

Society of Arts.

The BUILDER

AN

ILLUSTRATED WEEKLY MAGAZINE,

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,

SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word To BUILD is the Anglo-Saxon Byldan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

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VOLUME FOR 1878.

OFFICE: No. 46, CATHERINE STREET, COVENT GARDEN, LONDON, W.C.

Wyman & Sons, Printers,
Great Queen St., London, W.C.

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VOL. XXXVI. No. 1822.—SATURDAY, JAN. 5, 1878.

The Builder

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Best Wishes for the New Year.

FOUR days ago every one was wishing every one else "A happy New-Year." Letter-carriers were staggering under the weight of bags in which the ordinary modicum of regular correspondence was almost swamped amid the heaps of envelopes conveying hundreds of thousands of cards, all representing different methods of expressing the same wish, through the medium of verse not quite immortal, and with various embellishments of colour and gilding, figures and flowers. We are necessarily therefore a few days behind-hand in repeating the same good wish to all our readers; nor do we accompany its expression with any gauds of gilding and colouring overlaying our sober page. For the first deficiency the calendar alone is to blame;

> The fault, dear readers, is not in ourselves,
> But in the stars——

that four days of 1878 have elapsed before our usual opportunity of speech has come round; and as to the second, our part has mostly been to tell a plain, unvarnished tale, depending for its interest on trustworthiness in regard to fact and soundness in regard to theory, and often necessarily dealing with subjects which, however important in their bearing on public welfare, are hardly adapted for an ornamental setting.

Which remark, perhaps, may fitly preface the only special observation we have here to make in regard to our future course. Generally, we may say that the *Builder* is prepared to hold by the principles and method which have governed its conduct as a journal from its commencement, and that the coming year will find us, we trust, carrying on the work we have set ourselves with no abatement of zeal or energy; and of the nature of that work, and the manner in which it has been carried on, all our readers can judge for themselves. But perhaps we may take the opportunity further to observe, that if there is less space devoted in our pages to what it is the fashion to consider pre-eminently the æsthetic side of professional work than some enthusiasts would be satisfied with; if we pay greater attention to questions regarding the healthy and economic conditions of building than to the latest artistic fashions in furniture and decoration; this perverseness is the result of conviction and principle, not of carelessness as to what is going on. To everything, indeed, that concerns the artistic side of architecture proper, as the art of building with expression, whether in regard to the past or the present of architecture, we have always attached its full value,—always been forward to discuss and to illustrate it. But it is one thing to do this,—to recognise and endeavour to illustrate the principles and motives which lie at the root of all great architectural work; it is quite another thing to render our journal a medium for reflecting and coquetting with all the passing fashions, all the *pensées fugitives*, now more rife and more rapid in succession than ever, in regard to what society chooses in this or that decade to consider as essential to "good taste." These modern fancies for the reproduction of art of other times and other nations are not, perhaps, altogether bad, any more than they are altogether good. It may be that to care about having your houses and your rooms in some exotic or antiquated style, if it be a good and picturesque style in itself, is better than to have them absolutely ugly or in no style at all; though it must be confessed that there is something also to be said in favour of reality and honesty of purpose even when unaccompanied by "the æsthetic." But, at all events, it is not our province to court the approbation and sympathy of "Sir Visto": still less to adopt a view of the work and position of an architect which would bring him to the level only of a kind of superior class of upholsterer; a position which members of the æsthetic clique of the profession seem absolutely to court and to pride themselves on: so much so that we heard of a decorative architect coming to a more practical brother for information as to some every-day point in regard to drainage, with the remark, "I don't know anything about it myself, and I don't want to know." It would, we imagine, have been small comfort to the persons who might inhabit this gentleman's houses if he had provided them with hangings and wall-papers in perfect taste, accompanied with the chance or probability of some of them dying of fever from the effects of sewer gas: and these persons who "don't want to know" should keep a shop for "artistic" upholstery, and give up the name of architect or "chief builder" at once. "Then, do we wish to make drainage the basis of architecture?" By no means, in that literal and restricted sense. But we do wish to dwell upon the fact,—to reiterate it until it is acknowledged,—that the basis of architecture is practical and not sentimental; that in the first instance it is and must be, if it is to have any truth and reality in it, the effort to meet satisfactorily the increasingly difficult problem of realising the best conditions for healthy and happy life in towns, since in towns we must live; that "healthy" comes before "happy," as its necessary condition; and that in like manner sanitary building comes before beautiful building, and *a fortiori* before upholstery; and that the true and real basis for that originality in modern architecture which is so much cried after, lies in finding first the best practical conditions of building, and then superinducing upon them the best and most interesting architectural expression of which they are capable, and which will in that case be likely to be original and true, because it will be, what all real styles of architecture have been, the expression of the real building wants and building necessities of the day. To adopt styles and fancies in window-dressings and furniture, and call them "taste" (though such fancies, as indicating a movement of society, may not be without their interest), is to put the cart before the horse. This is what the people do who "do not want to know"; they are at present a large class, outside as well as inside the profession, and our business is to see that they shall know.

And we shall hardly be wandering from the same subject if we give to this principle of the useful before the beautiful a rather wider application also. As in the single building, be it college or mansion, suitability and healthfulness in regard to plan, and site, and use of material, form the basis of everything else; so also in the architectural expression of the life of the community at large. It is working at the wrong end to cry out for fine buildings and sculptured and mosaic decorations here and there, in the wealthier parts of a city especially, unless the same attention is being paid to the improvement

of the mass of dwellings, both in their suitability and pleasantness for human habitation, taken in detail, and in their architectural graciousness when considered *en masse*. No doubt it may be said that while the people have and apparently can have, no pleasure and no beauty in their homes, it is something to give them fine buildings and great monumental works to look at, by way of giving them an impression of something better and more inspiriting than the neighbourhoods in which they live can furnish them; and there is much reason in this way of putting it. Only practically, we fear, it will be found that the people do not appreciate these means of escaping from the commonplaces (and worse) of their surroundings so much as is sometimes supposed. For example, it may be said that the Westminster Palace is a great national work, a great ornament of London, open to the view of all classes alike,—something to gaze at with admiration,—and, as such, a boon worth paying for from the most philanthropic point of view: and to many it is this. But, *per contra*, we heard not long ago, from an informant who had every means of being sure of his facts, that, on the occasion of some popular procession to the House some little time since, many men who joined in this, and had lived all their lives about three miles east of Westminster, saw the great building for the first and perhaps only time in their lives on that occasion. That one fact will give to some a new idea of the state of isolation in which a great portion of London lives in regard to any architectural splendours in the more favoured regions of the great city. There is much architecture for the few going on; but where is the architecture for the many? That is the problem awaiting solution, and it is not too much to say that it would be a greater work for modern architecture to render the ordinary street dwellings of our towns healthy and pleasant to the sense of fitness and thence of beauty, than to rebuild, if we could, all the monuments of Mediæval church architecture in their pristine beauty and grandeur.

And so, if we endeavour to put our best wishes for the New Year into more definite shape, we may extend them rather further than mere wishes of success to our professional readers, having in view not only the ultra-professional extent of our circulation, but also the wide-bearing of the motto which has so long stood on our title-page, and which claims for the word *build* such a far wider meaning than relates to the mere putting together of bricks and mortar. Not that we would by any means overlook the lesser and more personal part of our good wishes. We heartily wish our professional friends increased occupation for their talents, and that they may find clients educated and liberal-minded in their ideas, and with good balances at their bankers. And we wish such clients may find architects who will ably carry out their wishes to a complete success; and that those clients whom Providence has made stupid, and who want they know not what, will find architects who will tell them what they want and produce it for them, even as Joseph interpreted Pharaoh's dream; a part, by the way, that an architect is so often called upon to act, that one might think Joseph should be a more suitable patron saint of the profession than Thomas, who, we believe, holds that responsible post, for reasons best known to "hierarchists." But more than all this do we wish to see the application of architecture to the needs of modern life put on a firmer basis; to see an aim recognised of more lasting and practical importance than the mere mimicry of passed-away fashions of building or furnishing; to see the profession practised in relation to the good and enjoyment of the people at large, rather than of a comparatively few "persons of taste" or ecclesiastical revivers (though these last, we think, are coming near to the end of their tether). The passing of the "Artisans' Dwellings Act" has been a step in this direction, but progress is very slow, and the work to be done is enormous in its extent and importance. We wish, too, to the two classes of building operatives, if we may use the term with a more general application than usual, the contractors and the manual labourers, who are now in such unfortunate opposition to one another, the temper and wisdom to take the right and philosophic way out of their dissensions, by a calm consideration of what the circumstances of trade really render possible for either side, instead of maintaining an attitude of drawn swords and "no surrender," which may look very heroic in a certain sense, but is certainly very injurious to the interests of both, and to the community at large. An arrangement should be come to at once;—not to-morrow, but to-day. We wish London, and other places which are in similar difficulties, a speedy solution of the question where they are to find water to drink. We wish the Metropolitan Board of Works a keener sense of its duties and responsibilities, or else a despotic head to enforce a quicker and more efficient performance of them. We wish the obelisk a safe landing and a suitable position. We wish to see a Southern Embankment to the Thames commenced: and we particularly wish some physicist would tell us what to do with our sewage,—if our own view, irrigation, is not always the right one. We might go on wishing for some time; but we content ourselves with calling to mind some of the things that most want doing, that have been most neglected and postponed, and most blundered over; and we wish the coming year may find some people taking profit from the lessons and reminders of the past in regard to some of these matters, and that the new year may at least improve on the doing of his predecessor, conjuring him thereto in the form of incantation left us by Burns:—

> "O *Seventy-eight*, thou's but a bairn,
> An' no owre auld, I hope, to learn!
> Thou beardless boy, I pray tak' care,
> Thou now hast got thy daddy's chair;
> * * * * *
> Be sure ye follow out the plan
> Nae waur than he did, honest man!
> *As muckle better as you can.*"

REPLY OF THE METROPOLITAN BOARD TO THE CHARGE OF POLLUTING THE THAMES.

SIR JOSEPH BAZALGETTE claims a victory over Capt. Calver, with regard to a hasty statement of the gallant officer, of which the Engineer to the Board of Works naturally makes the most. It is of great importance that the attention of the public should not be drawn away to any bye-issues from the vital points of the question of the safety of the Thames. Tactics of that nature are ordinary, and are well understood by tacticians. Their value consists in the fact that they are not usually understood by the public at large. A man may be very feeble, very ignorant, and very prone to magnify trifles, and yet may be the means of bringing before the public a question of imperial weight. The relief of an ancient capital from the pressure of famine by the occurrence of a sudden panic among the besieging army, was none the less welcome to the beleaguered and starved garrison from the fact that the first intelligence of the welcome change was brought by two lepers. We refer to such a case as this, not as being in any way analogous to the present, but as an outside instance of the truth that to disparage a witness on certain points, or even on material points, is one thing; to overthrow the main gist of his evidence is another. And even beyond this, such disparagement should rather show the need for further, and exhaustive, examination of the case, than have the result of confirming the position on which the evidence was calculated to throw a doubt.

We can speak with the more impartiality in this matter, because we made no use of those figures which Sir Joseph Bazalgette now impugns, but relied on calculations of our own, drawn from independent and reliable sources. It would thus be far more to the point for Sir Joseph Bazalgette to direct his attention to the arguments of the *Builder*, than for him to criticise statements instead of weighing facts. Mr. Mechi's intervention in the matter at the present stage, highly as that gentleman must be respected for his agricultural example, is also somewhat to be regretted, in so far as it tends to divert the public attention from the main and central facts.

Sir Joseph Bazalgette now estimates the solid contents of the sewage discharged into the Thames at Crossness at 89,063 tons per annum. Our own figures (p. 1261, vol. xxxv.) were 90,000 tons; showing a very close accord with Sir Joseph, although made from independent data. Reverting to those original figures which are thus satisfactorily verified, we find that they gave the result that the solid elements of the sewage of three millions of people amount in a day to 262 tons. To this has to be added the further quantity of 20·28 tons of soluble salts or other ponderable chemical substances. The minimum flow of the Thames has been taken at 380 millions of gallons in a day. The mean summer flow is estimated at about 440 millions of gallons per diem. This mean is of course raised, as an average, by the occurrence of floods. But floods, as a rule, bring down far more *débris* and accumulations of all kinds than occur in the usual contents of a river. In the case of a city, a very large quantity of organic matter is brought down by floods. Thames is far fouler to the eye in flood time than at any other. It will therefore, be unwise to regard the flood volume of the Thames as a figure which proportionately increases the average daily mean, when it is a question of purity. From 400 to 500 million gallons per diem is the utmost that can be taken with safety as representing the mean flow of the Thames; although it has to be borne in mind that the difference between flood and summer flow is about the ratio of 4 to 1¼.

Four hundred and forty millions of gallons is two millions of mètric tons of water. We have seen that from the sewage of three millions of people we obtain a certain definite quantitative result, as to which we are at one with Sir Joseph Bazalgette. If we take the present population at the figures given by the Registrar-General for the 698 miles of "Greater London," we have upwards of four millions and a quarter of souls, or more than a sixth of the total number of Englishmen residing at home. The proportionate contributions of solid matter, insoluble and soluble, derived from this population, amount to 371 tons of the former, and 28 tons of the latter, per diem. This, of course, is independent of any of the products of cleansing, cooking, manufacture, horse traffic, animal refuse of any kind,—in fact, of all the obnoxious products of the ordinary routine of civilised life with the exception of those arising from the process of digestion. But of the former elements alone we find that 371 tons of suspended, and 28 tons of dissolved, obnoxious matter are daily thrown into two million tons of water. This is equal to one part in 5,350 of the former, and to one part in 71,000 of the latter.

The definitions given by the River Pollution Commission of 1870 as to what is to be deemed pollution of water condemn as contaminated,—(1) any liquid containing in suspension more than one part by weight of dry organic matter, or more than three parts by weight of dry mineral matter, in 100,000 parts by weight of liquid; and (2) any liquid containing in solution more than two parts by weight of organic carbon, or three parts by weight of organic nitrogen in 100,000 parts by weight of liquid. If we take these limits as present in the same liquid, and add together the three parts of mineral matter, one of organic matter, two of carbon, and three of nitrogen, we have a total amount of these foreign elements of nine parts in 100,000, or of one part in 11,111 by weight of water, stated as the utmost permissible in water that is to be regarded as uncontaminated.

But if we add together in the same way the suspended and dissolved foreign elements which we have seen to be contributed daily to the Thames from the result of the daily food of the inhabitants of Greater London, we find one part of foreign matter must be present in every 5,000 parts of water. Thus the steady daily pollution of the Thames by the discharge of the metropolitan sewage is equal to two and a fifth times the admixture of foreign matter which the River Pollution Commission have declared to be the limit of safety.

It may be urged, perhaps, that the entire sewage of Greater London is not yet thrown into the Thames, and that to this extent our figures are exaggerated. But we reply that our inquiry relates not only to what is the case to-day, but also to what will be the case five, ten, or a hundred years hence. We are dealing, not with isolated facts, but with the outcome of a system. The system which we arraign as pestilential is that of the discharge into our great river of the crude sewage of the inhabitants of the metropolis. If there be a portion of that large area of 698 square miles which is not yet drained into the river, such a fact constitutes only a temporary exception to the general rule. The Board of Works contemplate that such drainage shall, sooner or later, take place. Unless the system be radically altered, when the amount of pollution we have indicated will occur is a question of time alone. If we consider 3¼ instead of 4¼ millions of people to be at present accommodated, we still find that the daily pollution is nearly twice

that allowed to the residents on the bank of any other river. It is not a question of two or three grains more or less per ton of water. It is the broad fact that a rate of pollution already denounced as dangerous will increase under the present order of things, with the normal increase of the metropolis, with which we have to deal. And it is not our intention to allow the public attention to be diverted by any side issue from that main and alarming fact.

This matter is not to be disposed of by a jaunty air. It is not to be treated as a subject decided on once for all, as to which the door is shut with reference to any new evidence. The real gravity of the case is not diminished by the fact that any misstatements have been made in the report to the Conservators of the Thames. We regard the action of that body as of great importance, not because the Conservators, or their hydrographer, have more pertinent and reliable information as to the gist of the case than we have ourselves been able to bring before the public, but for a reason of quite another order. The Metropolitan Board is the most powerful body connected with the local government of London. For good or for evil they have adopted a certain plan; and not only so, but have put their foot down, so as to refuse any modification of that plan. Against a body of this kind, that has dealt with many millions of public money, and that has recently shown, by the express declaration of its members, that it is not afraid of expense, when the question is of many millions more, it is hard for any voice to be uplifted with utility. The plainest scientific truths may be urged, but experience shows that they will be treated with scant respect; and either met by absolute silence, or shelved by the introduction of a side issue. But with the Conservators of the Thames this will not do. That body of men may be met, and, no doubt, will be met, with the most determined resistance by the Board of Works. But there will be, at all events, an opposition. There will be a fight before Parliament. There will be evidence brought before the public that those who dread the continued and aggravated pollution of the Thames have at least the mass of scientific evidence and the judgment of Royal Commissions, on their side. As to the proper function of the Conservators, the protection of the channel of the Thames, we intimated in a former article (p. 1262, vol. xxxv.) that the physical, or, rather, mechanical, part of the subject was not of a magnitude to oppress a great commercial city. We may accept the whole of the two first paragraphs of Sir J. Bazalgette's letter in the *Times* of December 28th, without having to modify a single word that we have written on the subject, in either our present or our former article. We have simply to call attention to the fact that Sir J. Bazalgette deals with only one specified portion of the solid matters thrown into the Thames by the Metropolitan Board of Works, as to which his figures verify our own. That 180,000 tons per annum should be substituted for 1,425,000 tons per annum does not concern us. Nor does it, so far as we see, much concern the real question before the public, which is, not the greater or less amount of dredging which the metropolitan nuisances will impose on the guardians of the river, but the slow, steady, and certain poisoning of the Thames and of those who dwell on its banks or drink its waters.

Mr. Mechi's intervention in the matter has again afforded to Sir J. Bazalgette an opportunity to show himself in the right. Two distinct questions have now to be decided. First, is the present convenient and inexpensive way of dealing with the sewage of London safe? Looking to the future, is it practicable? Will its effect, unless modified, be pernicious to the health of the metropolis?—pernicious in a mode that may at any time, and must at some time, prove fatally calamitous? To that question, if any reliance is to be placed on the reports of the Royal Commission on River Pollution, there can be but one reply. But the great point is to obtain that reply. This is the question now to settle. Next will come the second question,—If the present mode will, sooner or later, become intolerable, what is to be done? As to this, after long study of what has been thought, written, and done on the subject, we are not unprepared with a reply. Of this, however, it is not yet the time to speak. But to urge, before the crucial question is settled, the old arguments of "ruinous expenditure" and "national suicide," is only to give an easy triumph to the counsel for the Metropolitan Board of Works. Sir J. Bazalgette stands on invincible ground when he says "The Local Government Report of last year thus sums up and epitomises all existing experience up to that time: 'We may again repeat that no chemical or other treatment of town sewage with which we are acquainted is a commercial success.'"

It is somewhat unfortunate that this question should come upon the *tapis* at the present moment. The imperfections of the water supply of London form a constantly-recurring subject for public complaint, and for private speculation as to methods of redress. The Metropolitan Board has at length made an effort to grapple with this subject. With regard to the specific plan suggested to, and adopted by, the Board, we were unable to give it our support. But it by no means follows that matters can be left as they now are. And the worst of the affair is, that the movement on the part of the Board which has received so very divided a support from the members of that body, and which the publication of the report to the Conservators of the Thames cannot fail still further to paralyse, seems to have had no effect at present but that of stirring up some of the water companies to make the most hay that they can before their sun sets. Complaints of bad service and of doubled rates have been part of the Christmas fare of the inhabitants of important districts of London,—complaints which apparently might have been addressed to the man-in-the-moon with as good effect as to the water dispensers, or non-dispensers. If any check or hesitation on the part of the Board of Works had the effect of inducing the water companies to do their best to set their houses really in order, the case would be different. But if the policy adopted consist in the argument that as the property of the companies is sure to be expropriated, sooner or later, the great thing is to swell its apparent value, and thus to raise the price by-and-by to be enforced, the water companies will be putting themselves in direct opposition to the interests of London. There is but too much ground to fear that this is the case. But if we regret, as we do regret, for sound reasons, that the question of the efficacy and sound principle of the Metropolitan drainage works should now be raised, it is not because it is raised too early, but because it has not been brought forward early enough. It is a question that cannot be allowed to slumber for the sole reason that its discussion may discredit the Metropolitan Board of Works. Questionable as is the excellence of the present water supply, and urgent as are the demands of parts of London for improvement, the matter is hardly more urgent than the question of the daily pollution of the Thames. It is not the fault of the advocates of the primary principles of sanitary engineering, if this question of the pollution of the river is raised thirteen or fourteen years later than it ought to have been raised. By ourselves, among many others, repeated efforts have been made to call due attention to the case. We sympathise with the Metropolitan Board as to the confusion now added to their councils. But it is a confusion which we would have prevented. It is not one that can now be either smothered or concealed.

Objection has been taken to Sir J. Bazalgette's practical reply to the statement that great waste is incurred by the present disposal of the sewage. But that reply is a sound one. Not only so, it is a useful one. If at the present moment we are to re-open the long-vexed question of sewage utilisation, and to do nothing till that is settled in the way that its advocates wish, we shall continue to pump into the Thames till 1977,—if London be then in existence. The quaint confusion of ideas that calls upon Government to guarantee the profit of a professedly highly-profitable enterprise,—and that, not one to be wrought out in a dependency on the other side of the globe, but under our very eyes,—ought not to need much comment. It is urged at this moment, with as much vigour and earnestness by those who propose to supply the want of rain in India by making canals, which there will be no water to fill, as it is by those who propose to add to the national wealth by extracting 2d. per ton in value from a crude material at an outlay of from 3d. to 6d. But if we revert to the letter from Sir Joseph Bazalgette in the *Times* of the 18th of December, in which he has addressed himself with more serious care to the report of Captain Calver, our readers will see how far, in all that is positive in statement, Sir Joseph's admissions support our own arguments. The ordinary condition of river purity is shown, in that letter, to be at the rate of not exceeding two grains of organic matter in a gallon, or one in 35,000. It is thus clear that the steady contribution of one in 4,000 or one in 5,000 parts, to which we have referred, must be dreadfully obnoxious to the water in which that pollution is now occurring. The objection raised by Sir Joseph to the theory of Capt. Calver as to the upward movement of the sewage is very similar to that which we ourselves raised to the advocacy of a similar theory by the Astronomer Royal. But while we agree that if the case were such as has been unguardedly represented by these gentlemen, "the Thames and all other tidal rivers in the universe would long since have ceased to exist," the fact that there *is* an upward travelling motion of the polluted water is unshaken. It is the detail only which can be called in question. Again, the report quoted from Drs. Hoffman and Witt, which makes an allowance of "not greater than 250 tons a day of solid matter," is below our own, if only the matter of strictly human derivation suspended in the water be taken into account. Our own estimate for this, on the smaller amount of population contemplated when the data on which the figures are based were obtained, was only 209 tons instead of 250. It is in saying that the sewage is not only "highly diluted" (we have shown how highly), but further "oxydised and purified when tossed about in an ebb tide," that we join issue. "The process of purification is recognised when sewage is poured on land," says Sir Joseph. It is, and that fully, because it is an active and ascertained fact. That "it is equally true when poured into large volumes of flowing water," is an assertion which we take leave to question. At all events, the relative volume of water must be two and a fifth times that of the mean flow of the Thames for this dilution to take place to such an extent as to come within admitted limits of safety.

A point which has not yet received the attention that it merits is that of the relative volumes of the tidal and the fresh water contents of the Thames. Taking the results of the observations referred to in Mr. Redman's valuable paper (laid before the Institution of Civil Engineers on 27th March, 1877), we may average the rate of the tidal flow in the Thames at 2·8 miles, and that of the current at two miles, per hour. In five hours' flow, then, the tide will mount from Barking Reach for a distance of fourteen miles, or to one mile above London Bridge. The quantity of river water running freshly into these fourteen miles in seven hours of ebb, and pressing so to do in five hours of flow, will be, as before estimated, a million tons. The tidal contents of the same reach of river may be taken (with a mean 15 ft. of tide), at thirty-two times that amount. There is, therefore (or rather was when the Crossness pumping began), a tidal dilution of the water contaminated by the sewage, of 32 to 1. And in this fact lies the key to the question,—why is the polluting influence so slow in its accumulating nuisance? This body of water travels up and down, exchanging, in each double journey, a thirtieth (or rather a thirtysecond) of its volume, by receiving a million tons of fresh river water, and sending seaward a million tons of mixed sea water, river water, and sewage. But with this amount of purification per tide has to be compared the influx of 200 tons of fresh solid matter from the sewage. Thus though the dilution was in the first instance so considerable that it might be neglected with apparent reason, the steady increase of sewage matter which must incessantly accrue, under the fatal pollution of the Thames up to Westminster Bridge, is only a question of time.

This view of the case is independent of the precipitation of suspended matter to the bed of the river. That will, of course, chiefly take place where the tide meets the current,—either as the flood just rises on the ebb, or at slack high water. And there is ample evidence to show that while the Thames, with the Seine, and other tidal rivers, is constantly shifting, as well as increasing, the shoals and sand banks of its estuary, so is it also constantly shifting, as well as increasing, the silt beds, mud beds, or whatever we call the deposit, in the Pool and higher reaches of the Thames, and that, to some extent, as far as the tide rises. This is quite consistent with increased scour and deepening of the Channel in some places. Leaving this question to the Conservators, the question of the soluble contents of the river is not less im-

portant. Sir J. Bazalgette says, with perfect correctness, "ammonia and its salts are soluble; the same may be said of the salts of potash and soda, and as these things are, so far as they exist, dissolved, not suspended, in sewage, they can no more form deposits of solid matter from such sewage than the salt of the sea-water can form banks upon the sea coast or in the depth of the ocean." That is to say, there is no tendency to self-purification of the water from soluble obnoxious substances. In fact, we have a gradation supplied by nature, from the 2 or 3 per cent. of saline matter in the water of the Caspian, to the 24 per cent. in that of the Dead Sea. Whether we take, then, the figures above given as approximately those of mean volumes, or whether we take, with Rennie, the outfall of the Thames in twelve hours at 1,611,562 tons of water, and, with Mr. Redman, the tidal volume for the whole distance from Gravesend to Teddington at 107,544,643 tons of water, the principle involved is the same. The daily oscillation of the tide, while the daily quantity of sewage is in excess of the harmless proportion of dilution due to the mean outflow of the river, must cause a constant mixture of the matters held in solution in the reaches of the river from Crossness to Battersea, which, however slow, has an accumulating effect, and which must be ultimately destructive to life in or on the borders of the river. We shall be only too glad to see any plain scientific reply to this very formidable problem.

THE TROY COLLECTION AT SOUTH KENSINGTON.

As our readers are aware, the collection of articles found at Troy or Hissarlik (whichever name the reader pleases to give it) by Dr. Schliemann, have been arranged, under his superintendence, for public inspection at the South Kensington Museum. We have kept our readers so fully informed in regard to the details of Dr. Schliemann's Trojan discovery, as described by him in his book and in the various lectures which he has delivered in England, that there is hardly room for any fresh description or comment upon the objects now arranged for inspection, in regard to their artistic or historic significance. His fully-illustrated volume conveyed to his readers a clear impression of the nature of every type of relic that had been found; and many of the objects exhibited are simply slightly-varying repetitions of what is already widely known through his book. In saying this we are by no means intending to convey the slightest depreciation of the vivid interest attaching to the collection. Every object which is of real and undoubted antiquity is worth preservation for its own individual sake, even though there be many of the same kind and of great similarity; and there is all the difference in the world between merely reading about such things and seeing illustrations of them, however faithful, in comparison with the interest of beholding with our own eyes (as by Dr. Schliemann's courtesy we are enabled to behold them) the things which have been utensils or the playthings of a human society whose existence had passed away before history, in the ordinary sense, had a being. Therefore we counsel all who are within reach to go and visit for themselves this most interesting collection, which will be found in the second court of the Museum. No catalogue of the objects has as yet been published, nor do we know whether there is any certain intention of printing one. But, in fact, we doubt whether, in view of the plan of arrangement which has been made, a catalogue would be of any real advantage, or would tell any one what he could not see for himself. The following simple plan has been adopted of enabling the visitor to classify the objects for himself: each separate article has pasted on it a label representing in printed numerals the depth in feet below the surface at which it was found, and a sectional table showing the different strata of the remains, and indicating what, in Dr. Schliemann's view, is the nature of the contents of each, is framed and put up for inspection at various points. The section divides the strata of remains into a lowest stratum of from 52 ft. to 33 ft. in depth, representing the first town on the site; over this comes the stratum containing the remains of the supposed Homeric Ilium, from 33 ft. to 23 ft. depth; then a third stratum of work of the same type, but generally inferior in quality, bringing us up to a level of 13 ft. below the present surface; a fourth stratum of about 5 ft. in thickness; and the remaining upper stratum representing the relics of Greek Ilium, from which comes, among other pieces of most interesting and beautiful Greek work, the metope, with the figure of Apollo, with a nimbus, driving his four-horsed chariot, which was figured as a prominent object in Dr. Schliemann's book, and is now to be seen among his other treasures, a beautiful specimen of spirited and well-preserved bas-relief, almost purely Greek in character, except for the manner of representing the nimbus or rays round the head of the sun-god, which is done in a way that would have been at variance with the reticent character of pure Greek art.

What does strike one in looking at this collection of very ancient work is perhaps its generally practical character, accompanied, however, by one or two vagaries of design. We are speaking now mainly in regard to the clay vessels which form by far the largest portion of the collection. There is a particular form of jug that recurs in most of the strata, in which the ordinary form of jug lip for pouring out the liquid is lengthened out in a manner that gives the vessel a peculiar character, which, however, is derived strictly from the aim at practical convenience, and is, therefore, on the most rigid principles, a specimen of "good style." We find, however, this class of vase occurring in a "Siamese-twin" sort of form, two bottles joined together at the widest part of the body, in a manner which looks, at first sight, like a mere whim; or one bottle with two necks and lips closely adjoining. But we may presume that the object in this case was not whim, but the economy of time and exertion to be realised in filling two cups with one action. There is one little vase which has the two spouts in the same plane, one behind another, which does not seem so intelligible. Then, again, still looking at the practical side of the collection, there are rather flat bottles, very nearly similar in shape to the kind of flask now used to convey a small dose of wine or spirits by a railway traveller or a sportsman; and Dr. Schliemann calls these, with some show of reason, "hunting-bottles." The vases which present most real elegance of form are the long double-handled specimens, which, however, are less shaped for practical use than some others, as it does not seem that they will stand alone, except when empty and inverted. We failed to detect, in comparing, by means of the numerals attached, the products of the lower and the upper strata, any marked or progressive distinction in the style of design or of workmanship, as a general rule. It appeared that the products of the later and upper strata were occasionally distinguished by an attempt at ornament by incised grooves round the neck, &c.; in this respect differing from the older ornamented vases, where the ornament consists mainly of somewhat rough incisions or dents, made with a tool when the clay was still soft, in most cases following a rude design, in some cases merely hacked irregularly over the body of the jar. The most interesting of all the earthenware relics is the large jar which formed one of the illustrations which we were enabled to give in connexion with our first notice of Dr. Schliemann's book, which represents not only, as in many other cases, the owl-head, and the indication of breasts on the body of the vase, but also an ornamental belt crossing the body obliquely between the breasts. If there had been any doubt otherwise, what these protuberances on the body of the vessel were intended to mean, their anthropomorphic significance (*gynaiko-morphic* we should perhaps rather say) would be set at rest by this one vase, in which the belt occupies exactly the position constantly occupied by an ornamental or decorative belt in almost all countries. The large case of incised "whorls," as Dr. Schliemann calls them, is one of the most curious and puzzling parts of the collection, and we can hardly think that the real meaning of these numerous repetitions of one form (he exhumed some thousands of them) with varying markings on it has been satisfactorily determined. Nor can we feel at all sure that Dr. Schliemann is not rather libelling the original owners and inventors of these articles in giving the name of "idols" to the little spatula-looking objects which are ranged in one of the smaller cases; one might almost as well put up one of the old-fashioned flat-bowled ivory salt-spoons as an idol; the articles hardly seem designed to represent anything so important as a god.

But in regard to the contents of the treasure-chest which Dr. Schliemann dug out of the side of the bank with a knife in the manner which he has so graphically related to us, in fear and trembling lest his griping workmen should hear of and endeavour to "loot" it, and which, but for his and Mrs. Schliemann's spirit and readiness, we should never have had the opportunity of seeing at all,—in regard to this central part of the whole collection, there is no room for doubt or question at all. There is the ancient battered hinge, of admirable construction to combine strength with effective appearance; there is the key, rusted, and with its "wards" reduced to one mass, but as veritable and unmistakable a key in general shape and proportion as if Chubb had made it. There are the elegant twisted bracelets, but little out of shape, which the beauties of that long-lost town of Asia Minor wore, and the pins which they used to fasten up their hair or their dress; and there are two specimens, in wonderful preservation, of the beautiful gold head-gearing which must have been one of the most picturesque and rich-looking personal decorations of this kind ever invented, and which looks now so bright and complete that it might be taken just as it is, and worn by a modern beauty at a ball of to-day, with its fringe of gold pendants hanging down on the forehead, and its graceful and elegant side lappets drooping nearly to the shoulders, and forming a framework or setting for the countenance. Both these and the gold chains that are shown are most artistic in design and workmanship, and they all exhibit that delicate and refined treatment of the metal, in thin laminæ, which shows so true an instinct in regard to the treatment of the material, and is such a rebuke to our modern vulgar way of treating the metal in thick and solid pieces, as if mere cost of material were an element of design. This delicacy and reticence in the treatment of gold is the more remarkable, too, when we consider how obviously plentiful the metal was in those days, and in the East, in comparison with its scarcity among us.

There is one object in the collection which has been less dwelt upon and will be of less interest, perhaps, to the majority of visitors than many others, yet which seems to us to be worth special notice. This is one of the skulls contained in the same case which holds the large belted and breasted vase before mentioned. There is one, "probably of a woman," which presents nothing so special for remark, except the even and regular backward slant of the whole profile (as far as a skull indicates profile), though the head might have been a tolerably refined and intellectual one in a peculiar fashion; but the other skull, found, as we see from the label, in the Trojan stratum, is so extraordinarily *animal* in character, with its narrow receding forehead, projecting jaws, and powerful teeth (the latter almost entirely perfect) that if we are to take this as any typical specimen of the men who were engaged in the conflict about Troy, and who were the authors of much of the work exhibited here, we must come to the conclusion that in spite of the glamour thrown around them by Homer, they were, if physiological character means anything, a set of ruffians very low in the scale of existence. Certain Homeric critics have already drawn this deduction, mainly from the peculiarly barbaric acts of Achilles and the matter-of-course manner in which they are regarded, besides the general style of the hand-to-hand combats of the Iliad: it is certainly curious to find among these relics a skull so exceedingly calculated to confirm this uncomplimentary estimate of "the heroic age."

The Civil and Mechanical Engineers' Society.—The first meeting of the session was held at 7, Westminster-chambers, on the 20th ult. After a vote of thanks to the retiring president (Mr. R. M. Bancroft) had been accorded, the president (Mr. H. Valpy), M. Inst. C.E.) read the opening address. He expressed the hope that Mr. Dixon, who read a paper before the society last session on the transport of Cleopatra's Needle, might soon see his labours crowned with success. Allusion was made to the ventilation of sewers, and a plan was advocated for exhausting the sewer gases and burning them at stations out of London, instead of allowing them to force their way into the streets and houses.

DOINGS IN EDINBURGH.

OUR readers are aware that the cathedral church of St. Giles was, at the Reformation, converted into three separate churches. One of these, forming the south transept, has been vacated by the congregation lately worshipping in it, for a new church provided for them in Jeffrey-street. Dr. Chambers, the chairman of the Restoration Committee, has called attention to this circumstance, with a view to having that part of the fabric brought into unison with the newly-restored choir. This, it appears to us, cannot be done effectively unless the north transept, now used as a vestibule for the three churches, is taken into account, and included in the scheme. It unfortunately happens that the nave has only one independent entrance at the west end, and against that the pulpit is placed; but some means might be devised whereby entrance and exit to the nave might be obtained without interfering with the transepts and choir, such as throwing a screen across the north bay of the transept, and making an entrance to the north aisle of the nave. Both transepts are in a deplorable state; they are a disgrace to the city, and call loudly for reform. Were both transepts united with the choir, something of the aspect of a cathedral would be imparted to the interior, but by dealing with the south transept only, a lop-sided, unsatisfactory effect would be produced.

That something should be done to St. Giles's is all the more necessary when it is seen that the cathedral church of St. Mary begins to assume so stately an aspect. The work there is being vigorously carried on. The nave is now roofed in and slated, the slates used being of a pleasing green hue. The interior is still encumbered with scaffolding, but enough can be seen to give one some idea of the general effect. The bays of the nave are six in number, and are marked by pillars, cylindrical and octagonal in section alternately. These have boldly-carved caps, from which start clustered shafts to support the main ribs of the roof, which is groined in oak; these are alternated by single shafts springing from corbels above the apex of the arch of each bay. The ribs of the groining are ornamented on either side by the dog-tooth enrichment, and at the intersection there is a quatrefoil at the height of 84 ft. from the floor. The triforium has clustered shafts, with carved caps, and the arcading is richly moulded and decorated with the dog-tooth. The clearstory contains coupled two-light windows, with a quatrefoil at the apex, and the mouldings are richly adorned by carving having the peculiarities which characterise the early ecclesiastical buildings of Scotland.

One of the instructions to the competing architects was to the effect that the interior should be so arranged as to accommodate a large congregation within sight of the choir. The transepts have one aisle only, and the bay next to the choir has been carried off diagonally, thus affording those who may be in the transepts a view of the choir. This appears, as yet, to be the only peculiarity in the internal arrangement, and the effect promises to be good.

Passing to the exterior, we find that the architect has taken the detail of his west doorway from that of Holyrood Chapel, than which there is not a finer example in the kingdom. The great west window consists of four lancets deeply recessed and moulded, having a wheel above, all contained under a retaining arch. On either side the west towers are built to the springing of the gable, and are not to be completed. In the meantime, there are other two entrance doors, one at the middle of the north aisle of the nave, and the other at the centre of the south transept. Both of these are enriched with conventional carvings of birds, beasts, and foliage. The aisles of the choir and transepts have been built, the shafts of the former being clustered as a prelude to the greater adornment to be bestowed on that part of the edifice. The great windows in the gables are commenced. That of the choir is to consist of three large lancets deeply recessed and richly moulded,—the north transept of two lights, and the south of three lights; those in the transepts being surmounted by rose-windows of 24 ft. diameter each.

At the re-entering angles of the transepts are massive buttresses, which terminate in square pinnacles, having angle shafts, and from these flying buttresses are thrown to resist the pressure of the groining of the underpart of the great central tower, which has now attained a height of 85 ft.

Dean Montgomerie has intimated his intention of presenting to the cathedral a peal of bells, and several persons have expressed a desire to contribute stained-glass windows, so that there appears every likelihood of this great undertaking being satisfactorily carried out.

The newly-formed Free Church congregation at Mayfield, which, for the last twelve months, has met in the hall built as the nucleus of a group of ecclesiastical buildings, have now provided a residence for their pastor, and the foundations of the church itself have been laid. When completed these buildings will be *sui generis* in this city, as in no other instance has an attempt been made to unite in a group all the buildings connected with a church.

A site at the corner of Lauriston-place and Lauriston-park has been secured for the erection of a new Maternity Hospital, which is to be built at a cost of about 10,000*l*. The site is a suitable one, within easy distance of the Royal Infirmary, and close to Chalmers's Hospital. Part of the building fund has been contributed by the committee for raising a memorial to the late Sir James Y. Simpson, and the building is to be designated the Simpson Memorial Hospital.

Four years ago, the governors of Heriot's Hospital resolved to employ part of the surplus funds at their disposal in the erection of four new out-door schools. Two of these,—one at Davie-street and the other at London-road,—have been for some time in use, and a third has now been completed at Stockbridge, from the designs of Mr. Chesser, the architect to the governors. In this, as in all the other schools erected in connexion with their trust, the style of the parent institution has been followed. The building is two stories in height, and consists of a centre block and projecting wings. It is intended to accommodate 600 pupils, and the estimated cost is 5,800*l*. On the ground-floor are the class-rooms of the infant department,—one, 55½ ft. long by 34½ ft. broad; and the other, 21 ft. by 18 ft. The height of the ceilings is 15 ft., and cloak-rooms, lavatories, &c., are provided, and there is also a sewing-room, measuring 23 ft. by 20 ft. The rooms above correspond in dimensions to those on the ground-floor, but a height of 20 ft. is obtained by the ceiling being carried up into the roof.

A commencement has been made with the clearing of the site to be occupied by the new medical college. The houses occupying this site were built about a century ago, and that portion of them constituting Park-place consisted of what were then first-class city residences. One of these, of very graceful design, is considered to be the work of one of the brothers Adam. It was the town residence of the Campbells of Succoth, and was at one time occupied by Sir Islay Campbell, Lord President of the Court of Session. The last purpose it served was that of a seminary for young ladies. This house, Mr. Anderson, the architect of the College Buildings, proposes to re-erect and incorporate with the general design in such a manner as not to interfere with the æsthetic effect of the Anatomy Court, of which it will form a feature. Another of these houses belonged to the Taits of Harviston, and in it the present Archbishop of Canterbury was born, his mother having been a daughter of the Lord President Campbell above referred to. The interiors of these houses contain admirable specimens of mantel-pieces, doors, &c., similar in style to those so much affected by the modern Queen Anne School. These Mr. Anderson proposes to utilise as far as practicable in the new class-rooms; he also proposes to collect the numerous house-bells, have them melted and reproduced as one of the college bells, and of the wood of the trees in the gardens he would construct book-cases. The first portion of the new buildings to be proceeded with will occupy the southern part of the site, and comprise the departments of anatomy, physiology, practice of physic, pathology, and midwifery, as also the anatomical museum. The erection of these buildings is urgently called for, owing to the large yearly increase in the number of students attending the University. The number who matriculated this session is stated to have exceeded that of last session by 300, and some of the class-rooms are crowded to excess; and the appliances at the disposal of the professors are much behind modern requirements. To carry out the portions of Mr. Anderson's design absolutely required will entail a cost of about 188,000*l*.; towards this sum the public have contributed about 90,000*l*.; and the Government have promised to contribute 80,000*l*. conditionally upon the public subscribing the balance. In the meantime the College-hall and Great Tower, which form important features in the design, are to be held in abeyance.

On Monday, the 10th ult., a deputation waited upon the Lord Advocate with the object of urging upon his Lordship the desirability of the Government completing the Museum of Science and Art. It was stated that the proceedings connected with the origination of the museum began twenty-five years ago; that the Government acquired the property to the west of the University as a site for the building, the city undertaking to widen the narrow street leading to it to a breadth of 70 ft. The corporation have carried out their part of the agreement in a liberal spirit, having formed a new street of 80 ft. in width at a cost of 78,295*l*.; but, about four years ago, the Government suspended the annual grants, and the west wing of the museum remains to be built, although there is a number of valuable articles stowed away in cellars, where they cannot be inspected by the public. The sum required for the completion of the building is estimated at 30,000*l*.

Applications have been made to the City Improvement Trust by the directors of the School of Arts and the managers of the Normal School of the Church of Scotland for the purchase of the vacant piece of ground to the west of the former institution. The feeling was in favour of granting the site to the School of Arts, seeing that it adjoins their premises. It is only a few years ago since the new School of Arts was erected in Chambers-street, opposite the Museum, and it is satisfactory to learn that the increase in the number of students is such as to require additional accommodation.

The widow of Mr. Ross, the gentleman who presented to the city the large bronze fountain in West Princes-street-gardens, has bequeathed a sum of 1,500*l*., wherewith to erect a covered rock garden, and it has been remitted to Mr. McLeod, the superintendent of the gardens, to report as to the most suitable site for the rockery.

The mansion-house and grounds of Parson's-green, to the north-east of Arthur's Seat, and extending from the gate of the Queen's Park on the west, along the Portobello-road to Jock's Lodge on the east, comprising about thirty-six acres of ground, has been acquired by a limited liability company for building purposes. The ground-plan has been prepared by Mr. Calvert, architect, and is laid out for houses of various classes. The ground terminates at the west in a triangle, and this portion eastwards to the site of the lodge leading to the mansion-house is to be appropriated to workmen's houses; the frontage along the Portobello-road is to be devoted to shops with residences above, and to the south are crescents with ornamental shrubbery in front. Along the whole length of the southern boundary a road is to be carried, dividing the ground from the park. The ground is close to the North British Railway; the works of the company are at St. Margaret's, and an endeavour is to be made to secure a station to facilitate communication with the city.

The formation of the Metropolitan Cemetery, to the south of Morningside, and just without the city boundary, is progressing. We notice that a portion of the ground, which, from its swampy nature, has been considered unsuitable as a resting-place for the dead, has been appropriated to the living as a site for dwelling-houses. The site is below the level of the burn which bounds the ground to the north, and in wet weather was to a considerable extent under water. The burn, too, is little better than an open sewer for the adjacent lunatic asylum, and altogether the houses,—several blocks of which are already erected,—promise to be good feeders to the cemetery. It will be instructive to note the bills of mortality here, for the district generally is one of the most salubrious in the neighbourhood of the city.

We understand that the property in Princes-street, formerly the Alma Hotel, has been purchased for the Scottish Conservative Club. Property in this street now fetches large sums. The tenement forming No. 78, Princes-street and 2, Hanover-street, has been sold publicly at the price of 33,200*l*.; and generally household property throughout the city has of late risen very much in price, in some instances to double and three times its value ten years ago.

COUNTRY LIFE AND COUNTRY HOMES.

THOSE who have lost the freshness of youth, or have impaired their health in the dry routine of business or the rounds of dissipation, turn their eyes longingly towards the country, and gladly rush thither, when opportunity serves, to regain their strength and invigorate their minds

To the hard-worked student, or the man about town, the country reveals itself as a glimpse of another world: it is so still, so pure, so saint-like, so unlike their usual surroundings, so totally different from the bustle and confusion of the dense hives of industry and iniquity in which the greater part of their lives is passed.

Nature's perfumed breath and lovely face are charming to each of them. They raise the thoughts and expand the mind of the one, and pleasingly diversify the life and patch up the broken constitution of the other. To each the same idea presents itself; the idea that peace and happiness, health and contentment, are the inseparable concomitants of a country life and a country home. Vain mistake! The cottage that looks so charming in an artist's sketch, with the picturesqueness of a crippled roof and a time-marked exterior, is but a miserable abode when a miniature deluge pours in upon its inmates, and fitful draughts give rise to coughs, colds, and other ailments, and evil odours insensibly rob the strong arm of its strength, and break down the iron frame.

However pleasing a temporary stay in a village may be to the health or pleasure seeker, it does not appear in the same light to those who are born, grow old, and die in it. The stranger marks the foliage and the wealth of fern and flower, or basks in clover-scented fields in the spirit-raising sunshine, or inhales the morning air, strengthening and healthful, as though it had swept through the branches and borne away the fruit of the Tree of Life. The scenery, too, takes his eye; and, from his one-sided view of a country life, he derives pleasure from thinking of the morality, the happiness, and the occupations of country men and women.

Vain illusion, however! In villages, no more than in towns and cities, are found unalloyed happiness and spotless innocence. In them, as everywhere else, passions seethe and boil in the heart's cauldron, and petty jealousies and mistrusts are rife.

Nor is this all. Villages are collections of wretched and impure dwellings. Morality in them? The idea is absurd. The sleeping-apartments are insufficient to preserve even a slight show of decency; and men, women, and children are huddled away in a manner that baffles description. The sanitary arrangements are not to be compared for one moment with those possessed by the fowls of the air and the beasts of the field; in fact, there are none; or should they not be conspicuous by their total absence, they are conspicuous by their miserable makeshifts and deplorable shortcomings. The golden sun that floods the world with light, exposes the flagrant defects in the cottager's home. These cottages, with their adjuncts, are usually the vilest spots imaginable.

No one need envy the life of a cottager. The work is hard, and the wage scanty; the privations are many, and the pleasures few. Worn out with work, and with nothing to cheer him, he goes to roost with the birds, unless the village ale-house attracts him to its parlour. Well may cottagers exclaim, "Let us eat and drink, for to-morrow we die"; for there is nothing in the monotony of their lives to raise in them true conceptions of the dignity and the worth of man. If they possessed these conceptions they would not long retain their primeval simplicity, nor would they submit to be bound down as they now are. Ignorance and servitude appear to be twin sisters. Wherever there is enlightenment, feudalism is a thing of the past.

But there are bonds that are not lightly broken or set aside,—the bonds of affection and regard. Authors have loved to dwell on the patriarchal villagers, surrounded by a rising generation, descanting upon the virtues and traditions of the "family." The grey-haired enthusiast is becoming rare. His day is almost gone. Only in very few cases are there the simple confiding trust and regard once characteristic of peasantry. The locomotive has rudely swept away the cobwebs of sentimentalism; and men now openly advance their claims for just and liberal treatment, and regard those little occasional marks of consideration, so highly prized in the olden time, as their natural rights. As the villager feels more of the influence of the genius of civilisation, he too will take a firmer stand, and will demand, amongst other things, to be better housed.

Still, sympathy and generosity are everywhere recognised and appreciated; and by the judicious exercise of these admirable qualities the wealthy can make themselves loved, and their memories cherished, by those dependent upon them; but, alas! the wealthy, forgetful of their stewardship, are too often the votaries of fashion, and squander on their vices and follies sums which would add immensely to the health and comfort of the poor. The gulf between Dives and Lazarus is as wide and impassable in life as it is in death, so long as the rugged rocks of selfishness and indifference remain as a barrier, and frowning line its banks. These must first be removed, and only the milk of human kindness will remove them. It is when they fail to do this that public opinion is aroused, and they are censured.

The first duty of a landowner is to provide his tenantry, both large and small, with proper and substantial dwellings, with a sufficiency of sleeping accommodation, and with the utmost regard for the essentials to health, cleanliness, and decency; and when the occupants of the old rickety buildings have been transferred to more appropriate ones, the former should straightway be pulled down, and become, like serfdom and tyranny, of which they are fit emblems, shadows of the past.

At this day there are cottages unfit for human habitation, which have, nevertheless, to do duty each for a family. Not long ago the medical officer of a leading town in the North of England condemned some buildings as being uninhabitable, and a councillor asked if the tenants were weekly tenants, to which the medical officer replied that they were *very weakly* tenants; and although a jest on such a serious subject may seem to many somewhat akin to the "Dance of Death," yet underneath it there is a pregnant meaning not to be lost sight of in an age of opulence. Whilst wealth increases and luxury abounds, the homes of the poor remain as vile as ever.

Such buildings are common in the country. They are to be found with roofs partly stripped, staircases imperilling life and limb, damp oozing in everywhere, walls shaky, and windows and doors tumbling to pieces; and yet with persons living in them. What the condition of these persons is may be left to the imagination; suffice it to say that it is very different from the ideal conceived by the tourist. But when the cottager is stretched upon his bed, and sleep closes his weary eyes, the angel of God peacefully descends into his poverty-stricken abode, and tinges with a rosy hue the subject of his dreams; and, then, oblivious of his poverty and position, he smiles and feels that, although neglected, he, too, is human, and his heart is "warm with a flame out of heaven."

The Creator careth for His poor, and is mindful of those who feel for them, and endeavour to ameliorate their lot. How great the condemnation to be meted out to those who have the ability, but lack the will, to bring sunshine into their hearts and homes! The man that regardeth not his fellow man has verily lived in vain. Such a one should look firstly at his own studied ease and comfort, and then at the poor cottager, worse off than even his horses and dogs.

It cannot possibly be other than a source of pleasure to know that the poor are properly housed, and that attention has been paid to their welfare, both in a social and a sanitary aspect; and that, instead of a dull, miserable, plodding existence, their lives are gladdened with home comforts and joys before unknown.

When this desirable state of affairs is universal, and the minds of the poor are cultivated, their virtues will be amplified, and their failings diminished; and nowhere will there be found a nobler race of men than the cottagers of England.

BOW CHURCH, CHEAPSIDE.

THE celebrated vane of Bow Church—the world-renowned "dragon" of Cheapside—having during the past few weeks been under a compulsory "restoration," and quite recently restored to its place, we have taken the opportunity of collecting a few interesting notes about the equally celebrated church, the antiquity of which as an ecclesiastical foundation goeth back to the Conqueror's time.

John Stow, the earliest historian of the City of London, gives us a pretty good account of the church in his time; and, as his "Survey" is the standard book upon which all modern writers have built their descriptions, it may interest our readers to give a note or two about him. The son of a tailor, he was born in the parish of St. Michael, Cornhill, in 1525, and, as it happened in November, 1547, was admitted a freeman of the Merchant Taylors' Company,—the very month in which, 330 years later, the vane of Bow Church was taken down to be repaired. Stow's first publication was his "Summary of English Chronicles," in 1561; followed, in 1580, by his "Annales"; and, in 1598, by his "Survey of London." He died in 1605, and was buried in the church of St. Andrew Undershaft, but a few hundred yards from the spot where he was born, on the 8th of April of that year. And it is a curious fact that the monument to his memory erected therein by his widow was one of the very few City monuments that escaped the Great Fire of London in 1666. Another fact that has only just come to light (through the aid of Mr. Clode) is, that thirty years after being enrolled a freeman of the Merchant Taylors' Company, that guild granted him a pension in 1577 (just three centuries ago) of *four pounds per annum*, which was increased in 1600 to *six pounds*, through the exertions of the Master, Robert Dowe, who, in 1612, founded, among other charities, the custom of tolling the bell at St. Sepulchre's Church on the morning of executions at Newgate. Another "loving brother" of the same company was John Speed, the chronicler, who, being a tailor too, caused Spelman to remark that "we are beholden to Mr. Speed and Stow for *stitching* up for us our English history."

Well, our friend Stow tells us,—"At the upper end of Hosier-lane (Bow-lane in 1877) towards West Cheape, is the fair parish church of St. Mary Bow. This church, in the reign of William the Conqueror, being the *first* in this city built on arches of stone, was therefore called New Marie Church of St. Marie de Arcubus, or Le Bow, in West Cheaping; as Stratford Bridge, being the first built (by Matilde, the queen-wife to Henry I.). with arches of stone, was called Stratford-le-Bow." Stow then proceeds to tell us that the Court of Arches,—the Court of Appeal of the Archbishop of Canterbury, and a court which has become very notorious in the nineteenth century,—was held there from ancient times, and took its name from its place of meeting, the judge there sitting being called "Dean of the Arches." An interesting account of this Court is given by Newcourt, who was one of the proctors-general *temp.* William and Mary.

Now we do not propose to give an exhaustive history of this church, but rather to confine ourselves to data of interest. To begin, however, we find,—"The Chronicle of Florence of Worcester" gives us a very alarming account of a London tempest in A.D. 1091. "On Friday, the 16th of the Kalends of November (17 Oct.), a violent whirlwind, coming from the south-west, shook and threw down more than six hundred houses and very many churches in London. In the church of St. Mary, called at-the-Bow, it killed two men, and taking up the roof and its beams, and whirling it about hither and thither through the air, at length drove six of the beams, in the same order as that in which they lay in the roof itself, so deep into the earth that no more than the seventh or eighth part of them remained visible, their length being as much as twenty-seven or twenty-eight feet"! It must be borne in mind that the streets of London were not then paved, and that Cheapside was probably but marshy ground. A century after this,—in 1196,—Bow Church was again in trouble. William Fitz Osbert, alias Longbeard, ringleader of a mob of discontents against the rich, and, says Stow, "a seditious tailor," took possession of the steeple, fortified it, and laid up provisions there against an assault, the City authorities being determined to rid the City of the rioters. Longbeard refusing to come down, a fire was kindled at the bottom, and ultimately, sooner than be roasted alive, he and his eight companions surrendered, were condemned, drawn by the heels to the Elms at Smithfield (then all open country), executed, and hanged in chains. And yet this man, called by Stow "a deceiver, a secret murderer, a filthy fornicator, a pollutor of concubines, a false accuser of his elder brother," was actually believed a saint and martyr. Pilgrimages were made to Smithfield for many months after, and Archbishop Hubert was dismissed by the king for having been the cause of his death! Such were "the good old times."

Very nearly another hundred years after this, viz., in 1271, Bow steeple for the most part fell

down, and many persons were killed; while in 1284 another remarkable event is chronicled. In these times churches were blessed with the privilege of sanctuary, and if a murderer could only reach the sacred edifice he for a time was secure from arrest. Now Lawrence Ducket, goldsmith, having "grievously wounded" one Ralph Crepin, in Cheapside (then called West Cheap), he fled to Bow Church, but friends of Ralph followed him there, and after slaying him in the steeple, hanged up his body by the window as if he had committed suicide, which an inquisition duly recording, Ducket was buried in the Tower ditch. However, a boy who was hiding in the church at the time told the truth of the matter, and in the result no less than sixteen men were drawn and hanged, one woman was burned, others imprisoned, the church was interdicted, the doors and windows stopped up with thorns, and Lawrence Ducket's body was taken up from the ditch and decently buried in the churchyard!

Within the next two hundred years, events connected with Bow Church followed one another quickly enough, no doubt, but none of so sensational a character as those just recorded. But between these dates sprang into existence the predecessor of those famous bells which all true Cockneys have been delighted to hear from Whittington's time downwards. It is true that in the City Records in the year 1364, viz., the 37th of Edward III., we find a special order was made that no one should be daring enough to go wandering about the streets "after the hour of Curfew rang out at the church of our Lady at Bow,"—eight o'clock in the evening,—under the grave penalty of imprisonment in Newgate; but beyond this we are sadly afraid that we must disappoint all our modern believers in Dick Whittington's history,—at least, so far as Bow Bells are concerned. Nothing has yet been found corroborating the story, and it is not until half a century after our City hero's death that even the bell is mentioned again, viz., in 1469, when the Court of Common Council ordered it to be rung nightly at nine o'clock, and it was probably the same curfew, which was rung a century earlier, or a descendant, but certainly not that celebrated peal which echoed at High-gate-hill,—

> "Turn again, Whittington,
> Lord Mayor of London!"

Whether our Dick really did hear this Bow bell, history sayeth nothing, although our lamented friend, the Rev. Samuel Lysons, strongly suspected he did, and that it had been cast in the hero's native country,—at Gloucester, one of the earliest bell-foundries in England. But that is, of course, only supposition. But although we have all these doubts about the Whittington story, we can have none about Bow bell itself, for, registered at Somerset House is the will of John Don, proved in 1479, wherein he leaves to the parish two tenements in Hosier- (Bow) lane, for the maintenance of this very bell. And in obedience to the bequest the same was rung accordingly, and yet not always with sufficient punctuality to suit the City apprentices; for honest Stow records that they set up this rhyme:—

> "Clarke of the Bow Bell with the yellow lockes,
> For thy late ringing thy head shall have knockes;"

to which the clerk humbly replied:—

> "Children of Cheape, hold you all still,
> For you shall have the Bow Bell rung at your will."

And Stow further tells us that William Copland, the churchwarden in 1516, "gave the great bell, which made the fifth in the ring, to be rung nightly, at nine of the clock, and was first rung as a knell at the burial of the same Copland," by which we may presume that a peal of bells had by that time become tenants in Bow steeple, —for William Copland's will was registered between the years 1517 and 1520. Without going further into the general history of the bells, it may be interesting to note that Bow bell bears a date under the stock of 1669, that it was recast in 1738, is 65 in. diameter, 49 in. high, 4⅛ in. in thickness of sound-bow, and that the weight is 53 cwt. 24 lb., while the seven other bells were re-cast twenty years later, and two trebles were then added by subscription, the whole being rung for the first time on George III.'s birthday, 4th of June, 1762. Upon these bells have been rung many a merry peal, and, while thinking of this, it may not be out of place to note that the long-lost books of the "College Youths" Society of Ringers, of the dates 1637 to 1724, were recovered in 1820, and are now in the British Museum. The celebrity of Bow bells as the finest in the kingdom for melodious tones must be our excuse for dwelling so much on their history.

As to the church and its steeple, some general repairs, &c., after being several years in progress, were finished in 1512. "The arches or bowes thereupon with the lantherns, five in number, to wit, one at each corner, and one on the top in the middle upon the arches were also afterwards finished of stone brought from Caen in Normandy delivered at the Custom-house Quay for 4s. 8d. the ton." And it was intended (says Stow) to glaze the lanterns and put lights in them, so that travellers to the City should not miss their way. One of the "sights" seen in Cheapside in the sixteenth century is told by Machyn:—"The xxv. day of Marche, 1556, was oure Lady day, the Annunsyasyon, at Bow Chyrche, in London was hangyd with cloth of gold and with rich arras and cushions for the conveying of my Lord Cardenall Pole; ther dyd the Bysshope of Worcester dyd synge high masse mytyred; and ther wher dyver bysshopes, as the Bysshope of Ely, Bysshope of London, and Bysshope of Lynkolne, and the Yerle of Pembroke, and Ser Edward Hastynges, the Master of Horse, and dyvers odur nobuls." And on St. Thomas's day, 1559, the Archbishop of Canterbury attended the consecration of five new bishops in the church, while in February, 1561, the same author quaintly records the christening of Harry, son of Sir William Locke, "the wyche had nodur godfather nor godmother hymseylff."

The old steeple of Bow Church is shown by Hollar, and is more particularly exhibited on the ancient silver seal of the parish, dated 1580, which was dug up out of the ruins after the fire of 1666. It shows the upper portion of a square tower, with clock-face, Gothic window, and embattled cornice,—at each of the four angles a lantern, from which spring flying buttresses, of slender proportion, supporting a fifth lantern. Now, with regard to one of these lanterns, there are some curious historical evidences among the State papers in the Record Office. There is a certificate of the churchwardens, dated November 3rd, 1635, detailing the progress made in rebuilding the one lately taken down because it was dangerous. They had wrought up all the old stone, and had purchased 40 tons of new stone at an increased price, a restraint having been put on the supply from the quarry until the building of St. Paul's Cathedral was advanced. Annexed to this certificate is a minute, by Sir John Lambe, the Dean of Arches, releasing the churchwardens from excommunication, to which they had been sentenced for their negligence, and admonishing them to proceed at once with the restoration of the bow of the tower. There is another certificate, dated January 5th following, reporting progress, that all the stone had been wrought, and contracts entered into for rebuilding the lantern according to a model made. At the date of these repairs the rector was Jeremiah Leech, who had held it since 1617, who was subsequently sequestered for his loyalty, and died of grief in June, 1644, and whose wife, on November 13th, 1629, "drowned herself in the Thames," her body being found at Cuckold's Point.

A score years after this came to pass those terrible calamities,—the last Great Plague and Fire, 1665–1666. Of the former disease no less than 68,596 persons died in London in thirteen months, and of this total 7,165 died in one week ending 19th September, 1665! The population of London at that period was only 600,000, and a more mournful picture could not be painted than Evelyn, the diarist, records twelve days previously:—"I went all along the Citty and suburbs from Kent-streete to St. James's, a dismal passage and dangerous to see so many coffines exposed in the streets, now thin of people, the shops shutt up, and all in mournful silence, as not knowing whose turn might be next." And Pepys says:—"What a sad time it is to see no boats upon the river; and grass grows all up and down Whitehall Court"! And then came the Great Fire, which began its ravages at Pudding-lane (by the Monument) and ended at Pye-corner, Smithfield. It covered an area of 436 acres in ruins, destroyed fifteen wards, shattered eight others, consumed eighty-nine churches, four of the City gates, most of the public buildings, 13,200 dwelling-houses, and 460 streets,—and all this between the morning of the 2nd and the night of the 5th of September, 1666. In this conflagration all Cheapside perished, and with it the churches of Allhallows, Honey-lane; St. Pancras, Soper-lane; and St. Mary-le-Bow, all which three parishes being subsequently united, the new edifice in Cheapside was appointed the parish church.

Of the past history of this celebrated building we have not space at our command to give further details; and of the present church, its architectural merits have been repeatedly published. We may, however, note that the rebuilding was begun in 1673, at a cost of 8,071*l.* 18s. 1d.; and the spire between 1675 and 1680, at an expense of 7,388*l.* 8s. 7½d., being a total of 15,460*l.* 6s. 8½d., or between 4,000*l.* and 5,000*l.* more than any other City church. The architect was the architect of St. Paul's Cathedral, Sir Christopher Wren, and his first design was subsequently adopted for St. Magnus on Fish-street-hill. A writer in 1690 said,—"The church has been rebuilt very gorgeously, and the steeple finished with that elegancy of rare architecture, height, and curiosity, that it excels any in Christendom"; and a more modern book,* says concisely:—"To describe or criticise at length the steeple of Bow Church would now be supererogatory. Opinion has stamped it as one of the most successful works of its class, both as regards design and construction, and with this opinion we perfectly agree; indeed, we may add that, did Wren's reputation as an architect rest solely on this one building, it would, in our opinion, be perfectly secure."

From time to time the church has been repaved and refloored, and other reparations were made; the latest being ten years ago at a cost of about 2,000*l.* In 1818 Mr. George Gwilt, in repairing one of the pillars, had the good fortune to open the long-neglected crypt,—the original Norman building, and one of the most perfect relics of that time now existing in London. He also in part rebuilt the spire, but did not lower it, as often reported,—its actual height from the basement of the old church being 239 ft. 6 in. (*Gentleman's Magazine*, 1820), while the vane, the celebrated "dragon," is 8 ft. 8 in. in length from the mouth to the tail. Of this wonderful weather-cock many strange stories are told. One of Mother Shipton's prophecies states that when the dragon of Bow Church and the grasshopper of the Exchange should meet the London streets would be deluged with blood! Modern writers have asserted that both met in a stonemason's yard in Old-street, St. Luke's, in 1818, but the late Mr. Deputy Lott, the vestry clerk of the parish, informed us such was *not* the case. The Bow dragon never left the Vestry; it was there regilt, and thence it was taken direct upwards to its aërial resting-place. It is this very vane that has just undergone repairs at the hands of Messrs. Proctor & Co.

Perhaps out of the innumerable printed curiosities relating to London city, the broadside entitled "Upon the stately Structure of Bow Church and Steeple,"—a copy of which is in our possession,—may be considered a variety. We refrain from giving it *in extenso*, but here are some extracts which may interest:—

> "Look how the country Hobbs with wonder flock
> To see the City crest turned weather-cock!
> Which with each shifting gale veres to and fro,
> London has now got twelve strings to her Bow!
> The wind's south-east and straight the dragon ruffels
> His brazen wings to court the breeze from Brussels!
> The wind's at north! and now his hissing fork
> Whirls round to meet a flattering gale from York;
> Boxing the compass with each freshing gale;
> But still to London turns his threatening tayle.
> But stay! what's there? I spy a stranger thing;
> Our Red Cross brooded by the dragon's wing;
> The wing is warm; but oh! beware the sting!
> Poor English Cross, exposed to winds and weather
> Forced to seek shelter in the dragon's feathers!
> Ne'er had old Rome so rare a piece to brag on,
> A temple built to great Bell and the dragon!
> Whilst yet undaunted Protestants dare hope
> They that will worship Bell shall wear the Rope.
> Oh, how our English chronicles will shine,—
> Burnt Sixty-Six; Rebuilt in Seventy-nine.
> When Jacob Hall on his high Rope shows tricks
> The dragon flutters; the Lord Mayor's horse kicks;
> The Cheapside crowds and Pageants scarcely know
> Which most to admire, Hall, Hobbyhorse, or Bow!
> But what mad frenzy set your zeal on fire
> (Grave citizens!) to raise immortal spire
> On Sea-coal basis? which will sooner yield
> Matter to burn a temple than to build!
> What the coals build, the ashes bury! No men
> Of wisdom but would dread the threatening omen!
> . . . . . .
> To Royal Westminster next turn thy eye
> Perhaps a Parliament thou mayest espy,
> Dragons of old gave oracles at Rome
> Then prophesy their day, their date, and doom!"

Those of our readers who know Bow Church will have noticed the balcony under the clock. That balcony carries with it one of the most pleasing reminiscences of old London pageantry. On all Lord Mayors' days and those of civic processions this was the position of honour for royalty to

* Godwin's "Churches of London."

view the show from, but royalty did not always use it, for George III. preferred to see my Lord Mayor from Quaker Barclay's house opposite, now the site of No. 108, Cheapside, the oak panelling of the room used by the king being now fitted to a room at Mr. Jones's house, at Gungrog, North Wales.

The first monument of ancient date in the old church was that to Sir John Coventry, mercer of Cheap, Lord Mayor 1425, who resided in Cheapside, and was buried in the old fabric. He was ancestor of the Earls of Coventry, was a native of the City from which he took name, and was one of the executors of the celebrated Dick Whittington In the new church there are many tablets, &c. Among them must not be omitted one to Thomas Lott, who was for *fifty-six years* an inhabitant of Bow-lane, and died February 7th, 1833. His son was the well-known Deputy Lott, the indefatigable vestry clerk of the united parishes.

Speaking of Bow-lane reminds us that here lived Tom Coryat, the traveller; Parsons, the comedian, the son of a Bow-lane builder; and Richard Wood, the pastrycook and pieman. The latter died in July, 1795, having amassed something like 50,000*l*. He lived in a garret, lived at other people's expense, and happening to gorge an extra supply choked himself! It was reported that two nieces who were at service as maids-of-all-work inherited his fortune, and that, for want of a will, a natural son was left unprovided for.

"It is an ill wind that blows nobody any good," is an old proverb, and we have seen the fortunes of Bow Church in some of its many aspects. Perhaps, now that the City dragon again "flutters" in the wind after its recent "restoration," it will not object to "restore" to England (if it has the long-supposed power of prophecy) a little of the good fortune and trade, of which it is now more than ordinarily deficient.

ART GOSSIP FROM NEW YORK.

THERE are at present exhibiting in New York two loan collections, sufficiently complete in their selection and arrangement to attract and interest the most fastidious and irritable connoisseur.

At the Metropolitan Museum of Art, in addition to the Cesnola collection, which is now in perfect order, and the Castellani antiquities, there is a ceramic collection, smaller it is true, but certainly more perfect than any single room-full that the South Kensington Museum displays, more perfect because better classified, and freer from any specimen deficient in rare beauty. The late Mrs. M'Callum's extraordinary collection of old lace is here also on loan, but is severely criticised by the lovers of old lace in New York, who find it wanting in kinds of work which the southern ladies now residing here are exceedingly well up in. It is to be regretted on this account that its offer to America is weighted with the condition that if it be purchased, it is to retain the name of the collector. The fact is, the collection is evidently deficient in more than one kind of interesting archaic lace-work, and is especially so in cut-lace, that early beautiful work that to our mind is much more worthy of study than the lace of the last century.

We may take another opportunity of referring to the many beautiful objects that are exhibited at the Metropolitan Museum of Art; the American sculptors are especially happy in their contributions, but like the English sculptors, they have sad reason to complain that their works are badly seen, so badly in this collection, that even Mr. Story's magnificent "Cleopatra" gives the stranger who has not seen it under better circumstances very little idea of its unusual and great merit.

At the National Academy of Design there is at this moment also on view a special Loan Exhibition, of such an exceptional character as to entitle the display to claim to be called "the Little Louvre,"—so choice, so rare, and so historical are some of the objects exhibited. The exhibition is in aid of the Ladies' Society of Decorative Art, and has been inaugurated and arranged by a number of New York ladies interested naturally in household ornamentation, and they have succeeded in bringing together, with the utmost knowledge and taste, as interesting a collection of beautiful art-work as we have yet seen here, and which we have no hesitation in comparing—of course, on a very small scale—with the never-to-be-forgotten "Histoire de Travail" of the Exposition of Paris in 1867.

One peculiar and unusual charm that the National Academy Exhibition possesses consists in the agreeable idiosyncracy that prevails throughout the rooms. Here are to be seen, not the profusion of the industrious and enthusiastic collector, but the long-cherished household treasures that have adorned for years the homes of many a happy possessor.

Notwithstanding that what we call antiquities, of all ornamental objects, most easily arrange themselves, and appear always when they are together as if they had been used to their own good society, still it is not difficult to detect whether the precious object has been well cared for, or whether it has remained neglected for ages in some unappreciative hands. Nothing shows more clearly that the owner has been worthy its possession than that appearance of care that has been bestowed on the object, whatever it may be; few things can be more distressing to the amateur of beautiful art than its flagrant neglect.

The world has been vastly indebted for ages to that rightly-respected class of individuals the professional housekeeper, for the preservation of many of our most interesting art-treasures: her duty more than her knowledge has caused a love for the objects under her charge, and we most unfairly and ungenerously endeavour to reproach, as we sometimes do, our custodians and curators of museums by attempting to stigmatise them by the epithet of "old women,"—women, it appears to us, both young and old, and especially those who are neither, are precisely the proper individuals to look after all that is precious and beautiful,—our children, our antiquities, and our kitchens.

Among the pictures exhibited at the National Academy of Design are perfect specimens of the work of Theodore Rousseau, Diaz, Gustave Brion, Eugène Fromentin, Gerôme, Alma Tadema, Alfred Stevens, Meissonier, Edouard Frère, Daubigny, Vibert, Kœmerer, and Lucius Rossi; Meissonier being the only painter not quite at his best, an exceedingly rare thing, by the bye, with this most extraordinarily dexterous artist. In addition to the above great names, here are exhibited the works of fifty or sixty other Continental painters, all of less or more celebrity, and no single picture appears to have been purchased on any other ground than that of its merit and rarity. The three by Gerôme are in that great painter's best manner; Mr. Harper's Alma Tadema the "Magic Mirror," is excellent in its way; the Daubigny very far superior to anything that Daubigny is now painting; and Mr. Jordan Mott's lately-acquired Rousseau is one of those rare works that a century or two hence our descendants will regard with the utmost admiration. This is a rare picture, that will rank among landscapes with the small "Constable at the Louvre," with the choicest specimens of Nasmyth, and with a picture but little known, a landscape by Richard Corbould, the grandfather of Mr. E. H. Corbould, in whose possession it still remains, a picture so rare in its quality that we hope some day to hear that it is placed in our National Gallery.

Diaz's picture of the Forest of Fontainebleau, one of the many scenes from that artist-beloved forest that Diaz delighted so to paint, and which, like as the picture is to so many others that he has painted we remember seeing but a few months since in Paris, is one of those delightful realisations of sylvan scenery, that if such could have been seen by Mr. John Evelyn, of Deptford, two hundred years ago, would have delighted that old model of accomplished reputability. Gustave Brion, whose death we have had so lately to lament, is here very well represented by a romantic and poetical landscape.

Lucius Rossi's "Old Age of a Prince" looks as if it were painted from a perfectly-arranged *tableau vivant* of a courtly scene in the high days of the Guimard, whose dainty dress and exquisite dancing-pose excusably attract, with so much amusing interest, the almost equally dainty *abbé* by her side. We do not wonder at Mr. Astor, who owns this picture, or at other gentlemen as famous for their wealth, coveting and contriving to obtain pictures by this amusing and agreeable school. Surely never were pictures so calculated to please as the works of the modern Spanish painters. Have ever skilful workmen since the days of Paul Veronese indulged in a more defiant attempt for low-toned and subdued colouring?—were ever blue and orange more delightfully brought together, or pink and grey, or greens of all shades, with rosy tints of every happy description?—were ever silks and velvets so be-glorified since Paul Cagliari positively exhausted all possible agreeable contrast and harmonies of beautiful colours in his great picture, the Marriage of Cana, that gorgeous collection of noble and famous people who sit, day by day, at the Louvre to instruct the world how to look perfectly well-mannered and well-dressed even without a black dress coat and white tie?

With a community such as exists in America, who have a strong desire for the possession of beautiful art, the artists of the world need fear no want of remunerative sympathy, as long as they produce well-considered works; and if the American purchaser be less inclined to possess English pictures, and English ceramic work, it is owing, not so much to the higher prices of England as to the little comparative interest the American finds that his cousins take in the subject of art. On the visit of Americans to England and the Continent, on their way through London, they hear very little talk of painters but of Millais and Leighton, Grant and Richmond, the Royal Academy, and Mr. Agnew; and the high prices of these great people, and the glories of that great institution, somewhat astound them. By an American, a knowledge is early acquired of the commission business, which naturally makes him hesitate before rushing into a studio, where angels, unless they be exceedingly rich angels, might fear to tread: so Americans in London, on their way to visit their great friend, Mr. Worth, in Paris, and Pio Nono, in Rome, forego the allurements of the Royal Academy and the Grosvenor, and wait to buy charming little pictures by Vibert and Gonzalez, landscapes by Rousseau and Diaz, glorious Eastern dreams idealised by Gerôme, beautiful sketches by Fromentin, rather than purchase through Mr. Agnew English works at enormous prices.

In London, moreover, they find their friends, those to whom they have carried letters, even if they have been as lucky in this respect as Mr. Charles Sumner or Ticknor forty years ago, but little really interested in art; a small section of the middle class, chiefly people interested in the "South Kensington," talk a great deal on the subject; but, on the whole, in London there is a strange mixture of cool art talk, and the constant expression of warm feeling for politics and "society," and that indecision on the subject of the "styles" and manner of our artists which must be exceedingly perplexing to the Americans.

Some people are cruel enough to say that our artists are without art; that is, that they are untaught native geniuses, unguided by the unerring rules of the Conservatoire, and insufficiently obedient to the teaching of the Royal Academy, beyond the devoted aim of securing seven or eight positions for their pictures on the line at Burlington House,—a difficulty, we should say, about as impossible to sustain with credit as the clerical task of having to write and preach fifty-two sermons in as many weeks.

Amongst the treasures of old art that exist in America, exquisite fans take a very prominent place, and of those exhibited at the National Academy the collection can have been rivalled only by that at Vienna a few years ago. It is not too much to say of the collection now in New York, that every specimen is good of its kind, with a scientific arrangement that none but ladies, with that occult art that such a science requires, could have worked out. It would be invidious to compare Mrs. John Jay's fans with Mrs. Belmont's, or Mrs. Jones's with Mrs. Livingston's, or Mrs. Wetmore's with Mrs. Astor's, or Miss Bruen's with Mrs. Admiral Farragut's; all that is fair and safe to compare, and to pronounce decisively upon is, that the older the fan the more perfect, with the exception of some few of Louis XV.'s time, not unfrequently possessing a charm that is wanting in the fans of the reign of his great-grandfather, Louis XIV.

In fine old pieces of furniture the exhibition is sadly deficient, whether for want of room or that this branch of art is to be represented on some future occasion, it is difficult to say; there are two or three not by any means rare Oriental cabinets, a very doubtful marriage *casone*, a *bahut* or two (Flemish or French), two or three old chairs of an uncomfortable form, not suited for imitation, one extraordinary ivory Indian chair of great antiquity, strongly resembling that very interesting set of ivory chairs at Sir John Soane's Museum, taken from the palace of Tippoo Sahib; but Mrs. F. S. Eldridge's chair, at least for beauty and rarity, if not for

its historical value, would be worthy a collection of chairs such as the writer saw not long ago in Cromwell-place, where, within a stone's throw of the South Kensington Museum, are gathered the favourite chairs of many of England's most worthy representative men.

But though, on the whole, we fail to find in the exhibition at the National Academy any historical pieces of furniture such as we have named, or any worthy of careful study, we have seen in more than one house in New York some fine old pieces that have received for ages the attention they deserved.

American manufacturers are now flooding the market with what appears to be well-made, well-designed furniture, and Mr. Charles Eastlake would be surprised at the popularity of his name here in connexion with household decoration,—furniture especially.

Of the *bric-à-brac* here exhibited, and its scientific arrangement, it is impossible to speak too highly; nothing, considering the space, could be more complete; of the old china, from the most perfect specimens of blue hawthorn, set off after the direction of Mr. Rossetti by amber-coloured velvet, to the cherished and oldest specimens of Satsuma, from the finest pieces of Oriental embroidery and Persian hangings, from ordinary gold and silver spoons elaborately wrought, to the best specimens of Queen Anne silver,—one piece in particular having been presented in 1710 to Col. Peter Schuyler by Queen Anne herself, and exhibited by his descendant, Mr. George Schuyler, and some magnificent *repoussé* silver work, brought to America by Lord Fairfax; three or four superb pieces of Limoges enamel, old Wedgwood cameï that have quietly reposed in loving hands since they came, or were purchased at Wedgwood's place in Hatton-garden; brightly-coloured old Derby tea-services, that may have been shut up now more than a century in some well-kept Boston china-closet; splendid china punch-bowls, innocent of the beastly odour of rum for more than half a century, and redolent of Russia leather and scented visiting-cards for nearly as long a period; scarabei bracelets and necklaces, Russian and Scandinavian silver work, intricate Indian and Danish silver and gold work, perfect specimens of Nuremberg *repoussé* lateen metal, Castellani's exquisite modern reproductions, the only perfect realisations of old work that artists of the present day have created; Creole earrings, from Louisiana and Martinique; Roman jewelry, from the Piazza di Spagna; French jewelry, by Boilly, of the seventeenth century, and Froment Meurice of the present; beautiful objects by Bigatti, of Florence, and no mean specimens of goldsmith's work by Tiffany, of New York; old English china, more precious than modern; silver teapots, Burmese silver-work, beautiful old plaques, a crystal ball that would excusably excite the envy of such a collector as Mr. Burges, and mounted almost as skilfully as he could do it himself; groups of unique bronzes, by Barye; singularly beautiful specimens of sun-dried Mexican pottery, very few examples, if any, of which do we possess at the South Kensington Museum, those enriched with the delicate silver ornamentation having a charm equal to the finest Greek work; Persian pottery and jade vases; a lovely watch by that great artist of by-gone days, Briquet; with a host of other pretty things in the jewelry way, suggesting many a past history; one miniature by Malbone, so beautiful as to surpass all modern effort at miniature-painting, and probably in no degree inferior to the work of the best day of that lost art.

As for the lace here displayed, and the beautiful pieces of embroidery, Greek, Italian, Albanian, Spanish, Persian, and all other nationalities and periods, the school of decoration have nothing to do but to study it carefully. We have said nothing of majolica, which is here represented by some beautiful specimens, old tiles of the various esteemed fabrics; a few choice pieces of Venetian glass, some perfect specimens of copper Venetian buckets and Italian iron work; one Spanish silver lamp, resting on stag's horns, that might serve as a model for the best silversmith's work; in fact, a well-selected assortment of old art, enough to leaven a whole continent with correct theories on the subject; one omission, however, is sadly observable,—what artists understand by fine old tapestry is all but wanting, one small piece alone approaching what is right, the rest being coarse and characterless, or fine and of a bad period. On the whole, those who have to direct the student to proper objects for study will be rather embarrassed by the excess of riches from which to draw examples for assiduous emulation.

The possessors of the above specimens of beautiful art, all of which by-the-bye have been contributed by inhabitants of New York alone, are not by any means people who are likely to have been imposed upon in any purchases that they may have recently acquired; the appreciation of the kind of art that is here represented has long been with them a delight and a resource, and nowhere else but in the largest cities of Europe can there be said to exist so correct and so well-informed a community, small it is true, on such subjects; but let the followers beware, it is not every piece of Capo di Monte or other rare ware that is genuine; dealers, in fact, like many other tradesmen, are not invariably honest, and many of them, like the objects they deal in, may be said to be "brutal humbugs."

The collection resembles,—as, in fact, all such collections of bric-à-brac must,—the Hôtel Drouot on a Sunday afternoon early in May, but it would be difficult to say anything more in its favour; for, where are beautiful pictures so well seen and so unselfishly placed,—where are treasures from all parts of the world so perfectly arranged and exhibited for the amusement and instruction of the fortunate Parisian, native or temporary?

A rage is setting in in this city for ancient furniture and such-like captivating surroundings, and ere long we may hear of a manufactory "Down East" doing a roaring business in "Mayflower" furniture, just as at Birmingham we know that Pompeiian and Egyptian bronzes and scarabei are manufactured for the Italian and Egyptian markets.

As for Paris, or indeed the whole of France, Italy, and Flanders, why it is possible that for the last two centuries the amusing people of those countries have been playing tricks with us, and filling our houses with *réchauffées* of antiquities, and replenishing their own pockets with our not much, perhaps, more honestly earned spare cash.

With all the beauty that we have been endeavouring to recall, we fear that the stranger just arrived in New York, and who, on leaving the Brevoort or the Windsor Hotel paid a visit to the Loan Exhibition, might possibly fall into some slight error if he were hastily to conclude that he had at last reached a city where everything is beautiful and well arranged, and where all the inhabitants were well-looking and well-mannered, where wealth and comfort are not jostled by poverty and misery, and where vice is reduced to a minimum; where houses are well arranged, and streets and side-walks, without being literally paved with gold, are as broad and smooth as they ought to be, or, as they are, in Paris.

New York is not all beautiful; it is not every exhibition in this city that furnishes such examples of taste as the Metropolitan Museum and the National Academy are now showing; the pavements are not all like those of the Fifth Avenue and of Fourteenth-street; there are many hôtels less well managed than the two we have named; there are not a few vicious people here of all nationalities; there are several women in New York who are ill-dressed; there are, it is true, other cities in other parts of the world where more good music is frequently to be heard, and where a hope may be relied upon of a good opera, at least, after Easter; but London, even, has some faults, and a visit to the East End and its music-halls shows things not altogether creditable to the nation.

THE LATE THOMAS WRIGHT, ANTIQUARY.

To the roll of the distinguished men of letters who repose in Brompton Cemetery must now be added the name of Thomas Wright, M.A., F.S.A. His long and useful life closed on the Sunday preceding Christmas-day, and the funeral took place on Saturday last, in a simple unpretending fashion, in the presence of a few old and attached friends. The number would have been larger but for various untoward circumstances, and the attendance of representatives of some of the learned societies of which the deceased gentleman was so distinguished a member, might have been expected; but it was understood that the occasion was of a strictly private nature. Among those present were the Rev. Dr. Wilson, Mr. C. Roach Smith, F.S.A., Mr. Dillon Croker, F.S.A., Mr. C. R. Jones (representing old friends at Ludlow), Dr. Leonard (medical attendant), Mr. Pound, and Mr. Howell. They occupied the carriages, and Mr. Godwin, and Mr. Ireland, of the Society of Antiquaries, joined the funeral *cortége* at the grave, Mr. Halliwell Phillipps being prevented from attending through illness. Mr. Thomas Carlyle regretted that the state of his health did not permit him to be present, and Mr. George Cruikshank would have attended the funeral of his old friend, but at his advanced age was afraid to venture.

The story of the life of Thomas Wright is the story of his books and of his antiquarian researches. His tastes and his pursuits were those of a scholar, and he set an example of simple, earnest devotion to literature. His life dates from 1810, when he was born at Ludlow, and the number and quality of the works he produced attest his devotion to his art, and his unflagging assiduity in the practice of it. The titles of his books fill many pages of Allibone, and of his contributions to current literature no record has been kept. He was simply indefatigable in production, and it has been truly remarked that "no Englishman of our times has so intelligently treated so many different departments of literary research."

His work began while he was yet studying at Trinity College, Cambridge; and the antiquarian bent of his mind was shown in the use he made of the stores of old-world literature in the college libraries. On quitting Cambridge he at once made choice of his way of life. He dedicated himself to literature, and, coming direct to the metropolis, entered on the arduous career of authorship. On the whole, his early career was successful. He supported himself by his pen, and won a reputation which gained for him many and valuable friendships. Guizot appreciated his worth, and secured for him at an early age the distinction of being one of the Corresponding Members of the French Institute.

In 1843, he joined Mr. Roach Smith in founding the British Archæological Association, and this was the beginning of many active steps taken in the interests of archæology which should be remembered with gratitude.

The names of Mr. Wright's principal works will be familiar to all readers. Members of the Percy, the Caxton, and Early English Text Societies, and of the Roxburgh and Warton Clubs, hardly need reminding of the fine editorial work he did for them, any more than do students of our earlier literature of the impetus which, by more popular books, he gave to the study of the treasures of the past. To the general public he is best known by "The Celt, the Roman, and the Saxon," which passed through three editions; "England under the House of Hanover," 1848; "Popular Superstitions of England," 1845; "Domestic Manners and Sentiments in England during the Middle Ages;" "Womankind in Western Europe;" "The Life of Gillray;" and, beyond all in respect of popularity, his "History of Caricature and Grotesque in Literature and Art." It may be interesting to add that it was at the special request of Napoleon III. that he translated the imperial "Life of Julius Cæsar" into English. Also that among his recent works he attached special importance to his description of the Roman city of Uriconium, the excavations of which he, in 1859, personally superintended.

It remains but to add that, though a laborious writer, Thomas Wright did not pursue those branches of literature which lead to fortune. He was never free from anxiety on pecuniary grounds. Late in life a grant from the Civil List was most properly accorded to him, and when his powers failed, as they did towards the last, this constituted his chief source of support. With his life the grant, of course, ceases; but he has left behind him a widow, whose failing sight renders her an object of special compassion, and it is most sincerely to be hoped that her Majesty will be moved to continue wholly or in part the sum which constituted the chief public reward of one to whose services in the fields of literature and antiquities the public are so greatly indebted.

"Free Trade in Labour."—"A Building Artisan" has sent us a reply to Mr. Nisbet's communication, but we do not find occasion to print it; the two statements remain where they were.

BIRMINGHAM ENTERPRISE.

IT is but a few years ago since the handsome structure known as the Inns of Court Hotel remained a partially completed building, the Lincoln's-inn-Fields portion being a dreary unfinished block. The entire freehold property was brought to the hammer, and, to the disappointment of many eager buyers, it was knocked down to the "Midland." Considerable curiosity was excited respecting the purchasers, who appeared to be unknown. However, both portions of the building were speedily completed, and were subsequently acquired by the present Inns of Court Hotel Company, Limited, it being generally understood that the "Midland" had netted about 25,000*l.* by the transaction. At any rate, the Hotel Company acquired one of the best freehold properties in one of the most improving districts of Holborn and Lincoln's-inn-Fields. For the purposes of our present argument, the "Midland" purchased a comparative ruin, and left it a finished palace.

Again, there is the Cadogan and Hans Place Estate, a fine property adjoining Belgravia. This property drifts, it requires capital and administration, an Act of Parliament is necessary, vested interests have to be bought up, great improvements are projected, and important roads have to be constructed. The "Midland" take the matter in hand. An Act is obtained, the requisite capital is forthcoming, properties are purchased, and the roads and improvements are carried out. This estate is now one of the most promising properties in the West End, and is being rapidly covered by mansions of a superior class. It is understood that the "Midland" reaped large profit from this transaction.

An important estate at Kensington has also been acquired by the "Midland." Public tenders were invited for the construction of a bridge, over the lines of railway near Addison-road Station, thus connecting two important districts. This bridge is now in course of construction, and when completed great local improvements will be accomplished. Public tenders were also invited for the roads on the estate, involving an expenditure of 20,000*l.* This estate is now being rapidly covered with high-class property. We understand that the "Midland" in this case remain the owners.

A short time since one of the finest estates in the suburbs of London, the Westcombe Park and Woodlands Estate at Blackheath, consisting of about 120 acres, was offered by auction. On account of the superiority of the district, and the great difficulty of acquiring freehold land, the property was jealously watched, but the fortunate buyer was the "Midland." The estate was at once vigorously dealt with, liberal sums were offered for the best designs for its development, good men in the profession were attracted to the competition, and a sufficient number of designs were sent in to fill a great public building? The estate was speedily sold at a handsome profit to a public company, who are now actively taking steps for its immediate development.

These and other important transactions have, of course, made the name of the "Midland" familiar in London. Such is the impression created that we have investigated the meaning of the "Midland," and we find that it is a Joint Stock Company, with its head offices in Birmingham, called the Midland Land and Investment Corporation, Limited. It appears to have been in existence about fourteen years, and has had a very prosperous career. We find that the capital subscribed is about a quarter of a million, whilst the paid-up capital is about 62,000*l.*, the reserve fund being nearly 77,000*l.* The last dividend was at the rate of 15 per cent.

Now it is remarkable, not to say unique, that a Birmingham Joint Stock Company should carry on such important and lucrative transactions in London. It is alike interesting and significant that Birmingham is not content to be regarded as one of the leading manufacturing centres of the country, but its capitalists with great courage and, apparently, equal discretion, come to the metropolis, and carry away some of its treasures. The hand of welcome ought certainly to be offered to the "Midland," for although we have no acquaintance with its internal government, it is clearly a pioneer in the path of progress, and is evidently guided by intelligence.

Messrs. Driver, land agents and auctioneers, have taken into partnership, Mr. Henry Jonas, who, for the last eleven years, has been their chief land and timber valuing assistant.

ART-UNION OF LONDON.

WE have received an impression of the plate produced by this society for the subscribers of the current year,—"The Return of the Lifeboat." In their last report the Council state that "the great popularity which attended the first appearance of the marine subjects, 'Tilbury Fort,' 'Dutch Trawlers,' and 'Coast Scenery,' induced them to think that another plate of a similar kind might be acceptable." Mr. Edward Duncan has embodied, with considerable power, the exciting scene, showing how just outside of Whitby Harbour, the boat, manned by its hardy lifebelted crew, having on board the men taken from the wreck in the distance, has arrived so near the land as to enable a line to be thrown to the crowd of men standing ready and anxious to haul the boat on shore. The interpretation into black and white by the burin of Mr. Willmore is effected with much spirit, and the plate will be a fitting pendent to the "Dutch Trawlers," exactly matching it in size. In the report above alluded to it was further mentioned that Mr. John Bell had been commissioned to prepare for the Art-Union a reduced copy of his group, "America," from the Albert Memorial, Messrs. Doulton's copy of which for the Philadelphia Exhibition attracted great notice. We have had an opportunity of examining Mr Bell's reduced copy, which has been made with remarkable exactness and fidelity as to details; the several figures are graceful and natural in pose, and would be effective as single works, as well as when united in a group. This will be an important addition to the remarkable series of bronzes already produced by the Art-Union, as will also another, also in preparation, in a more severe style, "The Warrior and Wounded Youth," by Mr. Hamo Thornycroft.

The little almanack of this society contains much useful information.

THE KRUPP GUN FACTORY AT ESSEN

THE Krupp Gun is now famous throughout the world, from Germany to Japan; but the great factory at Essen is far less familiar than its formidable products. And yet it is an establishment, unique of its kind, which leaves a strong and permanent impression upon the memory, not merely on account of its wonderful mechanical arrangements, but also because of the way in which a perfect army of workmen is employed and maintained. A little way from Dusseldorf, out of the ordinary tourist tract, at the confluence of the Rhine and the Ruhr, stands the city of Essen, formerly a conventual domain, now the abode of founders. Its modern fame dates back little more than a quarter of a century, but in that time, from being a place with a thin and impoverished population, it has grown to be the home of sixty thousand inhabitants. Nature favoured the designs of the new speculators. Essen stands in the midst of a coal-field which, it is calculated, if worked at the rate of ten millions of tons a year, will not be exhausted at the end of forty centuries. In fact, it is the richest and most varied deposit in all Westphalia, and around it lie iron mines, mineral earths, and rocks, the produce of which is wrought up at Elberfeld, Oberhausen, Mulhouse, and many other towns teeming with industrial activity. Its situation, moreover, upon the Imperial highway between Coblentz and Minden, with a perfect network of auxiliary roads on every side, is peculiarly favourable, and the immense commerce carried on may be inferred from the fact that on one line of rails alone, a hundred trains, of twenty-five trucks each, all laden with coal, pass along daily, while these steam communications ramify beneath the roof of every workshop. Perhaps within no similar space existing in Europe is so striking a picture of industry at its highest pressure exhibited, for it must be remembered that Essen turns out its 500 great guns, at least, every week; furnaces pouring out their molten contents; red-hot masses travelling, as if mechanically, to the anvil, others which have undergone the cooling process, many also still in a state of incandescence, notwithstanding their grey and dull appearance. Giant hammers are incessantly dealing their blows, and the whole is one huge mingling of movement and clamour, fire and smoke. Forty years ago, a stranger visiting the neighbourhood would have perceived two stunted, insignificant houses, a single story high, one of which was used as an office for paying the workmen. Here Krupp, the elder, dwelt. In the other was the forge at which, with a solitary assistant, he fabricated articles in steel, which, when a sufficient quantity had been accumulated, he carried with him, on horseback, to sell among the people of the vicinity. And in that house, and at that forge, Frederick Krupp, the younger, from the age of fifteen, became not merely the companion of his father, but also an associate in his researches into the preparation and forging of steel. The futile experiments made might supply a lesson in patience to a generation of the disappointed. At a little distance from the family dwelling, indeed, there are workshops, containing the machinery, now obsolete, which laid the foundations of industrial fortune for Essen. It is often of singular appearance and curious construction, imitated, it would seem, from the old Catalan and Pyrennean factories; but M. Krupp introduced one improvement after another, until his hammer-heads weighed tons, instead of hundredweights. The steam-hammer, as we know it, was scarcely then known at all in Europe, and the Krupp invention would be regarded as an extraordinary piece of mechanism in our day. Old workmen at Essen still show the place where the elder Krupp used to snatch a little sleep while his subordinates were re-heating the iron. At the critical moment they woke him up, and he studied the succeeding operations as though he had been in a laboratory. Not a few of the folks about, penetrated with the superstitions of the neighbourhood, really believed him to be practising some supernatural arts, or spoke of him as having stumbled upon certain antique receipts which had been transmitted in the family from father to son. Nor was he himself eager to dissipate these ideas; they helped to keep his secrets for him; while, over the doorway of the workshop, he had printed, in three languages, a prohibition of entry to any stranger or ordinary artificer upon the establishment. The public then said, naturally enough, there is something to conceal. But the mystery of M. Krupp was a very simple one; he would allow nothing to pass unless it was, in his judgment, perfect. Of course, since that period, infinite changes have taken place, and the Essen foundries are governed as though they constituted a state. For the technical departments young men are sought in the most renowned polytechnic academies of Germany, and a lawyer is retained to give opinions upon what we should call points of patent law. As to machinery and implements, whatever presents a flaw is cast aside, no matter what its size or cost. They are fabricated on the spot, and can be refabricated if necessary. No doubt, in the manufacture itself, some new forms of amalgam were adopted, distinguishing Krupp from Sheffield or Bessemer steel; but it is no part of our purpose to describe the processes. However, it may be remarked that nearly all the furnaces have been several times reconstructed to obtain the necessary concentration and graduation of heat (in some of them the best Scotch bricks will become vitrified); that, in the manufacture of crucibles, even more numerous experiments were made, fragments of the old ones being generally employed as part materials for the new; and, if the new did not answer the essential conditions, they were forthwith ground to powder again, as they are, indeed, now; and when a hundred thousand, on a large scale, are prepared for seething, night and day at the same time, it will easily be conceived that this is no unimportant care undertaken by the management. They are only used once, are then destroyed, wrought up once more, and so on while the quality of the material lasts. Twelve hundred of these enormous crucibles, say, are arranged in the great melting-hall, where the metal is run off into moulds of various capacity. The men at work are in their stations and at their labours as if under military discipline. To each is assigned his task, which he understands, and with which at the time, no one is allowed to interfere. Should he blunder, the fault and the penalty are his. Nothing comes of it, after all that fiery scene, except a multitude of gigantic blocks, ready to be burnt, boiled, and tortured into other shapes, until the mighty hammers begin to perform their duty. By rival founders, and by independent scientific men, the weights of Herr Krupp's hammers were originally regarded as absurd: they must either fly to pieces, it was prophesied, or smash all the apparatus connected with them. But he rested his machines upon a sure basis,—three foundations:

one exceedingly deep and massive, of masonry; a second, also very thick and solid, of North German oak; a third of metal plates, riveted each above another, with layers of oak between, and whereupon this fabric was erected,—not only the stupendous hammer, but also the cluster of iron columns sustaining it; the blows, of inconceivable power, striking from a height of 6 yards, did not cause it to quiver. The entire structure cost upwards of 100,000*l.*; but since the date of its "inauguration," eighteen years ago, it has not been six weeks out of gear. Encouraged by this triumph, the great gun-maker has in hand a hammer weighing 100 tons, which will cost him double the amount mentioned. When we have referred to ten thousand as being the number of workmen of all classes employed, and to the fact that their wives and families occupy a small town by themselves, we have said enough for the present; but possibly some further account may be welcome, at a future opportunity, of the lives which these people lead, the principles upon which they are treated, and the way in which they are organised.

HOSPITAL ACCOMMODATION IN GLASGOW.

THE Lord Provost and chairman and members of the Glasgow Health Committee last week inspected a new permanent hospital for the treatment of infectious diseases at Belvedere, London-road, in the outskirts of the city. The hospital, which has gradually attained its present dimensions, will accommodate 600 beds, and allow 2,050 cubic feet of air for each patient. Supposing, however the building to be converted into a fever hospital proper, it would accommodate one half more patients with 1,500 cubic feet of air for each. The length of the convalescent wards is 21 ft., breadth 24 ft., and height 16 ft. 6 in., thus giving to each patient under small-pox conditions 1,419 ft. of cubic space. At the formal opening of the Institution, Bailie Ure, chairman of the health committee, delivered a comprehensive address on epidemic visitations to the city, and their treatment at the old hospital in Parliamentary-road. In September, 1870, the whole of the existing accommodation being taken up as the result of an epidemic of relapsing fever, a committee was appointed to fix on a site on which the nucleus of a permanent fever hospital could be erected. Ultimately, at an extraordinary meeting of the Police Board, the property of Belvedere was purchased for 17,000*l.*, reduced into an annual ground-rent at 4 per cent. The extent of the estate was about thirty-three acres. There was no time to prepare elaborate plans or build a hospital of permanent materials. Beds were urgently required, but the contractor entered the stubble-field to the east, where the wooden sheds were still in use, on the 22nd of November, 1870, and on the 19th of the following month, one pavilion was occupied by convalescents transferred from Parliamentary-road. From time to time, as finished, the new pavilions were occupied, until on the 10th of March, 1871, there were no fewer than 366 persons under treatment, and in the two hospitals 600 at one time. From a return furnished by Dr. Russell, he found that up to the 1st of May of the present year there had been 23,274 persons treated in these hospitals. In that number were included cases of every form of epidemic disease known in this country, including Asiatic cholera. The results of treatment compared favourably with those of any hospital in the kingdom, and if they maintained their present number of beds, – 620, which, however, would require further expenditure, owing to the temporary nature of the buildings,—they might say that no city in the kingdom was so well equipped with hospitals. The building now thrown open for inspection was the first hospital of a permanent nature they had erected. By way of meeting the cost, an assessment of ¼d. per pound above 10*l.*, and ⅛d. per pound under 20*l.*, was levied, on security of which 20,000*l.* had been borrowed from the Public Works Loan Commissioners, repayable in twenty years at 3½ per cent.; while the plans of the hospital were approved by the Board of Supervision on the 13th of June, 1874, and the first brick was laid on the 16th of February, 1875. Their officers, Bailie Ure proceeded to say, had been sanitary missionaries among the people, constantly inculcating and enforcing the laws of health. During the six years following Mr. Macleod's appointment as chief inspector of nuisances, his epidemic staff had made 1,366,708 house-to-house visitations, and in doing so discovered 14,200 cases of various infectious diseases. These cases were never lost sight of until removed to the hospital, or, where circumstances warranted their being treated at home, until perfect convalescence. In conclusion, the hospital was formally handed over to the custody of the Lord Provost and magistrates, and from them to Mr. M'Clellan, convener of the Hospital Committee.

THE PLANNING OF THE HOME.

(A CHRISTIAN CHIME.)

WOULD you build for time enduring,
Structures great, and homesteads true,
Art and health for all securing,
Truth and purpose keep in view.

Plan for health with tone emphatic,
Drain your home, give light and air
To your rooms, from base to attic,
And pure water do not spare.

Plan for comfort, build for morals,
And your homes will grow in time,
Virtues rare and worthy laurels,—
For these objects are sublime.

When the home is but a hovel,
Men like beasts will live and die,
In their darkness, pine and grovel,
Rot to earth, where soon they'll lie.

Vice will prosper, crime will flourish,
Gaols will open, gibbets loom,
Where men's homes are left to nourish
Victims for an early tomb.

Architects of honest mission,
Honour art, 'tis meet, but then
Shape your art to this condition,—
Build us healthy homes for men.

THE CABMEN'S SHELTER MOVEMENT.

London.—Five new shelters have been put up during the past year, and every shelter is doing well, and is said to be self-supporting.

Cardiff.—There are two cabmen's shelters at this seaport,—one near the docks and the other at Crockherbtown. The principal promoter of the movement (the ex-mayor) does not give up the hope of setting up another shelter in St. Mary-street when he has disposed of some other matters on hand.

Bradford, Yorkshire.—The movement, though tardily undertaken, apparently from misconceptions, appears to be succeeding very favourably, and unless Leeds extends its movement shortly and rapidly, Bradford will soon be ahead of its neighbour. The first shelter, which has recently been placed on the north side of Christ Church, is stated to be very useful, to be highly appreciated by the cabmen,—"not [as a local paper says] to be an eyesore to the thoroughfare," but to be an ornament to it.——Mr. George Firth has been permitted by the general purposes committee of the Bradford Corporation, to provide a shelter on the Leeds-road stand, subject to the approval of the council. It is rather remarkable that Mr. Ripley, M.P., had asked to be allowed to present that stand also with a shelter; but Mr. Firth was beforehand in his application. It is hoped that Mr. Ripley may carry out his benevolent wish at some other stand.

Leeds.—Though the Leeds movement is supported by a special clause in the New Borough Act, nothing yet, so far as our means of knowing are concerned, has been done to extend the movement, which at present consists of three shelters *not* in the highways.

Scarborough.—There are two shelters in this favourite watering-place. One is immediately opposite to the railway station, the other at the South Cliff, close to St. Martin's Church. The railway station shelter was purchased out of a fund originated by the well-known Congregational minister, the Rev. R. Balgarnie, of Scarborough. The other was a gift of a private gentleman. The cost of each was about 70*l.* Each will accommodate ten or twelve men. The builder was of Hull. The shelters contain washing-basin and water, gas, stove, table; each seat is separate, forming a box in which the men can place their things. There is a key to each shelter, kept by each man on the stand. They have three daily papers given, and possess a library. "They are" (says a competent authority in a private letter) "a great boon to the men on the stand." If any cabman, who is not connected with the stand, uses one of the shelters, he pays 2d. a day.

Halifax.—The first shelter was placed near the railway station, Halifax, fourteen months ago, at a cost of 80*l.* It has been greatly appreciated by the cabmen, who pay a small weekly subscription, which has not only defrayed current expenses, but has left a surplus which will be available for repairs, &c. From the commencement this shelter has been decidedly successful in keeping the drivers from the public-house.

FARM BUILDINGS AT HORSINGTON, SOMERSET.

HORSINGTON, where these farm-buildings are situated, is a parish in Somerset, 113 miles from London, and near the important station at Temple Combe, on the main line of the South-Western Railway; Wincanton, the nearest market town, being four miles distant on the Somerset and Dorset Railway, which is now comprised in the railway system of the Midland counties, having its junction with the South-Western Railway at Temple Combe, and thence on to Bath, Birmingham, and the North.

Horsington is a purely agricultural locality in the Vale of Blackmoor, noted for the beauty of its scenery and the fertility of the soil, as evidenced in its selection by the monks of Glastonbury for their domicile, and again by the Knights Templars at Temple (or Abbas) Combe, where the remains of a preceptory or commandery are yet existing.

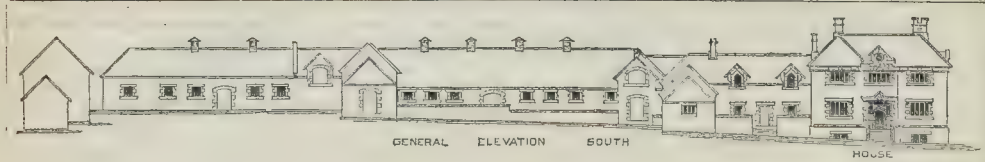
Horsington is principally occupied by dairy farms, being mostly pasture land, and the substrata, varying in different portions of the parish, consist of marl stone, Forest marble, Corn brash, and Oxford clay, distributed over 3,500 acres, which is the area of the parish: hence the variety of the herbage. There are but two or three landowners, the principal being Mr. Henry Bailward, lord of the manor, and Mr. Thomas Marriott Dodington, of Horsington House, by whom the buildings here illustrated have been erected for his present tenant, Mr. Robert Davis, by whose family the farm (Hiscocks) has been held for several generations. It comprises about 600 acres, but a gradual increase in extent is taking place.

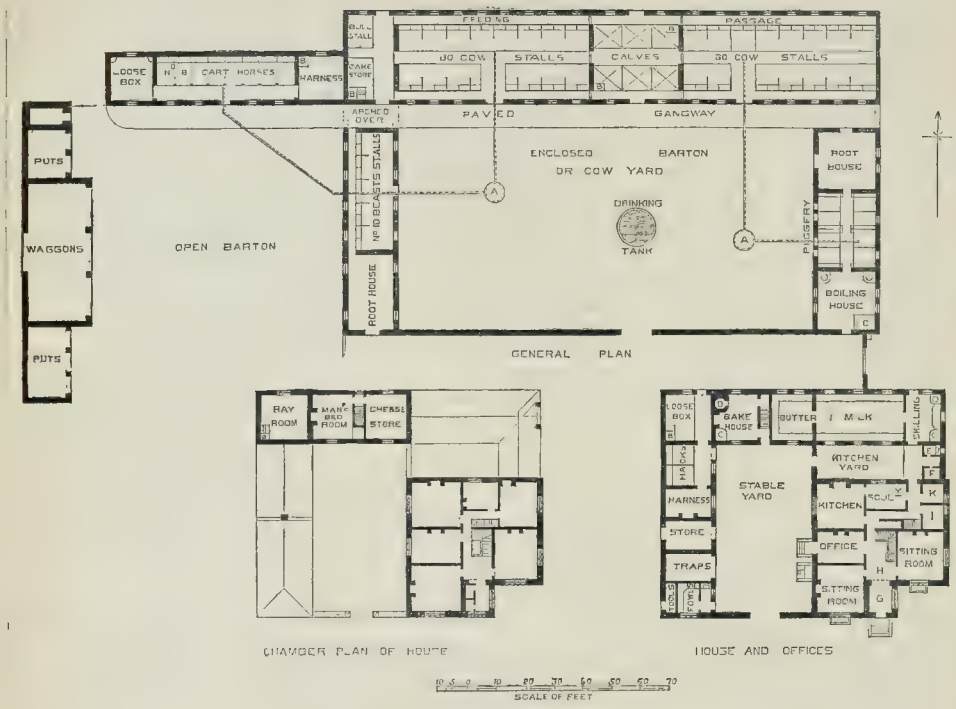
The buildings occupy an entirely new position, situated on rising ground, and commanding views of beautiful scenery of the hills of Dorset and Wilts, with the noted Alfred Tower in the distance. The several works were completed last year, and have been let out in two contracts: No. 1 comprises the farmhouse and offices attached, and No. 2 the buildings of the homestead adjoining. The whole have been substantially erected with stone walling, the dwelling-house having hammer-dressed Forest marble from the Bowden quarries, and the offices and No. 2 contract the local limestone; the latter being obtained in large-sized blocks, has been used "roughly bunched off," in rusticated alternate courses, giving a picturesque effect to the outbuildings of the homestead. All the dressings of windows, doors, chimneys, &c., are of Doulting stone, which was preferred to Bath stone, being equally easy of access.

The roofs are all covered with Welsh slates; the hips and ridges with sawn slate; those of the outbuildings being of sawn Ham stone.

The window-openings are filled in with stone mullions and iron casements and frames,—for the house, of an ornamental pattern, designed by the architect, double rebated; and for the outbuildings, "Moline's" patent wrought iron, where glazing is used. In the cow-houses and pig-stalls the openings have perforated iron grates, and are provided on the north sides only with at internal shutter-flap, to diminish the cold air-draughts when necessary. The foul and heated air is taken off through ventilators in roofs over the cow-houses, cart-horse stables, &c., which are open from the ground-floor the whole height to the roof.

The cow-houses are adapted for sixty cows, two in each stall, and these are fitted up with Musgrave's patent iron racks, mangers, and divisions, 8 ft. apart, let into stone curbs. Feeding passages at the cows' heads are provided, the cows being placed tail to tail, insuring greater convenience for cleaning and being easier of access from a central avenue 8 ft. wide, paved, having open channel gutters, and Musgrave's 9-in. trapped gratings over drains. This building is 186 ft. long by 30 ft. wide, having a compartment for calves 30 ft. square, fitted up





A. Manure-tank. C. Wash-tank. E. Earth-closet. G. Front entrance. I. Larder.
B. Hay shoot from lo't. D. Oren. F. Dust; rain-cistern over. H. Hall. K. Store.

FARM BUILDINGS, HORSINGTON, SOMERSET.—Mr. R. H. Shout, Architect.

with open timber stalls, dividing the cow-houses. The fatting beasts are placed in an adjoining building. These are fitted up with wood post and frame, open divisions, and mangers, &c.

The cart-horse stable is fitted up with iron racks and mangers (Musgrave's), adapted for eight horses, the only division between each being a moveable "bale" suspended at each end, so that when not used as a stable the building open from end to end, and useful for other purposes.

The piggery is a lofty building, roofed in and placed near the house (it may be deemed too near by some), for convenience in removing the refuse from the dairy and milk-house, &c., to a drain connected with a whey-tank underground, constructed of brick and cement, placed in the pigs' boiling-house. The sties are formed with Keinton stone slabs, and iron gates and divisions 3 ft. high, so contrived that two sties can be thrown into one, the gates when open folding across the central passage to give access to the barton or cow-yard through the openings, 3 ft. square, which are closed by doors sliding externally on an iron rail.

The drainage from beasts' and cow stalls, stables, piggery, &c., is collected from 9 in. pipes into manure-tanks, placed where shown in the barton: each having a man-hole attached, and into which a pump can be inserted for removal of the contents. The dwelling-house and offices are fitted up with Moule's patent earth-closets. Separate drain-pipes are provided for the rain-water from roofs into a drinking-pool in the centre of the cow-yard, where the levels permitted, but this is kept constantly supplied with water, as are the entire buildings and the upper floors of the dwelling, brought from a pure spring at Wilkin Throop, one mile distant, at a much higher level. This work formed a separate contract, with the construction of a large reservoir, at 360*l*. The cow-houses, &c., have standing hydrants and taps conveniently placed.

Hay-lofts are placed over calves' house, bulls' stall, and harness-room, with hay-shoots inclosed, to supply the different departments requiring it.

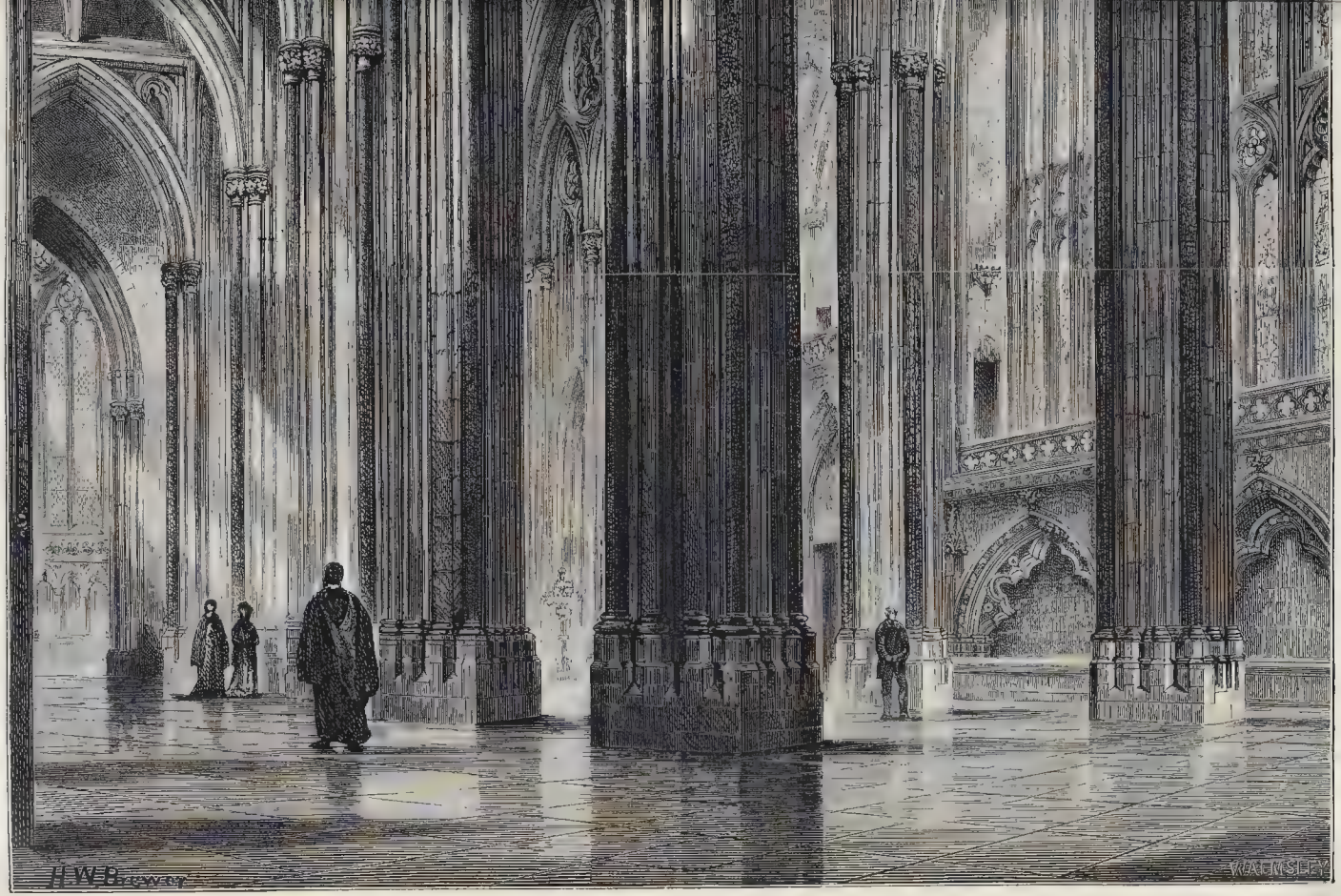
A building comprising granary and corn-store and machinery under, provided with the requisites to be worked by a water-wheel 20 ft. diameter; also, cyder-store, wring-house, and apple-loft over, is attached to a mill-stream adjacent, close to the homestead at a much lower level, but too far distant to be shown in the present illustrations. This was also under separate contract for 1,200*l*.

These buildings, from their extent and position on a lofty eminence, involving much trouble in arranging the levels of the various departments to avoid steps, &c., there being a fall of between 30 ft. and 40 ft. from one extreme of the site to the other, form a noticeable feature in the locality, which is very deficient in habitations or buildings of any class; such as there are being very dilapidated. Those practically acquainted with the necessary requirements have given these farm-buildings a very good character.

The whole has been designed and superintended by Mr. Robert H. Shout, architect, of Clevedon, near Bristol, and executed by Mr. Chas. Trask, of Norton-sub-Hamdon, under contract at 7,275*l*.; the total cost of all the works being nearly 9,000*l*.

Salisbury Cathedral.—At a recent meeting of the Restoration Committee a report was read on the works now in progress, and on those which have still to be executed. It was stated that the restoration of the nave, commenced soon after the re-opening of the choir, is advancing satisfactorily, but that additional funds are needed for undertaking the remaining works. If these could be put in hand at once, so as to be carried on simultaneously with those proceeding in the nave, it is believed that the entire cathedral might be opened for divine service by Michaelmas next; but in order to effect this object a sum of at least 6,000*l*. will be required. The amount already expended on the cathedral, from the commencement of the restoration, in 1863, to the present time, is 59,123*l*. 7*s*. 6*d*., exclusive of the reredos, the organ, and the choir-screen, which were special gifts.





THE NEW NAVE, BRISTOL CATHEDRAL.—Mr. Street, R.A., Architect.

THE NEW NAVE, BRISTOL CATHEDRAL.

THE most important event which has taken place in connexion with ecclesiastical architecture during the past year, has been the completion, or, to speak more correctly, the opening, of the new nave of Bristol Cathedral.

Those who were acquainted with the Cathedral of Bristol some years back will recollect that it consisted then of a choir and aisles, transepts of rather diminutive proportion for a cathedral, a large lantern tower, and three chapels. One of these had been converted into a vestry, and the two others were known respectively as the "elder Lady-chapel," and the "Newton chapel"; the former opening out of the eastern side of the south transept, and running parallel with the south choir-aisle, the latter occupying a correspondent situation to the north. A remakably-fine Norman chapter-house, with a very interesting vestibule or narthex, and portions of a somewhat meagre Perpendicular cloister, completed the attractions of this somewhat undignified cathedral.

That noble feature of all churches, the nave, was entirely wanting. If, however, the church did not possess those grand features which we find in most English cathedrals, it was not without great originality of design, and had at least one peculiarity which rendered it an interesting and suggestive study to the antiquary and the architect. This peculiarity is the fact that the choir and its aisles are of the same height, and thus there is no clearstory. That this very uncommon treatment was intended also to extend to the nave was amply proved by the fact that one respond of the nave arches had been erected and was imbedded in one of the buttresses supporting the tower to the west.

Now, although this treatment of nave and aisles of the same height is common enough in Germany, and by no means uncommon in France, yet it is so as applied to a large minster church in this country. It is perfectly true that examples of very large churches without clearstory are to be met with in England: the noble church of Dorchester, in Oxfordshire, will occur at once to the mind of any one well acquainted with this subject; yet none of these are cruciform churches, nor are they vaulted throughout, as is the case at Bristol.

It must not be supposed, however, that this treatment of the choir and nave of this cathedral is in any way a copy of what was done under similar circumstances in France or Germany. Externally the choir of Bristol Cathedral is entirely wanting in that effect of dignity and vastness which forms such a marked feature in what are called the German Hallenkirchen; for in all these buildings the aisles are carried up to the height of the nave, which, as in the cases of St. Martin's at Landshut, Holy Cross Church, Gmünd, the Cathedral at Munich, St. Mary's at Ingolstadt, and many others, is above 100 ft. to the vaulting. In Bristol Cathedral, on the contrary, it may be more correctly said that the nave, or choir, was brought down to the height of the aisles. That noble feature of a vast timber roof, covering nave and aisles in one immense span, and rising often to the height of 70 ft., giving marvellous effect of loftiness to the exterior, is, in the case of Bristol Cathedral, replaced by a treatment remarkable only for its poverty and thorough want of picturesqueness; for here the choir and aisles are covered in by nearly flat roofs, which are concealed from view by a very ugly parapet, broken by most skimping pinnacles. In fact, we doubt whether the Middle Ages ever produced anything so devoid of grandeur, dignity, and picturesqueness as this choir, when viewed from the exterior. Internally, however, there is much to be admired in this portion of the church, and were it not for the want of height the effect would be remarkably fine. By a most happy contrivance the difficulty which so puzzled the German architects of the Middle Ages of arranging the vaulting in such a way as to have that of the aisles level with the nave, has been here most satisfactorily overcome, in the following manner. The pendentives of the aisle vaults, instead of coming down at once on to the arch-piers, which would have produced one of two difficulties, viz., either the vaulting would have had to have been painfully stilted, or the crown so brought down that a large blank space would have been left between the vaulting of the nave and the pier-arches (a defect which is so injurious to the interiors of St. Stephen's, Vienna, and St. Mary's, at Ingolstadt), are here raised up upon a straight cornice, level with the haunches of the side arches, supported upon arches with pierced spandrels. The vault itself is irregular sexpartite; that is to say, there are two vaulting cells to the east and to the west, whereas there is only one to the north and to the south. By this arrangement one pendentive on the east and west side of each compartment comes down upon the cornice just over the point of the arch.

Another peculiarity in the design of the choir of Bristol Cathedral is the window tracery, which, although it is said to have been executed between the years 1306 and 1332, looks at least thirty years later. Double-light traceried heads are introduced below the transepts. All the rest of the detail of this choir is poor in design, and remarkably coarse in execution.

We have entered at some length into a description of the ancient choir of this cathedral because otherwise some of the peculiarities in the design of the new nave would be unintelligible; for Mr. Street, the architect who was intrusted with the work of completing this cathedral, by the addition of a nave and aisles, has considered it his duty rather to complete the scheme which the ancient architects had left unfinished, than to attempt to do anything which, however good in itself, might obliterate all traces of the intentions of the original builders; for although most probably the nave which Abbot Elliott or Abbot Newland intended to erect in the sixteenth century was never commenced, yet enough insight could be obtained into the general scheme of the Mediæval architects of this church, both from the choir, which they left complete, and from features which, however incomplete, served to demonstrate how the builders of former times would have combined their nave with the transepts and choir already existing.

Taking as his guide this Mediæval scheme, though varying and modifying the ancient detail, Mr. Street has erected a fine nave and aisles of five bays, with an extra bay at the west end, the aisles of which are formed by the basement stories of what will eventually be two western towers. These, however, at present, are only carried up to the height of the nave walls.

Externally, the west front has a deeply-recessed doorway, with very rich mouldings, over which there is an arcade, and above this again a wheel-window. The basement of each tower is occupied by a four-light window of the Geometric period.

The side of the nave in general outline resembles the choir, though its detail is bolder. Like the choir, it is lighted by large and very long four-light windows, which, like those of the choir, are divided by transoms with traceried heads below them. We cannot say that we admire this method of cutting windows in half, and introducing tracery where it seems much out of place. As, however, it forms such a distinctive feature of the ancient work, we do not for a moment intend to criticise or find fault with the introduction of it into the new nave.

There is a porch occupying the fifth bay, with a deeply-recessed doorway, the interior being vaulted.

The south side of the nave is very similar to the north, except that there is no porch.

Upon entering the cathedral by the western door, the general aspect is very striking, though totally unlike that of any other cathedral in this country. The most interesting view, however, is not from the west end, but that looking along the aisles, showing the remarkable treatment of the aisle vaults. Although similar in general arrangement to that of the choir aisles, yet the detail is quite different, and as this nave, although the continuation and completion of an ancient plan, is in itself a totally new work, we consider the architect was quite justified in having followed the general scheme of the ancient work, whilst he at the same time discarded its meagre detail.

Another feature, the general idea of which the architect has borrowed from the ancient choir, is the series of monumental recesses introduced below the windows; this is a very admirable method of preventing those who come after us from disfiguring a building with monuments, and of making such features subservient to the design of the building, rather than, as is too often the case, disfigurements.

ON THE REVIVAL OF THE LATER STYLES OF ENGLISH GOTHIC.

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association, on the 21st ult., Mr. Bowes A. Paice, president, in the chair, the following new members were elected, viz., Messrs. J. Shillcock, A. R. W. Simpson, J. M. Brooks, R. Sparrow, jun., and L. H. Duval.

Mr. J. D. Sedding then read a paper "On the Revival of the Later Styles of English Gothic," in which he sought to prove (1) that the later English Gothic is essentially noble; (2), that it is relatively superior to the earlier Gothic; and (3), that a hearty revival of the later styles is needful to the well-being of the existing Gothic school, and so of architectural design at large. He said that in seeking to establish the points bearing on the character of the two main divisions of Mediæval art, he could not conceal from himself that he was at issue with generally-received opinions, and that he ran the risk of wide dissent. For a long series of years it had been customary to treat the later Gothic with unsympathetic sternness,—to speak of it in terms of reprobation and contempt. Its name was a by-word and reproach in the pages of contemporary art literature. It had been almost entirely neglected as a subject for appreciative study, or as a source of inspiration for modern effort, and, in the case of church restorations, had not unfrequently been destroyed, with the most beneficient intentions, to make room for insertions of an earlier style. In theory, not only had its good points been mostly overlooked, but every blemish detected by the microscopic survey of querulous criticism had been exaggerated with all the amplifications of rhetoric; every instance by which its imperfections might be illustrated had been studiously collected. It had been described as the natural fruit of an art poisoned at the roots; as the product of corrupted taste and debased principles; as a decrepit thing which had lost all its native freshness and glory. On the other hand, it had been systematically urged that the relics of the earlier Middle Ages contained "the best, the most pure, the most vigorous, and the most perfect types of Gothic art." It was on these relics that modern Gothic design was founded. Architectural and archæological societies delighted to do the Early Gothic honour. Critics had made themselves susceptible to its influences, and had eulogised it in thrilling terms. The younger practitioner had obeyed the ruling of his elders, and studied it almost exclusively, believing with them that the attractive side of late art was to be resisted as poison, dangerous in proportion to its sweetness. Even the world had acquiesced in the tale importunate: not necessarily as a homage to truth, or because of instinctive sympathy, but because it was ever ready to accord a favourable reception to opinions which managed to exhale any real breath of enjoyment out of things. The disparaging tale about Late Gothic did not stop here as if it were merely a piece of dogmatic teaching that needed no verifying. Its authors knew, indeed, the virtue of strong enunciation of dogma, but in this case our allegiance was claimed by appeals to reason, taste, and conscience. We were assailed by formal arguments gathered from the fields of religion, of morality, philosophy, and art, the same arguments being available for innumerable guises. The sincerity and industry of the apologists of early art was thus unquestionable, and their pertinacity beyond all praise. At the same time, it might not improbably be cause of wonder to the future historian of art that so much persuasion and so much ingenuity were needed to prove the distinction between good and bad Gothic architecture, because, ordinarily speaking, the cause of perfection needed so little art to defend it, and a highly virtuous thing required no sophistries to recommend it. A faith so strongly established, and which had a body of authoritative opinion and some thirty years of general acceptance to support it, was not likely to be easily disturbed; and the author had little hope of producing conviction on points about which most people had definitely made up their minds. And yet there was much in the received verdict which should give cause for doubt in the minds of unbiased persons. It had been well observed that to be despised may be no ill-fortune: the real misfortune was only to be despicable. It was at least permissible for him to say that the Perpendicular, —"our detestable Perpendicular," as it was

called,—might be something very different from what it seemed to some: at any rate, its attributes might not all be cognisable by all. And further, it must be conceded that all men were not alike impressed by the same period. Looking back upon its origin, there was, he contended, much that was transient and accidental in the criticism on which this belief depended, that, if properly understood, should go far to mitigate the censures on one class of work and to minimise the extravagant praises of the other. The crude criticism of late work was founded upon insufficient study of English Gothic as a whole. Its birth dated from the very outset of the revival. It was not the offspring of experience, but of theory. The early popularity of the Gothic revival was the consequence of the world's temporary disposition that way, and it was a mere accident that the stream of romance and antiquarianism of which the revival was the concrete symbol flowed in that direction and not in the other. The scene of confusion which we have before us at the present moment in the world of architectural design was but the result of the bursting of the bubble. Profligacy had succeeded puritanism. Like most illusions, that about the perfection of early art was working its own retribution. The awakened taste of the younger generation, founded on study of the most approved models, rose at last in revolt, and the fact was becoming apparent which should have been seen from the first: that it was impossible to demolish the Perpendicular without shaking the very foundations of English Gothic, along with its chance of acceptance and extension with the nineteenth century. It had been overlooked that, after all, man was not made for a theoretic art, but art for man. Proceeding to speak of the attitude of modern criticism in the matter, Mr. Sedding said that for the purpose of passing judgment on the two main classes of Mediæval art, new architectural laws had been invented, new arbitrary tests had been applied, and theories advanced which were formerly unknown and undreamt of, and which in reality required that a building should possess much more than architectural perfection. Previously, the three qualities considered indispensable to a good structure were stability, utility, and beauty. And of old it sufficed that the general disposition of a building should be such as should give pleasure to the beholder and should combine the elements of proportion, harmony, and symmetry. These were broad, reasonable laws, fair and satisfactory, because whatever individual speculative opinions an ingenious mind might advance in condemnation of a building, it was still possible to maintain a decent respect for it so long as its essential points more or less conformed to those leading virtues which the suffrages of common sense and tradition had marked out. But the critic of the nineteenth century was far from satisfied with the old time-worn canons. They were too broad and generous for the purpose of his minute mind: the old standards were much too liberal for him. So he set to work to narrow the definition of virtue as commonly understood: he made new weights and measures,—in fact, two sorts for the two classes of work to be appraised,—and in order to accomplish his task effectually he made a clean sweep of all personal affinities. His system was the system of the austere ascetic, which required self-repression as its first condition. So he trampled on his own impulses, put a curb on spontaneous taste, and circumscribed within the narrowest limits the insidious workings of natural perceptions. Thus equipped, with purity and perfection for watchwords, good precepts at his fingers' ends, and clothed with complete confidence in the unerring certitude of his opinions,—he was equal to any valuation of the productions of his sires. Chance and circumstances had seemed to mark him out for this high office, and he felt fully competent for the task. Although creative art was at rather a low ebb just now, research was never so active. There was much to be gauged. Things that had been hidden in the dust of ages had been rudely unearthed, to be overhauled, questioned, ticketed, and assigned either to glory or perdition, as the case might be. There seemed to be amongst us an entire incapacity for doing justice to more than one period at a time. Indeed, a preference begotten of such processes was bound to generate a captious spirit. It was bound to be one-eyed. Its drift was to make sure of itself by decrying everything that was beyond its scope of vision. The facts on which the author relied to prove the nobility of the Late Gothic might be indicated under these heads: the vigour and variety of its types; the dignity of its effects; the greatness of its aims; its power of developing fresh ideas, new skill in work, and new scope of structural device and decoration. In his remarks on these several heads he endeavoured to show that, as compared with the earlier, the later Gothic was broader and deeper beyond comparison and measurement. He asked his hearers to forget as far as possible the absolute terminology of the apologists of early art, as narrow, erroneous, and misleading. They should not polarise "purity" as though its opposite were all that was bad. Perish "purity" that bred the mean spirit of a detective or an inquisitor whenever they were brought face to face with noble English works! The only "impurity" we knew of in the matter was where a building had imbibed the taint of something alien to itself. In dealing with his subject, the author contrasted Salisbury Cathedral and Rievaulx with Winchester Cathedral and Sherborne Abbey, and after dwelling at great length on the characteristics of the three first-named buildings, proceeded to say that Sherborne had much the same qualities as Winchester, but in a different dress. There were masculine vigour and breadth of treatment, richness, variety, and scientific skill, combined in the sweeping lines of the fan-vaulting, with its intricate traceries and numberless bosses; in the bold traceried windows; in the panelled arcades, the sculptured string-courses, and the traceried parapet. There was a bluff English massiveness in the ponderous arches and piers, in the large gargoyle carvings, and in the sturdy central tower. And all this massiveness and vigour and variety was relieved and brought into complete harmony by the rich tones of stained glass and coloured masonry. The presence of two-centred arches throughout this noble example of Late Perpendicular gave the author an opportunity for combating the idea that depressed arches, or four-centred arches, were universally employed in Perpendicular. On the contrary, the prevailing form of the arches or arcades, doors, and windows, in the five renowned Perpendicular counties of Somersetshire, Suffolk, Norfolk, Devon, and Cornwall, was that of the two-centred arch, often well pointed; or to mention other typical examples external to those counties, take Malvern, Christchurch (Hants), St. Mary Redcliffe (Bristol), Thirsk, and St. Mary's, Beverley; or, to take the question of the "perpendicular" or the "horizontal" character of the style, the old name was true to a shade, while the new name had not a shadow of authority to support it. Take the interiors of Winchester and St. Mary Redcliffe, and the choirs of Sherborne and Tewkesbury. Every line led up to the roof. The vertical lines were everywhere emphasised by being carried up in a continuous line from the floor to the groining, and were not interfered with in any way whatever by any horizontal lines of string-courses; indeed, the long "grating" window of panelled wall-tracery was of itself a token of the nature of the art. There was precisely the same character in such noble towers as Wrington and Leigh-on-Mendip. The buttresses rose boldly, in few steps from ground to parapet. In the great majority of instances the clearstory windows of Perpendicular churches were connected with the nave arcading beneath them by means of wall-panelling, whose lines were vertical. Very frequently the bays of the naves where emphasised by a portion of the pier running through from floor to roof; and the "Perpendicular" was emphatically not the "Horizontal." In conjunction with this assertion from Mr. Stevenson came another equally fallacious, which was that "the Pointed style arose from vaulting necessities; and, indeed, to the use of wooden roofs in England may be traced the abandonment of the pointed arch." Now, the pointed arch never was abandoned in windows or doors or nave-arches anywhere in England till the last stroke of Gothic; moreover, in the whole of the Devonshire and Cornwall and a large proportion of the Somersetshire churches, every rafter had its arched rib, from end to end; and so the pointed arch construction was common everywhere in Norfolk and Suffolk, in Thirsk, and Bere Regis, and Weare Gifford, and hundreds of other typical Perpendicular works. Mr. Sedding said he could not help thinking that a little further actual experience of Perpendicular work would have prevented this assertion, and that a glance through Mr. Brandon's "Examples of Open-timber Roofs" should dispel it once for all. Mr. Stevenson did not mention Italy in connexion with his theory. Perhaps he was right. But the Pointed style did prevail in Italy for a time, but always in conjunction with flat roofs. And, as to the use of wooden roofs in England having anything to do with the fall of Pointed architecture, the "horizontal" character of English Gothic should, according to this theory, be apparent from its first stroke, because wooden roofs always prevailed in England, and the examples of vaulted parish churches of all styles, not including the Norman, might be counted on the hands.

The author said, in conclusion:—I come now to the third point of my subject, the proposition that a hearty revival of the late Gothic is called for in the interest of the Gothic school and of architectural design at large. Perhaps after Mr. Stevenson's funeral oration upon Gothic architecture ancient and modern, I ought to apologise for wasting your time on such a topic. Perhaps at this point it should be proposed that my remarks be taken as read, as touching upon a theme of the past. But, with your permission, I will briefly review the situation, and extract from it whatever comfort I can. I came to Mr. Stevenson's lecture with great expectations. I knew that he was passing out of the servitude of an old attachment; I was prepared to hear the vanity of Gothic preached with all the more fervour in that he had himself surfeited from eating its mouldy fruits. It had long been whispered in Gath that this was a night much to be remembered; that Gothic was doomed out and out. More than this, I had chanced upon a little fugitive literature of the "Free Classic school" to which a few æsthetic ladies were the chief contributors, and having had my curiosity awakened by the whispers of the sybils, I looked forward to an intelligible conception of the artistic prospects of England from the lips of one of the prophets. It was with no surprise that I saw "old Gothic" architecture put back again affectionately but firmly into its old-world dust as a beautiful but obsolete science,—not to be altogether lost sight of, but kept handy as an illustration of negative excellence whenever the supremacy of the nineteenth century is in debate. Looking down from his eminent position, it was not to be expected that the lecturer should give other than a bird's-eye view of things. Yet although we did not get what we might call a very close or sympathetic portrayal of the features of the old Gothic, the main purpose of the lecturer was probably served, by showing us how clearly he understood the singular merits of the things he discarded, the magnanimity of his sympathies, his complaisant tenderness to fallen styles. But one got a very hazy notion of what was coming to pass in the new era. We heard that the whole of the past labours of the Gothic school were to be wiped out as a blot on the page of nineteenth-century progress. But, alas! nothing was settled for the future! The old faith was to be swept away; nothing seemed ready to be put in its place. The heavens were to be swept clear of the obsolete stars, but the new, bright, particular star was yet struggling in a fog. The lecture was, in truth, like a premature lifting of the curtain at a theatre; the footlights were ablaze, the band was playing, the audience were breathless, but the actors were not posed nor the properties fixed for the new piece; in fact, nothing had been done except to generally upset the properties of the previous piece. It was all chaos; creation had not begun. One fact alone loomed out of the darkness and confusion: there was to be henceforth but one style practised, and that was not to be based on anything that went before; there was to be no more "copying"; we were to have no more insipid reproductions of bygone times. I am not going to attempt to rebut Mr. Stevenson's charge of copyism against the Gothic school, although I deny it totally; but I wish to inquire whether this brand-new school is free from such a censure, and if not free, to what extent is it open to the charge? Has the new school, then, no ancestry?—did it simply "grow," like Topsy? Do its types and aims differ from those of every other style that has gone before? Has the new school no relations with the Old Classic, the Old Gothic, or the Mediæval Renaissance? A glance at the productions of the so-called "Free-Classic" school reminds us of the old proverb that they who live in glass houses should not throw stones. No one believes the curly dcr-

mers," the tapering pilasters," the attenuated sash-windows, the moulded cornices, and frisky foliage of the new school, are new-born features evolved out of the inner consciousness of nineteenth-century designers. Any one who has travelled at all in England and on the Continent can give chapter and verse for every fragment of design embodied with more or less skill in works of this class. We know something of the dormers and hipped roofs of Nuremberg and Rouen and Bruges; we can trace the miscellaneous parentage of a bit of eccentric detail; so that we take Mr. Stevenson's parental praise of the Queen Anne as a piece of fond infatuation, and his charge of copyism levelled at the Gothic school as a little unbecoming: his remarks are, indeed, but the poor commonplaces of party warfare, that vanish the moment they are touched. Nay, the case stands even worse than this; for every one who has the least insight into things knows quite well that this so-called "Free Classic," in which we all dabble a little, is neither more nor less than Gothic thinly veiled! "The hands may be the hands of Esau, but the voice is Jacob's voice." These buildings are Gothic in spirit, in conception, in outline, and in method of composition. The Free Classicist has put before the world a savoury, well-spiced, and carefully-flavoured dish, but the meat is not what it seems, and the supplanter gets the blessing by donning the robes of his rival. I am only showing the unwisdom of any attempt at Positivism in the matter of modern design, and am not striking at the liberty of any one to do whatever he wills to do. The new school is worthy of our heartiest commendation and encouragement. We must welcome life from whatever quarter it comes. We must welcome freshness, though it be the freshness of an exotic. We must never cease to listen for the faint steps of the Angel of Deliverance. I am far from prepared to say that the Perpendicular, or any style whatever, is the one only answer to all the wants of the age. To take merely the question of ecclesiastical architecture, which is one of the most interesting probably of the day, I would say, let the early styles be confined to the country, where cheapness and simplicity are necessary, and small churches needed. Use the Perpendicular for country towns, and the Renaissance for cities. I make the distinction in the two last because a Renaissance building has an essentially modern aspect, suited to the modern surroundings of a city; while, although a country town may have plenty of modern structures in its streets, it will probably also contain some historical remains or historical traditions, or some picturesque qualities of site, to recommend the adoption of an historic and picturesque type of English architecture like the Perpendicular. Further, the outside of a church in a country town has to be more studied than the outside of a church in a city. In a country town it is one of two or three conspicuous objects of the place; in a city a church is inconspicuous among factories and warehouses and crowded squares and streets. So that, granted the Renaissance style is equally suited for church architecture, and that it generally conforms to the essentials of a good structure, you do not so much regret that its least worthy side —its outside—is little observed, or observable, in the closely-populated spot in which it is planted.

There is still further reason for the employment of the Renaissance for cities. It is a noble style, marvellously well suited to nineteenth-century ideas and wants, and should, therefore, have its chance of use equally with other styles. The age we live in must be taken on its own terms. It were mere folly to ignore the tastes and wants of the age whose ministers we are. Let us by all means have defined principles and schools of practice, and hold to them; but not unwisely against its instincts, lest the age should recoil from us, leaving us high and dry on the strand to build ideal structures for a Utopia of our own. More than this, we should lay ourselves open to imbibe the spirit of our time in all its fulness; be constantly testing our work by this, and be ever ready frankly to accept the conditions it imposes upon us. Now, if there is one thing which appeals more than another to the modern mind, it is vastness, size, space. The Perpendicular, of all the English styles, comes nearest both in time and spirit to this age, and can respond to its wants by honest development of its original character, and therefore, it is, in my estimation, the most suited of all the Gothic styles to this time. But the Italian Renaissance runs close by the side of the English Perpendicular; it can be used for precisely the same ends, and can respond to the same requirements. If I were asked to name my favourite churches out of England, I should say first, St. Mark's, Venice; secondly, Milan Cathedral; and thirdly, Brunelleschi's noble Church of Santo Spirito, at Florence. If I were asked to name buildings which most conformed to my own views of what modern city churches should aim at—buildings which most appealed to me as a true son of the nineteenth century—which seemed to me to touch chords sympathic to the nineteenth century, and that could be appreciated without the least affectation or stress of taste,—I would say Brunelleschi's and Alberti's Renaissance churches.

Taking our model from the best Renaissance of Italy, we have a style that will adapt itself freely to all our wants, in the employment of which the best side of modern art can pour out its products at the feet of God: where our Burne Jones, Morris, and Poynter, Rossetti and Watts, Minton and Salviati, and our Royal Academy sculptors, can employ their genius without any sense of inconsistency, without any fear of transgressing precedent, or denying the primary intention of the art dealt with. You may cover the walls and arches of a modern Renaissance church with lovely carved subjects, terra-cottas, and inlaid marbles, as at St. Francisco at Rimini. You may have a church painted all over, every feature and every particle of wall-space having its due place in one vast scheme of colouration, as at St. Andrea at Mantua; or you may aim at stern, massive effects as at St. Spirito, Florence, whose noble lines have no touch of luxury or sensuality, but which seem to lift you into the serene region of pure intellect. And we Gothic revivalists may grant all this sphere of usefulness to the Renaissance, and yet have our hands full; the Renaissance will have its place whether we like it or no; and we may yield it due rights with kindly grace, and still hold as tenaciously as ever to our own position as Gothic revivalists. "Art is a city," Victor Hugo says, and the immortal citizens of art, like the citizens of heaven, speak but one universal tongue. Giotto of Florence and Poore of Salisbury, Brunelleschi of Florence and William of Wykeham, are brothers in a commonwealth where glory of rank is measured not by what individual style was employed, but by the genius of the artist and the everlasting worth of his work.

Yet there is something after all in national art, and specially so in the case of an insular people like ourselves, and I for one am not prepared to see Mr. Stevenson, in his dealings with Gothic architecture, enact the part of the little steamer in Turner's picture of "The old *Téméraire* tugged to her last home," without remonstrance. I have always resented the disdainful manner of the screeching little steamer, that with much puffing and letting off of superfluous steam, drags the old fighting-ship as a useless hulk at its heels, into the limbo of obsolete things. It does not fall to my lot to reply to him on the general question of the Gothic revival, but only as regards the revival of the Perpendicular, and this I have done with such power as I possess. It seems to me that a style which is native to England,—a style which was the most active in the whole range of English art, which has an illimitable variety of types, and an inexhaustible stock of resources, is not to be shelved by an essentially reproductive age like the present without detriment to the hopes of modern architecture. A style native to England in her palmy days, when both the characteristics of the race, and of her national art, had become intensified and perfected by time and culture, must naturally have within it those conditions which best enable the Englishman to express himself for all time.

I say this because I hold that in a true sense the Perpendicular is the English parallel of the art of Phidias,—that it does not simply represent the thoughts and capacities of one age only, but that, like the art of Phidias, it sums up the best of the complex gifts of a race once for all. It is the index of the English mind at the time of its highest visitation, when the English genius is roused to the full height of its varied powers. I hold that all that the Englishman has instinctively of sense of grace, of majesty, of judgment in proportion, of mystery, of grotesqueness, of refinement, of humour,—all the lights and shades of his character,—have a home there. The Perpendicular is to me the abiding, conclusive testimony of the truly great spirit of English art. I see this spirit under various interpretations, but still the self-same spirit, alike in the deep solemnity of Winchester, the massiveness of Sherborne, the elegance of Gloucester, the spaciousness and large quietude of Salle and Lavenham, the richness of Cawston and Southwold, the majesty of Wrington and Leigh-on-Mendip, the sober picturesqueness of Haddon, and Coventry, and Hever. It is not that one county is ahead of another, but that our forefathers were at the full height of their artistic stature everywhere alike; that they were at their level best from Land's End to Flamborough Head, from Southwold to St. David's.

We have a parallel culmination of English genius in another phase of art in the literature of Elizabeth's reign. And, in conclusion, let me submit these two points to your consideration,—first, that the works of Shakspeare, and Spenser, and Bacon, and Marlowe, still hold their own in the sympathies of this nineteenth century; time does not dethrone them; culture does not lessen their glory. Secondly, that they are the models of the best literature of today. There is only one English-speaking poet as original in poetry as Mr. Stevenson affects to be in architecture, and he is of American notoriety,—Walt Whitman by name. Every other poet is great enough to acknowledge that he serves his generation best by treading in the footsteps of his sires. He knows that he addresses the same race as Shakspeare, and he uses the same means, hoping for like results. And this is our standpoint in this Gothic revival. We hold to the fellowship of English genius through all times; we draw no hard-and-fast line between the works of one period and another: to us they are not conflicting, but harmonious and sympathetic. And while we would allow the "Free Classicists" perfect liberty to assimilate all manner of alien matter in the elaboration of their own system of composition, we claim like toleration in the free development of the Gothic architecture of England, in its entirety and fulness, without partiality or restraint.

A brief discussion ensued, in which Messrs. A. Payne, W. F. Potter, and H. L. Florence took part, and, a vote of thanks having been accorded to the author, the meeting terminated.

RECENT DISCOVERY OF THE REMAINS OF A ROMAN VILLA AT ABINGER, SURREY.

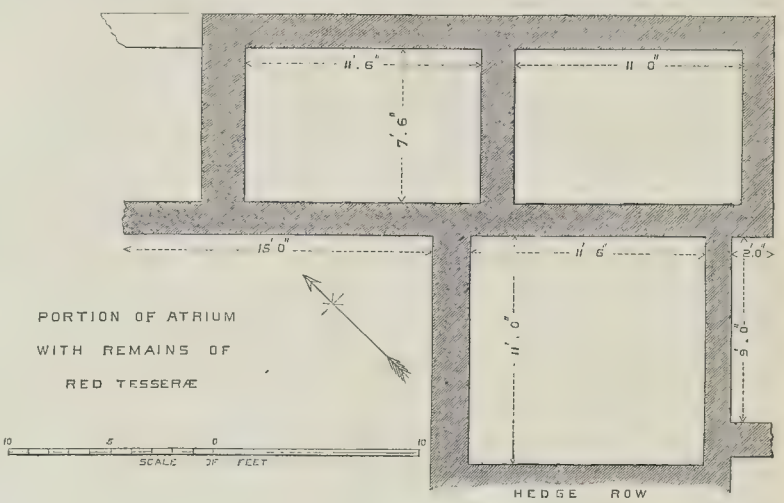
SURREY has not been celebrated for its "finds" of Roman villas, for although there were, doubtless, many of them situated near the famous "Stane-street," which ran through the centre of the county in a south-westerly direction to Chichester, the Regnum of the Romans, very few have been met with, and those that have, with perhaps the exception of the one at Walton Heath, discovered some hundred years ago, and the traces of two others at Bletchingley, under White Hill, and at Woodcote, near Sutton, found in the early part of the century, presented no features of importance, and have scarcely been noticed at all in consequence.

It is, therefore, with much interest we learn of the discovery of a Roman villa at Abinger, not far from Dorking, where the "Stane-street" can still be traced on its way into Sussex, and close upon the well-known Cold Harbour,* under Leith Hill, that vantage-ground of Surrey, from whose summit, Evelyn says, can be seen "twelve or thirteen counties," though Aubrey writes some ten, "and by the help of a telescope" another, naming "Wiltshire"! The remains are situated in a field gently rising to the north side of the road to the village of Abinger from Wotton, and is on the property of Mr. Thomas Henry Farrer, of Abinger Hall, once the seat of the Scarletts, the famous "Sir James," the first Baron Abinger, having resided in a mansion which has, however, been pulled down some years, and near to the site of which the present owner of the estate has built a commodious Elizabethan structure.

* Although the exact etymology of the word "Cold Harbour" has excited much attention from time to time, no two antiquaries being now quite satisfied as to its origin or meaning, it is worthy of the remark that the term seldom or never appears except in the neighbourhood of a Roman road or station, and although at this very Cold Harbour many explorations have been made for Roman remains without any being found as yet, there can be little doubt after this discovery so near, that it was some outpost for observation, probably attached to a station there, and in connexion with the proprietor or other great man to whom the building belonged, and who had, with so much taste, selected so beautiful a neighbourhood to live in.

To Mr. Farrer is due the credit of pursuing the discovery, which, as often happens in such cases, resulted from a simple act of useful husbandry, for whilst a certain piece of land close to some farm buildings was being dug into for a kitchen garden, large quantities of stones and tiles were brought to the surface, and at once proclaimed the fact that they were part of the foundations of some ancient dwelling. Mr. Farrer's attention being directed to the circumstance, he immediately set to work carefully to uncover the remaining portion of ground, and in doing so, fortunately came upon the present remains of the building, and which promises, from all appearances, much further to reward his zeal, and prove itself to be one of the largest villas yet discovered in Surrey, and perhaps destined to be a rival of the famous one at Bignor, "Ad Decimum," the station at the tenth milestone from Chichester, the Regnum of the Itineraries, and close by the "Stane-street," or same Roman road, upon which the Abinger Villa is situated, and not more than some thirty miles off, though in the next county to it.

Mr. B. Hicklin, of Roschill, Dorking, a member of the British Archæological Association, having heard of the discovery of the villa in question, which took place a little more than two months ago, through a neighbouring antiquary, went over to view it, and seeing enough, from his knowledge of Roman remains in Italy, to suspect it would prove an important addition to the antiquities of Surrey, he invited some of the officers and members of the Association to pay a visit to the ruins, and judge for themselves what they thought of it. This visit took place last week, and enough was seen, under the guidance of Mr. Hicklin, fully to compensate for the journey.



The present appearance of the remains, as given in the plan accompanying this notice, and which was made on the spot by Mr. C. H. Sparrow, from Wolverhampton, who, with his brother and Mr. George G. Adams, F.S.A., took the measurements, shows only a part of the villa, a hedge-row to the south cutting off communication at present with the land below, and from which, unfortunately, as already noticed, was taken the large quantities of stones and broken tiles before the knowledge was obtained of the nature of the structure of which they formed so integral a part.

Although it is intended again to dig into this land, it is to be feared that much of the general remains will have disappeared, although, as no hypocaust has yet been met with, or pavements either, nor, beyond some pieces of fine tiles and white tesseræ, anything indicating their existence, it may be hoped they will yet be found almost intact, either in the land below or the untouched land above and to the eastward of the present opened portions of the remains.

These consist, as the diagram shows, of a portion of the atrium, or reception-hall, of a Roman villa, paved with small red tesseræ, in many places very uneven from the subsidence of the soil; it measures 15 ft. from north-west to north-east, and nearly the same to the hedge-row, where at present communication apparently ceases, although on the removal of this mound there is little doubt but more of the atrium will be found.

Above this part of the building are indications of two walls running north-west, which probably enclosed a chamber, but of which nothing now can be recovered, the earth having been long ago removed or worn away far below the level of the present remains. To the east is a well-defined apartment, with thick divisional walls of stone and tile or Roman brick, measuring 11 ft. 6 in. in length by 7 ft. 6 in. in width; and another of similar dimensions, going eastward still. The wall at the end seems to stop there, although a closer digging may determine not so, as is the case with the chamber exactly south-east of the one just described, which is nearly square, measuring 11 ft. 6 in. in length by 11 ft. in breadth, and having, as given on the plan, a wall running from it, still going east, and enclosing a part of a room 9 ft. wide.

If further excavations are carefully carried on, it is probable that in this direction will be found the most interesting parts of the building, as towards the end of the house, opposite to the atrium, were usually many important chambers, including the peristyle.

On the party quitting the remains, some of them visited Mr. Farrer's house, and inspected the interesting collection he has already begun there of coins—silver and bronze,—several being of Constantine, and one of Faustina, the wife of Constantine II., who died master of all the empire, A.D. 361; mixed pottery, some Samian ware, pieces of tiles, some with nails attached to them, showing they belonged to the roof; fragments of white and red tesseræ, broken vases and other vessels, &c., all found in the *débris*, and likely, let us hope, to be largely added to.

On Wednesday last, at the first evening meeting of the British Archæological Association this year, Mr. George R. Wright, F.S.A., who with his friend Mr. Hicklin took an active part in the above exploration of the Abinger Villa, read a paper on the subject of this article, and was able to illustrate it by some of the antiquities found on the site, and kindly lent him for that purpose, and a full account of which will in due course appear in the Society's Journal.

THE PRIVATE BILL LEGISLATION FOR THE ENSUING SESSION.

PROJECTED RAILWAY AND OTHER PUBLIC WORKS.

THE period has again come round when the Parliamentary notices are given in respect of powers for the construction of new railway and other public works and buildings, and on examining the official list of plans which have just been deposited there is reason to believe that the private Bill legislation of 1878 will include the consideration of several projects of a highly-important character. The entire number of Bills is upwards of 320, of which more than 100 are in connexion with railway projects, whilst tramway, gas and water, town improvements, and pier and harbour undertakings are unusually numerous. No fewer than thirty of the different projects affect the metropolis, eleven of which are in connexion with railways.

These include a Bill promoted by the Metropolitan District Company for powers to construct a new line to Fulham, together with a pier on the Thames; and also a junction line at Acton. The proposed line to Fulham commences in the parish of Kensington, by a junction with the existing railway of the company at the south end of the platform of the West Brompton Station, terminating in the adjoining parish of Fulham, on the bank of the river Thames, at Willow Bank. The proposed pier commences at the termination of the railway, and extends for a length of 100 yards into the bed of the river, powers being also sought in the Bill for the construction of a floating-stage in connexion with the pier. The Acton junction line commences in the parish of Acton, by a junction with the North and South-Western Junction Line, and terminates in the parish of Ealing by a junction with the Ealing branch of the company, now in course of construction. The Metropolitan Company promote a Bill seeking powers to extend their line from the Aldgate Station to the Tower, and also for powers to construct an extension line from the Regent's-circus to the Farringdon Station. In respect of the last-named proposed line there is also a duplicate application by a company to be incorporated, with powers to construct a line between the points named. A new company also apply for powers to make a line between Fulham and Walham Green, the route being from Hammersmith, by a junction with the Hammersmith and City line, to Walham-green and Fulham. Several of the great companies promote Bills for extension works within the Metropolitan area. Amongst others, the London and North-Western Company in their Bill seek powers for the purchase of land and buildings at West Ham, adjoining the North Woolwich branch of the Great Eastern Company; also land and buildings in Stratford, on the east side of the North London line; also land and buildings in the Minories, Whitechapel, for the enlargement of their Haydon-square goods station; likewise land and buildings in St. Martin's-lane; together with powers to lay down lines of railway in Worship-street, Primrose-street, and Skinner-street. The Midland Company's Bill includes powers to construct a branch line at Kensington, in connexion with their extensive coal and merchandise depôt, now in course of construction, adjoining the Kensington High-street station of the Metropolitan Company. The Great Western Company likewise seek powers for extensive purchases of property in Paddington and Kensington for station extension purposes. The South-Eastern Company's Bill includes powers to purchase from the Charing-cross Hotel Company the buildings in extension of the hotel now in progress between Villiers-street and Buckingham-street. The Great Eastern Company's Bill contains powers for the widening and improvement of their North Woolwich branch, and that portion of the main line between Bethnal-green and Bow. The Metropolitan Inner Circle Completion Company promote a Bill containing clauses for extension of time for completing the link-line between the Mansion-house and Aldgate, and also powers to make arrangements with other companies. In addition to their various powers Bill, the London and Brighton Company have a Bill empowering them to construct a new line from Croydon to East Grinstead; whilst the London, Chatham, and Dover, and the South-Eastern Companies jointly promote a Bill, empowering them to enter into working arrangements with a view to amalgamation.

There are no fewer than twenty Bills, in addition to fifteen Board of Trade applications, for powers to construct tramways in several of the great towns in different parts of the country. Amongst them is a Bill promoted by a company to be incorporated for the construction of a tramway between King's-cross and the City, commencing in Pentonville-road, and terminating in Farringdon-road, near Saffron-hill and Ely-place. Another Bill is for the construction of tramways in different parts of Croydon and suburbs. There is also a Board of Trade application for powers to construct a tramway from the South-Western Railway Station to the camp at Aldershott.

There are upwards of sixty gas and water Bills, several of them of great magnitude and importance, including the two Bills promoted by the Metropolitan Board of Works for the purchase of the Metropolitan water companies and the construction of new works; also the gigantic scheme projected by the Manchester Corporation for obtaining a water supply from Thirlmere, in Cumberland. The bills of this class also include one promoted by "The South London Spring Water Company," whose object is "to utilise the pure spring water now lying underneath Tooting and Streatham." The Metropolitan Board of Works, in their New Works Bill, seek powers to construct wells and pumping-stations near Redhill, Hayes parish (Middlesex), Epsom, Keston in Kent, Eynsford in Kent, near the Eynsford Station of the London, Chatham, and Dover Railway, and Grays Thurrock in Essex. Also three reservoirs, one in Great Stanmore, Middlesex; one in Banstead, near Epsom Downs; and one in the parish of Chelsfield, Kent. The Bill likewise contains powers for the construction of mains and aqueducts several miles in length. The Bill also contains the usual powers as to compulsory purchase of land, the official notice stating that the object is "to afford a supply of water to every dwelling in the metropolis now supplied with water by any water-works company, or which may be so supplied at the time when the works of the Board shall be in operation." Another clause is "to impose a condition and obligation upon all persons who may be supplied with water by the Board to take a supply of water from the water-works company within whose limits of supply the premises of such respective persons may be situate." The promoters of the South London Spring Water project in their Bill apply for powers for supplying water from the springs at Tooting, with power to supply water to the various parishes and townships of Wimbledon, Croydon, Kingston, Lewisham, Streatham, Tooting, Camberwell, Lambeth, and the neighbourhood. The proposed well and pumping-station is in Tooting, in the parish of Streatham, on the north-east side of Garret-lane, with a reservoir immediately adjacent. The project also involves the construction of three other reservoirs, in addition to the one just named, and includes a service-reservoir and pumping-station in the parish of Croydon, on the west side of Beulah-hill, near South Norwood; also a reservoir in the parish of Lewisham, on the east side of Sydenham-hill; and another reservoir in the parish of Wimbledon. Powers are likewise sought for constructing several miles of aqueducts, and laying down pipes in the several parishes included in the project, namely, Camberwell, Lambeth, and the immediate locality.

The Bills of a miscellaneous character for projected works affecting the metropolis include one promoted by the Metropolitan Board of Works for the purchase of Plumstead Common, with powers to erect a lodge at Blackheath; also to provide for the maintenance of Plumstead Common and Shoulder-of-Mutton-green. The Bill contains provisions for excluding "all gipsies, hawkers, and rogues and vagabonds" from the common and green, and there is also a clause for the prevention of bird-catching, bird-trapping, and the robbing of birds' eggs, or the shooting or chasing of game. The Board have also another Bill under the head of "Metropolitan Management and Buildings Acts," to enlarge and amend some of the present powers as to buildings possessed by the Board. One of the clauses empowers the Board to impose new restrictions with respect to the erection or alteration of houses and buildings, particularly with respect to the distances at which such structures shall be from the centre of any carriage-road or footway. Another clause provides for the prevention of using for carriage traffic of roads being of less than 40 ft. in width where there are houses on each side of the road, and of less width than 20 ft. where there are only houses on one side. The Bill likewise contains provisions as to the foundations and sites of houses and buildings, and the mode in which, and the materials with which, such foundations shall be formed; also clauses as to the description and quality of the substances of which the walls shall be formed; enlarged powers to the Board as to the removal of dangerous structures; and increased powers to the Board with respect to theatres, music-halls, and other places of entertainment, with powers to insist upon any alterations in any such buildings which the Board may consider necessary for the public safety and convenience. The Corporation promote a Bill containing various powers, one of which has reference to the throwing open of St. Paul's Churchyard. Another clause in the Bill gives powers to the Corporation to plant, drain, and improve Epping Forest, to build and repair lodges and other buildings, and to make roads and ponds, and execute other works so as to make the forest a place of recreation for the public. The St. Paul's Churchyard portion of the Bill confirms an agreement entered into between the Corporation and the Dean and Chapter, under which the churchyard is in future to be managed by the Corporation as an open space and ornamental garden. The Corporation have also another Bill for the widening of London Bridge. The Bill contains clauses providing for the widening of the bridge 11 ft. on each side, commencing on the City side in King William-street, near the public stair between King William-street and Lower Thames-street on the east side, and the public stair between King William-street and Upper Thames-street on the west side; and on the Surrey side, nearly opposite to the railway approach from High-street. There is also a Bill containing powers for constructing a bridge across the Thames commencing at a point between the Tower and St. Katharine's Docks, and terminating on the Surrey side of the river near Free-school-street, Horselydown. The Commissioners of Her Majesty's Works and Public Buildings promote a Bill to purchase, by compulsion, for new public buildings, "all the lands, houses, buildings, streets, roads, and premises within the area bounded on the north by Charles-street, and that portion of Parliament-street which was formerly Upper Charles-street; on the south-side by Great George-street; on the east by Parliament-street; and on the west by St. James's Park." The Commissioners have likewise a Bill for powers to purchase additional property in the neighbourhood of Covent-garden and Bow-street, for the purposes of the new Bow-street Police Court buildings. The Post-office authorities have a Bill containing clauses and powers for the better protection of the national telegraphs vested in the Postmaster General, and to afford greater facilities for putting down and repairing and working the telegraphs. There is also a Bill in which powers are sought for the construction of a new bridge in Cromwell-road, over the West London Extension and Metropolitan District Railways, at the junction of Cromwell-road West with Warwick-road. There is likewise a Bill for the improvement of Albert-terrace, Hyde-park, with powers to make a new road from Knightsbridge into Hyde Park, in the line of Sloane-street.

A special feature amongst the undertakings affecting the several large towns is the number of tramways promoted by the various municipal bodies. Thus, the Corporations of Liverpool, Manchester, Bolton, Oldham, and other places, are applying for powers to lay down and work tramways in their respective localities, the Liverpool and Bolton Corporations also including in their Bills powers for working the lines with steam or other mechanical power. The Liverpool authorities further take powers for the conveyance on their lines of materials for sanitary purposes, and there is also a provision for running workmen's carriages at reduced fares.

There are upwards of twenty projects connected with docks, piers, and harbours, one of the most important of them being that for the enlargement and improvement of the Newhaven harbour and dock. The proposed works under the Bill are to consist of a breakwater, extending 900 yards seaward, together with a quay or wharf, and with a sea-wall 300 yards in length, which will form a new western entrance to the harbour. In connexion with the works it is also proposed to construct a new branch railway from the London and Brighton line, crossing over the river Ouse, and terminating at the proposed breakwater. Likewise a new dock on the east side of the river Ouse, twenty-four acres in extent, with a chamber and lock-gates for connecting the dock with the harbour. The Margate Pier and Harbour Company seek powers to widen parts of the jetty, and to construct landing-places and other works. Also powers to erect a covered pavilion on the pier, with two landing-stages at the head of the pier. The Kingston-upon-Hull Dock Company have a Bill for the construction of a new dock, twenty-five acres in extent. Also powers to purchase a large extent of property for enlarging some of the existing docks and quays on the Humber. There is likewise a Bill with powers for the erection of a pier at Hythe, 2,200 ft. in length, together with a tramway, toll-house, and other buildings on the pier. The Local Board of Southend apply for powers to construct two new piers, and to enlarge the present pier. The Mersey Docks and Harbour Board promote a Bill for constructing an overhead railway along the line of docks. There is also a Bill for powers to construct a bridge over the Severn, from Arlingham to Newnham. The Blackpool Pier Company have a Bill for the extension of the present pier. Powers are likewise sought to construct an open iron pier at Filey harbour, extending seaward 2,000 ft., together with a stone breakwater, 1,150 ft. in length. Another Bill seeks powers for constructing a pier and sea-wall in the parish of St. Helen's, Isle of Wight; whilst another body of promoters have a Bill for the erection of a pier at Shanklin, also in the Isle of Wight. Powers are also sought for the erection of a pier, 1,200 ft. in length, seaward, at Cliftonville, together with saloons, refreshment, and other rooms. There is likewise a Bill with powers to erect a promenade pier at Plymouth, 500 ft. in length. The Glamorganshire Canal and Dock Company have a Bill for the construction of docks, a timber float, and a railway, at Cardiff; and there is also a Bill for the construction of a bridge over the river Taff, at Cardiff.

There are several Bills for town improvements of an important and comprehensive character from more than a dozen of the great towns, and in several of the Bills very stringent powers as to the elevation, materials, and sanitary arrangements of buildings, are asked for. The towns from which these Bills proceed are respectively Sheffield, Nottingham, Huddersfield, Bradford, Swansea, Jarrow, Clitheroe, Burton-on-Trent, and Liverpool. The Sheffield Bill contains powers as to the means of ingress and egress to and from churches, chapels, schools, and places of amusement. The Clitheroe Bill includes powers to erect a new market; whilst that from Burton-on-Trent contains clauses for the erection of a new town-hall, municipal offices, court-house, market, and station-house. The Huddersfield Bill contains powers to provide dwellings for the working-classes; powers to close all polluted wells within the borough; and also powers to provide public water-closets and lavatories, and to charge for the same. The Jarrow Bill, amongst other powers, contains clauses for the erection of a new town-hall, municipal buildings, borough court, police courts and offices, slaughter-houses, &c. The Nottingham Bill contains exceptionally comprehensive powers as to buildings and general sanitary arrangements, one provision being that when a house or other building is unoccupied, the owner shall be held responsible for keeping it clean, and sweeping the footpaths in front of it. Another clause prevents the first occupancy as a dwelling-house of any new building in any new street until such street shall be formed, drained, and metalled, to the satisfaction of the corporation; and also to prevent the first occupancy as a dwelling-house of any building until the granting of a certificate by the corporation that such building is in accordance with the building bye-laws of the borough, and the drainage complete and duly ventilated. Another clause provides that due notice shall be given to the corporation when any person within the borough is suffering from smallpox, cholera, or any contagious disease.

The Bill for the great water-scheme of the Manchester corporation contains a clause giving powers to the corporation to purchase or lease for the drainage area of the works the mountain land around Thirlmere, containing 8,550 acres, subject to rights of pasturage. Powers are likewise sought to divert and impound upwards of forty streams and brooks which flow into the lake.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THE BYE-LAWS.

A MEETING under the auspices of the Home and Eastern Counties Committee of this Association was held at Dartford, Kent, on Saturday, the 15th ult., when the following members were present:—

Messrs. Ashmead, Bristol (president); Allen, Stratford-on-Avon; Angell, Stratford; Anscomb, Maidstone; Buckham, Ipswich; Cross, Dewsbury; Ditcham, Harwich; Ellice-Clark, Hove; Goodchild, Teddington; Jones, Ealing; Harding, Epsom; Honeycombe, Northfleet; Hope, Colchester; Lemon, Southampton; Maughan, Grimsby; Newman, Ryde; Macaulay, Kingston-on-Thames; May, Town-Malling; Noot, Tonbridge; Lewis, Enfield; Cook, Ware; Procter, Bolton; Pritchard, Warwick; Richards, Dursley; Rogers, Hornsey; Smethurst, Sowerby Bridge; Walker, Croydon; Stores, Southend; and a considerable number of visitors.

The Model Bye-Laws recently issued by the Local Government Board were discussed.

Mr. Angell moved the first resolution, to the effect that the Local Government Board be memorialised to sanction the payment of town surveyors by fees. He pointed out that in the metropolitan district the system of payment by fees had been carried out for many years,—the duties of the district surveyors being heavy, and entailing a large amount of work. The bye-laws of the Local Government Board contained much more stringent clauses than the bye-laws now in force in most towns, and if adopted would throw upon the surveyors additional work, such as was never contemplated a few years ago, and to see which carried out would require a considerable increase in their staff. He suggested that the salaries of the surveyors should be raised in proportion to their work, and that the fees should be paid to the credit of the authority,—not directly to the surveyor, as that would bring about an amount of personal inconvenience an officer should not be subjected to. Speculating builders now obtained the services of a qualified surveyor to superintend their erections, and the construction of their roads and sewers, without paying for them; and it was only fair to the bulk of the ratepayers, for whose protection bye-laws were made, that those who required looking after should pay some proportion of the expense. As to the bye-laws, his opinion was a Building Act for the entire country should supersede bye-laws.

Mr. Hope, of Colchester, in seconding the resolution, said if the new bye-laws were to be enforced, the number of inspectors for buildings would have to be considerably augmented. The local board surveyor's work had increased very materially of late years, and if he was called upon to inspect every part of every new house, in addition to his other work, he would require a considerable amount of assistance. It was not fair to call on the ratepayers for this,—those who were committing the faults should contribute to the cost of inspection.

The discussion was continued by Messrs. Newman, Lemon, Jones, Buckham, and Ashmead, all of whom were of opinion that the new bye-laws threw a great amount of additional work on the surveyors' department, and that it would be a fair thing to tax the speculator and not the ratepayers for supervision.

The resolution was carried.

Mr. Ellice-Clark moved that the Council of the Association report on the practicability of carrying out the new bye-laws. In doing so, he said it appeared as if the Public Health Acts and the Model Bye-Laws were drawn by Parliamentary draughtsmen and engineers in the sole interests of the fire-insurance companies, and that the borough surveyors, who could give the Government the best advice on the subject, had never been consulted at all, was a matter of fact. No borough surveyors had been examined before any of the Parliamentary Commissions; neither, so far as he knew, had they ever been consulted as to the drafting of the new bye-laws. This was evident from some of the clauses, to which he would briefly call attention. In the first place, there was a larger and greater variety of exempted buildings than under existing bye-laws, and the vexed question of wooden outhouses was dealt with under sub-section H, but not satisfactorily, inasmuch as they knew there were hundreds of wooden erections constantly being put up not for purposes mentioned in the bye-laws, and it was well-nigh impossible to prevent it. Mr. Clark went on to object to many of the proposed laws (most of those objected to, we are bound to say, seem to us very desirable), and maintained that these bye-laws could never be enforced by a sanitary authority; neither the people nor the authorities were educated up to them. They must know that most towns had bye-laws, and, he believed, in a large number no attempt was made to carry out the more stringent ones, because it was useless to pass laws so much in advance of people's ideas; if they did, the executive found, after much trouble and personal annoyance, it was useless, and after many attempts they were given up as hopeless. Let them attempt to carry out the bye-laws already enacted, and gradually educate their constituents up to them. They wanted restrictions that would ensure working-people dry houses, well drained, with pure water and breathing-room. Could not these be secured by something very much less stringent than the Model Bye-Laws, which, he believed, no authority in the kingdom had or would adopt? He could not vote with Mr. Angell for a general law for buildings, roads, and sewers. The local circumstances were so entirely different, as he knew from personal experience, that he believed it impossible to meet the very different cases by a general Act.

Mr. Jones, in seconding the resolution, said it was much to be regretted that the men who could best give an opinion on these subjects were never consulted, otherwise they would not have such inconsistencies and impracticable laws placed in their hands, to carry out which in practice they found impossible. Whilst there were many valuable restrictions in the new bye-laws, there could be no doubt that they went far beyond those existing, and, as far as he could charge his memory, beyond the Metropolitan Building Act. Bye-law 17 provided for a damp course 6 in. above the surface of the ground adjoining the wall. What if the house had a basement story? This would always be wet where the ground was not excavated to the depth of the lowest floor, and thus half of its value was lost.

The discussion was carried on by Messrs. Lemon, Angell, Buckham, Newman, Ashmead, and others, and the resolution was unanimously adopted.

The members afterwards visited the Dartford Section of the West Kent Main Sewer, under the guidance of Mr. Alfred Williams, the engineer, from whom it was learnt that nineteen shafts have been sunk to the level of the sewer, of from 40 ft. to 65 ft. below the surface; that 7,200 ft. of the sewer in tunnel, and 13,500 ft. in open cutting, had been constructed eastward of Penhill Bridge; that 3,200 ft. of the Cray Valley sewer were complete; while at the outlet works at Dartford 3,600 ft. of sewer and the floor of the filters and reservoirs were in a forward state, a total length of 5¼ miles of sewer being completed. The contractors were Messrs. John Neave & Sons.

The members lunched together, and returned to town in the evening.

CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

THIS school, which opened in January, 1873, completed its fifth year and fifteenth term on Saturday last, when the certificates awarded by the examiners were presented to the successful students. The number of students in the first term was nine; in the last, fifty-six.

The directors of the school have, since it opened, been successful in their efforts to obtain a succession of engineers of repute to preside at the closing meetings of the term, and to examine and report upon the work of the students. On this last occasion, General Sir Arthur T. Cotton, R.E., accepted the invitation to preside, but was prevented from attending by urgent business. Mr. Thomas Hughes, Q.C., chairman of the Crystal Palace Company, effectively performed the duties in his absence. The examiners were Messrs. R. P. Spice, president of the Society of Engineers, and R. H. Tweddell, C.E.

In the course of the proceedings Mr. Hughes, the chairman, presented the certificates. The lectures for the term were on "Materials and their Manufacture." Thirty students attended the lectures, and 23 of these were eligible for examination; of these 18 passed satisfactorily, and were awarded certificates. The highest number of marks attainable is 242. F. J. Scott was first, with 217 marks; W. A. Fenton, second, with 194 marks. Each of the 18 students certificated for the lecture examination had second certificates for merit in the drawing-office or other section. For work in the drawing-office 9 certificates were awarded, M. F. G. Wilson first; R. L. M'Laren and P. J. Ogle equal seconds; for pattern-making, 8 certificates, F. J. Scott first, W. H. Brown and H. C. Trollope equal seconds; for work in the fitting-shop, C. W. Carrington and T. E. Fuller equal firsts; E. Hott second. In the civil engineering section, 11 certificates were awarded to students of the first term,—their work being practical surveying and levelling, and plans and estimates of railways, &c., for Parliament,—G. S. Aitken first, G. B. Jenyns second, A. Pine third. For students of the second term,—their work being preparing specifications, estimates, working plans, and drawings for harbours, railways, docks, &c.,—6 certificates were awarded, G. S. Firth first, H. U. Wollaston second. Five certificates, first and second grades, were awarded to students in the colonial section.

Mr. Wilson stated that 195 students had entered the school since it opened. Of those who had passed through the school, 27 had been taken into engineers' offices without premium, and 69 had been taken with reduced premium. From this Christmas, 47 of the students who had passed through the school would be earning their own living in a variety of situations, more or less intimately connected with engineering. Mr. Wilson stated that a prize given by Mr. Casson, manager of Earl Dudley's works, had been awarded to Mr. W. Bridge, of the Colonial Section, for a paper describing the works; for this prize Carrington was second, and McLaren third. Other prizes, given by Mr. Davis, of Messrs. Sharp, Stewart, & Co.'s works, Manchester, had been awarded to Wilson and Carrington equal first, and Fuller second, for papers on "Tools." Mr. Wilson was glad to be able to address his pupils as "gentlemen," and that there was not a black sheep amongst them.

THE "INNER CIRCLE" RAILWAY COMPLETION.

At the Court of Common Council, on the 13th ult., the Improvement Committee presented a report on the existing Parliamentary powers for the completion of the Inner Circle Railway, and other subjects connected therewith. It stated, in effect, that power had been taken by the Acts to construct four new streets in the City, in the neighbourhood of Fenchurch-street and Eastcheap, and that it was provided that on the completion of the railway and the new streets, to the satisfaction (as regards the streets) of the City Commissioners of Sewers, those Commissioners should pay to the company 130,000*l.*, and that if such sum was contributed, and the streets and railway opened, the Metropolitan Board of Works should pay 370,000*l.* as a contribution towards the cost of making the new street from King William-street to Fenchurch-street. Both payments were conditional on the completion of the works, including the new streets. The powers for the construction of the railway and streets were extended to August, 1879. Possession had already been given to the contractor of the land required at the Mansion House station, whence to Eastcheap the line would be constructed beneath Queen Victoria-street and Cannon-street, and the proper notices had been given to the street authorities in respect of these works. The contractor was prepared to complete the line to Eastcheap by September, 1878, and the entire line by August, 1879, and the contract provided for a bonus on earlier completion, which he considered he would be able to effect.

Monoliths.—Mr. Hosken writes:—"I observe, under the heading of 'Granite Monoliths,' the remarks made about Cornish granite in your pages, and especially *Penryn* granite. I would endorse the statements, and beg to say that in one of the quarries belonging to Hosken & Co., near Penryn, there is *now* one block of good, sound grey granite lying, 44 ft. long, 30 ft. wide, and averaging at least 10 ft. thick, being 14 ft. at one end: so here is a jointless, flawless block, capable of being constructed into a monolith now, 14 ft. square at the base, and 44 ft. high. Of course, in these times, when labour is so costly, the expense of such an obelisk would be great; but after fifty years spent in developing granite on our estates, it should be known what the capabilities of the Penryn granite quarries are."

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE President of this Society for session 1877-78 is Mr. H. V. F. Valpy, M. Inst. C.E. The following is the syllabus of papers to be read:—

Jan. 10.—"House Drainage," by Mr. H. T. Munday, Assoc. Inst. C.E.
Jan. 24.—"Chimney Shafts," by Mr. R. M. Bancroft.
Feb. 7.—"Richmond Water Works," by Mr. A. F. E. Grant.
Feb. 21.—Discussion on Mr. Grant's paper.
March 7.—"Commonweal v. Bricks and Mortar," by Mr. Robt. E. Pownall, architect.
March 21.—"Railway Brakes," by Mr. Edward Perrett, Assoc. Inst. C.E.
April 11.—"Gas Works," by Mr. H. Ellis Hill, Assoc. Inst. C.E.
May 2.—"Landing Pier and Concrete Warehouses at Thames Haven," by Mr. William C. Street, Assoc. Inst. C.E.
May 16.—"Improved Mechanical Appliances relating to Metallic Mining," by Mr. Charles Twite, F.G.S., F.R.G.S., F.S.A.
May 30.—"Works in South America in the Time of the Jesuits and at the present Day," by Mr. Percy Burrell, Mem. Inst. C.E.

The annual meeting will be held on June 6.

The meetings of the Society are held in the rooms of the Iron and Steel Institute, 7, Westminster-chambers, the chair being taken at seven o'clock each evening.

Visits to various works in progress will be made during the season.

THE PARIS EXHIBITION.

A RECENT number of the *London Gazette* gives a list of the exhibitors in the British section. These number 505. Amongst them are to be found the names of Messrs. Maw & Co., Minton, and Minton Hollins, & Co., for tiles; Messrs. Wedgwood & Copeland, for artistic pottery; Messrs. Howell & Sons, for mosaics, &c.; Messrs. Pitman & Cuthbertson, Jackson & Graham, Holland, Wirth, Morton, Scott & Co., and Collinson & Lock, for art furniture; Messrs. Clayton & Bell, for stained glass; Mr. Harry Hems, for carved work; Messrs. Lascelles, and George Trollope & Sons, for high-class joinery; and many other well-known names. The list occupies thirty-seven pages of the *London Gazette*.

THE CADOGAN AND HANS PLACE ESTATE.

INCREASE IN VALUE IN 250 YEARS.

THE case of the "Attorney General *v.* The Duke of Northumberland and other Trustees," which came before the Master of the Rolls the other day, reveals some curious instances of the unintended effects of charity.

Henry Smith, a citizen and alderman of London, by his will of the 24th of April, 1627, bequeathed a sum of 1,000*l.* to be invested in land, "of the yearly value of threescore pounds per annum at the least," and distributed as therein mentioned "for the use of the poor captives being slaves under the Turkish pirates," and for their relief and ransom. The testator gave another 1,000*l.* to be laid out in land of the same value "for the use and relief of the poorest of his kindred, such as were not able to work for their living,—viz., sick, aged, and impotent persons, and such as could not maintain their own charge." Later on in his will he said, "That in the bestowing and distributing of his estate and goods to the poor to charitable uses it was according to his intent and desire that those of his kindred who were poor, aged, impotent, or any other way unable to help themselves, should be chiefly preferred and respected." These two sums of 1,000*l.* were, after the testator's death, invested in the purchase of about eighty acres of land in the parish of St. Mary Abbott, Kensington, and in Chelsea. By an Act of Parliament passed in the year 1772, which enabled the trustees to grant building leases of this land, after reciting that no apportionment on behalf of captives had been made since 1723, and that 7,530*l.* and 1,628*l.* 16*s.* 4*d.* in South Sea Annuities had been accumulated, it was enacted (if no part of the yearly interest should be required for captives) that the trustees might pay the whole interest and produce of the South Sea Annuities and the 60*l.* a year rent arising from the one moiety to and among the poor kindred of the testator, notwithstanding anything in the will to the contrary. The land had been gradually built over, and the rents from 130*l.* a year have now increased to nearly 11,000*l.*, and as part of the property consists of the "Cadogan and Hans-place Estate," which is just let for building purposes, there is a further large prospective increase probable. The trustees administered the funds according to their own discrimination down to the year 1849, when a scheme, subsequently altered by another in 188-, was settled by the Court. In consequence of the magnitude and peculiar character of the charity, Mr. Martin, one of the inspectors of the Charity Commissioners, made a report on the subject to them in 1868. In the appendix to their report for 1868 they showed the present working and condition of the charity, setting out a number of instances in which the recipients were in receipt of large incomes, so as clearly not to come within the meaning of "poor kindred" as defined by the will. The result of the report, in effect, was that the present mode of administering the charity tended to pauperise the recipients, and called for some change.

The Master of the Rolls said he should make a declaration in the words of the will that the income of the one moiety and of the South Sea Annuities and the 60*l.* a year were primarily applicable for the relief of those of the testator's poor kindred coming within the definition, and that, subject thereto, the surplus was applicable to general charitable purposes. As he thought such surplus would be very considerable, he was of opinion it was quite right to declare as he had done.

CASE UNDER THE METROPOLITAN BUILDING ACT.

WOODEN BUILDINGS.

AT the Hammersmith Police-court, on the 21st ult., Mr. William Bickmore, of Overstein-road, Hammersmith, was summoned by Mr. Knightley, district surveyor, for erecting an irregular building contrary to the Act, namely, a wooden addition attached to the main wall of his premises.

The case had been adjourned for the defendant to comply with the Act, but from Mr. Knightley's statement it appeared that no alterations had been made. On this occasion the defendant did not appear.

Mr. Knightley said the building was 9 ft. 6 in. in length, and used for the storage of coals and domestic utensils.

Mr. Bridge said it was not much larger than a dog-kennel. Was it wise for a district surveyor to interfere in such a case?

Mr. Knightley said it was, as it was part of his duty. If it were allowed other wooden buildings would be erected.

Mr. Bridge strongly advised Mr. Knightley to withdraw the summons. By overstraining, Acts of Parliament were made to appear, he said, acts of tyranny.

Mr. Knightley said fault was found with him for allowing small wooden buildings to remain, and he must throw the onus upon somebody.

Mr. Bridge then adjourned the summons for a month for the defendant to appear.

LIGHT AND AIR CASE.

PEACOCK *v.* HARPER.

IN this case, heard before Vice-Chancellor Sir Charles Hall, the plaintiff was the lessee of 9, Brunswick-terrace, Brighton, a house which has buildings (erected many years ago) extending backwards from and at a right-angle to the main portion of the house which fronts the sea, and covering about half the space at the back of the house, which was originally a back yard, and was still separated from a similar back yard in rear of No. 8 by a party-wall, about 16 ft. high. These buildings at the back had several windows looking towards the yard, the principal ones being a bay-window in a large bedroom, and the window of a schoolroom underneath.

The defendant was the freeholder and occupier of 8, Brunswick-terrace, and the plaintiff's case was that the defendant had, in October, 1876, altered and raised certain old buildings at the back of his house which were opposite, and in a position corresponding to those in the rear of the plaintiff's house, in such a manner as to diminish his light and air, and also by means of the windows, and particularly of a bay-window therein, opposite the plaintiff's bay-window, to destroy the privacy of his house.

During the hearing of the case, which occupied the greater part of four days, one or two points of considerable interest arose, and several witnesses were cross-examined on both sides.

His Lordship, in giving judgment, said that a great part of the matters complained of in the plaintiff's case related to the manner in which his look-out was affected, and did not show such an interference with light as to call for redress from the Court. But as to the schoolroom, there had been proved an interference with comfort and enjoyment, of a character sufficiently substantiated to prevent the room from being used for the purpose to which it had hitherto been applied. Something had been said on the other side as to that room having been a dark one before; that was no reason why it should be made darker. Nor was an observation which had been made as to the small size of the room entitled to any weight; it appeared to be a good substantial room, which the plaintiff was entitled to have protected. Having regard, however, to the state of the building when the action was commenced and to the conduct of the defendant (for which he was entitled to credit), his Lordship considered that it was not a case for a mandatory injunction, and it did not appear that there was any necessity for an injunction to prevent the building from being carried further. The proper remedy was an inquiry as to the damage which the plaintiff had sustained in respect of the schoolroom-window by reason of the defendant's buildings, and what was a sufficient compensation to be paid by the defendant; and if the defendant should, without any reasonable objection on the part of the plaintiff, improve, or offer to improve, the plaintiff's light by doing some work which appeared to be practicable upon his window, regard must be had to that as part of the compensation. The plaintiff would have his costs of the action, except so far as he was ordered to pay costs to the defendant, and the defendant would have costs of so much of the action as did not relate to seeking relief in respect of the schoolroom-window.

A Distinguished Irish Physician.—The statue of the late Dr. Robert J. Graves, F.R.S., by Mr. Albert Bruce-Joy, which has been placed in the principal hall of the King and Queen's College of Physicians, Dublin, was formally unveiled on the 19th ult. by his Grace the Duke of Marlborough, Lord-Lieutenant. The statue, of which we gave some particulars a few weeks ago, is very well spoken of.

THE CITY TO OXFORD STREET.

ON the 22nd ult. one of the first new buildings in the new street from the City to Oxford-street was opened by a dinner to the workpeople. The building is that of Joseph Mansell, chromo-lithographer, &c., and is situated in the portion of the improvement which runs through Theobald's-road. One hundred and sixty of the workpeople sat down to dinner. The building has been erected by Messrs. William Downs & Co., of Southwark, from the plans, &c., of Mr. Walter Emden.

Nearly the whole of the houses for this new street are now pulled down, and it is expected the whole thoroughfare will be completed shortly, and when the portion of the street from Oxford-street to Piccadilly, sanctioned by the Act of this year, is constructed, it will form a very important thoroughfare.

MASTERS AND MEN.

London.—The secretary of the Carpenters' and Joiners' Society of London has given the usual six months' notice for an increase of wages from 9d. an hour to 10d., and a reduction in time similar to that demanded by the masons now on strike.——The masons appear to be as determined now as they were in August, when the strike commenced, not to accede to any terms except the 10d. per hour which they are asking for. They say that if a season of severe frost sets in, they will in all respects be as well off as the Germans, for the works on which they are employed will be at a standstill, and it is not likely that the masters will pay them when idle. About 1,200 English masons are stated to be working in London at the increased rate of wage, and each of these men contributes 4s. 6d. per week to the strike fund, whilst members of lodges in the provinces are voluntarily subscribing beyond what they are asked to pay as units of the society at large.

A "Builder" writes,—The correspondence which has been going on in your pages is of very great importance, and ought to bring about a wholesome result. Mr. Broadhurst laid down what all master-builders understood to be the Union rule—viz., "That every mason must receive the average rate of wage, and if the employer was not satisfied he must be turned out of the shop." Mr. Nisbet now says that less competent men may be paid what they are worth. Mr. Nisbet again denies that the Union limits the amount of work which a man may execute, and this is in complete contradiction to what every one connected with the trade knows to be the pernicious practice of the Union. These rules are not published, and it would seem that the strike committee may represent the rules to be anything that would serve their turn for the moment. Had the Union revised their rules, as I ventured to suggest, I am certain that every average mason in London would have been fully employed this summer, and would have been able easily to earn his 45*s.* to 50*s.* per week, and more, if disposed to work a little overtime, when work happened to be pressing. Under the rules of the Masons' Union (as generally understood) industry, skill, education, and technical knowledge are of no use whatever. The best man has no possibility of making his advantages tell while he is limited to so many hours' work per week, and the production of his labour is to be restricted to that of his lazy comrade, under penalty of being fined. Let me urge on the great body of masons that they should revise these miserable rules.

THE MASONS' STRIKE.

SIR,—Will you kindly allow me to add a little more to what has already been written in reference to the masons' strike? About thirty years ago the masons struck at the Houses of Parliament; and, like the present strike, they continued it three months after the contest was lost to the men. I am sure if Messrs. H. Nisbet & Co. would listen to the older and wiser members of their Union the strike would cease. I am a building artisan, a mason, and have watched the course of events from the commencement, and I have failed to see any great endeavours on the part of the foremost referred to towards a settlement. The employers simply refuse to pay more than 9d. per hour, and have found men who will work for that wage, and can get plenty more to work for less; consequently, the masons have lost the battle, and, like brave men, they

should acknowledge their defeat. Whether Messrs. Nisbet, Broadhurst, & Co. will return to chiselling after they have done striking or not, they know best. I could mention two who did not do so after the lock-out. Mr. H. Nisbet speaks in loving terms of his model of a society shop. I dare say Messrs. Bull & Sons will not forget the honours paid to them by the Society, and I am quite sure the masons will ever remember Messrs. Bull & Sons. I am also quite sure if this strike ends in every man being paid what he is worth, no one but the duffer, the lazy, and strike-leaders will have cause to complain. E. M. T.

THE PORTER-CLARK PROCESS FOR PURIFYING AND SOFTENING WATER.

Sir,—I am so much indebted to you for the great space allotted in your issue of the 15th of December to an article upon the above subject, and to the illustrations and description of the application of my process, in three cases of some importance, under eminently practical and scientific auspices, that it is with reluctance I trespass upon your kindness to point out how mendaciously an anonymous correspondent, "S. W.," in your paper of last week, has misquoted the article in question.

What your article really does say "constitutes an essentially important and interesting feature in the process" is "*the facility with which, by the apparatus we have described, the cloths charged with deposit can be lifted off and replaced by others.*"

This feature is, I infer, so much opposed to *the* interest your correspondent takes in the subject, that he cannot resist the temptation to not only suppress it, but substitute what he would have your readers' believe "is stated in the article!"

Had he not yielded to this temptation, he might, possibly, have left the character of his interest in the subject unsuspected; as it is, I shall hope that the article will now be read the more attentively by those who may not hitherto have had the leisure to study it at length and in detail. It will hardly escape their notice, *apropos* of the suggestions of your correspondent, that my process has been adopted by the largest sugar-refinery in London. *Verb. sap.*

John Henderson Porter.

THE OBELISK.

Sir,—Excuse me for suggesting that a good and useful place for the obelisk (should it ever arrive) would be in the Cromwell-road, South Kensington, between the north-east corner of Thurloe-square and the entrance to the South Kensington Museum.

I say useful, because the road is about 111 ft. wide between the curbs, and having no crossing it is very dangerous, especially at night, being also very dark, so that if there was a broad paved landing-place round the obelisk, with some ornamental gas-lamps at the corners, it would be a great boon to pedestrians, besides which it could be seen for a long distance, the Cromwell-road being very long and wide. It could come up the river to the Cadogan Pier, and be taken up Oakley-street, Arthur-street, &c., almost in a direct line to where I propose it to be, with very little risk to the obelisk, or to the streets through which it would pass. T. W. Oliff.

*** A similar suggestion, not a bad one, we have already printed.

PORTLAND CEMENT CONCRETE.

Sir,—I would state in answer to your correspondent, "Surveyor," that I have had concrete road channelling and curbing, cast in one section, in use for about two years. Although not placed where there is very heavy traffic, yet it has been fairly tested, and sustained no injury, while its appearance and cost bear very favourable comparison with the ordinary stone curb and channelling.

Thos. Potter.

CHURCH-BUILDING NEWS.

Parkstone.—The work of partially rebuilding and enlarging the Church of St. Peter, Parkstone, Dorset, has been completed, and the edifice was reconsecrated on the 18th ult. The church now consists of a chancel, chancel-aisles, memorial chapel, north and south transepts, and a portion of the proposed nave, which for the present is used in conjunction with the remaining portion of the nave of the old church. In order to carry out the design now commenced the nave aisles are to be extended westward, and six bays and a tower and spire added at the south-west end of the nave. The width of the new building between the walls is 46 ft. 6 in., and the height to the crown of the groining 60 ft. The vestries and organ-chamber are intended to be built on the north side of the church. The style of the building is a severe type of First Pointed. Increased height has been obtained in the interior by the addition of a triforium under the clearstory. The ceiling is of pitch-pine, the main building being groined. The whole of the walls are lined with Bath stone, and the aisle vaultings are also in stone. The chancel-screen is of wrought iron and brass, the work of Messrs. Jones & Willis, of London. The lectern and other brass work was manufactured by Messrs. Johnson & Co., London, and the tile floors were supplied and laid by Messrs. Carter & Co., of Poole. Mr. F. Rogers, of London, was the architect, and Mr. P. J. McManus, of London, the contractor. The cost of the work has been about 6,000*l.*

Liscard.—St. Mary's Church, Liscard, was consecrated on the 16th ult. The church, for the present, will be a chapel of ease to the parish church of Wallasey, but it will ultimately be made into a separate ecclesiastical district. The new church is designed in one span of 38 ft. 6 in., with the addition of transepts, but without side aisles or pillars, so that the view of the east end is entirely unobstructed. The style chosen is Early Perpendicular, a style consonant with Cheshire traditions. The walls are built of local grey stone, relieved with Runcorn stone dressings; in the interior, the open seats are of polished pitch pine, and the floor of the nave is laid throughout with patent wood block pavement, which has the double merit of being warm to the feet and noiseless for walking upon. The decorative art has been almost exclusively confined to the chancel, and consists of "sgraffito" work on the walls. The floor of the chancel is laid with marble mosaic, and this and the "sgraffito" work has been executed by Messrs. G. Trollope & Sons, of London. An organ of two manuals, built by Hill, of London, occupies a chamber on the south side of the chancel, and a similar chamber on the north side forms the vestry. The warming apparatus has been fixed by Messrs. Haden & Sons, and the gasfitting by Messrs. Freeman & Collier, of Manchester. The church, which contains about 620 sittings, has been built under the immediate superintendence of Mr. E. W. Nobbs, Mr. Grayson being the consulting architect. The contractor was Mr. Ridehalgh, of Liscard. The cost has been 5,000*l.*, and the tower when added will cost 1,500*l.* more.

Stechford.—A temporary church, dedicated to "All Saints," was opened at Stechford, one of the suburbs of Birmingham, on the 18th ult. The building is constructed of iron and wood, on brick foundation. Internally the roof is of dark-stained pine, supported by massive beams. The chancel end is draped with tapestry. The nave, which has a fine, lofty appearance, is about 50 ft. by 30 ft., and the chancel and sacristy, which is slightly raised, measures 20 ft. by 14 ft. On the left of the chancel is a roomy organ-chamber. The upholstery was supplied by Messrs. Jones & Willis, of Birmingham. Mr. J. C. Hawes, of London, was the contractor, and Mr. W. T. Foulkes, of Birmingham, is the architect.

THE LATE MR. HUMBERT, ARCHITECT.

We have to record the death of Mr. Albert J. Humbert, F.R.I.B.A., which took place on the 24th ult., at Castle Mona, Douglas, in the Isle of Man, where he was staying for the benefit of his health.

Mr. Humbert commenced his professional career in partnership with Mr. Reeks (now of the Office of Works), and the houses known as "Carlisle Parade" and "Robertson-terrace," on the estate belonging to the Crown at Hastings, were erected from the designs and under the superintendence of those gentlemen. In 1853, Bodiam Church, in Sussex, was rebuilt by them. Subsequently, in conjunction with Mr. Reeks, Mr. Humbert submitted designs for the new Government Offices, which were exhibited in Westminster Hall. In 1858, a Committee of the House of Commons was appointed (on the motion of Mr. Beresford Hope) "to consider the reconstruction of the Foreign Office," and in the evidence before that committee it transpired that the drawings submitted by Messrs. Humbert & Reeks were comprised in the lists, prepared by Mr. Burn and by Messrs. Angell & Pownall, of the designs which, in the estimation of those gentlemen (the only professional men engaged in the selection), were worthy of premium (see *Builder*, page 478, vol. xvi.).

The Queen, when residing at Osborne, is in the habit of attending divine service at the parish church of Whippingham. The accommodation for the Royal Family being quite inadequate, Mr. Humbert was, in 1854, directed to rebuild the chancel, which he did in the Transition style of architecture prevalent towards the close of the twelfth century. In March, 1860, the old church was pulled down and re-erected, from designs prepared by him, H.R.H. the late Prince Consort manifesting the deepest interest in all the details of the work. In 1860 the Mausoleum of the late Duchess of Kent was erected at Frogmore, near Windsor, from Mr. Humbert's design. It consists of a cella surmounted by a dome, and surrounded with sixteen Ionic columns, monoliths of polished Cornish granite. In 1862, soon after the death of the Prince Consort, Mr. Humbert was commanded by her Majesty to prepare designs for the Royal Mausoleum at Frogmore; these designs were carried into execution under his direction, and were illustrated in our pages. Subsequently Sandringham House was rebuilt from his designs, and under his superintendence: upon the plan he expended much care and study. Mr. Humbert had a delicate sense of honour, and a somewhat reticent and reserved manner concealed a kind and generous disposition. He died in the fifty-sixth year of his age.

VARIORUM.

Dr. Doran, F.S.A., has contributed to the current number of the *Nineteenth Century* a particularly interesting paper, "Shakspeare in France," novel in matter and charming in style. Dr. Doran shows that till the advent of Pierre le Tourneur, who, in 1776, was one of the secretaries of Louis XVIII., France had no real knowledge of Shakspeare. It remained, however, for M. F. Hugo to naturalise him and add his name to the brilliant roll of the dramatic poets of France. Dr. Doran's paper will be read with pleasure in both countries.——"The Boy Engineers, What they did, and How they did it," by the Rev. J. Lukis (Trübner & Co.), is a capital little book, well calculated to develope any special bent or talent a boy may have, and to lead him to make his recreations prove valuable in after time.——*The Weekly Welcome* is one of the best and cheapest periodicals of its class; the illustrations are excellent.——"The Last Days of Temple Bar" is the title of the illustration appearing on the front page of the *Pictorial World* of this week. The sketch is dated December 21st, and shows the old City gate surrounded by the scaffolding recently erected. Several good pictures appear in this number.

Diaries.

We have received from Messrs. Letts & Son a bundle of their diaries and pocket-books, of which they publish no fewer than 100 varieties. Every one may find amongst them what he needs. There seems a little want of refinement in the pocket-books which have reached us; but, on the other hand, they are strong and cheap. ——"Saxby's Weather Table and Almanac" comes from the same firm. Experience has shown that Mr. Saxby does not speak at haphazard.——Messrs. Collingridge issue as usual their "City Diary." —— And "Blackwood's Scribbling Diary" has reached us as usual.—— The "Railway Diary and Officials' Directory" includes information specially its own.——"Calvert's Mechanic's Almanac" may be safely recommended as well worth the 4d. it costs.

Thomas Campbell.—The statue which has been erected in George-square, Glasgow, to Thomas Campbell, the poet, was unveiled on the 28th ult. It is the result of a public subscription, the sculptor being Mr. John Mossman, whose model was selected out of three submitted in competition. The statue, which is about 9 ft. in height, represents Campbell in the prime of life, the poet being attired in the costume of the time of the Prince Regent,—a coat buttoned tightly across the chest, deep vest, closely-fitting trousers, and Hessian boots. From the shoulders hangs a cloak, the manipulation of which is particularly elaborate on the left, where a portion of the mantle is caught up by the arm. The features have been moulded by Mr. Mossman, from Baily's marble bust of Campbell. The casting was done by Messrs. Cox & Sons, Thames Ditton.

Miscellanea.

A New Metropolitan Railway.—Major-General Hutchinson, R.E., of the Board of Trade, on the 27th ult. made an official inspection of the new railway which has been constructed by the Great Eastern Railway Company from the Seven Sisters Station on their Metropolitan Extension line to Wood-green. After carefully inspecting all the works and severely testing the various bridges (four heavy engines being employed for the purpose), Major-General Hutchinson approved the line, which was opened for general traffic on the 1st of January. The line will afford an independent access to the metropolis from Wood Green and West Green, two already large and rapidly-increasing districts, and it is rumoured that a scheme is under consideration for introducing a kind of Willesden Junction at the former place, it being thought that there is no more suitable spot on the northern side of London for the interchange of traffic than on the land which has been acquired by the Great Eastern Company in the locality named. The line, though short, has been "all work," necessitating the employment of contractor's plant worth over 20,000*l.* Nearly half a million tons of earth and clay have been excavated, and an extensive coal depôt is being constructed at West Green. Every brick used was made by the contractor upon the works. The signals were supplied and fixed by Messrs. Saxby & Farmer. The line was designed by the late engineer, Mr. Edward Wilson.

Recording Telephones.—We learn from the United States that Mr. Edison (says the *Printing Times and Lithographer*) has devised a means by which the utterances of the telephone may be put on record, and it will thus become possible to reproduce, years hence, not only the words, but the very inflection and tone of voice of individuals long dead. The method by which this result is to be produced is extremely simple. A speaking-tube fitted at one end with a mouthpiece, has at the other a metallic diaphraghm; that is to say, a miniature drumhead which vibrates powerfully under the influence of the human voice. Attached to the centre of the diaphragm is a point, which acts against a small strip of paper drawn slowly under it by clockwork, as in the well-known Morse recorder. When the apparatus is in action, if any one speaks through the mouthpiece, the strip of paper will be indented by the fine point. A somewhat similar instrument, in which a point is fitted to an exceedingly delicate diaphragm, is attached to a telephone. If now the prepared paper be drawn under this second point, it will cause the diaphragm to vibrate precisely as though it were spoken to, and the result is that the telephone is put into action, and the sound of the original voice reproduced as often as may be desired, so long as the paper lasts.

An Architect Wanted.—At the last meeting of the Wandsworth and Clapham Union, a letter was read from the Local Government Board asking that plans should be sent for their approval before they sanctioned the proposed expenditure of 453*l.* for enlarging the laundry, and for certain alterations to the Infirmary and Clapham Dispensary. A letter was also read from Mr. Wagner, stating that if the work to be done to the Clapham Dispensary were not to form a portion of his contract, he should decline to accept the part allotted to him by the Board. The Chairman gave notice that at the next meeting he should move the appointment of a professional architect to the Board. For the last two years they had been in need of one, and their proceedings in the present instance were completely stultified by the want of one. Mr. Dagnall said the union would have been hundreds of pounds in pocket if an architect had been appointed before. He moved that plans be sent to the Local Government Board, and when sealed the tenders received for the work be reconsidered. Mr. Stimpson seconded the motion, which was carried *nem. con.*

St. Philip's, Kennington-road.—A marble reredos, the gift of Mr. Anselm Odling, of Croydon, has just been placed at the back of the Communion-table in St. Philip's Church, Kennington-road. The reredos consists of five white marble plaques, the centre containing the monogram I.H.S., and the others the Lord's Prayer, the Apostles' Creed, and the Ten Commandments. The plaques are separated from each other by grey marble columns.

Mr. Ruskin's Next Step.—In the last number of *Fors Clavigera*, Mr. Ruskin says:—"The first seven years' letters of *Fors Clavigera* were ended in Corpus College, Oxford, 21st November, 1877." . . . . "So after this seventh year I am going out into the highways and hedges; but now no more with expostulation. I have wearied myself in the fire enough; and now, under the wild roses and traveller's joy of the lane hedges, will take what rest may be in my pilgrimage. I thought to have finished my work blameful before now, but '*Fors*' would not have it so; now, I am well convinced that she will let me follow the peaceful way towards the pleasant hills. Henceforth the main work of '*Fors*' will be constructive only, and I shall allow in the text of it no syllable of complaint or scorn. When notable public abuses or sins are brought to my knowledge, I will certainly bear witness against them, simply laying the evidence of them open in my correspondence, but sifted before it is printed."

Cleopatra's Needle.—Arrangements are being made for bringing Cleopatra's needle from the Spanish port of Ferrol. Mr. Dixon has given bail in the Admiralty Court to the owners of the *Fitzmaurice*, which picked up the *Cleopatra*, to meet such salvage as shall be awarded. Captain Carter, the master of the floating "needle-case," was sent to Ferrol with a picked English crew to resume possession of his ship, and a telegram announcing his arrival has reached Mr. Dixon's office. He has inspected the *Cleopatra*, and found her in much better trim than might have been looked for. The necessary repairs can be completed, he says, in ten days, and a tug is to be sent to tow the *Cleopatra* across the Bay of Biscay, the voyage lasting about five days.

Robbing Builders.—At an early hour on Christmas morning the premises of Mr. James Stirling, builder and decorator, of North-road, Uxbridge, were broken into by thieves, and property to the value of about 2,000*l.*, consisting of tools and a large amount of brass-work and gas-fittings, was carried away from the building. An attempt was also made to force two of Tann's safes; but, failing in this, the burglars made off. This is the second robbery that has been committed at Mr. Stirling's premises during the last six months. ——At an early hour on Sunday morning the premises belonging to Messrs. James & Henry Blenham & Co., builders, of Selsdale-road, Surbiton, were found to have been entered by thieves, and a large amount of property carried away from the premises.

Fall of Houses.—On Monday a house in Brookhouse-fields, Blackburn, in course of erection and nearly finished, fell, burying five operative masons under the *débris*. David Ainsworth was killed, and the wounds of the other four were more or less serious. Several other deaths are expected. Soon after the above accident, ten new extensive shops, three stories high, ready for roofing in Victoria-street, fell. Happily, the street was comparatively clear of pedestrians at the time, and no personal injury was occasioned. The two wrecked properties lie within a stone's throw of each other. It is suspected that in this case the walls were rendered unstable by the late wet weather and were too weak for the heavy beams laid upon them.

Proposed New Council Chamber, Guildhall.—At a meeting of the Court of Common Council on the 20th ult., the City Lands Committee reported on a reference to them by the Court to consider whether any improvement be capable of being effected in the design or suggested site for a new Council Chamber. They recommended that in accordance with the opinion expressed by the committee in the report presented by them on December 17th, 1874, a new Council Chamber should be at once erected, agreeably to the plan and model therein referred to, at the estimated expense of about 50,000*l.*, exclusive of fittings. The consideration of the question was adjourned.

Accident at the New Law Courts.—A serious accident occurred at the Law Courts on the 27th ult. One of the chains used for hoisting up blocks of stone snapped, and the stone it was raising fell upon a staircase at the south end of the eastern block; this broke away and destroyed the next staircase. The foreman of the masons, Mr. Clarke, was standing beneath the work, and hearing something snap, he stepped into an angle, and thus saved his life, as the weight of the stone which fell was nearly 2 tons.

Self-Sacrifice by a Workman.—An inquest was held on the 27th ult., at Wednesbury, on the body of John Hughes, stonemason, aged 26. About eighteen months ago, as deceased was at work in a stonemason's yard at Liverpool, he saw a large stone, which had been reared up endwise, about to topple over on a fellow-workman, whose back was towards it. Deceased sprang forward, and, being at that time a strong, muscular man, he succeeded in holding up the stone until his companion escaped. The consequence to himself of this act of devotion to his friend was the rupture of a blood-vessel, and from that time he gradually wasted away, until the other morning he was found dead in bed. Verdict, "Death from natural causes."

Drainage at Basingstoke.—A special meeting of the Basingstoke Town Council, sitting as the Urban Sanitary Authority, was held on the 20th ult., for the purpose of receiving tenders for the proposed drainage work. It was found that there were twenty-seven tenders in which the conditions laid down in the advertisement had been complied with, and they were referred to the drainage Committee, to consider and make all needful inquiries, and to report a fortnight hence. The *Reading Mercury* understands that the amounts varied from 12,000*l.* to 20,000*l.*

Designs Wanted.—Three prizes of 50*l.*, 30*l.*, and 20*l.* respectively, are offered by Messrs. Watherston & Son for the three best designs for a three-handled cup, with cover, to be used as a loving-cup. It must be 14 in. high, and illustrate the Biblical story of the labourers in the vineyard. The competition is limited to candidates, British born, who are, or have been, *bonâ-fide* students of Schools of Art recognised by the Science and Art Department. The awards will be made by the Director for Art, Mr. E. J. Poynter, R.A., whose decision will be final.

The late Fire at Messrs. Weeks & Co.'s Premises, Chelsea.—With reference to the destruction of the workshops of Messrs. Weeks by fire on Sunday, the 23rd ult, we are glad ot hear that only one out of the four business blocks was destroyed, and that by converting portions of the foundry, boiler works, and stores into temporary workshops, the general conduct of the business will suffer no interruption.

A Plantagenet Tomb.—The interesting monumental tomb, at King's Langley Church, of Prince Edmund of Langley, Duke of York, fifth son of Edward III., already mentioned, has been removed to a chapel expressly built for its reception, and the Queen has been pleased to grant 40*l.* from the privy purse towards placing a stained-glass window in the chapel to the memory of the prince, her Majesty's ancestor.

Reading Town-hall Competition.—Although, as we stated, the design by Mr. Sams was named first by the Building Committee, the same amount of premium,—108*l.* 6s. 8d.,—was awarded to each of two other designs, marked respectively "Plan" and "Be Strong,"—the latter the work of Messrs. W. & J. T. Brown and F. W. Albury. The course which is now being taken by the committee is causing much dissatisfaction.

Premises at Bohemia, Hastings.—Some extensive premises, in the Italian style of architecture, erected at Bohemia, a suburb of Hastings, by Mr. Wingfield, upholsterer, were opened on the 21st ult. The tower, which is surmounted by four pinnacles, is 95 ft. high. There are living compartments, and well-ventilated warehouse-room for fifty large mansions. Mr. W. L. Vernon is the architect.

German Iron.—Experiments recently made in Germany with various samples of German and foreign iron are reported to have proved beyond doubt that the Rhenish and Westphalian works can turn out as good pig-iron as, if not better than, any works in England or Scotland. German ironmasters are said to indulge the hope that the German market will soon be closed against England, and become independent.

A Huge Monolith.—A paragraph in a provincial paper says:—"From a quarry at Otley there has been taken a block of stone almost big enough for three Cleopatra's needles. It is 64 ft. long, 16 ft. wide, and 7 ft. thick, weighing over 500 tons."

New Centenary Congregational Church, Lancaster.—The designs submitted by Messrs. Hetherington & Oliver, architects, Carlisle, have been selected for adoption. Forty-two designs were sent in.

TENDERS

For the Grand Hotel, Trafalgar-square. Messrs. Francis & J. E. Saunders, architects :—

Trollope & Sons	£110,450	0	0
Ashby & Horner	108,150	0	0
Fish	108,000	0	0
Colls & Sons	107,350	0	0
Holland & Hannen	106,580	0	0
Ashby, Brothers	106,506	0	0
Brass	105,350	0	0
Dove, Brothers	105,365	0	0
Bangs & Co.	104,920	0	0
Merritt & Ashby	103,975	0	0

For the building of a new weigh-house, exhibition building for sanitary appliances, offices, and superintendent's residence, stables for fifty horses, cart-shed, engine and boiler house, workshops, &c., in the East Croft, London-road, for the Corporation of Nottingham. Mr. M. O. Tarbotton, engineer. Mr. W. Knight, quantity surveyor :—

Marriott & Wartnaby	£9,683	10	0
Maw & Ingle	9,673	0	0
Stevenson	9,288	0	0
Bailey	9,265	0	0
Bradley & Barker	9,177	0	0
Rains & Turson	9,000	0	0
Messem	8,913	0	0
Bell & Son	8,900	0	0
White	8,850	0	0
Fisher & Co.	8,800	0	0
Wilmott & Wray	8,800	0	0
Wheatly & Mawle	8,740	0	0
Hodson & Facon	8,500	0	0
Hind (accepted)	8,437	0	0
Ironwork.			
Hind & Son	£4,253	0	0
Goddard & Massey	3,185	0	0
Cowen & Co.	3,149	0	0
Lees, Brothers	2,791	0	0
Rollinson (accepted)	2,352	0	0

For rebuilding Nos. 11 and 12, Clement's-lane, and No. 26, Nicholas-lane, City, for Mr. T. R. Stokes. Messrs. Batterbury & Huxley, architects :—

Newman & Mann (accepted)	£11,350	0	0

For new schools, Buckingham-terrace, Portobello-road, Notting-hill, for the School Board for London. Mr. E. R. Hobson, architect. Quantities by Mr. John Nicholls :—

Stimpson & Co.	£8,358	0	0
Brass	7,595	0	0
Downs	7,548	0	0
Rankin	7,523	0	0
Atherton & Latta	7,507	0	0
Pritchard	7,495	0	0
Stephenson	7,430	0	0
Hook & Oldrey	7,433	0	0
Jerrard	7,447	0	0
Thompson	7,425	0	0
Nightingale	7,332	0	0

For new schools, Ellen-street, Hove, Sussex, for the Hove School Board. Messrs. Simpson & Roper, architects. Quantities by Mr. Thos. Simpson :—

Lockyer	£8,995	0	0
Chappell	8,974	0	0
Nash & Co.	8,920	0	0
Sawyer	8,888	0	0
Barnes	8,854	0	0
Bratton	8,830	0	0
Hide & Co.	8,670	0	0
Longley	8,400	0	0
Hook & Oldrey (accepted)	8,276	0	0
Reynolds, jun.	8,245	0	0

For a pair of Almshouses at Springfield, near Chelmsford, for Miss Seabrook. Mr. Clark, architect :—

Gozzett	£496	13	6
Dobson	440	0	0
Gardner & Son (accepted)	432	0	0

For completing and finishing three villa residences, Marlow-road, Anerley, for Mr. Williams. Mr. William Theobalds, architect :—

Newton, accepted.

For the Adamsdown Board Schools, for the Cardiff School Board. Mr. W. D. Blessley, architect :—

Eastabrook & Sons	£7,800	0	0
Jones, Brothers	7,600	0	0
Parnell & Fry	7,299	0	0
Gough	6,980	0	0
Robins	6,823	12	0
Thomas	6,386	0	0
Shepton	6,350	0	0

For house and lodge, Rudgwick, Sussex, for Mr. Renton. Mr. Shaw, architect. Quantities supplied by Messrs. Stoner, Brothers :—

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Dabbs	£2,880	.....	£520
Diamond	2,520	.....	466
Boyce	2,674	.....	398
Julian & Co.	2,425	.....	438
Stephens & Bastow*	2,440	.....	385
Goddard & Son	2,383	.....	413
Wood	2,394	.....	389
Hearle	2,249	.....	529

* Accepted.

For alterations, &c., to offices, Lombard-street. Mr. J. A. Lovejoy, architect :—

Brass	£2,814	0	0
Manley & Co.	2,795	15	0
Banks*	2,772	10	0

* Accepted subject to his approval of terms of contract.

For completing ten houses at Hounslow, for Messrs. Schofield & Co. Mr. J. W. Brooker, architect :—

Longmore	£4,570	0	0
Bartlett	4,500	0	0
Vincent	4,365	0	0
Lane	3,999	0	0
Simmons	3,985	0	0
Callum	3,684	0	0

For the erection, &c., of a 44-stall stable, at Blackheath, Kent. Mr. H. R. Allen, architect :—

Banks, accepted.

For works, 118, Great Russell-street. Mr. W. Paice, architect :—

Finch (accepted)	£225	0	0

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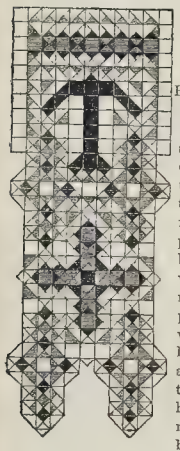
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The Outlook of Labour in 1878.

THE year 1878 opens under circumstances of some depression and some gloom. It is a cynical philosophy that teaches that we should take pleasure in the misfortunes of other people. But it is the better, and not the worse, side of human nature that leads us to prize such blessings as we possess the more highly, the more we are convinced of their transitory nature. And how easily misfortune may come is best brought home to our minds by the spectacle of the troubles of our neighbours. War amongst our Continental neighbours, and famine among our Indian fellow-subjects, have made 1877 a black and memorable year. Rain has now fallen copiously in India. The spring crop of 1878 is, in all expectation, safe. The worst menace of famine, that of the lapse of day after day without signs of the earth yielding its fruit, is past. But Indian finance is telling the story of 1877; and in how many families over the wide extent of seven degrees of longitude and fourteen degrees of latitude will not gaps and other marks of distress long recall the memory of the great drought?

Winter has frozen the hot stream of human blood, which has flowed at an average rate of some forty gallons an hour for 200 days during the past year. But the latest news from Russia tells of another conscription, of another half-million of men, in round numbers, whom ambition is about to divert from reproductive industry to the evil industry of destruction. The value of each man who falls in battle is reduced from that of a steady producer, at the rate of from 30*l.* per annum upwards, to that of the weight of the body as manure, to give it the very highest value. Into the terrible economics of war we are not about to enter. That which more concerns us in England is to inquire how far the arts of domestic war are being inflicted on our own country, by the hands of her own children. Relieved from the conscription which is crushing Russia, which has impoverished Germany, and which is so serious a family trial in France, how does the English peasant show his gratitude for the exemption?

Men who, like ourselves, feel deeply on that subject, are beginning to speak out. Sir Edmund Beckett, to whose letters to the daily press we have before now called the attention of our readers, has come forward with some very plain truths, couched in equally plain language. It is more easy to carp at what Sir Edmund says than to avoid the force of his arguments. Mr. Bevan, who has for some time been known as a writer on industrial subjects, has contributed a table in a form entirely new to statistics. It is a table of a very instructive kind. It gives the unpleasant fact, that during the year 1877 there has been a strike among the working classes every other day. Indeed, reckoning Sundays, there has been a strike every fifteen hours, if we take the working day at ten hours long. The total number of strikes during the year, Mr. Bevan says, has been 191, involving some fourteen sections of operatives. The uneasy state of labour appears, from this black list, to have been general. In the great mining and metallurgic industries there have been forty-four strikes, counting those of fifteen different trades, or occupations. In the trades connected with building there have been ninety-two strikes, including eighteen different trades. Textile workers have contributed eighteen disturbances to the course of labour; shipbuilders, eight; persons engaged in clothing others, also eight; workers in clay, glass, &c., seven; engineers and drivers, milesmen and roadmen, and "platers," among engineers, have each struck once. Nothing has occurred, indeed, of a magnitude comparable to that of the great railway shock of the United States. But the fact that any body of men are, or consider themselves to be, equal to the task of suspending the entire internal communication of the country, if they are dissatisfied, is one of the gravest that has become prominent during the present century. It is an inconvenience attaching to the railway system of which Stephenson could never have dreamed. It is worthy of note here that the persons employed in gasworks do not appear, in the past year, to have resorted to a measure as menacing to the public safety of our cities as a railway strike can be to that of our communication.

As to all these strikes, there is one common characteristic. Sir E. Beckett has put it in a very simple mathematical form. But even so simple a bit of algebra as the use of the expression, n weeks, for a certain number of weeks, may cause those who are not familiar with algebra to turn aside, and allow a very pointed argument to glance over their heads. The point is this. For every week lost in a strike a certain number of weeks' work, at the higher wages struck for, is required, in order to avoid positive loss to the workmen. Thus, in the case of a strike of six months' duration, for an advance of ten per cent. in wages, five years' labour at the higher rate will be required in order to make up the positive loss incurred in the strike. No one can suppose that wages can be settled so far in advance by the result of a single contention. Thus, it is tolerably clear that a prolonged strike, even if successful, or rapidly repeated strikes, even if successful, involve certain loss to the parties striking. It is of cardinal importance that the plain arithmetic of this fact should be understood by the workman. Triumph, it is almost certain, will be too dearly bought. Failure means pure, unmitigated, self-inflicted loss.

The main outcome of the strikes of 1877 has been failure on the part of the workmen. Thus, the colliers at Saundersfoot, South Wales, were out seven months for an increase of wages, and finally returned to work at the old terms. This was a pure and unmitigated loss of the income to the men, and of the fruit of their toil, and interest on capital to the masters, for seven-twelfths of the year. At Dronfield, seven and a half months; at Dodsworth, seven months; at Fife and Clackmannan, three months, were wasted with the same result. The joiners at Wolverhampton were out for six months; those at Manchester for eight months. The shipwrights on the Clyde stood still for nearly six months, and then submitted to arbitration, which went against them. The nut and bolt makers of Darlaston were idle for twenty-six weeks, and then returned to work at lower prices than those against which they struck. The London masons have succeeded in forcing the employers to have recourse to German and American labour. Of both of these there seems to be good reason to expect a too ample supply; while the immense reservoir of labour available from China and Japan, which has already produced so much effect in America, has as yet fortunately been almost untapped in this country. Almost, not altogether; Japanese compositors are now at work for English printers, though there has been but one compositors' strike and one printers' strike in 1877; and we hear, while writing, of the execution of the costly fittings of passenger steamers, not only by Japanese carpenters, but actually in Japan.

It is the contention of the organisers of strikes that their proceedings are regulated by the absolute principles of political economy. We have frequently urged the fact, in the columns of the *Builder*, that economic principles are not the only factors in political movement. Certain economic laws, no doubt, exist, and to a great extent have been traced to their source. But the operation of these laws is controlled to a very great extent by other considerations. Thus a wise and sound economy would be effected if the English peasantry would eat oatmeal, barley bread, or rye bread, instead of wheaten bread. The economy would come palpably home to every family. Health would, there is reason to conclude, be improved by the change. But the Englishman likes wheaten bread, and, worse than that, likes it new from the oven. He is not to be induced by motives of economy to make a change. In a few weeks he would not only find the pecuniary advantage of that change, but would take quite as much pleasure in the use of the substituted as he ever did in that of the original, food. But, simply, he will not try. With a fact like this staring us in the face, it is idle to talk of the controlling power of economical considerations.

It is just the same with reference to strikes. Thirty shillings a week is a moderate rate of wages. Many a craftsman can earn considerably more. The man who is in the receipt of that wage thinks he should prefer 33s.; it is only 10 per cent. more. The immense profit of the capitalist, he fancies, can readily afford that,—especially as it is only for one set of operatives out of ten. That is, only 1 per cent.—to the master—not 2½d. in the pound. Hold out! and that is sure to be yielded. So the men think. They are out for twenty-six weeks. Each loses, say, 39*l.* How much extra time, even if he got the 33s., must he work to make up for that serious loss? What does that loss come to when multiplied by the number of strikers? And on whom does it fall? It is true that the non-production does a double mischief. It curses him who does not work as well as him for whom he does not work. But no amount of inconvenience or loss suffered by the master interferes with the fact that the workman has fined himself 39*l.* Say he has had 18s. a week allowed him as strike-money by the union; that only means that out of the 39*l.* which he has lost, he has contrived to throw the burden of 23*l.* 8s. on his fellow-workmen. There is a sort of mutual assurance; but it is only the assurance that consists in a division of actual loss among a greater number of losers; and to replace this loss merely to make up for the money wasted by idleness, the workman will require steady work for five years at the higher rate of wages. Thus, if his strike succeeds, it has the sole effect of distributing over five years the earning of a sum of money which, without the strike, would have been earned in six months.

Not only, then, do those who endeavour to show that the workman is better without tools,—for that is the real meaning of labour without capital,—err in urging that the principles of political economy supersede every moral, social, or religious consideration, but they err also in their conception and application of the principles of political economy. Most especially do they err in the endeavour to enlist the whole labour-producing power of the United Kingdom in a mortal opposition to that policy which has given to the poor man the cheap loaf. The direct tendency of unionism is to destroy free trade. The two ideas are opposed, the two principles are mutually exclusive. Every trade, on the Union principle, is to be a close borough. The famous advice which that keen satirist, Dean Swift, gives to servants, is taken literally by the unionist,—meaning as we do, the man who endeavours to control the natural course of the labour market by menace, whether the menace be directed against the workman or against his employer. If your master has a thousand a year, the Dean says to the cook, remember that you have to spend at that rate. The same advice is given to the butler, the same to the coachman, and so on with each kind of expenditure. It is exactly the same with the attempt to isolate the interests of any trade. Now it is the coal-miner, now the ironworker, now the mason, who comes to the front of the battle. Suppose the first to succeed, and to raise his own wages ten per cent. We know, from definite experience, that the result of such a rise will be a far more than corresponding rise in the price of coal. Fifty per cent. will be nearer the mark. And how does that affect the course of every industry? Each man who augments his own wages by artificial means, augments, or at least tends to augment, in a far higher ratio, the cost of every article which those wages have to produce for him.

When protective laws encompassed the farmer with a barrier that he considered to be of vital service to himself, it must be remembered that it was not on the score of the farmer's welfare alone that those laws were supported. It was on the plea of national safety. At one time our navy was dependent on the home-growth of oak. Laws were consequently passed to protect the oak tree. In the same way it was long considered to be an axiom in politics that for a state to be safe it must be self-supporting. "What? Depend on the foreigners for food! How, then, in case of war? We shall be starved out at once." Such was long held to be an axiom of political wisdom. And it is only by the growth of the population to a number which it is entirely beyond the capacity of the area of the island to feed that this axiom has been overthrown. We could not grow the wheat we required, do what we would. Year by year we required more from abroad; and so it came to pass that we arrived, unexpectedly, at the truth that, by throwing down the barrier of the corn trade we could provide food for the people more certainly, as well as more cheaply, than in any other way.

It is the same in all occupations. The desire to keep a craft close is a very ancient one. At certain periods in national growth it may be a very useful one, just as the ferule of the schoolmaster is of use when applied to a boy, though it would only be an affront to a man. But it is impossible for a great and populous country to adopt a shuffling and contradictory policy in a matter of this kind. Trade must either be free or not. If our shops are to be open for Indian wheat and American flour, they must be open for all products of Indian and American labour. If these products can be best conveyed to, or manipulated on, our own soil, by the Indian or American workman, who shall say him nay? No one who is an advocate of free trade. That we should consume Japanese tea or American cheese, and say to the Japanese and to the American,—"Stop on our soil at your peril," is one of those anomalies that cannot be consistently defended. America has taught us that, disgusted as the native workman may be, native idleness will not hold its own against imported industry and thrift. It is in the nature of things that the same lesson will be taught the workman in this country, if he keeps up such an unnatural tension in the supply of native labour as to make the importation of foreign labour plainly lucrative. And the first step taken, the course will be frightfully rapid.

In one respect seasons of past prosperity have been, not only wasted, but turned to evil account. We have seen a great expansion of business, and a consequent increase in the remuneration of the workpeople. Trade has thriven, and the thrift has been such as to pay all concerned. The formation of trade unions, not as mutual benefit societies, but as labour-controlling associations, first assumed importance about the time that the prodigious stimulus to productive industry of all kinds which was given by the introduction of railways commenced. Thus trade has thriven as unions have become powerful. It is not unnatural for the unionist to say, "Trade has thriven because unions have become powerful." But no argument can be more childish. Mr. Bevan has pointed out that the improved condition of the workman has not been less in those occupations in which no unnatural constraint was put on the disposal of labour than in those in which the interference of the unions with the freedom of the individual workman has been most complete. He might go farther. The unions, as far as the rate of wages is concerned, can only do one of two things,—force an open door, or produce a temporary effect, which soon involves a reaction. When trade is enlarging, and prices are rising, skill and industry on the part of the workman become more and more valuable. Labour of all kinds rises in price, but the rise is most to the benefit of the best workman. In this case the union does not raise the price, it is general prosperity that does so. All that the union can do, in times of advancing prosperity, is to handicap the best workman. It limits the number of bricks he shall lay, the number of hours he shall work; it forbids him to work in the mode most remunerative to himself. In times like these, it would be more to the advantage of the skilled and rapid workman to pay a certain definite portion of his weekly wages for the express purpose of aiding the clumsy and idle workman to do little and bad work, than it would be to support a union which limits the productive power of industry. In the first instance, the workman would suffer injustice, but to an extent that he could readily calculate. In the second case, not only does the workman suffer, but the country also. Less work is done, less wealth is earned; and British industry is weighted in its competition with foreign industry.

It is not as if we possessed a monopoly of production. When we glance round the world we can see but one thing left amongst all those in which we were accustomed to consider that we had, to a certain extent, a monopoly. It is against this very English characteristic that labour-controlling regulations are directed. Coal, ironstone, other metals, clay, stone, marble, all the raw materials of industry are found all over the world. New mines and sources of supply are daily discovered. The earth, with us, does not yield such a return to labour as it does in countries nearer the equator. The means of transport, in which first our insular position, and then our inland navigation, gave us at one time so great an advantage, are now more generally equalised on the surface of the globe. In some important cases they are far cheaper elsewhere than in England. Thus on two American railways, since they have been constructed at about one-third in cost of the English buildings, while the traffic is generally larger, it is possible to carry much cheaper. On the East India Railway the cost of transport is less than half the average cost in this country. It is not, then, to the physical qualities of our island that we can look with any certitude, in order to command a prime place among the producing nations of the world. Our old glory was this. The English workman, all things considered, was the prince of workmen. Steady, reliable, provident, skilful, strong, industrious, civil, and unwearied, he used, as a rule, to turn out more and better work than any other workman. Employers of labour, both at home and abroad, knew this. The men took a pride in it. The fact was the backbone of our prosperity. The great contention which the English statesman, or enlightened patriot, has to urge against any combination for the control of labour is, that its result, if it succeed, is the destruction of the mainstay of our national welfare, the emulous, self-respecting, distinctive excellence of the foremost workmen, and the influence that their example exerts over all the inferior members of their craft.

We can fix our eyes on no portion of the industrial world without becoming aware of the existence of those who are steadily bending their energies to rival us in the productive race. In England, the home of the iron industry, there is no factory to be compared to the German factory of Krupp. In England, the cradle of the railway system, there is no railway conducted with the economy of the East India Railway. In England, the former cradle of literature and its appliances, we can obtain no paper such as that made in France, in Switzerland, or even in America; no printing, no illustrated literature like that of Paris. Italy, in spite of her comparative poverty, is before us in the size and power of her greatest men-of-war. We might extend this list very far. In so doing, we should still have to return to the same consideration. We made, in most of these matters, a start. We might have maintained that start; and to have done so would have been to increase the distance at which we should have kept ahead. We have lost this start, in almost every case. The uncertainty of the tenure by which we hold our yet remaining prosperity is frightfully illustrated by the fact. The centres of our most important industries are being displaced. The districts of England which once commanded the market of the world, are now so little in advance of the foreigners that they are beggared by a slight advantage obtained by some other English district. Such is the case with the two master industries of coal and iron, the outcome of which, for 1876, amounted to 62½ millions sterling. A slight increase in facilities in one district produces distress in others. The Cleveland iron district is monopolising our iron trade. The Scotch pig-iron trade, once considered one of the surest of our industries, is being actually extinguished by it. Cleveland iron, in large quantities, is now exported to Scotland. Nor to Scotland alone. It is exported,—in the crude state of pig iron,—in large quantities to Germany; where it is manufactured and wrought, and whence, in not a few instances, it is returned to England, to the exclusion of home-manufactured articles. The working-man, the friends of the working-man, and those self-called friends who may prove his most fatal enemies, cannot too anxiously study the statistics of the iron trade.

It is impossible to read the accounts which come from every district of England without the gravest anxiety. It is worse than idle to lay, as a very energetic opponent of the steam engine and all its works attempts to lay,—all the blame on the masters. It would be equally idle to lay it all on the men. It would, perhaps, be less difficult to gibbet some of those individuals on whom the most serious responsibility really devolves. That is not our task. Our object is to speak home to every man who has fewer shillings in his pocket, this winter tide, than he has been accustomed to have, and to ask him to reflect what that means. Has he, or has he not, in the past year, taken a pride to do his best? If not, has he slackened his

hand at the counsel of some speculative adviser? Has he been wilfully idle, rather than work at the best prices offered. Has he supported those who were idle rather than work at the market rate? If so, what has it cost him? What has he gained? It is only by putting such questions as these to themselves in time that our working men are likely to avoid having, perforce, a long leisure to reflect on their former welfare, and bitterly to regret the folly that counselled them to try and better their condition by wasting their time, and limiting the amount of their productive labour.

ANCIENT ART IN CYPRUS.

ON Christmas-Day, 1865, the newly-appointed American Consul for Cyprus was landed at Larnaca, on the south-eastern part of the coast, in a manner the least official or impressive that could well be. The big shore-boat or lighter having grounded four or five yards from the shore, the representative of the Great Republic was carried on the shoulders of a native boatman to the shore, and thus made his undiplomatic entry into the town where he was to reside. The feminine half of the Consulship was less ready to bend to circumstances, and it was not until the boat was lightened of its luggage, and drawn up higher, that the lady from New York condescended to jump on shore, without any assistance from the native arm. This rough style of landing seems only to have been in keeping with the first impression produced when the steamer cast anchor a mile from the shore. "The town, from that distance, looked the very picture of desolation; no sign of life, no vegetation anywhere visible, except a few solitary palm-trees, with their long leaves drooping, as if in sign of mourning. I admit that my first thought was to remain on board, and not to land on such a forlorn-looking island." Such were General di Cesnola's first impressions of the island from which, ten years later, he was to write the account of the interesting and remarkable archæological discoveries which are described and illustrated in his beautiful volume* and which, as Mr. Layard observed, "add a new and very important chapter to the history of art and archæology."

Apart from the variety and interest of the objects discovered, which together make one of the richest treasures it has fallen to the lot of one explorer to find in one place, the special importance of the "new chapter" thus opened arises in the most natural manner from the peculiar situation of Cyprus. A large island in an angle of the Mediterranean, nearly equi-distant from the sources of Grecian, Assyrian, and Egyptian art, it became a kind of neutral ground on which these met, producing a local art, exhibiting characteristics borrowed from all these sources. In some cases the remains found by General Cesnola represented separate types of art, apparently founded on that of one or another of the countries just named, and grouped together in the remains of one temple, but obviously not contemporaneous in execution; as if one or another type had been most prominent for a time, as one or another respectively of the nations around had been uppermost in its influence and power on the island. But in addition to this collocation of various types, there is, as General Cesnola observes, and as he shows by some of the illustrations of the objects found, a typical "Cypriote art," which really is "a mixture of Greek, Egyptian, and Assyrian," the characteristics of which can be traced in one and the same production. There is, in fact, scarcely a better-defined instance to be found of the influence of geographical position on the formation of an artistic style than is furnished by some of these remains of the ancient art of Cyprus.

General Cesnola devotes his introductory chapter to a sketch of the history of Cyprus, showing the various dominations under which it has been, as influencing its art: and it may be interesting just to touch on the salient points of this history, before making a few remarks on the nature of his discoveries. The history, of course, commences in conjecture, but the name of one of the principal towns, *Citium* (the modern Larnaca) adds probability to the belief that the island was the *Chittim* of the Old Testament, and that its wealth in copper* would have attracted to it at an early period the great traders of the ancient world, the Phœnicians. One of the first of the references to Chittim in the Old Testament (Numbers xxiv. 24) alludes to it as a place of maritime renown,—"Ships shall come from the coast of Chittim, and shall afflict Asshur," &c. The country then would seem to have been originally one of commercial and even of warlike enterprise; it was perhaps, as General Cesnola suggests, due in great measure to the enervating influence of its climate that Cyprus came to be at an early period of known history a place of typical luxury and sensuousness, and that Paphos became the great centre of the worship of Aphrodite. Such a country becomes usually the prey of more energetic races, so that it is not surprising that Cyprus should have become merely a kind of advanced post in the Mediterranean for different nations of the mainland, as each became successively uppermost in influence or power. Thus, long before the Christian era, the island appears to have passed successively under the rule of Egypt, Assyria, and Persia, and subsequently under that of the Athenians, who (under Evagoras) long contested its possession with the Persians. After Alexander's period the Ptolemies had their turn at the island, which was for some time a dependency of Egypt, ruled by a Viceroy of the Ptolemaic family: the last of these viceroys got into hot water with a powerful Roman, who had influence enough to get a decree passed to constitute the island a Roman province, a piece of annexation which was carried out under the orders of no less a person than Cato; and in 52 B.C. Cicero was pro-consul of the island, which was still under Roman rule at the time of the visit of St. Paul, who is related to have performed a miracle in the presence of the then pro-consul, Sergius Paulus. Under Constantine the island was one of the richest provinces of the empire, to which it continued to be attached during some centuries after the transfer of the seat of empire to Byzantium, in spite of numerous attempts on the part of the Arabs to obtain possession of it; an aim which they only temporarily realised during the first half of the tenth century. Another element was introduced into the island from the fact that it became a frequent halting-place for the crusaders, and it came temporarily into the power of Richard I. of England, who sold it to Guy of Lusignan, a French Crusader, from whose dynasty, after many ups and downs in war and policy, Cyprus passed into the condition of a Venetian State, through the alliance of its ruler with the beautiful Catharine Cornaro, who makes such a noble figure in Venetian history, and who, after her husband's death, gratified the greed of the Republic by abdicating in its favour. The island was formally taken possession of by Admiral Francesco Priolo in the name of the Republic, and it was General Cesnola's fortune in 1874 to stumble on a remarkable relic of this event in the shape of some fragments of a marble slab, in a church now used by the Turks as a granary and stable; on the upper part of which slab was carved, in low relief, the lion of St. Mark and a view of the town of Famagosta, with an inscription, nearly beaten out by the horse's hoofs, but of which enough was legible to show that it was in commemoration of the Admiral of the Venetian fleet and his official visit on February 28th, 1488. The Republic retained the island till 1570, when it was conquered by the Turks under circumstances of great barbarity, and has remained under their genial rule ever since.

In the course of so changing a history, and the successive prevalence of so many nationalities, it cannot be surprising that the art of the country should have presented an unusual and varying character. The very first object figured in General Cesnola's book is that of a distinctly Assyrian sculpture, a single figure in bas-relief, which is now in the Berlin Museum, and was found in the outskirts of the "marina" or coast portion of the town of Larnaca.* This was previous to the arrival of General Cesnola, who commenced his researches merely in a kind of casual manner in the neighbourhood of the town, finding on a mound near the "marina" a number of small terra-cotta figures of very various character, artistically speaking; some of them almost Greek in feeling and drapery, representing complete and tolerably well-proportioned figures; some of them entirely misshapen and barbaric in character, and representing figures with animals' heads, reminding one very strongly of some of the Hissarlik potteries, though the author refers them rather to Egypt. Thus at the outset is brought out the remarkable mixture of styles which forms the characteristic of the Cyprian artistic remains. The author subsequently found in the neighbourhood the remains of a Phœnician temple, a tomb with a remarkable sarcophagus with a female head carved on the lid, resembling very much the Phœnician sarcophagi from Sidon, preserved in the Louvre; a sarcophagus of the Roman period, with sacrificial bulls and garlands carved in relief upon it, and various vases and sepulchral *cippi*. After experimenting a little in this neighbourhood, and visiting the sites of Amathus and Paphos, the two other principal cities of Phœnician origin, General Cesnola came to the conclusion that a systematic exploration would be worth undertaking in every sense, but could not prevail on any of his acquaintances in Europe or America to embark capital in the enterprise. After additional difficulties with the Turkish authorities, who pretended that a special firman was required to authorise any digging, and who seem to have been entirely routed by the combined firmness and shrewdness of the American consul, the latter concluded to depend only upon himself, and devoted all his private means to exploring the antiquities of Cyprus.

This systematic exploration was commenced first at Dali (the ancient *Idalium*), whither the consul was driven to seek refuge from the excessive heat of Larnaca. The ground on the hill of Dali was honeycombed with tombs at a depth of 9 ft. or 10 ft., numbers of which were opened, and in most cases a platform was found round three sides of the interior, on which were three skeletons laid, or in some cases only two, laid longitudinally, always with their heads to the entrance, the centre space being occupied by vases and other mortuary objects. These General Cesnola considers to be all Phœnician; they are, at all events, very ancient, and many of the vases which are figured have a striking resemblance to some of the Hissarlik pottery. A few of them are in the South Kensington Museum, and among these may be noticed the peculiarity to which the author draws attention in some of those of which he gives illustrations, that the ornament is formed by circles described *vertically* on the sides of the vessel, instead of in the usual and natural manner of making such ornament horizontally in the process of turning on the wheel. He considers this fact to be an indication that, old as these works are, they belonged relatively to a time of decadence in the potter's art; and we agree with him that this way of placing ornament on the vessel looks like a deliberate attempt at novelty for the sake of novelty, always the sign of a declining taste. In the midst of these excavations, the workmen stumbled suddenly on another series of tombs at only about 3½ ft. deep, which were found full of articles of a totally different stamp, and obviously Roman in character. At the end of his third year's exploration at Dali, General Cesnola had opened about 10,000 tombs, and had collected from them an immense number of vases and other objects of historical interest. The next step was the exploration of some rock-cut tombs at the village of Alambra, a little distance west of Dali, which appeared to the excavator to be among the most ancient in the island, and which contained many of those little earthenware figurines found in other semi-Greek sites, about the intention of which there has been much controversy. General Cesnola disposes of the idea that they were children's toys, as has been supposed by some, by observing that he never found in any of the tombs in which these figurines occurred any skeleton of a child, but he did observe that wherever the nude female figures occurred there were also found articles of feminine toilet, such as a mirror and long hairpins and needles; which fact points to the conclusion that these were figures repre-

* Cyprus: its ancient Cities, Tombs, and Temples. A Narrative of Researches and Excavations during Ten Years' Residence as American Consul in that Island. By General Louis Palma di Cesnola. With maps and illustrations. London: John Murray. 1877.

* Many of our readers may not be aware that the word "copper" is derived from "Cyprus." The ancients had apparently no distinctive name for copper, except as one of the various forms of metal called χάλκος by the Greeks, and *æs* by the Romans (usually translated "brass" in our dictionaries), and as Cyprus furnished the best and greatest part of this metal, it came to be called χαλκος κύπριος and *æs cyprium*, thence shortened into *cyprium* and *cuprum*, German *kupfer*, English *copper*. The name of the island is conjectured to have been originally derived from the Hebrew name (*kopher*) of a plant that was abundant there, and much used to produce certain oils and unguents,—a derivation which, as the author remarks, corresponds in its method with that of the name of "Rhodes" from the rose.

* Larnaca proper is three-quarters of a mile inland, and there is an almost separate seaport suburb called the "marina," which is considered as part of the town.

senting Venus, or at least having a signification in regard to the sex of the occupant; and similarly, wherever a terra-cotta horseman was found in a tomb, there were also found along with it one or two spear-heads. These facts appear conclusive as to the object of the figures in question, specimens of which may be seen at the South Kensington Museum. But we doubt very much whether the small coloured figures of women found at Tanagra, and of which there are such a number in the British Museum, can be explained on the same hypothesis, as General Cesnola appears inclined to suppose. Figures and heads almost precisely similar to these Tanagra specimens were found by General Cesnola at Soli; engravings of some of them are given on page 230, and several specimens are to be seen in the cases at South Kensington containing his articles; and these latter (as we observed in the course of a few remarks last year on "changes and additions at South Kensington"), seem to explain the real object of the Tanagra figures, all of which have a break behind, as if they were to be or had been attached to something as ornaments, exactly in the way in which two similar figures are attached to two vases in the Kensington collection; and our impression still is that the great find of these pretty coloured statuettes at Tanagra was on the site of a manufactory of the article. The ruder Phœnician terra-cottas found in the tombs at Alambra are in quite a different category, and General Cesnola's theory of their meaning is probably correct: at all events, it explains them better than any other. These tombs at Alambra contained also vessels with two spouts, and others in the rude form of animals, almost precisely similar in outline and feeling to the corresponding objects in the Hissarlik collection, except that they are rather more ornamented with surface decoration.

The next series of excavations undertaken was in the neighbourhood of Athieno, the ancient Golgoi, not very far from Dali. Among the objects found at the commencement of the explorations here were some sepulchral *stelœ*, surmounted by winged sphinxes, and one of a rather ruder and earlier type, surmounted by two couchant lions back to back, underneath which was the well-known Egyptian symbol of the winged globe. In the same neighbourhood was found a sarcophagus, with sculptured figures in relief, of warriors engaged either in hunting or in combat (the presence of animals prominently in the composition renders it difficult to say which was intended), most remarkably resembling in style, costume, and action the pediment figures among the Xanthian marbles. Here we have again in juxtaposition symbols and styles which we usually connect with two totally distinct and comparatively distant localities, as distance was counted in the early ages of locomotion. But one day, just before an important meeting of consuls for a conference, arrived the news of a colossal stone head, discovered at a place called Aghios Photios, near Athenio, and urgent requests for a cart to remove it at once, before the proprietor of the land could interfere.* General Cesnola describes with a *naïveté* that is really amusing, whether intended so or not, his impatience of the proceedings of the consular meeting, and the "trivial questions" urged by members who, we may suppose, had *not* heard of any colossal heads awaiting removal. However, eventually these official trivialities were got over, and the General hurried off to the real work of the moment, learning the pleasant news on the way that his newly-found treasures had all been claimed by two of the police in the name of the Sultan. It was night when he galloped on to the scene of action:—

"All Athieno was bivouacked on the desert-like plain of Aghios Photios; the moon was not yet risen, and large fires were lit at different points, throwing fantastic shadows as men moved about, eagerly gesticulating and conversing. The light falling on their parti-coloured dress, gave them the appearance of a band of brigands, which in some measure they were. They numbered more than a hundred, and their shouts, altercations, and attempts at song made a perfect Pandemonium.

I may here be allowed to state that the successful issue of my affair with the Governor of Larnaca had favourably impressed the local authorities towards me, and had become well known to the populace. This now stood me in good stead. As I approached, the news spread of the arrival of the American Consul, and the uproar and confusion instantly ceased. Having been long accustomed to the control of large bodies of men during my military life, I had not much difficulty in comprehending the situation. At a little distance the two Turkish policemen were standing guard over the sculptures, and I at once rode towards them, dismounted, and ordered one of them to take my foaming animal in charge, and walk it about, which he did without question. I then called the other Zaptieh and motioned to him to disperse the crowd and clear a space round the sculptures. He obeyed as promptly as his companion, and these steps had due effect upon the multitude. I then saw for the first time the colossal head. As its massive stony features were revealed to me by the fitful gleams of the firelights, there arose a vision of a people whose master-hands had ages ago withered and fallen into dust. But this was no time for idle dreaming. I now ordered the carts to be brought near, had the sculptures carefully placed upon them, and giving my mule to M. Andrea Vondiziano, requested him to escort them on the way to Larnaca until he should meet with my cavass, to whose charge he could deliver them and return to Athieno. Thus I may say that I rather captured than discovered these stone treasures. And this was all accomplished without the dissenting voice of a single person; each one doing what he was requested to do with alacrity,—without a murmur even from the owner of the ground, who, however, followed me like my shadow."

This is a very graphic description of the kind of excitement which attended relic-hunting in Cyprus, and gives a good specimen both of the General's style of writing and of his ability to get his own way among Turkish officials and their subjects, of which there are several instances that are not a little amusing, and lead to the conclusion that the American consul must have been a difficult person to take advantage of. Among other ingenuities, when he had reason to believe that articles had been stolen, he produced Mr. Layard's book on Nineveh, and made it play the part of a book of divination, pointing to an illustration nearly resembling the abstracted article, and demanding its instant restitution,—the Cyprian mind being thereby persuaded that he had a book that showed him images of everything that was stolen. To return, however, to our antiques: Aghios Photios produced a remarkable collection of statues, some of them in a quite complete state, and representing an art compounded, as one might say, half of Egyptian and half of early Greek, some of them having points recalling the Branchidæ antiquities. One of the principal statues, a fully-draped bearded figure holding a dove, is very curious, as, in spite of the beard, there can, we think, be little doubt, from the development of the breasts of the figure, that it represents the goddess herself, bearded statues of Venus being not unknown; in fact, General Cesnola found two bearded female figures among the terra-cottas at Amathus. He hazards the conjecture doubtfully in regard to this figure, but to our thinking there can be little doubt about it. What mis-shapen conception this idea of a bearded Venus indicated, it would, perhaps, be "too curious" to inquire at this distance of time.

We have said enough to bring before readers whose attention has not been drawn to the Cesnola collection otherwise, the peculiar nature of the interest which attaches to the remains of Cyprian art, figured and described in this book, as representing a meeting-point at which the art of the surrounding nations was blended and fused. We may just notice the value and interest of the treasure of gold ornaments and gems found at Curium, in regard to which we note with interest one remark of the author, that as a general rule "when the mounting of these gems is in solid gold, the engraving on the stone is of different workmanship, and that, in fact, the artistic value of the ring rises in inverse proportion to its intrinsic value." We must refer our readers to the book for the rest of General Cesnola's labours in Cyprus, and the account of the ruse by which he in the end managed to get all his treasures shipped for London in defiance of the last act of hostility of the Turkish Government, who endeavoured to prevent his exporting them, but on the whole seemed to think better of him for having outwitted them. The late French Emperor had intended to purchase the whole collection, but the Franco-German war intervened. For some time previously to its departure the collection had become one of the lions of tourists, and "Cook's parties" would arrive in scores, take possession of the garden and courtyard, insist on seeing the American Consul's "museum," and if he was present, would ask impossible questions; one "elderly English lady, with the proverbial ringlets," who had examined the Athieno statues for some time, having asked him in the gravest manner "if he would be so kind as to explain to her the mysteries of the worship of Venus!" But, in spite of the heat and Cook's tourists, the Consul seems, from the conclusion of his book, to have quitted the shores of Cyprus with a certain regret, even a shade of tender sentiment. All readers of his book have reason to be glad of his appointment to the post which he filled for ten years. The volume is in every way a typical work of the kind, lucidly and agreeably written, and beautifully printed and illustrated. It is "affectionately inscribed," we may add, to the lady who refused to be carried out of the boat at Larnaca, "as a tribute to her love and devotion under great trials."

* We confess we are a little puzzled in regard to the philosophy of *meum* and *tuum* in some of these transactions, as related by the author.

ARCHITECTURAL THEORY IN AMERICA.

THE proceedings of the American Academy of Arts and Sciences contain an essay of considerable interest on an architectural problem, by Mr. Charles Eliot Norton, the professor of the History of Art in Harvard College. The author is well known personally in England, but hitherto chiefly as an elegant Italian scholar, and by a translation of the "Vita Nuova" of Dante. The report bears the date, as presented, October 10th, 1877; it is entitled "The Dimensions and Proportions of the Temple of Zeus at Olympia." This is the temple, on the site and in the precincts of which the exploration conducted at the expense of the German Government has already brought to light such important remains. Sculptured groups which adorned its pediments are being exhumed, and promise to go far to complete as well as to confirm the descriptions of the ancient traveller, Pausanias, who saw them uninjured and in their places; and in some instances these discoveries bring us further comfort by disposing of certain pertinacious theories as to schools and styles of art that developed rather rankly in Germany in the absence of positive information, by that process of evolution from within which has become proverbial. Three years ago it could more reasonably be said of these works, in a history of the Age of Pericles, to which they by date belong, "as we know nothing of the style of Pæonius of Mende, it were futile to speculate as to his treatment," &c., but the works may now speak for themselves,—will speak to those, at least, who see the originals at Athens, or can spare leisure to visit Berlin for a sight of the casts, or who perhaps may come upon others in America: we will not give up the hope that for the credit of the country our own generation will yet see the establishment of a public exhibition in London of casts of all the finest and most interesting sculptures of antiquity, and of these sculptures of Pæonius and Alcamenes among them. Considering what has been already found, it is not easy to set bounds to sanguine hopes as to what may not be turned up from the alluvial accumulations which cover deeply the ancient scene of the Olympic games, and all the celebrations that attended them. One matter of anxiety is, lest, in the fervour of research for works of plastic art and inscriptions, sufficient time and attention may not be spared to observe and measure, and record with the utmost fulness and exactness, all the details that are still with care recoverable of the architecture and proportions of the temple itself.

A few notes of dimensions have been published to supplement or correct those which were obtained by the partial excavations of the French Scientific Expedition to the Morea; but very few. The dimensions given by Blouet in the plates and text of the French work are most unfortunately inconsistent as well as scanty. The measured length and breadth of the stylobate do not bear out the statement that they are in conformity with those which are given by Pausanias, and the differences of columniations as set down are reducible to no system, and are much too excessive to be referred to indifference or accident in execution. This is unpromising enough, and we cannot but open Mr. Norton's essay with serious misgivings as to the probability of his making anything out of such materials for theorisation. If he has not done so, it is certainly not for want of application. For the most part, it is his view to proceed on the lines of a memoir to which he refers,—"On the Systems of Proportion employed in the Design of the Doric Temples at Phigaleia and Ægina," by William Watkiss Lloyd, appended to Mr. Cockerell's splendid work on these temples. London, 1860." "Mr. Lloyd," he adds, in explanation of his repeated references to this memoir and to a paper "On the General Theory of Proportion in Architectural Design, and its Exemplification in Detail in the Parthenon," in papers read at the Royal Institute of British Architects, London, 1859, "has made a valuable contribution to the establish-

ment of some of the leading principles of the science of Greek architecture." He also refers for important materials for the study to Penrose's admirable work on the Parthenon, published by the Dilettanti Society. The essay, accordingly, is devoted, in the first place, in accordance with these indications, to the discovery in this Olympian temple of the simple ratios of low natural numbers, to which he observes that the Greeks attached great value, not merely in the columns, but also in the proportions of the other parts and divisions of their structures.

This hexastyle Doric temple was the largest ever erected in Peloponnesus; our limits for its date are very wide,—between 435 B.C., when it was certainly complete and housed the colossal ivory and gold statue of Zeus by Phidias, and 572 B.C., almost a century and a half earlier, when the Eleians conquered Pisa, and were said to have founded the temple from its spoils. This is uncertain and vague enough; but the size of the temple —its columns had a diameter exceeding those of the Parthenon—is no presumption against an early date in the period which saw the erection of the first Parthenon, and the great temple at Samos. Nor is an early date inconsistent with observance of certain very precise principles of proportion,—albeit not so refined and elaborate as are found to rule in the Parthenon. Such rudimentary principles have been identified in the archaic Temple of Zeus at Ægina, and even in the still more archaic group of Doric columns at Corinth, in their composition as well as diameters. The text of Pausanias gives three dimensions, for the length, breadth, and height of the temple, which, however, fail to accommodate any simple proportions, and a better result might be hoped when the examination of the ruins proves that two of them at least are certainly wrong. Unluckily the new dimensions are not more helpful. In consequence, the theory which Mr. Norton builds up is dependent on hypothetical corrections that cannot be readily admitted unless as simply good for hypothetical conclusions. With this reservation they certainly deserve full praise for ingenuity. For an advance beyond these we must wait for the results of a survey of the ruin, executed with some approach to that rigorous conscientiousness which makes the work of Mr. Penrose on the Parthenon the basis and the test of any speculation on Greek architecture,—a veritable "possession for ever."

The essay includes a comparison of results, whatever their value, with a learned summary of the Pythagorean musical scale and doctrine of numbers as the key of Nature as well as art, and a collection of ancient authorities as to absolute and inherent qualities, conceived to be inherent in some mystical way in particular numbers. This subject has considerable antiquarian interest; but, from a scientific point of view, what is more required is the completion of a reasoned exposition of the appropriate part which proportion plays in architecture, as an art not subordinate to music, but co-ordinate. Music has its architectural characteristics, as all composers know, in precisely the same sense as architecture comprises musical. The subjects can only be treated satisfactorily in conjunction, but for that very reason confusion can only be avoided by a a strong line dividing the provinces of proportion, for either art. In the meantime we can but greet this sympathetic contribution from America with the most cordial satisfaction.

Factory Statistics.—In accordance with a resolution adopted at the Trade Unions Congress at Leicester in the autumn, it is stated that the Parliamentary Committee of the Trades Council are about to memorialise the Home Secretary (Mr. Cross) in favour of having the statistics relating to the various manufacturing industries in the United Kingdom, which have hitherto been prepared by the factory inspectors, published periodically. Up till now these returns have been collected and issued at irregular intervals of time, on the motion of a member of the House of Commons. With one exception also they have been limited in their application to our textile factories, but the Trades Council propose that they should embrace all branches of manufacturing industry. The administration of the Factory Department being now concentrated under one chief-inspector, Mr. Alexander Redgrave, C.B., the preparation of a periodical return of this kind will in the future be greatly simplified.

"BUILDINGS,"—"MANSIONS,"—"FLATS," "RESIDENCES,"—"DWELLINGS."

A CORRESPONDENT, possibly with the intention of paying a seasonable compliment, has sent us an inundation of tracings, photographs, and descriptions of associated blocks of residences erected in Chicago, Boston, New York, and other American cities, together with some in Vienna and Glasgow. He has also sent us the plans and an elevation of a similar building suggested for erection at South Kensington; and descriptions of others intended for Knightsbridge and Northumberland-avenue. In fine, he asks, with derisive emphasis, are these the things you, artistic and sanitary apostles, are prepared to advocate for the improvement of the London house and the English home? Many of the designs sent to us are of finished buildings now full of tenants; in most of them the entrances common to several groups and families are narrow, small, and ugly,—not much better than the ordinary private entrance to the apartments over a London shop. The halls and lobbies of the different sets of rooms are not only dark, but the majority have no means of obtaining light and air except from the rooms into which they lead and from the staircase with which they communicate. Moreover, the staircases are often only lighted by a skylight at the top of five or six stories; and in one instance, a "light and air shaft" from which stairs, hall, servants' rooms, and closets receive light, possesses the magnificent dimensions of 9 ft. by 3 ft. In the plan of the Viennese house sent to us, three rooms in each set are approached one through the other; in the Glasgow house the kitchen and bed-rooms of each set are next the entrance-door, and the two living-rooms are divided by a small bed-room. The plan of a flat on the ground-floor in a block of residences situated in a mews near Baker-street is included in the new year's gift we are acknowledging; and in this flat, which we are told commands 60*l.* per annum, a few miserably small and irregular rooms open into an unlighted narrow passage with the doors of the sitting-room and the kitchen in close proximity, and with the principal bed-room next the entrance-door.

We have never approved such a system of distribution; and it ought to be unnecessary for us to add that we regard the flat or horizontal system of house arrangement as the remedy for actual evils in an old city rather than the basis of plan for new houses in a new one. Years and years ago correspondents addressed letters to this journal, and we wrote articles, concerning the London lodging-house in which innumerable families, of all classes below a certain grade, may still be found in the heart of the metropolis. We have always looked upon such a lodging-house, of which no other European capital can boast, as a calamitous medley of extemporal divisions and sub-divisions, wherein no one group or one family can be privately or comfortably lodged. We have even hesitated to praise many of the new skilfully-planned blocks of French houses, simply because the method of building round a closed courtyard, and the internal "light and air" shafts to be found in them, are not to our mind desirable acquisitions for this country. Yet undoubtedly, in Paris and in Paris alone,—for all other cities have taken the French metropolis as their model,—is to be found the principle upon which new houses in the new streets of Central London should be planned. Towards the close of 1876, we said:*—"The Continental architect has solved the problem of housing numerous families and groups under one roof in a popular and an economical fashion; and though his work may be still blemished with many sanitary defects, it is infinitely better,—more scientific and artistic,—than anything to be found among those worn-out houses which contain the extemporised homes of thousands of Londoners, many of whom, though scandalously lodged, are neither poor, ill-educated, nor ill-bred."

Those very few English people who understand the flat system of house arrangement and organisation know also why the Romans adopted it for their Capital, and why Vitruvius recommended it; they know when and how the "house in flats" or "apartment house" rose in the French Capital at the end of the seventeenth century. But the ordinary Londoners,—and we include many architects therein,—have little or no conception of the art of planning a block of flat houses. The prevailing idea seems to be that to plan a flat of eight rooms it is only necessary to jumble together upon one floor the eight rooms of a vertical house, which is scientifically divided by floors into kitchens, sitting-rooms, and bedrooms. But, on the contrary, the greatest ingenuity and labour have often to be expended over so small a matter as the distribution of a flat dwelling-house of seven or eight rooms. If London architects and builders would diligently examine every house in the Boulevard Malesherbes or the Boulevard Haussmann they would be astonished to find in each some individuality of arrangement. They would be equally astonished to perceive,—as they could not fail to do,—that, though most of the houses are practically speculations,* often built by contractors of some branch of building construction, yet accomplished architects have designed them; the works have been superintended by architects,—the relations between the professional man and his client being precisely the same in their case as those usual in the erection of private mansions for noblemen or gentlemen. At the same time, Parisian speculators do not choose the suburbs of Paris to build huge houses of a shape and distribution intended exclusively for the crowded parts of a capital city. Even in the neighbourhood of the Arc de l'Étoile, there are now quite as many villas or small hôtels as there are maisons-à-loyer. In the vicinity of the Bois de Boulogne the roads and avenues are dotted with detached houses; and the same kind of villa residence is to be seen at the Bois de Vincennes. To suppose that we desire the Finchley-road or Haverstock-hill to be lined with tall blocks of mansions divided horizontally into numerous sets of residences, would be sheer nonsense. The flat system is applicable only to crowded centres, where a large number of persons require or desire to share in the advantages of a particular site, or a particular neighbourhood. We repeat our old dictum: to build vertical houses of three or four stories with a frontage to the street of 20 ft. or even 30 ft. is an extravagant method of covering costly land in the heart of London.

Nor would we advocate the erection, for any class of her Majesty's subjects, of huge blocks of dwellings which we have already ventured to term "barracks." It was announced a short time ago that a mansion was to be founded not far from Hyde Park-corner on the co-operative system, and it was to accommodate 600 families. Admit an exaggeration, and say that only sixty families were to be invited to partake of mutual household bliss, it is, at least, six times more than it is usual to find in first and second class Paris houses. We mention this because, in the dawning appreciation amongst Londoners of the advantages of which the flat system is possessed, there is every possibility that large sums of money will be lost over misunderstood and ill-considered attempts to introduce, not the economy of the French "*appartement*,"—not the luxury of the American "hotel" or "apartment house,"—but something purely English in its speculative promotion, its unscientific and inartistic arrangement, and its vulgar extravagance. People who believe that the improvement of a large part of Central London depends upon the introduction of shops and houses, similar to those that adorn Paris, would be the last to baulk any scheme for building good houses in flats. But it should be remembered that a great smash, or the serious failure of a company started for the erection of houses on the flat-system, would do harm, and increase the actual prejudice against flats, in the eyes of the masses who do not understand the subject. It is very natural and business-like to suppose that the greater the number of families you can house under one roof the more chance there is of such a speculation paying; the greater the number of people who co-operate the greater the means of combining luxury and convenience. But though undoubtedly London is cursed with an infinity of vertical party-walls which might be advantageously dispensed with, we would rather have the party-walls as they are, than dispense with them altogether. A party-wall has a moral as well as a fire-resisting value. Yet one of the projects we have lately examined consists of an enormous block of mansions arranged round a closed courtyard of about 100 ft. square, and covering an area of at least 300 ft. by 200 ft., without a single party-wall. The suggested building is intended for a plot of land, about

* *Builder*, vol. xxxiv., p. 968.

* They are called "Maisons de rapport."

1½ acre in extent, situated between the Albert Hall and Lowther Lodge, and necessarily it is to front the Kensington-road. In order to erect it a company has been started with the hope of obtaining a capital of 100,000*l.*, in 10,000 shares; and it has been formed, so says the prospectus, "for the erection of mansions on the flat system, which has been so successfully carried out by Mr. Hankey at Queen Anne's-gate, and elsewhere in London." Now, we presume to think that not only the principle of the flat system, but even its economy, has been misunderstood in the design for the Albert Hall Mansions; and it may be well to explain that from pavement to point of gable the suggested building is to be 110 ft. high, comprising, with the basement, nine stories. Of the design the less we say the better; suffice it, that an Athenian would not have understood it, a Roman would have called it barbarous, a Goth would have shuddered at it; yet it has received the distinguished approval of a distinguished architect.

A few words as to the general points of arrangement in the suggested mansions near the Albert Hall. There is to be a main entrance, which is to take the form of a *porte-cochère*, and under this, one porter is to be stationed in a spot whence he can see none of the entrances to the different staircases. In spite of this covered main entrance, there are no means of entering, under cover, from a carriage, any one of the staircases; no use is made of the covered main entrance to set down from cabs or carriages the inmates or their visitors. The excellence of the French plan, which partly consists in compelling every inmate of a block of houses to pass in and out through the *porte-cochère*, is ignored; yet, as all club managers know, only thereby can a strict guard be maintained. On the ground-floor of the proposed mansions there are six sets of apartments, the largest of thirteen rooms, and the smallest of eight rooms; the upper stories contain eight sets on each floor, the largest of fourteen rooms, the smallest of eight rooms. The majority of the rooms of each set open into one continuous corridor; not the smallest attempt is made to divide—except, perhaps, in the fourteen-roomed house the different sections of a dwelling. With the exception of one block (marked F on the plans before us), none of the corridors receive any direct light. They are lighted and ventilated by shafts, some of which are shown to be about 20 ft. by 6 ft. in area, and these shafts are necessarily 100 ft. in height, measured from the level of the courtyard. Some twenty-eight rooms on each floor are lighted solely from the courtyard, which, though 100 ft. wide, is surrounded by buildings 100 ft. high. Of course, we quite understand that both the plans and the elevation appended to the prospectus of the Albert Hall Mansions Company are mere sketches, and that the impossible, though effective, shadows etched upon the elevation are merely accidentally artistic. Great improvements in the details of arrangement may yet be made in the working drawings, but not enough, we fear, to render a colossal building of so complicated a character either healthy as a residence or economical as a home. The best advice we can offer to the architects of the incipient company is to begin another set of plans; to regard the American buildings, of the description they are evidently ambitious to emulate, as utterly opposed to the building traditions of London, or even Paris; and, above all things, to remember, while designing a new elevation, that the modern world will be 1900 in twenty-two years' time.

Joinery from America.—A new trade has lately grown up between Europe and America which must, sooner or later, be felt in an important branch of native industry. It is not generally known, but such is the fact, that American upholsterers are now exporting to Great Britain and the Continent large quantities of ready-made furniture, from kitchen chairs and tables to the most elegant accessories of the drawing-room. The facility with which these objects are turned out is almost marvellous. But, according to the *Globe*, it is not only in the matter of household furniture that competition is to be dreaded. The Americans are now sending us window-sashes, doors, skirting-boards, panel work, wainscots, and all descriptions of joinery, including very cheap coffins.

THE OLD MASTERS EXHIBITION.

It would be a mistake to say that the ninth winter exhibition at Burlington House is equal to most, or perhaps to any of its predecessors. No one who knows how rich this country is in old paintings would conclude that the deficiency is owing to the resources of the private collections being exhausted. On the contrary, we have no doubt there are in England enough art-treasures to supply a good many more winter exhibitions of the highest class, even omitting sketches and studies, which the proprietors of the Grosvenor Gallery have taken specially in hand. But there is a limit to the readiness of owners to lend. Those who have once done so are unwilling in some cases to repeat the risk or the trouble; otherwise, even if the highest class of paintings were exhausted in a year or two, many frequenters of these exhibitions would be very glad to begin the same set over again after a lapse of ten or twelve years. But that is hardly to be thought of, we fear.

The Academy have, during the last two or three exhibitions, aimed more or less at having a point or speciality in the collection, some set of works which are not usually seen, or the collection of which in one set of rooms presents special points of interest in the way of comparison. Thus, last year we had Raeburn's portraits,—a singularly successful hit, for they were so little known to many, and their remarkable merits caused so much surprise among those not previously acquainted with them, as to give rise even to an exaggerated and over-enthusiastic estimate. This year there are two specialities,—the exhibition in one room of a representative collection of the works of the so-called "Norwich school" of painters, and the collection of a large number of engravings after the works of Reynolds, Gainsborough, and Romney. Of this latter portion of the exhibition we may say at once that it appears to be the most thoroughly enjoyable of the whole; though we shall not, on this occasion at least, go into any detailed comments upon it, as it consists of engravings which are mostly more or less known, of works which are well known. But to find two rooms full of fine engravings from the three masters above-named, enabling us to enjoy and compare, within a comparatively small space, the most essential qualities, at least, of their art, is certainly a pleasure of no ordinary kind; and it is a remarkable proof how intrinsic is the source of interest in these works, that so much of their characteristic refinement and feeling is preserved in a form in which they are deprived of the advantage of effect arising from colour and scale. They form a beautiful collection, and their small size makes comparison easier and more comprehensive than usual.

As to the other point in the exhibition, it is somewhat of an illusion. In the first place, there is no "Norwich school." What is so called consists simply of Crome, and some inferior artists who imitated him, and of Cotman, who was quite above imitating Crome or any one else, and whose whole style and manner is so distinct from that of Crome and the Cromites as to preclude all idea of classing him with them. Of the latter, the one who comes nearest to his original is Stark, whose trees and foreground tones especially have a marked resemblance to the work of his model, so far as intention goes, though he is mostly feeble and deficient in atmosphere and breadth of effect in comparison with the real Crome. Vincent is mostly but tame: his "View from Sandlings Ferry, Norwich" (12) is the best, and has a good deal of quiet beauty. Cotman, who was potentially a more original genius than Crome, though owing to circumstances he accomplished less, has been far better represented in previous loan exhibitions, and no kindness is done to his memory by exhibiting such specimens of his work as No. 26 and one or two others; his "Windmill" and "Old Houses, Gorleston" (29, 30), are very powerful sketches,—the latter an instance of his intensity of representation, for the tenements seem to represent the very acme of dilapidation. Of Crome there are some very fine and not well-known specimens, especially the landscape (17) lent by Mr. Fordham, representing a road through a wood: it is seldom we see a picture in which we can so completely look through and through the landscape as in this. "On the Wensum" and the "View of Norwich" (47, 48) have also most beautiful qualities; the latter in design and tone having strong affinity with the earlier art of Turner. The artist's portrait of Opie hangs in the room: a head showing power without much refinement; indeed, Crome's advantages of birth and education were of a very negative kind. With his landscapes should be compared the fine "Study of a Burdock" (23), which might serve as a companion to the equally powerful "Thistle" which we remember in a former exhibition.

Passing to the more miscellaneous part of the collection, we are greeted in the second gallery by Reynolds's well-known portrait of "Lavinia, Countess Spencer," a face so beautiful in its combined tenderness and brightness of expression that one can hardly see it too often. A central object in this room is the Duke of Buccleugh's Canaletto representing the view of Whitehall looking towards Charing-cross, a splendid specimen of the artist's best powers, and so minute in its realism as to be a valuable topographical relic. On the right we look across Whitehall Gardens to a sketch of the Thames, and St. Paul's in the distance; on the left we see the present site of the Government Offices, occupied by a row of those tall, substantial prim-looking red brick houses, some representatives of which are still left at the Park end of Downing-street. Next to this is a somewhat remarkable-looking, but to our thinking, rather doubtful Terburg; an equestrian portrait of the Duke of Alva, by Rubens, of which the horse is the best part (the face, by the way, is quite unlike the received portraits of Alva); and two Lady Hamiltons, by Romney, of which No. 83 is much the best, but the contrast in style and character of the two representations of the same lady is certainly striking. Reynolds's portrait of Lady Cockburn and her three boys (89) is remarkable as one of the only two which he signed (Mrs. Siddons as the Tragic Muse being the other); the children are carelessly drawn, but the face of the principal figure is noble in pose and execution. His little girl with the dead bird (96) has a marked individuality about it, almost as much so as the more famous "Strawberry Girl," though not nearly equal to the latter in colour. We must just notice Gainsborough's portraits of Madame Le Brun and Mrs. Billington, the latter noticeable chiefly for its historic interest, and his highly characteristic "Dorothea, Lady Lethbridge" (108), a half-length side-face, in an oval, of a thin, straight-lined, but aristocratic figure, who looks as if nothing would move her from her *nonchalance*. The most decidedly unique work in this room is, however, the Jan Steen lent by the Queen, called "The Bedroom" (120), where the spectator looks through an arch flanked by columns into a bedroom where a Dutch damsel sits on the bed, from which she seems to have just risen, putting on her stockings, her thin legs bare to the knee; a lute and other objects are littered about the floor: a more odd mixture of a formal foreground and a slatternly interior, of splendid painting bestowed upon an uncouth and uninteresting scene, it would be hard to find.

The place of honour in the large gallery is occupied by Reynolds's "Cymon and Iphigenia," too well known to need description here; the finest point in it is the head of the sleeping beauty, rich in tone and contour, and flushed with the warmth of slumber: in his treatment of the clown Reynolds has not been happier or less vulgar than some of his predecessors. At either angle of the same end of the room are two remarkable portraits, that by Gainsborough of "W. Grant, Esq., of Congalton, skating in St. James's Park" (128), one of those experiments the painter was fond of indulging, an effort to catch his subject for portraiture at a moment of action involving a special attitude and appearance of movement, as in that portrait of a lady dancing which was in Burlington House a year or two back. "W. Grant, Esq., of Congalton," is a very fine and dignified looking man, but he skates rather too placidly, nor is the swing of the body quite realised. The opposite work is an exquisite Romney, "Mary, Lady Beauchamp" (137), a fair girl in a white dress falling in long floating folds over the figure, gazing upwards with her chin leaned on her hand. Romney's head of "Perdita" (136) is also very beautful. No. 140 is a Titian of very fine qualities,—"Portrait of a Youth" standing at a table, in black velvet dress just relieved by a thin gold chain and a slight end of a lace cravat at the throat, in the way Titian was so fond of producing a light spot or line to set off a costume of this kind: the head of the youth is very rich in colour, with the ripe full-blooded look of perfect health under a southern sky. But we have

passed over a fine Velasquez, the "Portrait of a Spanish Alcalde" (130), a three-quarter figure of a dark stiff Spaniard standing with his hands before him holding a letter, and looking immovably official; the painting has not perhaps so much defiant originality as we sometimes find in the portraits of Velasquez, but it is a more powerful thing than any of the Vandycks in the room, some of which are sumptuous enough in effect, but deficient in distinct character and expression. An interesting work is that of Angelo Bronzino, called "Portrait of a Youth" (149), who seems to have been a sculptor, judging from the statuette on the table and the figure of a nearly naked man (the model?) on the balcony in the background; the picture is hard and deficient in force of colour, but there is great character and feeling in the head. Vandyck's "Marchesa de Brignolé and Child" (158) seems somewhat faded also in colour, but in some other qualities it is the finest specimen of the painter in the exhibition; among other things the beautiful drawing of the left hand which droops over the arm of the seat is to be noted. Rembrandt's duplicate portraits of a Jewish Rabbi (167, 169), one painted on canvas and the other on panel, but almost photographically identical in design and execution, are full of force, both of character and colour; the canvas is the property of Viscount Powerscourt, and the panel that of the Duke of Devonshire. The well-known "Rembrandt's Mill" is lent by the Marquis of Lansdowne, and throws completely into the background the classic landscapes of Poussin, of which one or two good specimens are here, such as a former generation of criticism would have considered among the best achievements of landscape-painting; but they must take a secondary place now; like all artificial landscape, their repute has been to a certain extent artificial also.

In the fourth room are some portions of the paintings made by Ugolino di Sienna as an altar-piece for the church of Santa Croce at Florence, which was subsequently removed, and (we quote from the catalogue note) "Della Valle discovered it in the dormitory of a neighbouring convent, and it was sold to Mr. W. Y. Ottley, at the beginning of the present century. At the sale of the Ottley collection, in 1847, the various portions were dispersed." The altar-piece is known to have consisted of seven panels, or architectural divisions, with a predella below each; and the sketch restoration of it given in the catalogue shows a row of fourteen small panels, arcade fashion, over the large ones, and seven gablets over these. This arrangement, at all events, is borne out by the shapes and sizes of the portions exhibited here, which include three of the principal panels, each containing a half-length of a life-size figure; four of the small arcade pictures; two of the gablets; and the whole seven of the predella paintings. They are all in tempera on a gold ground, and are very well preserved specimens of the characteristics of the Siennese school of decorative painting; the large figures have considerable grandeur of design and conception, though exceedingly stiff and artificial. A very fine specimen of Giotto occupies the central position in the room, "The Death of the Virgin," a long composition with the principal group in the centre, and with a sloping top, pedimentwise. According to Vasari, the picture was at one time in the church of Ogni Santi at Florence, and was much admired by Michelangelo. Granting the *naïveté* of an early style, the composition is remarkable for the beauty and variety given to the various figures, without disturbing the decorative effect and repose of the whole. In the centre the dead body lies on a stone or marble couch ornamented with delicately-painted inlay; at either end an angel bends over; behind these, each way, is a receding group of spectators with various expressions of grief; the two last figures on the left are especially fine in pose and expression; the last one is turned almost away from the spectator, but there is expression in the drapery and pose of the whole. The golden aureoles of the figures cut and cross each other, and form a background to the whole. The picture is a fine specimen of decorative painting which has soul in it, and is not mere wall-covering. Two very interesting things near this are the painted front of an Italian wedding casket, of the fourteenth century, lent by Mr. Spencer Stanhope, representing a kind of "Decameron" scene with much spirit and fine colour; and an extraordinary work by Mantegna, which is quite unlike what we usually connect with his name, and, in fact, reminds one strongly, in colour, of Giorgione's long, low, decorative painting which was in the Winter Exhibition on a former occasion. The picture is a procession of the triumph of a general, with all Mantegna's wild fancy in the throng of figures and the martial trophies borne along. On the right sits a beautiful youth, with a branch of laurel, who seems to be singing the praises of the conqueror. Among other things of interest in this fourth room (devoted, as usual to specimens of the older schools of painting) are a set of four figures of the Seasons, by Sandro Botticelli, of which "Winter" is incomparably the best,—indeed, the others could only appear good in the eyes of Botticellists; a remarkably stiff but highly-finished portrait of a lady, by Ghirlandaio; a Holy Family, by Luini; and the singular allegorical painting by Holbein, representing the Wheel of Fortune. The small painting of the head of Christ crowned with thorns, ascribed to Leonardo da Vinci, looks genuine; it is, at all events, a very beautifully and delicately modelled head, though with no real pathos, only artistic sentiment, which does not render it the less characteristic of Leonardo.

The fifth gallery, which concludes the oil-paintings, contains a Siddons portrait, by Reynolds, and a Pitt portrait by Gainsborough; Hampstead pictures by Constable; a fine view of the Thames, looking up from below Westminster Bridge, by Canaletto, giving a good idea of the Abbey as it appeared then, the central pile of the view, before it was obscured by its still larger neighbour; and, among other curiosities, a portrait, by Hoppner, of Humphreys, a pugilist of his day, and a good- (and good-humoured) looking fellow too, in fighting costume, and in the attitude of defence against an adversary in the "P. R."

A MANUAL FOR MECHANICAL ENGINEERS.*

THIS is a formidable book, designed for engineers as a work of general reference. We can but glance at it, for it is full of figures; and we are quite unable to affirm, in a casual notice like the present, whether all or any of the figures are facts. But of this we are certain, that infinite care in the compilation of an enormous store of information and scientific investigation is revealed by the complete and deliberate manner in which the book is put together. Over a thousand octavo pages we find rules, tables, and data relating to strength of materials and of elementary construction; to the friction of solid bodies, and to the frictional resistances to mill gearing; to steam-boilers and the steam-engine; to the flow of air and of water; to air and water machinery; to the weight and specific gravity of metals; to heat, steam, combustion, fuel; to fundamental mechanical principles; to weights and measures; to money, British and foreign; together with—besides a host of other things—mathematical tables and geometrical problems, and a short but valuable chapter on Work or Labour.

Besides referring to the stores of learning and experimental data accumulated in the Transactions of the great engineering societies, and in various periodicals both native and foreign, the author cites some 300 authorities, from whom he has been able to draw much of his material.

The chapter devoted to the strength of elementary constructions should be read by those architects who, when they wish to use iron floors, sometimes submit themselves and their own judgment to the engineering specialist. Investigations by well-known men into the strength of cast-iron pillars and cast-iron flanged beams are quoted and compared. One practical result which may easily be remembered, and as easily acted upon, is that the weight which produces moderate flexure in a very long pillar is also very near the breaking weight,—a conclusion, as Mr. Clark points out, of great practical importance. Experimental observations made on the elastic strength and deflection of cast-iron flanged beams show that the limit of load, for uniform increments of deflection, averages about 80 per cent. of the ultimate strengths. An important comparison between rolled and framed girders, and its results, leaves us perplexed with the remembrance that while all new Paris is built with rolled girders and joists, the few iron floors and horizontal iron supports in London are of framed or riveted iron. Yet Mr. Clark says (page 657): — "Compared with solid rolled joists, the strength of riveted joists is less, and the deflection is greater. . . . It follows, from experimental tests (page 660) that the strength of solid-rolled joists is to that of riveted joists, of equal weights, as 1½ to 1, and that these deflections, under equal loads, are as 1 to 1½." We call the special attention of our readers to the above statement.

The imperial weights and measures of this country are examined and compared. The introduction to this part of the book may be new to many people:—

"The origin of English measures is the grain of corn. Thirty-two grains of wheat, dried and gathered from the middle of the ear, weighed what was called one penny-weight; twenty pennyweights were called one ounce; and twenty ounces one pound. Subsequently the pennyweight was divided into twenty-four grains. Troy weight was afterwards introduced by William the Conqueror, from Troyes, in France: but it gave dissatisfaction, as the troy pound did not weigh so much as the pound then in use; consequently a mean weight was established making sixteen ounces equal to one pound, and called avoirdupois (*avoir du poids*).

"Three grains of barleycorn well dried placed end to end made an inch the basis of length. The length of the arm of King Henry I. was made the length of the *ulna* or ell, which answers to the modern yard. The imperial standard yard is a solid square bar of gun-metal kept in the office of the Exchequer at Westminster, 38 in. length, 1 in. square, at the temperature 62 Fahr. Two cylindrical holes are drilled halt through the bar, one near each end, and the centres of these holes are 36 in., or 3 ft. apart,—the length of the imperial standard yard."

There is also in the Standard Department at Westminster, so says Mr. Clark, a newly-constructed subdivided standard yard, laid down upon a bar of Baily's metal, upon which a subdivided metre has also been laid down. The metrical standards are the metre (the unit of length), and the kilogramme (the unit of weight). In Paris these platinum standards are deposited in the Palais des Archives.

Certain items of information, given in the manual, are important as evidence of the slow progress of what one would suppose, in a time of extended international relations, to be inevitable. It appears that the French metrical system has been adopted, and its use made compulsory, by the following States:—France and Belgium, in 1801; Holland, in 1819; Greece, in 1836; Italy and Spain, in 1859; Portugal, in 1860-68; the German Empire, in 1872; Colombia, Venezuela, in 1872; Ecuador, Brazil, Peru, and Chili, in 1860; also by the Argentine Confederation and Uruguay. On the 20th May, 1875, the international convention for the adoption of the French metrical system of weights and measures was signed at Paris by the plenipotentiaries of France, Austria, Germany, Italy, Russia, Spain, Portugal, Turkey, Switzerland, Belgium, Sweden, Denmark, the United States, the Argentine Republic, Peru and Brazil.

At pages 151-2, Mr. Clark has printed tables of equivalent values of inches and millimetres. Tables No. 38 give millimetres = inches, inches decimally = millimetres, and inches in fractions = millimetres. By means of these tables, the equivalent values of inches in centimetres and decimetres, and even in metres, may be found by simply altering the position of the decimal point. Take, for example, the tabular value of one millimetre and shift the decimal successively by one digit towards the right-hand side; the values of a centimetre, a decimetre, and a metre are thereby expressed in inches as follows:—

1 millimetre	.....	0·0394 inches
1 centimetre	.....	0·394 ,,
1 decimetre	.....	3·94 ,,
1 metre	.....	39·4 ,,

Similarly, for example:—

0·32 inch	=	8·13 millimetres	
3·2	,, =	81·3	,,
32·0	,, =	813·0	,,

There are two square measures, or measures of surface, which frequently puzzle Englishmen engaged in the examination of French surveys and plans of estates,—the Are and the Hectare. The former equals 100 square metres; the latter, 10,000 square metres. The hectare is more than double the English acre; it contains more than 2½ acres. Thus:—

1 acre	=	4,840 square yards
1 hectare	=	11,960 square yards or 2 acres 2,280 square yards

Under the head of fundamental mechanical principles, Mr. Clark has compiled a chapter of elementary engineering science, with a mass of formulas valuable, not only as references, but as texts and tasks for students. His definition

* A Manual of Rules, Tables, and Data for Mechanical Engineers. By Daniel Kinnear Clark, M.I.C.E. Illustrated with numerous diagrams. Blackie & Son: London, Glasgow, and Edinburgh.

of "Work" is "the sustained exertion of pressure through space." The English unit of work is one foot-pound, and a foot-pound means a pressure of one pound exerted through a space of one foot. In like manner, the French unit of work is one kilogrammetre, which means a pressure of one kilogramme exerted through a space of one metre. In the approximate equivalents of French and English compound units of measurement, it is given (page 157) thus, –

1 kilogramme per metre... } ·672 pound per foot. 2·016 pounds per yard.
1 pound per foot 1·488 kilogrammes per metre.
1 pound per yard ·496 kilogramme per metre.

Again, –

1 kilogram-metre ($k+m$) } 7·233 foot-pounds.
1 foot-pound..... ·138 kilogrammetre.

According to Mr. Smeaton, the power of an ordinary labourer is equivalent generally to work done at the rate of 3,762 foot-pounds per minute. Mr. John Walker found that the average force exerted by an ordinary labourer in working daily at a winch, or a crane handle, is equivalent to 3,080 foot-pounds per minute; but Mr. Glynn says 3,300 foot-pounds per minute. It appears, however, that the average net daily work of an ordinary labourer at a pump, a winch, or a crane, may be taken at 3,300 foot-pounds per minute. A French estimate of the work of a labourer in France, turning a crank, is equivalent to 2,604 foot-pounds per minute, for eight hours a day, above ground, or six hours a day in a mine. To compare the labour of men and the labour of horses, according to one estimate a dray-horse can do work, for eight hours a day, equivalent to 33,000 foot-pounds per minute; but Tredgold's estimate for the same, under the same conditions, is 27,000 foot-pounds. Mr. Clark infers that the maximum work done by an average horse per day of eight hours, is at the rate of 25,000 foot-pounds per minute. He adds, from the results of trials at Bedford, that the average work of a horse is there seen to be 20,000 foot-pounds per minute. The term "horse-power" is a measure of the rate at which work is performed; and one horse-power is the expression of 33,000 foot-pounds of work done per minute, or 550 foot-pounds of work done per second.

We have simply strung together a few notes which we made while examining parts of Mr. Clark's excellent "Manual of Rules, Tables, and Data for Mechanical Engineers," and do not pretend to have reviewed it. To us it will remain an eminently useful book of reference.

CONSTITUTION OF THE INSTITUTION OF CIVIL ENGINEERS.

THE annual report of the Council of the Institution of Civil Engineers includes a recommendation to modify the constitution of the society. In the report for 1876 a scheme was proposed, having the aim of establishing a new class of subscribers, intermediate between the present grades of members and associates. The object of the distinction was to distinguish between such supporters of the institution as are actually engaged in the practice of the profession and those not so engaged. Many young professional men, not yet qualified under existing rules, to rank as members, are yet discontented with the name Associate,—a word which also covers those who are not necessarily engineers. At a meeting held in April last, to consider the recommendation of the Council, the project fell through; the resolution being passed "that in the opinion of this meeting it is not desirable at present to create any new class of members."

In the opinion of the outgoing Council the question of the separation of the professional from the non-professional Associates is one that will prove a constant source of embarrassment until it is satisfactorily solved. In the report for the past year, 1877, it is therefore suggested that in future the Institution shall consist of four classes; namely, senior members or fellows, members, associates, and honorary members, with an attached class of students. This suggestion met the approval of the annual meeting so far that a resolution was passed to the effect that the incoming Council be requested to prepare, for the consideration of a special general meeting of members and associates, such alterations in the bye-laws as the suggestions contained in the report with reference to classification may require. It is to be hoped that the intended improvement will not again be defeated by that strong prejudice against organisation which is so unfortunate a feature of the English character. No class of men in England suffers so much from want of organisation as do engineers. This fact may be shown either by regarding on the one hand the numbers of the profession, and on the other hand the total absence of any systematic general accord on the main principles of the chief engineering questions of the day; or, on the other hand, by comparing the *status* of the civil engineer either with that of the Royal Engineer in this country,—or with that of the organised corps of civil engineers in France or Italy.

The important influence which might be exerted by the profession of civil engineers, if any kind of efficient organisation were adopted, may be estimated from the facts contained in the annual report. There are now on the books of the Institution, 16 honorary members, 925 members, and 1,670 Associates, making 2,611 in all. The funded property of the Institution is now 38,773*l.* The total income for 1877 was 12,832*l.*; and the respectable sum of 5,178*l.* was spent during the past year in publication of the minutes of proceedings. The value of these published papers of the Institution is very great, and it would be well if their contents were more generally known,—not in the profession only, but to the public at large. A list of fifty subjects is now put forth, on which original communications are requested for the ensuing year. These subjects range from the principles and details of geodesic survey, to the naval or military item of "Torpedoes, and their Influence on Naval Construction." It will be observed with some surprise, considering the serious question now rising as to the non-remunerative nature of the mineral traffic on the railways both of this country and of the United States, that the Council of the Institution have omitted to call attention to an investigation to which the great founders of the profession would have bent their most earnest attention. The omission of any reference to the no less vital point of the disposal of sewage is probably due to the fact that several communications on the subject were discussed last session, without any definite result being attained. The cordial thanks of the Institution were deservedly tendered to Mr. James Forrest, the indefatigable secretary, for his long and valued services. The conclusion of the report is to the effect that the Institution is financially in a sound condition, but that at the same time the income proper is barely sufficient to balance the heavy expenditure entailed by carrying out the objects of the society on the liberal scale actually adopted. The Institution has our hearty good wishes; but we still object to their habit of preventing the public from knowing what is said and done at their ordinary meetings.

ON THE NEW METROPOLITAN MARKETS.*

AT present there are throughout the metropolis some forty or fifty places, at least, that are more or less known and frequented as markets for the sale of provisions, some consisting only of a few stalls or stands, and even those stalls or stands movable; others rising to a sufficient dignity to be brought before your notice on this occasion. Of these some are wholesale as well as retail,—*i.e.*, that is supplying both the dealer or retailer and the consumer. One or two alone have the greatest portion of the trade devoted to the wholesale; and in one special instance, indeed, may properly be considered not only as a metropolitan market, but an imperial one. It is impossible, in considering the subject before us, to ignore entirely the importance and peculiarities of the market-places and market-houses of the provinces, as well as of the Continent, though time will only permit a passing allusion to them. Not a bad type of the provincial market-house of some century or century and a half ago may now be seen within a few yards of Oxford-street, built when that part of the present metropolis was quite an outlying district,—connected, it is true, by Oxford-road, but disjoined from the city of London by pleasant Bloomsbury fields and lanes, the village of St. Giles being a sort of halfway resting-place; probably at that time the abode of a rural innocence long since departed. Of the various others, of course, first comes Covent-garden, famous throughout the world for its fruit, flowers, and vegetables. The name of this well-known place is one of the many instances of popular corruption of phrase. We are told that there was, as early as the thirteenth century, a large piece of ground known as the Convent Garden, belonging to Westminster Abbey. "In 1560 it consisted of an oblong walled space, sprinkled over with trees and some three or four cottages. In 1827 the Duke of Bedford obtained an Act for rebuilding the market, and the irregular sheds and standings began to be removed in 1828." The present buildings were designed by, and erected under the superintendence of, the late Mr. Fowler (a vice-president, and one of the founders of this Institute, and father of our esteemed coadjutor, Mr. Charles Fowler), and consists of a centre arcade, with two side rows of shops, intersected in the centre by another arcade at right angles, the whole being completed at the expense of John sixth Duke of Bedford. The market has since extended itself, and overflows into the adjoining streets, besides which a large new wholesale flower-market has been added, and I fancy the entire area used for market purposes may be roughly estimated as between four and five acres, or at least three times its original size. The Borough, Spitalfields, and Farringdon, all of them, like Covent-garden, are devoted to fruits, flowers, and vegetables.

Again, certain of the railways have made a sort of market of their own at their termini: as, for instance, the Great Northern, which has, I believe, at King's-cross, one of the largest potato markets in London. The market that at one time, in old London, was the largest and most frequented has long since vanished, viz. the Stocks market, and on part of its site now stands the Mansion House.

Islington Cattle Market is situate nearly a mile from King's-cross, up Maiden-lane (one of the oldest thoroughfares out of London), where stood Copenhagen House, said to have derived its name from the circumstance of a Danish prince having resided here during the great plague. This property and the surrounding fields, to the extent of nearly 100 acres, were purchased by the Corporation, who erected on it the Metropolitan Cattle Market, to supply the place of Smithfield. The market-place is a quadrangle, with a lofty clock-tower in the centre, and at each of the four corners a tavern, the open area being set off into divisions for the different kinds of live stock, and nearly half a million of money has been expended on the buildings and land.

The Foreign Cattle Market at Deptford is on the site of the Royal Dockyard, which first gave consequence to Deptford, and gradually increased its population and importance as a maritime vicinage to London. The dockyard was bought by the Corporation, at a cost of nearly 100,000*l.*, for the formation of a market for foreign cattle. The slips where the ships had been built were filled up and paved, and supplied with divisions and pens, &c., and various other alterations made, and it was opened for use on the 28th of December, 1871. The area of the market is about twenty-two acres.

There remain four more markets lately erected, or in course of erection, by the Corporation of the City of London, viz., the Metropolitan Meat Market, the Poultry and Provision Market, and the intended Vegetable Market at Smithfield, of which latter the foundations are now being executed on the adjoining land; all of these are in the ward of Farringdon Without, and the Fish Market, well known as Billingsgate, in the ward of Billingsgate. These four markets, in addition to the two live-markets before mentioned, have absorbed and will absorb an amount of money to be reckoned by millions. The most prominent and best known of the latter four is the market first erected and called the Metropolitan Meat Market, to the details of which, with a few preliminary remarks, I now desire to ask your attention.

Smithfield, the site of the Metropolitan Meat and Poultry Market, appears to have been originally an open space, of considerable but somewhat undefined extent. The name signifies a smooth plain, "smith" being a corruption of the Saxon word "smeth" (smooth). The uses to which in ancient times it was applied were extremely various.

In 1847 it contained just six acres. About this time public opinion had been loudly expressed as to the nuisance of the market and

* From a paper by Mr. Horace Jones, Fellow, read at the Institute of British Architects, as elsewhere mentioned.

the driving of cattle through the streets. The sanitary opinions of the day began to make themselves heard, declaring that the existence of a large live-cattle market, with its concomitant evils and nests of slaughter-houses and other similar trades in the centre of a city, was objectionable in the extreme; and in 1852 the Corporation obtained an Act of Parliament for the removal of the "Live-Cattle Market" to a more convenient and spacious site in Copenhagen Fields. This new market at Islington, constructed by the Corporation, from the design and under the superintendence of my predecessor, the late Mr. J. B. Bunning, the architect to the Corporation, was opened by the late Prince Consort on the 13th of June, 1855, under the name of the "Metropolitan Cattle Market."

Consideration was then given to the question of the appropriation of the site of Smithfield, thus left vacant. It was determined to build thereon a market for the sale of meat and poultry, the lower part or basement of which should form a railway depôt for goods, more especially meat or goods brought to the market above. For carrying out this purpose, an Act of Parliament was obtained in 1860, and under its powers the present building has been erected. Another Act was obtained in 1861 for dismarketing Newgate Market, which had been established by Act of Parliament in 1670, in place of the shambles which had previously occupied Newgate-street. The date of the ceremony of opening the New Market was, by Act of Parliament of 1861, declared to be the period of the closing of the old one in Newgate-street. Under the powers of certain Acts, the Corporation were authorised to raise large sums of money for the purchase of property, demolishing numbers of houses and other tenements, &c. The various railways, — viz., the Metropolitan, and the London, Chatham, and Dover especially,—had not been idle, and from the confused mass of streets, alleys, &c., were the wide streets and larger spaces and sites of the new markets educed. The Corporation were further authorised to raise the sum of 200,000*l.* for the erection of the market building. The Act also fixed the rental at 1d. a foot superficial per week for each shop; also a toll of ¼d. on every 21 lb. of meat, &c., brought into the market, with powers, under certain conditions, to raise the toll to ½d. on every 14 lb.

The carrying out of the work of the Metropolitan Meat Market was confided by the Corporation to the Markets Improvement Committee, who having purchased and cleared the property, set about obtaining designs for the proposed work; and after much time and labour and hearing and seeing various opinions and schemes, &c., finally instructed me to prepare a design, which was approved of by them and submitted to and adopted by the Court of Common Council in 1866. The site is a parallelogram 631 ft. long from west to east, and 246 ft. from north to south. Dictated by circumstances and arrangements made in Parliament with surrounding owners and various vested, or supposed to be vested, interests, a centre public roadway between 50 ft. and 60 ft. wide cuts the building into two halves. It must be borne in mind that the basement of this building is a railway station. Though at present used only for goods, yet the accommodation of staircases is provided (as it was intended to accommodate passenger traffic to and from the market) as well as lifts for the speedy delivery of goods from the railway trucks into the market. The only carriage approach to the goods station is the circular road on the south side, lying, in fact, between the Meat Market and St. Bartholomew's Hospital. The inner circular area, about one-third of an acre in extent, has been laid out and planted as a garden and pleasure-grounds at the expense of the Corporation, who have also erected a handsome fountain designed by Mr. Butler, on whom it reflects much credit. A reference to the plan of the basement shows that the supports of the floor of the market are irregularly placed to suit the direction of the railway rails, and, of course, from the circumstance of their irregularity, occasioned some extra consideration as to the arrangement of the upper supports which carry the roof above the ground-floor. These columns were originally intended to be executed in cast-iron, and, indeed, two at the north-west corner were so executed by the railway company when they first ran their line of rails through the northern side of this basement, and more than a year before any designs for the market were made, and after which period the change of the construction from cast-iron columns to wrought-iron stancheons was made. The construction of this basement was the joint work of the Corporation and the two railway companies, viz., the Metropolitan and the Great Western, the design being the joint production of Mr. John Fowler, the engineer to the railway companies, and myself, its execution being carried out under our joint superintendence. The construction of this basement (of nearly four acres) with its retaining walls, supports, and ceiling or floor of market, was no small work in expense. It is a series of nearly regularly placed principal girders about 240 ft. long running from north to south, and having an average but very irregular bearing of a little more than 30 ft. each, with the supports or stancheons as before stated placed so as to meet the necessities of the railway curves, &c. These carry numerous transverse girders running from east to west, 7 ft. 6 in. apart, from which brick arches are turned. Roughly there are about five miles length of girders supported on one hundred and eighty stancheons, and altogether about three thousand tons of wrought-iron.

About one-third of the area of the intended market was ready about the beginning of May, 1867, and by that time the work of the market proper was commenced, covering an area of 155,226 ft. Certain postulates were arrived at: Imprimis—the market was to be an enclosed market, so that full command could be held as to the entrance to and exit from it, and as to the hours of opening and closing, &c., so as to secure the receipt of toll, examination of provisions or material sold, and other fit and proper supervision. Secondly,—ample space in avenues and ready access to the surrounding streets.

After various diagrams had been prepared and submitted to, and discussed by the Committee and the meat trade (wholesale butchers and salesmen), who met regularly, and in fact were formed into a powerful and compact body or guild, with secretary and other officers, and brought their views and supported them very strongly and effectively before the committee, the working drawings (exhibited on the walls) were adopted. These show that the design consists of a number of equal parallelograms, formed firstly by dividing the whole area in half by the central roadway, and secondly by forming the central avenue, which is 25 ft. wide from west to east, giving four equal parts or quarters, each quarter having three avenues 74 ft. long and 18 ft. wide. Each of these minor blocks contains fourteen shops, about 36 ft. deep, with a width of 15 ft.,—the total number of shops being 162. These blocks of shops, formed partly by this central roadway, which was determined on in Parliament, so as not to lessen the means of access from the north of Clerkenwell to the City through Little Britain and King Edward-street, &c., and again by the central avenue running from east to west, and finally by the smaller avenues from north to south, form a disposition open to criticism, as it will be seen that certain shops not only are corner shops, but situated in and fronting the leading avenue, and usually supposed to be more desired and desirable than those in the side avenues, thus not keeping all the tenants on the same footing. With regard to this especial point, to which I shall again refer, especially when I come to the Poultry Market, I must here remind you that prominence of position is of less consequence where the trade is nearly or entirely wholesale (as it is in this market), than equality in size and internal convenience, for the purpose of conducting the trade; and these points are of more importance than show-room or publicity.

Having reference to a railway station below, with irregular supports to the floor of the market, controlled, as before mentioned, by the curves of the railway, and it being necessary to keep all the avenues clear of all columns, of course the first problem to solve was the contrivance of the roof, its support on and the disposition of the columns on the ground-floor, so as to obtain their proper bearing on the stancheons in basement. And here again came in more postulates. The roof of a market must, or rather ought to be, light, airy, and cool in summer, and whilst admitting light and air, it must keep out wet and cold in the winter. I have seen many markets, not only designs but actual buildings, covered with glass transmitting direct rays, more like cucumber-frames, or say crystal palaces, than the cool, shady, but airy retreat in hot weather that a market should be; and again others built or designed with shed roofs, apparently for the purpose of shutting out all the light, and admitting, through large unprotected openings, wind, snow, and sleet, which on a winter morning must be trying to salesmen and frequenters of the market. Nearly, in fact, the same principle has been employed in the roofs throughout, and I do not know that I could more correctly name it than by calling it an adaptation of the mansard principle with certain alterations suggested by circumstances and by the difference of the situations and the various spans of the different roofs.

Having exhausted your patience with the roof, I must ask you to turn your attention to the detail of the shops. As you may perceive, they average about 36 ft. by 15 ft., consisting, on ground-floor, of shop or selling-space, counting-house, with scale-room or beam, and small staircase to upper floor. This upper floor contains a small room, in no case for sleeping, but for retirement, meals, &c., averaging about 180 superficial feet, lavatory, and W.C. The height of the story being fixed at about 13 ft. from floor to ceiling, some economy in space was gained, especially on the ground-floor, by constructing an interlacing stair, by which the inhabitants of two shops would be enabled to ascend to the upper floors in the space occupied usually by 1½ stairs, or ¾ each, a saving in fact of 25 per cent. on each staircase. This arrangement saves on each floor at least 18 ft., or by the mode of charging rent, gives an advantage of 18 ft. at 2d. per foot (1d. on each floor) per week 3*s.* or 7*l.* 6*s.* per annum on each shop, —or say, upon the 162 shops, 1,182*l.* 12*s.*, a nice little sum at twenty years' purchase Of course there are many details which, in a brief notice of this description, must be omitted, though they necessarily involved special consideration: for instance, not only the provision for carrying away the water of roofs, but also of the closets, lavatories, &c., the thickness of the floor between station and market being limited, and the level or floor of station being considerably below the general level of the surrounding sewers.

The style of architecture adopted for the market building is that generally understood by the term Italian, but of a type more nearly allied to the Renaissance architecture of France than the more severe Palladian school. The prevailing feature is a series of arcaded recesses between Doric pilasters, fluted on the upper two-thirds, and elevated on pedestals. The entablature is returned and ornamented over the pilasters, and finished with ornamental vase-like terminations, which, recurring at regular spaces through the length of the building, give an effective sky-line. The general height of the external wall is 32 ft. Between the Portland stone pilasters the recess is built in red brickwork, which, by its contrast of colour, gives point to the architectural effect, and adds greatly to the appearance of the whole. The semi-circular head of the arcade is filled in with iron scroll-work, so designed as to occupy the space, and yet leave room for air and light to pass freely through, there being no glass behind. The keystones of the arches are carved, those over the twelve side entrances being carved into heads, the others into shields. The windows under these openings have stone sills and trusses, architraves, and cornices, and are also filled in with ironwork, but of a less ornamental character than that in the arched head above.

The chief points of architectural effect are the four towers, the frontispieces, or façades of the public roadway which passes through the market from north to south, and the pedimented gateways to the east and west fronts.

Some facts as to quantity of provisions supplied to the market may be interesting. Nearly 190,000 tons of meat were supplied last year; enough, indeed, to afford 4½ ounces of meat daily to four millions of mouths. No doubt a large quantity of this goes far beyond the metropolis, and at times to centres of population in the north, the midland, and the south, —making this market as a provision and meat market, not merely a metropolitan market, but really and truly an Imperial market,—fixing and defining the prices of meat from Aberdeen to Cornwall. It may also be interesting to learn that the receipts, as shown by the published reports, are between 50,000*l.* and 60,000*l.*, and, after allowing duly for repairs, collection, and every expense, there remains a large balance for interest of money and extinction of debt, and remuneration for capital invested.

What the present rate of loss in rental is I am not prepared to say, but I recollect for some five years the average loss of rent was between

10s. and 12s. per annum on the 50,000*l.* per annum.

The western approach street (from Farringdon-road to the north side of the market) required by the original Act, but constructed under the powers of a separate Act of Parliament, was an important work, and involved much labour in excavating for and forming a sewer and vaults under the Metropolitan Railway. A bridge over the railway also had to be constructed, the work to which was only performed during two or three hours in each night, or rather early morning (from one to four o'clock), to avoid the risk of accidents to passing trains, as the traffic of the railway was uninterrupted. The work was completed and opened in 1867.

Soon after the opening of the Meat Market in November, 1868, it was found that the requirements of the trade completely exhausted the space at the command of the committee to whom was intrusted this market, and they determined to recommend the proposition to remove the poultry trade, which at first occupied the eastern end, erecting for the poultry and provision trade a new market, and accommodating the butchers and salesmen (otherwise the meat trade) with the entirety of this market lately (in 1868) opened. In 1872, the Market Improvement Committee presented a report to the Common Council recommending the construction of

THE NEW LONDON CENTRAL POULTRY AND PROVISION MARKET, SMITHFIELD.

The new building in design and treatment is similar in its general features to the adjoining meat market. This was rendered necessary, not only by its being used for a cognate purpose, but also by its close proximity to the present structure, with which it was necessary that it should harmonise in appearance as well as in purpose. The Doric in both buildings is the governing order, but, instead of the series of arcaded recesses, the bays or compartments between the large pilasters are divided into two stories by a sub-order of more delicate design, over which in each case is an oval window, affording light and ventilation to the rooms above the shops.

The chief points of architectural effect in the external design are the four pavilions at the corners of the building,—the centre or clock towers on the north and south fronts, and the east and west entrance gateways. The four pavilions mark the extent of the façade, and were originally designed to contrast with those of the Meat Market, and it was only at the strongly expressed wish of the committee that they were re-designed to be more in accordance with the adjoining building, and the drawings of them speak for themselves. The clock towers which mark the centres of the northern and southern façades, where are double entrances to be referred to directly, are carried up above the general line of cornice with pilasters, and a pedimented cornice on each elevation, the space between the pilasters being occupied by a clock surrounded by a carved stone setting, of an ornate character, representing the supporters of the arms of the Butchers' and Poulterers' Companies. The entrance gateways at the east and west have also seen altered from my design to be only mere copies of those of the Meat Market, although the portals are filled in with ornamental cast-iron work of a different design.

BILLINGSGATE.

The rapid growth of London, the importance of the trade in this valuable article of food, and the desire of benefiting, not only salesmen and fishmongers, and carriers both by sea and land, but also the public at large, induced the Corporation of London, about five or six years ago, to apply to Parliament and obtain powers to rebuild on a larger scale this market, the Act for which was granted in 1872.

The total area of the new market on the level of Thames-street is 39,000 ft. against 20,000 ft. of the former market. From the peculiarities and nature of the site, being the bed of the estuary or creek before alluded to, it has been necessary to excavate the soil, a mingled mass of piling, river mud, cesspools, and refuse of all kinds, to a depth varying from 25 ft. to 50 ft. below the level of Thames-street. Warned by the lamentable fate which befel the adjoining public buildings some fifty years ago, sound and completely substantial foundations were executed, and the Corporation availed themselves of the increased depth of excavation to construct a lofty, airy, and fairly lighted basement, about 24 ft. high, which will also be available not only for a shell-fish market, but applicable for other market purposes, should overcrowding on the level of Thames-street render it necessary or desirable.

The accommodation provided is as follows:—The basement has an area of about 20,000 superficial feet. It has a groined, vaulted, and domed roof, supported on piers 24 ft. in height; large circular apertures, partly glazed and partly open, are formed in this roof for light and ventilation. This basement is approached on the north side (Thames-street), and south side (the river quay), by wide and commodious staircases, with a lift about 10 ft. 6 in. by 4 ft. 9 in. to each staircase. There are also double floors for the river-side taverns, and for the fourteen shops or warehouses on the east and west sides of the markets; the portion under the arcade, next Thames-street, is devoted to engines, boilers, steam-generators, for pumping, working lifts, supplying hot water, boiling shell-fish, &c.

The whole area of the market is just about 39,000 ft.; the interior area, exclusive of shops, taverns, and arcade, is covered with roofs on the louvre glass principle, carried on lattice girders of 60 ft. span, affording ample light and ventilation to the general market. The height from floor to roof is 31 ft. 6 in. at the plate, and 43 ft. at the ridge; and the area, with arcades, about 25,000 ft.

The gallery called the Haddock Market is 30 ft. in width, running from north to south above the general market. It is approached from the staircase halls, which serve for access to the basement and ground floors, and has an area of some 4,000 ft.; and, as its name implies, is a market for the sale of haddocks and other dried fish, a considerable traffic in which article is carried on at this market. The lighting and ventilating this part of the building is similar in every way to that of the general market, and somewhat similar to the principle adopted in the markets at Smithfield.

The heavy goods, barrels, &c., for the upper and lower floors of this building will be conveyed from the ground-floor by means of the hydraulic lifts, which will be fitted up near Thames-street, to take the land traffic, and next the river to accommodate goods brought by water. Boiling-places, supply of steam, &c., are, as before alluded to, provided for cooking lobsters, crabs, and other shell-fish of their different kinds, so that the entire fish business will find its centre in the new market.

The design of the building is Italian in character, and the materials used in its construction are Portland stone, with polished grey granite plinths and wall linings, the intervals between the archivolts and windows are filled in with yellow brick facings. The front next Thames-street consists of an arcade, terminated at its eastern and western extremities by pavilion buildings, and a pedimented central feature, marking the entrance to the shell-fish and dried-fish markets. The river-front is similar in general treatment, but differing in detail, and includes two large taverns, situated at its south-east and south-west extremities, on the upper rooms of which, no doubt, will be continued the fish-dinners which have been so long a part of Billingsgate life. The revenue of this market has, I am pleased to say, increased since its extension, so as to fully justify all that has been expended on it.*

A NEW LUNATIC ASYLUM FOR SURREY.

AT a meeting of the Surrey magistrates on the 1st inst., the committee appointed to provide an additional lunatic asylum said they had selected a site situated on the Reigate road, near Stoat's Nest Goods Station, on the London and Brighton Railway. It consisted of fourteen acres, and the cost would be 23,000*l.* The Committee recommended the Court to empower the Finance Committee to raise a sum of 5,000*l.* by debenture bonds for the purchase of the land, &c.

Sir Francis Scott said he was astonished at the sum proposed to be paid for the land, being at the rate of 165 years' purchase, and according to the estimate of the agent for the vendor, 15s. or 1*l.* per acre, 222 years.

Mr. Somes remarked that the subject had been thoroughly thrashed out, and the Court had decided to construct an additional asylum.

The report was agreed to.

* Illustrations of most of the buildings named will be found in our volumes.

THE POSITION OF THE MASONS' STRIKE.

WE regret that we cannot announce the termination of this disastrous dispute. From 600 to 650 men are on the strike roll, the single men receiving 18s. a week, the married a little more, according to the number of children. On the part of the employers it is asserted that they have not room in their shops at this moment for more than 300 men, and that in a very short time they would be unable to take back any of their old hands, even should they manifest willingness to return. They are about to make contracts for six months with more German masons. They profess perfect satisfaction with the work of the foreigners already employed by them. The English masons on their side profess to disbelieve much of this statement, pointing to the large amount of work that is waiting for execution as being sufficient to employ all who are now out as well as the foreigners who are already engaged, for whose rivalry as workmen they have no fear.

An earnest endeavour is being made from without to induce both sides to refer the points in dispute to the decision of one unprejudiced and competent person in whom both could place confidence, but what the result of the endeavour may be we cannot yet say. We earnestly exhort those who have influence to use it to bring about an immediate termination of this wasteful dispute. All must view with dislike this importation of foreign artificers. We cannot blame the masters for resorting to it, but it ought to be stopped as soon as possible. To extend it by bringing over, as some have proposed, hordes of half-civilised Japanese artisans would be a national misfortune. The actual difference between the associated masters and the men looks but small when the two statements are brought into juxtaposition. The secretary of the strike committee has said, in our pages, "We do not demand the same rate of pay" (the 10d., that is) "for all"; while those who represent the masters have said to us, "We are quite willing to give more than 9d. to good men." Surely it ought not to be difficult to bring about an amicable arrangement on such a basis as this, and to put an end to the present state of things, which is damaging everybody concerned.

WAREHOUSES, ST. JOHN-STREET, WEST SMITHFIELD.

THESE buildings are erected on a site leased from the Governors of St. Bartholomew's Hospital; one being for Mr. E. R. Parker, and the other for Messrs. Dillamore & Rowley. Mr. Parker's premises are very extensive, occupying an area of about 4,000 superficial feet, and comprise a large basement over nearly all the area, for the storage of provisions.

The front elevation is all of stone,—the portion up to the first-floor being of Portland, and the rest of Bath. The pilasters to the ground story are of polished Shap granite, supplied by Messrs. Fenning & Co. The rest of the premises are faced with Peart's white bricks. The ground-floor is devoted to offices and warehouse purposes, the upper floors in front being used as a manager's residence, whilst in the rear is another warehouse floor.

A cartway at the side leads to a large court-yard, around which are placed bacon stoves, cart-sheds, &c., whilst stabling is formed above these latter, reached by an inclined roadway, and above these are straw and hay lofts. The yard is covered by an iron-and-glass roof, glazed on Rendle's patent system, raised enough from the walls to ensure ventilation.

Platten's asphalte is used for the cartway court-yard, basement, and stables. The stable fittings and iron staircases were supplied by Messrs. Macphail & Co., of Thames-street, and the iron girders by Mr. Dawnay, of Queen-street.

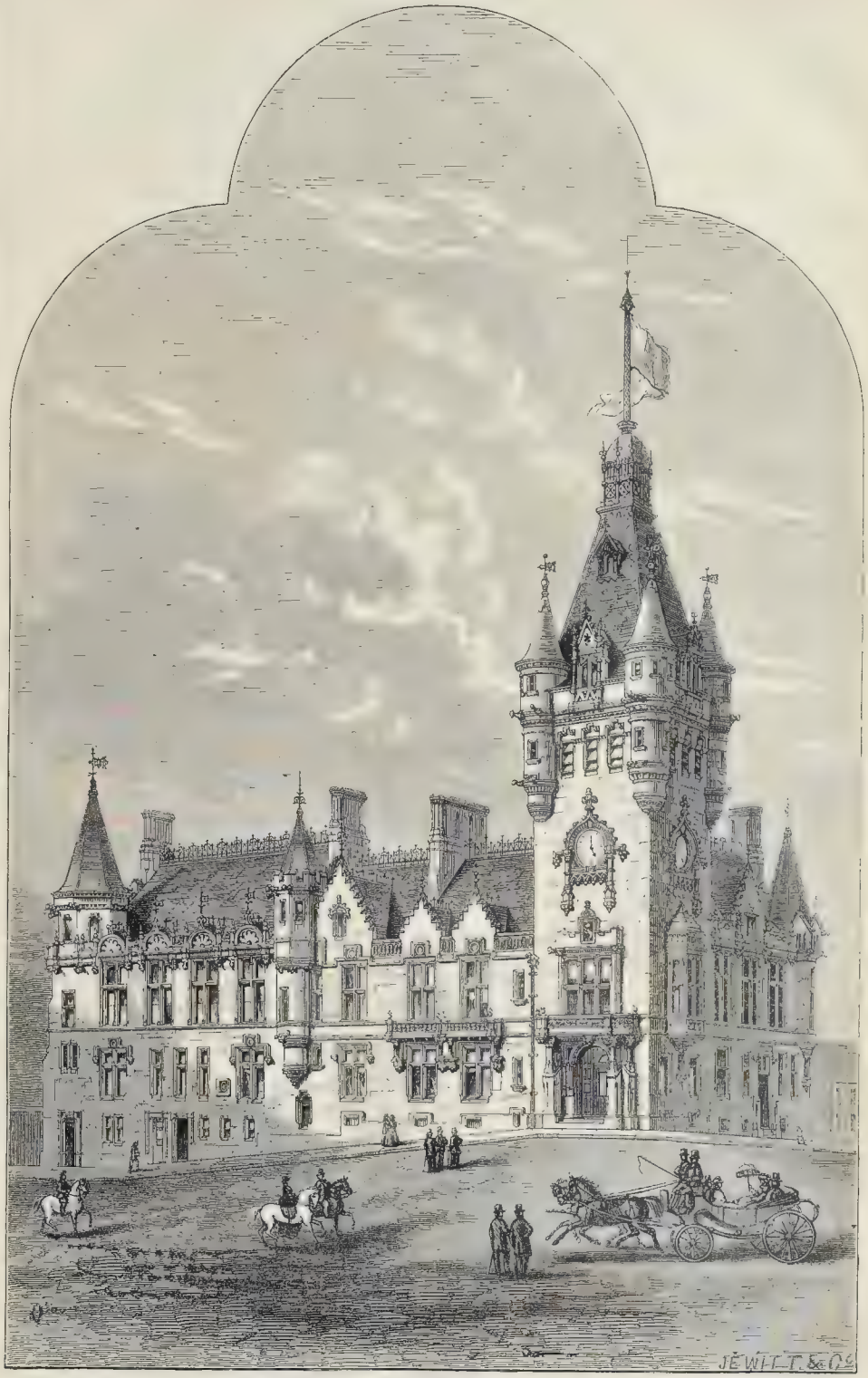
Messrs. Dillamore & Rowley's warehouse has a frontage of 20 ft. by 75 ft., and comprises a basement and four other floors. The building is 45 ft. long,—the rest of the ground-floor being roofed with a glass roof, giving light also to the basement below. All the upper floors are well lighted, back and front.

The elevation is of white and yellow bricks, with Bath stone for cornices and copings.

The architect for both buildings is Mr. Charles Bell, of Union-court, Old Broad-street; and the builder Mr. J. Woodward, of Wilson-street. The foreman of the works is Mr. Hill.



WAREHOUSES, ST. JOHN STREET, WEST SMITHFIELD.—Mr. Charles Bell, Architect.



NEW CORPORATION BUILDINGS, DUNFERMLINE, SCOTLAND.—MR. J. C. WALKER, ARCHITECT.

THE CORPORATION BUILDINGS, DUNFERMLINE.

LIKE other Corporations, the Corporation of Dunfermline have found it necessary to give up the old inconvenient meeting-place and to provide more fitting premises. Our engraving shows the structure they are putting up. In the course of the year 1875 the Council selected one of two designs which had been submitted by Mr. J. C. Walker, architect, Edinburgh, and accordingly he was requested to prepare working plans for the construction of the building. The design is a combination of old French Baronial and Gothic styles of architecture. Internally it will include the primary requisites of being commodious and suited for the modern requirements of business. The block presents two fronts, one to Bridge-street, and the other to Kirkgate, but the inequality of the ground will detract somewhat from its stately appearance as a whole. It will be two stories and part of a third above the pavement in Bridge-street; and on the east side, as the Kirkgate recedes, there will be three stories above the ground on the south end; the back will present five clear stories to the glen. The length of the east front will be 144 ft., and it will be 42 ft. 6 in. at its broadest part; on the north side, fronting Bridge-street, it will be 64 ft. 6 in. long, and 24 ft. 9 in. wide. On the ground floor in the south division, there will be the housekeeper's apartments and lamplighters' room, and also public closets; above these, on the second or basement floor, there will be a room for the Superintendent of the Burgh Constabulary, a second for the constables, and five police-cells; there will be a dwelling-house of three rooms for the police sergeant; a vacant space on which an apparatus may be erected for heating the building, and there will be several cellars. The same floor in the north division is divided into three rooms suited for an office, and connected with those on the floor overhead. The third or street floor has at the south end a room for the master of works, and behind it another for the collector, which is lighted from the back; next to these are four rooms for the office of the town-clerk, a fire-proof safe and charter room. On the same floor, fronting Bridge-street, there will be a large apartment suitable for the telling-room of a bank, a room for the manager, and another for the clerks. To these there is a separate entrance about midway of the front, and from 3 ft. to 4 ft. above the street, the intention being that this flat, and the rooms below shall be held by the same occupant.

The main entrance, however, to the municipal offices will be under the tower and level with the pavement facing the High-street. Passing through the inner door there will be a hall and an inner lobby leading to the town clerk's rooms, and on the right a staircase communicates with the upper floors. At the south end of the building, nearly opposite Maygate, there is an entrance to a stair conducting to the upper floor, which is designed for the burgh court-room. It is by this entrance the public will obtain access to the court-room, which will be 50 ft. in length and 31 ft. 6 in. wide, and its height from floor to ceiling 27 ft. 3 in. About half way up the street there is another entrance, by which admission may be obtained to the magistrates' room and two waiting-rooms, which are separated from the court by a large corridor. In the north division of the building there will be on the same floor a committee-room, under the tower, 19 ft. 6 in. by 16 ft. 6 in.; next to it is the council-chamber, which will occupy the whole of the remaining space on this floor; it will be 39 ft. 3 in. by 25 ft. 3 in., and the height from the floor to the centre of the roof 26 ft. There will be three windows facing Bridge-street, an oriel window in the north-west corner, and a similar one on the south-west corner of the room. The roof of the chamber, and also that of the burgh-room, will be finished with pitch pine and varnished. On the sides of the principal entrance under the tower there will be small columns of Peterhead granite supporting a balcony. The two windows which light the staircase will have at each side carved corbels, on which rest granite columns supporting balconies similar to that above the doorway. The windows of the burgh court-room will be surmounted with pediments and carved. About the centre of the east front the lines of the long wall are agreeably relieved by a projection indicating the interior staircase: it is carried up to the ridge, and terminates in a turret; there is a corresponding turret at the south-east corner above the entrance to the court. The gables have moulded crow-steps, and the wall-heads are guarded with a low ornamental stone railing. There will be a handsome oriel window on the north side of the committee-room, and a square projecting window on the east side above the principal entrance. The two spaces for the dials of the clock,—one on the north and the other on the east side,—are encircled with mouldings, having crockets surmounted with a finial, and having underneath two gurgoyles. Above the clock-room is the bell-room, and over it the tower-room, from the roof of which the sides of the tower begin to contract to the summit, and this is reached by means of a ladder. There is a narrow space at the top on which a man can get out and plant a flag; the space will be surmounted by an iron railing and weather vane. The corners of the tower where it begins to narrow will be flanked with four circular turrets. The height of the tower walls from the street is 78 ft., and altogether to the summit it is 116 ft.

The buildings are being erected by Messrs. W. & J. Hutchison, masons; and Messrs. H. & J. Philp, joiners. The stone used for the construction of the building is from Polmaise quarry, in the neighbourhood of Stirling. The cost of the building will be upwards of 20,000*l.*

The first stone was laid on the 12th of October, 1876, and the structure is now advancing towards completion.

THE LAW OF EASEMENTS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT a meeting of this Institute, held on Monday evening last, Mr. Charles Barry, president, in the chair, the following members were elected, viz.:—Fellow: Mr. Edwin Clare, of Guildford-street; Associates: Mr. C. H. Löhr, of Woburn-place, and Mr. A. E. Warner, of Regent-street; Honorary Associates: Rear-Admiral His Serene Highness Count Gleichen, Prince Victor of Hohenlohe Langenburg; the Right Hon. W. Cowper-Temple, M.P.; the Hon. Charles Gore; the Very Rev. the Dean of St. Paul's; the Rev. Charles B. Scott, D.D.; Lieut.-Col. Lenox-Prendergast; Mr. E. Brainerd Webb, C.E.; Sir John Gilbert, R.A.; and Mr. Solomon A. Hart, R.A.

Among the donations to the library were some drawings of Lord Burlington's, and the bye-laws of the newly-formed Institute of Canadian Architects, which have been modelled on those of the Royal Institute of British Architects.

The discussion then took place on Mr. Locock Webb's paper on the "Law of Easements," the substance of which has already appeared in the *Builder*.*

Professor Hayter Lewis proposed a vote of thanks to Mr. Webb for his valuable and interesting paper, which would be extremely useful to all the members of the Institute,—especially so to all those who carried out works in the City, where, if they attempted to carry a new building at all higher than the one which it displaced, they ran the risk of getting into great difficulties and incurring heavy expenditure. It was a good thing that the new class of members, the Honorary Associates, should have been represented for the first time by so able a paper as Mr. Locock Webb's, and it augured well for future benefits to be derived by the professional members from their new *confrères*. In the case of Palmer and Fletcher, mentioned by Mr. Locock Webb as having been decided in the time of Elizabeth, the law was laid down to the effect that if A built a house on part of his own land, and afterwards sold the house to B, and the land adjoining to C, who obstructed the lights, although the house was a new messuage, yet a person who claimed the land by purchase from the builder could not obstruct the lights any more than the builder himself, who could not derogate from his own grant, seeing that the lights were a necessary and essential part of the house. That case involved a very important point, and one which was not generally known to architects, nor even, as it appeared from a case in which the speaker was concerned some years ago, to the lawyers themselves, who advised the building owner in ignorance or forgetfulness of the case of Palmer *v.* Fletcher, and the consequence was that enormous expense was incurred.

Mr. I'Anson seconded the vote of thanks, and said that Mr. Locock Webb's paper had put very concisely and very neatly several points which practising architects and surveyors had continually to deal with. The paper had put in a very clear and intelligible manner the question of the angle of 45 degrees, which had hitherto been too much of an empiricism. In the multitude of questions which arose between adjoining owners, however, there were several not noticed in the paper, such as were involved, for instance, in the case where you look down an old wall which was materially out of the perpendicular, and rebuilt it vertically. He recollected a case of that kind at the back of a large hall in Threadneedle-street, built by a man named Moxon, who was a rather aggressive gentleman, as builders who built in the City often were. His (Mr. I'Anson's) client was an old lady who was supposed to be equally aggressive. The party-wall on one side of her premises was extremely out of the perpendicular, leaning outwards from her premises, so as to make the upper floors rather larger in area than the lower ones. The wall had to be rebuilt by Mr. Moxon, in connexion with the works he was carrying on adjoining, and being rebuilt vertically, the old lady's carpets were found to be rather too large, showing that her floor area had been diminished. In such a case, where was the tort? He could not give the solution to the question, for it got into the hands of the lawyers, and was, he believed, never settled. But the question arose, why was his client to lose part of the area of her floors because the wall was out of the perpendicular? Another question not noticed in the paper was such as arose under the following circumstances. If you pulled down a house built since the Fire of London, you found the party-wall to be built of very indifferent and sparsely-mortared brick-work, which, when the wooden panelling which lined the wall in the rooms of the house pulled down was removed, freely admitted both water and air to the adjoining house. Had the adjoining owner in such a case obtained, by prescription, the right to be sheltered by his neighbour? He (Mr. I'Anson) had had this question before him several times, and he had always boldly denied the possibility of such a prescriptive right existing, but he was by no means sure that he was right.

Mr. Frederick Ouvry said that as to the doctrine of the angle of 45 degrees, he had found it a very broken reed to lean upon, particularly so in the case of Jackson *v.* The Duke of Newcastle, when the duke was building a large mansion (now occupied by Lord Granville) in Carlton Gardens. Mr. Jackson was the owner of property in Cockspur-street, and he conceived that the new building would interfere with his light. The Master of the Rolls went to see the premises, and decided that whatever the angle might be, Jackson's light and air were interfered with, and granted an injunction. The case was taken before Lord Westbury, on appeal, who also saw the premises, and came to the conclusion that although there was an interference with light and air, there was not sufficient interference to necessitate an injunction, but the plaintiff was awarded 200*l.* damages, of which he probably got nothing, owing to the cost of litigation. With regard to the right to underground water, there was a passage in the paper which said, if "A made a grant of land to B without any exception of the rights of the streams of water in the land, neither A nor any one claiming under him could, it is conceived, lawfully do anything which would have the effect of draining the underground water or diverting any stream from the land, for such an act would operate as a derogation from A's grant." Now he (Mr. Ouvry) quite agreed with that as regarded surface-water and water running underground in a defined channel, but with regard to the water naturally existing and percolating through the soil irregularly, he ventured to think, with all due deference to Mr. Webb, that B had no right whatever to it, except the right of user. Mr. Webb had cited no case in support of his statement, but merely said "it was conceived" it would be so. It did not strike him (Mr. Ouvry) that in such a case there would be any implied covenant on the part of A that B should enjoy the underground water.

Mr. Hiscocks, after remarking upon the difficulty of the questions involved by easements, and upon their prolificness in giving employment to the "gentlemen of the long robe," referred to a case reported in the *Builder* a few weeks back,* in which the plaintiff's garden was overlooked by a window in a neighbouring house.

* Vol. xxxv., p. 1267.

* Vol. xxxv., p. 1182.

Plaintiff put up a hoarding to prevent an easement. Defendant had sawn down the hoarding, and was mulct in damages and costs

Mr. Jennings said it was not possible in all cases to prevent easements accruing merely by putting up hoardings. He cited a case in which a seven-storied flax-mill, in Westmoreland, was built with windows overlooking his client's land. Now to erect a hoarding of so great a height would have entailed a greater cost than the land was worth. It was very desirable that whenever the law was altered,—and it was very desirable that it should be altered,—there should be no right to light except by grant. There ought to be an absolute grant of light to give a person a right to it.

Mr. Dawson called attention to the cases cited by Mr. Locock Webb, of Clark *v.* Clarke, and Yates *v.* Jack, decided by Lord Cranworth. In the latter case it was held that the owner of ancient lights was entitled, not only to sufficient light for the purposes of his then business, but to all the light which he had enjoyed previously to the interruption sought to be restrained,—a decision which did not seem quite in accord with the words of Lord Justice James in the subsequent case of Kelk *v.* Pearson. As to the angle of 45 degrees, it was greatly to be desired that the height of houses and the width of streets should be rigidly regulated by some such rule, so that a line drawn at an angle of 45 degrees from the basement of one house should clear the top of the opposite house. This would, in most cases, allow of the erection of buildings consisting of ground, first, and second floors, and any stories above might be set back from the line of front, so as not to interfere with the light opposite. Such an arrangement, where practicable, would make our streets lighter and more airy, and would, be conceived, add greatly to their picturesqueness.

Mr. Chatfeild Clarke, in supporting the vote of thanks, said the case of the Prudential Assurance Company *v.* The National Provincial Plate Glass Company, referred to by Mr. Locock Webb, was a very important one, inasmuch as it laid down what was almost a new doctrine, for Mr. Justice Fry said that access of light must not be interfered with. The practical question for the Institute was to consider what could be done to do away with the cruel hardship, great annoyance, and exceeding loss which fell upon property-owners through the constant suits and litigation arising out of the uncertain state of the law on the subject of ancient lights. It was to be hoped that some of the members of the Institute would be able to make practical suggestions for the solution of the problem. He had, in another place, and on a former occasion, thrown out the suggestion that there should be a compulsory reference of such questions, in order to avoid the delays and expense of litigation. It was a pressing practical difficulty which arose at every step in building. It might be wrong to compulsorily take away a man's light, or part thereof, and to seek to compensate him by compelling him to take a certain amount of money as damages; but, on the other hand, the uncertainty, the delay, and the costs of litigation were so great as to afford unscrupulous people many opportunities of extorting money. He knew of certain building speculators in the City of London, who, having within the last few years built large premises which had injured the light on the opposite side of the street, were now able, owing to the unsatisfactory state of the law, to defy the parties whom they had injured to carry their premises any higher than they formerly were. He thought that a clear-headed lawyer, coupled with an experienced architect, would be able to draw up a Bill for definitely settling some of the doubts and perplexities which beset the question.

Professor Kerr explained, by means of a model, his method for mathematically ascertaining the amount of light obstructed, but regretted to say that it was not of much practical use in courts of law, because the courts would not pay any heed to mathematical calculations. The question of materiality of damage was still left to the judgment of the court or of the jury. The conclusion he had come to, after a great deal of experience in cases of light and air, was that there was no practical solution of the subject whatever; that no practical man could tell beforehand what would be the issue of any controversy or litigation; and that no man could determine, with anything like the precision which would suffice to guide an architect in the preparation of his design, what would be the opinion which the court or the jury might form as to materiality of damage. The right to light was a purely statutory one, though it was commonly spoken of as though it were a right arising out of one's own perceptions of the right and wrong of the matter. England was the very paradise of vested interests, or it would not tolerate the present unsatisfactory state of things. In France or America our law of ancient lights would not be tolerated for a moment. Seeing, then, that the law was in such a state of uncertainty, and seeing that the question of materiality of damage in such cases could only be determined by evidence, architects had to a great extent the remedy in their own hands: they should be more chary of coming forward to support claims for damage to light and air, and more disposed to take up defendants' cases. For himself, if a man came to him on behalf of a plaintiff, he never consented to take up the case till he had well investigated its reasonableness; for his experience taught him that in nine cases out of ten claims for damage to light and air were based upon something very different indeed to a sense of having suffered injustice. If architects would, then, do as he suggested, take up defendants' cases with alacrity, and plaintiffs' cases only after considerable hesitation and inquiry, they would not have anything like so much reason to complain of the obstructions which were continually meeting them at every turn. The architect's province was to design and carry out his building, but unfortunately it was left to the lawyers to administer the law; but if his (the Professor's) advice was acted upon, the lawyers would not have so much to do as was now the case.

The vote of thanks having been carried by acclamation.

Mr. Locock Webb, in the course of his reply, said that Professor Hayter Lewis's experience in the case cited by him showed the necessity of consulting not merely lawyers, but *able* lawyers. As to one of the points raised by Mr I'Anson, he did not know of any case which would support the view that there was any right or easement obtained, by the wall being out of the perpendicular, to the small excess of space which was afforded on one side of such wall. With reference to the case of Jackson *v.* The Duke of Newcastle, mentioned by Mr. Ouvry, if he (Mr. Locock Webb) remembered aright, one of the learned judges had, in a similar case, expressed an opinion differing from that of Lord Westbury. Having replied in detail to the points mooted by Mr. Jennings and Mr. Dawson, Mr. Webb said Mr. Chatfeild Clarke had raised the question whether it would not be possible to devise some means of settling such questions without going to law. Yes, he thought it would be possible, but it was a large question, and whatever suggestions he might have to offer with reference to it must be deferred. Professor Kerr had complained that the courts took no cognisance of mathematical propositions or proofs with regard to obstruction of light, but his complaint had less foundation than he supposed, for whenever he had been a witness opposed to his (Mr. Locock Webb's) case, he had found that a great deal of importance was attached to the evidence given by the Professor. The Professor had advised his professional colleagues to be more ready to take up defendants' cases, and not to take up plaintiffs' cases until they had been well looked into. That was a very wise piece of advice, because a prudent man never rushed into litigation, especially in a light and air case, until he had obtained the very best opinion he could get as to his rights. There were very few cases in which, where care was taken by a man to ascertain his rights,—unless he failed to prove his facts,—he had failed to sustain those rights in a court of law. The Professor's advice was good, also, inasmuch as defendants in light and air cases as a rule wanted all the assistance that could be given them.

The President expressed the hope that Mr. Locock Webb would, on a future occasion, give a further paper on the subject, and that he would amplify his necessarily brief remarks before they were printed in the "Transactions."

Mr. Horace Jones, the City Architect, then read a paper "On the New Metropolitan Markets," of which we give an abstract on another page.

The President, in announcing that the discussion would take place on the 21st inst. (when a paper will also be read by Mr. I'Anson "On the Architecture of Norway"), said that after Mr. Jones's paper, who should say that the line of division between architects and engineers existed? Mr. Jones's new markets were not only creditable as works of architecture, but they had involved constructive problems that would have taxed the ingenuity of an engineer.

"MIDDLE-CLASS HOUSES IN PARIS AND CENTRAL LONDON."

SIR,—I have just received the usual copies given to the author of a paper read before the Institute of Architects, and consequently until now I have remained partly ignorant of what the gentlemen who discussed my paper, some six weeks ago, said upon the subject of "flats" in London and Paris. The speeches, having been revised by the speakers, differ from the report in the *Builder* of November 24th last, and there are two statements in the president's speech calculated to do so much harm to the cause many others besides myself have at heart that I rely upon your kind assistance to refute or explain them. The importance attached by the outside public to what the chief of a fraternity says about the words or action of an individual member is greater, perhaps, than presidents and chairmen are often aware. With the middle-classes business is far too engrossing to permit much expenditure of thought about external matters. They are not concerned with what my Lord Beaconsfield says, but with what the *Times* or the *Daily Telegraph* says of what the premier says; and the Beaconsfield of our profession at the present moment is Mr. Charles Barry,—to my mind one of the best presidents that ever graced the Institute chair.

In p. 63 of the recent Transactions, Mr. Barry is made to say,—

> "Mr. White is a revolutionist in every sense of the word; he not only wants to revolutionise the arrangements of our houses, but to entirely alter ourselves in all our wants, habits, and mode of life. He spoke of French thrift as instanced by ready-money payments for articles daily consumed in the house, the purchase of which was to be personally conducted by the mistress of the house. In Paris there are many divisional markets, but in London we cannot entertain the idea of the housewife going to Smithfield to purchase meat or to Billingsgate to buy fish: that would be simply impracticable."

Now, sir, the passage in my paper, to which allusion is made in the above quotation, was printed a fortnight before Mr. Barry's speech was uttered, and it is as follows (p. 26):—

> "To provide the two daily meals, the mistress, attended by the cook, or the cook alone, goes to market; hardly more than just sufficient for the day is brought home, and usually the purchase is a ready-money one. Part of the secret of French thrift is concealed in that practice, and in the small space given to the kitchen, repulsive as the latter must be to an English housewife, whose own beef and mutton emerge from a complete set of apartments, presided over by a complete set of domestics."

In using the phrase "goes to market," I concluded that the old household slang would be understood by every one. When I was a child, to go to market was to go to the butcher's, the baker's, and the candlestick-maker's; to go to a market was another thing. In Paris, ladies would not, and could not, venture into the Halles; as a rule, the Parisian housewife, or her cook, purchases the daily provisions at the shops near her own residence. A similar custom, by-the-bye, seems to be getting fashionable in London, if I may judge from the numberless carriages which surround the co-operative stores, and the thousands of rich people who "do their marketing" themselves. Again, Mr. Barry has been made to say:

> "I am ready to acknowledge that there is a large section of Londoners to whom these flats would be the greatest boon, and I should be glad to see . . . . . the experiment tried on some scale sufficiently large to test Mr. White's theory. I have no doubt whatever that his skill would be equal to the occasion, but I should like to have the opportunity of witnessing the results; and as he says at the end of his paper he thinks it possible to erect houses for the middle classes in London which, after paying all demands and outgoings, shall yield a return of *ten or twelve per cent* he will no doubt be able eventually to effect the revolution in our dwellings which he desires, since such a return on our usual system is, at least, difficult."

What my paper said was this:—

> "I venture to think that by the utilisation of actual slums, with careful financial management and legislative aid, houses such as I have attempted to describe could be advantageously built, not alone for the middle classes, but for the working classes; and that they would return *eight or ten per cent.* per annum on the outlay for cost of land, construction, and maintenance. They would possess the additional advantage, which all Englishmen appreciate, of being, not barracks, taverns, or co-operative hotels, but,—purely and simply,—homes."

The president is a practical man—so are we all practical men—and I, though in this matter called a theorist, desire to be thought practical. It is not improbable, when the new streets are cut through Soho and the Seven Dials, that

Mr Barry will be called upon to build blocks of barracks for the working classes on portions of the vacant land. If, before doing so, he will favour me with a plan of the site, I will try to show how, on the Parisian system of arrangement and construction, an annual revenue, not of "ALMOST FIVE" PER CENT. as in the Peabody Buildings, nor of FIVE PER CENT. as in the Victoria Dwellings, but of EIGHT PER CENT., can be obtained, provided no extraordinary obstructions exist around. If I fail, the failure shall be published, and nothing shall be paid me for the trouble; but if I succeed I shall hold myself entitled to receive the biggest remuneration that Mr. Barry's commission and conscience will permit.

WILLAM H. WHITE.

P.S.—Since writing this letter, I have thought it well to look over Mr. Darbishire's paper on "Dwellings for the Poor,"—that is to say, the working classes—read on the 13th of December, 1875; and I cannot help thinking that the unique scandal, in Western Europe, of British pauperism is largely encouraged by that so-called philanthropy which induces opulent men and women to build charity-houses for stalwart working people, some of whom can afford to live six months in twelve without doing any work at all.

W. H. W.

A CATENARY SPIRE;

OR A MODE OF FORMING OPEN-WORK SPIRES OF CHAINS: A SUGGESTION.

OF all the elements that have entered into the composition or embellishment of a place of worship, from the Tabernacle in the Wilderness to the churches or chapels erecting at this moment, the spire,—emblem and confession of the Christian's hope of immortality, and pointing to his home beyond the tomb,—embodies, perhaps, the happiest and most appropriate conception. It seems to have been known, in some character or another, in very early times, since we find mention in Homer of "fair Ilion's glittering spires." It is the more valuable for its divesting the tower-form of its threatening aspect, and acting as an extinguisher of its war-like associations, unbecoming its place in Christian architecture.

To me, after its heaven-suggesting pointedness, the most beautiful and desirable quality a spire can have is aërial lightness; and I have often thought it a pity that seeds from the numerous beautiful pierced spires on the Continent,—airy fabrics, some of them, which seem the work of enchantresses,—have not been blown across the Channel into English art-soil, and borne fruit amongst us. Pierce a spire, and you become the rival of the fairies, and impart to it a ghostly, ethereal air, than which nothing can be more highly becoming in a structure of its character and office.

The angle-ribs, as the bounding lines, being the most prominent and constantly present features of such a composition—those by which the spire chiefly makes itself visible,—the most essential element, like the ribs in groined vaulting, it has occurred to me that a spire could be more easily constructed of a cluster of chains in the likeness of decorated angle-ribs, than of stone. In the case of the octagonal section, it would be formed of eight guy-chains, supported by a wrought-iron central rod carried up from the tower, and crowned at the top by a cast-iron finial, the latter prepared for the reception of the upper end of the eight chains, thence extended to eight corresponding eyes in a course of masonry at the top of the tower. The eight chains (chains constructively, of angle-rib form) would in their turn be prepared for the reception of three or four tiers or courses of perforated and decorated bands; each tier, of course, consisting of eight similar pieces. The chains could, I think,—consistent with strength and workable flexibility, or without prejudice to constructive propriety,—be made to suit any architectural design, from a simple bead-form to one richly moulded and twined with flowers, leaves, and tendrils.

A spire so constructed would be equal in effect to a completely pierced one of stone,—a nervous, well-relieved, vigorous structure, worthy of association with any composition, Gothic or Classic. Any degree of richness in character might be given to it by the design of the chains, and the number and design of the bands, and the filling-up of the interspaces or panels with a species of tracery in the same light material. Windows or dormers would be inadmissible, but many coigns of vantage might be found for sculptured figures—doves, eagles, &c., while groups of angels might surround the base, or glitter from corbels.

In painting it, I would give it two shades of light-grey, not to imitate stone, but to intensify the light and shade. Or it might be galvanised. Finials and some other prominent and enriched portions might be picked out in gold. Or, instead of painted iron, the whole might be executed in bronze.

The central iron rod, coincident with the axis of the spire, which is the stamen or spinal column of the construction, might be, according to its extent, put up in two or three lengths properly jointed, and secured below by running through a diagonal beam in the tower.

The advantages of this mode of spire-construction, which it is evident is applicable to any scale, from that of a large and lofty spire, made the main feature of the steeple, and dominating the tower, to a small one crowning a lantern, are that while it would be a most easy and inexpensive one, offering strength and durability, it would supply a great desideratum in this country, and yield an endless variety of beautiful examples of elegant fairy-like structures, in which the lace-like, gossamer character was carried to the utmost desirable extent, and beyond anything we could hope to obtain from masonry. In praising the masonic feats of the kind on the Continent, we hear non-professional travellers say that they are stone lace-work, net-work, cobweb. The spire I suggest would have more of the appearance of such airy substances than anything France or Germany exhibits. It would be a cobweb, but a very durable one, and one that, if carefully put together, the besom of destruction itself, or at least, the fiercest hurricane that could arise in our latitude, would be unable to sweep away.

With this aërial character of spire, the tower, however massive below, should be designed to assimilate above. Indeed, the tower-pinnacles, or spirelets surrounding the base of the spire, might be formed similarly to the spire, and perhaps should be so formed for harmony.

Let it not be supposed that I would have a chain-formed spire to feign or personate masonry. It would appear as what it is, an iron spire not a stone one; an especially important point in such a feature, which must not point to Heaven with a lie on its lips. There would be nothing sham about it. It might be called, from its mode of construction,—from being all bone and no flesh, a skeleton spire, but it could not be called a sham spire. It would be as real and genuine as a pierced stone spire; the only difference between it and the latter being that it must be to a greater extent open work. Nor will it violate constructive truth, *i.e.*, it will not appear to be constructed on different statical principles from those really employed in it, the chains being not really disguised chains. It is the tensile style of construction.

As to its material: I presume iron is as worthy of entering into the composition of God's house,—has as much right to rear its head into the welkin and to point upward as stone, which comes from no higher department of creation, and can have had no especial odour of sanctity given to it by its Creator, who, as he is no respecter of persons, can be no respecter of materials that his hand has made. The Tabernacle, made of linen and goats' hair, in which the Children of Israel worshipped in the wilderness, and in which was deposited the Ark of the Covenant and mercy-seat, and overshadowing cherubim, was deemed as holy as the gorgeous stone temple which replaced it.

The spire being a variation in regard to material from the tower, I deem rather a beauty than a defect. It would be no more a discordancy than a slate spire or steep roof, or than a white marble or polished granite spire would be over a free-stone tower,—a thing I have often wished to see. Expansion and contraction of metal would, I think, present no insurmountable difficulty.

I have only to add that if the idea here sketched out has ever been suggested before, I am unaware of it. I think it cannot have been, or it would somewhere have been realised.

SAMUEL HUGGINS.

Public Works in Hove.—The Hove Improvement Commissioners have applied to the Local Government Board for sanction to borrow 14,050*l.* for the purchase of land for a Town-hall, for works of paving and sewering, and for providing a depôt for storage purposes.

HYDE, ST. JAMES'S, AND THE GREEN PARKS.

IN consecutive alineation from east to west, these parks form a woodland range of over three miles, extending from the Horse Guards to Kensington, only intercepted by the great boulevard of Piccadilly.

In 1536 Henry VIII. bought the Manor of Hyde, of the Convent of Westminster, to extend his sporting-grounds; having previously purchased St. James's Park, which made a range of forest land extending from his Palace of Westminster to Hampstead Heath.

In 1574 Queen Elizabeth appointed Henry Carey, first Lord Hunsden, keeper, at a salary of 59*l.* 6s. 8d., besides a lodge and allowances,—a large sum in those days.

In 1660 Charles II. appointed Colonel James Hamilton, keeper, in the room of the Duke of Gloucester, and also granted him a triangular strip of land between the old lodge (now the site of Apsley House) and Park-lane, the old boundary, upon which plot was afterwards erected Hamilton-place and the adjacent palatial residences in Piccadilly.

In the times of James I. and previously, Spring-gardens, extending then to St. Martin's-in-the-Fields, was the fashionable promenade and sporting ground, used by all the notables of the day, and by the King himself; but during the Commonwealth Cromwell interdicted all privilege of public user on Sundays.

The Mall of St. James's Park became afterwards more used, and Charles I. made it a favoured place of resort, the Ride of the Hyde being the open for horse-races and other amusements, when in 1635 that monarch formally opened the parks to the public as pleasure-grounds.

Although William III. built a palace near Kensington, in the gardens, no great change was made until George II. and Queen Caroline added to and improved the palace as a residence, and cut off 300 acres of the park. The whole area was then laid out, planted, and walled in; and the nine pools or ponds transformed into the present Serpentine lake, 20,000*l.* having been expended thereon.

The greatest improvement in the parks of late years has been the demolition of the old obscene walls, and the substitution of iron railings, which gives a sense of enlargement, as viewed either from without or within, and that even when a width of from 10 ft. to 20 ft. may have been added to the road. In the great western boulevard of Piccadilly this is more particularly obvious where thirteen majestic plane-trees, which were formerly interned in the park, now stand out on the paved footway, in vigorous growth. In Park-lane also, as in the Bayswater-road and other places, the disclosure of park view and the opening out of the roadway has not only improved the aspect, but added, in many cases, 50 per cent. to the value of the houses.

In the Green Park there is, however, one great default, and that is the want of a carriage-road, to take the traffic between St. James's and Hyde Park. There is a fine and spacious road leading from the palace to Hyde Park, which runs straight alongside Buckingham Palace garden-wall; but at about 300 yards from the Duke of Wellington Arch this road curvets to the left, and, close to the old brick wall of Grosvenor-place, curvets back again to the arch-entrance grotesquely surmounted by the statue.

Parallel to this royal road there is, however, another, which if carried on *indirectum*, would strike out on the open space adjacent to the arch, and into Piccadilly exactly opposite to the park gates. Such a road, although now little over 20 ft. wide, need not interfere with the royal route, and would be of incalculable value to the whole population. There are open roads all round St. James's, also round and across Hyde Park; but no line of intercommunication through the Green Park, which, though open to pedestrians, bars the intercourse of carriages.

Some years back there were an old lodge and garden inclosed by walls in the Piccadilly centre of the Green Park, but all this has been cleared away and thrown open, after remonstrances in the *Builder* by the writer,—by whom also the new route from Westbourne-terrace (Victoria Gate) and over the Serpentine Bridge was also indicated. Since then eight gates and handsome lodges have been erected round Hyde Park, two on the north side, two on the east, and four on the south. These are utilitarian

and need not be objected to; but in the very centre and near the old Ranger's lodge, with its eight or ten acres of inclosed lawn, paddock, stables, and offices, there have been lately built a spacious garden, mansion, a lofty engine-house and office for the Board of Works, a large barrack with a smaller one, and two commodious villas on the Receiving-house side; added to which the vicinal magazine with its four permanent guards mars the most picturesque nook near the bridge, and therefore the most observed and palpable coigne of the park. In this beautiful woodland centre there is every indication of a growing village and population, 100 head of poultry, and of course milch cows, and so on.

Now, as the value of this park to the millions is in its trees and openings, its glades and shades, and, above all, in its lovely flower-walks and shrubbed plantations, surely the obtrusion of houses and domiciles is a most unjust invasion of their rights. The population increases yearly, and the town boundaries steadily advance upon the country, whereas the parks cannot be enlarged.

The style of landscape gardening, shrubberies, and flower-beds cannot be surpassed, so far as Hyde Park is concerned; but the condition of Kensington Gardens, with its deformed and decaying timber trees, would be considered a disgrace if witnessed in the plantations or groves of any country gentleman or resident holding only 100 acres of woodland.

A resident sub-ranger seems to give no protection against spoliation and waste; in fact, the only chance of redress would seem to be in the abatement and demolition of every domicile erected within the park borders, and the opening out of all inclosures, committing all to the care of a landscape-gardener who, like the present official, exhibits such taste and skill in the arrangement of flower borders and in the creation of fantastic and varied shrubberies.

QUONDAM.

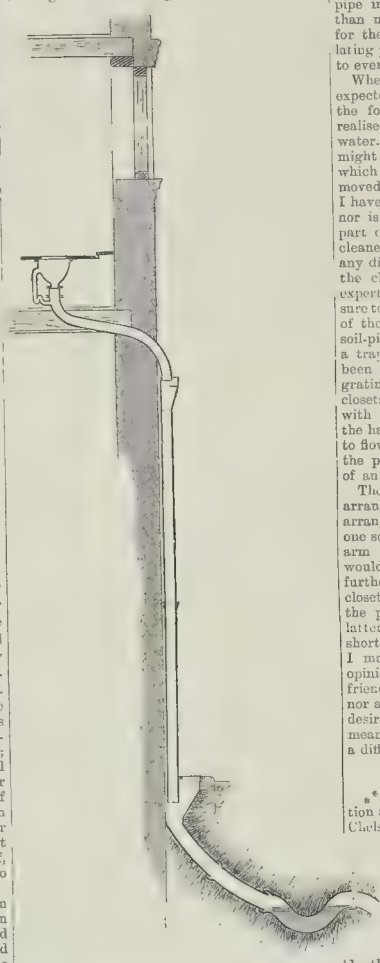
ON HOUSE DRAINAGE BY OPEN INSTEAD OF CLOSED SOIL-PIPES.

IT is hardly necessary to enter on a lengthy essay to urge the desirability of having our houses efficiently drained, as nearly all people now-a-days are fully alive to the necessity; and the numerous inventions which are continually being brought out prove that a very wide-spread feeling exists that our present arrangements are far from satisfactory, and are capable of much improvement. One of the drawbacks of all these new inventions is, that they complicate more or less the plan generally in use; either the mechanism is more elaborate, and consequently more liable to get out of order, or they require greater attention, as in the case of all those in which the improvement consists in the mechanical application of any deodorising or disinfecting chemical; with any arrangement of this latter kind, when the novelty is worn off, it ceases to be attended to regularly, and so becomes practically useless.

My object in writing these notes is to explain a plan I have adopted, and which has been found to be perfectly efficient; it is simpler and less costly than the plan generally in use; and as it is absolutely impossible for sewer-gas to enter a house where it is used, it follows that the occupants are free from all danger from this source,—a point that cannot be too strongly dwelt upon, when it is remembered that several of our most serious outbreaks of epidemic fever have been directly traced to a defective state of house-drainage, and also that medical men tell us that much illness, and even mortality, exist amongst children and people of delicate constitution, arising from the same cause; in fact, no one is safe: it is a danger ever present, and it is seldom discovered or even suspected till too late.

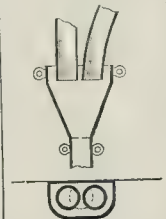
The modern plan, with hardly an exception, is to connect our closets with the underground drains by closed soil-pipes, trapped at one or more points. The plan I have adopted is to connect the closets with the drains by open soil-pipes, and to leave out all traps with the exception of one. Thus no lead D-traps are required; no so-called ventilating pipes; no expensive junctions to make (always a source of weakness and danger): the whole arrangement becomes simplified at once; and as a natural result is not so liable to get out of order. In the ordinary plan a quantity of foul sewer-gas is constantly being generated in the long length of closed soil-pipe. In my plan, as the soil-pipe is open, no gas can be generated, or remain in it.

The simplest plan is to make a short arm of lead pipe attached direct to the lower portion of the valve-box; just where the D-trap generally comes, and led through the exterior wall of the house in an easy bend, discharging into a funnel-shaped head of lead, forming the top of the soil-pipe. The soil-pipe is 3 in. in diameter, but might with advantage be less, open at the



top and bottom, the lower end terminating about 3 in. or 4 in. below the level of the ground, and directly over a carefully-constructed syphon trap of glazed earthenware, but leaving an open space of 6 in. or 8 in. between the foot of the soil-pipe and the top of the syphon.

The action is extremely simple,—when the handle of the closet is pulled up, the contents of the pan rush, unimpeded by any trap, straight through the short arm first mentioned, fall directly down the vertical open soil-pipe, and sweep through the trap with considerable force, into the underground drain; there is no place for any matter to lodge. In the ordinary arrangement, the contents of the pan fall into the D trap from a height of only a few inches; this trap has a constant tendency to choke; and it is no exaggeration to say that it is never clean. To ventilate this trap and soil-pipe, it has become a custom to put in what are called "ventilating pipes," carried to the ridge of the house or to the top of a chimney. They certainly serve to take off the extreme pressure of gas constantly accumulating in the upper part of the soil-pipe, and some of which is generally liberated whenever the handle is pulled up; but that is all they do; in no way can they be said to ventilate the soil-pipe, any more than a room could be said to be ventilated if it had a 2-in. pipe inserted in the ceiling; they are better than nothing, and that is all that can be said for them; but in this arrangement no ventilating pipes are required, as the air gets freely to every part.



When first I adopted this arrangement I expected occasionally to find impure matters at the foot of the soil-pipe, and had not fully realised the very cleansing effect of the fall of water. I also thought it probable that this part might become coated over with a foul deposit, which might occasionally require to be removed, but after an experience of two years, I have never once seen anything objectionable, nor is there the slightest deposit on the upper part of the trap. This trap has never been cleaned out, nor touched in any way, nor have any disinfectants ever been poured down any of the closets. Then I was warned by sanitary experts and plumbers alike, that there would be sure to be a smell; first, at the grating at the level of the ground; secondly, at the top of the open soil-pipe; and thirdly (owing to the absence of a trap), in the closets. No one has ever yet been able to detect the slightest smell at the grating, nor at the top of the soil-pipe, and the closets are exceptionally sweet. They are fitted with "water-waste preventers," so that when the handle is held up till the water has ceased to flow, the air can generally be felt to blow up the pipe, but it never brings with it any smell of an offensive nature.

The accompanying diagram shows the general arrangement. One of the blocks shows the arrangement when two closets discharge into one soil-pipe. One of these closets has a short arm about 4 ft. long, the arrangement that would be most usually required; but in order further to test the system, I made the other closet with a long arm, upwards of 12 ft. from the pan to the open mouth of the pipe. This latter is just as satisfactory as that with the shorter arm, being absolutely free from smell. I may add that I shall be glad to have the opinions of all interested in this subject, whether friendly or hostile. I have no patent to protect, nor any interest of any kind at stake. My only desire is to secure the simplest and most efficient means of effecting that which is admitted to be a difficulty and a source of danger.

R. NORMAN SHAW, R.A.

*** We have seen the arrangement in operation at a house built on the Embankment at Chelsea for Mr. Matthey, from the designs of Mr. Shaw, and were impressed by its simplicity and efficiency. Theoretically it might be urged that sufficient accumulation, even if small, would take place at the foot of the down-pipe to contaminate the air which passed up it. In practice, however, this is not the case, the rush of water down the pipe, increased by the smallness of the pipe's diameter, carries all before it.

THE PREVENTION OF INUNDATIONS.

At the meeting of the Metropolitan Board of Works on the 4th inst., the clerk read a letter which had been received from the Home Office, acknowledging the receipt of this Board's letter on the subject of the tidal overflows of the River Thames, and stating that the matter appears to the Home Secretary to be of such vital importance, that he hopes some means may be found by which another session may not pass without some remedy being provided.

Mr. Roche moved, "That the communication be referred to the Works and General Purposes Committee for consideration and report," and said he trusted the result would be that some measure might be prepared which, if not perfectly satisfactory to all parties, would at least have the effect of getting rid of the evils complained of.

Mr. Freeman seconded the motion, and, with Mr. Roche, earnestly hoped that something would be done at the earliest possible moment to put an end to these disastrous overflows.

After a few remarks from Mr. Richardson, the motion was put and carried.

ROSLIN CASTLE.

SOCIETY OF ANTIQUARIES OF SCOTLAND.

THE first meeting of this society for the present session was held on the 10th ult., when a paper was read entitled "Roslin Castle, its Buildings, Past and Present," by Mr. Andrew Kerr, architect, formerly of Her Majesty's Office of Works. He remarked that it seems probable from various notices and traditions that there may have been a stronghold of some kind at Roslin so early as the eleventh century, but no remains of any such early work can now be traced. The oldest part of the present castle appears to be of the early part of the fourteenth century, and was erected by Sir William St. Clair, who set out with the Bruce's heart to Palestine, and fell fighting against the Moors in Spain in 1330. The castle was added to by his great-grandson Henry, the second of the St. Clair line of the Earls of Orkney. He built the great keep or south-west tower. Sir William St. Clair, third Earl of Orkney, the founder of the Collegiate Church of Rosslyn, also made large additions to the castle. These exhibit many French features, and Mr. Kerr accounted for this by the fact that Sir William and his wife resided for some time in France. In 1455 James II. gave Sir William the earldom of Caithness in exchange for Nithsdale, and afterwards, in consideration of the elegant buildings he had erected, conferred upon him the dignity of Grand Master Mason of Scotland, a title which remained in the family till 1736, when it was given over to the Scottish Masonic craft. In 1544 the castle was burned by the English forces of Henry VIII. It was partially restored by Sir William St. Clair after 1580. His arms and those of his wife are seen on a shield over the fire-place of the great hall. The building was continued by Sir William of Pentland, his son, whose initials, with the date 1682, are cut on the lintel of the door leading to the great staircase. The ceiling of the dining-room, which is richly decorated, bears in the centre panel the Rosslyn arms and the date 1622. It is immediately after this that the castle seems to have been in its most complete condition. The north-west side was battered down and the castle plundered by General Monk. It was partially restored after this, but again attacked and plundered by a mob in 1688.

A prominent feature of the meeting was the exhibition of the legacy left to the museum by the late Mr. James Drummond, R.S.A., who had been for twenty-six years one of the honorary curators. There were also exhibited the extensive series of drawings purchased by the Society at the sale of the Drummond collection. These include a series of upwards of 200 of the sculptured stones and crosses of Iona and the West Highlands, thirty drawings of market crosses, and about 300 beautifully-finished drawings of Highland arms, brooches, &c. These drawings have been acquired by the Society by means of a guarantee fund subscribed by members and others.

IMPORTANT TRADE UNION CASE.

SOME time ago an action was raised in the Glasgow Sheriff Court by Messrs. Conper & Sons, flint-glass cutters, Glasgow, against John M'Farlane, secretary to the Flint Glass Cutters' Trade Union, for 100*l.* in name of damages, which they had sustained through the defender and other members of the Union having intimidated and sent away from their works men from England whom the pursuers had engaged during a strike of their workmen. Sheriff Galbraith, before whom the case was tried, gave his decision last week, finding that the several workmen mentioned in the petition were seduced and assisted to leave the pursuers' employment by an unlawful combination; that the defender was a member of that combination; that he was a party to, and assisted in, the removal of those men from the pursuers' works; and that, therefore, the defender was liable to the pursuers in damages, and assesses them at 50*l.* He also finds pursuers entitled to expenses. In a note to his interlocutor, his lordship says that the men were frightened into going away. They were repeatedly told that they were doing the old hands an injury by remaining, and that unless they left something might be done to get rid of them. He was clearly of opinion that a combination existed for the express purpose of emptying the pursuers' works. The defender's own witnesses admitted this. Such a combination being purely illegal, the only points for his lordship to consider were—1, what connexion had been proved between the defender M'Farlane and the society of which he was a member; and, 2, the amount of damages the pursuers were entitled to. He considered that the pursuers had sufficiently proved complicity on the part of the defender as to warrant decree in their favour. As to the amount of damages, he thought 50*l.* was a fair sum, as the pursuers only wanted to stop the annoyance and obstruction to which their workmen were subjected by outsiders. It was a practically understood thing that in all those unions there were certain men, known quite well, who were what was called wire-pullers, and yet one could not say precisely that they had been seen doing anything, although everybody knew that they were really the men that were acting. In the present case his lordship thinks that that was the position the defender occupied throughout the proceedings.

BUILDERS' CONTRACTS.

LEWIS *v.* BRASS.

IN this case, which was recently before the Court of Appeal, a question of great importance to builders and contractors was raised, viz., whether the acceptance of a builder's tender in writing amounted to a contract between the parties.

The plaintiff, desiring to make certain alterations to his premises, had sent to a number of builders bills of quantities, with envelopes entitled "tenders," for them to return with the price for which they would undertake the work, and in answer thereto the defendant sent a tender in these terms:—

"I hereby agree to execute complete within the space of twenty-six weeks from the day of receiving instructions to commence the whole of the work required to be done in alterations and additions to above premises, with the best materials, in strict accordance with the drawings and specification, and to your entire satisfaction, for the sum of 4,193*l.*"

The plaintiff's architect accepted this tender in these terms:—

"I am instructed by my client, Mr. John Lewis, to accept your tender of 4,193*l.* for works as above referred to. The contract will be prepared by Messrs. Underwood & Colman, Mr. Lewis's solicitors, and I have no doubt it will be ready for signature in the course of a few days."

The defendant, however, found that he had made a mistake in his estimate and withdrew his tender. The plaintiff had the work done by another builder for a larger sum, and sued the defendant for the difference.

At the trial before Mr. Justice Hawkins he left it to the jury whether the parties intended that they should be bound by the document as a contract. The jury found that they did, and gave a verdict for the plaintiff. Three judges of the Queen's Bench Division (Mr. Justice Mellor, Mr. Justice Lush, and Mr. Justice Field) upheld the verdict, and the defendant, the builder, appealed from that judgment. In the course of the argument Lord Justice Bramwell observed that he did not doubt that the parties thought they were bound by the acceptance of the tender. At the close of the arguments the Court took time to consider their judgment, which they now delivered, dismissing the appeal.

Lord Justice Bramwell.—We are of opinion that this judgment must be affirmed. There certainly was evidence to go to the jury that the parties were doing more than negotiating, and I think the verdict of the jury was right, that a contract was made, and not that certain steps in a negotiation had been made. I agree with the opinion of the Court below for the reasons there given when the appeal to them was made. But a point was made before us that was not mentioned in the Court below, and it was this, that the tender of the defendant had not been accepted "pure and simple," but with an additional term. And that contention was founded upon this,—that the letter of the plaintiff's agent, after saying, "I am instructed by my client, Mr. John Lewis, to accept your tender of 4,193*l.* for works as above referred to," went on and said, "The contract will be prepared by Messrs. Underwood & Colman." It was said that meant, "I can't really accept your tender as you have made it; but I accept it with this additional term, that a contract shall be made between you and my client by certain professional gentlemen." I don't think that is so. We must take into account that it is a matter of common knowledge that in works of this magnitude there generally is a formal contract drawn up between the parties, knowledge which we are justified in bringing to bear upon this case, as the defendant does not take any exception to this matter in the letter; and I think that the right construction to be put upon that is to read the words as though they were, "Of course, a contract will be desirable, and that will be prepared by Messrs. Underwood & Colman," not making the contract an addition to the terms agreed upon, but simply intimating what, in the opinion of the writer, was a convenient way to carry out the intentions of the parties. If that be so, the acceptance was pure and simple, and not in any way qualified or one containing any additional terms.

Lord Justice Brett said the moment the letter was written there was a contract made and complete. The latter part of that letter, speaking of a contract, speaks of a contract already made; that would be drawn up in the usual form and presented for signature.

Lord Justice Cotton agreed that on the construction of the documents there was a binding contract between the plaintiff and defendant, the acceptance in the letter not being rendered subject to the condition that a contract was to be agreed to and signed by the parties, and discussed certain decided cases in support of his opinion.

COMPENSATION CASE.

SIR SPENCER MARYON WILSON *v.* THE METROPOLITAN AND ST. JOHN'S WOOD RAILWAY.

THIS case was concluded at the Sheriff's Court, Red Lion-square, on the 31st ult., before Mr. Under-Sheriff Burchell and a special jury.

The claim, as presented to the Court, was for about 35,000*l.* for land in the Finchley-road, beyond the Swiss Cottage, which was required for a new station. The company had taken a portion of land for a tunnel, and had served a notice for a further portion. A sum of 5,500*l.* had been paid for the tunnel land, and the question in the present case was the sum to be awarded for the additional land. About 6 acres were required, and on the part of the claimant it was put at from 2,000*l.* to 3,000*l.* an acre.

Mr Alderman Ellis was the principal witness on the part of Sir Spencer Wilson, and Mr. Ritchie, surveyor, on behalf of the company. Other surveyors were called on both sides.

There was a great difference in the opinion of the surveyors. On one side it was alleged that the new railway-station would, until the property was developed, depreciate the estates of Sir Spencer Wilson, and, unless there was a main access to the station, considerably damage the owner's land. Another item in the case was a claim for 10 per cent. for compulsory sale, as usually given in compensation cases. On one side a claim of 3,000*l.* an acre was made, and on the other side 1,250*l.*, and on the same side, the new station, it was declared, would benefit the property, and not depreciate it; and further, that as the property in the neighbourhood, to some 100 acres, was in the market, the 10 per cent. for a compulsory sale was not to be awarded. On the part of the company, the jury were invited to consider that 8,500*l.* would be the full extent to be fixed, but on the part of Sir Spencer Wilson a much larger sum was suggested, as the "cream" of the land had been taken by the company.

Mr. Under-Sheriff Burchell summed up the case, and the jury returned a verdict for 17,000*l.*, with no damage for the severance.

ROTUNDA LYING-IN HOSPITAL, DUBLIN.

THE Governors of this excellent Institution have expended during the last eighteen months over 3,000*l.* in the much-needed reparation of the hospital buildings, and of the public rooms in connexion with them, also in making important alterations and sanitary improvements.

The lying-in department has been entirely separated from the chronic department, or that devoted to the treatment of diseases peculiar to women. A new detached dispensary building for extra patients has also been built.

Much remains still to be done in order to put the extensive buildings of the hospital in a state of thorough repair, which the governors hope to do by degrees, as their funds will permit.

Mr. Thomas Pemberton, builder, executed the greater portion of the works connected with the hospital; and Mr. Thomas Millard, builder, is now engaged on the repairs, &c., of the public rooms.

All the works have been carried out from the plans and under the direction of Mr. Frederick A. Butler, architect, Dublin.

THE DOUBLE-SPOUTED VESSELS IN THE TROY COLLECTION.

SIR,—I think the double vessels,—or double-necked vessels,—were made for pouring out oil and vinegar together for sauce to *wild asparagus*. This is still eaten in Italy. It is delicious; and it is always thought well to pour out the two liquids together.

F. R. C.

CONCRETE CHANNELLING.

SIR,—In reply to the letter from "Surveyor," we beg to inform you that we make our patent artificial stone for channelling and curbing, and for all purposes for which natural stone is used (cast in one section) in different sizes, and have used it upwards of fifteen years in "dwellings for the working classes" and in other buildings.

M. ALLEN & SON.

Japanese Workmen. — Mr. John Burns states that the internal fittings for the cabins of the steamship *Gallia*, now being constructed on the Clyde, for the Cunard Fleet, are to be made in Japan.

ROYAL ACADEMY ARCHITECTURAL SCHOOL.

Mr. R. PHENÉ SPIERS writes: — Will you kindly notify the following admissions to the Royal Academy Architectural School:—Probationers admitted: F. B. Bare, T. W. Besant, J. H. Buckiridge, C. W. Campbell, J. J. Gane, H. Goodall, D. A. Grigg, C. E. House, F. G. Howell, J. M. Jones, F. Miller, G. Petrie, H. J. Robinson, E. R. Small, L. A. S. Stokes, T. Watkins, G. Wheelhouse. Students admitted: 2nd Class—R. W. Collier, J. Clarke, T. Moore, C. Richardson. First Class—A. Berry.

FREEHOLD COTTAGE DWELLINGS COMPANY.

AT a general meeting, held on the 31st ult., Dr. W. H. Corfield, a member of the Board, presided, and a dividend of 5 per cent. on the preference shares, and 5½ per cent. on the ordinary shares, was declared. The Rev. F. C. Wills and Mr. W. Green, retiring directors, were re-elected members of the Board. A vote of thanks to the chairman was agreed to, and Dr. Corfield, in reply, congratulated the shareholders upon the satisfactory purchase of freehold property they had made at Walworth, and spoke of the gratifying results of the company's operations, which were clearly proved from the fact of their being able to pay a dividend of 5½ per cent. on the ordinary share capital of the company.

WATER SUPPLY.

Arbroath.—At a meeting of the Arbroath Police Commission, last month, Mr. Keith gave notice of a motion to the effect that, seeing the Nolt Loan water supply is practically inexhaustible, and is of excellent quality, there was no longer any reason why private supplies should be restricted to bakers and hotel-keepers only, and that they resolve to supply it on the same terms to private houses for culinary purposes only. The minutes of the Cleansing Committee were read, from which it appeared that the Clerk had been instructed to write a letter to Mr. John Murray, contractor, regarding his manure depôt at the Nolt Loan Well. Mr. Murray had replied that he was bound by his lease to manure his land. The present heap would be removed as soon as the dry weather set in, provided they could indicate some other spot on which to lay it down. He also intimated that the ditch through his land, which flowed past the well, was at one time pure water, which served his cattle. Since the new houses had been built, and their drains connected with the ditch, it had been an open sewer. He indicated that unless the nuisance were abated he would have to sue the Commission for damages. The matter then dropped. The Clerk then read a letter from the Board of Supervision, the writer of which (Mr. M'Niel) stated that the Nolt Loan water was insufficient in quantity and bad in quality; also, that the town being cleansed by contract, it was not sufficient, besides it was not competent for the Police Commissioners to do so. Mr. Dickson corroborated Mr. M'Niel's statements in every respect. The Nolt Loan Well had all along been a miserable makeshift. The supply had always been totally inadequate for a town of 23,000 inhabitants. No supply could be sufficient when it had to be carried off the streets. Besides, the field where the well was sunk was the most highly-manured field in Forfarshire, and it was impossible but that the water must be contaminated. Nevertheless, some of the members of the Commission who are opposed to obtaining a better supply, state that the water from the well is more palateable than that from Loch Katrine!

High Water Rates in South London.—A public meeting was held at the Bridge House Hotel, London Bridge, on the 13th ult., "to express," as the placards announcing the meeting put it, "the indignation felt in the district at the injustice of the course taken by the Southwark and Vauxhall and other water companies in abruptly and largely increasing the rates, and to consider the best means of remedying this grievous wrong." Mr. T. C. Brooke read a list of the increased charges which had been made by the Southwark and Vauxhall Company in seventy-nine cases, the increase being in one instance from 4*l.* to 37*l.*, in another from 4*l.* 4*s.* to 24*l.*, and in another from 20*l.* to 120*l.* 11*s.* 6*d.*; the aggregate increase in those seventy-nine cases being from 732*l.* 11*s.* 9*d.* to 1,617*l.* 17*s.* 6*d.*, or 125 per cent. Resolutions were unanimously carried strongly deprecating the recent action of the company; declaring that to construe the clause in the Act of Parliament, authorising the levying of a rate "at not more than five per cent. on the annual value" as giving power to charge five per cent. irrespective of the quantity consumed, was straining the Act beyond what was intended; and appointing a deputation of twenty to wait upon the Home Secretary and the Metropolitan Board to urge the necessity of the application of the meter system (as for gas) as the only fair means of charging for water. The tone of the speeches was one of decided hostility to the continuance of the monopoly of the water companies, and expressive of a determination to place the water supply under municipal control; some distrust, however, of the Metropolitan Board of Works being manifested, and it was suggested by one of the speakers that the object of the companies was evidently to fictitiously increase their income in order to increase the sum to be paid to them as compensation, an object in which they would be defeated, by inserting a clause that the last year's income be not taken into account.

Inverness.—The formal opening of the new works by which the town of Inverness is supplied with water from Loch Ashie by gravitation, took place on the 20th ult. at the reservoir, situated at Culduthel, about two miles to the south-east of the town, the ceremony of turning on the water supply having been entrusted to Mrs. Simpson, the wife of the Provost. Mr. Paterson, engineer of the works, presented Mrs. Simpson with a silver cup in commemoration of the event. Loch Ashie, from which the new supply of water is obtained, is six miles and a half distant from Inverness. Its level has been raised 2 ft. by embankment; a channel 100 yards long, and partly paved with stones and grounded with concrete, has been constructed at the outlet; and there is a height of 5 ft. of water over the mouth of the conduit-pipe. From the lake to the reservoir the distance is rather over four miles; the pipe used for the first mile being 11 in., and for the rest of the way 9 in. The track consisted mostly of clay, varied in some parts by running sand and moss, and at certain places, where the mixture was very close and compact, the cutting was by no means easy. The reservoir, situated on the farm of Oldtown of Culduthel, two miles and a quarter from the town, is simply a square basin 300 ft. wide at the top, 20 ft. deep, and capable of containing seven million gallons of water. One side is formed of the natural slope of the ground; and the other three sides form a vast rampart of great strength and thickness, and having a puddled wall embedded in the centre throughout its entire extent. At the point of greatest pressure, the embankment is 100 ft. thick at the base; at other places it is 45 ft.; and it slopes upward to the top, which forms a beautiful bulwark 12 ft. wide, enclosing the waters like a massive frame. The bottom and sides are laid with concrete. The outlet pocket is built of heavy concrete, 450 cubic yards in extent, and varying in thickness from 3 ft. 6 in. to 6 ft. A 12-in. pipe leads from the reservoir to the town.

THE MASONS' STRIKE.

SIR,—I read with some amazement the letter of Mr. H. Nisbet, Secretary of the Strike Committee, in your number of 22nd December. He ventures to state, distinctly in opposition to Mr. Broadhurst, that a union mason is allowed to work for less than the minimum rate if not up to the mark. Again he denies (in opposition to what we all well know), that "the Society limits the amount of work done by its members." What, then, is the meaning of fines for chasing? The union have now ample leisure for reflection, and why do they not see about altering their rules for the benefit of all? A very few years since I used to let the fixing of masonry by piece-work, and men could earn 3*l.* or 4*l.* per week. Why should the Union prevent these advantages to the skilful industrious man? Why, again, when trade is brisk, and especially when men are employed at a distance, should masons not be allowed to make a little overtime? In truth, sir, the rules and practices of the masons' union belong to the dark ages, when laws were made to prevent the extension of the metropolis, and to settle the price of bread and other sort of things on which people look back with wonder. I am now happily retired from business, and am able to do so by having always used vigorously the talents which God gave me. Had I allowed myself to be restricted to work so many hours a day, and not to do any more than some of my idle acquaintances, I should now be in a very different position.

A RETIRED BUILDER WHO HAS WORKED HARD.

The Building Trade.—At a meeting of the committee of the Central Association of Master Builders of London, held on Wednesday, the following resolution was carried unanimously:—"That the state of the building trade does not warrant any increase in the present rate of wages, nor is the committee prepared to recommend any reduction in the hours of labour, and, therefore, see no advantage in the proposed conference."

CHURCH-BUILDING NEWS.

Garston.—The new parish church of St. Michael, Garston, has been consecrated by the Bishop of Chester. The new church, which takes the place of the old parish church (which only accommodated 250 worshippers), is Gothic in style, and consists of nave, 92 ft. 6 in. by 22 ft.; chancel, 30 ft. 6 in. by 21 ft. 3 in., with apsis at east end; north and south transepts, 28 ft. 6 in. by 23 ft. 9 in.; north and south aisles, 68 ft. 9 in. by 11 ft. 9 in.; tower at north-west, 10 ft. by 10 ft. internally, used as a porch; opposite to which is a south porch, 11 ft. 6 in. by 9 ft.; organ-chamber at south-east, 15 ft. by 14 ft.; vestry at north-east, under which is a warming-chamber, 15 ft. by 14 ft. The church contains accommodation for 800 adults, one-half of the sittings being free, provision being made for choristers at the north and south of the chancel. The nave, which is lofty and of good proportions, is separated from the aisles by stone arcades of four pointed arches, supported by stone columns alternately circular and octagonal, with moulded bases and moulded and carved capitals; the large arches over the transepts being supported by double columns, the other side of these arches being supported by richly-carved and moulded brackets in the east wall of the nave. The nave roof is of high pitch, and the principals are constructed of laminated pitch-pine boards, moulded at bottom, and bolted together as an arched rib. The aisle roofs are on the lean-to principle. The tower has yet to be surmounted by a spire. The contract was taken by Mr. C. W. Mullin, of Liverpool, for the sum of 5,830*l.* Mr. Archer was the clerk of works. The whole has been erected from the designs and under the superintendence of Messrs. T. D. Barry & Son, architects, Liverpool.

Bradford.—The new Church of St. James, Bolton-road, Bradford, has just been consecrated by the Bishop of Ripon. The site abuts upon the Bradford and Eccleshill-road, bounded upon two sides by new streets. The plan comprises nave, aisle, chancel, organ-chamber, and vestry. The transeptal wings are occupied by the organ and clergy vestry. The church is approached by a porch, formed by the ground stage of the tower, which stands at the north-east angle of the building, with the doorway facing the road to Eccleshill. The dimensions of the church are: nave, 70 ft. long, 24 ft. broad, and 40 ft. high; aisles, 63 ft. long, 10 ft. broad, 18 ft. high; and chancel, 32 ft. long, 24 ft. wide, and 35 ft. high. The distance from the ground to the top of the stonework of the spire is 140 ft., and the vane adds about 10 ft. to the height. Accommodation is provided in the building for 400 persons. The whole of the interior of the church is plastered, with the exception of the windows, frames, and arch-dressing, which are of ashlar. The style is Early English, with a slight mixture of Continental design in the details. The church has been erected at the sole expense of Mr. J. A. Jowett, of Bolton. The following are the contractors who were connected with the progress of the building:—Mason and builder, Mr. Isaac Rhodes, Manningham; joiner, Mr. G. Booth, Bolton; plumber, Mr. J. Rhodes; slater, Mr. A. Hill, Bradford; plasterer, Mr. Hargreaves, Bradford; painter, Mr. Wallace, Bradford. The mosaic pavement in the porch has been executed by Messrs. Simpson & Sons, of London, who also have provided the wall decorations. The font and pulpit are by Messrs. F. Stake & Co., Bradford. The east window is by Messrs. Shrigley & Hunt, of Lancaster; and some grisaille win-

dows have been supplied by Mr. Edmondson, of Manchester. The lectern has been supplied by Messrs. Hart, Son, Peard, & Co., of London; and the whole of the gasfittings have been executed by Messrs. Hunt, of Birmingham. The whole edifice has been constructed from the designs, and under the superintendence, of Messrs. Andrews & Pepper, architects, Bradford.

Stoneywood.—A new church for the Stoneywood district of the parish of Newhills, Aberdeenshire, is about to be erected. The chief contracts for the work have been entered into. The church has been designed by Messrs. Henderson & Son, Aberdeen. It is of Gothic design, with gable facing the public road, and there will be a tower with belfry rising to a height of 78 ft. The church will be seated for about 800. A hall, vestry, and elders' room are to be erected behind the church. The principal contracts for the erection of the church and hall amount to about 3,100*l.* Further works will cost about 500*l.*, making a total of about 3,600*l.*

Tinsley, near Rotherham.—The foundation-stone of the new church (to take the place of the old one) here was laid on the 2nd inst. by Mrs. Overend, the donor of the church, in memory of her first husband, Mr. Hounsfield. Mr. G. E. Street, R.A., is the architect. The church, which is in the flowing Decorated style, is to consist of nave, north aisle, chancel, vestry, organ-chamber, and south porch. A bell-turret will surmount the chancel arch, and the east window, which has five lights, is to be filled with stained glass by Messrs. Clayton & Bell. The contractor for the building is Mr. James Fidler, of Eckington. The cost will be about 5,000*l.*, with accommodation for 397 persons. There was a very fair gathering of parishioners and others. Earl Fitzwilliam, with the Countess Fitzwilliam, Admiral Douglas, Mr. Overend, Q.C., Mrs. Overend, the vicar (Rev. J. F. Buckler) &c. His lordship presented the inscribed silver trowel and mallet to Mrs. Overend, who laid the stone. Mr. A. Hodgson is clerk of works.

DISSENTING CHURCH-BUILDING NEWS.

Ballymacarrett.— The foundation-stone of a Presbyterian church at Ballymacarrett has been laid. The church will occupy a prominent position on the Newtownards-road, in the centre of a rapidly-increasing district. The building will be a parallelogram on plan, with a circular tower attached to one extremity of the vestibule. Sittings will be provided for 430 persons on the ground-floor, and the galleries will accommodate 270 persons. The church will be entered by wide and lofty doorways, with two orders of deeply-recessed columns, having simply-carved caps and moulded bases, above which rest boldly-moulded arches and labels. Large mullioned windows, with traceried heads, will be placed in the front gable over the doorways. The sides of the church will be pierced between the buttresses with coupled windows, having trefoil cusped heads. Triple lights in two heights are placed in the transepts. The round tower, which terminates at a height of 100 ft. in a lofty weather-vane, will provide, in conjunction with another staircase, ample access to the galleries. All the external walls will be built of the local Silurian slate in random-coursed work, with dressings of Scrabo sandstone. The windows throughout the church will be filled with cathedral glass of varied tint in lead quarries. The ceilings will be plastered between the tie-beams, which will be stained dark and varnished. The builder is Mr. John Russell, Donegall Pass, and the works are being carried out from the plans and under the superintendence of the architects, Messrs. Young & Mackenzie, Belfast. The cost will amount to nearly 3,000*l.*

Deritend.—On the 26th ult. the memorial stone of a new Baptist chapel and Sunday schools was laid at Warwick-street, Deritend. The chapel will measure 60 ft. by 20 ft., and 15 ft. to the wall plate, with a small gallery at one end for the organ, choir, and children. For the purposes of a Sunday school the room will be divided into class-rooms by means of movable partitions. The front elevation of the building is to be of Gothic design, but wholly of brick-work. The contract for the erection of the chapel was about 600*l.*, but other contingent expenses will bring up the entire cost to something like 800*l.* Mr. George Ingall is the architect, and Mr. Lee, of Aston-road, the builder.

Armagh.—The memorial stone of a new Presbyterian Church was laid in Armagh on the 4th inst. The new church will occupy a site at the junction of Russell-street with the Mall, will partake in its general features of the English Gothic of the fourteenth century, the plan comprising a nave and two side aisles, having a total width of 55 ft. within the walls. The columns of the aisles are cast metal, of larger dimensions than constructively necessary, in order to avoid poverty of effect. Boarded ceilings will be used throughout. Galleries are placed against the walls on three sides. Sittings are provided for 470 persons on the ground-floor, and the galleries accommodate 350. Owing to the difference in level between the Mall and Russell-street, a basement is formed below the church, which will be utilised as a sexton's dwelling and for other purposes. At the junction of Russell-street and the Mall a pinnacled tower rises to a height of 100 ft. to the belfry. From this stage rises the spire, with tiers of lucarnes on each face, finishing at a height of 180 ft. with a vane. Messrs. J. & J. Guiler, Belfast, are the contractors for the work; and Mr. John Rhind is the clerk of works. The architects are Messrs. Young & Mackenzie, Belfast. The cost will be about 10,000*l.*

Banff.—A new Methodist Church is about to be erected in Banff. The site is between Reidhaven-street and the Young Men's Christian Association Hall, with frontage to Seafield-street. The plans, prepared by Mr. Ormiston, of Cousin & Ormiston, architects, Edinburgh, are for a church with a spire, and a manse. The scheme further includes a school, which may be erected if sufficient means are obtained. The design shows a Gothic building with sittings for 259 persons. It is estimated that the church buildings will cost about 1,400*l.*

Gateshead.— A new Presbyterian Church, situate in the Durham-road, Gateshead, was opened on the 26th ult. The building has accommodation for about 900 aduits, and has been erected from the design of Mr. J. J. Lish, Newcastle. It is in the Gothic style. The plan comprises a nave and two side aisles, with entrance porches and vestibule, and at the west end of the building there are a lecture-hall, sessions-house, minister's vestry, lavatories, and heating chamber. The most prominent features of the exterior are the tower and spire; the east gable, with its four-light grouped and traceried windows, and grouped entrance-door; and the south gallery entrance-porch. The spire is about 150 ft. in height. The building has been decorated throughout from designs by the architect, which have been carried out by Messrs. Adam Robertson & Son, Newcastle. Both plain and stained glazing have been executed by Messrs. W. J. Bover & Company, Limited, of Leeds. The gas-fittings have been manufactured by Messrs. T. Brown & Co., of Birmingham. The heating of the building was placed in the hands of Messrs. Dinning, Cooke, & Co., of Newcastle. Messrs. White & Sproat, of Blyth, have carried out the contract for the work, with the assistance of the following sub-contractors: Mr. Wallace, plasterer; Mr. Falconer, ironfounder; Messrs. Russell & Davis, plumbers, all of Newcastle. The wood-carving has been done by Messrs. G. Robinson & Son, of Newcastle; the stone carving being by Mr. Fielding, sculptor, of Leeds; while the upholstery throughout has been executed by Messrs. Carnegie & Gullachsen, of Newcastle. The total cost has been about 7,000*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Dundee. For some time back the sanctuary of St. Andrew's Roman Catholic Chapel has been undergoing a process of re-decoration, and a new altar and throne have just been erected, these finishing the work of adornment. The altar and throne are of Gothic design, and are composed of solid wood, carved and gilded. From the base to the top they are 22 ft. in height, and are placed above the marble tabernacle. Four pillars with gilded capitals ascend over the throne, and have long finials, so as to carry the flying canopies, which are clad on the under portion with lancet shafts, having crocketed tops. Springing from the tops of the finials are buttresses to support the lantern above the flying canopies, which are of octagonal form. These buttresses in turn support a smaller flying canopy, the whole finishing off with a crocketed finial. The tabernacle has been provided with niches on each side to correspond with the niches at the sides of the altar. The new reredos which has been erected forms a pleasing background to the altar, the dark panels showing to advantage the gilded pillars and cusped panel-heads. The appearance of the sanctuary is considerably enhanced by the erection of the altar and throne, which are beautiful pieces of workmanship, and harmonise well with the surroundings. They were designed by Mr. Patterson, carver, Edinburgh, who has also executed the work of their erection. The whole of the decorations have been carried out under the superintendence of the Rev. Mr. Clapperton.

SCHOOL-BUILDING NEWS.

Devonport.—The foundation-stone of the new buildings for the Devonport High School for Girls has been laid by Sir John St. Aubyn. The site is in Albert-road, Stoke, and adjoins St. Michael's Church eastwards. There is a considerable fall in the surface of the land both southwards and westwards, and the street level is a few feet above that of the site. The lower story of the new building, though entirely above ground on the south side, will therefore appear as a basement in the front. At present only a portion of the complete design is to be erected. Eventually the entire building will accommodate 250 pupils, the number to be now provided for being 150. There will be three floors: the basement, containing a large play-room 50 ft. by 17 ft., and a dayroom 25 ft. by 19 ft.; class-rooms and other accommodation for the Kinder-garten department, rooms for the caretaker, heating chamber, and all conveniences; the ground floor, comprising cloak-room, head mistress's room, secretary's office, and three large class-rooms; and the upper floor, containing a room for the assistant mistresses, and four large class-rooms. Externally, the structure will present a symmetrical front to Albert-road; the central range, with three dormer gabled windows, being flanked by projecting wings which are carried up as gables of Elizabethan or Tudor design. All the external facings will be of Portland cement, which has been adopted on account of the great difficulty experienced in otherwise erecting a building impervious to moisture. The architect is Mr. H. J. Paull, of London and Manchester. The contractor is Mr. Berry, of Plymouth. The clerk of works is Mr. Siddall.

Over Darwen. The foundation-stone of the additions to the Belgrave Independent Chapel schools was laid on New Year's Day. They are situated in the Bolton-road. The design is in character with the present chapel, which is of the Perpendicular style, local stone parpoints with ashlar dressings will be used, the windows to have tracery heads. The lecture-hall is to have an open-framed timbered roof. The additions consist of a lecture-hall, 86 ft. by 41 ft., capable of seating 500 persons, and has a prominent tower entrance and staircase. Under the above is an infants' school, 38 ft. by 15 ft. 6 in., and a Sunday-school, 46 ft. by 41 ft., with four class-rooms, 17 ft. by 12 ft. These are connected by a passage with the chapel vestries and play-ground at back of the chapel, also with a mixed day-school, 54 ft. by 28 ft. 6 in., and eight class-rooms, approached by a staircase; and adjacent thereto are cloak-rooms, lavatory, library, and tea-room. The total accommodation provided is for eight hundred children. The chapel will have a new organ-chamber, which will join the new block of buildings to the present chapel. The contract is being carried out for the sum of 5,000*l.* The contractors for the works are Messrs. Lloyd & Millward, of Over Darwen. The architect is Mr. W. Kenyon Knapp, late Ernest Bates, of Manchester.

STAINED GLASS.

London.—On New-Year's Day a memorial window, possessing more than a merely local interest, was unveiled in the church of the united parishes of St. Clement's, near Eastcheap, and St. Martin Orgar's. The parishioners, desiring to commemorate three eminently distinguished men formerly connected with their church, commissioned Mr. W. G. Taylor (late O'Connor & Taylor), of Berners-street, to design and execute, from authentic pictures, life-size portraits in glass of Bishop Pearson, the author of "The Treatise on the Creed"; of Thomas Fuller, the Church historian; and of Brian Walton, Bishop of Chester, the editor of the famous "Biblia Polyglotta." The window is in the Renaissance style. At

its base is a Latin inscription, as follows:—"In D.O.M. gloriam et in recordationem Thomæ Fuller Sacræ Theologiæ Professoris qui Anglorum laude dignorum vitas depinxit Ecclesiæ Britannicæ annales composuit. Joannis Pearson Episcopi Cestriensis qui Fidem Catholicam interpretatione luculenta explicuit. Briani Walton Episcopi Cestrienses qui compluribus linguis divinas scripturas edidit. Discrimina denorum idem spiritus (1 Cor. xii. 4)."

Harrogate.—A memorial window has been placed in the baptistery in the west end of Christ Church, High Harrogate, to the memory of the late Canon James, formerly vicar of that church. The subject is the Baptism of Christ by St. John in the Jordan. The window was designed and executed by Messrs. Shrigley & Hunt, Lancaster.

SCHOOL BOARD SCHOOLS.

Chalgrove (*Oxon*). — There has just been opened at Chalgrove a new school, providing accommodation for 114 children and a residence for the master. The works have been executed by Messrs. Howland & Wells, of Thame, who took the contract for building and furnishing at 1,208*l.*, but there have been no extras, and after deducting a portion of certain provisions included in the contract, the actual cost is found to be 1,185*l.* 14s. 7d. The architects are Messrs. Morris & Stallwood, of Reading.

Forest of Dean.—The first two schools erected by the Forest of Dean School Board have been formally opened. They are situate at Bilson and Pillowell. The Bilson school buildings form three sides of a quadrangle; the open side is to the south, and admits the sun into the infants' playground. Accommodation is afforded for 158 boys, 107 girls, and 168 infants, making a total of 433 children. Each boys' and girls' school-room and class-room is 18 ft. wide, whilst the infants' school-room is 20 ft. wide, giving a superficial area of 10 ft. of floor space for each child. All the rooms are 12 ft. high to the wall-plate, and open to the roofs. The rooms are warmed by open fireplaces, in which are fitted Whitwell's patent "Save-all-waste" fire-grates. The lavatories are supplied with Macfarlane's patent iron basins, in solid stands. The teachers' residences are of a superior character. One contains entrance-hall, staircase, two parlours, kitchen, scullery, pantry, the requisite out-offices, and four bedrooms; the other has one parlour and three bedrooms; the whole spacious in size, and supplied with every modern appliance. The buildings are constructed of stone, lined with bricks; the roofs are open-boarded, felted, and slated; the walls up to the window-cill level cemented all round. The infants' schoolroom is fitted with galleries, whilst the adult children are provided with the Vaga patent reversible desks and seats, and every requisite appliance, manufactured by Mr. J. Lewis, of Ross. The amounts of the contracts are as follow:—For schools, 2,864*l.*; houses, 1,076*l.*; boundaries and formation of site, 940*l.*; total, 4,880*l.*——The Pillowell School buildings, Whitecroft, near Lydney, are similarly arranged in plan and construction, but rather more detached and reversed to the plans of those of the Bilson School buildings, in order to suit the aspect of the site, the residences being placed on the left-hand corner instead of in the centre, the accommodation here being for 125 boys, 108 girls, and 167 infants, making a total of 400 children. The amounts of the contracts for these are as follow, viz.:—For schools, 2,857*l.*; houses, 1,086*l.*; boundaries and formation of site, &c., 730*l.*; total, 4,673*l.* When the cost of the houses is deducted from the total expenditure, as well as the formation of the sites, boundaries, &c., which in both these cases is necessarily somewhat expensive, owing to their position and peculiarities, the cost of the schools proper is only 7*l.* per head. Both of the contracts, amounting to a sum total of nearly 10,000*l.*, were commenced in September, 1876, and completed in every particular in rather over a year. The clerk of works for the Bilson School was Mr. H. Roberts, of Cinderford; and for the Pillowell School, Mr. W. Nicholson, of Whitecroft; the builder of both being Mr. William Bowers, of Hereford. The architects are Messrs. Haddon Brothers, of Hereford, whose plans were selected in competition.

Whitstable (*Kent*). —New Board schools have recently been opened at Whitstable, Kent, which have been erected for the United District of Whitstable and Seasalter. The boys' department has school and class room, and accommodates 110. The girls' department has school and two class rooms, giving accommodation for 170; and the infants' department has a large school-room, a seniors' class-room, and babies' room, accommodating 200 altogether. To each of these departments are attached a spacious cloak-lobby, with lavatories, and also extensive playgrounds; and the infants have a covered marching-shed, 160 ft. long. There are two residences for master and mistress, each containing six rooms, together with larder, fuel shed and usual offices. The heating of school and class rooms is by means of Messrs. Shillito & Shorland's (Manchester) grates; and the ventilation of these rooms has been provided for by upright shafts for the admission of fresh air, and extracting shafts, with small roof gablets, for taking off vitiated air. The erection and furnishing of the buildings has been carried out by Mr. Foad, contractor, of Whitstable, at a cost of about 4,900*l.* Mr. Jarvis, of Huntingdon, acted as clerk of works. The architects were Messrs. Morris & Stallwood, of Reading.

ODD COINCIDENCE.

On Saturday night, or early on Sunday morning, the premises of Mr. Samuel Morgan, builder and decorator, of Royal-road, Croydon, were entered by thieves, and property valued at 150*l.* was carried away from the building. This is the third occurrence of the sort of which we have received notice within a week, and in each case, we are further informed that the books were all saved through being in a certain maker's Safe,—the same maker in all the instances. We are too polite to suppose that the agents of this particular Safe man have had anything to do with these occurrences, but the coincidence is certainly striking. It will scarcely be believed, but since writing the above we have been asked to mention that the premises belonging to Messrs. Thomas Young & Co., of Catherine-street, Northend, Epsom, suffered severely from fire last Sunday morning. It originated in the workshops,—a large timber building of three floors; and again, it is stated, the books and money were preserved by one of the same maker's safes.

Miscellanea.

The Reredos at St. Ethelburga's.—Dr. Tristram, the Chancellor of the Diocese of London, has given judgment in the case of "The Rev. J. M. Rodwell *v.* The Churchwardens of St. Ethelburga," in which an application had been made by the rector for a confirmatory faculty to be granted for a reredos which had been placed in the church, and also to direct the restoration of the Communion-table, which had been removed some time back by the churchwardens. The Chancellor, in giving judgment, described the several compartments of the reredos containing representations of the life of our Lord on earth, to which were added two wings to preserve the reredos from dust, the work being carved. The churchwardens had taken some exception to the reredos, and he (Dr. Tristram) had visited the church, and did not think that the plan filed accurately described the reredos. There were thirty figures in the compartments representing the several scenes he had mentioned. On inspection after he had the plan, he found that the reredos was placed at the east end of the church, at the back of the altar, and was an ornament such as was used in Roman Catholic churches on the Continent. He was anxious that the Lord Bishop should visit the church, and his lordship had done so, and had made a report that it was not a proper ornament to be allowed. He (Dr. Tristram) had in the exercise of the discretion vested in him, thought it would be a wise exercise of the same to refuse the application for a faculty to allow the reredos to remain in the church, and it must, therefore, be removed.

Large Saws.—Mr. Adolphe Arbenz writes,—"Referring to my last letter, I beg now respectfully to inform you that I have received to-day an order from the United States for a considerable number of large saws, each of them measuring 60 ft. in length, by 4 in. and 6 in. in width, and 16 to 18 w.g. thick. Every one of these saws will be manufactured of one piece of steel, and guaranteed to be of the same temper all through."

Growth of Opinion on the Health Question.—It is satisfactory to those who have worked for years in asserting the vital importance of this question to find this now everywhere admitted. The *Times* writes,—"The improved health which is the result of improved sanitation points to the existence of better and more comfortable homes, and these in their turn point to a general improvement of the state of the wage-earning classes, especially in great towns, and thus strike at the roots of much of the vice and misery which all philanthropists agree to deplore, although too many trace them no further than to some immediate cause, such as intemperance, which in itself is largely an effect of causes that lie still deeper. Life, money, the vigour of the people, the decency and the comforts of home, and all that constitutes the difference between respectability and brutality, are included, in greater or less degree, in matters which have at first so little apparent connexion with them as the cleansing of streets and the disposal of sewage." It is interesting to inquire how it happens that, among a practical people like ourselves, the waste of money and of life indicated by our present mortality has so long been suffered to prevail. The *Times* thinks it is probable that the inefficient character of much of our sanitary legislation, and also the way in which legislation calculated to be efficient has been weakened or nullified by the executive, have been due to the deficiency in the House of Commons of members at once possessing the ear of the House and of the public, and capable of speaking upon health questions with full authority and knowledge. Almost every other great national interest is fully represented in Parliament, but the interests of public health are at best only represented by imperfectly skilled amateurs.

Worcester Diocesan Architectural Society.—The annual meeting of this society was held at Worcester on the29th ult. Mr. G. J. A. Walker in the chair. The report of the committee deplored the loss of several members. Six members had joined since last meeting, and the committee urged upon the members to give the society more strength by getting fresh members to join. They also proposed that some of the funds of the society should be expended in having drawings and paintings of old buildings and houses in Worcester and its immediate neighbourhood that were purchased for the purpose of improvement. A detailed account was given by the committee of the two excursions made by the society during the year: the first, in June, to Hales Owen and the neighbourhood; and the second, in August, to Tewkesbury Abbey, Deerhurst Church, and The Rhydd; as also the different churches built and restored in the diocese during the last twelve months. The report was unanimously adopted. Mr. Noake brought forward the subject of enlarging the basis of the society by admitting as members those outside the Church of England, and, after some discussion, the secretary was instructed to call a special meeting of the members together to consider the subject.

Steam Power for Street Tramways.—Some interesting trials with the view of adopting steam as a tractive power for tramways in Leeds, took place on the 28th ult., on the Headingley line, on which occur the steepest gradients on the local lines. A short time ago the same engine, which has been manufactured by Messrs. Kitson & Co., Airedale Foundry, was set to draw along that line one of the large American cars, which alone weighs nearly three tons, and there were in it between fifteen and twenty passengers. The only drawback then was that some of the water found its way into the ash-pan, and so generated an issue of steam. The engine (which is an upright one of 12-horse power nominal) was accordingly taken back to the foundry to have this defect remedied. Having been put right, it was on the date named used experimentally, and is reported by the *Leeds Mercury* to have done its work remarkably well. The car which it drew is one of the smaller ones, weighing about two tons; but in most of the journeys made it contained the full complement of thirty-four passengers. Although kept much within its capacity for speed, the steam car travelled quicker than those drawn by horses; and the engine neither emitted smoke nor steam to any appreciable extent, passengers being able to travel on the outside of the car without annoyance. It was also, as nearly as possible, noiseless. Nevertheless, it is reported to have scared several horses.

Bells for St. Paul's. — Several of the companies of the City will each defray the cost of a bell, to bear the arms and motto of the company by which it is presented. The first and second bells are given by the Drapers' Company, impressed with the triple crown and the motto, "Unto God only be honour and glory"; the third, fourth, fifth, and sixth bells by the Baroness Burdett-Coutts and the Turners' Company, with the Turners' motto, surmounted by a coronet, under which the words, "By faith I abteigne"; the seventh bell by the Salters' Company, arms—three salt-cellars, motto, "Sal sapit omnia"; eighth, the Merchant Taylors' Company, motto, "Concordia parvæ res crescunt"; ninth, Fishmongers' Company, "All worship to God only"; tenth, Clothworkers' Company, "My trust is in God alone"; eleventh, the Grocers', with the motto, "God, grant grace"; and twelfth, and most important, the tenor-bell, which weighs 60 cwt., the gift of the Corporation, bearing the City arms and the motto, "Domine, Dirige Nos." The weight of the whole peal will be 11 tons. On each bell as well will be impressed the arms of the Dean and Chapter, surmounted by the letter "D," each and every impression being enclosed in a shield-like framing, the design of the cathedral architect, Mr. F. C. Penrose, under whose direction also has been constructed the cage in which the bells will be enclosed, the construction of which alone will require an outlay of 1,000*l*. The bells, which will cost about 5,000*l*., are being cast at the foundry of Messrs. Taylor, Loughborough, and are to be finished in about six months. So says the *City Press*, which seems to regard it as a grievance "that the commission for the bells should have been given to a firm in Leicestershire, when there are bell-founders of great repute in the City and metropolitan district."

The Drainage of Hailsham.—On the 27th ult., Mr. Harrison, C.E., one of the Inspectors of the Local Government Board, held an inquiry at the Board-room of the Hailsham Workhouse for the purpose of ascertaining the necessity for the borrowing of a sum of 6,000*l*. for the purpose of constructing a system of drainage for the town of Hailsham. The first inquiry, when the question was originally brought under the notice of the Local Government Board, was held some three years since, and the Inspector then advised that the necessary work should be carried out. In the meantime, the subject has been before the Sanitary Authority, the various Boards of Guardians for the Union which have been elected since that date, and at length a system designed by Mr. G. A. Wallis, of Eastbourne, has been adopted. This, it was explained, would entail an expenditure of some 6,000*l*., of which sum 4,000*l*. would be for the drainage proper, with irrigation, and the remaining 2,000*l*. for a supply of pipes to be connected with the main laid from Polegate and connected with the Eastbourne Waterworks, and other necessaries for the reception of water for flushing. The Inspector expressed an opinion that the cost of this latter work was somewhat high, and regretted that Mr. Wallis had not been requested to meet him there. He also commented on the charge of 150*l*., to be paid in perpetuity to the Eastbourne Waterworks Company, as interest on the outlay involved in carrying the water from Polegate to Hailsham, and said that 1s. per thousand gallons for the water was also high. There was no opposition to the loan being applied for, nor to the works proposed to be carried out, and the Inspector stated he would forward his report as soon as possible after he had met Mr. Wallis.

Queen Margaret's Cave.—The *Edinburgh Daily Review* reports the intended restoration of a hitherto neglected relic at Dunfermline, dating from the time when King Malcolm held court at the Tower-hill. This relic is Queen Margaret's Cave, which consists of an apartment in the solid rock, and is situated a few hundred yards from the Tower-hill. It is 6 ft. 9 in. in height, 8 ft. 6 in. in width, and 11 ft. 9 in. in length. At the bottom of the cave is a small spring well, the water of which rises at times, and covers the whole of the lower space. Queen Margaret was accustomed, historians tell us, to repair constantly to the cave for the purpose of private devotion, and the king, discovering the real cause of her long absences, hearing while he listened prayers uttered by her on his behalf, caused the rude excavation in the rock, always damp and dingy, to be fitted up as an oratory. After the queen's death the place was permitted to fall into decay.

An Historical Church.—The Rev. D. Owen Davis, of Pontnewynydd Vicarage, Pontypool, writes:—"The parish from which I write claims the somewhat unenviable distinction of being one of the centres of the Chartist rising in 1838, in which Frost, Williams, and Jones took so prominent a part. After the rebellion had been firmly quelled a few gentlemen in the neighbourhood, amongst whom was Mr. Thomas Phillips, afterwards knighted for his gallant conduct at Newport, determined, as one means of instructing the populace in the duties of good citizenship, to erect a church in the district. The work was pushed forward at once, and the church of St. Luke, Pontnewynydd, was built, and consecrated by good Bishop Coplestone, of Llandaff. About four years ago, under a former incumbent, the hastily-erected structure was found to be greatly dilapidated, and it was taken down. An effort, which, unfortunately, proved unsuccessful, was made to rebuild it; the funds were exhausted when the walls were but a few feet from the ground. In this condition it remains, and is likely long to remain, for, owing probably to the hurried nature of the original undertaking, the site of the church was neither enfranchised nor transferred to the Ecclesiastical Commissioners, the building being merely vested in private trustees, of whom Sir Thomas Phillips was one; and thus it would seem that no one is now legally responsible for its restoration. Is it not a pity that for want of some 400*l*. this historical church should be left in ruins?"

Alleged Trade Union Intimidation.—At the Sheffield Quarter Sessions an application was made for the postponement of the trial of Robert Holmshaw, a trade-union secretary, for having intimidated a grinder named Hibbert. The defendant was committed for trial at the last Quarter Sessions, but two days before they commenced it was ascertained that Hibbert had been sent to America, his passage being paid, and money given to his wife to follow him with her child. The case was adjourned last session that the Treasury might be asked to assist in bringing Hibbert back, but they declined to interfere. Under these circumstances it was the intention of the prosecution to have gone on with the case in the absence of Hibbert, but a few days ago it was discovered that the most important witness left,—a man who heard the defendant threaten Hibbert that if he did not discharge an apprentice he would be "smashed,"—had also disappeared. The counsel for the prosecution stated that there was a strong case in point of law against the defendant, but a weak case in point of fact. He therefore applied that the indictment might be placed upon the file until the further orders of the Court. The application was granted.

New Public Hall, Grantown, N.B.—The new public hall at Grantown was opened on the 27th ult. The building covers 64 ft. by 40 ft. Facing southwards, the front elevation is built of dressed granite and freestone, and is broken up by numerous windows and doors. In the centre there is a break for a tablet of freestone, on which is inscribed the year 1877. The ground-floor of the building is occupied by two shops, with store accommodation behind, the upper part being the hall proper. The principal entrance is in the centre of the front, and a corridor, 8 ft. wide, leads to the staircase. The hall, which is provided with retiring-rooms, will be seated to accommodate 400. The architects were Messrs. Matthews & Mackenzie, of Aberdeen and Elgin; and the tradesmen were — for mason work, Messrs. John Grant & Son; carpenter, Messrs. D. Mackintosh & Son, Drummuillie; slater, Mr. James Winchester, Grantown; plasterer, Mr. Wm. Duffus, Grantown; painter, Bailie Tulloch, Inverness; plumber, Messrs. Hunter & Wink, Nairn. The cost has been about 1,500*l*.

The Late Sir Digby Wyatt. — A monument has just been erected in Usk Churchyard to the memory of the late Sir Digby Wyatt, by his brother, Mr. Thomas Henry Wyatt. It consists of a red Aberdeen granite ledger with chamfered edges, on which is the following inscription:—"Here rest the remains of Sir Matthew Digby Wyatt, Kt., born 28th July, 1820. Died 21st May, 1877. 'We asked life of Thee and Thou gavest him a long life, even for ever and ever.'—Ps. xxi. 4." On the top of the ledger is placed a Sicilian marble recumbent cross, the base of the monument being of grey Rubislaw granite, surrounded with a wrought-iron railing, on a Forest of Dean stone curb. The work has been executed by Messrs. Burke & Co., of Newman-street, Oxford-street.

Geological Time.—At the last meeting of the Royal Society, the Rev. Samuel Haughton read a paper on a new method of finding limits to the duration of certain geological periods. He had previously shown how he came to the conclusion that the elevation of Asia and Europe displaced the axis of *maximum inertia* through sixty-nine miles. The axis of rotation being thus separated from the axis of figure by sixty-nine miles, or one degree, began to revolve round it. But for friction, this would continue for ever, and the object of the paper was to discuss how long would be required for friction to bring the axis of rotation to again coincide with the axis of figure. The friction is that of the ocean, which always tends to revolve round yesterday's axis until compelled to revolve round to-day's axis by friction against its bed. The calculations brought out the result that 611,000 years would be required to restore the coincidence of the axes, and therefore, the formation of Asia and Europe cannot be more recent. Further calculations gave the minor assignable limit to geological time as eleven million years in round numbers.

The Late Mr. Burridge, Builder.—We regret to announce the death of Mr. Herbert Burridge, senior partner of the firm of Messrs. H. & F. Burridge, extensive builders at Exmouth, Devon. He died suddenly, a few days ago, of apoplexy, whilst yet under fifty years of age. Mr. Burridge was well known throughout the West of England. A greater part of the best portion of Exmouth, erected within recent times, owes its existence to the enterprise of this firm, or to their father before them. Amongst other works in which Mr. Burridge was engaged may be mentioned the building of the church at Withycombe, from the designs of Mr. E. Ashworth; extensive additions to Lord Poltimore's, at Poltimore, and to Sir Greville Smythe's, at Ashton Court, near Bristol, both under Mr. B. Ferrey, F.S.A.; the new church at Otterton, and the restored one at Up-Ottery, under the same architect; extensive additions to Lord Sidmouth's mansion, near Honiton; the New Board Schools at Exmouth, just completed; the important Coast Guard Station Depôt at Budleigh Salterton; and many churches, mansions, and other public buildings in the West.

Working Women's Hotel, New York.—The "Working Women's Hotel," at New York, founded by the late Alexander T. Stewart, is almost completed, and will soon be opened. It has cost about $2,000,000 to build and furnish it, and that amount is given absolutely to the enterprise; but thus started, it is to be self-supporting. There are upwards of 500 private rooms in the hotel, some double-rooms of 30 ft. by 16 ft., which two women may take, and other single rooms of half that size. A number of reception-rooms are provided, in which the residents may entertain their friends. The library is to be fully supplied with newspapers and periodical publications, and there are already 2,500 books upon the shelves. The main dining-room will seat 600 persons at a time. The house is intended to give to women who earn their own livelihood the best rooms, best furniture, best attendance, and best living, at a charge for the whole not exceeding $5 per week. A large room is to be used for supplying meals, or selected articles of food, at the lowest possible price to women who cannot be accommodated with lodging in the house.

Bubbenhall, Warwickshire. — A new reredos has been put up in this church, the gift of the Rev. A. N. Fanshaw, upon the occasion of his resignation of the living and the appointment in his place of the Rev. E. H. Harrison. It consists of a large moulded and cusped canopy, resting on carved capitals and marble columns, under which is sculptured the subject of the "Last Supper" in very bold relief. The background being well recessed, the shadows bring out the figures clearly. Mr. W. Jeffrey Hopkins, of Worcester, was the architect, and Mr. Boulton, of Cheltenham, the sculptor.

Death of a Steeple Jack.—William Dunbar, aged twenty-six, belonging to Dundee, met with a fearful death at Inverness. He was engaged repairing the steeple of the Free High Church in that town, when, either through the coldness of the weather, or through becoming giddy, he lost his hold and fell from a height of about 70 ft. He alighted on an iron railing, on which he was impaled. His death was instantaneous.

Accident at Lower Norwood.—On the 7th, a frightful accident, which it is expected will cause the death of one or two men, occurred at the new buildings being erected for the London and South-Western Bank, Lower Norwood. It appears that the structure has been carried to a height of about 30 ft., with a scaffold erected in front. At the time mentioned, ten men, principally bricklayers, labourers, and masons, had all congregated together on the top scaffold, where they thought they would be out of observation, for a conference as to some extra demand, it is alleged, of another ½d. per hour. While the discussion was going on, the architect and the contractor arrived, and were about to proceed up the ladder. Another labourer went up first with a load of bricks, and, it is believed, gave warning to the conference. He had no sooner put his foot upon the top scaffold than the whole came down together, precipitating all of them to the ground. A number of the men are dreadfully injured.

An English Colony in Russia.—The Russian journal *Zacht* publishes a letter which reveals the existence, near Archangel, of a small English colony, hitherto perfectly independent. This colony, which has been gradually formed by emigrants attracted by the establishment of some important sawmills by an English company, very soon formed a town, the existence of which has, so to speak, been so far ignored, and which has figured neither upon maps, on the cadastral register, nor on the tax-lists. The consequence is that the inhabitants, the number of whom is not stated in the journal, pay no kind of tax, and have remained up to the present independent of the local authorities.

Inventors' Exhibition.—An exhibition of a somewhat novel kind has been opened in the Palais de l'Industrie, Paris, the contributions being strictly confined to new inventions. According to the *Journal of Trade Marks*, it is proposed to hold the exhibition annually, and the opinion prevails that it will turn out a great success,—not in a popular sense, but commercially. There is certainly a good idea in bringing together all new inventions, or, at least, as many as possible. To many persons such a collection will be infinitely more satisfactory than a book on the subject, although an illustrated catalogue would furnish a valuable record of the practical science of the year.

Chiddy Memorial Cottage, Hanham, near Bristol.—The presentation of this cottage was made on the 8th inst. to the widow and family of the late John Chiddy, who was killed by an express train on the Great Western Railway whilst removing a stone from off the metals. The cottage is built of native Pennant stone, and is roofed with plain Bridgewater tiles, the cost being 267*l*. Half an acre of land was given with the cottage. The fund was raised by subscriptions from all parts of England. The architects are Messrs. J. W. Trew & Sons, Bristol.

The National Gallery.—There are of course several candidates for the vacant office of Keeper. Gossip says the chance lies between Mr. Holmes, the Queen's Librarian at Windsor, and Mr. Comyns Carr, the former for choice. There is a third gentleman, however, who does not wish his name mentioned, but is quietly forging a-head.

TENDERS

For rebuilding two warehouses in Bread-street. Messrs. Ford & Hesketh, architects:—

Kirk & Randall	£7,980	0	0
Morter	7,518	0	0
Nightingale	7,428	0	0
Shaw	7,356	0	0
Browne & Robinson	7,310	0	0
Arrowsmith	7,332	5	0
Mark	7,118	0	0
Scrivener & White	6,873	0	0
Ashby Bros.	6,944	0	0
Newman & Mann	6,850	0	0
Brass	6,676	0	0
Crabb	6,371	0	0

For building three houses on the north side of Honor Oak-road, Forest-hill, for Messrs. M'Call. Mr. J. P. Waterson, architect:

Martin	£3,187	0	0
Linfield	2,804	0	0
Parker & Evans	2,700	0	0
Bantrik & List	2,635	0	0
Taylor	2,491	0	0
Longman	1,500	0	0

For a block of model residences, Islington, for the Sanitary Dwellings Company, Limited. Mr. Banister Fletcher, architect:—

Bays Bros. & Allen (accepted)	£4,344	3	0

For alterations to house and shop, Finsbury-place, for Mr. George Powell. Mr. Banister Fletcher, architect:—

Deards	£1,317	0	0
Tayler	1,250	0	0
Bayes Bros. & Allen (accepted)	1,170	0	0

For the erection of a block of dwellings on the flat system, at Parkdale-road, Plumstead Park Estate. Mr. W. S. Witherington, architect:—

Combes (accepted)	£1,500	0	0

For rebuilding No. 10, Sun-court, and 46, Curzon-street, Mayfair, for Messrs. Wyld. Mr. Joseph S. Moye, architect. Quantities by Mr. A. F. Wrightson:—

Adamson & Sons	£2,351	0	0
Cairns	2,543	0	0
Curtis	2,479	0	0

For the erection of four shops at Enfield, for Mr. G. S. Grimmond. Mr. Joseph S. Moye, architect:—

Pratt & Wiseman	£2,749	0	0
L. & W. D. Patman	2,597	0	0
Fairhead	2,390	0	0
Grover	2,369	0	0

For two detached residences, Manor Park Streatham. Mr. F. C. Notley, architect:—

Buckland (accepted)	£3,385	0	0

For three villa residences at Wandsworth-common. Mr. F. C. Notley, architect:—

Hayworth (accepted)	£4,525	0	0

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The Builder.

VOL. XXXVI. No. 1824. SATURDAY, JANUARY 19, 1878.

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A Moral and Economic Aspect of the Sewage Question.

NEW excitement about the sewage outfall and its effect on the Thames has developed into a very pretty dispute (we will not say "quarrel") as it stands, even if it lead to no more definite result. In all such cases there is a certain amount of talk and recrimination to be got rid of,—a kind of waste gas driven off by combustion,—before we come to the solid matter of the point at issue,—the question, what is to be done? We may even yet be a good while in getting to any practical result; but it is something if we can even make a step or two in the direction of the right theory of action. What is, in fact, needed, in regard to this and some other questions of social economy of the day, is to bring theory and practice into closer relation one with the other. The main drainage works for London were practically, no doubt, a great piece of engineering skill and perseverance, involving great outlay and much practical skill in investigating and testing materials so as to produce a permanent result; yet all this labour and expense is, as we think people are beginning to see now, to a great extent, thrown away, through being based on a mistaken and incomplete theory to begin with.

Two points have struck us amid some of the paper warfare which has been started on the subject, by no means of equal importance, but which both serve to show the very partial view of the subject which is taken by those who are officially most concerned in it. One is, the exclusively legal aspect in which the matter is treated by the Board of Works or by those who are their spokesmen or champions before the public. One of these chivalrous defenders of the Board and its action seemed to think he had made quite a point in favour of his clients by showing that they had not, as some of their opponents asserted, contravened the provisions of the Rivers Pollution Act; that there was a clause in that Act specially exempting the case of the Thames and the main drainage works from its operation: furthermore, that it was a mistake to suppose that the Board of Works were under any obligation to deodorise the sewage before turning it into the river, except in regard to temporary outfalls until the main drainage outfall could be completed. But this is only proving a little too much; only, at the most, shifting the blame on to other and, perhaps, broader shoulders; or possibly we may go further and say that such a fact only shows that the Board and their engineers were shrewd enough to obtain legal sanction for shirking the most serious part of the problem, in order to apply with greater readiness a remedy of which it might have been prophesied (was, in fact, prophesied) that it would work no radical cure. Looking at this defence, based on their legal position, one cannot help asking under what exercise of influence in high places it came to pass that the Metropolitan Board of Works were permitted to form an exception to the operation of the Rivers Pollution Act in the case of the most important town on the most important river in England? The result simply comes to this, that the public and their Parliamentary representatives were deluded into the belief that a certain scheme, carried out at enormous cost, would prove an efficient solution of the question, "What is London to do with its sewage?" and that not only is it no solution, but is surely though slowly building up the original danger in a roundabout manner; but also that any exercise of common foresight on the part of those who carried out the scheme ought to have led necessarily to the conclusion that this would be the result. Yet for all this it seems to be considered a sufficient defence to say that the Board have done all that the law required of them. They do not recognise any moral or sanitary responsibility in the matter; they do not seem for a moment to entertain the idea that they, as the responsible body entrusted with the improvement of London, were under a moral obligation to find out the best method and carry it out; they have not asserted, or their friends have not done it for them, that they considered the sewage difficulty on every side, went to the root of the matter, and saw no better solution than that which has proved such a failure,—not at all; they are content to say that they were under no legal obligation to find a solution; that, like "the unprofitable servant" in the parable, they had done that which it was their legal compact to do, their "duty" only in the narrowest and most official sense. But they cannot morally (whatever they may do legally) shelter themselves behind the law in this way. On such points the Board of Works, being specially and immediately charged with these great sanitary operations, were bound to know more about the subject than any one else, to correct or supply the defective requirements of the law, not to shelter their costly half-measures behind it. To adopt the latter position is as reasonable as it would be to say that a man deserved no blame for keeping a cesspool close to his house property, though knowing it to be a nuisance, because the sanitary inspector was deficient in knowledge, and did not compel him to remove it.

That this merely legal responsibility is the view taken by the Board of Works of their position, we have had further confirmation in the tone they have openly and explicitly adopted in regard to the almost more pressing question, because dealing with a more instant though transient evil, of the Thames floods; in regard to which they have drawn upon themselves something more than a hint from the Home Secretary that they may be compelled to do their duty or resign their privileges. But leaving this point at present, which we allude to only as confirming the justice of our strictures in regard to the slack sense of responsibility on the part of the Board, we must say a word on another aspect of the question which has been incidentally suggested, but deserves far more consideration than it seems likely to receive. Among the arguments brought forward to justify the legal position of the promoters of the main drainage works, the following quotation from the Local Government Report of last year has been adduced:—"That towns situated on the sea coast, or on tidal estuaries, may be allowed to turn sewage into the sea or estuaries, below the line of low water, provided no nuisance is caused; and that such mode of getting rid of the sewage may be allowed and justified *on the score of economy*" (the italics are our own). The application of this to the particular question at issue is of course that Crossness comes under the conditions thus described in the Report. What we wish to draw attention to is the defence which is made of this way of getting rid of sewage as "economical"; and what is meant by that is (for in no other sense can it be true) that the particular town which gets rid of its sewage in this manner saves the cost of transportation of the sewage, and of the labour required for this, to a place where it can be made useful. Now, just consider what an utterly narrow and one-sided view of "economy" this is. Economy, if it means anything, means a wise saving and husbanding of resources, not the keeping of injurious things about one to save the cost of getting rid of them. Even as regards the special town which thus turns its sewage out on to its shores, there is, therefore, no real economy; a permanent danger to health is thus established, which in the case of a small town favourably situated in regard to tides, may, perhaps, be very slight, but which, it is to be remembered, is always tending to increase. But this economical statement of the matter becomes still more unphilosophical in its aspect when we take a broader view of the subject. No doubt it must be admitted that the golden promises about the national wealth to be derived from the utilisation of sewage, which were too enthusiastically and prematurely made when the idea of utilisation first occurred, can hardly be fulfilled; ratepayers must modify their ideas as to what can be expected in the way of return from that source, and as to the expenditure involved in it both relatively and positively. Still, there are the facts, which may now be taken as almost conclusively proved, that sewage is a nuisance and a danger when passed into rivers, or even into the sea in close proximity to a coast town, while it is innocuous when properly treated as manure; that in the former case it is clear loss, while in the latter case it has a certain "food-producing" power not inconsiderable, though not equal to what used to be sup-

posed. Admitting, therefore, all that has been urged against irrigation, that the farmers will not take the sewage, that it cannot be sold at remunerative prices, and so on,—it must nevertheless be concluded that if no return is obtained from irrigation, it is a wise economy notwithstanding to expend money in putting sewage where, at all events, it does good rather than harm, and making a step towards that ideal economy of physical science which is inferred in the saying that "dirt is only matter in the wrong place." And we may suggest in passing that if we can arrive at an organised system of sewage distribution over the land there is really no reason why the opposition of the farmers,—a class of the community always averse to novelty and not given to philosophise on the reasons of things,—should not be got over by compulsory legislation, just as reasonably as such legislation has been proposed in regard to the irrigation of India, both schemes being considered as concerned with the good of the people at large, to which private inclinations must bend. It is certain that, to carry the irrigation theory into practice in the case of sewage, and more especially in regard to London sewage, a systematised machinery of distribution on a large scale would be required; we say more especially in regard to London, because the amount to be dealt with is so great, and it would be necessary to provide for its distribution over so wide an area, the circumstances being quite different from those of an ordinary-sized town; and as it is pretty certainly ascertained that, at the worst, town sewage is more or less productive as a manure, and can be used in this way with effect in its agricultural results, and without being obnoxious in a sanitary point of view, the question to be considered is whether it is not worth while to set at once about the framing of a comprehensive system of sewage distribution, and the organisation of the machinery of collection and transportation. No doubt this will be a very costly operation to begin with, and will require not only machinery, but labour, the cost of the latter being a continuous item. And it is in reference to this point that we wish to recommend to those who think it so much more economical to run sewage into the sea, an aspect of the labour question, which is worth considering in connexion with the subject. Society is dragged upon by the clog of a very large, and we fear not a decreasing, pauper population; a portion of which consists of those, no doubt, who would always be paupers by option, as long as our inconsiderate and ill-organised charities give them an easy means of being so; but of whom, again, there is a large proportion who would gladly work if work could be found for them. It is one of the greatest difficulties encountered by those who are specially concerned in the work of helping their poorer brethren, especially in the present "slack times," to find any work for those who are willing to work, and who would do anything rather than sink into pauperism. So great, indeed, is the difficulty, that there is even a temptation to, as we may say, *invent* work for these unfortunate classes, and thus save the outward aspect of pauperism, though in reality adopting another form of it. And therefore a work which requires to be done for the general good, and upon which those who are now perforce idle and dependent, could find the opportunity for selling their labour with advantage to themselves and the community, ought really to be considered almost a godsend. If it becomes necessary, therefore, to organise sewage distribution on a large scale (and without some regular and extensive system it can hardly be efficiently carried out), this might really also be a step towards that organisation of labour on a large scale which is the only permanent remedy against the existence of distress and pauperism. And therefore it seems to us that when people talk of "economy" as an element in favour of the running of sewage to waste, they should take into account *per contra* not only the possibility that sewage distribution works may be made to pay their way if properly managed (and, in spite of some disappointments, the contrary is not proved), but also the opening afforded for employing labour on a great scale,—labour which is now idle,—in a way worth paying for in itself, and which would even recoup a great deal of its own cost by the reduction of what now goes to the support, on charitable grounds, of those who have no sale for their labour: not to speak of the incalculable social advantage of being able to turn a number of idle hands to work which would be directly for the *wealth* (as distinguished from "riches") of the whole community. We have sought on more than one occasion to call public attention to the existence of "lands that want hands." The proper treatment of the sewage question would involve work that wants hands, and provide us with a very important and permanent counterbalance against the drag on society, to put it on no higher ground, of hands that want work.

The article, "Lands that want Hands," to which we have referred in the foregoing remarks, and that was published July 9, 1870, excited some attention at the time, and had nearly eventuated in a practical result. The advice seems to us as sound now as then, and the repetition of the paragraph will serve to remind our readers that we have consistently and continuously protested against the waste and evil involved in pouring the sewage of towns into rivers. English capitalists would better serve their country, and probably themselves specially, by devoting some of their accumulations to the rendering of our waste lands fertile than by lending money to Russia to equip armies and form strategical railways to damage British interests, if not Britain.

After discussing in the article in question the mode of forming colonies abroad, we said,—

"There remains the question of the locality. Leaving aside for a moment the consideration of those wide geographical ranges, amid which we have to choose,—the Australian continent and islands, Southern Africa, Hillside India, Canada, that is asking for emigrants,—there is yet another suggestion to make. In the United Kingdom only 46,000,000 acres out of the entire area of 77,000,000 acres are at this moment under cultivation. Why not save the expense of flight, and start a normal home colony or two? We have asked the question before. Why not make the experiment of an organised settlement on a few square miles out of those 89,000 acres of the New Forest, of which we have heard so much lately? There is no untried climate to dread, no savage beast to fear, while the soil is principally sandy. We have the very finest opportunity for the application of sewage; the fertilisation would keep pace with increase of population. Without prejudice to other efforts, we might readily and rapidly establish one or two normal home colonies. Charity, too, might in this case be tempted by the offer of security,—that is to say, the advances asked from private sources would take the form of philanthropic loan (with a good prospect of return) rather than of charitable gifts. Who will be the first to start a home colony on the *Builder*'s plan, and to show that it is not in poisoning our rivers by the rich nitrates contained in our sewage that we show our most lamentable blindness, and our most irretrievable waste of the sources of national wealth? Were the matter taken in hand at once, Victoria Colony or Alexandra Colony, on the Hampshire forest land, might garner good harvests, and develope remunerative industry by the autumn of 1871."

The precise locality we leave open. To show that we have the courage of our opinions, and in the hope of aiding the commencement of a movement which could not fail to have good results, we are willing to depart from a rule hitherto acted on without deviation (*i.e.*, never to have a financial interest in projects we have advocated on public grounds), and to take shares to the extent of (say) 1,000*l.* in any well-considered and well-organised scheme which shall include the reclamation of land by means of London sewage and pauper labour.

THE SOCIETY OF BIBLICAL ARCHÆOLOGY.

"THE CYPRIOTE INSCRIPTION."

This young society has been early brought into notoriety by circumstances which, though they have an amusing aspect, bear evidence of the wide and overpowering sway of modern intelligence; of the fell determination to know and understand about a past some incidents of which have been accepted for 1,800 years as articles of belief; of the audacious confidence with which men will now ransack the site of a forgotten civilisation and apply whatever antiquarian spoil they may find, thereon or beneath, to the elucidation of historical fact or religious fable. That an inscription upon a bronze tablet or plate should have caused the Society of Biblical Archæology to be talked about in several languages and in different countries might perhaps have escaped ordinary observation had not the attention of the archæological community been directed towards the island of Cyprus by the recent publication of a book about its ancient cities, tombs, and temples.* As it is, whoever wishes to be accurately informed about Cyprus, and how its sepulchres have been the means of revealing the mystery of its early prosperity, must read General Palma di Cesnola's record of achievements which we have just reviewed; and whoever wishes to know how the accepted key to the secret of Cypriote writing was discovered must study the Transactions of the Society to which we refer.

The story of what may well be called "The Cypriote Inscription" is at once a triumph and a caution. It seems that some seven-and-twenty years ago the Duke de Luynes, bearing a great French name, and one famous in the annals of literature, obtained from an officer of his Consulate at Beyrouth a bronze tablet, rectangular and oblong in shape, having on one of its shorter sides a small handle with a movable ring; and both its faces were inscribed with an entirely unknown form of writing. The tablet itself is remarkable by placing it so that the ring is always on the right of the reader, each face can be read. The characters follow in Eastern fashion,—though the fashion was not universal, either in the East or in Cyprus,—from right to left. How to read the characters is another thing, and one in which the mystifications of decipherers or restorers have been startling and apparent.

The tablet in question was found in Cyprus, and it is known as the tablet of Dali, or the Dali plate; and Dali was identified, about the year 1862, by the Count de Vogüé, as the ancient Idalium. The tablet is now preserved in the De Luynes collection, at the Bibliothèque Nationale of Paris. Upon it, and all the proof that analogy can afford, the Duke de Luynes, in less than two years, constructed an alphabet, and restored a language. The former with perfect modesty and good faith was published, in 1852, in his book called "Numismatique et Inscriptions Cypriotes."

The Duke had inherited an archæological turn of mind; his mode of procedure was eminently rational. A year after the acquisition of his first prize, the Dali plate, he obtained another bronze curiosity which bore similar words traced in a similar character. He possessed copies and descriptions of medals and coins bearing hieroglyphics of an equally mysterious nature. He had observed in many collections of Grecian antiquities some classed as uncertain or inexplicable which bore on the surface characters or letters inscribed from right to left, and almost identical to those upon the tablet of Dali. He sorted, compared, extracted, tabulated; and he was aided in his labours by scraps of recorded history. The "mixture of Greek, Egyptian, and Assyrian which I call Cypriote art," as General Palma di Cesnola has lately said, was told by Herodotus, who described the Cyprians to be colonists from several nations, — from Athens, Arcadia, Cythnia, Phœnicia, and Ethiopia. The Duke knew that in the island the prevailing language in ancient times was the Greek, and that Grecian authors were familiar with Cypriote literature. But the Phœnician inhabitants had retained their native tongue, and he was aware that a number of words peculiar to Cyprus were of Semitic origin. The inscription was not in Greek, neither was it in Hebrew; the characters were arranged like those of the Egyptians and the Phœnicians. The mode of punctuation was contradictory. A part of the inscriptions was punctuated like many others found in Cyprus which were of Grecian and Phœnician origin; but the most important parts of the punctuation were exactly similar to those found in the oldest Coptic MSS. To decipher the enigma, it was necessary to have, if not an acquaintance with the nationality of the language, at least an alphabet. One of eighty-one letters, tabulated by the Duke de Luynes, was found to contain, when compared with three other genuine alphabets, seven Phœnician, twelve Lycian, and twenty-seven Egyptian characters; and the

* See p. 29, *ante*.

language thus restored was that of a Semitic tongue.

A German, Professor Röth, then came upon the scene; he was encouraged in his researches by the advice and initiatory efforts of the Duke. In 1855, the Professor, aided by a profound knowledge of the Hebrew tongue, produced a translation of the aforesaid tablet. It was neither more nor less than a proclamation in a Semitic language of King Amasis to the inhabitants of Cyprus at the moment when the island was seized by the Egyptians. A word which occurred on the tablet more than once, and which was to be found on other Cypriote inscriptions, was the name of a city: that of Salamis.

But in Cyprus itself there was an English collector of antiquities, her Majesty's Consul at Larnaca, by name Mr. R. Hamilton Lang. In a paper read at the close of 1871 before the Society of Biblical Archæology, he began by crediting the Duke de Luynes with having proved the existence of a Cypriote alphabet; and he produced a bi-lingual inscription upon marble in Phœnician and Cypriote characters, which he had had the fortune to find. Something about the marble would have perplexed any one other than an archæologist; the Cypriote text was nearly perfect, but portions of the Phœnician text had been broken away. Nevertheless, other Phœnician inscriptions found at the same time and place,—at the excavations of an ancient temple of Idalium,—were used to supply the missing fragment. Mr. Lang in compiling an alphabet, contented himself with fifty Cypriote letters as against eighty tabulated by the Duke de Luynes. The former concluded that the Cypriote and ancient Lycian alphabets were both derived from the same source; but that while the Lycians engrafted upon their ancient alphabet a great many Grecian letters, in Cyprus the ancient alphabet was preserved in its original purity and power. As a practical result of Mr. Lang's discovery of the Phœnico-Cypriote inscription,* it may be noted that the word deciphered by the Duke as "Salamis" began the Cypriote portion, and according to the Phœnician counterpart that word stood for "King." This was the first step in the presumedly right direction, and so acknowledged by Dr. Birch in a paper on "The Reading of the Inscription on the Bronze Plate of Dali," read before the Society on 2nd January, 1872. But before then the celebrated Assyriologist, Mr. George Smith, had had a good deal to say about Cypriote inscriptions. He studied the collection of antiquities sent by Mr. Lang to the British Museum, and particularly the bi-lingual inscription upon a fragment of marble. He remembered the situation of Cyprus in the Mediterranean with Asia Minor on the north, the coast of Phœnicia on the east, and Egypt on the south. On reviewing the words in neighbouring languages which have the meaning "king," he came to the conclusion that the Cypriote word for king was *basileus*, the same as the Greek. After further inquiries, he turned to the Dali plate, containing thirty-one lines of writing, and the longest text known in the supposed Cypriote language. He concluded that the language was allied to, though not the same as, the Greek, and he saw in it a Semitic element. This was confirmed by Dr. Birch who, from his own investigations, decided that the Cypriote must be a form of the Greek.

Since then and working upon the basis laid down by Mr. George Smith and Dr. Birch, the Germans have facilitated the inquiry. Moreover, a great number of similar inscriptions have lately been discovered and published by the Count de Vogüé and M. Pierides; one—a bi-lingual inscription,†—contains two words in Greek and Cypriote. What a colossus may not be built upon them! The Dali tablet, deciphered in 1869 at Frankfort and made a Psalm of the colony of Idalium in a Semitic language, was again translated in 1874. Herr Moris Schmidt, with a little precipitancy, published his translation of the tablet and of six other inscriptions. He was followed, the same year, by Herren Deecke and Siegismund. Their labours had been independent of each other, but the results they obtained almost completely agreed. The bronze tablet of Idalium, according to the most recent and trustworthy German version, is therefore thus conceived:‡—

ENGLISH TRANSLATION.

"When the Medes and the Kitians [Chittim? of Scripture] besieged the city of Idalium in the year when Philokupros son of Onasagoras was eponym [or chief magistrate?] the King Stasikupros and the City of the Idalians commanded Onasilus son of Onasikupros the physician and his brethren to heal the men that were wounded in the battle without receiving any fees. And at that time the King and the City made a covenant with Onasilus and his brethren, in lieu of all fees and rewards, to give them from the King's house and from the City [so many] talents of silver. Or else, instead of those talents of silver, the King and the City shall give to Onasilus and his brethren from the King's land, which is in the *sacred enclosure* [?] of Alphirita the piece of land in the valley which adjoins the field of Onkas and all the young plantations which are upon it, to hold it and take all its produce as long as he lives, free from all taxes. And if any one shall expel Onasilus, or his brethren, or the grandchildren of Onasikupros from this land, then the person who so expels them shall pay to Onasilus and his brethren, or to their children, the money aforesaid, that is to say [so many] talents of silver.

And moreover to Onasilus himself, apart from his other brethren, the King and the City have covenanted to give him in lieu of fees and rewards, silver amounting to [so much]. Or else, the King and the City shall give to Onasilus in lieu of that money, from the King's land at Melania in the plain the piece of land which adjoins the field of Amenias together with all the young plantations which are upon it, which adjoins the *street* [?] of Drumion and the sacred inclosure of Athena, and the garden in the field of Simmis which Diithemis the Aramnian held formerly, which adjoins [the house of] Passagoras son of Onasagoras and all the young plantations which are upon it, to hold it, with all its produce, as long as he lives, free from taxes. And if any one shall expel Onasilus or his children from this land, or from this garden, then he who expels him shall pay to Onasilus or his children the aforesaid sum of [so many] pieces of silver. And these declarations mutually exchanged, the King and the City have deposited with the goddess Athena of Idalium with oaths not to break these covenants as long as they live. Whoever shall break these covenants let him be held guilty of impiety. These lands and these gardens the sons of Onasikupros and his descendants shall hold for ever, so long as any remain in the sacred service of Idalium."

So much for the tablet of Dali! Of course we are not prepared to state that, numerous as are the words of the above translation, the last word has yet been said. Death, it is true, has removed some who might have combated the German professors over the Cypriote bronze. The Duke de Luynes is dead, so is his successor; and Mr. George Smith only recently died. The death of Herr Siegismund occurred in Cyprus itself at the early age of twenty-five from the results of a fall during the excavations made within an ancient temple. If any one were to ask us whether we thought that the famous inscription, variously and successively believed by excellent "authorities" to be Phœnician, Egyptian, and Lycian, is at last really and truly deciphered, we should have great difficulty in framing an appropriate answer. Systematically deprived, as the moderns are, by some archæologists, of the faith that has descended to them through generations, other archæologists are perhaps a little exacting in attempts to restore a belief in things historical and biblical according to a more learned but perhaps not more infallible guide. The presumption that the inscription on the Dali plate is Greek was, strangely enough, propounded by a man who is reputed not to have understood the Grecian language. However, though there is no absolute proof that the mystery is truly solved or that the Cypriote alphabet is yet correct, we are so far imbued with archæological conviction as to believe unreservedly in the restored Cypriote language until some other "authorities" conclusively prove the latest "restoration" to be imperfect or false.

Nevertheless, a French authority will not look at the matter with the light heart which we have dared to assume. The whole mystifications and their sequel are very clear to M. Michel Bréal, who, in the *Journal des Savants* of August and September last, says:—"George Smith est le véritable auteur du déchiffrement; car il a vu qu'elle était la langue, et ce premier point une fois acquis tout le reste devait s'ensuivre . . . . Le savant qui continua l'œuvre commencée n'est autre que le célèbre Égyptologue, Samuel Birch." Now, this gentleman is the president of the Society of Biblical Archæology; we have, therefore, no hesitation in saying that our object in describing the Cypriote Inscription mysteries, and the labour of love expended upon attempts to unravel them, is partly to notice a comparatively new and important society; to interest in its proceedings those of our readers who have not heard of it. Established, six years ago, for the promotion of the study of antiquities, discovered in what are called Biblical lands, it has already produced five volumes of Transactions, full of deep and valuable research, carefully illustrated by lithographs and woodcuts. The first part of the sixth volume is in the press, and it contains two fresh Papers on certain other Cypriote inscriptions. Each member receives a copy of the Transactions. The parts are issued twice a year, and a member's subscription is an annual 1*l.* 1*s.* The last published volume (vol. v.) contains some 600 octavo pages of matter, profusely interspersed with illustrations, by well-known linguists and archæologists. Among other contributors we notice the Rev. A. H. Sayce (who is the Foreign Secretary of the Society), Mr. William Simpson, the widely-encountered traveller and correspondent (who is the librarian), the late Mr. Fox Talbot, Mr. J. W. Bosanquet, Mr. W. St. Chad Boscawen, M. François Chabas, Lieut.-Col. Prideaux, and the president. Among Dr. Birch's supporters last year were Mr. Gladstone, the Earl of Harrowby, Mr. Newton, and Sir Henry Rawlinson, who, with others, adorn the list of vice-presidents for the present year.

* The marble is deposited in the British Museum.
† Deposited in the Louvre.
‡ See the Transactions, Society of Biblical Archæology, vol v., part 2, "On the Cypriote Inscriptions," by H. F. Talbot, F.R.S.

POTTERY AND THE NEW YEAR IN NEW YORK.

WRITING from Paris at this season last year, we suggested, not altogether without regard to the interests of the manufacturers, that the Parisians should utilise their immense amount of modern pottery, by constructing a French Monte Testaccio outside M. Thiers's fortifications. The suggestion was not adopted, but those concerned have done the next best thing, they have sent the bulk of their pottery to this country America, to be sold.

At all seasons of the year, Broadway, in New York, displays what appear to be innumerable prétty objects, but at this season especially the shops appear overloaded with finery, and the rage to inspect them, if not to purchase, must be most elating to the already sufficiently self-satisfied Broadway dealer.

Never, it is said, by the New York papers of this date, have the Christmas purchasers been more liberal or more lavish in their outlays, and never have the resources of the shopkeepers to dispose of their goods been so taxed, or more hours of the day occupied in selling; and much is said, almost to disgust, on the beauty of the objects sold, and especially with regard to the pottery, of which, however, one sees costly but ill-considered examples sold at prices so low, that, in the opinion at least of the uninitiated, they cannot possibly have been manufactured for a tenth of the price, in addition to which we are informed by the salesmen that the wares are disposed of at considerably less than the cost of duty.

To the credit of our friends here, we confess we do not see these hideous articles in their houses; most of these fortunate people are already supplied with decorative objects sufficiently costly, and, in point of taste, up at least to the standard of Tyburnia, or the other side of the Park; and the thousands of vases, flower-pots, and *plaques* that are now being sold are destined to make beautiful the innumerable boarding and lodging houses that abound in this straggling caravanserai.

The rage for old and new china that exists just now amounts to a positive tempest, so perseveringly set in that various manufacturers of Europe are obliged to tax themselves with ruinous rapidity to supply the demand, to the injury of good potters, the greater number appearing emulous of producing the largest amount of rubbish.

A New York faïence-shop at this season differs greatly from a London display, owing to the greater varieties of manufacture represented; here we have specimens of ware from

Dresden, Paris, Sèvres, Berlin, Worcester, and various small French and German towns, Limoges, Bourg-la-Reine, Nancy, Luneville, &c., while Palissy, Beauvais, Delft, and Rouen wares are contrasted with Oriental cloisonné work, and the quaint, curious, and costly Satsuma, Kaga, Imary, Hizen, Kioto, and Croquète porcelains of the "Land of Peace," ancient Japan; indeed, the purchaser, be his taste what it may, will find examples of every possible manufacture; Dresden, rare Capo di Monte, faïence from the workers of Bourg-la-Reine. Mediæval jugs, tankards, more modern punch-bowls, or Vieux Nevers, so prized by collectors. Jardinières of various forms, China candelabras, sconces, and Rococo toilette mirrors, *plaques*, "now so fashionable for the dining-room or library," as the trade tell you; punch and salad bowls in gorgeous Oriental colours; German wine and beer mugs, goblets, and tankards.

Japan, Tokio and Kioto, Loo-choo and Corea, have sent to New York many of their lovely things, and much of the beauty of which a greedy commercial spirit is now degrading. If this same commercial spirit, with regard to purely decorative useful objects, should continue in Japan, the time is not far distant when that country's great seats of industry, and the objects they have sent forth to the world for so long a time, will be lost, in the same way and for the same reason that, at the close of the seventeenth century, the beautiful products of Delft, in Holland, entirely disappeared, giving way to commercially-produced "blue china," as we call it, covered with degraded imitations of farms, the very meaning of which the hereditary artists had lost all knowledge of. It is somewhat curious that in the hey-day of Holland's art history, one does not find in the bourgeois pictures of De Hooge, Kalb, or Jan Steen, any representations of Delft ware; as decorations, these were so costly that the princes alone, whose tastes dictated and directed their production, could indulge in such objects, and hence we see in all the domestic scenes of the apparently not too comfortable interiors of the tradesmen of that day, the "crockery utensils in daily use consisting of very ordinary *grès de Flandre*.

Still at this moment there are in New York Japanese stores such collections of beautiful pottery as certainly have never before been brought together, and we may all look forward to the time when Satsuma and Saga wares will be as well known, and in as common ornamental use, as is Minton's and Copeland's china at the present time; but we believe we may rest, but warily, on the comfortable reliance that as Japan will, year by year, send us fewer of its noble products of the potter's art, our Mintons and Copelands will supply the world with ceramic work approaching nearer to that even receding ideal of perfection.

In looking through the various pottery exhibitions, presented to the New Yorkers this year, we find it difficult to point out, amidst the enormous mass of perfectly potted ornamental objects, any single design executed in Europe, painted or printed, possessing that kind of merit that is likely to secure for it a place in the cabinet, certainly not in the affections of any lover of pottery. Some of Doulton's mugs, of course, will be always admired, especially when heavily mounted in silver; as also some few pieces of imitation of various old wares. A few French plates particularly, when representing some of the charming Watteau figures, will always be prized by our lady friends, many of whom are our best art decorators, and most of whom, when they give their well-instructed minds to the subject, possess the doubtful art of making homes beautiful; but, for our part, the only modern pieces of pottery that we have seen in this year's shops, have been some admirable imitations of old English Bow pots, such as Wedgwood's agent desired the manufacturer at Etruria to send any number of to London; and some characteristic Dresden beer-jugs that have been reproduced with admirable skill as precisely suiting the wants apparently of nine-tenths of the population of the civilised world.

All of us would at least agree with Mr. Gladstone's opinion, that the art of porcelain is strictly a branch of fine art, as truly so as the art of the sculptor or that of the painter; but how the Americans are to combine the potter's art, which (we have on this point the authority of Mr. Campbell, of the firm of Minton) they have perfectly acquired, with the art of the painter and sculptor,—a much more difficult matter, -time alone will show.

A great deficiency in the present day with potters, certainly in America, and we think almost as certainly in Europe, is the want of a competent directing authority,—men of nice cultivation,—men like Mr. Thomas Bentley, in the last century, with whom Wedgwood associated himself in the great object of his life,—an object, so wide as to justify Mr. Gladstone's opinion with regard to Wedgwood, that, taken altogether, he was the most extraordinary man whose name is recorded in the history of the commercial world.

One unusual feature in the Christmas show of crockery in the shop of one dealer at least, whose name we are almost induced to advertise without the customary rate, is the display of Wedgwood ware, which, amidst the heaps and piles of imitations of other products and, still worse, original monstrosities, asserts its perfect propriety with extraordinary distinctness. Notwithstanding the classical *motif* of Wedgwood-ware, its exceeding originality appears just now very striking, and as we regard it amidst the mass of incorrectness, one feels not a little ashamed of the neglect that so many of us have felt for that great art-manufacturer's work. What gainers might we not all have been; how highly would not the future have respected us if our modern manufacturers were to retain some accomplished author, well up, and seeking instruction in the history and the meaning of art? How much might not be done, not only in that erroneously supposed narrow field of painting and sculpture; how much knowledge might not be obtained of the art of life, the art that leads men to live properly, to be patient and humble and to strive against always accumulating difficulties?

The scientific resources at the command of the potters of the present day leave barely anything more to acquire; there is scarcely a glaze or colour that is used in decoration that cannot be successfully produced or imitated from existing examples; but with all this knowledge, which America certainly has accomplished, or has within her reach, how can she, whose modern art at least makes no claim to a history of very long duration, hope to compete on equal terms with those who have inherited the traditionary methods of decoration that have existed in some ceramic fields for more than a thousand years, and in Europe equally for three or four centuries.

America has one chance alone of producing an original style of pottery that is likely to take a place,—a worthy place,—in the collections of the next or later generations, not by imitating the products of other countries or by endeavouring to paint broadly (and badly), as they now do, on large surfaces of porcelain or China, but by continuing to produce well-formed useful objects, of various shades of white, few of us, by the way, are aware how varied are the hues of that chromatic wonder and skilfully decorating, always under the direction of the artist, the margin (the *marli*, as the French call it), with some heraldic or emblematic device, appropriately displayed or artfully designed initial, leaving the greater part of the vase or what not to receive the lovely reflections of surrounding objects.

Such designs as these may be seen in the best period of old Bruges ware or Luxembourg ware, and more roughly executed in Pesaro majolica of the early part of the seventeenth century, and in the present day we all like a plain white dinner-plate, especially when we see a well-emblazoned coronet and arms on the margin.

Nothing can be better in its way than the kind of *Grès de Flandre* made at New Haven in Connecticut, which will certainly some day take a place on the collector's shelves. Very many objects of this at present rather coarse ware, may be made, that English purchasers would prize highly, and a skilful artist might suggest no end of designs suitable for this kind of ware.

Unsatisfactory as most American ornamental pottery undoubtedly is,—unsatisfactory as all modern ornamental pottery appears,—we have reason to expect in no very long time that America will produce, and send over to Europe, a mass of decorative pottery, to say nothing of other products from unexpected branches of cultivated manufacture. We must all despair of successfully imitating the best art of the Japanese, whose artists by selection are descended from artists far back even in the history of their ancient society, men who have been bred with a reed or a brush always in their hands, and who appear to desire no other information than how to use their tools properly; but in our day young ladies take to pottery-painting, sometimes as an amusement, rarely, we should think, with any great result, notwithstanding they occasionally reproduce a pretty-looking flower, and copy with some little resemblance a Pompadour figure, and make beautiful white plates sometimes only a little less perfect. Perhaps the best work that is now executed in the decorative potter's way is that done with a base purpose, to lead the purchaser into the belief that he is buying an original piece of Vieux Nevers, Rouen, or some other favourite faïence.

New York.

THE DINING-ROOM.

"ART AT HOME" SERIES.

THE most recent of this series of records of the tastes of the æsthetic party of, say 1875-80, in England, reaches us in the shape of an essay by Mrs. Loftie on the Dining-room.* The book has less that is absolutely absurd than some others of the series, partly perhaps because the author gives herself a wider range than mere fashions of decoration, by adopting the motto that "the best ornament for a dining-room is a well-cooked dinner," which enables her to include in her treatment of the subject a good many remarks upon systems of dining and on what may be called in a general way "social topics," in regard to which her remarks are generally sensible; though we must take most decided objection to one of her theories, that breakfast is a meal to which people may be expected and allowed to come lazily in at any time that suits them, and that consequently the room in which breakfast is carried on should necessarily be provided with special conveniences for keeping things hot, for the supply of late arrivals. That a large number of English people, especially of the wealthier class, do adopt this lazy and unsocial system is quite true; but we protest against any arrangements being made for its encouragement or palliation, as distinctly immoral. People who come down late and irregularly to breakfast, even when alone, very seldom do much good in the world (of course, we except those whose vocations necessarily cause them to work late at night); and when in company with others usually make them uncomfortable. Such persons deserve to be uncomfortable themselves, and ought not to have contrivances for keeping things hot for them.

It must be owned, however, that the motto on Mrs. Loftie's title-page leads one to expect an essay on cookery, and it is a little inconsistent to tell us, to begin with, that the dinner is the chief thing, and proceed to describe everything but that. In fact, the author is so excursive as to lead to the conclusion that some difficulty was experienced in making a book out of "the dining-room" at all. Two of these excursive pieces of criticism we entirely agree with; that in which the gross absurdity of rendering small articles of everyday use "ornamental" by making them in the shape of something intended for quite a different object,—a straw hat for a butter-cooler, and so on,—is stigmatised; and the remarks on the necessity that colour, like music, should be "in tune," and that the harmony of any special scheme of colouring is capable of being deduced on scientific principles analogous to those which regulate the harmony of tones. The parallel is not quite precise, and must not be pushed too far; but it is something to find in the "Art at Home" Series anything that can be called a real principle independent of fashion. The illustrations showing types of furniture are rather better, and certainly more consistent with the theories expressed in the book, than is the case in "The Drawing-room"; one design for a table (p. 61) is, however, very bad, and shows that the writer does not think how the article is made; if she did, she ought to have perceived that in order to obtain the thick knob in the centre of the legs, more than one-half of the material out of which each leg is made would have to be cut to waste; the design is contradictory of the proper process of manufacture, and such design is always bad. For the rest, the book is sprinkled with the usual small conceits, recommendations to whitewash and paper your own walls, and indulge in other fiddle-faddle work which might do very well to serve as an amusement for people who have nothing better to do, or whose education has not fitted them for any better way of

* The Dining-room. By Mrs. Loftie. London: Macmillan & Co. 1878.

employing their time. There are the usual recommendations to hunt out old things, instead of considering how new things may be made as good. Like the rest of her clique, Mrs. Loftie has a contempt for architects, and imagines that whatever they do that is contrary to her ideas proceeds from negligence or ignorance. She complacently tells us that "if builders and architects ever allowed the idea to cross their minds that houses were places to live in" a kitchen on the same floor as the dining-room, in an ordinary street house, might be most convenient, as there might be a "buttery-hatch" for the direct delivery of the dinner through the wall from the kitchen; and in another place she laments that lifts are so seldom used in small houses, and points out that where the dining-room is over the kitchen it could be so easily done; all that is wanted is a kind of cupboard in the corner communicating with both floors; and certainly a better contrivance for bringing all the smells of cooking into the dining-room as a preliminary to the dinner, could not be imagined. That, however, is a trifle which is below Mrs. Loftie's consideration, and which only an architect would condescend to think about.

"CLEOPATRA'S NEEDLE."*

MACAULAY'S eloquent description of the Church of England after its separation from that of Rome, is a striking eulogium of the judicious middle course, the results of which may be said to have left this island more politically happy than the rest of the world. The policy is confirmed and illustrated by a smooth couplet of Pope, himself a member of the most conservative institution among men,—

> "Be not the first by whom the new is tried,
> Nor yet the last to lay the old aside."

Whether in religion or politics, in mundane things of both a general and an individual character, the Englishman's happy medium is pursued and attained. In artistic matters the same thing is witnessed; if a project, no matter what, has to be executed, it is done not with the order and regularity of conventionalised method as in France, nor with the rough procedure of sturdy and heretical initiation as in America or Australia. Englishmen hesitate to regard "the old" in a utilitarian spirit; they decline to accept "the new" if it have nothing but a sentiment to recommend it. We remember to have witnessed the opposing results of old-world traditions and new-world education on the soil of Egypt itself: at the half-way house between England and the Antipodes. Towards the close of an afternoon in May, a few years ago, we were entering the city of Grand Cairo on the line of railway from Suez; and we then saw for the first time the great mosque of Mehemet Ali towering in front of us. In the next carriage were some Australians; their heads stretched out of window were directed towards the factory chimney which broke our view of the Pyramids. "There," cried we, "are the Pyramids!" "The what?" inquired they; and while we saw only the Pyramids they saw nothing but the factory chimney. The next day the Australians, a Frenchman, and ourselves, reached,—after hard climbing, which a small army of Arabs pretended to aid,—the top of the Great Pyramid. Gazing, as we all did, on an expanse of nothingness, the Frenchman broke silence by lamenting the want of an administration which would have placed Cheops's monument in the midst of a vast square with fountains, waterfalls, avenues of trees if not sphinxes, surrounded by a boulevard of restaurants, cafés, and café-concerts. The Australians were differently inspired. Had Cheops chosen Melbourne or Sydney for the seat of immortality and built a pyramid there, Barnum's representatives would have "run up" an easy stair and a neat handrail; tram-cars would have conveyed passengers with return-tickets from the city to the Pyramid top. The Englishmen, descended of an exceptional race, and being the citizens of a country with an exceptional metropolis, took a middle course: they said nothing.

That "nothing" so exactly describes the situation in which London is placed with regard to her promised obelisk, it is so truly illustrative of the chaos in which all matters relating to metropolitan adornment, or even improvement, are plunged, that we have ventured to introduce our own contribution to the already numerous stories of Egyptian travel. Though, in spite of possible accidents, "Cleopatra's Needle" is likely soon to reach the banks of the Thames, nothing is decided concerning its destination, nor, as far as we can perceive, does it seem to be anybody's duty to collect the fragments of public opinion and evolve out of them a mature decision. All that is absolutely certain is that Mr. Erasmus Wilson has chosen to make the nation an eccentric and a munificent gift, and that pending its formal presentation he has published as readable a book as it is possible to write upon a subject on which nearly every Egyptologist differs, and in the elucidation of which the "authorities" themselves are admittedly astray.

Such being the case, Mr. Erasmus Wilson has, perhaps wisely, made a book to attract public curiosity rather than one to confound private learning. Of course, he is an enthusiast; why should he not be? Because a man is scientific and endowed with faith, although a philosopher, shall he be deprived of the privilege of making sly cuts at "moral fitness" or commanding by appropriate references to Biblical story the attention of a Thwackum as well as a Square? Must even an obelisk from Syené be measured by that modern standard which Thackeray denounced as a miserable little two-foot rule? We confess to having enjoyed the book, and though we distinctly decline to believe that that famous sycamore tree near the site of the Egyptian Heliopolis was big enough in the year one to shade a Holy Family,—and though we, as critics, persist in pointing out that Catherine de Medici died a hundred years before our Charles II. died, and that possibly Henry II. of France is intended at page 36,—we heartily praise the style of gossiping narrative that the author of "Cleopatra's Needle" has used to make Englishmen familiar with the half-legendary stories bound up in his magnificent present to them. Here is a specimen of Mr. Wilson's mode of describing what is interesting alike to Marazion and to Cape Town:—"This maritime power of Egypt calls to mind two leading prejudices of the ancient Egyptians, which very much influenced their destiny: they were averse to change, preferring in all things to remain as they were, rather than risk the uncertainty of reform; and, secondly, they had a religious horror of the ocean, believing it to be a breach of the divine law to endeavour to subdue it, and attempt to navigate it. Therefore, when we hear of ships from Alexandria finding their way through the pillars of Hercules (otherwise the Straits of Gibraltar) to England, we recognise at once the adventures of neighbouring nations, particularly that of the Phœnicians, who traded with Cornwall, exchanging wheat for metal more than 500 years before the Christian Era. The last of the Egyptian kings, Nectanebo II., made a struggle against this ancient prejudice, and fitted up a fleet in the Red Sea manned by Phœnicians. His ships, steering steadily to the south, and afterwards following the line of the coast, succeeded in rounding the Cape of Good Hope, and reaching the Straits of Gibraltar, and so accomplishing the circumnavigation of Africa. The voyage lasted between two and three years, and the captain returned in safety to Egypt, but without his ships; he consequently failed to obtain credit for, or belief in, his success."

Page after page contains some bit of information or historical allusion incidental to obelisks in general. Pompey's, or rather Diocletian's, pillar at Alexandria, which we remember to have seen pointing heavenwards out of an uneven, a dirty and barren open space; the siege of Alexandria by Diocletian; Cairo, the queen of Eastern cities to all those who do not know India; the rainfall at Thebes; Dean Stanley and the sphinx; the Nile voyage; mummies; Queen Hatasou; the manufacturer of antiques; the obelisks in the British Museum; hieroglyphics, inscriptions, and a host of minor things, are lightly touched upon in an easy and amusing manner. The total number of obelisks said to be standing is, according to Mr. Erasmus Wilson, twenty-nine, and of these only six remain standing in Egypt itself; that is to say, one at Alexandria, one at Heliopolis, two at Karnak, one at Luxor and one at Philæ. But there are at least four obelisks intact and erect at Karnak, two of which,—a pair not above 20 ft. high, and with the lotos-leaf ornament carved upon their faces,—are remarkable exceptions to the Egyptian monolith. We cannot venture to give the size of the larger obelisks at Karnak, though Mr. Wilson, as the latest writer upon the subject, is bold enough to say that one is 75 ft. and another 97 ft. 6 in. in height. In Denon's great work, dedicated to the French army, and crowned by the Institute of France, there is an etching of the Karnak ruins, showing two great obelisks *in situ*. Nothing has occurred to disturb them since Denon sketched them; only the neighbouring village of Luxor contains an obelisk less,—that which now marks the centre of the Place de la Concorde.

Though the author of "Cleopatra's Needle" quotes confidently and freely from modern books like "A Short History of the Egyptian Obelisks," by Mr. W. R. Cooper, and from Mr. Bonomi's papers and Mr. Sharpe's works on obelisks and other Egyptian antiquities, he makes no mention of the fact that in the very first years of this century a learned French architect, Rondelet by name, published in his great work on the "Art de Bâtir," a comparative view of twenty-six obelisks together with some of their bases, and a more or less accurate table of heights in feet, metres, and other measures. We mention this because though Rondelet's learned and comprehensive work is known to have been the foundation of more than one subsequent book on building, he has not been sufficiently credited with the honour of early researches into the matter of obelisks. To Mr. Wilson's book is added an appendix in which several letters, amongst others a valuable one from Mr. Arthur Arnold to Lord Henry Lennox, and quotations, amongst others two from the *Builder* of 1851, are printed. The book itself concludes with an allusion to the transport of our obelisk to London and its proper site. "Since the prospect of its arrival has dawned," says the donor, "many have shown an interest in its disposal. Its earliest friend was the Earl of Harrowby who considered it worthy of one of the noblest sites in London; and sees in that site a 'moral fitness.' Indeed, to ourselves [that is, to Mr. Wilson] the question is not so much, -where it will look the best; as, where it will best be preserved and appreciated;—and we certainly know of no spot in the metropolis so fitting in every respect as St. Stephen's-green, otherwise Parliament-square, with its noble and venerable monuments and traditions. We could point out many good spots for its erection, but none better; and when the great height of the monument is taken into consideration, and the obstacles to moving it through a crowded city are considered, we ought to be more than content with the precincts of Westminster Abbey as its ultimate resting-place." We are sorry to differ, in this one particular, with our friend, Mr. Erasmus Wilson; and to differ unreservedly. We have already more than once printed our opinion about the proper site for such a trophy as the coming obelisk; and nothing has occurred to alter them.

* Cleopatra's Needle: with Brief Notes on Egypt and Egyptian Obelisks. By Erasmus Wilson, F.R.S. London: Bruin & Co.

THE ECCLESIASTICAL ARCHITECTURE OF RUSSIA IN THREE ERAS.*

III. THE RENAISSANCE STYLE. A.D. 1689-1858.

WITH the foundation of the new capital of Russia—St. Petersburg—the latter became the centre of Government, and, like Kief and Moscow, the field for the further development of architecture, at first in the Renaissance style, evidently borrowed, and subsequently in buildings in the national style. In the time of Peter the Great, and during the reign of his immediate successors, churches were built partly as the necessity arose, and partly in commemoration of historical events. Judging from the existing memorials of those times the architecture did not present any new elements in the proportions and parts of the Byzantine style, which was revived by the national taste of the sixteenth century, what has been added is a scarcely perceptible lightness. We see this in two churches of that period, which have been preserved and afterwards restored; that of the Holy Trinity, built as a memorial of the foundation of St. Petersburg, and restored in 1756; and that of Samsonee, erected in commemoration of the battle of Paltava, and restored in 1728. To the reign of Peter the Great belongs also the Church of Peter and Paul, within the fortress, also subsequently restored; this structure boasts the highest belfry-tower or steeple in St. Petersburg, built by Balles, a Dutch architect,—it is 383 ft. in height. But from the year 1749,—from the

* See vol. xxxv., pp. 1215, 1291.

date of the arrival in Russia in the reign of Elizaveta Petrovna, of Count Rastrelli,—ecclesiastical architecture was again resuscitated. The finest specimen of Rastrelli's style is the Cathedral of the Smolny* Monastery (1757 1832), situated on the finest site of the capital at its highest point at the great bend of the river Neva, —it, in the fullest sense of the word, reigns supreme over the locality surrounding it. Having a broad foundation, with plenty of room for the internal development of an extensive church, the exterior face of the structure is decorated with Gothic lightness, but without the least trace of the abuse of it. With this view for the exterior have been brought together all the elements of the Renaissance style, small light Corinthian pillars, pediment, and friezes, and semicircular and circular window-openings. The Byzantine domes undergo a complete transformation; from being wide and massive they become round and light, often transformed into flèches and thin points. The modern architecture, by its light, airy character, imparts to the buildings almost a poetic character, and contributes in a marvellous degree to the beauty of the landscape. This is the reason why Rastrelli's style gains so much in open and lofty localities: this is the prominent situation of the Smolny Cathedral and the Church of St. Andrew at Kief; the latter may be considered as one of the finest productions of this architect. But the great Renaissance movement made a deep impression upon art.

The imitation of great models became the rage. The Cathedral of St. Peter at Rome exercised a most fascinating influence on artists studying Italian art, and it could not be otherwise, seeing that on this structure were engaged the greatest artists the world ever produced. At St. Petersburg, after the model of this celebrated edifice, was built the Cathedral of Our Lady of Kazan. The general view of the church from the side of the Nefsky perspective presents a portico with six columns, with an attic and the dome above, and on each side a semicircular colonnade, formed of sixty-six columns, each having a diameter of 280 ft. The exterior of the main body of the structure is decorated with the elements of the Corinthian order, presenting pilasters at the sides of wide square windows, arranged in two stories, while the top windows are smaller in size,—a massive and elaborate cornice, and a high attic along the top edge of the building. There are three porticos on the north, south, and west sides; the largest one is at the western entrance. The walls are faced with a kind of yellow-grey freestone, and the capitals, bas-reliefs, and statues are made of the same material. The architraves are composed of entire slabs. The bases of the columns and pilasters are of cast-iron. The portico over the northern entrance is decorated with colossal bronze statues of John the Baptist, the Grand Prince Vladimir, St. Alexander Nefsky, and St. Andrew, cast by Yakimoff; the first after the model by Martios, the two others are by Pimenoff, and the latter by Demuth. The doors on this side are cast in bronze, according to the originals by Batister in the Florence Cathedral. The facing of the walls has suffered from the weather. The other doors are of wood. These two circumstances give to the cathedral a neglected and unfinished appearance, which shows itself also in the empty niches of the remaining porticos, evidently formed for similar statues. This is easily understood, seeing that the cathedral was consecrated in 1811, and that eight years later the foundation was laid of the Cathedral of St. Isaac, attracting to it the whole of the artistic power of the Empire. The interior of the Cathedral of Our Lady of Kazan is exceedingly grand, as with its architectural beauty is combined an extraordinary simplicity. The plan of the church is a Latin cross, being 238 ft. long and 182 ft. wide; the western arch occupies the space of 84 ft. The height from the floor to the top of the vaulting is 63 ft., and to the top of the dome 154 ft. The dome rises over the middle of the cathedral, ornamented with pilasters, and lighted by sixteen windows, and covered with a double vaulting. From the four piers which support the dome, extends to the high altar and to the three main doors of the church a colonnade, formed of four rows of Corinthian pillars of polished Finland granite, the monoliths forming the shafts of the columns are 35 ft. in height and 3 ft. 6 in. in diameter, their bases and capitals are of bronze; the capitals of the Corinthian order are remarkable for their elaborate design, instead of rosettes in the middle of the top edge, heads of cherubims are introduced. The silver ikonastasu of the high altar was made from the design of the architect, Ton; the four jasper pillars on each side of the "royal gates" (leading into the altar, and forming part of the ikonostas) cost 8,000*l*. One of the most striking features in this ikonostas are the branches which twine round the top semicircle and the crosses arranged on it, and showing through the interstices the bright crimson altar curtain behind. All this is executed with good taste and excellent finish. The quantity of solid silver used on the ikonostas amounts to 2,170 lb, and for the embossing and chasing alone of this silver was paid 30,000*l*. The "Royal Gates,"* which weigh 720 lb., and the balustrade in front of the altar-steps are plated with solid silver. The rays above the gates are also of solid silver, thickly gilt, and surround the word "God," formed of precious stones. The place or throne for the emperor, and the pulpit for the preacher (placed near the two piers supporting the dome, opposite the altar), as well as the floor of the church, are of marble of various colours, from the Governments of Olonets and Finland, and some from the Government of St. Petersburg. The steps leading to the altar and to the emperor's seat, and the preacher's pulpit, are of jasper. The statues and bas-reliefs are of plaster and alabaster. The paintings in the church are executed by the Russian artists Egorof, Shebouyef, Borovikoffsky, and Bessonny. As deserving special attention are pointed out the paintings on the piers representing episodes from the lives of "the three prelates." The dome, together with the cross, rises to a height of 231 ft. from the level of the ground, and, besides sixteen windows, is ornamented with a coronal of round window-openings. The aggregate cost of the structure amounted to 615,000*l*. The chief architect was Mr. Voronikhine. It is noticeable that all the materials for the construction of this church were obtained in the country, and that all the decorations and ornamentations were effected by Russian artists. Of the churches erected in Russia after the Kazan Cathedral should be noticed those of Troïtsky (Trinity) and Preobrajensky (Transfiguration). Both these churches resemble each other in their general architectural features; but the most noteworthy is the Troïtsky Cathedral. It was consecrated in 1838, and owing to its height (266 ft.) and classical form is exceedingly attractive. Near the central great dome are grouped four smaller ones, placed over the three principal naves. This group of domes, on a lofty, graceful, and well-proportioned edifice, imparts wonderful beauty to the whole. Corresponding to each side dome are four porticoes, of the Corinthian order, with elaborate friezes, bas-reliefs, and capitals. The columns are of a beautiful shape and proportions. This cathedral can be seen at a distance of 20 versts all round, and in fine weather produces a most charming effect, with its azure blue cupolas dotted with golden stars.

We have now to describe the most celebrated cathedral in Russia, that of St. Isaac, in St. Petersburg, on the construction of which, during half a century enormous sums were expended, and employing all the artistic strength of the empire. The cost of the building was 3,450,000*l*. The Cathedral of St. Isaac is situated in the very centre of the town, near the Neva; from the opposite side of which is disclosed a beautiful view of this edifice, and also in an oblique direction from the Admiralty, situated in the centre of the junction of the three principal streets of the capital. On the two sides of the cathedral are two splendid squares, laid out with flowers, shrubberies, &c.; one containing the monument to Nicolas I., the other the celebrated statue of Peter the Great, by Falconnet. This church is the highest structure in St. Petersburg, and towers above the surrounding lofty buildings of that part of the town. The architect was Mr. Auguste Ricknard de Montferrandt, who had already gained notoriety in the erection of the celebrated monument to Alexander I., —a granite monolith of extraordinary dimensions. In the construction of the building, besides Montferrandt, all the most celebrated Russian artists of the last half-century took part, among whom we may mention Brulow, Shebouyef, Steiben, Brunni, Bassin, Vitali, and Klodt. In the technical execution were engaged the best works and factories of the capital. For materials,—the marble was obtained chiefly from abroad, and the granite from the quarries in Finland. At the head of all this activity stood the late Emperor Nicolas I., whose iron will, constant care, and solicitude were instrumental in forwarding the rapid accomplishment of this gigantic undertaking.

That the works proceeded rapidly, taking all things into consideration, is proved by the circumstance that many of the technical arts connected with them had to be established, of which nothing had been known for the last century in Russia. As an example may be taken the production of mosaics. The Emperor Nicolas wishing to have the same applied to the representation of religious subjects in the new cathedral, in 1851 in the Academy of Sciences, a manufactory was established, and in 1858 the whole of the lower tier of the Ikonostas was decorated with mosaic pictures of enormous dimensions. In executing the erection of this building, Montferrandt not only demonstrated that he had full knowledge of those sublime laws of architecture which impart to the most gigantic proportions and complicated details the impression of grace and simplicity, but that he knew how to overcome a multitude of difficulties. We should bear in mind that he had strict injunctions to keep to the exact site on which stood the former church, and besides to preserve intact the parts of the old altars which had been consecrated. The general appearance of the church is exceedingly simple, and it is against this very simplicity that many short-sighted people—the seekers of powerful but non-enduring impressions—raise their objections. It is a rectangular case, on which is placed a dome of nearly the same height as the former. Each side of this square mass has a classical portico, the substructure of the great dome, surrounded by a circular full and elegant colonnade; then the transition from the rounded lines of the dome to the straight lines of the foundation is smoothed off by four small cupola belfry towers, and fur-sculptured ornaments at the corners of the top edge of the body of the building. These are all the salient features of the exterior of the church.

There exists a theory in art which does not recognise the composition of the round colonnade with a rectangular base, but here the violation of the artistic taste is to be explained by the history of the architecture, which recognises the lawfulness of such a composition. Thus Montferrandt in this instance was influenced by the example of Michelangelo himself, and a host of ecclesiastical structures, as much as he was restricted in the general disposition by the plan previously composed. However, it is but just to acknowledge that the architect has come victoriously out of the struggle. It is only from a distance, from the sides and from a certain height, that one perceives the abnormal composition, but viewed from the front at a short distance, the harmony of the effect is not disturbed in the least. The dome itself consists of three separate cupolas; the first, a spherical one, decorated with paintings seen from the interior of the cathedral, the second of a conical shape seen through the opening of the first, decorated with rays formed of shining brasswork terminating at the lantern, the third dome is the gilt one seen from the outside. The two first domes, *i.e.*, the hemispherical and conical, are formed of cast-iron ribs secured to a cast-iron ring resting on the top of the brickwork of the drum of the great dome, thus forming the key of the whole system of the ironwork, and the copper-gilt roof of the dome is fixed on iron rafters resting on the ribs of the conical vaulting. The space between the ribs of the first two cupolas, the hemispherical and conical, with the view to lightness, instead of bricks, is filled up with hollow cylinders of burnt clay (with all this lightened construction the aggregate weight of the dome is 2,197 tons, and this mass is lifted to the height of 140 ft.). The space between the middle conical vaulting and the attic of the dome, where its gilt roof commences, is lighted by twenty-four windows. In this space, between cast-iron pillars supporting a splendid system of iron ribs, constructed on the American principle, from the windows of the attic up to the lantern under the gilt roof winds a beautiful iron spiral staircase, leading through an opening to the lantern inside the gilt railings. We come now to the porticos; looking at them first in front and then a little sideways we get a majestic profile of purely classical lines. The columns are in the Corinthian style of the most sumptuous

* At present a school for young ladies of noble birth, supported by the State.

* The ikonostas has generally three entrances, the "royal gates" being in the centre. They are so called symbolically, because the form of the entrance to the throne (altar) of the King of Heaven.

kind of solid dark red granite. The length of the porticos is 220 ft., the length of the pediments 126 ft., and height 28 ft. The pediments and bas-reliefs of the porticos are executed in the most magnificent style. The granite monoliths on which the pediments rest vary in number in the different porticos. The columns in the northern and southern porticos are all arranged in three rows of sixteen in each row, and in the eastern and western in one row of eight columns. This difference in the porticos arises, as we have previously stated, from the plan of the building having been made according to the foundation of the old church, and also to the fact that the eastern and southern porticos were added afterwards. The original plan of the church differed considerably from that which was actually carried out. At first the architect intended to have only two porticos, and to place, instead of the four small towers, four large domes like the Troitsa (Trinity) Church, described above. It should be observed that for putting up the heavy columns of solid granite the most careful handling was necessary, and the most strict supervision over the construction of the scaffolding and appliances, and it is just here that Montferrandt deserves particular praise. It will not be out of place here to give the dimensions of the different columns of the St. Isaac's Cathedral, as compared with other celebrated monoliths:—

The Alexander Column at St. Petersburg without its pedestal and capital	84	ft. high
Pompey's Pillar in Alexandria	63	,,
The Obelisk of St. Peter's at Rome	78	,,
The Columns in the Porticos of St. Isaac's Cathedral	56	,,
Of the Columns, the Pantheon in Rome (St. Maria de la Rotonda)	46	,,
The Columns of the Dome Colonnade of St. Isaac's	42	,,
The Diocletian and Caracal Towers	28	,,
The Thirty-two Columns of the Belfry Towers of St. Isaac's	26	,,

The erection of the columns in the colonnade under the dome naturally required still greater care and skill, and more complicated mechanism and machinery. The marble ceilings of the porticos are divided in their length into three sections; the two side ones are flat, and the middle one has a hemispherical form. These ceilings are ornamented with *repoussé* brasswork and garlands, heads of cherubim cast by the galvanoplastic process, and other ornamentations. The floor of the porticos presents a tesselated pavement of white marble and red and grey granite, of a beautiful design. Three porticos serve as vestibules to the cathedral, which have magnificent bronze doors. The eastern portico covers three semicircular windows. In the north and south porticos, near the doors, are two niches, with three small doors in each, with a bas-relief over the latter. A semicircular bas-relief crowns each large door of these two porticos. Besides that, magnificent bas-reliefs decorate the pediments, and on the roof of the porticos are placed statues of the Evangelists and Apostles. The disposition of the bas-reliefs and statues decorating the porticos is as follows:—In the north portico the pediment is decorated with a bas-relief representing the "Resurrection of Christ," by the sculptor Lemaire. On the roof of the pediment are placed (from right to left) the statues of the apostle Peter, and John the Evangelist, and the apostle Paul; the statues of the work of Vitali. Above the great door a bas-relief representing the "Crucifixion." Above the small doors, "The Bearing of the Cross," and "The Burial of Christ in the Sepulchre," by Baron Klodt. The southern portico, a bas-relief of the "Adoration of the Magi," by Vitali; the statues of St. Andrew, St. Matthew, and St. Philip. Bas-relief over the great doors, the "Adoration of the Shepherds," by Vitali. Over the small doors, the "Massacre of the Innocents" and the "Appearance of the Angels to the Shepherds," by Professor Loginoffsky. The western portico, a bas-relief of St. Isaac and the Emperor Theodosius, by Vitali; the statues of St. Thomas, St. Mark, and St. Bartholomew. The southern portico, a bas-relief, St. Isaac, St. Luke, and St. Simeon; St. Isaac and the Emperor Valentine, by Lemaire; the statues St. James, St. Luke, and St. Simeon. From this enumeration it will be seen that the greater portion of the sculpture work fell to the lot of Vitali* (1794–1855). Vitali belongs to that class of artists whose talents develop themselves early in life, and who, when once brought out upon the broad path of their career, unfold their talents in all their splendour; in one word, this is not a plodding, laborious worker, but a genius in the fullest sense of the word. Besides the four bas-reliefs and twelve statues, Vitali produced the plaster casts of the caryatides and four groups of angels for the exterior decorations, twelve angels for the interior decoration of the dome, and two groups for the high altar. His best production, as also the best bas-relief, we consider to be "The Adoration of the Magi." In this composition the figure of the Virgin Mary is particularly artistic. The artist had to represent in the attitude and expression of the Virgin holding the infant Christ in her arms, pride and humility at the same time. All this will be found in the outlines and position of the figure. The remaining figures of the bas-relief are remarkable for the correctness of the drapery, the beauty of the postures, and the accuracy of the execution.* The other bas-relief by the same artist, St. Isaac and the Emperor Theodosius, is noteworthy for its historical interest. There, in the person of Theodosius, is represented Czar Alexander I., and in the person of the wife of the Emperor, the wife of the Czar; in the figures of the two courtiers, Prince Volkonsky and Olenine.† Montferrandt is also represented here holding a model of the cathedral. The two bas-reliefs of Lemaire (who also made the plaster-casts of the bas-relief of the Paris Pantheon) are not equal to the foregoing. One of them, St. Isaac and Valentine, may be regarded as a successful piece of work, and is noteworthy for its equestrian statue of the Emperor; but the other, "The Resurrection of Christ," is characterised by its dryness and the angularity of the figures.

The large doors leading into the cathedral alluded to above are of bronze, from the models of Professor Vitali. These doors are the largest in the world; and as regards the value of the material, and the beauty and elegance of the workmanship, as a first-class artistic production they will bear comparison with any of the other celebrated productions of this kind. Let us now glance at the technical construction of the building itself and the exterior walls. For the purpose of laying the new foundation (we must recollect that the cathedral is built in the plan of a former structure, and that some parts of it had been left), trenches were dug from 17 ft. to 21 ft. 6 in. deep. Into these trenches‡ piles were driven 21 ft. in length, the space between each pile being 14 in.; the piles were then cut level, and the intervening spaces rammed down tight; direct on to the piles were laid two rows of granite blocks, in length from 4 ft. 6 in., to 6 ft. 10 in., in width, 3 ft. 6 in., and 2 ft. 4 in. in thickness, joined together with iron clamps, and run in with lead. Upon this level surface was laid the rubble, 14 ft. in height, of socle slabs interlaid with granite stones, and occasionally in places which were to bear the weight of the arches, the dome, porticos, &c., the rubble consisted of a compact mass of granite; all this is bound together and run in with lead, like the lower course. The entire length of the foundation is 364 ft., and the width 315 ft. The foundation is provided with ventilating galleries 21 in. in height.

On the outside the foundation is faced with a socle of red Finland granite placed in two rows in blocks of from 4 ft. 6 in. to 6 ft. 10 in. in length, which are joined together with iron clamps, and run in with lead, and finished on the outside with a brilliant polish. The walls were laid in brick, on a course of granite and slabs of paving stone. From the granite socle to the roof (to a height of 105 ft.), the walls are faced with grey Russian§ marble. The four corners of the building above the entablature are decorated with eight bronze caryatides of angels, and higher at the corners of the attic are placed four groups of angels kneeling at the foot of tall lamps or candlesticks, ornamented with garlands and flowers. The nine large windows of the cathedral dome, 30 ft. 4 in. high, 11 ft. 4 in. wide, are ornamented with granite columns on consoles, with a cornice above them, and with galvanoplastic ornamentation. The substructure of the colonnade of the dome is of brick covered with marble, but the walls of the drum and lantern are of copper sheets, painted in imitation of marble. In conclusion of the description of the exterior we will here give the general dimensions of the cathedral:—

	Ft.	In.
Height, together with the cross	333	8
Length from east to west	365	7
Width from north to south	320	10
Height of the body of the church, from the foundation to the line where are placed the small cupolas	114	4
Height of dome, from its base to the base of the lantern	129	6

The interior of St. Isaac's Cathedral has all the attributes of a most sumptuous temple, with its quantities of gold, marbles of various colours, paintings, statues, malachite, lapis-lazuli, &c. The shape is that of a large parallelogram, in the eastern part of which is situated the high altar, and at the sides two small altars. The high altar opposite the western entrance, which is in three tiers, is decorated with ikonas, or holy pictures, in mosaic, with ten splendid highly-polished malachite pillars in front; behind the high altar is the chapel altar, of white marble, transparent, and shining with the gilding of the decorations, and crowned with a brightly-gilded group of "The Transfiguration." The floor is composed of marble parquette, and the walls and pillars are faced with valuable coloured marbles, with encrustations. The dome is decorated with twelve figures of angels, gilt, and the vaulting with ornaments and groups, and partly with paintings, as are also the niches in the lateral naves. These *platfond* paintings, in the most prominent parts, were executed by Bruni;* the latter executed also many of the frescoes, a row of which decorates the attic above the grand cornice, representing scenes from the sacred history of the Old and New Testaments. The *platfond* picture in the great dome, of the Virgin Mary surrounded by saints, and the Holy Apostles and Evangelists on the vaulting, were executed, partly by Brulow and partly by Basin, from the cartoons of the former. The two groups above the small ikonostases are by Piemenoff. The entire area of the interior of the cathedral is 112,000 ft.

CONSTANTINOPLE: PRESENT AND PAST.

No one at the present moment can feel otherwise than interested in the famous capital of the Turk—Constantinople, and in the precise look of its streets, and mosques, and other public buildings. If the river which runs through London has given to it a special direction and character, which it undoubtedly has done, so most certainly have the Bosphorus and the Golden Horn, and the surrounding country, given to Constantinople its special and peculiar character, and has made of it, as far at least as "site" goes—the finest city in Europe, if not, in the world! The Sultan's city is well worth a little trouble to get at, and to know a little about,—not exactly in the ordinary tourist's way of looking at such things, and as we are here but too apt to look at it,—but as the Turk himself sees it; not looking down upon it merely, but to be in it, and thus to see it—as a purely Turkish town.

In the first place, it is a noteworthy fact, not so generally apprehended even by professional builders and fine-art inventors and artists as it might be, that, while it is all the wide world over the steady aim of the layers-out and "planners" of modern towns and cities to make all the streets of them "straight streets," and quite even in width from one end of them to the other, and to as far as is possible make all the buildings in such street-ways quite even in height and, we had almost said, alike in architectural character, it would seem to have been the aim of the old town-builders, if they had any settled aim,—to make of the old towns a perfect maze of irregularities, and right puzzling ins and outs. No one street is ever, except by accident, straight; no two houses are alike, either in width or height; no one architectural thought in wood, brick, or stone, is ever like another. All would seem to be the result of accident, and each house the thought, the independent idea, of a new builder. No one can visit a town of the Middle Ages, or the parts of one wherein the old work yet remains intact, without note of this, and without a consciousness that he is looking, not at an organised and planned result, or at systematised art-action, but at a succession of artistic thoughts, rude enough at times, perhaps, but individual and independent of each other, as the pictures one after another in a gallery display.

* Russian Art-Journal. 1858. No. 19.

* St. Isaac et Theodose de Vitali, par A.W., A.R. 1846. vol. ii., p. 69.

† L'Adoration des Mages, Bas-relief de Vitala, par de Wite, Artiste Russe. 1846. Vol. iii., p. 1.

‡ St. Petersburg is built on marshy soil.

§ This marble was obtained from the Muccosol and Tivsi quarries in Finland, opened in 1819. The colour of the stone is whitish, with bluish and yellow veins.

* Description of Bruni's Cartoons, Artiste Russe, 1847. Vol. ii. pp. 33, 135.

Now all this irregularity, and want of definite, or indeed, any, plan, is accurately descriptive of Constantinople as it yet is, except, indeed, in those parts of it in and about the Imperial Palace, and the Government and public offices, and in and about all that section of it which has been the result of French influences. All these are of modern growth, and of to-day, and are not, for the most part, by native Turkish architects and builders at all, but by non-Turkish architects and designers,—the Imperial Palace conspicuously so. But it is not with this that we are now dealing, but with the purely Turkish and native portions of the city; an existing fact, not a little remarkable and noteworthy, and may some day or other, not very distant perhaps, exercise no small influence on the very fate of the imperial city itself. We have before us a pretty fairly accurate plan of the city, of quite modern date, and another of it before the "improvements" commenced by the later Sultans, so we can form a pretty accurate estimate of the facts as they were, and yet are. In the first place, a straight line on plan anywhere hardly exists; all the streets and narrow ways are as crooked and tortuous as they well can be, or as chance and accident can well have made them. The houses—or human dwelling-places shall we call them?—are as uneven in width and height as they well can be, to suit perchance simply the wants of each individual house-builder. Every street, in short, is a picture, inconvenient enough, for the street-way or road is as uneven as are the roofs of the houses; but a picture it all makes, if there be any meaning at all in that but too wide term. It was just such rough and uneven street-ways as those, with a bright sky, and the dome of some mosque in the distance, that Turner, at his best, loved to paint and luxuriate in, and to afterwards hang on the walls of the Royal Academy to be wondered at, and longed after by eager crowds! What such may be to live in may be another matter, but we are in Constantinople, and not in London, not in our modern and ever-to-be-renewed City,—without dreamings or romantic longings. These strange and narrow ways are, too, for the most part, silent, like the water-way streets of Venice, and, having no names, you must needs find out for yourself, by dint of instinct, where you are, and which way to go. It is the poetry of town-building, and seems the very place for those who will and do wander from London or Paris in search of the "picturesque," and for those who would see a little into the origin of town and city building, and like to see how the present has grown, and does yet grow, out of the past, or supplant it.

It would be impossible, even by comparing Constantinople with any famous Middle-Age European town, when in its very best and most picturesque state, to surpass the quaintness and irregularity of a purely Eastern city. Grand Cairo, Samarkand, and many of the towns in Central Asia, of which we get now and then glimpses by happy accident, are right full of this quaint picturesqueness, and fully bear this out. Constantinople is yet in its way, and in the purely Turkish and non-improved parts of it, as quaint and individual as any of these. We need not to point to any special part of it that we know of, for all of it is so more or less. Nay, in the most improved and modernised and "Frenchified,"—for what better word for it is there?—parts of it this is apparent. The Turk, to a certain extent, still powerfully asserts himself. Opposite the great mosque of the Santa Sophia, where improvements are to be found, is a quaint street-way of houses as purely Eastern and Turkish as they need to be, and fairly evidence to plain eyesight what the Constantinople of past days all through it was,—a purely and entirely Eastern city! It would, perhaps, be difficult to find a better exemplar of such anywhere. The projecting upper stories of the houses, the narrow half-closed windows, the quaint supporting brackets, the ivy and other plants which partly cover them, and the *uneven* building from age or otherwise, all go to make up a characteristic whole. Compare it with one of our quite new straight-edge streets.

It is impossible to glance thus, however dimly and hastily, at such a city and such a state of things, without a thought of the remarkable man who gave to the builders of it that religion which has made of it what it is. A *mosque* quite realises what this is. The very simplest of all possible buildings is a mosque. We do not here allude to the famous Santa Sophia, the Imperial Mosque, which would seem to have suffered not a little by restorations, and so-called "beautifying"; but to those simpler and more humble fanes, which yet preserve their primitive and individual character, almost any one of these humbler edifices will do for us here. A mosque may be quite square in plan, and roofed over by a central dome, with smaller ones round it, and must needs have a clock to determine the hours of prayer, a fountain for ablution, and a minaret, round which is a slight gallery, from which the "call to prayer" is sung or chanted at regular intervals. On this, as so characteristic of all Eastern cities, a good deal might be said, for it necessitated the graceful minaret, and it is these minarets which give to the quaint streets their peculiarly emphatic and individual character. They are to be seen everywhere, and are, indeed, marks of note and guides to our whereabouts over the uneven street-way and in and out of the complicated turnings of this city of the Sultan.

Much, doubtless, is to be gained in the future for art, and for the future of humanity itself, by the perpetual "progress" that is going on all about us, and by the changes that are going on everywhere, even as we look on; but there is a something lost as well as gained. The Constantinople of to-day, with all its many improvements and efforts to become more and more a "Western" city, and to fill itself with Western influences, artistic and otherwise, and, indeed, to become, as far as may be, a modern and newly-built-up town, must lose, however much it may gain. There is most surely a something else, and a something more, in a famous city, with a high-sounding and historic name, than mere prim brickwork and stone and wood construction, however cleverly and mechanically put together, and a new Constantinople—a quite new city—must needs lack much that even the present city yet has; and, still more, must it needs lack of that which made of the Constantinople of past centuries before improvements were even so much as dreamed of—what it was. In the days of the more famous sultans, and in times when the Turk worked out his own ideas,—artistic in his own way, and in a way special to himself, and for himself,—his wide-world famous city must have realised what we now can but imagine or read of in dreamy books. In the getting rid of such "antiques" and fever-nests there must needs be a gain, but is not a something lost too?

SOUTH SHIELDS.

ON the Durham coast, since the rise of the coal trade, there has been a growth of large towns: West Hartlepool is the first, and, perhaps, all things considered, the most notable example. Its older neighbour has been revived by the influence of railways and fuel shipments, and going north, we have Seaham, the birth of this generation practically; Sunderland, greatly extended; and, at the confluence of the Tyne with the ocean, South Shields. It has some claims to remembrance in the dark ages of the past; but it is within about a century only that it has become anything more than a village,—busy only with its many memories of the past. It is now a seaport; its manufactures are varied and extensive; its commerce is increasing; and the advancing fortunes of the river must leave their traces on its seaport, which now almost stretches hands across the sandy lake to the town which is the outgrowth of the village where centuries ago Bede lived, wrote, and, at last, "in the odour of sanctity, died." Little more than a century ago, South Shields was a port owning four vessels only; but before the era of railways the demand for coal had caused such an extended trade that it was computed that it owned some 300 vessels. It had then dry docks and timber-yards; it made glass and rope; and it had working near it,—on a comparatively small scale,—coal-mines; but its salt trade was dying out. Forty years ago, it had long enjoyed the advantages of good water-supply; steam ferry connexion had been made with its Tyne-severed neighbour; its Commissioners had been vested with local governmental powers; and the Reform Bill had conferred upon it representation in the Imperial Parliament. From that time forward its course has not been marked by the bounds in progress that some northern towns have known, but it has had a steady increase of trade, of industrial development, and of the profits of accumulated wealth.

As the shipping interest is prominent in South Shields, it may be briefly said that it is credited with building in 1876 some twenty-seven vessels, all steamers, and of a tonnage of 1,520 tons; so that it is evident that the "steam-tugs" formed no unimportant part of its contributions to naval architecture, the number being more, but the tonnage less, than in some recent years. The entrances into South Shields during the same year were 154 sailing-vessels of 46,592 tons; and 419 steam-vessels, of 209,710 tons; so that the total tonnage of the vessels entering was large; the clearances were not so large, probably owing to the vessels in part taking in cargoes higher up the river. Under the Sea Fisheries Act, forty boats were registered at South Shields. And, according to the same authority, South Shields now owns 140 sailing and 60 steam vessels, the aggregate tonnage of which is 74,509 tons. Of the exports in the shipping, it may be said that South Shields is classed with its neighbour, North Shields, and the exports of the two are given together in the official lists; but of the half million tons sent foreign, and 170,000 tons sent coastwise, the former place sends unquestionably a full share. This is, in degree, the outcome of the coal-pits near Shields; and in it there is laid the basis of a sound and an expanding trade. The chemical manufacture may be next indicated as one of those largely developed in the Shields district. Saltworks were formerly known on both sides of the river, and that from Shields is said to have repute in the kingdom, and to have been produced to such an extent on the southern bank of the river as to give to the wards which arose afterwards their designations; but though this passed away, yet the chemical manufacture arose in its place; and now not only is the Tyne noted for the improvements which it has given birth to in that manufacture, but the extent to which it is carried on gives to the river as a whole a high place in the chemical-manufacturing places of England; and of this the town at the mouth of the river has claim to its full share. The glass manufacture is also of large extent. It dates back for a considerable period, and up to 1845 the town is said to have made more plate glass than any other manufactory in the kingdom; and from the date of the abolition of the duty the produce of the glass-works very largely increased. A dozen years ago its capacity of production was said to be a million and a quarter feet yearly. In addition to other kinds of glass, such as bottles, there are smaller manufactories of kindred goods. Another special trade in the town is that of marine engine-building for tug-boats, the estimated yearly value of the work in connexion with which was, some years ago, estimated at 6,000*l.* yearly for the one chief firm. Looking along the Tyne, on the southern side, the eye meets with dockyards, shipyards, glass-bottle and chemical works, whilst behind these and the docks the town banks itself up, abutted by the railway; whilst to the west the large Tyne Dock, and the long timber-strewn shores of Jarrow Slake, with its wind-beaten monastery, reminding the gazer of its great and early inhabitant, shuts in the busy scene. But not only is South Shields a trading and manufacturing town of repute, but it is the centre of a populous trading district. Stretching from it, near the southern banks of the Tyne, there is a mass of villages almost joined together, each upheld by its mining or manufacturing industries, and of which the trade more or less centres in Shields. Thus its growth has been beyond that which might have been expected from its own commerce, because the streams that flow from these unite to swell the larger volume.

There has been a growth fully equivalent to what might have been foreseen as likely to accompany the development of commercial activity which has thus been hinted at; and in nothing is this more shown than by the provision which is made for the wants of a large population. Its free library numbers over 4,250 readers, and the weekly issues of books are over 2,250. The growth of population may be best shown from the statement that its Union, of about 15,775 acres, had in 1861 some 44,849 people; but by 1871 the numbers had increased to 74,441, and of the latter 45,000 are credited to the town. In the Union there are 390 indoor and 1,900 outdoor paupers; so that its proportion of paupers to the population is rather a high one. Yearly from 3,000 to 4,000 persons in the borough are proceeded against for crime, the bulk being for drunkenness and other like offences. Possibly much of the drunkenness is traceable to the seagoing population of the town, and to

the numbers attracted to the port; and here it may fittingly be said that at the South Shields Marine Office there are engaged usually every month above 850 men, employed in the steam ships, and about 250 men, employed in trading vessels trading from the river, in addition to apprentices and others. But there are statistics in relation to this great Tyneside port much more promising. It is to a large degree provident, as may be illustrated by the recital of the facts that one of the great Friendly Societies of the country, the Manchester Unity of Odd Fellows, is represented in South Shields by four "lodges," with 611 members, and which have an annual income of over 1,000*l.*, whilst other similar bodies are represented proportionally. In other provident institutions, savings banks and dispensaries, for instance,—the same admirable spirit is shown on a corresponding scale; and there is a large development of the philanthropy which cares for the outcast and the miserable; and in the various organisations of religious zeal there is in the town a full catalogue, as well as in those whose province is in the supervision of the arrangements of the sanitary and educational establishments of the town.

The future of the town is one of promise. It is not dependent, as are some northern towns, exclusively on one industry; for, as we have seen, its industries are varied in character as well as large in extent. It has large facilities for trade; it is on the whole fairly served by the great monopolising railway of the North; and if there were deficiencies in this respect, its situation at the junction of a great commercial river with the ocean would enable it to remedy them in a great degree. That situation gives it also an advantage as a manufacturing or shipping place; and of this far-sighted men have been keen to take hold. Thus the commerce of the town has been built up on an enduring basis; and though the trade may be subject to ebbs and flows, which characterise it in almost all its centres, yet on the whole the tide flows onward. At the present time, in some of the chief trades which support the Tyne ports, there is a serious depression, which, during many months' continuance has had its intensity increased rather than diminished. But it is evident that this cannot continue very much longer; and there should be signs of a revival when the lowest point has been reached. During recent years the commercial status of the Tyne ports has been greatly raised by the operations carried on on so extensive a scale by the Commissioners having charge of the river; and in the resultant advantages South Shields has participated. The effect of the magnificent works undertaken by the Tyne Commission has not even yet been fully reaped, nor has that body yet carried out all that it had in contemplation. There should accrue further benefits to the Tyneside towns from the works that have been finished, and from those yet to be executed. As the period of dull trade passes away, towns which have been in it stationary begin to spring forward again; and this in all probability will be the case in regard to the towns on the river Tyne. In the years of declining trade, the ratio of their growth has been checked; but it wants merely the return to a period of normal prosperity to cause again the growth to recommence and to extend the greatness of the trading centres.

THE KRUPP GUN FACTORY AT ESSEN

ENOUGH, perhaps, has been said,*—except in one respect,—to indicate from a visitor's point of view the greatness and variety of the industrial processes incessantly going forward at Essen. The material, the machinery, and the science employed in these mighty works have been summarily noticed, and we agree with a German writer in thinking that all this work might be useless without especial qualifications on the part of the master and the workmen. It is only when he claims them in the name of German workmen alone that he is manifestly, and even absurdly, wrong. All men, labouring in a labyrinth of giant engines, with furnaces and mighty incandescent masses perpetually surrounding them, must require manual promptness and exactitude, calm of mind, and a quick seizing power in the eye. These are characteristic of the Essen colony, yet not of the Essen colony in a degree distinguishing it above all others. So much, perhaps, must be remarked, in justice to their co-laborators in other iron-forging districts of Europe. Yet it is not to be denied that at the Essen Kruppgun factories is witnessed a picture of social economy scarcely less interesting than that of the mechanical organisation itself. There, every workman is, in a certain sense, a proprietor or partner in the concern. That is, above and beyond the amount of his paid wages, an extra amount accrues to, and is saved for him, according to the profits of the particular workshop in which he labours. At the end of eleven years he may begin, if he pleases, to benefit by this fund; but at the end of sixteen his receipts from it would generally be equivalent, per week, to the total of his ordinary wages. We have, in addition to the result of our own inquiries, the high authority of M. Reybaud for this statement, which applies, be it remembered, to a community numbering 8,000 artificers. Life for them, apart from their labour, is not very arduous. Cattle are abundant, and animal food is cheap. "The Bread Company of Essen" supplies that commodity to the "hands" pure, and at cost price; a family can thus subsist with ease, and each male member of it save 2s. or 3s. a week. Every man has his separate account with the management, and, although a resemblance may suggest itself, at a superficial glance, no such principle as that of the truck system, or the most distant approach to it, is recognised. The truth is, that there are no middlemen, and no illicit or dishonest gains to be enjoyed. At the same time, it must be allowed that the industrial discipline practised at Essen is not precisely that which we should rejoice to see emulated everywhere. The German, as a youth, submits to the yoke of a school; as a young man, to the training of the army; as a full adult, to the possible restraints of a full-grown soldier. And he carries these habits with him into the workshop. In point of fact, the factory at Essen, within the circuit of the works themselves, may be compared with nothing better than with a vast set of barracks, &c. In one of them 1,500 men are accommodated with lodging and food, at an average rate of 10d. a day each. If, however, they want coffee, of which the forgers and founders are consumers to an almost incredible extent,—because, they say, it best enables them to resist the enervating influences of the furnace,—they must pay a trifle extra to those distributors of the wholesome beverage who continually bring round their immense tin cans to meet the incessant demand. Besides these, there are coffee-saloons upon the largest scale, in which, however, little idleness is seen, and no clamour is heard. For those sons of Vulcan, in the valley of the Rhine, are a silent, contemplative, self-contained people, and when, at break of day, the signal rings, 8,000 men start from the little town below, or the scattered hamlets, or the industrial barracks, "inside the lines," listening only to the tramp of their own feet, without song or shout, or even audible talk, for they dwell so closely together, and their lives are so much upon a pattern, that there is really, as may be supposed, hardly anything left to say.

Nevertheless, this wonderful mechanical and social organisation is comparatively new. In 1851, a Commissioner reported upon the works of Herr Krupp that, in many respects, they were actually meritorious! A single gun represented them at the Great Exhibition in Hyde Park. A wider development drew much attention to Paris, where a large block of the perfected, so far,—Krupp steel, operated upon daily by skilled mechanics, attracted great scientific notice; but even then, with all his success, Herr Krupp wanted two essentials,—a sufficing capital and a sure market. We may judge these necessities by a glance at the tremendous blocks that lie, waiting for utilisation, in the "waiting-hall" at Essen; but this obstacle might have been easily met by the formation of a company, which, from its starting, would have enjoyed unrestricted credit. Herr Krupp, however, disliked the idea. He would be responsible to none except himself. He would be no man's manager, except in the way of borrowing on a running account, as it were, of loans, and no difficulty was encountered in carrying out the plan. Indeed, capitalists became more eager to advance than he to accept their assistance. In this way the Krupp Gun Factory grew up towards its present extraordinary proportions, and it is now a source of artillery supply to half the world. There was another impediment in the way, however, the deficient means of transport. Shut up in a corner of Northern Germany, the only free outlets from Essen were upon the great steam and ordinary highways of Prussia. The central and southern territories were separated from it by artificial barriers; but the firm was not less ready to build railroads than to arm ironclads, and "armour-plating," to employ a vulgarised French term, has long been a *spécialité* of Essen, forged steel being the invariable material manipulated, whether for locomotive wheel-tyres or the entire working apparatus of the locomotive itself. It is in the mechanism employed, however, that this Essen manufacturer feels his greatest pride. He points first to the old, and then to the new, process. Under the former, it required a hundred men, armed with levers, to move a mass, playfully called an "ingot," into its place, and reduce it roughly into form, and the work was accompanied by groans like those of the paviour, encouraging choruses like those heard at old-fashioned capstans, and occasional pauses of distress. Under the new, with the "pile-hammer" in action; a dozen men suffice; scarcely any effort is visible; there is no excitement, no noise. The furnace-doors are opened; the vast glowing mass becomes visible, resting upon its sledge-like frame; a complication of chain-work is put in motion, and the fiery load descends slowly, as it appears, though in reality with great swiftness, to its place beneath the hammer. There no human ingenuity has hitherto been able to prevent the very earth from vibrating under the blows, or the walls or roof from trembling, though the "hammer-scaffold" stands steady as a rock, while the chains and pulleys move the "ingot" backwards and forwards, round and round. The operation, already noticed by us in a first few remarks on the Krupp Gun Factory, is here repeated, upon, so to speak, a more portentous scale. As for the results claimed, they consist principally of three,—a longer range, a more accurate aim, and a more powerful penetration, with an easier method of loading, and improved facilities for repair. As to their cost, it is difficult to obtain anything approaching to a tariff, even upon the spot. Russia, even before Germany, became a patron of the Krupp cannon, purchasing them at the rate of 2,000*l.*, 3,000*l.*, and even 5,000*l.* each, incredible though it may seem; but so prodigal are the necessities of war! She stood not upon price, only on quality, and on that point was guided by the judgment of her distinguished engineer, Todleben. In the present temper of Europe, nothing is begrudged to the maker of an unsurpassed gun, and it is not rare for Herr Krupp to receive an order for a batch of 112 at a time. It is altogether a marvellous organisation this, on the banks of the Ruhr and the Rhine, with its gathering of skilled artificers from every corner of Germany, and even from beyond the German frontiers, its attraction for men of science belonging to all nations, its growth from the condition of a struggling little forge to that of a foundry unequalled in the world. Both Russia and France have vainly endeavoured to emulate it, but have failed, as it were, "out of sight," partly because neither possesses a position so favourable, concentrating within itself every necessary condition of iron and coal; but partly also, it must be admitted, because a man like Herr Krupp does not often repeat himself among his contemporaries. To read his own account of his own gun is partly to reach the secret of his success, so far as it has been mechanical; but this part of the study is one for the artillerist exclusively. Our object has simply been to suggest an idea of the way in which his family initiated the work, and in which he himself has carried it on.

* See p. 10, *ante*.

The City Gates. At this moment the following paragraph from Dr. Doran's interesting book, "London in the Jacobite Times," has interest:—"As the reign of George II. drew to a close, in the autumn of 1760, a change came over the City of London, which, to many, indicated a new era,—namely, the destruction of their City gates, in the preservation of which timid Whigs saw safety from the assaults of Jacobites. Read announced the fate of those imaginary defences in the *Journal* of August 2nd: 'On Wednesday, the materials of the three following City gates were sold before the Committee of Lands to Mr. Blagden, a carpenter in Coleman-street,—namely, Aldgate, for 157*l.* 10s.; Cripplegate, for 91*l.*; and Ludgate, for 148*l.* The purchaser is to begin to pull down the two first on the 1st day of September, and Ludgate on the 4th of August, and is to clear away all the rubbish, &c., in two months from these days.'"

ORNAMENT.*

IT is only in theory that ornament can be called good or bad in itself. It has practically no independent existence at all. It is entirely dependent upon its application. Good taste imposes this restraint upon all ornament, that it should be judiciously applied; that it should be strictly adapted to the nature of the material in which it is executed, and to its position and purpose,—and decoration cannot be guilty of a graver fault than that of interfering with the use of the object decorated. Nevertheless, the aim of ornament is beauty; and though there is what may be called a beauty in perfect fitness, fitness is not, strictly speaking, beautiful, necessary as it is to perfection in ornament. I dwell especially upon the necessity of fitness, because it seems to me almost unnecessary to urge the necessity of beauty. The sense of beauty is, to some extent, a gift. It must be cultivated; but it is chiefly by the use of our eyes that it can be developed; and though we can point to beauties in nature and art, the talk about beauty is comparatively fruitless, but we can demonstrate the fitness or unfitness of a thing for its purpose. Here, at least, we tread on ground firm enough for a basis of discussion. In the most successful examples of ancient art, of whatever time or country, we shall find this aptness to exist, and the chief use in studying them is not so much for their style as to see how of old the masters adapted their designs to its material purpose and position, for we may be sure that the measure of our success will depend upon our observing the same law of fitness.

If we come to look at the way in which the artists of past times worked in sympathy with their materials, we shall soon see that the limits imposed by a decorative necessity are not mere hindrances, but that they act as safeguards too, compelling them to breadth, repose, and even grandeur. Who can say how much of the superiority of old stained glass to Limoges enamel is due to the necessity of glazing and its consequent breadth of style? If the Etruscans had been familiar with the secrets of coloured glazes, we might have had Greek vases as tasteless as the works of Della Robbia and Palissy. If the nameless craftsmen of the Middle Ages and of the Cinquecento had been endowed with the pictorial powers of Raffaelle, perhaps *their* ornament, too, would have been as absurd as his. This failure of a great artist illustrates very fairly the difference between painting and decoration. Raffaelle in his arabesques has balanced the parts of his design with admirable instinct so far as effect is concerned, but he has done so at the expense of all consistency.

Unguided by any just estimate of the necessities of decorative painting, his naturalistic sympathies have led him into the most *unnatural* absurdities. Bulky and weighty objects appear in his pilasters to be supported by fragile threads. Men, boys, and animals, are represented, not hieroglyphically and as symbols, but in all the roundness and solidity of nature, bearing no proportion whatever to each other or to the foliage that surrounds them. Yet this is meant to be serious decoration. If a less realistic,—a fuller, apter style had been adopted, the artist would have been free to balance his parts without any other restriction than that of his own admirable sense of proportion and beauty; and Raffaelle need not have failed where men of far less than his genius triumphed. The arabesques of Holbein are far more satisfactory as ornament, and so is Arabian interlaced work, upon which, in name at least, they are both founded.

I have urged the necessity of aptness or fitness in ornament. There is one kind of fitness that is more frequently ignored than any other,—and that is one that cannot be ignored with impunity,—I mean, fitness for the nineteenth century. Much that was beautiful in the art of the past is nowadays unattainable, or if attainable, only at the sacrifice of that which is even more valuable. The utterly different political, commercial, mechanical, and social conditions of the present make a breach between ancient and modern art over which we cannot lightly leap to a satisfactory conclusion. To lay bare the principles of ancient art is not enough. It is still more important to decide which of them yet live, which of them have lived out their lives. We have to examine the conditions of the present day, too, and to discover what principles of ancient art will bear transplanting, which of them will be likely to live in the atmosphere of the nineteenth century. Gradually the conditions under which decorative art is produced have changed, the methods of its production and its mercantile position have changed, so gradually that ornamental art seems to have been unaware of this development, and has not grown with them. During the last twenty years, however, we have become awake to our position,—we recognise that if our manufacturers are to hold their own in the markets of the world, the art in them must be on a level with the workmanship.

One of the main difficulties that face us at the present time is in reconciling decorative art with commerce and manufacture. This is certain: that modern ornament is dependent upon trade. The interests are bound up together, and they are friends or neither who would counsel a divorce between them. It is true that in earlier and simpler times their union was more familiar and friendly. True, there is dissension between them now; but whatever may have been in the past, henceforward they cannot work apart, and the only firm basis for a reconciliation between them is a clear understanding of their relative positions, and a mutual agreement to work together for their mutual benefit.

Perhaps the conditions of the past were more favourable to art than the present state of things. We who, living in the present, know so well its drawbacks, are inclined to look back longingly to a past of which we have not realised the disadvantages. But it is fatal to oppose the spirit of the age. Strong men may, to some extent, direct it, but resistance to the feeble and wailing is foolish. Whether we like or no, machinery and steam power will have something to say concerning the manufactures of the future. Idle regrets for the handwork of the past will not have much effect upon the commercial spirit of those in whose hands the matter mainly rests. Perhaps what we want most of all is *common sense*.

Our other main difficulty is, as I have already suggested, in the adoption of a style. Reverence for the past by all means; but we need not stand gaping our admiration before it. If we wish to advance, it is our business to compare it with the present, and to build our future upon the result of our comparison. The teaching of the masters of the past in reference to style is in harmony with that of common sense, viz.,—that the bold plan is the successful one. They were artists, not archæologists, and if they borrowed a style or they adapted that too, like everything else, to their own ways and wants. For the rest, the conditions are so different that their practice throws little light upon our difficulty. In all ancient work style was more or less traditional,—certain forms and certain symbols were handed down from generation to generation, modified perhaps in transit; but whatever change took place was gradual, one style grew out of another. Deliberate innovation from the outside was not tolerated, and a general ignorance of what was going on in other parts of the world kept men out of the way of temptation to stray. Under the despotic government of the East, the types of ornament were fixed and almost unalterable. In the West art developed more rapidly under more enlightened rule; but of Gothic art, as it grew it absorbed the ideas of the time, it was unaffected by what was going on in Egypt, China, and Japan. Now the times are not in favour of despotism. We no longer act according to tradition. We are not unsophisticated as savages in bondage, like the Egyptians, isolated like the Chinese, cultivated like the Greeks, bigoted like the Arabs or the early Christians. We cannot go back. If we do not know enough to do better work than theirs, we know too much to be content with any of them. Each new field of study that is opened to us tempts afresh. We are unsettled; we cannot each make up our mind whether we will found our style on Greek or Gothic, Renaissance or Roman, Japanese or Jacobean, or even on Queen Anne. Our eyes are opened to the idea of style, and we are haunted by the consciousness of it. We have gathered a heap of ornamental treasure round us, till it hems in our movements and imprisons our ideas. Style, of course, is developed, like everything else, not generated spontaneously. Perhaps style is never recognised as such in its own day, but passes for a fashion. Perhaps, in the future, the most modern quality of personal individuality will take the place of a one common style; but this is certain, that if we are in earnest, if our hearts are in sympathy with our time, and we put our hearts into our work, the archæologist and, better still, the art-student of future centuries, will find about our productions a flavour which will be indeed the style of the nineteenth century.

* From a paper by Mr. Lewis F. Day, read at the Architectural Association, on the 11th inst.

LONDON ARCHITECTS AND NEW COLLEGE BUILDINGS AT CAMBRIDGE.

SEVERAL metropolitan architects of distinction are at present occupied in new college buildings and extensions at Cambridge. The combination-room of the large new hall at Pembroke College, of which Mr. Waterhouse is the architect, is completed and occupied, and the library range, which is the most interesting block, is in progress. The library is 90 ft. long, with an arched wooden roof. On the south side is the clock-tower, with a gabled spire, containing the staircase leading to the upper portion of the building. The lecture-room is in the lower story.

The new hall at Christ's College, from designs by Mr. G. Gilbert Scott, is nearly completed. It is said to be a reproduction of the original hall of the fifteenth century, and the collar-beam roof of the old building has been retained. It was hidden by the ceiling, and has been lifted up and placed on the new walls.

At Trinity two new ranges have been erected at the corner of Trinity-lane. Mr. Arthur Blomfield is the architect.

At St. Catherine's Hall, a new master's lodge and other buildings are being erected, with various repairs to several of the existing buildings, Mr. Fawcett being the architect.

The chapel of Trinity Hall has been decorated by Messrs. Heaton & Butler, of Garrick-street, Covent-garden, at the cost of Mrs. Geldart, widow of the late master.

Opposite St. John's College a new divinity school is in course of erection. It is in the Tudor style, and of red brick. Mr. Champneys, son of the late Dean of Lichfield, is the architect.

NEW BANKING OFFICES, COLOGNE.

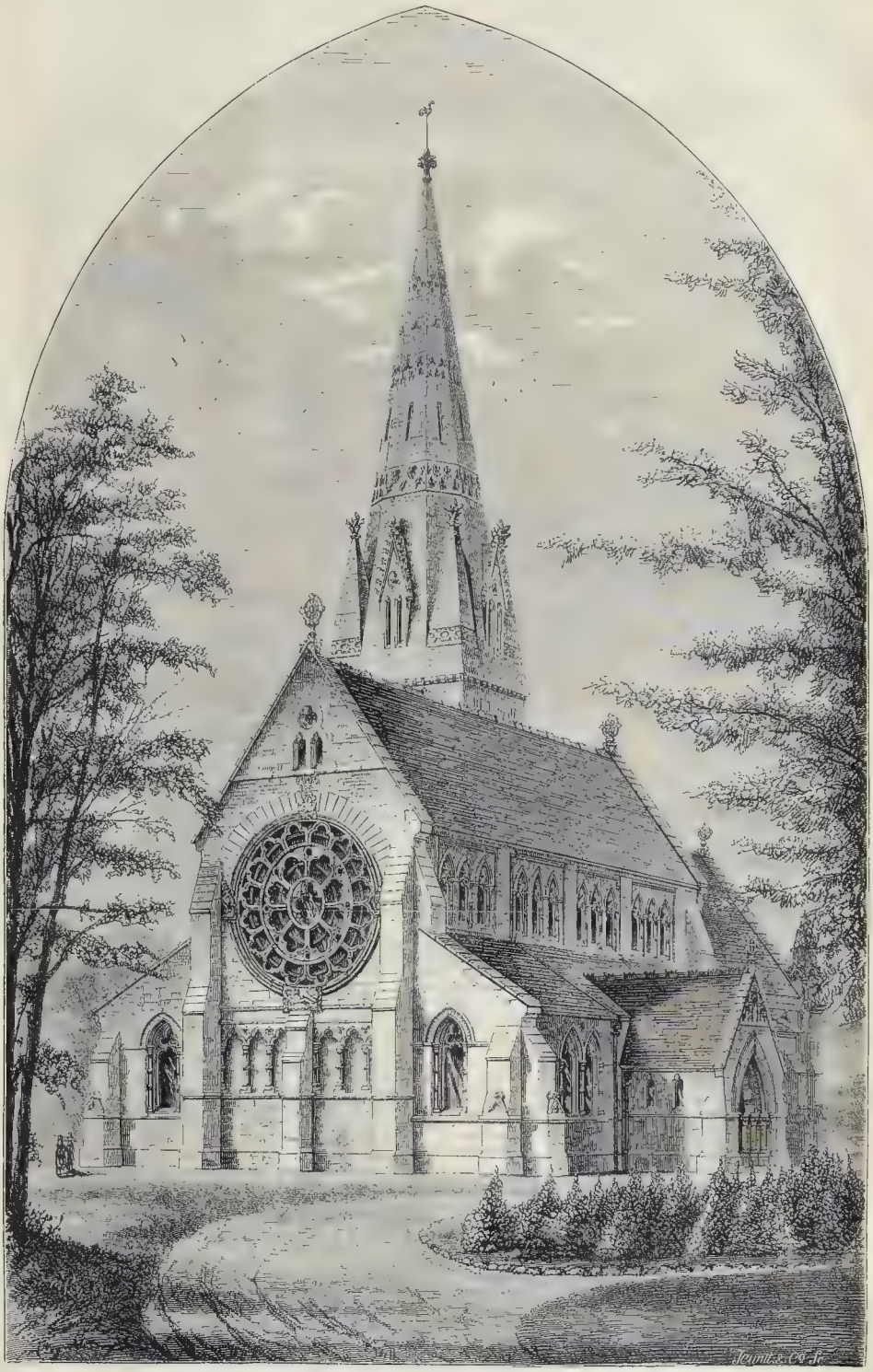
"Wer Köln nicht gesehen, hat Deutschland nicht gesehen."

FEW cities of Germany have such a wealth of handsome public and private buildings as Cologne. On looking at the view of the "Holy City" executed by Antonius of Worms, we understand why Cologne was early praised as the crown of German cities, and appreciate the old saying, "Whoever has not seen Cologne has not seen Germany." The churches possessed by Cologne before the first French revolution have been considerably reduced in number. The most remarkable and the handsomest have been preserved and restored in recent times. The same has been done with the Rathhaus and the Gürzenich, which in their new garb prove a great attraction to the admirers of Gothic architecture. Cologne was also rich in imposing edifices owned by the nobility, with high turrets, adorned by coats of arms, as well as in handsome residences of its wealthy citizens, devoted to the pursuits of commerce. They all bore testimony to a deep sense for art, to an appreciation for exterior as for interior decoration. With the French revolution a change came over Cologne. Trade and industry were paralysed; the former sources of subsistence of the population were cut off; many of the more opulent inhabitants had left the city; and thus plans for erecting handsome private buildings had to be relinquished. When Cologne, in 1815, was incorporated with Prussia, the consequences of the War of Liberation had to be effaced in the first place. By degrees, however, the citizens began to breathe more freely. The introduction of healthy foreign elements raised the population; capital began to flow in; trade and industry, under the good influence of the Prussian administration, revived; and thus in the years from 1820 to 1840 numerous private buildings were erected, suggestive, however, in their simple and plain execution, of the spirit of frugality then prevailing.

Since 1840 new life seems to have been instilled into the private architecture of Cologne; but its culminating period is that of the last quarter of a century, during which able architects have been busy utilising the ample means placed at their disposal by capitalists of Cologne. During that time the interior of Cologne has



NEW BANK BUILDINGS, COLOGNE.—Building-Inspector Pflaume, Architect.



SKELTON CHURCH, NEAR RIPON.—MR. WILLIAM BURGES, ARCHITECT



THE MEMORIAL CHURCH, SKELTON.—*Plan.*

been radically changed. Numerous new streets and squares have sprung into existence; and many imposing, palace-like, private buildings, mostly belonging to bankers or merchants, prove that also in this respect Cologne has not been behind the march of time.

Bau-Inspector Pflaume, like his predecessor in the office of town architect, Baurath Raschdorff, has furnished many of the designs of the newer buildings. Among his latest and best creations may be numbered the large offices erected for the A. Schaaffenhausen Banking Company, the subject of our illustration, which, with the buildings next door to it, and its handsomely decorated façade, attracts the attention of all passers-by. Herr Pflaume has a predilection for using for his buildings a white stone, derived from French quarries. It may be easily cut with the saw, but hardens on exposure to the air, assuming also a darker hue, very pleasant to the eye. This sandstone has been used for the new bank buildings, and is characteristic of the endeavours of Cologne architects, in recent years, of following the style of the German Renaissance. Life seems to be infused into the stone façade by the wealth of ornamentation and variety of forms displayed.

The ground story, in solid freestone, relieved only in the entrance by an effective border of oak-leaves, contains the offices,—which, through increase of business, the old building could no longer accommodate,—the private rooms of the three directors, &c. The upper stories contain the board-room and the residence of the managing director, furnished in every respect in accordance with modern requirements.

The semicircular heads of the windows on the first floor contain the arms of the towns of the Rhine Province and Westphalia in which the bank has branches. The frieze above them contains groups of children representing the industries peculiar to each town respectively. Thus over the arms of the town of Essen we see the miner descending the shaft; over that of Dortmund the iron smelter is stirring up the fire of the blast-furnace; over that of Coblenz we notice the vine-dresser, and over that of Crefeld the weaver. The three centre panels are occupied by the cities of Cologne, Düsseldorf, and Bonn, and the corresponding figure-subjects permit us to recognise those three cities on the Rhine as the seats of commerce, arts, and science. The entablature of the building is crowned by a row of dormer windows. The centre part rises above the latter, and supports upon well-formed socles, besides the centre window, two large statues, Industry and Peace, as denoted by inscriptions. The window is surmounted by a pediment, upon which is placed the figure of Mercury. A highly-pitched decorative roof, in zinc and slate, supplies a suitable background for the upper parts. A round turret, projecting like an oriel, and ending in a pointed roof and a finial of wrought iron, completes the pile. The picturesque effect of the whole will be increased when the newness of the material has been tempered by time.

Our recollections of the "sweetly-smelling" city extends over a great many years, and delightful recollections they are. Very different indeed is its aspect now from that which it presented when in early youth we first wandered at moonlight round the marvellous cathedral with the late Dr. Möller, of Darmstadt, at that time the Nestor of German architects, yet full of enthusiasm as a boy!

SKELTON CHURCH, NEAR RIPON.

THE Church represented by our engraving, and of which we also give the plan, is a memorial of the late Frederick Grantham Vyner (the youngest son of Lady Mary Vyner), who was murdered by Greek brigands in May, 1870. The foundation-stone at the north-east corner of the building bears this inscription:—"In memory of Frederick Grantham Vyner, this church is built by his mother, and dedicated to Christ the Consoler. This stone was laid May 17th, 1871."

By the approach from the village the chancel will be first seen. A five-light window occupies the width of the east end, and is surmounted by a crocketed label, whose finial supports a figure of Christ. On each side of the gable are two buttresses, adorned with armorial bearings. The gable is crowned with a cross. The north and south sides of this portion of the church are divided into three bays by buttresses, each bay has a two-light window, the spandrels in the tracery being adorned with Early English foliage. The priest's door is on the south side. The whole is surmounted by a block cornice with gargoyles. Upon each stage of the chancel buttresses is a shield with the armorial bearings of families connected with that of the noble foundress.

The tower at the north side of the church is of four stages. The bell-chamber, in the fourth stage, is lighted by two windows on each side, and from the cornice above springs a spire to the altitude of 66 ft., whose surface is adorned with three bands of tracery; at the angles are four octagonal pinnacles, adorned with tracery at their base, and terminating in finials. At the west end is a rose-window, the sculptures introduced at the four points of the outer circle, represent the ages of man,—youth, manhood, decrepitude, and the last moments of life. Below the window is a blind trefoiled arcade.

The porch on the south side has a foliated outer doorway, over which, in the gable, under a triple canopy, is a sculptured representation of the Good Shepherd. Within the porch are female heads in high relief.

Internally, the nave is of four bays, and is 64 ft. long by 19 ft. wide, and 42 ft. high. The piers which support the nave have moulded bases, annulets, and caps. In front Irish black marble banded shafts are carried up the face of the clearstory walls, and terminate in corbels supporting the tie-beams. These corbels are sculptured to represent, on the north side, infancy, boyhood, and old age; and on the opposite side, childhood, manhood, and mature age. The arches of the nave are adorned with the tooth ornament, and the spandrels are filled in with cinquefoils, adorned with foliage cusps. Above is a clearstory of twenty-one lights, arranged in triplet; a continuous arcade, whose arches spring off moulded capitals, supported by black marble shafts, enriches this part of the structure. The division of each bay is marked by the black marble shafts which rest on the base of the nave piers. The tie-beams and panelled wagon roof, as well as the aisle roofs, also panelled, are of yellow pine. The aisle walls have a trefoiled arcade along their whole length, with black marble shafts, such as those in the clearstory.

The chancel is rich in various-coloured marbles, stained glass, and painted decorations. It is raised one step from the level of the nave floor, and is approached through a moulded arch, whose piers of clustered green marble columns have Early English capitals. Over the chancel arch is an elaborate sculpture representing our Lord's Ascension; and in the soffit of the arch are angels with upraised wings on Jacob's ladder.

The east window, as well as the window on the north and south sides, have a double suite of tracery, supported on marble shafts. Laterally it is divided into three bays, the first bay on each side being devoted to stalls for the family of the foundress; the rest have an arcading on black marble columns, with trefoil heads; rich diaper work is introduced above this arcading. In the spandrels of the sub-arches are sculptured figures of angels bearing censers. The tracery of the other windows is similarly treated, having black marble-banded shafts and moulded capitals. The clustered shafts, of different-coloured marbles with carved capitals, divide the bays, and support the stone groining. The floor is inlaid with encaustic tiles. The reredos is of white alabaster. The centre compartment is a sculptured representation of the offering of the wise men, and in medallions on each side are heads of Isaias, prophet; Daniel, prophet; Jeremiah, prophet; Ezekial, prophet.

The lowest stage of the tower forms the vestry, from which there is access to the pulpit through a doorway at the east end of the north aisle. Over the vestry is the organ-chamber, and the organist is placed in a projecting loft or gallery, supported by a corbel sculptured with foliage and grotesque animals.

In the west wall, under the rose-window, is a trefoil-headed arcade with black marble shafts, running the width of the nave; above is a foliated cornice; and under the string-course is the following text, carved in thirteenth-century characters: "There is one God and one Mediator between God and men, the man Christ Jesus, who gave himself a ransom for all." (Taken from I Tim. ii. 5.)

At the west end of the south aisle is the font,—square, in "cup" form, and supported on short coloured marble columns. It is adorned on three sides with carved scroll-work, and on the east side are three angels in low relief, bearing a scroll, on which is the inscription, "Suffer little children to come unto me." This font, the gift of Lord Ripon, is in memory of his only daughter, who died in infancy. The pulpit is of red marble, bounded with white at top and bottom.

The aisle windows illustrate the parables and miracles of our Lord, and the clearstory contains full-length figures of the Prophets. In the centre of the rose-window is Christ the Consoler, and around him are the various conditions of life. Chancel: the east window has its five lights filled with stained glass, the centre compartment representing the Crucifixion, and Christ bearing the Cross, and on each side are the various types of that event from the Old Testament history, viz., Noah's sacrifice, Manoah's sacrifice; Isaac bearing the wood, and Abraham's sacrifice; the brazen serpent, and the widow of Sarepta; Moses smiting the rock, and Abel's sacrifice. In the centre of the upper tracery is the figure of Christ the Consoler. Underneath is the inscription, "Built by Lady Mary Vyner, in memory of her son Frederick Grantham Vyner, murdered by Brigands 1870." The chancel windows on the north and east side contain scenes from the life of our Lord, and the types of the events. They are arranged in pairs, each light containing the type and the antitype. These windows are memorials of different members of the foundress's family. On the north side, Henrietta Frances, Countess de Grey; Thomas Philip, Earl de Grey; Hon. Frederick W. Robinson. On the south side, Henry Vyner, Reginald Vyner, Theodosia Harriet, Marchioness of Northampton. The whole of the stained glass is by Saunders & Co., London, the cartoons having been prepared by Mr. F. Weekes.

The architect of this costly structure is Mr. W. Burges, London; the builder, Mr. J. Thompson, Peterborough; the clerk of the works, Mr. Sier, Kentish-town; the sculptor, Mr. T. Nicholes.

The church is fitted up with walnut open stalls, and provision is made for warming the edifice.

We may add that the chancel is divided from the nave by a marble screen, with gates of brass; the Communion-rails are also of brass, light and simple in design.

MODERN CHESTER.

ONE of the chief reasons which cause the unique features of some remarkable foreign towns to be noticed by English travellers is the fact that their surroundings are so widely different from those of English cities. The attention of the observer is stimulated by various mural social features, and consequently it seizes more quickly the unusual architectural and pictorial effects of streets and buildings. Noticeable as such a town as Nuremberg is, these elements undoubtedly add to the facility with which the English visitor perceives its curious and beautiful characteristics. Consequently, for the same reason, houses or buildings, which in any other country the Englishman would pause to behold with care, are passed by with comparatively little notice. Certain places in England may, consequently, be said to need more careful pointing to in order to renew the attention of those who would otherwise be somewhat inclined to pass them by without notice, or, at any rate, with a very casual and passing glance. Chester is a very excellent example of the proposition which has just been laid down. In many respects, it is a far more noticeable town than scores of European cities which the British tourist travels long miles to visit. But the most appreciative and constant visitor to Chester is the American, who, accustomed to the regularity and the monotonous newness of the houses of the United States, finds in Chester a city which is to him altogether unique, and carries him back,—if a cultivated man, to the prehistoric days of his own country, when his ancestors were Englishmen. We have no intention of writing a descriptive paper on Chester,—its unique features are too well known in their general aspects to need pointing out here,—its Rows, and its walls are the most remarkable in Great Britain. But Chester at the present time is worthy of notice for, at any rate, one thing, and that is the successful manner in which its citizens are endeavouring to retain the old and most remarkable characteristics of the ancient city, and yet at the same time to effect those various improvements and changes which the working of time and the necessity for improvement invariably demand. This is due, no doubt, to two causes. One of these is the pride which the inhabitants of Chester certainly take in a city which in certain respects is unequalled in this or in any other country. A pride in his town is certainly a characteristic of the Cestrian; if it were not so, we should certainly not see the strenuous endeavours which are visible to stand in the ancient ways, and yet to keep abreast of modern improvements. Not that there are not many things omitted which should be done; but, looking at the subject as a whole, undoubtedly Chester does exhibit very conspicuous improvement without change of character. Thus we have an instance of the useful influence of what is sometimes termed, with a certain contempt, "sentimentalism," for a pride in the reputation of certain streets is only another form of that same *esprit de corps*, in itself also a form of sentimentalism, which has so powerful an effect on all sorts of most matter-of-fact men. Another cause, however, most certainly, is the influence, direct and indirect, of the Duke of Westminster. By this we do not mean personal influence, but the natural effect which a cultivated and energetic spirit with social power has upon those around. Some of the property in the city is part of the Eaton estates, and where new buildings have to be erected it is done so as to keep intact the old characteristics of the town, and yet to do what modern improvement requires. Again, on the Eaton estates, which are so near to Chester as to be almost a part of the town, though they stretch many miles away, all the buildings, newly built or rebuilt, are erected in the most picturesque and simple style. The old black-and-white cottages, with pointed gables, are retained for the benefit of the eye, and the most important improvements of modern times are introduced for the sake of health and comfort. And of these matters the Duke of Westminster takes a personal and a particular interest, and naturally, therefore, the buildings on his estates, and his own inclinations as regards style, serve as examples for the material structures built by others, and for the guidance of other people's tastes. And if we add to this that in some important civic matters he takes a direct part, these two causes appear to be quite sufficient to account for this characteristic of modern Chester. This latter cause, if, as we believe it is, an important factor in the case, shows at once the immense artistic responsibility with which large landowners and persons of influence are burdened, and which they should not try to put away, even as regards matters which are indirectly affected by their own doings. We may cite, as a particular instance of what has been said in this paper, the cocoa-house recently opened in Foregate-street. Formerly known as the Nag's Head Inn, it has been turned into one of those most useful and most important buildings,—a public-house for tea, cocoa, and other comparatively harmless beverages. Here we have modern advancement peculiarly shown. Externally the building has been renovated in the old Cestrian style. There is the pointed gable, the lattice windows, the projecting balcony, and the whole is a singularly picturesque piece of town architecture. We might allude to several other buildings which, in the last few years, have been erected with this twofold purpose, such as the Grosvenor Hotel,—a fine and characteristic structure. And this intelligent appreciation of the picturesque and the convenient is made more striking when we are suddenly confronted by a building such as the new General Post-office, which was opened in the course of last year. Here we have a work of persons quite unconnected with the traditions of the city, and, with a singular want of taste, a red-brick building, with stone facings and marble pillars, in a style wholly and entirely different from that which characterises the city generally, has been placed in St. John-street. If we wanted an example of the effect of sentiment and local influence, we should point to this building, erected as it has been by a department of the State and not by the city. Again, the cathedral has been restored, but upon this we do not propose to touch. But close to it there stands, nearly completed, the new King's School. It is a building of red sandstone, in the Late Perpendicular style, which forms the side of the Town-hall square, and which has greatly added to the general appearance of the town. For this "place," as it should properly be called now, has not only this building, but opposite to it the Town-hall, the work of Mr. Waterhouse, which, with some imperfections, is undoubtedly a striking building. By the side of the King's School, though placed somewhat back, are the Cathedral, and to the south the old rows of Northgate-street. But this square is at present marred by an insignificant and ugly building standing between the Town-hall and the market, the latter of which is also a blot on the architecture of Chester. It is a comparatively new building, in a classical style, out of harmony with the character of the town and the style of the neighbouring buildings. Anything more conspicuously different than this building and the ancient abbey-gate, with its pointed Gothic arch standing at the north side of the King's School, it would be difficult to imagine. It is an instance of the want of taste and artistic discernment, which is visible even in a place like Chester, where, taken as a whole, a more distinct architectural character is prominent than in most English towns. It does not seem out of place to point here to another structure of beauty and note, namely, the old Norman Church of St. John the Baptist. Some years ago it was partially restored, and the ruins at the east end rescued from the neglect to which they had hitherto been subject. But at the present time the tower is rapidly decaying, and appears to be much in want of repair. It should always be borne in mind that restoration should be avoided as long as possible; but it frequently happens that by reason of undue tenderness more radical measures have ultimately to be taken than if something were done at an earlier period. Founded in 689, by Ethelred, King of Mercia, according to the chronicle of St. Werburgh.

> "In the honour of God and the Baptist St. John,
> With the help of Bishop Wulfrice and good exhortation,"—

This church deserves the most tender care.

From these few remarks it will be evident that modern Chester, allowing for various necessary modern changes, with some blots, remains a singularly noticeable town. The domestic architecture of the city during the last twenty years has returned to the older styles, and instead of the square red-brick houses and horizontal skylines which characterise what may be termed the older modern buildings of the town, the pointed gable and the protruding upper story are the main features of the newer build-

ings. If the system is carefully followed out, and the harmony of style prudently preserved, Chester will be long before it loses its character as a remarkable and a unique city.

CATHEDRAL OF LIMBURG-ON-THE-LAHN, AND RESTORATIONS AT HOME AND ABROAD.

SIR,—When, on the appearance a few weeks ago of your fine graphic illustration of the Cathedral of Limburg, I recognised in it an example of perfectly satisfactory architectural composition, not seeing at first the alarming subtitle to your forcible remonstrance "Restoration Abroad," like "breakers ahead," I little thought it was about to sustain a siege far worse than those ancient ones to which, as you remarked, such structures were once liable. Against this I cannot forbear seconding your protest by a few remarks, which, if they come too late to have any influence in the matter, may not return to me void, seeing we have many edifices at home equally valuable that are not yet secure from similar assault.

Such an architectural composition as the one in question, with its seven towers all commanded by its central steeple, and additionally interesting for showing the budding of the spire, and how the spire grew out of the high-pitched roof, and in the state which you describe it to be in from its great age, must be one of the most precious objects of the kind that Germany possesses; superior in beauty to any inanimate work of nature within the same compass. Paradoxical as it may seem, Time, the destroying angel,—all-conquering Time as he is termed,—is not the destroyer, but, on the contrary, the exquisite embellisher of architecture; and from his hand we receive it in its most attractive form; exhibiting a peculiar beauty that no new building could possess, and, consequently, beyond anything that restoration to pristine perfection, supposing it possible, could substitute, which must, therefore, be a retrograde process,—a beauty that neither art nor nature alone could achieve. The higher class of ancient buildings, in the preservation of which I am interested, as the Mediæval cathedrals of Germany, France, England, Spain, Italy; or, for it matters little what their styles, the baths, palaces, and triumphal arches of Rome, in the condition in which the ages have bequeathed them to us, reposing on the fair bosom of nature, and blended with and wrought into perfect harmony with her features, I say it advisedly, are gems of the brightest landscapes, apples of gold in pictures of silver,—the high-water marks of material beauty on the face of the earth, over the loveliest portions of which they shed fresh glory, and give to flower, and grass, and stream a new and divine birth; while embodying and exhibiting as they do a high degree of the quality,—beauty, the symbol and shadow of God, they are among the higher evidences of the infinite perfection of the creation, and raise our views of the Creator.

I am borne out in this estimate of ancient buildings by the fact that their delineation has formed the highest walk of landscape-painting, and that the greatest landscape-painters have shown their preference for them by seizing every opportunity of introducing them into their works. Not only has the great architectural painter Canaletto done so, but Claude Lorraine, Richard Wilson, Turner, the great Dutch painters, and most thinking and earnest landscape artists everywhere. In the last-named painter's "Rivers of France," there is scarcely a view that does not include a cathedral, palace, château, or old building of some kind. What is more, such objects evidently contain that which not any men successful at pure natural landscape, but only the very highest landscape-painters and first-class figure-painters,—men practised in the rendering of the full-toned harmony of beauty in the human form could take away with them.

But over and above this quality of surpassing beauty in ancient buildings is another and more intellectual attribute. They differ from new ones, not only in having more of beauty in them discernible by the eye of the body, but in having a virtue seen only by the eye of the imagination, viz., the memories of the past, with which they are pregnant. The eye sees on them the lights and shadows of the sun, the mind descries on them the lights and shadows of history, which give them an additional charm which it is impossible to over-estimate. The trees, rocks, fields, and mountains that we gaze on to-day are scarcely the same that our forefathers were familiar with, for they and all objects of pure nature, from the restless vital forces within them, are for ever renewing themselves; but a building remains the same. We know, looking on the Colosseum or Pantheon, that it was the work of human brains and hands 2,000 years ago, and we instinctively impute to it not only ears, which stone walls are figuratively said to have, but eyes, and view it as a witness of the events of our mortal story through the vanished ages of its existence; and it has for us henceforth, in addition to its original and acquired physical beauty, an intellectual expression and impassioned eloquence, the light of ancient days is on it,—the lingering beams of a departed glory; and the shadows still hover over it of the important events or renowned deeds of the illustrious, of which it was the scene or the witness. The edifices for which I am more especially concerned,—the cathedrals and abbeys of the Middle Ages,—are additionally interesting, for having been the ark in which was kept alive during the flood of barbarism that overspread Europe in the Dark Ages the precious seeds of art, and the lamp of ancient learning. And they were more than mere places of worship. What Mr. Ruskin avers of St. Mark's Church at Venice is true of them; they were types of the redeemed Church of God, and scrolls for the written Word of God. Their heaven-pointing spires and pinnacles are luminous with the hope and faith of the men who built them.

But these considerations will have little weight with men capable of destroying such a feature as the aërial gallery connecting the west towers of Limburg Cathedral, or of removing the ancient screens, and so disturbing the *genius loci* out of its sleep of ages. From such men the worst mischief is to be apprehended, even the renewal of some portions of the exterior. No part is safe; and what is worse, they are more likely to destroy the good points of the building than the bad ones, if it have any; the most exquisite features being those they are least likely to appreciate.

To such, appeal is vain. But surely the public of Germany, composed of the countrymen of Goethe, and Schiller, and Albert Dürer, has a sufficient leaven of taste and feeling for the beautiful in it to enable it to discern the infinite difference between a great building in all the glory and beauty of age, and one renewed; and to see the folly of the least attempt to renovate such a building as Limburg Cathedral. We know that there are in Germany of to-day hosts of men of genius in all branches of art,—genius which, being the power of producing what is beautiful, must include the intimate sense of it in nature, and all branches of art; and to such, as well as to non-professional men of taste generally, appeal cannot be made in vain. If it serve not in the present instance, it will yet be like bread cast upon the waters, to be seen and operate again; and, from signs at home, I think there is good ground for hope: a second attempt on the part of the clergy to take out the galleries and reduce to a vacuum the venerable parish church of Ormskirk, in Lancashire, containing the mortal remains of the heroic Charlotte de Tremouille, and the headless trunk of her husband, James, seventh Earl of Derby, and a long line of his house, has just been baffled by the opposition of the parishioners. There is now in existence a Society for the Protection of Ancient Buildings, including some of the deepest thinkers of the age; and I verily believe the day is not distant when it will be an understood fact, as undisputed as the right of every man to personal freedom, that to modernise an ancient building of the higher class is a crime against the republic of art, and against society,—when no man who regards his character would dare to do it,—when restoration committees will merge in building committees and repairs committees, and the word restoration as applied to architecture shall no longer exist.

I have in the above remarks, as in all former papers on the subject, opposed the so-called restoration of ancient buildings, chiefly on the ground of their present surpassingly beautiful state as distinct from their original one, and from any they can ever be restored to; and their potent and touching associations,—their eloquent volubility on the past; and I was pleased to see you, sir, adopting a similar view. But I am concerned to find that this seems to be the view of but few; and that most opponents of the restoration system object to it mainly on archæological grounds, and base their plea for the preservation of time-honoured structures on the value of their practical teachings with respect to the decorative style of architecture they illustrate, and their lessons in constructive science. The late Mr. Edmund Sharpe, in his lecture a year or two ago to the Architectural Association, considered the matter from this point; and condemned restorations for their rendering buildings false to history. The latest writer on the subject, Mr. George Aitchison, in his paper read to the National Association for the Promotion of Social Science at Aberdeen, and published in the *Builder*, and in a separate pamphlet, mentions that the look of newness induced by restoration unfits buildings for the painter. But his chief objection to it is that it mystifies archæologists; and he very ably advocates the true preservation of ancient edifices for their philosophic value,—their aid in making a natural history of man,—in constructing a science of life and of the soul. But this, however important, is by no means the highest use of the structures in question. It is to delight and charm us by their surpassing beauty, and their magical power over departed ages, which is felt not by a few enthusiasts only, but comes home to the heart and imagination of everybody who has any. They are for the higher education of the human spirit: to refine and elevate the passions, which, when properly guided, are the wings of the mind that lift it to its proper place, and advance it towards perfection. If they were not of such use to the people generally, they could not be of use to the artist, as they would not be appreciated in his pictures. While valuable to all, they are especially so to the higher order of minds, which they delight by tenderer strokes than art has the power to give; and they not only attract the painter, but nurse the poetic spirit of the bard. Nay, deans and chapters might be told that the high order of beauty they are destroying is perhaps as calculated to bear the soul aloft,—to assist its ascent towards God as the cathedral music.

This educational one is beyond all comparison the most important use of ancient buildings. Compared with this their other uses are as dust in the balance. What they reveal to us of political, ecclesiastical, or architectural history,—their lessons as to foundations, thickness of walls, comparative durability of materials, and construction generally, may be written down (as it has been to a great extent), and preserved in printed and illustrated books, and thus secured to posterity. Let them thus make their deposition, as to what they can divulge, before the magistrate, Archæology, and both historic and social science would be indemnified if they were thereupon blown into the air. But Beauty would sustain irreparable loss, and Architecture and Art would weep for the fairest of their children, and refuse to be comforted.

A good deal of countenance has been given to architectural restoring by the allowed, and supposed analogous practice of picture-restoring, and people naturally enough ask the question,—If damaged or decayed pictures, which are higher and more critical works of art than buildings are restored, why should not decayed buildings be? Picture-restoring somewhat resembles building-restoring, I grant. Let us look into it, and see how far it resembles it. A valuable picture, perhaps a little injured in one or two parts, but still beautiful and interesting altogether, is submitted by ordinary picture-restorers to something like the following process:—1. It is rubbed over with strong methylated spirits of wine, ostensibly to remove the varnish, which it not only does, but removes also all the delicate glazings and tonings,—as it were, skins the picture; for it must be observed that with the varnish which has gone over them, the delicate tints, glazings, and scumblings, with which most of the old masters finished their pictures, has in time got incorporated, rendering it impossible to remove one without the other. This process ordinarily reduces the picture to something like a *rubbing in*. 2. The parts originally injured are then filled up with composition, and painted over with raw, fresh colour; and, to prevent this looking too fresh, other and uninjured portions of the picture are "touched up" also. A coat of fresh varnish covers all this up, and makes the picture brand new.

But this process, which all genuine artists deplore, destructive as it is to the extant remains of a noble art, is by no means as mischievous as architectural restoring; for it leaves the subject, the design, the composition, and in some measure the chiaroscuro, and is only

sion line to Wood-green, which opens out an independent access between Wood Green and West Green, to the metropolis. It is stated that the Great Eastern Company contemplate extending the line to the Alexandra Palace, with a junction to Wood Green, so as to open a through communication to the north in connexion with the Great Eastern system. In addition to the two above-named new lines, the new route between London and Woolwich, *viâ* Greenwich, by which the Blackheath Tunnel is avoided, and the distance much shortened, was also to have been opened on new year's day, but it appears that the gradients of the line near the new Greenwich Station are not yet satisfactory to the Government Inspector, and some alterations have to be made before the line can be opened.——Simultaneously with the commencement of the new year the London, Brighton, and South Coast Company opened a new station, which they have just erected at Norbury, between Streatham and Thornton Heath, on the main high road between London and Croydon. The new station contains spacious booking-offices and waiting-rooms, with covered platforms upwards of 200 ft. in length.

PRESENTATION TO AN ARCHITECT.

A HANDSOME silver dessert-service, to be presented to Mr. W. Hamilton Beattie, architect, of Edinburgh, on the occasion of his marriage, has been manufactured by Mr. James Aitchison, of that city. The presentation consists of an elegant centre-piece and two candelabra in oxydised silver, the whole standing upon a plateau. The centre-piece is classical in design. Architecture is represented by a tall, richly-chased column, ornamented with the rose and thistle, rising from an oval base, and supporting a large fruit-dish. Around the column are grouped four artistically-modelled figures, emblematic of masonry, sculpture, painting, and carpentry. The base itself is richly encrusted in *repoussé* work. At each angle is a triton supporting a shell containing a glass fruit-dish. The candelabra are in unison with the centre-piece as regards outline, and are ornamented similarly by the rose and thistle. The plateau is relieved on either side by a shield, on one of which is engraved the combined monograms of the bride and bridegroom, and on the other the following inscription:—"Presented to William Hamilton Beattie, esq., architect, Edinburgh, by a number of friends, on the occasion of his marriage, as a mark of their high personal regard and appreciation of his professional talent. Edinburgh, 19th December, 1877." The service, which is designed and modelled by Mr. Clark Stanton, A.R.S.A., and manufactured by Mr. James Aitchison, is very creditable to all concerned. The cost of the service was 400*l*. Amongst the subscribers are members of the principal firms connected with building in Edinburgh, London, and Glasgow. Mr. Beattie's principal public works are the Royal Hotel, Edinburgh; the Princes-street Arcade; and the Marine Hotel, North Berwick.

SHEFFIELD.

THE contemplated street improvements at Sheffield embrace, amongst other schemes, the utilising of a considerable portion of the parish churchyard, which stands, prominent in its isolation, in the middle of the busiest part of the town. Party feeling is running very strong concerning this, and a poll has been demanded and is about to take place thereon. The church of St. Peter, itself, is a fine building, principally in the Perpendicular style, and has a good crocketed spire. There are traces of a church and surrounding graveyard having existed just after the Conquest,—and it is probable that at a still more remote period,—in the Saxon era,—an ecclesiastical building stood upon the same spot.

Annexed to the church is the Shrewsbury Chapel, where lie buried many of the ancient lords of Hallamshire; and in and around the church are buried the recorded worthies of Sheffield:—the Brights and the Wortleys, Marshalls, Waltons, Aslines, Browns, Elams, and Broomheads; Fentons, Roebucks, Ellisons, Eyres, Battys, and Handleys; Gardiners, Ellises, Lamberts, Creswicks, Waterhouses, Gaskoignes, Sutcliffs, Stanleys, and Nodders. There are Farbecks, Websters, Dolbys, Seamans, Ratcliffs, Halls, Fells, Sorbys, Fanshaws, Bamforths, and Spencers; Watsons, Sitwells, Hurts, Jessops, Prestons, Steers, Turners, Greaves, Spooners, and Harrisons. There lie slumbering Vicars Dossey, Wilkinson, Sutton, Sale, Holland (1579); Rogers the cutler, Sterndale the surgeon, and hundreds of other well-known Yorkshire names. The parish registers have been preserved since 1561, and in them are recorded upwards of a hundred thousand names. The churchyard on the Campo-lane side stands some 6 ft. above the roadway—an enormous casket of human remains.

It is wished to appropriate about a thousand square yards of this enclosure for new streets. Each square yard is calculated to contain about a dozen bodies. There have been no burials in the Sheffield graveyard for some time past; but for years before it was closed funerals took place at the rate of 1,000 a year. A hundred years ago it is recorded that the burials were only 500 a year, and the yard was then choke full. And it is a literal fact that burials ceased at last because the ground would hold no more bodies. The contemplated improvements are to be carried out at a probable cost of 600,000*l*. to the Town Council.

A NEW SQUARE IN THE CITY.

A NEW business centre in the City is at present in course of formation in the immediate neighbourhood of Ludgate-hill. Ludgate-circus has recently been added to the last-named well-known thoroughfare, and now the locality is about to be still further distinguished by Ludgate-square. Some time ago the dilapidated blocks of buildings known as Holliday-yard, entered from Creed-lane, were demolished by the Ecclesiastical Commissioners as the owners, and the site so cleared has just been leased by the London and County Building Company, who are now laying it out for the erection of buildings of a mercantile character. For this purpose some property has been purchased in Ludgate-hill, and a house with shop which stood upon the site has been taken down, in order to form an entrance into the new square from Ludgate-hill. This entrance will be 12 ft. wide, a space about 4 ft. in width being reserved on the east side, which is intended to form the approach, by a staircase, to offices which will be erected over the entrance to the square, the entrance itself forming an archway. The roadway through the square is being laid with blocks of wood pavement. Although nominally designated a square, the ground is angular in form, and the roadway curves in a south-easterly direction, from the Ludgate-hill entrance, towards Creed-lane, at the point which formed the old entrance to Holliday-yard. This approach will remain, there being thus two entrances to the square,—the new one in Ludgate-hill, and the original approach from Creed-lane. The ground on the east side of the square was much higher than that to the west, and it has been lowered several feet in order to suit the level of the Ludgate-hill entrance, and also to prevent there being any incline in the roadway, which is likewise on a dead level.

The first block of buildings erected in the new square has just been completed. It has been built for Messrs. Fourdrinier, Hunt, & Co., the well-known paper-manufacturers, who have removed from their former premises in Sherborne-lane, in consequence of the City Conservative Club-house being about to be erected on the site. It is stated that Messrs. Fourdrinier & Co. have occupied the premises in Sherborne-lane about 150 years. The site on which the new building has been erected is at the west side of the square, approached from the Ludgate-hill entrance. The premises occupy a ground area of 2,000 superficial feet. The building is of effective Gothic design, and has been treated specially with regard to obtaining ample light, together with being very substantially constructed, in order that every floor should be equal to carrying the heaviest weights. The elevation is 60 ft. in height, 44 ft. wide, and 55 ft. in depth, the materials consisting chiefly of iron and massive glass windows, with red brick piers. In addition to the basement, the building consists of five floors, the ground-floor having a strong iron girder at the ceiling, which supports the whole of the frontage of the upper floors of the structure. The elevation is divided into two bays, filled in with wood and glass, with side and central brick piers, surmounted by gables, with Bath stone copings and finials. The upper floor windows immediately under the gables are arched, the piers from which the arches spring having ornamental Bath stone capitals. The cost of the building is upwards of 5,500*l*.

Mr. Charles Bell, of Union-street, is the architect, and Messrs. Browne & Robinson are the contractors.

COUNTY CONSTABULARY BUILDINGS, PRESTON.

THE Lancashire county magistrates are at present engaged in the erection of new county constabulary buildings in Preston, where the general executive business will be carried on, and which is about to be still further centralised in that town. The new constabulary buildings now in progress are situate in Fishergate, the leading thoroughfare in the town, and in immediate proximity to the extensive new railway station at present in course of erection, and it is stated that when finished they will be one of the finest architectural blocks which the borough possesses. At an aggregate meeting of the magistrates from all parts of the county held at Preston last week, they resolved upon the purchase of 1,040 yards of land, adjoining the new buildings in progress, for the purpose of still further extending them, and providing spacious court-rooms for the meetings of the body, together with a suite of offices for the clerks of the peace and other officials of the county. The additional land to be purchased involves an outlay of 5,200*l*., and the estimated cost of the buildings is upwards of 20,000*l*. At the same meeting the bench also agreed to purchase 1,495 yards of land at Farnworth, near Bolton, and 813 yards at Wavertree, near Liverpool, for the erection of new county police stations at those places respectively, at a cost of between 5,000*l*. and 6,000*l*.

METROPOLITAN BOARD OF WORKS.

The Amendment of the Building Acts.

At the meeting on the 11th inst., the Parliamentary Committee presented a report submitting a draft Bill for the amendment of the Metropolis Management and Building Acts, and recommending that the same be approved, subject to any verbal alterations which may, under the advice of counsel, be considered expedient.

Mr. Freeman moved the adoption of the draft Bill as submitted by the committee, and the motion having been seconded by Mr. Selway, was put and carried.

Bridges over Public Thoroughfares.

The clerk laid before the Board a letter from Mr. W. Selby, requesting permission to erect a foot-bridge from Oxford-circus to Regent-street, in order to relieve the traffic in the street, and expressing his desire to erect similar bridges in other crowded parts of the metropolis in the event of his experiment being successful.

The communication was referred to the Works and General Purposes Committee.

Schemes under the Artisans' Dwellings Act.

A letter was received from the Home Office, inquiring whether any schemes under the Artisans and Labourers' Dwellings Improvement Act, 1875, are about to be promoted this session, and requesting that, if such is the case, they may be forwarded as soon as possible to the Office.

On the suggestion of the chairman, it was agreed to inform the Home Office that the schemes decided upon by the Board should be forwarded as soon as possible.

BRITISH MUSEUM READING-ROOM.

A DISTINGUISHED antiquary and author who was led to resort to the National Reading-room last week to dig out a few pieces of knowledge, wrote to us from bed to explain his non-adherence to an appointment,—"The draught yesterday at the British Museum has laid me up. It is cruel to the readers, and a disgrace to the authorities who do not take steps to get the defect remedied." We commend the subject to the kind consideration of Mr. Winter Jones, and hope his action will be *summary*.

Paris Exhibition.—Messrs. Gillow & Co. have been desired by the Royal Commissioners to decorate the English section and the pavilion of H.R.H. the Prince of Wales.

TREE-FELLING BY MACHINERY.

SOME interesting trials of a new "steam tree-feller," recently patented by Mr. Allen Ransome, of Stanley Works, Chelsea, took place on Thursday and Friday in last week, on the Roupell Park Estate, close to Tulse-hill Station. The trials made on the first day were private, being, in fact, a mere rehearsal of the public performance of the following day. The trials on each day were very successful, and it is claimed that the machine, attended by three men, will do as much work in a given amount of time as twenty-four woodmen using the axe. This is, we believe, the first time that tree-felling by steam power has been successfully accomplished,—that is to say, successfully accomplished not merely as a mere mechanical operation, but with economy of time and labour. The mechanism required for the operation is, of course, exceedingly simple, but it is in rendering this mechanism as light, small, and portable as possible, so that it may be readily moved about from tree to tree, and quickly adjusted for work, that the chief merit of Mr. Ransome's steam tree-feller consists. Previous attempts to fell trees by machinery have met with but doubtful success; the chief cause of failure being that the time occupied in fixing, adjusting, and moving the apparatus from tree to tree has cost more than felling them by hand.

The tree-feller consists of a horizontal steam cylinder of 4 in. diameter, and 2 ft. long, and having a stroke of 20 in., attached to a light cast-iron bed-plate, about 2 ft. 6 in. long by 1 ft. wide, upon which it is arranged to pivot on its centre, the pivoting motion being readily worked by a worm-wheel actuating a toothed arc or quadrant. The saw is fixed direct to the end of the piston rod, which is caused to travel in a true line when at work by guides; and the range of the pivoting motion of the cylinder is such as to enable the saw to pass through the largest logs that are ordinarily to be met with without moving the bed-plate. The guides for the piston-rod move with the cylinder as it turns on its pivot, and are supported at one end by the cylinder and at the other by a larger arc or quadrant supported on the long stem or neck of the bed-plate. This stem or neck grows out, so to speak, of the bed-plate for a distance of about 4 ft., and its further end is furnished with two fangs, which are made to bite into the butt of the tree by a chain passed round it just below the saw-cut, and drawn taut by a powerful screw passing right along under the stem and bed-plate.

The machine was supplied with steam at 50 lb. pressure from a 3-horse portable boiler through a flexible steam-pipe 50 ft. long, the boiler remaining in one place until the machine had cut down all the trees within the radius determined by the length of the steam-pipe.

From the foregoing description it will be seen that the only fixing the machine requires after it is laid down against the tree, is to draw it tight against the butt by the chain and screw above referred to; and as the whole apparatus, exclusive of the boiler, does not weigh more than about 4 cwt., it is readily carried about slung on poles between four men. The steam-pipe does not require to be disconnected while the machine is being removed, and a special valve is attached, by which it can be instantly started at any part of the stroke. The saw-cut is made 9 in. or 10 in. from the ground.

The greater part of the steam is admitted to the cylinder at the end nearest the tree, the cutting-stroke of the saw being towards the cylinder, and synchronous with the driving home of the piston to the bottom of the cylinder, where a small portion of steam is let in to serve as a cushion.

The first tree felled at the public trials on Friday was an elm, 2 ft. 9 in. across the cut. The machine having been adjusted, the saw was set in motion, and the tree fell in 4½ minutes, breaking the saw in its fall, however. This was no fault of the machine, but was due to the absence of woodmen, who would have been able to direct the fall of the tree so that it should clear the saw. This was done in the case of all the other trees cut down. In six minutes the machine was fixed to the second tree,—an elm, 3 ft. across the cut,—and the tree fell in a little less than eight minutes, there having been some interruption owing to the saw now used (a new one) being too much "hooked" in its teeth. The third elm, 2 ft. 6 in. in diameter, came down in 7½ minutes. In seven minutes more the machine was at work on the fourth tree, which was about 3 ft. 6 in. in diameter, and which fell in less than ten minutes. Four or five other trees were felled, one of them, with a diameter of 1 ft. 10½ in., being sawn through in a minute and a quarter, and, on account of the small size of the tree, without the use of the chain. In a private trial on Thursday, five trees were felled, inclusive of the time occupied in moving and adjusting the apparatus, in thirty-five minutes. In a hollow at the base of one of these trees was found an entire brick. The saw went right through the impediment, with the loss of a tooth.

It was the general opinion of the gentlemen present at the trial that the machine was perfectly successful, and that where there was much wood to fell it would be of great service, particularly in American, Indian, and other colonial forests, which it was desired to clear.

INSTITUTION OF CIVIL ENGINEERS.

THE PRESIDENT'S ADDRESS.

THE first meeting after the Christmas recess was held on Tuesday, the 15th of January, when the newly-elected president, Mr. John Frederic Bateman, delivered an inaugural address.

After a passing allusion to the growth of the Institution, which at the end of 1844 numbered only 552 of all classes, now increased to 3,189, reference was made to some of the addresses of the eighteen gentlemen who had previously occupied the presidential chair, mainly for the purposes of comparison. Thus, Mr. Robert Stephenson, in summarising the statistics of British railways to the end of 1854, mentioned that 368 millions sterling had been authorised to be expended, of which 286 millions had been raised; whereas at the end of 1876 these figures were respectively 742 and 682 millions. Again, Mr. Locke, in treating of French railways, remarked that at the close of 1856 concessions had been granted for 7,030 miles, of which 4,060 miles were open; whilst at the close of 1876 these mileages were 16,452 and 12,715. Mr. M'Clean had contrasted the income available for taxation in 1815 with 1856, and had shown that in the interval the revenue from land had not increased, while that from houses had augmented 300 per cent., and from quarries, mines, ironworks, canals, railways, &c., 1,200 per cent. There was evidence that since 1856 the increase had been very great, even if these high rates had not actually been maintained. These remarks showed how largely the engineer had been employed, and how much his labours had contributed to the development of the wealth and prosperity of all countries whe e he had been engaged.

Proceeding to matters more personal to every member of the Institution, the president urged that engineering was but, in fact, the embodiment of practical wisdom; or, in the words of Bacon, "the conjunction of contemplation and action." Thought, combined with practice, had led to the perfecting of the steam-engine by James Watt, to the successful application of the locomotive engine by George Stephenson, and to the production of the electric telegraph. It was to the combination of sound theory with successful practice that engineering owed its present position, and had been able to advance material prosperity. It might, however, lay claim to more than that, for the works of the engineer had carried the blessings of civilisation into every quarter of the globe: the steam-engine, in its various applications, had knitted together the most distant nations; ignorance had been brought into contact with knowledge, and heathenism with Christianity. On these grounds, and on others, the education of the engineer was of serious moment. In France, and on the Continent generally, where public works were mainly carried out by the governments, engineers were educated in special schools, the theoretical information thus acquired being admittedly superior, as a rule, to that imparted in this country; yet the students lacked that practical experience which had hitherto been the main source of the success of the English engineer, who owed little or nothing to Government patronage, and whose employment depended on individual merit, the works being undertaken by private enterprise. Still, our young engineers were not always prepared, by preliminary education, as well as they might be for the subsequent acquisition of practical knowledge. Special qualifications, and some of a high order, were required; and it would be well if advantage were taken of the numerous public schools in which instruction bearing on engineering was given, with a view to prevent young men becoming pupils without these qualifications. But it must be understood that such training could only be regarded as preparatory, and not as being complete in itself; and it was a mistake and mischievous where any college or school professed to fit a student to act at once as an engineer.

The President then gave a brief description of a few of the principal engineering works recently completed, or at present under construction; mentioning in telegraph engineering the telephones of Mr. A. G. Bell and Mr. Edison; instruments which differed in construction, but by both of which the human voice, with all its modulations, could be transmitted to great distances. Then, again, the quadruple system of telegraphy, imported from America, had also come into use. By this system two messages could be sent in each direction by the same wire at the same time. During the past year electricity had put forward other claims than those relating to means of communication. Thus, the electric light, if it could not at present compete successfully with the convenience in domestic arrangements of gas lighting, had been found useful and effective for the illumination of large spaces, and the invention was about to be applied at the Lizard Point Lighthouses.

In the conviction that experience of a special kind, gained during a long professional life, was of more real value than allusions, however lucid, to a variety of subjects, the president next adverted to a question which was of the highest importance in that branch of the profession to which his attention had been more particularly directed, viz.:—the rainfall of this country, and the quantity of water which flowed off the ground, available for the use of man if properly utilized, or destructive when uncontrolled and permitted to cause floods or torrents.

THE LATE MR. H. W. BURGESS, ARCHITECT.

WE have to record the death of Mr. Hartley William Burgess, A.R.I.B.A., which took place on the 13th inst., at 392, New-cross-road, Deptford, from the consequences of an accident at the Gravesend Railway Station. Mr. Burgess was in his fifty-second year. He was born in Jersey, and became an articled pupil of the late Mr. W. Brown, of Reading, afterwards entering the office of Messrs. Whichcord & Son, at Maidstone. For upwards of the last twenty years he has been connected with the office of Mr. John Whichcord, F.S.A., having the management of the District Office at Deptford, and acting as confidential assistant.

For some years past Mr. Burgess also practised independently, and his name is connected with several creditable structures in and around London.

DID ANGLO-SAXON SLAVES WEAR COLLARS?

SOME little time ago Mr. E. Armitage, R.A., wrote a letter to Mr. Edward Freeman, in which he said,—

"I am engaged on a large picture, representing a Saxon lord, on his death-bed, giving freedom to his theowes or serfs.

I venture to write to you for information on one or two points, as you are an authority on all matters connected with early English history.

1st. Did the slaves of that period wear collars or any other badge of servitude?

I have searched in vain for any account of these collars. The only authority I know of for the custom is Sir Walter Scott, who gives Gurth a collar in 'Ivanhoe.'"

This led to a racy correspondence, with which we have no occasion to meddle. A correspondent, however, from Derby, sends us the following reply to the inquiry:—Fosbroke, in his "Encyclopædia of Antiquities and Elements of Archæology," in treating of the customs that obtained amongst the Anglo-Saxons in relation to their slaves, states, "The tunick, open on the sides, appears to have been, among the early Anglo-Saxons at least, a distinguishing badge of slavery; but the decisive mark was a collar of iron, constantly worn round the neck of all bondsmen. In the museum of the Antiquarian Society of Edinburgh is a metal collar, constructed with a ring for receiving a padlock, with the following inscription:—'Alexander Stewart, found guilty of death, for theft at Perth, the 5th of December, 1701, and gifted by the Justiciary as a perpetual servant to

Sir John Erskine, of Alva.' This collar was found in the grave of the deceased in the burial-ground at Alva. In a daily journal (April, 1835) is the following paragraph:—'There has been lately found at Croytroy, in the Somme, a human skeleton, with an iron ring soldered round the neck, apparently of the twelfth or fourteenth century. The weight of the ring is considerable, though eaten by rust.'"

In reference to Roman slaves, the same authority gives the following information:—"If they ran away, a collar was put round their necks, with *Tene me, quia fugio*, &c. [Stop me, for I run away], of which several have been printed." The following is a specimen from Fabretti Inscr., p. 522:—"*Tene me quia fugio et revoca me in septis.*" Fosbroke further quotes,—"Blue, says Pliny, was the colour in which the Gauls clothed their slaves, and from hence, for many ages, blue coats were the liveries of servants and apprentices, even of younger brothers; as now of the blue-coat boys, blue schools in the country," &c.

Probably the blue colour of the smock or tunick (open on the sides) worn at the present time by our farm labourers is a relic of the Gaulish custom above quoted.

Again; in Crabb's "Technological Dictionary" (1823 edition) I find "*Collare*, a collar so called from *collum*, the neck, because it was worn about the neck. It was a sort of chain put round the necks of runaway slaves, with an inscription stating their name and offence, with which, till the time of Constantine, they were branded on the forehead; but afterwards it was engraved upon the collar itself, of which several examples are given by antiquaries, as one quoted by Pignorius,—'*Tene me quia fugi et revoca me domino meo Bonifacio Linario.*'"

And in "Bailey's Dictionary" (1742 edition) I find, "*Collar*, the upper part of a band or doublet; also a ring made of metal to put about the neck of a slave, dog, &c." A statute was enacted by Edward VI. that made it lawful to put a ring of iron round the neck, arm, or leg of a runaway slave. FREDERICK DAVIS.

THE MASONS' STRIKE.

SIR,—Your sympathy in the case of this strike is honourable alike to head and heart. I also deeply sympathise with the good men, who, however, are a minority; but I have nothing but contempt for the inciters of the strike and the drones who are contented to live upon strike allowance. If I were one of the masters, I would meet no workmen's deputation coming direct from the strike committee, as I should be satisfied by experience that no settled good would spring from the discussion. I have been behind the scenes; I have listened to a union council discussing trade affairs, and have been shocked to learn that masters must submit their tenders before accepting a contract, that the committee may see if or not the master can afford to pay the wages the Union intends to demand! The taking on of apprentices must be regulated by the committee, and even the employment of foremen must be agreeable to this secret tribunal. You may remember that the great strike at the commencement of the new Houses of Parliament was against Messrs. Grissell & Peto's manager. At Messrs. Doulton's new buildings the strike was against the firm's own men setting their own specially-designed and prepared terra cotta.

I am satisfied that the only safe course for the masters is to fight it out to the end, by engaging men wherever they can be obtained who will work without having union fetters about them. Trade unionism, in its worst form, is both to men and masters an unmitigated curse, without one redeeming feature in its favour; as, under a rampant unionism, masters or "contractors" must come to bankruptcy,—trade must diminish,—the best men must be reduced to a species of reversed slavery, by being prevented using the intelligence and ability they are endowed with,—and all are to be subject to a grinding and far-reaching tyranny. Masters, or contractors who do not submit must be denounced and rnined, and men who do not come in and conform are to be deprived of the opportunity of working at the trade they have learned, as unionism is to denounce and dominate wide as the trade extends, as trade-union presidents and delegates will neither show their rules nor their accounts. The roving delegates attend union meetings in private, make their own statements,—and terrible statements they sometimes are in their denunciations and threats to and of all who in any way oppose unionism,—that is, their special form of unionism.

It is surprising how good and intelligent men consent to be hoodwinked, led, and bullied by their leaders.

I inclose my name, by which you will know I speak from personal knowledge. Z.

"DOWN WITH THE BAR."

IT is not for the first time that we have noticed the wideness of view taken by the veteran author, Mr. J. R. Planché, in those extravaganzas which first delighted the town twenty and thirty years ago,—his grasp of the general rather than of the merely special which makes these works of his sound as *apropos* to-day, when revived, as they did at the time of their first representation. Looking accidentally just now through a printed copy of one of them, "The Haymarket Spring Meeting," we came upon couplet after couplet, which might have been written last week, and here is a whole passage, not a word of which needs alteration. *London*, one of the characters, in lamenting the snubs received from *Westminster*, when the latter enters and says,—

"How d'ye do, sister?

London (turns her back on her). Matchless impudence!

Westminster. 'Now do I fear I've done some grave offence

That looks disgracious in the City's eye,'

As Glo'ster says to the Lord Mayor; or why

Should London turn from Westminster so coldly?

London. 'Why?' Can you ask that question?

West. Yes, and boldly.

London. Boldly, indeed! Dost thou not seek my fall?

Would'st not wrench from me cap, sword, mace, and all?

Put down my Show, suppress my Corporation,

Of my own Thames dispute the conservation,

Give my Lord Mayor and Sheriffs both the bag,

Make of my livery mere tag and rag,

Chase Common Hunt and silence Common Crier,

Fling all my precious green fat in the fire,

Hang the whole Court of Aldermen in chains,

And leave of London's glory no remains?

West. You are mistaken: London's glory lies

In her great works and noble charities;

My Parliament is proud of them as you,

And honour gives where honour's justly due.

You're wrong to put yourself in such a passion,

Reform, my dear, is coming into fashion.

London. Reform! my ears are weary of the word.

West. It isn't pleasant, but it will be heard;

I'm sure against it Westminster fought hard,

In Covent Garden and Old Palace Yard,

But 'twas no use; so, sister, make your mind up,

And all your old affairs with courage wind up!

Take a fresh start—go hand in hand with me,

Care less for calipash and calipee,

Your ancient hospitality keep up,

But wider circulate the loving cup;

Instead of up the Thames alone swan-hopping,

Help me to keep it clean from Kew to Wapping;

Release the poor from pestilential sties,

Think of their rooms more than your companies!

Shall we, whose vital interests mutual are,

Divided see them still by Temple Bar?

Down with all bars that would two sisters sever,

London with Westminster should live for ever!"

THE TEMPLE CHURCH.

SIR,—I have to-day passed the porch of this fine relic of the past for the first time for many months, and lingered for a few seconds to admire the grace of an architectural monument which seems, like the Sibylline books, to have increased in value from the destruction of so much which once made London a noble storehouse of Mediæval architecture.

I was startled to notice white streaks following the line of the old mouldings, and white patches on many portions of the blackened surface of the stone. It needed no examination to lead me to apprehend the worst; and when I did examine I found that, as I feared, large portions of the surface are in a state of active disintegration and decay, and, if nothing is done, a few years must reduce the mouldings to a shapeless and unsound mass. I do not hope that the decay of this or of any other old stone can be perfectly and permanently arrested; but no one familiar with the entrance to the Chapter House from the cloisters of Westminster Abbey, and with what Sir Gilbert Scott has there done to retard decay, can doubt that the evil day may be very considerably postponed—and that by simple and safe means.

What Sir Gilbert Scott has done at Westminster, Mr. St. Aubyn can, I am sure, do at the Temple, and I write these lines in the hope that if you give them publicity they may catch the eye of some of the Benchers, and may result in the necessary authority being given to Mr. St. Aubyn to rescue, as far as it is possible, the porch and any other portions of the old work which are similarly attacked from threatened destruction, and to do it at once, for there is no time to lose.

A LOVER OF ANTIQUITY.

DWELLINGS FOR THE POOR.

SIR,—The following copy of a letter which I sent to the Right Honourable Mr. Gladstone, M.P., on improved dwellings for the poor of London, with his reply, may be of interest to your readers. G. RYAN.

"Honoured Sir,—Will you be kind enough to allow me to draw your attention to a subject of very great importance as regards the social and moral reform of the working people of this great metropolis, viz., improved dwellings for the poor of London; and I take this opportunity of writing to you upon this subject, knowing the very great interest that you have always taken in the working population of the United Kingdom; and it is with great pleasure that I have to inform you that several working men are coming to the front in this matter, and, with your great experience, it must have come under your observation that, through the great increase in the rents of apartments, and the way in which London has been cut up, especially in very poor localities, the startling fact that working men, with their wives, and in a very great many cases, eight or nine children, are all reluctantly compelled to live in one room. Let us just for one moment ask ourselves this question, Can this be healthy, or is it in any sense decent? There can be no fault attached to the breadwinner. Poor man, his wages may be at the very most 30s. per week to keep the whole of the family. Now, supposing a respectable working man, with a wife, and we will say two children, would like to live in some respectable neighbourhood. When he makes application for apartments, the first question that he is asked by the householder in nineteen cases out of twenty will be, Have you any children? If he says yes, he at once meets with a refusal; and perhaps the door is shut in his face. If our richer brethren would only take this matter in hand, a very great good would be the result. My object in placing this matter before you, in my very humble way, for your most earnest consideration, is that you, being one of our greatest and most learned statesmen, might propose some really substantial alteration for the benefit of the poor of London.—I am, Sir, yours most respectfully,

G. RYAN, a Working Man.

35, Union-street, Middlesex Hospital.

To the Right Honourable W. E. Gladstone."

REPLY.

"January 7, 1878.

Sir,—I am glad to learn from your letter that the artisans intend to enter seriously upon the question of dwellings for persons of their class.

I think they cannot do better than direct their attention to an excellent plan (as it seemed to me) which was designed and carried out some years back by the municipality of Glasgow, and which has been to a great extent, if not been completely, acted on. Information or particulars could be had, without doubt, from the town clerk or other officer of the town council.

Your faithful servant,

W. E. GLADSTONE.

G. Ryan, a working man, 35, Union-street, Middlesex Hospital."

WAGES.

AT the Wandsworth Police-court, Mr. Walter Edmund Macey, builder, of Queen's-road, Batterses, was summoned, before Mr. Paget, by William Woodham, a mason, who claimed 7s. 8d., being the remainder of his wages.

The complainant said he was paid at the rate of 7d. per hour. He claimed to be paid at the rate of 9d. There was no agreement.

The defendant, on being sworn, said he employed masons at various sums, averaging from 4d. to 9d. per hour, according to their worth. The complainant was not worth more than 7d. an hour. It was his custom to pay men according to their worth, except when he made an agreement.

Mr. Paget said it was the best plan, and dismissed the summons.

THE APPROPRIATION OF CONSECRATED CHURCHYARDS.—A LEGAL POINT.

A QUESTION of some importance as to the right to build upon consecrated churchyards is at present before the Chancellor of the Consistory Court of London. The rector and churchwardens of St. Matthew's, Bethnal-green, have made an application to the Chancellor for a faculty to erect a mortuary and coroner's court, and also a room for *post-mortem* examinations, on a portion of the site of the churchyard, and the application was opposed on the ground that the churchyard, having been consecrated, could not be appropriated to building purposes. It was stated before the chancellor that there were a considerable number of witnesses to be called both for and against the application, and that the decision of the chancellor might be regarded as a precedent with respect to the appropriation of other consecrated churchyards. The case was adjourned, it being intimated that the evidence and arguments would, in all probability, occupy several days.

The Wood Pavement in Piccadilly, very recently laid, is being taken up from the foundation, and fresh blocks are being laid. It might be useful to know what led to the failure.

NEW DOCK WORKS AT SUTTON BRIDGE.

A NEW dock is about to be constructed at Sutton Bridge, on the east coast, not far from King's Lynn. The works have been formally commenced, and the first sod has been turned by the Marquis of Huntly. Although there are 25 ft. of water at Sutton Bridge, at ordinary spring tides, admitting of vessels of the largest class navigating the river at this point, the absence of a dock has hitherto prevented shipping business from being carried on to any great extent. The Great Northern and the Midland Railway companies have a joint station there, with a line of railway connecting it with King's Lynn, and the new dock, when completed, will serve the extensive Derby and Nottingham coal-fields in the same manner as Great Grimsby is a marine outlet for the coal-fields of South Yorkshire. The Great Northern Company has subscribed 20,000*l.* towards the making of the dock, the estimated cost of which is 130,000*l.*, the area of the dock being eight acres. Mr. Brunlees, C.E., has designed the dock, and the works will be carried out under his supervision by Mr. Webster, the well-known contractor.

Miscellanea.

Health and Education.—This was the subject of a lecture given by Dr. B. W. Richardson, F.R.S., on Monday evening, at the London Institution. In the course of his remarks he said the healthiest and ruddiest children in London were to be found amongst those who played about the courts and squares, even though they were the denizens of courts and mews. Next came the children of the well-to-do, provided they were not harassed with long lessons, who were taken into public parks and gardens, or were driven out. But the unhealthiest were the children of the middle trading classes,—children who were not allowed to run wild in the streets, and could not be sent to the parks or the suburbs. This last class of children were kept close at home or at school, living in small rooms badly ventilated, and though they were well fed and clothed and comfortably bedded, they grew up almost universally unhealthy, yielding the larger number of those who died of pulmonary consumption. An increase of garden schools would supply what was desired, and in the large and splendid Board Schools, which were becoming a feature of the age, there was an approach to this end, but the end was not yet attained. In the critical period from eleven to sixteen or seventeen years of age there were three errors committed in education. First, overwork; secondly, want of care in detecting the natural character or turn of the mind; and, thirdly, the forcing the pupil into endless competitions. To overwork a growing horse would be held to be the most ignorant of processes, while to work a child harder, perhaps, than it would be worked at any other period of life, was thought to be most correct. When the clever boy or girl died, it was said, "Whom the gods love die young." This was false; for whom the gods loved died old. The prize system was bad fundamentally. In the matter of health that system stood at the bar guiltiest of the guilty. They had but to go to a prize distribution to see in the worn and languid faces of the successful the effects of the system, and there they did not see a tithe of the evil; they had not seen the children before the competition, nor did they see them after it, nor between the competition and the announcement of the awards. If they could see all the changes incident to these events, they would see what a mad system it was, and would understand how much the dull were to be envied, rather than the successful, and the flattered and triumphant.

House Drainage.—On the 10th inst. a paper on this subject was read by Mr. H. T. Munday, C.E., before the Civil and Mechanical Engineers' Society, at 7, Westminster-chambers; Mr. H. V. F. Valpy, the president, in the chair. The author described the present defective system which existed in nearly every house, and showed how, both in execution and design, the principles of sanitary science are habitually ignored. Descriptions were given of several different methods of house drainage, either patented or carried out by those who have made this subject their special study. On January 24th, a paper on "Chimney Stacks" will be read by Mr. R. M. Bancroft.

Temple Bar.—The first stone was taken down on the 2nd inst. The Bar has been removed with the exception of a pier on either side of the road. The carriage-way has been thrown open. The *City Press* says the building was composed in its exterior, and all its principal parts, of good Portland stone, as were the figures, which were found in a sound state of preservation. The portions not visible were chiefly of Bath stone, and this has very much perished, but the interior and filling up were unquestionably from *débris* of other buildings after the Fire of London, the Bar having been erected at that time. A large portion of the rubble walling shows that it formed parts of other buildings before it was used in the construction of the Bar, much of it showing bold mouldings and fine carvings. This material, therefore, would be of ancient date. A much longer time was required in pulling down the structure than was expected, on account of the large quantity of iron cramps that were used to hold the stones together, and which had to be cut out carefully. Iron cramps were used in Temple Bar of every conceivable shape, with a view to holding the stones together; but the oxidising and expansion and contraction of the iron break off the corners of the stones and allow the damp to penetrate, thus defeating the very purpose the cramps were intended to fulfil. Messrs. J. Mowlem & Co. were employed to pull down the Bar. The material has all been carted away to the vacant ground in Farringdon-road, awaiting the decision of the Corporation as to its final destination. No better site has been suggested than our own, the Thames Embankment entrance to the Temple.

The Farnesina Palace.—The Roman correspondent of the *Morning Post* says:—I have mentioned in previous letters the opposition made by the proprietor of the Farnesina Palace, a Spanish nobleman, to the curtailing of his grounds in order to widen the bed of the Tiber just before it reaches the Ponte Sisto. He apprehended, and the academicians of St. Luke's, with the Commissioners for the Preservation of Art in Rome, entertained similar fears, that bringing the course of the river so near the foundations of the palace would endanger its solidity and bring eventual destruction on the beautiful frescoes by Raffaelle, representing the story of Cupid and Psyche, Galatea, &c., which constitute one of the greatest artistical treasures of Rome. A Government commission of architects and engineers, however, decided that no such danger existed if the works were executed with due precaution, and so they were commenced last summer, and are now being carried on, much to the disgust of the Duke of Ripalda, as is evident from the following notice which I observed posted up in French and Italian on the closed gates of the villa opposite the Corsini Palace:—

"The Farnesina Villa having been mutilated in the most interesting and historic portion of its grounds in consequence of orders given by the Government for the prosecution of the Tiber works, which, in the opinion of the academicians of St. Luke's and the Commissioners for the Preservation of Monuments in Rome, will, it is feared, not only endanger the Farnesina Palace itself, but bring ruin upon the matchless works of art it contains, the villa is closed to the public, and will remain so as long as the danger alluded to continues to exist."

City Property.—The following case, says the *Metropolitan*, illustrates the increasing value of property in the City of London. Roberts *v.* The Metropolitan Railway Company (before Mr. Under-Sheriff and a Special Jury). Mr. Arthur Charles, Q.C., and Mr. Lumley Smith, instructed by Messrs. Thomson, Low, & Brooks, appeared for the claimant; and Mr. Harrison, Q.C., instructed by Messrs. Burchells, for the Metropolitan Railway Company. The property in question is situated in Sheppy-yard, in the parish of Holy Trinity, Minories, and was in the occupation of Mr. George Roberts, the freeholder, and used as a sack, bag, and tarpaulin manufactory. The premises, which were purchased by public auction in 1872 for 3,100*l.*, were assessed by the jury as of the value of 8,204*l.* for which amount the jury, after viewing the property and hearing the evidence of Mr. Alderman Ellis, Mr. Charles Dunch, and Mr. F. Inman Sharp, the surveyors for the claimant, and Mr. Trist and Mr. Farmer, for the company, gave their verdict as above.

Mr. George Cruikshank has been very seriously ill, his recovery being despaired of, but we are glad to learn that the most alarming symptoms have subsided, though the danger has not altogether passed.

London Water Supply.—Mr. Lewis Angell, C.E., read a paper on the Water Supply of London at a meeting of the Social Science Association on Monday evening, in which he argued that the present intermittent system of supply should be replaced by a constant flow at high pressure and under public control. The change from "intermittent" to constant supply, he admitted, would involve formidable financial considerations; therefore the cost of such reform, in the first instance, ought to be arranged on some equitable basis between the individual and public. The present daily average of 120 million gallons could not be obtained from pure sources; nor was it necessary, as one-sixteenth part would suffice for dietetic purposes; and as for the remainder, no very high standard of purity need be looked for. This proposition, he pointed out, would involve a dual supply as the most practicable solution of the difficulty, as proposed by the Metropolitan Board of Works, and suggested by him in 1874. Mr. Edwin Chadwick, C.B., who presided, opposed the principle laid down in the paper, pointing out that after the works for supplying of the metropolis had been brought under unity of management, spring supplies of superior quality would be found in sufficient bulk to exclude any pretext for restricting the ordinary consumption, and that the mains at present in use would suffice for the change. A duplicate system of works was not needed either for the domestic supply of water, or for the prevention of fires.

Sanitary Progress.—It is proposed by some of the most distinguished citizens of Edinburgh to apply the co-operative principle to scientific sanitary inspection. They are attempting to organise an association, the annual subscription to which will be one guinea, for the purpose of securing to its members, free of charge, that skilled sanitary supervision and advice which could only be got at great cost through individual action. The association is to secure the exclusive services of one or more well-educated young engineers, who, acting under the sober control of a consulting engineer of high standing, will, when required, inspect and report upon the dwellings of members, giving estimates as to the cost of any alterations that may be deemed advisable. Their recommendations must be limited to strictly indispensable points, and no officer of the association is to hold any pecuniary interest in any patent or manufacture. The Professor of Engineering in the University of Edinburgh has taken such a warm interest in this novel scheme that he has offered for the first year to give the association his gratuitous services. The idea is a very good one.

Self-Sacrifice by Workmen.—During the last twelve months we have chronicled four or five instances in which workmen have endangered or forfeited their lives in endeavouring to save others from injury or death. The latest case of the kind is that of Frederick Alfred Craft, aged 31, formerly a railway guard, and recently night inspector at the Woolwich Arsenal Station on the North Kent line, who was killed on Friday in last week by being run over by a train in the act of saving the life of an insane woman who had thrown herself in front of the engine. The Rev. G. Webb, foreman of the jury, expressed a hope that the public would recognise the self-sacrifice of the deceased by providing for his children, and a subscription was made on behalf of a fund which the station-master is raising. To this fund some of our readers may be able to contribute.

Prizes for Designs for Furniture.—The council of the Society of Arts are trustees of the sum of 400*l.*, presented to them by the Owen Jones Memorial Committee, being the balance of the subscriptions to that fund, upon trust to expend the interest thereof in prizes to "students of the schools of art who in annual competition produce the best designs for household furniture, carpets, wall-papers and hangings, damask chintzes, &c., regulated by the principles laid down by Owen Jones." The first award will be made at the annual competition in 1878, when the accumulated interest available will amount to about 25*l.*

Works on the Fine Arts.—The last catalogue issued by Mr. Quaritch (Piccadilly) includes a very large number of works on the fine arts, including architecture, and may be usefully studied. To know even what books there are on a subject available is a good step in knowledge. The catalogue before us is so suggestive it would not be difficult to make a very pleasant article on it.

The Institute Library.—The following architects have been admitted, under the recent regulations of the Council, to read in the library for a period of twelve months, viz., Messrs. W. W. K. Clarke, C. Dawson, A. T. Ellison, R. Henry, J. P. Lidstone, J. B. Phillips, H. M. Robinson, H. Tanner, F. D. Topham, and H. G. Turner. The acquisition of duplicate books for the loan collection, now in progress, will specially develop the value of this increasing library to the professional student.

The Royal Academy of Arts.—The Diploma Galleries of the Royal Academy, containing the works deposited by members on their election as Academicians, and other works the property of the Academy (including the Gibson Sculpture), are now open, free, to the public.——At a general assembly held last evening, the following gentlemen were elected as associates:—Briton Riviere, painter; Joseph E. Boehm, sculptor; Alfred Waterhouse, architect.

TENDERS

For additions to St. Peter's Schools, Paddington, for the Rev. O'Bryen Hodge. Mr. E. Vigers, jun., architect. Quantities by Mr. B. A. C. Herring:—

Stephenson	£1,491	0	0
Temple & Foster	1,395	0	0
Marsland	1,295	0	0
Andover	1,280	0	0
Stimpson	1,264	0	0
Lambol	1,247	0	0
Phillipson	1,230	0	0
Hook & Oldrey	1,218	0	0

Alternative Estimate:—

Stephenson	£1,380	0	0
Temple & Foster	1,257	0	0
Andover	1,175	0	0
Marsland	1,170	0	0
Lambol	1,156	0	0
Phillipson	1,146	0	0
Stimpson	1,094	0	0
Hook & Oldrey	1,093	0	0

For rebuilding No. 43, Ludgate-hill. Mr. Lewis Solomon, architect. Quantities supplied by Messrs. Williams & Gritten:—

Veare & Co.	£2,969	0	0
Newman & Mann	2,888	0	0
Browne & Robinson	2,697	0	0
Mark	2,500	0	0
Patman & Fotheringham	2,490	0	0
Elkington	2,480	0	0
Downs	2,369	0	0

For erecting carriage-shed and offices, No. 1, Coburg-street, for Messrs. Parkyns & Sons. Mr. Tolley, architect:—

Wells	£677	0	0
Williams & Sons	654	0	0
Toms	619	0	0
Cairns	613	0	0
Prout	598	15	0
Blandford & Co.	597	0	0
Bangs & Co.	581	0	0
Faulkner	575	0	0

For additional class-rooms and lavatories to the New Basford Board Schools, for the Nottingham School Board. Messrs. S. D. & H. Walker, architects:—

Daubney	£899	0	0
Hind	847	0	0
Bell & Son	844	0	0
Musson	826	0	0
S. & J. Cargill	820	0	0
Wood	785	0	0
Staniforth	760	18	0
Mosley	760	0	0
Bains & Turton	760	0	0
Stevenson	748	0	0
Hopewell	748	0	0
Jelley	721	0	0
Roberts & Perkins	719	0	0
Hodson & Facon (accepted)	677	10	0

For alterations to All Saints' Schools, Norfolk-square. Mr. Wm. White, architect:—

Hook & Oldrey	£461	0	0!
Gregory	359	0	0
Temple & Foster	275	0	0!

For removing houses, and building new stables, and enamelling-shops, in Salisbury-lane, for Messrs. Brindley & Co., exclusive of slater's work:—

Stephens (accepted)	£976	0	0

For alterations and repairs to private house, adjoining Red Lion Hotel, Hampton, for Sir Henry Meux & Co.:—

Blandford & Co. (accepted).			

For Baptist Chapel, Brunswick-road, Bromley, E., for the Rev. William Thomas Lambourne. Messrs. Hills & Fletcher, architects:—

Hoy (accepted)	£936	0	0

For new engine and boiler houses, for the Bristol Water Works Company. Mr. John Taylor, engineer. Quantities supplied:—

Veals (accepted)	£5,344	0	0

For new potato warehouse, Thomas-street, Bristol, for Mr. R. J. Neale. Mr. H. Williams, architect. Quantities supplied:—

Veals (accepted)	£2,595	0	0

For joiners' work. Messrs. Weeks & Hughes, architects:—

Pink	£276	10	0
Johnson	273	12	7
Petham	265	0	0
Frode	253	1	11
Uff	245	10	2
Edmond & Co.	245	0	0
Emery	239	0	0
Mokellow & Son	238	5	0
Penn	237	0	0
Doveland	218	13	3
Hill	226	0	0
Ede & Motley	225	10	0
Lascelles	225	0	0
Wing & Co.	216	2	0
Aldridge	210	13	0
Barnard	210	0	0
Heather	209	15	0
Redaile & Co.	2 2	3	3
Wisdom	2 2	0	0
Smitherman	198	7	0
Judd & Young (accepted)	173	15	0
Rees & Son	167	0	0
Wilton	165	0	0

TO CORRESPONDENTS.

"House Drainage by Open Soil pipe" (a number of letters on this subject mainly repeat each other).—S. B. "Germania" (we cannot assist).—C. F. T. (the subject has been treated of at various times in our columns. We are not able to advise on each special case. To use a "porous stone" for the purpose is simply idiotic).—D. & K.—K. P.—B. S.—S. I.—H. St. J.—F. D.—J. W.—E. M.—Miss C.—J. P.—T. M.—T. B. S.—R. F.—J. B.—D. J. B.—J. W.—L. D. & Co.—C. G.—W. H. F.—F. W. H.—B. W. P.

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The Builder.

Vol. XXXVI. No. 1865 Saturday, January 26 1878

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Architecture at Mycenæ.

It will be a matter much to be regretted if the Collection of Antiquities from the Troad which Dr. Schliemann has arranged for exhibition in the cases at South Kensington, does not ultimately find a place at the British Museum. It comprises documents which must be regarded in all future speculations that have pretensions to thoroughness respecting the earliest connexions and developments of the Hellenic people and of Hellenic art. It were merely futile to reflect superciliously on the rudeness and ungainliness which characterise so many of them; no disrespect would be shown to an inscription of like date, could such be found, that gave us half the information, however uncouth the dialect,—however rare and incidental might be the phrases which betrayed that it must, indeed, represent the speech of a people not unrelated to either Greek or Trojan ancestry. The collections of the British Museum are gradually providing us with specimens of every stage of the plastic art, including ceramic, of the ancient world; and it were a pity that an opportunity should be lost of filling a gap. It is, too, probably hopeless that any specimens will be obtainable even by interchange, and purchase is out of the question, from the discoveries at Mycenæ and at Spata in Attica, on which the Greeks set justly a patriotic value; the more reason to secure what links can be secured of a chain that every student of art and history must be earnest to extend. Dr. Schliemann seems to have announced some time since that the collection was not for sale; but even from his own point of view it would surely be desirable that it should finally rest in safe and permanent and national keeping; while the realised value might strengthen his hands for the researches which he still looks forward to, and for the prosecution of which it is the hope of all that his health may be equal. Such a transfer would lessen in no way his great claims on the combined respect and gratitude of the civilised world; and the world at large would benefit more by these specimens finding a European rather than an American home.

The antiquities of Hissarlik,—of that site in the Troad which by the consent of antiquity was recognised as that of Troy,—have certain points of agreement as well as of significant contrast with those of Mycenæ which are engraved profusely in Dr. Schliemann's recent publication, and both stand in like relations to the antiquities of Cyprus. These latter are also brought prominently before us at this very time by the work of General Cesnola; the mass of his collection has indeed passed to America, but some articles are in our Museum, with a considerable number from other excavations at Cyprus, and only require juxtaposition with the Hissarlik collection to acquire an interest still more important. The three publications,—"Troy and its Remains," "Mycenæ and Tiryns," and "Cyprus: its Cities, Tombs, and Temples," must range on library-shelves, and be studied most effectually in conjunction with whatever help is available from actual inspection of the remains, which it would be excellent to have in as close association, or almost as easily to be referred to.

It is at Mycenæ that we are attracted to take our stand, when we would "let observation, with extensive view," survey the world of which we obtain the glimpses through the night of ages. It was from Mycenæ, so the poet sang, that Agamemnon started, equipped with armour presented to him by a Cyprian king, for the siege of Troy, and the antiquities from this site while, for the most part, intermediate in age between the others, are in every respect more important. The students of architecture have long been familiar with many details of the primæval constructions of Argos, Mycenæ, and Tiryns, and the objects which excavation has now brought to light can be identified as pertaining to the same general period,—a period of uncertain but probably vast duration,—to which some of the most interesting of those structures owed their origin.

It is as long ago as 1830 that Professor Donaldson published, in the supplementary volume to Stuart's "Antiquities of Athens," a series of illustrations of the subterraneous structure known as the Treasury of Atreus. Details were partly furnished by Mr. Cockerell, who had made some excavations on the spot, and partly by drawings executed by Lusieri for Lord Elgin, and now preserved in the British Museum. Of the authenticity of these records there could be no question. Some of the ornamental fragments came into the British Museum as part of the Elgin collection, and there it has been our fate to hear an archæologist put aside a remark as to their importance, by the disparaging word, "Byzantine!" After Dr. Schliemann's discoveries, this at least will not have to be endured again. We have another example here how discoveries larger and under more striking circumstances are constantly required to notify to students that they had long possessed and neglected evidence which, however moderate in extent, was quite conclusive by itself on points of the highest interest.

The sites of at least five more such structures, as the better-preserved treasury of Athens so called, are shown on Dr. Schliemann's map, and he also furnishes some important details of one near the Lions' Gate, which was excavated by Mrs. Schliemann, smaller than that assigned to Atreus, and of ruder construction, but of the same general plan. A broad avenue, or *dromos*, between walls of squared stones, conducts in this case also to the portal, which admits by a narrower inner passage to the circular area of the chamber. The interior, as in other cases, was domed by a peculiar system of construction; and the exterior was entirely covered with earth. The portal itself is of noble dimensions, and treated with much dignity; the lintel is an enormous stone, in front of another much larger, which roofs the passage that is first entered. The lintel was relieved, as much from tradition of the construction, it is probable, as,—its strength considered,—of necessity, by a void triangular space, towards which the masonry approached on either side by projecting stones of regular courses, and which no doubt was originally closed by a single slab, as at the Lions' Gate of the citadel.

The circular chambers were contracted upwards by courses of stones gradually reduced in diameter, until a small aperture at the top could be covered by a single stone. The blocks of the lower courses of the largest example are 1 ft. 10 in. high and from 4 ft. to 7 ft. long, but they become gradually narrower towards the top.

It is much to be desired that the smaller treasury should be surveyed, measured, and excavated more completely than it was possible could be done under the circumstances of this first examination. It is of prime historical and architectural interest to discover what indications may present themselves of differences technical and artistic that represent progress and considerable lapse of time. Thus the section of the treasury of Atreus shows a quasi-parabolic curve which rises steeply from the ground line, and gives free headway quite close to the circumference; but Dr. Schliemann's section of the other example represents a tall right-lined triangle; and the sloping walls here meet the floor at an angle so acute as to seriously reduce the available standing area.

The larger chamber has a height of 45 ft., or nearly equal to the diameter at the floor line, 48 ft. The smaller, if it was really completed as the section of what remains would indicate, must have had the greater height of over 60 ft. to compare with base of about 42 ft.

In the Atreus treasury all the stones of the horizontal rings are of hard breccia, and were found worked fair and concentric to the depth of 3 in. from the inner face of the chamber, so as to meet with the greatest precision, and without any binding material. The remaining portion of the joint was less accurate, and even rough, but into these small stones were driven in very tight, like wedges, no doubt after the completion of an entire ring; solidity being thus ensured without risk of opening the internal joint. We then read (p. 43) that the irregular outside ends of the stones were not immediately covered with earth, but with enormous masses of stone. We should be glad of precise par-

ticulars how these were disposed; unless their vertical pressure fell well outside the base line they would certainly not tend, "by their ponderous weight to keep all the stones of the circular layers in position." These are among the many points of detail which must remain doubtful, awaiting the definite observations of an architect.

In both structures the stones were dressed off to a smooth slope in the interior; those of the larger, which we will call A, from the fourth course upward, show each two bored holes for the insertion of nails with broad, flat, unornamented heads. Gell, in his "Argolis," engraves one of these, which he had succeeded in detaching by use of a long pole from near the top; and the drawings of Lusieri show how they projected obliquely, and thus most suitably for their assumed purpose of suspending the metal plates which Homer's descriptions authorise us to infer originally clothed the walls. Some outline patterns on the local terra-cotta have much appearance of having been suggested by overlapping plates or scales so attached. The lower portion of the wall to the height of some 8 ft. was probably cased with wood. No such holes or nails were found in B, but a circumstance which Dr. Schliemaan quaintly says, "I cannot avoid mentioning," seems to indicate a partial application of some other contrivance. "On the inner east side of the Treasury there protrudes from between the stones the fragment of a bronze plate which sticks so fast that it cannot be drawn out; I therefore suppose that it was fastened there when the Treasury was built." He adds, it is true,—"It appears hardly possible that this could have happened merely by accident, but, on the other hand, I find it difficult to believe that this bronze plate could be the remnant of an ancient wall-coating of bronze plates, which were fastened not to the stones with nails, but were attached in the joints between them; because in this case, I presume, we ought to find remnants of those plates in many cases." Besides the nail Gell knocked out a bronze wedge, but in the darkness could not see how it had been employed. The composition of the metal was eighty-eight parts copper to twelve of tin.

The floor of A is the natural rock (p. 44). The floor of B was also found to be the levelled rock covered with a coating of sand and chalk, traces of which were found in many places, the remains it may be of a made surface as that of the rock slopes towards the centre which is 1 ft. lower than the threshold. The great chamber of A has a second doorway, at the right hand side within, which admits to a second chamber, nearly square on plan, 27 ft. either way, and 19 ft. high, entirely cut out of the rock. The doorway has the usual massive lintel and triangular relieving space, now void, which show conclusively that it was part of the original plan. In the centre of the floor Dr. Schliemann found a circular depression, in form of a large washbowl, 1 ft. 9 in. deep and 3 ft. 4 in. in diameter, and near it some large calcareous stones, apparently remains of some construction. Here, again, we feel defrauded at not being supplied with dimensions and sections,—hard as it may seem to complain of one who gives so much that he has not given more.

From silence, it is to be inferred that no trace of such a secondary chamber was to be found in B; but a distinct assurance would have been more satisfactory that it had been looked for and could not have existed. In such case it may be regarded as one of the additions that are to be expected in later developments of a traditional type. This difference may bear very importantly upon the question in what sense these so-called treasuries can ever have been tombs. The question of their purpose seems to lie between temple, tomb, and treasury; if ever employed as prisons, it must have been only secondarily. The mere traditional name of treasury need imply no more than an inference from a natural application for a dark underground chamber, or from occasional discoveries within them of valuable funereal deposits. It is inconsistent to suppose that depositories of royal wealth, the military chests of warlike chiefs, were outside the citadel, and scattered at all points about the city. Chambers for the dead, only rectangular on plan, are found constructed on this principle of overhanging courses of slabs and covered with mounds in the Greek cemeteries of Panticapæum and its conterminal districts, and also in Asia Minor. And, manifestly, it is not because we do not find graves sunk within these chambers at Mycenæ that we are not still at full liberty to regard them as tombs. In the parallel cases the dead were consigned to their solitude extended on open biers, enclosed in stone or other coffins; or sometimes urns are found which contain relics and ashes collected after process of cremation.

The doorway of the interior chamber of A exhibited plain proofs that it had been secured by strong bars or bolts, and Dr. Schliemann found like ample provision for bolts in the jambs and cill of the Lion Gate, and in the jambs of the postern gate of the Acropolis; but Gell reports, and Hughes, who travelled in 1813, makes the same observation, that no traces of holes for bolts, or sockets for hinges, were to be found at the great entrance of the Atreus treasury; if this were indeed the case, the sepulchral character of the building must be surrendered at once, and we should have a difficult task left on our hands to reconcile the anomaly with any other theory. But the recent excavations, which have cleared the entrance more thoroughly, seem to relieve us of the difficulty. It is only a pity that the statement is not given in terms more definite than these,—"In the middle of the doorway can be seen the holes for the bolts and hinges of the doors, and in the same line are a number of round holes, 2 in. in diameter and ½ in. deep; in these are two small holes for bronze nails, of which fragments still exist, to fasten on ornaments of a circular form." Hinges in the middle of a doorway, and ornaments in the same line as the bolts, are not, at first, expressions easy to understand; but of the main fact we need not doubt that the entrance had a secured door; however, the false impression of Gell, whose observation is not usually at fault, is to be accounted for. Indeed, half-way between entrance and chamber, Lusieri's plan has an indication of sockets for pivots, and though his section does not confirm the indication, that of Donaldson and Cockerell happily does so by showing pivot-holes in the roofing slab; half the entrance-passage, therefore, was open, and half closed off. The doorway of A is 18 ft. high and 9 ft. 2 in. broad at the cill, diminishing to 8 ft. 6 in. at the top. That of B is even 18 ft. 5 in. high, and 8 ft. 4 in. broad, but we miss any notice of sockets for bolts or hinges as either present or absent,—another matter for future visitors to look into. The entrance-passage of B is 13 ft. long, that of A is 18 ft. This passage in A, intermediate between the portal and the circular chamber, is roofed beyond the lintel, by a stone somewhat vast to be called a slab, and, like the lintel, "beautifully cut and polished." Its thickness is 3 ft. 9 in.; breadth, 17 ft.; and its length, 29 ft., on the upper surface, a dimension which is reduced to 27 ft. 6 in. on the lower, where it is cut off to agree with the sloping side of the chamber, while its upper and lower edges curve, to follow the circumferential line.

As the wall is continued vertically over the cill, a space was enclosed between it and the exterior of the chamber above the entrance-passage. The section in the supplementary volume, and the view of the interior given by Gell, show another relieving triangular opening in the side of the vault itself, over the entrance to the chamber below; but how the intermediate space above the great slab was treated or roofed there is no evidence at hand to show. As Dr. Schliemann would say, "we draw particular attention" to the bevel of the stone in the section of the interior opening.

Some important decorative details of these entrances are still to be described and their significance considered; but we may at once gather up what scattered notices give any help as to the original purpose of the vaults so elaborately constructed. A passage of Pausanias (2, 23, 7), which is quoted in Dr. Schliemann's note (p. 44) is important, but not quite so much so as it promises at a hasty reading of the text, to say nothing of the misleading Latin versions of the German editors. "The Argives have other things worth seeing; a subterranean structure over which was a bronze chamber which Acrisius made on a time for the safe-keeping of his daughter Danae; but which Perilaus when tyrant destroyed. There is this structure, then, and a monument of Crotopus and a naos of Dionysus Cresius." The editors, Siebelis as well as Schubart and Walz, connect these sentences most tantalisingly, as if the structure of the first could be identified with the burial referred to in the second. The commentators also are ready to authorise the translation "in which" instead of "over which"; but in truth neither can be allowed. A close and candid reading of the entire paragraph makes the interpretation as given above inevitable.

It seems, however, very clear that Sophocles considered that the prison of Danae was a subterranean metal-lined chamber; and it is then tempting to conjecture that the ruin charged upon Perilaus, whose date is quite uncertain, was in fact stripping off the metal from the underground structure which Pausanias found still existing, and described by the phrase which he applies to the treasuries of Mycenæ. The tragedian's words are, that "Danae endured to interchange the light of heaven for the brass-plated halls, and was kept imprisoned, hidden in a sepulchral thalamus." On the other hand, when we recall the legend that Jupiter, as a lover, visited Danae in the form of a shower of gold, and when Pausanias, after describing the treasury of Minyas at Orchomenus, distinguishes it from the tomb of Minyas, we seem thrown upon the associations of a treasury. The question as to the sepulchral character of these buildings has acquired fresh importance by the problem of their relation to the interments in contrasted fashion discovered by Dr. Schliemann on the acropolis. Further excavating alone can be looked to, to settle the question positively. On the whole, perhaps, what is most noteworthy in the literary allusions is that they agree in carrying back the origin of such structures to an age long anterior to that of the Pelopid dynasty, which is associated with the legends of the expedition to the Troad. The subversion of this dynasty is dated, with great probability, full one thousand years B.C. How much earlier may have been its establishment, and that of dynasties preceding it, are questions truly in the air. Such questions are as interesting, and perhaps as desperate withal, as a chronology of the geological formations that lie below London. We may think much of being able by study of fragments of ornamentation which are our indicating fossils, to make some approach to fixing at least an order of succession of monuments and hints of epochs of transition.

This subject demands treatment apart. With respect to construction and plan, the Treasuries,—that of Atreus particularly, exhibit the culmination, and that at a very advanced point indeed, of what we find in most rudimentary form at Tiryns, and developed some further stages at Mycenæ. The walls of Tiryns are piles of huge rough masses of rock, with no approach to observance of horizontal beds, and only occasional and apparently later marks of the tool; at Mycenæ, the blocks, still large, are more moderate, in many portions are for the most part wrought to quadrangular form, and laid in courses, while still no attention at all, or only the most exceptional, and perhaps accidental, is given to covering alternate joints. Galleries in the walls of Tiryns are formed by approximation of opposite stones, and Gell found remains of several bridges in the adjacent valleys, which had been formed in the same way by horizontally projecting stones. The horizontal lintel, with relieving void above, first appears at Mycenæ. Every stage of transition can be identified until we arrive at the Treasuries, which exhibit one great originality in, as it were, returning the gallery wall round upon itself, and so adjusting this principle of covering intervals to a circular plan; but still this improvement and very excellent workmanship are combined with no further constructive innovation,—least of all with any tendency to the rule of true arcuation.

Contrasted, therefore, as these structures are with what we know as the most characteristic architecture of Hellenism, they have so far an organic principle in common, exclusive dependence on trabeation,—the most loyal allegiance to the solidity of simple downpress. Whether an analogy of equal value can be made out between the ornamentation of two epochs is still to be considered, and fortunately we are not without valuable material for comparison.

Waste Land. — Sir Horace St. Paul, of Ellowes-hall, Dudley, has consented to have about thirty acres of his waste colliery lands at Coseley levelled and cultivated, with the view of finding employment for a large number of men who are suffering great privations owing to the depression of trade. As there are thousands of acres in a similar useless condition in the Black Country, it is hoped the example will be followed by other land-owners.

THE SO-CALLED LAW OF "ANCIENT" WINDOW-LIGHTS.

IN the largest and most important commercial centre, perhaps, in the world,—in a Capital whose sunlight has been not inaptly compared by a foreign cynic to the moonbeams of Venice, it is inevitable that the right to enjoy the sun should be eagerly acquired and jealously guarded; it is equally inevitable that London daylight, esteemed a piece of property, should be marketable. Nor can it surprise any one who knows how many obstructions,—with which other less fortunate nations are unfamiliar,—exist in this country to spoil good architecture and perplex an honest architect, that the law of window-lights or "ancient" lights is a matter rather of accident than of principle; a law or custom framed upon the most ancient maxim of all creation, that He shall take who has the power, And he shall keep who can.

Without the smallest intention or desire to increase the mental confusion of those who, not being technically learned in the Law of Easements, would like to hear something intelligible about the subject, we propose to make a few remarks upon the common-sense aspect of the actual difficulty,—to examine it from the point of view of justice, and not from one of Law or Equity, or any other focus of dilemma. Those who aspire to collect the details of the case of poor architecture in crowded cities, will find all the cases that lead up to it, and upon which its present uncertain position is founded, in books; from Gale on "Easements" to Elmes on "Architectural Jurisprudence," from Latham on "Window-lights" to Cox on "Ancient Lights." There are also valuable papers, printed in the Transactions of scientific societies, which treat practically of the Law as it is; one was read by Professor Kerr, another by Professor Donaldson, in the year 1866, before the Institute of Architects. A paper on the same subject was read before the Institution of Surveyors in 1875 by Mr. W. Dundas Gardiner; and only the other day one of her Majesty's Counsel continued the subject in a paper, part of which we printed, read before the Institute of Architects. It will probably astonish no man of business, certainly no lawyer, to learn that only since the publication of the earlier papers has litigation, connected with the right of light, assumed a form which bids fair to become a greater nuisance than the nuisance it pretends to remove.

Theoretically, the owner of a plot of land in London may build whatever he likes upon it, over all or any part of it, and to whatever height he pleases, provided only that his building does not injure the property or affect the rights of his neighbours. For instance, he is not at liberty to darken his neighbours' windows, though the nature of such darkening, or what darkens a window, is not defined. Suffice it that he is not legally allowed to build anything on his own land which interferes with the right to light that his neighbour or his neighbour's predecessor has enjoyed for a certain period of time. That period is regulated by an Act of Parliament passed in the second and third year of William IV. (1st of August, 1832), and called the Prescription Act. It is the only measure in which St. Stephen's has essayed to remove difficulties attending what are now known as "ancient" lights, that is to say, windows which have been permitted to exist for at least twenty years. Before the passing of the Prescription Act, the right pertaining to an ancient light could only be enforced by proving that the window existed from time immemorial, – or time whereof the memory of man runneth not to the contrary,—that is to say, from the reign of King Richard I. In 1832 it was enacted, "That when the Access and Use of Light to and for any Dwelling-house, Workshop, or other Building shall have been actually enjoyed therewith for the full Period of Twenty Years without Interruption, the Right thereto shall be deemed absolute and indefeasible . . . . unless . . . . enjoyed by some Consent or Agreement, &c." The practice, however, of granting injunctions to prevent the erection of buildings which may affect an "ancient" light has only become comparatively common during the last ten or twelve years. Before 1866, the best of the Lord Chancellors took a broad view of the exigencies of commerce and the progress of improvement in towns. For more than thirty years after the passing of the Prescription Act, an "ancient" light was regarded as too often an obstruction to improvement rather than as a fit object to obstruct improvement. The opinion expressed, much more than a hundred years before, by Lord Chancellor Hardwicke, was tacitly endorsed: an opinion that though "it is true the value of the plaintiff's house may be reduced by rendering the prospect less pleasant, but that is no reason to hinder a man from building on his own ground." Indeed, not long ago Lord Cranworth suggested in one case what a barrister, technically interested in the confused practice of "light and air," has called a very alarming doctrine, that dwellers in cities must submit to encroachments upon their "rights" as to windows which dwellers in the country might feasibly claim. But by the zeal of two Vice-Chancellors in 1865-6 effect was successfully given to the statute which defined and established the prescriptive right to light. They granted injunctions which caused one Lord Justice to say that the Vice-Chancellors had gone too far. Through the efforts of the latter, however, the Court of Appeal was squeezed into seeing that such injunctions were necessary. Even Lord Cranworth consented to undo the effect of what he had previously said; but his adherence was given with a protest. By the Prescription Act of 1832 the reputed custom of the City of London was abrogated. Of that custom, which permitted the erection of buildings to any height upon old foundations, Lord Cranworth said:—"The growing necessity for lofty buildings is shown by the great multiplication of them in all parts of the metropolis, and I cannot but fear that serious inconvenience may be felt by the abolition of the alleged custom." Many surveyors and architects, liberal and enlightened members of their now divided profession, concur in the opinions of Lord Hardwicke, Lord Justice Turner, and Lord Cranworth. They conscientiously believe that a great misfortune happened when the Court of Appeal ceased, in this instance, its constitutional opposition to the Court of Chancery.

Before proceeding further, let us attempt to define an easement, or at least to understand an accepted definition. According to the great authority, Gale, "It is a privilege without profit which the owner of one neighbouring tenement hath of another"; and "by which the servient owner is obliged to suffer or not to do something on his own land for the advantage of the dominant owner." The "dominant" is that one to which the alleged right belongs; the "servient" that upon which the obligation is imposed. The "right" imposing the obligation is called an "easement,"—a term which comes to us through the French from the Latin. The privileges it includes were called in the Roman civil law "*servitutes*": thus, the right of the dominant owner over the servient owner is called in English law a "servitude." This limitation on the power of a servient owner over his own land is tersely, and somewhat contradictorily, expressed in the ancient maxim of "So to use your land as not to injure another" (*sic utere tuo ut alienum non lædas*).

Now lawyers, surveyors, architects, and others who periodically report upon the state of the Law of Easements, tell us, in becoming terms, that it is based upon the Roman practice. What is not told by them, and what we consider highly essential to know, is not the practice alone, but the real state of the law of servitudes in ancient times. It is necessary to understand how feasibly to apply to London the maxim of the Digest,—"Let him who would injure the lights of his neighbours, or do any other thing to them, know that he ought to maintain the form and condition of the ancient structures" (*Qui luminibus vicinorum officere, aliudve quid facere contra commodum eorum vellet, sciet se formam ac statum antiquorum ædificiorum custodire debere*). It is necessary to be minutely informed of the circumstances connected with that law, recorded in the Institutes of Justinian, by which the owner is restrained from increasing the height of a house, lest he should darken his neighbours' windows (*ne altius quis tollat ædes suas ne luminibus vicini officiat*). It is necessary to have a better explanation than has yet been accorded to victims of "light" legislation how certain maxims which were current in Rome 1,400 and 2,000 years ago are applicable to London in the nineteenth century,—how the natural right of the owner to the use of his land, even up to the highest heaven (*cujus est solum ejus est ab imo usque ad cœlum*), provided he so use it as not to affect his neighbour (*sic utere tuo ut alienum non lædas*) either by force, stealth, or favour (NEC *vi*, NEC *clam*, NEC *precario*) can be made to apply to a province of houses rising, every score of years, nearer to the sky. The very words "dominant" and "servient" betray their origin. Among the Romans the mutual relation of master and slave was expressed by the terms of "*Dominus*" and "*Servus*" or "*Servitus*." The power of the master over his slave extended to the right of putting him to death; he could sell or punish his slave at pleasure. A Roman citizen could seize his creditors, or hold them in slavery; and he used his slaves as Englishmen and Americans once used theirs in Jamaica and Virginia. The Roman often gave his slave a piece of land, contiguous to or part of his own estate, and this piece was to be cultivated or built upon for the benefit of the slave's master who was thus the dominant owner. Under such conditions of existence the *servitutes* were clear and comprehensible. There were two classes of servitudes. Either they had for their subject a definite person who could exercise the right, and they ceased with the death of the person; or they had for their subject another piece of property, as land or a house, and the person who exercised the service (*servitus*) exercised it in respect of his right to the house or land which was its subject. Servitudes of the latter kind were called Prædial Servitudes. These implied the existence of two contiguous pieces of land, one of which owed a service to the other; and the service was due from the one to the other. The name of dominant tenement (*Prædium Dominans*), which is now used to designate the tenement to which the service or easement is due, is a modern invention. A service, now degenerated into an easement, was an advantage to the land to which it belonged; it must have been something that in some way increased the value of that land. It was also a thing that was permanently to the advantage of the dominant tenement or estate. The service was considered as belonging to the dominant estate in such a sense that it could not be alienated without the estate, nor pledged, nor let.*

The condition of the City of Rome 1,400 or 2,000 years ago is also worthy the attention of those who may yet frame a just and explicable law of light and air. Two laws of the eighth table, confirmed about B.C. 450 are as follow:—"Let the space of 2½ ft. of ground be always left between one house and another"; and "roads shall be 8 ft. wide when they run straight and when they turn, 16 ft." Five hundred years after those laws were promulgated some of the streets were still barely three yards wide, if we may judge from recent excavations in Rome. The articles upon the Era of the Cæsars lately published by ourselves (vol. xxxv., p. 417), go to show what the condition of the world's Capital, during the first century, resembled. The houses lofty and of many stories, principally of wood, projected over the streets and internal courtyards; and they were propped up in places. The colonnade and the portico, often of wood, formed parts of every house above those of the lowest kind. Neighbours could do more than shake hands from one house to another; they could look into and command one another's rooms. The shops were most frequently one apartment; some had a room at the back, lighted and entered from the shop. In the third century, if we may depend upon the fragments of the Marble Plan, wider streets and improved habitations existed in different quarters of the City. The "magnificence" of Rome from that time till at least the reign of Justinian (A.D. 528—545) is beyond possibility of doubt. But nothing extant, nothing that has been discovered by modern enterprise, suffices to show that the private comfort or ease, which is the distinguishing mark of recent times, was then understood, or that the "public magnificence," of which so many moderns have written, was anything else than the outcome of State aggrandisement. The conditions of life and habitation in Rome during the sixth or the third century, and of London in the nineteenth, are indubitably not analogous. The spirit of Law in the one ought not to be arbitrarily imposed as the letter of Law in the other. To descend to details, it is almost ridiculous to compare a diminutive ancient light, filled with talc or tiny bits of Roman glass, to the big sashes and bigger casements filled with the plate-glass of to-day; and soon to be catalogued as "ancient" windows.

Moreover, it would be well if those who have interests nobler than the so-called "expert," ready

* See the excellent articles:—"Servitutes," "Servitus," "Superficies," and "Accessio," in Dr. Smith's "Dictionary of Antiquities."

to be hired for either plaintiff or defendant, would consider how an owner, who presumedly owns his land *ab imo usque ad cœlum*, is to be limited in enjoyment of his own by the owner of a dominant tenement who either by force, stealth, or favour (AUT *vi*, AUT *clam*, AUT *precario*), or in some other manner, without the consent and concurrence of any "servient" owner,—has acquired such a right as to entirely control servient, that is to say, neighbouring, tenements. It would be well, we repeat, for all men of influence to consider how the owner of a dominant tenement can legally increase the value of his own property by, so far as access of light is concerned, practically embodying all servient tenements within his own estate. Let us imagine a case: that of the owners of a field just outside London, or any other increasing city in England. Say that it is situated at a spot now covered with grass and bushes, but a spot which, in twenty years' time, perhaps, will be absorbed in the suburbs already and gradually creeping up to it. The field, say, is divided longitudinally in two unequal parts. The larger part belongs to one owner; the smaller part, a mere slice, belongs to another. The former erects *on the very edge of his own ground*, and throughout the whole length of the field, an enormous mill, a hospital, or even a gun manufactory. He makes it, say, seven stories high, and he opens a hundred windows, some fourteen in each story, directly looking into his neighbour's little bit of the field. The building thus raised is the dominant tenement which, in twenty years (that is to say, in nineteen years and a day),* will have acquired by prescription an absolute and indefeasible right to prevent the owner of the adjoining little slice from erecting anything upon it except a one-story building; and even that would have to be placed at least 10 ft., throughout the whole length of the dominant tenement, from the edge of the servient owner's own property. If the owner of the dominant tenement carried on a special trade, such, for instance, as gun-making,—where light is required at so low an angle as to enable the workman to look down a gun-barrel,—the servient owner would be altogether prevented from using his own land for building purposes. He has, however, a remedy at law open to him, and the option of applying it within the statutory lapse of years. He may erect on his own land a screen-wall in brick or stone or wood, and entirely block up the hundred windows of the dominant tenement. But to erect such a screen might be attended with a cost double or treble the value of the slice of land he owns,—land, by the bye, which might only acquire value after twenty years or more. Yet that is the custom of this country introduced and supported by the Act of Prescription; and it is confirmed by a succession of Judges' judgments, imperfect, contradictory, and unjust.

Again, we know of a case which actually occurred. The owner of houses, built on the very verge of the land he owned, was on the eve of acquiring, by prescription,—that is to say, the lapse of less than twenty years,—an absolute dominant right over his neighbour's land. He was on the eve of acquiring the right to prevent his neighbour from making the same use of property that he himself, nearly twenty years before, had made; he was about to be possessed of the right to drive off his neighbour's buildings at an angle of 45 degrees, drawn from the centre of his basement windows, or, as we said before, if he could show necessity, at a much lower angle. The servient tenement changed owners just in time to "save its bacon," if we may use a phrase not recognised in equity; and the owner of the dominant tenement formally complained that the trade carried on within the servient tenement was offensive. The owner of the latter called in a well-known surveyor, who, finding that just a few months were still wanting to complete the required lapse of years, built up a lofty brick wall on his client's land, and so prevented the owner of the dominant tenement from seeing, or hearing, or smelling the offensive trade of the servient owner. This, which was done only at a vast expense, would have been impossible after the statutory years had elapsed.

It is, therefore, quite natural that most of the speakers on this subject at the Institution of Surveyors and the Institute of Architects should urge the revision of the law, or so-called law, of "ancient" lights. Mr. I'Anson, in discussing Mr. Dundas Gardiner's paper, said, very wisely, that it was not altogether a satisfactory solution of the difficulty of right acquired by undisturbed possession, for the Legislature to fix upon twenty years as the period in which a right to light might be lost or acquired. The rule, he continued, worked very oppressively in some instances. Twenty years in the life of a man was a comparatively long period, representing, as it did, two-thirds of a generation; but in the life of buildings it was a very little space of time, for an edifice might last 200 years, and the owner of a building, when he erected it, built it for a century or more. Mr. Chatfeild Clarke, both at the Institution of Surveyors and the Institute of Architects, expressed himself very clearly on this matter. Before the former he urged that where a building was raised opposite to another, each retaining rights of light, the party first raising ought absolutely to contract with the other to give a right to raise to a similar height at any time hereafter, each party having a power to attach this right to the property. In the recent discussion on Mr. Webb's paper, the same gentleman said that the practical question for the Institute to consider was, what could be done to alleviate the cruel hardship, the great annoyance, and the exceeding loss which fell upon owners of property through the constant ligitation arising out of the present state of the Law concerning "ancient" lights. He spoke of certain building speculators who, having within the last few years built large premises which had injured the light on the opposite side of the street, were now able, and legally encouraged, to defy the parties whom they had injured to carry the premises of the latter any higher than they formerly were. Nor was Professor Kerr less categorical in his denunciation of the present chaos of custom and opinion. He said that no practical man was able to tell beforehand what would be the issue of any controversy or litigation upon the subject; and that no man could determine, with precision enough to guide an architect in the preparation of a design, what would be the opinion which the Court, or a jury, would form as to materiality of damage in cases of light and air. England, he added, was the very Paradise of vested interests; and as damages, in such cases, could only be determined by architects and surveyors, he urged the profession to be more chary of coming forward to support claims of light and air, and more disposed to take up the victims', or, more properly, the defendants', cases.

There cannot be a doubt that the Law, such as it is, is of a character likely to place a weapon in the hands of evil-doers, and that the owner of the dominant tenement too often acts as a spoliator: that he is aggressive as well as dominant. The law in his case is that of "first come first served"; and it confesses itself, by the months of great judges, unable to protect the owners of property from being injured or despoiled. As to the protection of the servient owner from the aggression of the dominant, it is all very well to say, as lawyers do with cool complacency, that it is competent for the servient owner to obstruct aggressive lights, to protect himself by screens or walls, and thus prevent the accretion or growing up of the right, but in the case just instanced by Mr. Jennings, before the Institute of Architects, the cost of such protection alone, quite independent of all legal expenses, becomes intolerable and an impossibility. The Roman Institutes are indubitably most excellent in conception; but somehow in this age of competition and struggle, the maxim, "so to use your own as not to injure your neighbour," has got to be applied, in cases of "ancient" light, almost solely for the aggressor's advantage. Whereas it ought to be applied, *in the first instance*, to the aggressor himself,—the owner of a dominant tenement,—in order that the thing which he is permitted and encouraged to do may not be done. As it is, the owner of a bit of land, in the midst of a solitude which after an interval may become a populous district, often creates the *wrong* that gives him the *right* to apply an equally old maxim of misrule:—"I have hurt you, but you shall not hurt me"; a wrong, moreover, that he is taught to call his right by what we have heard described, in cold blood, as the iniquity of Equity.

Nor can it be denied that, in several instances, the state of the Law has encouraged extortionate claims, and that fear of such extortions or rather dread of litigation, is a powerful bar to the improvement of house property and the consequent progress of towns. Indeed, architects, not all without professional reputation, have lent themselves, under the name of "experts," to aid rapacity on the part of aggressive or dominant owners. The keen solicitor often influences, for his own as well as his client's purposes, inferior and ignorant members of a profession, the membership of which is open to all men qualified or unqualified. It has even been asserted that no sooner is an old building pulled down, and about to be reconstructed, than the smooth expert,—so called,—explains to the neighbours how, if they will but entrust themselves to him, he can obtain for them a liberal compensation from the unhappy servient over whom chance, or a lapse of twenty years, has given them a dominant right. The equitable law of light and air thus becomes in the hands of the unscrupulous an engine of oppression; yet, in a multitude of cases, the oppression, however virulent or even extortionate, results in little or no pecuniary profit to those engaged in it, other than the legal profession and the "scientific" assistants they employ. With a phalanx of expert witnesses duly prepared for attack and defence, and always ambitious to be sworn, counsel learned in the law dilate upon the prior decisions of courts. A select audience of the British public enjoy, without understanding, the technical wit of Bar and the facile stolidity of Science. The crash of intellect within the courts is only a little less conflicting than the conflicts between the courts themselves. The results would amuse all men, were they not disastrous to many. In most countries, even in those which preach equality before the Law, litigation is a luxury; and after the piling up of costs by the solicitors, after the venting of righteous indignation by the judge upon the presumed evil-doer—generally the defendant,—the successful party is often astounded at a victory which gives him power to curtail or destroy a new building, and to accept a paltry sum for allowing it to remain, or be completed.

If in this inquiry we have abstained from broaching the question of any other easement than that of window-lights, it is simply because we can only devote a certain amount of space to the matter. The right to air is inseparable from the right to light, and we would tolerate any anomaly of law or custom which prevented the gradual filling up of breathing-space within the *insulæ* of London and the great towns. But, if people will only reflect, it is since advantage was taken of the Prescription Act, since the Vice-Chancellors in 1865-6 granted injunctions under that Act, that many of the internal breathing-spaces in the heart of London have been built upon. There is no law to prevent the owner of an entire *insula* in any part of London from filling up the open yards between its four surrounding sides; there is no rule, municipal enactment, or local bye-law, to prevent half a dozen owners from paralysing one lung of their tenements to the detriment of those they employ, or of those to whom they let the upper portions of their houses.

The subject must not drop; the absolute necessity for a revision of the present laws or precedents regarding window-lights must be brought home to the Legislature. Some definite and defined principles ought to be laid down for the consideration of real experts, both legal and scientific. We are not quite satisfied with any of the papers that have been written during the last twelve years upon this subject. That of Mr. Dundas Gardiner, prepared nearly ten years after that of Professor Donaldson, is perhaps the best and most usefully argumentative. The paper just read before the Institute of Architects breaks no new ground. Mr. Locock Webb mainly repeats what has already been printed by many others, and appends an additional catalogue of cases. We would like a paper on the Law of Easements to treat that part of the subject relating to architecture and building under three general heads. One, the Law of Support to land and buildings, including the extraordinary laws which relate to persons who own a single story of a house,—a not uncommon tenure of chambers in the Inns of Court. Second, a consideration of the history, as well as the practice, of the Law of ancient Window-lights. This should show how it came to be included in the Prescription Act of 1832, and how that Act remained for nearly thirty-four years in abeyance as regards obstructions to light and air. Third, an inquiry into cases of negligence and Miscellaneous Easements. The whole subject requires intelligent ventilation; it will be a great thing to give not only the general public, but also many architects and surveyors, the chance of

* See Mr. Dundas Gardiner's paper in the Transactions of the Institution of Surveyors.

understanding the character of that action which the Legislature now sanctions and even promotes. It is perhaps not known to all professional men that some of the greatest landowners in the metropolis insert in their leases provisos expressly negativing the existence or acquisition by their lessees of any right of light and air, or other easement, over the adjoining property of the lessor. Such a clause, which of course is an advantage to the landowner, is equally advantageous to the well-disposed lessee and the good builder. But the introduction of such a clause into leases is only possible on great estates, or in parts of the metropolis where, according to the old proposition, easements have been extinguished by unity. Owners of slices of land, lessors of divided property, lessees of a house, or two or three houses, have no other protection than that code or system or custom which can enable so eminent a judge as the present Master of the Rolls to deliver, in the maturity of his wisdom, a judgment like that in the recent case of Aynsley *v.* Glover:—"*As I understand*," said Sir G. Jessell, "*the rule now is, and I shall so decide in future,—unless in the meantime the Appeal Court shall decide differently*—that whenever an action can be maintained at law . . . . then the injunction ought to follow in equity." It was the same judge who, in the year 1875, enjoined upon litigants the moral necessity of being neighbourly. In the case of Paulig *v.* Waterlow,—referring to a large new building erected upon the site of the old Finsbury Market,—the Master of the Rolls said that he remembered the place very well, because his father lived in Finsbury-square for ten years. It was a wretched market, and he was very unwilling that the improvements being effected by Mr. Waterlow should be stopped. He did not like injunctions being made use of to get an excessive sum. He concluded a generous exhortation, in which attempts to stop improvements were stigmatised in language worthy of a Master of the Rolls, by ordering the agent of improvement—defendant in the case—to pay the plaintiff—obstructor of such improvement—the sum of 500*l.* and his costs.

YRIARTE'S "VENICE."

THE earlier portion of M. Yriarte's splendid work on Venice we noticed in the *Builder* for March 10th of last year. The further and concluding portion of the work which is now before us,* continues in the first instance the subject of "art" (which had been treated in the former portion, so far as architecture and sculpture were concerned) by the historical and critical survey of Venetian painting, the art in which Venice achieved the greatest and most world-wide of her successes. To say anything new or special about the Venetian school of painting, in the course of a general chapter of limited extent, is what can hardly be expected of any writer in the present day; but M. Yriarte's remarks are at least always coloured by his own individuality of style and feeling, and present examples of good general characterisation expressed in a few significant sentences. His definition of the peculiar genius of Venetian painting in the introductory sentence of the chapter (to which an engraving of "Titian's Mistress" forms an appropriate vignette) is truly felt: "Ce ne sont ni des penseurs profonds, ni des esprits pondérés, ni des ascètes transfigurés par la foi; mais de libres esprits qui conçoivent sans effort et qui exécutent sans fatigue, des cervaux presque insouciants qui produisent comme la plante donne sa fleur, comme la fleur donne sa fruit, sans qu'on puisse tirer le leurs œuvres des déductions philosophiques." This is an admirable expression of the aspect in which Venitian painting, as a result, presents itself to the mind; though it would hardly be correct to assume that such work as that of Titian came to perfection without much mental study and thought; nor does the author, very likely, mean to infer otherwise. Another remark, that the Venetian painters are "the first decorators in the world," is an excellent generalisation as applied to the art of Veronese and a large number of other less eminent painters; but from this description, again, it would be absolutely requisite to eliminate Titian and Giorgione. In coming to speak specially of Titian, however, after going briefly through the preceding epoch, of which the Bellini were the central figures, M. Yriarte quite rises to the height of his subject, describing the career of the artist as a "*siècle*" in itself, "so brilliant, so productive, so full of honours, successes, and triumphs, that we pronounce his great name like that of a prince"; which, indeed, is too small an expression to do justice to Titian. When he touches on landscape, says the author, he does so "*avec une autorité extraordinaire*," which is a very true but hardly translatable way of putting it; and the expression in regard to the "Peter Martyr,"—"Quelle admirable combinaison de la forme humaine avec la silhouette auguste des grands arbres séculaires!"—shows how truly he has felt the spell of that grand lost painting. His short summing up of the nature of Giorgione, as man and artist, from whatever sources derived, is both comprehensive and highly in accordance with the feeling which the art of this unique painter conveys to us:—"The poetic figure of one who is at once a gay cavalier and a painter of genius; who has shaken off the yoke of his predecessors; carries on work and pleasure simultaneously, making life a kind of 'Decameron'; traversing Venice with lute in hand and dagger at his side, always in quest of amorous adventures and of emotions, ready equally for a duel or a serenade, adored by women and distrusted by men; an amiable braggadocio, jealous, violent, and generous at once,"—just the character, in short, which society has always pretended to disapprove and really admired; and if his pictures do not bear it all out, we certainly seem to read it in his portrait. In referring to his works, M. Yriarte overlooks, or is not aware of the fact, that the "Fête Champêtre" of the Louvre is a painting the authenticity of which has been much questioned. It would, perhaps, be a fair retort, however, to say, "to whom else could one assign it?" But what readers] should turn to M. Yriarte's pages for is not so much exactitude or novelty in regard to history and criticism, as that vivid sympathy with his subject, and power of equally vivid expression, which render his pages so lifelike and suggestive.

The author pursues the subject of Venetian painting through its decadence, marked by names many of which we associate with a peculiar grace and charm of their own, of a quality not to be found precisely in any other school; he draws attention in passing, we observe, to the superior place which is taken by Jacopo da Ponte (Bassano) when judged by his best works in Venice, as compared with that assigned to him on the ground of his other and inferior works. The two architectural painters, Canaletto and Guardi, come in for due share of notice, and we are quite with M. Yriarte in his judgment that the latter has the more force and genius of the two; though he considers that Canaletto, perhaps owing to the less imaginative character of his art, gave a more accurate impression of Venetian architecture and general topographical character. This is likely enough; artists of high imaginative power make bad topographers: Turner's essay to paint the harbours of England is a notable instance; he made a set of grand coast pictures, which the frequenters of the harbours indicated would mostly have found difficulty in recognising. It is curious how completely Canaletto's face, in the portrait of him which is given, explains the unsympathetic conventionality of his art.

The chapter on "Le Mouvement Littéraire" is chiefly interesting to us from the remarks on the Aldine printing foundation, and the circumstances which led to it, and on the subject of book illustrations. In fact, the Venetian school of literature is not of very high interest even to those whose study is essentially and primarily literature: it includes no great names. Among the illustrations to this chapter is one that is interesting for more than one reason, the *fac-simile* of a portrait of Pietro Aretino, drawn on wood by his distinguished friend Titian, and which formed an illustration to a book entitled "I Mondi del Doni," printed at Venice in 1552, by Marcolini. The portrait is a profile showing Aretino wearing an elaborate gold chain which had been sent to him by some royal admirer; and the forcible character expressed in the head gives some explanation of Titian's friendship for this vicious man and brilliant *littérateur*. The *fac-simile* of the opening pages of the Latin edition of Herodotus of 1494, printed at Venice by Gregorio, is really curious; it shows an admirable bold block type, the upper part of the page occupied by a quaint illustration representing the historian writing at a desk crowned with bays by an outlandish barelegged figure; the page, which is small in itself, is surrounded by a wide border of freely-designed arabesques, in white on a black ground, with two small *cartouches* containing drawings of scenes of an eminently Pagan character, illustrative of some of Herodotus's "facts": the arabesque border, with a different design in the cartouches, the author has used as an appropriate border to the title-page of his own book. He mentions also the illustrated edition of the "Songe de Poliphile" (1499) as showing remarkably high artistic character in dealing with the rude resources of the wood engraving of the period; a specimen of one of the illustrations is given, a female drawing along a large ornamental trophy on wheels, the whole drawn entirely in outline, with a very free and flowing line; there is something very poetic and fanciful about it. The book, the illustrated edition at least, is rare now; the offer of a copy is always a point in a dealer's catalogue.

In the chapter on "La Verre et la Mosaïque" we come on the subjects which, next to the Venetian school of painting, have gained for Venice the widest artistic fame, and which, in fact, are more a speciality of artistic production in connexion with her name than even her painting. In glass-work, as the author says, the Venetians have acquired a reputation without a rival, as well by variety and fancy of design as by beauty of workmanship. Why this art of glass-making was so specially taken up at Venice there is hardly any historical evidence to show; the first documents in which it is mentioned assume the existence of the manufacture as an established fact; the oldest being, according to M. Yriarte, an order of the Council in 1292 for transporting the glass manufactory from the Rivo Alto to the island of Murano, which has ever since been the principal scene of operations in this art. But the author's suggestion that a style of ornamental art which is so distinct in character from most Mediæval European art should have been brought from Eastern sources originally, is probable enough, if we consider the obviously Byzantine origin of the mosaic art of Venice, and the generally semi-Oriental character of her tendencies in art and in feeling. Indeed, the glass-work of Venice presents, in the general character of its design, a peculiar and almost unique blending of classic refinement of form and outline with Gothic caprice and fancifulness. But if this were so, it is obvious that Venice very soon put her own stamp on the art, and aimed especially at keeping control over it as a manufacture peculiar to herself, even in regard to the practical processes involved. So early as 1275 there is a decree in existence forbidding, under pain of confiscation, the exportation from Venice of the glass in its condition of raw material, or even of broken glass which could be analysed. And the author mentions that he had found, in the archives of the Frari at Venice, an interesting parchment document containing a commission from the Grand Vizier of the Sultan to the Turkish ambassador at Venice, to order from Murano 400 "mosque-lamps" with sentences from the Koran in coloured enamel, according to a design drawn on the parchment and accompanying the order, and which represented a usual form of Turkish lamp. M. Yriarte unfortunately does not give the date of this document.

It is unnecessary for us to dwell on the description of the process of mosaic and glass work at Venice, which is given by the author; enough has been said on these points in our columns at various times; we may notice with approval his remarks on the quality which has given more than anything else its special and high artistic interest to Venetian glass, the preservation of the essentially ductile and flexible character of the material when under manufacture. "That which characterises especially," he observes, "the Bohemian, French, and English glass productions, is their transparency and brilliance, qualities which they possess in a high degree, and which have attained in the present day their greatest perfection. In fact, the foreign manufactures" (he is speaking from the point of view of a Venetian) "have one main object—to imitate crystal. Thus, having secured in the material the qualities above mentioned, their aim is to give to their productions, after the molten glass has been shaped and has hardened, a still further brilliancy of effect by cutting, and to obtain by this mechanical means the richness, the variety of forms and vigour of

* Venise: Histoire, Arts, Industrie, la Ville, la Vie. Par Charles Yriarte. Paris: Rothschild.

contours, which alone can render them successful in the market. But to do this is to demand from glass what is not really due from it, and to change its nature, in robbing it of its two most essential qualities, lightness and ductility; and the glory of Murano is to have preserved the character of the material and made it accomplish that to which it is best suited." For this reason, he observes, Signor Salviati wished to keep the name of "glass," pure and simple, for the style of manufacture practised at Murano, and to call the glass made by the casting and cutting process "crystal" or "*verre cristallité*." The following comment on the process is worth translating, as it brings out well the essential difficulty of the manufacture and the qualities required for success in it:—

> Much patience is necessary, much skill, care, and quickness of hand as well as of mind, to be prepared against the thousand incidents of the formation. When we consider that all the manipulations of the glass are accomplished under the action of fire, to which each piece is submitted many times (occasionally fifty or sixty times successively) before being completed; and that the same fire which enables the workman to give such life to the material may a moment afterwards annihilate his labour by the softening of the glass and its consequent change of form; when we picture to ourselves how he is obliged often to give up the outline which he had intended and to realise another prompted by the necessity of the moment; we must recognise that it requires no little talent to triumph over such obstacles. In other industries, such, for example, as those of porcelain and faience,—the workman or the artist, working upon materials which are cold and obedient to his will, can take time over his work and go lovingly over and over it until he has completely satisfied himself. In the manufacture we are speaking of, on the other hand, all must be sudden, rapid, and spontaneous; and this is what constitutes the great difficulty of this beautiful art.

And unquestionably it is this necessarily instantaneous and free character of design which gives to Venetian glass a great deal of its peculiar life and interest. At the same time it must not be forgotten (as it sometimes is) that the object of the designer is to overcome the difficulties of the process, not to illustrate them; that a glass is not more valuable or more artistic for appearing to be stuck crooked on its stem, or showing a remarkable and awkward departure from the circular form when that form has been intended. Such slips show certainly that the artist has been treating the glass in the right manner, as a ductile material; they also show that he has not quite succeeded in his aim. Before quitting the subject, we may add that M. Yriarte's chapter on glass is very fully illustrated with many beautiful and characteristic designs. In referring to the art of mosaic he particularly alludes to the series of portraits of great painters in the South Kensington Museum as an important instance of the modern decorative application of the art.

We must pass over the chapters on costume and *dentelle*, interesting as they are, especially in regard to the illustrations of costume taken from old engravings. A whole chapter is devoted to the subject of "the Doge," that most splendidly surrounded and sumptuous of all the "chief magistracy" offices which have ever given to a republic the semblance of imperial magnificence.

One illustration really worth mention in this chapter is the reproduction of eight plates engraved by Pagani in 1550, which form a continuous representation of the Doge's state procession. It may be interesting just to tabulate the order and constitution of the "Lord Mayor's Show" of Venice: these are the items:—

The Doge.
The Doge's umbrella.
Ambassadors and orators.
The Doge's sword.
The most illustrious Signory.
The Patriarch.
The holy vessels and other sacred "regalia."
Secretaries.
The Doge's chaplain.
The Doge's cushion and chair.
The Grand Chancellor.
"Il Ballotino."*
Ambassadors and their attendants.
The Doge's trumpeters.
The Doge's attendants and grooms of the chambers.
The Canons of St. Marc.
The standards of the Republic.
The Doge's heralds.
Six silver trumpets.

The Doge, who heads the procession, is an old man, apparently almost bowed beneath the weight of his gorgeous dress; and his umbrella taxes the strength of the bearer. The "silver trumpets," which bring up the rear of the procession, are about 9 ft. long, and a boy walks before each trumpeter to hold up the further end of the instrument for him. A decorative background to the whole is formed by a double row of mezzanine and first-floor arcaded windows, from all of which the heads of spectators look out. The whole thing is very interesting, and, in the dress and attitudes of the processionists, conveys the idea of being a literal representation. A still more curious and a more primitive engraving (date not stated) is given, representing the ceremony of the wedding of the sea, showing the Ducal Palace, with a light upper story pierced with windows, quite different from the present finish of the building, which gives so much of its peculiar character.

The long concluding chapter on "La Vie et La Ville" gives many illustrations of the personages typical of modern Venice, and of various interiors and peculiar corners of the city. In the description of the impressions received on entering Venice from different quarters, M. Yriarte finds a natural place for the display of his unquestionable gift of picturesque language and vivid description. To feel the full impression of Venice on a first view, the visitor should approach it from the sea at mid-day and in full sunlight. He will see the place rise gradually from the sun-lit sea like a city in a dream—a dream, however, which he will find almost surpassed by the reality when he approaches near enough for the eye to reduce the fairy vision to its constituent elements. But there is choice of another impression for him if he approaches the city at night by the railway which now connects it with the main land, and then takes to the time-honoured Venetian conveyance. "What a strange impression will he then experience! To glide silently, in the depth of night, upon those noiseless black waters; to see tremulous lights pass to right and left; to hear the passing sound of an oar which stirs the water; to defile between hedges of architecture, processions of flying palaces which are rather felt than seen, as in an etching of Piranesi; to pass under bridges and hear cries of which one cannot catch the meaning; to graze every now and then against black canopies which glide by in the darkness as silently as your own; then from time to time to perceive, for a moment, the outline of a figure that bends over its oar, a lamp that burns in some angle of the canal brilliantly reflected in the water, a window lighted up and making a momentary glare; to progress through narrow lanes, to turn, and tack, and veer about without feeling any sense of movement, and then to draw up suddenly at a staircase whose steps plunge downward into the water, to enter by a noble vestibule, of a grand and proud style of architecture, a palace streaming with lights, full of life and movement, full of business-like people, who recal you, after your singular voyage, to the commonplace incidents of hotel life: it is certainly the strangest of dreams, and a sort of ideal nightmare."

* This officer is a boy. Was he, as the name seems to imply, the official whose duty it was to carry round the ballot-box in council?

JUDICIAL EXPLANATIONS OF THE ECCLESIASTICAL DILAPIDATIONS ACT, 1871.

MANY of our readers will probably not need to be reminded that in the year 1871 the Legislature passed an Act which embraces in a comparatively short and untechnical form the existing rules in regard to Ecclesiastical Dilapidations. No branch of law more needs to be plainly and straightforwardly exposed than this which affects the interests of thousands who are not lawyers, and the majority of whom can ill afford the costly amusement of legal experiments. We do not propose here to discuss either the policy or provisions of this Act, but merely to point out how some parts of it have, since it has been put in practice, received certain judicial explanations of the highest legal importance as regards this question of ecclesiastical dilapidations. And we venture to think that the matters which we shall refer to will have an interest not only for surveyors and other ecclesiastical officials, but also for clergymen who may have to do at any future time with the existing Act.

The first point on which it is necessary to touch are the provisions contained in section 29, which is the first which has to do with vacant benefices. It runs as follows: "Within *three* calendar months after the avoidance of any benefice . . . . the Bishop shall direct the surveyor who shall inspect the buildings of such benefice, and report to the Bishop what sum, if any, is required to make good the dilapidation to which the late incumbent or his estate is liable; and the late incumbent, his executors, or administrators, shall have right of entry at reasonable hours with his and their surveyor upon the premises of the vacated benefice until such time as the question of the dilapidations has been settled." The first point which has served to explain this section arose in this way. The bishop made his order within the required three months, but after that period had elapsed, the surveyor inspected the buildings, and reported to the bishop that a certain sum was payable by the late to the incoming incumbent in respect of dilapidations. Thereupon the old incumbent refused to pay this sum, on the legal ground that under the above section the surveyor should have made his inspection and reported to the bishop within three months from the time when the benefice became vacant. But the judges, who comprised the Exchequer Division of the High Court, had no hesitation at all in deciding against this defence, and accordingly the case of Gleaves *v.* Marriner (1 Law Reports, Exchequer Division, 107) has decided that it is not necessary that the inspection and report should be made within three months from the time at which the benefice became vacant. But a more difficult question arose in the course of last year, and one which is clearly far more important, and in some respects can hardly be viewed with as much satisfaction as that to which we have just alluded. In the case of Caldow *v.* Pixell (46 Law Journal Reports, Common Pleas Division, 541), the Bishop of Carlisle directed the surveyor of the diocese to inspect the buildings of the recently-vacated benefice more than three months after the avoidance by the late incumbent. Here, of course, the bishop had directly transgressed the provisions of the statute, and there seemed therefore to be some good grounds for the refusal of the late incumbent to pay the amount required to make good the dilapidations. At the same time it is obvious that if this view prevailed the incoming incumbent, through no fault of his own, would be put to large expense, and that the late incumbent would have got rid of a clear legal, and one may almost say, moral liability, which has been the custom of the English Church for a long time. The question therefore arose, was this provision a mere direction, of no obligatory force, or imperative, and entailing, by neglect of it, a nullification of the subsequent proceedings? The Court decided that it was directory only, and that therefore the subsequent proceedings remained valid, and that consequently the amount due from the late incumbent must be paid by him. It is obvious that this decision was just, as if it had been to the contrary very serious injury might have been done in the future, when, by any unforeseen accident, a bishop failed to make the required order. At the same time it is obvious that high ecclesiastical functionaries, and those who guide them in such matters, grievously neglect their duty when they fail to make an order within the required three months. For when time elapses after a benefice becomes vacant, it is clear that all sorts of things, in consequence of bad weather and other causes, may happen to the building in question, and that the outgoing incumbent may have to pay more than he would otherwise have been liable to; and we confess that we should have liked to have seen in this Act some penalty payable by the bishop or his registrar if the provisions of the Act in this respect were not carried out. For as the law at present stands, this part of the statute is very little more than a mere empty form of words.

The remaining point introduced some curious and important questions, and we shall best explain its results by detailing, first of all, the facts of the case of Wright *v.* Davies (46 Law Journal, Common Pleas, 49), where there were two decisions, that of the Court below being subsequently affirmed by the Court of Appeal. Two incumbents agreed to exchange their benefices, and also agreed that no payment should be made on either side for dilapidations. But, as harmony does not always reign supreme in the Church, it happened that the two clergymen in question fell out, and that one of them sued the other for a sum in respect of such dilapidations. Thereupon the other pleaded the agreement, and, by the judgment of two very competent

Courts, with success. Therefore the Ecclesiastical Dilapidations Act, 1871, in no way prevents two clergymen from exchanging livings, and from making an agreement that they shall pay nothing to each other in respect of dilapidations. But this, it must be observed, is simply an agreement *inter se*, and in no way interferes with the provisions of the Act in question. The bishop must make his order the surveyor must inspect and report, and the repairs must be done and the provisions of sections 37 and 40 must be complied with. These sections are as follow:—"The new incumbent shall, as, and when he shall recover the said sum, or any part thereof, forthwith pay the amount recovered to the governors; and if and whenever he shall recover any further part of the said sum, he shall in like manner forthwith pay to the governors the further sum so recovered." "The new incumbent shall, within six calendar months after the date of the order, pay to the governors . . . such sum . . . as will make up the sum stated in the order as the cost of the repairs." Therefore, as the Master of the Rolls very neatly expressed it, "the effect of the Act is not to make the new incumbent a trustee of the action, but a trustee of the sum recovered." In other words, he may make what agreement he pleases with the outgoing incumbent, and he is not bound to bring an action against him for the amount of the repairs, but he is bound to pay over such sum to the Governors of Queen Anne's bounty (and it matters not to them whence the money comes), and to put the buildings into a proper state of repair; and if he does not so do the amount may be recovered in a legal form by these officials. This decision seems to us one which is most satisfactory from a legal and general point of view, and to do full justice to all parties. But the facts of this same case also point a further moral; for it is clear that the plaintiff was not aware of the disparity in the amount required to repair the buildings of which he became possessed by his exchange. Therefore it is obvious that no clergyman should exchange livings without first ascertaining by means of a competent surveyor the state of the buildings of which he intends to possess himself, and surveyors should be equally careful to ascertain to the full the amount of repairs which will be required, as otherwise it may happen that when a bargain is completed the parties to it will find that they are put to all sorts of expenses for building and repairing, of which they had no sort of notion. As we have said, the above case clearly shows that the sufferer by the exchange can obtain in such circumstances no redress from the incumbent with whom he has made the contract, but that this contract is no bar to his liability to the Governors of the Queen Anne's Bounty. "It is an ill wind," says the proverb, "which blows nobody any good," and we can accordingly only hope that the misfortunes of the litigants in the cases upon which we have here touched will render the way of their brethren and ecclesiastical officials—whether bishops or surveyors—more clear.

EARLY NEW ENGLAND INTERIORS.

THE book which is sent over to us under the above title,* appears to be the first published indication of the adoption in America of the Queen Anne revival. At least, the author of the book, Mr. Arthur Little, whom we presume to be an architect, as he says the sketches are "the result of a summer's work, undertaken for his own pleasure and instruction," tells us that it is thought by many in his country that "with the revival of the so-called Classical style in England, as the Queen Anne or Free Classic" (a sentence which implies some confusion of ideas) "we on our side of the water should revive our Colonial style, which is everywhere marked with peculiar dignity, simplicity, and refinement"; and accordingly he took the sketches from which these illustrations are made, with the idea that they might in such a case become especially interesting, while in any case they form records of a style of house architecture, the original models of which are fast disappearing from American soil.

The short preface in which these remarks, and one or two suggestions as to the way in which these New England houses may have come to be built in the style which they present, are embodied, forms the only statement of the *raison d'être* of the book, which, beyond this, is simply a collection of lithographed drawings, mostly of interiors, with an occasional explanatory note. The reader may remember the notice of an illustrated work on "American Interiors" which appeared in our columns some time since, a book which purported to give illustrations of some of the best modern American habitations; and Mr. Little's book does for the older houses what that publication did for the modern ones. The reader must not, however, expect to find in it such work as may be found in the best Jacobean and Queen Anne interiors on this side of the Atlantic. It is quite true that the similarity in some of the details, and general appearance of the interiors, is so completely a repetition of what had been left in the old country, that we may very reasonably adopt Mr. Little's supposition, that some of these houses were the work of enterprising English carpenters who had emigrated to New England to try their fortune. The parlour in "Nichols House" (built about 1780) for instance, might be supposed to be one of the simpler of the Queen Anne revival designs of the present day among ourselves, with the orthodox "brass fender" and all, except that the plates are in the cupboard instead of being hung about the wall. It is a very nice specimen of a simple interior; but there are but few among the more ornate specimens which represent anything like a purely English taste; for the most part it is more like the reminiscence of the English taste, intended as an imitation, but inaccurate and deficient in refinement of detail. In one sense this makes the specimens all the more interesting, no doubt; but, if they are fairly represented here, they are more to be called interesting as old work than valuable as models for new work,—a remark which may apply, indeed, to a good deal of the real original Queen Anne style, and, therefore, *à fortiori* to specimens of its reproduction on another shore by those who had half forgotten it.

We thank the author, however, for having given us illustrations and a record of these early New England houses, for we entirely agree with him that they are of the greatest interest, and perhaps fully as much so to us as to his own countrymen. Their style reminds us, with peculiar force, how comparatively recent is the breaking off of that branch from the parent stem, which has developed into such a goodly tree; how close and near is the bond of race between us and those "cousins" who in many respects have come to such a different habit of thinking and living from ourselves. It is almost strange that such features as some that are illustrated here, some of these old windows and fireplaces, and doors with friezes and cornices over them, should come to us from a land of republicanism, a new country; they seem so connected in our associations with ancestral halls and old family traditions, such as only flourish in an ancient country with a long history behind it. And the fact is that in not a few cases the houses in which these details are found were really built by families whose ancestral name and fame are still known in England, and who were still proud of the family name in their exile from a country not then "moving to their mind," and long kept it attached to their New England place and mansion,—"called their lands after their own names,"—in very un-republican fashion. And so, too, we see here the architectural forms in house, or furniture, or fittings, which belonged to the old country, adopted and preserved in the new, and with the forms a great deal of the old feeling preserved, in all probability, also. The contemporary American poet (Whittier), whose lines Mr. Little quotes on his title-page, seems to feel this also: New England is the last abiding-place of the old aristocratic idea:—

> "Her home is brave in Jaffrey-street,
> With stately stairways worn
> By feet of old colonial knights,
> And ladies gently born."

And it is to such associations that these illustrations take us back, now that the bones of the old colonial knight are long since dust, and his good sword rust; for he had a good sword, and knew how to use it. It must have been, too, in connexion with some such home as one of these that Longfellow wrote his poem of "The Old Clock on the Stairs," of which some of Mr. Little's illustrations at once reminded us, they harmonise so exactly with the "local colour" of the poem.

As to the character of the work illustrated, considered from a more purely architectural point of view, there is little of external architecture, in which these New England dwellings would appear to have been very deficient, the few exterior views that are given showing only very plain houses of an almost cottage character, except as to size. The majority of the drawings represent interiors, and among the best of them are the staircases. It must not be supposed, however, that any of these exhibit that solidity of style and execution which belongs to the best English examples; as drawn in this book, at all events, the balusters are thin and meagre, and the general effect rather scamped. The only bit that reminds us of first-class work of the original Free Classic period in England is the newel and balustrade of the stair at Cabot House (*circa* 1755); here the balusters are rather wanting in substance, but their free treatment, all with slightly varying designs, is very pretty, and the newel with its spiral twist seems a capital bit of work. Cabot House, according to Mr. Little, is known to have been built (as he suggests that others may have been) by a carpenter direct from England—so at least he mentions in his preface, but without giving the authority for it. A feature which would appear to have been a great favourite with the New England house-builders, and also with the author (for he gives two or three very similar examples of it), is a semicircular-headed cupboard, with the ceiling inside terminating in a kind of semi-dome ornamented with flutings, and the edges of the shelves cut quaintly into an ornamental outline, which looks pretty and fanciful. The front entrance of "Nichols House" at Salem shows a Queen Anne or "Early Georgian" door with pilasters, little festoons, and a radiating fan-light, just as we may see it in Harley-street and Wimpole-street.* The chimney-piece at Waters House, built by "one Hosmer" about 1795, is just the style of thing we are familiar with in houses of the same date in England, and a pretty specimen in its way, only let our American friends understand that we consider that "way" to be a very weak and flimsy one. The chimney-piece in the next drawing, from Devereux House, looks still more like an old friend, and is a very good specimen of the Adams style. The before-mentioned Waters House, by the way, the author says contains the best collection of old Colonial furniture in the country; a remark which tempts us to inquire why he did not include some of the furniture in the drawings, instead of leaving the rooms all with bare floors. The side of the parlour in Hooper House, at Marblehead, said to have been the work of the same English builder who produced Cabot House, though looking very bare in the drawing, is very bold and effective in design, with its old-fashioned broad window-seats at the back of deep recesses. We do not remember to have heard of the town (or locality?) of Marblehead among actual existences before; the name seemed familiar nevertheless; and, in fact, "Marble Head" was the name of the country residence of that exemplary City man, Hobson Newcome, esq., as readers of Thackeray may remember. "Lee House," built by Jeremiah Lee in 1768, must have been a fine family house in its day, to judge from its wide and ample staircase, of which a drawing is given which is one of the best and most effective in the book. Mr. Little adds, "the balusters, of which there are three on each stair, each being different, are, as well as the wainscoting of the hall, of very fine old mahogany. The cornice, pilasters, and architraves of the window on the staircase are of pine, painted a good grey. The walls are covered with a panelled paper in black and white. The house has been used for seventy years as a bank, and is accessible to any one:" though whether that latter condition is in every way quite incident to the objects of a bank, seems rather questionable. The details of the newel and balusters are very similar to those of Cabot House, so much so, indeed, as to raise a question whether it was worth while to illustrate both in detail. The parlour chimney-piece in the same house is of later date, and is interesting, the author observes, as showing the intrusion of French taste upon the original grave English style, which it certainly does show; as a matter of design it is, however, vulgar and ugly to a degree. In regard to the painting of the stair-

* "Early New England Interiors: Sketches in Salem, Marblehead, Portsmouth, and Kittery." By Arthur Little. Boston: A. Williams & Co. London: Trübner & Co. 1878.

* Except where the fanlight has been replaced by a single sheet of plate-glass, which has been done in some cases, to the great annoyance, even indignation, of some house-owners of conservative tastes in these neighbourhoods; and we must say the fan-pattern was better than the bare glass.

case in Lee House, we may observe that there seems to be some undefined notion about the beauty of neutral pigments floating in Mr. Little's mind. Referring to an illustration from Langdon House a few pages further on, he observes again, "the woodwork is painted a good grey." In England we think it of the essence of woodwork, old woodwork especially, that it should be unpainted. Is the "good grey" in these cases original, or is it (as we should think more probable) a subsequent defamation of the material?

Though, however, we have been interested in turning over Mr. Little's illustrations, with all their suggestions of association local and historical, and though we praise him for doing them, he must pardon us if we cannot altogether praise his manner of doing them. We must conclude that the standard of draughtsmanship in America is not high, for we notice just the same sort of faults in these illustrations that we saw in "American Interiors": the lithographs are coarsely drawn and shaded, splashed over with lines as if cobwebs had been spun over the paper, the strong shadows coarsely blotched in, and (worst of all) the perspective constantly careless and defective. If this passes muster as good architectural drawing in America, our cousins are, at all events, far behind us in that particular; drawings like these would be thought decidedly third-rate in England or France. Some English draughtsmen have certainly favoured a very rough and untidy style of late, but it is a style with a method and force in its roughness, which these American drawings are quite without. What makes this clumsiness of drawing more noticeable is, that the book is got up regardless of expense in other respects, the lithographs and the short notes being alike printed on thick cream-laid paper, with ample margins, and interleaved, in a manner which with us would only be indulged in for illustrations of a high character of finish and elaboration, which these most assuredly are not.

DOINGS IN DEVON, DORSET, AND SOMERSET.

THE Local Government Board inspectors have been exercised for some weeks past on the head of the water supply and sewerage and drainage matters in a few of the West of England towns and villages. For the third time in about ten years, the town of Honiton, famous for its lace, has made itself remarkable for its factious quarrels among sections of its townfolk, each time resulting in a Government inquiry. We have nothing to say as to the comparative merits of rival schemes, nor are we inclined to pronounce which is the best. The fact is apparent, that the local authorities have for years hesitated, or rather neglected, to provide an efficient system of sewerage and water-supply for the town, and they have now only to thank themselves if the Local Government Board enforce the penal clauses of the Public Health Act. To escape the humiliation of being deprived of their powers, relieved of their duties, and the town mulcted in the costs of carrying out the necessary works through the instrumentality of the Central Board, it behoves the local authorities of Honiton to at once set themselves to the task of providing the urgent wants of the town.

There are, it appears, 150 private wells in Honiton, besides the sources of public supply; but the public wells, pumps, or fountains, even if proved to be sufficient in yield for the wants of the town, cannot be continued as sources of public supply for drinking purposes. Analyses have proved that the water of several of the wells is impure and contaminated with sewage matter. The inspector of nuisances in Honiton certainly deserves an embossed leather medal with a pair of tin clasps. He assured the Local Government Board Inspector, and other hearers at the inquiry, that all the drains were perfectly clean, and as to a certain well in Chapel-court, "He never saw a cleaner well in his life, there was not a quart of sewage in it." The force of nature can no further go after this evidence, and Honiton may be congratulated for its enlightened inspector of nuisances. When several cases of typhoid have been clearly traced to the drinking of the water of the wells in Honiton, further testimony in their favour is a mockery and a delusion.

At Dorchester the Government Inspector sat in reference to the application of the Town Council to borrow 8,000*l.* for providing drainage and water supply for the new district recently formed at the western end of the town. The surveyor stated that it was intended to carry the sewage into Frome as at present. As some difficulty was likely to arise in respect to the disposal of the sewage, it was recommended that the subject should be re-considered. Apart from the town supply of water and for the use of the barracks, it is proposed to erect an elevated reservoir at a cost of 1,350*l.*, to provide a new engine at an outlay of 350*l.*, and a new building at an expenditure of 318*l.* The Government will contribute 1,200*l.* of the cost. The Inspector of the Local Government Board promised to report favourably of the scheme of water supply for Dorchester.

The town of Martock, in Somerset, claims notice as well as Honiton in respect to her wells, and also in regard to her churchyards, or those included in that district. Indeed, throughout a wide extent of Somerset, as we have shown on previous occasions in these pages, the town wells and the churchyards act and re-act upon one another, and the unfortunate townsfolk, principally the working poor, are the chief sufferers. In many towns a number of habitations of the poor are backed out against the churchyard, and the wells of the towns and villages are not only polluted by the air of the miserable homes in which the poor are obliged to live. The chronic state of these homes is one of dampness, disease, and death; and could it be otherwise with churchyards in rear and open sewers in front? It will be remembered by many that we furnished pictures of the houses of the poor in several towns in the neighbourhood of, or not far distant from, Yeovil, and an attempt was made in some instances to deny our statements. The defender of one notorious village smiled at the idea that his model district could be unhealthy, because, forsooth, the hedgerows in sight of the poor people's homes in the village were "belted with primroses." Some of these towns which we noted have improved a little since 1870-72, and later; but the following statement, made a few days ago by Prebendary Salmon, at a meeting of the Martock Agricultural Society, will confirm much of what we have over and over again written in these pages:—

"He was more strongly of opinion every day that the churchyards throughout the country ought to be shut up altogether. In his own deanery, of which he had been rural dean for eighteen years, there were twenty churchyards, only four of which fulfilled the requirements of the Burial Acts as to sanitary matters. Most of those churchyards were poisoning the wells in their respective neighbourhoods and doing an incalculable deal of mischief to the people living around them. Six out of the twenty were rapidly filling and ten were utterly bad, and the sooner they were closed the better. He acknowledged that the assertion was a sweeping one, but he believed that the time was come when the churchyards should be closed. The Burial Acts enforced that there should be no cemetery within 10 yards of an inhabited dwelling. He saw no reason why he should have to worship God in the centre of 20,000 corpses, or that he should drink the water which percolated through the churchyard where 20,000 bodies were interred."

There is no necessity at all of making the subject of the closing of churchyards, or their continued use, a religious ground for quarrel. It is not a question of High Church or Low Church or Nonconformity, or who, or who have not a right to burial in them. It is an acknowledged fact that hundreds, yea thousands, of our churchyards still are in a disgraceful condition throughout the country; that they are choke full; and that for hundreds of years they have been heaped into again and again with poor humanity in all conditions of deceased bodily rottenness. The graveyard in these days in the midst of a crowded population is a very grave affair indeed. It is not too much to say that many of our people, like the barbarian victors of old, though in a different way, drink their last draught from the skulls of the dead. A well *per se* is not an evil, but, under the modern condition of towns and life and living, public wells and churchyards are an anachronism and a crime.

Margate.—At the last meeting of the Town Council of the borough of Margate, the surveyor, Mr. Albert Latham, C.E., was voted a gratuity of 200*l.* for past services, and his salary raised to 400*l.* per annum, with a private practice. On the same occasion he was publicly presented by the Mayor, at the request of the Royal Humane Society, with their medallion, for saving the life of an inhabitant who had fallen through the damaged flooring of the Aquarium bridge into the sea during a late storm.

NEW PUBLIC HALL FOR BARNSLEY.

A LONG-FELT want has been supplied by the opening of a public hall for Barnsley, which interesting ceremony was inaugurated on the 18th by two concerts. The town itself may be said to have about 30,000 inhabitants, but it is surrounded by a densely-populated district, in which some of the largest collieries in the kingdom are being opened out. Notwithstanding this, the largest building in the town (with the exception of a wooden structure) would not accommodate more than 400 or 500 persons. Many attempts have from time to time been made to erect a building, but it was not until the year 1873 that anything of a tangible nature took place. In the year named an eligible plot of land on the western side of Eldon-street was purchased for about 3,000*l.* The site is one of the most desirable in the town, being situate in one of the principal streets, and in close proximity to the railway stations. Separate proposals were made for raising the capital, and ultimately it was decided to issue ordinary and preference shares to the amount of 16,000*l.* The total cost is, however, 25,000*l.* The contract was let in the early part of 1876 to Messrs. Bootham & Broomhead, of Leeds, for 17,740*l.* 10*s.*, and the corner-stone was laid in the month of July in the same year, by Master Bruce C. V. Wentworth, of Wentworth Castle, to whose liberality the promoters are greatly indebted. The building, which has an extensive frontage to Eldon-street, has six lock-up shops to the front, and an entrance which is carved with representations of science and art on each side, and a likeness of Mr. H. Harvey, one of the leading promoters, on the key-stone. The front is composed of cut stone, from Matlock. Immediately above the central door is a balcony. The windows are circular-headed and moulded, the whole building being surmounted by a Mansard roof, and a central tower, rising to a height of 136 ft. from the ground level, above which is a flag-staff, 33 ft. in height. The entrance to the ground-floor is a spacious one, and fully befitting the building. There is a vestibule 41 ft. long by 14 ft. wide, from which a large news-room, 57 ft. long by 30 ft. wide, is approached. The reading-room, 34 ft. by 26 ft. and 20 ft. high, is entered from the same. Adjoining is a library, 33 ft. by 6 ft. in length and 26 ft. wide, and a room for the librarian, 26 ft. by 13 ft. A large room is also provided for a gentlemen's club, together with a commodious billiard-room, dressing-room, and ante-room, all of which are on the same floor. On the next floor, which is reached by a commodious staircase, are six let-off offices and the hall-keeper's residence, together with laboratories, &c.; and facing the front are seven other offices, cloak-room, &c. The large hall, which is on the same floor, is entered by two double swing doors, in front of which are screens to protect the visitors from the draught. The hall itself presents a commodious interior, being 144 ft. in length, and 58 ft. in width. It is 40 ft. in height to the under side of the tie-beam, and will comfortably accommodate 2,000 persons. There are two side balconies, each having two rows of seats. These, as well as an end gallery, are protected by an iron balustrade, painted in blue and white, and tipped with gold. The front area in the large hall is fitted with 1,200 chairs, and the back area, which will seat 800 persons, is supplied with benches. The hall is lighted at the side by eighteen circular-headed windows, with elaborately-worked groined arches. There are also three similar windows at the end of the building, which, like those at the sides, are of stained glass. The ceiling is somewhat elaborately adorned with twenty-four decorated centre-flowers of plaster. There are sixteen gas chandeliers, each of which has twenty-four burners. These were supplied by Messrs. Smith & Sons, Birmingham. The stage measures 33 ft. by 38 ft., the height in front being 24 ft. 6 in. It is provided with six splendid scenes, and is well fitted up with traps and other necessary effects. There is a good orchestra, and the front of the stage is so arranged as to be available as a platform for use at public meetings without interfering with the scenes. The large hall is reached from the back as well as the front entrance. In George-yard there are four stone staircases, each 6 ft. 6 in. in width, and there are no fewer than five available outlets in case of fire. The galleries are reached by four pitch-pine staircases, with oak hand-rails. The hall is heated by two of

Hayden & Son's (Trowbridge and Manchester) hot-air apparatus, and in the cornice which surrounds the ceiling runs an ornamental foul-air tube, fitted with one of their patent apparatus. The cornice is a moulded cove. The upper story in front is devoted to the school of art. The department devoted to gentlemen is 70 ft. in length and 27 ft. in width, and lighted in the daytime by eight bulls-eyes and a number of circular glass windows. The ladies' school is 40 ft. long by 16 ft. 6 in. in width, and is lighted by two windows and a glass roof. The entrance to the schools is by a side-staircase from Eldon-street, and this also furnishes access to some of the let-off offices. The schools of art and reading-rooms are heated by Hayden's hot-water apparatus, and the whole of the building is fitted with water-closets, wash-out pans. The architects are Messrs. Hill & Swan, of Leeds. The manager of the building work has been Mr. Hodgson, of Leeds. The whole of the joiner's work has been prepared in Leeds, under the direction of Mr. Armitage; and Mr. T. Westby, the foreman carpenter, has taken an active part in superintending the fittings. The other contractors reside at Leeds.

This hall, which will have been opened to the public when our notice appears, has been erected at a cost of about 25,000*l.*

THE NEW NATURAL HISTORY MUSEUM, SOUTH KENSINGTON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

THE Architectural Association made its first Saturday afternoon visit to buildings in progress during its present session on the 19th inst., the building selected being the new Natural History Museum at South Kensington, now in course of erection from the designs and under the superintendence of Mr. Alfred Waterhouse, A.R.A. The Association visited the building two years ago, as reported in the *Builder* at that time,* and as the building is now far advanced towards completion, we may add some further particulars to the general description then given. The building has its main frontage, 670 ft. in length, towards the Cromwell-road, and has a total depth from back to front of upwards of 290 ft. The main façade is broken up by a central block, 104 ft. long, having a projection of 26 ft., and by a pavilion at each end, each of these pavilions having a frontage of 53 ft., and a projection of 8 ft. The central portion of the façade contains the grand entrance, which will be through a richly-moulded and columniated doorway 42 ft. wide extreme measurement, and lofty in proportion. This doorway gives access to the entrance-hall, whence the visitor will pass into what is to be called the "Index Museum," which is placed at right angles to the main building, crossing it in the centre, and projecting some distance on the north or rear. This "Index Museum" measures 120 ft. by 97 ft., and has a height to the top of roof of 68 ft. It has a number of recessed bays or compartments along its sides, and its name is derived from the fact that it is intended to be an index to the whole contents of the museum, – that is to say, it will contain, in a comparatively small space, characteristic specimens of the entire collections, and will be, in fact, a complete synopsis of the contents of the whole museum. In the rear of this "Index Museum," and forming a portion of the projection to the rear already referred to, will be the gallery devoted to the British Natural History collections, 97 ft. by 77 ft., and beyond this will be two smoke and ventilating shafts, rising to a height of about 200 ft. (only one of these shafts is at present being proceeded with, however). These smoke-shafts are of considerable dimensions, and will be finished at the top with a pointed roof. They will occupy corresponding angles on the north or rear end of the central portion of the building to those which it is intended shall be occupied by the two south towers flanking the projecting centre portion of the building already referred to. These latter towers are only to be carried up, at present, a little higher than the apex of the central gable (which will be 110 ft. high), having been cut out of the contract at the instance of Mr. Ayrton, when First Commissioner of Works; but we are informed that there is now every probability of their being carried out in accordance with the original design, and in accordance with which they will attain a height of about 200 ft. The end pavilions of the main façade already referred to will be surmounted by long-sided octagon roofs, reaching to a height of 170 ft. from the ground. The main building contains basement, ground, first, and second floors. The basement will be used as workshops, and the three floors above on either side of the central hall or "Index Museum," will be occupied each by a large gallery, 234 ft. long by 50 ft. wide in the clear, with a height of about 20 ft. on the ground and first floors, and somewhat less in altitude on the second floor,—so that there will be six large galleries in the front or main building, besides basement. Running at right angles with the main building towards the north (and capable of further extension at some future time on the vacant land between the new buildings and the buildings south of the Horticultural Gardens), there are three large and three small galleries, all toplighted, running parallel to and on either side of the central projecting portion devoted to the "Index Museum" and the British Natural History collections, giving twelve galleries in all besides those in the main building. The six larger galleries are 137 ft. long by 42 ft. wide in the clear, and the six smaller ones are of the same length and about 20 ft. wide. The height of these six larger galleries to top of roof is 36 ft.; that of the smaller galleries some 10 ft. or 12 ft. less. These smaller galleries are "sandwiched," so to speak, between the larger ones, there being, as we hope we have made clear, three galleries of each size on either side of the central portion of the building, all being top-lighted and no open areas intervening. These transverse galleries are on the same level as, and are approached direct from, the ground-floor galleries in the main building, and from corridors running east and west from the "Index Museum." The upper galleries in the south-east and south-west portions of the main building will be approached by broad and handsome flights of stairs, constructed of Craigleith stone (which has been selected for the purpose on account of its extreme hardness and wear-resisting capabilities), and by open galleries traversing the sides of and looking into the "Index Museum," somewhat after the manner of the galleries to the new courts at the South Kensington Museum. The staircases will be approached direct from the "Index Museum" on the ground floor, and will be carried on boldly-designed and executed arches having a span of 46 ft., and constructed in five rings of brickwork faced with terra-cotta, the thickness of the wall being 3 ft. The walls, externally and internally, as well as the double rows of iron stanchions which assist in bearing the transverse girders carrying the floors of the upper galleries in the main building, are all faced with terra-cotta, the whole of the detail and ornament having been specially modelled under the direct personal supervision of the architect. The whole of the ornamentation of the eastern half of the main building, both internally and externally, is based on extinct species of animal and vegetable life, while the decoration of the western half is based on living species. The floors are as fire-proof in construction as it has been practicable to make them, being of concrete arches turned between rolled-iron joists, all the ironwork having been, as far as possible, buried in the concrete. The ironwork, of which a vast quantity is used in the building, all comes from Belgium. The basement is carried through from the main building right under the "Index" and British Natural History museums, and under the twelve transverse galleries already described, so that the basement is co-extensive with the total area of the building, thus giving enormous space for storage and workrooms. The ceilings of the various galleries are at present to be finished in plaster-work, but it is hoped that they will ultimately be decorated in colour in a manner appropriate to the use of the building. A large sum for decoration was included in the original estimates, but this also was cut out at the instance of Mr. Ayrton. The whole of the top-lighted galleries are glazed with plainly ground or obscured British plate glass, and special openings are made in the roof for carrying off vitiated air. Snow-shoots are also provided in the thickness of the wall-piers between the transverse galleries for the rapid removal of snow to the basement. The heating will be by means of hot water, the apparatus for which will be placed in the centre of the building, beneath the British Natural History Gallery. Messrs. Phipson have been entrusted with this portion of the work. The floors of the entrance-hall, the "Index Museum," and British Natural History Gallery will be paved with Burke's marble mosaic, and as these will be the really popular portions of the museum, they will be the only portions which it is contemplated to light with gas for evening opening. The floors of all the other galleries will be of wainscot oak. Iron doors or shutters by Messrs. Bunnett & Co. are provided for shutting off some of the galleries from each other. The building is well placed some distance back from the Cromwell-road, towards which it has its main façade, and from Exhibition-road and Queen's-gate, towards which are its return or side frontages. The extensive space in front and at the sides is to be laid out as a garden, which, with the building, covers the site of the Exhibition of 1862. The garden will be somewhat below the level of the surrounding roadways, and on the level of the basement floor of the building, a semicircular carriage approach being carried on arches from the Cromwell-road over the garden ground to the main entrance, in front of which will be a handsome wrought iron railing by Messrs. Hart, Son, Peard, & Co. The slating has been entrusted to Mr. Thomas Stirling, and the whole of the terra-cotta has been supplied by Messrs. Gibbs & Canning, of Tamworth. The clerk of the works is Mr. Charles Till, who, in the unavoidable absence of Mr. Waterhouse, courteously conducted the visitors over the works on Saturday last, and gave them a great deal of information. The general contractors are Messrs. G. Baker & Sons, who are represented on the works by their general foreman, Mr. Browning. It is expected that the present contract will be finished by the end of the current year. Seeing that there is comparatively little stone used in the building, the masons' strike has not materially affected the progress of the works. The new museum is probably the largest, if not, indeed, the only modern building in which terra-cotta has been exclusively used for external façades and interior wall-surfaces, all architectural and decorative features included, except the ceilings, floors, and cases to contain the specimens.

* *Builder*, vol. xxxiv., p. 120. A general view of the building appeared in vol. xxxi. (p. 10), and a plan of ground-floor in the same vol., p. 28. These will serve to make the present description of the building more readily understood.

PHOTOGRAPHY AND SCULPTURE.

A GALLERY of casts of the most noted masterpieces of sculpture has been more than once proposed. Such a gallery, it is obvious, should be found in every considerable town, for the purpose of artistic education and pleasure. But until this thing, so devoutly to be wished for, is in existence, it is quite certain that photography is the best secondary means of educating men's tastes in sculpture, and furnishing them with examples of the sculptor's power; and even when this distant day of galleries of sculpture appears, it is plain that photography will still have its place. Those who are unable from physical causes, or from the ties of business, to visit such galleries, will find in the photographic sculpture gallery the next best help. In the recently-published work,* "Masterpieces of Antique Art,"—a title somewhat unfortunately misleading, we have an example of the domestic collection of sculpture.

A few lines may, *en passant*, be fairly given to this useful and pleasing work, since it is the first genuine attempt to make full use of the opportunities which photography undoubtedly offers to the present generation. With the single exception of the Venus of Melos from the Louvre, the Vatican and the British Museum furnish all the examples of antique art to be found in this volume. Some of the illustrations are extremely satisfactory, and next to standing in front of the very objects themselves, are the best substitutes for a personal inspection of these great works of the masters of the past. Thus nothing better could be desired, for instance, than the view of Apollo Belvidere and the Meleager of the Vatican, but some of the others, such as portions of the bas-relief of the Parthenon in the British Museum and the Nile of the Vatican are not so successful. The cause is obvious. The frieze of the Parthenon consists of several continuous subjects, the spirit and grouping of which cannot be adequately shown by taking from them isolated pieces. Moreover, a statue in the round nearly always stands out

* "Masterpieces of Antique Art. Twenty-five Examples in permanent Photography." By Stephen Thompson. Griffith & Farren, London. 1878.

better and clearer as regards outline in a photograph than does a bas-relief; and as regards the Nile, by taking in a portion of the room in which it is placed, the observation is attracted by surrounding matters, and the size of the statue,—colossal in reality,—is considerably dwarfed. The letterpress, too, is generally satisfactory. The writer does not attempt any elaborate criticism of the works contained in this volume. He is content to give a short description and history of each; and on the whole he is wise in thus limiting himself. For it is not possible in the space which can be allotted to a writer in an illustrated work of this kind to write fully and satisfactorily, and therefore it is much better to be content with modest and truthful descriptions.

And it must be remembered,—and here we return to our primary subject,—that the value of collections such as those of photographs of sculpture, lies in the fact that they are ready at hand to serve as illustrations to writers of criticism, and when reference is at any time made to antique art, and so long as the reader has at hand the main features of the history of these great works, he has all that he requires.

Let any one, for instance, take up, for the purpose either of real study or to fill an empty hour from time to time, such a book as the late Richard Westmacott's "Handbook of Sculpture." He at once finds himself completely hampered by the want of examples of the principles laid down. The Vatican is far away. The British Museum cannot be magically brought into the library of the reader, and consequently much of the value of the work which is being studied is lost. Or take such a book as John Gibson's life, in which Greek art is being constantly referred to. Here, again, examples are absolutely necessary. No one can understand this great artist's career without knowing something of the characteristics of Greek work; and the same may be said of works from the topmost pinnacle of subtle criticism,—such as Lessing's Laocoon,—down to a criticism in a penny paper of the work of some contemporary artist. Therefore, we say that photography in relation to sculpture is of the highest possible value, whether regarded from the point of view of the earnest student of art or the mere dilettante amateur, and since sculpture is essentially an art in which form and not colour is the great element, none of those losses of effect take place which make photographs of pictures so unsatisfactory. The form of the work is clearly before the observer; that is the main thing which he requires. Moreover, even those who do not make sculpture any particular object of study or attention, there can be no doubt are artistically benefited by works of purity and simplicity, such as the Theseus or the Discobolus of the British Museum. The principles of the best sculpture, if well grasped, raise the standard of general taste, so that simplicity and grace are preferred in the common matters of the house to inharmonious arrangements and ugliness. On the other hand, the extravagances into which a fashionable following of "high art" are apt to lead persons who ignorantly follow what is the vogue are counteracted; and sculpture teaches these things more directly than the more complicated art of painting. In every way, therefore, the claims of photography to be the vehicle of familiarising men with the great works of sculpture, whether antique or modern, are many and permanent, and the work to which we have referred in this paper is a valuable help to either a study or a pleasure in sculpture.

LAND AND THE SEWAGE.

SIR,—I have read with interest your offer of last week, and hope something effectual will be done. *Guildford* will have to be drained. There is a fall to a sandy waste a few miles off which is the proper place for the sewage. The whole scheme might be tried here under more favourable auspices than in any other place that I know.

The only difficulty that is obvious would be the stirring up the sanitary authority to act at once. The subject is worth consideration.

C.

Sewage Treatment.—At the last meeting of the Aylesbury Local Board of Health it was resolved:—"That the Board are perfectly satisfied with the manner in which the sewage of the district has been treated by the Native Guano Company."

THE ACCIDENT IN THE HAYMARKET.

A NEW sensation for pleasure-seekers at what the City calls the "West End" has recently been provided in a thoroughfare not less world-renowned than the Haymarket; and, unless we are greatly mistaken, the accident will remind those who, in both Houses of Parliament, are seriously disposed to reform the building regulations and municipal supervision of the metropolis, that something more than the mere *laisser-faire* of current practice is incumbent upon the rulers, and necessary to the ruled, of a divided and barely governable capital. What responsibility rests upon the architect or the district surveyor in the present case has yet to be seen. As to the latter his legal duty principally lies in detecting error when it is accomplished, not in direction so as to avoid accident.

It appears, from unimpeachable circumstantial evidence, that warning was given during the afternoon of Thursday, the 17th inst., and before midnight the houses presented a heap of ruins. The two buildings were, one, an old, narrow-fronted house, used as an oyster-shop, and occupied by Mr. Baron; the other a brand new house, planted at the corner of Panton-street and the Haymarket, and flanked in Panton-street by another narrow-fronted old house. To construct the new house it had been necessary to rebuild the party-wall between it and the old house in Panton-street; but in the Haymarket the old party-wall on the ground-floor was underpinned and left standing, a new wall, nearly 50 ft. in height, being built upon it. The new wall, we suspect, proved too heavy for the old one, and hence the sad catastrophe. Nothing, however, can yet be known with certainty.

On Thursday, Mr. Baron and his assistants had noticed that the doors stuck in their frames, and it became evident, from the remarks of workmen who had been called in to ease them, that some movement had taken place. Towards night other warnings, such as falling plaster and creaking wood, were given, and the inhabitants, including Mr. Baron, wisely sought shelter in the street; but, in spite of the threatened catastrophe, Mr. Baron hesitated in escaping, and was buried beneath the materials of his own house.

It was, as we guess, the party-wall between poor Mr. Baron's shop and the new building that must have failed, the larger part of it falling inwards, that is, into the shop. A question may arise as to the character of its foundations, or as to whether the old wall was underpinned throughout its whole thickness. In falling the wall dragged with it the Haymarket façade of the new building. The columns and girders which supported that front all fell inwards, pushing one of the columns bearing the circular corner (always a dangerous arrangement) a little outwards towards Panton-street; and the Panton-street façade followed like the other façade towards the inside of the building. Next the party-wall between the old house in Panton-street and the new building was an iron stanchion which we saw broken short and clear across the middle. In the ruins on the morning after the accident, amid blocks of solid stone, were seen parts of cast-iron columns exhibiting remarkable fractures. The columns, 7 in. in diameter and 1¼ in. metal, were broken, not like match-wood but like a stick of sealing-wax,—clean and clear. One column, near the circular corner, presented a flaw of a somewhat serious character, and the fractures, to say the least, demand examination. The cover-plate of the main girder or bressumer,—over which the stone walls were built,—seemed as we looked on the ruins torn asunder like paper, its end section presenting the appearance of being laminated in an extraordinary fashion.

To build thick and heavy walls on cast-iron columns is a great risk. In this case it seems the owner was building upon his own freehold land. He was investing what was equivalent to his own money in a house which it was his interest to make durable and profitable as long as possible. But the architect trusted to cast-iron columns; and here he did what the law permits and even encourages. Further, there are precedents of wonderful endurance under similar disaster by the maligned cast-iron column. We have before us a photograph of fallen houses in the Tottenham-court-road, taken in May, 1857. There, a cast-iron column is seen erect amid the ruins, though the iron bressumer it supported had been broken clean across, and almost perpendicular with the column. Nevertheless, our own opinions about the advisability of supporting house-fronts upon naked iron are too well known from frequent repetition to need reiteration here. If there still be any sceptics let them ask Captain Shaw at what temperature naked iron succumbs and brings down the whole burden it is able, when cold, to support; and let them study in the Haymarket how a large, lofty, and strong new house can be knocked down by the failure of one wall, because all the superstructure on the other sides above the ground story depended for support upon a few iron columns.

It is only just to add that the office in which the drawings for the unfinished building that fell were made has a deservedly good reputation. We happen to have heard comments some time ago upon the plans prepared by the same firm of architects for the stone building on the opposite side of the Haymarket, almost exactly opposite the fallen houses. Two persons in authority, through whose hands the drawings passed, expressed to us casually their satisfaction and admiration for the business-like and even scientific character of the working and detail drawings.

The inquest was opened on Wednesday afternoon last at the St. Martin's Vestry-hall, before Mr. St. Clare Bedford, coroner. Formal evidence was given as to the finding and identity of the body of Mr. Baron, one of the witnesses being Mr. Lunn, foreman to Messrs. Newman & Mann, who were the builders engaged in the erection of the new structure. Medical testimony was also given as to the cause of death, which was stated to be, primarily, suffocation through pressure of the fallen *débris* on the chest of the deceased. The inquiry was adjourned until Friday, the 8th proximo, at three p.m., in order to suit the convenience of Mr. Vulliamy, Superintending Architect of the Metropolitan Board of Works, who will make a report as to the cause of the disaster.

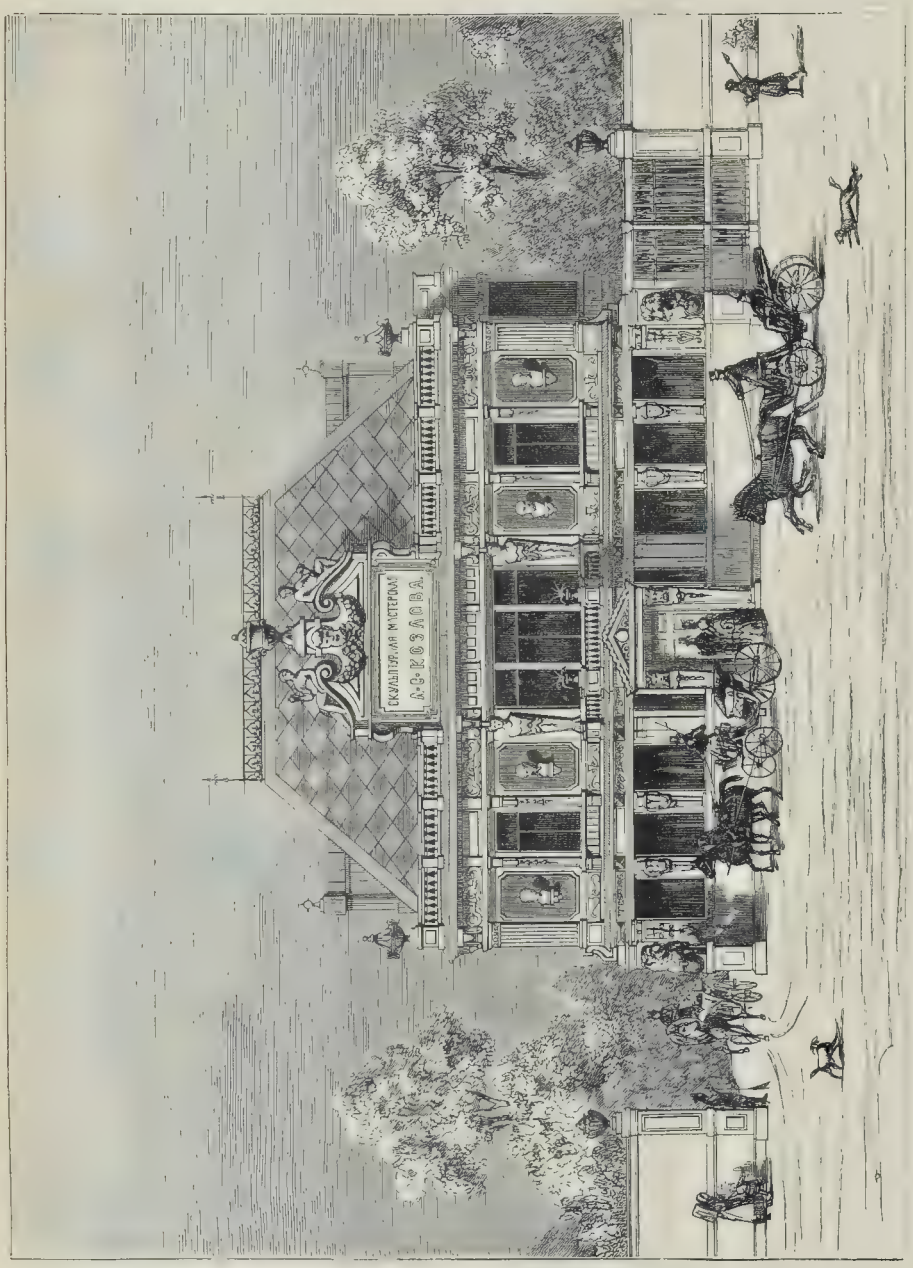
A RUSSIAN SCULPTOR'S STUDIO, MOSCOW.

BETWEEN the barrier of Tver and the road to Petrovsky Park, on the right stands picturesquely a villa residence of tasteful aspect. It is Mr. Kozloff's studio, the façade of which is here presented to the reader.

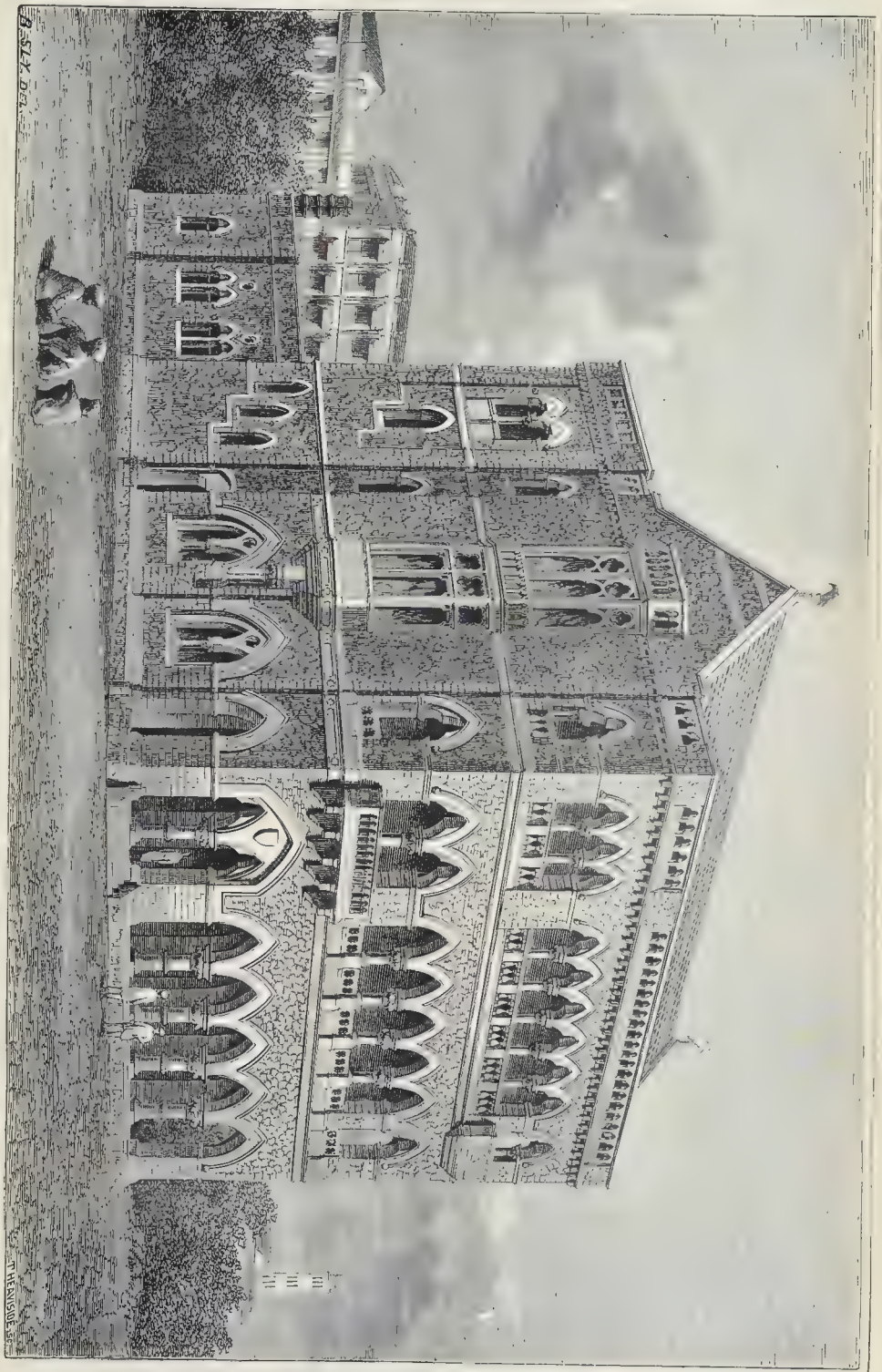
The building is constructed according to the plans of R. A. Gedike, professor of architecture. It is a cottage *ornée*, in the style of the most recent Parisian structures, having wide plate-glass windows and numerous statues. The fore-part is fitted up for the exhibition of completed works of sculpture, destined for the ornamentation of halls, gardens, and terraces, and the external fittings of houses. As a specialist, Mr. Kozloff has devoted himself exclusively to the production of *genre* decorations, but in the figure or statuary department he works in association with the Academician Opekoushine and the clever A. Shwarg. Their productions consist chiefly of works in terra-cotta, Portland cement (white and grey), alabaster, and papier-mâché.

Within a short period Mr. Kozloff has succeeded in winning in Moscow the confidence which he enjoyed in the Palmyra of the North, viz., St. Petersburg, and at the present hour his works are to be seen on the mansions of many eminent persons. He has been also intrusted with the internal restoration of the Petrovsky Palace, and with the fittings of the halls and the grand staircase of the Nobility Club-house, as well as the façade and also with the great hall of the Cezarewitch Nicolas's Lyceum.

Roman Catholic School-Chapel, Bradford-cum-Beswick.—The new school-chapel, which has been built in connexion with St. Bridget's Roman Catholic Mission, Mill-street, Bradford-cum-Beswick, has been opened. Mr. John L. Ward, of Upper Brook-street, is the architect, and also the contractor for the work. The building is of brick. The ground-floor contains main room, 80 ft. by 20 ft., and four class-rooms, each 17 ft. by 14 ft. There is a spacious stone staircase at each end of the building, leading to the first-floor. This room, which is 80 ft. by 39 ft., will be used as a temporary chapel, and will accommodate 500 worshippers. The contract for the building was 2,000*l.*, exclusive of school or church furniture.

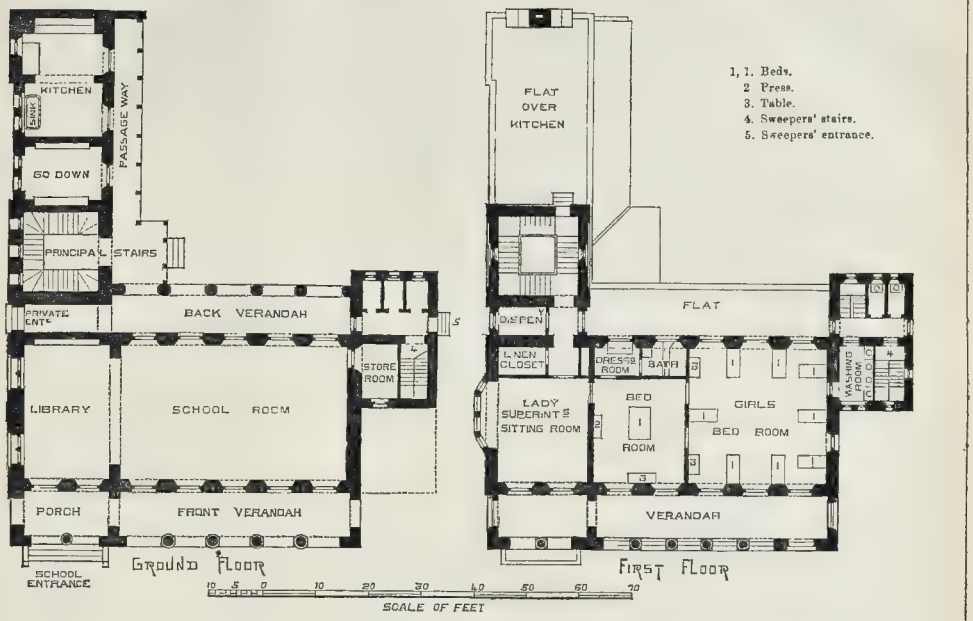


A RUSSIAN SCULPTOR'S STUDIO, MOSCOW.—PROFESSOR R. A. GEDIKE, ARCHITECT.



THE FREERE AND FLETCHER SCHOOLS FOR GIRLS, BOMBAY.

MR. GEORGE T. MOLEGEY, ARCHITECT. SUPERINTENDENT OF THE WORKS ON BEHALF OF THE GOVERNMENT, COL. JOHN D. FULLER.



THE FRERE AND FLETCHER SCHOOL FOR GIRLS, BOMBAY.—*Plans.*

FRERE AND FLETCHER SCHOOL FOR GIRLS, BOMBAY.

THE accompanying engraving represents the new home, and, permission being given, shows the new name of a school, heretofore known as Miss Prescott's, or the Fort Christian School,—the first and, as far as we know, the only one of its kind in India. It was begun some years ago by the late Rev. W. K. Fletcher, long a chaplain in the East-India Company's service, and well remembered for his active interest in the promotion of female education in the East before that subject was much thought of in England. The plan on which he started the school has been loyally carried out, and the result has proved, we are informed, so beneficial, that it is intended to render the school permanent, and, if possible, still more efficient. The basis is Church of England, all the trustees belonging of necessity to that body; but no children are excluded on account of their creed. It is a "mixed day-school,"—European and native sharing alike the secular instruction, whilst the religious is under the supervision of the cathedral chaplains. Non-Christian children join in the latter only with the permission of their parents; good faith being invariably kept.

The site on the esplanade is exceptionally good, and was given by the Government when Sir Bartle Frere was Governor of Bombay. Sir Bartle has never entirely lost sight of the Institution,—has befriended it on several occasions; and through his recommendation, the Society for Promoting Christian Knowledge have promised a grant of 500*l.* towards an Endowment Fund. The cost of the building is about 7,500*l.*, of which 5,000*l.* were the gift of a native gentleman, the remainder having been raised by public subscription, supplemented by the present Government of Bombay. Mr. George T. Molecey is the architect; and the superintendent of the works on behalf of the Government, Colonel John D. Fuller. The building is of stone, and the roof is covered with the Broomhall tiles. The school scheme as to admission of pupils, &c., was drawn up by the Advocate-General, and received the sanction of the High Court of Bombay, Government naming three lay trustees of official standing, the other two being the Archdeacon and Senior Chaplain. Under the same roof will be a boarding-school for European and Eurasian girls, especially orphans. Accommodation is provided for twenty-five boarders and two mistresses, besides a large school-room for general use; and the education contemplated is high-class,—the best possible attainable in the country.

It is now necessary to raise an "endowment fund" of at least 5,000*l.*, any contributions towards which will be thankfully received by the Lady Superintendent, Miss Mary Prescott, and may be paid to the credit of her account with the Chartered Mercantile Bank of India, Old Broad-street, London. The amount already received is about 900*l.*, including the sum promised conditionally by the Society for Promoting Christian Knowledge.

THE NEW METROPOLITAN MARKETS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, held on Monday evening last, Mr. J. Whichcord, vice-president, in the chair, the following new members were balloted for and duly elected, viz.:—As Fellows: Mr. T. Kesteven Hill, of Lancaster-place, and Mr. W. J. Green, of Delahay-street. As Associates: Mr. D. J. Ebbetts, of Kensington, and Mr. G. R. Julian, of Balham. As Honorary Associates: the Very Rev. the Dean of Westminster; the Right Hon. Gerard Noel, M.P.; Sir Charles A. Hartley, C.E.; the Rev. Benjamin Webb, M.A.; Mr. Joseph Sim Earle; Mr. G. Ridley; Mr. E. E. Antrobus, F.S.A.; Mr. Henry Holiday, and Mr. Herbert Jekyll, R.E.

The Chairman announced the decease of Sir William Stirling-Maxwell, an Honorary Fellow of the Institute, who was a careful writer upon pictorial art, especially that of Spain, and whose death would be a great loss to the Institute. He also announced the death of an Associate, Mr. Hartley William Burgess, who was his (the chairman's) close personal friend and valued assistant. (A notice of Mr. Burgess's death appeared in last week's *Builder*, p. 71, *ante*.)

Mr. Cockerell, Hon. Sec. for Foreign Correspondence, announced the death, on the last day of the old year, of Signor Giuseppe Mengoni, of Milan, Honorary and Corresponding Member, who died through injuries sustained by falling from a scaffold at the new arcade of Victor Emmanuel, Milan, which was being erected under his superintendence.

The secretary read a letter from the Leicestershire Society of Architects, inclosing a resolution expressing its appreciation of the efforts made by the Institute for the improvement of the status of the profession, especially as shown by the reforms of last session.

Mr. Charles Fowler called attention to the fact that the Metropolitan Board of Works intended to introduce a Bill into the present session of Parliament to amend the Metropolitan Building Act, and moved that the council be requested to obtain copies of the Bill, and, if they deemed it necessary, to appoint a special committee to consider the alterations proposed, with the view of making such suggestions or recommendations as the interests of the public and of the profession demanded.

Mr. Eastlake said that the first part of the resolution had been anticipated by the council, in accordance with whose instructions he had already applied for copies of the Bill, and in reply he had received a courteous answer from the Board to the effect that copies should be forwarded as soon as they were ready.

A member said he understood the Bill was already in print.

Mr. Hebb said that although the Bill was printed, it was still under the consideration of the Board, and was hardly in a fit condition to be made public at present; but he was quite sure that the Metropolitan Board would be only too glad to consult the Institute on the subject.

Mr. Fowler's resolution was then agreed to.

The discussion then took place on Mr. Horace Jones's paper on "The New Metropolitan Markets, an abstract of which appeared in the *Builder* a fortnight ago (p. 34, *ante*).

Mr. J. Douglass Mathews, in moving a vote of thanks to Mr. Horace Jones for his interesting and practical paper, said that the author had, without doubt, overcome in a very satisfactory way the difficulties he had to encounter. He had been especially successful in securing an equably-low temperature combined with efficient ventilation, for, notwithstanding the number of hours gas was burnt in the market, especially on winter mornings, the air was invariably good, and exceptionally sweet for a meat market. No better testimony could be borne to the suitability of the market than its success, owing to its being so readily taken-to by the meat trade, in spite of the disadvantages inevitably attending the dis-marketing of the old Newgate market, and the transference of its business to Smithfield. With regard to Billingsgate Market he could not say much, except that now it had

been re-built on so materially enlarged a scale, the question of approaches to it would have to be seriously considered. No market could be worse off, as regarded street approaches, than Billingsgate. In this connexion it appeared doubtful whether the corporation were doing the best thing in concentrating the meat, poultry, and fruit and vegetable markets, in the immediate neighbourhood of Smithfield. Though it was true that the approaches were better and the streets wider than in the case of Billingsgate, it should not be forgotten that the number of vans, carts, and trucks attending the three markets, and requiring temporary standing-room in the vicinity, was so great that it was likely to seriously interfere with the flow of traffic, notwithstanding the wide new streets which had been, or were to be, made. There was no doubt, however, that the site on which it was proposed to re-erect Farringdon Market was, in itself, far preferable to its existing site, although the great width of Farringdon-street was a most valuable point in connexion with the present structure.

Mr. Woodthorpe, as one who knew the difficulties which Mr. Jones had to overcome, and the various if not conflicting interests he had to study, congratulated him on his success, which was in every way worthy of the commendation of the Institute.

Mr. Rudkin, as representing the Corporation of London, and as identified with the meat trade, also expressed his perfect approval of all that had been said in commendation of the markets. In reference to the question of approaches, he agreed that those to Billingsgate were utterly inadequate. Some six years ago he had sought to induce the Court of Common Council not to rebuild or enlarge Billingsgate Market on its present site, but to build a large new fish-market in the neighbourhood of the New Meat Market, and in communication with the various railway systems whose lines converge, viâ the Metropolitan and London, Chatham, and Dover Railways, in that neighbourhood. He got a majority to favour his motion, which was afterwards, however, rescinded. Nevertheless, he believed that in twenty years hence his proposals in this respect would be adopted and carried into execution. Every year the proportion of fish brought by rail was increasing as against that brought by water, and if that increase continued, there would soon be no paramount reason why the market should necessarily be at the river-side. Fish could be landed at Grimsby, Hull, and other outlying ports in the evening, and sent direct by rail right into such a central market as he predicted would have to be erected, in time to be sold early the next morning. Lower Thames-street was already congested with the large amount of traffic incident on the fruit and Mincing-lane trades; and when to these was added the fish-trade, things were brought to a dead-lock. It was quite certain that one of these trades would have to seek fresh quarters, and for the reasons he had already given, he thought the fish-trade would be the better for removal. While, however, urging the desirability of concentrating the markets still further than at present proposed, it would never do to perpetuate or perpetrate such a condition of things as formerly existed in connexion with Newgate Market, or even such a state of things as existed in the vicinity of Billingsgate Market. Broad and well-formed streets of approach, conceived and carried out in a comprehensive spirit, were essential to the success of such markets as were necessary in London. As to the live-cattle trade, the Metropolitan Cattle Market at Islington had been under a cloud ever since the year 1866, in consequence of the outbreak of cattle plague, and he believed that the number of live beasts sent to market would diminish rather than increase, as it was now incontestably proved that the more nearly an animal could be slaughtered to the place where it was bred and fed, the better would be the quality of the meat and the heavier would the carcass weigh. Animals sent long distances in railway trucks, and driven, perhaps, considerable distances at either end of their journey, lost in weight very materially: they seemed to feed upon themselves, so to speak, and the money loss thus entailed averaged 35s. per animal. As to the Foreign Cattle Market at Deptford, he hoped that in the present session of Parliament the Corporation of London would get an Act making it compulsory that all foreign cattle imported into this country be landed at Deptford and there slaughtered, the carcasses being distributed thence by rail all over the country. In answer to a question by a member, Mr. Rudkin said that every accommodation was provided at the Metropolitan Meat Market for the reception of American meat. Finer meat than the great bulk of it it was impossible to obtain, and West-end residents partook of it, under the name of "Aberdeen," far more often than they were aware. In fact, it was impossible to tell the difference.

Mr. Ewan Christian said he regretted that no mention had been made of the name of the late Mr. Charles Pearson, the City solicitor, to whom was due the credit of originating the idea of the concentration of the London markets. He (Mr. Christian) remembered being present at a *conversazione* given by Mr. Pearson for the purpose of explaining his plans and models, and, while willing most heartily to accord all due credit to Mr. Horace Jones for the manner in which he had given practical effect to some of what were substantially Mr. Pearson's ideas, it seemed to have been forgotten in the paper, and by previous speakers, that that gentleman was really the precursor of much that had been done. The omission of all mention of his name was therefore hardly fair to his memory. If Londoners were enabled to get their meat, poultry, and vegetables with greater facility and cheapness, it was principally due to the persistency with which Mr. Pearson pursued the advocacy of his schemes.

Mr. Woodthorpe apologised for rising again, but he craved leave to say that a great deal of the credit claimed by Mr. Christian for Mr. Pearson was due to a well-known member of the architectural profession, viz., Mr. John Stevens, with whom he (Mr. Woodthorpe) was associated for some time, and therefore he had a full knowledge of the facts. The whole of the designs, drawings, models, sections, and every detail explanatory of Mr. Pearson's schemes, were carried out by Mr. Stevens, who was an exceedingly able man as well as a very talented draughtsman.

Mr. Charles Fowler said that as his father had been an architect concerned in the erection of a great many markets in the provinces and also in London (amongst them being the late Hungerford Market), he had taken great interest in the erection of the new metropolitan markets which their architect, Mr. Horace Jones, had described in his paper. The method and the details of construction adopted by Mr. Jones were far in advance of those adopted in the, as some considered, very elegant markets in Paris. The Halles Centrales embodied a great idea, but that idea started on a different basis to that underlying the necessities of the great London markets. As to material, he had always thought, and it was also the opinion of his father, that iron was a wrong material to be largely used in market construction. He also believed that the walls should be covered with wood or some other non-conducting material, and that there should be as little glass used as possible consistent with the amount of light and shelter required in the market. These conditions were especially necessary in a meat-market, where the temperature must be kept low, and he was therefore glad to see that they had been adhered to by Mr. Jones in the new markets. Although, perhaps, the Paris markets would strike the non-professional and non-technical observer as something grander and prettier than the London markets, the practical man would, on careful examination, admit that the new London markets were, in point of suitability for the purpose for which they were erected, greatly to be preferred to those of Paris. Of course, one great element of success in a market was suitability of position. It was owing to the non-observance of this condition that Hungerford Market failed. As to the exterior of the new markets, he thought Mr. Jones had succeeded in giving them a very good appearance architecturally, without sacrificing too much to outward show. Great height was quite unnecessary, but in the Halles Centrales economy was quite lost sight of in giving useless height to the façades. It was not to be forgotten that, as Mr. Jones had said, the new markets were not only metropolitan, but imperial or national, and as the business transacted within them was almost exclusively wholesale, their planning did not involve so many nice points of detail as would have been the case in exclusively retail markets, as to which a great deal had to be learnt by market constructors, many of whom seemed to imagine that a long covered avenue, not very wide, with stalls on either side, was all that was required. In the matter of the details of stalls in retail markets generally, and in all that appertained to the most advantageous display of the wares exposed for sale, our foreign neighbours seemed to excel us, and one consequence of this fuller attention to detail was that retail markets on the Continent presented a much more inviting appearance than did those in this country. In fact, we had hardly a single market in London which could be said to be inviting. In conclusion, Mr. Fowler added his testimony to the success with which Mr. Horace Jones had carried out the new markets.

The Chairman, in summing up the discussion, mentioned that the Corporation of Manchester had forwarded some interesting statistics as to the cost of market accommodation in that city, from which he had calculated that the cost per head to the community served by the markets was a fraction above 6*d*. It would be interesting to know what was the cost per head of the population of the metropolis of the markets erected and under the superintendence of Mr. Jones, who had thoroughly succeeded, at whatever cost, in securing, by his peculiar arrangement of roof construction, a temperature in his markets such as was utterly unknown in any other building of the kind. The notable schemes put forward by Mr. Pearson had been referred to, but the concentration of the markets was only a small portion of those schemes, as Mr. Pearson proposed the concentration of all the railway termini in the centre of the City,—a scheme which was abandoned as a whole owing to the difficulties in getting adequate street approaches. The vote of thanks was then put and carried by acclamation.

Mr. Horace Jones briefly replied, and in the course of his remarks he said that so many elements had to be taken into consideration that it was hardly possible to make a calculation as to the cost per head of the population served by the new markets, but he should say, roughly, that it was nearer 2*d*. than 6*d*. per head, as quoted for Manchester. As to Mr. Charles Pearson's claims to recognition in connexion with the concentration of the markets, all he could say was that however worthily conceived were his ideas, the carrying of some of them into execution in the shape of the Metropolitan Railway placed several difficulties in his (Mr. Jones's) way when he came to plan the markets.

Mr. F. C. Penrose, surveyor to the Dean and Chapter of St. Paul's, then read a brief communication respecting some recent improvements in paint materials, the invention of Mr. W. N. Wilkins. He said that these improvements were so important and valuable that the Dean and Chapter of St. Paul's had obtained the right to use the materials and processes, and had permitted him, at the particular request of the inventor, to bring them before the notice of the Institute. Their chief feature consisted in the abandonment of white lead and the substitution for it of kaolin or china-clay in combination with a small quantity of zinc-white. The inventor was also enabled to entirely dispense with driers by boiling a small quantity of Turkey umber with the oil to be used. Some works executed with his materials, and designated "oil-frescoes," were submitted to the meeting.

Mr. E. I'Anson then read a paper on "The Architecture of Norway," an abstract of which we give on another page.

Statue of the Prince Consort at Cambridge.—On Tuesday the Prince of Wales unveiled the marble statue of the late Prince Consort in the entrance-hall of the Fitzwilliam Museum, Cambridge. The Prince Consort was Chancellor of the University of Cambridge at his death, in 1861. The year after the subscription was started. More than 600 members of the University subscribed, and a sum but little short of 3,000*l*. has been raised. It was resolved that part of this sum should be appropriated to a statue; but there yet remains, through the careful husbanding of the Rev. Dr. Cartmell, the treasurer, nearly half the amount raised, which has yet to be appropriated to some object. The late Mr. J. H. Foley, R.A., was commissioned to execute a colossal monumental statue in marble of the Prince, and he commenced his work, which, from a variety of causes, was on hand a long time. In the earlier part of the time this was occasioned by the pressure of work; but, during the latter part, failure of health was the cause. Fortunately, before the death of the great artist, the statue was finished. The Prince is represented in his robes as Chancellor of the University.

THE ARCHITECTURE OF NORWAY.*

NORWAY is but sparsely endowed with any buildings of importance; it is, however, not destitute in this respect, and contains a few buildings of considerable interest. First, beyond all comparison, is the Cathedral of Throndhjem. This would be a fine building in any country. Throndhjem, the capital town of the district in which it stands, near the centre of Norway, contained, according to the census of 1855, 16,000 inhabitants; but a small portion of the cathedral, which was undergoing, when I was there (1872), extensive repairs and restoration, is at present in a fit state to be used. The service of the church is carried on in the south transept, and under the tower at the intersection of the nave and transepts. The whole portion westward of the central tower is in ruins, and, indeed, it seems doubtful if it were ever completed.

The cathedral, or, as it has been called, Christchurch (or the Trinity Church) of Throndhjem, was formerly the first, wealthiest, and most richly endowed church of the kingdom. The enshrined relics of the Norwegian martyr and saint, King Olaf Haraldsen, which were preserved here, attracted, during the Middle Ages, a number of pilgrims, who by their offerings greatly enriched this church. It has a length of 350 ft., is built in the form of a cross, at different periods, and consequently in different styles. The church was first erected about 1080, by the Norwegian king, Olaf Kyrre, in the Romanesque style (with round arches), and the architects were probably Anglo-Normans. The western part of it had a nave with two aisles, whilst the transept was without aisles, as well as the eastern part of the choir, which seems to have had a semicircular projection to the east of the high altar, and which stood exactly above the spot where King Olaf had been buried. The church remained unchanged, until Archbishop Eystein (1161-1188) added a chapter-house on the north side, which formed an independent building in the Gothic style (with pointed arches), and was by a gallery connected with the choir. His intention was to extend and rebuild the whole of the church, and he began with the choir; but at his death, in 1188, the work was far from being completed. After that the work advanced slowly, being frequently interrupted by civil wars; nor was it until 1247 that Archbishop Sigurd was able to lay the foundation of the western part, or "long house." The transept remained unchanged, and, with the exception of a few comparatively unimportant alterations and repairs, has been preserved as erected by Olaf Kyrre; the other parts are in the Gothic style of the thirteenth and fourteenth centuries. The "long house" consisted of a nave and two aisles, divided by two rows of columns, whilst the choir, which by the restoration also had received two narrow aisles, had five pillars on each side, to which must be added the four large pillars which carry the central tower, formerly terminating by a spire. From the choir protruded an octagon outbuilding, with a gallery and three side chapels, the easternmost of which was connected with the chapter-house. The nave, both in the "long house" and in the choir, was raised a story above the roofs of the aisles. The interior as well as the outside of the church was richly ornamented. There was a principal tower and spire, which stood in the centre of the building, whilst two lesser towers and spires rose one on each side of the western façade. Hardly half a century had elapsed since the rebuilding of the church, when it was destroyed by fire on the 3rd of April, 1328, and again it was struck by lightning and burnt in 1431. On both these occasions, however, means seem not to have been wanting to restore the building to its former state. But when, on the 3rd of May, 1531, it was again injured by fire, public feeling was greatly altered. The Reformation, which spread over so large a part of Europe, was adopted in 1537—the superstitious reverence for saints was gone: pilgrims no longer brought their gifts, and the church was stripped of its treasures, which were carried to Copenhagen. After that it was never restored to its former splendour, but remained in a very ruinous state during the greater part of the sixteenth century. In 1564, the Swedes, who had taken the town, removed the last silver nails out of the coffin of St. Olaf, and carried away the coffin itself to a church in Stirdalen, but from whence it was again brought to Throndhjem. After this, however, part of the church, viz., the choir and high choir were restored so as to serve as a parish church; but it was a restoration which hardly served to satisfy the most modest claims of the Protestant Church service. The fires by which the town of Throndhjem was destroyed in 1599, 1657, and 1681, spared the church, which was by degrees tolerably repaired; but in 1689 the central tower was thrown down by a storm, and in 1708 the whole church was again injured by a fire, as was also the town, and before the damage had been repaired, it was again, on the 25th of January, 1719, struck by lightning, and suffered again by fire. Since that time it has no more been exposed to such disaster, and although but the eastern part of the cathedral remains in its restored condition, it must still be looked upon as the finest monument of Middle-Age architecture in Norway. The roof covering the projection of the high choir dates from the last century, before that period it boasted a pointed spire. The above description is taken from a Norwegian work of some authority, but as it does not read very clearly, I refer to a briefer notice, as given in Fergusson's "Hand-book." The transept he describes as having been built by Archbishop Eystein, between 1160 and 1183; all that stands eastward of the transept was rebuilt in the sixtieth or seventieth year succeeding 1183. In 1248 the nave was commenced, and after the fire of 1328 the circular choir was built. Its length was 346 ft. or 350 ft.; its breadth 84 ft., except at the west end, where it was 140 ft. inside. The western front was originally flanked by two towers, and is now composed of two arcades of pointed and foliated arches of excellent Early English character, but it leans so much out of the perpendicular that it is buttressed up by very unsightly and large piers, which have been built without any reference to the architecture. All the slender pillars from which the arches spring are gone, both in the upper and lower arcades. Towards the north end in the upper arcade are the remains of four figures, and towards the middle, one which is nearly perfect. In Laing's "Norway," he says, "There are twenty niches in this front, which were originally filled with figures. From the folds of the dresses, hands, and hair of the heads, they could not have been the work of the same age or country which produced the grotesque masks and figures which are shown with profusion over the most ancient parts of the building. They are of a different taste or school from those figures in the Cathedral of Amiens and other churches of the same period; they display considerable merit, and deserve an examination by a competent judge."

The next church of importance is the Church of Stavauger. This, like the cathedral at Throndhjem, is built of stone, but no part of it is a ruin; it is a fine Norman church, with the chancel of the Decorated period. There is a fine porch on the north side, and the interior is fitted up with some sixteenth or seventeenth century wooden screen-work of good character. It has been recently restored, and is in perfect condition. The east end is square.

At Christiania is a church described in Murray's Handbook as the oldest church in the town, the Church of the Gamle Akers, and as having been restored in 1860; but I found that this restoration consisted, in fact, of an entire rebuilding; whether it faithfully reproduces the old building I am unable to determine; it is a good specimen, however, of a plain Norman church.

The only other stone churches which I saw were a large Norman Cathedral at Stor Hamor, on the Mösen Lake, not far from Christiania; of which, however, all that remains is an arcade, four arches, and three massive columns. This cathedral was burnt and plundered by the Swedes in 1567, but it remained until the seventeenth century, when it went to ruins. At the same place there were three other churches, and vestiges of at least one of which still remain, and are incorporated in a modern church which is visible from the lake.

In other parts of Norway which I passed through, I noticed some, and probably there are many other churches of Norman character, which are built in stone, but except one I noticed at Vossevanger, near Bergen, and a castellated building of some extent at Bergen, there are no important mediæval buildings which came under my observation. There are, however, other buildings, churches of small dimensions, but of considerable interest and exceptional character, well worthy of notice. I refer to some remarkable wooden churches, of which the two best known are those of Hitterdal and of Borgund; there is at least one more at Urnes, as there is an illustration of it given in Weale's Quarterly Papers, and there may be others still extant. That which I saw was the church of Borgund, but having seen drawings of the church of Urnes, and numerous photographs of Hitterdal, I am enabled to say that they are all very similar in character. They are, as stated, built of wood, as indeed very many of the more modern country churches still are; that at Borgund has a covered gallery all round, the object of which is by no means apparent, unless it be to protect the walls by the roofing which shelters them; the centre part of the building is raised higher than the aisles, so as to procure a clearstory, so that there are three roofs surmounting the building, the lower roof being that to the external gallery; the second roof being that over the aisles, and the third and upper roof is that which covers the nave and clearstory, and above that on the ridge of the upper roof to a square turret, but whether ever used as a bell-turret is uncertain, as near the church is a distinct and separate belfry. The building being nearly square, the roofs, before described, rise one above another at a steep pitch, and thus assume a pyramidal form. Where there are gables to doors or windows, as also to the main roofs, the ridge which covers them is at its end curved up and finished with a recurved perforated wooden finial, the whole strongly resembling the roof of the Kew pagoda, the whole decidedly Chinese or Asiatic in appearance. The exterior is covered with wooden shingle, placed lozenge-wise, or with plain wood slabs, and the roofs are covered with rough lozenge-shaped wooden shingle, so that the appearance is rough and mean; its picturesqueness and its very distinctive type of character, however, quite redeem it from insignificance. The interior of Borgund Church is as rude as the exterior, the nave columns are simple pine posts, with neither capitals nor bases, and except a rude and simple notching of some of the timbers supporting the interior walls of the clearstory, there is no attempt at decoration to be seen. Externally, the surrounding gallery has a well-proportioned arcade and turned columns, with caps and bases. The chief decoration in the church is to the south door; this has small attached columns on each side of the door-opening, and surrounding it a broad band as an architrave, which is richly sculptured with ornaments of a very marked Byzantine character. This church is one of the two oldest buildings in Norway: it seems to have been built in the eleventh or twelfth century, for the arches and the apse are semicircular, and it has all the character of the style of a small German Romanesque church, so far as it can be imitated in wood. It is built of Norwegian pine, and protected from the weather by a thick coating of pitch. The nave measures about 13 ft. 9 in. by 11 ft. 9 in., the aisles a little over 3 ft. wide, from out to out, the body of the church is about 28 ft. by 32 ft., and the length, including the apse, but not including the porch, is 59 ft., a low covered way, about 3 ft. wide, runs round the exterior body of the church. The belfry is of much more recent date, and stands some distance apart. A church like this (according to Laing's "Norway") existed at Leir del Sören; it was sold to the King of Prussia, and is now erected in Silesia.

The wooden church at Hitterdal has similar architraves as those to the door of Borgund Church, so also, from the drawings I have seen, has the church at Urnes; and in the Museum of Copenhagen I saw fragments of the architraves of the doors of other Norwegian churches all similar in character. The ornament on these architraves represent animals somewhat resembling lizards, or the ideal dragon, intertwining and biting each other, with an intertwining foliage decoration running through and combining the whole. Mr. Fergusson, in his Handbook, characterises this decoration as Runic, and I have somewhere seen, although I cannot now call to mind where, drawings of crosses either in Scotland or Ireland, ornamented in a similar manner, also described as Runic, which I consider are simply Byzantine. The stones carved with Runic characters have no sort of affinity with the Byzantine character of the wood carving I have referred to. Fergusson says there can be no doubt about the age of these

* From a paper read before the Royal Institute of British Architects on Monday evening last by Mr. E. I'Anson, F.G.S., fellow.

curious churches; for he adds, not only does the dragon tracery fix them as of the eleventh or twelfth century, but the capitals of the pillars and the general character of the buildings exactly correspond with the details of our own Norman architecture so far as the different materials admit. With the latter part of this I cannot say I fully concur; for, although in our own and Continental Norman there are decided traces of this dragon tracery, as Mr. Fergusson calls it, still it is very far indeed from being so fully developed as in these small Norwegian churches. In some parts of the decorations of St. Mark's, ornaments much more similar can be found. On the door of the cathedral at Salerno there is some very similar ornament; and only quite lately I observed some carved ornamentation almost identical in character on a door of one of the Romanesque churches at Cologne. It strikes me, however, as remarkable, that in the same small country of Norway, towards the latter end of the twelfth century, the distinctly Norman portions of the cathedral at Throndjhem were being built; and here the style of ornament was pure Norman of the style commonly called Saxon, and of which scarcely a trace occurs in the Byzantine carving used in these small churches.

Hitterdal is the next church to which I refer, and which I know only by photographs, description, and engravings. It is also one of the oldest in Norway, and of the same period and style as that of Borgund. Fergusson says, referring to these wooden churches:—"The largest of these is Hitterdal; it is 84 ft. long by 57 ft. across; its plan is that usual in churches of the age, except that it has a gallery all round on the outside; its external appearance is very remarkable, it is more like a Chinese Pagoda, or some strange creation of the South Sea Islander, than the sober production of the same people who built the bold and massive round Gothic edifices of the same age." Mr. Fergusson suggests that the panels may once have been adorned by Runic carving, which, as they decayed, have been replaced by plain timbers, detracting much, of course, from the original appearance. Near this church is a belfry, as at Borgund, almost of the same form, and both considerably more modern than the churches near to which they are placed.

Besides the wooden churches, there are in the Telemarken district many wooden houses or stores, of small size, the ornaments of which are very similar in character to the Byzantine decoration round the church doors, intermixed, however, with rude Renaissance work, and of them I exhibit some illustrations. Nearly all the houses in the country districts at least are built of wood, and from being cased externally with rough slabs, nothing can well be less sightly in appearance. What is very remarkable is the roof-covering, almost universally the bark of the birch, which is laid on at a comparatively flat pitch, and which has a wonderful power of resisting the dampness of the atmosphere; and that this covering must be of considerable duration is evidenced, because not only are the roofs covered with vegetation, but sometimes upon them small trees are actually growing, and they are so flat, and the houses are so very low and near the ground, that the goats easily get on to the roofs, where they apparently find good pasture-ground.

It is only in the larger towns, such as Christiania and Bergen, that the houses are built of stone; they are chiefly modern, few, if any, being older than the seventh century. I produce one or two sketches of houses of this character at Christiania. In the Museum at Copenhagen there is a remarkable collection of objects of the prehistoric age, a vast collection of flint implements, also of bronze and gold, which were not superseded by the use of iron and silver until the third century of our era. In examining the ornamentation on many of the objects of the bronze age, I was much struck with the resemblance of some of the ornamentation to the Byzantine and Greek. On several of the bronze vases the form of the guilloche, with various modifications, is the common ornament. And it occurred to me that these convoluted and interlaced lines, combined with the lizard or dragon form of Byzantine ornament, is the origin of that certainly distinct type of the decoration in the wooden churches of Norway, called Runic. On the staircase of the same museum are several sculptured wooden doorways from Norwegian churches, and there is one from a church in Iceland, the decoration on which is pure Byzantine in character.

WAGES AND RESULTS.

Last Monday evening, the 21st inst., Mr. Thomas Brassey, M.P., read a paper "On the Comparative Efficiency of English and Foreign Labour," at Hawkstone Hall, Westminster Bridge-road. The Rev. Newman Hall was in the chair, and there was a large attendance. Towards the close of his discourse Mr. Brassey said:—At Cincinnati, in Ohio, in 1872, the rate paid to the common labourer was one dollar 50 cents. (equal to 6s.) per day. The present rate is one dollar a day. This gives a reduction of 33⅓ per cent. The reduction in the wages of mechanics has been about equal to that in the wages for unskilled labour. Turning to the cost of living, the reduction has been fully proportionate to the difference in wages. Since 1872, coal has fallen 50 per cent., rent 35 per cent., clothing 50 per cent., house-furnishing goods have declined in value fully 40 per cent., furniture 35 per cent., glass-ware 35 per cent., cutlery 25 per cent., and crockery 20 per cent. Table expenses having remained the same, the reduction in the cost of living in the last five years is not less than 30 per cent. Hence, with wages reduced only about 35 per cent., the working men who are fully employed are not severe sufferers.

The leaders of our trade unions, who too often commit themselves, in unprosperous times, to a stubborn resistance to a reduction of wages, may study these figures with much advantage. They will see that the maintenance of high rates of wages all round is not an unmixed benefit to the people at home, while it must certainly affect prejudicially our power of competition abroad. A general advance of wages means a general rise of prices; and it is obvious that if that advance of prices be such that the increase in the cost of living up to a given standard absorbs the increase in wages, the rise of wages has conferred no practical benefit on the workmen. Conversely, the fall in wages may be fully compensated, as in America, by a proportionate reduction in the cost of living.

Mr. Archibald, our Consul-General in New York, gives some tables which show the fall which has taken place in wages in every State of the American Union:—

"The per-centage of reduction of railroad wages from 1873 to 1877 on seven different lines was as follows:—

	Per centage of Reduction.						Average.
Conductors	20	46	18⅔	...	22	28	8	24
Brakemen	19	38	23	14½	20	26	..	24
Firemen	9½	25	12	...	41	31	9½	21
Switchmen	23	23½	34½	19	33½	26	12	24
Trackmen	43	40	34½	33½	44	30	...	37

The per-centage of reduction for other classes of labour is shown in the following statements:—

BUILDING TRADES.

	Daily Wages.		Per cent. of Decrease.
	1873. d. c.	1877. d. c.	
Masons	4 00	2 50	37½
Masons' labourers	2 50	1 50	40
Plasterers	5 00	2 50	50
Carpenters	3 50	2 50	28⅝
Common labourers	1d. 75c. to 2d. 00c.	1 25	28⅛ to 37½

CONTRACTORS' MEN.

	1873.		1877.		Per cent of Decrease	
	D. c.	D. c.	D. c.	D. c.		
Stonemasons on railroad work	3 00	to 3 50	1 50	to 2 00	50 & 43	
Stone-cutters	4 50	5 00	...	2 50	44	50
Carpenters on railroad work	2 50	3 00	...	1 25	50	59
Blacksmiths (exceptionally skilful)	...	4 50	...	2 50	...	44
Blacksmiths (ordinary)	...	3 00	...	1 50	...	50
Blacksmiths' helpers	...	2 00	...	1 00	...	50
Tracklayers	..	2 00	1 12	1 25	44	37½
Engineers, steam shovel (per month)	118	00 125 00	..	60 00	48	52
Firemen, steam shovel (per day)	...	2 50	...	1 50	...	40

SUMMARY.

Railroad wages.—The average per centage of reduction varied from 21 per cent. for firemen, to 37 per cent. for trackmen.

Building trade wages.—The average per centage of decrease varied from 28½ per cent. to 50 per cent.

For other classes of labour as specified—

The average reduction was nearly twice as great as the average railroad reductions.

In the oil refineries and yards about New York, where a great many men of different trades are employed, including coopers, ship-carpenters, house-carpenters and machinists, the reductions of wages since 1873 have been about 25 per cent.

These figures should convey a most instructive lesson to our working people. I have on many occasions shown that the cost of production cannot be determined by the nominal rate of daily wages, and I have never been alarmed for the future of the industry of the United Kingdom simply because wages on the Continent of Europe were so much lower than in this country. I have been much more impressed with the capabilities of the manufacturers of the United States. In America labour has, until a recent period, commanded the highest rates of wages. The scarcity and the cost of labour have stimulated to the utmost the ingenuity of our intelligent and enterprising kinsmen across the Atlantic, who have all the qualities of the Anglo-Saxon race and a boundless field for their development. Labour-saving machinery and mechanical skill generally have thus been brought to great perfection. With high wages, and all the obstacles to trade which an extreme protectionist system presented, the cost of many articles has been brought down to a level which has enabled American manufacturers to compete successfully with our producers. I will give a striking case as an illustration. It might have been supposed that the rifles required for the Turkish armies would have been made by the comparatively cheap labour of Liége or Birmingham. That, however, has not been the case. A contract for rifles, amounting to $17,000,000, the largest single contract ever taken in America from a foreign nation, was given to the Providence Tool Company by the Turkish Government. The Tool Company were three years in preparing to begin the work upon the contract, and now employ 2,500 men, who turn out 200,000 Martini-Henry rifles per year, or 600 finished rifles in a day. "One of the side businesses of magnitude,"—to quote from the "Polytechnic Review,"—"which have grown principally out of this contract is that of the Excelsior Box Company of Providence, which is busy making 10,000 boxes per year for the Tool Company, in which to ship their guns to Turkey. The machinery for the manufacture of these boxes was perfected by an invention for the purpose. The company have still two years in which to complete the number of these boxes that they contracted to make, by which time, also, the Tool Company will have completed their immense contract with the Turkish Government."

The mechanical industry of the United States has been developed with equal success in other branches. The locomotive manufacturers of Pennsylvania have supplied engines to all the railways of South America, and I believe to our own Australian colonies also. It would seem at first sight incredible that our engine-builders should have been beaten in a neutral market with no hostile tariff. Anyhow, it would have been expected that if we were beaten it would have been by the Belgians or the German makers, who command an ample supply of labour at comparatively low rates. The contrary, however, has happened; and it is a country where labour is paid at rates unknown in the Old World which has usurped our place. We have been conquered by the mechanical skill of the employer in devising labour-saving machinery, and by the industry and energy of the workmen, who, if they have earned high wages, have worked longer and more industriously than many among our own mechanics have been disposed to do. I am not afraid of high wages, but I have a fear lest the foundation of our industrial prosperity should be undermined by restraints on the characteristic energy of our people. If our workmen allow themselves to be deluded with the notion that by working at half-speed they will prevent over-production, British industry cannot contend successfully against the free and vigorous efforts of our kinsmen in America. The only result of such

a suicidal course must be that the people who impose no artificial restrictions on their powers will take our place in every open market.

In conclusion, may I say that I offer in no narrow and selfish spirit, these suggestions to the consideration of my fellow-countrymen, whose lot it is to labour and to earn their bread by the sweat of their brow? I contemplate, with more equanimity than some students, perhaps, of economical science, the increasing participation of other nations in trades which once seemed destined to be the monopoly of the United Kingdom. Would it be a thing to be desired that our island should become the universal workshop of mankind? Would it add to the felicity of its inhabitants that the population of this huge metropolis should be doubled in number? Would you wish to see all Lancashire and Yorkshire honeycombed with coal-pits, every hill crowned with a monster manufactory, and the black country of Wolverhampton enlarged to twice its present limits? Is it not better that we should share with other nations in the development of those industries which, however admirable they may be as illustrations of the skill and energy of man, inevitably involve the destruction of much that is fair and lovely in nature? A life without trees and flowers, and blossoms, which no breeze from the hills or the sea ever refreshes, is a life imperfect, and wanting in the purest and the best pleasures which it is given to man to enjoy.

> "I heard a thousand blended notes,
> While in a grove I sat reclined,
> In that sweet mood when pleasant thoughts
> Bring sad thoughts to the mind.
>
> To her fair works did nature link
> The human soul that through me ran;
> And much it grieved my heart to think
> What man has made of man."

Let us, then, abandon the vain idea that it is an irreparable misfortune for our country to share with others in the development of the commerce of the world. Let us study the situation in a spirit of generosity to the foreigner and of justice to our own people. Montesquieu has well said: 'L'esprit de commerce produit dans les hommes un certain sentiment de justice exacte, opposé d'un côté au brigandage et de l'autre à ces vertus morales qui font qu'on ne discute pas toujours ses intérêts avec rigidité, et qu'on peut les négliger pour ceux des autres. Le commerce rend les hommes plus sociables, ou, si l'on veut, moins farouches, plus industrieux, plus actifs; mais il les rend en même temps moins courageux, plus rigides sur le droit parfait, moins sensibles aux sentiments de générosité."

It may be that the young men and women of the present and of coming generations may be required to go forth in augmented numbers to earn their livelihood in other lands. Such a contingency may be contemplated without regret, if our sons and daughters carry with them an affectionate memory of the mother country. In the Antipodes, or the New World, under the Union Jack, or it may be beneath the Stars and Stripes of the American Union, I see before me a glorious vision of the growth of the Anglo-Saxon race. I see new nations rising up, speaking our language, and educated in our literature, bound to us and to one another by the closest ties; and I see, in this wider distribution of our race, more individual happiness, and a surer basis for our greatness as a nation, than in the concentration of a redundant population within the narrow limits of their ancestral island home.

CONJOINT SEWAGE FARMS.

AN agreement has been entered into between the Merthyr and Aberdare Local Boards of Health with reference to the disposal of sewage. As this is, we believe, the first agreement of the kind extant, founded on the 28th section of "The Public Health Act, 1875," it is interesting. The Merthyr Sewage Farms are situate in the valley of the River Taff, near the confluence of the Aberdare Valley with the Taff Valley, and about eight miles from Aberdare. These farms have been acquired by the Merthyr Board under powers granted by Parliament in 1870, and it has been found that the land is so suitable for absorbing and purifying sewage, that at least double the quantity that was originally intended may be disposed of and cleansed by it. Hence the agreement to take upon the land, originally intended for the sewage of Merthyr only, the sewage of Aberdare also. Mr. Samuel Harpur is the Merthyr Tydfil Engineer.

THE EDUCATIONAL TRAINING NECESSARY FOR THE DEVELOPMENT OF TECHNICAL SKILL.

SIR,—A fortuitous concourse of circumstances is generally the cause of national pre-eminence. Such circumstances make that demand upon the energies of a people which leads to prosperity. A favoured people, by force of circumstances, is compelled to be aggressive, and this aggressiveness in its turn becomes a stimulus to endeavour to the outer nations; foreign activities are evoked, and the favoured nation has to stand upon the defensive. The time comes when national pre-eminence can only be maintained by intellectual supremacy, for intellectual power is the most potent arm in a nation's armoury. If that weapon be not of the best kind, the finest arm of precision, -her untold gold, her vast material resources, her ironclads, her fine troops, her monster guns, and her rifles,—will avail her little, for she will be unable to wield them. In times of prosperity, therefore, a nation ought to be solicitous about her system of national education, and use her utmost endeavours to establish it on the soundest principles.

Englishmen, as a rule, fully recognise the great importance of national education, and great pains have been bestowed, and are still being bestowed, upon its elaboration. It would appear to me, however, that we have erred in accepting an antiquated system upon trust, and without sufficiently scrutinising it to discover whether it be based upon sound principles. The leading notion of our teachers would seem to be that a man's intellect is in proportion to the number of subjects which he has "got up," and that the more extended the curriculum of study the *higher* the education. On this monstrous fallacy of *quantity*, education is proceeding to the injury of the individual, intellectually and physically, and to the detriment of the nation. No more pernicious scheme could possibly be devised than this so-called "*higher*" education for lowering the intellectual and physical status of a people.* Educators have failed to discriminate and to separate knowledge, or the material for thought, from the instrument of thought and the power of thinking. Knowledge is of many various kinds, but the instrument of thought and the mode of thinking rightly are one and the same, or an adjustment of the same, no matter to what subject they may be applied. We have, therefore, to study the mind as a mechanism if we desire to utilise the intellectual powers of men to the uttermost, to make them thinking and reasonable beings; and, above all things, we should studiously endeavour to protect the mental powers from being overloaded and clogged.

It is with the vital mechanism, in its totality, as with machines made by human hands, it will not work well, and the work which it turns out will be ill done, if it be imperfect and disproportioned in its adjustments; it will not properly perform its functions, mental or physical, if it be overladen; its power may either be concentrated or diffused; the amount of work which it does will be an equivalent of a certain force expended; and the force expended in one direction will diminish by that amount the force left available for use in another. We gather, then, both from the working of mechanical inventions and from our experience of the vital dynamics, that neither machines nor human beings can have their powers overtaxed, nor their power too much distributed, if we desire to get the most favourable results from them,—if we desire to have their full force brought to effect some special end. The educator has therefore to keep these principles of the human mechanism steadfastly in view in framing a system of national education.

Let us then first of all get a clear conception of the essential faculties of this human mechanism which it should be our first and main object to develop, to perfect, to bring into just proportion. These are,—1, the senses; 2, the memory; 3, the reason; 4, the physique. The senses, because for the sake of the accuracy of the understanding we should be able to observe correctly; the memory, because we should be able to fixedly retain what we have learnt and understood; and the reason, to enable us to attain to just views, and to systematise our knowledge. What subject is there that a man could not grapple with, within the limits of the human powers,—whose faculties of observation, memory, and reason were perfect? Or what feat of technical skill could a man not perform who, in addition to these perfections, possessed a well-proportioned or well-trained and healthy physique? I will not here dilate to the full on the best means of developing those several important elements of the human system, the senses, the memory, the reason, and the physique; but I shall endeavour to impress the reader with the importance of training the senses of sight, of hearing, and of touch, because I consider that the judicious training of these senses is indispensable to the production of good workmanship, from the making of a simple box to the carving of a fine statue. And upon this point, the training of the senses, I laid great stress in my pamphlet of 1851. The importance of this kind of training becomes the more evident when we reflect that it is from the impressions received through the eye and the ear that men are enabled to bear witness to what passes in the external world, and teachers of drawing and of music only fully know what false witnesses, without *mal-prepense*, these senses are before they have been properly trained. Let it not be forgotten either that it is upon the testimony of these two senses that character and life are frequently at stake. The desire to obey the command, "Thou shalt not bear false witness," may be strengthened; but evidence, nevertheless, cannot be guaranteed upon oath. For if a witness be an imperfect observer, either by the eye, or by the ear, as he commonly is, in default of not having received that sense-training upon which we are insisting, he may quite conscientiously swear that his imperfect perceptions are absolutely true. There is an art-teacher who points this moral in his class. If, says he, you misapprehend the relation with respect to the model immediately before you, and biding your own time and convenience for deliberate inspection, how can you exect to accurately observe, and to recollect the moving scenes and occurrences of every-day life? It is not only in the witness-box, however, that trained senses are required, but for the recognition and appreciation of beauty in nature, to preside watchfully over all kinds of work, and to endow the arts and the manufactures of a nation with those excellent qualities which would satisfy a discriminating demand. I am now, of course, more immediately referring to the sense of sight. You will find that painters and sculptors can, more readily than other men, turn their hands to any kind of work, and why? Not solely because the exercise of their professions requires the greatest nicety of touch, but because their sense of sight having been better trained, they see more correctly than other persons. Drawing and instrumental music respectively tend to perfect the senses of sight and of touch, and of hearing and of touch. They are to these senses what gymnastics are to the general physique.

If I somewhat enlarge on the foregoing observations in reference to the subject of drawing as the gymnastics of the sense of sight, it is because what is said of drawing as a means of training men to observe correctly, and to be dexterous-handed, may easily be applied to music as a means of training the senses of hearing and of touch. The plastic arts are in their highest manifestation the result of fine thought and fine feeling working with consummate technical skill. This technical part of art requires the development of those very faculties to perfection which are necessary to effect all kinds of handicraft, viz., correctness of eye and dexterity of hand. The mechanical part of art is the very highest kind of handicraft. Hence the importance of drawing in a system of formative training for the workman, or, indeed, for any man. But this kind of training, to have its full effect, should be commenced when the human being is most impressible and plastic to the moulder's hands. *Our School-Board Schools should be so constituted that they should be the great nurseries of technical skill.* Habituated as Englishmen have been to a certain set educational procedure, the views herein set forth may appear too theoretical, but since I first propounded them I have ascertained that, if theoretical, they were also once considered practical, and that the system of educational training now proposed was that adopted by the

* Since writing the above my views have received strong confirmation from the expressions of Dr. B. W. Richardson, in a lecture delivered at the London Institution,—"Young men and young women who are now presenting themselves for the higher class examinations are crushed by the insanity of the effort." "The system was a big sufficient evil to men, but what could happen to the world if women, anxious to emulate, were to have their way, and, like moths, follow their mates into the midnight candle of learning?"

nation which attained to the highest position in art, literature, and techtonics,—need I say, by Greece? There is evidence that from the fourth century B.C. onwards, drawing was ordinarily taught, and that every Greek boy either had, or was supposed to have, a musical ear. He was accordingly taught either the harp or the flute, and with it singing. There were also the finer gymnastics: the fine art of rhythmic movement, by which they sought to give grace of action and dignity of carriage. The Greek was, therefore, in every way attuned by art; in art he moved and had his being. And this symmetrical training, by a reflex action, was not without its marked beneficial effect on all kinds of workmanship.

The formative course of training which I have here but partially and rapidly sketched I have treated more fully in my little book, entitled, "Symmetrical Education." I myself believe that some such formative course should constitute the basis of our educational system; other branches of education might then be safely left to take care of themselves; professional, special or technical education, the knowledge of science and of languages should be a secondary consideration,—a course quite apart from the *formative*. The choice of subjects being left to the individual, and to be purchased by the individual, the schools or colleges established for these purposes should be the work of private enterprise; the professions should provide for their own technical instruction, and I think the masters and the workmen ought to be able to provide for any necessary technical instruction which the workshop itself failed to supply. The Central Technological College which I projected in 1851 was designed to bring together the greatest teachers in the world upon special subjects, and thus to make England the great educational as well as commercial centre of the world.

W. CAVE THOMAS.

THE MODEL BYE-LAWS.

LIVERPOOL ARCHITECTURAL SOCIETY.

AT the fifth meeting of this society, held on the 9th inst., the president, Mr. J. M. Hay, in the chair,

Mr. F. W. Hornblower, hon. sec., proposed that, as the question of professional charges in Liverpool, more especially with regard to valuations, was a very vexed one, a committee should be appointed to consider the question, but this was ultimately referred to the council, who were empowered to add to their number any Fellow of the society outside that body whose opinion they might consider it desirable to have.

Mr. Joseph Boult, Fellow, read a correspondence he had had with the town clerk at Chester (as being secretary of the council committee on the Model Bye-laws), together with a copy of a letter received by the town clerk from the Local Government Board, explaining that it was not the intention of that body to alter the bye-laws in any way, and proposed that "The council be requested to co-operate with the council of the city of Chester, and other public bodies and associations, with a view to obtaining a thorough investigation of the building usages throughout the country, and the enactment of a uniform system of regulations." In the course of his remarks, Mr. Boult said that within a radius of twenty miles round Liverpool there were nearly forty Local Boards or Urban Authorities, each of which had its own special building regulations. In his opinion, there should be in every large centre a court of experts, composed of architects, engineers, and practical builders, to whom all cases in dispute in matters connected with building should be referred; the responsible officer of every Local Board should be made to pass a proper examination, similar to that now passed by the London District Surveyors. This would in itself be equivalent to a diploma, and until this was the case, and the building laws had been thoroughly legislated upon, nothing satisfactory would be arrived at.

Mr. Hay, the president, thought Mr. Boult's motion a very good one. At the present time cases were often arising in which the *spirit* of the law was certainly not violated. The local surveyors, though they could perfectly well see the absurdity of such cases, were allowed no discretionary power. He himself was on one occasion prosecuted for a cause so utterly absurd that the presiding magistrate declared that unless he received a *mandamus* from the Court of Queen's Bench ordering him to sign it he would not do so. Contingencies were constantly arising which none but a Court of Appeal composed of experts could decide.

Mr. T. Mellard Reade, C.E., considered that so large and novel a scheme as that propounded by Mr. Boult would require much consideration, and indeed seemed at first sight impracticable. He wished to explain that his reason for opposing the Council's report on the Model Bye-laws was principally because he was of opinion that the question had been gone into too hurriedly. There was much that required revision in the bye-laws, more especially those relating to sewage matters, which latter, in his opinion, were opposed to all the most recent scientific revelations.

The President remarked that bye-laws should only lay down the law with regard to what *ought not to be*, not *what must be*. He had no sympathy with jerry-builders, but was nevertheless of opinion that should these bye-laws be adopted generally a complete stop would be put to the building of many classes of property.

Mr. James Montgomery, hon. treasurer, had much pleasure in seconding Mr. Boult's motion. Mr. Boult remarked that nothing satisfactory could be obtained till Parliament could be induced to legislate upon the question. The Liverpool Building Act was most imperfect; the late borough surveyor, Mr. Newlands, always said so. The town council had often included the amendment of the Act in their various Bills, but the particular Bills to which it had been attached had always fallen through. The chairman of the health committee had told him that they did not intend to bring it forward again, but would wait for a general amendment by national legislation,

After some further discussion, Mr. Boult's motion was put to the meeting, and carried unanimously.

PROPOSED RAILWAY BETWEEN THE CITY AND REGENT CIRCUS.

MR. LEWIS H. ISAACS, the surveyor to the Holborn District Board of Works, has reported to that body with reference to the railway proposed to be made between Farringdon-street and Regent-circus, and for which a Bill is being promoted in Parliament. Powers are sought for the construction of a railway in two sections, the first commencing in the parish of St. James, Westminster, on the north side of Tichborne-street, and terminating in the parish of St. James, Clerkenwell, by a junction with the main line of the Metropolitan Railway in Ray-street, and passing though the parishes of St. James, Westminster; St. Anne, Soho; St. Giles-in-the-Fields; St. George, Bloomsbury; St. George the Martyr; St. Andrew, Holborn-above-Bars; the Liberty of Saffron-hill, and the parish of Clerkenwell. The second section would commence at the termination of the first in Ray-street, and would end in the parish of St. Sepulchre by a junction with the main line of the Metropolitan Railway, at a point about 137 yards measured in a south-easterly direction from the southern side of Charles-street Bridge. No. 1 railway would be constructed partly under the new street authorised by the Metropolitan Street Improvements Act, 1877, partly under New Oxford-street, Hart-street, and Bloomsbury-square, and partly under the new street authorised by the Metropolitan Street Improvements Act of 1872.

"Its course will be better understood" (says Mr. Isaacs) "when I state that it would pass or cross under or near to Great Windmill-street, Rupert-street, and Princes-street, in the parish of St. James, Westminster; Dean-street, Frith-street, and Greek-street, in the parish of St. Anne, Soho; Crown-street, Dudley-street, and George-street, in the parish of St. Giles-in-the Fields; Hart-street, Vernon-place, and Bloomsbury-square, in the parish of St. George, Bloomsbury; along Theobald's-road, King's-road, and Liquorpond-street, in the united parishes of St. Andrew and St. George, cutting obliquely across Laystall-street, Vine-street, Eyre-street-hill, and Warner-street, to effect the necessary junction with the Metropolitan Railway in Ray-street. For the construction of railway No. 2, it would be necessary to divert Turnmill-street and Cowcross-street, for which purpose a large quantity of property is scheduled, although the levels of those streets, as also of all the others affected, would remain unaltered.

It should be stated that the proposed railways will be entirely underground, and considerable engineering difficulties will be experienced in effecting a junction with the Metropolitan Railway in Ray-street, owing to the great difference in the level of the ground in this street as compared with that of the other streets under which the line would pass. Thus, whilst the railway at the western end of Theobald's-road would be only 28 ft. 6 in. below the surface, on arriving at Gray's Inn-road it would be 47 ft., and in Laystall-street 52 ft. 6 in. below the ground level. It should also be noted that the junction in Ray-street with the main line rails of the Metropolitan Railway is proposed to be effected by means of a level crossing, an arrangement fraught with great danger to the travelling public, looking to the fact that this is about the busiest spot on the Metropolitan Railway system.

A considerable quantity of property is scheduled at the junction of King's-road with Gray's Inn-road, which would seem to imply that this spot has been selected for a station. The great depth at which the line would be constructed below the surface at this part would necessitate no less than seventy-five steps being mounted before the street could be reached from the platform level."

GROSVENOR-PLACE, THE GREEN PARK, AND HYDE PARK CORNER.

THE most important thoroughfare of Belgravian London would appear to have been the most neglected in the formation and laying out of its alineation. Before issuing out in Piccadilly, directly opposite to the entrance of Hyde Park, there is a slight deviation eastward; besides that the carriage-way, which is over 50 ft. wide in its main course, is here reduced by 10 ft. Just beyond St. George's Hospital, and opposite to the ducal range of mansions, the Green Park forms the boundary on the east for about 200 yards, and thence to Buckingham Palace-road, by the Royal Gardens, a devious wall, topped by iron railings, leaves a footway which, in some places, is 40 ft. wide, in others 8 ft., the main width being 12 ft.

In the full season this constriction of causeway occasions blocks and stoppages which, in so crowded a thoroughfare as Piccadilly, and at this juncture, must be fraught with danger,—in point of fact, two policemen are always on guard there for the protection of traffic. There is one way of improving the road at this point, whereby 6 ft. at least could be added to the driftway, and that is by removing the iron railing on the west side of the Wellington Arch, and withdrawing the footway close to that structure; and as the boundary wall and railing opposite to the hospital advances upon Grosvenor-place at a slight angle, to a point nearly opposite Grosvenor-crescent, and recedes thence, at a similar angle of divergence, to its junction with Buckingham Palace garden walls, a long strip of ground, extending over 100 yards, could be taken into the causeway, beginning at the arch with say 6 ft., increasing at the salient angle say to 12 ft., and terminating at the Buckingham Palace junction in the old line of wall, thus adding 12 ft. at the salient angles to the road space, without damage to the park. By this trifling addition the unsightly angular obtrusion of the old wall upon this fine thoroughfare might be abated, while a great benefit would accrue to public traffic, and a corresponding advantage be rendered to the occupants of this aristocratic quarter.

It should be observed that the three park-gates stand here with an interval of 42 ft. between each,—the entrance-gate on the left, or west, being opposite to Grosvenor-place; the central gate, directly opposite to the Wellington arch, being reserved for her Majesty; and the eastern gate of issue into Piccadilly, facing the open space which adjoins the arch, and which would appear to have been laid out for continuation of the royal road leading from the Palace to Hyde Park. This road is over 40 ft. wide, and runs for one-third of a mile in a straight line; and if continued would strike out exactly on the point reserved, next the arch, and opposite to the eastern gate of Hyde Park-corner.

Seeing that it needs but 200 yards of new road to complete a grand public thoroughfare, in a straight line, from Hyde Park-gate to the Palace; that there is no hill or obstruction in the way; and, above all, seeing that the short royal route of deviation through the Wellington

arch would not be interfered with, it may be hoped the royal sanction will be conceded for user by those who are in carriages of the only practicable line of intercommunication between the three parks.

Such a concession would open out from Westminster a park drive of over three miles, and an altogether new aspect of forest scenery in London, hitherto unappreciated because little known.

The enclosed grounds of Buckingham Palace are about equal in extent to those of the Green Park, to which the woodland plantations lend a sense of extension, not much contracted by the low ivy-clad wall.

There is yet another most important angle of St. James's Park, which much needs an open carriage access,—that by Spring-gardens. At present there are but two foot wickets; and yet these communicate with Charing-cross, the vital heart of Western London. There is at present a restricted opening by Mr. Drummond's old (late) Banking-house; but as this question is now under consideration of the Metropolitan Board of Works, who have of late years so improved and beautified our metropolis, it is left altogether to their care and attention by

QUONDAM.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

AT the fourth meeting of the session, held on the 16th, after various exhibitions, a paper was read by Mr. Syer Cuming, on "Mistletoe." The lecturer brought together many notices of thi sacred plant from the ancient Latin authors, as well as from those of later date, and its uses from the earliest times to the period when it ceased to be a decoration in our churches were related. In the discussion which followed, its service, from its triple arrangement of berries, as an emblem of the Trinity, was noted. Dr. Phené, F.S.A., described a large collection of ancient relics which he has recently brought from Hissarlik (Troy), from Sparta, Antiparos, Patmos, and many other sites, some of which have been very slightly explored or altogether neglected. Mr. Thomas Morgan, F.S.A., read a paper on the relics from Hissarlik found by Dr. Schliemann, and now at the South Kensington Museum. The extreme ages of the various relics were commented upon, as well as the unique forms of the articles of pottery,—so much unlike other known examples. Dr. Phené pointed out that the moulds found for casting weapons had their counterpart in many found in England. The Rev. A. Taylor showed that the "whorls" were very like similar objects known to have been used for spinning in the British isles.

PARLIAMENTARY ITEMS.

Hyde Park Corner.—In the House of Lords, on Tuesday, Earl Fortescue asked the Government whether there were to be any steps taken to diminish the very inconvenient confluence of vehicles at Hyde Park Corner during the London season; and, if so, when it was proposed to commence the requisite works. The noble Earl said that the crowd and confusion which existed upon this spot were a disgrace to any civilised capital, and especially so to that capital which was the most populous and the richest in the world. In reply, the Duke of Richmond and Gordon said he was afraid that he could only give to the noble Earl the same answer as the Prime Minister gave last year,—namely, that there was a plan in the office for remedying the evil complained of, but that to carry out this plan properly would cost so large a sum that at present the Government were not prepared to recommend to Parliament the execution of the work.

The New Law Courts.—In the House of Commons, on Tuesday, Mr. Hopwood asked the First Commissioner of Works whether the building of the Courts of Justice is progressing satisfactorily, considering the public importance of its early completion; whether any date has been fixed by which it is to be finished; and whether any indulgence, by extension of time or otherwise, has been granted to the contractor on account of disputes with his men, or for any other reason. Mr. Noel replied that the date for the completion of the contract was the 7th of August, 1880. The contractors were entitled to a short indulgence of nearly three months, which had been granted to them; but that was not on account of disputes with the men, but because they were entitled to it under the first of the three contracts which had been entered into with reference to the building.

DEMOLITION OF BULL'S GARDENS, CHELSEA.

AT a meeting of the Chelsea Vestry on the 1st inst., Mr. G. H. Stayton, the surveyor, reported on the above premises (consisting of twenty-two houses), under the Artisans' and Labourers' Dwellings Act, 1868, showing their miserable condition.

Mr. Fisher moved that a copy of the report be sent to Mr. Hunt, Lord Cadogan's surveyor.

Mr. Stroulger.—And also to Lord Cadogan.

Mr. Lawrence hardly thought it possible that Lord Cadogan could ever have consented to give a lease of such property. His lordship could not have known the state it was in.

It was resolved to send copies of the report to Lord Cadogan, Mr. Hunt, and Messrs. Lee & Pemberton, and to appoint that day fortnight to hear the owner's objections (if any), under the 6th and 7th sections of Torrens's Act.

Accordingly, on the 15th inst., Mr. Pemberton (Messrs. Lee & Pemberton, solicitors to the Cadogan Estate) attended the Vestry on behalf of Lord Cadogan, and stated that no opposition would be offered to the proposed demolition, and the Vestry unanimously resolved to proceed in accordance with the provisions of the Act.

CASE UNDER THE METROPOLITAN BUILDING ACT.

"WOODEN BUILDINGS."

AT the Hammersmith police-court, on the 18th inst., Mr. Knightley, district surveyor for Hammersmith, attended before Mr. Bridge in support of a summons which had been taken out against Mr. A. C. Palmer, a builder, for having erected a wooden building without giving two days' notice in writing, as required by section 38 of the Building Act. The building in question was used as a workshop, and consisted of posts fixed into the ground, to which boards were afterwards fixed, forming an enclosure. The district surveyor asked that a penalty might be inflicted in the first instance, after which he would have to proceed further in order to enforce the provisions of the Act in regard to construction; and the magistrate fined the defendant 20s. and costs.

COMMITTAL OF A BUILDER FOR BAD WORK.

MR. HUMPHREYS, coroner, has inquired into the circumstances attending the death of James Patrick O'Connell, aged 29, a bricklayer, who lost his life on the 16th inst., by the fall of a house, just completed, situated in Kenmore-road, Amherst-road, Hackney. The deceased was engaged in the erection of a block of houses, when the wall of an adjacent house fell upon and killed him. It having been alleged at a former stage of the inquiry that the materials used in the construction of the houses were of an inferior character, the coroner ordered an adjournment, in order that a practical and independent person should examine the materials used, and report thereon to the jury. Mr. H. W. Napier watched the case on behalf of the Metropolitan Board of Works; Mr. Phillips, for Mr. Hackett, the builder; Mr. Legge, the district surveyor attended. Frederick Taylor said he was timekeeper and clerk of the works in question. He was employed by Mr. Hackett to supply the contractor, Mr. W. Brown, with whatever materials might be required. The contractor undertook to find the labour at the rate of 3*l.* 10s. per rod, or 25*l.* for each house. Mr. Hackett supplied the whole of the materials.

Mr. John Hackett said he was a plumber and decorator, and lived at No. 27, Clonbrook-road, Stoke Newington. He purchased the ground from the trustees of the Tyssen-Amherst Estate in November last. His plans were prepared by Mr. Blackmore, architect. Witness was not a practical builder, and he had no knowledge of the quantity or quality of the materials used, and left that matter to the discretion of his contractor, Mr. Brown, who had orders to ask for whatever was necessary, and he would be supplied by the clerk of the works. The agreement was that the houses should be built in a workmanlike manner, and he paid him the amount of his offer without asking for a reduction. Witness admitted that Mr. Hamilton, the assistant surveyor to the district board of works, had a fortnight ago called his attention to the inferiority of the materials used, and he had some portions of the works rebuilt, but the wall which fell had not been interfered with. Mr. Humphreys here handed to the witness a copy of a notice served upon him by Mr. Legge. Witness said that on receipt of the document he waited on Mr. Legge.

Mr. Legge said his attention had been called to the buildings in question. At the interview he had with Mr. Hackett he told him plainly that unless he used better materials and conformed to the provisions of the Building Act he would before long find himself at Worship-street, and probably at the Old Bailey on a charge of manslaughter.

Mr. James Edmeston, architect, of Great Winchester-street, City, said he had been called upon to examine the materials used on the works. The conclusion he arrived at was that frost and wind had little or nothing to do with the fall of the wall, but that it was due in the first place to hasty (for the season of the year), careless, and bad workmanship; and in the second to the inferior quality of the materials used. The sand was not good, and the walls were filled up with loose stuff.

Mr. Kemp.—Do you consider the wall fell from preventible causes?

Witness.—I do.

Mr. Humphreys, in summing up, called the attention of the jury to the fact that the owner was not a practical builder, and that he had left his contract in the hands of a builder, to have his work done in a workmanlike manner. The builder was empowered to have the necessary materials, and no attempt had been made to get the work done at a cheap rate.

The Jury retired, and returned in a few minutes with a unanimous verdict of "Manslaughter" against Mr. Hackett. The coroner thereupon issued his warrant, committing him for trial.

PIPES AND FOUL AIR.

SIR,—It has long been my practice to construct waste-pipes from sinks, lavatories, &c., in the manner described by Mr. Norman Shaw, but I have never been so bold as to apply the principle as he has to soil-pipes, and I even now doubt if it would answer in large public institutions, though I certainly will make the experiment.

It is my experience that the short bent length of pipe running from the housemaid's sink to the "funnel-shaped head" becomes coated with a deposit which, when the apparatus is much used, emits a faint odour that gradually permeates the air of the room in which it is placed, and I should fear this would be the case in the short bent arm of Mr. Shaw's soil-pipes, despite the flushing effects of water.

The time requisite to form this deposit depends upon the number of times the apparatus is used, and therefore my doubt as to whether a hospital or a workhouse water-closet would so successfully stand the test for two years, as in the case of Mr. Shaw's house.

I have lately been successful in preventing foul air from entering buildings through soil and waste pipes by the introduction of a sloping lid covering, so hung that when not in use, and the lid closed, the w.c. pan, the sink, or lavatory basin is open to the outer air, but when the lid is raised, and these apparatus are being used, the outer air is excluded.

I enclose you a sketch of the contrivance, but as I cannot say with Mr. Shaw that I have no patent to protect, you will use your discretion as to publishing it. The cover may be seen in use at the New St. George's Union Infirmary, Fulham-road. H. SAXON SNELL.

SIR,—I have read with interest your account of Mr. Shaw's house-drainage by open soil-pipes. I am not, however, satisfied that the plan is safe, although it certainly possesses some excellent points. The following experiment would go far to determine my opinion to one side or the other:—Let the water-closet window be shut; let the water-closet door be open, and the handle up: let there be good fires in the house; let a good pungent smell be made inside the lowest pipe, just below the grating shown as at the level of the ground (fumes of paraffin or chlorine gas will answer my purpose); then let an observer go into the water-closet and try whether he smells these fumes while they are being generated below. If none of the fumes are, under those circumstances, sucked into the house, let them next be generated in the second section of open pipe, *i. e.* in the long vertical pipe, and let the observer try once more whether he smells them.

If he still fails to smell them, let them be generated inside the broad open section, that is to say, inside the pipe directly attached to the closet.

In this third case it is hardly conceivable that the fumes should not be sucked into the house; indeed, I expect that the fumes will be quite perceptible in all three cases.

If this be so, the house will sometimes be supplied with air through a soil-pipe of greater or less length,—a result which I cannot think desirable. It is bad enough that most houses should be supplied with a great part of their air through their water-closet window; and it

would surely be worse to have it supplied through a long soil-pipe, even allowing that the soil-pipe were for a soil-pipe very sweet and clean.

To take an analogous case: the drains of a town, if in good condition, should be so little offensive that we may walk inside them with no great reluctance. Still, we should not voluntarily supply our drawing-rooms or bedrooms with air previously prepared by being drawn through this sewer.

At any rate, let the experiment be tried so as to see whether the house would or would not, with Mr. Shaw's plan, receive part of its air supply through the long or short soil-pipes.

FLEEMING JENKIN,
Professor of Engineering in the University of Edinburgh.

P.S.—The drawing seems to show a Bramah Closet. It may be said that the house would only receive air through the soil-pipe for the very short time that the water-closet handle was up. This is quite true if the overflow trap is in order, and if the valve is tight; we must, however, face the case, of no uncommon occurrence, that the overflow trap is unsealed, or that the water has passed the valve, leaving the closet dry. We must even remember that careless people do leave the handles of water-closets drawn up.

SIR,—I have been sweet upon soil-pipes for many a year,—advocating, where occasion occurred, the great advantage of open tops for the free outlet of foul air. If architects have been slow converts, manufacturers have not, but the aims of the two are not always the same. Special and patented appliances are the terror of the one and the glory of the other. But still the ventilation of the soil-pipe has been so much discussed of late that I should have supposed the noxious old system of closed tops had quite ceased among skilful constructors. The letter of Mr. Shaw, however, in the *Builder*, of the 12th inst., shows me to be mistaken. He who applies an invention is practically as useful as the originator; and I rejoice to see Mr. Shaw in one of these characters, if not in both. As to open tops, indeed, he is quite out of the race; but the chief interest of his communication lies in the abandonment of the D-trap, and the direct junction of the soil-pipe with the closet apparatus. In the summer of 1875 I did precisely the same thing at the Pimlico Dispensary, Buckingham Palace-road, where it can be readily seen; but, as the pipe had to go through buildings below, one of Beard & Dent's cast-lead traps, with brass screw-cap, was used in lieu of the earthenware syphon. THOMAS MORRIS.

NOTES AT A FIRE.

MR. GEORGE H. CHUBB wrote to us last week but too late for insertion then, as follows:—

"Having had the opportunity of inspecting the interior of Messrs. Crocker's premises in Watling-street, recently destroyed by fire, perhaps I may be allowed to offer a few remarks on the curious effects which were noticeable. The fire commenced in a new block of the building almost completed, and there appears to have been on each floor a pair of sliding sheet-iron doors to separate this block from the rest, according to the requirements of the Building Act. These doors, I need hardly add, proved as usual perfectly useless, all but one having fallen and disappeared; and high up, on the top floor, there still remains a solitary door crumpled up like paper. The brickwork throughout the structure has stood the fierce heat remarkably well,—even the outer walls facing Watling-street, which had tie-rods through them, are still upright. In many places the expansion of iron girders has added to the destruction; but one of the strangest sights amid the ruins is a complete network of iron columns and pillars still in position, notwithstanding that adjacent floors and walls are completely destroyed. The heavy timber beams which were in the older portion of the building have all fallen, and are much charred, but by no means burnt through. In one place, at a height of 40 ft. from the ground, there is a wrought-iron beam, weighing two tons or more, and projecting some 25 ft. from a main wall, in which one end is imbedded, but otherwise hanging without any support whatever. The entrances to two of the strong rooms can be seen, but not approached as yet; the brickwork and stone lintel on the door of one appears to have suffered rather severely. Another strong room is buried under a considerable amount of rubbish, but a large safe was dug out by the firemen and its valuable contents found uninjured."

Institution of Surveyors.—At the next meeting, Monday evening, January 28th, a paper will be read by Mr. J. Smalman Smith, entitled "The Law of Support in its relation to Land, Mines, and Buildings."

THE MASONS' STRIKE.

THE GERMANS.

SIR,—In your number for January 19th, I find that a mason summoned Mr. Macey, the well-known builder. The former claimed to be paid at the rate of 9d. an hour, but the magistrate dismissed his complaint. He did not claim 10d. an hour. Is this a tacit admission on the part of the men that they are beaten, and that the strike is at an end? If not, why did not he ask for the full amount? If we are to believe all the Strike Committee would have us believe, we must conclude that very many employers pay 10d. an hour; and yet Mr. Macey, in his evidence, says he has men enough and to spare, and that their wages average from 4d. to 9d. an hour. If Mr. Macey can get men at those rates, other people can, and the strike is practically at an end.

It is useless to say that German masons cannot do good work. None but ignorant, untravelled men would make such an assertion, and when the abilities of our foreign brethren are questioned,—aye, and denied *in toto*,—such criticisms must be taken for what they are worth. Let any one connected with the building trade put a 10*l.* note in his pocket, and give himself a week at Dresden, Leipsic, and three or four other German cities. Let him examine, too, the noble bridges that span by the hundred the rivers of the Fatherland. Let him look closely into the new masonry at Cologne Cathedral, and, if he has time, let him run on still further and inspect the sumptuous Votive Church at Vienna just completed. What will be the practical lesson taught? Simply this, that at every hand beautiful masonry will be found,—masonry at least equal to our own, and yet *not done by us*. By whom has it been wrought, then? By foreign workmen, of course; and "what man has done [there], [man [the same one] can do" [here]. I am accustomed to employ a goodly number of hands, and find that when I have Germans on my staff, as I have sometimes, my experience is they are equal as workmen,—neither better nor worse,—to anybody else. HARRY HEMS.

SCHOOLS OF ART.

Cork.—The annual distribution of prizes to the students of the Cork School of Art has just taken place. The school had 249 students during the past year, and it has become necessary to find larger and more suitable premises than those now occupied. A site for a new building has been secured, and it is proposed to spend 5,000*l.* into the erection of the new structure, towards the cost of which the Department of Science and Art has agreed to contribute 1,000 guineas, subject to certain conditions. Mr. Brennan is the head-master of the school, and was spoken of as "having done wonders" with the means at his disposal. Professor Armstrong addressed the students, and read a paper "On the Dawn of Modern Art."

Oldham.—Mr. J. T. Hibbert, M.P., distributed the prizes to the successful students of the Oldham School of Art and Science on the 7th inst. The report states that 1,256 students have passed through the school during the last five years, bringing the total number who have attended since the opening, thirteen years ago, up to 2,135. This number may be analysed thus:—Students connected with engineering trades, 980; building trades, 329; cotton trades, 234; various trades, 592. Dividing the time, the increase during the past five years in number of students is 283 per cent. above that of 1872; in successes gained, 293 per cent. above that of 1872. These figures show that, notwithstanding the rise in number of students from 135 to 283, the successes are ten per cent. ahead. Foremost of the prizes that may be enumerated is the Whitworth scholarship, gained by Fred. Ogden, of the minimum value of 300*l.*, with the possible aggregate gain of 800*l.* during the three years of tenure. This is the sixth Whitworth scholarship gained by students of this school, the numbers now being,—London and Oldham highest, six each; Manchester five, Wolverton four, Crewe and Glasgow three each. Of the two Whitworth exhibitions awarded, one was gained by Tom G. Taylor; and John W. Geddes, with Travis Platt, granted second year of tenure. These exhibitions entitle the holders to free attendance for two years at several of the day classes at the Owens College. The important opening these exhibitions give to a student's career may be seen from the fact that by their means he may be aided to attend the Owens College, Manchester, for the winter sessions of several years, through the local exhibitions and Whitworth scholarships. A new feature is the number of prizes gained at the Owens College by students from this school,—a total of four prizes and fourteen first-class certificates.

BREARLEY & MARSDEN'S STONE-DRESSING MACHINE.

A NEW stone-dressing machine, patented by B. J. Brearley and G. H. Marsden, Holmfirth, has been exhibited at work by Messrs. T. Robinson & Son, engineers and wood-cutting machinists, Railway Works, Rochdale. The machine, of which a diagram appears in our advertising columns, is worked on the same principle as the table of an ordinary iron planing-machine. The tools or cutters are mounted upon a shaft bearing twelve eccentrics, and each of these eccentrics works one tool. The eccentrics are so set that only one tool strikes the stone at once. Each tool gives 250 strokes per minute, or a total of 3,000 for the twelve cutters. The machine will dress or face stone either to a plain smooth face, ready for polishing, or to work mouldings, channellings, &c. The machine, as we saw it in operation, does its work to a great degree of perfection. The cutters can be altered to any pattern required. The stone we saw being operated upon was 5 ft. long and 2 ft. wide. There were three separate mouldings, and several narrow flutings at the edge. We understand that the machine in operation was destined for Messrs. R. Neill & Sons, contractors, Manchester. The right of manufacturing has been bought by Messrs. Robinson & Son.

GAS ESCAPE.

SIR,—Gas explosions seem to have been frequent of late, and often from a light being taken to find out the escape. I should like to ask to what extent the sense of smell is a guide to the amount of escaped gas. Sometimes one enters theatres and places where there is a strong smell of gas, and yet the gas is burning safely all round; on the other hand, dangerous explosions occur where, unless people are void of the sense of smell, one would think that there was danger enough in the air to give a caution. Can escaped gas be dangerously accumulated, and yet there be no smell? HOUSEHOLDER.

BRICKMAKING.

SIR,—Being an old subscriber to your paper, and knowing you are ready to help any one out of difficulties, I venture to ask if any of your readers can inform me how to prevent bricks from cracking. I have had one of Messrs. Ward & Son's, of Leeds, patent brick machines fixed at great expense. The machine makes a good square brick; every brick receives a pressure of 30 lb. to every square inch, and the brick, when it leaves the machine, is nearly fit for the kiln; but when we come to burn the brick it is full of little cracks. If you or any of your readers can help me out of this difficulty I shall be very grateful. THOS. FERN.

LIGHT AND AIR CASE.

THE action, Moore *v.* Hall, Queen's Bench Division, before the Lord Chief Justice and a common jury, was brought by the plaintiff, proprietor of the Dundee and Newcastle Coffee-house, in Upperwell-court, or alley, High-street, Wapping, to recover damages for the diminution of light and air to his premises, caused by lofty warehouses erected by the defendant, without leave, on the opposite side of the way.

It appeared that the plaintiff had taken a lease of his premises for ninety years, eighty of which are yet to run, and that he fitted them up as a coffee-house, and furnished the rooms with numerous beds, at 9d., 1s., and 2s. per night, and did a good business in that item, there being in some of the large rooms as many as five beds. As instances of the injury to his establishment, he deposed that he had, prior to the erection of the warehouses by the defendant, a young gentleman, as lodger and part boarder, who was studying for the London University, and paid him a guinea a week, but who left him on the light, which was important to him, being diminished by the great height of the warehouses. Plaintiff also adduced evidence showing that a jobbing tailor, who worked in his front sitting-room, which had the benefit of a good light prior to the construction of the warehouses, could not, after the construction, work at his trade there, and was obliged, consequently, to transfer his occupation to a back room.

An architect and an auctioneer gave evidence of the depreciation of the value of the leasehold, owing to the diminished light.

The Lord Chief Justice, in summing up, said the question for their consideration was whether there had been practically any such sensible diminution of light to the plaintiff's premises by the warehouses on the opposite side of the way as would depreciate the value of his interest in his business. They had heard from him that he paid 42*l.* a year rent, and that the profits of his business, which he stated as 230*l.* a year since 1864, had fallen off owing to the diminution of light to his premises; and they had also heard from the plaintiff's wife, Mrs. Moore, that their gas bill had doubled by the necessarily increased consumption of the article. They would take those things into their consideration. On the other hand,

they would consider the evidence given on behalf of the defendant, which conflicted with that of the plaintiff, the contention being that there was no diminution of light by the warehouses, which were alleged to be a great improvement and benefit in the neighbourhood.

The jury conferred together a few minutes in their box, and returned a verdict for the plaintiff,—damages, 50*l.*, subject, on request of defendant's counsel, to the consideration of a point of law raised by them in the proceedings.

Judgment was prayed by the plaintiff's counsel; but the Lord Chief Justice said he would postpone it until Monday, to give the defendant's counsel time to consider whether they would press the point for argument.

Verdict for plaintiff accordingly.

Books Received.

Floral Designs for the Table; with 24 Original Coloured Designs. By JOHN PERKINS, Head Gardener to Lord Henniker. London: Wyman & Sons.

WE quite agree with Mr. Perkins that "Lightness and elegance should be the motto of every dinner-table decorator, and the view across the table should not be obstructed more than is absolutely necessary." A great change for the better in this respect has taken place in many quarters since we first raised a voice against the absurd manner in which people on one side of a table were hidden and separated from those on the other. Low trough-like vessels containing flowers in sand followed; and Mr. Perkins would supersede these by leaves and flowers laid on the cloth itself. He gives a number of designs and lists of plants fitted for the purpose, wherein, by the way, he should have used the common rather than the botanical name. The book will be found useful, especially by persons attached to important establishments where the table has to be decorated every day and variety is looked for.

VARIORUM.

"A Manual of Heating and Ventilation," by F. Schumann, C.E. (New York, D. Van Nostrand), is intended for the use of engineers and architects, and embraces a series of tables and formulas for dimensions of flow and return pipes. It is a book of results rather than of reasoning.——Mr. Ewing Matheson announces an "Aid Book to Engineering Enterprise Abroad." It will treat of public works and engineering enterprises in their inception and preliminary arrangement; of the different modes in which money is provided for their accomplishment; and of the economical and technical considerations by which success or failure is determined. The information necessary to the designs of engineers will be classified, as also those particulars by which contractors may estimate the cost of works, and capitalists the probabilities of profit.——"Quantities: a Text-book for Surveyors," by Banister Fletcher, Architect, consists of various papers said to have been issued originally in a weekly publication. It does not seem to us superior to existing works which have the same object in view; it is briefer than one and fuller than another of them, but it will doubtless be found useful by any who will study it as an introduction to the system pursued. It is published by Mr. Batsford.——"Seen and Unseen: an Epiphany Poem," by the Rev. S. T. Wood, M.A. (Simpkin, Marshall, & Co. Eastbourne: W. Leach), is out of our line. We do not presume to teach religion in words: with us *Laborare est orare.* Still, as it has reached us we will say the poem is in the form of conversations between two friends, one called Professor, the other Confessor. The Professor is scoffing and doubting, yet anxious to find the truth; the Confessor answers him, trying to satisfy his want. The arguments and ideas are poetically clothed and agreeably expressed.

Belgian Ironwork.—Messrs. Matheson & Grant say in their Engineering Trades report: —"Belgian iron is imported regularly and in large quantities into England in the form of rolled joists and small riveted girders; and the low prices at which this iron is sold are continually giving rise to an alarm-cry about foreign competition. But though some very good iron is made in Belgium, and can be purchased for use in England by those who take the necessary precautions, the large proportion of what is imported here for sale to builders is of the very lowest quality that can be made; this being the obvious result of competitive building tenders under architects who accept as sufficient anything that has the outward semblance of iron."

Miscellanea.

The Rowland Hill Memorial.—The executive committee for carrying out the memorial to Sir Rowland Hill at Kidderminster met on Tuesday to consider the question of site, and of choice of sculptor. It was stated that the amount promised amounted to 1,620*l.*, and the subscriptions came from over 100,000 in this country and abroad, the largest number, it was stated, which has ever contributed to any memorial. After deducting expenses and allowing for additional subscriptions, it was believed that a sum of 1,500*l.* would be available for the memorial. A committee was appointed to ask of the Town Council the choice of more central sites than those already offered by that body; and it was resolved to invite the following sculptors to send in models for the memorial:—Messrs. Brock, Thornycroft, P. Birch, Bruce Joy, S. Horner, Woolner, R.A., Bell, Fontana, Calder-Marshall, and G. A. Lawson. It was resolved that the statue should be of Carrara marble, the cost of the statue and pedestal not to exceed 1,300*l.* The models are to be sent in by July 1st, and the work to be completed within two years from that date.

Inhabited Houses in the Metropolis.—A return has been issued by the Metropolitan Board of Works of the number of inhabited houses in the metropolis in the years 1851 and 1871:—In 1851 the number of houses was 306,086. The population of the metropolis in 1851 was estimated at 2,363,405. In 1856 the rateable annual value of the metropolis was 11,283,663*l.*, the average value of each house being 36*l.* 17*s.* 3*d.* In 1871 the inhabited houses numbered 419,642. It will thus be seen that in the course of twenty years the number of houses increased to the extent of 113,556. In 1871 the population of the metropolis was 3,266,987. In 1876 the rateable annual value amounted to 23,111,313*l.*, the average value of each house being estimated at 55*l.* 1*s.* 5*d.* For the current year (1878) the rateable annual value of property in the metropolis had been set down at 23,469,970*l.*

Hydro-Geological Map.—Mr. F. R. Wilson, architect, the Sanitary Inspector of the Districts of Alnwick and the neighbourhood, has prepared, with much pains, as well as artistic skill, a Hydro-Geological Map of the Districts with which he is officially connected. It shows the entire sources, and resources, of water and water-supply. We do not know that a similarly comprehensive water-map of a large district has ever been before attempted. Local water-supplies are too generally considered by "authorities" piecemeal for want of comprehensive information on the subject. It is not unlikely that the Geological Survey Department may, in future, include details of springs and sources of water in the geological maps of the country. It would have been well if we had had "hydro-geological maps" of the entire kingdom made years ago.

Accident. — Dr. Hardwicke has held an inquiry at the Prince of Wales's Tavern, Caledonian-road, as to the death of William James Wisdom, 37, of 29, Summers-road, Portsmouth. The deceased, a carpenter, came up to London from Portsmouth a fortnight ago for work, and was engaged by Messrs. Mowlem & Burt, builders and contractors, who are erecting a new infirmary in the Archway-road, Highgate. On Wednesday in last week the deceased was engaged in fixing struts between the joists, when he put his foot on a temporary strut, which gave way, and the deceased fell down to the ground, 15 ft. beneath. He received a fracture of the skull, from which he died on the following day. The jury returned a verdict of "Accidental death."

New Church at Bow.—The ceremony of laying the foundation-stone of the new church of St. Paul's, in St. Stephen's-road, Roman-road, Old Ford, was performed by Mr. J. D. Allcroft. The style of the building is Early French, and the church is designed to hold about 740 persons, the cost being between 7,000*l.* and 8,000*l.* The architects of the new structure are Messrs. Newman & Billing, of Southwark; and the builders, Messrs. Wood, of Mile-end.

Designs for Plate.—As will be seen by an advertisement in another part of our paper, the drawings submitted in competition for the prizes offered by the Goldsmiths' Company for designs for plate, are now on exhibition at the Architectural Museum, Westminster.

Prince of Wales's Theatre. — SIR Delighted as I was on Saturday last with the performance of "Diplomacy" at this theatre, where refinement of language is the chief attraction, I was somewhat disappointed to hear now and then such bad grammar as the following:—"If everybody had *their* way"; "he *don't*"; "nor *me*" for "nor *I*"; "one or *the other*" for *another*, where several things are mentioned; "it was *him*"; and so on. The actors, who command so much praise, will surely take some trouble to remove such blots in the future progress of the piece.—J. B.

The Midland Land and Investment Corporation.—The success of this association seems almost *too* great. At the next annual meeting of the shareholders, to be held on the 28th inst., the directors will state that the balance of profit is 34,165*l.* 8*s.* 7*d.*, and will recommend that this amount be appropriated as follows:—

To pay a dividend at the rate of 15*l.* per cent. (free of income-tax)	£28,757 12 5
To carry to the reserve fund (thus raising this fund to 100,000*l.*)	23,200 0 0
To carry to the next account	2,207 16 2

New Railway and Tramway Bills.—The report of the Board of Trade on all the railway, canal, tramway, gas, and water Bills of the session of 1878 has been issued as a Parliamentary paper. The total number of Bills is 217, with a proposed capital of 42,263,179*l.* It is proposed to construct 674 miles of railway and 118 miles of tramways.

Amber Ornaments and Figures. — A number of correspondents ask for further information on this subject. If the writer of the paragraph has any to give we shall be happy to receive it.

Cleopatra's Needle has safely arrived in the Thames, and is now berthed in one of the basins of the East India Docks.

Town-hall, Chester.—The architect was Mr. W. H. Lynn, R.H.A., not Mr. Waterhouse as accidentally stated in our last.

Child's Bank.—The new building is to be erected, we understand, from the designs of Mr. John Gibson.

TENDERS

For the erection of two detached residences at Piper's-green, Kingsbury, for Mr. A. O. Crooke. Mr. Shoppee, architect:—

Whiteley	£2,475 0 0
Axford	2,345 0 0
Linfield	2,338 0 0
Green & King	2,159 0 0
Langmead & Way	2,141 0 0
Braid & Co.	2,140 0 0
Gibson Bros.	2,087 0 0
Hardy	2,050 0 0
Kearley	2,044 0 0
Donne	1,981 0 0
Mattock Bros.	1,891 0 0
Parker & Evans	1,764 0 0

For workshops, &c., for Messrs. Wendover & Co., Hanover-street, Portsea. Mr. E. Wendover, architect. Quantities supplied by Messrs. Hovenden, Heath, & Berridge:—

		Credit for old material.
Cooper	£1,800	—
Johns	1,600	£30
Croad	1,525	—
Bramble Bros.	1,495	—
Lawrence	1,470	25
Light Bros.	1,466	30
Burbidge (accepted)	1,435	20

For alterations to old house, and building west wing at Bishop's Down Grove, Tunbridge Wells, for the Bishop's Down Grove Spa and Hydropathic Company (Limited). Mr. M. Lawrence Caley, architect:—

Bayes Bros. & Allen	£4,058 0 0
Strange & Sons	3,990 0 0
Gallard & Son	3,925 10 6
Willicombe & Oakley (accepted)	3,800 0 0

For building residence at Frant, near Tunbridge Wells, for Mr. T. Hanson Lewis. Mr. M. Lawrence Caley, architect:—

Gallard & Son	£3,790 0 0
Strange & Sons	3,763 13 0
Wheatley	3,668 0 0
Willicombe & Oakley	3,263 0 0
Bayes Bros. & Allen	3,245 0 0
Beale & Son (error)	2,639 0 0

For pulling down old premises and building new shop and house in High-street, Tonbridge, for Messrs. Wightwick & Son. Mr. M. Lawrence Caley, architect. Quantities by Mr. Thos. Ladds:—

Dove	£3,899 0 0
Bayes Bros. & Allen	3,582 0 0
Punnett & Sons (accepted)	3,432 0 0
Clements & Wallis	3,395 0 0
Gallard & Son	3,394 0 0
Wheatley	3,267 0 0

For the erection of two chapels and a lodge in the new cemetery, for the Corporation of the Borough of Longton. Mr. A. Hardwicke, architect:—

Johnson	£3,156 0 0
H. & R. Inskip	2,784 0 0
Rowley & Lynex	2,400 0 0

For alterations and cabinet-work to Frankfort Arms public-house, Harrow-road, Paddington. Mr. G. G. Perry, architect:—

Wheelar	£595	0	0
Lamble	494	0	0
Bowles	493	0	0
Aitchison & Walker	427	0	0

For the erection of a disinfecting station for the Corporation of the Borough of Longton. Mr. A. Hardwicke, architect:—

Bennion	£335	0	0
Collis	225	0	0
H. & R. Inskip	195	0	0
Harvey	170	0	0

For detached villa at Dulwich, for Mr. G. Paulin. Messrs. Raynes & Shum, architects:—

Langmead & Way	£1,183	13	0
Brown	1,154	0	0
Braggins	1,070	0	0

For new premises, London-street, Reading, for Mr. Jos. Long. Messrs. Brown & Albury, architects:—

Filewood (accepted)	£2,500	0	0

Smith and Ironfounder's Work.

Williams (accepted)	£271	0	0

Plumber and Painter's Work.

Millington (accepted)	£349	0	0

For the erection of schools for the parish of St. Matthew, Silverhill, St. Leonard's-on-Sea. Messrs. Fowler & Hill, architects:—

H. & C. Hughes (accepted)	£1,280	0	0

For new hotel, Bridge-street, Northampton. Mr. S. J. Newman, architect:—

Loveday	£5,700	0	0
Dankley	5,253	0	0
Cosford	5,234	0	0
Clayson & Sharman	4,880	0	0
Watkin (accepted)	4,340	0	0

For the completion of a pair of villas in the Underhill-road, Lordship-lane, Dulwich, for Mr. George Paulin. Messrs Raynes & Shum, architects:—

Brown (accepted)	£780	0	0

Accepted for two cottages to be erected on the Canterbury-road, Folkestone, Kent, for Mr. J. Sharp. Mr. Burgess J. Reeve, architect.—

Excavator, Bricklayer, Mason, Slater, and Plasterer's Work.

Keeler	£154	10	0

Carpenter and Joiner's Work.

Reason	£135	0	0

Plumber, Glazier, and Painter's Work

Mempes	£12	0	0

For alterations and additions to shop and premises in High-street, Hythe, Kent (exclusive of painting), for Mr. D. Walter. Mr. Burgess J. Reeve, architect. Quantities supplied:—

Holdom	£650	0	0
Hoad	600	0	0
Prebble	595	0	0
Butler	585	0	0
Amos	539	0	0
Payn (accepted)	410	0	0

For completing residence in the Brockman-road, Folkestone, Kent (exclusive of drainage), for Mr. W. Tite. Messrs. Burgess & Reeve, architects. Quantities supplied:—

Slade (accepted)	£295	10	6

For alterations and additions at 13 and 15, Westbourne-grove, Bayswater, for Mr. Henry Dobb. Mr. W. S. Witherington, architect:—

Mark	£1,880	0	0
Drew	1,800	10	0
Somerville & Smith	1,705	9	0
Lascelles	1,664	0	0

For Congregational church and schools, Soho-hill, Birmingham. Messrs. Bidlake & Fleeming, architects:—

Hughes	£12,275	0	0
Barnsley & Sons	12,164	0	0
Horsley Bros.	11,891	0	0
Barker & Son	11,855	0	0
Garlick	11,445	0	0
Bennett	11,432	0	0
Wilson & Son	11,272	0	0
Nelson	11,193	0	0
Dawson & Bradney	11,028	0	0
Horeman & Co. (accepted)	10,973	0	0

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The Builder.

VOL. XXXVI. No. 1826 SATURDAY, FEBRUARY 2, 1878.

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On and About our Roads.

INTER has brought us its usual train of street miseries. To judge from the posting of two traffic-takers on Waterloo Bridge, the municipal authorities are about to propose some alteration in our streets. Most likely, indeed, the energies of the City Fathers are chiefly directed to the task of making the southern entrance to their dominion follow the example of the western, by toppling down London Bridge as well as Temple Bar. The result, however, on the traffic will be obviously different in the two cases. A more uninterrupted entrance will be afforded from the line of the Strand, through the area on which the tower of the New Law Courts already casts a portentous frown. But the only persons who will be benefited by the throwing more weight on the exactly-balanced piles of Rennie's closely-calculated foundations, will be the proprietors of the two neighbouring railway bridges, for whom the City authorities (so that Parliament permits) are preparing a lucrative God-send. It ought to be unnecessary, and we fear that it will be useless, in this year of confusion of councils, to call attention anew to the fact that the Southwark abutment of London Bridge was on the move under the very eye of its engineer, as will be found duly detailed in his biography; that it only stopped after the level of the masonry had been seriously disturbed; that the deepening of the river since 1830 must have tended rather to diminish than to increase the stability of the piles; and that if more weight be thrown on the area of the present foundations, there is very good reason to fear a catastrophe. This, however, is beside the point to which we now desire to call the attention of our readers,—a point from which our own thoughts have been for the moment diverted by the vision of those two menacing individuals, armed each with a pocket-book, shivering in the river fog.

For more years past than we care to count, the winter discomforts natural to the streets of a city have been aggravated in London by the conduct of those responsible for the maintenance of the roads. It is true that, under our present system (or, rather, abuse of system) the repair or relaying of a street that conveys a heavy traffic is a grievous inconvenience happen when it may. Still, it has so often occurred as almost to be looked upon as a normal state of things that it is just when Parliament meets, or when some special circumstance attracts an unusual number of visitors to London, that the most wide and thorough revision of the chief roadways has been taken in hand. Nor is it to be expected that the time-honoured independence of different dignitaries, which usually leads the gas-people to lift their mains about a week after a line of street has been newly paved, and the water-company to take up the stones as soon as the gas-folk have retired, will fail to be honoured, in the breach of viability rather than in the observance of public convenience, in the dark months of early 1878.

Notwithstanding the enormous amount of traffic which the Metropolitan and Metropolitan District Railways have taken off the streets, the pressure on the roadway system of London is more severe than any with which it can be compared. Nor is this all. That pressure is constantly increasing, and is likely to increase, with that normal increase of the population of the metropolis which has been found to be at a rate which doubles in forty years. As a general rule, in England, our improvements are partial, unconnected, and made by rule of thumb. It is probable that a very large amount of time, money, and vexation would be spared if we could impart a little of that German phlegm which enables our Northern cousins to study in silence, for the lifetime of two or three generations, the main problems of social life, and then to astonish the world by a quiet and irresistible conversion of the result of their meditations into concrete form. Nor, if we took a leaf from our French neighbours, and laid down primary conditions, from which are to be deduced general laws, and later, individual applications of these laws, might it prove altogether undesirable. That, however, is by the bye. We call ourselves a practical people. The truth is that we are apt to consider time spent in taking counsel, without in the meanwhile putting our hands to any work, to be lost. We must be doing,—doing something,—rather than waiting to learn what is the best thing to do. It cannot be denied that in this way we collect a vast amount of experience, positive as well as negative; nor is the latter kind of experience to be despised. It is, of course, better to ascertain a successful application of some new method than to prove its failure. But the failure is, in itself, instructive; and its due record may prevent dozens and hundreds of inventors from wasting their brain-power in following the same tempting path, which ends unfortunately in swamp.

It must be regarded as a striking instance of the manner in which public and permanent information of great value is to be derived from the efforts of individuals, or associations of individuals to carry out their own mercantile operations, that on the 1st of February, 1877, there were no fewer than fifty-seven separate portions of asphalte pavement, and fifty-four separate portions of wood pavement, laid in the City of London alone. Of each of these Mr. Haywood, the engineer and surveyor to the Commissioners of Sewers, has recorded the position, area in yards, date of laying, system on which laid, repairs done since it was new laid, and present condition. It is not our present object to discuss in detail this excellent report, or to pronounce an opinion between the different competitors for public favour, especially those who may be thought to run a neck-and-neck race. Our wish is rather to regard the subject in block; to divide it into intelligible chapters; and to ascertain what light may thus be cast on the important question,—"What kind of paving is, all things considered, the best for the streets of London?"

The street mileage of London, exclusive of the City, and of extra parochial districts, is given by Mr. Firth, in his bulky volumne on "Municipal London," at 1,410 miles. The rateable value of the property thus accommodated was, in 1873, nearly 18,000,000*l.* sterling. The area in statute acres is 75,490. The number of inhabited houses, in 1871, was 419,642. These latter totals, however, include the City acreage of 650 acres, and the number of 9,236 inhabited houses in the City. The rateable value of these was, in 1871, 2,530,868*l.*; giving a total rateable value for London of 20,509,437. The paving expenditure (still exclusive of the City), for the years from 1856 to 1875, was 3,038,406; or in round numbers 300,000*l.* per annum. The cost of sewers, sanitary, and other improvements during the same period, was 6,067,228*l.*, or about double the paving expenditure. The street mileage of the City is not given by Mr. Firth; but in 1866 Mr. Heywood reported that there existed fifty miles of public way, of which the carriageway area amounted to 390,260 square yards, the footway to 309,018, and thus the total area to 699,278 superficial yards, which is equal to 144·4 acres, or to nearly one-fourth (actually ·221) of the total area of the City. We thus attain a total street mileage of 1,460 miles for the metropolis, a figure which, in the more sparsely-peopled districts, will hereafter be somewhat augmented. Exclusive of the City, London pays rather more than 27s. per yard run per annum for the maintenance of her roads and streets.

It may be convenient here to recall the following facts:—The greater London of the Registrar-General contained, in 1876, 4,250,000 souls, in round numbers; it covered an area of 698 square miles. The incidence of local taxation per head on the population was 50s. per annum. Out of that every Londoner paid as follows:—For gas, 17s. 3d.; for water, 6s. 6d.; for poor-rate, 9s. 3d.; for local district board-rates, 7s. 8d.; for metropolitan police, 7s. 8d.; for corporation and commissioners of sewers for the City, 1s. 3d.; for Metropolitan Board of Works, 2s.; for coal and wine dues, 1s. 8d.; and for the London School Board, 7d. This

rateable division, per head of the population, of the large sum of 8,645,863*l.*, which, in 1874, was levied by the rates of the metropolis, will be of value as an index when any increase is proposed as to either of the items which go to make up the annual charge.

It may further be remarked, with reference to that cleansing of the streets to which we have to call attention, that while the average outflow from the metropolitan sewers is 628,000 metric tons per diem, the outflow in a wet day is raised to 897,000 metric tons. At the same time, it has been calculated that of the water sent in to London by the water companies, amounting to 520,000 metric tons per diem, 18,000 have escaped by evaporation or surface drainage into the rivers. The capacity of the drainage works, owing to their being constructed to carry off the rainfall as well as the regular water-supply, is 55 per cent. more than would otherwise have been requisite, and the weekly cost of the pumping exceeds by 23 per cent. what would otherwise have been required.

The cost of maintaining the various descriptions of pavements, which has hitherto been too often regarded as the sole question by the authorities, is, of course, the first which requires examination. From the recently-published volume on "Roads and Streets," by Messrs. Law & Clark, we learn that the highest annual cost of a macadamised street has amounted (in Piccadilly, 1870) to as much as from 3d. and 6d. to 4s. per square yard. Over an average of eight portions of heavily-traversed roadway, comprising Parliament-street, Bridge-street Westminster, Regent-street, and Piccadilly, between 1854 and 1876, an average cost is stated of 2s. 7¼d. per square yard of roadway per annum. In an extreme case a wear of as much as 7 in. of road-metal is indicated in a year. On 123½ miles of macadamised road in the suburban highways of the metropolis, on the Middlesex side of the river, in 1855, the cost was not more than 7¼d. per square yard per annum. The difference is of course due to the relative amounts of traffic thrown on the roads. On an examination of the macadamised road in the Mall, in St. James's Park, mentioned by the last-named authority, under citation from a work by Mr. Mitchel, on "A New Mode of Constructing the Surface of the Streets and Thoroughfares of London and other great Cities," it was found that 50 per cent. of the crust was composed of mud and sand, including fragments of stone, not more than 3-16ths in. thick. Nine-tenths of the cost of maintaining a macadamised road is incurred in the purchase of road-metal. This may be taken, if it be Guernsey granite, at 16s per ton delivered on the road. Thus we find that in lines of such constant traffic as that which follows the Regent-street and Parliament-street course, nearly one-third of a cubic yard of road-metal per square yard of road is ground into mud, and has to be removed by the scavengers in the course of the year. On a 30-ft. roadway this quantity amounts to 5,866 cubic yards per mile per annum. It may be readily seen from these figures why the nuisance of constant repair, and constant formation of mud, is such as to render macadamised roads out of the question for urban traffic. The one thing in their favour is their comparative quiet, as compared with stone pitching. On the other hand, they can never be absolutely clean, in any weather; and their disintegration is one source from which is produced much of the mud that is carried by the traffic on to pavements which might otherwise be far cleaner than is actually the case.

Stone pitching has the advantage over macadamised roads in durability, cheapness, and cleanliness. It has the cardinal disadvantage of being at once the noisiest and the most unsafe of all pavements. In thoroughly wet weather, indeed, granite is less slippery than either asphalte or wood. We are not in possession of comparative experiments made with macadamised road, but they are unnecessary, for the reasons given above. In a set of experiments made, during a period of fifty days, under the direction of Mr. Haywood, for every horse that fell on a wood pavement (taking equal numbers of horse-miles), 1·7 fell on asphalte, and 2·5 fell on granite. In looking at the concentrated traffic of the City, this single consideration is almost conclusive. The hindrance to business caused by street stoppages is a terrible tax, not only on the patience, but on the pocket. In Adelaide-place, London Bridge, according to Mr. Clark, where the road is 41 ft. wide, 16,000 vehicles pass in twelve hours. In Bishopsgate-street Without, over a width of 22 ft., 8,000 vehicles pass in the same time. In Cannon-street, over 36 ft. of width 12,000 vehicles pass. The average is 362 vehicles per foot wide of road per diem; or, we would rather say, 2,896 vehicles per line, or track of way, in the twelve hours. This is about four vehicles per minute, and, if the strain of traffic were unbroken, allowing 21 ft. for a vehicle, its horses, and an interval for safety, would give a mean uninterrupted speed of about one mile per hour. Stoppages, intervals, crossings, and irregular distribution of traffic during the day may make this arithmetical mean vary to four or five times its calculated value. As a rule, a man will make more way on foot in the City, during hours of business, notwithstanding the density of the foot traffic, than he can in a cab.

Now, reverting to Mr. Haywood's figures, we find that, during the fifty days of his observations, a horse fell for every 330 miles travelled on a wooden pavement. We take this as the unit, because it is the lowest ratio of falls, and is thus the general unit of safety, although an "improved wood pavement" is said to be safer, in the proportion of 446 to 330. It is difficult to give accurate results from the above facts, because the difference between the concentrated traffic at such spots as we have indicated, and the general traffic over the fifty miles of City roads, is not at present calculable. Neither can we tell the number of horses entering the City, nor the mileage which they make within it. But if we take the before-given figure of 2,896 vehicles, and allow 1·5 horses to each, travelling half a mile in each direction, or one mile in all, we shall have 4,344 horse miles per diem over a single track of road in the densest parts of the thoroughfare. This would give 13·4 falls in the twelve hours on one track, or 53·6 falls per day over the width of a 32 ft. road, for half a mile of the safest pavement. These 53·6 falls would be increased to 134 falls if the pavement be of granite. It is less easy to assign a value to each fall, as to the amount of interruption it would cause. It must be remembered that it is the exception, rather than the rule, for a horse to fall so as to block up only his own line of way. Generally an accident stops two if not three lines of traffic. But if we allow only a couple of minutes for the delay caused by each accident, we shall see that a loss of, at the very least, twenty-six minutes out of the short business day will be occasioned to the traveller over the distance, given on an average through the year. The tax that a slippery pavement thus imposes on the very life-blood of the metropolis,—the working time of its busiest men,—is thus rather indicated than estimated. Taking the chief time of business at six hours, from ten to four, 53·6 minutes are lost within the half mile in question on all the width of the road. We before estimated the arithmetical mean speed of traffic at a mile per hour. In two minutes, the period allowed for stoppage, a traveller would advance 88 yards. Within that distance would occur, on the given theory, a line of 12·6 passengers. Therefore, for the normal number of 53·6 falls, 675 persons would lose two minutes each. This is, no doubt, an under statement; but we are anxious to keep within the mark. The difference, then, in long time between the most slippery pavement, granite, and the least slippery, wood, will be equal to the loss of two minutes a piece by 1,013 persons, or to 33·4 business hours to one man. Thus at least a business week of somebody's life is shown to be wasted by every fall of a horse,—although the loss is divided into thousands of fractions, each fraught with its special cause of irritation, which cannot be measured by mere lapse of time.

After this it is not of very much use to repeat that the pitching of granite is the cheapest of all pavements, not exceeding in annual cost the price of 8d. per superficial yard. The amount of safety, indeed, has not been neglected in arriving at this price. The hardness and durability of the Penmaen Mawr stone are so far greater than is the case with granite, that a very great economy in the wear of material would be effected by the employment of the former material. But these very qualities of durability and hardness render the stone in question so excessively slippery that it has, by common consent, been laid aside for paving purposes. The blue Guernsey granite is far from being the hardest, even amongst granites, but it seems experimentally to have given more satisfaction than any other stone. The shoe of the horse meets with that amount of resistance from this stone, and causes that amount of abrasion, which hits the best limit of safety, on the one hand, and destruction of the roadway on the other. It must be observed, however, that while 8d. per yard is a fair average price for the maintenance of a granite pavement, it will not suffice for that purpose where the traffic is extraordinary. In Cheapside, Poultry, Old Broad-street, Moorgate-street, and Lombard-street, in 1871, the average total cost per square yard per year came to 1s. 7d.; rising, in Old Broad-street, to 2s. 9½d. for a pavement of setts of 3 in. by 6 in. of Aberdeen granite. The cost of a similar pavement over London Bridge, for twenty-one years, averaged 1s. 10½d. per square yard per year.

Between asphalte and wooden pavements, avoiding, as before mentioned, details as to different plans, the balance of expense does not very materially vary. It is probably slightly in favour of the latter; and may be taken for either at an average annual cost of 2s. 6d. per square yard. The advantage of silence, which both these pavements possess in an extraordinary degree as compared with granite, may also be taken as somewhat in favour of the wood. Asphalte is remarked to become more noisy the older is the roadway, a fact that probably arises from the compression of the material by traffic. On the other hand, the balance of cleanliness is apparently in favour of the asphalte, although it is by no means certain that it does not contribute more mineral element to the formation of mud than is the case with the wood. But the facility of cleansing, in the case of asphalte, is perfect. The use of a gutta-percha scraper or *squeegee* will keep both footway and roadway in excellent order for a less cost than that incurred by the far less effective scavenging of the granite sets. And by the turning of a jet of water over the roadway, a purity may be maintained that is almost absolute. It must be borne in mind, too, that these silent pavements have not hitherto had fair play in London as to cleanliness. So much mud is brought, in wet and in damp weather, from the stone roads, whether pitched or macadamised, that the silent pavement is laden with much extraneous matter, which is not due either to its own abrasion, or to its proper traffic. The mineral constituents of mud from stone-paved streets have been found to vary from 42 per cent. in dry weather, to 80 per cent in wet weather, when the abrasion is the greatest. The average is over 50 per cent. It is perhaps not to be supposed that a saving of 50 per cent. in the amount of mud formed would be effected by paving all the great thoroughfares, or, indeed, all London, with wood. But that there would be much less abrasion, and that of a less unmanageable material than powdered granite from a wooden pavement, there is little room to doubt.

One other feature has to be regarded, which has been almost absolutely left out of sight. The effect of a great fire on an asphalte pavement would be most formidable. Wood, indeed, might suffer, if the heat were very great. But, laid as pavement, it is not to be expected that wood would do more than char. Asphalte, even if it did not burst into flame, or rise in dense volumes of smoke, would become soft and impassable. In the case of any very serious conflagration this consideration might prove to be of the most signal importance.

We invite the independent consideration of our readers to the facts to which we have endeavoured to draw their attention. We might have gone into more detail as to the evidence as to what is, as yet, the best pavement offered to the public; but we preferred to treat the question broadly on its merits, and thus to steer perfectly clear of anything that might resemble personal prepossession or private favour. We think it looks as if the future paving of the metropolis must be of wood. If that proposition commands a general assent, it will be then time enough to discuss the best kind of wooden pavement. For quiet,—an element of extreme importance,—wood is the most silent. For safety it is the first of all practicable materials; for macadam is not one of these for a concentrated traffic. In cleanliness it is exceeded only by asphalte. Durability comes under the question of price. As to this, while the average cost of the wooden pavements taken to and laid in London is from three to four times that of the granite sets, that comparison does not show the subject in a right light; for it is comparing the cost of wood, in places where the traffic is usually very great, with that of stone over a larger average of road. But when we look at thoroughfares of very heavy traffic, we find the disparity of price diminishes very much. Thus the s one

paving over London Bridge costs 60 per cent. of the prices given (as actually resulting from experience) for wood. In Old Broad-street, as we have seen, it costs more. If to the consideration of the money value of time saved, and of cleanliness improved, by the use of wood, be added that of the saving of nervous distress caused by the absence of noise, we think it is apparent which way the balance leans. To indicate that tendency is the limit of the function of the public writer. He is most happy when he has no need to express an opinion of his own; but when he is satisfied that he has so fairly produced the facts of the case, whichever way they tend, that the formation of the definitive judgment may be a matter of mechanical simplicity.

BLOTS IN BRISTOL.

BRISTOL is an undoubtedly picturesque and interesting city, in regard both to its aspect and its history; it is also, like many other places which have that character, very dirty. We only here allude to this feature in the immediate outward aspect of the city, because when any one begins to consider Bristol from a sanitary point of view, that is the first and most obvious fact which strikes the eye,—how peculiarly muddy the streets are, and how begrimed and blackened many of the buildings. And though there may be something in the nature of the soil on which it stands to contribute to the extra dirtiness of its streets, or perhaps in the rapid variations of level and consequent confluence of wet and dirt on the lower levels, one feels that the fact of a town government being content to leave its streets so unclean is indicative of other things, less immediately apparent, some of which we propose to touch upon.

The fact is that Bristol, for a city which has had a name in history for riots and seditious outbreaks, seems at this present moment to be one of the most "conservative" places in the kingdom, if we take that term to imply a general tendency to be content with things as they are. We are fully aware that very large sums have been spent within the last ten years in improving thoroughfares, and that a certain number of the citizens are most munificent subscribers to such works as the new nave of the cathedral; but the large body of the inhabitants require to be awakened to the necessity for some improvements of a more practical nature. The official authorities of the city appear to be dilatory or divided in their counsels in regard to applying the machinery of reform, for Bristol has as yet made no step towards putting into operation the provisions of such a measure as the Artisans' Dwellings Act, in furtherance of any practical improvements, though the city is exactly one of those for which this and other Acts of the same tendency would seem, in regard to their spirit at least, to have been specially framed. The very circumstances which combine to give Bristol its picturesque character also conduce to make it a place much in need of modern improvements. It is one of those towns which have grown up spontaneously, and in accordance with no plan, following the irregularities and declivities of its site; a place where no street is at right angles to another, and which is full of narrow crooked lanes, and dark obscure corners, where old neglected houses hang together higgledy-piggledy, and blacken and decay and become filthy and unwholesome, out of sight and hearing of those who do not go to look for them. And when it came to our ears that some public-spirited persons in Bristol were making efforts, in their capacity as private individuals, to induce the authorities to apply the Artisans' Dwellings Act without delay in regard to two or three large blocks of property of very objectionable character, and in other ways to inaugurate public improvements of both moral and material importance, and that so far they had failed to receive any support from official sources, we felt moved to look for ourselves into the state of things and give help where help seemed to be wanted. We will therefore briefly describe what we saw for ourselves in a morning's ramble among the "picturesque" nooks of Bristol.

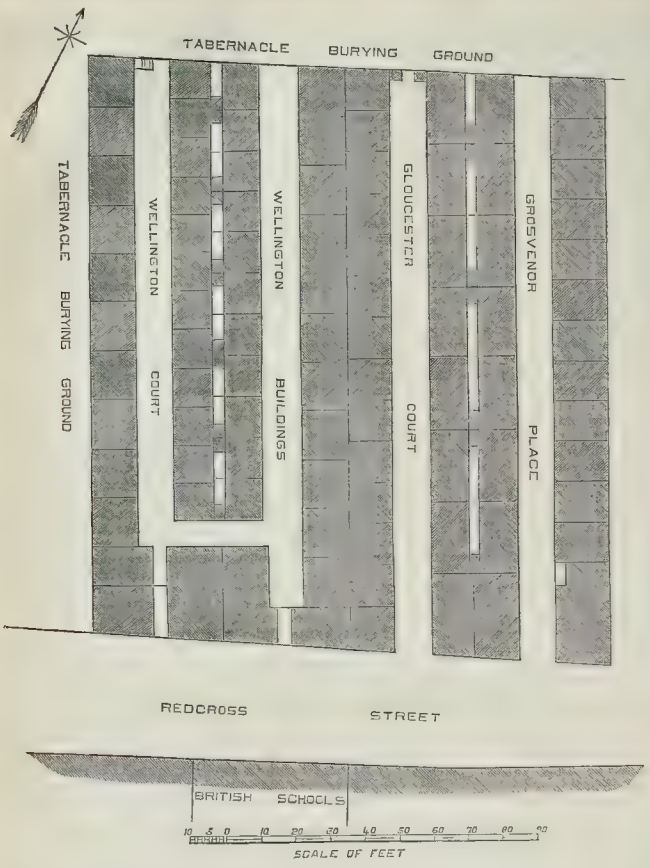
The first plot we visited was that between the angle of Broad-street and Wine-street, two of the principal streets in the city; Wine-street being, in fact, the Cheapside of Bristol. Along this space there wriggles a very narrow lane,—Tower-lane,—a paved footwalk with an open channel in the middle, which is said to be unsafe for respectable people at night, and which is lined with houses nearly all of which are now used for the most degrading and vicious purposes. Some of these ill-omened places belong, we understood, to a church-vestry in the town (!), being let for three lives, and then in the process of subletting coming down to this.* The owner of two more of them, on his attention being drawn to the nature of his property, confessed that he had not had an idea who or what the tenants were, but promptly evacuated them, and there the houses stand, shut up and going to pieces. In the same row, on the opposite side, are other ruined houses, some of them in immediate proximity to the premises of one of the principal hotels in the city, and which seem to have been deserted, or possibly condemned as unfit for use, and are tumbling to pieces,—parts of the walls in great gaps, windows and frames hanging in tatters. The aspect of things here and in some other parts of Bristol suggests the advisability of including in bye-laws relating to building some clause empowering the authorities to take down, or to compel owners to take down, structures which have been deserted or legally condemned as unfit for habitation, but which the owner of the property does not choose to rebuild or repair. These ruined and empty houses we have been speaking of are obviously in too bad a condition to be tenanted, and the chance of reletting them after repair is probably too small to induce the landlord to do anything with them; and so they rot away till they get to a state to be condemned as dangerous to public safety. But it is in every way bad for a neighbourhood that buildings should be allowed to stand empty and going to pieces until this point is reached. To proceed, however, with our tour of inspection. Further along Tower-lane we pass through a low dark passage under a house, and to the left down a narrow steep lane known as Pit Hay,—just one of those places which look so well in a sketch, with old gabled houses with overhanging stories and begrimed with age and dirt; they are mostly occupied as shops or small taverns, apparently not otherwise than respectable in one sense, but with a dirty slatternly look pervading them which is in keeping with the general aspect of the street. At the upper end, where we entered it from Tower-lane, the old buildings overhang and crowd so closely as to make it a dark corner even in broad daylight. Turning left again at the bottom of Pit Hay, we come to the ground below and at the back of the Tower-lane property, and, at the end of Wellington-street (only a back alley in spite of its name), find ourselves again amid a collection of houses of ill-fame, with exteriors to correspond,—smoke-blackened places, with windows and doors all awry, cement coming off in patches, and everything presenting as repelling an appearance as well could be.

Through the neighbourhood we have been describing it is the object of some of the few townspeople (for they seem to be a decided minority at present) who are interested in procuring improvements, to get a new street driven, which will carry on the line of Bridewell-street, a broad thoroughfare leading into the city from the north-east part of the town, to meet Wine-street, providing a straight main route between two important points where only a circuitous one is now available, and breaking up and demolishing at the same time Tower-lane and Pit Hay, with their iniquitous and squalid surroundings. Whether the condition of the house property in this region is literally such, in regard to its sanitary arrangements, as to qualify it for a compulsory application of the Artisans' Dwellings Act we do not here undertake to say; that must be investigated by an official who has an unquestioned right to enter; but in regard to this new street scheme the matter is being urged on the broader grounds of public convenience and public morality; and having seen the neighbourhood itself, and the plan of the proposed improvement, we do earnestly urge upon the authorities of Bristol the advisability of procuring Parliamentary powers for supporting and carrying out without delay an improvement which would be a positive public benefit (especially as the new Magistrates' courts are to be erected in the immediate vicinity), and at the same time afford opportunity for obliterating a disgraceful neighbourhood. And it must be remembered that street improvement is an immense moral agent in this way: sometimes the only effectual one. Acts connected with town improvements do not ostensibly,—perhaps could not,—legislate for the removal of districts on account of their moral unsanitariness: such matters are hardly sufficiently tangible for the action of the law. In the present instance, the houses we have referred to will never be taken or occupied for any better purpose: the stigma on the property is too great. In such a case the material improvement of the neighbourhood becomes its moral improvement: one of the many examples how closely morals and manners are bound up with habitations, in towns especially. A scheme has, we believe, been recently sanctioned for making a new street from the draw-bridge to Bristol Bridge, and very much such a street is wanted for considerations of traffic; it should have been made long ago, in fact; but the scheme can hardly have the moral importance of that through the Tower-lane district.*

We looked next at some property in which the technical conditions for the application of the Artisans' Dwellings Act are fully exemplified. This was a block of cottage property adjoining Redcross-street. On the way to it, along Broad Mead and through Merchant-street, we had occasion to note the proportion of public-houses, which seems unusually large; in Merchant-street (about 150 yards in length) we are afraid to say what was the total from recollection, but in one block of nine shops five were "publics." The typical Bristol public-house is not, however, so gaudy and glaring an attraction as the London one: there is less show of paint and gilding to lure the prey. To come to our cottage property, however; its general disposition is indicated in the annexed block plan. It consists of a series of rows of houses built back to back, with courts 10 ft. wide between; these courts are blocked at the upper end by a wall nearly the height of the cottages, so that there is no circulation of air through. The cottages are two-storied: they are not in a specially dilapidated condition, and the inhabitants seem respectable; but their arrangement is entirely subversive of health and decency. The privies or closets are some of them in little out-houses attached to the back in a narrow strip of open space between the backs of the houses; and these are the best, though these are dangerously close to the living-room door. The rest are placed in front of the houses, entered by a door flanking the house-door, and of course in full publicity and directly facing the windows of the opposite house. The remainder open at the back *directly from the living-room*, under the stairs, and without any external ventilation. They are mostly, if not all, water-closets with no water laid on, but worked by water that must be brought from the stand-pipe in the court and poured down. How often this is effectually done, and what the state of the traps and soil drains is likely to be, may be pretty well guessed. The closets which are at the back of the houses drain under the houses to a drain running down the centre of the court, which also takes the surface water through gratings in the flagging. The probable state of these drains is indicated by the pools of standing water we noticed over and around the gratings in some of the courts. The inhabitants did not, as far as we conversed with them, complain particularly,—people who live in unsanitary abodes, whether rich or poor, very seldom do, unfortunately; *they leave the death-rate to do it for them.* In this case the death-rate has averaged nearly fifty per 1,000 recently, the general average of Bristol being

* We are assured by a correspondent who has the means of being well informed, that most of the brothels in Bristol are houses *originally* leased by the Dean and Chapter, Trustees of Charities or Vestries, or by the Corporation. Of course these are sub-let in a manner that puts their original owners beyond any direct cognisance of the state of the property of which they have the reversion; but they can hardly be freed from a certain degree of responsibility in relation to it.

* We should like to suggest, however, whether the making of this street between the two bridges might not be the opportunity for so far improving the approaches to and surroundings of Queen-square, as to bring it into occupation again by a good class of tenants. It was obviously, before the dock and the "new cut" were made, the principal centre of old Bristol, and seems now to be sinking into offices and lodging-houses; but though the houses look a little dingy now, the square is essentially one of the best laid-out squares we know; and from our acquaintance with the domestic buildings of the period when it was made, we have no doubt that the older houses in it, sober as they look, are much better built than many of the modern showy ones in Clifton. It is quite a pity that a square so picturesque-looking, with its trees and cross-walks, and equestrian statue in the centre, and so interesting in its associations, should be allowed to be thrown away, and sink into third-class property. A short but good street from the centre of the north side of the square, joining the proposed new street from Bristol Bridge, would bring Queen-square again *en rapport* with the leading thoroughfares of the town, and give opportunity for its revival.



between twenty-three and twenty-four, and typhus has been prevalent. The authorities of Bristol have been memorialised to apply the Artisans' Dwellings Act to this property; and this property, with the sanitary and social arrangements and the death-rate above mentioned, their medical officer of health, strange to say, has refused to condemn. We should like to hear his defence.

On our way between the main points of interest we had occasion to notice one or two other interesting corners,—samples, no doubt, of many others. We may allude to "Pope's Parade" as a nook worth attention. Some houses at one side of it had been bought and re-let on Miss Octavia Hill's system, and the space in front of them re-flagged; on the other side the ground before the front doors is a shapeless embankment of mud and rubbish, from which corners and broken pieces of old flagging protrude, to remind one that it once looked a decent place. The visitor to "Jarman's-court," Broad-mead, may assure himself that the inhabitants have privy accommodation, as one of these necessary chambers, with no door, faces every one coming up the entry. Repairs have recently been done to the houses, but owners seem to feel under no obligation to assist decency, even where they consider other wants of the tenants. In a court in Leek-lane we found sanitary progress at work,—drain-pipes were being laid for the first time, which, it was to be hoped, would have the effect of improving the health of the inhabitants, but their chances did not seem over good even then; the small houses, one or two of them inhabited by very large families,* have the living-rooms sunk below the ground, while the upper rooms are almost in the roof; privies opposite the houses. Below the trench cut for the drain pipes was visible the top of a well or cesspool, but which, at all events, must have practically acted in the latter capacity, being just adjacent to the privies, and full of foul, contaminated water. Was this water to be left there? we inquired; and before leaving we elicited that the owner had been there that morning, and had nearly been persuaded to remove the water and fill up the well, but had eventually concluded he would not do so "until some further requisition were made to him"; so we presumed the drain-pipes were given on compulsion, and that the mass of putrid water still festers 4 ft. below the surface.

The other large block of property, which some of the well-wishers of Bristol want to see condemned, is situated in the angle between Lewins Mead and Lower Maudlin-street. Lewins Mead itself is a long straggling street containing some of the oldest houses in Bristol, picturesque in a certain way—at least they would appear so in a drawing; but it would be impossible to exaggerate the dirty, grimy, and forlorn look which many of them present, not to speak of their rickety condition, some of them seeming only to remain upright through the support of contiguous buildings. The property spoken of, adjoining this fragrant "mead," is occupied by warehouses and dwellings in crowded blocks intersected by very narrow allies and courts; and a block which forms an island in the middle consists entirely of brothels. Among the dwellings more respectably occupied we entered one which was impressive enough in its way, near a corner called Quaker's Friars. The houses here remind one of a rabbit-warren: you plunge down some steps into a dark hole, and in a corner where you can scarcely see is the entrance-door of a dwelling; you clamber up other steps to the left, and then up others to the right, all in nearly utter darkness: eventually we made our way up a perfectly dark and rickety corkscrew staircase which required some caution in its ascent and descent, and were introduced by the tenant, a feeble, decrepit old woman, who had with difficulty preceded us up the stairs, to her dwelling, a single small room containing two beds and a chair: her married daughter and son-in-law shared the room with her; he was out of work and had nowhere to go, and she was "that lonely" that she was glad to have them with her. The room was dreadfully close, and we at once noticed that the skylight by which it was lighted was a fixed sash, and would not open. Was there no ventilation? we asked; and we were shown a niche in the wall over one of the beds, looking like the commencement of a flue, and round the corner of this it was understood that there was a small ventilator of some kind which could be pushed open with a stick; she climbed on the bed every morning, she assured us, and managed to open it with her stick. The room adjoining on the same floor had been shut up by the landlord himself, as unfit to put any one in. This was a specimen of another block of property which the medical officer will not condemn. The death-rate in this property, we may add, has been near upon fifty recently.

In reference to this refusal to condemn, let us point out that the Artisans' Dwellings Act is not over-stringent in its terms as to what must be proved against an area to justify its condemnation. The general phrase, that a certain locality is in a state "unfit for human habitation," is followed by the very extended interpretation (clause 3 of the Act) "or that diseases indicating a generally low condition of health have been from time to time prevalent in a certain area within the jurisdiction of the local authority, and that such prevalence *may reasonably be attributed* to the closeness, narrowness, and bad arrangement, or the bad condition of the streets and houses, or groups of houses within such area," &c.; a form of expression that allows latitude enough to condemn any neighbourhood that is much in need of improvement, without standing on niceties of wording. We observe, however, that the Local Bye-Laws of the Bristol Board of Health, in the clause dealing with buildings "unfit for human habitation," sums up its condemnation in that phrase, which of course to many will seem a very strong expression, requiring a very bad condition of property to justify it; and perhaps the habit of considering the matter in reference to this wholesale phrase may have had its influence on the official mind. The Bristol Board of Health would do wisely to extend the wording of that clause, as well as to amend some other old-fashioned prescriptions in their code, such as that which states that "no cesspools shall be allowed, *except when unavoidable*," which must mean when the owner or the authorities will not go to the expense of providing drains. Seeing that it is universally recognised that a cesspool in a town is a serious danger to health, the rule is about as reasonable as if a criminal statute were to enact, "burglary shall not be allowed, except where the circumstances of the burglar render it necessary."

By way of an agreeable contrast, we may note one or two beneficial movements that are being carried on in Bristol. Against the numerous and dowdy-looking taverns with which the town abounds, we may set the recent opening of several "coffee taverns," two or three of which we went over, of remarkably comfortable, clean, and neat arrangement, and which are largely used by the working men; indeed, the admirable look of everything, eatables included, coupled with the low prices, induced us to inquire as to the return on the outlay, which, as we feared, did not at present reach a really remunerative figure. It may be a point of wisdom, however, to start such a movement by making it a little attractive at first, until it has got fairly going, when the securing of remunerative return will be easier. Prints and water-colours are also lent for the adornment of these rooms; and in the largest of the houses, which possesses a long upper room, it is proposed to have cheap concerts periodically. We also saw some "model cottages," built by the Industrial Dwellings Company, on a site facing Brandon-hill; these, which form three sides of a quadrangle round a courtyard, are nearly all occupied, and we understand are paying well, though built in an apparently much more costly manner than is generally the case with model houses in London, and with a certain degree of architectural effect.* There are points in their arrange-

* We should imagine decidedly over-crowded, but did not take a census of numbers. As a rule, however, we did not see reason to think that over-crowding was a special evil in Bristol,—at least, not to anything like the extent we are familiar with in London.

* The architect is Mr. E. Hoole, of London.

ment that might be amended; the position of the closets off the staircase is somewhat too public and too closely connected with the interior of the building, though there is a good through draught; and it would have been better to have grouped them separately for men and women; it is a mistake to go on the principle that people in that class do not want these refinements; it is the very provision of them in the plan of a building which is itself a refining influence, as has been often observed. The company have acquired land adjacent whereon to continue their operations. If it is correct, as we heard, that there is a disposition to make their next block of buildings of a higher class, to be let at larger rents, we must say that we think that a mistake at present. It is the lowest class in the scale of wealth who above all have need of healthier habitations, as they have least power of choice among existing ones; and the wished-for application of the Artisans' Dwellings Act gives the greater force to this reasoning, since it is of little use to turn people out of bad dwellings unless they have a chance of getting into better ones. The rents even of the present block are a trifle too high by comparison with the rents paid by the same class of tenants in other parts of the town: and though, of course, it is reasonable that tenants of whatever class should pay something for getting into better and healthier quarters, rents that are materially in advance of the previous current scale will defeat their own end, especially in regard to that class whose possible margin for increased outlay is so very small.

Looking again, in conclusion, to the general question of Bristol improvements, we should like to remind those most concerned how very little they have done to carry on the work which really promised to give a great new start to the place in the early part of the century. So little has really been made of this, in comparison with what might have been, that probably many visitors to the city at present are not in the least aware that the river which they cross at "Bristol Bridge," as well as the long float higher up, was brought there by artificial means half a century ago, when Bristol was made into a port by altering the course of the river, which formerly took a long bend away from the city. A writer in the able guide-book published under the sanction of the Executive Committee of the British Association (when that body last met in Bristol) expresses the opinion that the possibilities of prosperity and of a highly successful future are still all before Bristol, and that her real history as a modern city is to come. That may very well be; but the fair start will not be given to that promised career until the Bristolians show a real determination to make their city presentable and attractive, as well as to do away with its degrading and unhealthy spots. Though it may not be very easy to trace cause and effect in these matters, in detail at least, experience certainly shows that business and public interest on the largest scale will not be attracted to a modern city which does not outwardly show itself awake and eager to make a good appearance before the world. A city that is content with dirty crooked streets and grimy buildings will not, so long as that sort of contentment lasts, obtain a first-class position. Bristol may take Aberdeen as an example. Aberdeen was formerly just such a town as Bristol for the most part still is: dirty and squalid, and full of crooked lanes and dark corners. By a great effort, which left her for a time practically bankrupt, she changed the whole face of things by the great new street carried from end to end of the town; one of the most spirited things ever done by a corporation, and which (as those testify who have the best reason to know) has been the making of the prosperity of Aberdeen. There is unquestionably far more surplus wealth in Bristol than there ever was in Aberdeen; and with the development of the improvements that are so much wanted, the real prosperity of Bristol as a modern city will begin.

St. Giles's Cathedral, Edinburgh.—A meeting of the committee for the restoration of St. Giles's Cathedral, Edinburgh, has been held, Dr. William Chambers presiding. Mr. William Hay, architect, submitted a plan of the proposed restoration of that part of the building recently occupied as a place of worship by Trinity College Church congregation and now vacant. The committee approved generally of the plans.

THE GREAT WORKS AT THE CHIEF FRENCH PORTS.

THE gradual development of the ports of our own country that has accompanied the great increase in inland and maritime traffic caused by the introduction of steam transit has been notable in many respects. Birkenhead, for example, is a new creation, and the extension of dock accommodation, both on the Mersey and in the Thames, has been very remarkable. It may, however, be questioned whether the engineers of this country have in any instance attempted so bold a remodelling of an ancient harbour as has been effected, and is in course of completion, in the port of Havre de Grace. At Marseilles, again, a new city is rising on the shores of the Gulf of Lyons. The works at Havre have more interest for the English architect or engineer than those on the Mediterranean seaboard of France, owing to the fact that they have to be executed under conditions similar to those existing on our own tidal shores and estuaries. The Marseilles works come under a very different category, as the Mediterranean tides never exceed a few inches. It is thus the case that tide-work in the construction of foundations, that is to say, taking advantage of the ebb to save pumping, is impossible. On the other hand, the difficulties caused by the steady formation of deltas in a tideless sea drive the constructors of harbours to avoid the mouths of great rivers, and also, as at Marseilles, raise serious obstacles to the sanitation of the seaport towns.

Havre, founded in 1516 by King Francis I., was first provided with a basin and quay in 1628, by Cardinal de Richelieu. The former was improved, and transformed into a wet basin in 1667. From time to time the jetties were prolonged, in order to keep the shingle from the entrance channel; groynes were established on the westward shore; and three scouring sluices were successively constructed.

In 1787 the plan of Lamandé for the enlargement of the port was carried out. It consisted in the formation of the two basins of La Barre and Le Commerce; in the prolongation of the fore-port; and in the establishment of a sluice and reservoir for scouring to the south of the port.

This work was not complete until 1834. At this time Havre comprised an outer basin, a fore-port, four wet basins, and three scouring sluices. The fore-port had an area of 24·7z acres, with 700 yards of quay, and 9,500 square yards of platform. The wet-docks, with a surface of 30 acres, were surrounded by 3,000 yards of quays, and 50,000 square yards of platform.

The sills of the gates giving access to the wet-basins were laid 3·77 ft. below the datum line of the French marine charts; a level which allows a depth of 16·4 ft. at neaps, and of 21·97 ft. at ordinary springs. The entrance-channel had nearly the same depth within the fore-port, but the remainder of this area, and the outer part of the channel, were not so deep.

From 1835 to 1839 the average tonnage that entered the port amounted to 549,202 tons, in 4,524 vessels.

In 1839 and 1844 laws were passed to authorise the creation of the Vauban and the Eure basins; the establishment in the La Floride reservoir of a provisional basin for steamers; the construction of a graving-dock; and the deepening and improvement of the fore-port.

The gate of La Floride, the sill of which is 3·28 ft. below the level of those of the gates of Notre Dame and La Barre, was opened to commerce on the 14th of October, 1847. On the following day one of the mail-steamers plying between France and the United States entered the basin of La Floride.

The deepening of the port, commenced in 1846, was at that time well advanced. The object of the works was to lower the fore-port to a depth of 1·15 ft., and the canal to a depth of 4·42 ft., below the datum level. This object was not fully carried out. Large quantities of shingle were removed from the north of the jetty, to prevent its entrance into the channel. From 1848 to 1852, an average of 4,509 ships, with a tonnage of 581,476 tons, entered the port each year.

In 1854 a law was passed authorising the city to advance a sum of 320,000*l.* for the formation of a dock basin, and the improvement and deepening of the fore-port. The work was only attempted by means of dredging.

In January, 1864, the gate of "The Transatlantics" was opened to navigation, and the large graving-dock received a vessel for the first time. A gridiron and a private wet dock were all the facilities axisting for careening up to this time.

The gate of "The Transatlantics" has its apron 9·35 ft. below datum, and the opening has a width of 100 ft., these dimensions being required for the reception of large paddle-wheel steamers.

At this time Havre possessed all the requsites of a great port. The fore-port covered an area of 27·2 acres; the surface of the basins amounted to 126 acres; the length of the quays was 7,800 yards, out of which ships could lie alongide of 6,800 yards; and the surface of the platform was 133,000 square yards. The graving dock was 426 ft. long at the bottom. It could receive ships of the length of 492 ft. The entrance-gate was 98·4 ft. wide, and the depth of water over the apron was 23 ft. at neaps, and 28 ft. 6 in. at springs.

The width of the entrance channel to the right of the southern pier-head was 246 ft. Beyond, the width, which had formerly, in certain parts, not been more than 106 ft., had been increased to 262 ft., by the removal of the towers called Vidame and Francis I. The fore-port had been lowered to a depth of 5·4 ft. below datum; the channel, clear of the jetties, had a depth of 7 ft. below datum for a length of 436 yards, and a width of 109 yards.

The scouring system has been altogether abandoned. It could no longer be relied on to maintain the requisite depth, and recourse was had to dredging. The conditions proper to render scouring available are absent in the case of Havre, where the only reservoir, that of La Floride, is small; and the discharge of the sluices produced no effect on the bottom of the channel, which was covered with at least 6 ft. of water in the lowest state of the tide. Moreover, the material removed from the harbour by scouring formed those *buttes*, or sand banks, without the port, which were so much dreaded by the pilots, and which have now been removed by means of dredging.

From 1864 to 1868 the annual movement of the port comprised 6,015 ships, with a tonnage of 1,086,991 tons.

In 1864 the Chamber of Commerce decided that it was desirable to form a wet basin for the coasting steamers, and that the site of the ancient citadel should be made available for this purpose. By a law passed in the following year the Chamber of Commerce was authorised to expend the sum of 192,000*l.* for this purpose. The new basin, its lock entrance, and its three graving docks, were opened on the 5th December, 1871.

In the July of the year preceding, a decree was issued which declared the public utility of the enlargement of the fore-port, the completion of the Eure and Vauban basins, the construction of the St. Jean mole, and other works of less importance. For the execution of these works the Chamber of Commerce furnished a subvention of 280,000*l.*, and further advanced to the State a loan of 240,000*l.* All the works in question are now finished, with the exception of the enlargement of the fore-port, and the completion of the Vauban basin.

The Chamber of Commerce is reimbursed for this outlay by the imposition of tonnage dues. These are fixed at 75 centimes (7·2d.), per ton on French or assimilated ships; and at 90 centimes (8·64d.) on other vessels. A reduction of 30 centimes (2·88d.) per ton is made in the case of vessels of which more than nine-tenths of the cargo consists of coal, ice, or pine wood. French coasters and vessels not carrying on commerce within the port are exempted from the above dues.

In addition to the above works, improvements have been made in the appliances of the port; especially in the substitution of movable for fixed bridges. Of these the last decided on is the Eure bridge. Placed over a sluice of 52 ft. 6 in. in width, this bridge is 115 ft. 8 in. in length. Its weight, including a counterpoise of 25 tons, does not exceed 145 tons. Its cost was 2,720*l.* Two or three men can open or shut these bridges in less than two minutes.

In its present condition the Port of Havre consists of a channel between two jetties, a fore-port, eight wet basins, a lock entrance, thirteen dock gates, and four graving docks. The fore-port covers an area of 27·7 acres, with 1,800 yards of quay; although not more than 700 yards of quay, and 9,600 square yards of platform, are as yet utilised for the disposal of merchandise. The eight wet basins have an

aggregate area of 130 acres. Their quay walls are 9,755 yards long, of which 8,750 yards are utilisable for commerce. The surface of the platforms is 216,000 square yards. Five basins only open directly into the fore-port. They communicate with one another, and with the three other basins, by means of seven intermediate gates. The lock entrance is intended to prolong the time during which vessels can enter the basins, which is now about three hours, to between six and seven hours in each tide. It allows vessels to enter the basin of La Citadelle after the gates of the other basins are closed, and it allows vessels to put to sea as soon as the tide has attained a rise of 12 ft. above datum, at which elevation the lower gates of the lock are opened.

The draught of water of the ships which use the Port of Havre is determined by the depth of the sea over the level space which extends for nearly a mile and a half from the entrance of the port. The rise of the neap tide is not above 19·4 ft., and the depth of water over this area at the ebb is 6·56 ft. above datum on the charts; so that vessels drawing more than 23 ft. of water cannot enter the port during the neaps.

The annual cost of dredging is 8,000*l*. The fore-port, and the channel free of the jetties, to a distance of 545 yards from the pier-head of the northern jetty, are kept at a constant depth of 6·56 ft. below the datum of the charts. The bottom of the basins is periodically cleared to a depth of 1·6 ft. below the aprons of the entrance-gates. About 45,000 cubic yards of deposit accumulate each year in the fore-port, and 26,000 cubic yards clear of the jetties. Over the basins which communicate directly with the fore-port the annual deposit is about 2 in., and about half that depth in the others.

Twenty-six cranes, and three pairs of shears, one of which can lift 100 tons, have been fixed on the quays. The dock company has provided sheds on the quays of the dock-basin, and of the Vauban basin. Private sheds and warehouses are built on other quays. The mean number of vessels that have entered the port of Havre each year, from 1872 to 1876, has been 5815, with a tonnage of 1,637,010 tons. The dues have averaged 38,935*l*. per annum.

The execution of the works, of which full details are published, joined to that of the works for the rectification of the Seine, has produced a considerable effect on the maritime conditions of the port of Havre. As the tide rises, the current runs at right angles to the jetties until the mouth of the Seine is full. A counter-current then sets in, running N. 65° W., which is called the *Verhaule*. This current was formerly perceptible forty minutes before the time of high-water, and ran for two hours after that time. Its velocity was 5·74 ft. per second, for a tide of which the co-efficient is 100. Since the banking of the Seine has been carried out the duration of high-water is reduced by nearly forty minutes at springs, and by seven or eight minutes at neaps. The *verhaule* becomes perceptible from twenty-five to thirty minutes earlier than was formerly the case, and its rapidity is much greater. At Honfleur the time of high-water is now twenty-six minutes earlier than before these works were commenced.

Considerable silting up is taking place on both banks of the Seine. More than 20,000 acres of land have been reclaimed from the river, and the volume of water entering and issuing with each tide has been reduced by more than 100 millions of metric tons. The deposits which formerly occurred up the stream are now forming lower down. No diminution of depth has yet occurred in the immediate vicinity of the port of Havre. But constant vigilance has become necessary, as the danger is not remote, and the mode of protecting the port from further injury by the deposits of the Seine is already under consideration.

Considerable difficulties opposed the execution of a portion of the works for the extension of the port of Havre, owing to the occurrence of quicksands. The method adopted for obtaining a foundation on this treacherous material was probably suggested by experience of the well-foundations common in India, where numerous well-shafts are sunk through shifting sand, and being filled with stone and rubbish afford a perfectly reliable foundation, although they do not reach any solid stratum. Piles were first driven in two rows, on either side of the intended line of wall; they were connected by longitudinal timbers, and the earth was excavated down to the top of the quicksand. Wooden frames, covering each an area of about 20 square feet, were then placed at intervals along the line thus cleared, and brick walls, gradually oversetting, were built on the frames. As the brickwork was carried up the frames were undermined and gradually sank through the sand to a depth of 9 ft. or 10 ft., when a solid bottom was reached. The shaft thus formed was then filled with concrete.

The use of piling in foundations has probably been derived from the ancient lake dwellings, which stood on piles, and were accessible only by water. As applied to permanent structures, the theory of the bearing pile is, that the friction between its sides and the earth into which it is driven is sufficient to enable the head of the pile to support a given weight without sinking further. Thus the piers and abutments of Waterloo Bridge were built on wooden platforms, resting on piles 12 in. square driven 20 ft. into the bed of the river, which Sir John Rennie found to be strong gravel. In the case of London Bridge, which presented unusual difficulties, strong coffer-dams were constructed with three rows of piles; the ground was excavated within them to the depth of 30 ft., going below the low-water mark of spring tides; and piles of 12-in. diameter were then driven 20 ft. into the solid London clay, then reached, or until they would not sink more than an inch with a blow of a 12 cwt. monkey, falling from 18 ft. to 20 ft. The pile-heads, cut off to a level, were bolted to solid sills of timber, and covered with elm planking 6 in. thick. Notwithstanding this great care, when the first arch on the Surrey side was keyed in, and the full weight came on the foundation thus formed, the east end of the pier was found to have subsided from 10 in. to 14 in. more than the west end. This is only one of the professional data which show that the London clay is not to be relied on for a foundation, without great care.

The question of decay of piles is also important. In Holland, according to M. Gaudard, buildings on piles of larch, alder, and fir have lasted for centuries, whilst in Belgium large buildings have been endangered by the decay of the piles on which they rest. For alternate exposure to wet and dry, elm is the most reliable timber we have, but as to the behaviour of different kinds of wood when undisturbed in wet soil we have less information than would be desirable. The present course of practice is in favour of the use of iron cylinders in cases which formerly were managed by coffer-dams and bearing piles.

The plan of sinking shafts for foundations, which should protect the workmen who sink them, and which might afterwards become so many solid pillars of masonry, embedded in the sand or alluvial soil, is of great antiquity in India. It has been described by Colonel Frord, R.E., the Secretary of the Public Works Department of the Madras Government, in a handbook of public works in India published some years ago, which is now the text-book of the service. In many instances in India it would be impracticable to erect the large bridges required for the railways on any other plan, except at an enormous expense. The Indus and other rivers may be called travelling streams. In some places they gradually shift their beds, eroding the soil on one bank, and depositing shingle on the other. In other instances they suddenly change their channel during flood; and in well-known cases have entirely abandoned cities built on their banks. Where the work to be supported by a well-foundation is of a permanent and solid character, as in the case of a viaduct, it is possible to make perfectly sure of the foundation by the construction of a proper number of these shafts, although they do not penetrate below the sandy strata. But in hydraulic works the case is very different. In the works for the barrage of the Nile the operations of the engineers were so hurried by the childish impatience of the Egyptian Government that the sinking of the foundations was arrested before reaching solid ground. The material passed through was a fine silt, and there is reason to suppose that at least 100 ft. in thickness of this material had been deposited by the river in the course of ages at this spot. Thus the bottom of the foundations of the barrage works is some 60 ft. above the rock, or solid soil. This is all very well, as we have just remarked, in order to support a solid and unchanging weight. But it is another matter when the tremendous pressure of the Nile flood has to be resisted. The consequence of this haste or false economy has been, that the engineers have been in fear lest their entire work should be blown up by the pressure of the water. This would unquestionably have been the case if the barrage had been carried to the height originally intended. The sacrifice of head which it has been necessary to make in order to secure the stability of the barrage works has accordingly been so great that the benefit derivable from the same has been reduced to exceedingly modest dimensions.

In the case of the Havre breakwaters the mode adopted of sinking to the solid has proved perfectly successful. The spaces between the pillars formed as before described were successively excavated, under the protection of sheet planking, and filled up with concrete. Thus a solid concrete wall was built in instalments, and absolute security was attained by a cheap and ingenious method. The cost of excavating the whole trench required for the wall, on the old plan, by means of a coffer-dam, or continuous sheet-piling, with the constant employment of powerful steam pumps to keep down the water, would have been very great. The risk would also have been considerable, unless abutting piles had been driven, and the entire area opened had been protected in the most substantial manner. The sand was so quick that in some places it was necessary to caulk the joints of the planking placed between the pillars. In passing the site of the old fortifications, which had been destroyed in order to allow of the enlargement of the port, special difficulties arose. In order to obviate them, the shafts sunk on these spots were constructed of brickwork on three sides only, the fourth side being planked. This adaptation of new means to a definite end proved successful; and no accident occurred in carrying out this novel and arduous piece of work. Three pumps, each driven by a movable steam-engine, were employed for keeping under the water, and the total quantity of water thrown, to a height varying from 16 ft. to 43 ft., was estimated at upwards of 21 millions of metric tons. This is allowing four metric tons per minute for each pump; the total number of hours employed in pumping having been recorded as 89,718. The marvellous detail with which the French engineers record every incident, the numerous items which go to make up the schedules, and the exercise of a constant supervision of the smallest points, are subjects of astonishment to the English professional man, when he first becomes acquainted with the foreign practice. But the admirable exactitude of the statistical returns which are thus rendered possible is enough to make up for the extra trouble. It is certain that the labours of the French engineers are not only very efficient for the execution of the works they design, but also of extraordinary advantage to their professional brethren elsewhere, as preserving the most instructive details both of practice and of cost.

ROYAL ACADEMY ARCHITECTURAL LECTURES.

On Thursday last, Jan. 31st, Professor E. M. Barry delivered the first of a series of lectures which we shall print in full, as we have done on all former occasions. In our present issue we confine ourselves to his prefatory observations, which referred to

THE LATE MR. SYDNEY SMIRKE, R.A.

Before commencing my first lecture of a new series, I desire to pay a tribute of respect to the memory of one who but lately occupied an honourable position within these walls, but whose place is now vacant amongst us.

Since we last met in this room death has taken from us Mr. Sydney Smirke, who formerly occupied the chair which I now fill, as his unworthy successor.

Mr. Smirke bore a name distinguished in architecture, being the younger brother of the late Sir Robert Smirke, an architect of great reputation, and a Royal Academician. He was educated for the profession, and became also connected with the Royal Academy from an early age. His name appears as Gold Medallist in 1819, when he was about twenty years old. He afterwards obtained a large professional practice, and the architectural works which he has left behind him are both numerous and important. He was a witness of the Gothic Revival, but not a very active worker in that direction, although several tasks of magnitude

were entrusted to him. I may allude particularly to the restoration of the Temple Church (as to which work he was associated with Mr. Burton), and that of the Savoy Chapel. He also executed some Elizabethan buildings, with others in a Late Gothic style, for the Society of the Inner Temple, and carried out other works of less importance in the Revived Mediæval architecture, which had become favoured by the public.

The course of Mr. Smirke's studies, however, combined with the traditions of his family, and his own natural taste, led him to prefer the Classical forms of the Renaissance architecture of Italy, a good specimen of which is to be seen in his design for the Carlton Club, Pall-mall. His completion of the British Museum, which had been left unfinished by his brother, and his design for the great reading-room, illustrated at once his constructive skill and his artistic feeling. The same remark applies to his works generally, whether those executed in conjunction with others, as the Conservative Club in St. James's-street, and the Oxford and Cambridge Club; or those buildings for which he was more fully responsible.

Mr. Smirke was held in the highest honour in his own profession, as is proved by the award to him, in 1860, of the royal gold medal, by the Institute of British Architects of which he was a fellow. A distinction which was equally prized was conferred by the Royal Academicians, when, on the death of Sir Charles Barry, they nominated him their architect, to design the new home of the Royal Academy, in Burlington House. How well Mr. Smirke acquitted himself here we all know, and you see around you his worthy monument. It was his last professional work, and, devoted as he was to the welfare of the Royal Academy, he would probably have wished it so to be. He had filled the chair of Professor of Architecture, with the offices of treasurer and trustee, and the great aim of his daily work among us was to deserve and enjoy the confidence and regard of his brother artists.

On the completion of the Academy buildings, Mr. Smirke retired from office, and sought the leisure of a well-earned retirement. He died in 1877, at the age of seventy-eight, after a distinguished and useful career. It has been said that there was a hesitation in his manner, approaching to coldness; but although this may have so appeared to strangers, those who knew Mr. Smirke were well aware that beneath such apparent reserve, there were warm feelings, a sensitive nature, and generous ideas. Trusted by all who had to do with him, he was emphatically a man of honour and of culture, deserving of the highest confidence. Patient and painstaking, he was ever anxious to do his best, in whatever he undertook. Possessing a refined taste, and a cultivated mind, he shrank from all that approached exaggeration or vulgarity, whether in art, or in society. One of the small band of architects who are members of the Royal Academy, Mr. Smirke was always anxious to do all that was possible to further the interests of his favourite art, by extending the benefits of our schools to the students of the profession generally. He took a warm interest in the establishment of the Architectural School on its present basis, and in all that related to the course of study therein.

His name will ever be held in deserved honour within these walls. He is gone from us, but his works remain, and his career may well serve as an example, as well as an encouragement, to those young men who are now at the threshold of their professional life.

Well will it be with all of us, if, when for us too, the darkness comes, and the shadows lengthen, we can look back on a past life as honourable, and as void of offence. In the meantime, we may, at least, lay our offering of affectionate respect on the tomb of one whose memory is yet green; of a departed friend in whom we mourn a skilful constructor; an accomplished artist; and a Christian gentleman.

Metropolitan Water Supply.—On the 18th ult. a meeting of delegates from the vestries of the metropolis was held at the offices of the National Chamber of Trade, 416, Strand, to take into consideration the Bills introduced into Parliament at the instance of the Metropolitan Board of Works with regard to the water supply of London. Mr. Attenborough presided, and a long discussion ensued.

A BOOK ABOUT ORGAN-CASES.

UNDER the title of "The Box of Whistles," is published an illustrated book* on organ-cases,—not a book of new designs, but illustrations of existing organs, mostly among the old and celebrated instruments of Germany. The author is quite justified in saying that he is occupying new ground; but the book is very disappointing, and deals in a very slight and unsystematic manner with a subject which, for the very reason that it has been neglected, was worth treating much more thoroughly, if at all. We object to the title to begin with. There is a catch-penny look about it, and it is not suitable in a book written in honour of a grand instrument to adopt the name given to it in derision by a (musically) barbarous nation; and the author does not seem to have any settled purpose in his book, or to have made up his mind for whom he was writing. He goes occasionally into little matters about organ-building, but in a way that is too slight to serve any purpose. His illustrations are of little value to architects, for the details of the designs are not sufficiently well shown. In his concluding paragraph it does seem to occur to him that his notes are not very systematic; they are, he explains, simply the result of sketches and notes taken at different times. If the book had been called "Sketches and Notes on English and Foreign Organ-cases" its title would have been a better index of its contents, and the illustrations might then have been confined to sketches and details without colour. But an attempt has been made to get up a showy book without sufficient basis to go upon, by means of large and coarsely-executed chromolithographs, the colour and detail drawing in which are such as to be quite annoying to artists and architects. They will just do to make a picture-book of organs, for people who have no knowledge of the subject to turn over; and the book will perhaps serve to remind some amateurs of the organ how much elaboration used to be spent upon the old cases in comparison with the bare stand of pipes which we are too often content with now. This is the one point perhaps in which the book may have a practical result. The author generously observes that he will be amply repaid if his work "in any way tend to the improvement of the organ"; but it is difficult to see in what way it could do so, since it is little more than a representation of organ-cases picked out by chance, and many of which, however interesting, are extremely faulty and even vulgar in design, when regarded from an artistic point of view, and could not by any means be held out as models.

On the one point just referred to, however, we are glad to read Mr. Norbury's remarks, and to endorse them,—in favour of making the organ-case a regularly designed and complete architectural structure, and not a mere frame filled with pipes. With him, we "look upon caseless organs, with their rows of painted pipes, as something horrid." The organ in its finest form is, as he says, an instrument which gives pleasure to three classes of individuals, the musician, the mechanician, and the architect. As to the second point, it is somewhat curious to note that most private persons who are able to indulge in building an organ for their own use appear to care much more about the mechanism than the tone. As to the architectural interest, Mr. Norbury quotes the remark of an artist in Paris (name not given) who said that the price charged for "les auditions particulières" of the Haarlem organ was well worth paying, if it were only for the sole pleasure of admiring its magnificent exterior. And this is as it should be. The organ differs from every other musical instrument in that it is not a mere piece of furniture, but an erection,—a thing built up like a palace; and it is as worthy of high-class and sound architectural design as a building; and, in fact, offers an opportunity to the architect to indulge his fancy in a way much less trammelled by practical requirements than is commonly the case in his work. The habit now is to dispense with the architect, as a rule; to put the pipes up in naked and unsightly rows, and then to let loose a decorator upon them to cover them with colours like Harlequin's coat. How vulgar and tawdry these cases look in comparison with some of the old English and German organs, with their stately architectural design and sober gilt pipes, it is hardly necessary to point out.

At the same time, there are certain general principles not to be overlooked in this architectural treatment of the organ, and which our author is silent about. He has some notions about "flats" and "towers," in an empirical way; and he likes to see statues on the tops of the towers, "though of course they are a useless expense." For such a position "angels with trumpets and harps are excellent." So they are in old-fashioned organs, where people put them in a semi-childish spirit, and with a naïve sort of belief in angels whose habitual occupation was harp-playing; but it is hardly worth while to do that sort of thing over again in these days. Figures, if introduced into a modern organ-case, should be rather for beauty than for mere symbolism; and should present really artistic feeling and individuality, and not be carved perfunctorily to fill up a situation, which is sure to be the result if it is agreed that figures are "the right thing"; organ-builders would be quite capable, in that case, of keeping angels "in stock" to stick about their instruments. Then there is the question of the employment of the pipes as part of the design. We quite agree with the author as to letting the organ be seen as an organ, not shutting it up behind an ornamental screen that gives no indication of an organ, which has been sometimes done. And large organ-pipes, of good metal, are fine pieces of work in themselves, and combine exceedingly well as parts of a quasi-architectural design, giving powerful vertical lines to the composition, and imparting to the whole design also an apparent voiceful power quite different from the effect of a mere screen of dumb wood-carving. Let the pipes, therefore, form part of the design, let the organ appear as an organ; but in doing this do not let the practical considerations be overlooked.

It may be taken as agreed that sham-pipes are an abomination not to be thought of. But in that case the real pipes must not be placed so as to convey to the mind of any one who knows the construction of an organ that they are shams, or, at all events, are far out of their right place. Some time since we called attention to this point in an article on the architectural treatment of the organ.* We reminded designers of organ-cases that it was desirable that pipes used in the front design should be so arranged as to stand as near as possible to their natural place in the instrument; and that when the pipes are taken "far from their wind," extra complication and extra chance of leakage and failure must result. And we drew attention to the fact, which we here repeat, that the natural and universal arrangement of a large organ by the builder is with the larger pipes at either side, and the smaller ones in the centre, and that, therefore, a design for a front with a large centre and low wings is not only liable to involve inconvenience of arrangement, but is artistically bad as contradicting the facts of the construction. This point was, for the most part, kept in view by the older designers of cases, and the majority of those shown in Mr. Norbury's book have the larger towers at the extreme angles of the front. Where, for architectural reasons, a central or pyramidal composition is desired, it is possible to secure this in the general treatment of the design: this is very ably done in the case of the Haarlem organ, where the angle towers containing the largest pipes are nevertheless kept low, and the centre raised in a very effective manner without taking the larger pipes out of their places to secure it. Some of the smaller ones, however, seem to be mounted much too high, and must either be shams or be very inconveniently placed in a practical point of view. This is a criticism which would apply to a good many of the most striking designs engraved in this book, the Continental ones especially; and it is one which architects who are called upon to design organ-cases should bear in mind. A very rich and suitable *appearance* is given to a large case, no doubt, by inserting groups of small pipes in out-of-the-way nooks and lofty perches all over it; but this effect is only pleasing to those who know nothing of the interior construction of the instrument: as soon as we know that these little groups of pipes must either be dummies, or must be got into that position at a great disadvantage to the mechanical arrangement of the instrument, the device becomes an impertinence, and ceases to please.

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* The Box of Whistles: an illustrated Book on Organ-cases, with Notes on Organs at Home and Abroad. By John Norbury. London: Bradbury, Agnew, & Co. 1877.

* "Notes on Church Organs": in the *Builder* for October 23rd, 1869.

The older organs, Continental especially, had a great source of effect now nearly abandoned, in the practice of making the pipes belonging to the lightest manual (*choir-organ* in England *positiv* in Germany) form a visibly separate organ: a small instrument in front of the larger one. Hardly any arrangement of an organ can be so effective as this combination of a large and a small instrument, the latter forming a kind of echo of the former, and aiding so greatly in giving scale to the whole; and the arrangement is a really practical one, bringing forward the light bright stops which are used to accompany the choir, so that their sounds are as clearly and distinctly defined as possible. The only disadvantage was to the organist, who, thus sitting between the two instruments, was doubly boxed up, and prevented from properly hearing his own effects; but this might easily be remedied in the case of new organs, where a different arrangement of the keyboard can be made. The practical value of this dividing of the light portions of the organ from the heavy parts is beginning to be felt in dealing with new organs for our cathedrals, the modern instruments being too large to be placed bodily on the choir-screen in the old position. Thus in the recent re-arrangement of the interior of Chester Cathedral, though the principal part of the new organ has been erected in the transept, a small case was erected on the choir-screen to contain the lighter portion of the choir-stops,—a matter of absolute practical necessity, as, without bringing some of the organ near to the singers, it is often impossible to keep them in tune with the instrument. Another point in the treatment of the pipes of the organ in design, which has hardly received any attention, is the use which might very well be made of the large square wooden pipes of the deeper pedal stops, in giving weight and mass to parts of the design and varying its character. The largest of these pipes can be panelled, and otherwise treated with surface decoration, and form a very effective contrast to the metal pipes.

In the majority of English organs, both old and new, the prevalent defect is a squareness and timidity of composition, a want of feeling for variety of plan and multiplicity of effect. The contrast between even the best of the older English cases and the Continental ones in this respect is very noticeable; it must be remembered, however, that the Continental designers had the advantage of a much larger scale to work upon, all the older English instruments being of comparatively small size. The treatment of the pipes in groups or "towers," circular or lozenge-shaped in plan, with only small "flats" between, is much more effective than one in which a great proportion of flat treatment is used, with only occasional breaks or projections, which always look tame, besides lessening the scale. A "multitudinous" effect is more suitable, and produces a much more striking result in a great instrument, than a bald simplicity. This multitudinous and piled-up appearance is the source of the great effectiveness of the Haarlem and Hertogenbosch organ-cases, the latter of which Mr. Norbury calls "perhaps the finest in Europe"; the details of both are open to a great deal of criticism, but their splendid and sumptuous effect cannot for a moment be questioned. On the other hand, when an organ is on a small scale, true taste would dictate that the designer should aim at a dignified effect by massing the instrument as much as possible, and not try to give it the appearance of a large instrument by cutting it up into too many minute portions. In this respect the comparatively small organ in St. Magnus the Martyr's, which is one of Mr. Norbury's illustrations, is very characteristic and pleasing, though it would be better without the row of pipes in the pediment, which is an obvious sham. St. Sepulchre's, a larger organ, and one of the finest and most celebrated in London, which forms another illustration, presents the anomaly of a capital and strictly logical design in general treatment, with almost the worst and weakest detail possible. It is a pity the author did not give the admirable design of the small organ in All-hallows, Lombard-street, which is really refined and artistic in treatment; he mentions it, we observe, with due praise.

Detail is, in fact, the weak point of organ-cases generally, not merely in regard to style, but in regard to constructive expression and fitness. Purity of style in the older organ-cases is not to be expected, for the instrument grew into being in a period of impure taste; and although organs are spoken of and existed in the Mediæval period, the instrument was then so small and insignificant as to be hardly worth taking into account in comparison with what it afterwards became.* But in the matter of constructive expression both old and modern designers of organ-cases have too constantly adopted certain stereotyped forms, which are false and conventional. For instance, the brackets on which the pipes stand in the illustration of the organ in St. Wolfram's, at Abbeville, represent a kind of detail very commonly used; and in this case, as in so many others, the brackets spring from or stand against a mere panel, without any indication as to how their weight and that of the pipes they carry is really supported. An organ should have its construction at least indicated; it should be possible to understand how it is supported; but the usual object of builders seem to be to cheat the eye by built-up brackets and corbellings, and panelling which conceals the real structure behind a kind of band-box. The support of the whole instrument from the floor (when it does not stand upon the floor) is an important point. The support should appear visibly sufficient and stable, either by columns or by solid brackets. As an instance of an exceedingly bad design in this respect, we may adduce that of Rheims Cathedral organ in Mr. Norbury's book, which stands upon a sham vaulting or corbelling system, made of rib and panel boarding. Rouen Cathedral organ, in the next illustration, is far better, being carried on beams supported by buttresses of masonry carrying stone projecting corbels; if the timber beams were only a little more emphasised, the substructure would be quite satisfactory. The small hanging organ in the nave, at Freiburg-im-Bresgau (not to be confounded with the celebrated great instrument at Swiss Freiburg), is very well supported as far as the main organ is concerned, by a solid balk of timber running longitudinally against the wall under it, and cut to the shape of a corbel at either end; but the choir organ of the same instrument is carried on a wretched panelled sham corbel of joiner's Gothic design. One of the most artistically supported of the hanging organs is that at St. Bavon's, Ghent, which stands over an open arch supported by columns, forming part of the architectural design of the building: the case itself is a very pretty design, though absurdly incongruous in detail, the side towers being supported at the foot by naked fauns, and surmounted by angels blowing trumpets. The little cage of pipes at the top of the centre feature is an obvious sham.†

Mr. Norbury touches incidentally on one or two practical points which, though strictly perhaps matters of organ-building, are sufficiently connected with the architect's province to be alluded to here. One of these is the system which architects, desirous to get the organ reduced to what they consider a manageable size in regard to architectural effect, have recently forced upon the organ-builders, of distributing the large pipes into nooks and corners of the building to get them out of the way. He just mentions this, in passing, in regard to the Chester organ, where the large pedal pipes have been put on the ground at the end of the transept, where, as Mr. Norbury rightly observes, they are very unlikely to be effective; and we drew attention some time since to the same mistake at Worcester Cathedral. It is quite a different thing from placing the choir-organ separate from the rest of the instrument, because in that case the separated portions are intended rather to contrast than to combine; but to split up those parts of an organ which are intended to form a homogeneous whole, and scatter them about into corners of the building, is ridiculous, and we must plainly say that architects have no right to get over the difficulty by spoiling the instrument; their duty is to see how a large organ can be effectively treated as a whole, not to cut it up into bits and get rid of it in that way. Mr. Norbury is wrong in his idea that no one is agreed as to the best arrangement of the pedal-board; he will find all first-class players are unanimous in favour of the radiating pedal-board. It is worth remark, as an instance of the utter want of common sense in regard to some practical matters in organ-building, that not only is there no common scale or make of pedal-keys agreed upon among builders, but even the same builders will make pedal-boards of the most varying scale and plan in different instruments,—a fact which will probably astonish some of our friends who are not familiar with organic mechanism. What would be said if in every house you were liable to be asked to play on a piano with keys of different size and shape from the last you handled? There would almost be a demand for an Act of Parliament to rectify the confusion. Mr. Norbury is wrong in his objection to another improvement, that of bringing the keyboard away from the organ and reversing it so that the player faces the room. In the present state of mechanical skill in English organ-building, the carrying of the "movement" under the player's seat is no real difficulty and only a slight extra expense, and the advantage and comfort to the player in sitting away from his instrument and facing the audience, instead of sitting almost in the organ, as he generally does, are very great, more especially when it is a question of following a conductor; Mr. Norbury is quite mistaken in thinking that it is as easy or comfortable to do that "through a glass darkly" as "face to face," as any one who has tried it could have told him.

The author was justified, from his point of view, in passing over with a mere allusion some of the large organs of England which he names. The Albert Hall organ can scarcely be said to have a "case" at all, and that of the Crystal Palace organ is simply hideous; but he ought not to have passed over without a word the great organ at Liverpool, the case of which was designed by Cockerell, and, though open to criticism, is one of the best of large modern cases, and contains very fine and original points in design.

Though not able to say much for Mr. Norbury's book *per se*, we have thought it worth while to make it an excuse for giving a little space to the subject, as it is one of some interest, not often handled, and a good deal misunderstood, owing to the reciprocal deficiencies of the two classes of persons most concerned in it; organ-builders in general knowing nothing of design and architects very little of organ-building. If the two would put their heads together a little more, we should probably see something better than we generally do in the outward form and features of our church and concert organs.

* We gave an illustration (in the *Builder* of December 9, 1871) of a very fine Gothic organ-*loft* from St. Pantaleon at Cologne. But the original organ was no longer in existence.

† The organ at St. Bavon's will have a special interest for some readers through its association with Adelaide Procter's beautiful poem, "A Tomb in Ghent."

AT THE TOP OF TWO TOWERS.

One misty morning, last year, at the momen when, according to all veracious almanacks, grouse-shooting begins and the session of Parliament ought to end, we stood at the foot o Westminster Clock-tower. The "Story of the Government Offices" was in our pockets; we sought fresh inspiration within the very precincts whence her Majesty's printer gets most of his "copy." The mist which, London-like, had degenerated into a fog, was so thick that no mortal eye saw us pass a little door, evidently left ajar for the workmen who, up above in the clouds, were repairing and brightening; and for whose use a great scaffold had been erected. The cracked bell, that had called so many Royal Commissions and Select Parliamentary Committees to abortive labour, was silent; and the hour of our trespass cannot be known. To follow the winding stairs, and afterwards to cling tightly to each easy ladder, was all we had to do,—though the work was hard enough,—to reach the mimic leaves of the huge gilded finial. There, however, all was obscure: fog above and around us, fog below. Every workman had fled; not a solitary body could be found. Yet we heard voices! One a gay, light, cheery, laughing voice; and another, heavy, pompous, priggish.

"*Sacre bleu*," said the former, "your Majesty hath all along argued in favour of absolute power; you forget, Georgey, the terrible responsibility of initiating reform, the danger of pronouncing an irrevocable no this, or no that."

"By no means, Charles; but I do maintain that, without having had the opportunity offered me, I improved the West of London. You had the chance, literally thrown at you, of re-arranging the entire City; but your Majesty was weak enough to build the new streets on

heir old lines, and the new houses on the old foundations."

"That s true, but my people were burnt out; they were houseless and could not wait for plans or schemes of alteration. I acted constitutionally, and neither Wren nor Evelyn was of the number of my ministers; they were, therefore, not competent to offer me advice. Your Majesty, dear boy, would have found other things to do than talk architecture, had you lived at Whitehall."

"Nevertheless, my dear Charles," said the other voice, "I must impress upon you a fact which is now patent to me. Where there is no responsibility, where the duty of doing something is divided among a dozen people, the man of action will not risk life or reputation merely to share glory with the inactive eleven, or enjoy unappreciated death alone."

Aghast, breathless, yet eager to catch every word, we had enough presence of mind to ask ourselves the names of these potentates. Impossible to doubt that one was Charles, the Merry Monarch; but the graver voice, could it be that of George, Prince Regent and Rex? If so, the purgatory of fog, in which both the kings were enveloped, must have exercised an influence difficult to explain.

"*Eh! bien, donc*," continued Charles, "you would rule this unhappily prosperous country otherwise than you did if Fate gave you another fling. *Voyons, cher*, none have denied that I was a thoroughly constitutional sovereign: I did nothing myself, and I left everybody in the land free to do the same. A 'God bless you, my old friend,' given heartily to every lord, squire, and tradesman a king encounters is the secret of regal popularity; and I was successful."

"And I, too,—I was not the fool that Thackeray said I was," rejoined his companion. "I took Louis XIV. for my model, and, damme, sir,—there is no harm in saying damme now, Charles,—I made a road right through London from Carlton House to my park at Marylebone, just as Louis did from the Tuileries to Courbevoie."

This was indeed the king who, in youth, cried out "Wilkes and liberty!" in his father's closet; and who in age believed he had led the Life Guards at Waterloo. That purgatory should sharpen the wit, we do not say the judgment, of men, raised a new sensation within us.

"Nicely you bungled over it. Your Royal Highness's sewer was made in a straight line and the Regent's Street in a curve, so that the big drain ran under the new houses and not the new street. Your Majesty's 'Courbevoie' began at Swan & Edgar's, the French king's road ran for three miles in a straight line."

"True," said George IV., in a tone betraying annoyance, but still as full of dignity as before, "I accept your Majesty's just reproach. But since my time no one has done so good a service to the town as I did, and with my own money too. At the present hour, a large part of our estate, where your Majesty's palace was, for instance, is a mere waste. No revenue comes from it, and Parliament laughs at it. Had I deemed it useful, I would have dropped my Niece a hint, but the Crown is not now interested in its own property. The nation pays the sovereign a fixed sum, and whether our estate pays or does not pay is quite immaterial, to judge from appearances, to both sovereign and nation. If I had to rule England again, I would treat London as Louis XIV. and his grandson treated Paris, and as, a hundred years after, the third Napoleon treated the splendid capital."

"*Parbleu*, do you remember our visit during the glorious days of July? Ha! Ha! Ha! I know a little about blessed restorations, and can understand the French difficulty. However, when you and I were in Paris, Georgey, in 1830, think what the Place Louis XV. was like,—it's the Place de la Concorde now: a sea of mud when it rained, and a desert of gritty sand when the sun shone. Between the Tuileries and the Louvre there were streets of closely-packed houses, booths, and shops."

"Yes," said George IV., "thanks to Louis Napoleon and the artistic character of the municipal organisation he developed, a Republic is now able to do with ease what he, an autocrat, had, at first, difficulty in accomplishing. If I were Regent again, I'd snap finger and thumb at the landowners, encumbered leases, and all that sort of thing. I'd tell my Lord Beaconsfield to carry a Bill of Expropriation for Public Utility, and pension him off if he failed."

"Shilly-shally, dilly-dally," laughed the Merry Monarch, "if half only of the money absolutely wasted over Foreign Office diplomacy were transferred to the use of the Home Office, they would have more than enough to improve all the cities of Great Britain and Ireland. But London, which has teeming questions of life and health at each point of the compass, could not exist without its free press; and what would a daily journal do without an Eastern Question?"

"The fact is, Charles, no improvements can possibly be made until some determined person takes the matter seriously in hand. Boards and Committees are all very well to go through the form of ordering a competent official, who knows how to manage them, to do what is right and proper; but any hope that Boards can initiate, or do anything of their united free will, is absurd. British method is half a delusion. On the surface it is a republican system, with a monarchical head. But if any one takes the trouble to inquire, great things have been done in England ONLY when some subtle person has guided and governed events as an absolute monarch, under cover of republican forms."

We were more and more impressed with the change that an æther of purgatory had occasioned in the first gentleman (of his day) in Europe. We even prayed that several officials, now in high places, could be similarly directed on the road of amendment.

"May it please your Majesties," we ventured to utter in trembling accents. There was just a flutter of wings, and a voice somewhat reservedly pronounced a harsh "Speak, mortal."

"May it please your Majesties to say how an earnest reformer should begin?"

"You must hang some one," said Charles, laughing.

"You must use measures of a determined character," said the other. "You must expose those interested in keeping things as they are, and you must take from them, at the risk even of being unjust, the power they unscrupulously wield to obstruct."

"Behead the Chief Commissioner and hang the Chairman of the Metropolitan Board, just to give the people a taste for further—ahem—sacrifice."

This seemed too dreadful, but one gets used to everything. "Does your Majesty think," said we, turning to Charles II., "that would not suffice?"

"Oh, no," cried out both the monarchs in a breath.

We started at the ominous negative.

"If I chose to exert myself," said George IV., "I could tell John Bright how to do the country a good turn, and make his last days better even than the first. I respect Bright; and, on his way up, one of Edward Hyde's descendants did not hesitate to say how he admired the great and good champion's simplicity. John Bright ought to lead the party of municipal reform. Were I still king, I would send two or three of the English obstructionists to govern some of the more peaceful islands in the Pacific."

"*Allons, cher ami, vous allez trop vite. Savez-vous les Anglais ne sont cont-nts ni de vous ni de moi.* They pulled down Carlton House and did not rebuild it; Whitehall was burnt down, and they have left the site half a slum, fashionable and official if you like, but still, comparatively speaking, a slum. *On ne veut pas, aujourd'hui, se souvenir de nos petites dames et de leur postérité aggrandie. Et cela ne m'étonne point.*"

The voice of the Stuart dropped slowly during the whole of the last speech, for the fog had lightened. The Guelph, with his strong British accent, unlike that of his companion who had known the European world, called out "*Au revoir*"; but our sight was no longer blinded. A panorama of houses and streets lay beneath, and, in spite of the strange conversation we had just held, we knew it to be the capital city of Victoria, our Queen.

The fog had lifted; masses of grey and brown were hanging in the heavens. The sun, just powerful enough to shadow the Embankment and the bridges, imparted a suspicion of life to the dirty windows of houses in Parliament-street. We tried to recall the appearance of Westminster, when King-street was the sole approach to it from Charing-cross, and when two huge gate-houses spanned the former at Whitehall and at Downing-street. Then glancing northwards, our eyes stumbled, as it were, upon narrow, irregular St. Martin's-lane and back again to the remaining portion of narrow, irregular King-street. Whence is derived that peculiarly native genius for doing things by halves which, at intervals of a century, is conspicuous in the order of Metropolis Improvement Acts? To improve the approaches to Westminster and the Abbey, it was deemed expedient, not to widen and straighten the sole existing approach, but to open an entirely new one. Parliament-street thus became the high-road; King-street was relegated to the condition of a mere by-way. Instead of gaining by the improvement, it fell lower still into a state of half-slum, for many years the chosen haunt of the recruiting-officer and his prey. An almost similar fate awaits St. Martin's-lane. Instead of continuing the widened opening and improved alignment, begun during the earlier years of this century,—when Trafalgar-square was laid out,—the new main thoroughfare from Charing-cross to Oxford-street is to deviate to the left, behind the National Gallery. Thus the old historical lane, which joined the two churches in the fields, will become a by-way, and the squalor of the Seven Dials, likewise unimproved, descend to the very mouth of the new street. As these reflections crossed others, we turned towards Victoria-street. So great a thoroughfare seemed to be poorly led up to. Originally intended as a West-end approach to Parliament, it bears the miserable stamp of failure. Its borders in parts are still barren of buildings,—ay, even after twenty years. Here and there intrudes a shop between blocks of offices, warehouses, dwellings and a hotel, all blank, dreary, spiritless. A great highway like that ought to form a continuous line of shops. Though traffic depends less upon shops than shops depend upon traffic, good shops increase and induce traffic. But Dulness, in æsthetic enjoyment of the genteel, will not live over a shop. Gentility is content to be victimised, and the family shrine planted, by the British fashion of compromise, in an extravagant "flat," forms a charming sacrifice to native prejudice in a street that cost 300*l.* a yard run. Indeed, the whole street of not much more than a thousand yards cost much more than 300,000*l.* Some twenty years before it was begun Select Committees sat on the means of its promotion. It was this same cutting which, had it been executed in accordance with certain of the innumerable plans of experts and competent officials, might have provided a direct communication between Buckingham Palace and the high roads to Surrey and Kent *v.d.* the Horse-ferry; it might also have provided an equally direct highway between Victoria Station and Westminster Bridge. But looking over the pyramidion of the obelisk-model we marvelled at the utterly irregular character of the open space between the Abbey and King-street. We wondered what calamitous custom, or "law," existed to annihilate the splendid frontage towards Parliament-square and exactly opposite the clock tower; we wondered why, instead of the back-door and side windows of a sooty tenement in Great George-street, there could not be busy shops and offices and comfortable dwellings.

The fog had enveloped us again, and the same voices asked mockingly why we stared at Victoria-street.

"I could tell you a thing or two about that artery, as the newspapers call it," said Charles II., "which would make your fortune if you repeated the thing properly. I could show you the way into an action for libel by simply telling the whole truth. As defendant, you would have half England on your side; and it might cost no more than a thousand pounds or so."

Obviously we declined; but we begged to be admitted into their Majesties' confidence.

"During all the years," said George IV., "that they were sitting and reporting about a possible Victoria-street, there was one obstacle that would not budge: it was Beer."

"Ha! Ha! Ha!" interposed the Stuart, "not a scheme for the suggested street was presented—not a Select Committee-man thought he had done his duty until the Oracle had been consulted about the Brewery."

"He! He! He!" slowly chimed in the Guelph, still mindful of his dignity, "it was Elliot's Brewery that helped to make Victoria-street what it is."

Odd coincidence, mysterious revelation, strange and weird-like fact! It is a barrack-yard that stops the way between the Strand and Regent-circus; it is Sir Robert Peel's stable that obstructs the ancient site of Whitehall; it is a row of half-worn-out houses on a patrician estate that impedes action between Trafalgar-square and Oxford-street; it is the "Argyle" that frightens the Metropolitan Board in an

attempt to connect Regent-circus with St. Giles's and Holborn-viaduct; it is an old lease that prevents the widening of Abingdon-street; and it was Elliot's Brewery that spoilt the great Belgravian approach to Westminster.

"*Corpus d'Anglais, va!*" cried Charles, "you are little better than the worst Frenchmen, even at your best. When I was king, the *grands seigneurs* used to make a purse now and then for themselves, but when the time came they paid a great deal back with their lives in defence of their country and the people. Nowadays it is the people who, under the item, Contracts, rob themselves and each other; and when the German is at their gates, are unwilling or unable to fight for their own hearths and homes. They made boots with paper soles for their fighting-men, and the soldier broke open the commissariat wagons. The mayors of the Commune sold the English gifts after the great siege at a profit, and . . . ."

"His Majesty's memory and observation are excellent," interposed George; "but what has that to do with our metropolitan alterations?"

"You shall see, *cher*," retorted Charles, "to what my homily tends. That same quality of patriotism has a wider range and application than the mere defence of oneself against a foreign enemy; it concerns the defence of oneself against oneself. Is there not patriotism in rendering, at self-sacrifice, a City and a Metropolis, not only the worthy Capital of a great Empire, but worthy also its proper place in the world? Do land-owners, house-owners, shopkeepers, and tenants of all kinds, think you, care a rush about improving London if they happen to be luckily placed on a threatened line of demolishment? Even when amendment lies easily within their power, they decline to do any, even the least, thing for the public good. Look at the Honourable Society of Lincoln's Inn; they are rebuilding on the west side of Chancery-lane almost on the old lines; they are totally careless of the public convenience, or even of the advantage, in a crowded narrow street, of straight lines and right angles. I was a fair limner myself, Georgey, and know something of draughtsmanship. The town is cursed with the greed of professional obstructors. Money, sir, is what they want, and everything on the London soil, even to an ancient light, is reducible to sterling coin. 'Tis not enough in England to improve a man's property, he expects you to pay him for having improved it. Ah! for the English to revile the French about patriotism is to repeat the old parable of the mote and the beam."

"My dear Charles, you are incorrigible; some years ago they passed an Act, was it not called 'Cross's Act?' And George, fourth of that name, condescended to do more than smile at his own wit. His brother monarch roared with merriment; and the purgatory of fog bubbled, so to speak, into a general cachinnation, dispersing the clouds within which we had been concealed.

Our eyes fixed in the direction of Victoria-street, covered the Abbey, the entrance to Dean's-yard, and the Westminster School. We recalled the fact that the school is about either to be removed altogether or rebuilt near its present position. Surely, then, a possibility of improvement is at hand. We were thus reminded of the many forgotten plans and projects for ventilating the south side of the Abbey; and we could perceive, from our eminence, that a street connecting Buckingham Palace with the Royal entrance to the Palace of Westminster was not only desirable but absolutely feasible. To more than one architect, and to more than one projector, is due the credit of having suggested and laid down the lines of such a street. The thoroughfare might run in a straight line perpendicularly with the alignment of Old Palace-yard up to the junction with Victoria-street. The houses on each side of Orchard-street would thus be absorbed, and the new street could run, without destroying any really Mediæval building, through Great Dean's-yard, alongside the condemned Westminster School, to the very centre of the Victoria Tower. Health and energy would thereby be introduced into the nest of inclosed courts and alleys that block the Abbey and cloisters on the southern side. The continuation of such a new and useful thoroughfare from Victoria-street to Buckingham Palace would be a small affair. The way is already made, only the alignment requires straightening. It would cross Victoria-street obliquely, and connect the palaces of the Sovereign and the Legislature almost in a straight line.

The monarchs returned in the clouds gathered again about us. Reading our thoughts, Charles II. hinted that our expectations were exorbitant, for only seventy years had elapsed since Reform cut into the Abbey and the old Palace, and it was barely 130 years since Parliament-street was made.

"You must wait," said the king, "at least a hundred years yet. Meantime get Whitehall rebuilt, and put your new Public Offices there: you will thus begin the picture of London Improved, as it ought to appear from the river."

"And pray do not permit them," continued George IV., "to waste any more money in buying land between Charles-street and Great George-street. Both his Majesty and myself would prefer to keep those streets as they are. Let them absorb King-street if they choose; but do not buy more land there than is absolutely necessary to make a decent frontage of Government buildings to Parliament-square and Parliament-street; for perhaps you are not aware that the land in question is now *officially* increased to more than double its real value."

"And don't, whatever you do, go in for Gothic," cried Charles II., looking hard at George IV., whose equanimity instantly forsook him. He was thinking, no doubt, of Strawberry-hill and the Brighton Pavilion.

"Nor with the new Renaissance," replied the Augustus of Carlton House magnificence, recovering himself and frowning sternly at Charles, who muttered,—"Sister Anne, sister Anne!"

"By-the-bye, mortal," said the master of Whitehall, "have you been to the new Bow-and-Arrow Tower?"

We turned aside to conceal a smile at his Majesty's ignorance of life in the year 1878.

"Come, lean on my liver-wing," laughed the king, good-naturedly; "and I say, George, give him a lift with your near leg."

Before we knew where we were, or what we were going to do, we were in mid-air. The London atmosphere, of mist, steam, smoke, and tobacco, prevented us from seeing the carts and carriages in the streets, nor could the passers-by see us.

"*Tous, c'est ici.*"

After experiencing a slight jolting, we found ourselves under the open point of a Mediæval tower. Down below, there was a hoard; and other rough woodwork seemed to show that a siege was expected, or perhaps it had just taken place.

"There's where they shoot the arrows," shouted the merry monarch, "and here's where the archer looks down to see if he has killed his man. Oranges and lemons, the bells of St. Clement's. . . . ."

Sure enough, the steeple of the Dane was at a little distance; we turned round, and the lantern of St. Dunstan shone obscurely. Gracious powers! we are at Temple Bar!

"Now you know where you are," interposed George, "the Bar is below, only the heads we kept there have been sold to Guy's Hospital. Would you like to hear what an old emperor said to me about it? I think his name was Justinian."

"No, no, 'twas Constantine."

"My dear Charles, the renegade Constantine has never got up as high as this; 'twas certainly Justinian. He told me that Fleet-street and the Strand reminded him of what he had heard about Rome, a hundred years after the Gothic invasion. Coarse as Temple Bar is, Justinian compared it to an ancient Roman monument; he thought it looked even refined by the side of its rising and aggressive neighbour. Nevertheless the emperor liked the new Palace of Justice, because he hates London; he said it was pleasant to be reminded thereby of France, Venice, Spain, and Constantinople, and, looking on the Law Courts, to turn his back completely on a city of blacks and vested interests."

"He was wrong, Georgey, for inside it's all English. They have the sash-windows that I introduced, blank cemented walls, and the old deal boards that used to worry me at Whitehall. They have a corridor running the whole length of the building with a window at each extremity."

Nettled at this bit of royal criticism from a constitutionally-careless sovereign, we ventured to correct his Majesty's judgment. "Sire," said we, "this building is in the Gothic style of architecture; its external elevation is the faithful index of its internal plan. Each petty detail is the stern reflexion of a true principle. The accidental projection of a gablet; the raised and hipped roof, pointing to heaven; the rounded turrets at each angle, supported upon and crowned with stone, are all things of absolute use as well as undoubted beauty. The remnant of your Majesty's Palace of Whitehall is a sorry sham——."

"Silence, miserable sinner! You never saw Whitehall, nor the beauties it concealed. I countenanced no shams; but I was too fond of happiness to forego the pleasure of being well deceived."

"Quite right, Charles, for when I built the Pavilion, you remember Brighthelmstone and your prawn breakfast,—I made no pretence of principle. It was a whim, and it pleased me. What's the good of being a monarch if one can't execute one's whims, and can't be always pleased?"

"Your Majesty hath spoken well," said King Charles; and he remembered, perhaps a little late, the dignity he could so well assume. "It hath long seemed to me that a word from Victoria had set these mortals by the ears. I would not have countenanced the shams that have been audaciously perpetrated above the very effigies of my martyred father and most loving sister. Mortal, look at those stone turrets: no windows light them, no doors open into them, yet they are hollow, and built of strong, thick stone walls. They sustain the weight of no wide arch; they are the counterforts of no heavy roof. Creep, wretch, behind that gable with the many windows, you will find the sloping timbers of the roof dividing obliquely the supposed rooms those windows light. That opening filled with fancy-wrought glass is the window of a granary in which not even grain will ever be stored; across it, and close to the glass, are laid timbers entirely unlike, in slope or shape, the external outline of the gablet in which the window lies. This architecture is one of many beauties and of many delightful surprises. But he who hath the boldness to maintain each surprise to be necessitated by circumstances other than a capricious inclination for the picturesque, is more valorous than discreet."

At that moment George IV. poised himself upon one of the lofty gables fronting Bell-yard. The king's foot rested on a carved finial, which, to our perplexed vision, seemed disproportionately heavy. "We have not brought you here," exclaimed the monarch, with stern emphasis, "for the gratification of an indecent desire to find fault, —the curse of critics, —but to show you the path of duty; to enjoin you not to quit that path until the goal be reached and your duty be done. How many years, think you, have elapsed since Alderman Pickett laid the inhabitants not of Fleet-street and the Strand alone, but of all London, under an obligation?"

The fog was clearing; we were thus enabled to get a sight of St. Clement's Church, which in Alderman Pickett's time had been barricaded with old dilapidated houses. The houses were gone, but the ground on which they stood did not seem to be of much use even now,—the spot is not much better, hardly any cleaner, than before; nor is the road between the church and the Law Courts much used by carriages. The Act of Parliament passed in the forty-sixth year of the reign of George III., and which referred to five earlier Acts of the same purport having the same purpose, provided for the raising of sums of money "to widen the entrance into the City of London near Temple Bar." Powers were then given to dispose of buildings by way of lottery; there were three lotteries, and no tickets were to be sold until the new buildings were completed. Three years afterwards, that Act was amended and enlarged by another Act. The two first lotteries had already been drawn; the third was not drawn till 1811. Of course it is terrible to think of improving the town by the aid of lotteries; but, at least, those lotteries had some method about them. At the present day Metropolis Improvement is an unorganised lottery, about the results of which no one is certain, and in the conduct of which no one believes. Of the character of the new buildings that are to face the Law Courts, of even the frontage line they are to take, is anything yet known? Is there anybody to say to the owners, "That is your frontage line, please to keep to it"? Nor since St. Clement's was cleared has anything been done to remove the obstructive houses

between that church and St. Mary's. Forty-two years ago, a Select Committee "considered" the feasibility of a new street from the Strand to Holborn; it proposed to take down the houses on the north side of the former thoroughfare, and between the two churches. Many another Select Committee has also "considered" the desirability of making a broad and direct opening into Lincoln's-inn-fields both from the Strand and from Holborn. But, after all these years, nothing, absolutely nothing, concerning the approaches to the City by Temple Bar, or to Westminster by Whitehall and Parliament-street, has been done or even decided to be done. The very thought of improvement lies enveloped in the fog of confused legislation.

"It is simply disgraceful to allow the New Law Courts to rise," said the monarchs, "and to lose the chance of a direct opening from the Strand into Lincoln's-inn-fields and Holborn. Are you prepared, mortal, to urge the immediate reconsideration of that matter and immediate action thereon?"

Neither of the kings could hear our feeble but unqualified voice of assent from their distant eminence.

"We, George Rex, who made the Regent's Street, command you not to rest one week until some responsible person be appointed,—some human being, not a Board,—to take upon himself the chief and sole initiation of Metropolis Improvements. Strike at the root of the evil that holds London in its meshes, spare none of those who promote the spread of that evil."

"Be constitutional, as I was," cried the Stuart, "but hit hard."

"Be absolute in wielding constitutional powers," cried the Guelph, slowly disappearing.

"Do it constitutionally," shouted Charles II., almost from the other side of Chancery-lane, "but peg away."

* * * * *

"Are their Majesties gone?" we said, as a servant touched us on the shoulder; "have you shown them out?"

"Please, sir, the cart's at the door with the Parliamentary Papers."

"Oh! for the new TALE OF ST. STEPHEN'S. Hire some carpenters, and try to get the papers all in before midnight,—but have their Majesties really departed?"

"You've been asleep, sir, and no one has called."

"Stuff, we were never so wide-awake as at the present moment."

In evidence of the fact, a letter we had only just received lay on the table. It was a note from the Mulligan of Bally-Mulligan, intimating his intention to move:—

"*That* a SELECT COMMITTEE be ordered to "report upon the Mental Condition of those "members of both Houses of Parliament who, "since the passing of an Act, 35 Geo. III., c. "126, have SURVIVED official inquiries into the best "mode of improving the Approaches to London "and Westminster (having regard to the concen- "tration of PUBLIC OFFICES at Whitehall, and of "the LAW COURTS at Temple Bar), with a view "to Scientific Method in its design, and of "Rigorous Economy in its execution.

"*Further, that* the Committee HAVE POWER to "send for Papers.

"*Further, that* the Committee HAVE POWER to "report their Observations."

This, it appears, will be seconded by the member for Donnybrook, and supported by the whole Irish Brigade. The Mulligan of Bally-mulligan therefore asks for facts. What a pity that their Majesties should have left! Nevertheless, though the monarchs cared not to hear our willing answer to their gracious exhortations, they may be certain that during this session we will "HIT HARD" at men as well as things; and for many sessions hereafter we will "PEG AWAY" at the chaos of Unrule that afflicts London.

Suggested Hotel de Ville for London.—In view of the possibility that the municipal government of London will be reorganised, a correspondent of the *Daily News* suggests that the large area formerly occupied by the City Gasworks at the eastern end of the Victoria Embankment would form an appropriate site for a series of grand central municipal offices for the whole of London. Guildhall, even if considerably enlarged, would, he affirms, be too restricted in area and inaccessible as to locality, to serve as the head-quarters of a municipality governing the whole of London.

OLYMPIA.

MR. SIDNEY COLVIN, M.A., Slade Professor of Fine Art at Cambridge, delivered a lecture on Thursday evening, the 24th ult., at the London Institution, Finsbury-circus, on "Olympia and Ancient Greek Athletics," to a crowded audience.

Professor Colvin commenced by saying that the Olympic games, so famous among the Greeks, were held at the beginning of every fifth year on the banks of the Alpheus, near Olympia, in the Peloponnesus, now the Morea. The river Alpheus was very much subject to violent floods and storms, which were frequent, owing to the adjacent mountains. Within a sacred enclosure on the banks was the place where the games took place, it being filled with temples and statues and other glorious works of Greek art, being the greatest museum of arts which had ever existed. The excavations which were now going on in that city was not a matter of one or two seasons, but it would probably be fully four or five years before they were finally completed. They were carried out in a most systematic way by trained archæologists, at the cost of the German Government, the enterprise upon which they were engaged being of an extensive character, the results of their labours being the greatest in any age. They had heard a great deal of the discoveries at Troy and Mycenæ, at sites which were identified with the name of Homer, and what relation these discoveries of Dr. Schliemann actually bore to any Greek civilisation which the poems of Homer described was a thing at which they would have to work a long while yet before they could be sure of the truth; but, as regarded the excavations at Olympia, they were of more importance to the student of Greek antiquity than other discoveries, because Olympia was the great centre of the common and united life of the Greeks; it was the great museum of their art, not in obscure days of the origin of Greek civilisation, but in its full ripeness and glory. They heard from various sources of information what one expected to find there in the shape of marble statues, the handywork of men whose names were handed down to them. Many of the memorials actually to be found belonged to the greatest times of Greek art, and there was a difference between the perfect sculptures they could identify as being the work of the Greeks and the doubtful, obscure, semi-barbarous discoveries found in the legendary statues of Troy and Mycenæ. Without doing injustice to the praiseworthy discoveries of Dr. Schliemann, they ought, nevertheless, to bear in mind the sovereign importance and the really much greater interest of the work which was now being done in the valley of Olympia.

With regard to Olympia itself, they knew that all the fame and glory of the country rested upon the love of the Greeks for physical sport, physical powers, and physical beauty. It had often been said that the modern idea of Englishmen was similar to that of the ancient Greeks, viz., a love of physical sports, and an ignorance of all languages except his own. If that were true, the Greeks had some excuse, because their language was the one civilised language of their time. In their athletic games, in cases of fraud where a competitor would not do his best and was found out, the penalty for him was to help to make the place beautiful by giving a bronze statue to the presiding god of the place,—Jupiter, and when the traveller Pausanias visited Olympia he found a vast number of these bronze statues, which had been dedicated to Jupiter. As to the historical origin of the games, nothing in Greek life, collective or private, ever took place independently of Greek religion, every act being patronised and protected by some deity or other amongst the Greek gods. At first the meetings were purely of a provincial character, there being only a few races, but after a time they became more important, and gained a great reputation, and the Greeks of various races were brought together in a spirit of unity and friendship, and gradually the festival became pan-Hellenic. At first it consisted only of foot races between competitors in the neighbourhood, but after a time the names of the victors became solemnly recorded in history, and Greek chronology became to be dated. The youths were exercised in five kinds of combats, the conquerors being highly honoured for their skill in jumping, racing, throwing the javelin, wrestling, and boxing. Although it was forbidden for women to be present at the games, they were allowed to send their chariots and drivers to compete in the four-horse chariot races. From a single race meeting it became so popular that it was protracted to five days. July was the month selected, in which the whole of the Greek-speaking race were bound to unite together in the valley of Olympia, the festival being celebrated for 1,100 years. The contests were not only confined to athletic sports, but there were musical and poetical competitions. Historians like Herodotus used to publicly read their writings; while Socrates,

"The old man eloquent,"

also publicly appeared before the Greeks. But the whole glory of the Olympian celebration for the universal Greek mind was for physical prowess and physical beauty. Originally the prizes were in money, because it had been thought desirable to attract competitors, but that was soon found to be unnecessary, and then was substituted the prize of a crown made of a kind of wild olive, which was noble and heroic. The victor first of all had his name proclaimed by heralds, then he and his country were congratulated upon the honour that was gained, after which the games were over, and the great crowd went home. In many instances the victors were retained for ever after in the public service, and hymns were written in their honour by the greatest poets. For instance, the greater part of the poems of Pindar referred to the victors of the Olympic games.

The victors, too, were honoured in an imperishable form of art, for the sacred enclosure of the Alpheus contained a crowd of statues which were dedicated to Olympia, being generally of bronze, and set up in honour of the victors. The site where these games took place was a most favourable one for the preservation of ancient ruins, it being not built upon hard rock or on a volcanic site, but in the midst of an alluvial plain; therefore, the soil was such that the sculpture would be preserved, and it was hoped that the German explorers now at work would be highly successful in their task. Many sculptures had already been found in a good state of preservation.

Professor Colvin, by means of the oxy-hydrogen light, then showed a number of these sculptures, which he said were the result of the first year's discoveries.

PROPOSED THOROUGHFARE FROM HOLBORN TO THE STRAND.

MR. W. M. TEULON has prepared a plan proposing certain improvements in the Strand, combined with that of a new street thence into Holborn. The scheme has been approved by the Strand District Board of Works, and they have forwarded it to the Metropolitan Board of Works, recommending that it shall be carried out: that Board have had it under consideration, and have referred it to their Committee of Works. The features in the Strand improvement consist in the demolition of the block of houses between the churches of St. Clement Danes and St. Mary-le-Strand, thereby bringing out those two structures into full view, and widening the Strand at that part to the present north side of Holywell-street. As a resting place in this wide roadway he proposes to have an avenue of plane trees somewhat similar to the Unter den Linden at Berlin, with a garden at the east end; the purpose of this would be to afford a shady rest with seats, and to divide the traffic, besides contributing to the ornament and cheerfulness of an important thoroughfare.

Also the widening of Wych-street is intended to relieve the Strand of such traffic as may be flowing from the northern parts of London to the Law Courts or the City; to effect which it will be necessary to remove the two theatres (the "Globe" and the "Opera Comique"), and appropriate their sites to building purposes.

The proposed new street is laid out with a view to utilising existing thoroughfares to the fullest extent, by simply connecting them together,—thus, by cutting a way through Clare-market, and widening Houghton-street and Newcastle-street, a commodious street would be formed from the Strand into Lincoln's-inn-fields; and by the removal of Little Turnstile and the adjacent houses the same would be effected between Lincoln's-inn-fields and Holborn. Mr. Teulon, rightly or wrongly, has widened streets only on one side, so as not to interfere with the trade thereof more than is necessary. In connexion with the Strand we observe that

the roadway north of St. Mary-le-Strand Church is also widened, thus continuing the double traffic line some little distance westward. It is obvious that when the Law Courts are opened, the present streets will be utterly insufficient for the greatly increased traffic that will surely result; and that it would be desirable to prepare for what will inevitably come to pass before the time arrives when it will be absolutely needed.

Mr. Thomas Peard, of Wych-street, who has for some time given his attention to the subject, has also sent us a plan with the same objects in view. It includes several suggestions that may well be considered by the authorities before coming to a final decision, but we are bound to say that the want of *directness* in the main thoroughfare, as proposed, is decidedly against the acceptance of it as a whole.

BINGLEY BAPTIST CHAPEL.

The building shown by the accompanying engraving was opened last year. It stands on a corner site in Park-road, and consists of a nave, 72 ft. long (measured on the gallery floor) and 37 ft. wide; transepts, baptistery, &c., with galleries all round; porch, giving access to both floors of the church, and to the basement and vestries (with lavatory, &c.) on the ground floor. The basement is occupied by a large school-room, 36 ft. by 37 ft.; two class-rooms, each 15 ft. 6 in. by 20 ft. (with sliding partitions between each of them and the school-room), and a smaller class-room, besides heating, lumber and store-rooms, with staircases to the ground floor at either end. The school floor is nearly at a level with the side street, which is rendered practicable by the rapid fall of the ground. The chapel is roofed with open timbers, boarded; and the seats are open benches. The style of the building, which was designed by Mr. F. Bartram Payton, of Bradford, architect, is an early and plain kind of Gothic. The tower, which contains a staircase leading to the galleries, rises to a height of nearly 100 ft. to the summit of the finial; and the site is enclosed by a low wall, with ornamental palisades and gates. The total cost, exclusive of land, was 4,400*l.*; and the number of sittings, at 20 in. each, is about 650. The masons' work was done by Messrs. Fould, Brothers; the joiners' work by Mr. Whitley; the slating by Mr. T. Thornton; the plastering by Messrs. Greenwood & Spurr; and the painting by Mr. Dawson, all of Bingley. Mr. Schofield, and Messrs. Taylor & Parsons (all of Bradford), respectively did the plumbers' and iron work; the latter also supplied the heating apparatus, which is for hot water. The gasfittings were supplied by Messrs. Freeman & Collier, of Manchester.



BAPTIST CHAPEL, BINGLEY.—Mr. F. Bartram Payton, Architect.

Presentation from Builders. — Messrs. Mappin & Webb have manufactured a silver centrepiece, with plateau and base, for presentation to Mr. William Pink, from the Master Builders' Association of Portsmouth. It bears, with arms and monogram, the following inscription:—

"Presented to William Pink, Esq., by the members of the Master Builders' Association, in recognition of his public services as Mayor of the Borough of Portsmouth during two successive years, and of being instrumental in establishing a Benevolent Fund in connexion with the Association, and also as a token of esteem."

KNIGHTSBRIDGE BARRACKS.

We give in our present issue a general plan and two elevations (one towards the Park, in two parts, and one towards the Knightsbridge-road) of the new Cavalry Barracks now erecting on the former site, from the designs of Mr. Thomas Henry Wyatt. A long controversy was carried on as to the desirableness of re-erecting these barracks in Hyde Park, but, ultimately, for asserted strategic reasons, the old site was determined upon.

The buildings which have recently been taken down were constructed to accommodate six troops. On a plan approved by his Majesty George III. is written in pencil, "Copy sent to the King, March 28, 1792." It is signed by James Johnson, architect, and in an engraved survey of London of 1794, the main block of buildings is shown, being much as it recently stood. Several additions were subsequently made, and there is a plan in existence, showing the officers' quarters, dated 1795. The long row of officers' stables was built about 1815, and various minor additions were made as late as 1840. In 1717 no buildings existed in Hyde Park west of Park-place, and where the barracks recently stood there was a pool.

In 1855, in a public competition for barracks, the first prize for a "Cavalry Barrack" was awarded to Mr. T. H. Wyatt and his brother, the late Sir Digby Wyatt. In spite of repeated promises from various Secretaries of State for War that a cavalry barrack should be entrusted to these gentlemen, it was not till 1875 that Mr. Hardy, recognising the strength of their claim for employment, decided on placing this work in the hands of Messrs. Wyatt. The unfortunate illness and subsequent death of Sir Digby Wyatt prevented his taking any share in this work, so the charge of it has fallen on Mr. T. H. Wyatt.

The site, which has always had the disadvantage of being unduly narrow, was rendered still more difficult to deal with by the sale to the Metropolitan Board of Works of a strip of land, comprising about 500 square yards, next the Knightsbridge-road (shown on the plan), so as to give that road a uniform width of about 60 ft., and this unfortunately occurs where the riding-school is now placed, and where width was much needed.

The front of the barrack, next Knightsbridge-road, has been thrown forward to the line of the street, thus enlarging the internal parade-ground, and by keeping vacant spaces open at the east and west end of the barracks improved ventilation will be obtained.

The accommodation in the new barracks will be:—For 23 officers; for 352 non-commissioned officers and men (single); for 40 married men; for 386 troop horses; and for 76 officers' chargers, and 15 horses in the infirmary stables.

It was originally proposed to retain the block of officers' quarters, merely adding a new mess establishment as a wing, and to have retained the old riding-school. Mr. Hardy was, however, induced to sanction the erection of a new and more uniform block for the officers' quarters, and a new riding-school, the old one having been most inconveniently placed, and being less than the average size. It will now be placed between the barracks and the officers' quarters, so that the troopers will be able to ride into it from their parade, and the officers on the opposite side from their stables and quarters.

The different arrangement necessary for the accommodation of unmarried troopers and married men has led to a different treatment of the elevations next the park and next the Knightsbridge-road. In the former case very large dormitories, with fireplaces only at the ends, required a somewhat monotonous treatment; whilst in the latter case each married couple, having two rooms, and each with fire-places, led to a more varied and broken treatment; in the latter case eighty flues are called for, in the former case there are only twelve necessary. Between the upper part of the pilasters which form the chimney-stacks, a balustrade runs the whole length, and the upright line of the attic roof, and the dormer windows in it are set back 6 ft. so as to form an external gallery for the children of the regiment to play in.

The open terrace and pavilions on the park side are for men to smoke in.

The horses are, of course, on the ground-floor, and on the level of the parade; but inasmuch as there is a difference of 11 ft. between the archway on the park side, and the pavement in the Knightsbridge-road, much greater height is given to the building on its south front, and opportunity is afforded for having a range of workshops and stores in a basement story under the whole of this block.

The materials used in the construction of this barrack are Portland stone and red brick; and the floors are in some instances built fireproof with wrought-iron and concrete. Large water-tanks are provided in the several towers.

The contract has been taken by Mr. Shaw, of the late firm of Jackson & Shaw, and the time originally fixed for its completion was two years and a half. How that question may be affected by the masons' strike remains to be seen.

ELEVATION NEXT THE PARK, SHOWING OFFICERS' QUARTERS.

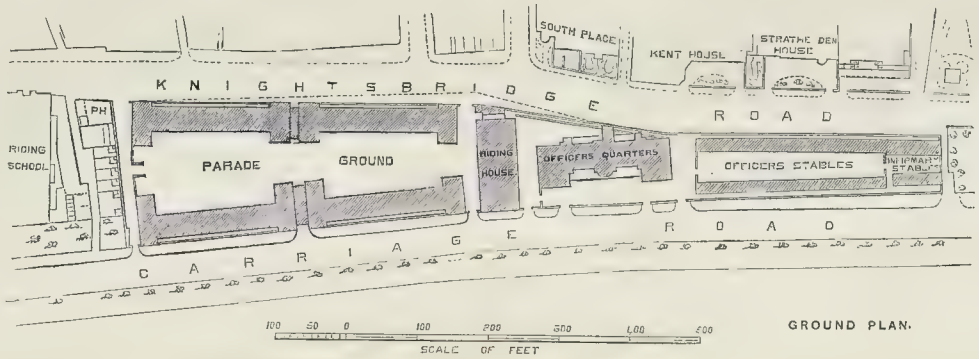




ELEVATION NEXT THE KNIGHTSBRIDGE ROAD.



ELEVATION NEXT THE PARK.



GROUND PLAN.

KNIGHTSBRIDGE BARRACKS.—Mr. Thomas Henry Wyatt, Architect.

"RESTORATION" *v.* "CONSERVATION."

ARCHITECTURAL ASSOCIATION.

AT the ordinary fornightly meeting of this Association on the 25th January, Mr. Bowes A. Paice, president, in the chair, Messrs. A. H. Belcher and F. Oliphant were elected members.

A vote of thanks was passed to Mr. Waterhouse for his kindness in allowing the members of the Association to visit the new Natural History Museum at South Kensington (as reported in our last), the President remarking that Mr. Waterhouse was one of the few senior members of the profession who still retained his connexion with the Association as a member, and the Association could not but consider it a great honour that they had now an Associate of the Royal Academy amongst them.

It was announced that the next visit would be made this (Saturday) afternoon to the Carpenters' Hall, London Wall. (For further particulars see advertisement.)

Two papers were then read on the subject of "Restoration" *v.* "Conservation."

Mr. William White, F.S.A., read the first paper, in the course of which he said that, taking for granted that without grave reasons of expediency, or almost of necessity, we were not justified in altering or defacing an old architectural feature which might become, if handed down intact, the channel of association with the past, and a link in the history of art,—a landmark of original design or of later development,—the question to be discussed was one not so much of controversy between "conservation" and "restoration," as of endeavouring to draw some line of demarcation, if that were possible, between what relics of the past ought to be, and what ought not to be, "conserved," in respect of taste, of date, of construction, of character, of association, on the one hand; and in respect of decay, expediency, necessity, on the other; the end in view being the attainment to some general agreement of principle and of practice as to the means most likely to tend to true and proper conservation. In spite of the loss,—the most sad, most grievous loss,—in past years of much that ought to have been retained, yet what had been left had been conserved for very many generations yet to come for the formation and growth of revived art, for the deepening of association with the past,—national, domestic, and religious,—instead of its being utterly destroyed, as it very shortly would have been if only such patching and protecting as was now advocated in some quarters had been followed out. Much as some might sneer at the revival of historical and antiquarian sentiment, of ritual propriety, and of ecclesiastical continuity,—of religious earnestness, of piety, of poetry, of romance,—as being responsible even indirectly for the destructive element in church restoration, he could not but think that in England that very revival had been chiefly instrumental in a restoration as conservative even as it had been, instead of religious activity culminating, as it did for a long time in Ireland, in the production of the most bald and uninteresting buildings, to the utter disregard of the ancient churches. But when, as Dr. Colvin called him, "the exponent of the passion of the architecture of the Middle Ages," in the simple Protestantism of his own views, could make no allowance for anything beyond the most bare and abstract, if lucid, æstheticism, what could be expected but that his teaching should be ignored, at any rate in so far as he himself had ignored its just influence upon the revived ecclesiastical traditions and popular religion of the nation? And should we be taunted with the expenditure of millions in church restoration? Verily, the learned Professor must have but little knowledge of the claims of external religion, little sense of the needs of an awakening church, little perception of the value really set upon the heritage of our fathers (though the means of showing it might have been for a long time somewhat mistaken), if he could bring himself to believe that the money was expended for the mere gratification of a whim or in submission to a fashion, or even to serve the baser interests of those engaged in the work. And, although many of his strictures were unhappily but too true as to wholesale destruction of the marks of age and antiquity, yet it was possible to make too much of the prevalent idea that because the softening tones of age and decay enhanced the beauty of good old forms, therefore age and decay must be good in themselves, and not merely as accidental accessories. Art was to be dependent upon them, rather than they upon art. Some distinction likewise ought to be drawn between merely old work and art-work, between surfaces or mouldings cut by line and by rule, and carvings or sculpture cut only by the dexterous hand, aided and inspired by a faculty which could not be subjected to laws of mechanical operation. If architects and others were to be condemned as destructive restorationists equally whether they would replace or repair a marble clustered column, falling to pieces through neglect or natural decay, or whether they would tenderly clean off with a penknife, or other delicate instrument, the incrustations of lime or whiting and size which had overlaid the delicate touch of the carver of its foliated or sculptured capital, whilst they shrank from touching even the most damaged part of real sculpture or carving, let their well-meaning judges beware lest they exposed themselves to the charge of being, if not destructive conservationists, at least of being sentimental and misguided enthusiasts. To take another crucial instance of a very pertinent and practical nature. Would it have been better to have left the interior of Exeter Cathedral in its old neglected state, than to remove the dirty yellow wash laid forty years ago upon a similar coating thirty years older, and to bring out the rich tints of the original stonework? The real question was, however, not how far the claims of strict conservation might be defended or not, but how far they were practicable, and not merely theoretical, in the form in which they had lately been put forward. Church restorers might recognise and admit to the full the duty of preserving untouched every scrap, every lineament of the past, for the sake of posterity, for the sake of art, for the sake of historical record or sentimental association, whilst they failed to see how those ends were really to be attained by the use of the means suggested, especially when carried to the extent to which it was proposed to apply them. The very objects in view were, by an exaggerated idea of conservation, in danger of being defeated by the means taken for effecting them. A lamentable amount of destruction had undeniably taken place under the guise of restoration, but the proposed conservation would be often and quite as lamentably destructive, not only of the buildings, but also of the purposes which the conservation itself was designed to serve. It was laid down as a general principle that if a building could not be conserved without restoration, a new one should be built by its side, and the old one should be left intact on its old site. But, even allowing this, surely some distinction ought to be drawn between the rural village church on the brink of destruction,—its roof perished, the mere patching together, perhaps, of various timbers, its walls disintegrated and ready to fall,—and the noble remains of substantial structures which, in spite of their roofless state and their centuries of neglect, had so wonderfully resisted the encroachments of decay. Granting that the old building would still be left for the purpose of art and antiquarian study, for old associations and for future poetic inspiration, the new one was to be *used;* and it was quite certain that if old buildings were thus to become mere museums of antiquarianism, or of curiosity, all affection for them as the sacred repositories of art would very quickly die away. Taste, instead of being educated up to their appreciation, would be lowered to the the inferior forms and associations with which it would then, in the new buildings, be surrounded, seeing (and admitting the assumption) that anything now put up must be utterly and immeasurably inferior to the old. Even though an appreciation of the old forms should to some extent survive, those forms would soon come to be regarded rather as picturesque remains than as living monuments of art,—for people's minds and tastes were moulded by contact with what they saw and lived upon in their daily domestic and religious life. It was very greatly through familiarity with buildings restored in a manner fitted to their proper use that the people generally had at all become educated to see in ancient work anything beyond the commonplace of neglect and decay. No, said Mr. White; let us have some inevitable mutilation rather than countenance such destruction as would follow from mere conservation, seeing that many old buildings would inevitably be swept away, sooner or later, when they had ceased to serve any useful purpose. The forms, outlines, proportions, and numberless features, might yet remain to us, even in the case of an ill-built and dilapidated building already tottering to its fall, and which, unless "restored," would certainly, ere long, be removed. Let the restoration be done with the tenderest hand, and with the most reverent heart, by carefully retaining every vestige that could safely be kept. In the restoration of old decayed or mutilated stone or wood work, let it be insisted on that the material should be pieced or repaired rather than renewed, and that some old crumbling scrap,—say, of an ancient door or window,—should be worked-in in the new work instead of completely obliterating all vestiges of the identity of the old building.

Mr. R. E. Pownall followed with a paper on the same subject, in which, speaking as an architect and as a lover and student of old buildings, he expressed great sympathy with the protests made of late years against the mania for restoration. He quoted Sir Gilbert Scott and others for the purpose of showing that, even with the very best intentions and the utmost care and anxiety on behalf of church "restorers," irrevocable damage had been done, and was likely to be done, and contended that all students of history and lovers of architecture ought to unite in a protest against denuding old buildings of all features which, because they were not of a particular period, might be deemed, by restorers, excrescences or anachronisms. Architects and clergymen had much to answer for in this connexion, and the new society for the preservation of ancient buildings had not been established a day too soon.

The discussion of the papers was adjourned.

AN EDINBURGH PROFESSOR ON DOMESTIC SANITATION.

ON Tuesday, the 22nd ult., the Professor of Civil Engineering in the University of Edinburgh, Mr. Fleeming Jenkin, delivered a lecture to the members of the Philosophical Institution of that city on Domestic Sanitation.

The Professor stated that in order to ascertain whether the sanitary arrangements of a house were satisfactory, it was necessary to have proper professional assistance, and he hoped to be able to show that the conditions of a healthy dwelling might be secured, at no great cost, in most of the houses actually occupied. In Edinburgh, for the most part, the subsoil drainage and construction of the walls and floors of houses were good, but the internal arrangements for water-supply and sanitary appliances were referrable to a time when sanitary engineering was very imperfectly understood. The germ theory explained how families who lived in the midst of great filth might not be affected thereby in their health, while others in large and clean mansions were struck down by fever and diphtheria. The filth which was compatible with health was isolated filth; and until the germs of some disease were introduced, this filth was merely injurious, not poisonous. It was when confined to sewers, &c., where the germs were most prolific and the system of drainage too frequently acted as so many suckers, by which the germs were drawn into the house. It was not necessary to produce that effect if nothing injurious went down the pipes: it was what came up them, owing to their connexion with the other parts of the drainage, which produced the evil; for although nothing more serious than scented soap went down from a bedroom, the germs of typhoid fever might ascend to it.

The first sanitary principle to be attended to in a town-house was to cut off entirely the gas evolved in the common sewer from the house. The next was to isolate all tainted matter sent out of the house from the air and water let into it, and the more rapidly the tainted matter left the house the better.

Professor Jenkin then, by means of diagrams, explained how this desirable end could be effected. He advocated double-traps with an opening to the outer air between them, and showed experimentally the action of this device. He warned his hearers against the numerous devices palmed upon the public, which had been brought under his notice. He then stated the causes which often led to the stoppage of sewage in its transit to the sewer. Periodical inspection was necessary to detect these stoppages, and with such a trap as he had described this inspection could be made in a few minutes.

The lecturer then, by means of a diagram, explained how the system of pipes in a house should be arranged, and stated the chief dangers to be:—(1) Complete stoppage by

kitchen grease or other rubbish, whereby the house was not drained at all; but its filth, through leaky drains or otherwise, deposited in the basement; (2) absence of proper traps and ventilation whereby the sewer-gas escaped into the rooms; (3) old systems imperfectly cut off; (4) cisterns placed where they were liable to be contaminated. No great expense, no patented arrangements, were required to remedy these evils, but the application of principles to particular cases and skilled advice and periodical inspection. Official inspection he could not advocate, and the officials laid down general principles so severe that to put them into practice involved the destruction of existing arrangements; and, if asked to frame positive laws to be obeyed under penalty, the conditions were so easy that no safety was given. The only objection to voluntary inspection lay in its expense, and in the difficulty of selecting an adviser. The idea had occurred to the Professor that these difficulties might be overcome by means of association. An association had accordingly been formed in which the assistance of Dr. Littlejohn and Councillor Gowans had been most valuable.

The outline of the proposed association is as follows:—

By clubbing together, the body will do at small cost what would cost each member a considerable sum but for the application of the co-operative principle; and the recommendations made will be subject to the control not only of a professional man of high standing, but also to that of a body of men of many professions who will form the council of management. It may really be hoped that the problem of how to put and keep our houses in good sanitary condition is in a fair way of solution.

Any one in Edinburgh may become a member of the new association by payment of an annual guinea. The association will retain the exclusive services of one or more young but well-trained engineers, who will act under the general superintendence of a consulting engineer of high standing. The premises of each member will, in the first instance, be very thoroughly inspected, and a report furnished, giving, if need be, specific recommendations as to improvements in drainage, ventilation, and water supply, with estimates. Any alterations in his sanitary fittings which the member makes, with the approval of the society's officers, will be supervised by them. The first inspection of each house will, of course, be of special importance; but although sanitary appliances may be once set in order there is no security that they will remain so. There are numberless ways in which drains may go wrong, in their legitimate as well as illegitimate use, and to guarantee continued efficiency periodic examinations must be made. The engineer of the association will inspect every member's house once a year, and give a report upon its state. Besides these privileges, which are possessed in virtue of the annual subscription, members may obtain the services of the inspectors at other times, or with regard to other buildings, on payment of small supplementary fees; so that a member about to build a house may receive advice on the sanitary merits of his architect's plans, or one about to buy or hire a house may send the engineer of the association to report upon it. All the inspections will be carried out on general lines laid down by the consulting engineer, whose professional position and experience will in this way give to the work of the younger men the authoritative character it would otherwise want, and to whose maturer judgment cases of special difficulty will be referred. The association is not purely selfish in its aim, for it will afford an opening for the philanthropy of its members, by enabling them, on payment of small fees, to obtain reports on the dwellings of the poor. The fees charged will be regulated in proportion to the rental of the buildings examined in such a way as to prevent the abuse of this rule. The association will not conflict with the public authorities, but rather help them to detect infringements of their regulations. None of its officers may be patentees of sanitary appliances, or have any interest whatever in recommending outlay.

Glasgow.—On the 23rd ult. the Glasgow operative masons received intimation from their employers of a proposed reduction of 1d. per hour (from 9d. to 8d.) on their present rate of wages, to take effect from the 18th of March next.

THE ART OF MARBLING.

At the Society of Arts on January 23rd, Mr. C. W. Woolnough read a paper on the art of marbling as applied to paper. In the course of it he said,—Fifty years ago, it was almost as difficult to get a sight of the inside of a marbling establishment as it would be to get into the presence of Royalty; every crack and aperture, may even the very keyhole, were stopped up or obscured, to prevent any glimpse being obtained as to the method by which it was accomplished; and, as comparatively few were in possession of its secrets, it was a very remunerative craft, and good profits were realised.

When I was about thirteen years of age, I accompanied an individual who was going to fetch some books which had been sent out to be marbled; when we arrived they were not all finished, and your humble servant was admitted into the sanctum to wait for the remainder. I was so stricken with wonder and admiration at the sight, that I resolved in my own mind not to rest till I had found out how to do it. I will not now take up time by telling you of all the failures and the disappointments I met with; but at length, by unremitting toil and persevering efforts, I was in the end rewarded with success, and though for a long time the results were very imperfect, yet I could perceive that I had got hold of the root of the matter, and, after much practice, I, of course, approached nearer a perfect result; and as I was indebted to no one for the knowledge I had obtained, in the year 1853 I published a small work on the subject, which gave great offence to the fraternity, on account of its truthfulness, and the way in which the various kinds of marbling were set forth, and the manner of their accomplishment explained. You see here now before me a shallow vessel or trough, about 2½ in. or 3 in. in depth; it contains a thin mucilage. Now, there are several kinds of mucilage, viz., first, and most important, gum tragacanth, called by some gum dragon; secondly, linseed or flax seed; thirdly, Irish or Carrageen moss; fourthly, a seed, called among the initiated, flea seed, the name being given on account of its great resemblance to that well-known but troublesome insect, but really the seed of a kind of plantago, cultivated, I believe, in the south of France, and much superior to linseed, on the ground that it retains its properties a much longer time; besides one tablespoonful will produce as much mucilage as half-a-pint of the linseed. The mucilage used this evening is a solution of gum tragacanth. It takes two or three days to dissolve, and requires to be frequently stirred or beaten up during that time, in order to break the lumps, and to combine the gum with the water, after which it must be strained through a fine hair or muslin sieve before using. I shall now proceed to show you by what means the colour is made to float and expand upon the surface of this liquid, but first will prove that, without some other agency than water in the mixing of the colours, they will neither float nor spread, and there is but one thing at present known that will effect this. It is a very simple though subtle and powerful fluid,—no expensive or elaborately prepared article; it is purely a production of nature, being nothing more nor less than the gall of an animal. Ox-gall is the sort generally used; it is the easiest to be obtained, and is within the reach of all who may wish to try the experiment. I will not say that the gall of a horse may not be as effective as that of an ox, having never tried it; but I have tried the gall of sheep, and proved it much weaker, so that ox-galls diluted with water would be quite as good as that; but there is sometimes a great difference in the galls taken from different animals, some being far more powerful in their operation than others. The gall of one animal may be thick and ropy, which is objectionable, while that from another may be beautifully fluid, which is more pleasant to use. When fresh, it has no unpleasant odour, but when stale it is anything but agreeable, though none the worse for the required purpose; indeed, I consider it preferable.

I will now proceed to show you the action of the gall. I first draw this thin flat piece of wood, called a skimmer, over the surface of the solution trough. You ask me why I do this? I reply, because, while I have been reading or speaking, there has been forming, on the top of the liquid a film or thin skin, which, though imperceptible to the eye, is quite sufficient to frustrate the proper result. I now take a colour mixed only with water and allow a few drops to fall; it neither floats nor spreads, but falls to the bottom of the trough. I now pour a little gall into the same colour and again sprinkle some on the surface, this time, however, it floats and spreads all over the surface of the mucilage. I just lay on that a piece of white paper, and pouring into a glass a little water, I add a few drops of gall, and with a brush sprinkle it over the portion of the surface of colour not covered by the paper, and you will see that it has divided the colour into veins, thereby showing the effect produced by the gall when it is mixed with the colours; and in order to enable you to see the effect of this more vividly, I will lay on another piece of paper by the side of the first, and lifting the two out simultaneously, the operation or effect of the gall is clearly made manifest. This is the foundation of the whole process; this is the root from which all the branches spring, and although there may be other ingredients required to produce various effects, still these two simple productions of nature,—the gum and the gall,—constitute the life and soul of this (as the late Dr. Normandy designated it) "pretty mysterious art." . . . .

Now, after laying on all the colours, it rests entirely with the operator what shall be produced after all, for out of these few colours as they now lie floating on the surface, a diversity of results can be obtained quite distinct the one from the other, and with a piece of pointed stick, a comb, or a piece of wire, you may indulge your fancy to almost any extent; and then, by diversifying the colours or the arrangement of the colours, an almost infinite variety of combinations and changes may be produced. Having disposed of the first question, viz., what is it that causes the colour to float and spread out upon the surface of the solution? we come to the second. What is it that keeps the colours from commingling, when they fall one upon another? or, in other words, what is it that keeps each colour clear and distinct, though several may even be thrown on at the same time, and though they may be even twisted round,—nay, almost stirred with a pointed stick, every colour retaining its perfect individuality, though in so very minute a degree as to require a magnifying glass to reveal it? My humble opinion is this: the moment the colour touches the surface of the mucilage, it displaces a portion of mucilage itself, which forms a bind of bulwark or barrier around it, and thus prevents it meeting with the colours which had been previously put on; so that, were you to put on a yellow and immediately follow with a blue, there would be no signs of a green being produced, although, if you were to mix the two colours together before you put them on to the mucilage you would have a decided green at once.

DISTRICT SURVEYORS AND THEIR DUTIES.

Metropolitan Board of Works.

At the meeting of the Metropolitan Board of Works on the 25th ult., a letter was read from the foreman of the coroner's jury empannelled to inquire into the cause of the death of Patrick O'Connell, who was killed by the fall of a house at Hackney, as reported in our last (p. 26, *ante*). The builder, Mr. Hackett, had, in accordance with the verdict of the jury, been committed on the coroner's warrant to take his trial for "manslaughter," and the foreman of the jury now wrote to ask the Board to undertake the prosecution, seeing that it was a matter affecting the public safety, and that the coroner's officer, upon whom the prosecution would practically devolve, unless it were taken up by the Board, was without the legal training and the means to enable him properly to conduct the prosecution.

Mr. Runtz, who represents Hackney at the Board, moved that the letter be referred to the works and general purposes committee for consideration and action, if deemed necessary. *Primâ facie*, it appeared to him to be a case in which the Board ought to take upon itself the *rôle* of public prosecutor. He believed that one of the so called 9-in. walls in question was built entirely of bats,—there was not a whole brick in it,—consequently, there was no bond; it was rather two 4½-in. walls side by side than one 9-in. wall, while the mortar was such in name only.

Mr. Selway seconded the motion, and incidentally remarked that while perhaps some of the district surveyors were not always sufficiently stringent, in the present case the builder had been warned by the district surveyor.

Mr. Richardson and Mr. Fowler supported the motion, the latter gentleman saying that it was to be regretted that in the present case the district surveyor had contented himself with giving notice to the builder, instead of taking out a summons against him.

Mr. Furniss, chairman of the Building Act Committee, said it was clear to him that the system of allowing district surveyors to carry on private practice as architects was a wrong one, and led to the neglect of their public duties. Something must be done, either by the Board itself or by Act of Parliament, to obtain more power of controlling the district surveyors, who, if thay were confined to their official duties, would be far more efficient officers.

Mr. Cook said the question before the Board involved a great and important principle, and he should be sorry if, through the apathy of the Board, the prosecution fell through. In the interests of the public generally, the Board ought to take up the prosecution. The rubbish used by speculating builders was so vile, and it was put together so rapidly and carelessly, that the only wonder was that such "accidents" as that in question were not of far more frequent occurrence. The evil had attained such alarming proportions that nothing but constant supervision would suffice to check it.

The motion was unanimously adopted.

The Superintending Architect reported on a letter received from Mr. John Turner, district surveyor for East Islington, stating that the term of three months during which his son, Mr. J. Goldicutt Turner, had been appointed by the Board to act as his deputy, had now expired, and asking that such appointment be renewed for three months longer. Mr. Vulliamy recommended that the application be granted, and

Mr. Runtz made a motion to that effect; but

Mr. Fowler thought there ought to be some understanding come to by the Board as to appointment of deputy district surveyors, both as to the limit of duration of such appointments and as to their renewal. He said this without any disrespect to Mr. Turner, who was an old and most exemplary officer of the Board.

Mr. Furniss said the whole subject of district surveyors and their duties needed consideration by the Board, not only in respect of the appointment of deputies, but in other directions. Indeed, he saw no remedy but in compelling them to devote their whole time to the performance of their duties,—in other words, to give up practice on their own account. Whenever a district surveyor was professionally engaged in connexion with a building, it was customary to appoint another surveyor to see that everything was in accordance with the Building Act. In such cases, the neighbouring surveyor was generally appointed. Each officer might almost as well be allowed to superintend his own buildings.

Mr. Selway said some discretion ought surely to be allowed to the Board in considering such applications as that of Mr. Turner, but the essence of discretion was that there should be no hard and fast rules such as those suggested by Mr. Fowler. In the present case Mr. Turner was quite capable of fulfilling, and, as a matter of fact, he believed he did fulfil, all the duties of his office with the exception that at present he was physically unable to climb a ladder. He was an old and most deserving officer of the Board, and it was but reasonable to grant his request.

The recommendation of the Superintending Architect was then unanimously agreed to.

At the same meeting of the Board, a report of the Building Act Committee was submitted, with respect to proceedings taken at the Westminster Police Court by Mr. E. D. Drury, district surveyor, against Mr. Hankey, with reference to certain buildings at Queen Anne's-gate, Westminster. The committee recommended,—

"(*a*) That subject to the opinion of the Superintending Architect to be stated in writing to the Board, the Board do not insist on Mr. Drury continuing the proceedings with regard to the height of the buildings; (*b*) that the Board do insist on the floors of the passages being made of fireproof materials, in accordance with the Building Act; and (*c*) that subject to the arrangement of fireproof doors being made to the satisfaction of the Superintending Architect and Captain Shaw, the Board do approve of the same."

The Superintending Architect (Mr. G. Vulliamy) presented a report with reference to this subject, in which he stated that, having regard to the satisfactory character of the materials and workmanship, he was of opinion that the Board might safely approve of the construction of these buildings to the height sanctioned by the committee.

Mr. Furniss moved the adoption of the report of the committee.

Mr. Dresser-Rogers complained of the air of semi-independence adopted by many district surveyors, after appointment, towards the Board. He thought the district surveyors should rather inform the Board of likely or probable infractions of the law. At the present time it was left until the work had been done, and thus the Board lost a fair opportunity of enforcing the law.

Mr. Runtz was afraid the previous speaker hardly understood this case. The Board consented to Mr. Hankey's plans for carrying his buildings to a height of 141 ft.; but when it was found that he had carried them to a height of 147 ft. he was summoned. It appeared, however, that the plan approved by the Board included a Mansard roof, and this might have made the total height of the building 150 ft. or 160 ft.; but in carrying his walls to a height of 147 ft. he proposed to omit the Mansard roof in consideration of the improved facilities that would thus be afforded for the extinction of fire, should anything of the kind occur. Under these circumstances, the committee recommended that no further proceedings should be taken.

Mr. Furniss said Mr. Hankey was quite willing to comply with these requirements of the Board.

HERR KRUPP, OF ESSEN.

SIR,—Your interesting articles upon the great gun-factory in Westphalia have no doubt been read with much curiosity by many readers, for in these troubled times a gunmaker is almost as important a man as a king-maker used to be years ago.

It may be pleasant to supplement what has been written, by a personal recollection or two of the man in person. Towards the latter end of '71, Herr and Frau Krupp, accompanied by their son and other members of the family, came over to England for the winter, and with much good taste pitched upon the prettiest watering-place in the country,—Torquay, as their home *pro tem.* One rather odd coincidence was, that the then recently-dethroned Emperor of the French was then residing in the same town, and indeed quite near to the great German's villa. But, after all, so many well-known people are accustomed to go to Torquay (it is wonderful how much they all look like common folk), that the existence of a couple -yea, or of a score—of this world's notabilities in the place at once, is no unfrequent thing. We happened to have a contract in hand upon the Strand there at the time, and as everybody, of necessity, comes once or twice a day along that live promenade,—we, as a matter of course, saw everybody. Nearly every day just before eleven the unfortunate Emperor would drive slowly by; but far more punctually, immediately after the strike of the hour, Herr Krupp, accompanied by a gentleman or two, and generally by his English stud groom, would ride by, always on horseback, never in a carriage. They generally took the lovely road round the bay, towards Paignton; and could return home after an hour and a half's airing. The Herr is a sparely-made man, between fifty and sixty, with a somewhat haggard face, long scanty beard and whiskers, the hair plentifully scattered with grey. He is not a graceful rider; but the "cabbies,"—and Torquay cabmen are really authorities on horse-flesh,—have told me his cattle were the finest that ever came into the town. During the family's stay in England, Herr Krupp bought many hundreds of picked horses, and these used to be sent to Germany every week. The old gentleman never went personally horse-buying, to my knowledge; but his son and the stud groom I have seen a score of times at Newton Abbot and at Plymouth selecting the best obtainable animals. There was never a week passed, either, but that the pair paid a visit to a large horse bazaar, a few doors from where I reside in Exeter. Herr Krupp, jun., would then loll up against the wall by my yard, light a cigar, rub his glasses,—he always wore "specs,"—although not more (then) than about twenty-one, and possessing a beautifully full black eye,—and have the horses trotted up and down the street for his approval. The stud groom, who as I before said, is a Briton, and a particularly nice fellow, would light up too, and for hours together they would stand there chatting, whilst every really good horse that was brought out, after a little discussion, became the Herr's property. I have many a time felt right vexed to see such beautiful animals lost to the country. However, they were not "tight" with the money; and in what little business transactions I had with the family, I may say I found them to be thoroughly straightforward.

I remember being at Essen once, and the impression was that it was undoubtedly a vast place, but it did not impress me that such an amount of business "go" existed there as one was accustomed to see in the busy armour-plate times at such places as Sir John Brown's Cyclops Works at Sheffield. Further, unlike our English manufacturers, Herr Krupp is exceedingly jealous of visitors; indeed, it is only with the utmost difficulty that a foreigner gets a view of all that is going on in the works. Perhaps one of the greatest, if not the greatest, iron man that England has produced is the well-known Mr. Cammell, of Sheffield. Originally this gentleman kept a little "Tom-and-Jerry" shop in that town, and began manufacturing iron with three helpers. He now (or did recently) employs upwards of 5,000 hands, and, odd enough to relate, one of the original trio still remains in his service. I happened to execute a commission at his shooting-box, near Hathersage, in Derbyshire, a few years ago, and he told me then, with great glee, how he managed to see over the Essen factory. Many a time he went over purposely into Germany, but always without success, for under no circumstances would the officials admit him. Now it happened that in '51 Herr Krupp exhibited at our Great Exhibition. The German was unknown, and his exhibit met with no favour in the eyes of our countrymen; indeed, they were almost antagonistic to the foreigner. One of the few who pitied Krupp was jolly little Mr. Cammell. He invited the gunmaker to his hotel; and many a pleasant evening they spent together during the season. The Exhibition over, the friends parted, and never met again. Mr. Cammell resolved to take advantage of their old acquaintance; so, ordering his coachman to drive hard, and stop for no one, he boldly drove into the place, and straight across to Mr. Krupp's private office. Then, before anybody could say him nay, he bustled into the place, caught the German by the hand, congratulated him upon his looks, and reminded him that more than twenty years had rolled away since they, too, had spent cosy hours together in London. "And now," continued Mr. Cammell, "I've come across purposely to see your place. You must take me round yourself everywhere, and show me everything." Herr Krupp could not refuse his late host's bluffness; it took him quite off his guard; and all the plucky English manufacturer wished to see, he had opportunities for examining to his heart's content. I may add that Mr. Cammell does not think Herr Krupp's system will ultimately prove successful; and he considers our English guns by far the better weapons. May the day be far distant ere their comparative merits are tried; for we belong to one race; are associated together by a thousand kindred ties; and, after all done and said, it is very seldom that any good is obtained by "knocking up a row!"

HARRY HEMS.

THE MILL STATUE.

As our readers are aware, the statue erected on the Thames Embankment in honour of John Stuart Mill was formally inaugurated on Saturday last. One always looks with a good deal of interest, but not often with very much of hope, to any addition to the list of our public statues; a list including so many unhappy and unsatisfactory attempts. In the present instance the name of Mr. Woolner as the sculptor was a guarantee that the statue would, at all events, not be commonplace. As a fact, it is very much the reverse; there is an individuality and intensity of expression about the figure which quite takes it out of the category of regulation memorial statues. The author of the "Essay on Liberty" is seated, stooping forward with an eager look, while the right hand, resting behind on a book, serves to aid in keeping the balance of the whole figure. The intense expression of the thin worn features and sharp prominent nose is very well realised, and at once stamps the head as that of a man of no ordinary power: and the attitude of the figure has a great appearance of realism, suggesting "*sic sedebat.*" Yet, regarding the whole in reference to the conditions of sculptural art, we are led to question whether this very realism of action is not a

drawback to the work in an artistic point of view; whether a bust alone, on a suitable pedestal, might not have been a more graceful and pleasing memorial. For, in spite of the character in the attitude, the effect is not dignified and not sufficiently quiescent for sculpture. In front of the figure the effect of the whole pose is really bad and awkward, and from the left side of the figure also; the best view of it is the oblique one from the right, where the stooping figure gets the balance and support of the right hand and arm. The point we wish to draw attention to is that when the subject of such a statue was decidedly weak in physique, and the figure presented nothing specially suitable for effective treatment in sculpture, which was certainly the case with Mill (and even as it is we are inclined to think the sculptor has exaggerated his height in order to give more importance to the statue) it may be better judgment to give only a portrait-head rather than a whole figure, especially when the fame and achievements of the person represented were so purely intellectual as in this case. We may suggest as instances in which this has been ably done the monument to Alfred de Musset, illustrated in Daly's "Architecture Funéraire," and that to the painter Regnault, designed by MM. Pascal and Coquart, of which we gave an illustration in the *Builder* for Nov. 4, 1876. We advance this view on the principle that a sculptured portrait memorial should preserve that which was noblest in the external aspect of its original; and that to perpetuate an awkwardness of attitude or a defective figure, however characteristic it may be, is hardly in keeping with the real aim of monumental art.

The position of the figure, near the School Board buildings, and looking towards the seat of Government at Westminster, is in itself very suitable; and we may add, what cannot often be said of our public statues, that it is supported by an elegant and well-designed pedestal.

THE KINGSLEY MEMORIAL FOUNTAIN.

It may be remembered that some time ago it was announced that the widow of the late Canon Kingsley had decided to erect a monument to his memory, which was to take the form of a drinking-fountain, and that her wish was that it should be erected in some part of the parish of Bermondsey. The fountain, which is said to be a handsome mural structure, is now completed, and ready for erection, but an unforeseen difficulty has arisen in reference to the Bermondsey site, and it now appears that that parish will not have the benefit of Mrs. Kingsley's gift. After a lengthened correspondence on the subject with the Bermondsey authorities, it seems to have been ultimately agreed upon that the fountain should be erected in Convent-row, a densely-populated district, where it might have been of great service to the inhabitants. The authorities of that particular locality, however, are said to have interposed some further obstacle, which has induced the widow of the late canon to withdraw her original proposal, and we understand that Poplar will now have the benefit which was to have been conferred upon Bermondsey, Mrs. Kingsley having placed the matter in the hands of the Metropolitan Drinking Fountain Association, with the expression of her wish that it may be erected in Poplar, and we learn that this will at once be carried out.

FOOTPATHS IN ST. JAMES'S PARK.

Our attention has been directed to the very discreditable state of two of the main thoroughfares for foot-passengers in St. James's Park. One is the broad walk skirting the enclosed portion of the Park from the end of Birdcage-walk to the point opposite the Duke of York's Column. This is a walk not only largely used by "the many," who may have their right also to clean paths, but it is one of the most direct footways between the region of Westminster and Club-land, and as such is not unused by gaitered clerical dignitaries and statesmen high in office. Two or three months ago men were at work chipping and turning over the top of the soil with spades and picks, as if in preparation for putting some new finish on the path; but, if so, it has been thought better of, and since these operations, the footwalk has been dirtier and softer than ever, and in rainy weather is so bad that pedestrians take the carriage-way in preference. The other walk referred to is that leading up from the bridge over the Park water to the point opposite Marlborough House, the direct way between Pall Mall and Queen Anne's-gate and the St. James's Park Railway Station, and a thoroughfare very largely used: this is even worse than the other, and in rainy weather is a perfect ditch; and here the passenger has no choice of walking, being railed in on either side. Asphalte has been laid down on the walk between the Marlborough House and Buckingham Palace points, but there is much more regular foot-traffic *across* St. James's Park than along it, in the last-named centre walk especially. The walks in question ought at once to be properly laid with some material that will give a dry, clean surface; their present state is a source of constant discomfort, and very discreditable.

DIFFUSION OF SANITARY KNOWLEDGE.

At the annual meeting of the Keighley Trade, Science, and Art Schools, Sir Henry Cole, C.B., distributed the prizes, and spoke well of what had been done by the town. At the close of his address, Sir Henry, after alluding to the teaching of domestic economy, said there was another subject he wished to mention, a very broad one, and one which he was sorry to say the northern counties were pre-eminently deficient in. It was what they might call the general public health question, or sanitation, as some called it. The present Prime Minister made a prominent feature of it. He had spoken of his Government as being distinguished by it, and he had used the phrase *sanitas sanitatum*. But the Government had not done much in the matter; they had done their best, in a little way, in an attempt to improve the health of those who lived in towns. What was to be desired was a diffusion of scientific knowledge among the people: then sanitary questions would make greater headway. Keighley was in advance of any large town in Yorkshire with regard to public sanitary matters. Leeds was really in such a deplorable condition that the clergy of all kinds ought to offer up prayer for its reclamation. Bradford, he was bound to say, was just one shade better; it did not pollute its river quite as much as they did, and it sent an effluent into its river very fairly pure, in fact very good, but, like Leeds, it was losing thousands of pounds every year by wasting what nature intended should not be lost. Dewsbury, Halifax, Barnsley, Rotherham, Sheffield, and Wakefield were all in a deplorable condition in that respect, but at Keighley he was glad to say they were better. The Bishop of Manchester had said that we ought not to stop amusements, but try to purify them, and he thought from what he (Sir Henry) had heard, that the managers of the Institute were trying to do that to some extent. It had been revealed to him that day, with a little hesitation, that during the last week they had had some country dances in that hall. Now, he thought that was an exceedingly good thing to do, and for his part he would say, if the lads and lasses attending the Institute had a weekly dance in that hall, it would be turning the place to a very good account. He therefore hoped they would not leave dancing to the annual festival, for it was a very good and healthy exercise, and young people ought to enjoy it. The speaker went on to urge the importance of teaching music in a thorough and systematic manner at mechanics' institutes, and concluded by saying that he thought it was highly advisable that Keighley should be incorporated, for there were many things which a corporation could secure which a Local Board or Board of Health could not. His parting advice to them, therefore, was to determine to get a corporation as soon as they could.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the meeting of the Society held on the 24th ult., Mr. C. H. Driver, V.P., in the chair, a paper on Chimney-shafts was read by Mr. R. M. Bancroft, past-president of the Society. After drawing attention to the wide differences of opinion between various authorities who have written on the subject, especially with regard to parallel and taper flues, and whether chimneys should have a regular batter or outline similar to the theoretical diminution of columns, which, it was said, should have a slight swell in the centre of their length, the author proceeded to describe upwards of forty chimneys which the different owners and designers had supplied him with particulars of. These he had tabulated, to show at a glance height, thickness of walls, proportions of diameter to height, weight, cost, time of building, &c. He drew attention to the designs of caps, and in one case noted where a cap had cost 700*l.* in repairs and removal after the stack had been completed. Mr. Bancroft then drew attention to the difficulties in straightening chimneys when out of the perpendicular, and mentioned several successful cases where this had been done; but in one example, through neglect, a fatal accident and much damage was caused. Taking down old chimneys was also descanted upon, and a chapter on lightning-conductors concluded the paper.

A discussion followed, in which the vice-president, Messrs. Perrett, Payne, R. H. Twigg, Willcocks, Howard, Street, Munday, and Hill took part. The meeting was then adjourned till Thursday, February 7th, when a paper will be read by Mr. A. F. E. Grant on Richmond Waterworks.

THE WORKMEN'S BUILDINGS IN PECKHAM AND THE METROPOLITAN BOARD OF WORKS.

Some time ago, as our readers know, the Board issued two summonses against Mr. William Nunn for the infringement of the Building Act in reference to a block of buildings which he is at present erecting in Choumert-road, Peckham. One of the summonses alleged that the infringement of the Building Act consisted in the ventilation and general sanitary arrangements of the buildings having been so far disregarded as to render the several tenements absolutely unhealthy. The second summons had reference to the width of the street leading from the buildings. On the occasion of the first hearing of the summonses the case was adjourned in order to enable the magistrate to view the premises, and having done so, he (as reported in the *Builder* at the time) gave his decision against the Metropolitan Board, dismissing both summonses with costs, the provisions of the existing Building Act not being sufficiently definite to meet the evils complained of by the Board. Since the decision was given the Local Government Board have been requested to take action in the matter, but they have declined to do so. The general purposes committee of the Camberwell Vestry, in whose district the buildings are situated, have, however, recommended that, in relation to this matter, the Metropolitan Board take steps in the present session of Parliament to obtain the insertion of a clause in the new Building Act which they are promoting, in order to alter, as they state, "such an anomalous state of the law," and we understand that the Board have agreed to apply for such a clause to be included in the Bill.

Mr. Nunn has, it is said, a ground of complaint in that the district surveyor raised no objection to the plan adopted till the building was nearly finished.

ELECTRIC LIGHT.

At the Institution of Civil Engineers, on the 22nd of January, the paper read was on "Some Recent Improvements in Dynamo-electric Apparatus," by Dr. Higgs and Mr. Brittle, C.E. A description was given of the latest construction of Siemens's dynamo-electric machine and electric lamp, the latter devised specially for lighthouse illumination, and similar lamps were about to be supplied for the Lizard Lighthouse.

Much excitement had been evinced as to the probable competition between gas and electricity, as sources of light-power. Although, under certain circumstances, these two agents undoubtedly came into competition, they had two separate fields. Hitherto gas had been employed for lighting spaces of both large and small dimensions, because a better source of light for large spaces had not been procurable with economy. But for lighting large spaces not subdivided by opaque objects or screens, it was a want of economy to employ gas. Assuming light-power proportional to horse-power expended, 100 horse-power would give 150,000 candles' light; distributed from three points, the cost would not be more than 1*l.* 2*s.* 6*d.* per hour, each light-centre giving an illumination which would enable small print to be read at a distance of quarter a mile from the light. A burner giving the light of twenty candles consumed six cubic feet of gas per hour, which might be

manufactured at a cost of 2s. per 1,000 cubic feet. This gave 7,500 burners' light only, and 45,000 cubic feet of gas at a cost of 4*l.* 5s. per hour, a ratio of 4 to 1 in favour of electric lighting. The economical ratios differed greatly, being dependent chiefly upon the price of gas and of the motor power employed. For large spaces the cost of electric lighting was about one-fourth, or even one-fifth that of gas lighting, when steam had been used as power, and wear and tear were reckoned. With a gas engine as motor, the ratio had only been as 1 to 3, the greatest economy having been with a turbine as motor. At M. Dieu's workshops at Davours, the cost per hour for gas was 2s. 0·632d. against 1s. 7·2d. for electric lighting. M. Ducommun found, taking into account wear and tear and interest, that gas cost 2·25 times more than the electric light, which ratio was increased to 7·15 when wear and tear and interest were left out of consideration. At Messrs. Siemens Brothers' Telegraph Works the economy was as 2 to 1 in favour of electric lighting. If, however, the ratio of light-intensities were adopted as the ratio of efficiency, the advantage would be considerably higher (20 to 1) in favour of electric lighting. It might be laid down as proved by experience, that for lighting large spaces, not too much subdivided, the advantage was greatly in favour of the electric light; but that where numerous light-centres of small intensity were required, or where the space was much subdivided, the advantage was in favour of gas. This advantage would cease when a practical method of subdividing the electric light was obtained.

THE BOWES MUSEUM.

THIS fine building which, since the latter end of 1869, has been in course of erection at Barnard Castle, may now be said to be approaching completion. Since its foundation was laid by the late Mrs. Bowes, better known, perhaps, as the Countess Montalbo, the edifice, which is palatial in its extent, has slowly grown up, story by story, until the "Josephine and John Bowes Museum" gives promise of being the finest erection of its kind, not situated in one of the larger cities of the kingdom, to be met with in England. Extending to a length of over 300 ft., built in stone with all the grace and strength characterising the best period of French Renaissance, and fronted with a terrace and gardens, which will recall the finest specimens of Parisian taste, the Bowes Museum stands almost unrivalled among similar constructions. Particularly fortunate in its site, the noble lines of the building are not spoiled by contrast with meaner accessories. Unfortunately, Mrs. Bowes, dying in 1874, did not live to see her work completed. It has, however, been carried on by Mr. Bowes with a tender solicitude that nothing should be wanting to make the Museum what it was originally intended to be, and the several principal rooms already completed show that his wishes will be more than realised.

Entering the Museum through a bold circular-headed doorway, 24 ft. by 6 ft. high, the principal hall and grand staircase are reached. These are lined with polished ashlar stonework. The entrance-hall is about 42 ft. square and 31 ft. high. The cold and severe effect of the freestone employed in its construction is, in the lower part of the hall, relieved by polished supports of Peterhead granite, which carry the landings communicating with the museum or first floor. Passing under massively-decorated stone arches, the visitor, leaving the entrance-hall behind him, ascends a broad flight of polished granite steps to reach the first landing above, which is constructed of huge slabs of Craigleith stone. Right and left of the landing, to which the grand staircase gives access, are the two end wings, or end pavilions, the passage communicating with them being 9 ft. wide. In the first floor, which is built upon twelve solid stone-arched basement rooms or cellars, are the triad of museum or exhibition halls. Their total measurement is 200 ft. by 45 ft. Down the centre run three series of five lofty polished Dunhouse stone columns, which support the floor above. These art-galleries have a total height in wall-exhibition space of 28 ft. Above this they are carried a further height of 22 ft. The principal decorations are in buff and chocolate. The lighting is by flat roof-windows inserted under the outside lights. The picture-rods are secured in supports fixed into lead-plugged sockets, which are let into the main walls of the building. Moulded bases and panels decorate the dado in each of the three rooms. The galleries, it may be stated, are copies of one at Munich. Altogether there are over 100 rooms in the Bowes Museum. The masonry was finished five years after the building was commenced, and the last three years have been spent in fitting up the interior. In front of the museum, a terrace, 372 ft. in length, is being constructed. It is to be ornamented with a series of rock-faced stone panels, with circular and square-headed recesses for the insertion of groups of statuary.

To the east of the Bowes Museum has recently been commenced the memorial chapel, in which it is intended to place the remains of the late Countess, to whose munificence Barnard Castle will be indebted for the princely gift of the Museum and its contents.

Both Mr. Watson (Newcastle), the architect, and Mr. Kyle (Newcastle), the builder, have evidently striven to plan and erect a building which should last, if not for all time, at any rate for a far longer period than most contemporary buildings. The total cost of the Museum, as it stands, will be about 100,000*l.*, exclusive of the 25 acres of ground on which the Museum and Chapel stand. Illustrations will be found in one of our earlier volumes.

PROPOSED NEW VESTRY-HALL FOR BERMONDSEY.

THE question of erecting a new Vestry-hall came before the Bermondsey Vestry at their last meeting. It was stated that the room in which the Board now met did not belong to the Vestry, and that the only office they possessed was a hired one. It was urged that in a parish of that extent, with a valuation of 400,000*l.*, they ought to have offices worthy of the parish, as other parishes of less rateable value than this, and also of less importance, possessed suitable office buildings. Several members spoke strongly in favour of the proposal.

A resolution was passed to the effect that the Board at once take into consideration the question of providing a new Vestry-hall and offices for the transaction of the business of the Board.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

SIR,—With reference to your recent kindly notice of this Society, allow me to state that the council had a type of Cypriote cut expressly to illustrate the "Tablet of Dali," Mr. George Smith drawing the characters himself. In the like manner, when Capt. Prideaux began his series of papers on the Himzeritic language, a special arrangement was entered into with Messrs. Harrison to cut a fount of that type also, the Society contributing towards the expense of the same. We were further prepared to cut the Hamethite characters as well had there been a sufficient consensus among scholars as to the exact form of the hieroglyphics to be selected; and I must add with praise that the late George Smith promised me that he would draw up such a type of the Hamethite characters when he should return from his third expedition to Nineveh, that third and fatal journey from which he never came back.

W. N. COOPER, Secretary.

THE SO-CALLED LAW OF ANCIENT WINDOW-LIGHTS.

SIR,—I was glad to see the article in your paper of January 26. You say, very truly, that the absolute necessity for revision of the present laws regarding window-lights must be brought home to the Legislature. The law as it now stands does place a weapon in the hands of evil-doers, and it is a weapon which will be more frequently used as the evil-doers find out that they possess it.

The Act of 1832 was probably intended to define a right of light as one "actually enjoyed for the full period of twenty years without interruption," owing to the difficulty of proving, in a court of law, the existence of an "absolute and indefeasible right of light from time immemorial." The Act could not have been intended to have the effect it has, and will continue to have, until it is repealed or altered.

Two cases have lately occurred in my own experience, in which the "dominant" owners broke out window-lights overlooking the neighbouring property, and asserted their right to do so; "we can break out any lights we please, and you can, if you choose, block them up." And the lights were blocked up, by erecting expensive screens of timber and boards, at the cost of the "servient" owner. Ugly and expensive robbery and annoyance, by Act of Parliament.

Another case was told me by a brother architect as having occurred within his knowledge. Two neighbours lived on excellent terms. One of them, finding his back kitchen rather dark, requested and obtained verbal permission to open a window light over his neighbour's yard. In the course of time, the obliging "servient" neighbour died, and his son, wishing to make some additions to the premises, had to pay 150*l.*, after considerable litigation, to purchase that right of light, which had then been allowed to remain a little over twenty years.

In point of fact, a man who opens a window-light over his neighbour's property commits a trespass, and injures the property of his neighbour; and such an act ought to be made amenable to the laws of trespass, with greater strictness than any other, because it is a more dangerous and more insidious trespass.

W. JACKSON.

ART EDUCATION IN MANCHESTER.

THE *Manchester Courier* says that the revised Art Museum scheme for Manchester contains the following suggestion, prepared by Mr. J. H. Nodal, at the request of the committee, for the Art Museum in relation to schools and workmen's clubs:—

To Mr. Horsfall's scheme, which contemplates one central art museum only, the committee have thought it desirable to make an addition. They propose to place collections of works of art in the Board and other elementary schools of the city and in working men's clubs. A single museum is obviously an inadequate provision for a widely-extended town like Manchester, and, unless supplemented, it would but imperfectly fulfil the purposes described in Mr. Horsfall's pamphlet. But the Board schools and working men's clubs supply a means of spreading the influence of the museum and its works over a wide area, besides attaining some ends which even the central institution would be powerless to accomplish. The idea is to spend a portion of the funds at the command of the committee in the purchase of really fine drawings, casts, and artistic reproductions, which shall be suitable in subject and character to the minds of children, and shall interest them in the same way as the works in the central museum will interest grown-up people. These it is proposed to arrange as attractively as possible in the Board schools and in any other elementary schools, the managers of which are willing to work with the committee. If arrangements can be made, and there is little doubt they can, the schoolrooms might be opened on certain evenings to the parents of the children and the people of the neighbourhood, and, as in the central museum, there might be given some music and readings, and simple explanatory addresses. A similar plan might be followed with regard to working men's clubs. It is difficult to exaggerate the importance of bringing children under the influence of really beautiful forms of art. The silent education of the eye has been too little considered in our educational systems. Moreover, the teachers of our Board schools would gain greatly by the proposed scheme. They urgently need, and would be much encouraged by, the countenance and sympathy of those who may be expected to work with the art-museum committee. Unlike the teachers in voluntary schools, who can generally depend for counsel and encouragement upon the clergymen, ministers, and members of the congregations, the masters and mistresses of the Board schools occupy a somewhat isolated position. Their connexion with the members of the School Board is necessarily little more than official. From the parents of the children they can look for little or no aid or sympathy, and it would undoubtedly be a great gain to them, and would give an impulse to their work, if their several schools could be brought within the range of a more general and public recognition, such as the plan of the art-museum committee is calculated to accomplish.

"DID ANGLO-SAXON SLAVES WEAR COLLARS?"

REFERRING to my letter to you, which appeared in your impression of the 19th ult., I now beg to hand you the inclosed (with permission) copy of a letter I have received from Mr. E. Armitage, R.A., on the above subject. Perhaps some of your readers can give further information. FREDERICK DAVIS.

"Dear Sir—I am very grateful to you for having taken so much trouble about the collar question. My correspondence with Mr. Freeman took place in October, 1876. It was, therefore, of ancient date, and was published accidentally without my knowledge.

The picture was finished in time for the Royal Academy Exhibition of 1877, and is now in the Walker Gallery at Liverpool.

'Fosbroke' is certainly mistaken in saying that an iron collar was worn by the Saxon slaves; they were worn by the ancient *Roman* slaves, but never by a *British* serf. This I ascertained, beyond the possibility of doubt, before finishing the picture.

Mr. F. Palgrave, in his great work on the Normans, mentions Gurth's collar as an instance of a popular mistake; but perhaps the best evi-

dence against collars is their non-existence in any museum. Saxon necklaces, armlets, bracelets, and even toothpicks, are common enough, but no iron collars.

Those you mention in your letter are either Roman or else are collars for criminals. British serfs were sometimes branded on the shoulder with the name or the mark of their master; but this was not often done.

When I told Mr. Freeman that I had searched in vain for any account of these collars, I meant that I had not found them mentioned in *several* histories of England (the Pictorial amongst others). Subsequently, through the kindness of the British Museum officials, and also through Dean Stanley, I satisfied myself of their non-existence.—E. Armitage."

OPEN SOIL-PIPES.

Sir,—I should like to ask if Mr. Norman Shaw's improvement in the arrangement of closets and soil-pipes has been exposed to the trial of actual daily use during a period of continued severe frost?

As far as my experience goes, the danger of stoppage in frosty weather is the chief drawback to the principle of disconnexion when applied to sink and other wastes. This courageous and consistent extension of that principle to our greatest domestic nuisance and convenience seems to me exposed to risk from the same cause. I should fear that first icicles, then a plug of frozen sewage matter, and then a total stoppage would form in a hard frost at the point of disconnexion, and if this cannot be prevented, or has not been shown by sufficient experience not to occur, the improvement, great as it promises to be, can hardly be safely adopted.

I hope Mr. Norman Shaw will not object to reply to this question through your columns, as both question and answer bear upon this most important subject very directly.

T. Roger Smith.

Sir,—The correspondence upon this subject will, I trust, be the means of greatly advancing our knowledge as to the utility or otherwise of such a revolutionary method of soil-pipe construction as that advocated by Mr. R. Norman Shaw in your issue of January 12th. For my own part I must confess to some misgivings upon the point, and incline to the opinion of Mr. H. Saxon Snell, that a coating of excrement will be formed, if not upon the whole length of soil-pipe above the syphon-trap at foot, at least in that portion of it immediately below the closet, where its position is nearly horizontal. A very important consideration is urged by Professor Fleeming Jenkin, who points out that upon Mr. Shaw's own showing the water-closet he describes, although deprived of its water-trap, is of the Bramah pattern. As the valves of this type of closet are by no means absolutely certain to remain air-tight, the question arises whether Mr. Shaw would be satisfied with this construction of soil-pipe when provided with nothing but an ordinary open hopper as the closet apparatus. There is, in my opinion, one very serious objection to the adoption of such an arrangement in the liability to the spread of infection from the specific poison of enteric diseases. Assuming that Mr. Snell's surmise is well founded, and that a coating of deposit, however slight, is formed in any portion of the soil-pipe, there will be a danger of polluted air rising from the soil-pipe into the hopper, and thence into the house. As to the probable nature of sewer-air produced under such circumstances, there is a remarkable paragraph in Dr. Buchanan's Report to the Local Government Board upon the outbreak of enteric fever in Caius College, Cambridge, in 1873.

Commenting upon the supposed access of specifically polluted sewer air to the college water-supply through a closet-trap emptied by atmospheric influences of its water, he writes as follows:—"Sewer air, as such, finding its way to the water-pipes, would probably be more dangerous than sewer air that reached them after having been absorbed by and evaporated from water; for the latter sort of air could only contain *volatile* impurities, while the former would contain *particulate elements* as well; and it is probably *such elements* that any specifically injurious quality of sewer air resides." The italics are my own. Unless such a statement as this is to be ignored as entirely worthless (and I should hesitate before doing so), I think it will be conceded that whatever means be adopted for the disconnexion and ventilation of the soil-pipe, the trap below the closet-hopper should still be retained, although there is no doubt that many forms of trap now in use are objectionable. I trust that the experiments suggested by Professor Jenkin will be duly tried, and that Mr. Shaw or others interested will communicate the results to your columns.

John S. Hodgson, C.E.

We can give our testimony to the excellence of the system of drainage described by Mr. Billing. We have carried it out in many places, and with the best effect. We also tested it in a block of offices where five waterclosets lead into one stack of soil-pipe, with only one trap, and that at foot of soil-pipe. These continue to work without the slightest smell. We find that valve-closets should be used, not pan-closets.

Ashby & Horner.

Sir,—The usual arrangements of soil-pipes may be conveniently divided into three classes, viz.:—

(A.) Closed and trapped, without ventilation.

(B.) Closed and trapped, with ventilation.

(C.) Open and untrapped, and therefore self-ventilated.

As to A, comment is needless, because ventilation in some form is a *sine qua non*.

As to B, If correct ventilation be established the remaining point is the position of the trap.

Now a trap at the top of the soil-pipe seems *primâ facie*, more desirable than a trap at the foot; for, surely, there is less danger of exhalation from a trap alone, than from a trap and soil-pipe combined.

It is argued that with the trap at the bottom (both pipe and trap being ventilated), no foul air enters the building from either.

But is this a practical fact? Is it actually the case that ventilation of either one or both is constant and complete under all conditions of the atmosphere? Has it been demonstrated that, where unequal temperatures exist in different portions of any given soil-pipe, which may be partially inside and partially outside a building, *all* foul gas escapes at the highest orifice of the ventilating shaft, and that none finds its way into the building? Besides, cannot a trap at the top of a soil pipe be as completely ventilated alone as a trap placed at the bottom and ventilated in conjunction with the soil-pipe?

However varied opinions may be on these points, it will doubtless be conceded that in every sound and proper system of drainage by closed pipes, the following rules should be scrupulously adhered to:—

1. That a water-trap divide the sewer and house drain.

2. That each section of pipes be ventilated by a shaft of adequate dimensions, so arranged that fresh air can enter as freely as foul air can escape.

3. That all pipes and joints be absolutely air-tight.

Very scant attention is bestowed on the last rule, even in vertical pipes above ground; while in underground drainage the mere suggestion of making the whole system air-tight is commonly smiled at as chimerical, even by some thoughtful and distinguished men. Yet, as a matter of health, air-tight drain-pipes inside or underneath a building are just as necessary as air-tight gas-pipes.

The merits of system C were exhaustively placed before the public by Mr. R. Norman Shaw, in your issue of the 12th, and so ably supplemented by Mr. Rogers Field, in your impression of the 19th inst., that further explanation is unnecessary.

The advantages of this arrangement are self-evident. All trapping of soil pipes is dispensed, and thorough ventilation obtained. With an air-tight drain under the building, all inlets to the same placed outside, soil and all other pipes disconnected therefrom, no sewer-gas can be generated, or possibly enter the building.

There can be small doubt that, with a quick fall to the soil-pipe, a good flush of water, and pipes of proper diameter, this system is eminently satisfactory, and will be rapidly adopted by all who crave for healthy houses. It but for has the substantial recommendations of simplicity and economy.

Walter Buckridge.

CLEOPATRA'S NEEDLE.

Sir, Now Cleopatra's Needle has arrived, and awaits its destination, would it not be well while to make one more effort in your journal to avert such a *dénouement* as its erection in Parliament-square? The curious thing is, that this site has been approved by several "eminent architects"; but, surely, one consideration alone should suffice to decide the question, viz., that the whole of this particular site is as it is such an assemblage of incongruities that, to add one more, by the presence of this ancient monument, would cap the absurdity to a degree, and furnish one more example of the unfortunate mistakes which have made our public sites and buildings the laughing-stock of Europe. From whatever point viewed the jumble is startling. The Crimean Memorial in the Broad Sanctuary, the Abbey, St. Margaret's, Canning's colossal statue,—as compared with others of a different size, and which even are not uniform as to size of figure or design, and height of pedestal,—the *bizarre* fountain, the medley of lamps and railings, make an *ensemble* from which every element of repose is lacking; while the marked characteristic of Egyptian architecture is repose, and it is evident that nothing but an open, unobstructed site would be congruous with this interesting memorial of the past.

Referring to the whole site of Parliament-square,—how much was lost by the abandonment of Sir C. Barry's design for completing the quadrangle of New Palace-yard! The present gaunt aspect of the Clock-tower and the array of garish lamps are most unfortunate. Is it too much to hope that, on the completion of the New Law Courts, and the removal of the Westminster Courts, the original design will be carried out in its entirety?—"a consummation most devoutly to be wished for."

B.

We have received a letter from the President of the Institute of Architects advocating the claims of a site proposed in our columns early in the discussion,—that in St. James's Park, just inside the iron inclosure, and opposite the centre of the Horse Guards. Our flag, however, is marked "Embankment," as from the first, and we have nailed it to the mast. The model, as our readers know, is to be tried on the Embankment presently; and we are much pleased to hear that the Parliament-square site, at any rate, is abandoned.

THE MASONS' STRIKE.

Sir,—A letter in your important organ of the trade, from Mr. Harry Hems, on the above subject, has attracted my attention, and caused me to look for him in the "London Directory" in vain. I wanted to know what manner of man he was who approved of 4d. masons! Mr. Hems refers to the case of Mr. Macey, a well-known builder, who was summoned by a mason, and it came out that Mr. Macey can get men at from 4d. to 9d.! Perhaps this accounts for the extraordinary difference in estimates which we so often find in your columns. But great is the mystery of contracts. In the City of London paving is supplied at 6½d. a foot, which, according to the builders' price books, is worth 14d. per foot at least. How they work that little game is a problem which I mean to solve one of these fine days. However, as a master mason of twenty-five years' standing, I do not believe in treating the men as enemies, but as fellow-tradesmen. They have a right to put a price on their work, just as we have on ours, and they have an equal right to combine to fix a price as we have. If you were buying a pig from one of your men, you would ask him his price for it, and he would have a right to put a price on it, as he has a right to put a price on his labour. I do not think this masons' strike was well timed or advisable, but the men were honest and honourable enough. They gave six months' notice, and offered to meet the masters and arbitrate. Your correspondent, "Z," says, "I would meet no workmen's deputation," &c. Well, that is tantamount to saying that "Z" must fix the price and hours of other people's labour, and they must have no voice in the matter. As to the regulation of apprentices and foremen, that is one of those things, as the song says,—

"We often hear about, but very seldom see."

There are so many Carlton Club scandals floating about regarding trade unions, invented by aristocratic idlers and tax-eaters, that I am surprised at "Z," who says he is a practical man, repeating the gossip of a lot of thimble-riggers, who know no more about building than spinsters, and never did a day's work in their lives. It is of no use to oppose trade unions now. What are clubs, and inns of court, and universities, and halls of various professions, and a State Church, but trade unions? The upper and middle classes have had their guilds for ages, why not the mason? Why cry out, "Enough! enough!" so early in the case of the poor mason, when you have allowed the barristers and lawyers to prey upon the public with their exclusive arrangements so long? Why do not the builders and master masons have a trade union, not to cut the men's throat, but to stop the cutting of one another's throat? It is notorious that during a lock-out many builders will pick out the best men, and give them the advance on the sly. But I think if only the spirit of arbitration were to animate masters and men, these strikes and locks-out would be prevented altogether. The trade-union leaders are not such violent men as not to listen to reason. They are the statesmen of labour, and they would be only too happy to meet the kings of capital if these mighty Cæsars would condescend to receive them as ambassadors. But while all parties are so stiff-necked, disputes *will* occur, and great harm is the result.

If the masters would show a willingness to meet the men, they would get on all the better.

I can remember when Trego's men had to go to the City by the penny boat to be paid. There was a great fuss made about the four o'clock movement at that time, but the end of all this stiff-neckedness was that the masters conceded more in the end than they would have done by arbitration. True, the men suffer much; and I think if a little more consideration were shown for the homes of the working men than to deal out "the sack" wholesale without any previous notice,—as is too often done,—the men would not fail to return the compliment.

The Germans and other foreigners are, no doubt, very good masons, but English masons are unsurpassed, and I believe they will pay their masters very well at the price they charge for their labour. No one regrets these disputes more than I do. I say, let capital be respected; let labour be respected; and with mutual respect and confidence Englishmen will at least get on as well with one another as they will with Yankees or Dutchmen, to say nothing of the Chinese and Japanese, who will next be invited over, I suppose, to build our future monastery-prisons, charitably termed "courts" and palaces. I have been at meetings of masters, and I have noticed that those who carry the sway are young college-bred gentlemen, sons of builders, but not themselves practical men. Practical men know that the unionists are the best workers, and they do not want to lose their valuable services. Those who attempt to crush societies are doing a foolish and suicidal thing. They tried to crush the engineers, and what was the result? The engineers are the strongest society in the world. The man who would crush the masons is no friend to the masters, the men, or the country at large.

A MASTER MASON.

*** We have been most anxious throughout this disastrous dispute to allow the friends of both sides to state from time to time their views, and have in consequence permitted here and there assertions to be made which we knew to be exaggerated. Our present correspondent, for example, a well-known master mason, speaks of men "who would crush the masons"; but we do not know of any such attempt. The masons say they must have 10d. an hour; the masters say they cannot pay so much, and are doing their best to obtain the same sort of labour at a cheaper rate. What further loss, waste, and distress will come of the struggle, we deeply regret to have to say, it yet remains to be seen. "Master Mason" would also have it understood that the men would leave the question to *arbitration*; and another correspondent, who describes himself as "A Mason on Strike and a Delegate," asserts the same thing. We feel bound, therefore, to state, as we can without betraying what might be considered confidence, that the difficulties which have intervened to prevent this most desirable step were not raised by the employers.

WOOD PAVEMENT.

SIR,—There was a paragraph in your paper of the 19th ult., inquiring why the wood pavement in Piccadilly was being restored. I am glad, therefore, to give you the following information.

The pavement was laid nearly five years ago, on this company's original system of double flooring-boards. This system has been for some time abandoned, principally on account of the sinking of the soil beneath the boards, resulting in the blocks becoming loosened and separated. The pavements recently laid by this company in the City, the Strand, at Derby, &c., on a bed of concrete, are as solid as any pavements can be made, and the joints between the blocks being cemented with asphalte, no water can possibly penetrate.

The company has relaid a large area laid on the original system, where defective from bad foundation, and has promptly fulfilled every engagement for maintenance and repair. This has only been done by great outlay, and the experience of nearly six years has proved that no wood pavement can be substantial unless the surface water is effectually kept from penetrating to the foundation. All the various fancy systems with material between the blocks and the foundation will soon be things of the past.

ARTHUR R. GRENFELL,
Chairman, Improved Wood Pavement Co.

THE FALL OF HOUSES IN THE HAYMARKET.

AT the meeting of the Metropolitan Board of Works, on the 25th ult., a report was brought up from the Building Act Committee with reference to the fall of two houses, Nos. 22 and 23, in the Haymarket, on Thursday night, the 17th ult. The report stated that the subject had been under the consideration of the committee, who had conferred with Mr. Robert Walker, the district surveyor, thereon, but that the ground at the present time was entirely covered with fallen materials, and until these were cleared away and the basement exposed, it would be quite impossible to form an opinion as to the cause of the accident.

Mr. Furniss said the committee were not sufficiently advanced in information to be enabled to report fully on this subject, but as the public mind was somewhat excited on the question, they thought it best to bring up this interim report, in order that the public might know that the matter was receiving every attention, and that a full and ample report would be submitted on a future occasion.

The Clerk subsequently laid before the Board a letter from the Home Office, requesting that a report may be made to the Board on the subject of the recent fall of two houses in the Haymarket, and that a copy of such report, when made, may be sent to the Home Department for the information of the Secretary of State.

The Chairman stated that he had taken care to inform the Home Secretary that this subject was being inquired into by a committee, and that the results of their investigations would, he had no doubt, be forwarded to him.

ROYAL FREE HOSPITAL, GRAY'S-INN ROAD.

ON Thursday, the 24th ult., the new wing that has recently been added to this hospital (to be called the Victoria wing) was opened by the general committee, all formal ceremony being deferred until the whole of the proposed additions are completed; by this addition the total accommodation of this valuable institution has been raised to 150 beds. The Victoria wing contains three wards, ward staircase, and general accommodation for the out-patients' department. Each ward is 101 ft. in length by 22 ft in width, and holds sixteen beds, giving a cubical air space of 2,000 ft. per bed. The baths, water-closets, lavatories, &c., are placed in a small block at the side of the wards opening direct from them, and are so arranged that a through current of air is obtained for ventilation. The out-patients' department contains large waiting-rooms for males and females, physicians and surgeons' rooms, dispensary, and waiting-hall, affording accommodation for the relief of 500 patients daily. The works have been carried out from the designs and under the superintendence of Mr. Wm. Harvey, the architect to the hospital, at a cost of about 13,200*l.*, Mr. Shepherd, of Bermondsey, being the contractor. The floors throughout were constructed on Messrs. Dennett's fireproof system; the tanks, hot-water apparatus, and service were fixed by Messrs. Turner & Co.; and the lavatories, closets, and copper sinks, &c., were supplied by Messrs. Tylor & Sons.

PENGE NEW WESLEYAN CHAPEL.

THE memorial-stones of a new Wesleyan Chapel at Penge, Surrey, were laid on the 17th ult. It will occupy a position facing the southern end of Oakfield-road. The style of architecture will be Gothic, freely treated. The front will have a tower and spire rising to a height of 150 ft., and a central gable, the upper part of the latter being almost filled with a triplet arrangement of traceried windows, the lower part being occupied by the principal doorway. The sides will be divided into six bays, each of which will have triplet windows, with tracery and arched heads. The two southernmost bays on each side will be treated as transepts. The chancel will be at the south end of the chapel. The staircases will form features of the design, one being between the gable and the tower, with entrance from the tower, and the other being on the eastern side of the gable.

The interior of the building will be divided by three aisles, so as to allow of a number of small pews being obtained, the whole of which will have open ends. The chancel will have a curved ceiling thrown into panels by moulded ribs, with moulded and enriched frieze along the walls. The organ-chamber will be on the east side of the chancel, into which it opens, as well as into the transepts. The vestries will be on the west side of the chancel. A gallery, supported on columns, will extend round three sides of the building. The roof will be in one span, so that there will be nothing to intercept the view of those who occupy the gallery, and will be divided into six bays by moulded and framed principals of pitch pine, having perforated spandrels, and supported on moulded stone corbels. A ceiling will be fixed for the sake of acoustic results and freedom from down-draughts. The total number of sittings provided will be 1,046. The external walls will be of Kentish rag, with Bath stone dressings.

The total cost of the building will be 8,000*l.* The architect whose design was chosen in competition is Mr. C. O. Ellison, of Liverpool; and the contract for the whole of the work has been let to Messrs. J. & C. Bowyer, of Upper Norwood.

AN ARCHITECT'S CLAIM AGAINST A BUILDER.

AT the Lambeth County Court, last week, Mr. Lockhead, an architect, residing at Tooting, claimed 23*l.* from Mr. Snelling, a builder, of South Lambeth-road, for professional services rendered to the defendant in preparing plans, elevations, and sections for ten new houses in South Lambeth-road, and three shops in Stockwell-road. The case turned upon the question whether the plans were satisfactory. The defendant had paid 10*l.* into court.

On behalf of the plaintiff it was stated that at the request of the defendant he viewed a site for him in the South Lambeth-road, which led to his employment by the defendant in connexion with the houses and shops in question. He was occupied seventeen days in preparing the plans for the buildings, and the defendant had expressed entire satisfaction with them. When, however, the bill was sent in, he objected to the charge, and although he (the plaintiff) offered to refer the matter to Mr. Anson, the architect to the estate, the defendant objected.

Mr. Gibson, architect, was called on the part of the plaintiff, and stated that the ordinary professional charge was 5 per cent. on the outlay, if the plans were carried out; but for such work as that on which the plaintiff had been engaged the charge was 1½ per cent., and 3 guineas the minimum charge per day. He thought the plaintiff's charges were perfectly reasonable and consistent.

It was admitted on the part of the defendant that he had in the first instance expressed satisfaction with the drawings, but that when submitted to the ground landlord they were not approved of, and another architect had to be employed to prepare the plans in accordance with which the buildings were eventually erected.

Professional evidence was given on behalf of the defendant to the effect that the plans furnished by the plaintiff were only preliminary ones, and not worth the sum charged by the plaintiff.

In the absence of any agreement between the plaintiff and defendant, as to any particular sum to be paid for the plaintiff's services, the judge said the question was whether or not a reasonable sum had been charged. He was of opinion that the plaintiff had charged more than he was entitled to, but at the same time he did not think that the 10*l.* paid into court by the defendant was sufficient, and he therefore awarded him 5*l.* in addition.

CASES UNDER METROPOLITAN BUILDING ACT.

DISTRICT SURVEYOR'S FEES.

A SUMMONS was heard by Mr. Bridge, at the Hammersmith Police-court, on the 19th ult., which had been taken out at the instance of Mr. T. E. Knightley, district surveyor for Hammersmith, against Mr. Thomas Stanway, a builder, for refusing to pay the fees arising out of certain work done to three houses in Keith-grove, Shepherd's-bush.

The work consisted of alterations; an extra room having been built on the back additions. The account was disputed on the ground that the District Surveyor, in determining his fees, had included the "area" of the front vaults, defendant contending that, according to sec. 3 of the Act, he was not entitled to do so, as the vaults in question did not exceed the height of the ground story.

The magistrate asked whether, as a matter of fact, this had been done, and the District Surveyor replied that it had, but submitted that the Act entitled him to do so; his dimensions were compared with the defendant's and found to agree. He explained that by sec. 3 "area" was deemed to be the superficies of a horizontal section of such building made at the point of its greatest surface, &c., but this was for the purpose of construction, and limitation of areas (as shown by subsequent sections throughout the Act), and not for District Surveyors' fees; for this purpose, viz., "Fees payable to District Surveyors," the Act provided a distinct schedule, containing a note that "area" shall include the area of any attached building. This had been done, and afterwards one-half the fee in the case of a new building of the same area had been charged. He produced the report of a case decided by Sir James Ingham, where a similar objection had been raised, the magistrate ruling that for the purpose of fees, according to schedule 2, the "area" of any attached building whatsoever must be included.

Mr. Bridge said this case seemed to the point: there was not the slightest doubt in his mind that the front vaults were attached buildings. As to the definition given by sec. 3 of the term "area," that was held by the District Surveyor, and had been laid down by Sir James Ingham, to be superseded by the note at the end of the second schedule. He should follow the view taken by Sir James Ingham, and decide in favour of the District Surveyor.

DAMAGE IN BUILDING.

GARRETT *v.* KIRK AND OTHERS.

This was an action brought in the Exchequer Division, before Mr. Justice Hawkins, to recover compensation for injuries sustained by the plaintiff owing to the alleged negligence of the defendants in pulling down and rebuilding the Civil Service Co-operative Stores.

The defendants denied their liability beyond a sum of 5*l.*, which was paid into court.

The plaintiff was a whitesmith and metal merchant, residing in Arundel-place, Haymarket, and the defendants were respectively contractors and dealers in general goods.

It was stated on behalf of the plaintiff that at eight o'clock in the morning of the 20th of October a police inspector rushed into the plaintiff's house and ordered everybody out of the building, as it was on the point of falling down, and some men in the employ of the defendants came in and removed a large quantity of furniture and goods. The alarm was alleged to have been caused by the excavations which the contractors had made for the purpose of rebuilding a part of the stores, which had brought about a subsidence of the ground upon which the plaintiff's house was built. The plaintiff now claimed in respect of loss sustained by removing his business and furniture, and also for the obstruction of light and air by the erection of the new store buildings. The contractors alleged that they had properly shored up the plaintiff's premises, and denied liability, while the Co-operative Society brought 5*l.* into Court as sufficient to meet the plaintiff's claim against them.

The Jury gave a verdict for the plaintiff as against the contractors with 140*l.* damages; and as against the Co-operative Society with 5*l.* damages beyond the sum paid into Court.

Judgment was entered for both amounts, the former with and the latter without costs.

OIL PAINTINGS, OR OLEOGRAPHS?

HARWITZ *v.* DOYLE.

This case was before Mr. J. F. Collier, the judge of the Liverpool County Court, the other day. It was an issue sent for trial from the Queen's Bench Division of the High Court of Justice by Mr. Justice Field. The plaintiffs were picture-dealers, carrying on business in London, and the defendant was in the same business at Southport. The action was brought to recover the agreed price of certain pictures sold by the plaintiffs to the defendant, and guaranteed by them to be oil paintings. The defence was substantially that the pictures in question were not oil paintings, as they were represented to be, but were oleographs; in other words, that they were transfers taken from original pictures by photography, printed on paper or canvas, and afterwards "sharpened up" by the painter's brush. A sum of 19*l.* 14*s.* 6*d.* had been paid into Court, and the balance of the claim of 31*l.* 14*s.* 6*d.* was disputed.

Mr. S. H. Graves appeared for the plaintiffs, and called Mr. Bauer, an artist brought specially from Vienna, to prove that he painted the two pictures produced, and called respectively "Monsieur Monks," originally painted by Schmidt, and "Gossips," by Passini. The witness offered, as a test of the genuineness of his work, to rub out the whole of it by means of turpentine, and stated that if he did so it would leave the canvas almost clean, which would not be the case if the picture were an oleograph. He stated further that it was impossible to produce oleographs on canvas.

Dr. O'Feely, who appeared for the defendant, called Mr. Charles Swan, a picture-dealer, of Mount Pleasant, Liverpool, who examined the picture, and stated that it was not a genuine oil painting, but was an oleograph on canvas, for producing which a process had been invented about two years ago. He proceeded to explain his reasons for his opinion, and said that on holding the picture up to the light the canvas was penetrated by the latter in parts where it would have been impenetrable except in the case of oleographs. The witness produced examples of oleographs on paper, but said he had none on canvas, although he had seen several of them, and they were commonly met with.

On account of the conflict of evidence, the judge, on his own responsibility, sent for Mr. Grindley, a well-known Liverpool picture-dealer, and requested him to express an opinion as to whether the pictures produced were oil paintings or not. Mr. Grindley having replied that they were, his Honour gave judgment for the plaintiffs for the full amount of their claim, with costs.

THE WELLINGTON MONUMENT, ST. PAUL'S.

We are glad to be able to say that the Wellington Monument is at length completed. As soon as H.M. Office of Works have had the pavement laid in the chapel, the monument will, we believe, be opened to the public.

ARCHITECTURE AT THE PARIS EXHIBITION.

Architectural drawings, photographs, and models intended for the Paris Universal Exhibition will be received at the Western Exhibition Galleries, South Kensington, on Monday, the 18th of February, and three following days.

This arrangement will be communicated by the Commissioners to all who have applied for space by circular. The number of applications is so considerable, and the amount of space applied for is so much in excess of what can possibly be granted to architecture, that the committee of the Institute of Architects who have this matter in hand will have a difficult task to perform in making the selection of those drawings, &c., which will actually be forwarded to Paris.

STANLEY'S FLUID PROFESSIONAL COLOURS.

Mr Stanley, of Great Turnstile, has essayed another effort for the advantage of architects and engineers; this time it is in the shape of colours already prepared for immediate use. In the well-made box before us there are twelve bottles, each containing the colour, in liquid, for a specific purpose, and labelled accordingly,—"Brickwork in Elevation," "Brickwork in Section," "Concrete," "Earth," and so on. There are two labels especially that should be added, —"Cast Iron" and "Wrought Iron," in these days of iron construction. Having practically tried the colours, we can say they are remarkably good, and dry soon, though not too soon to interfere with satisfactory working. We think the arrangement will meet with the approval of architects and engineers.

SCHOOLS OF ART.

Rotherham.—The prizes to the students of the Rotherham School of Art were distributed the other evening by the Hon. E. Stanhope. At the commencement of the proceedings a letter was read from the mayor, who seems to have taken umbrage at the committee having invited any one but himself to present the prizes or take the chair, and therefore, he wrote, he could not be present "to take the place of a mere townsman only." His absence, however, does not seem to have detracted from the success of the meeting. The annual report of the committee stated that the names of seventy-five students appeared on the register for the past year, and in April last 552 drawings, executed in the school by fifty-three students, were forwarded to the Science and Art Department at South Kensington for examination, and the Department examiners awarded the following prizes to the school:—One free studentship, one silver medal, four third-grade book prizes, eleven second-grade prizes, and two Queen's science prizes. Twenty-two students passed in the second-grade examination, and three in science. There are now sixty students on the register. It is proposed to erect new buildings for the use of the school, as the present accommodation is inadequate. A site has been purchased, but funds are required for the building. The report of the art-master (Mr. G. A. Illston) was then read, and from this it appeared that the school was gradually increasing and advancing its position amongst the schools of art in the country.

Nottingham. — The prizes gained by the students of the Nottingham School of Art were distributed on the 8th ult. by Mr. Justice Mellor. The school, under the head-mastership of Mr. J. S. Rawle, F.S.A., continues to maintain a high position. In the National Competition for 1877, the Nottingham school has taken a greater number of awards than any other in the kingdom. The following are the most successful schools:—Nottingham, 24 awards; South Kensington Head Schools, 19; Lincoln, 18; Bloomsbury (London), 17; Lambeth, 14; Westminster, 14; Manchester, 12; Birmingham, 11; Sheffield, 11; Edinburgh, 9; Dublin, 6; West London, 6; Belfast, 5; Kidderminster, 5; Leicester, 5. Nottingham has taken about one-sixth of the awards given to provincial schools; and one-tenth of the entire number distributed throughout the country to 141 schools of art. The awards obtained by Nottingham in 1877 are greater in number than those ever obtained by any other school in the kingdom, except South Kensington. Nottingham has also gained more advanced third-grade prizes than any school in the kingdom, having obtained one-sixteenth of the entire number awarded. The most successful schools are—Nottingham, 55 awards; South Kensington Head Schools, 43; Birmingham, 33; Sheffield, 29; Edinburgh, 28; Manchester, 28; Lambeth, 25; Kidderminster, 23; Bloomsbury (London), 20; Dublin, 19; Dundee, 19; Lincoln, 19; Belfast, 18; West London, 17; Westminster, 17. In their annual report, the committee express their regret that the South Kensington authorities propose to discontinue the bonus awards to successful art-masters. To quote official Departmental Blue Books, these awards were made to those schools "in which the general amount of work, as tested by examinations was relatively most satisfactory." The Government commenced giving these awards in 1868, but has now determined that no further awards are to be made. The committee regret this decision, as one of the most important tests as to a school's efficiency, and a great incentive to watchful care on the part of the art-masters, are now removed. The head master of the Nottingham School during the nine years in which these awards have been made, has gained a higher amount in bonuses than any other master in the kingdom.

Books Received.

Building Construction: showing the Employment of Timber, Lead, and Iron Work in the Practical Construction of Buildings. By R. Scott Burn. London and Glasgow: William Collins, Sons, & Co. 1877.

This is the second of Collins's "Advanced Science Series" of books on construction; the first of which is headed "Brickwork and Masonry." The book is handy in size, and contains a great deal of practical information in a small space, and a great many illustrative diagrams, which, however, are rather roughly got up. The sketch-illustrations of iron roof trusses, for example, are hardly what one would expect to find in any volume published in a series with the epithet of "advanced science" appended to it. There is not the remotest indication as to how they are put together, though the general principles and methods of iron joinery, as it may be termed, are separately illustrated. It would be impossible, however, to give all that was needed without raising the book to a prohibitive price; but we complain of its rather pretentious and over-comprehensive title. In the occasional illustrations which touch on ornamental treatment, the book is no better than such books usually are; the barge-boards and other things of the kind shown on pages 66, 67, are miserable; and as the book does not profess to teach design, but only construction, why meddle with design at all? The illustrations of scaffolding seem rather meagre, and the means of putting together are again not indicated. Some of the smaller and most commonplace details are not quite to be depended upon; for instance, the sill and bottom rail of a window, of which the section is given on page 132, would not be weather-tight in a driving rain; the sill ought to be worked with a throating in the solid. One point in the book which we take serious exception to is the amount of space devoted to the illustration of a scamping American way of making timber framing, called the "balloon-frame system," and which simply consists in dispensing altogether with the trouble and expense of halving, mortising, tenoning, or any of the received methods of producing permanent timber construction, and merely butting the timbers together and "side-nailing" them. The author, indeed, uses the grander term of "the diagonal principle" in nailing, but it is only what English workmen have long known and practised as "side nailing" in work the strength of which is not important. To see such a cheap and bad system seriously put forth and recommended in an English book for workmen has a very bad appearance. The amusing part of it is that the author draws special reference (p. 93) to the great strength of the joining between a bearer and an upright figured on that page, observing that the joists resting on the bearer will break in the middle rather than the bearer give way, but overlooks the fact that this is the one point in the system in which the proper method of framing is adopted, and the bearer is let into the upright, and depends on the strength of the wood, and not on the nails; and as on a previous page he says that any cutting or fitting of the timbers is at variance with the principle of the work, this is all the more inconsistent.

THE MASONS' RULES.

SIR,—Mr. H. Nisbet, the Secretary of the Masons' Strike Committee, wrote to the *Times* a few days since a letter in which there is the following amazing statement:—"Any man (a mason) can do as much work as he is able without any interference on the part of the Society." Every one connected with the trade knows, unfortunately, to the contrary. Mr. Nisbet made a similar statement in a daily paper a few weeks since, and was immediately answered by a working mason, who gave him full particulars of his having been heavily fined for doing too much work, or as it is technically called "chasing." Mr. Nisbet could not and did not deny these facts.

But the published rules of the Masons' Union are in contradiction to Mr. H. Nisbet; as, for instance, Rule 8 says working overtime shall be abolished, and where any member works overtime he shall be fined not exceeding 2*l*. The same rule prohibits piece-work or sub-contracting. Rule 9 justifies lodges in resisting the introduction of artificial light.

Your readers will be enabled to judge by these rules of the truth of Mr. H. Nisbet's assertion. A MASTER BUILDER.

DAMP WALLS.

SIR,—A correspondent of yours recommended some waterproof paper for damp walls. I have procured the paper; will some correspondent let me know how it is to be put on? The usual paste and size will not adhere to damp walls. A. P.

ROT.

SIR,—Some few years since a friend of mine built a greenhouse (22 ft. by 13 ft.) on the floor above the ground-floor of his house. The joists and flooring were precisely similar to those put in the other portions of the house, and on the flooring were laid ordinary red brick tiles, 12 in. square by 1½ in. thick. The floor was laid level, and no drain was put to carry off water. Upon taking up one of the tiles, which had fallen in at one end; a short time since I was concerned to find that the flooring underneath it had become perfectly rotten; and this appears to be the case all over the greenhouse. Of course the tiles and flooring will have to be taken up, and I am desirous of knowing what should be done to prevent a recurrence of such a mishap, and what sort of floor should be laid. If any of your readers would advise me I should be much obliged. QUERIST.

P.S.—Between the tiles and the flooring there appears to have been cement and sand, but, I should think, a very small proportion of the former; for it has not formed a solid mass, but is quite loose like sand.

Miscellanea.

Ferrumite Paving.—At a meeting of the Alverstoke Local Board on the 17th ult., the roads and works committee recommended that the ferrumite paving be laid in Stoke and Forton roads, and the streets adjoining, and that such Ferrumite be manufactured at least three months before use. Mr. Mumby said the committee had considered three materials—York paving, Purbeck stone, and ferrumite. If it had not been for the cost the committee would have recommended York paving. With regard to the ferrumite, they had not had a very large experience; but some had been laid down at Portsmouth, where the traffic was very heavy, for some years, and were exceedingly well. They had had a sample at Gosport for nearly twelve months, and one of the squares which had been taken up showed no perceptible wear. Some marks which had been scratched on the stone by the surveyor in March last, when the stone was laid, still remained, thus showing that the wearing had been very small. The York and Purbeck paving were much more worn. The ferrumite was much cheaper, therefore, not only on the score of durability, but in first cost, as it was only about 5s. 8d. a square yard, against 6s. 9d. and 10s. 6d. in Purbeck and York paving. But over and above the saving which would be effected financially, the committee, with one exception, agreed that it was very much the best material to use, because it was harder, better to look at, pleasanter to walk on, and in every possible point they considered the ferrumite was to be preferred. The surveyor's report on the subject bore out these statements, and the report was adopted.

The Kensington Surveyor.—The Kensington Vestry have raised the salary of their surveyor, Mr. William Weaver, 100*l*. per annum. We record it with pleasure, knowing Mr. Weaver to be not only an energetic officer, but most courteous and obliging to those who have occasion to apply to him on his branch of parish business.

Case under the Employers and Workmen Act—At Lambeth Police Court, Mr. Chance has given his decision in a case in which a question of some interest was raised under the Employers and Workmen Act. Two journeymen carpenters, named Woodhead and Toby, summoned Mr. William Smith, builder, of Lower Kennington-lane, for wages. According to the statement of complainants they were engaged to go to Edenbridge, Kent, to work, and they were to be paid London full time,—9d. per hour. When they got to Edenbridge they had to seek for lodgings, which occupied them the whole day, for which they charged working time. They were to have London wages, and lodging and railway fare. They worked some hours on the three following days, when a dispute arose, and they came to town. They demanded the full time, as also the railway fare and money for lodgings. The claim was resisted on the ground that very little work had been done by the complainants on the buildings, and it could not be tolerated that men were to waste a whole day looking for lodgings, and then charge the same sum as if they had worked. After a very lengthened hearing, Mr. Chance declined to give the full amount of the claim, on the ground that more actual work might have been done by complainants, and considered they had lost two half-days. He took occasion to remark that such disputes would be avoided if parties made proper agreements when they arranged for work. He made an order in each case of 1*l*. 0s. 9d., and 12s. costs.

Burns Monument for Dumfries.—The *Scotsman* says it has been resolved to take steps for the erection of a monument commemorative of Robert Burns's intimate connexion with the good town of Dumfries. The committee charged with the prosecution of the undertaking have made a choice of a design by Mrs. D. O. Hill, Edinburgh, worked out, so far, only in the form of a small model. The framework, so to speak, of the composition consists of a composite pedestal, intended to stand 13 ft. high, the central part of which would be square in form. In each side is a panel, which may, if thought desirable, receive a bas-relief; and at each of the four corners there is carried up to the height of 4 ft. from the ground a projecting shaft, of square section, designed to support a symbolic figure. The statue of Burns, which will occupy the summit of the pedestal, is proposed to be cast in bronze, of the height of 8 ft. Of the subsidiary figures, which are intended to be of life size, and will be executed in bronze or stone, one is designed to represent the genius of Poesy. Another will be representative of Religion. Patriotism is symbolised by a figure in belted plaid and shirt of mail, grasping a sword in the right hand and resting the left on an ample shield; while in the joyous peasant with her reaping-hook is suggested the type of healthy rustic beauty which inspired so many of Burns's exquisite lyrics. In the event of bas-reliefs being added, these will embrace designs illustrative of the "Cottar's Saturday Night," "Tam o' Shanter," and possibly the "Jolly Beggars." For the execution of the monument the sum of 3,000*l*. is required.

Universal Catalogue of Printed Books.—His Royal Highness the Prince of Wales, president of the Society of Arts, has referred to the council the subject of the cost of producing a universal catalogue of all books printed in the United Kingdom up to the year 1600. This idea originated with Mr. Dilke (grandfather of the present baronet), who published it in the *Athenæum* of the 11th of May, 1850. It was brought to the notice of the Society of Arts as far back as December, 1852; and two years ago, just before the Prince of Wales started for India, a printed specimen of such a catalogue was submitted to his Royal Highness. The council of the Society, being desirous of collecting information to enable them to report to their president, have addressed various questions to librarians, publishers, and printers, and invited replies on or before the 15th inst.

Pure Water for Swindon.—The report of the directors of the Swindon Waterworks Company, to be submitted to a general meeting on the 4th inst., contains the following passage:—

"Your directors have entered into a contract with Mr. J. H. Porter, C.E., to apply his patent for the purification and filtration of water (known as the 'Porter-Clark' process) to the water of the company so as to filter and partially soften it. This will be attended with considerable expense; but your directors feel that, having the supply of this increasing town under their control, it is their duty and their best policy to give the inhabitants the purest water in their power."

The Late Dr. Doran, F.S.A.—With extreme sorrow we hear of the death of Dr. John Doran; he expired on the 25th ult., in his seventy-first year, after an illness of three days only. A week before, we had quoted a paragraph from his last work, "London in the Jacobite Times," and had been listening in person to a discussion between him and the author of the "Cyclopædia of Costume" as to the early history of Harlequin, when the remarkable memory of both in matters connected with the stage was strikingly shown. Dr. Doran was the author of a long range of books, and of innumerable contributions to periodical works; he was, moreover, the editor of *Notes and Queries*. An agreeable sketch of the early history of the *Athenæum*, sent by him to that journal a fortnight ago, has been quoted in many quarters. He was a most estimable man and a delightful companion. In many circles his presence will long be sorely missed.

International Scales for Drawings.—Mr. Edwin Lawrence recently wrote to the *Times*:—"It may be valuable to those of your readers who intend to exhibit plans or models at the Paris Exhibition to know that these can be made to a scale capable of being expressed in any language. The only common measures between English feet and inches and foreign decimal scales are the numbers 2 and 10, so the only possible international scales are the following:—Full size = grandeur naturelle; half full size, or 6 in. = 1 ft. = la moitié, ou ·5; quarter full size, or 3 in. = 1 ft. = le quart, ou ·25; 1½ in. = 1 ft. = ·125; ¾ in. = 1 ft. = ·0625. Or 1-10th of any of the above,—viz.: 12-10 in. = 1 ft. = ·1; 6-10 in. = 1 ft. ·05; 3-10 in. = 1 ft. = ·025; 3-20 in. = 1 ft. = ·0125; 3-40 in. = 1 ft. = ·00625. A drawing has only to be made of any of these scales, and marked with the English words, and the corresponding decimal will be understood all over the world."

Technical Education.—The Goldsmiths' Company, with a view to the encouragement of technical education in the design and execution of works of art in the precious metals, have renewed their offer of an annual prize of 50*l*. for the best design, and also 50*l*. for the best model of some article in gold and silver, which, when manufactured, shall exceed 30 ounces in weight; an annual prize of 25*l*. for the best execution and workmanship of some such article; three prizes of 25*l*. each for the best design, model, and execution of some article of less weight than 30 ounces; and prizes of 25*l*. each for the best specimens of chasing or *repoussé* work and engraving.

A Pleasing Occurrence took place on Saturday last, when Mr. W. Richardson, of the firm of Richardson, Ellson, & Co., art metal workers, London and Coventry, was presented by the *employés* of the London house with a valuable timepiece and a handsomely bound copy of Wey's "Rome" on the occasion of his fiftieth birthday.

TENDERS

For alterations and additions to the Crown Tavern, Brewer-street, Golden-square, for Mr. Crack. Mr J. Jewhurst, architect:—

Stamp & Bowtle	£1,936 0 0
Simpson	1,337 0 0
Batley	1,294 0 0
Gibbon & Mitchell	1,190 0 0
Jackson & Todd	1,145 10 0

For dining-hall in connexion with the Boys' School, Cambridge. Mr. Robert Curwen, jun., architect. Quantities supplied by Mr. J. S. Alder:—

Kirk & Randal	£3,884 0 0
Brass	3,650 0 0
Higgs & Hill	3,630 0 0
Dove, Bros.	3,627 0 0
L. H. & R. Roberts	3,555 10 0
Perry & Co.	3,420 0 0
H. & S. Pattinson	3,298 0 0
Bell & Sons	3,208 0 0
Denson	3,190 0 0

Accepted for a building at Altrincham, Cheshire, for Mr. W. Cunliffe Brooks, M.P., to be used as the new post-office. Mr. George Truefitt, architect:—

Bricklayer's Work.	
Hamilton	£818 10 0
Joiner's Work.	
Cross & Bell	7.0 0 0
Stonework.	
Patteson	592 10 0
Plumber's Work.	
Walton	332 0 0
Plastering and Painting.	
Owen	140 0 0
Tiling.	
Ashcroft	111 6 6

For Basingstoke Sewerage Works, for the Town Council. Mr. W. F. Rowell, engineer:—

Small & Son (accepted)	£12,902 0 0

For stables at the rear of No. 32, Belsize Park, Hampstead, for Mr. J. F. Huggins. Mr. John Pugh, architect; Mr. J. Glenn, surveyor:—

Larter & Son	£669	0	0
Thomas & Son	661	5	0
Kerry	640	11	8
Julian & Co.	621	0	0
Whiteley	597	10	0

For erecting new cart-sheds for the Kensington Vestry:—

Taylor & Co.	£605	0	0
Hockley	595	0	0
Mears	590	0	0
Lathey, Bros.	583	0	0
Thorn	577	0	0

For rebuilding premises, 102 and 104, Seymour-street, for Mr. J. Elvidge. Messrs. J. Saville & Son, architects:—

Fawkes	£2,967	0	0
L. H. & R. Roberts	2,597	0	0
Campion (too late)	2,469	0	0
Manley & Rogers	2,297	0	0
Scrivener & White	2,287	0	0
Temple & Forster	2,247	0	0
Nightingale	2,237	0	0
Braid & Co. (accepted)	2,220	0	0
Wild	2,010	0	0

For alterations and additions to Turkish baths, Caledonian-road, for Mr. J. Johnson. Messrs. J. Saville & Son, architects:—

Temple & Forster	£929	10	0

For alterations and repairs to 19a, Grosvenor-square, for Mr. C. Wring. Messrs. J. Saville & Son, architects:—

General Works.

Temple & Forster	£1,057	0	0

Engineer's Works.

Adams & Son	398	0	0

For house on the Holloway Estate, Dorking, for Mr. J. W. Sugg. Mr. Dibble, architect:—

Colls & Son	£1,937	0	0
Ecker	1,890	0	0
Goddard & Sons	1,830	0	0
Heselgrave	1,769	0	0
Hamblin, Bros.	1,668	0	0

For building Alexandra Schools, Penge, Surrey, for the Beckenham School Board. Mr. A. R. Scanning, architect. Quantities by Messrs. Linsdell & Giffard:—

Niblett	£10,019	0	0
Lee & Wotton	9,966	10	0
Sabey & Son	9,600	0	0
Staines & Son	8,954	0	0
Bayes, Bros., & Allen	8,750	0	0
Sheffield & Prebble	8,657	0	0
Parker & Evans	8,506	0	0
Tongue	8,299	0	0
Joselyne (accepted)	7,855	0	0
Vincent	7,660	0	0

For Bromley-road Schools:—

Lee & Wotton	£773	0	0
Niblett	749	0	0
Bayes, Bros., & Allen	718	0	0
Staines & Son	696	0	0
Taylor & Co.	662	0	0
Hudson	650	0	0
Waugh	649	0	0
Parker & Evans	630	0	0
Joselyne	597	0	0
Prebble	583	0	0
Vincent (accepted)	580	0	0

For the construction of steam engines and other cast-iron work, at Basingstoke, for the Town Council. Mr. W. F. Rowell, engineer:—

Laidlaw & Sons (accepted)	£4,023	0	0

In the list of tenders for Messrs. Weeks & Hughes, in the place of "Ede & Motley," read "Eede & Notley."

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We are compelled to decline pointing out books and giving addresses.

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The Builder.

VOL. XXXVI. No. 1827. SATURDAY, FEBRUARY 9, 1878.

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Work and Wages.

IT will not be questioned that Mr. Brassey has peculiar claims, both personal and hereditary, to be listened to in regard to the subject of the relations of labour and capital, and his name alone is likely to attract the attention and command the respect of working men when he speaks on a subject in which their interests are so much involved. His paper read before the Institute of Architects on Monday evening, which we print elsewhere, will, we hope, receive their serious attention: and it is with the view of emphasising and supporting the important points brought out in his remarks, rather than of criticising a paper with which we are almost entirely in agreement, that we make a few brief comments upon it.

We must in the first instance, however, express a certain degree of hesitation in regard to one of the most pointed inferences which Mr. Brassey draws from the facts before him,—an inference which would be eagerly seized hold of by different parties in the strife for different reasons, viz., that the action of trade unions has had little to do with the rise of wages in the building trades. His view is, that the union is merely the machinery by which the demand for higher wages, under certain conditions of the labour market, makes itself felt; that it is not an active agent in the sending up of prices, which has really resulted, in the ordinary course of things, through the demand for skilled labour; and in support of this view he points to the fact that the ordinary labourers, who have no organisation, have obtained a proportionately greater increase of wages, in the same space of time, than the trades which have operated through the agency of organised unions. Now, that trade unions cannot permanently raise prices beyond the normal limit fixed by supply and demand most of us know very well, and it is exactly one of the points which, in the interest of all concerned, we are most desirous that the men should recognise. But it does not follow from this that a well-organised co-operation may not artificially raise wages very considerably for a time. In the fact that it can do so—that it *has* done so recently—lies the very mischief which is at the root of the present difficulty. The unions have forced wages up to a point at which profitable investment and employment of capital in building operations is becoming more and more difficult, and in so doing are cutting away the ground from under their own feet. The fact of the great increase in the unorganised labourers' wages appears to us to be susceptible of an explanation quite in accordance with this view. It arises, of course, from a difficulty in procuring labourers in comparison with skilled workmen; and when alongside of this fact we hear so much about bad work, and when we know that the practical effect (however unintentional, as the union representatives say) of the union protectionist is too often to put a bad workman on a level with the good, we may well conclude that those are passing as skilled workmen who, if there were a free and unrestricted competition between high and low standard of ability, would find themselves compelled to take to the lower grade of labour.

There would certainly be nothing surprising in the fact that organisation, carried so far as that of the trade unions has been carried, had forced up inferior labour into places too high for it, according to the natural influence of supply and demand, and thus had an indirect effect upon branches of labour not ostensibly connected with it, just as it has unquestionably forced up the prices of commodities quite unconnected with building operations.

This latter fact of the rise of prices in the necessaries of life is one of the most important points touched upon in Mr. Brassey's paper—one of the most important, we mean, for the workmen and their counsellors to study and reflect upon. To those who have given any attention at all to the influences which operate upon prices, this result of higher wages is of course regarded as an almost necessary and inevitable consequence. The working man, if he forces up wages by co-operation, cannot in any case have his increase of wealth all to himself; the butcher, the baker, and the candle-stick maker will have their share of it. In addition to the evidence of this which was brought forward in Mr. Brassey's paper,* some very instructive statistics may be found in the report of Mr. Plunkett to our Secretary for Foreign Affairs in regard to the causes and circumstances of the late great railway strike in America. This report, which was referred to and quoted by Mr. Brassey, and which we shall have to mention again, can be purchased for 8d. at any shop for the sale of Parliamentary papers, and those concerned in the present unfortunate struggle would find it a good eight-pennyworth, deserving their perusal.

But on one point the statistics brought forward by Mr. Brassey appear to leave no possible room for doubt. Not only are we now contending with shorter hours and higher pay, which might or might not be equitable or desirable according to circumstances, but we have the additional stumbling-block of labour less efficient and less diligent during the hours when it is supposed to last. This is a fault which no principles of political economy can excuse, a source of weakness which no counter-effort can make head against. It is an absolute waste of energy and of productive power, which can have none but an injurious effect upon all concerned. And, unfortunately, it is only what is to be expected from the results, whether deliberately intended or not, of the principle of action of the trade unions in discouraging, from possibly pardonable but certainly most erroneous motives, the acceleration of work beyond a certain general standard. We especially wish not to impute corrupt motives, either to men or masters; but as a matter of fact, let the representatives of the men interpret the meaning of their rules how they may, the result of their application is to discourage strenuous and earnest labour. We put this as moderately as possible, but we do earnestly urge the most thoughtful and the most honourable among the workmen (and there are many among them who in the fullest sense deserve both epithets) to consider seriously what lasting good they can possibly expect from an organisation for delaying and slackening the hand of labour, which means simply throwing away that time and energy which in the end constitute the wealth both of themselves and of those who employ them; and whether the facts stated by Mr. Brassey in regard to the comparative time occupied now and formerly in the execution of the same amount of work can be regarded, by any sane person, in any other light than as a serious evidence of retrogression (we hope only temporary) in the character and efficiency of English working men.

Referring for a moment to the report of Mr. Plunkett on the American strike, we may adduce one or two sentences from it, which will serve to show that the objections strongly urged against some of the principles involved in the system of strikes in this country are equally strongly felt in the very differently constituted society of America. The strike committees in England maintain their right, in the interests of the cause, to forbid men to work who may be willing to work at rates below that which the strikes are demanding; and though the Unions theoretically repudiate any idea of compulsory treatment or tyranny, we know that practically this is resorted to, as well as many forms of unfair persecution and cajolery, to induce those who might not be otherwise so disposed to join in the strike. In the "free country" across the Atlantic this theory of action is thought as ill of as here. It is freely conceded here, says the Consul-General of New York (in his report affixed as an appendix to Mr. Plunkett's paper), that the men had a perfect right to cease work if they chose; "what the people, however,

* In reference to the relation between wages and cost of living, there seems however to be a little want of precision in the way the argument is put by Mr. Brassey, which leads to what looks rather like arguing in a circle. In an early part of his paper he says that "the rise in the rate of wages is undoubtedly due partly to the increased cost of living," while later he speaks of the increased cost of living as a result or concomitant of the rise in wages.

could not and would not admit, was that any body of men had a right to prevent others who might be willing to do so from working in their places. That, in their opinion, was *an inexcusable wrong*." And American opinion can help our men to a judgment in regard to the common sense of the matter, as well as the morality of it. Speaking of the financial failure of the "Brotherhood of Locomotive Engineers," the *New York Tribune* says (September 14):—

"What has happened is just what might be expected to happen. If those who pay money into the Treasury stop earning money, it follows logically that there will soon be no money to pay out. This is the radical defect of all associations of the kind. Their paper constitutions appear to be the quintessence of providence as well as of benevolence; but when cash begins to come in very sparingly, and to go out very plentifully, it requires no great knowledge of finance to see that it will soon stop going out altogether."

The only difference between the English masons and the American engineers in this respect is that the former, through superior organisation, and perhaps what may be called superior staying-power, are able to hold out longer; and the *reductio ad absurdum* of the whole is, that the more thoroughly the strike is organised as a general movement, the more men are persuaded to stop work, the sooner will the staying-power be exhausted. The weapon is double-edged, and cuts both ways. And even if we imagine what we suppose would be considered an ideally perfect strike to be realised, in which every member of the trade should combine, and at a time when there was an exceptionally large reserve fund in hand, then the only ultimate result is either a rise in wages very trifling in comparison with the amount of wage absolutely lost, or else a price on labour which proves prohibitive, and stops the embarkation of capital in building operations. This latter remark has of course become a mere truism; yet, in the interests of those who imagine they can raise wages *ad libitum* by combination, it seems necessary to go on repeating it until they attend to it.

The remedy proposed by Mr. Brassey is neither co-operation nor arbitration between capital and labour (and the latter expedient, it must be admitted, is rather a method for terminating a strike amicably than for preventing strikes in general), but the principle of paying for work in proportion to its excellence and quantity, not in proportion merely to the time a man is employed over doing it. The dislike of the men to the system of piecework is comprehensible as long as they are under the unhealthy state of almost enforced laxity and dawdling labour to which the trade-unions regulations have contributed to bring them. Let them once recognise the fact that the way to better their position is to do as much good work as they can, and not as little as they can, and it may be confidently hoped that a change of feeling and of principle will be brought about. A high rate of wages does not mean prosperity, when accompanied by a high cost of living and a diminished labour-market. Prosperity is the offspring of well-directed and economical productive labour; and economy of time is an essential part of this. What is wanted is harder work, and the recognition of and payment for work in proportion to its excellence. And the proposition of a well-known contractor, quoted by Mr. Brassey, in reference to the desirability of longer hours in summer, and the abolition of the half-holiday, except as a special arrangement when asked for, is well worth the men's consideration. They have no room for thinking themselves a specially overworked class. They have not really as long working hours as many professional men who can rarely give themselves a clear evening's rest: and no professional man can throw down his tools, of whatever kind, as the clock strikes five, and free himself from whatever he is engaged upon; nor would most men with a true interest in their work, wish this. The narrow and grudging view of work which this habit indicates has been noted by a great English novelist* as a characteristic shortcoming of the English workman, and one which can hardly co-exist with true interest and pride in the work done. These faults we hope and believe the working-classes will consider and amend; for, however they have tried public patience lately, we quite concur in the spirit of Mr. Brassey's remarks about the English workman, and his general superiority in moral stamina, and in thoughtfulness and reasoning power, over the representatives of his class in any other country.

Let us conclude with a heartfelt echo of Mr. Brassey's suggestion for increasing the supply, and thereby lowering the cost of labour. We want, he says, not only harder work, but more workers; and the deficiency of skilled labour he traces, in great part, to that false social feeling which sees a stigma in manual labour; which places a comparatively useless clerkship at a desk above the manual trades which require real skill, study, and dexterity, and are far healthier to the workers and more useful to the world than much of the unproductive and merely perfunctory work of those who pride themselves on being a grade above the skilled workman. We thank Mr. Brassey sincerely for his earnest word in season on such a subject; the prejudice he refers to is one which is as ridiculous as it is hurtful. It needs far harder training, far more ability, to be a really good mason or joiner, than to count money over a desk. On the other hand, we exhort the working man, who is now in many cases, as those who know him know, a thoughtful, well-mannered, and even sometimes a well-read man, to endeavour more and more to exemplify the dignity of his calling, and its compatibility with real refinement and high principle; to put aside his class prejudices and antipathies, and to consider not how he can do the least work for the highest wages, but how he can best and most thoroughly do his part of the world's work, and the world will certainly not be ungrateful in the long run.

* See the opening chapter of "Adam Bede."

PROFESSOR E. M. BARRY'S LECTURES AT THE ROYAL ACADEMY.*

POSITION OF MODERN ARCHITECTS IN RESPECT OF ARCHITECTURAL RESTORATION.

ANOTHER year has come round, and with it the duty of proceeding further in the consideration of the subjects to which I called your attention last session. Having reviewed the progress of Domestic architecture from the days of ancient Greece and Rome, we have already discussed its modifications in England, during the twelfth, the thirteenth, the fourteenth, and the fifteenth centuries. In the present course, I propose to continue the investigation, and having glanced at some portions of the subject, which seem to call for further review, I hope to proceed onwards, as far as the period which witnessed the revival of Classical architecture in England, in place of the Mediæval forms which prevailed from the reigns of the Norman sovereigns until the times of the Tudors.

Before entering upon this task, however, we may devote ourselves, at present, to the consideration of the more general question of the duty of modern architects, in face of the peculiar circumstances of our own time, and particularly with reference to the difficult question of the Restoration of Ancient Buildings. The second lecture will deal with early military architecture. It seems necessary, in treating of the great works of Mediæval art, that we should not ignore those important buildings, which were constructed for defensive purposes, by the Normans and their successors, and which, not belonging to ecclesiastical architecture, may fairly claim a place in any description of civil and domestic works. I propose then to pass onwards, in the third lecture, to the further consideration of the works of the fifteenth century; and to follow afterwards, in the next discourse, with some review of the Transitional architecture of England, which we know by the titles of Elizabethan and Jacobean. At this point of our inquiries, we may be naturally arrested by the sudden and remarkable results which arose from the revival of learning in the fifteenth century, after the fall of Constantinople, a revival which made its influence felt, in all parts of civilised Europe, and gave birth to the style and habits of thought which we call the Renaissance. The new ideas have had an influence which has lasted, with more or less strength, until the present time, and it may therefore be desirable that we should endeavour to consider the Renaissance, in some of its aspects, in the fifth and sixth lectures of the series. The first of these will be devoted to Italian Renaissance in the land of its birth, while the latter will discuss the manner in which the new task was received and developed in England, under the guidance of our illustrious predecessors, Inigo Jones and Sir Christopher Wren.

It must be evident, at the outset of our preliminary inquiry, that the architect of to-day has difficulties to contend with which are peculiar to himself; and that if he be, in some cases, more free than his predecessors, he is in others far more trammelled by the exigencies of fashion and science, and by the many vacillations of public taste.

We shall see, by and by, in treating of the Italian Renaissance, that the great artists of Italy could not avoid being influenced by the knowledge they possessed of ancient architecture, the ruins and relics of which they saw everywhere around them. These were a book to them, though sealed in a casket and in a dead language, until the enthusiasm for classical literature, kindled by their poets, pierced through the accumulated crust of ages, and, by furnishing the key to the casket, set free its contents, while leaving, we trust, both for them and for us, hope at the bottom.

The Italian love for ancient art was never dead. Here and there some indications of Renaissance were always appearing, and the opposing principles of the arcuated Gothic style were never heartily welcomed, or completely adopted. The architects of the day could not, therefore, shut their eyes to all that had been done before, and they could not, and did not, work in the single-minded manner which was only possible to those who, like the Northern Mediæval builders, knew but one style. The position of the Italians, particularly after the Renaissance, was, therefore, in some respects, not unlike our own. Having knowledge, they had incurred the responsibility of choice, and with various forms of art before them, they, like ourselves, were at liberty to use their freedom by selection.

Modifications of Roman principles led to the round arches of the Romanesque and Norman schools; soon to be followed by the Lombard varieties of Italian Gothic. Eclecticism was enthroned in Venice, when the East was ransacked for marble columns and mosaics, and the horses of Lysippus were utilised as architectural adornments of a front, totally unlike any other structure in the world, and delighting us with its strange romantic beauty, in defiance of all rules of regular architecture. We seek in vain in Italy, for anything like the rigidity of custom which obtained amongst ourselves.

Italian political divisions led to divergence in art, in spite of the welding influences of a common faith. Thus, at Florence, we find a type of building suggestive of fortified grandeur; at Genoa, of mercantile prosperity; at the Eternal City, of an ecclesiastical pomp, which claimed to rule the world. In all cases, the temper of the times, and local taste, determined the character of the architecture, whether domestic or ecclesiastical; and thus led to a variety, in strong contrast to the uniformity of Northern Gothic art.

It is impossible not to recognise in the circumstances above described, a similarity to those under which a modern architect is called to apply his art. He, too, has now the history of ancient art laid bare before him, and this to a much greater extent than at any former time; he also is bound to consider local requirements, and the peculiarities of taste arising therefrom; and he has, moreover, scientific and sanitary problems to solve, which were never dreamt of by his predecessors. If we add to this description the class of economic restrictions, to which he is subject, it will be apparent that although he shares the freedom of choice possessed by the old Italian architects, he is even more limited and controlled by exigencies outside his art.

The modern architect, again, is implored by opposing schools to proceed in opposite directions. If he listen to the one, he must ignore the past, and set up for originality; if he consent to the guidance of the other, he must be satisfied with imitation of the works of bygone ages. All true artists are indeed original, in a certain sense, but a new and original style of architecture has never yet been invented. We can read the history of our art backwards, until all traces of origin are lost in the mists of a dim antiquity, passing through Rome and Greece to Etruria and Asia Minor, and thence to the almost mythical annals of Egypt and Assyria. In such investigations, the origin of forms which became gradually developed, and dominant, may be traced in the works of different tribes and races, leading up to, and culminating in, the perfection which is only to be achieved by persistent effort.

Architecture is thus surrounded with associations; it is a history, as well as an art. If it has

* First lecture, delivered January 31st, 1878.

been so in Italy, the case is not different in England. Here, we have had also a regular succession of recognised architectural forms. We do not, it is true, recognise the intrusion of the opposing influence of rival styles (except perhaps at first), but we find here also a development of design, which is in a high degree historical. The Saxon gave way to the Norman, in art as in politics, and the latter initiated a movement to be carried onwards through centuries. This movement gave us that which we term the Early English, the Decorated, the Perpendicular, and the Tudor; and lost itself at length in the Elizabethan and Renaissance of the Stuarts.

Our ancient buildings reflect these charges. In them we find evidences of them all. Few are uniform in style. Norman towers, pointed arches, lancet windows, and perpendicular tracery are frequently found in the same edifice. Differences of ecclesiastical rule, as of the great monastic orders, have left their mark on the plans of abbeys and cathedrals, so that those who run may read a very history in stone.

How is the modern architect to deal with this history,—this record of olden days? If it be his duty to hand down to posterity that which he has received, he must at least see that it sustains no injury in his hands, maintenance, at any rate, is necessary; and between maintenance and restoration the boundary is narrow.

If an architect appeals to society for guidance, he is confronted at once by two, if not more, parties, each of which is full of confidence. He is at once brought into contact with the Materialists of the present, and with the archæologists, as worshippers of the past. The question becomes rapidly one of sentiment, rather than of architecture. Do not suppose that I say this in any spirit of disrespect. The day has never been,—it will never arrive,—when men can disregard the instincts of the human mind, and reduce all actions to a calculated system of dry reasoning,—a rule-of-three of hard facts, ignoring the qualities which have made men happy, and nations great. Architecture must ever be associated with those feelings which we call sentiment, and the question of the restoration of ancient buildings is one which cannot be treated in a purely architectural sense.

Let us inquire, therefore, what our various advisers would have us to do.

And, first, as to the materialists of the present. What say they? To-day is their day. Philosophy lends to them an epicurean disregard of aught that they cannot touch, handle, and enjoy. Science says to them, Why look back? You are the lords of the heritage, the salt of the earth. The present is your own; it will not last: make use of it quickly. Do your best with it; seize its advantages; let the future look to itself. You cannot resuscitate the past. You ought not, if you could. Forget it as soon as possible. Talk not of ancient buildings and historic monuments. They have had their day; it is now over; let them not cumber the ground, and encroach on the rights of the living. The philosopher, the man of science, the nicely-calculating constructor, the utilitarian engineer,—these are the men of the day, the magicians who wield the lever that can move the world. The inventors of railways and steam-engines, of gas, electric telegraphs and telephones, have nothing to do with mouldering ruins, and with "musty parchments." The present alone is ours: the past is gone; the future is all dark: "Let us eat and drink, for to-morrow we die."

From the disciples of this school we cannot expect aid in our veneration for antiquity, nor is the case much more promising with those who, while disdaining the worship of the present, fix their eyes mainly on the future. To them, too, the past is dead. Its lessons are out of date, its maxims are antiquated. It cannot be mended; what has been, has been. It has had its day. Life is too short, they say, for looking back; the present is even fading away as we gaze upon it. Let us fix our eyes on the future; let us shape that if we can. Each may do something, even in his own little sphere. We cannot mend the past; we are already too late for the present. The future is the true aim of those who would promote the wisdom and happiness of unborn generations.

The latter class of thinkers agrees with the first, in refusing reverence to the past. The dead, they both say, cannot teach; vigour and life belong to the living; the past is left to bookworms and antiquaries. The aims of to-day are so urgent and all-absorbing, that there is no place left for the relics and remains of olden time. They are already smitten with decay. They must die. Bury them out of sight, and let them give place to a truer, because a newer, philosophy.

It is impossible for us, as artists, to accept this reasoning, nor are we left in doubt as to the views of its opponents. I have called the one class materialists of the present; let us now see what the other, the worshippers of the past, can say.

They will tell us that no one can ignore the past, neither the nation, nor the individual. If the child be the father of the man, so is the past the precursor of the present, the warning of what shall be in the future. Our great buildings are precious heirlooms, to be neither destroyed nor tampered with. Look to them lovingly, treat them with reverence, sustain them with an affectionate and filial solicitude. Do not too hastily assume that we are wiser, better, happier than our fathers; continue old customs, and forget not, in the toil and bustle of to-day, the bright memories of antiquity. A great country can never really forget the past; for with the associations of the latter is combined all that speaks to men of public duty and patriotism. "England expects every man to do his duty" was the signal which thrilled every heart at Trafalgar, because it spoke to each man, of an historical past, as well as of a present, and a future.

And, indeed, we in England can never undervalue the past. We have descendants in all parts of the globe, communities who look up to the parent country, and call it "home," in Europe, Asia, Africa, and America. In the latter continent, moreover, we are face to face with a great nation, not always with us, but, notwithstanding, of us; speaking our language, reading our literature, thinking our thoughts, and for the most part respecting the same things. What is it that these dwellers in new countries say to us in the old? In the abundance of youthful energy they do not always envy us our old laws, our customs, our political institutions; these they believe, it may be, they can improve or surpass. Are we rich, busy, and strong? It is, they think, only a question of time, when they will be richer, busier, stronger. No,—there may be respect, and even imitation; but there is no envy of these things. That is reserved for our ancient buildings, our venerable history, our national past.

Newness has ever a taint of vulgarity. It does not touch the institutions, the architecture, the traditions of an old country, which bears on its surface relics of many days, past and gone, and seems to connect the Middle Ages with the times before and after them, by means of ties as strong as they are imperceptible, and which have borne the tension of centuries. These things are to us a priceless heritage, not to be made, discovered, or bought, but to be cherished and appreciated. We cannot afford to lose that which can never be replaced. Our old buildings are in the same category with our national history, and must be as dear to us as the latter.

If we would have our sons perform great deeds in the future, we must see that they respect the past; we must preserve its archives and traditions; and pointing with one hand to the memories of departed heroes, we may extend the other towards the dim horizon, which seems to bound the future, and say to the youthful aspirant, "Go and do thou likewise."

It was a great English teacher who declared the value of antiquity in a seat of education, which should ever be the birthplace of noble aspirations and lofty sentiments. To the men of the present, as well as to the men of the past, it may ever be said, Boast not of either, for is not man ever the same? He is no nearer happiness than of old, because he can now telegraph, or travel at immense speed, any more than because he may have inherited a glorious history. His individual strength and health are as they were, when the world was young. Science and philosophy help him but little in his struggles and anxieties here. They leave him to fight his daily battle of life as best he may, and it is well, if in the speculative regions of free thought, they do not make the future darker for him than for the simpler trustfulness of his fathers.

This brings me to the consideration of a third class of suggestions with which our architects must also deal. These are intimately connected with the sacred uses to which most of our ancient buildings in this country are devoted. The question of restoration has been associated with, if, indeed, it have not arisen from, a great religious and social change. Revivals of forms and ceremonies have had much to do with architectural restoration of churches, and, from the days of the Cambridge Camden Society, the clergy have been at the head of that notable movement, which has, to a great extent, caused the Gothic revival.

It is not unnatural now that, after so much activity, men should look around, and should begin to ask what has been the result of an age of restoration. One result is unquestionably to be seen in the public interest shown in such matters, and in the vast sums of money subscribed for works of restoration. Men have learnt to love the old structures which they formerly neglected, without a suspicion that their love might prove destructive. Costly buildings and crowded services are seen around us in all directions, and an ever-growing determination is apparent to attract the masses to our churches. If we have occasionally reason to deplore the effects of misguided reforms on the fabrics of our churches, we must, nevertheless, remember that there are human wants and sympathies to be recognised, to which even archæological zeal must submit to be subordinated.

Our churches are not mere tombs of the dead, but places of worship for the living; while protecting them, with jealous care, from the spoiler, they must yet be made suitable to their high purpose in the spiritual life of this, our day. Full as they are to us of the chastening memories of the past, they must be regarded as something more than libraries of old-world learning, than museums of strange and curious art. They, like ourselves, have their duty to do to the present. To reconcile this duty with affection for the past is not always an easy duty for the architect; but it has to be faced.

If the church of the district be so arranged that reverence in the services be impossible; if the pomps and vanities of earthly grandeur make themselves felt in it; if there be signs of neglect and deadness, all the more conspicuous from the contrast outside its doors, are we seriously to be told that we must not alter all this?—and why? Because the gallery which darkens and divides bears the names of some old churchwardens; because the damp and ague-giving pavement exhibits some half-legible inscription; because the great squire's pew, which symbolises selfishness, and shuts out the poor, has perchance some pleasant mouldings, some cornices of Georgian date, or, better still, some reminiscences of Queen Anne.

This is to load us with fetters, to press respect for the past too far, and such exaggerations can only produce reaction. We are told sometimes that we have no right to touch such churches as I have alluded to. Their galleries or pavements, their dank chancels, and dismal recesses, their pews with fireplaces, and easy chairs, must not be molested, for they are historical. Historical indeed! but of what? Historical of carelessness and coldness: of disregard for that better past, which all of us must reverence. Historical of a state of society which would reserve even heaven itself for the rich and great, while bidding the poor to worship at a distance, and beneath their footstool. Is this a history which we are bound to perpetuate, and are the most sacred cravings of our inmost life to be limited for ever by the misdoings of a former generation? If their history is to be jealously preserved, why should the actions of the present age be stifled and unrecorded?

The church restorers of to-day have at least worked with high and definite aims; they have sought to restore to the many the alienations of the few; they have opened churches and multiplied services; they have banished, to a great extent, the distinctions of rank and wealth from the House of God; they have endeavoured, not without success, to reconcile old art with modern use. Is this work so small a matter that it is a thing to be ashamed of? to be named in whispers? and mentioned with deprecation?

If past days of deadness are to have their history, is there to be none of a revival of life and eagerness, of high intentions and lofty aims? If a church has been "restored and beautified," a hundred or a hundred and fifty years ago, by the village carpenter, can it be really contended that we must allow his ignorant botching to remain, because it is "historical"? and, if so, why is his claim on future history to be preferred to that of the better instructed restorer of the nineteenth century?

Our ancient buildings are indeed heirlooms, not to be lightly tampered with, but as most of them happen also to be churches, they must be used by the living, and must suit their requirements. They must be rescued from damp and decay, even if in so doing their picturesqueness be impaired, a picturesqueness not to be regarded if it arise from dirt, or "matter in the wrong place." They must be available for the sacred wants of the present time,—protected from a gospel of decay and death, which would hand them over to the owls, the moles, and the bats.

While carefully regarding the claims of the past, our churches must be the well-used heritage of the living,—places to which men may withdraw from the turmoil and din of life, safe, if it be but for a moment, from the struggles ever going on outside their walls for rank and power and wealth: the things for which mankind will fight, and lie, and steal, and sell their very souls.

To the vast number of earnest men, who regard our churches from this point of view, there is something saddening and petty in the exaggerations of mere archæology, which would hinder all improvements; while, to those who are practically acquainted with the urgent difficulties of daily life, and the need of church accommodation for our vast population, it almost sounds like a feeble joke to be told that they are to allow our old churches to go to ruin, while they build new structures for living use, side by side with their crumbling fragments.

And now, gentlemen, we return to the question, what is the modern architect to do? He cannot please every one. He cannot admit that all historical architecture is of necessity good, or all restoration bad, although he must recognise that a time of activity is a time of mistakes, as well as of successes, and that all restorations of ancient buildings should be presided over by a conservative jealousy of change. If he be called upon to adapt an old church, for example, to the needs of a vast congregation, let him be careful not to outstrip these needs, from any fancies of his own, or desire to comply with the ephemeral fashions of the day. If it be his duty not to starve the wants of the present, it should be his pride to reconcile them, as far as may be practicable, with the historical associations of the past. He must be guided by common-sense, as well as by sentiment, and must be on his guard against nostrums.

Among the latter is a too exclusive devotion to any one phase of bygone art, when such devotion leads to unnecessary interference with old work. Almost any of our old buildings are, as we have seen, an epitome of past styles. To this, they owe no inconsiderable part of their interest, and it is intolerable that all the latter should be sacrificed, as is sometimes the case, because the architect is persuaded that the "Middle Pointed," as he will perhaps call it, is the best style of architecture, to which everything should be made to conform.

It is said, and justly, that this is the spirit in which our ancestors worked; they cared not for old forms, and removed them without scruple. Our case, however, is different,—they worked in their own vernacular method, and knew no other; we are, at best, applying our grammatical knowledge of styles, which have ceased to be our familiar servants. It is not for us to construct an elaborate imitation of old work, and pass it off as a really ancient building. This is, in fact, to design an elaborate forgery.

We have no right, therefore, to enter upon a work of restoration, with the intention of seeking congruity, by the application of our individual tastes. To do as little as may be absolutely necessary, should rather be our aim, and we should not be afraid to let such necessary work tell its own tale, in the after history of the building.

If this be a needful caution to the architect, something may also be urged on those who are more immediately the guardians of our ancient churches,—namely, the clergy. They have done great things in their generation, good and harm, mixed no doubt; but much more good than harm. To them, too, uniformity is at times a temptation. Inconveniences which would often be surmounted by patience, are sometimes grappled with at once, to the serious loss of the old historical associations of the building. A pulpit is too big, or too small, or, still worse, it is not in the fashionable style of the day. It must go, and the next time that some far-off wanderer revisits the church of his youth, all is changed, the well-remembered aspect of the place has become strange and unfamiliar. The reading-desk has vanished, the seats are re-arranged: old glass has given place to new in the windows, and the stately, if cumbrous pulpit has gone, in favour of a successor redolent of varnish, and in the newest style of so-called Ecclesiastical art.

It cannot be unfair to remind all concerned, that our old buildings are held by them not as their own, but as a sacred trust; and that special tastes, and fashions, are, as regards them, out of place. The church belongs to the people, and it is not a fit arena for experiments, either of architecture, or of ceremonial. It should be to us, as far as possible, the sign of eternal truth, fixed, clear, and unchangeable.

We may learn a lesson, in these things, from the recent past. We know what was done by Wren at Westminster, and by Wyatt at Salisbury, with the best intentions doubtless, and as was probably thought, at the time, with considerable success. These were but types of what was going on, in the country generally. What is thought of it now? The present objections to restoration owe much of their force to the active dislike which has been shown to such operations. Are we sure that the time may not soon arrive, when many restorations, now extolled, will not be condemned in their turn? We may, at least, learn modesty from such reflections, and may cast in our lot with all true lovers of art, in wishing to confine our restorations within the limits of common-sense and necessity.

To preserve and to protect our ancient buildings is the duty of every man of culture and taste, and it can scarcely be needed to found a new Society for this purpose. With its efforts, if presided over by good judgment, every architect, worthy of the name, must sympathise, and it is, I think, to be regretted, that the society should have seemed to give any encouragement to the contrary conclusion.

We have seen, however, how difficult is the position of the architect who is called upon to deal with the question of restoration. He is not the master, and cannot control the variations of public feeling. The influence of a great national movement is not to be hampered or defied. If we have mistakes to deplore, we have also successes to chronicle, and at no time in the history of our art have conservative sentiments been so powerful, as they now are, among our best architects.

Irresponsible critics have always an easy task: to them all is simple, and straightforward, and they neither know nor care for the anxieties of the architect, who is called upon to act while they are talking. It has seemed to be impossible to advocate the preservation of ancient buildings without assailing architects in general, and particularly some who have been most successful, and have shown both learning and judgment in their work. Their mouths are necessarily shut, but I feel bound to protest against such hasty accusations. I do so the more conveniently, because, although yielding to none in admiration of ancient Mediæval art, the caprices of professional employment have not led me much in the direction of restoration, and I can speak, therefore, with some of the impartiality of an outsider.

Few things have been more remarkable in the history of our time than the devotion of the architects of this country to the study of the principles and practice of our ancient architecture,—a devotion unsurpassed, as I believe, in any age or country. They are the last men in the world who can fairly be denounced as ignorant innovators, in one sweeping censure; or be entitled to the name, which has been pleasantly assigned to them, of "architectural wreckers."

It would, indeed, be strange if the English architect should be a destroyer or an iconoclast; not only is his native country rich beyond most others in all historical associations, but the very spirit of its policy has always been that of respect for antiquity. Our great monuments have ever been prized, ancient precedents have ever been followed in our legal tribunals, and at the Court of our sovereigns. We celebrate anniversaries, and venerate great memories. Our Houses of Parliament observe forms, handed down to them from olden times, and our legislators are surrounded by the monuments of the great statesmen, warriors, and sages of the past.

It has not always been so elsewhere. The protection of the ancient buildings of a neighbouring country has not been so much regarded there, as it has been with us, as a labour of love. It has been more deeply tinged with that passion for newness which has ever had a powerful influence on a nation of logicians. At the French Revolution ancient things were fused, as in a crucible, fired by a fierce hatred of the traditions of a detested ancestry. Old buildings now pulled down or desecrated, old institutions destroyed, and the very names of old places, times, seasons, and days of the week, were changed for new ones.

We have never had so fierce a trial; our changes of public life have been like our changes of architecture, more peaceful and gradual. We are accustomed to add, extend, and reform, rather than destroy and invent; and our English architects have ever been foremost in the ranks of Conservative restorers.

It is not inconsistent with this tradition that they should be unable to accept the position of idle observers of the decay of the great monuments left to us by our ancestors. It is their duty to look forward as well as backward, and they have to provide for the present, as well as to reflect on the past. In so doing, they do but re-echo the convictions of their countrymen, that each successive generation has its own work to perform, and that the world will not be made happier or wiser by a listless worship of the past, and yearnings for "good old times," which can never return.

What, indeed, were these good old times? and ought we to wish them back again? We think so, perhaps, when we note the beauties of old masterpieces of art, and ask ourselves why we prefer the old to the new. It may be, however, that we are but passing through a transition, and are unduly impatient for its close. We see the evils around us, and fancy they are new. The past has been well compared to some vast mirage in an Eastern desert. The spot on which we stand is, in our eyes, parched and bare; a dry and thirsty sand; while around us, on all sides, over the past as well as towards the future, we see an indication, and a promise of wells and pasture, of green turf, and refreshing waters. We refuse, as pilgrims, to be contented: our present position is intolerable. All about us seems so mean, so uninteresting, so inartistic, that we rush fowards, or retrace hastily our steps, only to find the mirage ever retreating before us,—a mockery, a delusion, and a sham.

If there be anything in architecture that is worthy of the attention of earnest men, it cannot be that we are to look only to the past. We are bound to revere its memories, to sustain its glories, to protect its achievements. Its old buildings must be very dear to us; but we must still look forward.

The doctrine of modern degeneracy is not to be silently accepted. It has been well said, "If the golden age be past, it was not genuine." Were it otherwise, our energies would be paralysed at the outset of our career. National progress assumes, it may be, forms which are new and artistically distasteful to us, and we, perhaps hastily, assume that all is wrong, and that we must try, —alas! how unavailingly,—to go back to that past which is gone for ever. Rather should we conclude that we have to seek in our own day the key to the enigma, and apply to the material progress which goes on around us, the refining and civilising influence of art.

We cannot go back, we cannot re-create the old buildings, which we possess as our birthright. They often tell us of a state of affairs without counterpart in these modern days. These things were not of necessity better than the things of to-day, but they are our inheritance, to be guarded and preserved. They are, however, not to be recalled. Change passes on all things, and that which is appropriate to-day, may have become obsolete to-morrow.

We cannot look back too lovingly when we are engaged in restoring an ancient building, but for the work of to-day a mere retrospect will not suffice. It is worse than useless to spend our lives in dreams of a beautiful past, when our best exertions are needed to overcome the new and special difficulties of our own times.

Let us now consider the position at which we have arrived, in respect of restoration of ancient architecture. I have spoken to little purpose, if it be not evident to you that the question is not an easy one; and that the architect is by no means wholly responsible for its solution. This depends on serious considerations, which I have attempted to indicate, and on deep feelings in the hearts of men.

The architect, as a practical artist, has to take into account much that may be disregarded by the enthusiastic archæologist. He must use

common sense in the application of his art; for architecture is for use, as well as for æsthetic enjoyment. His art, in fact, must be useful, if his art is to be used. In his works of necessary restoration, he must face many difficulties, and combat rival theories. When cases of doubtful authenticity are placed before him, he must know how to choose the good, and reject the bad. He must unite the sympathies of an artist with the needful services of the practical reconstructor. In so doing, he will distrust all dicta of fashionable taste, he will respect historical associations, and will think little of self.

You will say there is nothing new in all this. Even so. It is the same old story, since the world began. "To refuse the evil, and to choose the good," this is the duty of man, and the architect must apply it to his art, as well as to his course of daily life.

It is impossible to lay down any fixed rules with respect to the restoration of ancient buildings. There is no royal road to the conclusion of the matter, which must be dependent on the learning, taste, and discretion of those employed.

Long before any special Society was thought of, the Royal Institute of British Architects had fully considered the questions now raised, as if for the first time; and they drew up a paper of admirable rules to be observed, as far as practicable, in all restorations of old buildings. I cannot do better than advise those who are concerned in such works to obtain these rules, and to be guided by them. They will at least prove to all, whether within or without the profession, that an affectionate regard for our old Mediæval architecture has never ceased to be a ruling principle in the representative body of British architects.

And now it is time to conclude. We accept in all sincerity the protests against over-restoration, to which allusion has been made. We are glad to welcome as assistants in our labour of love any associations of earnest men, while deprecating extravagance of cliqueism to which such associations are perhaps in some degree exposed. We value the past too much to deface its records, to tamper with its history, which belongs to the future, as well as to ourselves. For the rest, we must refuse to be bound too rigidly, and in new works we are not to try for an impossible resuscitation, but are to have some confidence in ourselves.

We are not to be for ever attempting to try back, when the difficulties of modern problems assail us. We are to preserve our ancient buildings, as far as this may be done, without harm to the living, and without necessarily believing that such buildings would be suitable if accurately reproduced, to the exigencies of society around us, which differs in essential particulars from that of the Middle Ages.

We are not called on to despair of art because the old is often better than the new. We will not forget the past, but we will do our best in the present, and also turn our eyes on the future. If the dead can speak to us, can we do nothing that shall be eloquent when we are gone? Shall it be said of us, that we have only repaired the tombs of the Prophets? May we not rather draw from our studies of the past, a fresh inspiration,—an encouragement to new efforts of noble and elevating art? Surely there must be scope for such exertions, both now and in the days to come.

In the meantime, we must hold fast to what we have, while we must oppose the calm conclusions of common sense to the bidding of those, who, making of the past fetters too heavy to be borne, would have us stereotype each antiquated blemish, by reason only of its actual existence.

We must not forget the living in our zeal for the dead, and we must uphold, repair, and, where necessary, restore our ancient architecture, in a spirit of conservative jealousy of unnecessary change; while to the mere materialist, who, eager for novelty, and caring only for the present, is ever ready to revolutionise, with the vulgarity of newness, we may then fairly say, "I will not give the inheritance of my fathers unto thee."

Stanley's Fluid Professional Colours.—Mr. Stanley has supplied the two colours named by us last week as wanting in the architect's box,—for wrought iron and cast iron. They form part, it seems, of the box prepared for engineers. Architects who desire to supply themselves with these colours should look through all the lists and make their own selection.

ON THE RISE OF WAGES IN THE BUILDING TRADES OF LONDON.*

THE present paper has been prepared in compliance with an invitation of long standing, which I esteem it a great honour to have received. The delay in the preparation of the following statement is due to the pressure of many engagements, and to my protracted absence on a voyage of circumnavigation. Even now I should have been quite unable to have performed my task without the aid and co-operation of others. I have little spare time for such an investigation, and I have no technical knowledge. Under these circumstances I appealed to gentlemen whom I knew to be thoroughly conversant with the subject, and I gratefully acknowledge their readiness to assist me. Being anxious to collect the information required from impartial sources, I applied to Messrs. Hunt & Stephenson, the well-known surveyors; as representatives of the builders, I communicated with my old friends, Messrs. Lucas Brothers; and lastly, with a view to obtain a fair statement on behalf of the workmen, I asked the co-operation of Mr. Howell. These gentlemen, therefore, are in point of fact the authors of the following paper. If it possesses any importance as a contribution to the sum of knowledge on that labour movement which constitutes one of the most urgent questions of our time, it is to the practical authorities whom I have quoted that its value must be attributed.

To the Council of the Institute of British Architects belongs the credit of suggesting that a review of the alteration in the rate of wages in the building trade should be prepared. It is only by bringing into view the fluctuations in prices during a tolerably extended period that the relation between cause and effect can be satisfactorily traced, and principles laid down for the future guidance of masters and men. It was truly said by Lord Bolingbroke that history is philosophy teaching us by examples how to conduct ourselves in all the struggles of public and private life.

I begin by giving a statement of the increase of wages and reduction of working-hours in the building trades in London from 1837 to 1847. The current wage of building operatives in London from the year 1836 was 5s. per day of ten hours, or 30s. per week of sixty hours. This rate was generally adopted, but it was not universally paid in all branches of the building trades until 1847. In fact, it was only established as the standard rate by dint of protracted efforts, extending over a period of several years. Masons and bricklayers were the first to secure the advance. The carpenters, plasterers, and painters followed their example.

In the year 1847 a movement was set on foot for a reduction of one hour and a half on Saturdays, the men leaving work at four o'clock. This agitation seems to have originated from the idea of the Saturday half-holiday which had been promoted by Lord Shaftesbury and other eminent philanthropists. After a comparatively short struggle, the hour and a half was conceded; and it soon became general for all the branches of the building trades to leave work at four o'clock on Saturdays. Only one master persisted in refusing this boon, and he was ruined for his obstinacy.

In the year 1853 an effort was made to obtain a reduction of time to nine hours a day. The men were offered a rise in wages of 6d. per day, which was accepted, and the nine-hour agitation was abandoned. The 5s. 6d. per day was not universally conceded in all branches of the building trades for some years, although the leading firms gave it to the majority of their workmen.

In 1857 an agitation was recommenced for the Saturday half-holiday. This was abandoned in 1858, and a limitation of the hours of work to nine hours a day was accepted instead. In 1859 the movement in favour of the half-holiday was again resumed, and the demands of the men being refused, a strike ensued, which was followed by a lock-out of the whole of the building operatives in London. Eventually, in 1861, the masters introduced the hour system, payment being made at the rate of 7d. per hour. A reduction in time was obtained of two hours on Saturdays, the men working through the dinner-hour, but leaving work at one instead of four as formerly. In 1865 a rise of ½d., making the wages 7½d. per hour, was granted without a strike. In 1866 another rise of ½d. per hour was granted, making the rate 8d. per hour.

After a strike and partial lock-out in 1872 the masters granted a further advance of ½d., making the rate of wages 8½d. per hour. There was a simultaneous reduction in time of four hours per week; the men leaving work on the first five days of the week at five o'clock, and on Saturdays at twelve. The hour for commencing work was at the same time fixed at half-past six on Mondays. In 1873 another rise of a ½d. per hour was granted without a strike, making 9d. per hour, and the working-hours were fixed at nine and a half per day, or 52½ hours per week.

In 1876 a memorial was sent to the master builders asking for an advance of wages from 9d. to 10d. per hour. This demand being refused, on the 30th of June, 1877, the masons struck, and the strike is still pending. It will be seen from the foregoing statement, which embraces a period of thirty years, that there has been a reduction since 1847 of seven hours and a half in time,—that is to say, from 60 hours per week to 52½ hours. The current wages in 1847 were at the rate of 5s. per day of ten hours, or 30s. per week, for 60 hours' work. In 1877 the current wages were 1l. 19s. 4½d. for 52½ hours' work, being an increase of wages amounting to 9s. 4½d. per week. This represents a rise of 31½ per cent. on the original scale of wages, at the rate of 30s. per week, and of 12½ per cent. in time value, or a total advance in thirty years of 44 per cent.

Mr. Howell further states that greater care is taken to ensure regularity of employment. The masons and carpenters have better sheds or workshops. Wherever it is possible, the bricklayers engaged in cutting arches, splays, &c., are under cover in wet weather. On the other hand, it is said that large contracts are finished more rapidly. Hence the men have to look out for fresh jobs oftener than they had to do thirty years ago. The time also is kept more strictly than it used to be. A workman must be at his work at six o'clock precisely. No five minutes allowance is now given. The workmen are equally prompt in dropping their tools as the clock strikes five.

Messrs. Lucas have prepared a memorandum giving the various wages by the day or the hour both for labourers and mechanics. It will be seen upon examination that these figures, although stated in a different form, correspond exactly with those contained in Mr. Howell's paper:—

	Mechanics. s. d.	Labourers. s. d.
Sept., 1853. Wages per day of ten hours=Sixty hours per week were	5 0	3 0
Sept. 4, 1853, to March 22, 1861 ditto	5 6	3 4
March 23, 1861, to Sept. 27, 1865. Payment by the day was discontinued and the men were paid at the rate per hour of	0 7	0 4½
Sept. 28, 1865, to May 4, 1866 ditto	0 7½	0 4¾
May 5, 1866, to July 5, 1872 ditto	0 8	0 4¾
July 6, 1872, to Aug. 1, 1873 ditto	0 8½	0 5¼
Aug. 2, 1873, to present time ditto	0 9	0 5½

The present working-hours are:— Monday, 9 hours; Tuesday, 9½; Wednesday, 9½; Thursday, 9½; Friday, 9½; Saturday, 5½; total, 52½ hours; as compared with 60 hours for the summer and 47 hours for the winter season, commencing six weeks before and ending six weeks after Christmas.

This shows an increase of 50 per cent. upon the wages of mechanics, and 64 per cent. upon those of labourers. In addition to this, there is a loss in time of 7½ hours per week. The men now only work 52½ instead of 60 hours,—a reduction of 12¼ per cent. in time; the mechanics receive 39s. 4½d. for the 52½ hours, instead of 30s. for 60 hours; and the labourers also work 12½ per cent. less time, and receive 25s. 2d. for 52½ hours as against 18s. for 60 hours. It is a remarkable circumstance that the most important advances have been obtained by the unskilled workmen. The lower the original rate of wage the greater has been the advance. This is clearly shown in the following table prepared by Mr Stephenson:—

Wages.	In 1835 per hour.	In 1875 per hour.	Increase.
	d.	d.	
Excavators	4½	6¼	28 per cent.
Bricklayers	7½	9	20 ,,
Masons	7½	9	20 ,,
,, Fixers	8	9½	19 ,,
Carpenters	7½	9	20 ,,
Joiners	7½	9	20 ,,
Smiths	7½	9	20 ,,
Plasterers	7½	9	20 ,,
Painters and Glaziers	7	8½	22 ,,
Plumbers	8½	10	17½ ,,
General Labourers	4½	6¼	35 ,,
Scaffolders	4½	6½	28 ,,
Plumbers' Labourers	4½	6¼	28 ,,

* From a paper read by Mr. T. Brassey, M.P., before the Royal Institute of British Architects, on Monday evening last, as elsewhere mentioned.

It might have been expected that in trades where the unions were most completely organised the greatest advances would have been secured. But this has not happened. It is the least skilled trades, it is the common labour, the supply of which is not limited by any necessity for a preliminary apprenticeship, which have benefited most by the increased demand for labour. The rise in the rate of wages is doubtless due partly to the increased cost of living. The pay of those labourers whose wages were nearest to a mere subsistence level has been most sensibly influenced by the changes which have led to an increase in the cost of articles of the first necessity. The price of labour, as I have so often reminded employers, in the very terms used by the father of Political Economy, is determined, not by the completeness of its trade organisation, but by its relative scarcity. In the instance before us, we see that the advance has been most conspicuous in the case of labourers who have no trade-union organisation. Are we not therefore justified in the conclusion that trade unions in the long run exercise but a small influence over the rate of wages in comparison with the inevitable and natural operations of an alteration between the demand and supply of the necessary commodity of labour?

Let us now proceed to ascertain how far the cost of building has been influenced by the increased cost of labour. First let us consider the cost of materials. Messrs. Lucas observe, "The cost of materials fluctuates from time to time, but as a whole we find that the average cost is about the same as formerly, the reduction of duty on bricks, timber, glass, &c., being in our favour."

Mr. Stephenson has kindly prepared a memorandum showing the difference in the prices of materials in London between 1865 and 1875. Bricks and Portland stone are cheaper; in timber there is some increase; and in other articles there is a considerable augmentation of price:—

Materials.	In 1865.	In 1875.	Difference.
Bricks	34s. per thousand	27s. per thousand	20 per cent. reduction
Grey Lime	10s. per yard	11s. per yard	10 per cent. increase.
Roman Cement	1s. per bushel	1s. per bushel	
Portland Cement	1s. 9d. ,,	2s. 2d. ,,	26 per cent. increase.
Port and Stone (at Deptford)	2s. 1d. per foot cube	2s. per foot cube	4 per cent. reduction
Yorkshire 3-in.	63s. per 100 feet	83s. per 100 feet	33 per cent. increase.
Middling Dantzic Fir, average price	7l. 5s. per load	8l. per load	7 per cent. ,,
Archangel Deals	11l. per standard head	16l. per standard head	16 per cent. mean
Petersburg Deals	12l. 5s. ,,	14l. 10s. ,,	Ditto
Lead, Milled Sheet	21s. per cwt.	24s. per cwt.	14 per cent. increase.
Glass, Plate, and Sheet	... ...	Advance about 20 per cent.	

In point of fact, the actual cost, as before stated, was a little over 100s. per rod, and this notwithstanding all the additional advantage of the possession of steam-power. This illustration proves beyond all doubt that the men at the present time do very little more than half the work for 9d. per hour that they formerly did for 6d.

These experiences of a large building firm are corroborated from a different and perhaps a more impartial point of view, by Messrs. Hunt & Stephenson. An opportunity of applying an accurate test to determine the depreciation or appreciation in the cost of buildings has recently occurred, Mr. Stephenson having been called upon to make a close professional estimate of the cost of re-erecting an ordinary dwelling-house which had been built in 1865 for the sum of 5,000*l*. The building in question was demolished to make room for a Metropolitan Railway Extension, and it was ascertained that it would cost no less than 5,624*l*. to rebuild it in 1875. The table at the bottom of the page gives some very interesting details as calculated by Mr. Stephenson.*

Having given the results of the experience of large employers in this country, it may be interesting to you to know that abroad the diminished industry of the operatives under the same conditions has been even more conspicuous. The following paragraph recently appeared in *The Times* newspaper:—

"At the time when prices were most inflated the work and wages of masons in Berlin were submitted to a crucial test. Between 1868 and 1873 the wages of this class of operatives were increased by 50 per cent. In the former year a certain number of masons were accustomed to dress 618 stones of a particular description in a week. In 1873 the same number of men dressed in the same time no more than 304 stones, less than half, and as they were paid as much for the smaller number as the greater quantity, it follows that the cost of building a house in Berlin had more than doubled within a period of six years. A similar process has been going on, with more or less rapidity, in most of the cities of Germany and Switzerland. Professor Gustav Kohn, in a pamphlet recently published ("Deutsch Zeitund Streit-Fragen," Heft 77. Vertheurung des Lebensunterhalter in der Gegenwart, von Gustav Kohn. Berlin, 1876), compares the cost of building in London and Zurich, and although there is no great difference between the two places in the price of materials, he arrives at the conclusion that it costs twice as much to erect and finish a house in the Swiss city as in the metropolis of Great Britain, and to this difference he attributes the fact that rents are so much higher in the former place than in the latter. In order to arrive at a just conclusion, he eliminates from his comparison the business and fashionable quarters, where the question might be complicated by the elements of expensive sites and heavy ground-rents, and chooses in the most outward periphery of Zurich a locality which is to that place what Wimbledon is to London. If the result of the Professor's investigations is to be trusted, a dwelling that at Wimbledon is rented at 40*l*. a year could not be obtained at Zurich for less than from 1,500 francs to 2,000 francs a year. And as wages, the cost of materials, the value of money and of land, are pretty much the same in both places, it follows that the difference in rents must arise from the superior skill of English builders and the greater efficiency of English labour. This is the conclusion of Herr Kohn based as well on induction as on his own personal observation and inquiries."

Mr. Howell contends that the net cost of building has not increased in proportion to the advance of wages. He points to the use of machinery in some branches, to the introduction of better appliances in others, and to the development of greater skill in special branches. As a rule he considers that the foremen of the present day are much superior in ability and character to the majority of those who previously had charge of large undertakings. As an instance of work being done more cheaply, he refers to a statement made to him by a mason of considerable experience and skill, to the effect that each of the blocks of the fluted columns at the British Museum cost, on an average, 5*l*., whereas now he would be glad to undertake any number of them at 3*l*. 10s. each.

This reduction in the price of stonework for the British Museum would, however, only be possible upon the piece-work system. The introduction of piecework is earnestly desired by the masters; but, as Messrs. Lucas remark:—

"By the rules and regulations of the trade unions no set-work or piece-work is allowed, the great object being to obtain the largest amount of pay for the smallest amount of work and the least number of working-hours; and with every increased rate of wages they go for a decreased number of hours' work in the day, and do a less amount of work in the hour, so that the public are hit all round."

In concluding their most valuable paper, Messrs. Lucas say:—

"We believe the reduction in the hours of labour and the half-holiday a mistake. Any man wanting a holiday can always have it, and the old time of 60 hours per week in the summer months is not too much in such a generally healthy business. It appears absurd to lose the summer months and not make hay whilst the sun shines. In the winter time it might perhaps be better upon out-door works to commence after breakfast, say at eight o'clock, and leave off at half-past four, with half an hour for dinner, making eight hours per day, or forty-eight hours per week, or an average for the year of fifty seven hours, and 2*l*. 2s. 9d. per week wages; and we have not the slightest doubt that the men would gladly fall into such an arrangement, but for the interference of the trade unions. It is clearly to be understood that the foregoing observations apply to architectural buildings only, and not to contracting and engineering works. These are mainly carried out upon the plan advocated by the late Mr. Brassey, that of *set-work*. A certain amount of pay is offered for a given amount of work. The men are paid for any work done in excess of the minimum amount allowed, and this is the only fair and satisfactory course to be adopted in the building trades in the interests of the men, the masters, and of the public generally."

Having given in detail the successive advances in wages, and shown the increase in the cost of building, it will be interesting to inquire how far the condition of the operatives has been substantially improved by the rise in the rates of wages. Has there been any appreciable improvement in their food and in their dwell-

The increase of wages, according to Messrs. Lucas, ought to have been more than covered by the introduction of machinery for many building operations,—for hoisting all materials, instead of carrying by hod and raising by hand labour; for grinding mortar, and for the execution of all kinds of carpenter's, joiner's, and mason's work. They say, however, that their experience shows that the cost of building has actually increased from 20 to 30 per cent., and this increase is entirely due to the small amount of work now done by the men, compared with what they did some few years ago. As an illustration of this they refer to the new station, hotel, locomotive works, and goods sheds at York, which they have recently erected for the North-Eastern Railway Company. These works were of great magnitude, and were superintended by one of the most experienced and able members of their staff. The materials were bought for less than the estimated price, and the introduction of steam-power to an unusual extent,—in fact, whenever it could be used,—effected an immense saving upon the labour. But all these advantages (they say) were more than neutralised by the indolence of the men. A conspicuous instance is quoted. The labour upon the brickwork, which would formerly have cost 3*l*s. per rod by piece-work, was estimated at a price which Mr. Harrison, the Engineer of the North-Eastern Railway Company, considered liberal for such work, viz., 3*l*. 3s. per rod. The actual cost was a little more than 5*l*., or 1*l*. 17s. per rod more than Messrs. Lucas received from the Company. In this case, therefore, a loss of 55 per cent. was sustained upon the estimate for labour. If, however, the men had done a fair and proper amount of work the cost would have been as follows:—

With wages at the prices formerly paid, at the rate of 6d. per hour	£1 18	0 per rod.
Add 5 per cent. for increase of wages at present time	0 19	0
	£2 17	0

* *Estimate showing the Amount of Each Trade in a Building of an assumed Cost of* 5,000*l*., *and the Increase in Cost of both Labour and Materials.*

LABOUR.	1865. Apportioned Value of each Trade.	1865. Relative Proportion of Labour and Materials.		1875. Increase in Cost of Labour.		1875. Increase in Cost of Materials.		1875. Decrease.	1875. Proportion of Cost of Labour to Cost of Materials in the several Trades.		Average Increase and Decrease in Total Cost in 1875 over 1865.	
									Labour	Plant and Materials.		
	£	£	£	Per Cent.	£	Per Cent	£	£	Per Cent.	Per Cent	£	£
Excavator	100	90	10	28	25	—	—		90	10	25	—
Bricklayer	1200	300	900	27	81			10	25	75	—	19
Mason	800	480	320	24	115	27	88		60	40	195	—
Slater	50	10	40	27½	3	20	8		20	80	11	—
Carpenter	400	100	300	24	24	7	21	—	25	75	45	—
Joiner	800	480	320	21	99	16	51		60	40	147	—
Smith & Founder	350	70	280	20	14	—	—	—	20	80	14	—
Plumber	250	88	262	25	22	14	37	—	25	75	59	—
Plasterer	400	240	160	27	65	10	16	—	60	40	81	—
Glazier	150	23	127	22	22	(20	23		15	85	51	—
Painter	150	75	75	22½		(5	4	—	50	50		
		1859	2794		487		252					
					1936		109					
					2423		112					
							274				15	
							2699				643	
							265				19	
Fees of Quantity Surveyor, Local Authorities and sundry other Fees, &c.	250										624	
	£5000		5000		£5624	Nearly 12½ per cent. advance on 1865.					5000	
											5624	

ings? Is their leisure time profitably and innocently employed? Mr. Howell has supplied a complete statement on this subject. We will take first the article of meat. The rise in the price of meat is concisely shown in the subjoined table:—

Date.	Average Prices.					
	Beef—per stone.	Increase.	Per cent.	Mutton—per stone	Increase	Per cent.
	s. d.	s. d.		s. d.	s. d.	
1847–1853.....	4 2½			4 5		
1853–1867.....	5 6½	0 10	20	5 9	1 4	30
1867–1873.....	5 6	1 4	30	6 4	1 11	43
1874–1875...	5 8½	1 6	35½	6 5	2 0	45
1876–1877 ...	5 11	1 9½	39	6 9	2 5	50

"In round figures, the price of meat, wholesale, in the market, has increased in the case of beef about 40 per cent., mutton about 50 per cent. Pork has increased proportionately, and bacon at a higher rate still. The price obtained for beasts at the annual cattle-shows from 1847 to 1877 is as follows:—From 1847 to 1856 inclusive, the average price ranged from 4s. per stone for seconds to 5s. 7½d. for prime cattle. From 1857 to 1866 inclusive, the average price ranged from 4s. 1d. for seconds to 6s. 2d. for prime qualities. From 1867 to 1877 inclusive, the average price ranged from 5s. 6½d. for seconds to 8s. 1½d. for prime meat. During the latter period the quality of meat has greatly improved, but on the other hand the poorer classes have had to pay more per pound for inferior meat than the wealthier classes have paid for joints of the best quality. The retail price of meat to working people has increased not less than 75 per cent., or oftener 80 per cent., and butchers are more careful than formerly not to cut to waste. Hence there are fewer pieces called 'block ornaments.' This is equally true as regards slices of bacon. Poultry and fish have advanced in price nearly, if not quite, in the same ratio as meat. Rabbits fetch even a higher price in proportion. As for hares and other game, the poorer classes seldom taste such things. They know nothing of them, except what they see at the poulterers' shops."

Take next the items of bread, vegetables, clothing, and rent:—

"The price of British wheat has varied from 50s. 6d. per quarter in 1848 to 74s. 8d. in 1855, which was the highest during the past thirty years. Since 1864 it has varied from 40s. 2d. to 44s. 5d. in 1867. The average prices smoked for the last five years have been:—In 1873, 61s. 8d.; 1874, 44s. 2d.; 1875, 45s. 3d.; 1876, 50s. 3d.; 1877, 51s. 9d. The ordinary baker's bread in the poorer districts is now 7d. and 7½d. per 4 lb. loaf. It has not been so low as 6d. per loaf for some years. Very inferior bread is nominally cheaper, though actually it is the dearest, in proportion to the solid nourishment it contains. The prices of potatoes and other vegetables, as sold at the greengrocers' shops, have gone up during the past thirty years as much as 100 per cent. Potatoes, which were formerly sold at ½d. per pound, and then at the rate of 3 lb. for 2d., are now 1½d. per lb., being an increase of over 100 per cent. Cabbages, which could be bought at ½d. each, is now 2d. or 2½d. Turnips, which were formerly sold at about 2d. per bunch, are now from 5d. to 6d. The price of parsnips has advanced from ½d. to 1½d.; and all other kinds of garden stuff are equally enhanced in price. Coal, butter, and cheese are most important items, especially the two first. Many thousands of the working-classes buy in their coal by the cwt. or in sacks. For some years past the lowest price charged per cwt. has been 1s. 6d., or 30s. per ton. In 1872–73 the price went up to 50s. per ton. The coal consumed by the work people is generally very inferior, and the purchasers are robbed in weight and measure. Those who live in apartments have seldom room for more than a sack at a time; but in newer houses room is provided for half a ton or a ton. The article of butter has ranged from 1s. 6d. per lb. to 1s. 10d. for very inferior qualities; it is described as little better than mere grease. The consumption of salt butter has diminished of late years, and Brittany butter has been substituted. Cheese, which in days gone by was cheap, is now rather a luxury. It is not used by poor people as it was formerly. The only articles on which there has been a reduction are sugar and tea; but most working people concur in saying that tea, as sold at the grocers, is not so good as formerly. House-rent has greatly increased. Apartments of two rooms on a floor have gone up from 4s. 6d. and 5s. 6d. to 6s. 6d. and 9s. per week. The rent of single rooms has risen from 2s. 6d. and 3s. 6d. to 5s. and 8s. 6d. Small houses are very scarce. For a house with four rooms and a washhouse the rents have advanced from 6s. or 6s. 6d to 10s. or 11s. Peabody's buildings and the model dwellings are full to repletion, and so great is the demand for accommodation that enough names are flown on the books to fill several more blocks of houses. Boots and shoes are dearer, and the leather is not so good. These articles are of the first importance to working people who have to work out-of-doors or walk long distances. Clothing has also gone up in price, although not in the same proportion as other articles. Apparel, however, is usually bought ready-made by machinery, and as machine-sewing is inferior to hand-sewing, clothing is less durable. Cottons and flannels are cheaper, but stuffs and homespuns are dearer, at retail prices, and the quality is much depreciated. Almost every little article of domestic consumption has increased in price. Though the increase in cost may only amount to ½d., the advance is often equivalent to a rise of 40 to 50 per cent. on a small item. It is the universal complaint of the wives of workmen in the present day that they have a difficulty in 'keeping house,' in consequence of the dearness of everything. One of the greatest evils from which the working-classes suffer is that, being obliged to buy in small quantities, they go to small hucksters' shops, or what are called 'general shops,' where they pay the best price for very inferior articles. The poorer the neighbourhood the greater the difficulty in obtaining articles of good quality, and yet the prices charged are very nearly equal to those charged for the best qualities in the best establishments."

The well-managed co-operative stores of the North of England have provided a most effective means of supplying the wants of the working-classes. In the metropolis, co-operative organisation has been but slowly and imperfectly developed. Perhaps the very number of the population has made the work more difficult: there is less cohesion, less interdependence, and less mutual sympathy in the multitudinous masses of the metropolis, than in the more compact populations of our northern cities, where similarity of employment and a more uniform social status bind the people together, and both dispose and enable them to combine more readily for a common object. Mr. Howell concludes by stating that, with all the drawbacks which he has enumerated,

"The majority of workmen's houses are far superior to those of the same class thirty and even twenty years ago. There is an air of comfort and cleanliness, as a general rule, in the homes of the artisans and mechanics, which shows progress and improvement; and there are fewer wretched homes even in the poorest localities than of old."

I have given *in extenso* Mr. Howell's statement as to the economic condition of the operatives in the metropolis. It affords much food for reflection. It has been shown in the tables, prepared by Messrs. Hunt & Stephenson, Messrs. Lucas, and Mr. Howell, that, during the period embraced in our review, wages have advanced 50 per cent. for mechanics and 64 per cent. for labourers. In the same period, however, the cost of living has increased in such proportions that the wives of the workmen have experienced an ever-increasing difficulty in making both ends meet. Mr. Howell, indeed, describes a general improvement in the interior of the workmen's houses; but that amelioration is probably due to advancing civilisation, rather than to the increased spending power of the people. Improved taste and tidier habits, and a more restricted indulgence in intoxicating liquors would have converted a great number of the miserable hovels of thirty years ago into comfortable dwellings, even though wages had remained at the former rates. The consumption of beer and spirits has, we know, increased of late years to a melancholy extent. There is reason to believe that a considerable proportion of the increased wages of the common labourer has been misapplied in self-indulgence. Mr. Howell's remarks as to the improvement observable in the dwellings must be understood to apply almost exclusively to the mechanics; and we may venture to hope that the majority of the skilled workmen have made a good use of their increased wages.

The recent report of Mr. Plunkett on the Railway Riots in America gives most interesting details on the relation between wages and the cost of living in the United States. In America, with every advance in wages there has been a corresponding rise of prices, while, owing to the fall in prices which has followed the recent reductions of wages, working men in regular employment have suffered no privation of the necessaries of life. Workmen are perfectly entitled to take advantage of every turn of the market in their favour; but it is a delusion to suppose that a general advance in the rates of wages, accompanied, as it must be, by a corresponding advance in prices, is pure gain to themselves.

In connexion with this subject, I must once more express my conviction that an exaggerated impression prevails of the power of the trade unions to advance wages by the mere completeness of their organisation, apart from other influences which are more effective and more natural in their operation. In every controversy with the masters the trade unions occupy a prominent position as the spokesmen and advocates of the workmen; but the trade unions cannot possibly force the employers to carry on their operations at a loss, neither can they compel the public to buy an article or to build a house at a price which they cannot afford to pay. The wages of mechanics in the building trades have been rapidly raised, and are now kept up solely by the constant demand for labour in those trades. The active prosecution of building operations seems somewhat inconsistent with the general depression in almost every other branch of trade. The cause of this apparent anomaly is to be found in the failure of joint-stock undertakings and the revelations of the Foreign Loans Committee. Until a recent period a large proportion of the savings of the country were being absorbed in the conversion of private manufacturing and trading establishments into corporate undertakings, and large sums were lent to weak and almost unknown Governments, who had succeeded in alluring the too credulous public by the offer of high rates of interest. Experience has shown that Boards of directors, with little personal interest in their work, and no technical knowledge, cannot take the place of an individual manager having a large stake in the result, and qualified by technical training and long experience to conduct a difficult business. The joint-stock mania has now happily subsided, and it would be impossible, in the present temper of the public mind, to introduce on the Stock Exchange, with any prospect of success, a loan to a needy foreign State of the second rank. In the absence of other opportunities for investments, the savings of the country are now being applied to building operations. In the suburbs of the metropolis and in the environs of our principal towns, long rows of houses are rising up, built with borrowed capital. Timid people, who are afraid of employing their money in more distant operations, are satisfied with the security offered by a mortgage on houses erected in their own neighbourhood. They possess, in the form of a mortgage on buildings, a tangible security, and one the value of which they think they perfectly understand. Building has accordingly been carried on with unrelaxed energy, and possibly in excess of the wants of the public. Meanwhile, the demand for mechanics and labourers has been sustained at a time when industrial operations generally have been contracted. Thus we see a strike amongst the masons for an advance of wages at a time when the only strikes which are taking place in other trades are strikes against a reduction.

Is the present activity in the building trade likely to continue? This is a question which well merits the attentive consideration of our workmen. Is it not an inevitable consequence of the continued depression of trade, that the savings of the country, which have lately been invested so freely in mortgages on new buildings, must be temporarily reduced in amount? If this be so, the demand for labour will slacken, and wages must ultimately fall. It is further to be observed that the depression of trade, which has been so serious in this country, has been still more marked abroad. There are large multitudes of skilled men without employment on the Continent. If they are introduced into this country, the English workmen have no more right to complain or to resist than the workmen in France, who quietly suffered my father to take over a body of 5,000 English navvies to make the railway from Paris to Rouen. The bricks in the tunnels under the city of Rouen were all laid by London bricklayers.

It was argued at the recent Conferences of the International, that, without a combination among the workmen of all nations, there can be no general rise of wages. The country in which production is dear will be driven out of the market by the production of other countries in which work is done at a cheaper rate. The same principle applies to the building as to every other trade. Hitherto, owing to the difficulty of communication, the rates of wages have been determined by local circumstances. Railways have tended to diminish these local inequalities, because the supply of labour can now be drawn from an ever-widening area. In the shipbuilding yards on the Thames, the great mass of the joiners are Scotchmen, and there is but a slight difference between the wages on the Thames and on the Clyde. It is as easy to introduce masons from Hamburg as to bring joiners from Scotland. There need be no fear of the competition of foreigners with Englishmen if only the latter will be true to themselves. All workmen labour at a disadvantage in a foreign country, and I am certain that foreigners will never be allowed to gain a permanent footing in this country. The great evil in the organisation of the building trades in London has been the substitution of payment by time for payment by results. Piece-work under adequate supervision is the only system which is equitable alike to the employer, the workman, and the public. There can be no objection to mechanics earning 7s. or 8s. a day, provided they have fairly earned their high wages by a just amount of work. The employer will raise no objection to the payment of a liberal scale provided he knows what he will be required to pay, and how much work will be done day by day. On the other hand, it is utterly wrong that good men and bad men should be paid at a uniform rate of 10d. per hour. It is a system which never could have been forced upon the building trades but for the unusual scarcity of labour. The depression in trade to which I have already referred may lead to a contraction in building

operations, and it would be well that the opportunity should be embraced for settling the relations between the employer and the employed in the building trades on that equitable basis on which business in every other branch of trade has been conducted. No industrial organisation can be sound in which, to use the words of Mr. Herbert Spencer, "duty done and income gained do not go hand in hand, and the failure will be great in proportion as the dependence of income upon duty is remote."

The conclusions to be drawn from our investigation may be laid down as follows:—(1) during the last thirty years there has been an increase in wages of 44 per cent., and in the cost of building of from 20 to 30 per cent.; (2) the advances of wages have been largely absorbed in the enhanced cost of living; (3) the increase in wages has been caused by unprecedented activity in the building trade; (4) the prospect of a more satisfactory organisation of the building trades depends on the adoption of an equitable system of payment by piece.

I have narrated the story of the rise of wages in the building trades with strict impartiality. Many of those present regard the trade unions with a dread which I do not share. I can fully understand why it is that the trade unions are not viewed with special favour by the master-builders, who have been perpetually thwarted; it is hard to have to yield to the dictation of irresponsible men and to be required to pay wages at rates never contemplated at the time when contracts have been entered into. I sympathise with those who have suffered those losses and vexations, but I must point out that if the unions connected with the building trades have given trouble it has been the consequence of a great and sustained demand for labour. For years past no skilled mechanic in the metropolis has ever known what it is to be without employment. Our ancient and noble capital has been extended with extraordinary rapidity. Almost everybody who has been successful in a business or professional career in the provinces or abroad, has crowded into London, and made it, year by year, more and more the centre of British society in all its various grades, and a place of meeting for persons of every taste and pursuit, whether artistic, scientific, or literary. The man of pleasure and the severe student can here always find congenial company and gratify their special tastes. It may appear that wages have been advanced under the pressure of the trade unions, but competition among the masters for labour, of which there was an insufficient supply, has been the primary cause of its enhanced value. If the demand for buildings were to abate in any sensible degree, the price of labour would fall in proportion. The instance which I have quoted at Zurich shows what advances will take place in the price of labour under the same conditions in which the London builders have been placed, and that, too, in a land of exceptionally cheap labour.

Complaints are urged of the indifference of the trade unions to the interests of the public. No doubt those organisations have been established to promote the interests of a class, and not for the general good of society; but my experience of the motives and actions of the leaders of trade unions has led me to believe that although their energies are concentrated on the single object of improving the position of their clients, they do not seek to promote those objects by violent measures. I attended the late Congress of the Trade Unions at Leicester, and I can bear testimony to the admirable manner in which the proceedings were conducted. The programme of subjects for discussion was reasonable and appropriate. The questions which it was proposed to ventilate in Parliament were fitting topics for Parliamentary debate. There was a creditable freedom from class prejudices. Contrast the proceedings at Leicester with the debates of the International Society on the Continent, or the recent demonstration in New York, where nonsense was talked of a kind which would never have been listened to in this country. Have any of the trade unions of London ever maintained that, "To protect the useful classes against the avarice of capitalists, or the derangement of trade, the various branches of useful industry should be instituted by the Governments upon equitable principles, and thereby furnish employment to those who might be otherwise idle"? Has it ever been resolved at a mass meeting in this city, "That the time has arrived for all working people to resist by all legal means the oppression of capital, and the robbery which it perpetrates on labour"? My view is that we have in the English working people a body of men less likely to be led away by visionary ideas, less ready to listen to vague and envious denunciations, more strongly influenced by a sense of duty and more law-abiding than the corresponding classes in any other country. With all these merits, however, they are not exempt from human infirmity. The principle of self-interest is strong with them, as it is with their masters, and it is not always enlightened. They seek to sell their labour to the highest bidder, just as the masters demand the best price which the very keen competition amongst themselves allows them to secure,—and a very low price it often is.

While I have pointed out the inevitable and disastrous consequences of a too aggressive action on the part of the operatives, I am not an advocate of a too acquiescent temper of mind. The industrial capacity of workmen cannot be developed unless they live in reasonable comfort, in houses in which they take a pride, sustained by adequate sustenance, and encouraged by the prospect of bettering their condition. It is not in countries where the standard of living is lowest, and the pleasures of hope are denied, that production is most rapid and economical. "La pesanteur des charges," said Montesquieu, "produit d'abord le travail; le travail l'accablement; l'accablement l'esprit de paresse."

I conclude with one practical suggestion. The labour problem will find its natural solution in an increased supply of labour. It is for this purpose that a handful of foreigners has been lately introduced; but would it not be more easy and more satisfactory to train up the youth of our country in greater numbers to be skilled of our country in greater numbers to be skilled handicraftsmen? It seems to me that the reluctance to perform manual labour is a great and growing evil, an evil which has its origin, not so much in a dislike to hard work, as in that false social system which gives to the man at the desk a higher rank than it accords to him who stands in a fustian jacket at the mason's bench. I am a warm friend to popular education, but let us guard ourselves against its attendant risks. Let us take care that the educational advantages which we are now giving to the people are not perverted.

Mr. Plunkett quotes from the *Philadelphia Times* some very pertinent observations:—

"What a terrible satire upon our boasted free-school system is conveyed in the word 'educated.' Our children have their poor little brains crammed full of all kinds of impossible knowledge of names, and dates, and numbers, and unintelligible rules, till there is absolutely no room left to hold any of the simple truths which former generations deemed more important than all the learning of the books. The result is that they leave school ignorant of what is most essential, and outside of the schools there is no provision for their learning anything."

It is by courteous bearing in all the relations of life that the privileged classes can best testify their sense of the real dignity which attaches to honest labour, and show their conviction that the skilful labour of the hands is not inconsistent with culture and refinement.

TEMPLE BAR: ITS PRETENSIONS AND ITS PEDIGREE.

Temple Bar is gone,—gone, and with it have gone its statues of Stuarts,—statues which remained undisturbed even when the coping above them was surmounted by the heads of the ill-starred adherents who perished in the desperate cause of their ill-starred and ill-deserving dynasty. Even now Charles I., James II., and Anne maintain themselves erect on public pedestals in London; while the gratitude that the nation owes to William III. for his effective help in a revolution from which all parties are content to date our happy exemption from dynastic contentions and the security of fully-established liberty, still lacks such acknowledgment. The two first Georges, who, however unsympathetic, were, at least, not traitors to an adopted country that advanced in power and prosperity in every successive year of their reigns, are equally "unmemorised" in either stone or brass in our public thoroughfares. How far sovereigns who succeeded them are to be felicitated on such monumental compliments as livelier loyalty has afforded them, it might be invidious to discuss; their statues have not fates attached to that of an obstructive building, and they are not likely to be involved on this account in such a dislodgment as has overtaken predecessors, or to be grudged the sites of their pedestals. It is quite possible that an entire series of English sovereigns may have places among the canopied niches of the Houses of Parliament, but the fact does not come forth very conspicuously in evidence; they must be carefully looked for if there they are really to be found, and identification may at last depend upon the painful and, perhaps, uncertain decipherment of a Gothicised legend. So it is that with Temple Bar we certainly lose our only example at present of an architectural elevation of which the importance was enhanced in any considerable proportion by the association of life-size regal statues.

From this consideration, and not from this alone, we could perhaps have better spared a better structure. That its time was fully come, and that it was happier for all that it should be swept away, may be heartily admitted; but in this, as in many another case, the most assured euthanasia does not and ought not to cancel all pleasant memories, and therefore not to check every sense of tender regret. When release is secured, it is delicate to adopt the air of regarding what is accomplished beyond reversal as much a gracious as a welcome and timely relief, and to do our best to suppress an expression of that very coarse sentiment,—a good riddance. Let us settle ourselves to enjoy with complacency an accession of elbow-room without an odious comparison with the late irksome company of the departed; nay, rather dwell for a time on some of the redeeming qualities that made it less intolerable while it existed.

Temple Bar has gone, and there are youngsters among us who, in future years, will talk with the pride and pleasure of marvellous survivors, of having seen it, and passed through the narrow passage where Goldsmith twitted Johnson with Jacobite sympathies which were common to the traitors exposed above them, just as some who will not confess to being the oldest among us recal old London Bridge and Carlton House, and the days when cabs and omnibuses and railways and blue-coated policemen were not. When a Puritan Parliament demolished the cross at Charing as a type of superstition as dangerous as a white surplice or the ring in matrimony, a witty ballad of the time described the perplexity of the lawyers at the loss of a landmark on their way from the Temple to Westminster Hall:

"At the end of the Strand they make a stand,
Staring, and at a loss,
And chafing say, "This is not the way:
We must go by Charing Cross!"

Something has been done, but not quite with sufficient promptitude, to spare the recurrence of such difficulties after the present demolition, by the harrying up of the Courts from Westminster to meet the lawyers far more than half-way,—indeed, just over the way. But the Bar, after maintaining its ground with very legal pertinacity, has still had to go before the Courts are ready. At least it has not departed without vindicating infliction of exaggerated inconvenience during its last few days, a loyal adherence to the maxim much honoured in its neighbourhood,—"*stare super antiquas vias*,"—indulgently translateable, —"of standing in the way for all time." It was allowed the satisfaction of following, not making, a precedent, and it takes its place on the way to oblivion, as far as the City is concerned, as the latest at present of a train of coëval buildings which were once as conspicuous and more honoured than itself. Churches, towers, and steeples have gone before it in not inconsiderable numbers,—some of them not without well-merited regrets as they succumbed to what was for them necessity. What claim, let us calmly and candidly inquire, has Temple Bar to a share of such regrets on the score of architectural merits,—and architecture has but little self-respect that appeals to tenderness, as simply aged or helpless,—interestingly idiotic or imbecile, and in so far representative of an antiquity that is only interesting because antique.

It must be admitted that when it came into being it was not without a fair reason for existence. The city of London was then still London, and the only London; it was still the populous hive of busy residents which is described in such enthusiastic terms in the Areopagitica of Milton; it contained the hearths and homes of the men who gave shelter and guarantee for the safety of the Five Members; its chief municipal offices were filled from that class of its merchants whose success conducted to a peerage.

The City of London, compact and powerful

then, covered insignificant space as compared with the Greater London of our day, but it is likely that its wealth and political importance were much greater than at present relatively to other centres of industry and influence. Proximity to the royal and legislative and legal precincts of the City of Westminster had much to do with this in days of more tardy travel and communication. Even if some of these favourable differences were already on the decline, the consciousness of them and confidence in them were unimpaired. Fairly enough, then, might citizens renew an ancient monumental assertion of the extent of their municipal authority, and most appropriately at the demarcation of the roadway by which royalty was wont to arrive within their privileged borders, and had from the earliest times given ceremonious admission and confirmation of civic dignities and privileges.

But it is to be feared that not very much could be said for the propriety in expression of the design of the Bar even in its earliest day. The best that can be said, perhaps, is that it was an attempt to approach such an expression by the application of a style of architecture which was in harmony with a recent genuine advance in culture and education. The architect was content with providing the solid timber doors that were indispensable for the civic assertion of privilege,—which we remember seeing in process of being eased upon long rusty hinges at a not unimportant crisis of modern history, — in anticipation of that visit of William IV. to the City which was suddenly given up under circumstances of no little excitement. He did not, at any rate, seek for novelty in an anachronism of the worst kind,—a resuscitation of the effete,—of the defunct. He did not bar the way with a portcullis to threaten with its spikes overhead every pleasure or profitladen vehicle that passed underneath; he forbore to crown it with battlements and give them a fictitious justification by projecting machicolations to assist defenders in conveniently pouring boiling oil or melted lead upon passengers below,—passengers already formidably threatened by bolts and quarrels and clothyard shafts from flanking loopholes. Such an agglomeration of inconsistencies our ancestors and ourselves have been spared, and as the restoration of the Bar in any style seems now to be given up, we may trust that our descendants also will be as mercifully dealt with. It is somewhat to be thankful for.

It must be admitted, however, that this civic arch had incongruities of its own. There was no meaning or appropriateness whatever in the chamber above it; central, spacious, announced by its conspicuous window and flanked by royal statues, it was only fitted to suggest a wonder who could be supposed to haunt, or what could be shut up in it. Some hint of an intention of watch and ward, of observation, or of parley, on the occasions of state when the gateway had some semblance of a function would have been given, had the window opened upon a balcony, or been manifestly intended to open at all, like the *ringhiera* of an Italian town-hall; in the absence of this the inference was too manifest and two oppressive, that the space had to be filled up somehow for the sake of mass and elevation, and wasted for any other purpose because no reasonable purpose could be invented—no alternative readily presented itself. Another offence was the disproportionate encroachment of the piers upon space allotted for foot-passengers; the inconvenience of this was only sensibly felt since the streets have become so populous within our own time; but from the very first a refined eye would have protested against the inharmonious distribution of intervals between open carriageway and wire-drawing passages at the sides. The deeper the passages the more offensive is undue contraction of the opening. It is in these not-unfrequently-occurring occasions of grouped entrances that we have reason to value the architectural sense, which knows exactly how to give importance to a main entrance by contrast with subordinate, and to duly graduate subordination; excessive reduction of the inferior openings degrades the chief and central by the incongruity of such mean companionship; and if they are insignificant, it stands a weakened, sudden, and unsightly gap. For guidance in such proportions we must go elsewhere than to Roman triumphal arches. It might not be worth while to call back to judgment the demerits of the departed, but that the complaint of *Macbeth*, at the reappearance of *Banquo*, applies with tenfold force to architecture,—"The time has been," he says,—

> "That when the brains were out the man would die,
> And there an end; but now they rise again
> With twenty mortal murders on their crowns,
> And push us from our stools."

We can scarcely say that we are safe at present against having to defend the noblest sites against incursion of revived abuses in building, the intrusive ghosts of the obsolete. We might compound for giving way sometimes in courtesy to what was excellent in its own day, if only it be moderately conciliatory towards the requirements of our own; but let us fervently hope to be spared an invitation to respect on the score of antiquity what was never good at any time. The danger is not trifling, for tenacity of life is not proportioned in any kingdom either of nature or art to the value of the imperilled vitality,—

> "Still her old empire to restore she tries,
> For, born a goddess, Dulness never dies."

Temple Bar, it is probable, to use an expressive phrase of Æschylus, was "not ungrandfathered" by that arch of Hadrian at Athens, which on its opposite sides bore inscriptions declaring metrically such a division of two cities as Temple Bar signified unphonetically. The ancient city of Theseus was thus divided from the later Athens, of which adulation recognised Hadrian as a founder worthy of equal honour. Passage was given through an archway of nearly 20 ft. span, but there were no side passages; the structure, apparently, by its finish, stood free all round, and it seems that pedestrian traffic circulated on either side even as it does at the great triumphal arch of Paris,—the Arc de l'Étoile.

Certain delicacies of execution and studious attention to proportion still vindicate a survival of Athenian art on an Athenian site; but they are associated with innovations by which Roman architects vitiated one style without pushing boldly forward to such harmony of use and structure and ornament as would fairly give promise of a worthy successor. Columns stand free on tall pedestals on either side of the arch, to support returns of the broken entablature, or the entablature is so broken in order to give the columns something to support; there is no saying certainly which. A curved architrave springs boldly from the capitals of the piers, but, like the arch itself, is not countenanced by subsidiary repetition.

Still, in a comparatively small building, a certain refinement in execution, and sweetness of gradation in magnitude of parts, produce a decorative effect of some value, if we consent not to be as fastidious as in rigid justice and prudence also it usually behoves us to be. The two fronts are exactly similar, and the fronts are the building, and we have no solid masses to challenge inquiry after a better reason for their existence than that a certain space had to be filled up, and might as well be filled as left uselessly empty.

The four columns of an upper order have exactly four-fifths of the height of the lower; a pair of attached semi-columns in the centre support an advanced pediment, and the interval beneath this was filled by a very thin slab of marble, which thus backed a shallow rectangular niche on either front. The intervals towards the free columns to right and left were open. No marks were found of any statues having ever been placed either in the lateral intercolumns or the two central niches. Yet, unless some such completion were designed, we can scarcely but visit such a superstructure with still severer condemnation than that of the dusty room that surmounted Temple Bar. A mere pile of architectural members with no purpose beyond the exhibition of themselves, can never supply a satisfactory finish to a composition. It is only as exhibiting and protecting elaborate enrichment by sculpture, painting, or mosaic, that the pedimented extensions which rise free above the façades of Italian churches at Lucca, Sienna, or Orvieto, vindicate themselves to our sensibilities.

Such as it is, the Arch of Hadrian seems too similar to the first attempt at Greek architecture in England not to have been in some way related to it. This is the little Gate of Honour of Caius College, at Cambridge, which is recorded to have been "erected in 1557, after the design of John of Padua." Here we have a more solid building than a mere double front, and the three intercolumnar spaces are occupied by round-headed niches, like those of our departed Bar. From the design of this Gate of Honour to that of Temple Bar is the most moderate transition conceivable of architectural evolution, and it is needless to remind how familiar Wren,—if really the author of Temple Bar,—was with Cambridge. Cambridge, it may be noticed, reproduces at Downing College another Greek portal with a certain degree of accuracy,—that of the Propylæa,—a hexastyle portico where a broad ditriglyphal interval gave a central carriageway between pairs of normal intervals for entrance on foot on either side. This was also the scheme of the portal of the new Agora at Athens,—so called by Stuart, a Doric tetrastyle with a central ditriglyphal interval.

Comparison with the precedents of Roman triumphal arches may be thought to have been too long delayed. Some of the most important of these,—the arches of Severus, of Constantine, the arch at Orange, and some others,—correspond with the plan of Temple Bar in flanking a broad central arch with others smaller, and usually, indeed, disproportionably smaller, at the sides; they correspond, also, in a very positive cumbrousness which might have been relieved had the sculptured memorials of campaigns which they bear, like the great Egyptian pylons, been less clumsily distributed. As it is, they unhappily agree, also, in presenting a mass of construction which is very inadequately vindicated by appropriate expression of purpose, but they have not the same relation to the Athenian precedent of order above order. The imitations of these in modern times which obstruct the movement of mankind while making a pretence to accommodate it, are among those expenditures of architectural resources which bear least proportion to architectural genius or true architectural reward either in use, or dignity, or beauty. It is but little palliation of such failures if an attempt has been made sometimes to conciliate what Vitruvius calls the *decor ad consuetudinem*, by burrowing into the brute mass of blind masonry, and effectuating within it at least accommodation for a doorkeeper and his wife. Some time since it was possible to recognise the combination by the top of a smoke-cowl which inconsiderately overpeered the sky-line of our own Marble Arch, but this seems lately to have retired under rebuke.

We may, however, challenge Europe, with considerable confidence, for an architectural entrance to a public place which is more appropriate and more graceful than that which distinguishes and enlivens the entrance to Hyde Park by Apsley House. The relative proportions of the openings are here most agreeable; their distribution satisfies at once the convenient and the picturesque; the connecting screen of columns is sufficient to mark the boundary; their festal style announces a scene of exhilaration and elegance and beauty; and the whole composition is of sufficient extent to form a not too sudden transition from the civic architecture as it opens a way to free and verdant space,—to reaches of avenues and promenades by an expanse of water.

Of the opposite arch over Constitution-hill we cannot trust ourselves to speak; for, in truth, so long as it remains crowned—dishonoured—by the falsely-elevated bronze above it, we do not trust ourselves to look in its direction. If all that is said be true, the monument to the great Duke which is now approaching completion in St. Paul's, is worthy of his patriotic services;—why should not the completion of this be made the occasion of removing elsewhere that statue of him which as now erected inevitably associates a memory so honoured with a sense of national humiliation and ridiculousness?

THE PROGRESS OF THE WATER SUPPLY QUESTION.

WE have before us, in the sessional proceedings of the Social Science Association, the detailed report of a paper which was read, and a discussion which took place, on January 14th, in regard to the water supply of London, and which we have already referred to in a brief note (p. 73, *ante*). The full report brings out more distinctly the significant fact that while the paper, read by Mr. Angell, C.E., was a decided advocacy of the Board of Works' scheme, the chairman for the evening, no less an authority than Mr. Edwin Chadwick, "charged" in direct opposition to the views propounded in the paper, and described the dual scheme as one which would be "an addition to the great and expensive blunders already committed by that unscientific Board." Mr. Chad-

wick's remarks, which went to some length, are well worth the attention of those who will be called upon to decide in Parliament the fate of the scheme which we presume the Board of Works still mean to press to an issue, though the fact that their scheme did not find a single supporter among speakers of very various views at the meeting referred to, which was especially a scientific meeting, looks favourable for those who are convinced of the futility and imperfection of the scheme. We may so far, however, hail Mr. Angell as an ally, in that he entered a vigorous protest against suffering any continuance of the present state of things a moment longer than could be helped, and against the idea that water contaminated by sewage could by any treatment be rendered really pure enough for drinking. His statement that "in the civic palace of this, the wealthiest city of the world, three-quarters of an inch of floating fungi scrub was lately found on the surface, and three-eighths of an inch of mud in the bottom, in the cisterns which supply the Lord Mayor, while a bottle of water on his lordship's table contained hundreds of nematoid worms," ought to be sufficient in itself to silence the contented people who wish to go on as we are; one or two of whom, extraordinary to say, seem to have given expression to their contentment at the same meeting. And we have no doubt, from the tone of Mr. Angell's paper, that he would not underrate the desirability of a supply of water of first-class purity for every purpose, if he had not before his eyes the bugbear of financing considerations. "The magnitude of London, and financial considerations, pointed to a limited supply of perfectly pure water for dietetic purposes, supplemented by the present sources for general purposes." As to the financial aspect of the dual scheme, and the delusive nature of the promises held out by its promoters, we have said already enough when discussing the scheme shortly after its first promulgation. But the question is not, will not be to the public mind, one of money in the first instance. There is enough money to be had for any scheme which will do the thing thoroughly, whatever its cost, we might almost say, supposing there is no alternative between an enormous cost and an imperfect system. Mr. Angell's ambiguous phrase, "the magnitude of London and financial considerations," looks like an attempt to parade before our eyes a formidable vision of our great expenditure, while putting on one side that of our great resources; ignoring the fact that a great annual "turnover" means, unless everything is under utterly false and unhealthy conditions, a great annual revenue. There is, however, in fact, no reason to fear that a complete scheme of pure supply could not be realised for an outlay by no means enormous or extravagant as compared with that of the dual scheme, if we take into account the immense advantage, even for the present, and far more for the future, of doing the thing thoroughly once for all, instead of patching up a middle system which it is impossible for any one possessed of ordinary foresight to regard as permanently satisfactory. As to the difficulties and disadvantages likely to attend the formation of a double supply system over such an immense area of inhabited country, we have already spoken as strongly as it was possible to speak. But let us take this opportunity, at least, of drawing attention to and enforcing Mr. Chadwick's observations in regard to the intrinsically unsatisfactory nature of a supply which gives perfectly pure water only for dietetic purposes, and assumes that we may be content with comparatively impure water for other purposes. As he said, "for clothes-washing, for boilers, for steam power, and for art purposes, it was as desirable that water should be free from foreign matter as for drinking purposes." And even putting out of account the mechanical and chemical inconvenience, for many purposes, of water charged with any impurities, there remains the great sanitary evil of having constantly passing through our houses, and brought into personal contact with us in a variety of ways, water which is really, less or more, a carrier of disease or contamination. It is astonishing that any one can even have heard of the recent new lights thrown on the origin and spread of disease by the researches of Professor Tyndall and others, and talk as if the procuring of absolutely uncontaminated water were of no consequence when it is "not to be taken internally."

As to some part of the general theory of water-supply touched upon by Mr. Chadwick in his remarks, we opine that he rather weakened his position than otherwise by insisting on the advantage and the adequacy of a spring supply. It would require a very convincing body of statistics to satisfy us that such a source of supply, however admirable it would almost certainly be as to quality, would be likely to be adequate in quantity for London, without the expense of an enormous collecting ground, and a most complicated carrying and collecting system. The requirements of London in this respect cannot be judged of in the same way as those of a town of ordinary size. And however we may delight ourselves in the idea of the purity of a spring supply, it must be remembered that to take such a supply is to deprive ourselves of nearly all the collecting power existing for us by means of natural forces. We cannot help suggesting that this consideration seems to point at least to the advisability of again turning over seriously the question of a lake supply; in other words, of obtaining, by a single carrier, water which nature has already collected in a reservoir out of the reach of artificial contamination. Mr. Chadwick's reference to the new processes of softening water also recals to us a suggestion for water supply which we had occasion to notice *en passant* not long since in reviewing Mr. Reid's work on Portland cement (*Builder*, Dec. 22nd, 1877). He recommended, among the possible uses to which Portland cement might be put on a great scale, the formation of a great system of catch-water reservoirs for collecting and storing the rainfall. We pointed out that he seemed to have overlooked the fact that this could not be clear gain, since the rain-water furnished what we subsequently pumped up from the earth in somewhat altered chemical conditions; but we then also observed that it was a question worth considering, whether it were more economical to store the rain-water before it sank into the earth, or to pump it up from thence afterwards. If rain-water were chemically all that we desire, there could hardly be a moment's doubt what the answer would be. We know, however, that it is not so for every purpose. But the question certainly does suggest itself, since we find that so much of the water we pump up, and especially in the neighbourhood of London, is also chemically unsuitable in another way, since so much is made just now of processes for "softening" the chalk water (without which processes there cannot be a pretence that the water to be provided by the dual system would be thoroughly acceptable for drinking), whether chemistry is not as equal to the task of "hardening" and (if necessary) otherwise treating rain-water in an alterative way; and whether this, taking the matter all round, would not prove to be the easiest and cheapest principle of the two. As a general rule, we know to our cost that it is a great deal easier to alter water by getting foreign matter into it than by getting it out.

We are well satisfied with the result of the Social Science meeting: it has suggested nothing positive, but it has added another probability in favour of the rejection of the dual system Bill, and has made negatively, if not positively, a step in the right direction. We will only for the present reiterate what we have before said, that no scheme of water supply will be satisfactory which does not give London a full and ample supply of perfectly pure water, and that we are confident money will not be grudged or be wanting for any scheme which will really and thoroughly accomplish that object.

THE PARIS EXHIBITION, 1878: A GLIMPSE.

Some ferrent French journalists have expressed their sentiments on the subject of peace by saying that war would interfere with the grand International Exhibition at Paris for the year 1878. Whether such an emulation could go on simultaneously with the terrible rivalries of war might be a question which could only solve itself in the midst of facts; but certain it is that the preparations of Paris have not been stayed for a moment, and we have in our hands the rough draft of a catalogue representing the treasures of decorative art which will be shown by the Eastern nations in competition with the French. The Parisian arcade will enter into competition with the Oriental bazaar; and it is into this bazaar that we are permitted beforehand to cast a scrutiny, with all the laws, regulations, and suggestions of its industry, so long misunderstood in Europe. Naturally enough, in nearly all emulative exhibitions, the East comes next after Italy, for Murano is Oriental to the core; but Russia is still to the front with her gigantic Asiatic claims. We shall have once more her Byzantine mosaics, with her mighty candelabra of rose-coloured lapis-lazuli and Siberian rodomite, her "rock of rubies," malachite, and porphyry of every imaginable metallic tint. This, however, is not the true East, and it is only from a stray leaf of the catalogue that we surmise so much of what will be seen after May 1st. The really Oriental cabinets, if furnished as we are told to expect, will surpass those set forth in any previous display, and may go far, perhaps, towards convincing the West that, with all its industry and ingenuity, the principal part of its luxury has been derived from the East,—that is, in sculptured marble-work, apart from statuary and the potter's art. We have sought in the rough catalogue before us and among the hitherto unarranged collections a justification of this idea. The general result must, of course, be amazing and splendid. All previous exhibitions, in their Oriental departments, must necessarily be surpassed in kashmirs of India, jewels from Lahore; satins and nankeens, ivories and porcelains, from China; damasks, carpets, and velvets from Aleppo, Shiraz, and Ispahan; gauzes and muslins from Gwalior and Agra; weapons and carpets from Kurdistan; bronzes and manuscript scrolls from Japan; and a thousand other artistic miscellanies, through which lessons may be taught. To arrive at this teaching, the Oriental Courts at the forthcoming Paris Exhibition will be engaged, and the objects of it are set forth by the programme now within our reach practically enough; harmony in colour, solidity in fabric, cheapness in the market; and why, ask the critics, should there remain any doubt upon the subject? They are challenging a rivalry with the brocades of Babylon, Memphis, Tyre, Byzantium, and Trebizonde. That emulation, however, is a thing of the past. The catalogue, at any rate, informs us chiefly about shawls and carpets from Broussa and Calcutta, Hindustan and China, and, we are confidently assured, the finest looms on the banks of the Ganges will not yield, for the Oriental Courts of the forthcoming Paris Exhibition, results comparable with those which will be admired in the crystal cases from Lyons. There is, at all events, splendid promise in this detachment from the general catalogue,—precious woods, sculptured and engraved; patterns in marqueterie beyond all modern fancy; damascenings priceless; illuminated manuscripts; porcelain of all ages; enamelled lamp-balls, and other things precious beyond price, from ancient Rome to modern Venice. Yet, even this is only half of the East, Eastern,—with its jewelled goblets, lamps, pipes, and other trifles, which might as well have belonged to Barbary as to Ispahan; it has very little to do with the East, pure and simple; it is African, and not Asiatic. We must regret that, in the volume of the catalogue, as yet inchoate, which is now in hand, no such distinction has been marked. On the contrary, a strong superiority will be claimed, at the Exhibition, on the part of Arab, as contrasted with genuinely Asiatic, arts and architecture, and the distinction will include even jewellery, and an attempt is made, with some interesting results, no doubt, to write over again, the history of the turquoise,—"jewel of warriors," and of Scripture; but into these pages we have not space to enter, albeit that the temptations of the uncorrected catalogue are many.

There are to be two specially Asiatic "streets" at the Exhibition—so cosmopolitan will be its nature,—one for China and one for Japan. We already find displayed in them magnificent volumes, imperial in their typographic splendour, noble engravings on wood, illustrating the arts and manners as they flourished under old dynasties; exquisite specimens of that "white and blue" for which a mandarin in tolerable circumstances would generally give anything less precious to himself than his head; and the more than a thousand-and-one Oriental niceties which so often, in our days, convert a Mayfair drawing-room into an imitated Whang-Fo-Fy. The traffic in this Oriental industry, as indicated in sundry notes appended to the catalogue, has marvellously ripened within the last few years. The rival Tycoons themselves have become traders,—in lacquered chests, trays, tables, cabinets, "whatnots," and every kind of amalgamation with mother-of-pearl, porcelain, tortoise-shell, ivory, wood-work, and paper; and the items of this Oriental Exhibition will occupy more than a hundred pages of the Parisian cata-

logue. There are, indeed, many items included which are not, in any sense, of a frivolous, or even of a fanciful, use. Many, indeed, are set down at prices almost grotesque in their extravagance; but these, in nearly all cases, are, it would seem, examples of the native, and, in fact, inimitable, lacquer—little tables costing 500*l.* each; chairs of nut-wood, valuable alone on account of their exquisite workmanship; small fireside benches, wrought with fables from the mythological forests of the interior; and so forth. But the fragment of catalogue for the 1st of May, 1878, does not conduct us alone into the far islands and continents of Asia. We shall next stop in Persia, whence, as the enumeration promises, a splendid display will come: cotton and linen fabrics, such as have never been surpassed,—porcelains, arabesques, rose-bordered "marguerites," geometrical carpets, and those inimitable rugs, of which even the poets of Persia sing, saying,—"Who puts a foot upon them is lost." Here will be—for we have not seen them, as yet, only their designation in the catalogue—velvets of that magic tint which, to the eye, varies from scarlet to blue or black; curtains of intolerably variegated hues, from Ispahan; "prints" whence the hand has erased every trace of machine-work; carved chests, bookbindings, mirrors, arabesques, and lacquers, all bearing the bloom of that incomparable varnish which was a secret in the days of Chardin, and is a secret still. The way is now pointed towards Turkey, always superb in its display of slippers and pipes, rose essences and seraglio pastilles; Turkey, never failing in its appreciation of colour, though dead to all ideas of form; Turkey, educated in the one art by the influence of the Sun, and ignorant of the other because it has smoked its own imagination out of shape, and confounded the outlines of a minaret with those of a tobacco-bowl. We can promise the visitors of 1878 a rich exhibition of both varieties,—cushions, collections of arms, marbles intended to be let into the thickness of walls,—quite a modern fashion for the East,—and, as we feel rather anxious to see, the divan or smoking seat converted, Temple fashion, into a bedstead, which suggests, indeed, a broad advance in civilisation. This is rather European than Eastern, however, and is very delicately alluded to in the bit of mutilated catalogue which it is our privilege to possess. Let us pass on, hopefully, to specimens of transparent Albanian silk, linen, and cotton, delicate as gauze, yet strong as cloth,—cheap or dear to suit the conditions of every class,—"tissues light as vapour," the compiler assures us; golden belts from Tripoli; red necklets from Aleppo; horrible imitations of the Gobelins tapestry; to all of which the promoters of the Oriental department in the forthcoming Paris Exhibition are pledged. They present, moreover, lists of Oriental cups, coffers, works in jade and crystal, golden arabesques, incrustations of ruby and emerald and Indian ornaments, without which, it may be presumed, no such exhibition, international or not, would be complete. There will be the average number of models, more or less magnificent, from Amritsir, Ahmedabad, Beejapur, and elsewhere, but the interest in these will be small in comparison with that excited by the modern wealth of the East as it will be illustrated in these collections, and especially by those wonders of decorative art, the mysteries of which possibly, though lost to Asia, may have been recovered by Europe. Their results, at any rate, abound,—in ceramics, in bronze, in crystals, in shawl fabrics and household art patterns, for which the rest of the world has no comparison, and can find none. But, amid the whole profusion of Eastern invention and beauty, if we closely look at the indications of the catalogue, and the titles of the exhibiting firms, we shall find that a good deal of Eastern art preparing for May next is European in origin, and Oriental only in the most mimetic sense.

New Town-hall at Annan.—On the 22nd ult. the new Town-hall, which has been in course of erection during the last two years, from designs by Mr. R. Smith, architect, Glasgow, was opened. The building is in the Scotch Baronial style, and the material used is red sandstone. There is a tower 105 ft. high, in which there are a clock and bells. There are numerous rooms in the building for the use of the town clerk, magistrates, witnesses, &c. The principal hall measures 45 ft. by 25 ft. The building occupies the site of the former Town-hall, and has cost upwards of 3,000*l.*

METROPOLIS MANAGEMENT AND BUILDING ACTS AMENDMENT BILL, 1878.

THIS Bill, which has been entrusted to the Chairman of the Metropolitan Board of Works, appears to have been framed principally for the purpose of regulating the erection of buildings in close proximity to roads and passages; for the purpose of affording protection to the public who frequent theatres and music-halls; for the purpose of preventing the pollution of sites and the foundations of new buildings, of improving the character of building construction generally, and also in order to make more adequate provisions with respect to the payment of expenses incurred by the Board in relation to dangerous structures. It is, perhaps, needless to add that the Bill proposes to considerably strengthen the powers of the Board; but some of the powers it proposes to accord are of such a character as to appear neither more nor less than a suggested transfer of authority, which should be the exclusive privilege of an Imperial Legislature, to a Metropolitan Parliament.

The first provisions of this suggested Act touch upon what has come to be called the alignment of a street or highway; and thereby the frontwall or the frontage of no new buildings, erected in an old street, can be placed at less than a certain distance from the centre of that same street. If the street is used for carriage traffic the distance from the centre to the alignment is prescribed to be 20 ft.; if only a footway, 10 ft. But the Board reserve the right to "consent to the construction, formation, or extension of any house, building, forecourt, or space, at a distance less than the prescribed distance from the centre of the roadway." It is further proposed that no street or passage, used for foot traffic only, whether before or after the passing of the Amended Act, shall be used for carriage traffic unless the space between the alignment of the houses, on each side, be widened to the full width of 40 ft., except with the consent of the Board.

The powers asked for by the Board to require the proprietors of theatres and certain music-halls, in certain cases, to remedy structural defects, can only be submitted to public appreciation in the language of the Bill, abbreviated as much as we dare: thus, whenever it appears to the Board that any licensed building kept open for dancing, music, or other public entertainment, and capable of accommodating more than fifty persons at one time, is so defective in structure that special danger from fire may result to the public frequenting the same, then the Board may, *if such structural defects can be remedied at a moderate expenditure*, require the owner to make such alterations within a reasonable time, which shall be specified in an official notice. But the owner may, within fourteen days after the receipt of the notice, serve a counter notice of appeal upon the Board. In that case the appeal will be referred to an arbitrator appointed by the Secretary of State, at the request of either the Board or the appellant. The Board propose also to make regulations respecting theatres and music-halls, and to print them with the date thereof. After the making of such regulations, to be afterwards amended and altered, *at any date*, no person shall keep open a place of public resort, such as a theatre or music-hall, unless the Board have granted him a certificate under their seal.

The Board propose to make such bye-laws as they deem expedient with respect to the following matters:—

1. The foundations of new buildings; the sites of houses, and other buildings to be erected after the passing of the amended Act; and the mode in which such foundations shall be made or such sites shall be excavated and filled up. These bye-laws would have reference to stability, the prevention of fires, and the protection of health.

2. The description and quality of wall construction authorised by section 12 of the present Building Act.

3. The powers and duties of district surveyors in relation to the above matters; for their guidance in such matters; and for the fees to be paid to them in respect to new bye-laws, and to duties imposed upon them by the new and amended Act.

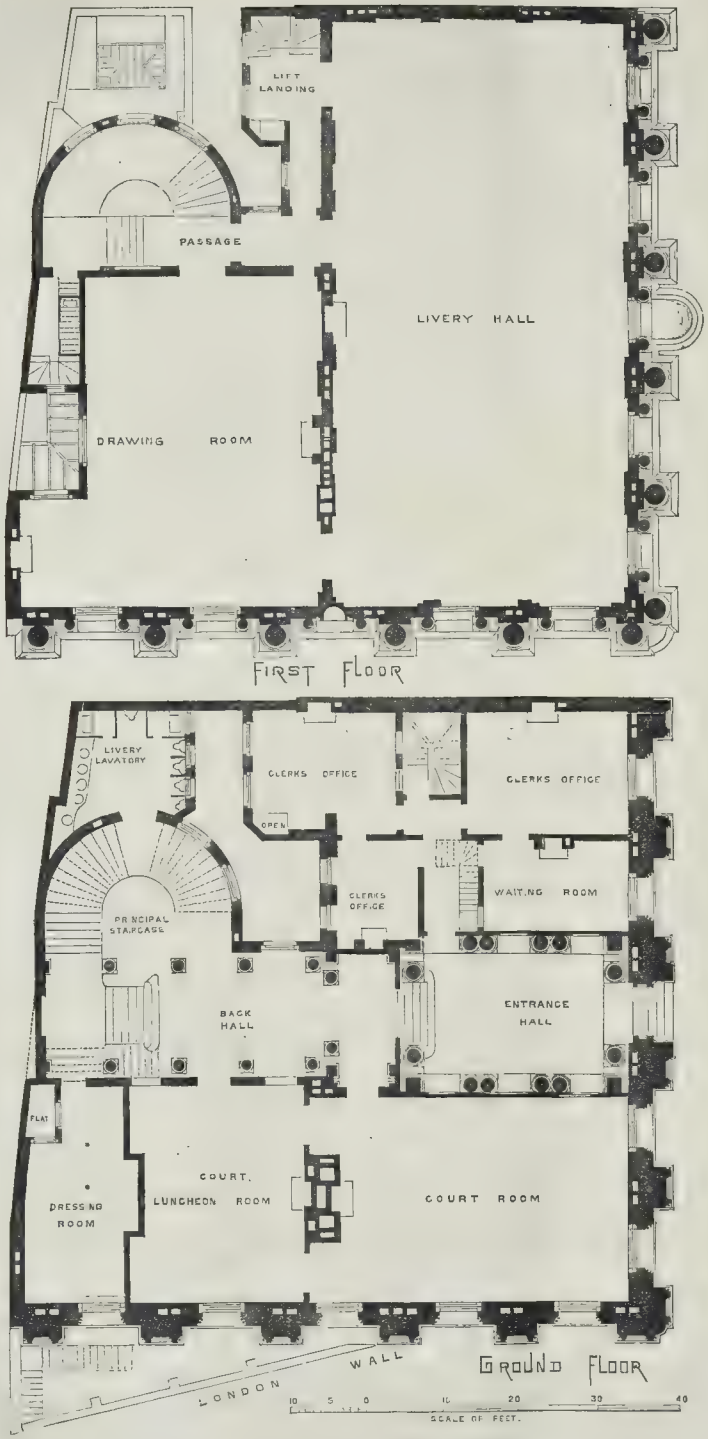
The Board are also to make such bye-laws as they think fit with regard to the deposit of the plans and sections of intended buildings; with regard to inspection by the district surveyor or any officer of the Board; and with regard to the alteration or pulling down of any new building erected in contravention of their bye-laws. Moreover, all the provisions contained in sections 202 and 203 of the Metropolis Management Act now in force referring to bye-laws made by the Board are to apply to any new bye-laws made under the authority of the suggested and amended Act of 1878; the Board, be it well understood, reserving to themselves the right to dispense with the observance of any bye-law.

The Bill proposes to amend section 74 of the Metropolitan Building Act now in force with respect to the sale of dangerous structures. Where any structure is sold by the Board in manner prescribed by that section, the purchaser may immediately enter upon the land which holds the dangerous structure for the purpose of removing the latter; and when the proceeds of such sale are insufficient to repay the Board the amount of the expenses incurred, the Board may sell the land upon which the dangerous structure stood. The Bill also extends the power of the Board with regard to the inspection, by officers of the Board, of theatres, music-halls, buildings, and other works. Power is also proposed to be given to the owners of houses to enter them in order to comply with notices served by the Board. The owner may, after giving seven days' notice in writing to the occupier of a house, and on production of the notice of the Board, enter and do whatever is necessary therein; and any person refusing to admit him or to afford him reasonable assistance will incur for each offence a penalty not exceeding twenty pounds.

We have said that the Board propose to make bye-laws with respect to certain matters contained in the three paragraphs we have reduced and printed above. They also propose to dispense with the observance of any bye-law when they think fit. They also propose, whenever they may deem it expedient, to "alter, vary, and amend such bye-laws." Further, with respect to new theatres and new music-halls, they propose to make regulations, and from time to time, as they may deem expedient, to "alter, vary, and amend such regulations." Now the public attention must be seriously directed to these portions of the Bill; for the Metropolitan Board of Works are about actually to ask Parliament to give them the power to make legal whatever illegality they may be pleased, or they may be forced, to commit. And this absolute power is to be given, not to an individual upon whom the metropolitan ratepayers can lay responsibility, but to a soulless, bodiless Board elected by the vestries and, as it has been shown in our columns in the matter of the "National" Opera-house, to a Board, as [virtually irresponsible to public indignation as they are careless of public opinion.*

It is perfectly consistent that owners, architects, and builders engaged in the construction of houses, theatres, and other buildings, should be subjected to laws and regulations, the terms of which have been submitted to Parliament, and, through the Press, to the public; but that they should be subjected to laws and regulations made in the dark, and which, in the dark, may be altered and amended at pleasure, is a new phase of constitutional enactment. Even presuming that the bye-laws, framed by the Metropolitan Board concerning new houses, were technically perfect and equitably just,—that the regulations concerning theatres and music-halls were effective and popular,—owners, architects, and builders could never be certain, from one week's end to another, that such byelaws and regulations still composed the law of the land. To permit the metropolis, looking at the matter as if the metropolis were really represented by the Metropolitan Board, to make bye-laws according to its own sweet will, is to controvert the possible unification and reform contemplated by the Local Government Board. Such an example, set by London outside the City precincts, would be fatal to the institution of those General Building Regulations which many men, who understand the matter better than the metropolitan vestries or their representatives can understand it, have recently advocated in different parts of England and Scotland. Furthermore, there are architects and builders who are members of vestries and of the Board; as framers of bye-laws, regulations, and other details of legislative enactment, they will become both judge and interested party in particular cases. Observe, a bye-law will, of course, refer to concrete

* See "The 'National' Opera-house, the Metropolitan Board of Works, and the Public," in the *Builder* of the 6th of October, 1877.



THE NEW HALL FOR THE CARPENTERS' COMPANY.—*Plans.*



CARPENTERS' HALL, LONDON W



R. W. Willmer Pocock, Architect.

foundations, but one of the judges who happens to be engaged as architect of a new building thinks the site so good and firm that concrete will be unnecessary; he consults his brother judges, and the bye-law is not enforced, or another bye-law is made to suit such a case. Again, a bye-law will doubtless refer to fire-resisting floors or horizontal party-floors, but an owner, who knows a member of the Board, will explain that he does not intend to inhabit the house he is about to build,—that he has no objection to run the risk of nightly destruction,—and that 2 in. deal joists would suit him better than fire-resisting concrete. The member of the Board consults his brother legislators, and they consent to the non-observance of the bye-law, more particularly because the gentleman is a lessee of the Board, and paid a heavy premium to an original lessee who has departed, for the inestimable privilege. Furthermore, an owner whose architect and whose builder lay their foundations in accordance with one bye-law may find on the visit, a month afterwards, of the district surveyor, that another and opposite or a more complete regulation applies to the subject of foundations.

We can conceive nothing more likely to encourage jobbery and corruption than to give a Vestry Parliament the power to make the law it was originally authorised simply to enforce. On the other hand, the Bill is deficient in details which have to do with the enforcement of a Building Act. It does not propose to give a district surveyor the power, or compel him to discharge the duty, of—for instance—preventing such an accident as that which lately happened in the Haymarket. A district surveyor's responsibilities are minimised by the terms of the Acts now in force; the suggested Act does not increase them in such a way as to afford that defence to the public which may be reasonably demanded, and which seems urgently required.

CARPENTERS' HALL, LONDON WALL.

IN our present number we give a view and plans of the principal floors of the new hall now in course of erection at the junction of London-wall and Throgmorton-avenue for the Worshipful Company of Carpenters, from the designs, and under the superintendence, of Mr. W. Willmer Pocock, architect. The building occupies part of the site of the old hall, which, after being for many years past, mainly in the occupation of Messrs. Waterlow, the well-known printers, has now been partially demolished. The new building, as will be seen, is nearly square on plan, and it is entered from Throgmorton-avenue,—a new and convenient thoroughfare which has been made by the joint action of the Carpenters' and Drapers' Companies from London-wall into Throgmorton-street, passing into the latter street by an archway adjoining Drapers' Hall. The manner in which the space is divided on the two principal floors will be seen from the plans. We give the dimensions of the principal apartments. Taking first the ground-floor, the court-room measures 42 ft. by 26 ft. by 18 ft. high in the clear. The court luncheon-room is 28 ft. by 24 ft. by 18 ft. high. The entrance-hall is 3 ft. above the level of Throgmorton-avenue, being approached by six steps, each having a rise of 6 in. On the level of this entrance-hall, and entered from it, will be the clerks' offices, waiting-rooms, &c. Over these offices, and between them and the floor of the livery-hall above, will be a mezzanine, containing rooms for the storage of china and glass and other appurtenances of the dinner-table. What is called the "back hall" ascends by six additional steps to a height of 3 ft. above the entrance-hall, and as the court-room and the court luncheon-room are entered from this "back hall," it follows that these rooms are 6 ft. above the level of the pavement in Throgmorton-avenue. The first floor is principally occupied by the large or livery hall, 76 ft. long, 38 ft. wide, and 36 ft. high, being one of the largest livery halls in London. Adjoining the livery hall, and entered from it at one end as well as from the staircase-landing, is the drawing-room, 42 ft. by 30 ft., having a coved ceiling. Descending to the basement, we enter the kitchen, 38 ft. long, 26 ft. wide, and 20 ft. high, the floor being about 14 ft. below the level of the street pavement. Adjoining are the scullery and other offices. The kitchen is capable of cooking for 250 persons at once. The architect has sought to prevent the smell of the kitchen from rising to the hall and other parts of the building by devising a number of large flues in the thickness of the chimney-breast, and opening into the kitchen near the ceiling. These flues, the air in which will be rarefied by the heat of the kitchen and other chimneys, will, Mr. Pocock hopes and believes, extract not only all the smells from the kitchen, but will cause the kitchen to draw *into* it from *down* the staircase, a strong current of air,—thus reversing the usual process. A lift is provided, but this, we understand, will not be used for carrying up the dinner,—only for sending down the dishes after they have been on the table, together with glass and china. The dinner will be passed up, in the usual way, from hand to hand, by a numerous retinue of servants stationed on the staircase from the kitchen upwards,—it being found that this method is much more expeditious than the use of a lift. Beneath the clerk's office is a strong-room of somewhat peculiar construction, in order to preserve the company's records and papers from destruction by fire.

The view which we give herewith renders any description of the façades unnecessary. The material used for the whole of the exterior is Portland stone. The coupled and detached columns in the entrance-hall and back hall will be of scagliola porphyry. The principal staircase is of stone. The floors are not of iron and concrete, nor are they all of any professedly "fireproof" construction, the ordinary joists and floorboards being adopted,—1¼ in. battens being used for the floors of livery-hall and other of the principal apartments in the building, covered with ⅛ in. or ⅜ in. pitch-pine laid in narrow widths. Where "fireproofing" is attempted, it is by brick arches and piers, or concrete and timber, in preference to iron supports. The roof will be covered with Bangor slates. The foundation-stone was laid on August 1st, 1876, as reported in the *Builder* at the time,* but the works have been greatly interrupted during the past six or eight months owing to the masons' strike. Mr. Brass is the builder, the amount of the present contract being just under 29,000*l.*, but this sum does not include all the internal finishing and embellishment. Mr. Parsons is the clerk of the works, and Mr. Jackson is the general foreman.

The members of the Architectural Association, to the number of forty or fifty, visited the building on Saturday afternoon last, when Mr. Pocock was kind enough to conduct them over the works. The visitors were also greatly indebted to the courtesy of Mr. Parsons in affording information.

Although, in years long gone by, we have dwelt at some length on the history of the Carpenters' Company, a few historical notes will be of interest at the present time. Mr. E. B. Jupp, in his interesting history of the guild,† says that the date of the formation of the company is a matter of much uncertainty. As it was not one of the eighteen amerced by Henry II. as adulterine, it may be inferred that it was not then in existence, or that it was already invested with legal sanction; but we have no certain evidence in support of either supposition. Maitland, writing in 1739, terms it an "ancient fraternity," and assigns as the date of its incorporation, 7th July, 1344 (17 Edward III.). Stow, on the other hand, a much higher authority, who wrote in 1598, gives 7th July, 17 Edward IV. (1477) as the date of the first charter. The company certainly possess a charter of the latter date, and as both writers agree in the day of the month and the year of the reign, it is evident that unless there were two charters granted to the company, each bearing date 7th July in the seventeenth year of the reign of an Edward, Maitland must be in error, and that the charter to which he refers as having been granted by Edward III. was in reality that of Edward IV. But whatever may be the date of the incorporation, the existence of the guild prior to Edward IV.'s reign is, according to Mr. Jupp, indisputable. Edward IV.'s charter was granted at the instance of "the freemen of the Mystery of Carpentry of our City of London" to "Peter bailie, john White, and Andrew essex, Freemen of the Mystery of Carpentry of our City of London," showing the existence of freemen of the guild prior to that time; and, indeed, a distinct notice of the guild as existing in the last year of the reign of Henry V. (1421-2) is to be found in a book belonging to the Brewers' Company;‡ while Stow, in giving the date of the Carpenters' incorporation, acquaints us that the society was one of ancient standing. It also appears from records in the possession of the Carpenters' Company, that in 1128 the site of the hall, which is now partially demolished, was let on lease by Roger Jordan, the Prior of the Hospital of St. Mary without Bishopsgate, commonly called St. Mary Spital, to "Richard Aas, Peter Sextein, and Richard Punchon, citizens and carpenters of London," for a term of ninety-eight years, at the rent of 20s. The fee-simple was subsequently acquired. Within a year after the date of the lease the "Great Hall" was built, and the lease assigned to twenty-nine members of the company. As the Account Book does not commence till 1438, there are no particulars of the expenses of these buildings; but Mr. Jupp gives a number of entries relating to repairs made during the years 1441-1189. The company possess no record, however, from the seventh to the twenty-fourth year of the reign of Henry VIII. (1515-1532). This, says Mr. Jupp, leaves us in uncertainty whether the original hall is still* standing, or whether a new hall may not have been erected during the interval,—though there is nothing in subsequent entries to favour the latter conjecture.

In 1438 the guild was exercising the usual functions of a trade mystery, and the before-mentioned Richard Punchon, with William Crofton and Thomas Coventry, were its wardens. The earliest direct mention we find of the Carpenters' Company is, however, as before stated, 1421, and it is then spoken of as a craft of no recent formation; while the very nature of the trade induces the conviction that an association for its protection must have had a far earlier origin. The City Records show that at least as early as the beginning of Edward I.'s reign (1271) two master-carpenters, and the same number of master-masons, were sworn as officers to perform certain duties with reference to buildings and walls and the boundaries of land in the City,—duties evidently of much the same nature as those confided to a similar number of members of these two companies up till within about a century and a half ago.

The records of the company, though surpassed in antiquity by those of some few others, the Grocers', for example, yet present a tolerably unbroken series from the seventeenth year of Henry VI. The Great Fire of London, by which the books of so many other companies were destroyed, fortunately stayed its ravages before reaching Carpenters' Hall.

The original roof of the great hall was (according to Malcolm) originally of oak. It is uncertain when this was removed, but in its place the ceiling of the hall until lately existing was put up in 1671.† The entrance-hall and principal staircase leading to the court-rooms were erected about the year 1780, from the design of Mr. William Jupp, grandfather of the late clerk, Mr. E. B. Jupp. The entrance-hall is richly decorated in basso-relievo, with emblematic figures and implements used in carpentry, curiously and effectively grouped, and with heads of Vitruvius, Palladio, Inigo Jones, and Wren, designed by Bacon. The old archway, forming the entrance from the street, was also built by Mr. William Jupp, and was surmounted by a bead of Inigo Jones, likewise the work of Bacon.‡

An account of the internal decorations of the old hall, before referred to, written by Mr. F. W. Fairholt, was published in the *Journal* of the Archæological Association for January, 1846.

It may be noted, in conclusion, that amongst recent Masters of the Company have been Alderman Sir James Clarke Lawrence and his brother, Alderman William Lawrence, of the well-known building firm of Lawrence & Sons.

* Vol. xxiv., p. 776.

† "An Historical Account of the Worshipful Company of Carpenters of the City of London." By Edward Basil Jupp, Clerk of the Company. London, 1848.

‡ Brewers' Company: Court Minutes from 1418 to 1440, folio 2.

Valuation.—Mr. William Eve, of Union-court, Old Broad-street, has been appointed by the guardians of the North Aylesford Union to value the whole of the property in the fifteen parishes comprising that union.

* That is, in 1848, the date of Mr. Jupp's book.

† During the progress of some repairs in 1845, some interesting paintings were discovered on this ceiling. Drawings of them, made by Mr. William Wright, a member of the Institute of British Architects, were presented thirty years ago to the Institute, by Mr. William Fuller Pocock, M.I.B.A., the father of the architect of the new hall, and about that time Master of the Company.

‡ This head has been utilised by Mr. Pocock in the new hall as a keystone for the central window-head on the ground-floor of the London-wall façade. With Inigo Jones, however, the company claims no connexion, Inigo, according to general report, was a member of the Joiners' Company.

GEORGE CRUIKSHANK.

The death of this excellent man, and, in his own way, unique artist, must not be allowed to pass without a word of cordial recognition, in these columns, of his long life-work. Born in 1794, Cruikshank lived an active and energetic life; and remarkably long for an artist, one may say; for the artist temperament seldom is combined with that calm habit of mind and well-balanced physique which are the usual conditions of exceptional longevity. He himself would have attributed his hale and lengthened old age to the abstinence so beautifully expressed by Shakspeare,—

> "For that in youth I never did apply
> Hot and rebellious liquors to my blood,"

for his adherence to teetotalism, and absolute belief in the necessity and efficacy, in regard to health and morals, of a water regimen, were notorious; nor do we, though not marching under his banner in this respect, take a word of exception to his faith. Perhaps we may suggest that the real philosophy of the case is, that those systems which are so happily and strongly constituted as never to feel the need of extra stimulant, are also those which are best calculated to withstand the wear and tear of the battle of life; and that hence may arise the apparent argument in favour of total abstinence sometimes adduced by long-lived water-drinkers; though we suspect, if it came to a matter of statistics, there are just as many facts the other way. However that may be, George Cruikshank had a principle, and acted resolutely up to it; and it is this which has given an additional interest to his life and works, and to the consideration of his place in art. As an artist, his reputation might be open to no little question and criticism; but he was something more than an artist.

Like so many other men who have made their mark in the world, Cruikshank was an illustration of the hereditary character of genius, for his father was a caricaturist, and the boy first came into notice, and had the bent of his labours fixed, by his youthful attempts in imitation of his father attracting the attention of a publisher, who commissioned him to illustrate some publications, chiefly for children. He subsequently obtained admission as an Academy student, though it does not appear that he made much or systematic use of the opportunities of drawing there. He was subsequently engaged in illustrating two periodical publications called *The Scourge* and *The Meteor*, titles which remind us of the change of times since he began his work.* Among other early works was "Life in London," a series of designs intended to represent the dangers which befell the youth bent on "seeing life," and which were, we are told, so misunderstood by the person who contributed the literary portion of the moralising, that Cruikshank threw it up in disgust, and left his brother Robert to finish the designs. Thus it is evident that in this early period he was emphatically a moralist in design, rather than an artist pure and simple; and it may be said that in his later career he seldom deserted morality for art, except for pure playfulness—for the illustration of such things as the fairy-tales of "Puss in Boots," "Jack and the Beanstalk," and other such delightful vagaries, which he illustrated with the wit of a man and the simplicity of a child. The designs for "Oliver Twist," which are more serious in character, may be said to have been done at least as much with a moral as with an artistic end.

Probably we may rightly consider that the central productions of his life were the two in which he embodied, with such intensity, his convictions as to the effects of drink as the great social curse of the day,—"The Worship of Bacchus," and "The Bottle." In the former design the satirist is universal and unsparing in his attack; in the centre we see placed on high the deluding æsthetic ideal of Bacchus as the brilliant beautiful god, much as Lough imagined him in his noble statue of "Comus"; but even in the marble group which thus forms the centre of the whole, the subordinate figures show the animal element evoked by drink, in the grotesque-headed forms which recline beside the principal figure, and the goat which forms an ill-omened "supporter" to one of them. And in the multiplied human groups beneath the satire becomes terribly earnest; the soldier and sailor undergoing torture on either side are backed by "the canteen" and "The Jolly Tar" tavern; the tippling Churchman is rebuked by the Mahommedan (a compliment which we suspect very few followers of the Prophet can fairly lay claim to); the wedding party are far gone in silly hilarity, and the guest who proposes the health of the bride and bridegroom has knocked his chair over, and can hardly stand himself; and so the pitiless artist goes on through all grades of society, painting nothing which is not, or was not in his day, literally true in itself, though, of course, when we contemplate it seriously, there is a manifest one-sidedness in this view of life. The series of eight designs called "The Bottle" is superior to this: superior in drawing, and more serious and pathetic in feeling, and absolutely truthful as a representation of what frequently did and always may happen, as the result of an undue indulgence, among the lower orders especially, who have still so little check upon them in the way of social stigma for this vice. It is impossible for any one to follow this series, from the cheerful, honest look of the family party in the first scene, through their several stages of misery and degradation, without feeling profoundly touched; the rather because, except perhaps in the last scene of the lunatic asylum, the representation is not carried beyond the bounds of what is strictly probable, and in accordance with our knowledge of life.* In the set called "The Drunkard's Children," the artist overstepped the bounds of probability, so far as his dire history is to be considered as an illustration of the effects of drink only; the designs are somewhat sensational, and the only one which has both artistic power and real pathos, that of the wretched woman throwing herself from the bridge, represents a catastrophe too familiar indeed in the darker annals of London life, but with which drink has often had little or nothing to do. Among the designs which have an exclusively moral end there is one now hanging among the collection at the Westminster Aquarium which will hardly be known to or remembered by most readers of the present day, any more than the circumstances which occasioned it: this is the design for a one-pound Bank of England note, "not to be imitated," the border being formed at the side with manacles, and at the top with a row of gibbets, with men and women hanging from them. Often and often have we heard our much-esteemed old friend relate how that at some very distant date he saw a crowd assembled in the City, attracted by the simultaneous execution of several wretched people, two of them women, for the forgery of one-pound Bank of England notes; that he went home, and in a few minutes drew this design, which was engraved by Hone, and created a great sensation, going through a second edition the next day; that it made the Bank people furious, and was the means of leading to a re-consideration of the degree of criminality for which capital punishment should be awarded. It seems difficult to believe true, as we know it to be, that an incident calling forth such a protest should have occurred within the memory of a man who has only just died.

In regard to Cruikshank's genius, considered from an artistic point of view, there is much room for criticism, no doubt, nor can we pretend to endorse all that has been said about it in the enthusiasm naturally aroused under the immediate circumstances of his loss. But there is one class of work in which he showed himself an artist possessed of most refined perception and power of execution,—we mean etching. Of his coloured designs it is well not to say too much; but his small etchings show a most delicate and rare feeling for the specialities of that beautiful branch of executive art. In this way few things could be better of their kind than the "Hop-o'-my-Thumb" illustrations, and still better perhaps are the finished and delightfully *bizarre* designs for the wild legend of "The Man without a Shadow." An admirable specimen, too, is the illustration of "Vanity Fair" for the "Pilgrim's Progress," the rampant wickedness of which we remember used to horrify us in our childish period. It will surprise many to find among Cruikshank's early etchings designs for "Paradise Lost" (1827) in a very serious and even poetic style; that of the rebel angels rising from the lake at the call of their leader is quite Miltonic in conception. His "Falstaff," in a set of scenes for "Henry IV." and the "Merry Wives of Windsor," is very original and quite unlike ordinary conceptions of Falstaff in its geniality and refinement; the latter quality perhaps a little *too* marked for the character, but it is good as a protest against the common mistake of making "that fat rogue" a vulgar and coarse-looking man. A peculiar and very characteristic piece of humour, with a certain historical interest also, is that contrasting Manchester and London "in 1851"; the former nothing but empty, silent streets, the latter a moving, struggling mass of humanity. In regard to Cruikshank's more serious efforts in art, it may be recalled, also, that he occasionally made designs for execution in sculpture; and almost the last occasion on which his name came prominently before the public was in connexion with a correspondence in the *Times* in regard to the statue of Bruce for the field of Bannockburn, which he claimed to have originally designed, and which was eventually, it was said, carried out on the basis of his design, but with deviations from the historical correctness of costume and incident which he had endeavoured to secure. Without undertaking to judge the case on what was rather one-sided evidence, we may say that we saw every reason to believe that he had some just ground of complaint in regard to this matter. If we began to speak of his social characteristics,—of those times, when with Dickens, Foster, Jerrold, Egg, Peter Cunningham, Stone, Mark Lemon, and others, he came before the public as an actor in aid of the ill-conceived "Guild of Literature," it would be difficult to check the flow of memories, and impossible to keep within our limits. It must be left to other hands. Farewell! good, honest, simple "George." England has lost a man to be proud of, and we have lost a friend.

* One thinks of Goldsmith,—

> "The one writes the *Snarler*, the other the *Scourge*;
> Some think he writes *Cinna*,—he owns to *Panurge*."

* It is worth note that this set of designs called forth an expression of feeling, in some most sad and serious lines, from a poet so opposite in constitutional and artistic spirit as Mr. Matthew Arnold, among whose sonnets is one "On seeing Cruikshank's Picture of 'The Bottle.'"

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute on Monday evening last, Mr. Charles Barry, president, in the chair, the following new members were elected, viz.:—As Honorary Associates: the Right Hon. the Earl of Powis, D.C.L.; the Ven. Lord Alwyne Compton; and Mr. Richard Ansdell, R.A. As Associate: Mr. W. T. Sams.

The following nominations for membership were read, viz.:—Mr. J. T. Wood, as Honorary Fellow*; the Right Hon. G. C. Bentinck as Honorary Associate; Mr. Henry Jarvis, jun. (at present an Associate), and Mr. Thomas Verity, as Fellows; and Messrs. C. H. Purdey, W. H. Harber, and A. G. Taylor, as Associates.

The Secretary having announced several donations to the library, the President called attention to the efforts being made by the Council to obtain duplicate copies of works of general interest and usefulness, in order to form a lending library. Those efforts had already been attended with some measure of success, but in order to render them completely successful the co-operation of all the members of the Institute was necessary. Those who had spare copies of works of general interest might greatly aid in the establishment of so useful an adjunct to the Institute as a lending library.

The Proposed New Building Act.—The President said that the members of the Institute would be interested in knowing that the Metropolitan Board of Works were promoting a Bill in Parliament for the regulation of metropolitan building operations, probably with the hope and intent that such regulation should be on such a basis that it might eventually be extended to the whole of the kingdom, thus reconciling the extraordinary differences now existing in the requirements of local bye-laws. A copy of the Bill had been sent to the Institute, and the Council had appointed a committee to examine it and report thereon. The proposed new Bill was very short and somewhat summary,—far more so than on former occasions; and from the very trenchant way in which it dealt with the subject, it would require very careful examination. When the committee had reported to the Council, it might be necessary for the Institute to take some public action in the matter.

The Royal Gold Medal, 1878.—The President said: I have now to announce to you that the Council, after grave consideration of the merits of a great many gentlemen of very great merit,

* The President announced that Mr. Wood, well known as the discoverer of the Temple of Diana at Ephesus, was about to take up his residence abroad, and therefore the Council proposed that he be transferred from the class of Fellows to that of Honorary Fellows.

have come to the conclusion to recommend the Institute to award the Royal Gold Medal for the present year to Mr. Alfred Waterhouse, A.R.A.

The discussion then took place on Mr. I'Anson's paper* on "The Architecture of Norway," to which we may refer on another occasion.

Mr. T. Brassey, M.P., then read a paper on "The Rise and Fall of Wages in the Building Trade," which we print, p. 129, *ante*.

THE NEW TOWN HALL, PAISLEY.

MESSRS. CLARK & Co., of the Anchor Thread Works, Paisley, the representatives of the late Mr. George A. Clark, who bequeathed a sum of 20,000*l.* for the erection of a local Town Hall, have just made their final decision in regard to the plans of the building. Until now the plan prepared by Mr. Charles Davidson seems to have met with the most favourable consideration, but this has just been declined in favour of that submitted in the competition four years ago, by Mr. Lynn, architect, Belfast, under the signature of "Simplicity," and which was then rejected solely on account of the price exceeding the sum of 20,000*l.*, above mentioned. Mr. Matheson, Edinburgh, whose assistance was asked, in awarding the premiums expressed the opinion that Mr. Lynn's was the best of all the plans exhibited, and Messrs. Clark have now determined to set aside the consideration of additional cost, which they will defray out of their own pockets, to adopt Mr. Lynn's design, not only as the most beautiful, but as the best adapted to the purpose of the town. The main front of the building is to Abbey-close, and facing the venerable pile itself. In style the new hall will be in imitation of St. George's Hall, Liverpool, and will extend in front about 200 ft. The position of the large hall will be indicated in front by a pedimented portico, elevated on massive piers. At the west end the building will be surmounted by an imposing clock-tower, containing a peal of bells similar to those in the cathedral towers of England. The large hall, which occupies the centre of the block, is 130 ft. long. The space on the ground-floor, exclusive of orchestra, is about 80 ft. by 60 ft., and may be approached not only from a front portico, but from north and south porches. The three front or principal entrances open into a spacious entrance-hall, with cloak-rooms on either side, and from which access is obtained to the corridors and staircases on either side of the large hall. Round three sides of this latter apartment will run a balcony about 11 ft. in width, and raised 11 ft. from the floor level, to be entered at different points from the upper corridors, and also by separate staircases leading from the entrance-hall. A space on the same level as the balcony, measuring 60 ft. by 20 ft., and over the entrance-hall, will be available as a promenade, and in fine weather could be thrown open to the loggia of front portico. Accommodation is provided for 2,000 persons in the large hall, 1,200 being seated on the ground floor, 400 in the balcony or lower gallery, and 400 in an upper gallery, with the orchestra and promenade in addition. Underneath the orchestra, at the west end of the hall, is arranged a serving-room, to be used in connexion with public dinners, with hoists, &c., communicating with the kitchen in the basement flat. Another feature in the building is the minor hall, which will be on the north side of the larger apartment, and will be entered from Smithhills-street. Its dimensions are 53 ft. by 30 ft., including a platform 12 ft. wide, and affording accommodation to about 300 persons. The reading-room and smoking-room, 49 ft. by 42 ft., is to be placed on the south side next the U. P. Church, and entered from the south portico, while the officer's residence, which consists of seven rooms, is placed at the north-west angle, adjoining the bridge over the river Cart, and has convenient communication with all parts of the building. The estimated cost of the structure is 40,000*l.*, and the site 10,000*l.* A portion of the site is already being cleared, and orders, it is expected, will be placed in the hands of tradesmen immediately. Mrs. Clark, of Gateshead, mother of the donor, has expressed her intention, we believe, to place an organ in the large hall; and it is proposed that, in an unoccupied space at the north-east angle of the site, there shall be erected a statue of the late Mr. G. A. Clark, thus balancing the statue of Wilson, the famous ornithologist, in the opposite angle of the Abbey churchyard.

* See p. 91, *ante*.

THE ART MANUFACTURES OF JAPAN.

ON the 30th ult., Dr. Dresser read a paper at the Society of Arts on this subject, founded on personal observation, which much interested his hearers. We print the more salient portions of it.

Nothing impressed me so much, said the lecturer, as the result of my observations in Japan, as the smallness of everything. The pottery of Owaji was large in comparison with most of the manufactories that I saw, yet it could only turn out one decorated tea-service a year. Generally speaking, one man constitutes the entire manufacturing staff of a factory, or, if he is an old man, the father and son.

I visited, while in Japan, sixty-eight potteries, and the most interesting wares were generally made in the following way:—In a lovely little room, the floor of which was covered with mats, dwelt the potter. I may tell you that in a Japanese living room there is not one particle of furniture,—no chair, no table, no cabinet. The floor is covered with thick mats, each of which is 6 ft. by 3 ft. (their foot and their yard are each of the same length as ours, but the inches are longer, as there are but 10 in. to the foot, and every room in Japan is of the size of a certain number of mats). One mat being removed from the floor, a potter's wheel is exposed to view, but the wheel is of the simplest character, as it is a mere circular stone of the form of a Cheshire cheese, level with the uncovered floor, and working on a vertical axis which is fixed in a log of wood beneath the floor. At one side of the wheel is a clean tray bearing a lump of clay. At the other side is another tray—often well lacquered, on which the vessels, when shaped, are placed. The operator now kneeling in front of the wheel, and sitting more or less back on his heels, sets the disk in motion by whipping it with the tips of his fingers till the necessary speed is attained in its rotations. He now places a piece of clay upon the wheel and gives to it form in the usual manner, stopping to whip the stone whenever it is necessary that its speed should be re-quickened, and in this way he shapes his wares. Not unfrequently the potter, after removing from the wheel the vessel which he has formed, distorts its shape, substituting quaintness of contour for a symmetrical form, and in the pottery district of Mino I found one man who was known under the cognomen of the funny man, as he invariably gave to his wares eccentricity of character. Few in Japan can afford to burn their own wares, hence a number of potters congregate around a public kiln where their wares are fired at periodical intervals. In many cases, a potter only makes plain wares, when he sells his productions to artists, who not unfrequently reside at great distances from the potteries (nearly all the enamel blue ware is painted in Tokio on vessels made in Seto, about 300 miles distant). In this case the artist usually keeps a stall, or little shop, and paints his wares, and attends to customers, as necessary. Such a man fires his own paintings in a kiln about 18 in. high, and 15 in. in diameter, the kiln being circular and having a domed top. Having painted a sufficient number of pieces the kiln is charged, and the small charcoal fire by which it is to be heated is lighted; but the potter not only lights the fire of his kiln, but he also lights his pipe, and this he recharges about every three minutes, for it is very small; he now sits, the very picture of happiness, till his wares are fired. In this way things are managed in Japan, and while there are potteries with more pretentiousness to be found they are of rare occurrence, and where anything approaching European ideas has been adopted, excellence of execution is replaced by slovenliness, and the desire for gain supplants love of the work. Yet there are factories in which numbers of household vessels are made.

I visited a town which was devoted to the production of curious scarves and fabrics; and formerly the productions of this district were of the highest merit and interest. Two pieces of white silk-crape are taken, each of which is about three yards in length and 12 in. in width (12 in. is the usual width of native cloths). These two pieces of fabric are placed together so that one is exactly over the other; thus placed we will regard them as forming one double fabric, and will forget that there are two thicknesses, for they are both treated as one, and the two are manipulated together, so as to effect a saving of labour. A small piece of pointed stick, resembling a common meat-skewer, and a quantity of waxed thread, are the requisites of the process. From below a small portion of the fabric is pressed upwards on the point of the skewer into the form of a little cone of, say, half an inch in height,—a cone which is kept in form by the waxed string being wrapped around it; the skewer is now withdrawn and removed about half an inch from this little tuft, when it is employed to raise a second cone, which in its turn is wrapped round by the waxed thread. This formation of little tufts is repeated till the entire fabric is covered with them, when it is ready for dyeing. Thus prepared, the fabric is taken to a dye-vat (a vat which in this case generally contains scarlet or pink colouring matter), and here it is dipped. The action of the dye is, at the same time, to give colour to the cloth and to shrink it: hence, where the dye has come in contact with the crape a shrinking has taken place, thus permanent conical eminences are formed. The waxed thread is now removed, each little tuft being unwound, and not only has a curious fabric been formed, with a surface consisting of conical eminences, but also a fabric which is variegated in colour, for where the wax thread was in contact with the crape the dye could not act upon it; thus, by the one operation a fabric is produced both variegated and of a rich coarsely-granulated character. These scarves were, when single, worth about 1*l.* sterling each. They were then such as any lady in the land might covet; but to ourselves in part, and still more to the Americans, attaches the blame of bringing comparative ruin to the town where they were made, and of destroying a lovely manufacture. "I will give you 18s. each for them." "I will give you 15s." "I will give you 12s.," and so on. This is what the consecutive foreign merchants said, till the last gave about 3d. Let me show you what this lovely manufacture has degenerated to; and these miserable fabrics are the best that can now be procured at the town where once only beautiful objects were made.

We talk of the degeneracy of Japanese manufactures, but who is the cause of this sad falling off in the quality of their productions? And we wonder whether Japan can now produce what it did prior to the overthrow of Shogoon's rule. I am happy to tell you that Japanese arts are not yet lost, and that Japanese love of the beautiful has not been stifled, for in all cases where I offered remunerative prices I got the old thing with its beauties and strange merits. But as we are thus destroying the beautiful arts of a people saturated with the refinements which spring only from an old civilisation, can we wonder at that dislike to the foreigner which permeates so much of Japanese society? I do not; and were I a Japanese I should hate the foreigner with a sincere and unmitigated hatred.

This process of tieing the cloth into knots is used as a means of placing a spot, or curious pattern on fabrics, not only in Japan, but also in India, and the silk pocket-handkerchiefs which were in common use by gentlemen about thirty years since were spotted in this way. Here is a specimen from India showing the nature of the process.

While speaking of fabrics, let me try to describe to you various processes which I witnessed in one of the largest print-producing establishments in Japan; and what struck me as remarkable here was that most processes consisted in the combination of hand-work and of mechanical methods. First, I saw blocks which worked in pairs: the one was simply a heavy piece of wood with a perfectly smooth surface, the other had the pattern which was to be placed on the cloth cut into it; thus the figured block had the pattern wrought in intaglio upon it. From the deeper portions of the intaglio figure holes were bored through the block to its outer surface, where they were enlarged into funnel-shaped tubes. In order that the fabric be figured, it is stretched over the plain block, which has its smooth side upwards. Upon this lower block the figured block is inverted, hence the fabric lies between the smooth surface of the plain block and the figured surface of the upper block. Pressure is now employed so as to bring the surfaces of the two blocks as near to each other as possible, and a dye is poured down the funnel-shaped holes and thus comes in contact with the fabric wherever the block is engraved. When the fabric has become saturated with the dye the blocks, while still in close contact, are inverted, so that the surplus dye is poured off, and the fabric has received its pattern; for the pressure has been sufficient to

prevent the "running" of the dyes, and thus the disfigurement of the fabric. We, in our own calico-print works, employ a process similar to this. The next process was that of placing a pattern upon the cloth by simply stencilling the pattern instead of printing it, the stencil-plates being formed of paper rendered non-absorbent by oil or some similar body, probably by Japanese lacquer. But of this process there are two methods, for in certain cases the pattern is stencilled in the ordinary manner, a dye being used as we use paint; in the other a "resist" is stencilled on the cloth, and the entire fabric is afterwards immersed in the dye-vat, when it becomes dyed in every part save that which was protected by the "resist." "Resist" may be starch or gum, or any material that will cover up the surface of the cloth and prevent a dye-stuff from coming in contact with it. Another process consists in reversing the common operation of stencilling; thus in ordinary cases if we wished to stencil a leaf in red upon a white ground, we should cut from a sheet of paper a leaf of the shape desired when we should have a hole in the paper from which we cut it, of the same shape as the leaf cut out. In this case, we should use the sheet of paper from which the leaf had been cut, and by dabbing our red colour through this hole should get a copy of the leaf in red. But the method to which I now wish to draw your attention consists in using the leaf-like bit of paper which has been cut from the sheet, and placing it on the cloth, and spreading over it, and that portion of the cloth which surrounds it, by the agency of a sort of trowel, a paste-like "resist." This done, the leaf-shaped piece of paper is picked up from the fabric, together with that portion of the resist that covers it, by the agency of a point or pin, and thus the fabric is left exposed where the paper leaf was. As many leaves as are desired are placed over the fabric, and the whole is covered with resist; the various leaves are now picked out and removed, and upon the resist becoming dry, the fabric is immersed in a dye, when the exposed parts,—the leaves,—acquire a colour, say red. This operation being completed, the resist is removed from the cloth by the action of water, and we have red leaves on a white ground. . . . .

Shall we now visit the metal-workers, and see how they conduct their manufactures? for what we shall here see is as remarkable as the means by which fabrics are figured. This kettle is characteristic of what is in general use in Japan. I sincerely wish that it was characteristic of the kettles in general use in England. It is an object of pleasant form which is covered with conical protrusions having a geometrical arrangement. While the eminences by which the heating surface is so ingeniously increased are very numerous, and while they are so accurately disposed upon the surface that we can scarcely detect the slightest displacement of any one of it, they are yet the result of hand-labour. A hollow mould which is to give form to the outer surface of the kettle is made of sand, but it is yet smooth, and has been shaped on a block of wood of the required form. The mould-maker now takes a small bar of iron, about 3 in. in length, with an end so formed as to represent exactly one of the eminences which he wishes to have on the side of the kettle. With this he makes depressions in the mould which has up to this time been smooth; and the positions of the depressions which he makes, and the degree of their depth (depressions which, when the pot is cast, will become eminences) he determines by eye, without the aid of any measurements whatever. It is not uncommon to find Japanese bronzes, and even iron pots, with flowers, or birds, or a dragon in almost full relief upon them. The casting of such objects by us would be accomplished by "piece moulds," and casting by piece moulds is always expensive; but the Japanese will cast a chrysanthemum, with its numerous juxtaposed petals, as perfectly as a more simple ornament, and such a casting no piece-mould could enable us to produce. Whatever is to be cast is modelled in wax: if a flower is to protrude in almost full relief from the sides of a pot, it is first modelled in wax. It is then attached to a wooden block of simple form, such as would, if the wax flower were not attached to it, drop from the sand were it used for the formation of a mould. The model, consisting partly of wood and partly of wax, being ready is carefully brushed over with a pulp formed of sandy clay. When this is dry, a second coating is given of a pulp containing more sand, and perhaps a third and a fourth. When these are dry sand is piled up around the mass and pressed into the interstices between the parts, but these are already largely filled by the previous applications of semi-fluid matter. When sufficient sand has been pressed around the model to form a solid mould the mass is taken to a sort of kiln or muffle and is there exposed to a degree of heat sufficient to melt out all the wax, which first becomes absorbed by the sand, and then dissipated as gas from the mould. The wax of which I am speaking is not wax simply, but a mixture of wax and resin. The mould is now prepared, but I did not see the actual casting. One of the largest bronze manufacturers in Tokio kindly offered to give up a day in order to show me the entire process, but I was, unfortunately, so occupied, that I could not avail myself of his kindness. I was, however, told that the moulds were warmed before the casting was made, so that the metal might not be chilled while running along the smaller channels of the mould; and this I think very likely, but as all my information had to be gathered through interpreters great difficulties were experienced, for in some instances excellent interpreters do not happen to know the technical terms which belong to special trades and manufactures.

I cannot close without making one remark, which is this,—that while the art processes of Japan are such as to render the production of quantity impossible, if excellence is to be attained, they yet secure the highest degree of art merit. I have watched the poor artisan labouring at his work with an earnestness and love such as I never beheld out of Japan, and the very features of the workmen testify to their happiness, and to the love with which they perform their painstaking labour. No thought of gain appears to enter their minds, and no touch is spared which will make the work more lovely; this is how the beautiful works which we delight to look upon are produced. They are works born of loving labour; they are the children of happy contented men, who love their labour as they love their lives, and who, separated from the former, would part with the latter. How different are these from our workmen! The one supremely happy, the other always unhappy; for he who seeks to do the least work possible for the largest amount of gain can never know peace: the one perfectly contented with the simplest of fare, the other always craving after more while yet well fed. If our workmen could but see the dear old men of Japan engaged in their various handicrafts they could not fail to learn that happiness is not found in short hours and high pay, but in the love of our work. And this is the reward which these poor men receive—perfect happiness! The Japanese handicraftsman, owing to his happiness, content, and skill, have the friendship and patronage of the lords of the land (the Daimios), who will converse with them and receive them at their palaces, whilst no merely moneyed man—even the richest of merchants—has any status in Japanese society; but we must ever remember that through his virtues the workman has made himself worthy of the friendship of his lord, and a fitting companion for him.

A discussion having ensued,

Dr. Dresser, in reply, said with respect to the wages question, he had found it very difficult to get any information, though he had been especially requested to inquire into it by Mr. Mounsey, the first secretary of the legation. A man made a piece of work and sold it for a certain sum, but as he might spend a week over one and five weeks over another, according as he felt inspired, it was very difficult to ascertain his average earnings. He could only say this, that Messrs. Londos had ordered a service of silver, consisting of teapot, sugar-basin, and milk-jug, which was to be made by the very best workmen, and their collective labour amounted to 1,600 days, yet the retail price in London was only 300*l*. That was the only data he could give on the subject. It was quite true that one of the Cunard steamers was to be fitted with woodwork from Japan; and, more curious still, it was found to pay to import bricks from Japan to England. The Japanese possessed no mechanical advantage over us, rather the reverse; but there could be no doubt that labour was much cheaper. With regard to the quantities, it did not matter whether you had a machine which made thousands of articles, or thousands of individuals who made one each. He had seen a large village—almost a town—entirely engaged in manufacturing umbrellas, and the entire country round was dotted with them, put out to dry, like mushrooms. Sometimes, again, you saw little forests of dolls' heads. All these things were made in cottages, not in factories. They were all, however, common things. What he said was, that Japan could not produce quantities if excellence was to be achieved. Mr. Pare doubted whether Japan could produce work as good as formerly, but he was quite sure it could, though not in large quantities. Mr. Pare had not yet seen them, but it was only eight months since he left Japan, and it would be a year or two before the first piece would arrive. In twenty or thirty years there might be several. He perfectly concurred in the remarks of Mr. Wallis, who had had great experience in these matters, for it was quite true that the Japanese workman did think through the material which he employed.

THE MASONS' STRIKE.

Sir,—I have no wish to express one word calculated to prolong the wretched strike now going on. I have, however, not the least hope of convincing any union leader or delegate by my arguments, or of shortening the contest one jot. This must wear out; for so long as 18s. per week can be paid to men on strike, I dare predict that it never will end. There will, however, in the long run, be a sad weedy lot on the strike list,—men to whom 18s. per week is about as much as they are worth, and who would consequently strike to the end of their lives. I wonder the best men do not see this. A strike is of no benefit to good men, but an unmitigated evil, and sore tax. To strive to make all men equal may be compared to handicapping a living man with a dead one. Unionism seeks to equalise wages, and settle the amount to be paid per day. It seeks to limit the time a man shall labour within each twenty-four hours. It determines to limit apprentices. It absolutely forbids piece-work and over-time. It aims at making its laws and regulations general, and would fain enmesh all labour in one huge net. Capital is to be *nil;* labour is to be lord of all. Able men have dreamed such dreams,—have striven to level mankind; but have ruinously failed. Liberty, equality, fraternity, have been the watchwords of a great nation, and a Government has run its course bearing this motto. Liberty was, however, found to be circumscribed within very narrow limits; equality was one man as good as another, "and better"; fraternity was interpreted to mean "Do as I say, or take the consequences." The guillotine was a great ally of fraternity, as it settled, at one stroke, all differences in friendships and opinions.

Our modern union presidents and delegates cannot publicly, as in the French revolutionary time, chop heads off, but they aim at doing something nearly as bad; they will, if they can, prevent a man earning his living by his trade outside the circle of their dominion; and this, with their will, is to be effective, so far as the special trade is concerned. Nay, they will, also, if possible, go beyond one trade and sweep in the whole labouring population. At this moment there is throughout the manufacturing and commercial world a general foreboding of evil as to the effects anticipated from trade unionism. Capital shrinks from the ordeal of repeated trade-unions contests, and must ultimately decline to enter the lists, as capital cannot consent to use similar weapons of offence to those resorted to by the worst members of trade-unions when on strike, who entice men by drink, and then, Lady Macbeth like, drug their victim's cup: who prowl about the works they have refused to work at, to kidnap the timid, and, by threats, frighten them into leaving, and then at their lodges boast as to how many men they have sent away. A trade union registers its members, and if there is a strike pickets the work struck against, to prevent any man taking up the labour at that place which the union has put under its ban; but it also strives to prevent the man turned out from working at his trade in any other place, excepting under union regulations, and the weekly contribution from his wages is demanded to prolong the strike until the master makes an unconditional surrender. A master turns a man off, but he does not, as a rule, vindictively follow him from place to place to shut him out of other work, which unions do.

It is this dreadful far-reaching tyranny which makes trade-unionism so abominable, so to be repudiated; and, by the good and think-

ing men who are the victims, so dreaded. The men who are acting as presidents, secretaries, and delegates are, for the most part, puffed up with their position. They have the gift of ready-speaking, and can spout fluently on the advantages to be derived from their union, but have no perception of the difference betwixt union for sensible and beneficial purposes, and ruinous unionism, which aims to make equal that which nature has made unequal, and strives, Procrustes like, to make all men fit the union standard beds.

With respect to the Law Courts strike for limitation of hours and equality of pay, I will state why this is practically impossible: excepting the worst blunderer and most incompetent man is to be the standard, Gothic masonry is the test of a good mason. Out of 100 ordinary masons there may not be 25 good and efficient Gothic workmen; and so much better is the good man than the blunderer, that he will do in one week working similar hours and on similar work, three times as much and three times better than the blunderer. How, then, in fairness, either on behalf of himself or on behalf of the public, is a master to be dictated to and told that time and wages shall be equal? Trade-union leaders must have imported this equality dictum, as it cannot be the true growth of intelligent working Englishmen.

But what will inevitably be the upshot of successful Unionism? Diminution of trade in every possible way. Architects will leave moulded stonework out of their designs, or cement and terra-cotta will take the place of stone at half the cost. Machinery to work stone will be introduced, and the trade of a stonemason will become a thing of the past. Portland cement, at this moment, can be cast into any sort of moulded form, or into any plain ashlar form, which shall look as good as the best Portland stone, and be stronger, and wear longer. Portland and other similar cements are being so used, not only in England, but in Belgium, Holland, France, and Germany. If the Law Courts had to be again contracted for, it would be practicable to substitute cement or Ransome's patent material for stone, and to do without stonemasons. Trade unions demand non-interference: they must be the supreme arbiters and masters. Men must work and earn as they dictate, and masters must obey; so that freedom must begin and end in the Lodge of the Union. There must be no outside interference against the secret laws, rules, and orders; but the law allows picketing. The law in this is most unfair. If freedom means anything, it should mean that if one man will not work, another may. At all events, it ought to mean this; and when a strike has cleared the men from any piece of work, the master ought to be free to bring in, *without hindrance*, other men, either from Germany, France, Italy, Japan, or China. A trade union cannot be allowed to have a monopoly of labour, as there ought to be free trade in labour as there is in corn, sugar, tea, and coffee.

Let trade-union presidents, delegates, and members learn this very simple lesson. Z.

SIR,—I notice that "A Master Mason" alludes, in your issue of the 2nd inst., to my query as to whether the strike has ended, seeing that by evidence given in court, it has just been stated on good authority that plenty of masons may readily be procured in London at prices varying from 4d. to 9d. an hour. And I notice, too, that he fails to answer that question; but instead gives to the world the fact that he has looked into the "London Directory,"—and looked in vain,—for my name. Hence he concludes I cannot know anything about the matter at issue. If he had looked for the names of Messrs. Bull & Sons, who are building the Law Courts, he would not have found theirs there either; and he ought surely to realise that people really do exist in the world although their names do not happen to appear in that wonderful compilation of nomenclature,—the "London Directory." It is just possible that this deliberate closing of eyes to real facts may be productive one day of real difficulty and loss. With the Jews Canaan was the world. Yet, in the end, that country was laid bare by the despised Gentiles. Rome, too, had its world; but the barbarous Goths came at length, and the strength of Rome was told as a tale of the past. And so, if London begins to think itself all the world, a day may come when it will find out its mistake, and realise bitterly that other places and other people can do, almost as well, all that she prides herself upon.

I do not think any one could assert that the best masonry in England is to be found in London; and even if it be so, Bradford and Leeds, Manchester and Liverpool, as well as other towns I could mention, run her a very close race. Further than this, the finest workmen in London, it is well known, are not natives of the place, but are countrymen. A born Londoner, as a rule, is but a poor tool. It is the Yorkshireman or the Scotsman who, having a good country training behind him, quickly picks up town experience, and beats every one, after due residence in London. I say this, perhaps, to my own disadvantage, seeing that I was born and bred in the metropolis myself; but it is, nevertheless, a positive fact.

I do not advocate a low rate of remuneration. It is known that I pay a higher rate of wages than any one in the city in which I reside, and the practical result is that I have the best men. But I do not bind myself to pay men, be they masons or carvers, joiners or labourers, just what they choose to ask, or all at one regulation price. Such a proceeding would be suicidal in the extreme, stifling effectually all efforts at advancement either on the part of those I employ or myself; and further than this, I can say that out of fifty men, I do not think I have a dozen belonging to unions; whilst those who do are, with one or two exceptions, anything but the highest class men; yet, if it were possible, many unions would equalise the wages. Here is an illustration:—A month or two ago a workman came into the office, and said he must have a farthing an hour more. I replied that I could not afford it: that I was already paying him a farthing an hour higher money than that set down by the Union, and I thought he ought to be satisfied. "And so I am, sir," he retorted, "I never was paid so much in my life before; but the rest are getting more than I, and, you see, are making it hot for me, because I'm working under their money." I promised to see into it on the following Saturday, and so I did, for my cashier gave each and sundry his "back-day," with the intimation, however, that they could start again at the union scale,—*i.e.*, a halfpenny an hour less than they were previously having. The result was that the shop was empty for a week, and then filled again at the lower rate.

Further than this, I cannot think of a single union man who has fought his way up in the world. I know of scores of others who, by hard work and application, ay, and by *chasing* too, have raised themselves to high positions; but, although I have known upholders of unions go into business, their after-life does not seem to have been marked by any ultimate success. Personally, I have gone through the stages of street errand-boy, apprentice, journeyman, foreman, and employer without union assistance, or other help; and am thankful that, whilst my grey hairs are few and far between, I am able to feel myself, in a pecuniary sense, quite independent of my business. And yet, I remember vividly, many years ago, threatening to throw a fellow-workman off a scaffold in the Strand, W.C.,—and I *would* have thrown him off, too, had he persisted!—for abusing me, with all the uncouth eloquence of a vile tongue, because I was working at a less rate of wages than himself. My mother taught me that a nimble sixpence was better than a slow shilling; and I have not yet learned to look with disrespect upon the admonitions of the dear old lady.

It is not the most money that brings the most happiness. I happen to be a member of several public boards and a governor of many charitable institutions, and I see thereby much misery and poverty. I do not believe so much of this proceeds from drunkenness as many would have us believe. I consider that improvidence has quite as much to answer for as hard drinking. Look at the Sheffield district just now: nowhere were wages higher, nor have unions been anywhere stronger than in that city of soot. There lived Broadheads and other gentlemen who did not at all mind blowing an unfortunate up with half a barrel of powder (and his wife and children too) if he would not conform to the rules laid down by the union. There, to-day, and God only knows for how long to come, the people are starving; whole districts are entirely destitute; whole streets with every breadwinner therein standing gaunt and hungry, watching his family die by inches. And why? Simply because labour has gone up and trade has gone down. Cheaper markets have been found, and the huge factories, teeming with industrial human life a dozen years ago, are now still and forsaken. Short time came, then three days a week, then one; then they were shut up altogether, with no hope, no prospect held out of resuming work. What are the unions doing for these people *now?* What, indeed! Why, if it were not for those who never belonged to unions, and who are charitably doing their best by helping them to tide over this terrible time, they would die of starvation in this Christian land,—ay, by the hundred.

HARRY HEMS.

RAILWAY "FOGGING."

OF much that is seen and known in connexion with railway working, a good deal is freely censured, but much more is unseen, unknown, and unappreciated. It would be worse than absurd to charge railway directors and managers with complicity in the production of "London particular" fogs, but some people consider it reasonable to exercise the privilege of grumbling on account of delays or accidents caused by the obscuration of the atmosphere. In dense fogs railway managers and servants, in striving to carry their passengers safely and quickly, have to sustain responsibilities, and to incur loss, risks, and danger that do not attach to those concerned in any other species of locomotion. On such a day as we had not long ago the passenger-boats on the river ceased plying, as a matter of course, and without notice to the public. A clear starlight night should be followed in the ordinary course of nature by a dawn, but morning does not always chase away the darkness of the night; it is sometimes succeeded by a dense gloom as dark as Erebus, more dangerous to street traffic than the blackness of midnight. Omnibuses and cabs pierce the fog in the best way they can, and foot passengers avoid as best they may the perils of the streets, and of being crushed by hoofs or wheels. Little or nothing is possible, perhaps, in the way of preventives of street accidents in fogs, and little or nothing is attempted.

It is interesting to know something of the extraordinary resources of the railway companies that conduct heavy suburban traffics, under sudden emergencies, amongst others the occurrence of a dense fog. One possible expedient they never adopt: to telegraph down the line, "Because of the fog the Blank Company's trains will not run till further notice." What consternation, inconvenience, and dislocation of business such an announcement would cause; what objurgations it would evoke! Residential and other business passengers cannot brook delay, from fog or any other cause; and the companies, under all circumstances, do their best to carry them quickly and safely. The morning traffic of most of the lines with London termini is known to be enormous. It is computed that between eight and ten o'clock every morning 10,000 passengers arrive at, or pass, London Bridge Station,—an amount of traffic that could not possibly be carried on by any other known mode of conveyance than railway trains. Under any circumstances the safe conduct of such a traffic requires the most carefully elaborated arrangements, as regards signalling and otherwise; and a state of the atmosphere that leaves the signals visible seems to be almost indispensable. A dense fog renders the ordinary elaborate system of visible distant and other signals practically useless. Direction by sight thus failing, the drivers of trains have to be guided by sound, and this substitute for the invisible semaphore arms is applied by fog-men and fog-signals. Concerning each a few particulars are subjoined.

The South-Eastern Company is more extensively concerned with "fogging," probably, in proportion to mileage, especially in the London district, than any other. The London stations of the company may be taken as illustrating the working of the system. The fogmen take their instructions from the station-masters and permanent way inspectors. At London Bridge the station-master has 27 fogmen under his orders; at Cannon-street station there are 21 men employed as fog-signal men; at Waterloo Junction, 12; and at Charing-cross Station, 6 men,—total, 66. In addition to these, there are 13 men stationed on the London Viaduct, at Spa-road and New-cross Stations, and on the Bricklayers' Arms line, or 109 men employed in fog-signalling upon lines not more than four miles apart between extreme points. These men, in the London district, consist partly of platelayers and partly of men told off for the

duty from the station staffs. Throughout the country districts the fogmen are platelayers. Special regulations are printed for the direction of the men, who are posted in particular positions, each of which, and the man attached to it, is indicated by its own progressive number, the particular locality of the post, and the lines that the signalman has to watch. The men are required to keep as near to their respective lines, and to one position, as possible, so that drivers may know where to look for them, and not mistake their signals. The men in the signal cabins continue at work as usual during the densest fog, pulling their levers, raising and lowering semaphore arms, opening and closing points, although they cannot see an object a few yards distant from their box. They are directed in their movements by the elegant miniature semaphore signals in their cabin that have electrical communication with the signal stations on each side, and advise from time to time whether there is a train on a particular section of a line, or that it is "line clear," thus enabling the ordinary signal-man, with the help of the fog-men outside, to continue to work during the fog upon the "block system." The signals displayed by the men correspond with those of the distant and other signals; they (the men) are really auxiliaries for the station, junction, and distant signals next to which they are posted. Whenever the distant or other signal is at "danger," the man who is working with such signal places two fog-signals on the rail, and exhibits a "danger" hand signal, until the ordinary signal is changed to "clear." When the fog is very dense the men are required to proceed to their posts at once, at six a.m., without waiting to be sent for. An unsatisfactory condition, subject to which they discharge their perilous duty, is that they must continue at such duty until they receive notice from their gangers that they are no longer required. They are expressly forbidden to leave until such notice has been given by their respective gangers. It is of vital importance that the posts should be occupied, but not by men taxed beyond the powers of human endurance. That the duty is dangerous may be readily believed when it is considered that the men work so much in the dark, with sound muffled, as well as the air darkened by the fog, with much to bewilder them, and little space in which to move. The man's post is usually in what is called the "six-feet way," in some places only about 4 ft. clear between the pairs of rails. The wide overhanging carriages introduced some time since, that carry five passengers on each seat in second and third class carriages, instead of four as formerly, and four instead of three first-class, have reduced the clear space between trains meeting each other to about 2 ft., and in some instances the fog-man has to lie down in the six-feet way while the trains pass. Unhappily fatal accidents to fog-signal men can scarcely be considered rare occurrences: a single engine has been known to kill three men stationed near each other within a few seconds. Last year, out of 108 fatal accidents to railway servants, sixty-five were "run over and killed," a considerable portion of them fog-men, probably. This occupation is not in favour among those concerned; some men, indeed, refuse employment if "fogging" is to be a condition of its acceptance. During the prevalence of a fog, all the signals at stations, junctions, &c., are kept lighted, and all passenger and empty trains are required to carry lighted head and tail lamps. The fog-signal men are all equipped with the necessary hand-signals and fog-signals.

The exploding signals, little seen although often heard on and near railways in and about London, during foggy weather, are round cases of thin sheet iron, with flat bottoms and convex tops. They are 2 in. in diameter, and ½ in. thick. They have straps of thin lead attached that are bent round the edge of the rail to keep the signal in position. It is charged with detonating powder, and two percussion caps, that explode when the wheel of the locomotive passes over it, and ignite the charge. They cost 14s. 6d. per gross, or about 1½d. each. One company that uses a large quantity has always a stock of 50,000 in store at the beginning of the winter season; but this is only a part of the consumption, twenty gross at a time is often served out to a single station-master. The mode of distribution is by requisition to the store-keeper from station-masters, who, in turn, distribute them to the men, by whom they are carried in haversacks provided for the purpose.

The South-Eastern Company exhibit some other marvels of railway travelling. They bring trains into London Bridge Station from the North Kent and main lines at an average of about two minutes during certain hours of the day, all these trains coming in upon a single line of rails. At Cannon-street Station 150 trains and engines run in and out in the two busiest hours of the morning, and as many during two hours in the afternoon. That is seventy-five in the hour, or one in forty-eight seconds, on an average. The conduct, with safety and celerity, of such a crowded and complex traffic as that over Cannon-street viaduct, is conclusive evidence of the forethought and skill of those who organised it, and of the care, vigilance, and ability of those by whom it is conducted, whether in fine weather or in fog.

PROJECTIONS.

RIGHT TO REPLACE OLD ERECTIONS BEYOND THE GENERAL LINE OF BUILDINGS.

The case of the Holborn Board of Works *v.* Edwards was decided by Mr. Barstow, at Clerkenwell, on Friday, the 1st inst.

The erection in question was on the north side of an old building, which stood at the south-west corner of Great Ormond-yard, near Queen-square, Bloomsbury. Its length was about 28 ft. from east to west, and the amount of projection from the general line about 5 ft 6 in. Forecourts, also 5 ft. 6 in., built over in parts, exist to the eastward of the projection. The north front was inclosed on the ground story with coach-house doors. A staircase at the west end led to a landing; and entered from this landing was a w.-c., also a sink, &c. The whole was covered with tiles (total height from ground about 18 ft.). The inclosure of the one-pair story was mainly in woodwork.

The whole building, including the projecting portions, was pulled down in September, 1877, carefully-measured drawings by Messrs. J. & S. F. Clarkson, the architects and surveyors, being previously made. The re-erection was commenced immediately after the demolition, and the projecting portions were inclosed by brick walls similarly to the rest of the building. Objection being made by the Holborn Board in November, the work to the projection was not farther advanced; but the rest of the building was carried up, and is now roofed in. The complaint was made under the 75th section of the Metropolis Local Management Amendment Act, 1862 (25 & 26 Vict., cap. 120), "before a Justice of the Peace for an order in writing, directing the demolition of such building or erection," the work already executed on the projection "being beyond the general line of buildings in the row of houses in which the same is situate," &c.

For the plaintiffs it was contended that the old projection had been taken away, and that, not having been a building, it could not be replaced. The general line of buildings had been decided (December 20th, 1877) by the Superintending Architect to the Metropolitan Board of Works to be the line of the main buildings, from which the erection in question was a projection.

For the defendant it was contended,—(1) that the projecting portion was an integral part of the building adjoining it; the existence of water-closet, sink, staircase, &c., albeit in a structure mainly of wood, and the considerable total size of the structures (28 ft. by 5 ft. 6 in. by 18 ft high), proving this; (2) that Clause 75 deals with the case of buildings on ground not built upon before; and that Clause 74 deals with ancient projections; that the right to build again over land previously built over, can only be interfered with when the powers of the seventy-fourth section are put in force and compensation made. The Holborn Board manifesting no intention to urge the demolition with compensation, under the seventy-fourth section, Messrs. Clarkson wrote to the Superintending Architect of the Metropolitan Board of Works, and received the following reply:—

"December 22nd, 1877.

"As you are aware, application was made to me by the Holborn District Board, under the 75th section of the Metropolis Management Amendment Act, '62, to decide the general line of buildings in Great Ormond-yard; but no application has been made to the Metropolitan Board to put in force the power conferred by the 74th section of that Act with respect to the projection at No. 10. An improvement of a strictly local character would be effected by the removal of the projection at No. 10, and in such cases it is the practice of the Board to entertain proposals when made by Local Boards only. On these occasions the question of the payment of the expense is settled by arrangement between the two Boards."

Mr. Barstow decided that the erection was an ancient building, and could be replaced; and made an order for costs against the Holborn Board.

The decision of the Lords Justices in the Westminster Board of Works *v.* Lord Auckland was followed in this case, though not precisely on all fours with it; there does not appear to have been any intention to raise the Great Ormond-yard structure higher than it was previously to the pulling down. The proper interpretation of the seventy-fourth and seventy-fifth sections of the Act may be considered to be:—

(1.) The seventy-fourth section, in cases where the Metropolitan Board of Works is of opinion that a projection beyond the general line should not be replaced, gives powers to that Board to require the owner to set back to the general line, and to pay him compensation for any damage and expenses which he may sustain or incur. If the Metropolitan Board does not put these powers into action an ancient projection may be replaced without consent being asked.

(2.) The seventy-fifth section applies to the *fresh* projections beyond the general line of frontage,—applying thus largely to land which has not been previously built over at all,—also, in other cases, where a projection is desired beyond the general line, which (projection) has not existed before. In these cases, having no previously-acquired rights, the building owner is to take the initiative, and obtain the consent in writing of the Metropolitan Board of Works before he can lawfully erect any proposed projection.

THE GREAT WESTERN RAILWAY COMPANY'S NEW SLEEPING-CARRIAGES.

The Great Western Railway Company's manager of the carriage department at Swindon has just invented a new description of sleeping-carriage, several of which have been built at the Swindon works, and within the last week or two one has been put upon the night mail between London and Penzance, with another for the corresponding return train from Penzance to London. The carriage has a distinctiveness as compared with the sleeping-carriages on the London and North-Western and other lines. Each carriage is divided into two compartments, the larger of the two being arranged for gentlemen. It is very lofty, spacious, and well ventilated. This portion of the carriage contains seven seats, the interior being elegantly fitted up. The seats are lined and backed with morocco, and all the furniture is of walnut, with gilded mouldings and elaborate ornamentation. A peculiar feature of the invention is that by merely lifting a brass handle above the head the back of the seat falls, revealing a soft spring bed, having a canopy in white satin rep. The ample area of the interior is shown by the fact that when all the seven beds are exposed, and ready for sleeping upon, there is still space left for walking about. The windows of the carriage are exceptionally large, and fitted with green satin curtains. The compartment contains a lavatory and other domestic conveniences. In the roof there is an entirely new kind of ventilating apparatus, and a speciality of the invention is that when the occupants of the several beds have retired to rest the light can at once be covered over without being extinguished. The ladies' compartment is similarly fitted up in every respect, the only difference being that there are but four beds. The compartments are handsomely furnished with Brussels carpets, tables, and chairs, and resemble small and compact drawing-rooms. It is to be hoped draughts from the windows are provided against. We can remember a night of misery once passed in a sleeping-car between King's-cross and Scotland.

WATER SUPPLY.

Sir,—Is it, I would venture to inquire, absolutely necessary that the pure supply from the fountains above should be scattered over hill and vale, be corrupted through ditch and strata, and gathered into streams before it is drawn off to quench human thirst? Could it not be collected fresh from heaven, and stored for our use? I, myself, could conceive means by which the return of the outpour of grossness might be prevented, and by which a supply of pure water might be secured without seeking it 100 miles from home.

Metis.

CONSTRUCTION OF A CANOE LAKE AT RYDE.

THE Town Council of Ryde, Isle of Wight, are about to construct a shallow lake for canoeing and juvenile paddling. The lake is to be constructed on the shore in front of the town, and will be about seven acres in extent. This area on the shore will be inclosed by a dwarf wall, about 18 in. in height, which will provide a large space of shallow water for canoeing and paddling. The wall will be several feet in width, so as to form a promenade round the lake, the inner wall being several yards from the sea-wall, and between the two walls there will be a long sloping artificial beach, from the centre of which there will be flights of steps leading to a fine parade which has just been constructed the entire length of the sea-wall. The inclosed land behind this parade is now being ornamentally laid out with trees and shrubs. In addition to this improvement, the Corporation contemplate making sea-side drives in the neighbourhood, of some miles in length. The lake about to be formed would have been made some time since, but the Admiralty and the Board of Trade would not permit it. These bodies have, however, now waived their objections, and the works are to be carried out at once.

THE TIMBER TRADE.

MESSRS. COLTART, SMITH, & Co., in their annual "Wood Circular," just now issued, from Liverpool, say: "The favourable anticipations which were generally entertained at this time last year as to the prospects of general business for 1877 have unfortunately not been realised, for the past year has been characterised by greater depression in some of the leading branches of trade than has probably ever been known before. This is to be attributed in a great measure to the suspense consequent on the outbreak of war in the East in the spring, and the probability of this country being drawn into the conflict, which undoubtedly had the effect of paralysing enterprise, and postponing the much-needed improvement which appeared to have set in at the close of 1876, and until the present uneasiness as to the issue of the Eastern question passes away, there is little hope of a return to any real prosperity.

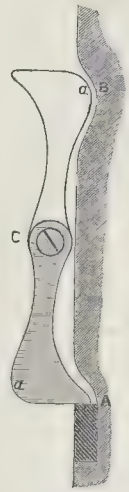
Amid the general depression which has been experienced in most other trades, the continued growth of the wood trade, year by year, is remarkable, the business of 1877 having exceeded even that of the previous year, which was the largest on record. The extraordinary demand for wood, which has been so favourable a feature in the trade for some years, still continues unabated, and the consumption for the past year (notwithstanding the occurrence of strikes among the building operatives in this district, which seriously interfered with it) shows a considerable increase over the very large consumption of 1876; but, unfortunately, the total imports have far exceeded even this large consumption, and these excessive supplies, which were principally sent forward by shippers on consignment, have left unusually large stocks on hand, especially of the lower qualities.

During the first portion of the year the Bank rate continued at the low rate of 2 per cent., but in May, in consequence of a drain of bullion, the minimum was advanced to 3 per cent., and afterwards to 5 per cent. in October, since which it has again returned to 2 per cent. The value of money on the whole, however, has been very moderate, the average for the year having been only about 2½ per cent. This has undoubtedly been advantageous to the trade, as it has enabled importers to hold their very large stocks on easy terms.

The tonnage employed in the trade during the past year amounted to 603,747 tons, as compared with 594,465 tons in 1876, and the continual expansion of the wood trade of this port, year by year, unaccompanied, as it is, by increased facilities for working it, has again added considerably to the difficulties of importers, who, in many instances, as in previous years, have been compelled to submit to forced sales at great loss, or have had to pay heavy penalty rents, solely from the want of adequate quay space to handle the cargoes when landed, all of which add considerably to the cost, and place importers here at great disadvantage as compared with those of other ports, which are better favoured in this respect. This demand for the serious and prompt attention of the Dock Board, as Garston, Fleetwood, Glasson Dock, and Barrow are all offering very tempting terms to induce business, which must have the effect of drawing away some portion of the trade of this port."

A NEW WINDOW-FASTENER.

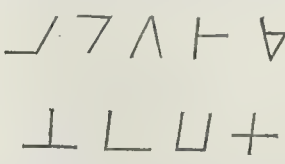
SIR,—There is a want of a simple and self-acting window-fastener, especially for the purpose of keeping the lower sash locked down while the upper one is free. The old-fashioned fall-catch, like the one sketched here, does it, when placed as usual above the meeting-rails, but it is too high to reach without getting on a chair, unless the windows are low, and consequently it is generally kept thrown back and out of gear, to save trouble; and besides that, it is easy to open it by a wire from outside if the upper sash is pulled down a little. The following simple modification of it puts it out of all reach from outside, and yet quite handy inside, and it cannot be out of gear when the sash is down.



A B is the front of one upright sash-bar at any convenient height. At A there is a notch protected with iron below it, or a notch in a plate of iron. C *a* is the common fall-catch, down in the notch A, and obviously preventing the window from being raised. C B is the catch lifted up when you want to raise the window, and then its back, *a*, lies in an upper notch B, of the shape shown in the sketch, the weight being properly adjusted. As soon as you raise the sash the catch will be thrown out of the notch B, and fall ready to enter A whenever the sash comes down again. The same object may be effected, only not so neatly, and requiring more depth in the side bead, by a single projecting piece at A, instead of the two notches. I have only to add that it answers perfectly, and effects some of the objects as the window-fastener described in my Book on Building more simply, though not all of them. EDM. BECKETT.

MASONS' MARKS IN ITALY.

SIR,—I recently paid a visit to Solmona,—the ancient Sulmo,—Ovid's birthplace. The present attractions of the town are its position and Gothic remains. At the end of the principal street is a picturesque fountain, supplied by a Gothic aqueduct. For a space of about fifty yards before arriving at the fountain the aqueduct is clear of buildings. I carefully examined the stones, and I found those upon one side and at the top, forming the specus, which is open, were all marked thus:—



These were all the marks I could find on the piece of the aqueduct exposed to view and clear of the houses. They were many times repeated. They are on the side farthest from the street, that side having no marks. The fountain has an inscription and date, 1474, and this is probably the date of the aqueduct.

This may be of interest to your readers.

Rome. S. RUSSELL FORBES.

BAD BUILDING.

SIR,—Let us be fair and just, and say at once to the ground landlords,—If you will exact such hard terms from needy men, simply to cover your ground, accept the responsibility, and acknowledge your co-partnership with the

SPECULATING BUILDER.

POWERS OF URBAN SANITARY AUTHORITIES.

BAKER *v.* MAYOR AND CORPORATION OF PORTSMOUTH.

THIS case came before Lords Justices Bramwell, Brett, and Cotton, in the Court of Appeal at Westminster, a few days ago. It was an appeal by the plaintiff from a judgment on demurrer of Barons Pollock and Huddleston.

Mr. Kingdon, Q.C., appeared for the appellant, who he said, was a builder carrying on business at Portsmouth. The statement of claim alleged that he was also the occupier of land within the borough on which he had constructed a bad road and had built sixteen houses. The defendants were the Urban Sanitary Authority, and had made bye-laws, and the plaintiff admitted that he had failed to deposit plans of his new buildings which were intended to be erected upon the land, as he ought to have done, in pursuance of the bye-laws. The plaintiff proceeded to build houses, and had finished twelve out of sixteen houses before any interference on the part of the defendants. Then, on the 22nd of November, the defendants charged the plaintiff with having built the houses without having first deposited the plans in accordance with the bye-laws. The plaintiff was accordingly ordered to pay a fine. On the 9th of December, 1875, defendants sent a number of workmen, who, by their orders, pulled down twelve of the houses, eight of which had been roofed in, and in doing so, as the plaintiff alleged, used so much violence that the materials were rendered almost valueless. It was mentioned in the Court below that the jury at the trial found the value of the houses to be 50*l.*, and that an excess of violence was used, resulting in the destruction of materials worth 18*l.* In their statement of defence, the Corporation said that by their third bye-law it was provided that no building should be erected on the side of any street until such street had been constructed to the approval of the Urban Sanitary Authority. They justified pulling down on the ground that the buildings were erected before a street between two rows of houses had been constructed to the approval of the Surveyor of the Local Board. They further justified themselves by saying that plaintiff did not deposit plans, and therefore they said that under the thirty-seventh bye law they could not only fine the plaintiff for not having given notice, but further, having given him time to show cause against it, could proceed to pull down the houses. He demurred to that defence, and raised very substantial questions as to the validity of the bye-laws. There was not the least pretension in the present case that the houses were otherwise than properly built. Ultimately,—

Lord Justice Bramwell said he thought the judgment of the Court below must be affirmed. There was no doubt very great power was given to Local Boards. Probably it was given on the ground that it was well to have a giant's strength, and that it was certain they would not use it like a giant, tyrannously. His lordship thought, therefore, that the Court ought to construe these Acts of Parliament without regard to the considerations suggested to them by the appellant. There must be a great discretionary power vested in the Local Boards. As to the first sub-section of the 34th clause of the Public Health Act, 1848, with respect to the "width, level, and construction of new streets and the sewerage thereof," the word "street" meant the way between the buildings and the buildings themselves. He had come to this conclusion because it was a possible meaning of the words, and because, looking to the Act of Parliament, it seemed a right meaning to give it. Perhaps the strongest reason for so reading the clause was that, except that power, there was none to regulate new buildings in new streets. For these and other reasons his lordship was of opinion that sub-section 1 referred to buildings as well as to the foot and carriage ways. That being so, the defendants had a right to say that until a street had been approved by them as a foot and carriage way no buildings should be constructed at the side. Therefore the defendants were in the right in making a bye-law which would be enough to justify them in what they had done.

Lord Justices Brett and Cotton concurred, and the appeal was therefore dismissed.

BUILDINGS ACT AMENDMENT BILL.

SIR,—Additional safeguards are necessary, and I venture, after much experience, to say that for houses, walls should not in any case be permitted less than 13 in. thick,—certainly all the quoins and angles, and half of the whole wall.

Three stories in 9-in. work is not safe as allowed by the Buildings Act,—especially undesirable, as attempts to get first-class workmanship will *always* be abortive. A SURVEYOR.

THE MEASURING-TAPE.

SIR,—Referring to the paragraph in your last impression on "Stanley's Fluid Colours," I wish that gentleman would again "essay another effort" for us, and produce a serviceable tape. One that would not stretch or contract, could be used in wet weather, and, unlike all the steel tapes that I have known, would not readily break, or amputate your fingers and otherwise lacerate your person by its knife-like qualities, would be welcomed by many.

AN ARCHITECT.

CLEOPATRA'S NEEDLE.

SIR,—Will you allow me, through your valuable columns, to suggest that a competent committee be formed, and that they should invite sketches of suggestions of sites for Cleopatra's Needle, to be accompanied with not less than two views of each site, to be sent in with motto and sealed envelope as usual. I cannot help thinking that this would be the most practical way of disposing of what has become a somewhat vexed question. N. WEBB.

OPEN SOIL-PIPES.

Sir,—Soil-pipes become more or less coated with organic matters, which flushes of water do not entirely remove. Hence, effluvium is constantly engendered within the pipes. Where a soil-pipe is open to the air at bottom and top, an upward current flows through it which conveys the effluvium out at the top. Where a branch-pipe is carried from the soil-pipe to an untrapped closet or sink, part of the effluvium current travelling up the soil-pipe turns up the branch-pipe and passes through the closet or sink into the house every time the valve or stopper is opened. I have tested this in various ways many times, always with the same result. Now if, as is strongly argued, disease germs are at times present in the effluvium, the inhabitants who happen to inhale the effluvium run the risk of being poisoned thereby. Soil-pipes, therefore, should always be open to the air at bottom and top, so as to allow a free current of air to pass upwards through them, and *ventilated syphon traps* should always be put directly under the closets and sinks, so as to prevent the effluvium engendered in the soil-pipe from being drawn through them into the house. This is the result of my more than thirty years' experience as a sanitary engineer.

John Phillips.

Sir,—Having read the many valuable articles upon this subject, by Mr. Norman Shaw and many other correspondents, I thought it would not be out of place to give you my opinion and experience as a practical engineer upon this important question.

Open soil-pipes are the right thing, there can be no question, if properly fixed, whether fixed with traps or without. I say, with or without, for I fail to see how the trap, if properly fixed and ventilated, can become a generator of foul gases, and there can be no doubt but that a trap will prevent the air blowing through the soil-pipe when the closet is in action, and the communication established between the house and the outside air.

In my opinion, the main soil-pipe should be carried up inside the house instead of outside, to prevent freezing, and to encourage better ventilation: the inside of the house being much warmer than outside, the air in the soil-pipe becomes heated and somewhat lighter, and gradually rises to the highest point, at the same time drawing a fresh supply from the various openings which communicate with the outside air.

In this case the branch from the closet is branched into the upright soil-pipe with as much fall as possible, at the same time taking another branch from the other side somewhat higher up, and carrying it through to the outside face of the wall; this opening can be masked for appearance sake with an ornamental air-brick, allowing plenty of fresh air to make its way through to the main pipe, but at the same time stopping foreign substances from blocking up the opening. The intercepting trap should be a properly formed trap of the D-shape (and not a syphon), with an air or ventilating pipe carried from the side next the sewer, to relieve the trap of any undue pressure in case of heavy rains filling the drains and compressing the gases, when they are sure to find an outlet somewhere.

John Smeaton
(Wm. Smeaton & Sons).

Sir,—Will you allow me to make a few remarks in answer to some of your correspondence on this subject; but first I have to thank you for the little note you added at the end of my paper. From it I gathered that you had seen the arrangement at work, and that you approved of the principle generally; of course I am quite aware that there are minor points which might be improved: if any good is to come out of this correspondence, it will be the elucidation and development of these minor points, so as, if possible, to secure absolute perfection.

With the letter from Mr. Rogers Field I am more than satisfied; he has made the subject his special study, understands thoroughly all the difficulties and all the various schemes that have been attempted to improve on the old arrangements. When he gives what I may venture to call an unqualified approval to my scheme, I have good cause to be satisfied. I was fully convinced of the accuracy of the principle before, and after his testimony I may say I am now doubly convinced.

Mr. Arthur Billing's plan may be a very good one, or it may not, but as it has no points of resemblance to mine, I need not occupy your space by going into its merits. The essence of my plan consists in having ventilating openings at the level of the ground, and at one or more points in the height of the soil-pipe, thus cutting it into short sections and never carrying it up above parapets or to the roof. Mr. Billing says: "do not have openings to ventilate the soil pipes either at the ground level or half way up the wall of the house." He also carries the soil pipe "well up above all windows and top of the parapets of the house," and has an exhausting cowl placed upon the top; it is evident that the two systems are perfectly different, I may almost say antagonistic.

I think I may say that Mr. H. Saxon Snell approves, but has doubts; his doubts, however, I am glad to see, are not very strong, as he says, "I certainly will make the experiment." I sincerely hope he will do so, and as soon as possible. We shall all look forward to his report, though I fear we must wait some years for it, as, of course, he will give it a fair trial. His doubt seems to arise from a feeling that in a short time a foul coating will be formed on the inside of the pipe, akin to that which is found on the inside of the drain-pipe from a scullery or housemaid's sink; but he must excuse me for saying that between the two there is no sort of analogy. The contents of the vessels emptied into the sink are generally composed of greasy and frequently hot water, with soap and all sorts of refuse from washing up. This trickles slowly away through the bell trap or the perforated brass grating which our friend the plumber always considerately inserts at the top of the pipe and just under the plug. This little sinking into which the plug drops is always filled with a sort of pulp, which the housemaid from time to time digs out with her fingers or a bit of stick. Such a thing as a strong flush does not exist in any sink I have ever seen, though I can see no reason why it should not. In the case of the soil-pipe, a small quantity of fecal matter is contained in a large quantity of clean water, and the whole leaves the pan with a strong and very rapid rush. In our own house the housemaid's sink has often an unpleasant smell, and the scullery has the usual unmistakable sinky flavour about it, though both are disconnected from all soil-pipes and drains. The deposit of which Mr. Snell speaks has, I have no doubt, been formed in both these pipes, and it emits the "faint odour," but I am sure that no such coating exists in the soil-pipe, which has been in use exactly the same length of time; and this, I consider, is owing to the flushing effect of the water.

Professor Fleeming Jenkin is quite right in wishing to have it well tested, but is not the test which he proposes somewhat too severe? To close the water-closet window, to open the water-closet door, to make up rousing fires all over the house, to cut off the water supply, to pull up the handle and to keep it held up, and then to make horrid smells at the open end of the pipe,—is this a reasonable test? I think not. In all arrangements of this kind the occupants of a house may be asked to contribute some small amount of care. In our gas and water supply, would it be reasonable to say that the former must not be used on the plea that if the taps are left open (and, as the Professor says, "we must ever remember that careless people do leave" taps open), and all openings shut, that an explosion might follow; or, in the case of water, that if the overflow from the cistern is stopped up, and the ball-cock fixed down, we should have our houses deluged the first time the water came on. But even supposing this disorganised ruin of a water-closet to exist, and the air to pour into the house through the 4 ft. of soil-pipe, I maintain that it would not be the deadly air that finds its way into too many of our houses from closed or imperfectly ventilated soil-pipes, and that it would be harmless, though not perhaps the most desirable way of airing a house.

Mr. Thomas Morris evidently believes a little in it, for he once used part of it. I hope I may succeed in persuading him to use the whole scheme. I am sure he will not regret giving it a trial.

I now come to the very serious question of frost, raised by Mr. Roger Smith, and to this, I regret to say, I cannot give an answer based on experience—for hard frosts seem to be out of fashion now. This winter we have had none; last winter, a very slight one, which partially froze one of the water-waste preventers, and so cut off our supply of water. I thawed it with a little warm water, and so in ten minutes removed the only difficulty I have ever had. Still we must look this possibility in the face. I have been rather waiting for a frost, so that one might see what would happen; but, pending its arrival, I shall certainly proceed to take some part precautions. I propose to attach to the lower of the soil-pipe a metal case, about 2 ft. or 3 ft. high, containing a gas jet. Where no gas exists a lamp would, I have no doubt, do as well. I should think this would give complete warmth in the soil-pipe to prevent any freezing from taking place; but this is a mere suggestion. When I have tried it I will let you know the result. At the risk of trespassing on your space beyond all bounds, I must ask you to allow me to quote the last two sentences of Mr. Walter Buckeridge's letter. In speaking of my plan, he says:—

"The advantages of this arrangement are self-evident. All trapping of soil-pipes is abolished, and thorough ventilation obtained. With an air-tight drain under the building, all inlets to the same placed outside, soil and other pipes disconnected therefrom, no sewer gas can be generated, or possibly enter the building.

"There can be small doubt that, with a quick fall to the soil-pipe, a good flush of water, and pipes of proper diameter, this system is eminently satisfactory, and will be rapidly adopted by all who crave for healthy houses. It further has the substantial recommendation of simplicity and economy."

R. Norman Shaw, R.A.

A BARNSTAPLE BUILDER.

The death is announced of Mr. John Dendle, a well-known and extensive builder at Barnstaple. Mr. Dendle died in his 60th year on the 27th ultimo. He came, as a young man, to Barnstaple, from an outlying district, as a journeyman carpenter, and step by step won for himself the position of the principal contractor in the neighbourhood. He was a member of the Town Council for many years, and took an active interest in all public matters. Under Sir G. Gilbert Scott he restored the parish churches of SS. Peter and Paul, Barnstaple; and St. Peter's, Tawstock, under Mr. Fowler, F.S.A., of Louth; that of St. George, Georgeham; and under Messrs. Gould & Son, of Barnstaple, All Saints, Winkleigh, and St. John's, Bishop's Tawton. Besides these recent jobs, Mr. Dendle carried out innumerable contracts in various parts of England, and he was, as well, a large contractor with the Government for the supply of oak. What one journeyman carpenter has done another may do.

CINDERFORD WATERWORKS.

On Thursday, the 31st ult., the new works for the supply of Cinderford with water were formally opened by the members of the Rural Sanitary Authority of the Westbury-on-Severn Union. The water is obtained from Greenbottom, near Littledean, and pumped by two high-pressure engines, of 20-horse power each, through an 8-in. rising main to a reservoir near Latimer lodge, half a mile distant, the lift being 400 ft. The pumping establishment is built of local stone, and includes a cottage for the engine attendant. The reservoir is 60 ft. in diameter, and 10 ft. deep, and holds 180,000 gallons. The mains, from 8 in. to 3 in. in diameter, extend about eleven miles, and 130 hydrants are provided. The pipes have been provided by Messrs. J. Lawrie & Co., London; the engines and pumping machinery by Messrs. Jas. Watt & Co., Soho; and the buildings, reservoir, and pipe-laying have been executed by Messrs. Phillips & Co., of London.

The works have cost about 8,000*l.*, and have been designed and carried out by Messrs. Gotto & Beesley, engineers; Mr. Spence, the surveyor to the Board, having acted as resident engineer.

The Queen's Theatre at Wigan was completely burnt down on Monday night, the fire being one of the most serious which have ever occurred in the district. The theatre was built entirely of wood, and was opened about two years and a half ago. The auditorium was capable of holding over 2,000 persons. The stage was a very large one, and there were extensive dressing-rooms. The performance concluded shortly after half-past ten, the place was locked up, and everybody had left; but about eleven o'clock flames were seen issuing from the roof of the building, over the stage.

ACTION BY A SCULPTOR.

ADAMS *v.* BARKER.

THIS was an action brought in the Westminster County Court, on the 30th ult., before Mr. Judge Bayley, by Mr. G. G. Adams, the well-known sculptor, to recover from the defendant, one of the firm of Savory & Moore, New Bond-street, the sum of ten guineas for loss of labour and time under the following circumstances:—

Mr. Doveton Smyth appeared as solicitor for the plaintiff, and Mr. Cox as counsel for the defence. From the plaintiff's statement it appeared that he was called upon by the defendant to execute a sketch for a marble monument to the memory of the Rev. J. Howarth, the late rector of St. George's, Hanover-square, which was to be placed by some of the parishioners in St. George's Church. The plaintiff said that on the 27th of April last he executed the sketch in question, which he submitted to the defendant, and proceeded to set up the model in clay; when the defendant was for the first time informed that he must not proceed with the work until the consent of the Rev. Capel Cure, the present rector, was obtained, of which the plaintiff was assured was merely a matter of form, as the late rector was a great favourite amongst his parishioners. The plaintiff added that he would have executed the bust for 100 guineas, which would have been his lowest charge; and when it was found that the present rector of the parish considered that monuments of this description were not suitable memorials, and he disapproved of them being erected in his church, he (the plaintiff) discontinued the work and charged the sum now sued for merely for his loss of time. In cross-examination by Mr. Cox, the plaintiff said his lowest charges were five guineas a day; he was known as the sculptor of several public monuments, as well as many monuments in St. Paul's Cathedral. It was urged by the defendant's counsel that the order was for a sketch only, and that the order for the monument was to be merely conditional upon the rector's approval.

The Judge said he well knew of the plaintiff's standing as a sculptor, and he was quite aware that he would not have expended his labour on a merely speculative order. It was natural to suppose that even if the rector's approval in the matter were required, it would not have been withheld; and therefore looking at all the surroundings of the case, he should rule in favour of the plaintiff for five guineas, with costs of attorney and witnesses.

ROT.

SIR,—In answer to "Querist's" letter in your paper of the 2nd of February. The floor in question can be carried with triangular iron joists, concreted between, the surface of the concrete so formed to carry off any surface water to a drain, on top of which put a layer of asphalte, with a slight gutter or fillet in asphalte in the angle of the floor and vertical wall, to prevent any surface water from getting through; or the floor may be carried with wood joists, as before, boarded over. If there is a fall required, the joists may be battened to form the fall before boarding; when the boards are properly fastened, lay over paperhanger's canvas, or common felt, but by no means concrete or plaster, as this adds to the weight of the roof, and has a tendency to rot the boarding. On the top of the felt lay a coating of asphalte, as before described; the asphalte must not be put on the wood, as the expansion and contraction of the wood are likely to crack the asphalte. This method will be lighter than the original, and, if properly done, will last as long as the building stands. I have had several of these cases under my personal superintendence, and know from experience my plan to be good. T. FALDO.

Books Received.

The Picture-Amateur's Handbook and Dictionary of Painters. By PHILIPPE DARYL, B.A. London: Crosby Lockwood & Co. 1878.

THIS is a useful and sensible little book, intended to supply amateurs with a general basis of information for judging of the value and authorship of paintings, without encumbering them with a heavy and expensive treatise. Of course, it cannot be said that all the detailed knowledge requisite to make a "connoisseur" is to be found here; but the author's remarks upon the various methods and schools of painting, brief as they necessarily are, will be found to be very comprehensive, and his short sections on "How an oil painting is made," "The anatomy of an old picture," "Colours," "On cleaning pictures," &c., are eminently practical and to the point, and give with remarkable clearness, in a few words, information which will probably be new to many who have been looking at pictures with more or less pleasure all their lives without a thought about the *modus operandi* of the painter; a matter in regard to which even a little knowledge, so far from being dangerous, is very desirable, and likely, if properly applied, very much to increase the spectator's critical insight in regard to a work of art. The bulk of the book is occupied by a dictionary of painters which, considering its small compass, is really admirable; even where only a few words are devoted to an artist his specialty is well indicated; and the utility of a table of dates of painters in so portable a form is unquestionable. We can cordially recommend the book.

Miscellanea.

Leicestershire Architectural Society.—The annual general meeting of this society was held in the lecture-hall of the town museum. A bi-monthly meeting of this society was also held at the old Town-hall library in the afternoon, the Rev. J. H. Hill in the chair. In the evening a large audience assembled in the lecture-hall of the Town Museum, to hear a lecture on "Notes on St. Alban's Abbey," by Mr. James Neale, F.S.A., architect. After the lecture, Sir Henry Dryden said,—The renovating of these great buildings had been one of the many causes in the rise of prices and buildings. There were two classes of old buildings,—those that were used and those that were not used. Now, with regard to those that were used, there were two ways of looking at them,—the picturesque view, and the architectural view. They also had a utilitarian view. He, however, must say that there had been more damage done to ancient architecture within the last thirty years than in any period of its existence by what was commonly called restoration. The utilitarian view taken by some people would lead them to disregard altogether these ancient works as ancient buildings, and merely to keep them up for the use they were able to make of them. The archæologist, on the other hand, too frequently ignored the utilitarian view, and therefore the society which had been started within the last year or two for the preservation of ancient buildings, in merely opposing restoration without giving any consideration as to what to do with these buildings, had rather ignored the utilitarian view. He was grateful to Mr. Neale for the labour which he had bestowed on this ancient building of St. Alban's.

Acock's Green Sewerage Works.—Last May the Solihull Rural Sanitary Authority, whose governing powers include the district of Acock's Green, entered into a contract with Messrs. Green & Son, of Warwick, for the formation of sewerage works for that district. The works were commenced in June, and, though not finally completed, were, however, sufficiently advanced to admit, on Saturday, of their being tested as to their capabilities for dealing with the sewage of the district. The outfall grounds are situated on the north side of the Warwick and Birmingham Canal, and about three-quarters of a mile from the railway-station at Acock's Green. The sewerage of the district is composed of 15-in., 12-in., 10-in., and 9-in. pipe sewers, and is nearly four miles in length. The outfall-sewer, 15 in. in diameter, has a capacity (when flowing full) of discharging a million and a half gallons in twenty-four hours. The system adopted is the "separate and straight line" system, having manholes at each change of gradient and lateral deviation. The sewage at the outfall is received into four tanks, each 36 ft. by 16 ft. The sewage farm has been leased from the Yardley Charity Trustees for a term of thirty years. The new works were projected by Mr. Pritchard, and have been carried out under his supervision.

The Invalids' Home Association (Home Hospitals).—This Home Association has been established for the purpose of extending to members of the middle classes and others, at a remunerative rate of payment, some of the advantages which the poor now gratuitously enjoy in charity hospitals. After consideration of the various methods of organisation, it was decided that the funds required to be raised in the first instance for the establishment of invalids' homes, which will then, it is anticipated, become self-supporting, should be obtained by means of governorships of a proprietary character, such as have been found to constitute a convenient basis for various proprietary colleges,—Marlborough College, for example. The working capital thus raised will be regarded simply as a loan at interest, and any profit that may accrue in the working of the homes it is proposed to devote to the extension of the system. The committee are of opinion that to place the undertaking on a sound financial basis, a sum of 20,000*l.* will be required, and this they believe will be readily subscribed. The committee appeal to the public for support.

The West-end Branch of the Bank of England.—Two or three years ago the directors of the Bank of England sanctioned extensive alterations of the interior of the West-end branch in Burlington-gardens. The premises were formerly the town residence of the Marquis of Anglesey, and the mansion was acquired by the bank nearly a quarter of a century ago at the cost, it is said, of 40,000*l.* The alterations, which are now nearly completed, consist of the partitioning off and converting into business offices and private apartments for the manager (Colonel Francis) of the spacious upper rooms, including the Ball-room, hitherto unoccupied. The ball-room contained a magnificent mantelpiece of white alabaster, with an elaborately-carved representation of Diana and the wood nymphs. For this ornament (says the *Morning Post*) the directors have had several offers from customers of the bank, as much as 1,000 guineas having been tendered for it more than once. The directors, however, decided not to part with it, and the mantelpiece has just been removed to the City to decorate the bank parlour of the head office. The alterations at the West End are estimated to cost about 12,000*l.*

Society of Engineers.—The first ordinary meeting of the Society of Engineers for the present year was held on Monday evening last in the Society's Hall, Westminster-chambers, Victoria-street. At the conclusion of the ordinary routine business, the retiring president, Mr. Thomas Cargill, presented the premiums of books which had been awarded to the following gentlemen for papers read during the past year, viz.:—To Mr. J. Walter Pearse, for his paper on the "Mechanical Firing of Steam Boilers"; to Mr. Alfred Le Grand, for his paper on "Tube Wells"; and to Mr. Ralph H. Tweddell, for his paper on "Direct-acting Hydraulic Machinery." The premiums having been presented, Mr. Cargill retired from the chair, receiving a cordial vote of thanks from the meeting. He then introduced to the members the president for 1878, Mr. Robert Paulson Spice, who delivered an inaugural address.

Building on the Surrey Gardens.—The Surrey Gardens have been purchased for building purposes by Messrs. Sutton & Dudley, and in a very short time the gardens will be covered with bricks and mortar. The plans for laying out the ground for building purposes have already been prepared, and last week the Newington Vestry, in whose district the gardens are situated, sanctioned the roads which are proposed to be constructed. The gardens cover an area of about ten acres in extent, and the estimated number of buildings is between 300 and 400. It is stated that there is a probability of the large theatre being retained.

Liverpool Engineering Society. — This society held its usual fortnightly meeting at the Royal Institution, Colquitt-street, on the 30th ult., Mr. Robinson Souttar, president, in the chair. The first portion of the evening was devoted to the discussion of Mr. Boult's paper on "Portland Cement Concrete," after which Mr. Arthur J. Maginnis read a paper on "Atlantic Lines and Steamships."

Accident with a Lift.—An accident, resulting in the loss of one life, and injuries, more or less serious, to three persons, occurred on Monday morning last at the warehouse of the Army and Navy Co-operative Society, in Johnson's-place, Pimlico. Owing to a flaw in the wheel of the new lift which had been constructed, the lift, whilst engaged in taking up a tierce of coffee to the roasting-room, fell.

The Threatened Carpenters' Strike.—The carpenters and joiners have recently held a delegate meeting, at which resolutions were passed repudiating, on behalf of the trade, the action of a certain number of the trade committee, who some time ago sent a communication to the masters, demanding 10d. an hour and giving six months' notice.

Position of the Masons' Strike. — We are sorry to say circumstances are unchanged. At a meeting of the Central Association of Master Builders, held on Thursday, the 7th inst., a proposition for arbitration, submitted with the concurrence of the Strike Committee, was declined.

Fatal Panic in a Foreign Circus.—At an Italian circus erected in Boulogne during the late fair there, an alarm of fire was shamefully raised in pure mischief on the 3rd inst., when a large number of persons were killed, and more were injured.

The New Dresden Theatre.—The new Royal Theatre, built on the site where the old one stood, which was destroyed by fire in 1869, has been opened in presence of the King and Queen. Semper, the architect, who is known in England, was called, with his son Manfred, and, according to the correspondent of the *Standard*, the whole auditory, in presence of the royal family, exclaimed three times, "Long live Semper!" an ovation the more remarkable as Semper was at one time compelled to leave Saxony, having taken part in the revolution in 1849. The new theatre, in the Renaissance style, is one of the finest in Europe. The curtain, ceiling, and decorations are magnificent. The *foyers* and vestibules have been painted by some of the first German artists.

Institution of Surveyors.—The next meeting will be held on Monday evening, Feb. 11th, when a discussion will take place upon the paper read at the last meeting by Mr. J. Smalman Smith, entitled "The Law of Support in its relation to Lands, Mines, and Buildings."

The Obelisk.—The position chosen on the Embankment for the erection of the model, we greatly fear, will not be satisfactory. It will be hidden and damaged by the two masses of granite between which it is placed. It is not our site.

TENDERS

For the erection of schools and residence for the Brightwell and Britwell (W. D.) School Board, Oxon. Messrs. Morris & Stallwood, architects:—

Anderson	£2,181	5	0
Calder & Co.	1,908	1	0
Reavell	1,891	0	0
Dodd	1,888	10	0
Howland & Wells	1,685	3	6
Walter	1,680	0	0
Simonds	1,650	0	0
Holland & Sons	1,650	0	0
Cox	1,587	0	0
Holly & Butler (accepted)	1,489	0	0
Glanville	1,430	0	0
Brasher	1,343	4	0

For proposed additions and alterations to assistant master's boarding-house, Dry-hill Park, Tonbridge, for the Rev. Theo. B. Rowe, M.A., head-master. Messrs. Wadmore & Baker, architects:—

Dove	£3,955	0	0
Punnett	3,891	0	0

For bar fittings, &c., at the Three Nuns Hotel, Aldgate, London. Tarring & Wilkinson, architects:—

Bar Fittings, Joiners' Work, &c.

Phillips & Son	£2,119	0	0
Sage	2,108	0	0
Drew	1,490	0	0
Stephenson	1,429	0	0
Langridge & Sons (accepted)	1,321	15	0

Gas Fittings.

Benham	£192	0	0
Vaughan	115	10	0
Rothwell (accepted)	89	15	0

Pewtering.

Watts	£262	0	0
Bliss & Co.	235	0	0
Heath (accepted)	227	10	0

Glazing.

Hughes	£238	10	0
Bussell, Gibbs, & Co. (accepted)	35	0	0
Goslett & Co. (not complete)	28	4	6

For stabling and carriage-sheds, Athol-street, Bromley, for the North Metropolitan Tramway Company. Mr. Geo. Hopkins, architect:—

Aitchison & Walker (accepted)	£1,425	0	0

For building two workshops, Seabright-street, Hackney-road, for Mr. W. Rogers. Mr. J. G. Needham, architect:—

Thomerson	£415	0	0
Jarvis & Sons	335	0	0
Edwards	375	10	0
Judd & Hawkings	359	0	0

For Yardley (Birmingham) Sewerage Works. Contract No. 2. Mr. E. Pritchard, engineer. Quantities by Mr. E. J. Parnell:—

Rendell	£29,521	4	3
Smith	22,250	0	0
Marriott	21,200	0	0
Heeps	20,680	0	0
Mackay	20,370	0	0
Palmer	20,300	0	0
Young & Co.	19,975	0	0
Miles	19,386	0	0
Law	19,069	0	0
Bourne	18,350	0	0
Robinson	17,850	0	0
Lea	17,475	10	0
Meats, Bros.	17,000	0	0
Carrall & Lewis	16,929	15	0
Bush (accepted)	16,144	8	3
Frayne, Bros.	12,486	19	5

For the erection of Baptist Chapel, Henley-on-Thames. Messrs. J. Omer Cooper & Son, architects. Quantities by Messrs. Weymouth & Son:—

Sheffield & Prebble	£2,679	0	0
Lenfield	2,614	0	0
Jones & Co.	2,590	0	0
Woodbridge	2,477	0	0
Simonds	2,476	0	0
Bishop	2,472	0	0
Talbot	2,337	0	0
Weyman	2,266	0	0
Claridge	2,215	0	0
Clements	1,918	19	0

For alterations to White Swan Inn, Bristol. Messrs. Haddon, Bros., architects. Quantities supplied:—

Davies	£1,340	0	0
D. J. & D. Davies	1,220	0	0
Stephens & Bastow*	1,190	0	0
Price	1,152	0	0

* Accepted with deductions.

Mr. Hamblet, of West Bromwich, has obtained the contract for all the blue bricks required by the Great Northern Railway Company for the next twelve months.

TO CORRESPONDENTS.

J. B. E.—T. & W.—W. S.—T. B.—E. J. T.—R. L. S.—W. & B.—E. P.—M.—S. B.—S.—W. W.—T. C. M.—J. H.—C. & Co.—W. B.—H. J. P.—S. S. H.—G. & B.—F. T.—H. M.—E. R. T.—E. J. T.—R. N. S.—H. S.—A. & W.—S. P. C.—J. H.—Correspondent (gentlemen who wish their names spelt correctly should write them so that there need be no mistake in printing. We uniformly decline to set right errors caused by a correspondent's own stupidity. When a man signs his name so that it cannot be read with certainty he shows an utter want of consideration for other people, and deserves none himself).—R McD. (in type).—Householder (in type)

We are compelled to decline pointing out books and giving addresses.

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NOTE. The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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THE INDEX and TITLE-PAGE for the Volume of last year (1877) was given as a Supplement with the Number for January 19th last.

A COLOURED TITLE-PAGE may be had, gratis, on personal application at the Office.

CLOTH-CASES for binding the Numbers are now ready, price 2s. 6d. each; also

READING-CASES (Cloth), with Strings, to hold a Month's Numbers, price 2s. each.

THE THIRTY-FIFTH VOLUME of "The Builder" (bound) for the year 1877 is just published, price One Guinea.

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Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited),
Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [Advt.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [Advt.]

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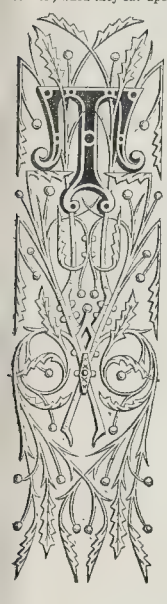
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THE HOUSEHOLD AT DIFFERENT ERAS.*

SOME NOTES AND DEDUCTIONS.

"His Majesty, James I., would say to the lords of his council, when they sat upon any great matter, and came from council in to him:—'Well, you have sat; but what have you hatched?'"—*Lord Bacon's "Apothegms."*



THE giants and beanstalks of a past, more or less remote, have one advantage over those with which the childhood of living men was familiar: belief in their actual existence is assisted by substantial evidence still remaining upon the surface of the globe. But a first encounter with the reality of life suffices to destroy the fabric of a nursery tale. Moreover, envy of the past, a perpetually recurring foible of all time, is strengthened at the present day by the labour of old-curiosity-mongers and the devotion of collectors. The early hobby of a few has become a science to many, and, distinguished by a grand name, has developed into a recreation. But that quality of the archæologist, which enables him to identify by comparison and analogy, induces exaggerated ideas of relative proportion. He finds at Athens ruins of temples and other monuments of an ancient capital, the centre of a once exalted form of civilisation; he concludes that the same elegance and refinement marked those parts of the city which he does not find. He sees at Rome fragments of colossal and rich architecture,—some, like the Pantheon, almost defiant of Time; he chooses to believe that a nation whose public buildings were magnificent must have been equally happy in its private houses. In presence of the great works of the Middle Ages the archæologist is equally sanguine, equally convinced. Within the shadow of Reims Cathedral, or under the frown of Durham Towers, he conjures up streets of houses and public buildings of similar workmanship and beauty; he forgets that such records of past epochs are still standing, because in a great measure they were extraordinarily well built. He is quite unprepared to admit that all cities and villages of ancient and mediæval times have disappeared partly because they were not better built,—to keep within the mark,—than those of the present day.

Nor are the moderns, in their reverence for the ancients, satisfied with a display of mere sentimental respect. They credit the Greeks, during the Era of Pericles, with much of the practical science which was generated by the legacy of Bacon. Take an instance, connected with our own branch of criticism and discussion: the *entasis* of the antique column, the curved horizontal lines of the Parthenon, are ascribed to marvellous methods of scientific deduction. It would be sacrilege to call them tricks of eye and hand, similar to those of which men are now adepts upon paper, played by the ancients upon solid materials. The architecture of a community of masters and slaves who measured time by a stick; whose practice of arithmetic consisted in signs with the fingers, in the use of a counting-table and dice; whose knowledge of anatomy and the human skeleton was restricted to a superficial, even though constant, study of the living form; whose admiration of the beauties of nature was expended upon the Ilissus, and a few groves of fruit-trees,—is held up to students as inimitable, because the modern mind has neither capacity nor inclination to attain, even by consummate and continued exercise, a like mathematical exactness!

What Cicero called "public magnificence" is, it may be candidly admitted, inimitable, at the present day. The conditions of existence, both public and social, are now opposed to it; and century after century those conditions have undergone gradual but sure alteration. We have presumed to see three marked characteristics of existence during the twenty-four centuries of which History talks with confidence. In the Era of Grecian and Roman civilisation the State was everything, the Individual comparatively nothing; hence the public magnificence of Antiquity. In the Mediæval Era the State was subservient to ecclesiastical power and, within the community, the Corporation,—of Religion, of Arms, or of Trade,—was everything, the Individual comparatively nothing; even the landowner was then, so to speak, the head of a corporation, for not only did he hold land in trust for those subjects and serfs who lived and worked upon it, but he was theoretically bound to his subjects by ties as stringent as those by which his subjects were practically held. In the modern Era a state of things, pointing to political equality and to republican institutions, is manifest: the Individual is, or at least will be, everything, the State comparatively nothing; and within the community, in spite of Societies, Associations, and Unions of all kinds, the Individual is, or will be, everything, the Corporation comparatively nothing. It has, therefore, been of more than ordinary interest to trace the influence of three great radical modifications upon the Household and the House,—from the public "magnificence" of Antiquity, through the corporate or co-operative "magnificence" of the Middle Ages, to the private "magnificence" of our own time; and it may be useful to add that we should not have entered upon the inquiry had not M. Viollet-le-Duc written, in an evil hour of relaxation, his "Histoire de l'Habitation Humaine."

That book professes to see in almost every epoch of the past,—up to the time, at least, of Louis XIV.,—all the knowledge and experience of architecture that the moderns have acquired from the study of ancient and mediæval monuments. Even

> "As learned commentators view,
> In Homer, more than Homer knew,"

so M. Viollet-le-Duc has drawn plans and façades of habitations sufficient to make the most self-satisfied students despair, not only of themselves, but of everybody else, now and to come; and he has not, in this particular, stopped at Homer. He has given to every representative hero of past ages a like prescience and superiority. He has not attempted to inquire into the few facts that are known concerning ancient houses; he has designed a Grecian residence very much as if he had been commissioned to do so for a client who desired to possess a mansion in the Grecian method. There was some excuse for Mazois, who wrote just after everybody's head was turned with the wonderful revelations of Pompeii; there was an excuse for the Abbé Barthelemi, whose "Voyage d'Anacharsis" was a philosophical essay on the ancient Greeks, and whose plans of the Grecian house were not laid down by himself. But there was no excuse for M. Viollet-le-Duc to combine in his plan all the extravagance of Perrault and Galiani with all the ignorance which the modern Gothic school too often displays in its appreciation of ancient history, both archæological and social. Until recently, all M. Viollet-le-Duc's works have been accepted in this country,—principally because of the charming, if not deceptive, drawings that illustrate them,—as authorities which only the worst heretic in architectural principles would venture to deny; and, allowing the usual grain of salt, his minute description of mediæval building, manners, and costume is generally trustworthy and always graphic. But it is a totally different matter when he applies all that he has been able to discover in his researches into French practice to Rome, Greece, Asia Minor, India, and Egypt.

We cannot claim to have discovered that no modern had succeeded in making a plan of a Grecian house sufficiently to accord with the descriptions extant by ancient poets, dramatists and historians. Becker, the learned author of "Charicles" and "Gallus," found that out; and he filled up the void with diagrams of a supposed house in Athens. But we have been the first to point out that Becker's plan, which has been reproduced in classical books of reference, notably Dr. William Smith's well-known "Dictionary of Greek and Roman Antiquities," covers a superficial area so preposterously colossal as to exceed even the dimensions of the Parthenon measured upon the topmost step of the Temple. In a city like Athens, where, even after Pericles, the architecture of public buildings was small,—the Parthenon being only comparatively colossal,—the private dwellings were not only small, and of the commonest materials, but they were of low and mean eleva-

* See vol. xxxv., pp. 176, 244; 3 8, 417; 468; 627 673; 778; 949, 1243.

tion, squeezed together on the borders of narrow and crooked streets. We have tried to explain by a comparative reference to private houses and huts in Indian cities at the present day that the Grecian, and indeed the early Roman, dwelling was simply a development of a primitive four-sided inclosure, one story high, with a door on one side. Through a hole in the roof, or a central yard open to the sky, light and air descended upon the master and his sons, his women and cattle, and "the stranger within his gates." This inclosure, of course, varied in size, according to the wealth or strength of the owner. In a large inclosure the covered portions were built round and against the four walls, thus leaving an open space or courtyard in the centre; ultimately this quadrangle, if it may be so called, was surrounded by colonnades or verandahs which protected from wind, rain, and sun the doorless and windowless apartments. This once understood, the difficulty of the passage in Xenophon's "Memorabilia," where Socrates referred to the southern porticos, —which should be made higher in order that the sun in winter may not be shut out,—and to the northern porticos,—which should be made lower so that the cold winds may not fall on them, becomes easy to remove. To have made, as Becker suggested, the main front of every house in the crooked streets of crowded Athens face the south, was simply impossible; but on the principle of every house obtaining light and air upon its own ground, and from an internal courtyard, whichever of the four porticos faced the south could be raised with impunity, and without reference to the main or the inferior fronts of the building. These are points of importance to which the attention of classical commentators and essayists may be advantageously directed, for our own explanations of the flat-roofed, one-storied Athenian dwelling are based upon acquaintance with similar inclosures in India. There the traveller will often find a practical explanation of references to Grecian buildings which puzzle the Western student of classical literature. We may also remark that should a new edition of Becker's "Gallus" be called for, the pages devoted to the Roman house contain, we venture to think, some technical errors; the space given to a consideration of the *atrium* and the *cavum ædium*, or *cavædium*, may be profitably curtailed. There can hardly be any dispute, judging, as all must do, from the scanty facts handed down to the present time, that the early Roman dwelling was contained within one inclosure,—the *atrium*. A Roman spoke of his *atrium* as an Englishman speaks of his house; and there is really nothing to show, as Becker suggested, and as we have attempted to controvert, that the entrance-passage leading between the two shops of a Pompeian or a Roman house into the *cavædium*, or internal common court, was ever specially designated as the *atrium*; indeed, there is nothing extant, at least of technical value, to support Becker's further hypothesis, that the *alæ* were aisles flanking either side of the *atrium* regarded as an entrance-hall or a passage-way.

Nor has the inquiry we have made into the character of ancient dwelling-houses helped to show that the respect for what is now called "truthful execution" was much or any greater in the best period of Antiquity, and at the beginning of the Christian Era, than it is at present. Athens for a time was the home of all good artists. From the Piræus, works of art were exported on speculation to every part of the known world; and unless, in the course of two thousand years, human nature has altered more than has the human form, that mercantile spirit which distinguished the Republic, and which philosophers and gentlemen affected to despise, was accompanied with the inevitable share of intrigue and adulteration of extended trade. Nor do the details of social life, in the best time of Athens, point to that diffusion of artistic appreciation and feeling which the modern art enthusiast often maintains is necessary to make a nation artistic. It is certain that the workmen who built the Parthenon were slaves; and what, after all, is there extraordinary in the fact?—at least, to those who have seen the common Hindús engaged in workmanship of the very highest artistic character. —workmanship which some in England would have the world believe to be possible only to men or women of social refinement and æsthetic cultivation. To take the ancient writings literally, it must be assumed that the chiefs who directed the works of the Parthenon were also bought and sold; and the Greeks, it is well known, used their slaves for purposes of trade and revenue. Nor were their wives and female children much higher than slaves. If we turn to Rome, the picture is varied by the fact that women shared in the every-day life of the men; and that the slaves were not sources of revenue, but ministers of personal use and luxury. Yet, although Cicero pronounced medicine, architecture, and education to be professions worthy of gentlemen, in his time pedagogues, artists, amanuenses, and doctors were generally slaves. As far as the possession of "a taste" goes, the Roman seems to have been to the Greek very much like what, at the present day, the ordinary Londoner is to the ordinary Parisian. The affectation of the wits was to live in houses of Athenian style and arrangement; and in the Augustan period, it is said that apartments were decorated in different styles, in the Egyptian, the Ionian, and in one called of fantasy, but which is now termed Roman. Nor were the fashions of the time in unison, according to the modern creed, with the intellectual refinement which a few attained, or with the urbanity which many possessed. The streets and market-places presented, in the days of Cicero and long afterwards, successive scenes of riotous confusion; on dark nights barely illumined by the torches of individual processions, they were always dangerous and often impassable. Many of the shops were booths erected under the arcades or outside the lines of houses; they thus obstructed the roadway as well as the pavement. The lofty blocks of dwellings frequently tumbled about the ears of their inhabitants, and the whole city, during the entire course of the first century, was a periodical prey to fire, which devoured often an entire region.

Two facts that our archæological survey, however imperfect, of Grecian and Roman history elicits may seriously be offered to the votaries of science and art. Both in Greece and Rome the father exercised his right to destroy or "expose," his offspring, and this must often have resulted in death. Obviously the halt and the blind, the weak and defective human beings were thus eliminated; hence to some extent the comparative beauty and superior animal character of the ancients. The other fact to be noted is that during the political domination of Greece, and in the best Græco-Roman monuments of a later time, the sculptor indubitably shaped in stone and marble the circumstance and insignia of every-day life, and he clothed his figures in contemporary costume.

The same thing is frequently said of mediæval sculpture; but we are unable to endorse the statement without some qualifications. We venture, however, to believe that the narrow tortuous streets and overhanging buildings in the byways and slums of Rome bore a greater resemblance to a city of the Middle Ages than it is now often thought convenient to admit; at the same time we are convinced that early French and English building traditions were acquired from Roman, or what scholars prefer to call Classical example. The possession of that *naïveté* which so many recent essayists have tried to father upon young communities is by no means borne out by history, either past or present. The simplicity that does not know how to lie in wood and stone dwells only in the imagination of poets, and the poets are not necessarily concocters of verse. The reason why the cathedrals, abbeys, castles, and public edifices erected in Western Europe during the twelfth and thirteenth centuries bear so striking a resemblance, has been attributed to the presumed similarity of action which the human mind displays when inspired by true principles, and engaged in the pursuit of truth. The few have thus argued, the many have been contented to accept the supposed fact without argument or discussion. Some have said that the resemblance exists because only a few, a peripatetic few, designed the nucleus of those buildings; others have said that the buildings are alike because the traditions upon which their design was based were similar. No doubt both the suppositions are correct as far as they go; but how was it that only a few designed great contemporary monuments in Spain, France, Germany, and England? How was it that the Spanish and German, the French and English traditions accorded so closely that a traveller can now detect resemblances in abbeys, castles, and cathedrals, erected about the same time in every corner of Western Europe? We have ventured to formulate the answer to which a few writers, notably M. Viollet-le-Duc and Mr. Fergusson, have casually led up to but not defined. It was that the building traditions of Western Europe were guided until the fourteenth century by men who received their education from one common school; and to the authority of that school is due the early development of those traditions, based as they were upon the study of antique books and the remnants of antique buildings. That school, that centre of education, was Cluny; very little if anything is known of the buildings which composed the Abbey at the period of its surprising and extended influence. The church, of course modified and enlarged, remained until the Great Revolution, when it was wantonly destroyed; and the MSS. for which the library was famous have been burnt or dispersed. But it is certain from numerous sources of evidence, mostly authenticated, that Cluny, in the early period of the Middle Ages, was as much the artistic centre of Western Europe as Paris is now the political centre of France or as the Vatican is still the religious centre of Roman Christendom.

We touched superficially upon the customs of feudal tenure and the relation of the subject and the serf,—for even the vassal was held by a tie that would now be compared to serfdom,—to their lord and part-owner. The vestiges of that relationship were completely obliterated in France only after the great Revolution. The *droits de Seigneur*, which, among other things, gave to the lord the right of taking something more than a first salute from the bride of his subject, and the custom of *mainmorte*, which prevented a large number of a nobleman's tenantry from disposing of their persons,—the "dead hand" keeping them tied to the land on which they were born,—are now very amusing incidents of hereditary possession in the soil, which, like the air we breathe and the light we enjoy, is beginning to be considered the common property of a nation; but they were very serious grievances once, and they doubtless aggravated the horrors of 1793. The coming question of the land, in this country, did not form part of our text, but it is a question which a journal like the *Builder* cannot consent to ignore, especially when it is remembered how the British landowners' privileges and exemption from certain taxes, of which the general public are ignorant, affect the architecture of all Engish cities, and reduce the ease and comfort of the vast majority of English households. The reference we were enabled to make to the "Lettres sur l'Histoire de France," by Augustin Thierry, may perhaps induce a few to read those excellent letters; and if we dared to touch upon the rise, in the twelfth century, of so dreadful a thing as the "*Commune*," Mr. John Hollingshead has rescued us from obloquy by wittily describing it in the new periodical, *Mirth*, as merely another name for "local self-government."

The influence of Indian story upon European thought in the sixteenth and seventeenth centuries is not, we think, rated at the present day at its true value. Indeed, for nearly 200 years before the great conquests made by the English in India were preparing, the mind of Europe was fed by travellers who brought back or wrote home tales of the Pathán and Mogul princes, of the wonderful cities they built and the great territory they governed. The effect thus indirectly produced upon England was a yearning to see the world, and that yearning had much to do with the mental stir which, at the Reformation and for long years after the Revolution, induced the state of discontent that heralds a change and generally means progress.

But the conversion of the mediæval château into the hôtel of the Bourbon, or the house of the Tudor and the Stuart, was more gradual than has been too frequently asserted. The old manners "in hall," identified with the practice of Richard Cœur-de-Lion, of the Henrys and of Edward III., were common in the days of Elizabeth. It was only in the seventeenth century that the neck, so to speak, of early tradition was effectually wrung; and we have put a very pertinent question to revivalists; whether, as regards arrangement and general convenience, the houses which in Paris were pulled down, at or about the time when London lay smouldering in ruins, were better, healthier, and more comfortable than those which Louis XIV. and Charles II. ordered to be built? Of one thing, however, there cannot be a doubt. At the close of the seventeenth century, the condition of Paris, then the capital of the world,—of which Louis the Great was the

central star,—was such as even those accustomed to the actual filth and dilapidation of a large portion of Central London cannot hope to realise. It has been made clear, we trust, in the last article upon the Household during the Era of "Louis Quatorze" that, two hundred years ago, the type of Paris house was almost similar,—the difference being one of size more than anything else,—to most of the houses which during this century have risen not only in the heart of London but in the heart of nearly every large city in England. Those houses, narrow-fronted and consisting often of two rooms over two rooms, have been entirely swept away from all parts of Paris and from the centre of provincial cities like Bordeaux, Lyons, and Marseilles. In the place of five, ten, or a dozen old-fashioned houses have risen great blocks of shops and dwellings,—the *maisons-à-loyer* of French cities. In the heart of Paris the thoroughfares are bordered with horizontal houses reared one above another, over, almost invariably, a vast ground-story of shops, while towards the circumference and in the suburbs there are whole streets containing gentlemen's hôtels and detached villas; and the same rule is followed in the provincial capitals. It seems to be the unwritten law that crowded centres of habitation must be arranged in horizontal layers and not in vertical slips. Were we to apply the same rule to Central London the domestic buildings bordering all the thoroughfares would be divided in three or more horizontal layers: one at the street level of shops or warehouses, an intermediary layer of business offices, and a superstructure of one, two, or more layers of dwellings. The importance of the Individual in our time,—an importance, we repeat, relatively as great now as that of the Corporation in the Middle Ages, and that of the State in Antiquity, renders it necessary for the centre of a great city to possess, besides places of business, a large number of small residences rather than a few great mansions. We consider this point of such importance, particularly in face of the contemplated construction of new streets and the yet possible application of the Artisans' Dwellings Act, that we propose to publish a series of suggestions and sketch-plans of shops, offices, and dwellings for Central London. We hope to be able to describe as clearly and succinctly as possible How to PLAN, CONSTRUCT, and ORGANISE the so-called HOUSES-IN-FLATS, of which so much has recently been written and said. At the same time we shall continue our inquiry into the house of the last hundred years as it has developed in France and England. Our object has hitherto been to show that the constantly-recurring modifications,—religious, political, and domestic,—which mark century and century, or even generation and generation, not only mean progress, but they have actually resulted, as far as the upper and middle classes—ay, and even the lower classes,—are concerned, in better dwellings and more comfortable homes, bad and ill-arranged as these are in the larger part of Central London, and most of the great English towns. People who think otherwise will do well to remember Macaulay's splendid termination to his minute summary of English life nearly two hundred years ago. His deduction was that constant improvement is generated from constant discontent, and that if we were perfectly satisfied with the present, we should cease to contrive, to labour, and to save, with a view to the future. "In truth," said the great historian, "we are under a deception similar to that which misleads the traveller in the Arabian Desert. Beneath the caravan all is dry and bare; but far in advance and far in the rear is the semblance of refreshing waters. The pilgrims hasten forward, and find nothing but sand, where an hour before they had seen a lake. They turn their eyes and see a lake where an hour ago they were toiling through sand."

The Proposed New Town Hall for Barrow.—The Barrow Town Council have determined to instruct Mr. W. H. Lynn, architect, of Belfast, the successful competitor for the designs of the new Town Hall and offices, to prepare the working drawings, specifications, and quantities for the construction of that portion of the building required for the accommodation of the committees and officers of the various departments, but that the work be not commenced until additional loans under the Act shall have been arranged for, and the question shall have again been submitted to the Council.

FURTHER ESSENTIAL FACTS AS TO THE FOULING OF THE THAMES.

IN our first notice of Capt. Calver's report on the condition of the river Thames (vol. xxxv., p. 1262), we remarked that we did not quite follow the argument of Sir Joseph Bazalgette as to the seaward movement of the water contaminated by the sewage pumped into the river at Barking Reach and at Crossness. Sir J. Bazalgette has returned to the subject, in a long letter to the editor of the *Standard*, in which he states that he is "preparing a report which will deal with every statement made by the Captain in detail." In the meantime he offers comments upon Captain Calver and Captain Galton's letters. We referred, in a recent number, to the fact that the brief of one advocate of the plans of the Metropolitan Board appeared to be limited to the very narrow contention that up to this time that body had not acted illegally; a charge which was not under discussion. And we cannot congratulate Sir Joseph Bazalgette on a more comprehensive grasp of the subject, or a greater readiness to rely upon great principles, rather than on what we must term quibbles of detail, than was evinced by the legal gentleman who also defended the action of the Board.

On the 14th of March, 1865, a paper on the main drainage of London, and the interception of the sewage from the river Thames, by Joseph William Bazalgette, M. Inst. C.E., was read at the Institution of Civil Engineers. The discussion of this paper occupied that and the three following sittings; and it is to the report in question, and to the minutes of the discussion, that we have to refer for the best available account of the works now complete or in course of completion, and of the expectation and intent of their designer. Here, too, we find the explanation of that statement as to the seaward passage of the sewage to which we have already referred.

It should be observed that the title of the paper is, to some extent, a misnomer. At all events, it is guilty of a serious error of omission. The works, which it was estimated in that report would cost, when completed, about 4,100,000*l.*, had cost, according to Mr. Firth, in August, 1875, half a million in excess of that estimate. Their object, we are told in the report, was "the interception of the sewage (as far as possible by gravitation), together with so much of the rainfall mixed with it as could reasonably be dealt with, so as to divert it from the river near London." It is in the last two words that the pith of the question is to be sought. In addition to this debated and debatable point, the following further objects are designated "The substitution of a constant, instead of an intermittent, flow in the sewers; the abolition of stagnant and tide-locked sewers, with their consequent accumulation of deposit; and the provision of deep and improved outfalls, for the extension of sewerage into districts previously, for want of such outfalls, imperfectly drained." With one very important exception, as to which we have some further inquiries to make, we cannot but hold that these three very important objects have to a considerable extent been attained by the construction of the works of the metropolitan scheme.

According to the system which it was sought to improve (as personal experience confirms the statement of the reporter), the London main sewers fell into the valley of the Thames; and most of them, passing under the low grounds at the margin of the river, discharged their contents into the channel at a level but a little above that of low water. As the tide rose above a certain height it closed the outlets, and pushed back the sewage, which thus accumulated in the low-lying parts of the sewers, and rapidly filled them up with the precipitated deposit. It is estimated in the report that the stagnancy thus caused continued for about three times the period of the actual flow, or for nine hours out of a twelve-hour tide. The mean lunar day may be taken as twenty-four hours fifty-four minutes, so that twelve hours twenty-seven minutes is the mean tidal interval. The time of high water at London Bridge, Mr. Redman states, five centuries back, was reckoned three hours after the moon's transit. It is now two hours after, having been accelerated one hour by the various changes in the channel of the river. The extreme range of tide at Gravesend, from 1812 to 1845, was registered at 24 ft. 6 in. The tide of the 18th of October, 1841, which was estimated as the highest known for half a century, was 1 ft. higher than the above, giving an extreme range of 25 ft. 6 in. The low-water mark in London is now determined at 19 ft. 8 in. below Trinity standard. We thus obtain a range of 19 ft. 8 in., or 236 in., in 747 minutes; and if the flow of the sewers was uninterrupted for the fourth part of each tide, the level of the discharge must have been at 79 in. above low-water line. As to the pounding back of the sewage, those who had residences or offices in Westminster were unfortunately but too familiar with the fact.

The effect upon the Thames above bridge by thus discharging the sewage within a certain distance of time before and after low-water was attained by the river was, as the reporter justly observes, most injurious. Because, says Sir J. Bazalgette, "not only was it carried by the rising tide up the river, to be brought back to London by the following ebb-tide, there to mix with each day's fresh supply, the progress of many days' accumulation towards the sea being almost imperceptible; but the volume of the pure water in the river being at that time at its minimum rendered it quite incapable of diluting and disinfecting such vast masses of sewage." It is very important to mark these admissions, and also to mark the confusion betrayed in the mind of the writer between the two perfectly distinct operations of dilution and disinfection. This, in fact, is the key to the whole question. The engineer to the Metropolitan Board of Works says,—dilute sewage, and you thereby destroy or disinfect it. The Rivers Pollution Commissioners, the chemists, and, we must add, our own convictions, say, dilute it to any extent practicable under the circumstances, and you have a polluted and poisonous material still to deal with. Here, then, is a question, not of detail, but of principle. It is not in debate whether this or that observation of Captain Calver be accurate, but whether the very aim and purpose of the engineer of the Metropolitan Board has been at all directed towards the true solution of the great problem left in his hands. Unless we are to set aside the outcome of the work of the Rivers Pollution Commissioners. Such has not been the case.

In the system now adopted, the report continues, it has been sought to remove these evils by the construction of new lines of sewers, laid at right angles to the existing sewers, and a little below their level, so as to intercept their contents, and convey them to an outfall fourteen miles below London Bridge. We observe that in the plan and section of the river Thames, which were appended to Mr. Redman's paper on that river, read at the Institution of Civil Engineers on the 27th of March, 1877, the infall of Barking Creek occurs between the eleventh and twefth mile, measured along the centre of the river, from London Bridge, and Crossness is at about the thirteenth mile. But it is an erroneous, not to say an invidious, thing to intimate that London Bridge is the eastern limit of London. The river life of the port lies below, not above, that barrier; and stretches for full three miles seaward. Blackwall is nearly seven river miles below London Bridge, Bow Creek being just at the seventh mile. There is a bend of the river to the south, but the country can hardly be said to have been reached at Blackwall. The upper outfall, that of the northern district of London, instead of being at the assumed distance of fourteen miles from the metropolis, is thus only between four and a half and five miles from its edge, an edge that is continually advancing. This is a most material correction to be applied to the calculations which we are about to review.

At the outlets, continues the reporter, the sewage is delivered into reservoirs, situate on the banks of the Thames, and placed at such a level as will enable them to discharge into the river at or about the time of high water. By this arrangement, the sewage is not only at once diluted by the large volume of water in the Thames at high-water, but is also carried by the ebb tide to a point in the river twenty-six miles below London Bridge, and its return by the following flood tide, within the metropolitan area, is effectually prevented. Again we have to inquire, is this a correct representation of the fact?

In taking the water-supply of the metropolis, which forms the normal current of the sewage, at 120 million gallons per diem, we give a figure considerably below the future requirements of the population. As to the rainfall, Sir Joseph Bazalgette states that a quantity equal to the hundredth part of an inch in an hour, or ¼ in. in twenty-four hours, would occupy as much space as the maximum prospective flow of sewage provided for. Passing by, for the moment, the

question of the amount, and the more practical question of the distribution, of London rainfall, we come to the provisions for raising the mixed sewage and rain-water into the reservoirs discharging into the Thames. The engine-power at the Abbey Mills pumping-station is calculated for the purpose of lifting a maximum quantity of 15,000 cubic feet of mixed sewage and rainfall per minute, to a height of 36 ft. The maximum quantity to be lifted by the engines at the Crossness reservoir and pumping-station is stated at ordinarily 10,000 cubic feet per minute. During the night that quantity will be considerably reduced, while on the other hand it will be nearly doubled on occasions of heavy rainfall. We have taken the sewage alone, without rainfall, at 120,000,000 gallons. At the rate of 25,000 cubic feet, or 156,000 gallons per minute, given by the aggregate pumping power, thirteen hours will be required to raise the given quantity of water, or 6¼ hours per tide. The interval between the tides, as we have seen, is 12 hours and 27 minutes, five-twelfths of the time being flow and seven-twelfths ebb. Thus supposing the discharge to commence at high water, it must continue nearly to the close of the ebb, the time required for outfall being 6 hours 30 minutes, and the ebb lasting for seven hours. This will provide for sewage alone. As rainfall is given as approximately equal in amount to sewage, on a wet day all, or nearly all, the time occupied by the flowing as well as by the ebbing tide will be required to empty the reservoirs. Under the most favourable circumstances we must expect the sewage to be poured into the river down to within half an hour of low water. What comes of the assertion that its return within the metropolitan area by the following flood is effectually prevented? What comes of the promise to discharge it fourteen miles below London?

According to the figures which we have cited from reliable authority, and subject to the variations of wind, tide, and rainfall, the skeleton of the case appears to be this. At ordinary spring tides, on a dry day, the flow of sewage into the Thames will commence at the turn of the tide, and continue to within from thirty to forty minutes of low water. The ebb of the Thames, at the springs, lasts for a little over seven hours, and the rapidity of the current and of the tide is thus stated by Mr. Redman. The velocity of the first of the flood is from 1¾ to 2 miles per hour, and of the last of the ebb from 2½ to 3½ miles per hour. When the river begins to flow, then, there will intervene a length of from three-quarters of a mile to a mile of pure water between the pumping-station and the outgoing mixture of current and sewage. Moreover, this mixture, having commenced at high water with a maximum dilution, will have become more and more impure, minute by minute, as the river diminishes in volume; and will at last have become quite as contaminated as was the case at the mouths of the old sewers, above bridge, before the intercepting works were commenced. This contaminated water, returning 12¼ miles with the flood tide (according to the experiments), will ascend the river to a point about twelve miles above the infall. That is to say, that the Barking sewage will go up to some half-mile above London Bridge, and that the full mixture from the two infalls will be carried right into the Pool, to the very heart of the shipping, and not only far above Blackwall, but into the midst of Eastern or commercial London. In wet weather the dilution may be more, but the time of discharge will be proportionately longer, so that the foul matter will ascend higher up the channel of the river.

Unless it can be shown that the whole contents of the reservoirs, which it takes six hours and a half to pump up into them, can be discharged in one great rush at the top of the tide, or thereabouts, it is impossible to impugn the above conclusion. We are taking the discharge to be equal to the pumping power. This is the only feature of the case as to which definite information fails. If any correction is here to be made, we state this so as to give the Metropolitan Board the full value of such correction. Taking the published facts, the result is now before our readers.

We omit, for the present, any further reference to the question of the forging of the suspended matter up the Thames, owing to the difference in velocity of the ebb and flow, to a point above that to which the measurement of the ebb and flow of the tide shows that it must certainly be carried at springs. We do so, not from the feeling that this question is by any means satisfactorily settled, but because it is waste of time to deal with a minor matter in dispute while there is enough indisputable evidence attainable on which to form a judicial opinion. But we think that sufficient attention has not been given yet to the details of the float experiment in 1851. We are not, indeed, prepared to admit that the volumetric flow of the river can be ascertained by means of a velocity calculated from the movement of a float. The current-meter has given us data enough to show that it is quite possible that there may be a downward movement of current, on the bed of the river, at the same time that there is an upward flow of tide on the surface. Referring to this, chiefly in order to prove on how very slight a basis the entire theory of the purity of the river above the pumping stations rests, we call attention to the facts as stated by Sir J. Bazalgette. On the 13th of July, 1851, a float was put into the middle of the river opposite Barking Creek, two hours after high water. At low water that float had reached a point eleven miles and three-quarters below that point. It returned, with the next flood tide, to one mile above it. It follows thatif the float had been put into the river at the turn of tide, it would have ascended the channel to a point considerably above that on which it was placed. This was at the spring tides. By July 24th the float was thirteen miles below Barking Creek at high water, having gone down the river fourteen miles during the falling off of spring tides to neaps. As the floods became stronger, it worked its way up the river with each succeeding tide, till July 29th, when it came again within five miles below Barking Reach. Thus, while there was a total gain of distance in the fortnight of five miles, in the oscillation backward and forward of the float, there was an advance up stream of nine miles from high water neap to high water spring. It follows from the experiment, which is relied on by the metropolitan engineer, that the sewage pumped into the Thames at Barking at high water neaps will, in the course of a fortnight, have worked up the river to the middle of the Pool, or to within two miles and a half of London Bridge. In brief, the result of Mr. F. Forster's experiments led to the conclusion that a substance in suspension works up the river about one mile per day as the springs strengthen, and down the river two miles a day as they fall off. Thus, even if Westminster is above the range of the direct regurgitation of the mixture of sewage and river water, the Pool, and even London Bridge, are not.

It will be observed that this working up the river at high tide is an independent movement, not comprised in the calculation we before made as to the ascent of suspended matters thrown into the river between high and low water. The mile per day ascent during the increase of the springs is, in the main, overbalanced by the two miles per day descent during the neaps. But it is a fact that exists, and has to be accounted for. And with regard to suspended matter thrown into the river, one, two, or any number of hours after high water, such matter is subject both to the return due to the next in-coming tide, and to the daily ascent during the strengthening of the springs. Between these two influences, then, it is tolerably clear that a considerable portion of the sewage must ascend above Westminster Bridge, as Captain Calver deduces from the analysis of the river mud. His views, then, find a supporter with whom Sir Joseph Bazalgette can ill afford to quarrel, as it is none other than Sir Joseph Bazalgette himself. We have to add together the 12¾ miles ascent at spring flood, and the nine miles ascent from neap to spring, which gives a total ascent for sewage entering the river at low water neaps. This makes 21¾ miles, from which has to be deducted the distance due to the flow of the current between the cessation of pumping and low water. Allowing liberally for this, we find that the water contaminated by the northern outfall will, under certain circumstances, ascend the channel of the river for twenty miles above Barking Creek, or for 8¼ miles above London Bridge.

The only escape from this argument would be the statement that the contents of the reservoirs, which it takes six hours and a half to pump full, when there is no rain, can be discharged in a very short time into the river. If such were the case, however, there would be no dilution, and successive masses of unmixed sewage would float, like islands of putrefaction, up and down the water high-way to our capital.

We think, therefore, that something has to be done before the public can be asked to give much heed to Sir J. Bazalgette's letter of Jan. 16. The points there discussed are not needful to open until those we have raised are disposed of. As to the superior carrying-power of the flood-stream, the hypothesis, true or untrue, is unnecessary in view of the simple measurements we have given. The report in 1869, now cited by Sir J. Bazalgette, can hardly be referred to as conclusive as to the state of matters in 1878. What Sir J. Bazalgette means by the statement, "the only polluting substances in the sewage are the organic carbon and the organic nitrogen," he will perhaps explain. As we understand the matter, it is not a delicate and perhaps disputable chemical analysis which is in question, but the pressure of masses of fermenting sewage floating up and down the stream. However impracticable it may be to carry down the sewage to Sea-reach without pumping, it is difficult to see how that fact bears on the case, as there is 36 ft. of pumping at the present time. All these attempts to turn off public attention from the main points at issue can be acceptable only to those who will cling to any straw in support of views once taken up.

We hold, in accord with the best study we have been able to give, and, we believe, also in accord with all sound and impartial judges, that, as matter of principle, it is highly objectionable to turn crude sewage into a navigable river. The noxious organic matter can only be neutralised by being oxidised; and oxygen enough for this purpose cannot be supplied (except by artificial means) while the matter is suspended in water,—at least, to any practical extent. Apart, however, from this great point of principle, we say, and we appeal to our readers whether we have not demonstrated, that Barking Reach is too near to London to prevent the ascent of the polluted water in bulk to the heart of the commerce of the Pool, and to some degree above Westminster. We found that demonstration on the basis adopted by Sir Joseph Bazalgette himself, as to the action of the Thames in ebb and flow, and from neaps to springs. Further, it may be added that the tides during which the experiments were made were those of July and August, and that the effect of the equinoxial spring tides must be still more formidable. The entire argument as to the non-ascent of the polluted water to London is founded on two assumptions, neither of which will stand investigation. The first of these is, that London Bridge is the eastern limit of London. We say that it would be more correct to call it the centre of London, and the western limit of the commercial activity carried on on the river. The second assumption is, that the sewage is only thrown into the river at high water, so that it cannot return, by the ordinary flow of the tide, to the point where it is thrown in, although it is admitted that what is thrown in at neap high water will work its way some nine miles up the river by the following spring high water. We point out that 120 millions of gallons of sewage are not to be thrown into the river in the course of half an hour, and that the more sudden and voluminous is the discharge, the more poisonous will be the effect on the river highway. On the other hand, the time actually occupied in pumping takes up almost the entire interval between high and low water. In fact, there is that mass of sewage to be dealt with daily. There is no escape from the dilemma. Either it is concentrated, in which case it is pestilential, and will in time drive all commerce from the Thames; or it is spread over a longer or shorter time of discharge, in which case the height to which the polluted water will ascend London Bridge will be in the inverse ratio of its dilution. Nor is this all. Forty years hence the sewage of London, if the present rate of increase be maintained, will be double what it is now,—240 millions of gallons,—half the summer flow of the Thames! It is inconceivable, to our mind, how any one should gravely attempt to justify the continuance of such a state of things. To say that a temporary advantage has been gained is all very well. To think that London, when made aware of the facts above stated, will endure what the Metropolitan Board consider a satisfactory treatment of the drainage, is simply shutting one's eyes to the trouble ahead. The one main truth,—"sewage must be oxidised," is conclusive as to principle. As to detail, each year that a proper meeting of the great difficulty is deferred only increases danger, and will increase expense; and that not n London only, but wherever sanitary authorities adopt the indefensible plan o turning their sewage into our rivers.

PROFESSOR E. M. BARRY'S LECTURES AT THE ROYAL ACADEMY.*

EARLY MILITARY ARCHITECTURE.

LAST session, in reviewing the progress of Domestic architecture in this country, we stopped, as you may remember, at the Great Fire of London in 1666. Before pursuing our investigations further, we may pause for a while, so as to take a retrospect of the various phases of art which have come under our notice, and through which we have advanced, step by step, to the time when our ancient architecture lost its charm over the minds of Englishmen, and rendered possible the Renaissance.

In the first place, we may remark how gradually changes were adopted. The Roman brought his house, as well as his laws and religion, with him. He had no temptation to assimilate his manners to those of peoples whom he despised as inferior to himself in civilisation. "*Væ victis!*" was the war-cry of the day, and conquest produced uniformity. A Roman house was, therefore, substantially the same, wherever it was built. The principal feature, the atrium, was the precursor of the hall of later times, and has influenced, more or less, almost the whole of the purely secular architecture of after-ages. We have seen, on former occasions, how the hall gained in importance as civilisation advanced, up to a certain point, and then declined, as the desire for privacy arose, and softened manners assumed an influence over Mediæval customs.

When the rule of the Romans ceased in these islands, their successors adopted their modes of building, and followed the precedents left by them. The covered atrium was not only the chief part of the house, but even the house itself. Divided, as the Saxons were, into clans and families, and living together for mutual protection, no great care was given by them to fortifications, and a mere wall of defence surrounding their dwelling, or groups of dwellings, appears to have proved sufficient for safety.

This simplicity of life did not last, and our Saxon ancestors were rudely awakened from any dreams of security by the Norman Conquest. The tenure of the Norman was that of a conqueror, bound to maintain his footing by force, as he had gained it. He came from a country more advanced in civilisation than Britain. Proud, haughty, and chivalrous, he, like the Roman, expected to impose his will on others, to force them into his ways, not to follow theirs with them. This is the time of Norman keeps and strongholds; the house had become a castle. The rule of might was symbolised by the architecture of the day. Strength and solidity were the qualities aimed at, and these were secured by the forced labour of a subject population.

The great castles are thus one more of the many illustrations of the dependence of architecture on the combination of human labour. However elevated may be the thought of the designer, it must be embodied in a concrete form to become architecture. Leaving artistic considerations even out of the question, there is always something impressive in the result of vast labour, much as there is in the sight of some great multitude. We seem to realise in such cases some of the thoughts and trials of others, our own ideas appear small and petty in presence of grandeur, and there is, moreover, the small still voice ever whispering in our ear, that "all is vanity." The old stones crumble, the walls totter and fall, change is upon every thing. Myriads of men have passed away, and still, from generation to generation, the great problems of humanity remain the same, unsolved, if not insoluble.

The great castles are thus, like the Egyptian pyramids, emblems of the power of man over matter, although, in as far as they display beauty of art, they are, to that extent, less striking as simple illustrations of the principle. Heaps of stones are nothing, but when piled up, as we see them on the banks of the Nile, they are perhaps the most conspicuous symbols possible of brute force and despotic authority.

Castles, however, differ from the Pyramids, in that they were built for use, and needed for security. They were required to be defensible, not only against the tumultuous attacks of an ill-armed peasantry, but also against engines of war. These formidable contrivances, dating often, in principle, from great antiquity, were daily becoming more powerful and complicated. The story of mankind is, indeed, one long history of strife, of the study of the attack and the defence; from the poisoned arrow of the naked savage, to the last development of our iron-clad ships and forts, our mysterious torpedoes, and our "Woolwich infants."

In speaking to you last year almost exclusively of the more domestic structures of Mediæval times, I said little about the military character impressed by the Norman architects on their work in this country, and before passing onwards, it may be well to dwell, for a time, on that phase of constructional art. It is not the less interesting to do so, because we may assume that this class of work has now passed definitely from the control of the architect. Not only are the days of portcullises and battlements gone from us, but even stone buildings are no longer trusted. Naval artillerymen expect to be protected by iron, almost as thick as the old stone walls, and armies buried in earthen trenches deal death and destruction to their foes, at enormous distances, with arms of precision, as we have very recently seen at Plevna. If the quarrels of the great lords of old were savage and frequent, it may, perhaps, be asked what improvement can we boast of, when the victims of a war are reckoned by hundreds of thousands, not of combatants alone? Our business to-night, however, is not with the wars, but with the structures of the Normans, and to them we will return.

To the Normans we owe many fine works of art in our cathedrals, as at Peterborough, Durham, Canterbury, and many other places. They brought with them to their new possessions wealth, knowledge, and skill; for much of the ornamental portions at least of these buildings must have been executed by foreign workmen. Exercising the rights of conquest, they added to their riches by exactions and confiscations, and thus became able to command the labour of thousands. Beginning with imitations of forms familiar to them at home, their architects, being cut off from Continental associations, soon developed a character of their own, and introduced special forms and features, which distinguish the Norman style as naturalised in England. These novelties were, however, reserved for the great churches, and scarcely apply to the castles, which we are now considering, and which, as is usual with military buildings, followed pretty strictly the rules of precedent.

In treating of Pompeii, I took occasion to draw your attention to the walls of that city, as they furnish a good example of the Roman method of constructing the fortified *enceinte* of towns and fortresses. This formed a precedent long followed in succeeding times. Projecting towers and bastions were also based upon plans of Roman fortifications. The embattled and protected walls enclosed an area of ground, often considerable, which was commanded, in its turn, by the castle or keep, towering above the walls, and protecting them. This was the castellum, the capitol, the castle, or château, of various ages, and different tongues.

These arrangements were adopted in principle in most strong places, and were found sufficient to secure safety for the inmates. If a battering-ram were made stronger, the walls were increased in thickness, or their shape improved, and the art of defence prospered. It was not, indeed, until gunpowder was invented that this state of things began to be called in question. In the twelfth century, and for long afterwards, the attack was almost hopeless as a direct means of capture. With the use of artillery, the case became reversed, and from that time to the present, the fight between guns and armour has continued, with apparently varying shades of success, but with a steady advance in the power of attack, so that, as regards sieges, it has even become a military proverb, that "a place attacked, is a place taken."

This was very far from being the case in the Middle Ages, and the Mediæval castles abound with contrivances for so isolating portions of the work, that even in case of partial disaster or treachery, the garrison might retreat from point to point, and continue the defence. The towers were thus often separate fortresses, supplied with ovens, water, and necessaries of life. They were, moreover, so designed as to be formidable to the besieged, as well as to the besiegers. In cases of towns, it often happened that the citizens had little interest in the defence, and less appetite for the horrors of war. The fortifications were held, it might well be, by some robber baron, interested only in plunder, and regarding rich burghers as a shepherd does sheep to be shorn. The latter were, therefore, kept at a distance, and not allowed access to the defensive works of turret, bastion, or battlements. This necessitated the long walled passages and staircases of communication, which are to be traced in many ruined castles. In some cases such passages led to an adjoining stream or river, and communicated with ferries or bridges.

It was often a great object to command navigable streams, such, for example, as the Rhine, on the banks of which the remains of castles meet us at every turn. The trade of such watery highways was naturally at the mercy of the lords of these strong places, who were thus enabled to impose terms, and fill their coffers. The Rhine, however, and rivers of great magnitude, could not be bridged, and could not therefore fall into the absolute power of a single master. In cases where bridges were possible, it was customary to make such structures an integral portion of the work of fortification. Their parapets were embattled, the spaces over the piers became bastions of defence, and towers flanked the bridge at each end. Some of you may remember the quaint and effective battlements still to be seen on the bridge at Pesth, and also at Verona, which though, of course, later in date than Norman times, have handed down to us the precedents of earlier days.

When the castle or fortified town had thrown its bridge across the stream, it was evident that the end of the bridge farthest from the works was a vulnerable point, and, as such, was likely to be seriously attacked by an enemy It was, therefore, defended by a fortification of its own, which became known as the *tête-de-pont*. Sometimes this was a tower only, but in other cases it became an important work, with turrets and connecting walls, forming, in fact, a fortress in itself, and a strong outwork to the castle or city. In process of time, the *têtes-de-pont* often included whole suburbs, as you may trace in many modernised cities at the present day, such as Dresden, Cologne, or Mayence.

The general design or plan of the fortifications was dictated principally by the form of the site, and was, therefore, as a rule, irregular. A commanding position was selected, and in cases where the building was placed on low ground, for local reasons, such as from the wish to command a stream or river, care was taken to obtain control where possible of any neighbouring hill, or eminence, and walls were even carried over the same, in certain cases.

Although the general shape of the whole work might be irregular, the heart or kernel of the whole, which we call the keep or donjon, was for the most part regular on plan, and designed on certain accepted principles, which were varied from time to time. It was of course necessary that this all-important work should possess great strength and power of resistance, and it is here, therefore, that we expect to find the best evidence of the technical skill of the day. The *enceints* might be forced, but even then the keep would remain as a last retreat to the beleaguered garrison. The earliest form appears to have been a square or rectangle, strengthened by turrets and buttresses, as you may see at the Tower of London. The interior was divided into stories, which contained stores of food, ovens, wells, and the inevitable dungeon. The rooms were sometimes vaulted with stone, and in other cases, the floors were carried on massive wooden beams, resting on stone piers and corbels.

The keep was the fortress proper, and commanded everything. It was placed on high ground, and access to it was commonly restricted to a narrow doorway, placed some feet above the ground, or approached by ladders or steps, which could easily be removed by the garrison. At the time of the Norman conquest of England, the rule appears to have been to make the buildings rectangular; but a change was gradually beginning, and soon it became customary to adopt curved forms, so that by the middle of the twelfth century, the square and rectangular plan was wellnigh abandoned. We then find a series of curves, either used alone, or in combination with straight walls, and rectangular turrets.

It was found that the angles of the old square keeps were the most vulnerable points, and were susceptible of attack by mining, and otherwise. The object of the military architect was therefore to avoid such angles, as much as possible, and to present to the enemy, instead of them, curved forms of equal strength in all their parts. Towards the close of the twelfth century this idea seems to have been for the first time

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* Second lecture delivered February 7th, 1878.

carried to its logical result, and we then find keeps of a complete circular plan.

One of the most celebrated examples of this mode of work is to be found in the castle of Coucy, on the north-eastern frontier of France, which has been described and illustated by M. Viollet-le-Duc. The donjon was erected, it is believed, about the year 1220, and the circular towers, or turrets, at the same time. Portions of the entrance gateway, and the great halls, were rebuilt early in the fifteenth century. The entrance was protected by a moat, over which a bridge led to the gate of the castle. The bridge was not a permanent structure, but was built with a wooden gangway resting on piers, so that it could be removed in case of a siege.

Although as you will have noticed, the date of Coucy is later than that of the Norman castles in England, it will, I think, be interesting to examine it, as presenting to us an example of the extent to which architectural art came, in process of time, to be applied to such utilitarian structures as fortresses. In earlier days, nothing of the kind was attempted. Even mouldings were almost unknown, and no sculpture, save perhaps an occasional heraldic device, was to be seen. On the other hand, every attention was given to the strength of the walls, and to the quality of the masonry. Here at Coucy, we find we have been led up to a work of importance, as a specimen of architecture. It is not only an engineering achievement; but also a work of architectural art.

We may, perhaps, recall in passing, how we have advanced to this combination. The square plan was abandoned in favour of curves for purely scientific reasons. Similar causes led to the adoption of the circular form, and we thus arrive at an ultimate result, dictated altogether by utilitarian considerations. In this case, however, they have not led to ugliness, but to the reverse; and from that circumstance, we may perhaps find something to reflect upon. We know but too well, how matters with us seem almost naturally to drift into ugliness, so that artists have reason to dread the very name of utilitarianism and science.

We have seen our wooden walls,—the dashing frigates and splendid line-of-battle ships, with which Nelson met a world in arms,—at last driven from the seas, not by enemies, such as they have ever conquered and never feared, but by the quiet and resistless advance of science. In the place of objects which every artist loved to draw, we have now huge monsters, gaunt and mastless, moved by steam, and governed by means of electricity, and while we can only hope they are safe, we know only too well that they are hideous. May we not cling to the idea that there is something wanting here, which may yet be supplied by a future development of artistic instinct? and that as the architects of Coucy worked hand-in-hand with science, as far as it had then advanced, a similar course on our part need not necessarily lead to an utter negation of art?

The château of Coucy is interesting, moreover, as occupying an intermediate rank between the great castles of the country and the citadels of the towns. In the former case, we find, as I have already pointed out, large areas of land enclosed by defensive works. To them an army could retreat, and considerable internal space within the walls was, therefore, needed. There must not only be the keep or castle proper, but extensive buildings were further needed as barracks for the soldiers, storehouses, and the like. If there should be a town near to such a stronghold, it might be connected by intermediate works, and care would be taken to command it from the towers. High roads and streams would be, as far as possible, brought under the control of the garrison.

Such castles as these possessed, as a matter of course, high political importance, and could not be safely neglected by any army of invasion, as from them expeditions could sally forth at will to intercept the communications of their enemy. It was necessary, therefore, for the latter to resort to a siege, and this was, as we have seen, a very slow, and not very hopeful process in the Middle Ages.

The other class of fortresses, or town citadels, include those which were constructed to defend or overawe a city or village, to control a river, or to provide a refuge for small bodies of men, the retinue of some bold chief or baron. They often formed part of the city itself, so that their defences were necessarily influenced by the situation and peculiarities of the latter, and are thus frequently connected with the city walls, which were incorporated into the system of defensive works. In such cases the castle became a citadel, a place of refuge in case of siege, which might be held by a small band of resolute men, after the town beneath had surrendered, or had been taken by assault. The town was indeed an item of the whole scheme of fortifications, and the castle the heart of the whole.

These two descriptions apply to the two broad distinctions of Mediæval castles, but between them there are of course many varieties, and the castle of Coucy may be looked upon as a connecting link. Here, the town is so far connected with the castle, that it forms a part of the whole fortification. On the other hand, the castle, with its donjon or keep, is complete in itself, and isolated from the city by wide spaces, a gateway, and defences. Although available for defending the town, the castle is independent, and can stand alone. The whole space inclosed by the walls is of the usual irregular character, in accordance with the peculiarities of the ground, but the citadel is, as we have seen, of the severely regular form which the scientific military engineering of the day prescribed.

To pass to the castle from the town, it was necessary first to force the gateway and its lateral defences. This done, the large open space, or Place d'Armes, would have to be traversed, fully exposed, as it was, to the missiles of the castle, flowing with full force from an elevated position. If we suppose these difficulties surmounted by the besiegers, they would yet have to pass the great moat which separates the Place d'Armes from the works of the castle, and not until success had crowned their successive efforts could they even approach the great donjon, the key to the whole stronghold.

Occupying the highest ground, this great work commanded the town, the Place d'Armes, the castle itself, with its outbuildings of all kinds, and the backs of the outer lines of fortifications. Completely circular on plan, having an external diameter of some 115 ft., and being upwards of 200 ft. high, it presented equal defensive strength on every side. It was also surrounded by a ditch, with a drawbridge, in connexion with the entrance, which was at some distance from the ground, and strongly defended. The interior was divided into three stories, each nearly 75 ft. in height, and beautifully vaulted in stone, the arches being acutely pointed. The walls were of great strength, those of the lower story being some 30 ft. thick.

The walls of the lowest story were almost solid, the only apertures being the entrance before alluded to, and a few narrow slits of windows, at a great height from the ground. Here was a deep well, and space for storage of food, and munitions of war. A winding staircase led to the upper stories, and some other accommodation was also provided in the thickness of the wall, near to the sally-port.

Passing upwards, we find the middle story, with a very similar apartment, about 50 ft. in diameter, but here there was a fireplace, and we may conclude that it was the chief dwelling apartment. There are several windows, and, in the case of one of them, there was a chamber, or private entrance to a passage, communicating with a small sally-port, distinct from the chief entrance. This sally-port being at a great height from the ground, would give access by means of a drawbridge to the backs of the parapets of the surrounding walls, so that the soldiers in the donjon could at any time pass on to the other and lower defences of the castle. The sally-port being small, and thus placed, did not call for special defensive works, such as those to be found at the principal entrances, which consisted of iron railings, two doors, and a portcullis.

The whole space within the walls is occupied by the great vaulted room, but there is also a second small private chamber, probably for the lord of the castle, cleverly constructed in the thickness of the wall. The widows are few and small, and apertures were evidently grudged by the architects. Ventilation was probably obtained by leaving the central ring or eye of the groining open, an arrangement obviously convenient also for hoisting goods and projectiles from the lower stories to the battlements.

These apertures, being exactly over each other, would also admit light, as well as promote ventilation, and it may be remarked that the amount of light which can be admitted in this manner is very great. It is, in fact, the mode adopted by the builders of the Pantheon at Rome, and few who have seen the striking interior of that building can have failed to notice, probably with some surprise, the satisfactory quality, and abundant quantity, of illumination obtained from a small area of opening in the very centre of the semicircular dome.

The arches of the vaulting at Coucy have fallen, or have been destroyed, but enough remains in the springing-courses, corbels, and other architectural details, to show that the work was of fine character and pure design, and the capitals in particular were well carved and moulded. It will be perceived, from the illustrations, that the whole work presented a striking architectural character, somewhat at variance with our preconceived ideas of the severity and sternness of castle-building. The ground-floor is remarkable from its solid and monumental character, well befitting its position. The intermediate hall being lighter and more spacious, has an especial fitness for its intention, as a chief place of habitation; while the third story has a character quite different from the others, and deserving some special notice.

This story consists of only one room, with a vaulted and groined roof like those below; but at this point the designers evidently considered that it was no longer necessary to maintain the walls of the strength and thickness which they had adopted for the lower stories. Retaining, therefore, the same width of chamber as before, between the piers of the vault, they have formed great recesses in the outside walls, and have connected the recesses by arched openings. By this means they have obtained a spacious gallery surrounding the entire chamber, constructed in the thickness of the wall.

This arrangement is of clever and ingenious construction, and is, moreover, very effective architecturally. The galleries are built in solid masonry, but there are not wanting indications that wooden supports, carried from pier to pier, were employed to project the gallery-fronts as far as the columnar piers of the groining. With these subsidiary features, the galleries formed a striking addition, not only to the architectural effect, but also to the size of the room, and the accommodation which it afforded. It might have been used for the place of assembly of a numerous garrison, as it could hold, for this purpose, some 1,200 men.

It is to be noticed, in examining the construction of this story, that the piers and arches are carefully arranged, on the soundest principles. The piers are placed in the direct line of resistance to the thrust of the arches of the groined roof; and although the recesses are large, full advantage is taken of the thickness of the walls to obtain piers of the best shape to resist lateral pressure.

The whole building is a conspicuous example of success, obtained by the architect, working hand-in-hand with the military engineer, and being, in all probability, one and the same person.

Passing upwards from this handsome and interesting hall, by the winding staircase which gives access to each story in turn, we come to the roof, surrounded by a continuous wall pierced with openings, which served the purpose of embrasures. The space above the groining is covered with flags, which may have been further protected, wholly or in part, by lead. There is a considerable fall outwards, to enable the water to flow off readily, through apertures specially provided for it. At this level, there are massive corbels built into the walls on the outside, and projecting outwards, on which it is supposed timber work may have rested.

Such was the donjon of Coucy, a monument of defensive architecture, of proportions almost suited to giants, and rivalling the works of the ancient Romans in the grandeur of its conception and the massiveness of its execution.

It was an embodiment in stone of the power and pride of its owners. Their heraldic device was sculptured over the door, and represented a combat between a man and a lion. To be lion-hearted was an appropriate boast of the Barons of Coucy, who delighted in their proud motto,—

> "Roi, je ne suis,
> Prince, ni Comte aussi,
> Je suis le Sire de Coucy."

We have seen how the square turrets were gradually modified, and gave place to circular forms, and how a combination of curves became ultimately merged in one great circular plan, as at Coucy. This form, however, was only applicable to the donjon, and the walls

of *enceinte* were still irregular in form. They therefore, necessarily, continued to be defended in the old way, by towers, which were built, as before, of the circular plan.

At Château Gaillard, on the Seine, the inner line of defence is composed of a series of curves, which almost join one another, and form a wall of very great strength. This arrangement is, however, peculiar, and as Château Gaillard was the favourite work of our King Richard I., and as he is known to have devoted great personal attention to the design, it has been supposed that the special features found in this great work, and which are not to be traced elsewhere, were due to the personal views and orders of the "lion-hearted" monarch, and possibly derived from his Eastern experience.

In other cases, the circular turret was still employed, with a greater or less length of curtain or straight wall between the turrets. It became evident, however, as the power of attack increased, that such curtains needed more protection, and the obvious method of affording it was to multiply the towers. As, however, this was very costly, and not always easy to achieve for local reasons, an alternative suggested itself by advancing the towers, and thus obtaining a greater lateral command of the curtains. To project the towers, however, unduly, would weaken the whole work, and to increase their diameter led to expense and inconvenience. A modification of the circular form was consequently arrived at by the addition of a projection on the outer face, which thus finished with an angle. The circular form was still unchanged within, but the outer portion of the turret assumed, on plan, the shape of an acutely-pointed arch, which we may term a horn or beak.

It will readily be perceived that the adoption of this form secured important advantages. Not only did it give to the defenders a better range for the defence of the curtains, but it strengthened the walls of the tower at the point where attack was most to be expected, and, moreover, tended to keep assailants further from the walls, and consequently in positions more exposed to converging fire.

To succeed in the attack in those days was impossible without coming to close quarters, and every difficulty thrown in the way of the approach was an important gain to the defence. The projecting angle, or horn, arose therefore naturally from scientific considerations and the proved exigencies of the case, and the principle was capable of further development. We thus find the horn assuming gradually a more elongated shape, and the towers projecting more and more from the walls, till they become oblong on plan, with curved and pointed ends, the latter being sometimes built of an angular shape, with straight sides.

It is evident that in the construction of important places, the science of defence was thoroughly studied and brought to great perfection, and the reason is not far to seek. Such works were the natural outcome of the feudal system, in which each great lord was a petty monarch, with his court and policy, his army and dependents, owing him obedience and fealty, and not looking beyond him.

Each feudal chieftain had, therefore, the perils, as well as the pleasures, of independence. He had to look to his own safety, so that no one should make him afraid. He needed to be able to assemble his vassals, and defend them in case of need. His ambition might even lead him to refuse that service to his feudal superior which he exacted rigidly from his own people. He was, in fact, the strong man armed, and armed against the world, against friends who might become foes; against the foreigner as well as the neighbour; sometimes against his superiors, and often against his own people.

It was not the day of great armies, but rather of small bands of hardy men, trained to arms from their youth. With them the lord and his family lived in the great castle, and when necessity arose for further aid, it was met by hiring bands of roving adventurers, who made war their trade, and sold their services to the highest bidder.

It is necessary to bear these circumstances in mind in order to understand the full importance that was attached to perfecting the defensive works of such fortresses as that of Coucy, and also to appreciate the architectural skill which was brought to bear on its internal details. In the chapels, refectories, halls, and other out-buildings, the beauty of architecture is often very great, though generally of a later date than the castle itself. It is, however, of the latter that we are now treating, as the former buildings, while following the variations of styles, in the same manner as other architecture of the period, have not the peculiarities of construction which mark out the castles proper as objects for especial notice in connexion with the subject before us.

The defences of such buildings became stronger and stronger. Towers were multiplied, drawbridges added, and machicolations permanently constructed of stone, when suddenly there appeared upon the scene a power which was destined to revolutionise the art of war. I allude, of course, to the invention of gunpowder, and the use of artillery. The feudal system was essentially one of individual prowess, and yielded slowly and reluctantly to a rival, which sought for strength in combination, and mowed down knights and serving men in a common destruction.

It was evident to the thoughtful inquirer that the days of lofty castles, with their commanding walls and towers, were numbered, and that they could not brave a power which, by breaching the weakest part, turned their strength into feeblences. But men are slow to change, and the old forms long continued, till they merged at last into the picturesque battlements and turrets of purely civil architecture. France was especially the country for fortresses, and we find, consequently, that the influence of military traditions on civil work, in that country, is more marked than is the case in England.

The French châteaux are illustrations of the transition from the Mediæval fortification to the palatial residence. We have there the comfort of adequate internal arrangements, while outside, there is still the gateway with its flanking turrets, as at Chaumont; the bridge, as at Chenonceaux; the moats, parapets, and towers, of Azay-le-Rideau, and other examples.

The circular turrets, with their extinguisher-like roofs have indeed come to be recognised as a distinguishing feature of French domestic architecture. In England the case was different. Our castles were, in the first place, less numerous, and less important. The state of public affairs was less unsettled, and our insular position was then, as now, our chief protection. The fortresses were, more frequently, strongholds of the king, as trustee for the nation, and in cases where they were erected by private persons, they owed their existence, for the most part, to special circumstances, such as the temporarily unsettled state of frontier counties,—as, for example, those which formed the border land between England and Scotland, or England and Wales. The round towers of Ireland, and the sea-coast fortifications, had also, in the same way, only a local importance.

We do not, therefore, trace in English domestic architecture, subsequently to the Norman and castle building period, anything like the same military influence that we see in France. The battlements of our Mediæval houses soon became merely ornamental details, and the turreted gateways a sign only of architectural magnificence. The moats became gardens, and chimneys took the place of turrets. The castle of the Norman lord had given place to the hall or manor-house, of the English nobleman and squire.

Here we may leave this part of our subject for the present, while, before concluding, I say a few words about the modes of attack which were practised against Mediæval fortresses, and to resist which onslaughts they were especially, and as we have seen, carefully and scientifically designed. In so doing, I shall also call your attention to the methods which were employed by the besieged to supplement their permanent work by additional defences of timber, which either formed a part of the regular structure, or were erected to cope with a temporary emergency, and were afterwards removed. This question has been carefully studied by M. Viollet-le-Duc, and we may profitably consider his suggestions on the subject.

In dealing with the architectural forms of castles, we have naturally concentrated our attention on the defence. We have seen, however, how such forms became varied, in consequence of experience, and how increased power of attack was met by a more than corresponding addition to defensive strength. It therefore becomes desirable to notice, briefly, how the attack was carried on, and to what structural forms the necessities of defence gave rise.

Space would fail us to pursue the subject beyond the invention of gunpowder. The changes caused by this great revolution, indeed, soon took the fortress out of the hands of the architect altogether, and we have, therefore, no further concern with it here. We shall consequently have to refer only to the old and primitive modes of warfare; which, handed down from the times of the Romans, were perfected more or less by our Mediæval forefathers, and were used against such structures as we have left to us at Coucy and elsewhere.

First of all, we come to the battering-ram, an engine familiar to all readers of history, and needing no description. It was necessary to place the ram near to the walls, and hence the necessity for towers of defence. Such defensive works were attacked by other towers, constructed under shelter by the besiegers, and then moved by them to situations opposite to the chosen points of attack. These towers of offence required to be higher than the battlements of the fortress, so that the attacking force might descend upon the latter, by means of bridges and movable platforms in such a manner as to overpower the defenders by weight and numbers. In order to provide a suitable foundation for the erection of the battering-ram, or the tower, it was necessary to approach the walls. This was done by trenches, protected and covered by timber. To resist fire, raw hides were used over the timber, and under this protection, the besiegers advanced, and could mine or injure the walls.

In cases where the above-named method of attack was not applicable, as, for example, where a moat existed, an instrument known as the "cat" was employed. This was an oblong covered shed, constructed of timber, and protected against fire by hides, as before described. The cat was built on a platform, which was pushed forward on rollers, and from an opening in front, fascines and other matters were thrown into the ditches and moat, as the advance took place. Arrived at last at the foot of the wall, the men inside the cat could work, undisturbed, at their mining and offensive operations. In the meantime, their comrades were not idle, but shot down the defenders, when possible, by means of bows and crossbows, while for more serious operations the catapult of the Romans was still employed. The bow-men were protected by sloping shields, and fired though loop-holes left for the purpose.

The wooden towers before mentioned were constructed and moved forward, in the same way as the cat, with long timbers, ropes, and pulleys. They were, of necessity, very strongly constructed, and could contain a large number of men. As the tower gradually advanced, the moat was filled, by materials thrown from the tower, and thus a way was prepared to the foot of the walls. When the distance was thus reduced, the tower was slightly inclined, and thus rushed forward, or fell of its own weight against the top of the wall, and the upper part of the face of the tower being suddenly lowered, as a drawbridge, the assailants rushed forward, to be followed by streams of reinforcements, advancing through the tower as by a ladder.

This was the turning point of the siege, and the defenders, if overpowered, must either surrender, or retreat, as was generally the case, from turret to turret, till they reached the donjon, or keep, which, as we have already seen, was often complete in itself, requiring a regular siege, and well-nigh impregnable.

Before yielding, therefore, the besieged had many resources. Their walls were too high to admit of being scaled, they were too strong to yield to the labours of the miner, unless these latter were strenuous and long-continued. But the defenders behind the parapets laboured under one difficulty of a serious nature, in that they were unable to command the foot of the walls, without exposing themselves to be shot. Embrasures were made with sloping cills, but no slope could be constructed of sufficient steepness to overcome this disadvantage. Supplementary defences were therefore devised, in the form of wooden structures, super-imposed on the solid walls, and projecting beyond them. These structures have been called hoards.

The object of the hoards was to enable the men on the top of the walls to command the whole outer face, and to be able to drop missiles on the heads of the enemies and assailants below. The hoards, in early examples, were supported on strong wooden beams, pushed from the inside through holes left for the purpose in the walls. These beams projected outwards, as corbels, and on these corbels, wooden galleries were built, and in some cases covered with roofs.

Traces of such timber hoards may be found

in buildings of as early a date as the twelfth century, and they continued to be employed until the fourteenth century, when they were, for the most past, laid aside for the more solid constructions of stone, which we find forming overhanging balconies, cornices, and galleries. These were supported on boldly moulded corbels of stone, 3 ft. or 4 ft. apart, and apertures were left in the floor, between the corbels, for the use of the defence.

The effect of these projections was considerable in an architectural sense, and gave an air of finish and completeness to the structure, as may be seen at Pierrefonds and other places. They had an enduring influence in the forms of subsequent styles, and long survived in England in the overhanging cornices and battlements of the gate towers and turrets of Tudor, and Elizabethan days.

Between the times of the use of timber beam corbels, and those of masonry, there was a considerable interval, and during this period of transition, a combination of the two systems was adopted. To masons so well skilled as the builders of the Norman castles, the change from wooden to stone corbels would readily suggest itself, although the cost, and the weight of permanent stone galleries, walls, and embrasures might not as yet be willingly faced. Accordingly, we find, as at Coucy, examples of permanent stone corbels, without any superstructure, but obviously intended to support, in case of need, timber gangways, or galleries. The corbels are built into the solid walls, and upon them, the additional defences required could be readily erected, in case of need.

It is now time to conclude my description of the methods of design and construction used by the military architects of the Middle Ages, and particularly by the Normans. It was in their own country, that their art was carried by them to the highest pitch of development, but we may trace its influence in many remains of English castles.

In the Tower of London, we have a specimen of the square or rectangular keep, with flanking turrets, also rectangular on plan. Rochester and Norwich furnish us also with interesting examples, and in the well-known Round Tower of Windsor, we have a modern imitation of the all but circular form, grand in its simplicity, which superseded the squares and partial curves of earlier times.

It will have been noticed how distinctly the style of design adopted for these structures stands out from that of the ecclesiastical buildings. It is, in fact, a Military style, with some affinity for Domestic work, and it is interesting to us as showing, among other things, how possible it may be to develop architectural character from scientific requirements. Nothing could be more prosaic and commonplace than the demands of soldiers for the defence of their fortresses. Nevertheless, we find these demands complied with, in the very spirit of common sense, which is, nevertheless, able to snatch a beauty from art.

It is, consequently, impossible for us to study the works of this remarkable age without a strong feeling of admiration for the skill of its architects, and without a conviction that if artistic considerations were properly regarded in our own days, perfect utility need not, and should not, be inconsistent with architectural beauty; nor scientific devotion necessarily opposed to æsthetic culture.

THE PRESERVATION OF MONUMENTS FROM ATMOSPHERIC INFLUENCES.

At the present moment, when one of the needles of Cleopatra, dug out of the sands of Egypt, to be placed in a prominent position in the British capital, has at last safely arrived in the Thames, an interesting article from the pen of Dr. Mohr, on the above important subject, is very apropos. It may not be inappropriate to ask ourselves what will be the probable fate of this historical monolith. A case in point is furnished by the Luxor obelisk, erected in 1836 in the Place de la Concorde, at Paris. That obelisk, it will be remembered, stood, in company with a larger one, before the great Temple of Thebes, called by Homer the City of a Hundred Gates, at the present day Luxor. It is, judging by the hieroglyphics still preserved upon it, and deciphered some time ago, 3,400 years old. It consists of syenite granite, of a coarse grain and reddish-brown colour. The writer has seen it four times in the course of twenty-eight years, and at intervals, and each time he has been astonished at the changes in its surface which it experienced in so short a time. When he saw it in 1844 for the first time, it still exhibited the red colour of the feldspar, and had consequently not suffered at all by its 3,400 years in Egypt. At each later visit the surface was duller, lighter, and when seen for the last time (in 1872) it exhibited a white surface, i.e., a white layer of kaoline, the last product of destruction of granite. The thirty-six years' presence in Paris had been more injurious to it than as many centuries' exposure in Egypt. If once the polish is broken, water adheres more easily to the rougher surface, and destruction proceeds more rapidly. The unhewn block of granite upon which the equestrian statue of Peter the Great at St. Petersburg rests has been greatly injured, exposure to the severe Northern clime and the rough surface probably contributing mostly to its decay. The breaking up of the block may be looked forward to in time.

Now, Cleopatra's Needle will be exposed to more injurious influences than the Luxor obelisk. The climate of England, the smoke and atmosphere of London, will not require so much time as the purer air of Paris, where still much wood is burned in stoves. The destructive forces are of a mechanical and chemical nature. The explosive force of the freezing water, the solving effect of water, of carbonic acid, the sulphurous acid from coal, are sufficient to destroy ultimately any stone. In the interior of the earth carbonic acid and water by themselves suffice in converting basalt and diorite into potter's clay, and granite and syenite into kaoline or porcelain clay. Above the surface of the earth, the effects of the weather are called "weathering," and no stone resists permanently this influence in our climate.

Horizontal surfaces are more liable to its attacks than vertical, from which the rain runs off, and upon which snow finds no hold. The great granite basin in front of the New Museum at Berlin is covered over in winter, so that rain and snow cannot enter it. Having a natural fissure, it would in course of time fall into two parts by the freezing of water. The vertical walls of the Mausoleum at Charlottenburg and of the granite blocks of the Long Bridge at Berlin are still well preserved, and some time will elapse before the effects of the weather will be visible upon them.

The question now arises whether there are no means for successfully resisting the destroying influences of the atmosphere. In the first place, it would be advisable to render the surfaces of monuments less susceptible or less amenable to the contact with water. Leaving out of the question oils and greases liable to oxidation, a slight layer of pure wax or paraffine might be recommended. Wax may be solved in warm benzine or petroleum ether to a very thin solution (perhaps 1 per cent. of wax), this solution laid on with a broad brush on the surface, and, after the evaporation of the solvent, rubbed smooth by means of a brush or a woollen cloth. The operation resembles the waxing of parquet floors, where the wax, however, is not solved in ethereal oils, but mixed in a solution of potash to a milk-like liquid. The mixture thus applied is very thin, perfectly transparent, permits the nature of the material underneath to be plainly discerned, and imparts to it even a certain lustre, called glazing. It has been found that a higher lustre is imparted to slabs of white marble with which stoves are covered by the application of this glazing, without changing in the least the colour of the marble. Oil paintings, in like manner, receive a similar lustre by the last coat of varnish. A new oil-painting turns dull after some time, partly through the oil being taken up by the porous canvas underneath, partly through the oil becoming oxidised. The so-called dry oils do not dry, in the proper sense of the word, like water or alcohol, but the liquid oils are changed into firm resinous bodies by the absorption of oxygen. The colourless varnish made of mastic dries in consequence of the evaporation of the solvent oil of turpentine, and leaves behind a shining thin layer of the resin, which imparts a uniform lustre. All those organic substances do not last for ever, but must be renewed from time to time. Experience alone will show how long such a coating of wax will last. As soon, however, as the granite is once more completely wetted by the rain, it is time for a renewal.

Now, as regards monuments of bronze. Bronze consists of copper and tin, with a trifling addition of lead and zinc. Bronze monuments are cast like bells and ordnance. The two base metals do not retain their lustre nor their colour in the open air, but, by oxydation and carbonic acid, turn, in the most favourable case, duller, darker, and in places green. This green tinge is carbonate of copper, malachite, and in time the metallic lustre disappears entirely. Copper being the most valuable of the baser metals used for monuments, the green layer was called *Aeruga nobilis*, commonly, however, "Patina." It may be mentioned here that already in 1869 Professor Magnus published in *Poggendorff's Annalen* (136, p. 481) an article on obtaining a beautiful patina on bronze monuments in large towns. It was stated that in nearly all large towns, especially in such where coal is burnt, the experience has been made that bronze monuments erected in public places, instead of becoming coated by a patina, assume a dirty dark appearance, something like cast iron. This is especially the case in the manufacturing towns of England and Scotland. An equestrian statue which the author saw at Glasgow in 1840 was pitch-black, with a perfectly dull surface, as if it had received a coating of some liquid with which lamp-black had been mixed. Besides the unavoidable effects of the atmosphere by oxygen and carbonic acid, the other agents are here sulphuric acid gas, sulphurous acid, hydrochloric acid, and finely-divided particles of soot. It is a Sisyphus labour to erect bronzes in such towns. It is absolutely necessary to take account of the nature of the material. If we were to apply to antique marble turned yellow by age a coating of pure oil colour, or to one turned black a copper-coloured covering, we should commit a barbarism. With this view, Professor Magnus suggests only such substances as permit of the nature of the material being clearly discernible. He recommends, finally, a thin coating of foot-oil, which has, however, to be rubbed down with a cloth to such a degree as to leave only a very thin, almost dry, but lustrous surface; and he believes that, if a public bronze monument, after being cleaned, is rubbed once a month with oil, it would assume a beautiful patina. In large bronzes, such, for instance, as the great monument of Frederick the Great at Berlin, this would be impracticable, and means must be found to protect them for longer periods. It might be assumed that the means above suggested, of a thin polished coating of white wax, would promise to last longer; and it would be worth while to make the experiment. The writer suggests that trials should be made with the new Emperor Bell, recently hung in Cologne Cathedral. Monuments of zinc, galvanised, would also be suitable for such a treatment.

Monuments in white marble suffer in large towns principally from dust, soot, and rain. In Berlin, the marble statues of Bülow and Scharnhorst are encased during winter in a wooden box; they are cleaned in the spring by washing with soap and water, by which treatment they are kept in a decent state. Carbonate of lime is not insoluble in water, so that the rain is continually carrying off some particles from the statues. The effect of water on carbonate of lime is best illustrated in limestone caverns, which have all been washed out by rain-water, caverns occurring in no other formation but limestone. The four medallions on the Arc de Triomphe de l'Étoile at Paris are carved out of a close-grained limestone. If we examine closely the figures, depressions are noticed in places where the water must run down in consequence of the conformation of the stone. A heavy shower of rain will do less harm than a slow, steady downpour, when the water has time to become saturated with carbonate of lime. A surface, consequently, which is less affected by water would also be here very useful. Perhaps a coating of alumina soap, which would be formed by the successive application of solutions of soap and alum, might be useful, as it would be possible to apply them by means of a fire-engine. The first coating must, of course, be dry before the second is applied. As is known, alumina soap, insoluble in water, possesses such a repellant force to the latter that dry flannel coated with it, after being dried, is impervious to it. The experiment has not yet been made; but it seems certain that the coating does not form an opaque mass. It would not change the appearance of marble in the least, no more than it makes a change in the look of flannel. It is possible that dust will more easily adhere to it than to dry marble.

Monuments of cast-iron are very rare, and never possess a lustrous appearance. Even if this

is imparted to them at first by polishing, they will soon lose it. Everybody is acquainted with iron rust. If it is desired not to hide the nature of the material, the coating with wax recommends itself, and then thorough rubbing in of black-lead. They then resemble polished stoves of cast iron, upon which graphite cannot be laid on with wax, but is usually applied with vinegar and a brush. In the open air, this coating, which is even used for the interior of boilers, would cause water to run off quickly. All monuments already severely injured by the atmosphere would gain in appearance and durability by cleaning and the application of a protecting coating.

HARE'S "WALKS IN LONDON."

THIS is the latest of the almost innumerable books about London,* and in its way by no means one of the worst. That qualifying phrase we must use, since Mr. Hare's book cannot claim the position of a work of original research and reliability; it consists rather of a putting together of facts and records from other published sources in a connected and readable form. The author, indeed, disclaims in his preface the idea of having aimed at anything original, quoting a phrase of Mr. Kinglake's as to "the immutable law which compels a man with a pen in his hand to be uttering now and then a sentiment not his own;" which is, perhaps, rather a limited expression to use in regard to the part which other people's sentiments occupy in his book. Mr. Hare is good enough to acknowledge his debt to our columns, and of, course, is heartily welcome; and he mentions the late Mr. Timbs also as one to whose works he is much indebted. It is curious, however, that there is, as far as we observed, no reference to the "Handbook" of Peter Cunningham, whose work was far more reliable, and more "at first hand" than that of Timbs, who was, in fact, himself a compiler or book-maker; whereas Cunningham was really one of the fullest and most reliable of London archæologists, and a far more important contributor to the subject.

The special value of Mr. Hare's book consists in the fact that it is likely to be read by many who would not be likely to read, or possibly even to hear of, Timbs or Cunningham. He has succeeded in making it, as he says he intended, something more interesting than a mere guide-book, while at the same time it will serve that purpose for the majority of readers, who wish for general information without caring to go too much into questions of archæological research. The book is attractive in appearance, and pleasantly written, and might suggest matter for a good deal of comment if we had not already said so much on the subject at various times as to leave no room for opening it again now, except for really new facts or theories. Mr. Hare's pages give evidence that he has for the most part seen with his own eyes what he writes about, and that his task has been done in a spirit of real interest in his subject, and not in a dry perfunctory manner; and it is this quality which more than anything else removes the work from the category of mere bookmaking. The slight illustrations given, though in a few instances not very happy,—the view of Charing-cross on the third page, for instance, conveys somehow a quite illusory idea,—are many of them very successful in giving by simple means the character of some of the old bits of the City; they are drawn on wood by Mr. T. Sulman from the author's own sketches. There is also the very necessary addition of a fairly adequate index.

Where Mr. Hare fails, in one or two ways which ought to be pointed out, is mostly where he goes off his track as an annalist and a pleasant talker on old remains, to attempt the part of an art-critic. His notes on the National Gallery pictures, for instance, were really not in the least necessary to his book, considering the ample information procurable by every one, in so far more convenient a form, in the National Gallery catalogue; and Mr. Hare's critical remarks are really at times fearful and wonderful, and astonish us in a writer whose name indicates an hereditary right to be far less provincial in his tone upon these matters. A list of what is in the gallery would have been all very well, but the critical part had been better omitted. The literary allusions are still more surprising in many cases; some of those, for instance, *apropos* of personages commemorated in the Abbey monuments, are almost the remarks of a school-boy. It is singular to us, also, that in speaking of the Mayfair region and its associations in English literature, Mr. Hare can find nothing more interesting or to the point than an allusion to a murder-story in one of Trollope's novels. The fact that these prim, well-built brick streets and squares were the scenes in which Thackeray's men and women moved gives them perhaps the highest intellectual interest they have; an interest as undying as that which attaches to the portico of the church in Covent-garden under which Clarissa Harlowe passed; a reminiscence which is also out of Mr. Hare's beat apparently, though he finds room for the far less real, less living figure of "Southerne, the dramatist."

There is a certain degree of confusion in the method of going over some of the places which it would be well to amend in any future edition. It would not be easy for a reader making use of the book as a guide to find out always on which side of Pall-mall his guide is taking him; and in going up St. James's-street the guide palbably forgets this himself, for having begun at the lower end and going up the street, after a little digression to King-street, he goes on up St. James's-street again to find Brooks's on the *right*. To talk of the street as eventually *falling* into Piccadilly shows also a confusion of expression. Some of the omissions in the description of this region, which we happened to look at a little more particularly, argue a certain degree of carelessness. As it was worth while to mention that Willis's Rooms was once "Almack's," surely it was almost equally worth while to mention that "Crockford's" stood at the top of St. James's-street, and to give the name of the large and important club now occupying the site, of which there is no mention, though the writer evidently intends to name the principal clubs. In Regent-street there is no mention made of the Junior United Service Club, the one building in the lower part of Regent-street which, from its conspicuous corner site, is sure to be an object of attention; and though the precincts of Marlborough House and the St. James's-gateway are treated somewhat at length, the Junior Naval and Military, which is so prominent and ornate a building, is not mentioned. On the other hand, in Bond-street, there is a contemptuous note bestowed upon the Grosvenor Gallery as "an inartistic front of mountebank architecture by W. T. Sams." As the Grosvenor front is not complete at all, there seems some sort of personal grudge in thus condemning it and its architect in advance, when the completed buildings of the "Devonshire" and "Junior Naval and Military" are not noticed at all. But Mr. Hare is very dogmatic and captious in his architectural criticisms, snapping at certain things in an irritable manner, especially if they are Classic. He has only a sneer for Somerset House, and quotes, to show the impression it makes upon foreigners, the words of M. Taine, who was almost a worse art-critic than himself. He alludes to the Albert Hall as an ugly exterior; but he does not mention the fact, so interesting and significant in relation to modern decorative art, that the exterior mosaics of the drum were designed by some of our first artists, at almost nominal remuneration, through their interest in the work. Mr. Norman Shaw's name is mentioned with high eulogium as the architect of Lowther Lodge; but Sir Digby Wyatt does not get even his name mentioned for Alford House. All which confirms what we before observed, that the author, unlike Iago, is nothing when critical, and had better have avoided that ground.

The book, however, is a very pleasant, and will probably be a popular one, which is the reason we wish to guard readers against taking it as any guide in critical matters. Some of the remarks in the introductory chapter as to the extent of the picturesque element in London are very true, and we are glad to read them, as they do justice to some of the attractive qualities of a city whose claims to be regarded as externally interesting are very much underrated. Some great inconveniences are sensibly touched upon in the same chapter; as, for instance, the necessity for a competent and well-informed supervision in the nomenclature of streets (and we would add, on our own account, in their numbering also). It is truly, as he says, perfectly contemptible that there should be "95 streets in London called King; 99, Queen; 78, Prince's; 109, George; 119, John; 91, Charles; 87, James; 58, Thomas; 47, Henry; 54, Alfred; 88, William; 57, Elizabeth; 151, Church; 69, Chapel; 129, Union; 166, New; 90, North and South; 50, East and West; 127, York; 87, Gloucester; 56, Cambridge; 76, Brunswick; 70, Devonshire; 60, Norfolk; 50, Richmond; &c." The catalogue is indeed formidable, though having in one sense an historic significance in showing the prevalent influence of the great English families whose names or titles have been thus multitudinously perpetuated, and we rather suspect Mr. Hare has not allowed for the changes in street nomenclature made by the Metropolitan Board of Works. On the other hand, it is a little too favourable a report to say that no town is better supplied with greenery than London. That is just what we want more of. Mr. Hare has a good word even for the fogs, as assistants to artistic effect "when not too thick": certainly he quotes Hawthorne as being much afflicted at them; but the fact is that that not always genial visitor on another occasion practically withdrew his complaint; for in a letter to a friend, after observing that every other day there was a fog so thick that you could not see your hand before you, he explained in the next sentence that after all he "did not care about seeing his hand before him."

In spite of inaccuracies and shortcomings, we recommend Mr. Hare's book to general readers, and hope it will meet with a good circulation, as tending to awaken in many an interest in things in their city they have not before paid much attention to. As he observes, "There are many, especially young men, for whom time in London hangs very heavy, and to whom the perpetual lounge in the Park must end by becoming monotonous and wearisome; and for these a new mine of interest and pleasure is only waiting to be worked. If they will take even the walks indicated in these volumes, they can scarcely fail to end them by agreeing with Dr. Johnson, that he who is tired of London is tired of existence."

* Walks in London. By Augustus C. Hare. Daldy, Isbister, & Co. London: 1878.

NORTH DURHAM COLLIERY DISTRICT.

ONE of the oldest of the colliery districts of Durham is that which lies a little inland, between the River Wear and the pretty ravines that are a few miles to the north of Hartlepool. It has some of the advantages which befit any coal-yielding district for growth; there are good harbours near for shipment; there is abundant store of coals, and varied seams, and labour is plentiful, whilst facilities for transit have long been fairly good. Hence there have been the usual developments which coal-yielding districts in Britain know; not the upgrowth of one large town, but of many villages; not the construction of great passenger-lines of railways, but the construction of many colliery branches, and the hindrance of passenger traffic rather for the sake of the fuller service of the mineral traffic. That district has been the chief cause of the development and growth of the large export trade in coals and of the shipping towns; it has chiefly contributed to the upgrowth of Sunderland, and it is the main source of the prosperity of the little seaport of Seaham Harbour, whilst others a little more distant have derived considerable stimulus from the trade there commenced.

Only two score years ago that large district was in a partially developed state. Ryhope was then a pleasant little watering-place; Monkwearmouth was just winning its coal; Seaham Harbour was just commenced; Hetton-le-Hole was working the mineral treasures around it; but, except at South Hetton, and thence to the south, the district glanced at was practically an unknown land for commercial purposes, and not until the acquirement of efficient and complete railway communication with the ports at the north and south of the district, was there commenced that development of the coal trade the full effects of which we know. There were coal winnings and workings, it is true; but they were on a small scale, and this was necessarily so, because the facilities for the disposal of the coal were so limited. It was not until the chain of railway communication was extended to Hartlepool on the one hand, and to Sunderland, that the demand for coal, speaking generally, became anything but one for land-sale purposes, and that the villages began to emerge from the state of petty hamlets. When that communication was given, the demand for coal began immediately to rise. The shipments of coal from Hartlepool were largely drawn from the district indicated, and they rose rapidly. The exact

figures are not obtainable, as for some years the shipments at Hartlepool were included in those of the port of Stockton; but from 1845 to 1850 the shipments rose from 884,408 tons to 1,562,400 tons; and later there was a much more rapid ratio; but as it was drawn in considerable degree from the South Durham coal-field, it is not necessary to quote the figures. It may, however, be said, that from a comparatively trivial output, the coal production of North Durham has risen to 6,174,147 tons in the last year for which the official statistics are procurable. Sunderland ships now some 3,100,000 tons; Seaham ships half a million tons; and a considerable portion of the 1,500,000 sent out of the port of Hartlepool is drawn from the North Durham district. As a consequence of this vast development of mining enterprise, there has been a large accretion of population; and now the district of Easington, which covers much of that district, has a population of 33,693, of whom over 6,000 were added in the decade between the two last censuses, whilst a considerable portion is included in the neighbouring unions, and swells their returns. Glancing only at the Easington Union, it may be said that it had at the time of the latest return some 621 paupers, and that the ratio of these to the population was considerably less than those representing the town unions, or than the average of those in the country. And in many of the accompaniments of increased population, there has been a full growth. A score of villages have sprung into prominence: Thornley has risen until it may almost claim the rank of a town, whilst there are adjuncts in the shape of Wheatley Hill and other villages near. Castle Eden has become a health resort, but it has added also a mining village of great extent; around Seaham there is a congeries of colliery villages; and from Ryhope to Thornley there are a dozen villages of considerable importance, dependent, invariably, in each case, on the all-prevalent coal-mining industry. Although there has been a considerable attraction of population, it cannot be said that there has been full provision made as yet for its comfort. Up to within two or three years] ago the state of the colliery district under consideration was most discreditable, so far as regards sanitary matters; and not many thickly-populated parts of the country revealed a more deplorable deficiency of educational facilities than it had to confess as the result of the inquires made shortly after the passing of the Education Act. In some degree both these defects have been remedied, but only in degree. There is, however in course of provision, where it has not been already provided, tolerably complete school provision; but the local governing provision is as yet singularly incomplete. The villages consist largely of the old-fashioned type of colliery cottages, which seem to have been meant to combine the most discomfort and dirt, and which have neither pretensions to beauty of appearance or choice of situation. Indeed, although some of the graver evils have been removed, there yet lurk in the arrangements of these villages the seeds of disease, and only the favouring circumstances of heat or overcrowding are needed to bring about their germination into the outbreak of fever and other ailments so often known. The difficulty finds its origin in the fact that at the time of the erection of the bulk of the villages, the good old rule sufficed the builders of merely providing house accommodation contiguous to the colliery, and ventilation and drainage were the afterthoughts which there was little or no opportunity sought to carry out. Hence the district has "long unlovely streets" of dingy cottages, to which the not-infrequent public-house affords one of the few contrasts. Not seldom, rows of piggeries front the houses; the open gutters in front of the houses form the mode of drainage which is too general. When the flush of prosperity visited the coal-yielding districts four or five years ago, one of its results was seen in the influx of population which crowded the old pit villages, and too often paved the way for visitations of zymotic diseases. Eventually a large portion of the district was brought under the care of the various sanitary boards formed; but although these have attacked, and in some instances removed, the chief evils, yet there remains an immense amount of work to be done before the Augean stable is thoroughly cleansed. And the conditions under which these boards perform their functions, the fewness of their representative members, and the largeness of the district over which they have supervision, places great obstacles in the early carrying out of the remainder of the work. Hence, though the heavy death-rate has been reduced, it is much higher than what it should be for a district which includes such a large tract of rural territory; for there is around and near most of these pit villages a belt of fair and fertile agricultural land. Private enterprise has yet much to do in the provision of sufficient commodious and comfortable house accommodation for this large district; and when this is done, it is more than probable that much will have been done to lessen the excessive drunkenness which prevails in times of prosperity. But beyond the domain of private enterprise, and having also oversight over it, there is need for the provision of that efficient local government which would take charge of the sanitary arrangements of the overgrowth in villages, and give to them the benefits which towns enjoy from their councils. Until this is in some way done the colliery districts will feel in the abnormal death-rate the results of the violation of sanitary laws that prevailed in their development, and which has not yet altogether ceased.

"LIFE AND DEATH."

A NEW PICTURE BY SIR NOEL PATON.

For some years past Sir Noel Paton has ceased to exhibit his paintings in the galleries of the Royal Scottish Academy, of which he is a member. Whatever may be the reason for this it is not for us to inquire; it is sufficient for our purpose that his works can be seen elsewhere. Sir Noel has attained a position and earned for himself a name which renders him independent of the ordinary channels of reaching the public. His works are eagerly sought after, and are generally secured by dealers who find it to their profit to exhibit them.

The subject of the artist's last work, entitled "Life and Death," is suggested by the scene from the "Pilgrim's Progress" in the "Significant Room" of the Interpreter's house, where Christiana and her company were shown a "man that could look no way but downwards, with a muck-rake in his hand. There also stood One over his head, a celestial crown in his hand, and proffered him that crown for his muck-rake, but the man did neither look up nor regard, but raked to himself the straws, the small sticks, and the dust of the floor."

The man is represented in the prison-house of his own desires, bending on one knee, and having a chain attached to his left ancle. He is no mere miser, although he has attached to his girdle a sealed bag of money. He is not content with that alone, but eagerly stoops to gather other things at his feet, regardless of the fact that, from a rent in the bag, the gold coin is dropping out. The object at which he most eagerly clutches is one of the bubbles issuing from the mouth of a glittering snake. Sir Noel is very expert at rendering the effect of the prismatic colours in a filling bubble, and delights in introducing such into his works. In the dust-heap there is a variety of articles: a richly-jewelled diadem, stained with blood; a fan of peacock's feathers; roses in full bloom, bespattered with mud; a bracelet, with the device of a heart; "The Treatise of Honour," open at the title-page; and in the midst of all is a human skull. The coils of the snake, emitting from its mouth the evanescent bubbles which have caught the man's fancy, encircle the whole, and a bloated toad crouches beside the heap. There is also a circlet of pearls not raked into the heap, which, from their dimness and pulpiness of texture, are evidently false. On his back the man carries a wallet filled with parchment charters, his broad-brimmed hat is adorned with a peacock's feather, and in his left hand he holds the rake with which he has gathered together his earthly treasures. At his feet is a lantern, the apertures of which are in the form of Gothic church windows, from which a murky light is emitted.

Over the man of the world stands the Son of Man; in his right hand he holds aloft a celestial crown,—a crown of thorns, but adorned with seven stars and glorified by an effulgent halo which takes the form of a cross. Christ the consoler holds his left hand over the head of the worldling ready to bless when the blessing will be acceptable. Dimly seen over all hovers with outstretched wings the guardian angel, waiting with sorrowful anxiety for the conversion of the sinner.

It will be seen that the artist has not adhered strictly to the details of Bunyan's allegory, but has, from the depths of his inner consciousness, drawn out symbol after symbol. The man with the rake is not merely the personification of mammon-worship, he is an ambitious voluptuary, grasping eagerly at whatever is coveted by the man of the world; his whole soul is engaged in the pursuit, regardless of the divine blessing proffered to him. But the light which encircles the Saviour, and which lights up the picture with divine radiance, falls upon him, and may yet awaken him to a sense of whence it proceeds.

Sir Noel does not deal with the incidents of daily life and experience,—his work is that of "manhood with a female eye." He sometimes mistakes imitation for representation; his conception is greater than his perception; he seeks to excite the imagination by realising the beautiful rather than by suggesting it, and in doing so loses the stereoscopic effect of reality.

In dealing with work such as his, it is absurd to decry it because it does not exhibit the robustness and reticence of the old masters; it is a product of the age, one of the phases of the times; it appeals to the sympathies of many who are not devoid of the higher culture. "Humanity has its moods," and to one of these Sir Noel appeals; we believe he will be looked upon as a representative painter of the nineteenth century, when the names of others who affect to despise his works will have sunk into oblivion.

We remark, however, that in the work under review there is greater vigour in the handling and depth of tone in the general effect than in any work of the artist which we have seen. It has an appearance of substantiality, although somewhat deficient in texture, and although the details are carefully worked] out, they are not obtrusively so.

Altogether, it is a remarkable work, and well worthy of the study of those interested in modern art.

THE CLIFTON LIONS AND THEIR HOUSE.

The Zoological Gardens at Clifton, small in extent, and not over-well kept, contain now an assortment of lions and tigers, the former especially, such as we do not believe is to be seen in any other collection in England, in regard to the number and beauty of the specimens. There are two magnificent lions (father and son), two younger ones in fine condition, a variety of lionesses, and three families of "children" in different stages of growth. Add to these three or four tigers, in very fine condition, though not such large and grand animals as the lions, and divers smaller fry of felines.

The animals are really worth seeing; but our immediate object in mentioning them is to call attention to their dwelling, which is not satisfactory. In the first place, the cages are cruelly small; it is really pitiful to see the animals confined in spaces scarcely larger each way than the length of their bodies, and it is quite a marvel how they come to be in such health and condition under the circumstances, especially as a good many of them were born in the gardens, and have never had any more exercise than twisting backwards and forwards in their narrow bounds; probably the air and the site are favourable to them, but it is cruelty to animals to mew them up in so narrow a space. That is the lions' side of the question; but there is the human side also. We do not consider the cages really safe for such large and powerful animals. The bars are thinner than we have generally seen used, and in places much rusted, and, as far as one can see in work that is covered with paint, it appears that the iron frames are not even set in rebates in the story-posts which form the frame-work of the whole front of the dens, but are merely set against them and attached by rivets screwed through the iron frame into the story-post; and in that case of course their strength is only equal to the power of the rivets to resist a sudden cross-strain, tending to snap them in the middle, when the whole front would come out. The animals are so accustomed to the confinement, that the idea of attempting to break out would never ordinarily occur to them; but we cannot avoid the conclusion that either of the two big lions would soon have the front out if he were provoked into a spring with his whole weight against it. Another point is, the amount of woodwork in the construction. Cages for dangerous wild beasts should always be made of incombustible

material. Probably every care is taken, and very likely no fire is ever brought near the house; but we know that fires sometimes break out in the most unaccountable manner, and if the building in question did take fire, the possibility is that several brace of lions and tigers would be loose over the downs before it could be put out. It would be a very fine sight too,—from the top of a tree. But, without the least wishing to make a "scare," we cannot help suggesting that if the owners of the gardens intend to keep all these animals there, including the rapidly rising families, the rebuilding of the cages on a larger scale, and with better materials and construction, is something like a duty, both to the lions and to Clifton. In that case the cages ought to be, like those at Regent's Park, floored with cement and divided by brick walls, with iron sliding doors where required. In the present cages everything except the back wall is wood,—floor, sides, and all, and some of it in a decidedly rickety condition.

THE ARCHITECTURE OF NORWAY.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE discussion on Mr. I'Anson's paper* on this subject took place on the 4th inst.

The President (Mr. Charles Barry), in opening the discussion, observed that Mr. I'Anson's paper treated of a subject new to most of them, and interesting to all, not only for the information given, but also on account of the suggestions raised. Amongst other things which occurred to him on reading the paper was the question how it was that, co-existent in point of time, a number of buildings, highly decorated and presenting architectural features of an interesting character, in the Early English style, should have arisen in the old country at a time when only wooden buildings of a very rough character were generally erected there. Those buildings were of a small and mean character, and it was hardly conceivable how a structure of 14 ft. by 12 ft. could be dignified with the name of a church. A question had been raised as to the character of the ornamentation, called by Mr. Fergusson Runic, and by Mr. I'Anson Byzantine, who referred to its similarity of character with that of St. Mark's at Venice, which certainly was not Runic.

Professor Hayter Lewis said he knew little or nothing about the architecture of Norway, and the only thing that occurred to him to remark upon was that Mr. I'Anson alluded particularly to Early English architecture being so well developed, and to so many features of it being found in the churches of Norway, such as the peculiar characteristics of foliage and the contour of the mouldings. It had seldom fallen to his own lot to meet with many specimens of Early English on the Continent. Even in France one might go through a large number of churches and not meet with one specimen of Early English of the thirteenth century. Therefore, it would be interesting to hear from Mr. I'Anson whether this thirteenth-century Early English work which he referred to had the peculiar characteristics he (Professor Lewis) had mentioned with regard to the foliage of the capitals and the other features which were found in the Early English of this country. He would also like to know how far the characteristics of Perpendicular work were found in these buildings in Norway. Sir C. Anderson's work, published in 1852, contained the particulars of a highly interesting church in Norway, which Mr. I'Anson mentioned as having been restored,—not as we regard restoration, but pulled down and rebuilt. The question was whether the "restored" work was copied from that of the original building.

Mr. Street, R.A., said that from the plans exhibited he gathered that Mr. I'Anson assumed that the eastern chapel in the church of St. Clement and the rest of the buildings were of the same date, though subsequently modified. He would ask Mr. I'Anson to reconsider that point. The building originally was built over the tomb of King Olaf, subsequently to which the chapter or church of St. Clement was built. After that there was record of a church being built to the west of the tomb-house, which occupied the site of the present choir. At a later period there was record of a transept, which still remained; after that the nave, and after that again the tomb of King Olaf was pulled down to the ground. His own impression was that the only work of the thirteenth century remaining was the choir, which seemed to have been intended to join the tomb-house; whilst the separate chapel, approached by a flight of stairs from the high choir, formed no part of the present church. The whole building was one of extreme interest. The chapel was such a remarkable work in many respects that one would be glad to find anything which would explain its history. It would be interesting to find out what historical connexion there was between this church in Norway and churches of a similar character in other countries. If they went across the sea to the North of Scotland,—to Orkney,—they met with Kirkwall Cathedral, built in the time of the Normans. That was English in character, and Throndhjem, judging from the illustrations, must have been an exotic brought to Norway. He would ask Mr. I'Anson whether he considered the scarcity of workable stone in Norway accounted for the large amount of building in timber there. This church was built of stone which appeared to have been easily worked, because there was a lavish amount of enrichment and ornamentation. The transept was as thoroughly English in character as it could possibly be. Against that transept there were marks of a groined building having been placed, and he would like to know whether against the south transept there were marks of any other building, such as a clearstory. He agreed with Mr. I'Anson as to a great deal of this work being Early English, whilst some of it was of Decorated character. At the end of the transept there was an octagonal turret, which was a very beautiful work. The ground plan, he imagined, was designed by some one who saw his way to complete the whole thing, with its four chapels. He knew of no building which could have led up to this, unless it were the other little church which Mr. I'Anson had illustrated, and which was of earlier date than that at Throndhjem. He should like to know whether the curious screens at the lower part of the arcade of the chapel were carried all round, as they were described as being of a very peculiar character. The great glory of the thing to his mind was the eastern chapel west front, which was a very beautiful example of Early English work. One would like beyond anything to learn something of the history of the men who executed this work, but in the absence of letterpress to the illustrations that had been published, the history of the building was left to conjecture. Some remarkable features were presented by the doors, a description of which was given in Mr. Laing's book. He would add to the task he had already imposed upon Mr. I'Anson, by asking him to tell them something about the mode of construction of the wooden churches he had described—how the timbers were put together, whether there was anything between the timbers, whether they were filled in with clay or wattle, or whether they were entirely covered with planking. Then, on what foundations did they rest? Had they stood for ten or eleven centuries upon stone walls, or did they go into the bare ground? He would also like to hear something about the construction of the roof, and whether the curious system of gables had any pretence to being of the same age as the arcades beneath. In that part of the world there were but few stone buildings of any architectural pretension; it was, therefore, impossible to conceive that such a building as that at Throndhjem could have been developed from other buildings in its neighbourhood. They knew that the Vikings of Norway travelled great distances in all directions, and it was quite possible that in this work they repeated something which they had seen at an enormous distance from their own country, but as stonework required the employment of masons to execute it, it was fair to assume that sixty or a hundred masons must have been imported from other countries.

Mr. I'Anson, in replying, said his information with respect to the chapter-house was principally obtained from Norwegian descriptions. He did not recollect that there were any traces on the south side of the building of a cloister. The wooden screen to which he had alluded was more nearly English Perpendicular than either French or late German work. He knew nothing of a more thoroughly English character except in some of the churches of Vienna. He had not sufficient evidence to be able to say whether the arches of the cloisters were worked in afterwards, but they were of a later date, probably by half a century, than the windows of the clearstory. With regard to any evidence showing that there ever were towers over the projection at the west end, he was unable to bring forward any. When he was at Throndhjem in 1872 the building was in course of restoration. He was unable to see the architect, but he inspected several drawings of the proposed restoration. With regard to the wooden churches, they were certainly very small, with but little attempt at exterior ornamentation. The pillars, of which there were four on each side, rose from the floor up to the roof, and above the lower story they were braced together by cross braces, which were the only pieces of ornamentation in the interior of the church. The roof was supported on queen-posts, and there was no filling in between the timbers. With regard to the foundations, they were, to a certain extent, of stone, but whether the whole were so he did not notice. The stone of which the cathedral of Throndhjem was built was almost a primitive rock, very much of the nature of gneiss, which appeared to be well adapted for constructive purposes. At no great distance from the town there was a white stone of a very excellent description, which was procured in long slabs, and of that stone the cathedral was principally built. The influence of Byzantine art was very apparent in the decorations of the cathedral, that being at the present time the type of almost all German decoration, and in the most important cases it was very Byzantine indeed. On the subject of the timber of Norway, Mr. I'Anson remarked that a large portion of Norway was covered with forests of pine, which was of two kinds, viz., Scotch fir and spruce fir, but he could not say with certainty whether the latter was of the same description as that grown in England. The coast of Norway was deeply indented with fiords or arms of the sea, which ran into the interior of the country almost at right angles. The mountains, some of which were of considerable elevation and generally covered with snow, rose in a very precipitous way from the margins of the fiords. In Norway, as in many other countries, the giants of the forests had been sought out and had disappeared, but still timber was there in great abundance, and supplied the larger portion of fir used in England.

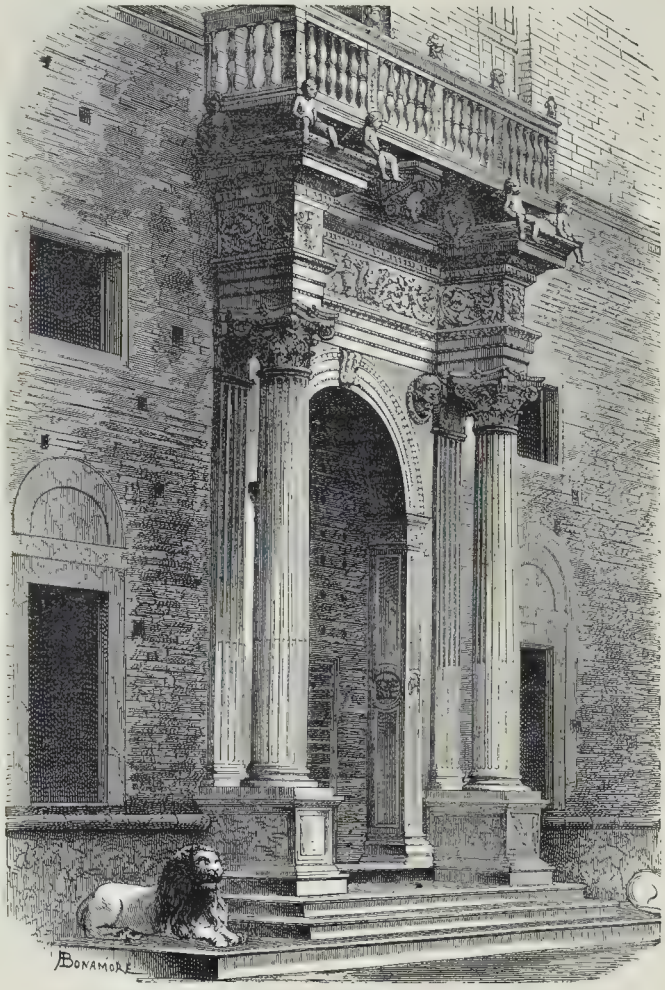
* See p. 91, *ante*.

UNHEALTHY DWELLINGS IN ST. JAMES'S, WESTMINSTER, AND MILE END.

THERE appear to be hovels unfit for human habitation in the parish of St. James's, Westminster, in common with the less favoured districts in the metropolis, and the vestry are taking action in reference to some houses in Green's-court and Peter-street, the condition of which the sanitary committee have reported, on the statement of the medical officer of health and the surveyor, to be something shocking. They are described as "wretched hovels, and a disgrace to humanity." Mr. Bradshaw, the chairman of the sanitary committee, stated that the committee were determined to carry out the provisions of the Artisans' and Labourers' Dwellings Act, and to provide the working people with abodes fit for human beings to live in.

A similar story as to some houses comes from Mile-end. The medical officer of health and the surveyor report that a number of houses in Little Bridge-street are in a most deplorable condition, wanting the very commonest necessaries of human habitation, and that the surroundings are of a similar character. The surveyor adds that measures of an extreme radical character only will be sufficient to place the houses in a fit condition to live in. The Vestry at their last meeting had before them the question as to what steps should be taken with the houses, under the Artisans' and Labourers' Dwellings Act, and a gentleman who had been summoned as owner to make any objection to the Board's action, stated that he was only a leaseholder, and that his term had but three years to run, and that under these circumstances he was not the owner within the meaning of the Act. On this representation the Vestry resolved to summon the owner and freeholder.

The Late Mr. J. Neale, Architect.—On the part of Mrs. Neale, who with her children, are left in very straitened circumstances by the sudden and premature death of her husband (Mr. J. Neale, architect, of Bristol and Exeter), an endeavour is being made to raise a small sum. Donations will be received by Messrs. Sanders, Barnes, & Co., Exeter Bank.



THE PORTAL OF THE PALAZZO DEI LEONI, AT FERRARA.—Baldassare Peruzzi, Architect.

THE PORTAL OF THE PALAZZO DEI LEONI AT FERRARA.

The Ferrara portal illustrated in this number holds a high place amongst specimens of Italian art. Italian architects generally proceed from the motive that the portal represents the magnificence of the owner; like the symphony of an opera, it is the quintessence of the whole work.

At Ferrara, the Corso which runs from S. Giovanni to the gate which leads to the Po, intersects the Via Piopponi, forming a space open to the four points of the compass. The north-east corner is formed by the palace the portal of which we have illustrated, now belonging to the Prosperi family, and constructed originally for Francesco di Geronimo Castelli. He belonged to a family of professors, being the son of the Geronimo Castelli who, under Borso Estense (1450—1471), reformed the University of Ferrara.

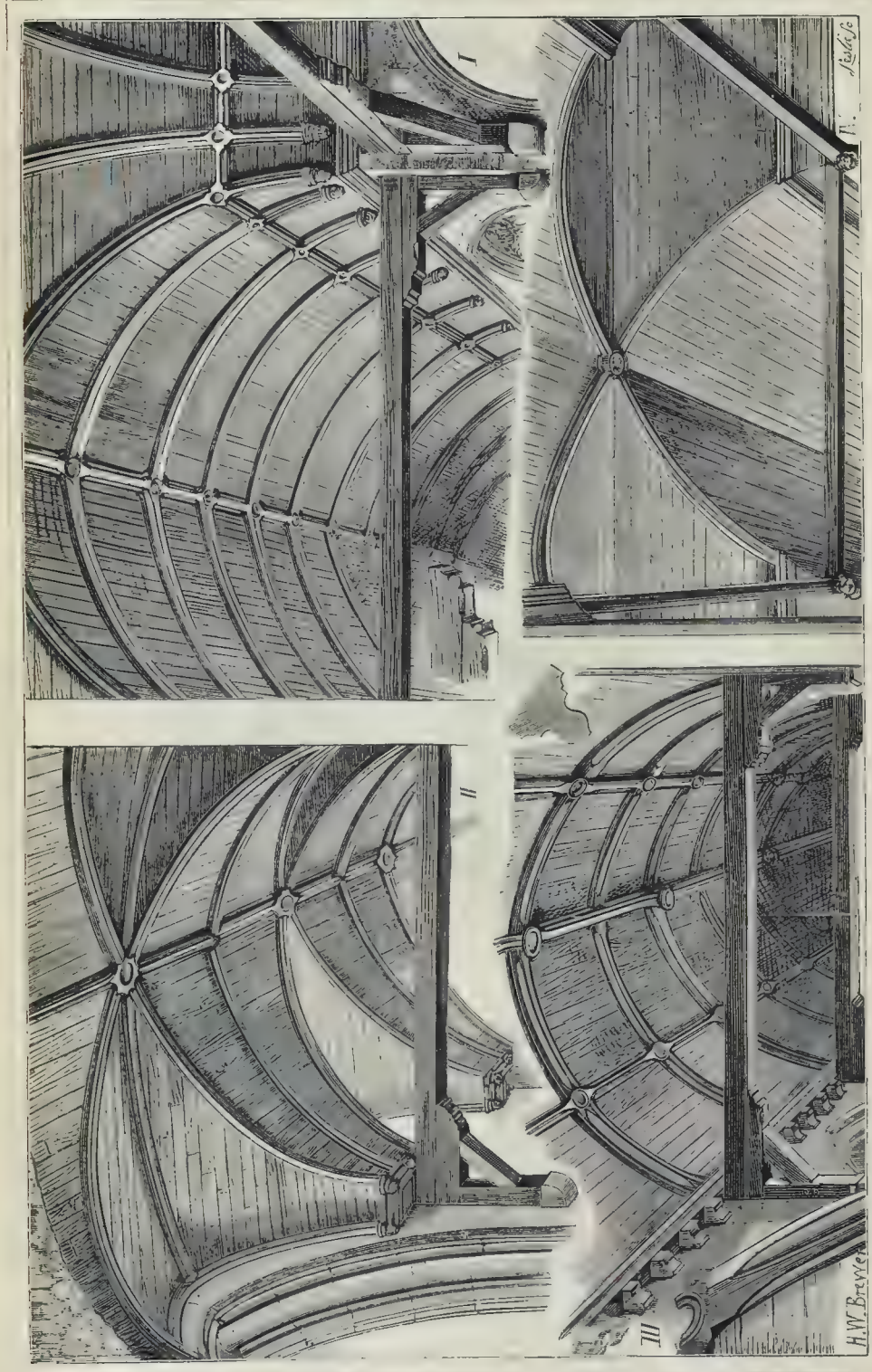
From this family the palace passed to the Giraldis, a family of *literati*, which produced Gilio, philologist and archæologist (1479–1552), and Cinzio (1504–1573), author of the poem of "Ecatommiti," of the tragedy of "Ercole," and other pieces. The Giraldi family being extinct, the palace passed to the Marchese del Sarato, or Sacrati, descended from the Parmesan family of the Majoli, a member of which, Azzo Novello, overthrew Federico, near Parma, on February 18, 1248. Finally, in the present century, the building became the property of the Counts of Prosperi, who have possessed it since then.

The architect of the palace was Baldassare Peruzzi, one of those artists who, unfortunate during their lifetime, become great after their death. He grew up in the troublous times of the fourteenth and fifteenth centuries, "subjected in life," says Lanzi, "to many disadvantages; less successful than arrogant and imprudent rivals, because too modest and timid; robbed at Rome of all he had, compelled now to live in Siena, now in Bologna, on a meagre income; dying at a time when he began to be known; ending his life, too, almost suspected of felony, and with the painful knowledge of leaving a wife and family almost beggars. He is now included amongst the best architects of his age, celebrated through the Farnese Palace."

WOODEN ROOFS IN HOLLAND.

There is, perhaps, no feature of a Gothic church which so greatly influences the general arrangement and architectural disposition of the building as the roof. When we study the plan of a French cathedral, or of one of those fine Perpendicular churches which abound in our eastern counties, we cannot help being struck by the fact that the great differences between the two plans adopted are almost entirely caused by the fact that the one is essentially a vaulted church, and the other is covered with an open timber roof.

It is not our intention to draw comparison between the vaulting of the French churches and the open-timber roofs of the English: both are thoroughly good, both are remarkably beautiful, and, we may add, both have been described times out of number; but we wish to call attention to a system of church roofing which may be said to hold a place midway between the two: we refer to the wooden barrel-vaults of the Dutch churches. It may be objected that as these Dutch roofs possess neither the beauty of a French vault nor that of an English open-



ANCIENT WOODEN ROOFS, IN HOLLAND.



HINGHAM CHURCH, NORFOLK (FOURTEENTH CENTURY).—AS RECENTLY RESTORED UNDER MR. JAMES K. COLLING, ARCHITECT.

timber roof, what is the use of studying them? To this we answer, the Dutch in the Middle Ages were prevented from using the fine stone vaults of the French, inasmuch as they had to build their great churches upon a swampy, marshy soil, and they were unable to construct the beautiful open-timber roofs used in England, because they did not possess the fine oak and chestnut which were considered necessary materials out of which to construct these roofs. The only timber which they possessed in large quantities was pine, and they accordingly invented a kind of roof which could be well and easily constructed in that material, a roof evidently intended to depend almost wholly for its effect upon decoration. At the present day it is common enough to see elaborate open-timber roofs constructed in deal, without tie-beams, but what will be the condition of these roofs in forty or fifty years time? Even now we hear over and over again of roofs of this description requiring to be reconstructed, which have only been put up some twenty or twenty-five years. Now, the kind of roof of which we give illustrations could be constructed in deal so as to last 400 years, as is proved by those now existing in Holland.

The examples we give are from the following churches:—No. 1. Roof over the nave of the church at Gouda. No. 2. Roof over the aisles of the nave in the same church. These roofs date between the years 1552-1556. They look much earlier, but it must be recollected that Gothic architecture continued to be used in the Netherlands long after it was given up in other parts of the Continent. The position of the tie-beams is remarkable, but common to most Dutch roofs. The fact is they served as ties or girders to the walls as well as to the roof.

Our next example is from the church of Schiedam, but it might serve to represent the roofs over at least a dozen other churches, as it is such a very common form of roof in Holland.

Fig. 4 represents the roof over the crossing at Bergem-op-Zoom. It will be noticed that both at Bergem-op-Zoom and at Gouda the roofs of the nave, choir, and transepts intersect, so that there are no arches at the "crossing." This treatment is very common in Holland. There are one or two examples of it in England. Chartham Church, Kent, occurs to our mind.

It was supposed formerly that the fine roofs of our Norfolk and Suffolk churches were constructed in the Netherlands, and sent over here ready made, but we think this idea may be at once dismissed. There are certainly two facts which seem at first to favour the supposition, but we think they are easily disposed of. They are these. Over the building called the Hoog Geregtshof, at the Hague, is a very large hammer-beam roof of rather rude construction, to which the date 1250 has been usually ascribed; but there is no authority for this date, even supposing the building itself to be as early, which we very much doubt. There is nothing to prove the roof to be coeval with it, and we know by experience that everything in Holland looks about a century and a half earlier than it really is. Who, for instance, looking at the roofs over the church of Gouda would take it to be sixteenth century work? Would he not rather ascribe it to the fourteenth century? And in all probability this roof at the Hague is only a rather rude production of the fifteenth century. The other argument is that Flamboyant tracery is to be seen in the piercings of the Norfolk roofs, and this is perfectly true; but it should be recollected that this is the exception, and even where it occurs it is so mixed up with details of an undoubtedly Perpendicular character, that it is probably only some kind of recollection of foreign detail which came to the mind of the workman. Again, this kind of Flamboyant tracery is often seen in the "tower lights" and small unglazed openings in the Norfolk churches.

THE NATIONAL GALLERY.

WHEN we named some little time ago two of the candidates for the appointment left vacant by the death of Mr. Wornum, we spoke of a third, who preferred that his name should not be mentioned. The "dark" candidate has won:—The Prime Minister has appointed Mr. Charles Lock Eastlake, secretary to the Royal Institute of British Architects, and nephew of the late Sir Charles Eastlake, to be Keeper and Secretary of the National Gallery.

HINGHAM CHURCH, NORFOLK.

THIS church, dedicated to St. Andrew, is one of the largest and handsomest churches in the county of Norfolk. The whole church, with the exception of a few minor portions, is of the fourteenth century, and is said to have been entirely rebuilt by Remigius de Hethersete, A.D. 1316 to 1359. It consists of a noble nave and aisles, with large chancel, which contains a very handsome and lofty monument in stone to a Lord de Morley, erected in the fifteenth century. The tower, which is very large and lofty, is at the west end, and on the south side there is a good but somewhat plain porch, which is the usual entrance to the church.

The nave piers and arches are lofty and of good proportions, with well-moulded caps and bases. The aisle windows of two lights each are filled with the characteristic tracery of the fourteenth century. The east window of the south aisle is of three lights, and is an excellent example of the tracery of the period. The eastern portions of both the north and south aisles were divided off into chapels at some period during the fifteenth century, and consequently some of the eastern windows are of that period; the earlier windows having evidently been removed, and later ones, of three lights each, inserted.

In the restoration of the church, the first object was very properly to put the structure itself into a sound and satisfactory condition; for, unfortunately, the whole church had been, for many years, very much neglected, and the roofs and other parts of the fabric had become dreadfully dilapidated. The nave roof, which was of a low pitch, in a very mean and debased style, was so much decayed that, under the advice of the architect, it was determined to remove it, and to erect a new one of a better character and steeper pitch, more suited to and harmonising with the other parts of the building. The new roof is of the exact pitch of the original one, the dripstone of which still exists on the eastern wall of the tower, distinctly showing its slope. It now again serves as the dripstone to the present roof.

The new roof is simple, as befits the building. The timbers, all of oak, are large and massive. The moulded curved ribs spring from carved stone corbels, which support bold hammer-beams, from which spring the main curved ribs, the spandrels being filled in with tracery and foliage.

The aisle roofs are not entirely new, but have been carefully restored by removing decayed parts and substituting new where necessary. Their character is somewhat unusual for aisle roofs, they being formed with hammer-beams next the aisle walls, from which spring curved ribs, which rest on stone corbels in the nave walls. They are the original roofs.

The stonework and walls throughout, with the exception of some portions which it was necessary to postpone for the want of funds, have been carefully restored, both inside and outside, and the tracery of the windows and other parts made new only where it was absolutely necessary. The internal stonework of the church, more especially the nave piers and arches, have at some time or other suffered very much from fire, although no record appears to exist of any such conflagration having occurred. Ample evidence, however, was found to show that both the nave and chancel had suffered from a most extensive fire, in which both the nave and chancel roofs were destroyed, but the aisle roofs, although probably much injured, certainly escaped.

The effects of the fire were shown by the state of the stonework, the piers and arches of the nave, the chancel arch, and other parts, being scaled, and the stone turned of a reddish colour to some depth below the surface by the action of the fire. Several of the shafts were scaled from top to bottom, the defective parts having been at some time or other very clumsily patched and covered up with plaster, and then the whole of the stonework throughout the church coloured over with a yellow wash. When this plaster and colour came to be removed the injury was found to be very extensive, and much of the stone was still in a very loose and unsound condition. The whole of these injured and unsound parts were cut out and solid stonework inserted, until every part was made as perfect and substantial as when the work was first erected. The stone used in the restorations was that from the Ketton quarries in Rutlandshire, and is of a very similar nature to the stone of which the church was originally built, which also probably came from the same neighbourhood.

Upon restoring the walls of the chancel, a piscina and three sedilia were discovered in the south wall in the usual position, and which appear to have been inserted in the fifteenth century; but they were found so much injured and scaled by the action of the fire which has been just mentioned, as well as having had all projecting parts destroyed and chopped off when the walls were plastered, that it was considered not advisable to restore them. Parts, however, have been left exposed to view, in order to give an idea of what they have originally been. The chancel roof, which is a modern one, and not of so good a character as could be wished, was nevertheless found to be so sound and in such good condition that it was necessarily retained. The yellow wash with which it was covered was removed, and the timbers stained to correspond with the other roofs. The east window is filled with foreign stained glass of an interesting character, inserted some time during the last century, and which was brought to this country by one of the Lords Wodehouse, an ancestor of the present Earl of Kimberley. At that time the stonework of the window appears to have been altered to suit the glass.

Having got so far successfully with the roofs and walls of the building, the late rector, the Rev. Edward Gurdon, and his committee, determined to clear away the wretched old boxed seating with which the church was lumbered up, and which was in a disgracefully dirty and dilapidated condition.

The whole of the foregoing work was carried out in a satisfactory manner by Mr. R. Cornish, builder, of North Walsham, for the woodwork, and by Mr. J. W. Lacey, of Norwich, for the stonework. The contract for the new seating was taken and carried out by Mr. William Hubbard, builder, of East Dereham. The seating consists of solid oak carved bench-ends, and seats with sloping backs, set out with ample room both for kneeling and sitting. In the carving of the bench-ends, which consists of a great variety of natural foliage, heads are introduced occasionally, as well as animal and insect forms, which serve to give character and variety to the carving. The front and back framing of the seating have carved panels, embracing a great variety of foliage. The whole of the wood-carving, with a few exceptions, was executed by Mr. James Forsyth, of London.

The whole of the works, which have cost about 4,000*l.*, have been carried out under the superintendence of Mr. James K. Colling, architect, of London.

Since the completion of the restoration, the Rev. Edward Gurdon, to whose exertions it was mainly due, having died, the committee and other friends have restored the south porch as a mark of the estimation in which they held the late rector, and have placed a marble tablet within it to his memory.

"RESTORATION" *v.* "CONSERVATION."

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association on the 8th inst., Mr. Bowes A. Paice, president, in the chair, Messrs. A. Meyer, E. Perrin, and H. E. Hawkes, were elected members. A vote of thanks was accorded to Mr. W. Willmer Pocock for permitting the members to visit the new hall of the Carpenters' Company, in London-wall, as recorded in our last, and it was announced that the next visit would be made to-day (Saturday) to the new buildings in the Temple.

The discussion then took place on the papers read at the previous meeting by Messrs. White and Pownall on "Restoration" *v.* "Conservation."

Mr. L. W. Ridge complained of the want of definiteness in the way in which the aims of the new Society had been put forward. Mr. Pownall had remarked, in allusion to an essay of Professor Colvin, that it had not been answered, and he thence argued that it was unanswerable, forgetting that there were statements which did not need to be answered; they spoke for themselves. For instance, the Professor had quoted Viollet-le-Duc to the effect that "to restore a building was not to preserve, to repair, or to rebuild it," but to "reinstate it in a condition of completeness which could never have existed." Could any one say that this was a correct description of the present mode of restoration in

England? The essayist failed to draw any distinction between restoration at home and abroad, and hence he had gone astray in his argument. As a matter of fact, the manner in which French cathedrals had been restored had provoked much criticism and remonstrance in this country. No answer was required to the remark that the products of the Queen Anne age were better than the "sham Mediæval products" of the present day. Why "sham"? They were solid enough, and if it were said that they were only copies, what else were the studies of Queen Anne? When a person preferred Melrose, Tintern, or Rievaulx to Durham or Worcester,—when he said he liked an unrestored church in all its dirt and decay better than a restored one, it was not possible to argue this question of "restoration" with him. It was of no use for those who sided with the Society to assert that venerable buildings had been destroyed, unless instances were brought forward. Granted that a great deal of damage had been done by an almost mad Gothicism, it was by no means a legitimate conclusion that there should be no restoration at all. If men would but judge modern work without the preconceived idea that it must necessarily be bad, they would be able to find some good qualities, some redeeming points, in it. It was a fallacy to say that modern work was uninteresting because it was not original; on the contrary, there was a great deal that was original and characteristic of the present age. It was an absurdity to propose that an old building should be left to itself when no longer fit for use, and another one built by its side to supply the want that the old building would meet were it restored. Let them imagine the application of such a doctrine to an ordinary village church. Architects in practice had some experience of church restoration committees in rural districts. What would the farmers and small tradesmen say to such a proposition as that gravely advocated by the new society? They would laugh at the idea; and really, the preservation of an ordinary village church as an "historical monument" was almost too funny. Would the parish vestry even care to go to the expense of lighting a fire in an old building thus set apart? Everybody knew how much a stove would do to preserve an old building. If the local people would not go to the trouble or expense of looking after these old buildings, who was to do it? The fact was, they would be allowed to crumble into dust. Complicated issues arose in discussing the question of church restorations, one of which was that a considerable portion of the community did not approve of the great amount of *kudos* which the Gothic revival had given to the Church. He would, therefore, further discuss the question in reference to another class of building, and one not now much studied, viz., half-timbered houses. Take the cottage-houses of the sixteenth century in which the parsons formerly lived. Many of these had been encased with an outer shell of brick walls. Although having a modern appearance externally, internally the rooms were low, and the beams protruded through the ceilings in a way very much out of consonance with modern usage. These interiors had been altered, perhaps, by every subsequent tenant, and had, according to the views of the new society, become a page of history, and, according to some people, nothing could be more admirable than such a conglomeration. Such buildings, however, failed in the matter of convenience, not being nearly so convenient as the old buildings would have been. Secondly, they failed in their architectural appearance, because the architect who erected the encasing walls of brick was tied down by the old remains. In short, such a house gave no idea on the face of it of what it had once been like. Where old half-timbered houses had been "propped up," they had generally been allowed to fall into utter decay until they had to be removed for the public safety. But, where such houses had been carefully restored, the result was very different. In them the old timbers were brought into view, the noggin reproduced and perhaps covered with cement, and the whole of the building made habitable, perhaps even by reducing the width of the chimney-openings, and inserting kitchen ranges to burn coal in lieu of the fire-dogs adopted to burn wood. To so adapt such a building to modern requirements was expensive; it cost about as much as the place was worth; but when once it was done it afforded a very fair and truthful idea of what such buildings were like to look at and to live in. The speaker concluded by saying that he pleaded, with a majority of the profession and a large portion of the public, against a minority who had had no great experience of the subject they had so glibly discussed. His wish was to preserve buildings. One false premise that the Society was based on was the notion that architectural history did at any time stop. The Society said that "architectural history died out, as popular art at least, just as the knowledge of Mediæval art was born." He was unable to understand what that meant, for it appeared to him that the knowledge of Mediæval art was the one thing that made architecture popular, and so much money as had been spent on church restoration would never have been raised had not architecture been popular. Surely our Gothic architecture, which was founded on buildings complete and in use, was as much a thing grown into our nature as the Renaissance or that which followed it in Europe. Other times and other countries had had their distinctive architecture; we at this time had what was far more remarkable, viz., a distinctive knowledge of architecture, such as no other country had ever possessed. Architects of the nineteenth century had studied architecture as it never before had been studied, and they had produced work with an accuracy never before attempted. The attempt might be unfortunate, but in his (Mr. Ridge's) opinion, it was perfectly legitimate.

Mr. Hebb deprecated anything like collision or conflict of opinion between the Association and the new society, which was at least intended to promote the interests of architecture. He confessed to surprise that amongst architects there should exist any division of opinion as to the proper method of the conservation of buildings. He apprehended that if a man took a proper view of the subject, no division of opinion should arise, but that both terms should be convertible. However, it seemed that a difference was disguised under the words. Some men brought to bear on their work a due reverence, while others went to work with a total disregard of all that deserved to be conserved. He would remind them that the question of conservation—he used the word in a sense understood by them—was no new thing. The principles upheld by the Society had been enunciated years and years ago by men most entitled to hold an opinion on the subject. As an instance, he referred to the utterances of Mr. Ruskin delivered some years since in his "Seven Lamps of Architecture," in which he distinctly laid down the principles that ought to guide architects in the restoration of buildings. The principle of modern times appeared to be to neglect them in the first place, and to restore them afterwards, but if proper care were taken of them from the first there would be no need to restore them. A few sheets of lead on the roof, the leaves swept out of the watercourses, &c., would save the walls and roof from ruin. We had no right to touch these buildings; they were not ours, they belonged partly to those who built them and partly to all after us. As a guiding rule, the Society said—Do not destroy anything that you cannot replace, for where you destroy you do away with something which, in all probability, you can never put back again. An architect, of all men, should be most scrupulous about destroying anything in the shape of building or architecture, because he knew, better than any other, by what great care, by the exercise of how much thought, and trouble, and self-restraint, the building was built up. Architects should cherish a sympathetic feeling towards old buildings, though, as a rule, they seemed to have little sympathy for them. They dealt with them tenderly, as the phrase was; but with no more feeling than the angler had for the worm he put on his hook, Isaak Walton's advice as to which was, "Do it tenderly." He had no wish to hurt the feelings of anybody, but architects were impelled to "restore" by interest, by wanting a job, and because they feared that if they did not do the work some one else would do it for them. Many men undertook to restore a building, lest it should fall into less competent hands than their own. Mr. Ridge had asked what ought to be done with an old building supposing that it had outlived its use, and there was no purpose that it could serve? Abroad, a certain class of buildings were historical records, and were retained as valuable in illustrating certain historical associations. Most of them were empty, and as we should say, useless, and they were kept up at the cost of the nation. Well, if there were no particular use for such buildings, they ought still to be kept if they pointed to some historical episode of the country. The French, however, were just as bad in their treatment of buildings as the English. Putting aside all controversy as to churches, and in particular as to Gothic churches, into which a certain amount of acerbity always entered, he desired to call the attention of the Association to the destruction of the City churches, with a view to interest them in their preservation. Every Parliament brought in a Bill for the destruction of some one or other of these old churches, and there was a probability that they would all go in time unless vigorous protests were made. It was a matter on which they all could be unanimous, and he hoped the Association would unite with the Society in deprecating the further destruction of Wren's churches.

Mr. G. H. Birch, A.R.I.B.A., said the Society for the Protection of Ancient Buildings possessed many among its members who were better qualified than himself to defend its principles and maintain the grave charges which it had laid at the door of the architectural profession. It made those charges boldly and unhesitatingly; but what reply had been made to them? Nothing but a general chorus of, "Please, sir, it wasn't me. I didn't do it. I'm always so careful!" Only one architect had come forward boldly to meet this charge face to face,—not to rebut it, but to lay down counter-principles to extenuate and to excuse, and to meet assertions by the *tu quoque* argument. The Society made a charge of "forgery," against restorers,—an offence attended with unpleasant results in some walks of life. It said, "Buildings have been dealt with by men of talent often, and worthy of better employment, but deaf to the claims of poetry and history in the highest sense of the words." Mr. White admitted the truth of this charge when he said that "a lamentable amount of destruction has undeniably taken place under the guise of restoration." This admission gave the Society its *raison d'être*. To borrow a simile from the medical profession, architects had been treating decrepit buildings with such strong doses that they had "cleaned them out" entirely, and would do well to make way for those who believed in a crutch rather than in providing a brand new limb. He confessed to a feeling of revulsion against a restored church, "restored" in the worst sense of the word, and experienced a sickening feeling of dread when, engaged on any antiquarian research, he was led to a building which had suffered from the purging process. In ninety-nine cases out of a hundred, that which he went to see, and which he knew from records existed up to a very recent period, he found gone for ever, and with it a chapter of the history of the building, which no amount of slippery glazed tiles, stained seats, or bristling brass-burners, could atone for. Indeed, the state of many of these "restored" buildings was not inaptly described, in a circular issued by the Society, as "useless for study and chilling to enthusiasm." The Society had been most unjustly accused of wishing to allow every old building to remain in a state of tumble-down decay; but there was no authority for such a statement. The Society justly asked that protection might be put in the place of "restoration," and that decay might be staved off by daily care: leaky roofs and tottering walls preserved by other means than those of total destruction and the substitution of lifeless copies. Were these requests unreasonable? Just 200 years ago the city of London was occupied in rebuilding its parish churches from the crumbling ruins left by the Great Fire, and notwithstanding their number and the comparatively impoverished state both of the City from its then recent calamity, and of the State from the gross mismanagement of its rulers, the task was completed in a manner which excited our admiration to this day for the beauty and variety displayed, the sumptuousness and completeness of the fittings which characterised them all, and the solid and substantial manner in which the work was effected. Surely this fact, standing as it did alone in the history of Christendom of so much being effected mostly within twenty years, should and ought to have had some weight with us in these days; yet one after another these churches were being levelled to the dust, and scarcely a finger was raised in protest. This being the case, could we be surprised at the formation of a society for the preservation of ancient buildings of all times and styles? Where the City churches had not been destroyed, nor marked for destruction, attempts had been made to alter the character of the art which distin-

guished them from those of other periods. Some had been "Normanised," "Gothicised," or "Byzantanised." Fine old oak panelling had been turned out to line smoking-rooms in the suburban retreats of wealthy citizens, and in some cases flimsy deal had been substituted. Stained glass from which one turned in horror obscured the interiors with a dim, but anything but a religious light; and garish colour, which could only be described as "absolutely fiendish," had been introduced. It might be urged, and with some plausibility, that the newness and rawness of modern work, so offensive to the eye and grating to the feelings of lovers of antiquity, needed but the hallowed touch of the hand of time to soften down once more those staring tints to mellowed beauty; to clothe with moss and lichen walls and buttress, spire and pinnacle; and that it was, after all, but selfishness which would stay the hand raised to destroy the work of time so ruthlessly and needlessly; and that there was a time when that which was so lovely had no existence,—when the building was comparatively as staring and new as the one from which people now turned away with a shudder. "Time did it once; could it not do it again?" He (Mr. Birch) hardly thought so. Like a chord of music, whose exquisite harmony enchanted you when first struck, and to whose fading strains, as they grew fainter and fainter, you strove to listen so as not to lose the faintest sounds of the sweet cadence,—so it was with these old buildings which had been restored; their continuity was broken; a rude hand had stopped the strain for ever. Twenty generations must come and go before it was heard again, but it never could be that which fell upon your ear. New strings and new wood had been added; the instrument was no longer the same, and could no longer emit the same divine harmony whose mellowed beauty enchanted you.

Mr. E. J. Tarver remarked that there was much to be said on both sides of the question, which was as interesting to the sketching student as to the practising architect. The gist of the views held by the Society for the Protection of Ancient Monuments might be said to amount to this: that things are interesting for what they are, and not for what they seem. It was easy to sympathise with the disappointment of a student who discovered that he had been making an elaborate measured drawing of a "restoration" when he thought he had sketched a piece of real old work. But it appeared to him (Mr. Tarver) that such abuses in dealing with old buildings should be met by following a simple rule, viz., to strike the word "probable" out of the dictionary, and, wherever there was the slightest doubt as to the original form of any missing feature, to let it alone, or to replace it with something evidently modern. Consistently following out the principle that things were interesting for what they were and not for what they seemed to be, we should find that our ancient churches were still places of worship, and, therefore, they should not seem to be shored-up ruins. Mr. Pownall had said that "old buildings should be adapted to present uses, and, if unsuitable or too defective, others should be built, and the old buildings used for some purpose to which they were suited." Had Mr. Pownall thought out the meaning of that sentence to its practical result? He would, indeed, be most ingenious if he could suggest some purpose, other than that of public worship, to which these "too defective" churches were suited. He (Mr. Tarver) ventured to prophesy that they would be left to the bats and owls. There was an instance of this at Old Stantonbury, where the ancient church had been necessarily abandoned in favour of a new one built in a more populous part of the parish. He visited it nearly twenty years ago, and was then nearly knocked down by the fusty smell that greeted him on unlocking the rusty door. Whether any of the internal fittings remained for Mr. Stevenson and his friends to fondle and adore he could not say, but he knew another church in Kent which had been abandoned, and the villagers had made very short work of the fittings and anything else available for firewood. While, therefore, agreeing with the Society in the dislike of the "sham history" produced by some of the cleverest recent so-called "restorations," he could not admit that the treatment of our ancient buildings was to be met by Mr. Stevenson's three short words, "Let it alone." They reminded him of the enthusiastic young gentleman who came to the untimely end narrated in Longfellow's poem, "Excelsior," upon which he (Mr. Tarver) had penned the following parody expressive of the views of Mr. Stevenson and his friends:—

The shades of night were fleeting fast
As to an English church there pass'd
One who, at any sacrifice,
Would act upon this strange advice,
"Let it alone!"

Its state was sad; some bricks beneath
Propp'd what would fall, shorn of its sheath
Of ashlar stones; nor could be rung
The bells aloft. But still he sung
"Let it alone!"

"Try not my steps!" the pulpit said,
"Weak bends the rood-beam overhead;
The vault beneath, both deep and wide
Is falling in!" But still he cried,
"Let it alone!"

"Oh, stay!" the queen-truss said, "and thrust
Thy head up here, and mind the dust!"
The dry-rot choked his bright blue eye,
But still he answer'd, sneezing, "Fie!
'Let it alone!'"

"Beware the stone spire's weaken'd haunch!
Beware the filthy avalanche
Of jackdaws' nests!" His last reply
Was this: "Around it let them fly!
'Let it alone!'"

A blow dealt by the fitful wind
Here struck the wall they'd underpinn'd
With rotten brickwork; and it falls,
Half burying him, who faintly calls
"Let it alone!"

There in the ruin cold and grey,
Speechless, but obstinate, he lay,
While from Whitehall,* serene and far,
A voice fell, "See how much you mar
By letting alone!"

Mr. Stevenson said he did not know that he was the author of the dictum, "Let it alone"; in fact, he did not know that any member of the Society had quite said that, at any rate, with regard to churches. He noticed, however, that Professor Barry, in his lecture at the Royal Academy, made substantially the same statement against the conservationists, saying that it sounded "almost like a joke" to tell us to allow our old buildings to fall into ruins. What the conservationists really said was indicated by Mr. Ruskin's words to the effect that many old buildings could be kept in a good state of preservation by seeing that the roofs were kept watertight, and so on. There was, however, no reason why difference of opinion on the subject need destroy good will. Architects ought all to be willing to have their work criticised. He felt, in writing the paper which he read at the Institute, that he had to explain an anomaly. While the principles professed seemed excellent, and as strict as the most zealous opponents of restoration could desire, the practice followed was, in his opinion, disastrous, and was destroying the historical value of our national monuments. He could not believe that architects, for the sake of gain or any unworthy motive, were acting against their principles, but rather that there must be some flaw in the statement of the principles. The advice to preserve everything ancient was admirable; but the restorers limited the meaning of the term, thinking nothing ancient unless it were 300 years old, thus wiping out three centuries of English art and history, and in the destruction of Perpendicular work carrying back the period of modernism to the fourteenth century. The most perfect work of these centuries was ruthlessly altered, and was accounted old rubbish and bad taste. This broke the continuity of history; the building ceased to be a record of the past, and, worse than this, while part of the record was destroyed, the rest was falsified, the parts destroyed being replaced by new work aping the style of the old, so that only trained experience could tell what was authentic and what was the false imitation of the modern architect. All architectural students had experienced the sense of disgust and despair with which, on going to sketch an old church, they found it had been "restored." An architectural tour in England was now a heartbreak. He remembered, many years ago, coming unexpectedly on St. Michael's Church, at St. Alban's, on the site of old Verulam. It was a visible monument of English history, from the Roman to the present times. Buttresses of Roman brick, beautiful in form though old in date, gave a glow of red to the old grey Gothic walls; the additions of different dates, in which the monument of the founder of modern thought and modern progress,—Francis Bacon, Lord Verulam, was but a natural link. He saw the church again last year; the brick buttresses were gone, replaced by "neat" Perpendicular ones; the walls were scraped and pointed. Only the old plastered tower,—left untouched, as if the money had failed before the restoration was finished,—still gave a flavour of the past. There was a new Gothic oak chancel-screen of the usual type, suggesting compasses and a drawing-board; new low pews, made up partly of old woodwork, which might have been in the church before, or might not. In one wall a hole had been left to show some Roman brickwork. There was some new decorative painting,—a feeble echo of the feeble modern German styles, and a coarse thirteenth-century modern stained glass of the usual blue-purple tone. Bacon's monument looked out of keeping and out of place, as if it ought to have been removed as incongruous. Sir Gilbert Scott defended this restoration as a careful one, but to him (Mr. Stevenson) the church seemed ruined, and its value and interest gone. Another point of difference between restorers and conservationists was as to the plea of "necessity." It was urged that the churches must be restored, and that it was useless to persuade the clergy and those who had the care of them not to restore them; and that the finding fault with the practice of conservative architects resulted in handing the old buildings over to local incompetency. The strong desire of the clergy to pull about old churches was obvious. Sir Gilbert Scott, who had had large experience of it, said it was irresistible, and that it had forced him at at times to act against his better judgment. The motives for restoration were strong. It had been considered "the right thing" to do. One parish restored its church, and the neighbouring one was ashamed of being behind-hand in "the good work." Restoration was considered a proof that the church was alive, and had awakened from the sleep of the last century. Then life was sometimes dull in the country, and the restoration of the church gave the people something to do. The antiquary of the parish saw a chance of proving favourite theories, and the people who delighted in bricks and mortar,—a class against whom as an architect he should be sorry to say a word,—saw scope for their energies. Mr. White had asked if every former age was to be allowed to leave its record on our churches, and only ours was to be ordered to keep its hands off. He (Mr. Stevenson) was sure that the last idea coming generations would have of us and of our work was that we had not left our mark sufficiently on the historical buildings of the country. He ventured to affirm that this generation had, mainly by its restoration mania, marred, altered, and destroyed more historical monuments than any previous three centuries put together. We had revised and re-written in our own handwriting, copying as well as we could the old characters, every old record we could lay our hands on. Posterity would not thank us; rather they would curse us as self-conceited destroyers of the records of our country's history. Of the churches which once adorned the narrow limits of the City of London, whose hundred spires grouped around St. Paul's made a city any nation might be proud of, and struck the fancy even of those to whom the glories of Venice were familiar (as was seen from Canaletto's picture now in the collection of the Old Masters),—of all these churches soon not one, apparently, would be left untouched. About half of them were being destroyed for the sake of the money to be got for their sites. Surely England and the Church of England were rich enough to keep some architectural monuments for the sake of architecture and of history! The churches which were spared by greed were being destroyed by "restoration." He believed St. Stephen's, Walbrook, was threatened with complete repair and restoration. When the Chapter-house of Westminster Abbey had ceased to be the House of Commons, Wren was asked to make in it the alterations necessary to utilise it as a library. In that age, even men of the taste and refinement of John Evelyn thought Gothic barbarous, but Wren had more appreciation than his age, and he refused to have any hand in destroying the work of which *he*, at least, saw the beauty. It was a shabby return on the part of the architects of the present generation for Wren's loyalty to old Gothic architecture, that they should alter the interiors, destroying the proportions of the few churches of Wren's in the City which the need or the

* The address of the Incorporated Society for the Building and Enlargement of Churches.

desire of the Church for money was sparing us. It was a disgrace to our generation that not one should be left as he designed it of his London churches, which, if we were capable of appreciating architecture, even if we disliked his style, we must see to be full of finish and variety, and beauty,—that we should either alter or destroy every one of these works of one of the greatest of English architects.

Mr. Blashill said he did not see how the destruction of City churches affected the subject of restoration. The case of St. Antholin's was not a question of restoration, though it was a question of brutal destruction, no doubt. Mr. Hebb had alluded to an important question when he hinted, as others had also done, that restorers did a great deal of what they did as a matter of interest. But this was a very delicate matter, and ought not to be mentioned without good grounds. They had had from Mr. Stevenson and other speakers a pleasing picture of an unrestored church, which was, however, to a great extent a mere ideal.

Mr. M. B. Adams said that the principles of the Society for the Preservation of Ancient Monuments were not new. Divested of exaggeration and sentimentalism, they would be found to be in reality the very principles followed by the architects condemned by the Society. The speaker condemned the Society for its alleged unfairness in meting out a different measure of censure and reprobation to an eminent architect who was supposed to have offended against conservative principles in restoration, to that meted out to less prominent men. He admitted that irreparable damage was often done in the course of restorations, in the absence of the architect, particularly where there were drunken or negligent clerks of works. He exhibited a carved bear from a miserere in one of our cathedrals, cut off by a workman out of mere wantonness, and who was so little able to appreciate it, that he had boiled it in soda-water to get the dirt off! This vandalism occurred in the course of a restoration which was being carried out by one of our most eminent architects.

Mr. Clarkson thought that some architects showed themselves unduly sensitive to criticism. The question was a matter of detail to be argued out, and he considered it would be most serviceable to the profession if architects would agree to let the utmost candour be used, as no one would be offended by it. There were persons who improved on Dr. Johnson's method, and whether the pistol missed fire or not, they felt bound to knock somebody down with the butt-end. It was not everybody who could resolve to point himself out as the proper recipient for such an honour.

Mr. Payne said it would be a great thing if the Society would clearly define its intentions. He thought one set of views were stated to the profession, and another story told to the public. Damage was stated to be done because much rubbish had been cleared away. He had been engaged when a pupil on the church of Darlington. The church was cruciform, and the whole of the arcading, which ran round both chancel and transepts, had been filled in with brickwork, the oak roof hidden by a plaster ceiling, and galleries put in. If the Society objected to the undoing of such work, he would like to know what else could have been done. He believed people much preferred the present state of churches to the past.

Mr. Pownall thought the counsel for the defence had made out no case. They said they suffered from misrepresentation, and counsel for the plaintiff said the same. The Society, it was true, said, let alone, but within certain limits. What still remained to them should be left, unless a strong argument were produced for meddling. A little while back a proposition had been made to restore Kirkstall Abbey, and he would like to know if such a proposition accorded with the views of the restorationists? He wondered at Mr. Adams producing a mutilated stall-head as an argument; for, putting workmen out of the question, were not many such pieces to be found in architects' offices? Twenty years ago you could scarcely go into a church without finding some trace of Stuart work, and now not a vestige of Jacobean could be found, and but little of Perpendicular. Surely Perpendicular had a purpose to serve, and where it was removed, was anything better or fitter put in its place?

Mr. W. White, F.S.A., said that he was glad to have the last word, as it enabled him to set right a mistake Mr. Stevenson had made in regard to his (Mr. White's) having stated that the architects of the present day were not to leave their mark on their buildings. He had been speaking of the village carpenters, and said that their enormities might not be displaced lest ours were set up in their stead, which was a totally different light to look at it in. It had been laid down that restoration was necessary where stability or decency required it. Well, who wanted more? One remark he wished to emphasise was that sufficient distinction had not been made between old buildings that were substantial, and old buildings which were tottering to their ruin. As to the City churches, they were being destroyed by the authorities against all the protests of architects and antiquaries, and he did not see what that had to do with the restorationists.

OPENING OF THE NEW EARL'S COURT RAILWAY STATION.

The new station of the Metropolitan District Railway Company at Earl's Court, which has been in course of erection during the last twelve months, was opened for traffic on Friday, the 1st inst. The station has been built on the west side of Earl's Court-road, from which the booking-offices, waiting-rooms, refreshment-rooms, and other apartments in the building are approached. The elevation is in white Suffolk brick, with a spacious entrance in the centre, and a residence at the south end for the station-master. The building stands at an elevation of about 25 ft. above the railway level, and rests upon massive wrought-iron girders, 90 ft. in length, which are thrown across the line and supported on iron columns and the north and south walls enclosing the station area below. These girders are 40 tons in weight, and are the largest which have hitherto been introduced in any of the District Company's stations. From the area between the booking-offices and waiting-rooms two exits lead to a gallery, from which there are two flights of double stairs, divided in the centre, frow which the railway level and two platforms beneath are reached. These platforms are 500 ft. in length and 25 ft. wide with a double line of rails between them in the centre, and two other single lines on the north and south sides of the station respectively, the two last-named lines being for the through up-and-down traffic, *viâ* Addison-road and Willesden, and the central lines for the Hammersmith and Richmond traffic. The main outer walls inclosing the station area are of enormous strength and solidity, being 9 ft. thick, and composed of Portland cement concrete, 30,000 tons of Portland cement from the Burham Works having been used in their construction. The Earl's Court is the first station belonging to the District Company, the walls of which have been constructed of this material. The inner face of the walls, inside the station, is divided into seventeen recessed arches on either side, the arches being 15 ft. in width, and springing from piers 5 ft. wide. Along the centre of each platform there is a range of twenty-four ornamental double lamps, on moulded iron standards or posts, about 12 ft. in height. The station roof, which is in truss form, is 300 ft. in length, and 100 ft. in width, and is supported on light ornamental iron purlins and principals, the centre portion being composed of glass, and the sides of wood. The extreme height of the roof, from the level of the rails to the apex, is 60 ft. It is worthy of remark that although no fewer than 24 trains per hour, or more than 350 trains daily, pass through the station, the works have been carried on and completed without in the least disturbing the traffic, and without the slightest accident. This is owing to the precautions taken by the company's resident engineer, Mr. T. S. Speck, by whom also the roads were laid. The diamond crossings just outside of the station are of a peculiarly complicated nature, eight roads meeting at one point.

The station and works have been designed by Mr. J. Wolfe Barry, C.E., the company's engineer, and carried out by Messrs. Lucas & Aird, the contractors. The whole of the ironwork has been supplied by Messrs. John Butler & Sons, of Leeds, and the ornamental lamps on the platform came from Messrs. Stevens & Sons, of Southwark. The cost of the station is about 30,000*l*.

Simultaneously with the construction of the station, other works of an important character have been going forward in the immediate locality. The Midland Company's new coal depôt adjoining the High-street, Kensington, is approaching completion, and in order to arrive at it their coal-trains will have to pass through the Earl's Court Station, on leaving their main line *viâ* Acton and Gunnersbury. A little to the east of the Earl's Court Station the main lines of the District Company to the Mansion House, and to High-street, Kensington, converge, and in order to avoid the danger of the Midland Company's coal-trains crossing the main lines, and obstructing the great stream of passenger traffic, a subway or low level line, about a quarter of a mile in length, has been constructed, the dip commencing on the south side of the District line a short distance east of the Earl's Court Station. It proceeds by a descending gradient until it reaches the point where the Mansion House and Kensington lines converge, where it crosses under them at a depth of 18 ft. below the main-line level, and thence, by an ascending gradient, forms a junction with the main Kensington line a short distance further in a north-easterly direction. The subway is constructed between concrete walls, 5 ft. in thickness, and in carrying out the work it has been found necessary to underpin Cromwell-road and Knaresborough-road bridges, by brick-work 4 ft. in thickness and 16 ft. in extent. At the point where the subway crosses under the main line, the latter has been reconstructed, iron girders having been thrown across, and the line relaid. Messrs. Lucas & Aird have also executed these last-named works.

THE RELATIONS OF TRADE UNIONS TO WORKING MEN.

Sir,—Trade unions are at present only in their infancy, and necessarily contain much that is crude, and much that is unsound; but by bringing them more into accordance with the natural feelings of Englishmen, and supplying the intellectual requirements of workmen, the crudeness will be removed, and the unsoundness expunged. Granted that the influences of trade unions at the present time are not exerted for the national good, these unions may, nevertheless, be rendered mighty instruments for improving the workman intellectually, and for inciting him to industry and perseverance, as I hope to be enabled to prove on another occasion. I fancy that an error lies at the very roots of trade unions,—the error of supposing that high wages are to be obtained through the agency of strikes, rather than by close, hard study, and superior ability. A man in other walks in life, when he has resolved to emerge from obscurity, and take a place in a higher sphere, sets to work to cultivate his mind, train his faculties, and slowly climb the ladder of fame; and if, as is most probable, hundreds of other persons are emulous of doing the same, it is only by honourable rivalry, concentrated thought, and unwearied labour, that the coveted distinction can be gained. Fortune favours the brave. He who deprives himself of what the world falsely calls pleasure, and plodding steadily onwards, patiently and hopefully executes his self-imposed tasks, will rise—must rise; there is no power on earth sufficiently strong to keep him down. The ambitious lads, the striving workmen, the hard-worked lawyers, and glory-seeking statesmen, should all pursue the objects of their ambition in the same way,—by labouring patiently; not by banding themselves together in their respective trades or professions, and endeavouring to coerce society into conferring upon them the coveted distinctions. Employers are very chary of taking a contract; for, sure as ever they do, and get well into it, the various trades will agitate for an increase of wages. This tends to check all the great industries of the country, and place it in a disadvantage in its competition with other nations; and entails, at times, a great amount of distress, which the additional wage, when won, will not wholly remove for many a day, and which, if these demands are successfully resisted by employers, will hang like a funeral pall upon the homes of thousands. If trade has for a long time been very brisk, and employers have been making fortunes on a large scale, I see no objection to the workman endeavouring to obtain a share of the general prosperity, but I cannot go so far as to assert that the workman employed to do a certain class of work, and paid according to the custom of the trade, can demand to participate in the profits realised by his employer. The workman does the work allotted to him, and is paid for it. It is a simple matter of exchange. The result

of his labour is converted into money by the tact, skill, and experience of the employer. The latter has to run all the risk, to undergo all the anxiety, to provide money to pay his workmen, to procure the work to keep the business going, and to bear all the losses. True, he is dependent upon the labour of workmen for the obtaining of the material to be converted into money, but his capital can always procure labour. He is, therefore, to a very great extent independent of the workman. Were he to close his works, much distress would prevail in consequence, and the workman, thus thrown out of employment, would have,—perhaps at great loss and inconvenience,—to go whither work was to be obtained. If, when trade is very brisk, and employers are rearing colossal fortunes, these employers act ungenerously towards their workmen, the only way in which the latter can effectually enforce their claims is by uniting and making a general stand. Take, for instance, farm-labourers. Every impartial person will readily admit that they have been sadly underpaid; yet a single farm-labourer could not demand from his employer a higher wage than he had previously received, with any probability of obtaining it, whereas by uniting with others of the same class, having the same object in view, he succeeded in obtaining it. I desire to see the antagonism now existing between class and class wholly removed, and the employer and the employed regarding each other with frankness and confidence, settling their differences, as they arise, by some authoritative and established mode,—such as arbitration,—doing away with those appeals to passion and sentiment which only embitter a struggle, and estrange the opposing parties, without producing any beneficial results, but which leave rankling feelings of dislike and mistrust, and afford never-failing themes for the exercise of the fiery eloquence of the professional agitator. Some say that trade unions are opposed to strikes. In theory they may be; but it is indisputable that, in the event of any dispute arising with employers, men invariably look to their societies for assistance, and seldom look in vain, no matter how senseless the dispute or how unworthy of support. For what is this moral and financial support usually given? To enable workmen to obtain increased wages, and to lessen the hours of labour. This cannot fail to operate prejudicially upon the great body of workmen. The natural order of things is overthrown. Instead of having to give nights to study and days to labour in order to obtain a greater wage or a better position, the thing now appears to be effected by joining a society, conforming slavishly to its rules, and demanding more money and less work. But where is all this to stop? Where is the line to be drawn? What is to be the limit of the inflation of wages? Will trade unions press their demands till foreigners have driven us out of the market, and declining industries lead to swift rising discontent and great social disasters?

> "Ill fares the land to hast'ning ills a prey,
> Where wealth accumulates and men decay."

Then, again, the arbitrariness of trade unions is intolerable. The Czar of all the Russias, with his absolute power, is scarcely more despotic than the trade-union leaders. It is unfortunately a fact that demagagues and professional agitators, whilst claiming freedom of thought and liberty of action for themselves, deny these inestimable privileges to their disciples. Individual thought and action are suppressed; and there must be no dissent from their decrees. Why should a man surrender his own opinions to, and place himself wholly in the hands of, a few men who make a living out of trade disputes, and do their best to promote disputes? Why should a man be prevented from gaining an honest livelihood because he refuses to band himself with a body of men whose conduct and views do not meet with his approval? Why should he be hunted out, and have his life made a burden to him? Cannot a man—in this land, too, of all others—do as he likes, work when he likes, and as long as he likes? If he is to be a serf, away with all the rant of liberty of which we hear so much: it is at once a matter of living *by rule*.

To remedy this, Messrs. Schofield & Co., some time ago, proposed to employers in the building trades the formation of what they termed a Freemen's union; the one, great, fundamental rule laid down by them being that "every workman should be allowed to work how, when, and as long as he liked." Now, to my plain, unsophisticated mind, this rule goes to the root of the matter, and proclaims for every man that inexpressible blessing, liberty of action.

> "Determined, hold
> Your independence; for, that once destroy'd,
> Unfounded, Freedom is a morning dream,
> That flits aerial from the spreading eye."

Here, too, is room for advancement. The wings of Genius are not clipped. The man of energy may strike out boldly, and surpass those who will not be equally energetic. There is no royal road to real eminence; but from the summit of the distant object towards which the ardent man is toiling, the voice of Wisdom sounds sweetly and clearly,—"Those that seek me early shall find me." Those desirous of striving for better positions, and those who prize their freedom, can conscientiously acquiesce in this regulation: non-society men would especially feel at home in such a union; and from the mere fact of workmen being brought into direct contact with employers, a removal of a certain amount of prejudice on both sides would inevitably follow. It is not easy to start an association of this kind. The promoters have to contend with under-*currents* of great force. . . . .

This is a splendid field for the exercise of benevolent motives. Educate the men, and draw closer the bonds between them and their employers. Unfortunately, owing to the disturbing influences of striking unions, the working classes have been, and still are, in a state of commotion; and the prospect of a lasting calm appears to be remote. The storm that has been, and is raging, resembles that storm which agitates the depths of the ocean, and arouses old Neptune; for even the quiet, unobtrusive workman is forced to take some part in the struggle. Would that the voice Divine might again be heard above the raging of the elements, uttering those memorable words, "Peace, be still!" Trade unions have their roots deeply embedded in the land. In some respects they have been of real service to the workmen, and were they but brought more into accordance with those grand old institutions, the trade guilds of an age gone by, and made good educational mediums to meet the wants of the present age, I would gladly see their branches spread on every side. Let them allow to every man the birthright he claims as an Englishman, —liberty of action; let them place sound instruction within the reach of every man; let them offer to every man inducements to increase his knowledge, and excel in workmanship; let them endeavour to promote a cordial understanding between the employer and the employed, and remove those restrictions which are detrimental to their dignity; then they will fulfil every purpose, and adapt themselves to every requirement, and freemen's unions, as mooted, will be uncalled for.

THOMAS BALES.

TRADE MATTERS.

SIR,—Your correspondent, "H. H.," asserts that he cannot think of a single union man that has risen. I give him three names,—Joseph Taylor (Pimlico), Robert Neale (Manchester), John Bastow (Bristol), out of scores.

I am in favour of employers accepting unions as inevitable, and I expect to see the time when sub-contracts for labour on large buildings will be let to the *union*, and not to individual men, and the loss or profit shared by the members. Depend on it, wages would not be uniform then, nor would every man that could pay his entrance-fee be admitted a member.

I should like to see the pay-day done away with, and men paid on different days of the week; the payment of all men on one day is a cause of drinking and improvidence.

Mr. Brassey's paper is a valuable one, but it simply consists of statistics. The trade unionist looks at the social aspect. The question he asks is this,—"Why does piece-work always lower and degrade the worker, and the quality of the work executed?" He points to the hatter, the shoemaker, the tailor, the cheap furniture makers, and numerous other trades, that piece-work and excessive labour have reduced to starvation prices, and lowered the position of the workman and the quality of the work. I cannot see, with such an example before them, that we can expect workmen to adopt piece-work, except in very simple operations.

The diminution in the amount of work done in a day is a very serious matter. In my own experience it is one-half what it used to be; in fact, it is become so serious that all calculations as to cost of labour are worthless, as the cost is just what the workmen choose to make it; but I do not think this is confined to the building trade or workmen. How many clerks and draughtsmen are there that write, figure, and draw all the office-hours? And this, I think, the cause of the present state of trade.

The construction of railways and their maintenance, telegraphs, and the growth of the staple industries of the country, have caused a demand for skilled and intelligent labour. Several causes have combined to reduce the supply:—

1st. The abolition of the apprentice system.

2nd. Emigration. This takes the workman away during his productive years, and saddles the country with his cost in helpless infancy, and often returns him to the old country to maintain in old age.

3rd. The false and foolish gentility that sends all the boys for *clerks*, and would rather see them starving, driving a pen, than independent, driving a nail.

All can do something to alter this. Estate owners should insist that their tenants take apprentices where they practise trades. The various charity trustees, where apprentice-fees are given, should see there is a real and not a sham apprenticeship. Youths should be encouraged to learn trades. Twenty years ago the building workmen were recruited from a much higher class than at present.

The building trade is feeling the depression in trade, and the masons would do well to close the strike at once, and if any employers paying 10d. choose to reduce to the 9d. accept it gracefully: it would only strengthen their position. The other branches I hope will be warned by the masons' failure, and not begin a hopeless struggle.

I know your readers will acquit me of any interested motives when I say I belong to a branch of the building trade in which there has been no advance of wages on an average for the last forty years. CLERK OF WORKS.

THE METROPOLITAN BOARD OF WORKS WATER BILLS AND THE LOCAL VESTRIES.

THE two Bills promoted by the Metropolitan Board of Works for purchasing the water companies, and also for constructing new works with the view of obtaining an additional supply, have formed the subject for animated discussions at the meetings of the several local Vestries and district Boards of Works during the past week or two, during which it has been elicited that there is considerable diversity of views, with respect to the two projects, several of these bodies being warmly in favour of the Purchase Bill, and others adverse to it; whilst the proposed New Works Bill appears to meet with the almost universal opposition of the various district authorities within the metropolis.

Amongst the Vestries and Boards of Works which have just expressed their opinions and determination upon the two measures the following may be enumerated:—The Strand Board of Works have pronounced strongly in favour of the Purchase Bill, but have an equally strong objection to the Bill for providing a new supply; and the Bermondsey Vestry have adopted a precisely similar resolution.——The St. Pancras Vestry appear adverse to both Bills, and have been chiefly instrumental in promoting a conference of the several vestries on the subject, when a considerable number of these bodies were represented at the conference, held at the St. Pancras vestry-hall on Friday week.——The general purposes committee of the Islington Vestry, whilst stating that they do not think that the Metropolitan Board had sufficiently consulted the Vestries before deciding on the purchase of the present companies, do not recommend that the Bill be opposed; but that the Bill seeking powers to sink new wells and provide a double supply, ought to be resolutely opposed, as altogether unnecessary.——The Mile-end Vestry likewise support the purchase Bill, but have agreed to petition against the new works and double supply Bill.——At the last meeting of the Rotherhithe Vestry both Bills were warmly supported, and received the sanction of the vestry, and during the discussion it was stated that the constant supply, hydrants in the streets, and the improvement of the quality of the water, which had been recommended by select

committee after select committee, and by commission after commission, could not be effected until the water-supply was placed under municipal authority. Mr. Tolhurst, one of the members, stated that if the interests of the various water companies had been purchased in 1851, the price would not have exceeded 6,000,000*l.*, whereas had it been effected in 1865, the purchase-money would have been 12,000,000*l.*; and that, as a rise was constantly taking place in the value of the several companies, the longer the purchase of the works of the different companies was delayed, so much the more would have to be paid for them. The saving to the metropolis by having the works in the hands of the Metropolitan Board would not be less than 130,000*l.* a year.——The Shoreditch Vestry support the Purchase Bill, but for the present decline to express an opinion as regards the New Works Bill.——St. George's-in-the-East Vestry are in favour of the Purchase Bill, but will assist in the opposition to the New Works Bill, being of opinion that when the Metropolitan Board have acquired possession of the existing works, they will be enabled to improve them to such an extent that a second supply will not be required. ——The St. George, Hanover-square, Vestry intend to offer resistance to both Bills, and have agreed to oppose them on the double grounds that the Metropolitan Board ought not to have the direction of the water-supply of the metropolis, and also on the further ground that the Board is not able efficiently to carry out one-tenth part of the work which it has at present in hand.——The Lewisham Board warmly support the Purchase Bill, but oppose the New Works Bill, stating that they can see no sufficient cause for expending such a vast sum of money in order to carry out Messrs. Bramwell & Easton's high-pressure supply ——The Holborn District Board approve the Purchase Bill, but dissent from the New Works Bill. At the meeting when the first-named Bill was sanctioned, Mr. Jarvis, however, remarked that he dreaded the cost to which the ratepayers would be put by the purchase of the present companies.—— The St. Olave's District Board support both Bills, several members giving their support to the whole scheme, on the ground that nothing could be more unsatisfactory than the present supply. Mr. Sewell, however, opposed the New Supply Bill, stating that the 6,000,000*l.* which it was proposed to expend upon it would be entirely thrown away.

Several other vestries some time ago expressed their views upon the two Bills, some of which are favourable, and others adverse.

NEW MALTING AT BURTON-ON-TRENT.

The malting recently erected in New-street, by Messrs. Bindley & Co., brewers, has now been finished by fixing the machinery for moving the malt and barley, and forms a very compact building.

It is of a substantial character throughout, with hollow outside walls, and Dennett's concrete arches, for equalising the temperature upon the withering-floors.

The bottom floor, forming a basement, is used as an ale-store for the adjoining brewery (this being separated from the malting only by a private road, 19 ft. wide), and the casks are lowered and raised by a direct-acting hydraulic lift, worked from the brewery tank.

The three floors above this are used as withering-floors, one-third of the quantity of barley wetted being worked forward along each floor simultaneously, to the kiln, which forms the end of the building opposite to the cistern. The cistern is placed upon the ground-floor, and upon each of the floors above this are barley garners of considerable size, which empty by means of shoots on to a self-acting Boby machine in the cistern.

The floor above the top withering-floor is fitted with ten malt-bins, each capable of holding about 140 quarters, and with large storage-room for hops in addition. The malt is sent from this floor down a shoot into the hopper of the malt-mill placed in the brewery, thus avoiding considerable expense in the final handling of the malt.

A narrow floor above the malt-bins, forming the upper part of the roof, is used as a screening floor, and it is here that the greater part of the machinery is placed. The motive power is supplied by a six-horse power vertical high-pressure steam-engine, bolted to the wall between the malt-bin floor and the kiln, the steam being taken from the brewery boiler; and this engine by a belt drives a main shaft running along under the ridge of the roof. This shaft by level friction-gear drives an endless chain for raising the barley from wagons outside, and by two sets of plain friction-gear raises the wetted barley from the couch to the two upper withering-floors, and, after withering, from all the floors on to the kiln. The novelty in the machinery, however, consists in the arrangement for moving the dried malt from the kiln-floor. This is done by a worm which runs the whole length of the building, and is continued by an inclined worm (one end of which is hinged and the other end of which can be raised or lowered) to the centre of the kiln, where it is terminated by a hopper. Upon the floor over the malt-bins is a large circular screen driven by an endless rope, this screen being so arranged that it can be moved over all the malt-bins without disconnecting the rope, openings in the worm-box being arranged to suit the varying positions of the screen. In working the machinery, the outer end of the movable worm-box is lowered to a convenient height above the kiln-floor, and the malt is fed into the hopper by one man, who is relieved at intervals. It is carried up this inclined worm-box, having a slope of about 1 in 3, and falls into the long straight worm, by which it is carried to the required point, where it falls into the hopper of the circular screen, and thence, when screened, into the bin; the whole of the work of throwing from kiln, screening, and filling into bins, being performed at the rate of forty-five quarters per hour in one operation.

It only remains to add that the work has been carried out in a satisfactory manner by the different contractors, these being,—for the building Messrs. Bowler & Beck, of Burton-on-Trent; for the building ironwork, Messrs. W. S. Hall & Co., of Nuneaton; and for the machinery, Messrs. Gimson & Co., of Leicester; the whole having been designed by, and erected under the superintendence of, Mr. J. B. Everard, C.E., of Leicester.

THE CONSTRUCTION OF BRIDGES IN FRANCE.

We learn from statistics recently collected that France possesses at present 1,982 large bridges of more or less importance, the aggregate length of which is between sixty-three and sixty-four English miles, and which have been erected at a cost of 11,420,000*l.* Of that number, 861 bridges were in existence at the beginning of this century, sixty-four were erected under the First Empire, 180 under the Restoration, 580 during the reign of Louis-Philippe, while 297 have been constructed since 1848.

The eleven most important bridges, erected at a total expense of 1,864,320*l.*, are the following:—

Bridges.	Length. Feet.	Cost. £.
Bordeaux	1,644	274,000
Cubzac, over the Dordogne	1,788	83,000
Saint-Esprit	2,421	180,000
Toulouse, over the Garonne	—	108,000
Libourne, over the Dordogne	—	168,440
Tours, over the Loire	1,424	169,000
Pont de la Guillotière, Lyons	880	100,000
Pont-Neuf, Paris	758	160,000
Pont d'Iéna, Paris	—	245,400
Rouen	762	258,520
Brest	—	112,000

Of the many bridges of Paris, only two are mentioned in the above table. Some idea of the value represented by the remainder, and their cost of preservation, may be formed from the fact that during the last few years 783,640*l.* have been expended in building and repairing them.

EDINBURGH.

At a meeting of the Town Council of Edinburgh on the 5th instant, a letter from Dr. Wm. Chambers in regard to the proposed restoration of St. Giles's Cathedral, along with a plan and a report by Mr. Wm. Hay, architect, were considered. The aim of the committee is purely national and artistic. They desire to restore to Edinburgh as nearly as possible in its integrity a very noble and interesting work of art, intimately associated with many events in the history of Scotland, and which circumstances have for several centuries shrouded from observation.

It is difficult in any work of this kind to form a very correct estimate of the cost, but it may be assumed from the experience gained in the recent restorations of the choir that the value of the old materials would defray the cost of removing the seating, galleries, stone stairs, &c.; and that a sum of no less than 1,500*l.* would be required for the intended restorations, exclusive of what might be expended on the stalls proposed for the Order of the Thistle.

A new place of worship for the Free Tron congregation, which has been erected in Chambers-street, Edinburgh, was opened on the 6th inst. by the Rev. Donald Fraser, London. The church, which is in the Lombardic style of architecture, has cost over 6,500*l.* Mr. R. Thornton Shiells is the architect.

MESSRS. CROSSE & BLACKWELL'S NEW BUILDINGS IN CROWN-STREET.

A very extensive new manufactory is at present in course of erection for Messrs. Crosse & Blackwell, in Crown-street, New Oxford-street, nearly opposite Tottenham-court-road. The building covers a ground area of nearly 6,000 superficial feet, and is unusually lofty, being carried to a height of 76 ft. It has two prominent frontages, the Crown-street elevation being 80 ft. long, with another elevation of similar character in Sutton-street, running from east to west, to the extent of 90 ft. in length. The building contains five floors and a deep basement, each floor containing a range of large double mullion windows, with iron columns and sashes. The fourth-floor windows are arched in Portland stone, which is freely introduced on the entire face of the elevation, the whole of the window dressings, ornamental bands, and cornices being of this material, whilst the main body of the frontages are in red brick, with panels in Pether's brick under the windows of each floor. Piers in red brick, 2 ft. in width, and projecting considerably beyond the main face of the elevation, are carried up from the ground-line, between each floor window, to the main cornice, up to which point the building is 58 ft. in height. The fifth floor is in the high-pitched roof, and this is surmounted by lancet lights carried over the entire area. At the north-east angle of the building there is a tower, surmounted by a spire, the entire height of which is 94 ft. The tower, the elevation of which is faced with Portland stone, contains a range of four Gothic windows, having stone heads and mullions, with red brick arches and stone keys, the frontages of the tower being still further ornamented with yellow brick in diamond pattern. The spire is slated in blue and purple, with green bands. Internally, the building is very strongly constructed. Each floor is supported on strong iron columns and iron flitch girders, the floor joists being 11 in. by 3 in. in thickness, and the floor-boards 2 in. thick, strengthened with hoop-iron tongues. The ground-floor is arched over in brickwork, and made entirely fireproof.

Mr. Roumieu is the architect; Messrs. Macey & Son are the contractors; and Mr. Bailey superintended the erection of the building as clerk of the works. The estimated cost of the works is 15,000*l.*

It may be stated that the building is intended exclusively for carrying on the manufacturing department of Messrs. Crosse & Blackwell's business.

LINCOLN SCHOOL OF ART.

The annual meeting was held on January 31st, under the presidency of the Mayor, the Bishop of Lincoln distributing the medals and prizes obtained by the students. These included three gold medals, four silver, two bronze, and nine prizes in the National competition, in addition to twenty-five third-grade prizes and twenty second-grade prizes. The gold medals are for painting from nature in oil (F. Bramley) and water-colour (F. Harris), and for painting the human figure from life in oil (F. Bramley); three of the silver medals were for the same stages, the fourth being for machine-drawing. Those connected with the school claim that for several years this school has taken the highest and largest number of awards in the national competition for the above stages, and that this year the awards place it at the head of all the schools of art.

For painting the figure from life only three awards were made to all the schools of art, viz., one gold, one silver, and one bronze,—the gold and bronze falling to Lincoln; and out of a total of nine awards to machine-drawing, six fell to Lincoln.

Mr. Edward R. Taylor, who has been master from the opening of the school in 1863, was recently appointed head-master of the Birmingham School of Art; and Mr. A. W. Webster, of South Kensington, is his successor at Lincoln.

MR. NORMAN SHAW'S OPEN SOIL-PIPE.

SIR,—So much has already been written since the publication of Mr. Norman Shaw's essay on the open soil-pipe that my remarks would perhaps be uninteresting if I were not in a position to give the results of a few simple experiments I made with Mr. Shaw at his own house.

Before describing them, however, I cannot help remarking that some correspondents on the subject have wandered considerably from the point, and have gone so far as to dilate upon systems of ventilating sewers. The question to be dealt with only relates to the means of ventilating the soil-pipe, and connecting the house-drain with the present sewers, imperfectly ventilated, I admit, but nevertheless beyond the control of the architect or house-builder.

Mr. Norman Shaw describes a plan he adopted, he believed, with complete success, and without any pretension of having discovered an "only safe method" or a system capable of universal application, invited free criticism on his plan and suggestions for improvement. He is only dogmatic once, and that is where, in reference to his system, he says, "And as it is absolutely impossible for sewer gas to enter a house where it is used, it follows that the occupants are free from all danger from this source."

The chief novelty in the plan advocated is the disconnexion of the pipe at the nearest or most convenient point below the closets. The main question is, Whether it is better that the effluvium caused by the fouling of the pipe or the sewer gas that may pass the syphon trap should be discharged at such point of disconnexion or above the roof of the house?

It is somewhat beyond the province of the architect or engineer to determine how much or how little sewer-gas or offensive effluvium may be injurious to health. What he has to do is to devise the simplest and most perfect means for reducing the danger to a minimum. It is my firm conviction that the plan advocated by Mr. Norman Shaw does not accomplish this object.

The illustration in Mr. Shaw's pamphlet shows his system as applied to his own house, which is situated on a hill, at a considerable distance from any other dwelling, and is drained into the public sewer in the road, from which it is distant some 50 ft. or 60 ft. In the centre of the road, a few feet higher up the hill, is one of the ventilators of this sewer, so that the pressure of gas upon his syphon would probably at no time be great.

We first went into the upper water-closets, and there, even when the handle was raised and the water had ceased to run, I could not detect any smell. I then let down the handle, thus closing the valve, but leaving no water in the basin, removed the grating at the foot of the soil-pipe, and burnt some ozone paper, holding it a few inches up the pipe; in a few seconds the smoke issued from the head of the soil-pipe at the junction of the stack-pipe with the soil-pipe, then from the upper joints, and lastly at the head of the stack-pipe. A puff of wind at the moment blew the smoke from the open head and the joints of the stack-pipe against two or three of the windows, and upon re-entering the house and ascending the staircase I could distinctly smell the smoke. We waited until no more smoke issued from the open head, and then gently raised the handle in the closet without letting the water run: a small quantity of smoke rose into the basin and the smell was quite strong, thus demonstrating that a certain quantity of smoke had accumulated in the length of pipe between the basin and the open head. I next went into the lower closet, which adjoins the housemaid's sink, and is evidently used much more frequently than the upper one. It so happened that the previous visitor had used the apparatus carelessly; there was a disagreeable smell. Upon opening the valve wide, a strong offensive smell arose,—a smell similar to that from a foul container. I thought this smell might be got rid of by letting water down; but, notwithstanding several good flushes, the smell still remained.

Reference to the diagram will show that the arm from the closet is considerably shorter than that from the upper one; and I attribute the smell to the foulness of the pipe caused by the more frequent use of the closet and the flatter bend of the arm.

The next experiment was with a view to ascertain whether any sewer gas that might escape through the syphon trap would come out at the grating, or pass up the pipe. For this purpose I put some lighted ozone paper into a gallipot, and by means of a string lowered it into the drain-pipe, and replaced the grating. The smoke passed up the pipes as before, very little indeed issuing from the grating. During this experiment the water was allowed to remain in the basins, and the w.c. doors were closed. Upon re-entering the house, a strong smell of the smoke pervaded the staircase. We waited as before, until no smoke could be seen issuing from the open head or joints of the pipe, and then flushed the closets, but, upon opening the valve, we found that notwithstanding the flush a strong smell of smoke proceeded up the pipe.

If such results as I have described arise in connexion with a house standing as Mr. Shaw's does, how much more would the evil be magnified where houses are closely packed together? Mr. Norman Shaw is only seeking for truth, and I feel sure he will be the first to admit that these experiments have demonstrated that the system he suggested is not "perfectly efficient," nor that "it is absolutely impossible for sewer-gas to enter a house where it is used."

I have no hesitation in expressing my own opinion that the ventilation of the trap and soil-pipe by means of a pipe of adequate size, with air-tight joints carried above the roofs with a cowl, or, more properly, an exhaust ventilator, with, of course, a proper inlet for air, or a ventilating trap judiciously placed according to varying circumstances, is the best plan that has yet been devised for preventing sewer-gas from entering houses.

ERNEST TURNER.

WATER SUPPLY.

SIR,—The letter of "Metis," in the *Builder* of the 9th of February, raises an inquiry on a subject as to which I have for some time contemplated inviting the attention of inventors.

An inch of rainfall on an acre of ground is equal to 100 tons of water.

For the supply of an urban population an allowance of 50 tons of water per head per annum is ample.

The rainfall of England may be taken, in ordinary years, at an average of 36 in. The rainfall of the Thames Valley, in the dryest year ever measured, was 16·1 in. Thus the rainfall on an acre of roof in the metropolis is enough to supply the wants of thirty-two inhabitants, in the dryest season.

As to the catching a sufficient quantity of water, there can be no difficulty. The point for men of science to attend to, is the instant purification of the water as it falls. If, for example, the water from a roof, instead of being collected, soot and all impurities together, in a water-butt, were made to flow through a surface of prepared charcoal or other good filtering material, into a closed receptacle, would it not at once give something better than we find supplied by the water companies?

I purposely abstain from offering any more definite suggestion as to the means of securing purity, limpidity, and sparkle. An object so very simple is surely not beyond the reach of the chemical science of the day.

A little attention paid to this subject would enable a large number of urban residents to attain a very considerable degree of independence, with regard to the water companies. To introduce a competitive supply from heaven itself would certainly be the best means of improving the water sold by these great corporations. All that is required is a swift, simple, cheap, and effective mode of making rainwater pure and palatable. Are we, in the present day, to ask this in vain of our men of science?

F. R. C.

Fire in a Church.—A fire has occurred in Free St. Andrew's Church, Dundee. The congregation were in the middle of the first prayer. A sort of panic ensued, but the minister calmed the congregation, and so prevented disastrous consequences. The fire was caused by an overheated stove, and was got under in a short time. Part of the roof fell in, and the damage done by water is considerable.

"LIFE IN LONDON."

SIR,—In the article upon the late George Cruikshank, published in the *Builder* of Saturday, February 9, the following passage occurs:—"Among the early works was 'Life in London,' a series of designs intended to represent the dangers which befell the youth bent on 'seeing life,' and which were, we are told, so misunderstood by the person who contributed the literary portion of the moralising, that Cruikshank threw it up in disgust, and left his brother Robert to finish the designs."

In this paragraph I *know* there to be not a syllable of truth either in what is asserted or what is implied. That "the person" who contributed the literary portion did not misunderstand the purport of the work needs no vindication of mine. The finish to "Life in London" answers that misstatement. That Cruikshank "threw it up in disgust" is even more untrue. I have already, in a communication to a daily contemporary, stated that the secession of Mr. George Cruikshank from his engagement on "Life in London" was *not* occasioned by his being "emphatically a moralist."

Such a statement, if it were not a slander on the author and on his dead brother Robert, would be painfully ludicrous in its falsity.

With reference to the misplaced sneer at "the person" who contributed the literary portion of the work, I may say, in mere justice to him, that his popularity extended to all parts of the globe where the English language is read or spoken; that his society was courted by the most distinguished men of his day, by most of the peerage, even up to royalty itself; and as regards his literary ability to understand his *own* design and *own* work, one of his most encomiastic critics and warmest admirers was the late Professor Wilson (Christopher North), as the pages of *Blackwood* will testify.

As you have not hesitated, Sir, in publishing a mis-statement defamatory to the reputation and memory of my late father, I expect you, in common justice, to afford me this opportunity to flatly contradict it.

PIERCE EGAN.

*** The remark that Cruikshank was "emphatically a moralist" had no reference whatever to the fact of his having thrown up "Life in London," but to the tenour of his work generally, as we should think would be obvious to any one who read the article. The statement Mr. Egan complains of was made on what we believed to be reliable authority; and the expression "person" was not intended as a "sneer." Mr. Egan does not tell us why Cruikshank did throw up the engagement.

THE OBELISK.

ALL things considered, we are disposed to recommend the site on which the model is now set up as the best permanent site for the obelisk. It will be remembered that we have all along, from the first, recommended the Embankment as the position for best combining a fine effect with convenience for safe conveyance of the block into position, without unnecessary cost and without the risk to public property which would certainly be incurred in taking it any distance through the streets of London. Our idea, however, was of a specially formed site or *place* in the centre of the Embankment Gardens, opposite one of the streets leading up to the Strand and combined with a flight of steps giving communication between the Strand and the gardens; and we even (as we partly hinted) looked to the possibility of the obelisk, when so placed, forming eventually the culminating point of a new and more handsome communication between the Strand and the river than at present exists, when an opportunity came of rebuilding some of the property south of the Strand, which so very much needs re-arranging. And we still think that, in view of a large scheme of that kind, the garden site, properly treated, would be the best. But we recognise the fact that the obelisk could not be so treated without a considerable expense in laying out the site in the gardens, to give it a dignified effect; and that from various circumstances it is not likely that at present such expenditure would be entered into, either out of the private or public purse. And the present position has the advantage of economy, of a clear view of the obelisk on all sides, and of the long horizontal line of the Embankment wall as a base to contrast with the vertical line of the obelisk. We do not

believe any position will be found which will be so effective and so generally satisfactory with so little outlay or alteration; and therefore desire definitely to support it as the best solution of the question practicable.

But while approving of the position in general, we must point out a decided defect in detail, which was what induced us, on first glancing at the site last week, before the model was finished, to doubt it. The position is flanked by two of the great senseless blocks of granite masonry, having no meaning whatever, which were built up on the Embankment through some wonderful idea of engineering æsthetics. Mr. Dixon, judging from his letter in the *Times*, in which he spoke of the obelisk as being flanked by "the granite masses of the embankment," seemed to regard these blocks as an advantage. But the fact is they will look more useless than ever when the obelisk is erected between them, and will be very much in the way and hide its base. Our first impression, that they would actually hide a considerable part of the obelisk itself, is, we are glad to see, incorrect, as the model is shown mounted on a base sufficiently high to clear them; and but for this it would have been impossible to regard the arrangement with a word of favour. But even as it is, the position of these flanking masses is most objectionable, as they hide the real base of the obelisk from a distance, while they render it necessary to raise and elaborate the base so much as to look very bad when we do get into a position to see it. As the model stands now, in order to show the whole of the obelisk it is raised upon a complication, first of three rather shallow and wide steps, then a plinth of about double their height, then a large pedestal about as high as it is wide; and on the top of all this comes the obelisk. This complication of base injures its simplicity and monumental character, and makes it look too much as if perched up in the air rather than on the ground.

What is wanted is simply this: the two side-blocks should be taken down to about the lowest course of masonry above the plinth moulding, so as to remove the whole of the "panel" (a most absurd feature in granite design), and leave them with the appearance of a plinth with a blocking, sufficiently high to stop the Embankment balustrade. The real base of the obelisk could then be lowered to more suitable proportions, and would at the same time be much better seen. A couple of absurd and unmeaning erections would be got rid of, or at least reduced to sensible proportions, and would then have a real meaning as "stops" to the line of the Embankment on either side of the obelisk, instead of standing up and concealing its base and looking as if they wanted something else to complete them. The alteration is one very easily made, and when it is made the position will be in almost every respect satisfactory.

THE PENGE NEW PUBLIC OFFICES.

It has been decided that the new public offices which are about to be erected at Penge shall not be carried out in the manner at first intended. According to the original design they were to have been built in Kentish rag-stone, but at the suggestion of the local board, Mr. Elkington, the architect, has made considerable alterations in the plans, and the building will now be erected in red brick. Other alterations of a varied character have likewise been made, but the size and capacity of the board-room and other apartments as originally designed will be adhered to. The alterations have been made with the view of reducing the estimated cost of the building, which the Board considered excessive. The contract price of the building as altered is 4,341*l.*; a saving of 1,000*l.* will be effected as compared with the cost of carrying out the original design; and this sum includes the heating apparatus, which was not in the first contract. Messrs. Bowyer are the contractors.

The Artisans' Institute, Castle-street.—The Rev. Henry Solly has resigned the office of principal, but will perform its duties till May. Mr. Solly says in a letter to the members,—"Much money, labour, and time have been spent on this Institute, and though the results have been far from adequate to the expenditure, and disappointing in some respects beyond what we could reasonably expect, there can be no doubt (happily) that it has borne much good fruit, and we believe of a permanent character."

THE CARPENTERS AND JOINERS.

Sir,—At the conference on Monday last between the deputation of the Amalgamated Society of Carpenters and Joiners and the Master Builders' Association, among other matters in the resolution handed to the deputation was the following notice:—"If the workmen found the time inconvenient for commencing work, an alteration might be made by the men commencing work at half-past six instead of six a.m., and leaving off at half-past five instead of at five p.m."

I would cordially recommend the adoption of the same hours to the Painters' and Decorators' firms. I think it would be a great advantage to all, for since the stoppage of the early morning trains upon the Metropolitan Railway great numbers of workmen are not at their work at six o'clock, thus causing great loss of time and inconvenience. It is preferable for all to begin work, to suspend work for meals, and to leave off, at the same hour. It would prevent many petty thefts of tools and materials which continually occur, often in consequence of the disorder caused by the men coming in and leaving at irregular times.

I shall be glad to see such an alteration in the hours made, as I believe it would be a mutual advantage to clients, masters, and workmen. I may mention that in our shop half-past six was formerly the time of commencement, and always answered very well.

William Pitman.

BRICK-BURNING.

Sir,—With the view to assist Thomas Free, who wrote in a recent number of the *Builder* as to the making of sound bricks, I would wish to draw his attention to the fact that all strong clays shrink greatly in drying, and when new green bricks are dried too quickly, the outside will dry before the body of the brick has had time to dry and shrink: consequently, the outside skin, not being elastic, must be torn into a network of minute cracks, all over the surface of the brick; in this case it would be useful to add more sand to the clay (causing them to shrink less), and to give more time in the drying to such highly-pressed bricks. The same unsoundness may also be caused by trying to burn the bricks before they are properly dried, and firing too briskly at first. They will be injured not only from the causes mentioned above, but also from the water they contain being converted into steam, which softens and bursts the brick as it is driven off by the heat that is applied too suddenly. I hope that the above hints may be of use to your correspondent, and elicit some other opinions on the important subject of brick-burning,—one that is seldom written about, but has much to do with the sanitary progress so earnestly advocated in your pages.

Robert McDermott.

TURNCOCKS.

Sir,—In Captain Shaw's report on the operations of the Fire Brigade during last year (as summarised in an evening paper) allusion is made to the "late attendance or non-attendance of turncocks in certain cases." It has always struck me as extremely absurd that the Fire Brigade, on whom the safety of London depends, should be hampered by having to wait upon the water companies. It may be a long time before the new water system for all London proposed by the Metropolitan Board is in force, and even before the general use, with proper pressure, of hydrants, but surely a very short legislative remedy might be applied to the Acts instituting the water companies, giving the officers of the Fire Brigade control over the water supply when a fire occurs.

An intelligent body of men like those under Captain Shaw might in a very short time be taught the mystery of the keys and the situation of the mains, and their relative influence in every locality, in order to act promptly and independently. A set of turnkeys should form part of the equipment of each fire-engine.

Householder.

Jordan's Excelsior Appliances.—This patentee claims that his mode of building in concrete is a "decorative and finished system"; as his appliances admit of the introduction of facing tiles, quoins, cornices, and strings. A pamphlet issued by him gives full particulars, and includes comparative estimates.

ARCHITECTS' RESPONSIBILITIES.

CLARK & CO. *v.* LONDON AND PROVINCIAL BANK.

In this action, at the Bloomsbury County Court, before Mr. Judge Russell, the plaintiffs, patentees and manufacturers of the patent revolving shutters, of Rathbone-place, sued the defendants to recover the sum of 17*l.* 14*s.*, for revolving shutters supplied to the branch establishment at Grays, in Essex.

Mr. Charles Williams appeared as solicitor for the plaintiffs, while the defendants were represented by Mr. Roland as counsel.

It transpired from Mr. Williams's opening that on the 27th of November last Mr. Gosling, the defendants' architect, ordered the shutters in question, and Mr. Williams was about to call Mr. Taylor, the plaintiffs' manager, when Mr. Roland said at once that his evidence was immaterial, as his clients were in no way responsible, as Mr. Gosling had ordered the shutters, and not the present defendants.

Mr. Williams here interposed by stating that no certificate on which the architect relied was given, but the builder had allowed the contract price to be set off against his overdrawn account with the bank.

The learned Judge said he would hear the manager's statement. The manager said he received the order in question from Mr. Gosling, by letter, on the 27th of November last, to supply the shutters in question, which letter he now produced in court. He further stated, in reply to Mr. Charles Williams, that he had no knowledge whatever of the builder Higgins, but had he known him, he would not have given him credit.

At this stage of the case, the learned Judge considered that Mr. Gosling appeared to have gone beyond his power in pledging the credit of his employers, and that unless some "parole" evidence was adduced, he should rule in favour of the defendants.

Mr. Gosling was then called, who stated he was an architect, of George-street, Mansion House, and said he saw defendants' manager, and told him he had ordered the shutters, and on the 14th of December he wrote to the manager telling him that the shutters would be sent off the following day, with a man to fix them.

At this stage of the case, the learned Judge remarked that he considered, from the evidence adduced, Mr. Gosling had gone beyond his authority in pledging the credit of the Bank.

Mr. Williams urged that this was a practice constantly done by professional men in Mr. Gosling's position, who were entrusted to carry out the wishes of their clients.

The learned Judge here said that it appeared to him that Higgins, who was the builder and contractor, was the fit person to sue, as it was his business to supply all that was necessary under an architect's certificate, and therefore was liable if any one else was. In saying that his Honour said he had no doubt in his own mind that Mr. Gosling had acted in perfect good faith, although somewhat in excess of his duty.

Mr. Williams said that after his Honour's remarks he hoped that such a representative case would be made a matter of publicity, in which observation his Honour concurred.

Judgment was therefore entered in favour of the defendants, with the costs of counsel, attorney, and witnesses.

Mr. Williams here said he should ask the Court to give leave to appeal, which application the Judge at once granted.

LIGHT AND AIR CASE.

THE BELVOIR AND PIER HOTEL COMPANY *v.* WYNNE.

In this case (which came before the Master of the Rolls on the 11th inst.), the plaintiffs sought to restrain the defendant from obstructing the access of light and air to their hotel by erecting buildings on the opposite side of the way in Church-street, Rhyl.

The case came first before the Court on the 8th of March last, on a motion by the plaintiffs for an injunction to restrain the defendant from erecting his buildings so as to interfere with the light and air of the plaintiffs. The injunction was granted, and thereupon the defendant altered his plans, and built according to such altered plans. On the 11th of May a motion was made to commit the defendant for a breach of the injunction; but upon an undertaking being given not to proceed with the building, this motion was ordered to stand over till the hearing. The hearing came on on Monday, and the question to be decided was whether the defendant's buildings as altered obstructed the access of light and air to the plaintiffs' hotel. Plaintiffs alleged that they did, and asked for a mandatory injunction to pull down the parts of the defendant's buildings which interfered with plaintiffs' hotel. Defendant contended that the light in the plaintiffs' hotel was as good now as formerly.

His Lordship held that it was not a case for an injunction, but only for damages, and these he directed should be assessed by one of the official referees. He also gave the plaintiffs their costs.

St. Barnabas's Church, Warrington.—Six architects were invited to send in designs in competition for the erection of the proposed new church of St. Barnabas, in Lovely-lane, and (according to the *Warrington Guardian*) four of them responded to the invitation. These were Mr. Owen and Mr. Pierpoint, of Warrington; Mr. C. O. Ellison, of Liverpool; and Mr. Whitley, of Dover. The other two gentlemen who were invited to compete, but did not do so, were Mr. J. Douglas, of Chester; and Mr. John White, of Warrington. The Building Committee selected the design with the motto "Truth," which, on the sealed letter being opened, was found to belong to Mr. Owen. Mr. Owen's design shows a structure in the Early English style, with a bold but not too prominent tower and spire.

Books Received.

Lectures on the Labour Question. By THOMAS BRASSEY, M.P. London: Longmans. 1878.

JUST now that some attention has been directed in the architectural world to Mr. Brassey's ideas in regard to the labour question, we may suitably mention that his previous lectures on this subject have been published in a collected form. The author especially says that he does not claim to say anything new on the subject, but aims at directing the attention of the labouring classes to truths in which they are so deeply concerned. The lectures are eleven in number, delivered at different times and places, but all within a recent period; including such subjects as "Capital and Labour," "Co-operative Production," "Labour at Home and Abroad," &c., their general characteristic being the application, in a common-sense manner, and in very straightforward language, of recognised theories of political economy to practical life. Turning over the leaves, our eye is caught by two sentences, which we may quote,—one addressed to capitalists, another to labourers. The first is the remark how "the tendency of the different classes to occupy separate quarters brings many social evils in its train,—want of sympathy, indifference, it may be hostility, between the poor and the rich. It is much to be lamented that our successful employers of labour are so anxious to withdraw from the scene of their labours, and become country gentlemen, members of Parliament, or residents abroad. . . . . The withdrawal of the personal influence of the employer, just when it is becoming most valuable, is much to be regretted. . . . . More frequent and familiar interchange of thought would break down the barriers which divide the different orders and conditions of men, and a kindlier spirit would pervade the atmosphere in which we live." This is what Charles Kingsley (almost the first, perhaps) preached many years ago in "Yeast," and which a few,—but a very few,—are trying to carry out now; but, on the whole, we fear this tendency to withdrawal is stronger than ever. The other sentence referred to is one of great significance at present: "I believe that better machinery, a higher intelligence, improved skill, and *greater diligence during the hours of labour*, will effectually counteract the tendency of higher wages to increase the cost of production. The working people have the control of this question in their own hands. By higher skill or greater diligence they may increase their wages, without adding to the cost of production."

Conversations with Little Geologists on the Six Days of Creation. Illustrated with a Geological Chart. By J. W. GROVER, C.E. London: E. Stanford. 1878.

IN this publication Mr. Grover seeks to convey to juvenile minds some of the leading facts in the story of Creation. It was prepared originally entirely for the use of his own children, but has found its way into print through some friends who have taken a kindly interest in it. Although the treatise is a small one, the subject is very large, and is explained by a coloured chart, showing the order in which creation occurred, as taught both by geology and Genesis. Mr. Grover boldly cuts the knot of a difficulty by regarding without comment the seven "days" as seven periods of unknown duration. Without reference to any theological question, however, the "Conversations" are calculated to convey to young minds a considerable amount of knowledge. They are written in a reverent and charming spirit, and deserve to be widely circulated.

VARIORUM.

AN abridged version of "The Life of Sir William Fairbairn, F.R.S.," by William Pole, has been published by Messrs. Longmans, Green, & Co., and makes a charming book, calculated to interest all who take it up. We reviewed with much commendation the larger original work when it appeared; the intention of the present issue is to place the personal narrative at small cost within the reach of those who do not desire the scientific and technical portions at full length.——"The Art of House-Painting," by John Stevens (Trübner & Co.), is a little book from America. By painters who have never read a book about their own trade, it will be found to contain some useful hints. It deals, however, with only the commonest sort of work, and is entirely elementary.——*Belgravia*, the *Gentleman's Magazine*, the *Victoria Magazine*, Cassell's *Family Magazine*, the *Quiver*, and several other monthlies, have reached us, and seem all up to their own usual level. The amount of literature of this kind now provided is immense.——"Great Industries of Great Britain" says of wire rope:—"The use of iron as a substitute for hemp originated about forty years ago, with Mr. G. W. Binks, of Poplar, then foreman ropemaker at Woolwich Dockyard. Owing to various causes, hemp had become very scarce and dear, the price at one time reaching 4*l.* per cwt. This led to experiments being made with the view of discovering some fibre that would take the place of hemp, and render us independent of the vicissitudes to which the hemp-growers of Russia were subject. Mr. Binks procured some fine iron wire, and tested its utility in the form of a cord. He was surprised at the strength displayed by this baby iron rope, and submitted specimens to the Admiralty. The officials in that department pooh-poohed the idea of rigging a ship with iron, and Mr. Binks met with no encouragement at their hands. A captain on board one of Her Majesty's ships came to Mr. Binks's aid, however, and enabled him to establish a small wire-rope manufactory at Grimsby. This was in 1835, and it was a considerable time later than that before the invention was fully appreciated. Now there are nearly as many manufactories in the country for making wire-rope as there are for making ropes of hemp, and the uses of their products are almost innumerable. Cords made of copper and brass wire have also taken the place of hemp for certain purposes. Besides supplying an extensive and rapidly-increasing home demand, our wire-rope makers export to the value of about a million sterling per annum."

Miscellanea.

The Thirlmere Water Scheme.—The Manchester Corporation (Water) Bill came before the House of Commons on Tuesday, when Mr. E. S. Howard moved the rejection of the measure, on the ground that it was simply a project to enable Manchester to make a profit out of a monopoly which would destroy some of the most picturesque scenery of Cumberland. To this it was rejoined by Mr. Birley, Mr. Jacob Bright, and others, that the question of scenery was one on which the arbiters of taste were not agreed, and that a scheme of great social utility ought not to be set aside on merely æsthetic considerations. Mr. Raikes suggested that the House ought, in the first instance, to decide whether Manchester really wanted the water. Eventually at the suggestion of Mr. Sclater-Booth, the Bill was read a second time, on the understanding that it should be referred to a hybrid committee, composed of five members to be chosen by the House, and four by the committee of selection.

Men and their Employers in Germany. The Emperor of Germany, in his recent speech to Parliament, said:—"To satisfy the wishes expressed in your last session, two Bills have been drawn up for the purpose of amending the existing laws on industry and commerce. One of these Bills regulates the relations between working men and their employers; the other provides for the establishment of special Courts to decide promptly and equitably any differences arising in the pursuit of industry and trade. Both Bills are designed to remove difficulties affecting the development of our industry, and doubly felt at the present time in the lasting depression of commerce."

The Fall of Houses in the Haymarket. Mr. St. Clair Bedford, the coroner for Westminster, resumed the inquiry at the Vestry-hall, St. Martin's-place, Trafalgar-place, on the 8th inst., into the cause of the death of Mr. William Baron, an oyster-merchant, who was killed by the fall of his house in the Haymarket, on the 17th ult. The coroner informed the Court that he had received a notice from Mr. Vulliamy, of the Metropolitan Board of Works, informing him that the examination and investigation of the property would take at least ten days longer, and, therefore, he should have to adjourn the inquiry until Wednesday, the 27th inst. The inquiry was therefore adjourned.

Royal Architectural Museum.—The Skinners' Company have given ten guineas in aid of the fund for promoting technical education at the Architectural Museum, Westminster.

Hemming's-row.—On the 8th inst. the Right Hon. J. Gerard Noel, her Majesty's First Commissioner of Works, received a deputation from the Vestry of St. Martin-in-the-fields, who called his attention to the National Gallery improvement scheme as connected with the widening of Hemming's-row. The gentlemen severally addressed the First Commissioner, and from their statements it appears that eleven years ago the authorities of the parish sold to the Commissioners of Works the old workhouse in Hemming's-row, and surrendered to them Duke's-court and a piece of ground in Castle-street, then open, but since enclosed as a part of the barracks, on the understanding that the Government would remove the workhouse building and put back the line of building 30 ft., and to improve the roadway of Hemming's-row by that amount of space. Mr. Gerard Noel admitted that the building was an unsightly one, and said the extent of his duties in the House of Commons prevented him from viewing it that day, but he would take the matter into his immediate favourable consideration, and would communicate with the Vestry.

New Post-office, Stockton.—After considerable negotiations, the Government have approved of a site for a new building in Mill-lane, Stockton, a short distance from the High-street, and the carrying out of the work has been let to Mr. J. W. Davison, builder, of Stockton, who has engaged to complete it by March, 1879. The building, the design of which is Italian, will contain on the basement floor telegraph inspector's room, battery, store and retiring rooms, and will be lighted from the front and sides, a space of several feet intervening between the walls of the adjoining property and those of the new building.

Conference of Working Men.—A Conference, attended by 150 working-men delegates, was held in Bristol on Tuesday night, and lasted five hours. Speeches were made by Mr. Morley, M.P., Mr. Macdonald, M.P., Mr. Halliday, and other working-class leaders, and various causes were assigned for the present depression in trade. Ultimately it was resolved that in the opinion of the Conference the establishment of a just and comprehensive system of conciliation in the settlement of disputes between employers and employed would tend to the benefit of both classes and the nation at large.

The Brighton Spring Loan Exhibition will be opened this Friday, the 15th instant. The collection includes a number of interesting sketches and studies.

TENDERS

For making-up new roads, footpaths, &c., for the borough of Portsmouth Urban Sanitary Authority. Mr. G. Adames, engineer:—

Contract No. 25.—Campbell-road Block.

Ward	£5,001 9 9
W. R. & C. Light	4,784 13 11
Hayter (accepted)	4,706 7 5

Contract No. 27.—Somerset-road Block.

H. & W. Evans	£2,567 10 5
Ward	2,416 3 8
Hayter (accepted)	2,321 4 1

For workshops, in Albion-street, and alterations to premises, 37, Caledonian-road, N., for Messrs. J. & H. Cooper. Messrs. John Saville & Son, architects:—

Lart & Son	£530 0 0
Sims	475 0 0
Cocks	449 0 0
Fawkes	420 0 0
Wicks	420 0 0
Gann	405 13 0

For the erection of vicarage, Brockenhurst, Hants. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard:

Smith, Waters, & Co.	£3,532 0 0
Hoare Bros. & Walden	3,206 0 0
Rushley & Springer	3,144 0 0
Burkett	3,100 0 0
Hoofenhurst & Son	3,050 0 0
Cooke	2,999 0 0
Hammerton Bros. & Vine	2,905 0 0
Alridge	2,736 0 0

For proposed alterations and repairs to the Crown and Sceptre, Streatham-hill, for Mr. T. Cribb. Mr. W. J. Miller, architect. Quantities supplied:—

Lauble	£2,591 0 0
Bishop	2,260 0 0
Taylor	2,134 0 0
Bassett & Son	2,100 10 0
Higgs	2,012 0 0

For the erection of a house at Great Peindon, Essex. Messrs. Lee Bros. & Pain, architects. Quantities supplied:—

Field & Son	£3,836 0 0
Patrick	3,249 0 0
Buntley	3,192 0 0
L. H. & R. Roberts	3,134 0 0
Hunt	3,093 0 0
Gasscock	3,076 0 0

For the erection of presbytery, Anerley, Surrey. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard :—

Adamson & Son	£1,515	0	0
Bayes Bros. & Allen	1,406	0	0
Anley	1,385	0	0
Bangs & Co.	1,368	0	0
Falkner	1,351	0	0
Stamp & Bowtle	1,341	0	0

For the erection of school-chapel, Mansfield, Notts. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard :—

Allen	£1,213	7	6
Parsons	1,045	0	0
Johnson	1,037	0	0
Brailsford & Brown	1,029	0	0
Vallance & Sons	1,000	0	0
Fisher Bros.	989	0	0
C. & J. Harvey	839	0	0
Vallance	828	0	0
Brown & Copestake	813	6	0
Greenwood	808	12	3

For the restoration of Coverham Church, Yorks. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard :—

Young	£1,989	0	0
Osborne	1,960	0	0
Wood	1,865	0	0
Kitchin	1,785	0	0
Maiver	1,780	0	0
Moore	1,747	0	0
Jones & Sons	1,590	0	0
Pearson & Horn	1,290	0	0

For the erection of a house at Putney. Lee Bros. & Pain, architects. Quantities supplied :—

Pain (accepted)	£3,452	0	0

For Local Board Offices, Surveyor's house, and engine-house, for the Wimbledon Local Board. Mr. T. Goodchild, architect. Quantities by Messrs. Welch & Atkinson :—

Shearburn	£4,740	0	0
Hickinbotham	4,556	0	0
Braid	4,400	0	0
Robinson	4,289	0	0
Linfield	4,235	0	0
Hunt	4,008	0	0
Ackerman	3,995	0	0
Harmer	3,985	0	0
Garrud (accepted)	3,783	5	0

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Bibley	1,475	0	0	1,480	0	0
Butler	—			1,444	16	8
Meader	1,390	0	0	1,390	0	0
Jenkins Bros.	1,288	14	0	1,293	14	0
Groves (accepted)	1,282	10	0	1,282	10	0

Contract No. 6.—St. John's-road.

Jolliffe	1,550	0	0	1,580	0	0
Butler	—			1,287	6	11
Saunders	1,270	0	0	1,270	0	0
Meader	1,247	0	0	1,247	0	0
Bibley	1,167	10	0	1,170	0	0
Jenkins Bros.	1,089	6	6	1,089	6	6
Groves (accepted)	963	0	0	963	0	0

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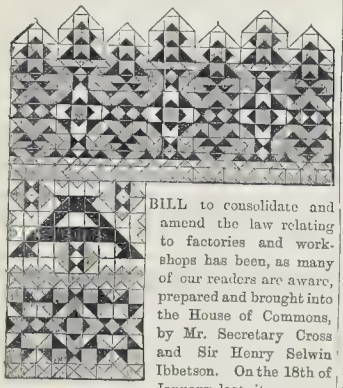
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Sanitary and Social Provisions of the Factories and Workshops Bill.



A BILL to consolidate and amend the law relating to factories and workshops has been, as many of our readers are aware, prepared and brought into the House of Commons, by Mr. Secretary Cross and Sir Henry Selwin Ibbetson. On the 18th of January last it was ordered by the House to be printed. It is a serious document of 64 pages, commencing with a lucid table of contents, under the title "Arrangement of Clauses," and concluding with five schedules of special provisions, special restrictions, special exceptions, list of factories and workshops, and list of Acts repealed. These comprise no less than sixteen Acts of Parliament (from 42 Geo. III., c. 73, to 37 & 38 Vict., c. 44), of which the whole are repealed; while amendments are made to a slight extent in the Sanitary Act of 1866, the Public Health Act of 1875, and the Elementary Education Act of 1876.

An adequate discussion in committee of the 100 clauses, each of them divided in numbered paragraphs, of this important Bill, would alone demand an amount of public time which is very unlikely to be afforded during the present session, when events of so grave a character are stirring the country to its very core. But it will be unfortunate if, on this account, the Bill should fail to be considered. In the remarks which we have to offer on the subject, it will be our endeavour rather to further than to obstruct the aims of the preparers of the Bill; and the criticisms that we suggest are directed mainly to the end of simplifying what we regard as complicated, and rendering definite what is still, though unintentionally, vague.

In fact, it is clear that it is impossible efficiently to discuss in any but a very small and specially educated committee a measure of detail like the present. With all the care that presumably has been bestowed on the Bill, points come out even on a first perusal that require explanation if not modification. The introduction into a complex structure of the kind, of amendments which have been drawn up by any one who had not the whole scheme of the Bill at his fingers' ends, would almost certainly create confusion and subsequent expense. As to the chief aims of the framers of the Bill we suppose that there is little opposition likely to be made. But if ever there was a case in which it was desirable first to indicate broadly the objects sought, and then to commit to the most educated technical experts the task of framing the measure so as to carry out those objects, and to do, and to disturb, nothing else, certainly this is one of that nature.

The first part of the Bill deals with the general law relating to factories and workshops. The clauses regard (1) sanitary provisions, (2) safety, (3) employment and meals, (4) holidays, (5) education of children, (6) certificates of fitness for employment, and (7) accidents. The Bill, it may be remarked, has no preamble, and is intended to come into operation on January 1st, 1879.

The sanitary provisions proposed are, (1) that a factory and a workshop (it should have been every factory or workshop) shall be kept in a cleanly state, and free from effluvia arising from any drain, privy, or other nuisance; (2) further, it shall not be so overcrowded while work is carried on therein as to be injurious to the health of the persons employed therein, and shall be ventilated in such a manner as to render harmless, so far as practicable, all the gases, vapours, dust, or other impurities generated in the course of the manufacturing process or handicraft therein carried on, that may be injurious to health. Provision is added that if it appears to an Inspector under this Act that the above provisions are violated by nuisances not coming under the powers of the Act, he is to report to the sanitary authority of the district, which is to take action accordingly.

The first and third of these provisions appear to be simple and effective. As to the second, however, it is obvious that the door is left open for a large amount of contention and litigation, unless normal principles are laid down by the Act. What is sufficient ventilation? From 14·6 to 21·6 cubic feet of air pass through the lungs of an adult in an hour. Atmospheric air, fit for healthy respiration, contains 20·96 per cent. of oxygen. A very small reduction in the proportion of oxygen, even so little as to reduce it to 20·75 per cent., if the place is occupied with carbonic acid and exhalations from the person, is sensibly felt, and is injurious to health. In passing through the lungs, air loses from 4 to 6 per cent. of its volume of oxygen, and gains from 4 to 5 per cent. of carbonic acid. It follows that the respiration of an individual, in an hour, will vitiate from twenty to thirty times its own bulk of air. If we take the lower estimate, which is that of Mr. Huxley, of the amount of air passing through the lungs, making it 350 cubic feet per diem instead of 518, or 14·6 cubic feet, instead of 21·6 cubic feet per hour, we find the amount to be lower by one-fourth than in the latter estimate. Under any circumstances we find a vitiation of some 300 cubic feet of atmospheric air is effected, in each hour, by each individual. It is therefore necessary, when many persons are crowded together, either to provide by the lofty structure of the apartment for the inclusion of a certain quantity of air, or to provide for the regular ventilation of the room, so as to effect a certain exchange of the air vitiated by respiration for pure air.

As to this the requirements of different trades will exercise a considerable influence. A draught is hostile to some delicate procedures. When this is the case, it is plain that the room should be more lofty. Supposing each worker to occupy an area of 9 square feet, his respiration in an hour would vitiate the atmosphere of the room to the height of 11 ft. to such an extent as to require it to be changed thrice in the hour. We are not giving these data as those which should be imported into an Act of Parliament. But they ought to be considered by the framers of the Act. And not only so,—but either principles should be laid down, or leading dimensions should be stated, so as to enable an inspector to report, or a judge to decide, whether any particular factory or workshop was or was not overcrowded or insufficiently ventilated. It is clear that a room which would be healthy for a given number of workpeople would become unhealthy if the number were increased. Some definite rule or limit should be laid down in any measure which professes to deal with this subject, or it can lead only to squabbles.

With regard to safety, the object of the provisions is one in which all persons must agree. That being the case, it seems strange that the advice of some engineer accustomed to the framing of specifications was not sought, in order to supply the Legislature with a clearer and more definite clause than that which stands in the Bill. We question very much whether many magistrates would be aware of what the Legislature means by a "teagle." "Every hoist or teagle, near to which children or young persons are liable to pass, or to be employed, and every fly-wheel directly connected with steam or water or other mechanical power, whether in the engine-house or not, and every part of a steam-engine and water-wheel shall be securely fenced; and every wheel-race, not otherwise secured, shall be securely fenced close to the edge of the wheel-race; and every part of the mill gearing must be either securely fenced, or be in such position or of such construction as to be equally safe to any person employed in the factory as it would be if securely fenced." The framer of this marvellous clause seems to be unaware that a fly-wheel is a part of a steam-engine. Again, some of the most dangerous machinery used in textile processes, that which traverses a certain space, is hardly within the definitions given. As, in the matter of ventilation, the laying down of certain normal relations of numbers and of space is requisite, leaving details to be supplied, in each instance, by the inspector, so in this important, though less difficult, question of the protection of the persons employed in a factory

from being caught unawares by any part of the machinery in motion, the simple and effective plan would be to lay down the principle that the occupier of the factory should be, under the Act, responsible for such mischief, unless he could show that the portion of the machine in question was protected by such guards or fenders as should render it impossible for any one to be injured unawares unless by his own fault. The principle is all that can be laid down. The question of the efficiency of the fencing is one that can only be settled by evidence in each particular case. It would, in our opinion, have been better to admit this at once, and to have framed the Bill in accordance with that principle, rather than to revert imperfectly to the old legal method of attempting to specify every possible contingency, and to introduce into the statutes at large such terms as "tengle" and "wheel-race." Something of this kind must have occurred to the framers, or to the revisers, of the Bill, as we find at the end of the clause prescribing the notice of dangerous machinery which is to be given by the inspector, that "for the purpose of this section, and of any provisions of the Act relating thereto, machinery shall be taken to include any driving strap or band." So far, so well. But suppose the case of an unprotected wire rope, driven with considerable velocity, and communicating movement from a steam-engine, or water-motor, to agricultural or other machinery. Supposing any question of such an offence to arise, the counsel for the defendant would at once be furnished with a sufficient defence. "It is clear," he would say, "that the Legislature in its wisdom has maturely considered the subject. It has specified teagles and wheel-races as matters to be protected; and it has declared a strap or band to be machinery. But it has said nothing as to my client's works, where a wire rope is employed, and its omission so to do must be taken as purposed and conclusive." And so, we apprehend, the judges would find it to be.

Clause 7 provides for the fencing of vat-pans or other structures near which children or young persons are likely to pass or to be employed. We are not ourselves aware of the circumstances under which it is customary, or indeed possible, that "vat-pans" should be filled "with molten metal or otherwise," and can only conclude that the lawyer who drafted the clause would have been all the better for a little council from some one who knew the nature of vat-pans, and was aware of the circumstances under which vessels filled with cold, as well as with "hot liquid," ought to be prevented from becoming sources of danger to the unwary. We do not wish to be critical,—but the attempt to specify instances, when made by a person not at home in the subject, is always liable to defeat the efficacy of a new law.

With the object of the preceding clauses relating to sanitary provisions and to safety we are altogether agreed. The only question open is as to the simplest and most effective way of giving the sanction of law to the requirements of health and safety. When we come to the third head, that of "employment and meals," we are also in accord with the framers of the Bill,—with, however, a certain reserve. This reserve seems to have been shared by the framers themselves, to judge from certain clauses to which we have to refer. But there appears to us to be so much inconvenience introduced by the attempt to specify in legal terms every possible arrangement which is to be allowed, that we cannot but think that an enormous amount of time might be saved, and much future squabble and difficulty prevented, by redrawing this part of the Bill, on the principle of stating, in a few words, what it is the real purpose of the Legislature to enact.

That purpose, as regards duration of work, is simple and every way desirable. It is, however, in the eleven clauses under review, mixed up with the important sanitary question of the place for taking meals, which should have been placed among the sanitary clauses. The Legislature wishes to limit the number of hours for which children, young persons, and women may be employed in any factory or workshop. The limits fixed regard the number of hours' total work that may be performed in a year, in a week, in a day, or in an unbroken period of time. "Child," we are informed by clause 91, means a person under the age of fourteen years; "young person" means a person between the ages of fourteen and eighteen; and "woman" means a female of eighteen years and upwards. From the [illegible] of general detail it was [illegible] extract the two statements that "night" is used in this Bill to denote the period of time between nine o'clock p.m. and six a.m., and that mill-gearing comprehends every shaft, and every wheel, drum, or pulley by means of which the motion of the first-moving power is communicated to any machine appertaining to a manufacturing process. The clause as to the band or strap, before cited, seems thus to have been an after-thought; and the omission of ropes, chains, wires, or metallic ropes, is one which some honourable member will, no doubt, do us the favour to bring under the notice of the Committee. The employment of children under ten years old is prohibited by clause 20.

With regard to meals, it is provided by clause 17 that the times allowed for meals shall be the same for all children, young persons, and women; a clause which is probably intended to prevent any tampering with the meal hours; but which is not altogether unobjectionable. It goes on to enact that no child, young person, or woman shall be employed, or allowed to remain in any room in which any manufacturing process or handicraft is being carried on, during any part of the time allowed for meals. If the object of this clause is to prevent the meals from being taken in the work-room, it will not be attained; as, if the machinery be stopped, the clause would not prevent such a use of the room. It is, we think, very important on sanitary grounds that the work-rooms should be empty and unoccupied during meal times, and ventilation would thus be aided. But any express provision to this effect would do more harm than good unless it were accompanied by a provision that a refectory should be attached to every factory. Of the desirableness of this there can be no doubt. Whether Parliament may be disposed to insist on it is another question. But, at all events, the intent of the Act should be made plain. It would be better to allow meals in the work-rooms, openly, while the machinery was at rest, than to turn out the poor children into the street, or the draughty corridors of the factory, in bad weather. The provision of a refectory is, therefore, demanded not only on humane, but on sanitary grounds.

The times to which it is proposed to limit the legal employment of the persons protected by this Bill are as follows:—In a workshop where women, but not young persons or children, are employed, the working-hours are limited to eleven and a half for five days in the week, and to seven and a half on Saturday,—sixty-five in all. This is the essential point. The fixing the limits of employment between six a.m. and nine p.m. is a questionable mode of carrying it out, and the allowance of four hours and a half for meals out of a day of fifteen hours is hardly the best mode of attaining the object of the Bill. With regard to children, different clauses are made to apply to textile and to non-textile factories. In the former ten hours' work per day for five days, and six hours' on Saturday, making fifty-six hours' working-time per week are allowed. For non-textile factories the same limits are repeated,—the object of this apparently unmeaning complication of the Bill being apparently to provide for a stand-up fight in Committee. But the whole is given with a detail which is more perplexing than explanatory,—and by a complicated prescription of the hours of commencement, of close, and of meals, which appears to us to be highly objectionable, as interfering with the ability of the manufacturer to make the best use of his machinery.

It is very obvious to those who study the subject that the determination of the same hours for commencing and closing work all the year round is one of those matters in which Parliament defies nature. In other countries the natural length of the day, determined by the season of the year, regulates the work and the amusement and rest of the peasant as well as of the noble. It is a greater hardship to have to get up at six a.m. in winter than to rise at four a.m. in summer. The winter night commences at half-past four, the summer night four hours or four hours and a half later. If a manufacturer were inclined to take notice of this fact, by working a double set of hands in the summer, the Act would step in and forbid them. There are certain exceptions, no doubt, for which we refer to the Bill. But the great idea that it is to the advantage of the manufacturing population, as well as to that of the owners of factories, to be able to employ the largest possible number of hands to a given expenditure in machinery, is one that has not dawned on the minds of the [illegible] this Bill. Nothing, however, can be more undeniable as an economical truth. We therefore look with extreme jealousy on the clumsy and arbitrary appointment of fixed hours for commencing and closing labour if the hours are made the same all the year round. It is an interference with the right of the labourer. It is an interference with the right of the mill-owner; and it is brought in as a clumsy mode of doing what may be directly done with advantage, namely, limiting the working-hours, not of the factory, but of the individual factory hands.

A valuable feature of the Bill is the insisting on a certificate of fitness for employment for any persons under the age of sixteen, by the certifying surgeon of the district. Written notice of the incapacity for work of any such person is to be given to the occupier of the workshop. Certificates of birth "may be" produced to a certifying surgeon; and the inspector may annul the surgeon's certificate if he has reasonable cause to believe that the age of the person in question is less than that therein stated. Further, a new certificate must be obtained at the age of fourteen, or, as the Bill quaintly puts it, "when a child becomes a young person." These stringent provisions are calculated to do away with abuses of which the surgeons have, not without reason, complained; and so far to make inspection a reality, and not a sham.

Accidents, in conclusion of this part of the Bill, causing loss of life or bodily injury, are to be reported within forty-eight hours to the certifying surgeon of the district, who is then to investigate and report to the inspector within twenty-four hours.

Part II. of the Bill contains special provisions as to particular classes of factories and workshops. In all cases the interiors of such buildings are either to be painted and varnished within once in seven years, or lime-washed once in fourteen months. (Once in twelve months would be a better time.) Bakehouses, if painted, are to be washed with soap and hot water, and otherwise to be lime-washed, every six months. There is a clause enjoining ventilation by fans or other means in certain cases; under the head of "Special Provisions for Health" the following restrictions are enacted. No young person or child shall be employed in a part of a factory where the silvering of mirrors by the mercurial process, or the making of white lead, is carried on. No child or young female shall be employed in a part of a factory where the annealing of glass is carried on. No girl under the age of sixteen shall be employed in the making or finishing of bricks or tiles, not being ornamental tiles, or in the making of salt. No child shall be employed in a part of a factory or workshop where metal-grinding or the dipping of lucifer matches is carried on. No child under the age of eleven shall be employed in fustian-cutting.

Clause 39 prohibits the taking of meals, or remaining during meal-times in certain portions of certain factories, which are specified in Schedule No. 2; and power is given to the Secretary of State to extend the number of prohibited places.

The exceptions to the Act with regard to overtime, nightwork, domestic factories and workshops, and certain other workshops, are so numerous and minute that the reader who desires to master them must refer to the Bill. As in much recent legislation, a special directive power,—which is, in fact, an almost independent legislative power,—is given to the Secretary of State for requiring special sanitary provisions, or allowing special exceptions. A clause of this kind shows how very far from exhaustive the provisions of the Act are, and throw grave doubt on the wisdom of attempting with one hand to regulate so many minute details by discussion in a Parliamentary Committee, while on the other hand, by a stroke of the pen, any Secretary of State may alter almost any detail in its practical working. It is very possible that the entrusting of this kind of power to a high official may be better than a repeated application to Parliament for any alteration of the law. At the same time, it is right that attention should be called to a very remarkable, though silent, change which is being effected in the administration of the country. The orders of the Secretary of State are to be laid before Parliament within forty days; but their passing unnoticed is almost a matter of certainty.

The third part of the Bill relates to administration, penalties, and legal proceedings; and the fourth contains definitions, saving clauses,

limitation of the application of the Act in Scotland and Ireland; and repeal of the Acts cited in the fifth schedule. The Bill, as a whole, displays a great amount of pains, thought, and care. It is directed, in the main, to objects as to the importance of which there can be no doubt. The chief defects appear to arise from the want of that special knowledge of various details on which legislation is proposed which can only be supplied by the assistance of experts, both in mechanical knowledge and in the use of the English language. Even when it seems cumbrous and perplexed, it will probably be found capable of working, which is much to say, unless it be altered in Committee. In case of any serious discussion of that nature, we venture to hope that the suggestions above given may prove of use both to the advocates of the Bill and to the country at large.

PROFESSOR E. M. BARRY'S LECTURES AT THE ROYAL ACADEMY.*

FIFTEENTH CENTURY AND ENGLISH TRANSITIONAL ARCHITECTURE.

HAVING formerly asked you to consider and remark the processes by which English domestic architecture had developed itself, I now wish to follow up the same inquiry.

I propose now to resume the consideration of fifteenth-century architecture in England, together with the developments of later periods. In so doing, I do not think it necessary to repeat the general observations of last year, but shall rather bring before you, as well as I can, some illustrations of the principles of design, which I then described.

We shall find in our studies of domestic architecture, a steady, though gradual, transition, from the castle, as described in my last lecture, to the peaceful manor-house of the English squire. Features originally devised for defence, were clung to, as it were, with the affection which springs from use and tradition, and such details thus survived, as architectural ornaments, long after the reasons for their existence had passed away. It is ever so with architecture, an art which is, or should be, conservative in its very nature; and it is a forgetfulness of this essential principle of its existence, which leads some impatient observers to be ever asking for new methods, and new styles, in disregard of precedents and of the lessons of antiquity.

I have referred, on former occasions, to the general use of timber for dwelling-houses, particularly in towns; but we are now entering upon the consideration of a system of more solid construction. The castles, on being transformed into palaces, lost but little of their grandeur, while they gained in architectural beauty of detail. They continued to be, as of old, the central places of abode of the great lords of the soil. They could accommodate, and to some extent protect, large bodies of retainers; but the necessities of warfare were gradually passing away before the advance of civilisation and of settled order. The great English mansions thus came to assume that air of mingled dignity and homeliness which has ever been considered their most pleasing characteristic.

The walls still enclosed large spaces, and could be defended in case of need. The drawbridge was often maintained. Bastions, battlements, and machicolations were preserved, if not constructed; but the character of the buildings enclosed was greatly altered. The house and the castle are seen combined, not indeed without a certain antagonism, of which the ultimate results could already be foreseen. The old was becoming older, and verging on the obsolete; while its destined successor was steadily advancing to maturity.

We may trace this conflict of principles, very clearly, in castles like those of Kenilworth and Warwick, which contain buildings of various dates, and in which are preserved remains of the works of different builders.

At Kenilworth, the large square tower or keep declares its early origin. I have already referred, in my last lecture, to the original prevalence of this form, and to its gradual abandonment in favour of curves and circles.

Warwick Castle, built at the end of the fourteenth and the commencement of the fifteenth century, illustrates this change, for we have here the keep of a more irregular form, made up of angles and curves. The gateways, walls, turrets, and other defences, are still found, but the dwelling of the owner has a prominence altogether new, and significant. It is no longer surrounded by the walls, but actually interrupts their continuity. It now refuses to be cooped up in dull courtyards, but is built against the river, and looks over the country. The various offices and departments, which were in earlier times scattered throughout the whole of the enclosure, are brought together and aggregated in one mass, with every regard for dignity and convenience, as then understood.

From such an arrangement, it was but a step to the altogether unfortified mansion. The walls were comparatively useless, since the introduction of gunpowder, and soon became mere enclosures, to keep off robbers and pilferers; thus losing altogether their character of an integral part of the building. At the same time, the latter gained by the increased space, and spread itself out, not only in greater masses, but by including in its own construction spacious courts and quadrangles. As these changes were the results of peace and prosperity, they varied naturally according to the condition of different parts of the country. Thus, in the north, and towards the Scottish border, on the sea coast, and also on the side of Wales, we may find a system of fortification lingering, after it had become merged in more domestic construction, in other and more settled districts.

At Alnwick, for example, although the original structure received many additions, by successive owners, the military and defensive character of the whole building was consistently preserved. Not only were the moat and external defences jealously maintained, but within the walls were to be found wells, ovens, slaughter-houses, and all requisite appliances for resisting a siege.

The Peles, or tower-like houses, have been before referred to, as existing in the Border counties. They possess considerable strength, and resemble portions of the larger castles, forming a connecting link between the latter and the unfortified dwelling houses, which in the fifteenth and succeeding centuries became common in England. Few large houses were built before the latter date, without some attempt at fortification, and such defensive works were indeed almost compulsory.

Royal licences were issued, which were, in fact, commands, in virtue of which the builders of important structures were bound to build walls of defence, and "embattle, kernel, and machecollate" the same. These documents were called "Licences to Crenellate," and Mr. Parker has published one of them, the date of which is believed to be A.D. 1483. It is a licence from "Edward, by the grace of God, King of England and France, and Lord of Ireland," to Edmund Bedingfield, esquire, of Oxburgh, in the county of Norfolk.

It is declared to be given in consideration of the latter's good and gracious services, aforetimes rendered to the king, from day to day, and "which he still continues inclined to render." He is, therefore, to be permitted "to build, make, and construct, with stone, lime, and sand, towers and walls, in and about his manour of Oxburgh," so that such manor may be enclosed, and "the walls and towers so embattled, kernelled, and machicolated, built, and constructed, to hold for himself and his heirs, for ever." A further clause declares the royal pardon for all transgressions previously committed by Mr. Bedingfield, in consideration of his building the fortifications above described, and further grants to him certain privileges as to holding markets, and taking tolls therefrom. The deed is dated from Westminster, in the twenty-second year of the reign of King Edward IV.

We may, I think, conclude from this document, that to "crenellate," or fortify, in some measure, a private dwelling-house, was at once a privilege and an obligation. It was a social distinction, marking out the house and its owner as possessing importance, and it was also apparently a matter of public policy, inasmuch as the Crown was ready to grant advantages in order to secure its accomplishment. The offer of such inducements, however, indicates that the necessity for defences was passing away, and that they had become a matter of fashion and rarity. Henceforward the disuse of fortifications was general.

Haddon Hall, in Derbyshire, so well known to most of us, well illustrates the state of transition. At a distance, it presents a castellated appearance; but on closer inspection, very little real fortification can be seen. The gateway, with its tower, is part of the fifteenth century buildings, and displays that compromise between details of defence and ornament, which was characteristic of the period. The buildings are no longer huddled together within enclosing walls and turrets, but there are two open courts, with the hall in a central position between them.

The chapel is of great antiquity, not later in parts than the twelfth century, as there are evident remains of Norman work. The building is irregular, and appears to have had an existence, independent of the castle. It is rather a nucleus, around which the latter has been built, than a private chapel belonging to the place. It may have been originally a parish church, existing from earlier times, before the adjoining structures were erected. The chancel, which was the private chapel of the house, dates from the fifteenth century.

We see in the earlier parts of Haddon Hall all the characteristics of a Transitional period, and the hall is of Perpendicular architecture. The offices attached to it are spacious, and suitable to the advancing ideas of comfort; containing store-rooms, buttery, and kitchen, with ample hospitable-looking fireplaces. In the exterior, there are still remains of the details of fortification in the "crenellated" parapets, but in the later additions to the building, domestic influences are paramount. These additions are of much later date, and have probably replaced an earlier structure on the same site.

The Elizabethan wing consists of a long gallery, as usual in such buildings, a parlour, or withdrawing-room for the family, and other reception-rooms, with a range of servants' offices below. The whole is thoroughly domestic in its character, and looks on one of the quaint gardens of the time, with the charming terrace, so often sketched by artists.

We thus find at Haddon, that which is so delightful to the archæologist, a history in stone, not spoilt or falsified by the modern restorer, although the older builders have worked their will upon the pile, and, as usual, have paid little regard to the work of their predecessors. The old Norman church is the key of the whole. It may probably have preserved an especial sanctity. Defences would thus be necessary, if only for the security of the offerings at the shrine. A stronghold would be attached, with walls of *enceinte* to enclose the church. Situated far from the border, we need not suppose the works to have been of great strength or importance, and such as they were, they might soon disappear, and their materials be used as a quarry for the succeeding buildings.

Each phase of architectural art has left its mark. There is a Norman font in the aisle of the chapel, an Early-English window in the nave, while one of the Perpendicular period adorns the chancel. The entrance gateway, the hall, and offices are of similar style, and at last we come to the purely domestic buildings of Elizabethan architecture, already described. Here we have large windows, spacious rooms, and elaborate internal decoration of oak-panelling and plaster, with wide fireplaces, and other evidences of the comfort and refinement of English home life. The type of the Mediæval fortified mansion or manor house had passed away, with the feudalism which had first given birth to it, and we may observe in these transitional mansions a striking evidence of the increase of wealth and luxury among the people, which has continued to our own time.

Having passed in review the principal distinguishing peculiarities of the Mediæval architecture of the fifteenth century, we may perhaps now turn our attention to the succeeding phases of English architecture. After the close of the fifteenth century, the forms of Mediæval art became poor and debased, the style appeared to be dying out, and a change was imminent. It came in the forms known to us as Elizabethan and Jacobean, to be shortly followed by the Renaissance and Classic Revival.

In treating of this Transitional work, it must not be supposed that the principles which guided it are only to be observed in great palaces and mansions. We naturally think first of such lordly piles as Hatfield, Hampton Court, Haddon, and the like, but it may be doubted whether the examples to be found in more humble tenements are not, at the least, of equal interest. Indeed, it is often the exuberance of ornament in the great mansions which offends an eye better pleased with the quaint though simpler treatment of the Elizabethan grange

* Third lecture, delivered February 14th, 1878.

farm-house, or cottage. It must, I think, be admitted that the style proved itself to be equal to the demands made upon it, although with drawbacks to be presently noticed; and that, so far, it may, therefore, be held to have justified its existence.

The principal peculiarity of Elizabethan work, which distinguishes it from the Mediæval styles which it succeeded, is the admixture of classical details, with general forms of a Gothic character. Thus the gable, an essentially Gothic feature, was retained, though masked, and deprived of its importance, and broken up into forms more or less fantastic. Mullioned windows were still employed, but often in combination with pilasters, and with a complete change of mouldings.

In the interior, the hall and other arrangements of the Mediæval house were, for a long time, to be found as before; but they were supplemented by numerous additions and modifications. The latter were indeed so varied and fanciful, that it is not easy to define with precision the forms of so-called Elizabethan art, for we may find in one example a roughness and vulgarity of execution, almost deserving the title of barbarous, while in other buildings of the same style, we can detect evidences of purity of taste, together with a beauty of detail, almost equal to classical examples of good Italian work.

There is little doubt, that at this period, there was a considerable influx into England of foreign workmen. Such an influx had indeed existed, from as early a date as the Norman Conquest, but the movement had now acquired a greater importance, from the increased and increasing wealth of England, and the comparatively settled and peaceful condition of the country, as contrasted with the general state of Europe.

Although our forefathers were far from any recognition of the modern doctrine of free trade, their commerce with foreign nations was already assuming large proportions, and the merchants of London and other large towns were already both rich and influential. We have already alluded to the importation of glass from Italy, both for drinking vessels and windows, and of tapestry from Arras. Cloth was also sent from Belgium and Flanders, and the spices of Arabia and India were not wanting. With these importations came, as we may suppose, workmen, either in search of adventure or driven from their own lands (as were the Huguenots from France) by religious persecution or civil dissensions. These men brought with them the cunning of their various arts, such as stone and wood carving, and the like; and as the Classical Renaissance was more advanced on the Continent than with us, they would naturally prefer the forms of design, with which they had already become familiar, in their own country.

If we consider Inigo Jones as the first architect of note who devoted himself to Classical architecture in England, we may observe that he was born when Palladio was verging on the grave; and that St. Peter's at Rome was designed about a century before the Classical Revival in England.

The Elizabethan method indicated the first attempt at change. It was, to a great extent, a fusion between the new and the old architecture, and in that character has not, perhaps, always received the attention and consideration to which it is entitled. This neglect has probably arisen, to a great extent, from the rude execution of much of its detail, and the badness of its representations of the human figure. Nevertheless, there are numerous examples of good taste, and delicate workmanship of ornament, and if the style had lasted long enough in the ascendant, there is no apparent reason why the defects of execution should not have been rectified.

The same may be said of Elizabethan sculpture. There can be no such thing as perfect architecture, which does not include good sculpture. The Mediæval architects of the thirteenth and fourteenth centuries well understood this truth, and applied themselves to its recognition with great, though partial success. The Greeks were, as we know, the great masters of plastic art, and it may be doubted whether the satisfactory application of sculpture, in its highest development, has ever been attained, apart from Classical ideas, and principles of design.

Now, the Elizabethan architects were ready to admit these principles. They did so, indeed, to a very great extent, in their enlarged niches, their pilasters decorated with arabesques, and their employment of ornament as a surface decoration. But as to sculpture of the human form, they were altogether deficient, and their execution lagged far behind their intention.

Why was this? In the first place, theirs was an age of sudden development. Wealth and prosperity had come upon the country rapidly, or, to quote a modern saying, by "leaps and bounds." There was much work to be done, and not a corresponding number of hands to do it. Hence grand ideas, but ill-finished workmanship.

Italian artists, like John of Padua, might direct, but they were obliged to trust to German, English, and Flemish workmen to carry out their ideas. Sculpture had not flourished in its highest forms, in England, during the later phases of Mediæval art. Carved ornament was indeed prominent enough, as, for example, the ever-present roses of the Tudor period, but figure sculpture had become strained, and even grotesque. These are also the faults which strike us in Elizabethan work. We find in it much to admire, if only the execution were equal to the design. Figures, bas-reliefs, and sculptures abound, and it is not the fault of the style if they are not good. Often grotesque and eccentric, the latter has yet a picturesque striking character, and is racy of the soil.

Such as it was, the Transitional style filled up the gap between the Late Tudor of King Henry VIII., and the revived Classicalism of Charles I., and has even continued to be employed down to the present time, passing through various phases, now leaning on Gothic, now on Classical traditions; still subsisting, indeed, with certain modifications, in that which has lately been termed Queen Anne architecture.

Another circumstance to be now specially noticed, is the presence in the same building of different materials. We have seen that, roughly speaking, in early Mediæval times, the private residences were of wood, and the castles, abbeys, and churches, of stone. Not only so, but the construction was simple. Different trades, as, for example, that of the smith, might pride themselves on their technical skill; but their efforts were more or less isolated, and there was rarely to be seen that combination of labour, which some of the great Elizabethan structures exhibit. Thus, to the mason, bricklayer, and carpenter, was now added the plasterer, whose work, both on wall and ceiling, is perhaps the most interesting peculiarity of the style.

It has been too much the custom of late years to depreciate this material, a reaction springing no doubt from its great and frequent abuse. No artist, however, will I think treat plaster with contempt, who is familiar with the intricate designs, and fine and often beautiful execution, of many an Elizabethan ceiling or frieze. The use of plaster ceilings was a natural consequence of the custom, which now became common, of building houses of several stories.

From the Norman house of a single floor, with its central uncovered atrium, we have advanced to the old English mansions of Burleigh, Crewe, Hatfield, or Longleat, with their numerous chambers, arranged in several floors, and built around open courts. The Mediæval artists followed a vertical system. Arches, gables, and pinnacles were alike aspiring, and the glory of the style were the towers and spires. House building, when it became necessary to employ several floors, naturally drifted into horizontalism, and so turned towards the trabeated systems of classical art.

Ceilings of large spans, sometimes coved and groined, but often altogether flat, came into use, and the plasterer was equal to the occasion of devising ornaments, of an original and pleasing nature, for the decoration of these flat and curved surfaces. Here, as in other cases, the construction called for the ornamentation, and the latter did not dictate to the former.

There is little trace, in Elizabethan architecture, of the skill which raised the vaults and groinings, even of Tudor times. Elizabethan masonry is indeed often highly elaborate, as, for example, in the curious and ornamental scrolls, and fantastic gables and turrets, but the elaboration is, for the most part, of ornament only. The old energy of construction appears to have died away, and its place to be imperfectly supplied by applied decoration.

As the mason lost in importance, the bricklayer advanced, the two working commonly together, in the combination of red brickwork and stone, so familiar to us in almost all parts of England. When stone was abundant, it still, of course, continued to be the material most used; but in other parts, as in the Eastern countries, brick houses exist which were erected from the fifteenth century; and in the later examples, are to be found moulded bricks and terra cotta, which played an important part in certain types of Elizabethan architecture.

These details were first commonly used in the reign of King Henry VIII., although there may be occasional instances of their earlier employment. There is a good example in Sutton Place, near Guildford, built by Sir Richard Sutton, about 1530. Here the mouldings of doorways and windows are of moulded brick, or terra cotta; and surface decoration abounds, all executed in the same material, which was now extensively employed, though not often as freely, as at Sutton Place.

For chimneys, brickwork was generally used, and the stacks of massed and clustered shafts, soon became one of the most striking architectural features of the time. Springing, as they did, from domestic necessity, their importance was frankly recognised by the builders of the time. Sometimes square, sometimes circular, polygonal, or octagonal in plan, they were for the most part grouped together, and stood in continuous plinths. The capitals were, in some cases, single, and in others continuous, like the base, and they were frequently placed in internal walls.

There are numerous examples of such chimneys, familiar to most of us, in which the moulded brickwork is of the most elaborate description, like the red brick details of Hampton Court Palace. It is evident that the designers of these works delighted in the use of moulded brick, and devoted themselves heartily to its study and manufacture. The custom waned, however, until, in modern times, it seemed to have been lost, and a tax having been placed upon bricks, the usual deadening influences of such fiscal interference set in, and progress and improvement seemed to be at an end.

Happily, this state of things is over. We have free trade in bricks, as far at least as the State is concerned; and the revival of interest in brick architecture, and the increased employment of moulded brickwork, is one of the most noticeable signs of the present time. So much so indeed, that it almost seems necessary to say a word of caution to enthusiasts, to induce them to remember that the legitimate use of moulded bricks is limited, and needs both taste and judgment.

The same remark holds good with reference to terra cotta, which is indeed only another form of brickwork. Valuable as this material is, and readily as it will lend itself to artistic treatment, it cannot compete with masonry as regards solidity, or truth of line. It was only occasionally used by the Elizabethan builders, excepting for such ornamental and isolated structures as chimney shafts.

In cases where stone was not easily attainable, the walls were built of brick, frequently of red colour, with dressings of stone, the mullions of the windows, the string-courses, parapets and copings being constructed of the same material. The bricks were usually of smaller size than our regulation dimensions. They were not very regular in shape, and consequently the joints were large, with a good deal of mortar; but as the latter was usually good, the walls were not destitute of solidity and strength.

The bricklayers seem to have thought that the surface of their work needed ornament, for they were fond of using a few black bricks, with those of other colours. The latter were disposed so as to give the well-known diagonal patterns in the brick walls of their buildings. This treatment is undoubtedly pleasing, when not used in excess. It breaks the effect of monotony, which too much plain surface is apt to produce. It is unobtrusive; and while it is an evidence of thought and care on the part of the builders, it does not, when sparingly employed, challenge attention or arrest the eye by startling contrast.

In some of our recent revivals, the use of parti-coloured brickwork has been common. It has respectable precedents in its favour, *only when used in moderation*. An idea, good in itself, is easily overdone, and the great danger which waits on imitators is exaggeration. It is thus with the use of the coloured lines, diapers, and patterns, which we so often see used in edifices of moderate dimensions, which cannot afford to trifle with the element of size. The effect of such a treatment is too often to minimise the building, and to weary the eye with a succession of tiresome and uninteresting geo-

metrical puzzles. I would therefore caution the student against a too ready indulgence in this cheap decoration, and would counsel him to devote his first care to the design of the masses and proportions of his work. The introduction of coloured brickwork into Elizabethan buildings is seldom liable to such objections as I have named, and with due restraint it is a fair expedient in the hands of the architect.

Perhaps the most noticeable development of the period we are now discussing, is the treatment of the windows. From the few and scanty loopholes of the castle, we have advanced to a perfect blaze of light, and walls almost made of windows, as at Hardwick Hall, Derbyshire. Oriel windows had long existed, particularly in connexion with the dining-halls, as I have described in a previous lecture. They were, however, commonly used where special dignity or importance was sought. We now find oriel and bay windows adopted with the greatest freedom, so that they may almost be said to be inseparably connected with Elizabethan domestic work. We have projecting windows of all kinds of design, with canted sides, square sides, curved sides, and even semicircular in plan. They are usually built up from the ground, although the use of corbels was still frequent. From being a subordinate feature, the windows now challenge attention, and dominate the gables and other parts of the elevation. Not only are they wide, and ample on plan, but they are of such height that they need to be divided by horizontal transoms, several of which are often to be seen in the same window.

The change from mediæval economy to Elizabethan exuberance in the matter of windows is very remarkable. It was foreshadowed in the works of the Tudor period, and even church architecture shared in the movement. The great east window of Gloucester Cathedral is an instance of daring, I had almost said reckless extravagance, of fenestration.

The Elizabethan builders went, however, as a rule, beyond their Tudor predecessors in this respect. They widened the bays, and increased their projection, they lengthened the lights, discarding tracery, and even the flat four-centred arch which so long lingered, as a relic of mediæval forms. Their windows were, as a rule, made up of rectangular divisions; and arches, which had now become semicircular, were reserved for doorways.

We may still trace a disposition to coquet, as it were, with Gothic details, particularly where ecclesiastical feeling was in any way regarded. Thus, at Crewe Hall, where all the windows of the rooms are square in their form, there is one exception to the general rule. This is in the chapel, where the window, which is semicircular on plan, has curved heads with cusps set in a square, in the later Mediæval manner. This circumstance is the more remarkable, as the whole building was erected at the same time,—from 1615 to 1636.

It is evident that glass must have become cheaper and easier to procure, before such windows as those of the Elizabethan era could be planned and executed. This was doubtless the case, being one of the results of the advance of the country in wealth and commerce. It was not very long since that glass windows were luxuries, carried about from place to place by the great lords, on their journeys to their various country seats or town palaces. Windows were holes in the walls, to be closed by wooden shutters, and, therefore, not to be lavishly employed. Now, we find enormous surfaces of glass, with little attention to shutters or other means of security. Not only was glass readily attainable, but men were able to think more of the comfort, and less of the defensive security, of their residences.

In early examples, and in exceptional cases, we still find evidences of a certain distrust in the height of the cills above the floors, so that it is difficult, and in some instances impossible, for the inmates to look out of the windows. In almost all cases, indeed, the window-cills are higher than modern ideas approve. This is, however, in all probability, often a mere question of taste. Our forefathers do not seem to have attached the same importance to the enjoyment of a view of fine scenery as we do, nor were they fond of living on the ground floor. The chief room of the Elizabethan residences was the long gallery, an upstairs apartment, usually extending the whole length of the house. The great reception-rooms, excepting the dining-hall, were also frequently placed upstairs, and under these circumstances a good view of the surrounding country could be readily obtained.

A low window-cill is a feature common in southern countries, and connected with the frequency of balconies. It has never been a favourite in England, as it is, for example, in France, where it is the custom to carry down the windows, in almost all cases, to within a short distance of the floor. In genial climates the architects were ever eager to use the balcony as one of the most obvious means of producing effect within their reach; but in English domestic work it was, as a rule, forbidden by the exigencies of the climate, and the feature is not commonly to be seen in our old architecture.

Another peculiarity to be noticed is the irregular, and often fantastic, shape of the gables. The principles of design now in vogue had become so much influenced by classical ideas, that the verticality of former days was out of date, and a more horizontal treatment was everywhere apparent. In houses of several stories the floors asserted themselves, even externally. Buildings were crowned with cornices and parapets, while roofs of moderate pitch and span replaced the high coverings of earlier times. The gable thus lost a great part of its original importance. It was not by any means, however, discarded, and, in some cases, even seemed to be regarded with special favour, from the care given to the design of the varied outlines which had come into favour.

With simplicity of form, the real importance of the gable had very much passed away. It had become, as it were, a plaything, to be used as an ornament behind projecting windows. It was frequently cut off from below by cornices and parapets, and so recessed as to lose any great amount of dignity. For farm-buildings and structures of moderate pretensions the gable still kept much of its old prominence; but in mansions, such as Crewe Hall, it had become a minor detail in the composition; while at Longleat, and still more at Wollaton, it was only represented by scrolls and ornaments, recalling, in an indirect manner, its former outline.

A similar declension may be observed in the importance of towers. At Wollaton, indeed, the tradition of the old keep of the castle survives in the elevated mass of the central hall. The Elizabethan was not, however, a tower-building style. Turrets, indeed, abound, but they are seldom of much structural importance. Attached to gateways, and flanking entrances, they served to keep up a certain stateliness, and preserved the traditions of earlier days. The high spire-like tops had gone, with their stone finials and crockets, and the favourite mode of finishing the turrets was now a depressed form of ogee, commonly made of wood, and covered with lead. In the times of castle building, the tower was the house, now the house was everything, and turrets were only ornamental portions of the latter.

The skyline was broken by chimney-shafts, arranged, as has been said, in groups, or in lines, and their number and importance were significant of the increase of domestic comfort now sought for, in the internal arrangements of the house. The fireplaces had become the most conspicuous feature of the living-rooms. They are often massive structures, extending to the ceiling, and ornamented with rich panelling, niches, and sculpture. They illustrate very clearly the transition that was in progress, and the taste that was springing up for Italian detail and style.

The earlier examples of Elizabethan fireplaces have projecting hoods, and follow the ancient manner of construction, which was pointed out to you in our examination of the works of the thirteenth and fourteenth centuries. Gradually departing from this type, we come to designs of a less prominent character as regards shape, and more decorated in detail. Chimney-pieces were important architectural compositions, built against the side of the room, and forming its chief ornament. They were usually divided into two parts, and the rudiments of the window-shelf began to appear, though the time of nick-nacks was not yet. The material was usually stone, and this was sometimes employed for the whole structure, though, more commonly, the upper part of the composition was made of wood, and even of plaster.

The amount of woodwork in Elizabethan houses was very great. Panelling was not only plentifully used for window and door dressings, but it also extended from floor to ceiling, in the galleries and principal rooms. The staircases also were often masterpieces of the carpenter's art. The panels were designed with numerous mouldings, of shallow section, often roughly worked. In the best examples the mouldings were worked on the solid rails, and in the earlier work were combined with chamfered top and bottom rails, in accordance with the custom of Mediæval workmen.

The wood used was generally oak, and the grain or pattern upon it is very distinct and far more beautiful than we can generally obtain in the oak and wainscot of modern commerce. Our forefathers grew, and worked, their own timber, and were better able than we often are to refuse the bad, and select the good. Modern possessors of old English mansions have often complained of the abundance of oak panelling. It has grown dark and almost black with age, and thus has given the apartments a sombre appearance, and has caused difficulties in lighting it, especially at night. Of late years we have seen a great movement of restoration, which has in many cases taken the form of undoing previous mischief, and numberless have been the cases where the old oak panelling has been found concealed under coats of white paint and paperhanging.

The early habits of our forefathers led them to think little of lighting their rooms at night, and with gas and other illuminating agencies at our disposal, there need be no reason for us to deny ourselves the pleasure of restoring their work to its original beauty.

And now I must, for the present, bring the description of the Transitional style before us to a close. Having described some of its peculiarities, we will, on another occasion, examine some existing examples of this manner of work more in detail. As regards the style itself, it is impossible to claim for it a high artistic position, at least as it was worked out by the Elizabethan architects. At the same time, it may be doubted, as I have before said, whether full justice has been done to its merits, and more particularly to its possibilities.

The buildings which were erected in the Elizabethan style, have qualities not without claims on our approval. There was evident in them, in the first place, a care for architectural effect; the construction was generally sound and truthful; and whether the building were a palace, as at Hatfield or Burleigh, or a farm-house, or a plain yeoman's dwelling, there was an appropriateness in the design which rarely fails to please. If we are sometimes offended by clumsily-executed mouldings, or by the intrusion of discordant forms, we must remember that their designers were feeling their way, and that but for circumstances, hereafter to be noticed, they might, if left alone, have achieved something purer and better.

Some modifications of architecture were imperatively called for by social changes, and these were sought in the direction of greater elasticity. The methods adopted, whatever their faults, not only answered their purpose, but were perhaps more distinctively English than any of those which preceded them, or by which they have been followed.

The English Transitional style had thus a strongly marked and national character. If it had not the grandness of the Italian, it was better adapted to English wants, tastes, and the requirements of the climate. If it missed the picturesqueness of the French, with its affluence of dormers, balconies, and turrets, it had, nevertheless, a local colour and effectiveness of its own, suiting well the parks, dales, and valleys of English counties. It spoke of home life, with all its softening associations, and even where it displayed the grandeur of wealth and rank, it did so in such a manner as to indicate the position of a landlord living at peace among his tenantry, rather than that of a feudal chief, cherishing exclusive privileges, and obliged to be ready, at any time, to defend the same, and subjugate the people beneath, rather than around him.

The mansions of Old England were thus houses, and not castles, and they remain to us in great numbers, in all their beauty, while many a prouder structure abroad has disappeared by incendiary fires, or has been laid waste by civil violence.

In the works of the Elizabethan period in this country, we may, I think, see traces everywhere of that measured and gradual advance in civilisation and comfort, as well as of the respect for law and order which has prevailed, more or less, in our fortunate land, through the most troubled times, and which has consequently and appropriately found expression in Transitional English architecture.

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AMERICAN WATER-COLOUR ART.

The American Water-Colour Society, on the evening of the 1st of this month, held its eleventh annual private view, a private view whereat attended some three or four hundred artists, and a few members of the press; for here, as in London and Paris, artists of all kinds appear to love the agreeable pleasure of courting friendly encomium, and those instructive directors of our tastes, the critics, are only too good-natured in gratifying their friends. Here they were all the other evening, artists, critics, frame-makers, purchasers, and all those useful people who join in building up our taste in art.

Before the week is over, those happy artists whose captivating talents are sufficiently attractive to call for learned criticism from our overworked and *blasés* critics, may expect to read how they have this year surpassed their last year's productions, and what justification for hope the nation may have that American painters may shortly defy the world in the silent pursuit of the studio, as they are so successfully doing in the more noisy and less innocent career of popular government.

There is one feature in New York private views, one great claim we may say, that is wanting so far as our experience goes in English and French private views: a well-arranged and a well-served *buffet*, really artfully supplied with precisely the needed pabulum that few of us can resist after eleven p.m. Nothing that we have seen for many a day can compare with the entertainment supplied at the American Water-Colour Exhibition.

The eleventh Water-Colour Exhibition in New York, we have been told, is an advance on last year's, which we are also informed was an advance on former displays, so that the 569 works this year exhibited may without injustice be alluded to as falling some degree short of perfection. We do not like the French word "*genre*," but it is so well understood now that we are at a loss for a better; this style has gained but an uncertain footing among American painters, and those who affect water-colours, judging by their works in the present exhibition, have done very little to vindicate their claim to rank as masters. Poverty of design or motive, feebleness of composition and want of truthfulness in detail, characterise most of the "*genre*" drawings now on view in the Academy of Design; the work is often so trivial as to induce the belief that not only is no improvement possible, but that the artists must in time deteriorate from their present low standard. Unwelcome as the statement may be, candour compels us to say that nearly all the good "*genre*" pictures in the Exhibition (and none of them are of superlative excellence) are the production of foreign artists. A want of what artists understand by "breadth" is painfully observable in all that is here exhibited, and if the American water-colour painter expects by minute and painfully-realistic transcripts of natural objects to make up for this great deficiency, he will find himself mistaken. Skilful painters have outgrown the pre-Raffaellite period (in France and Belgium those great schools of water-colour art, it never had any influence), and all those who seek for what is right now in water-colour, desire to see representations, broadly and effectively produced, rather than that prosaic accuracy which so many are wedded to.

There are, however, in this exhibition some drawings by native artists, notably landscapes of New England and Eastern coast scenery, amply sufficient to satisfy us that American water-colour painters, like American sculptors and etchers, are, in not a few instances, as devoted students and faithful producers as the gifted workers of any other country.

The regular picture exhibition season in New York appears to commence somewhat earlier than in Paris or London. In Paris the *cercle* of the Place Vendôme, or that of the Rue St. Arnaud, do not generally begin to show their fresh art-treasures until the spring; but here, the Century, the Union League, and several other clubs, have been making monthly displays since last October, and, indeed, for the last three months there has been a succession of picture-shows at one or another of the "art-rooms" that abound in the neighbourhood of Union-square and Fifth-avenue.

Certainly New York affords to the mere lover of pictures for the innocent amusement they give, a sufficiently ample field for mild enjoyment; any day throughout the year, in the galleries of Messrs. Goupil or Schaus, may be found gathered together in some form or other whatever is new or costly in the way of pictorial art from Europe; and if New York cannot exactly claim the power to support an establishment like Colnaghi's or Graves's, of London, or Rapilly's or Danlos fils, of Paris, they may boast at least more than one art-shop that fairly rivals the best of the more showy exhibition places of Europe.

New York has not a Christie & Manson, nor a M. Pillet, of the Hôtel Drouot, but the many famous auctioneers of this city, who might, if we may venture to suggest, take some admirable lessons from those truthful disposers of interesting property, contrive to offer week after week an enormous mass of attractive artistic finery that meets here just now with an unwilling and cautious number of buyers, who one would think were deterred from purchasing, by an unaccountably acquired knowledge of the worthlessness of the objects placed before them. As for that industrious class of speculative collectors, who furnish the sale-rooms of the New World with miscellaneous objects for use and foolish ornament, we can only say, the sooner they give up their unremunerative trade, and take to the business of taking care of what is worthy of being preserved, we shall all be gainers in the end.

New York.

ART BOOKS AND CATALOGUES.

It may not perchance have struck many even of those who have thought of what books and newspapers now do, how vast is the influence they have on human destiny. They seem all but to form a sort of second thinking population, and to have a kind of existence of their own. The very dead speak still in books, and we may hear in them the voices of those who once on a time lived in such now dead cities as antique Athens, and Rome, and Jerusalem. All this, though so trite, is sufficiently astonishing, though perchance so little thought of, from the fact of its very familiarity. It would be sufficiently wonderful if but one single volume, or "voice" could be heard as coming from the age of Pericles and Phidias, or from that of Cæsar and Cicero, or were there now but one general London newspaper telling of all that happened, all the world over, *yesterday*. But what is to be said when we come to numbers all but countless of books, and records of the most distant past, as of the actual present, for while an event is actually occurring, an account and record of it are in course of being printed! Books are now to be numbered not by units, but by thousands, and by tens of thousands, and hundreds of thousands,—there is no end of them. And as if this were not enough, the very catalogues of them,—book catalogues,—alone would form a library if collected together, and would be a study in themselves.

Book cataloguing, indeed,—and the work, by the way, but has just commenced,—forms in itself a right curious subject of inquiry and research. Go into the library of the British Museum, and you find immediately before you not fewer than 1,000 volumes of the catalogue of the contents of its huge collation of books. So far from this being a completed work, it is but the very roughest commencement of what there is yet to do, and which will be, there is no doubt, in the future done. And not only has the great national museum its special catalogue and catalogues, but most other libraries of note, both small and great, have theirs; and the booksellers, too, all about us, have theirs as well,—huge volumes enough, some of them, as many well know, such as that bulky *tome* of Mr. Bohn's containing a list of books which a lifetime could not read through. But, still, all this even is but rough and very imperfect work, for these voluminous catalogues are a perfect puzzle even to those who devote themselves,—unhappily, we fear, in many cases,—to *books*, and books only, and all but forget the *objects* about which the very volumes are written. But there is no escaping from books and printed matter, and the very word education, as it is now understood, would all but disappear were *book* learning eliminated.

To commence on Mr. Quaritch's catalogue, mentioned the other day, is a difficult task, for every page of an art-catalogue is full of suggestive matter, and names which in many cases have been held but in feeble remembrance, though worth more of lasting fame. We must needs pass them by in our hurried survey and rapid turning over of leaves. There are here Cruikshank's illustrations, of which it can be only necessary to remind the reader, and to remember the venerable artist for what he has done for the world of art. There are here Albert Dürer's works, on copper and steel, and some fine photographs of his woodcuts. Dürer was a great artist, all ways; for, as a German, he worked in a true German way, and worked, too, with his own hand, so that we see the artist workman truly typified; we see the *hand-writing* of the man visibly before us; we see the extent of his art-power, what he could do and what he could not do. This you can never do in copies, however able they may be, and however carefully and conscientiously executed. It would be well specially to note in such class catalogues the books which contain such autographic work, and to point out its special significance. A volume thus illustrated by the very hand of the artist himself, the joint production of his head and hand, is beyond price, and has more effect on the mind of the student of art than can be well estimated, the student himself being, may be, almost unconscious of its influence. But it is not the less real on that account.

We are confining ourselves to drawings, prints, and engravings, in the hope of being able to return to this suggestive list of fine-art specialities, and gorgeous books, and folio volumes of rare artistic work. We have a suggestive note here of Mr. Ruskin's art labours, and wonder a little at the power over the art-mind of "collectors," of rare things and of proof impressions of plates; for the cost of a first edition of "Modern Painters" is somewhat startling. Vol. I. would seem, indeed, to be fitted only,—as our catalogue says,—"for a fastidious collector." We cannot say that we much envy fastidious collectors. A few only of the plates in these books of Ruskin's are by his own hand, be it noticed; and copies, be it again noted, are not like original and autographic work, especially here. The "Examples of the Architecture of Venice," selected, and drawn, and measured from the buildings themselves, and of which two parts only have been published, are to be seen. No text appeared with the second part. "The Stones of Venice," and the "Seven Lamps," and "Fors," are all here; and even more than these, perhaps. There is Turner's great autograph,—the "Liber Studiorum,"—an early copy; landscapes, marine views, and rural and mountain scenery. It would be hard to make a selection: all and each of the plates telling a story. The cost of the complete set of volumes is high. Ought not, we may ask, a complete series of these magnificent drawings and interpretations of Nature to form a part of the National Picture Gallery?

There are here, too, works of Holbein, Hogarth, and Flaxman, with many others, and Michel-angelo, whom we must needs leave for a more special opportunity; for, truth to say, these *copied* and engraved works do but very scant justice to the gigantic powers of the great artist, and yet have the *fac-similes* of J. Linnell of the designs of the artist for the Sistine ceiling no small merit, and are worth attentive looking at. We must note some books, careful as they are, and to which students owe so much, such as Ottley's "Italian and Florentine Schools of Design"; and his collection of 129 *fac-similes* of prints by the early masters of the Italian, German, and Flemish schools. Then there are four or five pages devoted to Piranesi's works, so well known to art students, and full of so much that all must now miss. It would be curious to inquire how this is, and how it is that there is a special interest in these drawings and engravings, of views of architecture not now to be come at. The "Antichita Romane," architectural details, baths, aqueducts, sepulchral monuments, as here and elsewhere shown, possess a peculiar charm which it would be difficult to describe, or to accurately define. How is this? We might go on to almost any length, and wonder at the things that have been done so long before the world had arrived at its present high state of culture and power of mechanism!

But there is very much more than would seem likely at first sight in a catalogue of art-books, and especially in a class catalogue like that to which we are now more especially referring in this new catalogue of unique volumes. The very headings to the several sections are suggestive, indeed, of difficulties, and questions, and thoughts of past and present, if not of future art, without

number. The history, or rather histories of fine art, what do they not suggest? Not that the history of art has been as yet thoroughly written, but that the way to it is before us. Under this general heading we have books of prints, and which, indeed, form a history of art in themselves. The strange fancies of William Blake, of the date of 1794, evidencing to those who do not perhaps see quite clearly what the imaginative power in the mind of man will sometimes do; they may here find it fully and uniquely represented and exemplified. Would it not, we may here in passing ask, be a good thing to set apart a room in the National Gallery, even as it is, for the express purpose of exhibiting a selection of such works as these, either on the walls of it, or on tables, in well and strongly bound volumes. This very book, Blake's "Songs of Experience," might well and worthily find a first place. Virgil's "Pastorals," again, find illustration by this weird artist, aided by Cruikshank and Bewick. These are really historical, and typify the time. If, perchance, those in the future who are to follow us are curious to know what the art of the age was, it must be from such work as this.

It is impossible in so short a notice to do more than indicate a few of the great names in art, when there are so many of them. In a class catalogue, as here—(which, by the way, might be very much improved, and rendered much easier of reference, for there is no adequate alphabetical index to names or subject matters),—it is difficult at times to determine which is most important to find first, the artist or his work, and we look for the one to find the other. Here, not to attempt a long list of names, we have a series of subject matters and details which may well fill the mind of the most enthusiastic and industrious with dismay. We take them as in the catalogue at random,—arms and armour, costume, "emblems," engravings, furniture, gems, picture and art galleries, mosaic ornament, a somewhat too indefinite word,—monuments, "pageants," a very curiously illustrated subject, and once on a time the cause and foundation of so much that is artistic and noteworthy, and inclusive of so many things. Painters, portraits, sculpture, tapestry, with other items artistic; and last, but not least, architecture, in all its phases, and from all the four quarters of the globe, and from all times, and illustrated in all ways from the most rapid sketching, as in Digby Wyatt's books, to Penrose's "Geometry" of the Parthenon. If *books* can do the work of modern art progress, why here may be found the way to it. We hope Mr. Quaritch will add to his industriously-composed catalogue an *alphabetical* guide to it.

"SOUTH AFRICA."

THE book before us with this title* is the result, as we learn from the preface, of a long-formed intention on the part of an eminent novelist to "do" South Africa. Mr. Trollope, in the intervals of his remarkable and voluminous labours as a writer of fiction, has found time to "do" most of the colonies; and perhaps this expression (which he himself uses of his work) is tolerably characteristic of the manner and type of book which he has produced in regard to this and other localities he has visited, and of the nature of the interest which may be looked for in reading it. We all know that works which are really reliable and accurate in information as to the history and the social and political conditions of a neighbourhood are not to be produced on the basis of the notes of a hurried visit; and the author himself seems to imply, from his method of speaking of his labours, that this kind of historical and statistical value is not what he professes to claim for his pages. On the other hand, those who know Mr. Trollope's other publications of this kind will expect to find, what in its own way is equally valuable, a spirited and vivid impression of the nature of the country and the ways of its people, and a quick perception in regard to the bearing of isolated facts and anecdotes upon general theories as to the present and future of the country.

In this respect Mr. Trollope's book on South Africa is in no way inferior to its predecessors of the same class. What may be called the historical and political portions of the book are those into which we could hardly undertake to enter here, as they will not bear brief or superficial treatment, and anything beyond that would carry us too far out of the proper range of our columns. We may observe that the book gives a sketch of the early Dutch history of the colony, and of the entry of England upon the scene; and the author then proceeds to a description of his impressions and observations on the South Africa of the present day, starting from Cape Town and proceeding through Natal, the Transvaal, Griqualand, the Orange Free State, and the native territory. There is one important subject partaking both of social and political interest, in regard to which Mr. Trollope has a good deal to say that is very much to the point,—the relation of the white to the coloured population; a matter on which he seems to have been, throughout his short tour, specially desirous of gaining knowledge and forming conclusions: and his conclusions seem to be not different from those which have been formed in other similar cases where the white and coloured races have been brought into close proximity, as in India.

Granting, as he says in his introductory chapter, that compulsory labour, in which the wages are settled by the employer without consulting the employed, is only a form of slavery, and to be condemned, the more we do, short of compulsion, to bring the coloured man into harness and habituate him to regular work, the better for himself and for the colony. "A little garden, a wretched hut, and a great many hymns, do not seem to me to bring the man any nearer to civilisation: work alone will civilise him; and his incentive to work should be, and is, the desire to procure those good things which he sees to be in the enjoyment of white men around him. He is quite alive to this desire, and is led into new habits by good eating, good clothes, even by finery and luxuries, much quicker than by hymns and gardens supposed to be just sufficient to maintain an innocent existence." In regard to this point there seems to be just the difficulty felt with the Kafirs which has been felt with the freed slaves in the United States. They are apt to be so easily contented and so little ambitious, and can live on so little, that there is great difficulty in inducing them to labour, or to think that labour would be good for them. To bring the white and coloured races closer together in their associations and habits of life will be, as Mr. Trollope says, a gradual remedy for this state of things; and it should seem that the difficulty in accomplishing this is not all on the side of the natives. He observes, for instance, that in the Cape Colony the white labourer will not work on equal terms with the Kafir; he expects to be "boss," or master; he will lay bricks when they are brought for him by a black hodman, but he will not lay a brick at one end of the wall while a Kafir is laying an equal brick at the other end. Here, again, we have the United States difficulty as to the social recognition of the freed black over again. Yet the possibility of getting the Kafir to regular work in a systematic manner is shown in such a case as that of the Kimberley diamond mines in Griqualand, where the annual amount of wages, paid almost entirely into the hands of Kafir labourers, has varied from 600,000*l.* to 1,600,000*l.* in recent years. As a comment on this, we subjoin the description of leaving work at the Kimberley mine, which affords a good specimen of the kind of interest in which Mr. Trollope's book abounds:—

"Perhaps the most interesting sight at the mine is the escaping of the men from their labour at six o'clock. Then, at the sound of some welcomed gong, they begin to swarm up the sides close at each other's heels, apparently altogether indifferent as to whether there be a path or no. They come as flies come up a wall, only capering as flies never caper, and shouting as they come. In endless strings, as ants follow each other, they move, passing along ways which seem to offer no hold for the human foot. Then it is that one can best observe their costume, in which a jacket is never absent, but in which a pair of trousers rarely forms a portion. A soldier's red jacket or a sailor's blue jacket has more charms than any other vestment. They seem always to be good-humoured, always well-behaved; but then they are always thieves; and yet how grand a thing it is that so large a number of these men should have been brought, in so short a space of time, to the habit of receiving wages, and to the capacity of bargaining as to the wages for which they will work. I shall not, however, think it so grand a thing if any one addresses them as the free and independent electors of Kimberley before they have got trousers to cover their nakedness.

I must add, also, that a visitor to Kimberley should, if possible, take an opportunity of looking down upon the mine by moonlight. It is a weird and wonderful sight, and may almost be called sublime in its peculiar strangeness."

The difficulty about work seems to be even greater with the Zulu than with the Kafir, and the farmers in Natal consider it very hard that, with 300,000 of a labouring class around them, the 20,000 white "capitalists in a small way" should be short of labour. Of course, as Mr. Trollope observes, it does not occur to the Natal farmer that if the Zulu has enough to live on without working he should be as free to enjoy himself in idleness as an English lord. The point to be aimed at, again, is the same as in the case of the Kafirs,—to bring the two classes of population into such close relations that the less civilised race should acquire the tastes and ambitions of the more civilised, when they will also find the necessity of entering into the labours of the latter.

Among the interesting and striking portions of the book may be named the description of the remarkable stalactite caves called the Cango Grottos, and the wonderful effects seen in them by the aid of blue-lights. Of more practical interest is the account given of ostrich-farming, near Grahamstown, in Cape Colony. This is a line of industry (or agriculture, are we to say?) quite out of the experience of most English readers. The feathers are, of course, the object of culture, and each bird gives two "crops" of these annually, the value of a year's feathers being somewhere about 15*l.* per bird. As the birds require no expensive feeding (though not so omnivorous as used to be popularly supposed), the ostrich-farm is on the whole a paying thing; but it has to be carried out on scientific principles, and generally with the aid of mechanical incubators for hatching, as the birds injure their feathers in sitting. The method of reaping (if we may use the word) the feathers is curious, and seems not very kind to the birds. They are enticed by maize, which they are very fond of (and which we may suggest is *not* spelt "maze"; perhaps a misprint), into a pen, one side of which is movable; and when a sufficient number of birds are in, the side of the pen is moved up, on the principle of the crushing-room which is said to have been in use in the Middle Ages, till the birds are so closely packed that they cannot spread their wings or kick, when a man goes in and plucks or cuts the feathers from the under side of the wings; the plucking being preferred by the owners, as getting a better weight of feather, and inducing a quicker growth of the new feather, than cutting: how the birds look on it we cannot tell, but Mr. Trollope was assured that they took so little notice of the operation that it could not be supposed to cause them any particular pain. We do not ourselves understand how the operator gets among the birds if they are so closely packed as described; but that, of course, is his concern.

There are some interesting remarks as to the difficulties in road-making in Natal; the roads close to and even in the towns being often so bad "that it is felt to be almost rude to allude to them specially;" and some of the good ones that have been made have cost, through inexperience or official peculation, most disproportionate sums. In regard to Maritzburg, the principal town of Natal, of which Mr. Trollope does not say much in the way of description, it may interest our readers if we mention, of our own knowledge, that the water-supply question is just arising there, and judging from a lively correspondence in the columns of the *Natal Witness*, seems likely to become a question of municipal contention. It seems that the water for drinking is simply taken up out of open gutters called "sluits" which run through the streets, and which appear to be somewhat in the nature of natural streams or brooks taken into artificial channels along the streets. But as these are open to every sort of accidental or incidental contamination, the more enlightened inhabitants of Maritzburg are beginning to protest, in that forcible and lively style which seems peculiar to colonial journalism, against being compelled to drink water brought to their doors in this primitive and unconventional manner. Another peculiar point in the arrangement of Maritzburg is, that the word "street" does not apply to the passage way between the blocks of houses, but to the blocks of houses themselves. The town is all laid out in long parallel blocks of building, back to back, with long streets, as we should say, between them, and short cross streets; but the block itself is called "Pieter-street," or whatever may be the name, and is divided transversely into blocks of the width of a house, the block being numbered, and the houses looking to either side, in block 37 for example, are both called "37, Pieter-street." The fact is curious as illustrating the different ways of doing things, and also as bearing on the very various meanings which the word "street" has

* South Africa. By Anthony Trollope. London: Chapman & Hall. 1878.

gone through. In some of the south counties of England it stands for a village; and when the Dutch built Maritzburg the equivalent word, which has passed into the English "street," probably meant a block of building.

The description of the diamond-mine town of Kimberley is interesting and characteristic, though certainly not inviting. The town is "built of corrugated iron." The one fact is enough; we fancy we see it. Bricks cannot be made which will stand the weather, because fuel is so expensive that two thoughts have to be given to boiling a kettle; and to lay an ordinary room with a boarded floor would cost about 40*l*. In consequence, even people doing well with their diamonds live in comfortless houses, always meaning to leave next year or the year after, but always remaining to make more money and a larger fortune for the "retirement" which, as is so often the case, is postponed *sine die*. The town has a square called Russell-square, considered very fine, but chiefly remarkable because one of the two buildings in the town which have more than one story stands in it. "'I thought it very ugly at first,' said a lady who had been brought out from England to make her residence among diamonds, 'but I have looked at it now till I have to own its magnificence.'" In this case familiarity seems to have had the reverse of the proverbial effect. What seems to us still uglier is what Mr. Trollope says of the devotion of educated people to the work of turning over dirt for the discovery of the fictitiously-valuable diamonds. The diamond-seeker cannot give up his work and take to his literature at four or five p.m.; his mind is never off the chance that "dirt thrice turned may yet be a fourth time turned with some hope of profit." Ladies and children turn dirt instead of doing needle-work or playing. "And when ladies have told me, as ladies did tell me,—pretty, clever, well-dressed women,—of hours so passed, of day after day spent in the turning of dust by their own fingers, because there might still be diamonds among the dust, I thought I would almost sooner have seen my own wife or my own girl with a broom at a street-crossing." Truly we are with Mr. Trollope there.

Indeed, one of the morals which his book seems to point, and which he himself appears to have had a good deal before his own mind in the course of his investigations in South Africa, is the regenerating influence of honest labour. He urges with much truth (vol. ii., p. 188) that regular labour and the habits it induces are more likely to bring about a higher religious creed than the inculcation of the religious teaching is likely to effect by itself. The missionaries, he complains, have tried here and there to make a model Christian after their own hearts, with very partial success. Mr. Trollope had not seen the model Christian perfected; but, he says, "when I have looked down into the Kimberley mine and seen three or four thousand of them at work,—though each of them would willingly have stolen a diamond if the occasion came,—I felt that I was looking at three or four thousand growing Christians." Let us hope so too.

WORK AND WAGES IN THE BUILDING TRADES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The discussion on Mr. Brassey's paper * on this subject took place on Monday evening last, Mr. G. E. Street, R.A., in the chair. There was a very full meeting.

Mr. George Howell, as representing the workmen, was first called upon to speak. He said there could be no body of gentlemen better qualified to discuss this question than architects, holding as they did a position of neutrality between employers and workmen. It was stated in Mr. Brassey's paper that the Saturday half-holiday commenced in 1859, that was an error; it was in 1857. Two points were strongly emphasised in Mr. Brassey's paper,—firstly, the alleged reluctance on the part of the workmen to piece-work, and secondly, the alleged want of earnestness on the part of the workmen to do a fair day's work for their wages. Now, as to the first of these points, practised architects would not need to be told that, in building operations, it was almost impossible to apply the principle of piece-work throughout all branches. There were certain departments of work in which it could be applied; but how, he would ask, was it to be applied to brickwork, for instance, except, perhaps, in cutting gauged arches and the like? To apply the principle of piece-work or task-work to bricklayer's work, it must take the particular form recommended by Mr. Brassey,—a number of workmen taking the work and dividing the profits between them,—a method of working which was impracticable in connexion with the present system of contracts. Piece-work, he admitted, could be very well applied to some parts of mason's work and to joiners' work generally; but, in other branches of the trade, there were practical difficulties in the way of piece-work which had not been got over, and which could not be got over. The principle of piece-work could only be advantageously applied where a man could bring his whole energies to bear on his work, and be responsible for it until it was completed. A tailor and a shoemaker could do this, and so could workmen in some branches of the building trade. Many of the alleged difficulties on the part of the workmen in regard to piece-work had been really the difficulties experienced in applying the principle throughout the trade. He had had experience as a man and as a foreman, and to some little extent as a master, and he had not been able to see how piece-work was to be generally applied in the building trade. The second point referred to in Mr. Brassey's paper involved one of the most disastrous allegations that had ever been made, or that ever could be made, against the workmen, viz., that they "skulked," as it were, at their work, and did not endeavour to earn the wages they received. He was prepared to admit that there was in human nature,—and in *all* human nature, not only that of the workman,—a desire to get as much money as possible for as little work as possible, but that was a very different thing to saying that because men had a certain amount of work allotted to them for a certain wage, they should, as a matter of course, seek to "skulk" out of that work. He denied the existence of such a disposition to "skulk" amongst the working-men of this country, and he denied the accuracy of Mr. Brassey's conclusions as to the diminution in the amount of work done by a workman now as compared with what he did twenty years ago. It was, however, very difficult to test the amount of work a man ought to do. Some people, for instance, thought that the proper number of bricks for a man to lay in a day was 1,000, but all practical men knew that while in some cases it was possible to lay an even greater number, in other cases it would require absolutely harder work and closer application in order to lay 500, or even 300. Of course it entirely depended on the way in which the work had to be executed. He had talked with a large number of foremen and others as to the amount of work done by workmen in the building trade at the present time as compared with twenty-five years ago, and the answer he had received in almost all cases with regard to skilled men had been that their work to-day would bear comparison, in amount and quality, with that done at any former period. The only exception had been with regard to cases where there had been a sort of "nigger-driving" by "sloggers" or "jerry-builders" in the outlying parts of London, where men were encouraged by sixpence a day extra to surpass each other in the quantity of the work done, to the detriment of its quality. He denied that workmen as a body failed to do a fair day's work for their wages; at any rate, if the allegations to the contrary were true, the foremen must be very incompetent. Foremen ought to know the amount of work a man should do, and they ought to know how to dispose their men on a job so as to give each one the work for which he was most adapted, and so obtain the best aggregate result of their labours. As to the statements contained in Mr. Brassey's paper as to the cost of the new railway station at York, he did not wish to say one word which could be construed as disrespectful to the gentlemen (Messrs. Lucas) who supplied that information; but, after all, it was only an *ex parte* statement, and therefore not sufficient to enable an accurate conclusion to be drawn; it needed to be supplemented by a statement of many other circumstances and details before it could be positively accepted. Numberless statements of the kind had been made without any adequate foundation, and, strange to say, they had been quoted as indisputable by Mr. Greig, Mr. Thornton, and other writers on the subject. Ninety-nine out of every hundred of the allegations against trade unions in respect of restrictions were absolutely untrue. Take the case of "one-handed" bricklayers, against whom it had been attempted to raise a laugh because they would not use both hands in laying bricks. As a matter of fact, the cases in which it was possible for a man to lay bricks with both hands were very few, and they formed but a small portion of the aggregate amount of brickwork done,—for instance, in very wide walls and in footings, where a man could occasionally drop his trowel, although even then, with the almost certain risk of cutting or chapping the thumb of his trowel-hand to an extent that would, on the whole, hinder rather than facilitate his rate of work. In nearly the whole of his work, the bricklayer needed his trowel constantly in his hand, and, therefore, he ought not to be reproached for laying bricks with only one hand. It was as difficult for a bricklayer to lay bricks with both hands as it would be for a clerk to write with both hands. He did not mean to say that trade unions had not some stupid rules, or that they had not had such rules in the past; but some of these had been got rid of. The opponents of the unions would do well to attack only those rules which were absurd.

Mr. Alsagar Hay Hill, of the *Labour News*, referred to the strike and lock-out of 1859, and read an extract from a paper read by him on the subject before the Royal Historical Society, in which he laid the chief blame of that contest on Mr. George Potter. He said it was an important matter for trade unions to consider whether they ought not to take some steps to imbue their members with a feeling of fair play and consideration for employers, because while capital could do nothing without labour, labour was dependent upon capital. If working men would reflect upon this the interests of this country, in a commercial and manufacturing sense, would be more fully maintained. He had for a great many years taken deep interest in the welfare of the working classes, having himself worked at the bench when a lad of fourteen or fifteen in the town of Preston; and this subject of the relationship between masters and men had attracted his attention at that early age by seeing, in Canal-street, Preston, a "great demonstration" of men who had come out on strike against the use of the then newly-invented "self-acting mule." It had now become a canon that the attention of men to their work was in an inverse ratio to the amount of their earnings. Let all workmen be paid what their work was worth, and let there be no attempt at uniformity or levelling. He thought that the remedy for the state of things caused by strikes would manifest itself in a few years, when we might hope that English workmen would be better educated than at present, and would, therefore, know something of political economy. We were told on high authority that charity was twice blessed,—it blessed him that gave and him that received; but the 150*l*. taken by the masons on strike from the Bricklayers' Society on Saturday last could not have had a blessing attached to it, because it was a premium upon, he would not say idleness, but at any rate upon neglect of work.

Mr. Horace Jones said there was a great deal in Mr. Brassey's paper with which he agreed, but the facts brought together in it were not so complete as could have been wished. For instance, he had taken no note of one very important factor in the case, viz., the importation and accumulation of gold and silver. From 1865 to 1875 there had been an accumulation of gold and silver bullion in this country to the extent of from forty to fifty millions sterling, and this would necessarily cause a rise of prices in almost all articles of consumption. He regretted that the old conditions of work should have died out; he believed that but for the decadence of those conditions trade unions would never have been called into existence, or at any rate, that their policy and objects would have been of a different character. Up till fifty or sixty years ago there were, instead of the large firms of builders now existing, numerous small master-men in each branch of the building trade. Each of these masters worked with his own hands at his trade, and was assisted by two or three apprentices and two or three skilled workmen, who had become skilled by means of a term of apprenticeship, served, in all likelihood, under the master whom they were continuing to serve. These men were paid so much a week, good weather or bad, all the year round. There was something like community of interests between employer and employed

* See p. 129, *ante*.

under this arrangement, the relationships subsisting between masters and men being more like those subsisting between the various members of a family. That good work was done under such a system was shown by the works of Sir William Chambers and Sir Christopher Wren, with which the names of some of the small master-tradesmen had been honourably associated. He did not agree with Mr. Howell that it was a fixed principle with all men to receive pay for a certain amount of work, and to do as small a part as possible of the stipulated quantity.

Mr. George Potter said that according to some gentlemen, working men were always very desirous to be "striking," but the contrary was the case. Mr. Hill had accused him (Mr. Potter) of being the chief cause of the strike and lock-out in the London building trades in 1859. He was glad he was there to correct the mis-statement, for although he played a humble part in those events, everybody knew, or ought to know, that the strike was agreed upon only after due deliberation by the workmen in every branch of the building trade. The workmen, by a large majority of their delegates, decided to cease work; but he, with a great many more of the leading delegates, opposed that course, and urged the desirability of the men continuing at their work until the points in dispute had been further discussed. He, however, was in the minority. Those who, like Mr. Hill, presumed to speak to the public with authority on such questions, ought to know that no strike of any magnitude could take place without the sanction of a majority of the trade, and that it was not in the power of the secretary or officers of a union, except with the sanction of the members, to declare a strike. The event referred to took place nearly twenty years ago, and the part he (Mr. Potter) took in the matter had been repeatedly misrepresented. In the conclusions arrived at by Mr. Brassey in his paper there was very much that all would agree upon. Mr. Brassey had given a considerable amount of attention to the subject, and had therefore some right to be heard, especially as he apparently tried to speak without prejudices for or against either party to the controversy. It was not correct, as had been suggested by Mr. Hill, that trade unionists as a body denounced capital or capitalists. Now and then, perhaps, one or two of their spokesmen would speak rashly and unwisely, but such extreme men did not represent the great bulk of the members. Capital was necessary to the employment of labour, as labour was for the development of capital, and both should share in the joint results of their combination. The question was, what proportion of these results should go to capital, and what would be a fair reward to labour. It had been mentioned that the building operatives had, within the last twenty-five years, advanced 44 per cent. in their wages; but capital had increased no less than 250 per cent. in the same period. In this increase of wealth, were workmen to be prohibited from sharing? He contended that the building operatives had bettered their social position by means of their increased wages, and that their work was proportionately better than it used to be. Trade unions were charged with suggesting or demanding that all workmen—good, bad, or indifferent—should be paid alike. That was not true,—the unions merely fixed the minimum wage, beyond which a man was free to get as much as he could. As to piece-work, in many branches of the building trade it was impracticable. In some branches it was of course available, as in joiners' work; but even there it was attended with certain evils, as the men were instigated by the masters to "race each other's guts out," and as the men earned rather large wages by such rapidity of work, the work was "scamped," and the masters sought to reduce the prices given. Piece work ought to be done at a scale of fixed prices,—prices which would enable a competent and industrious workman to earn fair wages. As to overtime, it was the curse of the building trade, and the workmen were right in resisting it. He himself had known what it was to be on a job from five in the morning until eleven at night, and so utterly exhausted had he become during the last few hours that he had dropped to sleep on the shavings in the shop, —and for the time thus spent in sleep his master had paid. It was impossible for men to work well if they had to work overtime. In fact, overtime was unprofitable to the masters, and was a curse to the men and a nuisance to the society. As to the general question of wages, the men thought their claims were not unreasonable when they saw the enormous discrepancies in builders' tenders for large works. Take the case of the Law Courts, for instance. The highest tender was 1,000,000*l.*, but the accepted tender was only 720,000*l.* Now, if one firm could execute a large job for a quarter of a million of money less than another firm, and pay good wages to the workmen, and yet see its way to a fair profit, what must be the profits sometimes made by builders? He regretted, with Mr. Horace Jones, that the old relations between masters and men had died out,—that the numerous small masters had been overridden by the giant firms of the present day.

Mr. C. Lucas said it would be "bad form" for him, even if he could do so, to say an unfair word against the operatives, for he had profited largely by them, and they had, on the whole, behaved extremely well to him in times past; and it was therefore only from a sense of duty towards the men and towards the public that his firm was induced to give some of the information contained in Mr. Brassey's paper. The accuracy of that information had not been disputed. If Mr. Howell and Mr. Potter were to talk till doomsday they would not alter the indisputable fact that the workmen did not now do near so much in a day's work as they did when they were paid lower wages. Mr. Howell had suggested that the undue cost of labour in the brickwork at York Station was due to an incompetent foreman. He (Mr. Lucas) begged to say that the work was under the supervision of Mr. Clemence, who was a most experienced man, and had superintended many of the principal works undertaken by the firm. [Mr. Howell here disclaimed any personal imputation upon Mr. Clements.] Having supplied the facts referred to in Mr. Brassey's paper, he (Mr. Lucas) felt bound to stand up and vindicate them. He found that upon all work except that done in the shop (which was to a large extent done by machinery) and on engineering works, the amount of work done by the men had diminished as their wages had increased. He regretted to have to say this, because he had no antagonism to working-men. Why should he have? He had been a working-man himself. He began life as a boy earning 6*s.* a week, and the President of the Institute (Mr. Barry) knew him at that time. He had risen, but he never had a shilling but what he worked for. He had, in fact, attained his present position step by step, simply because he had always sought to do all he knew to make the best friends of his employers. He did not say this boastingly, but he affirmed unhesitatingly that he should never have risen as he had done had he been hampered as working-men now allowed themselves to be hampered by trade unions. Whatever might be the ability and industry of a workman, he defied him to rise to a similar position under the present regulations of the unions. Whatever might be a man's merits as a workman, they would go for little without freedom of labour. He was prepared to substantiate the statement that workmen in the building trade did little more than half the work for 9d. an hour than they did when they were getting only 6d. His firm's accurately-kept books of prime cost for a series of years would prove this, and they were open to the inspection of the President and Council of the Institute, or any body of gentlemen interested in the subject. He was the last man to object to the working-man being paid good wages: his sympathies were naturally with the working-man; and as a builder it was quite immaterial to him how high wages were provided that the public (who was the real paymaster) would pay them, and provided that he knew exactly how much work to expect for a given sum spent in wages. He denied Mr. Howell's assertion that it was a recognised principle with all classes of men to do as little as possible, and in the shortest amount of time, for the largest sum of money they could get. He agreed with Mr. Potter that in piece-work prices should be fixed at such a rate as would enable a man to earn a fair amount without undue exertion, and he did not know that the Council of the Institute could be better employed than, with the assistance of expert surveyors, framing a list of what really were fair prices for labour. He was prepared, on behalf of his firm, to give to the workmen all they received for labour, less 10 per cent.,—5 per cent. for interest on capital, and 5 per cent. for labour and brainwork in supervision and for risks. It was absurd to say that brickwork could not be done by the "piece"; he had let thousands of rods of brickwork at so much per rod. He was sorry to see how the workmen were injuring their own cause, and alienating their best friends, amongst whom he counted himself and his brother, who had never subjected their men to unkindness in word or deed. The men were, in fact, "cutting their own throats." As an instance of this he would mention that his firm were now engaged in constructing some dock walls, in which half a million yards of concrete would be required in lieu of masonry or brickwork; this represented brickwork to the value of a million, and masonry to the extent of two millions of money. Another instance was afforded in the case of the Charing-cross Hotel extension, which his firm was carrying out, and in which all the stonework had been cut out, even to the steps, in consequence of the strike. Even stucco was being largely resorted to, in consequence of the prohibitive rate charged for labour on stonework. Mr. Potter said it was all nonsense to say that the unions demanded a uniform rate of wages for all men. Whatever their rules might say, their practical operation had that result. He thought that workmen would do much better, instead of sacrificing such enormous sums of money as they did in strikes, to invest their funds in co-operative building companies, and so become their own masters. Were they to do this he ventured to say that they would not be in business a month before they would find all their calculations upset by the union rules. Masters knew too well the value of good workmen to treat them unfairly. It was urged by the workmen that the piece-work system would lead to "scamped" work; but that was an argument that told against the men themselves, for if the work would be "scamped," there must be "scamps" to scamp it. But this was merely a question of supervision. Workingmen in the building trade would do well to consider their present position. The trade was not what it had been, nor could it be expected that it would maintain the briskness of the last thirty years. London had been, to a great extent, rebuilt during that period, and new suburbs had arisen; new streets and railway extensions had also been carried out, and there was not a great deal of this work remaining to be done, and, in consequence of the enhanced and uncertain cost of building operations, people did not spend money in bricks and mortar unless they were absolutely compelled to do so. He submitted to the men, with all kindness and with all sincerity, that the adoption of the piece-work system would be to the mutual interests of masters and men, provided fair prices could be agreed upon. He had a large number of men in his employ working on this principle; many of them had been with the firm from boyhood, and their sons were now working with them. He regretted that his firm had made a mistake in counselling the concession of the "nine hours" and the Saturday half-holiday, but he believed at the time that the men would work with increased energy during the rest of the week as the result of those concessions. Such had not been the case, however. He thought it was a great mistake for building operatives to leave off work as early in summer as in winter, seeing that it was only in summer that outdoor work could be done. He thought that in summer time workmen might reasonably be asked to work ten hours a day, and six times ten, that is, sixty hours per week. He earnestly counselled the men to consider well their position, and, in all friendship and affection, he would advise them, as he did his own sons, to be in earnest over their work, and to do it well.

Mr. I'Anson had been astonished, as a practical architect, to hear Mr. Howell say that brickwork could not be done by the "piece," for he could conceive of no branch of work in the building trade which was more capable of being carried out in that way. No doubt, as Mr. Potter had suggested, it was the combination of labour with capital which produced results in building, and without doubt each was theoretically entitled to a share of the profits. But what those respective shares should be was an extremely difficult matter to settle. The value of labour, in fact, as of any other commodity, could only be fixed by the operation of the law of supply and demand. There was no better illustration of the operation of this law than was afforded by the case of domestic servants. They had no union, and therefore no strikes, yet their wages had increased within the last thirty years by something like fifty per

cent., simply because there was an ever-increasing demand for their services. It was an utter fallacy for a union to make rules the only effect of which could be to bring the good workman down to the level of his inferior in skill.

Mr. Howell: There is no such rule in any trade union in the kingdom.

Mr. I'Anson said the disclaimer just made was a most gratifying one. He thought the course pursued by the master builders of London in regard to the masons' strike was quite justifiable. They wanted labour, and the whole world being free to choose from, they went wherever they could get it. No one could dispute their right to do this.

Lord Houghton said that some years ago he was one of a committee appointed by the British Association on the relations between capital and labour, and on that occasion he had come in contact with Mr. Howell, Mr. Potter, Mr. Lloyd Jones, and other representatives of the working men,—and most intelligent men he found them to be. But what struck him most was that they were continually iterating the same statements, without being able to support them by any considerable amount of new facts; they were unable to prove that any of the continual strikes which had taken place throughout the country could be said to have "paid," or produced results to the workmen commensurate with the outlay. Considering the immense amount of money that had been sacrificed in strikes, and, what was even more sad, the enormous amount of loss of habits of industry which had been brought about by the enforced abstinence from labour which they entailed, the committee came to the conclusion that although there might have been, and no doubt was, a very large and considerable legitimate increase in the profits of labour in several trades, yet, nevertheless, there was abundant reason for believing that these results would have accrued in the ordinary course of things without the loss incurred by strikes. He could only say, in corroboration of what had been already said, that in his own sphere of life people were becoming more and more disinclined to spend money in building, in consequence of the uncertainty introduced by the possibility of strikes. He regretted the necessity that had arisen for the importation of foreign labour, and thought that it was an experiment which would not be found to succeed in the long run, for it was an exceedingly difficult thing to acclimatise foreign labour. He believed that the only true remedy would be found in the advancement of the education of the workman in the doctrines of political economy. Workmen ought, also, to learn something from the present position of affairs. Let them look at the stagnation in the coal and iron trades, and at the condition of South Wales.

Professor Kerr said that Mr. Howell and Mr. Potter had expressed their willingness to appeal to the judgment of architects. Now, he thought he might safely say that all architects, in the Institute at any rate, were prepared to countenance and encourage trade unions for all good purposes, because they themselves knew how good a purpose was served in their own profession by their being bonded together in unity. But there were two things in connexion with trade unions that architects would never countenance, viz., the attempt to equalise wages, and the monstrously cumbrous, awkward, and wicked policy of strikes. There could never be any necessity for a strike. A strike was an act of open war,—war *à outrance*. If there was anything which would benefit workmen it would be the pursuit of an undivided policy of perfect peace. The common sense of the country might always be relied upon in such matters, and the architects were in accord with the public when they said that they would never agree to the equalisation of wages or to a policy of strikes.

Mr. T. Chatfeild Clarke said it would be a great mistake if the representatives of the workmen then present were to leave the meeting without feeling that the architects were able, to a certain extent, to sympathise with and understand the position taken by the men. He (Mr. Clarke) for one, in common with a great many other speakers, could not shut his eyes to the undoubted fact that there had of late years been a great decadence both in the quantity and quality of work done; but, on the other hand, he held that the working man, as a free agent, had a perfect right to combine with his fellow-workmen to obtain the best possible price for their labour, to an extent short of anything like intimidation. He believed that arbitration was the true remedy for settling all such disputes, but however much he might regret the injurious effects of strikes, he could not regard them as crimes; they were the unfortunate result of disputes between capital and labour, where neither party would give in.

Mr. Arthur Cates said he had an instance of the way in which trade unions exerted themselves in restraint of trade. A granite merchant in the West of England recently acquired some granite quarries at Dartmoor, with the view of embarking considerable capital in them. The system on which the works had been hitherto conducted was piece-work, each man being paid by measurement for what he did. No sooner had he completed his arrangements (which were made on the supposition that the existing mode of work would be continued) than the Granite Masons' Society issued an order to this effect,—"That no more piece-work be done, and that day-work be insisted upon, at one rate of wages." The result had been that the proprietor had been prevented from developing the quarries, as he had intended, by the employment of 300 or 400 men, and was now only employing thirty men in making pitching. He found it was impossible, under the day-work system, to execute any ashlar plinth or moulded work for less than from 25 per cent to 30 per cent. advance on prices under the piece-work system.

Mr. Trollope said that allusion had been made to the strike of 1859, and as his firm was the first struck against, he might explain how it arose. They had some masons at work, and his brother, in looking round the works, was continually seeing one man who appeared to be doing little or no work. He spoke to the foreman about it, and suggested his discharge, but the foreman explained that the man in question was a "shop steward," and that if he were to be discharged all the other men would strike. Now, the amount of work done by that man in a week was found to amount only to 15s. 6d., whereas he was being paid 35s. The man was discharged, and the whole of the men afterwards left. He agreed with all that Mr. Lucas had so ably said.

Mr. Ewan Christian said he was glad to hear that the rule as to all men being paid alike was abolished, for such a principle was grossly unjust to the skilful and rapid workman. Thirty-eight years ago he was, as clerk of works, superintending the erection of a church. Some years previously he had been advised by a very shrewd builder in Nottingham to take account of every piece of work done on a building, and to value it as it went on. He adopted the suggestion, and a most valuable one it was, and he had since taught a great many young architects to do the same. One curious point in his experience at that remote period was this: twelve masons were working together under one shed, and it so happened one particular Monday morning that each of these men had a similar stone put upon his banker, and that each stone had to be worked into a moulded capital of exactly the same size and design. Of these twelve men, the first man finished his capital, and did it better than any man in the shop, in three days. The second man finished his in four days, the next in four and a half days, and the others in from four and a half to five and a half days, the last man taking six days to complete his work. Now all these men were paid alike, 5s. per day, and it struck him at the time as being most unjust, for if the one who occupied six days over the job was fairly paid at 5s. per day, the one who finished it in three days was obviously worth 10s. a day. As to what Mr. Howell had said as to all workmen getting as much money as possible and doing as little work as possible in return, all he (Mr. Christian) could say that no man who was "worth his salt" would descend to such behaviour.

Mr. W. H. Lascelles said that as a master builder, although in a somewhat smaller way than Mr. Lucas, he felt bound to say a word in defence of the men. He and his predecessors had carried on business for forty years, and had never been struck against, nor had they ever had any difficulties with their workmen. As to the amount of work done, he found that the men did as much now as they did twenty-five years ago. He admitted that his was exclusively a "piece-work" shop, and that the work was principally done by machinery. He had always found his men ready to assist him, and the utmost good will prevailed on both sides. He did not know how many union men he might have in his employment, perhaps ten, perhaps a hundred: he had never cared to inquire. One of his men he knew as having been on a union committee, and he was a most excellent workman, and had been with him for many years.

Mr. Lucas said that he agreed with Mr. Lascelles as to shop-work; it was on outdoor jobs that there was a diminution in the amount and value of work done by the men.

Mr. Alsagar H. Hill asked whether Messrs. Lucas would ask their workmen to share losses on contracts or by compositions of creditors? If not, it was a one-sided bargain to allow the workmen to share the profits of the business.

Mr. Lucas explained that he made no such proposal. He simply said that, as an earnest of his desire to pay men well for their labour, he would let them have all he charged for their labour, less 10 per cent.,—5 per cent. for personal labour, supervision, and risks, and 5 per cent. for interest on capital. His firm did not profess to work for less than 10 per cent. profit, nor did he believe that any firm could afford to work for less.

Mr. Henfrey said that as a contractor of twenty-five years' standing he endorsed the statement formulated in Mr. Brassey's paper, and vouched for by Messrs. Lucas, that there had been an enormous increase in the cost of labour. In 1843 or 1844 he built a railway viaduct in Manchester. He let the brickwork by the piece, and the prices he paid were from 1s. 10d. per cubic yard for the foundations, to 3s. in the arches and parapets, whereas the price mentioned by Messrs. Lucas as having been paid by them at York was 9s. He supposed they had to do it by daywork.

Mr. Lucas: Yes; the men would not take it by the piece.

The Chairman (Mr. Street, R.A.), in closing the discussion, said he had been pleased at the tone and temper preserved throughout the debate. Mr. Brassey's paper was a clear statement of the case, and he must say that the discussion had only tended to confirm its accuracy. It was pointed out, and very justly, that the increased cost of living, and the increase in the price of almost everything, justified a very considerable advance in wages. The question which the paper went very far towards solving was that of the law of supply and demand. Mr. Brassey had pointed out that the common labourer, whose claims had not been supported by any union, had obtained a larger increase of wages than the artisan himself. Speaking for architects, with the most kindly feeling towards the men, and with the greatest possible desire to encourage good work, he must say that the result of his experience was certainly such as very much to confirm what had been said by Messrs. Lucas to the effect that, in the present day, we did not get the same amount of work that we used to get. Nor did the quality of the work exhibit any tendency towards improvement. Messrs. Howell and Potter had stated that the unions only fixed the minimum rate of wages, and did not restrict men from earning larger wages. However limited their restrictions might be, the practical effect of them was to secure a uniform rate, which was very unjust. In masons' work, for instance, it required a very skilled man to make a good "Gothic" mason; but why should such a man be paid only at the same rate as the mason who worked on ordinary and inferior work? How, under such rules, could the good workman hope to better his position? As to the rules said to exist on the books of some societies limiting the amount of work that men should do, they were self-condemned. He could not quite agree with Professor Kerr, for he saw no wickedness in a strike provided it was undertaken with the view of obtaining a fair day's wages for a fair day's work, but let the men be sure of their object before striking. The case of dictation by a union cited by Mr. Cates was but a typical one. Such rules as had been quoted did interfere, more or less, with the freedom of the workmen. The discussion at the Institute, if it did nothing else, would serve to show the workmen that there was no hostility to them on the part of the architects, and far less than they might suppose on the part of the builders. He thought the speech of Mr. Lucas was creditable to him in every way. He hoped that the workmen would see that it was as much to the interest of the masters to avoid strikes as it could be to the interest of the men. The statements made by Mr. Lucas as to the substitution of concrete and stucco for stone

and brickwork were full of serious import, not only to the workmen, but to architects and the public, for the use of such materials must have a tendency to destroy all artistic expression in buildings, and if they were to be restricted to concrete and compo, instead of masonry and brickwork, architects would almost have to give up. He appealed to the representatives of the workmen then present to consider their position and what had been said, and he hoped that one result of the discussion would be to hasten the time when the unions would cease to put forth such rules as those which had been condemned, and which were of such a mysterious character that when quoted by one side they were always energetically repudiated by the other.

The discussion then terminated, much regret being expressed at Mr. Brassey's absence.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute, on Monday evening last, Mr. G. E. Street, R.A., in the chair, the following new members were balloted for and duly elected, viz.:—As Fellows: Messrs. Robert Henry Burden and Henry Hall. As Associates: Messrs. Rowland Lockyer Cox, Frederick Henry Williams, and Francis Fowler, jun. As Honorary Associates: Sir Watkin Williams Wynn, bart., M.P.; Sir Charles Reed, LL.D.; and Dr. C. W. Siemens, C.E.

The Pugin Studentship.—The drawings and sketches submitted by candidates for the Pugin Travelling Studentship of 1878 were exhibited, and it was announced that the Council had, after due examination of the drawings, awarded the studentship to Mr. G. W. Browne, the Sharpe Prize of 10*l.* being awarded to Mr. W. J. Millard, and a medal of merit to Mr. Sydney Vacher.

The Secretaryship.—The Chairman said that, within the last few days, as most of the members would know, an appointment had been made which would of necessity remove from the Institute one of its most useful and efficient officers, viz., Mr. Eastlake, who had been appointed Keeper of the National Gallery. Mr. Eastlake had placed his resignation in the hands of the Council. Mr. Eastlake had been most diligent in his duties, and it was noteworthy that during the whole of the eleven years he had been an officer of the Institute, he had never been absent from one of its meetings. The Council had passed the following resolution:—

"That the Council of the Royal Institute of British Architects cannot allow Mr. Eastlake's resignation to be accepted without recording their regret at their own loss, and their warm thanks to him for the industry, skill, and courtesy which he has so invariably shown during the eleven years of his service as secretary. At the same time they congratulate him heartily upon his appointment to the Keepership of the National Gallery."

The resolution was received with much applause.

Mr. Eastlake said he thanked the Institute very kindly for the manner in which they had received the announcement of his resignation. The appointment which the Prime Minister had been pleased to bestow on him was one which, on personal and family grounds, was very agreeable to him. If anything could have enhanced the pleasure which he felt in accepting it, it would be the hope, and he might say the conviction, that in quitting the service of the Institute after eleven years' official labours, he would carry with him the good wishes of so many of the members, most of whom he might, indeed, call his friends. His services would be at the disposal of the Institute until his successor was appointed.

The discussion then took place on Mr. Brassey's paper on "The Rise of Wages in the Building Trades of London," which we printed a fortnight ago (p. 129, *ante*). We give a report of the discussion in another part of the present number.

It was stated that the meeting to be held on the 4th of March will not be a "special general meeting for the award of medals and prizes," as previously announced. On that date Professor Donaldson will read a paper "On Obelisks: their Purpose, Position, Proportion, and Materials."

Bills to consolidate the law relating to weights and measures, and to provide for the insurance of buildings belonging to ecclesiastical benefices in England and Wales, have been printed.

A NEW HOUSE-IN-FLATS.

A BUILDER, Mr. James Blyth, who has erected a good many villa residences and semi-detached houses at St. John's Wood, is engaged upon a block of middle-class dwellings within a stone's-throw of that station of the Underground Railway. The carcass of the building approaches completion, and it contains, from top to bottom, no less than twelve self-contained dwellings. Each dwelling is provided with a kitchen and its necessary offices. There are two dwellings on each floor, approached by one stone staircase. The different stories are divided horizontally by party floors of concrete, laid between joists and iron bars, somewhat according to the Parisian system of construction; but the joists are steel rails, originally intended for a line of railway. Over the concrete a wooden floor is to be fixed. Though the distinction between the sitting, the sleeping, and the cooking accommodation is not so defined as we should advocate, the arrangement of the dwelling is an improvement upon the ordinary London "flat." Some of the windows are to be filled with oak casements, and small balconies are to be fixed outside. Besides plenty of cupboards, a wine-cellar and a coal-cellar are provided in the flat; and each dwelling has a cellar allotted to it in the basement. A porter is to reside in the block. The staircase is so arranged with a window on each story that the well-hole can be advantageously used for a goods-lift; it is so situated that a small furnace or an ordinary stove, placed in the basement would warm the air from top to bottom. If the smoke-shaft of that furnace or stove were carried up the well-hole into a small chamber at the top water could be warmed by it. We have seen this done with success, and offer the suggestion to the gentleman who is building this house-in-flats upon his own freehold ground. So confident, indeed, are all people who build flats in the success of their scheme, however primitively planned, that we shall not surprise any one by stating the minimum rent, all taxes and rates included, expected from one of these dwellings. It contains barely five rooms, and there are already numerous applicants who seem prepared to give 75*l.* a year for a home on the top floor, and in St. John's Wood.

ROYAL ALFRED SAILORS' HOME, BOMBAY.

THE building is Gothic in style, with a Mohammedan feeling: it was designed by Mr. F. W. Stevens, A.I.C.E.

The length of the frontage of the building is 270 ft., and the breadth 55 ft. It has two wings, one on the north side, 110 ft. in length by 58 ft. in width, and the other on the south side, 58 ft. in length and 58 ft. in width. There is accommodation for twenty officers, fifty-eight seamen, superintendent, assistant superintendent, and twenty servants.

The walls of the wings of the building have been built sufficiently thick to carry another floor, if at any time further accommodation is required.

Ground Floor.—The entrance-hall and principal staircase are in the centre of the building. The former has a panelled teak wooden ceiling, and the floor is paved with Minton tiles; the latter, which is 6 ft. in width, is constructed of blue stone with iron railing carried on groined arches. At the back of this hall is a baggage-room (24 ft. by 17 ft.), and in the front the carriage-porch (20 ft. by 15 ft.); in the north of the entrance-hall are the following offices:—Officers' sitting-room (26 ft. by 25 ft.), officers' dining-room (31 ft. by 24 ft.), pantry (24 ft. by 13 ft.), seamen's dining-hall (48 ft. by 24 ft.), provision storeroom (31 ft. by 24 ft.), dinner-service-room (31 ft. by 13 ft.), bar (16 ft. 6 in. by 9 ft.), kitchen (30 ft. by 20 ft.), scullery (20 ft. by 16 ft.), and quarters for twenty servants. On the east are the seamen's lavatories, baths, &c., which are approached from the main building by a verandah 7 ft. 6 in. in width. On the south side are the superintendent's offices (25 ft. by 12 ft.), clerk's office (25 ft. by 13 ft. 6 in.), seamen's reading-room (43 ft. by 24 ft.), storeroom for records, &c. (12 ft. by 11 ft. 6 in.), and the superintendent's quarters, composed of the following rooms: drawing-room (24 ft. by 15 ft.), storeroom (12 ft. by 11 ft. 6 in.), staircase (4 ft. in width), kitchen, and servants' room. There is a private entrance to these quarters on the south side. Verandahs, 9 ft. 6 in wide, run round the whole of the building on this floor.

First Floor.—On the north side of the principal staircase are placed the following rooms:—Dormitory for the accommodation of twenty officers (80 ft. 6 in. by 24 ft. 6 in.), with lavatories, baths, &c., and a dormitory for eighteen seamen (71 ft. by 25 ft.). In front of the main staircase is the assistant superintendent's room, and on the south side a dormitory for twenty seamen (83 ft. by 25 ft.), and the superintendent's quarters composed of the following rooms:—Two bedrooms (each 24 ft. by 16 ft.), with bath-rooms, &c., attached; verandahs, 10 ft. 3 in. wide, run round the whole of the building on this floor.

Second Floor.—On this floor there is one large dormitory for twenty seamen (76 ft. by 27 ft.), with bath-rooms, &c., attached. Verandahs, 10 ft. 6 in. in width, are to be placed on the east and west sides.

The facing of the building is of blue basalt; the carved cornices, bands, mouldings, dressings, &c., of Porebunder (a calcareous sandstone); the caps and finely-carved work of Hemnugger silicious sandstone; the arching, of Coorla blue basalt and Hemnugger stone; the flooring of asphalte; the covering of the main roof of the Broomhall Company's patent red tiles, laid on teak planking; the covering of outbuilding-roofs of Vieille Montagne Company's zinc. The piece of sculpture in the front gable, which represents Neptune, nymphs, sea-horses, and sea-lions on either side of it, were executed by Mr. Boulton, sculptor, of Cheltenham, in Bath stone. The caps, ornamental cornices, &c., are from models supplied by Mr. Kipling, late of the Bombay School of Arts, as also the medallion of his Highness Khunderao Gaikwar, in marble, in front of the porch. The ornamental iron gates to the entrance-hall, and the iron grilles, were manufactured by Macfarlane & Co., of Glasgow. The staircase-railing, iron finials, and castings, by Mr. Burjorjie Nowrojie, of the Bombay School of Arts.

The following is the inscription on the foundation-stone in the main staircase vestibule:—

"The First Stone of
this Building,
Erected as a HOUSE FOR THE SEAMEN of this Port,
and dedicated by
HIS HIGHNESS KHUNDERAO GAIKWAR, G.C.S.I.,
As a perpetual token of his loyal attachment to
H.M. QUEEN VICTORIA,
And in commemoration of the auspicious arrival in
Bombay of
H.R.H. the DUKE OF EDINBURGH,
K.C., K.T.G., C.M., G.G.C.S.I., P.C.R.N.,
Master of the Corporation of Trinity House,
Was laid by
His Royal Highness
This 17th day of March, 1870.
The Rt. Honourable W. R. SEYMOUR U. FITZGERALD
being Governor of the Presidency."

And a marble tablet with the following inscription has been erected in the same vestibule:—

"THE SAILORS' HOME
Was erected from Designs by
F. W. STEVENS, Assoc. Inst. C.E.,
And sanctioned by
The Government of Bombay,
On the 5th of December, 1871.
The work was commenced on the 28th February, 1872,
and was completed on the 29th February, 1876.
His Excellency the Hon. Sir PHILIP EDMOND WODEHOUSE,
K.C.B., Governor and President in Council."

The work was carried out under the immediate orders of Mr. J. H. E. HART, M.Inst.C.E., from February, 1872, to November, 1872; Col. J. A. FULLER, R.E., from November, 1872, to November, 1876. Mr. F. W. STEVENS, Assoc. Inst. C.E., executive engineer in charge. SITARAM KHUNDERAO, overseer.

His Highness KHUNDERAO GAIKWAR, G.C.S.I., contributed Rs. 2,0,000.

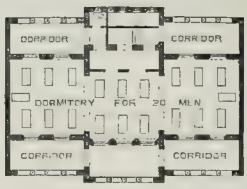
Estimate as sanctioned ..... Rs. 3,68,565
Actual cost* ..... Rs.

Major-General M. K. KENNEDY, R.E., Secretary to Government Public Works Department."

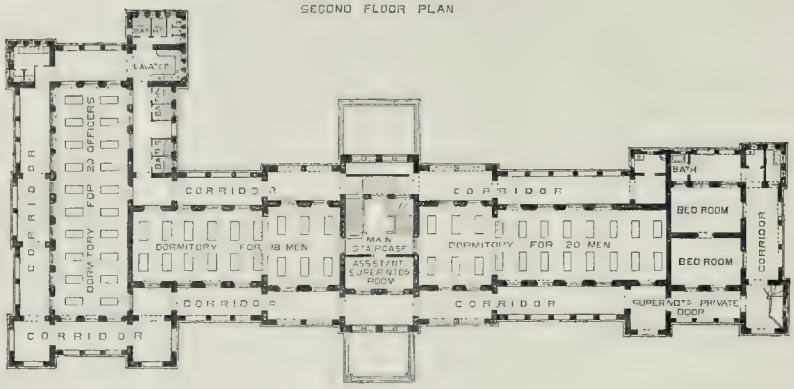
The building was publicly opened on the 19th of December, 1876, by his Excellency the Right Honourable Lord Lytton, G.M.S.I., Viceroy and Governor-General of India.

The building contains 1,026,624 cubic feet, and the rate is 5 annas 9 pies (8⅝ pence) per cubic foot.

* Accounts not closed, but expenditure is within estimate.



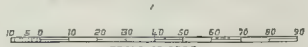
SECOND FLOOR PLAN



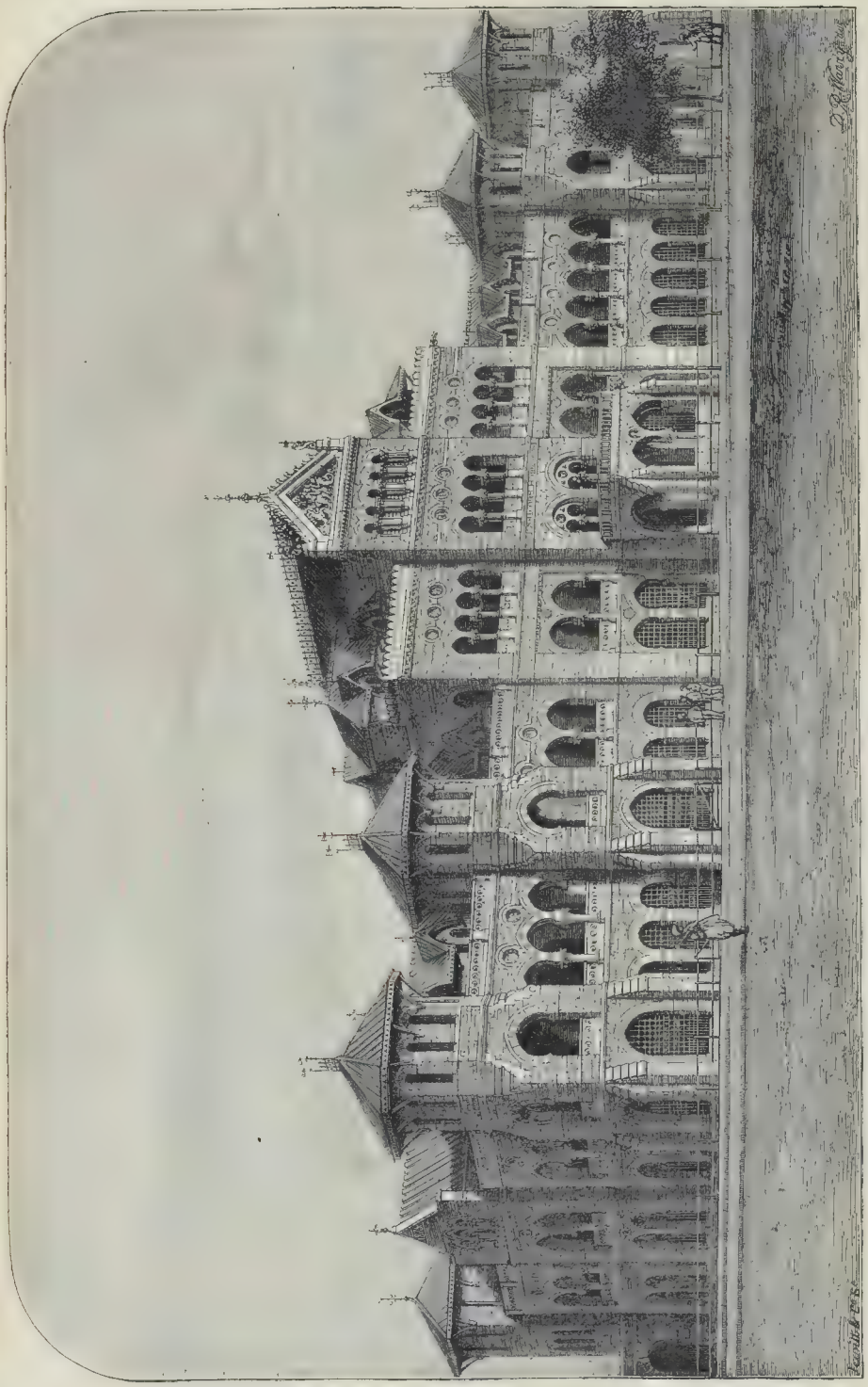
FIRST FLOOR PLAN



GROUND FLOOR PLAN



ROYAL ALFRED SAILORS' HOME, BOMBAY.—*Plans.*



ROYAL ALFRED SAILORS' HOME, BOMBAY.—Mr. F. W. Stevens, Architect.



LONDON STREET ARCHITECTURE: COLEMAN STREET AND GRESHAM STREET.—MESSRS. J. & W. WIMBLE, ARCHITECTS.

LONDON STREET ARCHITECTURE.

OFFICE BUILDINGS, COLEMAN AND GRESHAM STREETS.

THE buildings of which we give an illustration in our present number have been erected for Mr. Edward Burrell, of Lincoln's-inn-Fields, upon the site of some very old and dilapidated buildings, which had an irregular line of frontage, and till recently disfigured this very prominent position.

The basement is very extensive and lofty, and is exceptionally well lighted. The ground-floor is so arranged as to be divided if necessary into three distinct blocks, with separate entrances from Coleman-street, and is lighted in the rear with lofty lantern lights. The upper floors are approached by a broad stone staircase, having stained-glass windows by Messrs. Powell, of Whitefriars. Each floor has a separate block of lavatories, &c., and is so arranged that the offices can be let in suites of any number of rooms or the partitions entirely removed.

The style is Græco-Italian, and the elevation consists of an order with red granite pilasters, and enriched caps on the ground-floor, rusticated piers on the first, surmounted with flat panelled pilasters, two stories high, carrying an entablature with bold block cornice; the whole terminating in a Mansard roof, with dormers.

By arrangement with the Corporation, a uniform frontage of about 101 ft. in lieu of the old irregular line has been obtained, and the rounded corner, which is visible for a considerable distance up Lothbury and Princes-street, has been emphasised by the erection of a clock-turret carrying a dial with a double disc of plate-glass enamelled with opal, for illumination, supplied by Sir John Bennett.

The work has been carried out in Corsham Down stone, with brown Portland cornices and weatherings.

The windows, doorways, and lobby, on the ground floor are fitted up with American walnut partially ebonised, the lobby being paved with marble mosaic supplied by Messrs. Burke & Co., of Newman-street.

The fireproof flooring has been carried out by Messrs. Homan & Rogers, and the stone figures supporting the clock and the carving generally have been executed by Mr. Samuel Sansom.

The builders were Messrs. Ashby & Horner, and the architects, Messrs. J. & W. Wimble, of Queen Victoria-street.

THE INDUSTRIAL ARTS.—RIVALRY OF 1878.

THE catalogue of the forthcoming May International Exhibition at Paris divides the arts of design connected with industry into three classes:—Goldsmiths' work, bronzes, and cabinet-making. It is well known that, at all similar emulations hitherto, the French have claimed in these departments an unchallengeable superiority over all rivals, the Austrians not excepted. They are prepared to assert themselves still more emphatically during the present year, and certainly, so far as the filling up of space goes, their display will probably outdazzle those of all competitors. Of course, it is impossible with no more than a descriptive summary in hand, to anticipate either the verdict of public taste, or the decisions of the juries; but the fact cannot be questioned that France does devote a peculiar and ambitious genius to the development of these crafts, occupying, as they do, a position midway between the fine and the mechanical arts. The three divisions set forth principally include works in wood, mixed metals, and gold and silver, and those who remember previous exhibitions will not be disappointed. Moreover, as the different prefaces show, a distinct repudiation is made of those pretentious models by which, under the Consulate, the First, and even the Second Empire, antiquity was supposed to be illustrated. The Restoration took an equally ridiculous turn, and imitated the Renaissance. But a still worse fashion set in when, under the Citizen King, every order and description of people was desirous of appearing rich, and then set in the reign of casts, of plating, and of veneer. We have found this spirit rampant in every Exhibition, from long before 1851, and we shall find it domineering still in 1878. In one paragraph, introductory to a long list of objects which we are told to expect in a particular "Court," the admission is made that nothing, however new in detail, can now or henceforth be attempted without a reference, more or less general, to some favourite type, and the types named after the fourteenth and fifteenth Louis have not yet had their impressions removed from the gold, and silver, and bronze, and even the household furniture-work of France. Nevertheless, not going so far as that a certain historical consistency is maintained, since we have had always, and are sure to have again, the examples of Amboise, Fontainebleau, and Versailles itself, blended together, with less than the clearness of a mosaic, and all the incongruities of a curiosity-dealer's shop,—a spectacle which will be repeated at the Exhibition, and which we witness, on a reduced scale, in nearly every great modern mansion of Paris. The grand idea of late years appears to have been that of cheapening the markets of art. Now, it is an excellent thing to cheapen bread and wine; but cheapened art is too often degraded art, and can be nothing else, whether bestowed upon a needle-case or a picture-frame, by a copyist or a plaster-of-Paris modellist, by an amateur who hangs his walls with lithographs rather than go to the cost of steel engravings, or a mediævalist who prefers the price he pays for stained pear-wood to that which he would have to pay for ebony. Again, with respect to bronzes. The price-lists appended to the catalogue are practical exposures of shams. A rough blending of copper with zinc costs comparatively little, is of attractive aspect, may be tampered with so as to produce one effect after another, according to the desires of the *virtuoso*, and thus has it come about that what is called "the artistic metal," otherwise, "the barbarity of invention," holds so high a place in those mechanics' establishments which are dignified with the rank of "studios" in not a few quarters of Paris. But even to this depth there is a lower still, and bronzed plaster-of-Paris, or zinc from the roof of old houses, daubed over with a meretricious wash, satisfies the æsthetic wants of the Parisian, who, as one of his own countrymen says, with admirable candour, would rather have a paste-board Parthenon than none at all. It is not, of course, to be supposed that the administrative representatives of French art-industry at the forthcoming Exhibition will lend themselves to the converting of it into a sort of Parisian Lowther Arcade; and, still less, that there is not an abundance of genuine work to be placed in contrast with the fictitious, should the latter, unfortunately, find a place at all. The great house of Barbedienne, under whatever name it is now actually ruled, will, as we perceive from the roughly-draughted catalogue, not be absent, with its solid, pure, and highly-toned workmanship, wherein the human figure, especially, seems quickened into a keener life than even that which is suggested by the grandest outlines in marble. Those who remember the "Laocoön," the "Moses," the "Night and Day," and the "Dreamer" from the Barbedienne foundries, will anticipate that a quarter of a century's experience has not been thrown away by them. Those, of course, were studies from the Chapel of the Medici, in the Vatican, and, according to some critics, were, as copies, decidedly imperfect; but mere copying has never been the purpose aimed at, and it is simple pedantry to complain that we do not possess the exact copy of a copy whereof the original is lost. Necessarily the figures are reduced, by the mathematical process known in Paris as that of M. Collas, whose hand is to be visible again this year with his moulds of sand and wax, wherefrom he promises shall emerge a "Venus of Milo" in bronze, more perfect than any which the house of Barbedienne itself has hitherto produced,—cast in the "true metal of Corinth," which modern archæologists of no slight authority declare was not brass, but bronze. At all events, the Barbedienne cabinet is sure to be interesting. With it may be ranked the double group of MM. Clesinger and Cavalier, with their soft metallic draperies, dead-surfaced Mediæval armour, fierce warlike portraits, and figures of horses, which always look as if they were pawing a parade-ground rather than snorting and plunging amid the fires and thunders of a battle-field. M. Clesinger is an artist whom the French bronze-workers greatly admire; but we find catalogued side by side with him, such masters,—to appear, however, only at second-hand,—as Germain Pilon, Jean Coresin, and Jacques Sarazin, whose genius, it need hardly be said, has not been inherited by the bronze-workers of the nineteenth century, however scrupulous their employment of materials, or conscientious their study of models. With reference to the goldsmith's art, it was pointed out, five-and-twenty years ago, that Europe might have to wait long for the successor of Benvenuto Cellini. Benvenuto, of course, is not responsible for all the work attributed to him,—not even, perhaps, for all to which his name is signed. For he never gave his name to such a multitude of miscellanies as are here classified together, as though in an auctioneer's list, and offered as illustrations of the most modern of the modern goldsmith's art in France: chatelains, brooches, and salt-cellars among them,—very luxurious and superb, no doubt, yet suggestive rather of a window in the Rue de la Paix than of a cabinet in an International Exhibition. Again, he never contented himself with buying precious metals in the mass, distributing them among his artificers, and stamping each separate "masterpiece" with his sign-manual, as, from the merest glance at this gold and silver smith's inventory,—which is no improper epithet for it,—will be seen to be the case with many exhibitors, M. Christofle always excepted,—of the great bazaar Exhibition of May next. Not but that, in many historical instances, the artist-master has, so to speak, created a generation of artist-students, who have united his with their own fame, and transmitted them through a long posterity; but that the catalogue, in many of its pages, bears too plainly the resemblance to a price-list. To the revived practice of jewelling plate no reasonable objection can be taken. It was a habit with some of the greatest among the Italian gold-artists, and when governed by chastity of taste, adds a splendour to the purest work. We are promised, moreover, a reproduction, on a moderate scale, of the celebrated Venus, in ivory and gold, which grew into a myth of glory among the ancients; several smaller examples of that which was, at one time, reckoned as one of the lost arts,—the combination of ivory with the precious metal; and some images, in which are sought to be reproduced that process of blackening silver which, in one epoch of art history, was regarded as little short of a miracle, and which was usually associated with a prodigal employment of gems. Oxidised silver, too, takes a great range, in an infinite variety of forms; but, so far as can be judged at present, in imitations from Ghiberti and Michelangelo,—the bronze nymph at Fontainebleau, the Perseus at Florence, and copies from the heroic images of Feaicheres and Klagusenn at Dresden. These, we are assured, will be amply represented from the *ateliers* of the MM. Fleurant-Meurice, whose sculptured vases, in precious metal, are to occupy almost an entire court of the Exhibition; that is to say, in this especial department of combined art and industry. There are to be, as registered in the as yet uncirculated catalogue, services of gold, silver, and blended metal; fountains, with groups, caryatides of suggestive heaviness; fables from the Theogony of Hesiod and the idylls of Theocritus,—figures of from 6 in. to 6 ft. in height; and neither sculpture nor handiwork, but a medley between the two, which may be left, in order that a glance may be given to the studio,—for a studio it should be,—of the genuine cabinet-maker. In that category long lists appear of carvers in wood; of workmen who have fitted up, with their own hands, the new Parisian Palace of Industry; of libraries furnished according to the most scholarly tastes; and, more than that, of a working-class art industry, which will,—so it is predicted,—represent an advance far beyond that recognised in former Exhibitions. So far as can be judged from the barren tables before us, an immense amount of attention is bestowed upon Gothic or Louis Quatorze toys, while very little is given to public works of modern utility, or to modern habitations for modern Frenchmen to live in. French social wants appear to be at war with the French social arts in this as in not a few other respects.

Prescot Drinking Fountain.—In spite of the large amount of omnibus and cart traffic from Liverpool, St. Helen's, and other places daily passing through Prescot, no provision whatever has been made until now for supplying either man or beast, during their journeyings with a drink of good pure water. This long-felt want has at length been supplied by Mr. Samuel Peed, of Cambridge, for many years steward of the manor of Prescot. The gift is a drinking-fountain of bronze, about 3 ft. in diameter, let into the wall near the parish church gates. Mr. Peed's thoughtful gift is much appreciated.

THE THIRLMERE SCHEME.

The Bill for providing Manchester with water from Thirlmere has been referred to a Select Committee for full consideration: the best course which could have been adopted. The refusal or the passing of this Bill may have a very important effect on the future of the water supply question; and in Committee the real facts of the case on either side will be elicited much better than in the process of discussion in the House, where there is so much opportunity for mere declamation by persons totally unacquainted with, or indifferent to, scientific facts. We may observe, however, that in the discussion which did take place on the second reading the practical side of the question was better and more decisively represented than we had expected; and, moreover, that one gentleman, Mr. Fletcher, who spoke from the point of view of a "Lake-dweller," distinctly supported the Bill on the side of sentiment also, as he observed that the acquirement of the district for watershed by Manchester, and which was not to be built upon, would protect it from the incursions of people who "built Gothic villas," and that, in fact, Thirlmere in this respect would be "a brand plucked from the burning."

Whilst referring to the subject, we have pleasure in recognising the exceedingly-sensible and all-round view of the matter taken by our contemporary the *Times* in its leading article of the 13th inst., and which re-affirms almost entirely the view of the case which was urged in our own columns (in the *Builder* for December 1st last year). It is so rarely that non-professional papers take a calm view of these matters and keep outside of popular cries, that we have pleasure in recognising the fact that while other journals, weekly papers of considerable standing especially, have been ranting and sentimentalising on the subject, the leading daily paper has had the sense to recognise the real practical importance of the case in regard to water supply, and the exceeding futility and onesidedness of a great many of the objections which have been raised against the scheme, and which the *Times* characterises as merely the dislike of some amiable persons to seeing anything altered which they have been accustomed to. The writer of the article also perceives, what Mr. Ruskin and the sentimentalists will not perceive, that there is a real intellectual interest imparted to a country by great engineering works in many cases, and that they are by no means necessarily sources of degradation and spoliation to a landscape.

We observe that in a more recent edition of the pamphlet of the "Thirlmere Defence Association," the only sentence in our article of Dec. 1st, which could be construed into an unqualified sympathy with the "Defenders" has been printed, among "opinions of the press," without the context, which would have shown its real bearing, so as to represent the *Builder* as an adherent of their views. This is a very old trick with tradesmen, but ought to be rather beneath the members of the "Defence Convention." We hope those who take any interest in the subject will read our remarks in full, and not accept us as among the champions of a body of perhaps well-meaning, but certainly very excitable persons.

THE NEW DECORATIONS AT THE BRIGHTON ROYAL PAVILION.

The capacious suite of rooms that have been newly decorated were thrown open to the public on Monday (Feb. 18th), and visited by several hundreds of persons more or less interested in the Royal Pavilion, Brighton. The embellishments, which owe their origin to the late Sir Cordy Burrows, Alderman Brigden, and Councillor Friend, during their term of office on the Improvements Committee, are elaborate and effective. The colours are florid and harmonious, and the delineations show the ring of the pure French School, in which M. Armand D. Bouvard, the artist retained by the town, has studied. The state banquet-room is particularly picturesque; the huge palm-head full of fruit that expands in the lofty cupola teems with realistic beauty; the shades are strictly perfect, and the vengeful expression depicted on the enraged features of the gigantic flying dragon that, with wings expanded, appears fluttering beneath, is very natural. The cardinal points of the room are enriched by birds suspended by collars from the cornice carrying chandeliers pendent from the neck.

The coved ceiling at the extremities is decorated with arabesques, and these, for elegance of design, are some of the choicest in England. The entablatures of symbolical subjects in the other compartments are clever, as also the arabesques at the opposite extremes of the much venerated god-tree, that is held in such respect throughout this tea-growing country. The fibres of the herbage are minutely traced, and have excited admiration, as also the Chinese gallery, and the twin staircases; over these, on the north side, the decorations are interesting.

A bouquet of rich ripe exotic fruit protected by a pair of dragons gives the spectator an idea of John Chinaman's superstitious belief in demons. The south section, similarly guarded, contains a pair of enormous dragons in the act of executing the wrestler's grip, to terminate the deadly struggle that the clever painter has described more eloquently than by words. The centre of the gallery is remarkable for a graphic picture of the protective god of the Celestials against storms; the angry elements in retreat through the sky are shown by a couple of scorpions taking their flight. The walls of the corridors are a greenish grey, and finished in oil-colours. Upon them and the staircases 2,000 yards of canvases have been suspended, and over 3,000 different descriptions of vegetation peculiar to China are described by the aid of the pencil and brush with singular accuracy. The six large windows on the landings contain life-size figures of personages that abound east of the Caspian sea, costumed according to authorities. The paintings have been executed at a great expense, and the artist merits thanks. The surveyor is Mr. P. C. Lockwood.

NEW CHAMBERS IN THE TEMPLE.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last a large number of the members of the Architectural Association visited the new buildings now being erected for the Benchers of the Inner and Middle Temples respectively, and which occupy a commanding site overlooking the Temple Gardens, the Victoria Embankment, and the Thames. The buildings are situate on a site not far from the Middle Temple Library, having their main frontage towards the river. They comprise basement, ground-floor, and five floors above the ground level, the two uppermost stories being placed in the mansard roofs. The buildings may be said to be in two blocks, disconnected except at the centre of the principal façade, on the ground level of which is a handsome and elaborately sculptured archway leading through the building to, and in continuation of, Middle Temple-lane, although it is not at present in contemplation to admit carriages from the Embankment. The block to the east of Middle Temple-lane is the larger one, and belongs to the Inner Temple, being, in fact, a continuation southwards of Harcourt-buildings. The block on the west side is in continuation of the old buildings facing the west side of the lane on the east, and the Middle Temple-gardens on the west. The buildings thus consist of two blocks extending southwards, and united by a third block running from east to west, and carried over the foot of Middle Temple-lane by the archway already mentioned. The block plan of the new buildings is, in fact, an irregularly-shaped U. Besides the principal façade towards the south, there are the east and west façades, overlooking the gardens of the Inner and Middle Temples respectively. These façades are in Portland stone, with the exception of the basement, which consists of a massive grey granite podium, about 8 ft. high, battering from top to bottom. Access to the various floors is obtained by doorways and staircases entered from under the central archway on either side. The stairs are of Scotgate Ash stone, the staircase walls being covered with glazed bricks, those in the western block being white, supplied by Messrs. Cliff, and those in the eastern block of variegated greenish blue tints, and supplied by Messrs. Peart. The rooms on the various floors are arranged in suites of four in the eastern or Inner Temple block, and in suites of three in the Middle Temple block, the rooms over the archway connecting the blocks belonging, some to the Middle Temple and some to the Inner Temple, and entered from their respective blocks accordingly. Each suite of rooms will be provided with lavatories and water-closets, together with small rooms for the charwomen, or "laundresses," as they are called, who clean the chambers and light the fires. Although each set of chambers will be nominally let to only one occupant, that occupant will be free to sublet or share his chambers with two or more other barristers or friends. Very few of the occupants will sleep on the premises. The basement will be devoted to the storage of coal and similar purposes, lifts being provided from the basement level to the various staircase landings. All the floors and corridors are to be of Dennett's patent fireproof construction. The principal façade is agreeably broken up and diversified by large bay windows on either side of the central archway, and extending up through each story, the south-east and south-west angles being occupied by bold projecting pavilions, circular on plan. These pavilions and bow windows will afford exceedingly pleasant outlooks up and down the river. The circular pavilions will be surmounted by turrets, and the mansard roofs of the buildings will be broken up by gabled dormers. The buildings are being carried out under the joint superintendence of Mr. E. M. Barry, R.A., on behalf of the Middle Temple, and Mr. J. P. St. Aubyn on behalf of the Inner Temple; Mr. Barry, however, being the designer of the whole of the principal façades. Mr. G. W. Booth is the contractor. There are two contracts, that for the eastern block being 43,000*l.*, and that for the western block 33,000*l.* (each contract including a portion of the southern or connecting block), making a total of 76,000*l.* In the principal front, the central archway is flanked on either side by a massive pedestal and niche, intended to be occupied by statues in Portland stone by Mr. Calder Marshall. On the Middle Temple-lane side the archway will be flanked by two large lions *gardant*, carved in Portland stone. Mr. Mabey is the carver; Mr. Goodchild is the clerk of the works; and the contractor's manager is Mr. Houghton, who informed us that the German masons now at work on the building are giving great satisfaction. All the masons required have long since been obtained, and eight or ten applications per day are being made for work.

THE ENGLISH IRON INDUSTRY IN 1877.

A review of the English iron industry in 1877 which appears in the columns of the *Statistische Correspondenz* deserves quoting in our pages, for several reasons. Its observations on the cause of the present depressed state of our iron trade are sensible and to the point, and they are accompanied by hints as to the direction in which its principal activity ought to be applied. But it also contains some astute remarks respecting its future prosperity. "The English iron industry," says the writer, "like that of the continent, during 1877, has been in a more depressed state than even in the preceding years. The Scottish pig-iron industry has especially suffered, the decrease in its production amounting to 121,000 tons, having fallen from 1,103,000 to 982,000 tons. The consumption of pig-iron in the Scottish foundries and forges, together with the quantities exported, reached only 840,000 tons, against 910,000 tons in 1876. Stocks have increased by 142,000 tons. As in Scotland, so in Lancashire, Yorkshire, Derbyshire, and Lincolnshire, the production of iron has suffered under the competition of Cleveland. The imports of Cleveland pig-iron into Scotland (from Middlesbrough to Grangemouth) have risen, within the last two years from 353,000 to 421,000 tons. The manufacture of pig-iron in Cleveland amounted to 2,100,000 tons, consequently to more than double the Scottish production. The competition of Cleveland has not only kept English buyers from the Manchester market, but has attracted also continental buyers to Middlesbrough. German and Belgian manufacturers of iron goods bought there in 1877 pig-iron, in order to sell their produce in the English market with advantage, notwithstanding the double cost of transport. The English manufacturers of iron goods, which only a few years ago commanded the markets of the world, have been compelled at the present moment to relinquish their place on the European continent as well as in the United States in consequence of native competition. But it would be a great mistake to suppose that

the export of pig-iron from Cleveland is a sign of a more favourable turn in the history of the English iron industry. Increase of exports is by no means inducive of a change favourable to the trade of a country. Assisted by exceptionally favourable conditions for production, Cleveland is able to produce annually large quantities of pig-iron; but the export of this raw material to countries where labour is cheaper withdraws from the English coal and iron trades a considerable profit, and the re-importation of the iron after its manufacture sends down prices in the English market to the loss of home manufacture. Thus it is known, for instance, that Belgian iron is used both in London and Glasgow for building operations, and that English railway stations, and railway buildings generally, have been roofed with roofing materials brought from abroad. These facts permit us to recognise that the English iron industry ought no longer, as hitherto, to direct its principal attention to the manufacture and technical employment of pig-iron, but that it is now imperative that it should turn its activity to increased production of pig-iron.

The decreased demand of the colonies for iron goods has also disadvantageously affected the production of England. Of rails, in 1876, 80,000 tons were exported to Australia, in 1877 only 30,000 tons; the export to India fell from 95,000 to 55,000 tons; in Russia alone the demand for English rails continued. Considering the merely temporary nature of the requirements of the Russian market, and the unfavourable financial position of India, these results are most discouraging.

The decline in the prices of coal and iron, together with the improved mechanical appliances, have influenced the English steel industry in a most favourable manner. But it is a vital question for English industry generally that it should be sure of the production of steel, the material of which is destined to regulate the industrial development of the future. The price of steel rails has fallen since 1873 from 18*l.* 10*s.* to 6*l.* 1*s.* The decline per cent. in price is not larger than for North English pig-iron, which in 1873 cost 7*l.* 5*s.*, but in 1877 fetched only 2*l.* 1*s.*

Although the development of one branch of the iron industry may be most discouraging to the English producer, the predominance of the pig-iron manufacture and the steel industry in the markets of the world is at present assured. The iron industry, under the influence of the present crisis, suffers severely; but nothing warrants the belief that the latter will be permanent. Experience, on the contrary, shows that similar mercantile and industrial revolutions in the English iron trade recur regularly, mostly in intervals of ten years. If we compare its present state with the results obtained at the beginning of this decade, it will be seen that matters have not changed for the worse. During the last ten years the English iron industry has developed its productiveness to an extent previously unknown, which has enabled undertakers to realise large profits within a short time. It is hardly likely that a similar increase in the figures of production, as was witnessed in the years 1871—1874, will ever occur again, unless an unexpected activity in the construction of Indian, Australian, and New Zealand railways should set in. But if it is considered that English capitalists, after the sad experiences made in North, Central, and South America, will hardly feel inclined again to risk their money in foreign railway undertakings, it may be affirmed, with some degree of confidence, that, in place of over-speculation and over-production, something like a steady development of the iron industry will take place. The latter, although it will not bring large gains, accompanied, of course, by a high premium of risk, will insure to the undertaker a recompense and reward corresponding to his activity."

Holywell New Market.—At the meeting of the Holywell Local Board, on the 11th inst., the consent of the Local Government Board to borrow 5,000*l.* for erecting a market-hall was received. It was resolved that the thanks of the Board be presented to the Duke of Westminster for relinquishing the right to the market tolls on the payment of a small consideration and free from all legal charges. The plans of the proposed market and town-halls, prepared by Messrs. R. Scrivener & Son, architects, Hanley, were considered, and a special meeting of the Board for the same object was ordered to take place on the 21st inst.

SOME POINTS IN THE LAW RELATING TO THE ARBITRATION RULES OF BENEFIT BUILDING SOCIETIES.

THE first Building Society was established in this country in the year 1809, and therefore these associations are mainly a growth of the present century. Every year since that date they have been increasing in numbers and importance, and there is probably now not a town in this country, more than a village in size, which does not possess one or more of these societies. It is of the utmost importance, therefore, that the development of the law in regard to them should be carefully chronicled, for it is by legal decisions that the Acts relating to them have been interpreted and points of any doubt made clear. The Building Societies Act of 1874 (37 & 38 Vict., cap. 41) put into a new and compendious form a great part of the law regarding these associations, but whilst it thus, in some respects, forms a new starting-point in the history of Building Societies, the large majority of cases which were decided upon the previous Acts, namely, 10 Geo. IV., cap. 56, and 6 & 7 Will. IV., cap. 32, are either directly or indirectly in force. But there is a little fact connected with the most recent Act which is worthy of notice here, even if only to show the haphazard fashion in which a great deal of the legislative work of this country is performed. In 1875 a second new and small Building Societies Act was passed. And for what purpose? Because the words of section 8 of the principal Act, whereby existing societies not having a certificate of incorporation were deemed to be societies under the Building Societies Act of 1874, "were inserted through inadvertence." Such a clear and culpable slip shows how exceedingly carefully all those who have to do with legislative measures should watch their progress through the legislature, otherwise clauses will be inserted, and may become law, "through inadvertence." We propose to return from this slight digression, to point out now the results of certain recent decisions upon the question of arbitration in disputes which may arise between Building Societies and their members, and even if the recent cases, to some extent, reiterate well-known principles, these can never be too firmly grasped by all whom they may concern.

The point upon which we wish to touch is a decision of the Master of the Rolls, delivered in the course of last year, in the case "Wright *v.* The Monarch Benefit Building Society" (46 *Law Journal* Reports, Chancery, p. 649), a case which one feels astonished should have come before a judicial tribunal at all, so plain does it appear, but which will no doubt be of service in preventing further attempts by members to break through rules to which they have subscribed. Mr. Wright was a member of, and a shareholder in, the above society, and had conveyed to it certain property, by way of mortgage, in order to secure the repayment of various sums lent to him by the society. He had subsequently sold this property, and averred that in order to complete the sale he had been compelled to pay certain sums to the society which were not due: accordingly he came before the Master of the Rolls to obtain an account from the society, and payment to him of any sum that might be due. But it was proved that all disputes were, according to the rules, to be settled by arbitration, and section 21 of the Act distinctly states that "The rules of a society shall be binding on the several members and officers of the society, and on all persons claiming on account of a member or under the rules, all of whom shall be *deemed and taken to have full notice thereof.*" And it will be observed from the words which we have placed in italics, that even if a member does not actually know the contents of the rules of a society to which he belongs, he is presumed to be aware of them, and therefore it is of the utmost moment that persons should be cautious in their dealings with societies. For it need hardly be said that in this case the judge, in the most emphatic manner, held that Mr. Wright was bound by the rules of the society of which he was a member. He may, as regards the accounts have been thoroughly in the right, but it is evident that makes it all the more necessary to avoid hasty dealings with societies; for where the rules say that disputes are to be referred to arbitrators, to arbitrators they must go, and no court of law has any jurisdiction in the matter. In this instance we have witnessed a member in the wrong. In the case to which we next turn as an illustration will be noticed a warning to the society as such in the manner of carrying on its business. This decision was one of the Court of Common Pleas in 1875—Prentice *v.* London and others (44 *Law Journal* Reports, Common Pleas, p. 353), given, as will be observed, after the Act of 1874 was passed, but this society was registered under the previous Act, which contains very similar provisions as to arbitration. The plaintiff was the transferee of certain shares in the society, the defendants being the trustees of the Albion Mutual Benefit Building Society. The transferor had parted with the shares to Mr. Prentice, but the society, in consequence of the misconduct of the former holder, considered that they were forfeited. When, however, Mr. Prentice brings an action to recover their value, the society plead that the matter ought to be referred to arbitration. But the principle which we mentioned in the previous portion of our remarks, that disputes, when the rules said they were to be referred to an arbitrator, must be so referred, is limited by the fact that the disputes must arise between members *as members*, or between the society and a member *as a member*, and that the subject matter of the dispute should relate to the affairs of the society. Now, it must be obvious that the question whether a man is or is not legally a member of the society does not fall within the limitation. It is, in fact, a question as to his admittance to the position which, when it is attained, will then, as one of its elements, oblige him to submit disputes to arbitration. The rule upon which the decision in the present case turned was materially as follows:—"Should any dispute arise respecting the construction of these rules, ... such dispute shall be referred to arbitration." But in addition to the singular contradiction in the defendants' case, namely,—that in one portion of it they denied the membership of the plaintiff, and in another asserted that he was bound to refer his dispute as a member to arbitration, the question, as Mr. Justice Brett observed, was "whether Mr. Prentice was lawfully a member, therefore the statute and rules as to arbitration do not apply." Thus we have here at once an instance of the extent to which the arbitration question is carried, and its proper limits, and also a clear misunderstanding by the directors of the laws and rules governing a building society, with which they, of all persons, should have been thoroughly and accurately acquainted. Other cases might be referred to to make this example even more clear; but we purpose only to take one, in order to point out an instance of the working of the exception that, not only must the disputes be between the members of the society and the society in order to be referred to an arbitrator, but that the subject matter in dispute must relate to the affairs of the society. This was the case of Morrison *v.* Glover, decided by the Court of Exchequer in 1849, but which is still regarded as a leading case on this subject. There the defendant had mortgaged leasehold land to the plaintiff and others, who were the trustees of a building society, and had covenanted to pay the ground-rent to Lord Cadogan. This he failed to do, and the trustees accordingly brought an action against him for breach of covenant, which the Court decided they could do, and that the rules as to arbitration were not applicable, since the dispute arose between these persons, not as members of the society, but simply as mortgagor and mortgagee; for it will be observed that the reason for the decision was that the matter did not touch upon the positions occupied by those persons as members of a society,—in other words, it was an independent transaction. At the same time, we are inclined to think that, with the somewhat wider views of the judges of to-day, it would very likely be that in a similar case, except for the fact of the precedent, such a dispute would have been considered sufficiently a matter relating to the society, so as to enable the arbitration rules to take effect; for a very wide distinction seems to us apparent between this illustration and that last given, in which it was purely a question of the right to membership. At the same time, the principle of the case of Morrison *v.* Glover was expressly and by name affirmed in the case of Prentice *v.* London, and therefore, whether the application be good or bad, the principle is certainly sound, and a portion of the existing law, and as such must be borne in mind by those who are concerned with building societies. If this general principle as to arbitration, with the limitation which we have

pointed out, be properly understood by those, on the one hand, who are simply members, and those, on the other, who have the direction of these societies, their usefulness will be increased, and much vexation and loss of money will be avoided.

CHAMBERS IN THE CHALK.

What seems a curious discovery has just been made at Eltham Park, in the immediate vicinity of one of the ancient royal palaces of England. The authenticity of the discovery may not be doubted, we believe, being vouched for by Mr. Thomas Jackson, holder of the demesne of Eltham Park.

Within the last few days Mr. Jackson employed some of his workpeople to discover, if they could, the cause of leakage in his water-supply pipes. Prosecuting researches, they came upon a brick-lined drain, 2 ft. 9 in. square, the existence of which had never before been suspected, the course of which they followed, and, to their amazement, found it to end at the top of a shaft 5 ft. in diameter, and no less than 140 ft. deep. Due precautions having been exercised, the shaft was descended, and seemed to be of much older construction than the drain that led to it. The first 70 ft. of the shaft, or thereabouts, is lined with brick, and for 35 ft. lower with blocks of chalk, about the size of bricks; below this distance,—about 105 ft.,—the shaft has no lining, but is cut in the solid chalk. From the bottom of the shaft a large chamber is entered by an archway 6 ft. high, by about 30 in. wide, cut entirely out of the chalk. This gives admission to a chamber 66 ft. long by 33 ft. wide, and 8 ft. high; that is also cut out of the chalk, with bands of flint showing horizontally round it. The roof, which is flat, is supported by three pillars running along the centre, and eight others projecting from the sides of the cavern, all of these pillars, as the cavern itself is, being cut out of the chalk. A few bones, apparently of cattle, were found in the cavern, and several iron nails driven into the wall at various places, with an iron bracket, supposed to have been placed for the support of a lantern, torch, or candle. The shaft was closed at the top by a brick arch, the crown of which reached within about 6 in. of the grass, yet, strange though it may seem, Mr. Jackson states that none of the people working on the estate, their recollection carrying them back for fully fifty years, had any knowledge whatever of these curious subterraneous structures and excavations. The character of the bricks, nails, and the form of the iron bracket, may be a clue to antiquaries in coming to some conclusion as to the original and subsequent uses of this singular excavation.

Eltham, as our readers know, is a place of considerable historical interest. In its churchyard are interred the remains of Dr. George Horne, Bishop of Norwich; Sir W. Baines, bart.; and Doggett, the comedian, of coat and badge celebrity. The registers date back to 1580. In the time of William the Norman the manor was part of the possessions of Odo, Bishop of Bayeux; on his disgrace it passed into the hands of the Crown, and partly of the Mandeville family. Edward II. resided here. In the ninth year of his reign his queen gave birth to a son—John of Eltham, brother of Edward III., who (Edward III.) held his Parliament twice at the Palace of Eltham, and there entertained with great pomp and magnificence King John of France. Eltham Palace continued to be a favourite place of abode for sovereigns of the Plantagenet, Lancaster, York, and Tudor lines up to the time of Henry VIII., who gave his preference to Greenwich Palace, although he still continued to reside occasionally at Eltham.

MASONS' STRIKE.

Sir,—The following is a copy of notice given to *employés* in the firm of Messrs. Moslin Bros. this day, and if you can find space in your valued paper for the admission of the same, we shall be greatly obliged, as we understand that many of the large firms have acted on the same principle this week:—

COPY OF NOTICE.

"As we are of opinion that it is quite time the present strike of masons came to an end, the only possible advantage that is very likely to be derived is to keep the idle in idleness,—we therefore give notice that we shall not pay the 10d. per hour after Friday, the 22nd inst."

Moslin Bros.

16*th February*, 1878.

NOTES FROM LIVERPOOL.

At a meeting of the Mersey Docks and Harbour Board on the 14th instant, it was resolved, on the recommendation of the Works Committee that a communication be made to the directors of the Lancashire and Yorkshire Railway Company with a view to ascertain what accommodation in the shape of land and other conveniences they might require from the Board to carry out a proposed scheme for the widening of their line of railway at and towards the junction with the present high level railway. Mr. Harrison, the chairman of the committee, in moving the adoption of the recommendation, said that increased facilities for shipment of coal could be obtained much earlier in the way proposed, and at considerably less expense than in any other way. At present the facilities at Bramley-Moore and Wellington Docks admitted of about 9,000 tons of coal per week in the winter season being shipped, and about 11,000 tons per week in summer, and the total in the year was taken away by a fleet of about 600 vessels, and something like 2,000 flats. It would be much better if this fleet of vessels and flats were accommodated at the Salisbury and Bramley-Moore Dock entrances than at the north docks, and if the proposed increased facilities were given, the working of the north docks would be much simplified, and it might render the construction of the northernmost dock unnecessary, at all events for a long time to come. The Board would thus have at their disposal at the north end a large area of land for any purpose, which they could use for the storage of timber if the Board so decided, and thus give early relief to the timber trade, which is, and has been for some time, very much hampered by want of room. Mr. Kellock said it was most desirable to obtain increased accommodation for the coal trade in Liverpool. Last year there were shipped only 404,350 tons of coal from Liverpool, with the Lancashire and Yorkshire coalfields close at their own doors, whereas on the Birkenhead side there were shipped 1,413,000 tons.

The Liverpool Town Council recently agreed to allow pictures by Sir John Gilbert and Mr. A. D. Fripp, belonging to them, to be sent to the Paris Exhibition, and at the meeting of the Council on the 16th inst. a letter was read from the Prince of Wales, the president of the English Commission, asking for the loan of "Serf Emancipation," by Mr. E. Armitage, who has expressed his desire that it should appear in the Exhibition. The request was unanimously acceded to.

THE ARCHITECTURE OF NORWAY.

Sir,—It seems evident, from the account of the architecture of Norway, as brought before the Royal Institute of British Architects at two of its recent meetings (see the *Builder*, pp. 91 and 161, *ante*), that the author of the paper on the first occasion, and those who took part in the discussion on the second occasion, had but imperfect knowledge of a very important source of information relative to the subject, namely, the folio book entitled in its English title-page, "The Cathedral of Throndheim. Published by order of the Norwegian Government. Text by Professor P. A. Munch. Drawings by Architect H. E. Schirmer. Christiania. Printed by W. C. Fabritius. 1859." This book, which is really a fine book, and which got into England early in January, 1860, consists of forty-eight pages of text, Norwegian and English in parallel columns, and thirty-one grand plates, engraved by our own J. H. Le Keux in his boldest and most effective manner. The plates, or some of them, for the Norwegian Government book has *plans*, were probably laid before the meetings referred to, for Mr. I'Anson in his paper mentions, "a work on Throndhjem Cathedral, well illustrated, but undated, and without letterpress, containing perspective views, and many details, drawn by Shirman [*sic*], and engraved by Le Keux [but no plan], which is in the Institute Library."

If we English are not more acquainted with what has been written on Norwegian architecture than we are, it is not for want of help from the learned men of Norway; for in their anxiety that their labours on the architecture of Norway should, as far as possible, be set completely before English people, they have for many years past been in the habit of publishing some of their contributions to the subject, which they evidently deemed to be of interest to both nations, not only in their own language, but in their own language side by side with an English translation thereof.

With regard to the question of the introduction of the use of stone for Norwegian buildings, and without entering into detail connected with exceptions, it may be stated generally that the opinion of Scandinavian learned men would seem to be, that while Paganism reigned throughout their lands all buildings were constructed of timber, and that a significant change from timber to lime and stone took place on the introduction of Christianity,—that is, in the beginning of the eleventh century. On this point M. Nicolaysen's "Norwegian Buildings from Former Times" may be consulted.

E. C. Ireland.

SUGGESTED CONFERENCE ON WATER SUPPLY.

H.R.H. the Prince of Wales, president of the Society of Arts, in a letter to the Council of that body, says:—

"Our great cities and populous towns, such as Manchester, Liverpool, Birmingham, and others, are, each for itself, taking steps to obtain an improved and increased supply, whilst the metropolis is seeking further powers from the Legislature with the same object in view. The smaller towns and villages are dependent on accidental sources of supply, and in many instances these are wholly inadequate for health and comfort. While the larger populations are striving, each independently and at enormous cost, to secure for themselves this article of prime necessity, the smaller localities must make the best shift they can, and in many instances are all but without supply at all. Under these circumstances, I would draw the attention of the Council to the subject, and suggest whether, at the present time, great public good would not arise from an open discussion of the question in the Society's rooms, with a view to the consideration of how far the great natural resources of the kingdom might, by some large and comprehensive scheme of a national character, adapted to the varying specialities and wants of districts, be turned to account, for the benefit, not merely of a few large centres of population, but for the advantage of the general body of the nation at large."

The Council has appointed a committee to take into consideration the best means of carrying into effect the suggestions thus made.

WATER SUPPLY.

Sir,—By some accident my letter of the 9th inst. got contaminated by a paragraph of quite foreign matter. My question with respect to our water supply was simply whether it is absolutely necessary to allow heaven's pure outpour to be sullied through all kinds of channels before we stoop to drink and quench our thirst? Are there no means of collecting it uncontaminated and fresh from the fountain head? The clouds are the real fountains of pure water. The purged and liberated vapour descends as unsullied snow upon the Alps, and as crystal water at lower elevations. To collect rain-water fouled by a London atmosphere is, however, by no means my project. This would be but to escape the ditch to fall into the gutter. My project is to create clean water-sheds on elevated districts sufficiently wide of London. I would make artificial mountains to receive the rain, by paving sufficient areas on the plateaux, lying at a proper distance from towns and cities, with slate. These paved areas would have proper water-courses to convey the rainfall to reservoirs. Hill tops, and hill sides having gradients too steep to be available for husbandry might be so utilised. Different means might be required to effect the same end under different circumstances.

Meter.

Proposed Improvements at Walmer.—A meeting of the ratepayers of Walmer has been held to confer with Major Hector Tulloch, R.E., the Government inspector appointed to hold an inquiry regarding an application of the Walmer Local Board for the sanction of the Local Government Board to the borrowing the sum of 2,600*l.* for sewage works for the drainage of Upper Walmer, and of 1,000*l.* for street improvements. It was stated that the sewage would be discharged into the sea, and that no land would be purchased; the outfall being laid at the level of low-water mark. A petition against the proposed drainage scheme, signed by about twenty-five ratepayers and owners of property, was handed in, and it stated that the drainage was not required, the different properties which the scheme would embrace being "well supplied with cess-pools." The Inspector stated that the objections raised were not valid, and he must of necessity sanction the drainage works.

SOIL-PIPES AND SEWER GAS.

SIR,—Having been asked to state my views with regard to Mr. Norman Shaw's method of dealing with soil-pipes, perhaps you will allow me to say a few words in your columns.

In the first place, I take it as an accepted fact that all the leading sanitary authorities of the day are agreed that the three following principles ought to govern the treatment of all soil-pipes in connexion with dwelling-houses:—

1. That every soil-pipe should be disconnected from the underground drains in such a way that no sewer gas can pass from the drain either into the soil-pipe or into the house.

2. That from end to end of all soil-pipes, whether inside or outside the walls of a house, fresh air should be passing continually, instead of foul air being continually bottled up in them, as heretofore; which is the case, in spite of their being left open at the top, whenever they are not open to the air at their lower ends too. Pipes that have been so treated from the first will never, I believe, get sufficiently foul inside to give an offensive odour to the air passing through them, and will certainly never impregnate it with the germs of disease, provided the closets are supplied with water enough to flush them properly at each discharge, and that a sufficiently rapid fall is given to the branch from the closet to the soil-pipe. Such soil-pipes are, in fact, air-pipes for the whole twenty-four hours of the day, less the few seconds occupied by the descent of sewage matter.

3. That a trap of any kind attached to a closet-pan is a delusion and a snare, whether ventilated or not ventilated, being simply a means of retaining within the walls of a house sewage matter which ought to pass out of the house at once. I hold that the above points have now passed beyond the region of argument into that of practical experience, as numbers of private houses and public institutions bear ample witness to; therefore it would be mere waste of time to try and meet the objections of those who are not in a position to show that they have more reliable grounds for argument than are derived from the exercise of their own imaginations. Well, does Mr. Shaw's plan fulfil these conditions? I think there is no doubt that it does, provided that the drain into which the disconnecting syphon-trap discharges is thoroughly ventilated; if not, then special means must be taken to prevent sewer gas from forcing its way through the water in the trap. This is a point which appears to have been overlooked by Mr. Shaw, for his drawing shows no safety-pipe on the sewer side of his syphon-trap. I call it a safety-pipe, because it is only used for private safety, and not as a means of ventilating the public sewer. I do not say that in all cases it is absolutely necessary, but I do say that in all cases of badly-ventilated drains it is safer to put one in, and there are many cases in which its omission would be a fatal mistake. Sometimes a specially-jointed rain-water pipe may be used for the purpose, but it must always discharge well away from any window or flue, whether for air or smoke; and being only a safety-valve, a 2-in. or 3-in. pipe will be large enough. It cannot be too often repeated, that sewer gas under pressure passes readily through water. In a case I had lately to deal with in London, the safety-pipe was temporarily stopped by a man who was working unpleasantly close to its outlet, the result being that the gas came bubbling through the water in the syphon trap with such force that the surface of the water was covered with a froth at least 2 in. thick. It was a case in which seeing was by no means necessary to believing; for the stench was unbearable, and yet the former occupier of the house had had the same thing going on constantly within the very walls of his dwelling, which, perhaps, accounted for the fact that every window and door had been fitted with special ventilators, and a ventilating pipe run up from the top of the soil-pipe,—all in the vain hope, no doubt, of curing an evil, the source of which was a hidden mystery.

With regard to minor details, there are one or two points in Mr. Shaw's plan that I would notice: one is, that the syphon-trap should be readily got at for inspection; another, that any gas finding its way through the unguarded water-trap is directly invited to enter, first, the open mouth of the soil-pipe, and then the open mouth of the branch leading to the closet, for they are both placed in its direct course; and a third, that the hopper-head seems to require a cover, arranged so as not to interfere with the free passage of air, since people who are not enthusiasts on the subject of soil-pipes would not care about watching the system in action from their upper windows; whilst not only might birds look upon it as a good place for a nest, but ingenious children would be very likely to exercise their skill by pitching things into it from the windows above, or from the ground below.

Subject to the above remarks, I believe that Mr. Shaw's plan will be found to answer its purpose as well in the future as it has done for the past two years. At the same time, I do not think it can claim the merit of being simpler than several other methods in use for attaining the same end; whilst the fact of air which has passed through a soil-pipe being liable to enter in at your windows, however harmless and inodorous it may be, would be a serious objection in the eyes of most people, and one which no amount of reasoning would overcome, since the final end of their argument would be, "The idea is quite enough; I prefer its being done in some other way"; and since there is really no necessity for hurting any one's feelings of propriety, I do not think that the open hopper-head, which is the only special feature in Mr. Shaw's drawing, will ever be generally adopted, though in particular situations, as against blank walls, out of sight, it may here and there be introduced.

In my own house I have adopted Banner's system, the perfect working of which is undeniable, owing to the extracting force of the cowl, which draws the air down through the closet-pan when the valve is open.

As regards other so-called systems, they are nearly all of them derived from the same source, whether they adopt an extracting cowl or not. It is to Mr. Banner's persistent advocacy of the system he first applied to his own house that we owe the fact that it is no longer considered necessary to put up with sewer gases in our houses in return for the convenience of indoor water-closets; nor do I ignore the great claim which I believe Mr. Buchan has upon our gratitude for his success in the same field north of the Tweed. That the system of open ventilation will be more generally extended to underground drains than it is at present, I feel convinced; it is being carried out in several places at the present time, all the branch drains leading to the sewer being open to the air from end to end, so that the syphons cutting off the drains from the soil-pipe require the addition of no safety-pipes to guard them from being forced. I am even sanguine enough to believe that the time will come when we shall be able to stand near any of the street gullies in Regent-street, on a hot summer's day, without being poisoned by pent-up sewer gases discharged through their iron gratings. H. C. SEDDON.

P.S.—Since writing this letter I have read Mr. Ernest Turner's account in your last issue, of some experiments made by him at Mr. Shaw's house, the results of which are precisely what I should have expected, and completely bear out the views I have expressed above.

SIR,—Mr. Norman Shaw is right in having a ventilating opening in his soil-pipe at the bottom level with the ground; wrong in having an opening in the height under his windows; wrong in not continuing the pipe above the parapet or roof; wrong in not carrying a ventilating-pipe from the top of each branch soil-pipe upwards into the main pipe continued; and wrong in in using closets without traps.

What takes place is this:—The current of air which enters the soil-pipe at the bottom escapes at the opening in the height, charged with the effluvium generated within the pipe. As this opening is close by the head of the window, and directly under three or four others, the foul air flowing out of the opening is drawn into the house through the windows. Also, as the branch soil-pipes have no ventilating pipes from them, they are charged with the effluvium generated within them, which effluvium puffs into the house through the closets every time the valves are opened, as the closets are without traps.

The experiments made by Mr. Turner and Mr. Shaw with the pipes in question confirm the above, which was written before the experiments were made, and teach this lesson,—that it is a mistake, and likely to introduce noxious effluvium, and consequently disease, into houses, to use closets and sinks without traps, branch soil-pipes without ventilating pipes from them, and main soil-pipes with openings or terminations near windows.

It is not generally known,—but it is a fact,—that all soil-pipes of lead and iron do become more or less coated with filth, and corroded or perforated by the gases which generate within them. I have largely used, with success, 4-in. and 6-in. glazed stoneware pipes for soil-pipes, which do not coat nearly so much, nor corrode at all; but great care must be taken to make the joints perfectly air and water tight. Such pipes can be specially made in 3 ft. and 4 ft. lengths, and they may be built in walls, and tightly jointed as the walls are carried up, leaving junctions at points in the height for pipes from closets and sinks. Such pipes may also be used, in like manner, for rain-water pipes from roofs. They are cheaper than lead or iron pipes, never require painting, do not choke up or leak, and may be made accessible at the bottom and top and in the height. I have used them very largely for this purpose with great success. JOHN PHILLIPS.

MR. NORMAN SHAW IN REPLY.

SIR,—I had not intended to trespass on your space again, but I must ask you to allow me to make a few remarks in answer to Mr. Ernest Turner's letter of last week.

The account of his visit to my house is in all essentials accurate, but I am unable to agree with the conclusions at which he arrives.

In the closet with the long arm he "could not detect any smell"; the other, which, as he suggests, a previous visitor had used carelessly, was certainly, for the time, down to the level of an ordinary closet,—no better, and no worse.

Then we had the "smoke test" to our heart's content. When ozone paper was burned under the open end of the soil-pipe, the smoke issued from the top in a fine dense cloud, enveloped the back of the house, and blew about in all directions. If we were to be invaded in a similar manner by a torrent of sewer gas, I fear it would indeed be all up with us. Of course it was not for me to suggest tests or dictate in any way, but I could not help being quietly amused at the fact that these experiments, interesting though they were, were all performed on the *wrong side of the trap*. The underground trap, put in for the purpose of intercepting the flow of gas from the sewers, and which is the backbone of most systems, was quietly ignored. This trap may very fairly be compared to the fastenings we put on our entrance-doors (not impregnable, perhaps, but on which we all rely for a very considerable measure of safety), but imagine any one standing on the *inside* of the door and asserting that locks and bolts are of no use, as from the position he then occupied he could wander all over the house at will! To have made the experiment in any way conclusive, the gallipot, free of bad smell, should have been in the drain,—on the other side of the trap. We should then have seen how much would have passed the trap, how long it would have been about it, and whither it would have gone when it had passed.

Again, when we went to smell the fumes in the closet, as Mr. Turner says, the water had been previously run off, so that the pan was dry, or nearly so. We pulled up the handle with as much caution as if we had expected to find a ferocious rat concealed on the underside of the valve. Fumes of ozone paper were in the pipe, and so some came out; but had the pan been in its usual condition,—namely, half full of water,—when the handle was raised the water would have driven all before it, and we should, as before, have failed to detect any smell. I cannot help thinking that Mr. Turner's experiments are inconclusive. On his own showing, an open soil-pipe that had been in constant use for two years was so sweet that he failed to detect any smell in it (and it must be remembered that it is open soil-pipes that we have been discussing). The "smoke test" was not satisfactory, as it was applied in the wrong place. A longer trial may yield different results, but at present Mr. Turner's report appears rather to confirm my experience.

R. NORMAN SHAW, R.A.

Birmingham proposes to furnish its free libraries handsomely. At a meeting of the Town Council on Tuesday the Free Libraries Committee were empowered to spend 11,000*l.*, in addition to a like sum formerly granted.

THE LEATHERSELLERS' NEW LIVERY HALL.

The Worshipful Company of Leathersellers are erecting a new Livery Hall and other buildings on a site of land covering an area of about 7,000 superficial feet immediately adjoining their present hall in St. Helen's-place, Bishopsgate-street. For the purposes of the new building, the Company's Almshouses, and a number of offices adjoining, have been cleared away. The principal elevation and entrance to the new building will be at the extreme east end of St. Helen's-place, facing the south, and about 40 ft. in length, but the extreme length of the building, after passing along the corridor, through the main entrance, is upwards of 100 ft. The St. Helen's-place frontage, which a little more than 30 ft. in height, consisting only of the ground-floor, is entirely in Portland stone enriched with ornamental carving. The entrance is at the east end, under an archway surmounted by a pediment, above which are the arms of the Company, the west angle of the elevation being surmounted by the figure of a griffin. The central portion of the elevation terminates with a balustrade; whilst on each side of the entrance, and also at the west end of the frontage, fluted columns are carried up. The entrance leads into a corridor, 12 ft. in width, and 56 ft. in length, on the right hand side of which is a cloak-room, 32 ft. by 15 ft., together with lavatories. From the corridor the reception-room is approached. This apartment is 39 ft. by 27 ft., and it is intended to be elaborately finished. On the left side of the corridor, immediately opposite to the reception-room, is a vestibule, 16 ft. by 9 ft., through which the grand new hall of the company is entered. This apartment is 73 ft. long by 37 ft. wide, and is exceptionally lofty, being 35 ft. in height. On the west side is a very large and massive bay-window, by which the apartment is mainly lighted. The hall is intended to be internally finished and decorated in an artistic manner. It will have a flat ceiling, in panels, with enrichments. A dado, 6 ft. in height, will be carried round the walls, whilst the upper portion of the mural decorations will harmonise with the artistic character of the ceiling. In the centre of the ceiling there will be an ornamental ventilating-shaft. The elevation of the east end of the building, running north and south, and facing the present hall of the company, is in white glazed brick, with Portland stone dressings. All the chimney-shafts are in red brick. The upper story of the building will contain the kitchens, culinary department, and stores, together with the keeper's residence.

The architect is Mr. Andrew Wilson, of East-India-avenue, and the builders are Messrs. Ashby & Horner, whose contract is 16,000*l.*, but it is understood that, with the decorations, the building will cost a much larger sum. Mr. James Hayes is the general foreman of the works.

RICHMOND WATER WORKS.

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

A lecture, illustrated by diagrams and drawings, was given before this Society on the 7th inst. by Mr. Alfred F. E. Grant, on the supply of water to the town of Richmond, in Surrey. After some early history, the permanent works were described thus:—

The pipes were all, before leaving the works, tested to a pressure equivalent to a 600-ft. head. They were, when hot, coated with Dr. Smith's patent solution.

The reservoir is situated in Richmond Park, and is 110 ft. 4 in. by 108 ft. 4 in., and 10 ft. 3 in. deep from the springing of the groining for the bottom to the springing of the covering arches, which are 9 in. brickwork, and are 11 ft. span; the spandrels are filled with concrete; the side walls are 18 in. thick; the reservoir is built on a bed of concrete 9 in. thick. It is rendered in Portland cement ½ in. thick on the bottom and side walls. It is constructed to hold 750,000 gallons, was seven months in building, and was opened on December 20, 1876.

The Well.—It was originally intended to sink only one well at Richmond down into the chalk, and to place the pumps in this well; it was deemed advisable afterwards, however, to sink another well,—a pumping well,—to a depth of only 140 ft., and to place the pumps in this well, and to connect the same with the main well by means of a 14-in. cast-iron pipe, with a sluice-cock upon the same.

In boring, the chalk was hit at 263 ft. 6 in. from the surface. The well for the first 170 ft. is 7 ft. 6 in. diameter, and is lined with 9-in. brickwork in cement from this point for the next 40 ft. Cast-iron cylinders, 6 ft. 6 in. diameter, are next used, and then to the bottom of the well 5-ft. cylinders are used.

Engines and Boilers.—The engines are beam, compound, condensing, high and low pressure, fitted with variable expansion gear.

TERMINABLE BUILDING SOCIETIES.

SMITH AND OTHERS *v.* SIDDELEY.

This case, heard in the Court of Appeal on the 12th inst., before Lords Justices Bramwell, Brett, and Cotton, was an appeal by the plaintiffs from the judgment of Justices Grove and Lindley on a special case.

The plaintiffs were trustees of the Second Bowkett Building Society, established at Liverpool in 1865, under the provisions of 6 & 7 William IV., cap. 32. The action was brought to recover a sum of 213*l.*, alleged to be due from the defendant, an advanced member of the society. The society had for its object the raising by monthly subscription shares of the value of 120*l.* There were two classes of members the advanced or invested members, and the unadvanced. Altogether, there were 1601 invested shares in the society, and 135 purchased shares. The defendant on the 13th of September, 1865, had purchased and had advanced to him thirty shares of the society, at 6*l.* 5*s.* per share, and on the 11th of May, 1866, executed a mortgage of some houses belonging to him in Burleigh-road, Liverpool.

The question raised by the special case was substantially whether by rule 33 the defendant had a complete answer to this action. Rule 33 professed to provide in its terms for what might be called a winding-up of the society in its eleventh year. In October, 1876, the period mentioned in Rule 33 for the existence of the society had elapsed, and the first question was whether, under these circumstances, the defendant was released from his liability to pay his subscriptions on a share.

The defendant contended that he was released from payment by the eleven years having elapsed; whereas, the plaintiff, the trustee in the action, sought to show that the liability to continue the payments remained until the actual winding-up in about two years' time. The case having been decided against the trustees of the society, they now appealed.

The appeal was dismissed.

ACTION FOR NEGLECT OF SANITARY PRECAUTIONS.

ELLISSEN *v.* LAWRIE.

This was an action (Exchequer Division, before Mr. Justice Hawkins) against an architect and surveyor, who had been employed by the plaintiff to design and superintend work and repairs to be done to the plaintiff's house.

Mr. Talfourd Salter, Q.C., and Mr. Ledbury appeared for the plaintiff; the defendant conducted his own case.

The circumstances were somewhat peculiar. The house in question was at Maida-hill, and before the contract was entered into one of the plaintiff's children who resided in the house died, and in consequence the plaintiff determined to have the sewerage arrangements examined and put into a state of complete repair The defendant was employed for this purpose, and he was to prepare designs and superintend the carrying out of the work, and Messrs. Holland, who made a tender, were employed by him to do the work under his supervision.

The repairs were completed in the autumn of 1872, when the plaintiff and his family returned to the house. There was one room on the second floor, which from this date until the end of 1875, was used as a lumber-room, but then was converted into a day nursery. In the spring of 1876 two of the children who used the nursery fell ill, and in September of the same year, on the plaintiff's family returning from the sea side, another child suffered from ulceration of the throat The plaintiff's wife and the nurse who attended the child were also ill, and on their recovery, by the doctor's advice, the family removed from the house. It was then discovered that the front ventilating-pipe had been carried through the nursery inside the wall, and was covered over by boarding and papering. The pipe, which was a new one, passed from the sewer, and for some distance ran up the outside of the house, but then turned inside and passed through the nursery. It was there severed, the joint being within the room; but the end of the upper pipe had been simply placed in the lower, and the crevice was not filled up with solder or cement. There was a complaint of a similar kind with regard to the back ventilating-pipe, and further complaints about the pipes in a water-closet on the same floor. Another contractor was then called in to alter and repair the house, and the plaintiff claimed the expenses thereby incurred and doctor's fees and other expenses. In cross-examination the plaintiff admitted that from time to time he had been within the nursery, when used as a lumber-room, between 1872 and 1876, but had never detected any bad smell or made any complaint. At the conclusion of the plaintiff's evidence, as it was necessary to go deeply into figures, and was in other respects more convenient, a formal verdict was taken for the plaintiff, and the matters in dispute were referred to a barrister, who was to be assisted by a surveyor, to be agreed upon by both parties.

MYCENÆ.

Dear Sir,—In your admirable article in the *Builder* of January 26th ("Architecture at Mycenæ), you say regarding Mrs. Schliemann's Treasury,—"We miss any notice of sockets or bolts, or hinges, as either present or absent." But you find the holes for the upper door-hinges indicated p. 119; of the lower hinges there is no trace, and the threshold shows no signs that the piece containing the hinges might have been broken off. In the two uprights to the right and left there are no holes for the bolts.

Athens, Feb. 8, 1878. Hy. Schliemann.

THE OBELISK.

Sir,—I think everybody will be disposed to acquiesce in your conclusion, on page 173, that "the best solution of the question practicable" is that now approved by the Metropolitan Board of Works. We may well be content that this is not likely to add another to the London public monument failures. The view when the obelisk hits the south-west angle of Somerset House promises to be something very charming, espe-especially when the westering sun is shining. May I state my difficulty as to the sphinxes which are to mount guard on the large piles of granite, once deemed necessary for giving emphasis to the steps down to the water? I trust your remarks as to the reduction of those playful erections may have good effect. They crowd upon the obelisk painfully, and introduce undesirable confusion, especially in some distant views. The monolith should be brought obviously down on to its supports; in other words, the plinths, &c., on which it will stand, or a good part of them, ought to be well seen in every general view. I am disposed to think that the reduction in mass should be accompanied by an alteration in form, so as to make the long sides parallel to the Embankment. It would seem a fine opportunity for a sculptor of genius to re-create, in granite in 1878, the old idea of the Egyptian sphynx,—not slavishly copying an ancient model, but taking a bold original course as a Greek would have done. But it may be doubted whether the effect of the pair, either looking out from, or looking in upon, the Embankment, would be quite happy. Should they not look up and down the stream? The eternal smile, on the Coptic head of the monster looking to the sea, would recall ancient Egypt; it might be possible to indicate that the Nile is symbolised by this watery figure. A vigorous English face might belong to the head looking up the Thames, for the English river has its duty towards the relic, which is to remain,—let us hope for long centuries,—erect on the bank, till, in fact, Time's tooth gnaws through the granite itself. A.R.I.B.A.

GETTING A TRADE.

Sir,—In your last issue I was somewhat interested in the letter signed "Clerk of Works" on "Trade Matters," in which the writer says, "Several causes have combined to reduce the supply," and gives three reasons for the same. The third runs thus, "The false and foolish gentility that sends all the boys for clerks," &c., and to this I would take a slight exception from my own personal experience. I happen to be blessed with a large family, and one of my sons has just left school, and expressed a wish to learn the building trade. I accordingly made application to five firms with the result now given:

A.	Premium £30.	
B.	" 20.	No vacancy.
C.	" 70.	
D.	" 100.	
E.	No premium.	No vacancy.

Being but a clerk, the heavy premiums asked have prevented my being able to allow him to follow his bent. Tools, also, involve a heavy cost, and with a smaller wage than is given as a rule at first start in commercial life, it does not always follow that "false and foolish gentility" is the sole cause, but too frequently the lack of means to pay a premium. Nemo.

Manchester.—The Children's Hospital (of which we gave a view and plan some four or five years ago) has been completed and opened. The total cost has been 36,000*l.*, or 200*l.* per bed. The hospital is all one story in height. Mr. Southern, of Salford, was the contractor for the eastern building, which was carried out from the designs of Messrs. Pennington & Bridgen.

ST. GEORGE THE MARTYR, BLOOMSBURY.

THE new boys' schools for this parish, of which an account was given at the time of the laying of the foundation-stone, at page 720 of last year's volume, were opened with ceremony by Lord Henry Scott, M.P., on Friday, the 15th inst. In appearance the new buildings harmonise with the Girls' and Infant Schools on the opposite side of Gloucester-street, erected in 1864, from the designs of the late Mr. S. S. Teulon; and illustrated by view and plan in the *Builder* for 1864, page 793. The materials are the same, namely, stock bricks, Box-ground Bath stone, and blue slates, and there is a recurrence of the same simple details. The building just completed has been arranged to serve two special purpose. The school and class rooms will give desk accommodation for 200 boys. When required, the rooms will be the hall of the parish, in which social meetings, concerts, &c., will be held. The large room is 60 ft. by 34 ft. on the floor,—covered with a boarded and panelled hammer-beam roof (31 ft. total height), affording sitting-room for 350 persons. Residences of head and assistant masters, and caretaker, are placed in the tall building next Queen-square. Mr. John Wells was the builder. Messrs. Clarkson, of Great Ormond-street, architects, have designed and superintended these and the other buildings recently erected for this parish.

RACKING UP WAGES.

SIR,—I had occasion to leave the North of England to superintend some works in the South about three years ago. I was first attracted by the marvellously slow way the masons turned their work out, and took occasion to watch them at my leisure. I may say here they were paid 9½d. per hour; the foreman, a Londoner, 1s. per hour,—all society men, of course,—and the foreman, with the usual trade-unionistic energy about him, seemed sorry when the job was done; he had, in addition to lodgings, his railway fare paid weekly (a little over ten miles out), and told his employer it was usual for foremen to travel second-class.

In a very many cases I do not so much blame trade unions as lack of energy in some foremen. Personally, I was never in a trade union in my life, and have passed the grades of apprentice, journeyman, and foreman, and am now superintendent. To illustrate my meaning fully, and briefly, I will give two prices (I could give more) of cost of labour only.

Bull-nosing 4-in. flagging cost 10d. per foot linear, which I have done at 6½d.

York-stone work, I have noticed, has cost 11s. 6d. per cubic foot, which I have done for 5s. 6d. per foot.

One Yorkshireman will do on hard grit as much as two Londoners (if there be no Society to stop him), and quite as well (I do not in any way allude to quarry-work).

I heard, with some regret, the contractor lost money on his stonework. I am in possession of nearly the whole of the time these men worked, and the above prices I believe to be as near as possible. It is good work, as I could not superintend anything else. M. F. L.

CHURCH BUILDING NEWS.

Bodmin. The parish church of St. Mary and St. Petrock, Bodmin, is now in course of restoration, under the direction of Mr. R. J. Withers, who, on examining the building, found that the roofs and the whole of the west end, a greater portion of the north aisle, and several of the columns and arches forming its arcade, would have to be taken down, and rebuilt. A great part of this work has been done by the local builders. The carved work is at present in the hands of Mr. Harry Hems, of Exeter, and for the first time in the history of the diocese, the arms of the See of Truro are being carved thereon. The main part of the present church was built in the fifteenth century, but portions of it belong to the twelfth. It is the largest church in the county, measuring 150 ft. from east to west, and 63 ft. from north to south. There is a nave, chancel, north and south aisles, and tower. Once there was a spire, but that was struck by lightning in the latter part of 1699, and utterly destroyed.

Chippenham.—On the 15th of January the parish church of Chippenham was re-opened, after restoration, at a cost of between 6,000*l.* and 7,000*l.* The architect by whom the works were carried out is Mr. R. Darley, of Chippenham, and the building contractors have been Messrs. Smith & Light, also of Chippenham.

Combpyne.—The restoration of the quaint little parish church of St. Mary, Combpyne, near Axminster, has been taken in hand, at the instance and at the cost of Sir Henry Peek, M.P., and the work is far advanced towards completion. Built principally in the Early English and Decorated styles, the church consists merely of nave, chancel, western tower, vestry, and porch. The exterior walls and windows have been repaired where needful, and the whole of the stonework repointed after the ancient fashion known as "snail-creep." The stone used throughout the dressings is Beer; so, too, is much of the walling, though flints are also plentifully introduced. The roofs have been re-covered with blue slates. Above the altar is a triple-light lancet window, which has been refilled with stained glass, from the studio of Messrs. Jones & Willis. A small lancet window on the south-west side of the chancel, deeply splayed into the wall, the existence of which was quite unknown until during the present restoration, has been filled with a representation of the Holy Virgin, the work of Messrs. Lavers, Barraud, & Westlake, of London. The works generally have been carried out from the designs of Messrs. Ernest George & Peto, architects, of London, and under the immediate supervision of their clerk of works, Mr. William Prosser. The carved work is by Mr. Harry Hems, of Exeter; and the general contract has nearly been brought to a termination by Messrs. Hutchins & Berry, builders, of Colyford, Devon.

Maidstone.—Mr. E. W. Stephens, architect, has prepared drawings for the proposed tower and spire, new chancel, and organ-chamber for St. Philip's Church, Maidstone. The tower and spire will be on the north side of the church, facing the centre of the Kingsley-road, and will rise to a height of 130 ft. from the pavement level, and taking the place of the present porch, will form one of the chief entrances to the church. Over the entrance will be ringing and belfry floors; on the north side of the tower a clock-face will be placed 55 ft. from the ground, and sufficiently large to be seen from a considerable distance, and the tower and spire, standing at one of the highest points of the town, will be a most commanding feature. The new chancel with its apsidal end will be 30 ft. long by 21 ft. wide, and 34 ft. high inside, roofed over with a groined roof of pitch pine, the feet of the ribs terminating on the carved caps of the Mansfield stone shafts rising from the pavement. The seating will be of pitch pine. It is proposed to erect a reredos round the five bays of the apse, composed of various coloured marbles, Caen stone, and a base of polished granite, the centre panel of pure statuary marble, and enriched with carved caps and cornice.

Worcester.—On the 1st inst. the Bishop of Worcester consecrated the new chapel built for the inmates of St. Oswald's Hospital, Worcester. The church is in the Geometrical Decorated style, and consists of a nave, 45 ft. by 19 ft.; chancel, 17 ft. by 16 ft. 6 in.; also small vestry. The entrance is from a porch at the west end of the south side into a small ante-chapel, which contains the whole of the mural tablets removed from the old chapel building. This is divided from the nave by an open screen, finished with a ridge of ornamental metal work, having a door in the same. The walls internally are finished with drab-coloured bricks, relieved by strings or bands of red and buff tiles, those around the chancel being appropriately intermixed with porcelain tiles, supplied by Messrs. Grainger, and the floors are laid with encaustic tiles. The nave has a high-pitched open-framed roof, and that to the chancel is boarded and finished with moulded mitred ribs. The sittings are of pitch pine, and of open-bench construction; the reading-stand is of similar material; the whole, together with the roof timbers, being varnished. The pulpit is of stone, sunk and moulded, and finished with pierced Gothic work. All external doors are of oak. The church is warmed by an apparatus supplied by Messrs. Haden & Son, of Trowbridge. The entire cost of the whole of the buildings and works is about 12,500*l.* The whole has been carried out under the direction and sole superintendence of Mr. H. Rowe, architect, Messrs. Collins & Cullis, of Tewkesbury, having been the contractors.

St. Keyne.—The well of St. Keyne, with its romantic tradition, made universally famous by Southey's poem, has caused the little Cornish parish from which it derives its name to become everywhere familiar. It may, therefore, be said that, on account of the well of St. Keyne, the restoration of the parish church of St. Keyne will excite a wide-spread interest. The *Cornish Telegraph* says that the Rev. T. L. Symes, when he took possession of the living, some seven years ago, found both church and rectory-house in a very dilapidated condition, and it says much for his energy that he has now so rebuilt and restored both of those buildings that they are in a very creditable and substantial condition. The church, which presents no very attractive feature, and which is singularly devoid of monumental records, occupies a very prominent position on the summit of an eminence. It is in the Early Perpendicular style, and consists of a chancel, nave, north aisle, south porch, and tower. With the exception of the tower and a portion of the north and east walls, the whole church has been rebuilt. A new bell has been added, and two others re-cast and re-hung; there are now five bells in all, in excellent condition, and of musical tone. The floors are laid with Worcestershire tiles. The architect was Mr. J. Piers St. Aubyn, and the contractor Mr. May, of Pool. The entire cost has been about 1,250*l.* The re-opening service has just been held.

DISSENTING CHURCH-BUILDING NEWS.

Downend.—The new Wesleyan Chapel at Downend is a building in the Gothic style of architecture, and will seat 350 worshippers, sixty of whom will have to sit in the end gallery on either side of the organ. The exterior walls of the building are of Pennant stone, with Westwood dressing, the roof being slate, with red tile crease. Inside, the walls are finished in stucco and jointed. The ceiling is boarded in hexagonal form, with arched principals resting on stone corbels, and moulded wall-plates, filled in between with white pine V-jointed boarding: the principals, purlines, &c., being of pitch pine. The traceried windows are filled with sea-green and clear cathedral glass. The pews are of yellow pine, sized and varnished, and the rostrum and communion-rails are of pitch and yellow pine, cut, moulded, chamfered, cusped, and slightly curved. The chapel is heated by two of Gurney's stoves, and lighted by three gas coronas, suspended from the principals of the roof, and also by wall brackets. The total cost of the building will be 2,100*l.*, of which about 750*l.* remains to be raised. Messrs. Bevan & Sons, of Bedminster, are the contractors, and Mr. W. H. Clark, of Bristol, is the architect.

Sparkbrook.—The memorial stone of a new Baptist Chapel, at Sparkbrook, Birmingham, has been laid. The body of the chapel is a parallelogram, 69 ft. by 49 ft. This will be divided into central nave, with an aisle on each side, by two rows of four cast-iron columns supporting an arcading of framed woodwork, and the arched timbering carrying an open roof, which will be 46 ft. high from floor to apex. There will be two side galleries and a large end gallery, the latter being carried back over the main entrances. The style of the buildings is Gothic, of an early type, modified to suit the materials used, viz., brick walls and Bath stone tracery pinnacles and copings, with moulded and ornamental brick and terra-cotta in constructive arches and decorative features. The designs of the architect (Mr. Hale) were selected in competition. The new building will seat 1,120. The works are being carried out by Messrs. Davies Brothers, whose estimate for chapel and caretaker's house, amounting to 6,352*l.*, was accepted.

SCHOOL BOARD SCHOOLS.

Whitehills.—New board schools at Whitehills, Banff, were opened on the 8th ult. Accommodation is afforded for 192 pupils. The main building fronts west, and the class-rooms are at the back at right angles. The school is to be conducted on the mixed system, and there are separate entrances, playgrounds, &c., for boys and girls. The buildings have freestone facings, and have been built mostly with stones quarried from the site of the school. The cost will be about 1,800*l.* Mr. Miller is the architect, and the contractors were:—For mason work, Messrs. Peterkin & Cheyne, Portessie; carpenter, Mr. Murdoch, Banff; slater, Mr. Walker, Banff; plasterer, Mr. Lyon, Whitehills; plumber, Mr. Duthie, Banff.

Liverpool.—New Board Schools, at the corner of Stanley-road and Latham-street, have just been completed. The buildings are of grey brick, with red stone dressings, and comprise, in the block fronting Latham-street, large school and class rooms for senior boys and girls, and upper and lower mixed schools, with house for caretaker attached; and in the other block, fronting Stanley-road, large infant school and class rooms, with rooms of similar size over, to be used at present as a covered playground for infants, but which will eventually be used as a

schoolroom. A swimming-bath is provided in the basement for the use of the senior children. [Good!] The classrooms are provided with movable partitions, which can be raised or lowered at pleasure by means of an apparatus, supplied by Messrs. Walker & Pendleton. The arrangements for warming have been carried out by Mr. Gibson, Harlow's hot-water system having been adopted. Ample playgrounds for the children have been provided, and laid with asphalte. The contract for the work was 11,339*l*. Mr. T. Urmson was the contractor; Mr. James Peers was clerk of the works; and Messrs. H. & A. P. Fry were the architects.

THE MASONS' STRIKE.

THE LATELY PROPOSED ARBITRATION.

On this subject a singularly-stupid paragraph appears in the paper called *Capital and Labour*, written with entire ignorance of the circumstances. When the proposition was first mooted, the employers, or their representatives, were quite ready to consider favourably a proposal to leave the question in dispute to arbitration, and even to accept as arbitrator a gentleman named. The representatives of the men, after several conferences, called a meeting of delegates, and, with an expression of thanks for the endeavour that had been made, declined arbitration. The matter was considered closed. Three or four weeks afterwards, however, the gentleman who had first moved in it (Mr. Godwin) received another communication from the men stating that the question had been placed before a general meeting of the masons; that they had declared themselves now willing to assent to arbitration, and asking him to renew his good offices. Mr. Godwin replied that he would willingly do what he could, but that he had every reason to fear the time had gone by, and that the masters then viewed the matter differently from what they had done. This proved to be the case, and the masters declined arbitration. If necessary,—and, judging from the ignorant sneer of *Capital and Labour*, and an erroneous statement in a daily paper on the part of the men, it probably will be,—the letters can be printed.

STAINED GLASS.

Fallowfield.—A large memorial window has been presented by the Misses Lucas to the Church of the Holy Innocents, Fallowfield. The window contains fifteen large medallions, illustrative of events in the lives of SS. Peter and Paul, relieved by smaller panels representing the twelve apostles and angels bearing the emblems of the keys and sword. The effect produced is striking. The whole has been designed and executed by Messrs. Lavers, Barraud, & Westlake.

Kensal Green.—A stained-glass window has just been inserted in St. Mary's Cemetery Chapel, Kensal Green. It is a single-light window, with the figure of St. Michael and Dragon, with canopy, and angel holding a scroll. The window is in memory of Mr. J. M'Cormack, and was executed by Mr. T. Cox.

Colchester.—A small stained-glass window has been erected in All Saints' Church, Stanway, to the memory of Mr. Dolby, the first incumbent of All Saints' Chapelry. The window was executed by Messrs. Cox & Sons, of London, and the subject is Our Saviour standing with arm upraised, underneath being the words, "I am the way, the truth, and the life."

Birchanger.—Messrs. Pitman & Cuthbertson have completed a memorial window for Birchanger Church, Essex, and it is about to be set up there.

Italy.—A new weekly periodical, having for its model the *Saturday Review*, was begun in Florence the first week of the year, initiated by two young Italians,—Leopoldo Franchetti and Sydney Sonnino,—to which a vast number of the principal literary men in Italy have promised to contribute. It consists of 16 pages of two columns each page of print, four of advertisements. Its objects, in the words of the programme to the first number, are "to open a field for the discussion and study of the principal political and social questions now in agitation in Italy; to keep the Italian public informed of the great scientific and literary questions of the day being advanced in other nations; and to co-operate towards the greater intellectual and moral unification of the nation."

Books Received.

Notes on the Churches of Kent. By the late Sir Stephen Glynne, Bart. With illustrations. London: John Murray. 1877.

This volume, as we learn from the preface, comprises only a small portion of the notes on churches in England and Wales which Sir Stephen Glynne was systematically engaged upon during the greater part of his life, a certain space of time in each year being devoted to it with the greatest regularity. The notes which were thus made included remarks and memoranda on no less than 5,530 churches; the present volume, comprising the churches of Kent, includes 312 edifices, all of a date prior to the Restoration. If we take this thick and well-filled volume as a sample of the whole work thus accomplished, it represents unquestionably a very unusual amount of systematic and careful labour on the subject by an amateur. The notes were commenced in 1829, and therefore in regard to some of the churches are out of date as a description of their actual state, since they have undergone so much repair and restoration, well or ill done, as to render the description inapplicable in many points now. But this fact, while it prevents the book from being a guide or handbook for the present day to some extent, in another respect perhaps gives it more value as a record of the state of such churches before the modern alterations.

The editor, or writer of the preface, "W. H. G.," extols Sir Stephen as a remarkably accurate and careful recorder of what he saw; observing, too, that from his large acquaintance with churches, and long habit of taking notes and studying them in this way, he read the history of a building with remarkable certainty and rapidity, and seldom troubled the special custodians of the building for any information. This we can very well believe: it is impossible for any man of sense and power of observation to undertake a study of that sort systematically without soon acquiring a very considerable insight into the meaning of facts. At the same time, the real value of the book, looking to the requirements and tastes of the present day, is limited. It is, in fact, rather like a remainder from the time when there was among architects and clerical connoisseurs alike a belief that to make notes and sketches of old churches was one of the highest ends of life, a virtue which was its own reward; and the result of these labours in the present case is published at a time when the vivid interest in such memoranda has somewhat failed. For this reason alone we should have some doubt of the book finding a large demand, apart from the fact that it is very dry in style, and rather resembles a catalogue of churches than a book about them. It is the kind of book which will, however, be in demand among those who wish for a well-stocked archæological library, as one item in such a collection, for reference; though its value would have been much increased by more illustrations, even at the expense of shortening the notes considerably. The descriptions of detail are not always in quite correct or precise architectural language.

On the whole, looking with every sympathy on the book as the painstaking work of an excellent man, bent on illustrating a subject in which he was greatly interested, we should say that the value of these notes has been a little (pardonably) exaggerated by those who have been concerned in publishing them since the author's death; and, that though they did well in publishing this selection from a certain portion of Sir Stephen Glynne's labours, as a specimen of what he had occupied so much of his life upon, it is doubtful whether it would be a wise policy to publish any more from the large mass of materials they have in their possession, or whether the notes have, either to the public or to the architectural student, a value quite commensurate with the expense of publication.

VARIORUM.

"Old and New London" has advanced into Camberwell, and says,—"Camberwell is now so truly part and parcel of the metropolis that it would be impossible to write an account of London south of the Thames without some notice of its past and present history. No one, we are told, can assert at what period the parish became an inhabited spot. Local antiquaries find pleasure in tracking the path of the Roman conquerors of Britain across the hills and valleys which surround the metropolis. Their legions, as we know, had various camps in the neighbourhood of Londinium, and it is not improbable that they formed one on the pretty hill, known in later days as Ladlands, or Primrose Hill, best reached from Camberwell by way of Dog-kennel Lane, in the southern part of the parish. It must have been a commanding position in those days, when the Thames at high tide expanded into a vast lake, reaching to the base of the rounded Surrey Hills, near which were marshes inhabited by bitterns, herons, and other waterfowl. Herne Hill, in this neighbourhood, by the way, is thought by some to have been originally Heron Hill, 'heron' being the old orthography. Coming down to times the history of which is more defined and authentic, we find Camberwell defined in Domesday-Book as a manor of some value. The name is written "Ca'brewelle,' and the adjoining manor, Peckham, is described as 'Pecheha.' In subsequent records we meet with 'Camerwell,' 'Cambwell,' and 'Kamwell.' Some etymologists trace the first portion of the name to the British *cwm hir*, long valley; and suppose that the last syllable has reference to some springs of water, at one time famous. This may be the case, for there are, or were, mineral springs at Dulwich, Norwood (the Beulah Spa is memorable), and other places in the neighbourhood. It may be added that, as the parish church has been dedicated from Saxon times to St. Giles, the special patron of cripples, it has been suggested that there were certain springs in the neighbourhood possessing salutary virtues for persons so afflicted; and that as the old British word *cam* signifies 'crooked,' Camberwell may simply mean 'the well of the crooked.' Within the last century or so three ancient wells were discovered in a field in the parish, but they were covered in again by the owner of the land." —— The *New Popular Educator* gives some advice as to sketching from nature:—"When we sit down to draw an out-door scene, the first questions that occur to us are: Does it compose well? Are the principal lines of the subject harmoniously arranged and connected with each other? Do any of the less important parts obtrude in such a way as to offend the eye with their masses and angles, to the detriment of other parts of greater consequence? These questions, and others of a like nature, will suggest themselves; and in the course of our experience we shall find out that we have the liberty, or licence, as it is termed, to modify the composition in such a way as to make it agreeable, without sacrificing the truthfulness of the whole. To apply these remarks, let us suppose we are about to draw a scene of which the view is limited; in other words, there is very little choice of position from which to take it. For instance, it might be a tower or ruin, having its most interesting part concealed by trees. The licence we speak of would permit that the position of the trees might be changed, or their branches directed another way; or they might be thinned or cut out so as to admit a view of the part we wish to preserve. Much of this may be done without in the least altering the character of the subject. We give this simply to supply an instance where the taste and judgment of the artist must be exercised. Some artists will even venture to remove trees and buildings to other situations altogether. It was the frequent practice of an eminent English landscape-painter to take great liberties with his subject in this respect. He would remove a large group of trees to the opposite side of a river, rather than they should interfere with the lines he wished to preserve; and especially if they were useful in their new position to give additional improvement to his picture. But a wholesale interference with the true portraiture of the landscape is dangerous without long previous experience; in youthful hands it may act prejudicially in the practical part of the work. It is only they who know well what they are about who can venture to such an extent as we have just mentioned."

Mahogany and the Threatened War.—It is stated that two firms alone have undertaken to supply the Royal Laboratory Department at Woolwich, on or before the 31st of March, with mahogany to the value of 41,000*l*. Mahogany is largely used in the Laboratory in the manufacture of ammunition-boxes and for similar purposes, being the most suitable material in many respects, especially in its power of withstanding variations of climate.

CASE UNDER METROPOLITAN BUILDING ACT.

BAD MATERIALS.

MR. JARVIS, the District Surveyor of Camberwell, summoned Mr. Lister, a builder, before the magistrate at the Lambeth Police-court on the 19th inst. for having built some houses in Waghorne-street, Peckham, with walls not properly bonded and solidly put together with mortar or cement.

Mr. Washington, solicitor, appeared for the district surveyor, and stated that this was a case where the builder persisted in using bad mortar, although repeatedly complaints of its inferior quality had been made by the district surveyor.

After the district surveyor had given evidence, and submitted specimens of the mortar taken from the walls,

A gentleman, who appeared for the builder, stated that he was authorised by him to agree on his behalf to amend the work complained of.

Upon this the Magistrate made an order for the builder to pull down the walls within twenty-one days.

Miscellanea.

Co-operative Hall and Stores, Radcliffe. A new block of buildings which has been erected by the Radcliffe & Pilkington Co-operative Society has lately been opened. The buildings are situated in the centre of the town, with a frontage to the principal street of 178 ft., and cover an area of 1,325 square yards. The whole is cellared throughout, the basement being used for storage; the ground-floor is occupied by shops for sale of groceries, drapery, boots and shoes, furniture, and meat. The first-floor is occupied entirely by storerooms, newsroom, library, offices, and workrooms. The second-floor over one portion of the building provides large work-rooms, as well as club-room, and an assembly-room capable of accommodating from 1,300 to 1,400 people. The room, which is about 104 ft. long, 45 ft. wide, and 31 ft. high, is entered by three separate staircases, two of these being fireproof. A tea-room, fitted up with every requisite for providing tea for 1,000 or 1,500, adjoins the assembly-room. The buildings, which will cost about 12,000*l.*, have been erected from designs prepared by Messrs. Maxwell & Tuke, of Bury. The contractors have been:—Masons, Messrs. Openshaw & Buckley; joiners' work, Mr. John Allen; plumbing, the late Mr. Wm. Brooks, all of Radcliffe; brickwork, Mr. J. Bleackley, Prestwich; plastering, painting, and decorating, Messrs. J. Lomax & Sons, Bury; heating, Messrs. B. Hoyle & Co., Manchester.

Growth of Crewe.—At the annual meeting of the Crewe Mechanics' Institute, last week, the President (Mr. F. W. Webb, the Chief Locomotive Superintendent of the London and North-Western Railway Company) brought forward a scheme for the enlargement of the institute,—which is, in fact, the Town-hall of the newly-incorporated borough,—an enlargement which has been rendered necessary by the rapid growth of the borough, the population of which has advanced from 15,000 to 25,000 during the past ten years. The hall, although considerably enlarged six years ago, is again too small for the requirements of the borough, and Mr. Webb now proposes to take in a considerable mass of the adjoining property, so as to add a large number of class-rooms and a lecture-theatre, in order to increase the efficiency of the classes now carried on under the Science and Art Department. The proposed alterations are estimated to cost from 6,000*l.* to 7,000*l.*, for the whole of which sum Crewe will be indebted to the generosity of the London and North-Western Railway Company. The town of Crewe is, as everybody knows, entirely the creation of the company, who have made it their great factory and entrepôt of locomotives and rolling stock. The company have no doubt good reason to believe that the outlay above mentioned will be well invested, inasmuch as it will go towards promoting the intelligence, and therefore, let us hope, the efficiency, of their workmen.

Widnes.—Efforts are now being made with the view of adding to the meagre church accommodation at Widnes. The existing church has only sittings for 450 people, and these are principally occupied by pew-holders, while there are computed to be about 2,000 church people in the town. Plans and schemes have been drawn up for the erection of a new church, and it is hoped that a site will be given. At the same time, a church is to be built for the parish of Farnworth, which will practically give to Widnes three churches.

Continuation of Chelsea Embankment.—At the last meeting of the Metropolitan Board of Works, Spring-gardens, a deputation presented a memorial on the subject of the Embankment of the Thames between Battersea Bridge and Cremorne. Mr. Lawrence urged that, instead of being a local improvement, it would be a great metropolitan one. Cremorne Gardens had ceased to exist, and it would be converted into building land. The freeholder, on being communicated with, offered, on the plan shown, to lay out two roads 50 ft. wide, coming out directly opposite the leading thoroughfares connected with the western parts of the metropolis, and so opening up the Embankment into these important districts. The building-ground comprised something like 38 acres. The proposed access to the Embankment would be one of those wide roads cutting diagonally across Cremorne Gardens, across the Fulham-road into Redcliffe-gardens, and further across that important part of the Old Brompton-road into Earl's Court and High-street, Kensington. The other road, 50 ft. wide, would come out at Gunter-grove, across into the Finborough-road, and away right into direct communication with the Uxbridge-road. Mr. Richardson asked if the Cremorne land had been purchased for building purposes. Mr. Lawrence said no one at present had purchased it, so far as they were aware. The matter was left open for the answer of the Metropolitan Board. Mr. Richardson pointed out that the land would be much increased in value by the Embankment. Would the freeholder contribute anything towards the improvement?

The Peabody Fund. The thirteenth annual report of the trustees of the Peabody Donation Fund has been issued. The trustees announce that they have received a donation of 12,065*l.* towards the general purposes of the fund from an anonymous source. The amount of the fund at the close of the year 1876 was 643,316*l.* 19s. 11d. To this has been added the sum of 21,783*l.* 16s. 6d., the net income of the past year, and the donation above mentioned, thus making the total amount of the trusts on the 31st of December last 677,165*l.* 16s. 5d. The sum of 72,627*l.* 3s. 8d. has been spent in the purchase of freehold property and the erection of buildings. Of this sum 25,000*l.* were paid for the purchase of Rochester-buildings, Old Pye-street, Westminster, belonging to Mrs. William Gibbs, who sold the estate greatly below its original cost, as she felt that this undertaking of her late husband for the benefit of the poor would be better managed by the Peabody trustees than if she retained it in her own hands. The trustees have, up to the present time, provided accommodation for 2,341 families, or upwards of 10,000 persons. The average weekly earnings of the head of each family in residence at the end of the year was 1*l.* 4s. 6d., varying from 1*l.* 0s. 10d. at Shadwell, to 1*l.* 6s. 3d. at Southwark-street. The average rent of each dwelling is 4s. 2d. per week, which includes the free use of sculleries, laundries, and bath-rooms.

Street Improvements in Chester.—At the meeting of the Chester town council on the 13th inst., the report of a special committee appointed to consider the question of the widening of Northgate-street was presented. This question first engaged the attention of the council in 1874. Since then the opening of the Cheshire Lines Railway Station, and other increasing traffic, has made it necessary for the subject to receive greater attention, and various plans have been considered. The committee said they could recommend no scheme which did not provide a liberal widening of the street from the Cross to the Market-square, and had engaged Messrs. T. A. Lockwood (architect) and R. Roberts (surveyor), who had made a report upon the subject. The committee recommended one plan to be adopted. That plan made a uniform width of 70 ft. from the market to the cross, and would take away the present Church of St. Peter, with the exception of the tower, while the body of the church would be rebuilt on the other side of the tower. The cost of that scheme would be 56,121*l.*, exclusive of survey and legal charges; but 8,000*l.* already laid out for propping in the block to be cleared would have to be deducted from that amount. The council would exercise a control over the buildings to be erected, and the architecture would remain "in the Chester character."

New Railway.—The opening of the first section of the West Lancashire Railway took place on Tuesday. The line will, when completed, connect Preston and Southport.

Trade Conference.—A general conference of employers of labour and trade delegates from all parts of the kingdom was held at Bristol on Tuesday night, under the presidency of the Rev. Dr. Percival, the Principal of Clifton College. There was a large attendance in the Guildhall, which was lent by the mayor for the purpose, and among those present were Mr. S. Morley, M.P.; Mr. Macdonald, M.P.; and Mr. Halliday, the president of the South Wales Miners' Union. The proceedings opened with an address by the chairman, who expressed a hope that the conference would succeed in ascertaining the means by which the present depression of trade might be removed. Mr. Handel Cossham, a colliery owner, of West Gloucestershire, then delivered an elaborate address on the causes of the depression and the reduction in the value of labour. Mr. Macdonald, M.P., said that capitalists told them that the interests of capital and labour were mutual, but he could not see it. He expressed his approval of piece-work as far more honourable and honest for both parties, and defended the principle of a minimum wage. Mr. Hunt then read the report of the delegates who had gone to South Wales to inquire into the condition of miners. It showed that there was a great falling off in trade, and a very critical state of affairs. Mr. Abrahams (Swansea) moved, "That, in the opinion of this conference the establishment of a just and comprehensive system of conciliation for the settlement of disputes between employers and employed would tend to the benefit of both classes and of the nation at large." The resolution was carried unanimously.

Substitutes for Boxwood. It appears that in consequence of the continued increased cost of boxwood and its rapid decrease in quality, one of the principal importers of this and other hard woods into this country has succeeded in introducing two American woods to be used instead of box in the manufacture of shuttles, a purpose for which immense quantities of boxwood have hitherto been used. The woods so substituted are those of the cornel and persimmon. The first is apparently the *Cornus florida*, a deciduous tree, about 30 ft. high, growing abundantly in woods in various parts of North America. The wood, though of small size, is hard, heavy, and close-grained, and is used chiefly in America for the handles of tools and for shuttle-making, and when properly seasoned, is much superior to Persian boxwood. The same may be said of the persimmon (*Diospyros virginiana*), a tree belonging to the ebony family, a native of the United States, where it grows to a height of from 50 ft. to 60 ft. and a diameter of 1 ft. or 18 in. The heartwood is of a dark brown colour and very hard. The trunk is covered with a very thick, hard, and rugged bark. One great point to be particularly remembered in the preparation of these woods for shuttle-making, is the very gradual drying by artificial means.—*Gardener's Magazine.*

"Social Notes concerning Social Reforms, Social Requirements, Social Progress."—This is the title of a new weekly publication which is about to appear, with Mr. S. C. Hall, F.S.A., as directing editor. The managing editor is Mr W. Pepperell. The parties concerned say,—"With a view to bring opinions, resulting from earnest thought and large experience, as it were, into a focus, the publication entitled 'Social Notes' will be issued." In order to obtain a large circulation, the price of the work will be 1d.; 5,000 copies will be transmitted, weekly or monthly (gratuitously, through the post), to social institutions, charity societies, hospitals, literary and scientific institutions, free libraries, mechanics' institutes, workmen's reading clubs, official magistrates, clergy of the Church of England, Nonconforming clergy, and other public bodies and institutions interested in the subjects considered and discussed. We may be sure, with Mr. S. C. Hall's name to it, that the intention is thoroughly good.

The State of the Building Trade.—A deputation representing the Amalgamated Society of Carpenters and Joiners had a conference a few days ago with the members of the Master Builders' Association. The deputation asked for an increase in the rate of wages and a reduction of the working hours. The Masters' Association came to the following resolution, which was handed to the deputation:—

"That the present time is inopportune for a rise in wages or for diminishing the hours of labour; and further, if the carpenters found the time for commencing work inconvenient, an alteration might be made by the men commencing work at 6.30 instead of 6 a.m., and leaving off at 5.30 instead of at 5 p.m."

St. Helen's, Bishopsgate.—The Lord Mayor, attending in state, has unveiled a new stained-glass window, in commemoration of the many civic and other worthies buried in the church. To meet the cost of the window, which was executed by Mr. A. Gibbs, the Grocers', Skinners', Haberdashers', Drapers', and Mercers' Companies, the Marquis of Northampton, and Miss Cottrell Dormer, had generously contributed, but there was still a deficiency of about 250*l*. The Lord Mayor unveiled the window, and in a brief speech expressed the pleasure it gave him, especially as alderman of the ward of Bishopsgate, to take part in further beautifying a church of which all citizens were so justly proud. He congratulated his chaplain, Dr. Cox, on the success of his labours, and promised his aid in removing the debt in connexion with the work.

TENDERS

For new cocoa-mills, &c., Holland-street, Blackfriars, for Messrs. James Epps & Co. Mr. Edwin T. Hall, architect. Quantities by Mr. Thomas M. Deacon:—

Colls & Sons	£31,777 0 0
Jarrett	31,500 0 0
Clarke & Bracey	31,245 0 0
McLachlan & Sons	31,050 0 0
Holland & Hannen	30,690 0 0
Perkins	29,873 0 0
Howard & Co.	29,605 0 0
Josolyne	29,490 0 0
Downs & Co.	29,390 0 0
Browne & Robinson	29,380 0 0
Bangs & Co. (accepted)	28,883 0 0

For the erection of new church and parish-room, St. Antholin's, Stepney. Mr. E. Christian, architect. Quantities by Mr. Goodman:—

Colls & Son	£9,350 0 0
Patman & Fotheringham	9,225 0 0
Dove Bros.	8,920 0 0
Tyerman	8,843 0 0
Ennor	8,530 0 0
Brass	8,218 0 0
Downs & Co.	8,180 0 0
Shaw	7,640 0 0

For works at Broad-street, Bloomsbury, for Lord Hanmer. Mr. F. Beeston, architect:

Downs & Co. (accepted).

For alterations and additions to stables, Nos. 7, 8, and 9, Carlton-mews, Carlton-road, Kilburn, for Mr. Edward Goddard. Mr. Wm. Eversden, surveyor:—

Laugridge	£541 0 0
French	478 0 0
Whiteman	425 0 0
Dale (accepted)	394 0 0

For alterations to the Rose and Crown, Spicer-street, Spitalfields, for Mr. H. Morley. Mr. Edward Brown, architect:—

Marr (accepted)	£450 0 0

For alterations to the Royal Oak, Columbia-street, Bethnal-green, for Mr. B. Hyams. Mr. Edward Brown, architect:—

Stamp & Bowtle	£463 0 0
Marr	380 0 0
Royal (accepted)	362 0 0

For sanitary, ventilating, and decorative works, at 32, Belsize-park, Hampstead, for Mr. John F. Huggins. Mr. John Pugh, architect. Quantities not supplied:—

Larter & Son	£468 10 0
Whiteley	457 18 9
Norman	432 6 9

For the erection of Jewin Welsh Chapel, Bridgwater-gardens. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

		Extra for Portland stone.
Crabb	£5,500	£400
Richards	5,490	360
Ashby Brothers	5,394	700
Woodward	5,330	—
Hobson	6,216	245
Braid	5,063	420
Tarrant	5,152	299
Nightingale	4,982	310
Brass	4,858	196
Browne & Robinson*	4,780	185

* Accepted.

For the erection of Board school, Framwellgate, Durham. Mr. C. Hodgson Fowler, architect. Quantities by Mr. Geo. D. Irwin:—

Caldcleugh	£2,490 0 0
Dixon	2,173 0 0
Wardroper & Son	2,150 0 0
Sanderson	2,143 0 0
Elliot	2,147 0 0
Gradon & Son	2,096 0 0
Ainsley & Mowbray	2,080 0 0
Robson & Tremble	2,070 0 0
Taylor	2,053 0 0
Gardener	1,988 0 0
Pratt	1,942 0 0
Hurst & White	1,859 0 0

For St. Bartholomew's Church, Chichester. Mr. H. E. Rumble, architect:—

Pazey (accepted).

For additions to dwelling-house and new warehouse on the canal, Salisbury, for Messrs. Watson & Godden. Mr. Fred Bath, architect. Quantities supplied:—

Plowman	£945 10 0
Williams	944 0 0
Curtis, Sons, & Mist	890 0 0
Young & Sons	884 0 0
G. Harris,	877 10 0
Tryhorn	855 0 0
Barber	785 0 0
Cooper	757 0 0
Sawkins (accepted)	747 0 0
A. Harris (withdrawn)	630 0 0

For alterations of shops in the Grove, Stratford. Quantities by Messrs. R. L. Curtis & Sons:—

Martin	£1,387 0 0
North Brothers	1,260 0 0
Reed	1,250 0 0
Hoskins	1,225 0 0
Norton	1,117 0 0

For chambers at the corner of Savoy-street, Strand, for Mr. G. Rees. Messrs. A. & C. Harston, architects. Second competition. Quantities by Mr. C. Poland:—

Stephenson	£12,905 0 0
Woodward	12,427 0 0
Killby	12,226 0 0
Sheffield & Prebble (accepted)	11,479 0 0

For sanitary and other fittings, cold-water pipes and fittings, hot-water boilers, pipes, and fittings, steam warming, &c., at the School for Imbecile Children, Darenth, Kent. Messrs. A. & C. Harston, architects:—

Jeakes & Co.	£8,824 0 0
Smeaton & Son	8,034 0 0
Smeaton & Co.	7,874 0 0
May Brothers	7,578 0 0
Rosser & Russell	7,323 0 0
Smith, Son, & Co.	7,231 0 0
Millar & Son	6,125 0 0
Pontifex & Wood (accepted)	6,000 0 0

For steam boilers, engineering, and pumping machinery, for the School for Imbecile Children, Darenth, Kent, belonging to the Managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, architects:—

Hall & Co.	£4,975 0 0
Horn	4,375 0 0
Simpson & Co.	3,990 0 0
Owens	3,406 0 0
Fraser Brothers	3,265 0 0
Pratchitt Brothers	3,239 0 0
Hunter & English	3,180 0 0
Eastons & Anderson	3,170 0 0
May Brothers	2,960 0 0
Pontifex & Wood (accepted)	2,388 0 0

For additional boiler and increased power of pumping machinery, to serve second asylum, Darenth, Kent:—

Pontifex & Wood (accepted)	£325 0 0

For the erection of Cottages, Shaftesbury-road, Romford, Essex. Mr. Geo. Sparrow Harrison, architect:—

Black (accepted)	£1,015 0 0

For plasterer's work at two pair of semi-detached villa residences, situated in Cornwallis Park, Hastings, for Messrs. Brown & Co. Messrs. Cross & Wells, architects:—

Smith & Co.	£2,240 0 0
Tapp	1,682 0 0
Mauser	1,545 0 0
Abbott	1,502 0 0
Geary	1,311 0 0

For alterations to Messrs. S. Smith & Co.'s banking premises, Market-place, Mansfield. Mr. Geo. R. Isborn, architect:—

Fisher Brothers	£350 0 0
Dennett & Co. (accepted)	276 0 0

For new front and enlargement of premises in rear of 79, Brompton-road. Mr. G. Edwards, architect:—

Hockley	£1,468 0 0
Saunders	1,369 0 0
Richardson	1,333 0 0
Hall	1,275 0 0
Mathews	1,192 0 0
Wilkins	1,154 0 0
Stimpson & Co. (accepted)	1,117 0 0

For Hastings and St. Leonards-on-Sea Baths and Aquarium. Messrs. Cross, Jeffery, Skiller, & Wells, architects:—

Dressing-boxes, &c., to Gentlemen's Swimming-bath.

Wood	£712 6 0
Howell & Son	698 0 0
Geary	685 0 0
Vidler	680 0 0
Reeve	675 0 0
Harman	657 0 0
Rodda	653 0 0

Chimney-shaft, &c.

Reeve	545 0 0
Buller	534 0 0

Iron Skylights.

Dawnay	659 0 0

For Winter Garden, Torquay. Messrs. Watson & Harvey, architects. Quantities by Mr. H. Smith:—

General Building Works.

Bovey	£7,700 0 0
Goss	7,630 0 0

Ironwork.

Pollyblank	7,150 0 0
Rosser & Russell	6,981 0 0
Stark & Co.	6,500 0 0
Edmonds & Co.	5,490 0 0
Young & Co.	5,250 0 0
Handyside & Co.	4,832 0 0
Shewell & Co.	4,722 0 0
The Horseley Company	4,683 12 6
Dawnay	4,576 0 0
Stacey, Davis, & Co.	4,547 1 9
Jukes, Coulson, Stokes, & Co.	4,418 0 0
Tildesley	4,278 0 0

Glazing.

Lovell & Co.	1,313 0 0
Edmonds	1,189 0 0
Thomas	1,149 17 4
Young & Co.	985 0 0

TO CORRESPONDENTS.

G. D. I.—A. R.—H. C. S.—W. B.—S. F. C.—W. F. C.—Dr. A.—P. E.—L. G.—M. H. F. C.—T. B.—Mr. C.—T. B.—R. N. S.—A Stonemason.—D. T. & F.—J. T. P.—C S. G.—H. T.—G. R. I.—S. & Co.—J. W. S.—E. C. I.—H. S. S.—W. G.—Dr. A.—W. G.—Mayor of Manchester.—F C. (next week).—H. A. G. (already noticed)

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The Prince of Wales's Letter to the Society of Arts.

IT is ground for no ordinary gratification to those who have devoted years of patient effort to the subject of sanitary reform, to find a portion of the question so seriously taken up by his Royal Highness the Prince of Wales. On the very day on which attention was called in our columns to the propriety of re-considering the important desideratum of the direct application of rainfall to domestic consumption, a letter from the Prince, in his capacity of President of the Society of Arts, to the chairman of that association, was published, calling attention to the inquiry "how far the great natural resources of the kingdom might, by some large and comprehensive scheme of a national character, adapted to the varying specialities and wants of districts, be turned to account, for the benefit, not merely of a few large centres of population, but for the advantage of the general body of the nation at large." A grand national issue, the vital importance of which becomes each year more pressing, is thus, for the first time, raised in a tone commensurate with its importance. The immediate occasion, we may venture to conjecture, that drew the attention of his Royal Highness to a matter so deeply affecting the welfare of that class of his future subjects whose interests are, as a rule, but too little cared for by projectors of great undertakings, has been the Manchester and Thirlmere project. This scheme, while it has come to the front of the movement, is, it should be remembered, but one of a very large and very questionable class of projects. The ideas of tapping the fountain-heads of the Welsh, the Cumberland, and the Westmoreland rivers, and of diverting a considerable portion of the waters of the Severn, the Wye, the Eden, or the Dove, for distances varying from 135 to 270 miles, into the water-shed of the Thames, for the supply of London, have each found advocates and projectors. In each of these cases, as in that of Manchester and Thirlmere, the question has been brought forward as if the sole issue to be determined were this: "A population of such a magnitude requires water. It can obtain what it requires, at a cost which it is ready to pay, from such a source. All that remains is to settle with the proprietors of the source in question; and no one else has any business to interfere."

The fatal error in this line of argument lies in the fact that it entirely ignores the main point of the steady increase of the population of the whole country. Owing to causes which are not in every case of permanent operation, increase of density of population has occurred at certain centres at a rate more than double that which takes place over the total area of the country. But new centres may, and in point of fact do, continually develope themselves. The imporrance of existing centres thus proportionately, or even actually, diminishes. Thus the population of certain iron districts is now on the decline; owing to the exceptional advantages, as to economy of production, which are enjoyed in the Cleveland district. And even apart from the question of centres, the steady increase in the fertility of human life displayed by the whole country is a feature of national promise which it is pure folly to ignore. The country does not grow so fast as the towns. But the country grows rapidly. Its requirements in that "article of prime necessity," water, are increasing every year. Not only, in the words of the Prince of Wales, is it now the case "that the smaller localities must make the best shift they can, and are in many cases all but without supply at all," but projects are brought forward which, if carried out, will make it impossible hereafter to remedy that evil. It is essential, before legislative sanction be given to any of these gigantic schemes, that the question how far it is matter of sound policy to attempt to override the natural indications of physical geography should be fully debated and set at rest.

If we borrow a few figures from the author of an exhaustive article on the water supply of London, in the *British Quarterly Review* for October, 1874, we find that one per cent. of the annual rainfall of England is enough to supply the entire population of the country with fifty tons of water per head per annum. If the area and population of the British Islands be taken, instead of that of England alone, the proportion required would be considerably less. The whole area of England is now actually divided, by Nature herself, into certain water-shed districts. These may be advantageously massed in ten naturally-bounded engineering provinces or districts, of which four throw the waters to the east, two to the south, and four to the west. Of these, the eastern and western provinces are drained by the principal rivers of the island. The shorter southern slopes are drained by shorter and more numerous streams, which have not sufficient height of course to unite in main channels. Each district, however, has its own physical peculiarities, which must be studied by any one who would intelligently deal with the question of its proper rainfall and outfall. The proportion between the total amount of annual rainfall in either of these main districts, and the population resident within its limits, has never been calculated. But if we take the case of the province in which the rainfall is the least, and the population the largest, namely, the Thames Valley, we shall see that there can be no sound reason assigned for seeking a water supply beyond the natural limits of the water-shed. The Thames basin covers 3,300,000 acres. The least amount of annual rainfall known to have occurred over this area was in the year 1832, when 16·1 in. were registered. The supply in that year, then, was 5,313 millions of tons of water. Take the population at the outside figure of five million souls, 250 millions out of 5,313 million tons of water would be the utmost they could require within the year, or less than five per cent. of the supply. Is it deserving of serious discussion whether it can be really worth while to go for 180, or even for 270, miles to rob another water-shed of a treasure which is so freely allowed to run to waste at our very doors? The question is one that answers itself.

The endeavours of the Society of Arts to give effect to the invitation of the Prince of Wales may take one of two main courses. It may either be attempted to elicit and discuss the main features of "some large and comprehensive scheme of a national character"; or it may be thought wiser to take counsel as to the steps necessary to take in order to form a solid and substantial judgment as to the best, or, indeed, the only proper, scheme. The first method is that which most naturally suggests itself to the English mind. It is one that, no doubt, would meet with prompt response from a very large number of persons. When the Metropolitan Commissioners of Sewers, in 1849, advertised for plans for the purification of the river Thames, no fewer than 116 separate projects were sent in and submitted for discussion. If the area be enlarged from that of the Thames valley to that of all England, and if, instead of the single detail of the protection of one river, the entire subject of the supply of pure water be thrown open for discussion, the amount of labour that will be thrown on the investigating body will be such as utterly to break it down. In the absence of either professional machinery for the determination of normal facts, or judicial authority for the sifting, as well as for the collection of evidence, an inquiry of a satisfactory nature would be utterly impossible, within any assignable limits of time. We have more than once called attention to the great loss of time and of valuable energy that is due to our habit of discussing matters in coteries, without coming to any definite conclusion. It is not so very long since we saw this course adopted with reference to a subject which cannot be dissociated from the question of water-supply, namely, that of the disposal of sewage. We had to refer to discussions at the meeting of the British Association, at the

rooms of the Society of Arts, in the Theatre of the Institution of Civil Engineers, and in two or three other places almost simultaneously. At each of these meetings the same features were reproduced. Earnest men, more or less capable of clearly stating their views to a mixed audience, seized the opportunity to bring forward their several hobbies -using the word in a respectful sense. At as much length as the rules of each gathering allowed, each projector insisted on his own experience, for—at least in the case of the Society of Arts—pure project was wisely excluded from discussion. Such experience, however, was made to assume the form of *ex parte* evidence, as invariably will be the case in any but a judicial inquiry. There was a good-natured objection to interruption of the speakers, even by pertinent cross questions. Each theory thus put forward in the guise of practice, was followed, and contradicted, by another similarly urged. Much that was desirable to know was, no doubt, thus brought forward. But it was left pretty much in the character of undigested information. No certain, definite, normal principles were extracted and sanctioned by common consent at either meeting. The main question got no forwarder. Facts, no doubt, were published, and rendered to some extent permanently accessible, and that is something. But after all these conferences, and collections of evidence, we are unaware that a single rule of general practice has been laid down, as the result of years of discussion, for the guidance of the sanitary engineer, or for that of either the urban or sanitary authorities throughout the country. And with the present winter season the whole matter is begun again at the very beginning, in the controversy between Captain Calver and Sir J. W. Bazalgette, with as much freshness, vigour, and absence of determined principle of action as if neither British Association, Institution of Civil Engineers, Society of Arts, nor any other body had ever given an hour's time to the subject.

If, then, wisdom comes by experience, we venture to suggest that it is requisite to do something of a very different nature from asking projectors for plans, and discussing them, when sent in, either publicly or privately. The only response which the Society of Arts can give that will rise to the importance of the question, must be laid down on quite different lines from those which were adopted for its sewage conference. We have none of us forgotten that it was from the bosom of the Society of Arts that the project of the Great Exhibition of 1851 originally issued. But that was not carried out by inviting indiscriminate proposals, and discussing them with interminable and ineffective patience. The organisation of a special authority, competent to deal with the subject, was the step which converted the wishes of a number of estimable gentlemen into a great and beneficent fact. It is in the same direction that we can alone now look for any really efficient aid from the councils of the Society. What they have to offer to their royal president is not advice as to detailed plans, but suggestions as to a method in which a great national subject may be dealt with, once and for all, in a manner worthy of a great nation. It is for the Society of Arts to suggest that if we constantly fritter away the observations we make, and the experience we collect, the water-supply "question" and the sewage "question" will be in the same unsatisfactory state in 1901 as that in which they now are. Confining our remarks to the first, the subject of His Royal Highness's letter, it must be allowed that the mere admission of the fact that the question of water supply is, at this moment, an entirely open one, is little less than an admission how very little we have advanced beyond a state of barbarism in the matter. The requirements of the case are so simple, the facts bearing upon it are so few, so definite, and so capable of being exactly ascertained, that it is positively humiliating to be told that as yet we have not got beyond the stage of opinion. Difference of opinion, in such a matter as this, is only a euphuism for ignorance of fact.

If we are asked why, in the present state of physical science, and of engineering efficiency, it is the case that our "smaller towns and villages are dependent on accidental sources of water supply"; that "our great cities and populous towns are, each for itself, taking steps to procure an improved and enlarged supply"; and that we are entirely destitute of any "large and comprehensive scheme of a national character"; we must take leave to reply by a single observation. England, alone among the great European States, has no such thing as a department, or as a Minister, of Public Works. Not that no money is spent by the public in order to obtain some administrative guidance on these points. We have numerous officials of high rank and large pay, but their national utility,—in such a matter, for instance, as that under discussion,—is reduced to little or nothing by want of system. We have a Board of Trade that professes to rule our railways, although it is unable at this moment, after fifty years of experience, to tell what it costs to convey a hundred tons of loaded train for a mile on any railway in the United Kingdom. We have a Board of Works, as to the functions and operation of which it is necessary to have some special knowledge, in order to be able to form any definite idea. We have a Local Government Board, the chief function of which appears hitherto to have been the encouragement of that very mode of taking steps, each great town for itself, irrespective of the common benefit, of which the Prince of Wales so justly questions the propriety. We have a large vestry-elected Board of Local Metropolitan Government, which has spent from four to five millions on a system of drainage based on the assumption that the sewage which it takes more than six hours to pump up is all turned out on the top of the tide. If we want any improvement in a harbour, we have to go to the naval authorities of the Admiralty; and if we want to work a colliery or mine, we find ourselves under the orders of the Home Secretary. If we want to make an additional half-mile of railway, we have to apply to Parliament for authorisation. It is not the case that we are let alone, without administrative superintendence, to carry on our public works as we like. We are hedged in by restrictions on every side; but the restricting powers are not on speaking terms with one another. At times, as in the recent case with regard to third-class traffic on one of the London railways, they may be said to be virtually at law with one another. So permanent is the hitch arising from this state of things, that notwithstanding the serious damage inflicted on a large portion of the metropolis by the floods of the Thames last year, no one has yet been able to ascertain which is the responsible authority in the matter; and Southwark and Lambeth are thus left to pray to Hercules, or any other invisible protector, for low tides and west winds at certain seasons of the year. What has been done to protect that large mass of suffering Londoners is briefly told. It is nothing.

Let us look at the youngest member of the European family of nations. The union which was effected by Egbert in England has been accomplished by Victor Emmanuel in Italy. As to the inducement for, and the power of, regarding our great river courses as essentially national questions, we have thus, by more than 1,000 years, the start of the Italians. At the present moment we have no public survey of the Thames valley. We do not know how much water comes down it in a flood. We have to take from private sources our information as to its rainfall and summer flow. We are ignorant of those elements with regard to its principal affluents. We are helpless in the presence of an overflow in the metropolis itself. All these things we speak of as problems as insoluble as "the water supply question."

Let us look at Italy. The Director-General of Hydraulic Works in Italy read at the Geographical International Congress, held at Paris in 1875, a report on the water systems of Italy, the materials for which had been collected by the Department of Public Works. The systematic inquiry which repeatedly, especially in the year 1872, we pointed out as the first step to be taken towards any serious attempt at solving the grave sanitary problem of water supply and disposal of drainage, has been efficiently undertaken by the Italian Government. Although their information is not yet complete, it is rapidly in course of completion. Six large tables have already been published. It is not too much to say that if we had, as we have before suggested, corresponding tables accessible as to the water system of England, "the water-supply question" in any particular instance would be capable of satisfactory solution by any engineer of eminence in the course of a few hours.

The first of these tables is entitled "Hydrographic Compendium of the Italian Provinces; with Orographic, Geographic, and Climatological References." It contains data as to the hydrography of sixty-nine provinces. It indicates the area and the population of each; the height above the sea, and the topographical position of the chief towns; the number, elevation, and area of the hills and table-lands; the area of woods, lakes, and marshes; the number, length, sections, and volumes of the water-courses; and observations of the rainfall, temperature, and barometric pressure. It results from this table that there is an average length of 1,080 yards of water-course, and a mean area of 16¾ acres of stagnant water, pools, or marshes, for every square mile of territory. What machinery would have to be put in motion in order to obtain a similar hydrographic compendium of the United Kingdom?

A second table contains the hydrometric synopsis of one hundred rivers and torrents of Italy. It gives an exact idea of the capacity and distribution of the principal water-courses. It is needless to say that we have no such information with regard to those of England. The third table gives an account of the water-courses regulated at the charge of the State; the fourth, of the water-courses administered by companies; and the fifth, which is only as yet complete for twenty-four provinces, gives the statistics of the utilisation of the public works. The State now takes care of 404 miles of river-bank of the first class; 3,171 miles of river-bank of the second class; 1,853 miles of navigable rivers and canals; 600 miles of rivers or canals for irrigation; and 1,051 miles of the same for drainage. Of companies connected with water-courses there exist 825; dealing with 7,196 miles of channel. These works protect 512,000 acres, drain 1,995,000 acres, and serve for various purposes a further area of 1,720 acres. In the twelve provinces of which the returns are complete the utilised water-power is equal to a dynamical force of 43,000 horse power, requiring the tendence of 11,282 workmen. The last of the six tables is a compendium of the results of the water administration, showing that upwards of 10,000,000 acres of land have been protected by public or private works, and that another million of acres are improved or in course of reclamation.

With regard to the most important of the rivers of Italy, the Po, the special information which the Public Works Department has collected and published with reference to its course contrasts very painfully with our own state of contented ignorance as to the actual phenomena and state of the Thames, the Severn, the Shannon, or any other important river of the United Kingdom. Between 1872 and 1874 the entire course of the Po was levelled on each bank. The crests of the banks, the flood high-water lines, the levels of the meadows, the lowest water-levels in summer, and the maximum and mean depths of the river, were all ascertained, recorded, plotted, and referred to permanent bench-marks, and to a base-line 10 mètres below mean sea-level. The length of the section on the right bank is 350 miles 600 yards; that on the left bank is 349 miles 441 yards. The sections are drawn on the scale of 1 in 15,000 horizontal, and 1 in 200 vertical. The distances are progressively numbered in kilomètres, and the publication of the drawings gives every detail requisite for a full knowledge of the river. Numerous cross sections, plans and sections of affluents, and above 200 diagrams of daily observations made on different hydrometers erected on the embanked portions of the river, accompany the survey. Furnished with this information, the Italian Government have commenced a series of works for the improvement of the Po, the cost, the time for the completion, and the effect, of which can be distinctly foreseen. A separate Commission has investigated the subject of the inundations of the Tiber, which present a still closer parallel to those of the Thames, inasmuch as these calamities affect the capitals of the respective countries. The report of this Commission is exhaustive as to the history of these inundations, as well as with regard to the different schemes proposed to obviate them, and as to the project now in course of execution for the defence of the city of Rome from the river.

When we contrast the clear, exhaustive, orderly collection of the necessary physical facts of the hydrography of Italy, and the publication of such information as is of public service, by the care of the Minister of Public Works, with the utter ignorance of these matters existing in this country, and the entire disregard of the suggestion that, before dealing with the physical facts, it is necessary to have a comprehensive view of their nature and mutual

relations, the result is at once instructive and humiliating. It is not the case that we spend no money in collecting information. We spend enormously large sums, which are almost entirely wasted, because the information is collected for specific objects alone, and never co-ordinated or in any way preserved for public use. In our Ordnance Survey, especially where the hypsometric and the geological observations are published, we have a basis more useful than any which the Italian Government had at the commencement of its care of the water-courses of Italy. Beyond this, for knowledge of rainfall, volumes of rivers, sections, schemes of navigation, of irrigation, of protection, we have to depend almost entirely on private enterprise. The consequence is an almost total ignorance of some of the chief data of national prosperity; and the cropping up, constantly and repeatedly, of what are euphuistically called "questions," such as the London main drainage "question," the Manchester and Thirlmere "question," the auxiliary London water-supply "question," the future water-supply of London "question" (as to which Mr. Hassard takes the earliest opportunity afforded by the publication of the Prince of Wales's letter to advocate the transporting of the "great and undisputed rainfall" of the lake district to London), and the "question" of the mode in which almost every urban and rural sanitary authority is making ducks and drakes of the ratepayers' money, in the absence of any intelligent, well-informed, systematic plan or Ministerial advice or control. "Questions," indeed, these things are; but they are so only in virtue of our disgraceful ignorance. Had we information such as that which the economical Government of Italy has understood that it would be advantageous to collect, few or none of these "questions" would now be open. Each of them could be settled, within a few days, by any competent engineer who was in possession of all the data. No one's opinion is worth a farthing regarding any one of them, in the absence of these data. If the initiation of His Royal Highness the Prince of Wales brings this main fact into full relief, some hope may be entertained that we are about to enter on the only course that will, by substituting accurate knowledge for mere guesses, abolish our great plague of "questions."

PROFESSOR E. M. BARRY'S LECTURES AT THE ROYAL ACADEMY.*

TRANSITIONAL OR ELIZABETHAN ARCHITECTURE.

My last lecture dealt partially with the architecture used in this country, in the sixteenth and seventeenth centuries, during the reigns of Queen Elizabeth and James I., and known commonly by the titles of Elizabethan and Jacobean. It may be appropriately called Transitional, for it was, as we then saw, varied in its character, and unsettled in its principles.

Clinging to Mediævalism, in its affection for mullions, gables, and general picturesqueness, it nevertheless aimed at the regularity, measured symmetry, and details of Italian work. Columns, pilasters, balustrades, and cornices are evidences of this intention, and if the style had lasted long enough to have enabled the workmen to acquire more thoroughly the grammar of their art, it might have led to a national style, combining freedom with order,—picturesqueness with purity of detail.

This, however, was not to be,—a taste soon arose, which looked down on both Elizabethan and Gothic art alike, as barbarous. Disdaining compromises, and proud of its recently acquired knowledge, every form, till then familiar, was proscribed by the new taste, and our architecture was henceforth to wear an Italian dress. The works of the Elizabethan builders were, therefore, as has been said, Transitional; marking, as it were, a truce before the battle,—a pause which heralded a revolution. The revival of purely Classical architecture will claim notice from us hereafter; and if we bear in mind the tendencies of modern taste around us at the present time, we shall, I think, find that it has lately been drifting in a direction not very far removed from that taken by the architects of the Transition.

Let us, in illustration, pass in review the work of some of the Elizabethan artists. We will take an early and a late example,—Longleat Hall, in Wiltshire, and Crewe Hall, in Cheshire,—both of them important and interesting structures. Longleat was built, it is believed, between 1567 and 1579. It is dignified in its architecture, and displays many of the characteristic signs of the times, to which I have before alluded. Thus, although it retains some Gothic details, no one could mistake it for a Mediæval building. On the other hand, the absence of large single windows, with their cornices and pediments, would prevent an Italian of the Renaissance from declaring it his own.

Longleat was, nevertheless, as is supposed, the work of an Italian, whose history, under the name of John of Padua, is somewhat obscure. His name is to be found in warrants of King Henry VIII. and Edward VI. The troubled existence of the latter did not admit of much culture of art, even if there had been any royal tendency in that direction. The great religious storm about to burst in persecution and bloodshed was already casting its baneful shadow on the land, and ecclesiastical disputes about religious doctrines, church ornaments, and vestments, pushed other questions aside.

The gaiety and magnificence of the Tudors seemed to have passed away, or, at least, to be in abeyance; and we pass, in our artistic review, from the days of Henry to those of Elizabeth, almost ignoring the brief and troubled existence of King Edward; turning away, perhaps not unwillingly, from the lurid glare which the flames of martyrdom cast, only too conspicuously, on the succeeding reign of his unattractive and morose sister.

The change was considerable from the days of the "Merrie Monarch." King Henry had a Tudor-like sense of his own importance. He would be a great king, of a great nation. His court must be magnificent. If he would brook no inferiority to the Pope, he would, on the other hand, allow of no derogation from his own authority, in things ecclesiastical, as well as civil. He held intercourse with foreign artists, and sometimes, as when he went abroad to meet Francis I., at the Field of the Cloth of Gold, he sought to revive the Old-World glories of chivalry with its traditions of Mediæval art.

Although an Englishman of Englishmen, King Henry saw that other nations had advanced further than his own in the direction of artistic taste and refinement. He was therefore anxious to encourage progress in these matters, and with this view gave hospitality readily to foreigners, such as John of Padua.

We accordingly find this personage regularly installed at Court, in virtue of a Royal Patent. It bears the date of 1541, and confers the new title of "Devizor" of his Majesty's buildings. We have here evidence of something like the position of a modern, or consulting architect, exercising a control of design and superintendence, but not devoting himself exclusively to a single work. We know less than could be wished of the doings of John of Padua, in virtue of his public appointment, but in addition to Longleat, he is said to have built old Somerset House, which has now entirely disappeared, to make way for the present building, designed by Sir W. Chambers, and completed not many years ago by the late Sir James Pennethorne.

There is a considerable amount of resemblance in parts of the two designs, of Longleat and old Somerset House, which may betoken a common origin. John of Padua was certainly taken into favour by the Lord Protector Somerset, and the latter was engaged in building his palace, during the period of his authority in the State. Several payments to the architect are recorded by King Henry and King Edward, but his relations to Somerset cannot be clearly ascertained, although we know that the moderate payment of 2s. a day was assigned to him in his character of "Devizor," probably a retaining fee, to secure priority of service. The appointment was a new one, and was likely to arouse jealousy in times not too tolerant of foreigners.

We may probably assume that Longleat was the work of John of Padua, and we shall find much in its design and arrangement which will serve to prove the extent of Italian influence on the principles adopted. The house is quadrangular on plan, with buildings arranged round inner courts of moderate dimensions. This was not a very usual form in England. We have, indeed, various examples of buildings erected around quadrangles of large size, as we saw at Haddon, or as may be found in most of the colleges of Oxford and Cambridge. In such cases, however, the quadrangle was the principal, and the building the secondary feature. We are in a court, with buildings, often isolated, around us; not in a building with a court in the midst of it. The latter is a fair description of Longleat, and would apply also to most Italian palaces.

The open central space was essentially a southern feature, based on Roman customs; which latter were, as we saw in our examination of Pompeii, a continuation of Greek traditions. By a system of natural development, the atrium of ancient Rome became, as a matter of course, the cortile of the Italian palace. But if the small inner court be a pleasing feature in the South, productive of shade, coolness, and shelter from the sun, its advantages are more than questionable in northern climes, and it was not generally adopted by the Transitional architects of our own country.

A square or oblong plan was the usual type in England; and if more room were required, wings were thrown out at each end, with the space between them unenclosed. There was reason as well as good sense in this method of design, for unless the building was of the dimensions of a palace, any enclosed court could only be small. The sun would rarely enter it, and it would become a source of damp, coldness, and discomfort to the rooms around it. In many of the cases in which such an arrangement has been adopted by the early builders, the experience of subsequent inhabitants has led them to cover over the court, and so convert it into an integral part of the house.

At Longleat, we have the open spaces arranged as an Italian would have built them; but not altogether used in a similar manner. The Italian palaces were for towns; but our great nobles have ever thought more of their country seats than of their urban residences. The great palazzi in the narrow and crowded streets of southern towns, such as Rome, Florence, Pisa, Siena, seems to turn inwards with a proud disdain. The inner court was a badge of rank,—a shelter from noise, heat, and bustle. With it, the living-rooms were naturally connected, and the open balconies and corridors around the court served as ante-rooms, as well as means of communication from room to room.

In England the aspect of the house was outwards, and the windows were so placed as to command views of the country around. This is the case at Longleat, and we should expect it would be so in a great English country mansion; for although a foreign designer would necessarily be allowed considerable latitude in architectural design, we may be sure that the owner, who would have to live in the house when built, would insist upon a voice as to its general arrangement and aspect.

Passing from the disposition of the plan, we find in the exterior unmistakable evidence of Italian taste; indeed, the latter is so predominant, that but for the mullions, and a few other peculiarities, which may presently be noticed, we might almost fancy ourselves in presence of an Italian palace. We have the three orders superimposed, in accordance with the revived Classic custom: first, the Doric; then, the Ionic; and, lastly, the Corinthian. The pilasters are well executed, with diameters diminishing from the lower story to the higher. Each order has its appropriate entablature of architrave, frieze, and cornice, designed with due subordination of parts; and the whole is crowned by a regular balustrade.

The pervading principle of the design of Longleat is that of horizontalism. Each floor is marked clearly and decidedly by the entablatures, and each story is distinguished by a different order of pilasters. There is a central entrance in a symmetrical front, and a very few additions and suppressions would give a complete Italian character to the whole composition.

On the other hand, we have the mullioned windows, so dear to Mediævalists, and the projections common in Elizabethan work. These projections, indeed, are very pleasing, and serve to redeem the front from flatness and insipidity. They form bay windows, moreover, and so increase the internal space as well as the cheerfulness of the rooms, and they mark the Transitional character of the design.

Taken as a whole, Longleat is one of the most remarkable and beautiful buildings of the period, and the details indicate a purity of taste rarely to be found in other examples. Whether it may be ascribed to John of Padua or not, the design is obviously the work of an architect of taste and refinement, who was well accustomed to Italian work, and probably acquainted with Italian artists. The latter were, as we know, beginning to be largely employed in different countries, and some skilled archi-

* Fourth lecture, delivered February 21, 1878.

tects, as, for example, Vignola, are known to have stayed in France, and practised their art in that country.

From Longleat we will now turn to Crewe Hall, in Cheshire,—a much later example, but, nevertheless, not without some coincidences of principle, mixed with considerable individuality of its own. Crewe Hall was built from 1615 to 1636, about half a century after Longleat.

It may be interesting to notice some points characteristic of the time of which we are treating, in the career of Sir Randulph Crewe, the restorer of his family, as well as the builder of its home. He was born in 1558, probably at Nantwich, in Cheshire. Following the profession of the law, he became Serjeant about 1615, and was one of the earliest members of Serjeants' Inn, which has lately, as you are aware, been disestablished and disendowed by the Serjeants themselves.

Sir Randulph Crewe became Lord Chief Justice of the King's Bench in January, 1625, and his portrait long adorned the walls of Serjeants' Inn. The times were full of trouble for public men, as Sir Randulph soon found, to his cost; for he was dismissed from his high office by King Charles I., after a tenure of less than two years.

The historian Fuller thus records the fall of the Lord Chief Justice:—"King Charles's occasions," he says, "calling for speedy supplies of money, some great ones adjudged it unsafe to venture on a Parliament (for fear, in these distempered times, *the physic would side with the disease*) and put the king to furnish his supplies, by way of loan. Sir Randulph, being demanded his judgment of the design, and the consequence thereof (the imprisoning of recusants to pay it), openly manifested his dislike of such preter-legal courses, and therefore, on the 9th of November, 1626, was commanded to forbear his sitting in the Court; and the next day was by writ discharged from his office, whereat he discovered no more discontentment, than the weary traveller is offended, when told that he is arrived at his journey's end."

The above account is not quite consistent with repeated attempts which were made by Sir Randulph to regain his office. A powerful effort in his favour was made, in 1641, by Mr. Hollis, whose speech on the subject adverts to the independence of Judges, and the public dangers which would arise from corruption on the Bench.

Hollis declares of Sir Randulph Crewe, that "that worthy reverend Judge," because he would not act "contrary to his oath and conscience, drew upon himself the displeasure of some great persons about His Majesty," and lost his place, and the profit of his office, for fourteen years, "which by a just calculation, in so long a revolution of time, amounts to 26,000*l.* or thereabouts." He further summed up the case as follows:—"Sir Randulph kept his innocency when others let theirs go; when himself and the Commonwealth were alike deserted; which raises his merit to a higher pitch; for to be honest when everybody else is honest when honesty is in fashion, and is Trump, as I may say, is nothing so meritorious; but to stand alone in the breach, to own honesty when others dare not do it, cannot be sufficiently applauded, nor sufficiently rewarded; and that did this good old man do: in a time of general desertion, he preserved himself pure and untainted."

Notwithstanding such powerful advocacy, the Chief Justice remained in disgrace, although he had reason to believe that the Duke of Buckingham, who was supposed to have been the cause of his dismissal, had repented of the action, and had resolved to intervene in his favour, and procure his restoration to the Bench. All such hopes were ended, however, by the assassination of the Duke by the hand of Felton, in 1628, and Sir Randulph Crewe remained, as before, an exile from royal favour.

The ex-Judge lived thereafter in retirement, and devoted himself to the care of his estate, and the finishing and adornment of Crewe Hall. He died in 1645-6, at the ripe old age of 87, as his eulogist Fuller says "out of office, not out of honour, living at his house at Westminster, much praised for his hospitality."

Sir Randulph Crewe was buried in the chancel of Barthomley Church, in Cheshire. He lived to see Crewe Hall garrisoned by the Parliamentary troops, and the scene of a bloody contest in 1643, when it was taken by the royal forces, and held by Lord Byron for the king. It was surrendered again a few months afterwards by Captain Fisher, who had succeeded to the command after the raising of the siege of Nantwich, and the discouragement of the Royalist cause.

The high position of the Chief Justice, and his influential connexions, make it probable that he was well aware of the progress of other great buildings, such as Longleat, and as John of Padua was highly placed in the royal favour, he might naturally be acquainted with the works of that artist, and would thus be possibly influenced by his views of design.

The Crewe Hall was finished, as has been said, about 1636, and the family possesses two interesting oil pictures painted immediately after the completion of the works. These paintings enable us to form a clear idea of the hall as it existed when fresh from the hands of its founder. They are the more interesting, because the building has passed through many vicissitudes.

The out-buildings, containing the servants' offices, have been long since removed, and a new wing was added, about 100 years ago, to contain those rooms, arranged in a manner more consistent with modern requirements. In 1866, a destructive fire ravaged the whole building and destroyed almost every part, except portions of the dining-hall, and the comparatively modern wing.

The destruction was so complete, that the Hall, as it now exists, is less a restoration than a rebuilding, although the greatest care has been taken to recover the design of Sir Randulph, for such of the work as it has been possible to restore. It is believed that all the rooms built by him, and which still exist, exhibit the original appearance, although with less roughness of execution and uncouthness of detail, particularly in respect of the human figure.

Such peculiarities cannot, I think, be properly repeated in a modern reconstruction. They are a part of old work; and, as long as they exist, have an historical interest, which should not be tampered with; but when the fabric, with all its associations, has been swept away, by fire or otherwise, it is not the part of the nineteenth-century restorer to reproduce matters which, at best, were the weaknesses of his predecessors. He is, in such cases, free to select, and should not seek, by a clever imitation of bygone tricks of construction or design, to deceive the spectator, as to the age of his own work, and so pass off the latter as something which it is not.

On the other hand, we cannot, as I have said in a former lecture, assent to the conclusion that all restoration is a wrong and unclean thing, not to be tolerated,—a crime to be denounced and punished. An owner of a great historic mansion, born and bred in it, honouring and loving every stone in the fabric, is not to be told that it is gone from him for ever, that he must not venture to reproduce it, lest the restoration should shock the æsthetic sensibilities of some antiquary, the high sentimentalism of some "superior person."

He may fairly reply, "I shall follow in the steps of my fathers, I will restore what is good, I will discard what is bad, or obsolete, and I will add all that I consider necessary, in the altered circumstances of my own time. As I am not ashamed of my work, I will not seek to conceal it by artifice; but it shall stand out, in respect of date, as clearly as the work which it replaces, and which I have lost, by no fault of my own. Such is, as far as I know, the spirit in which my forefathers worked; it was also the spirit of the best architects of old, and I will follow their lead."

This appears to me a reasonable view of restoration of such buildings as Crewe Hall, and it has, as a matter of fact, been rebuilt and otherwise dealt with, in accordance with such principles. The building, therefore, is only partially the same as that left by its original designers; but in the rebuilding, their design has been reproduced wherever practicable, with such modifications as have been referred to, and the date of the new work is conspicuous in various parts of the house, so that there may be no room for error as to the time of its execution.

I may, perhaps, be permitted here to quote some graceful lines, which were written on the occasion of the completion of the works of renovation in 1870. They are from the refined and polished pen of a living poet, a nobleman nearly related to Lord Crewe, and of widespread literary fame,—I mean Lord Houghton; whose approbation of a work of reconstruction has, moreover, a somewhat special value, as coming from a member of the new Society for the Preservation of Ancient Buildings, which has been supposed by some to be ready to denounce all restorations, in equally unmeasured terms:

"Over the Old, a solemn sadness lies,
Upon the New, a garish freshness shines,
Happy the Work, that blends for heart and eyes,
Present and Past, in undistinguished lines.

Thus Art combines in this manorial pile,
Scenes of the grand Antique, and modern Fair,
Historic faces from old corners smile,
And young feet tread the renovated stair

Come, Friend and Guest! enjoy as suits the mood,
Serious or gay, content with either fare;
And pray that, for all time, the greatly good
May dwell herein, as erst the goodly great."

Let us now turn our attention to the building, as shown to us in the paintings. We find the house externally a square block of about 100 ft. square each way. The minor offices are separated, in small gabled buildings, and there is a forecourt of moderate size, walled in from the park, and inclosing a raised terrace in front of the house.

The building is much smaller than Longleat, and less imposing in architectural character and detail; but it is impossible not to be struck with certain points of resemblance. We have the same grouping together in one large block, the same projections of bays and oriels. There is the same wealth of windows, with numerous mullions and transoms, and the same horizontal spirit of design.

On the other hand, we may trace a more English feeling pervading the later example. The English architect of Crewe was less at home than the Italian designer of Longleat with orders and pilasters, and the use of them is consequently limited to the principal entrance. The well known feature of the gable is also retained; and though in the main building it appears in so subordinate a form that it may be said to exist under protest, in the outbuildings we have the gable freely used, both in its simple shape and in the curved, and fantastic forms, which succeeded the severer lines of the mediæval styles. The chimneys of red moulded brick, the mixture of brick and stone in the elevations, combine, with the peculiarities above mentioned, to give Crewe Hall a more homelike character than attaches to the more stately and palatial Longleat.

Let us now pass inwards, and examine the plan. For a block of 100 ft. square, some method of internal lighting was necessary, and we shall find that this was obtained by means of an internal court, a foreign feature, rather than English, as we have already seen. The arrangement of Crewe Hall is, indeed, Italian, in the same sense as that of Longleat, and possibly from the same causes, but the details are more in accordance with English customs.

We have before noticed how the tendency arose to gather together the isolated buildings, at first scattered very much at random, within the fortified *enceinte* of Mediæval castles. In great structures, the apartments were then, as we know, built round quadrangles. The English manor houses followed the policy of concentration, by adopting a plan of centre and wings, while the Italian method favoured the small central court, in the midst of a square block of building.

We shall find at Crewe a Transitional character, which serves to mark the fusion of the two principles of English and Italian work. The general arrangement accords with the latter, while the disposal of the design in detail, recalls, in more than one interesting particular, the arrangement of Mediæval houses. Thus, we have the Hall, as the great feature of the interior. It is, as of old, a room of great dignity and importance. Close to it is the parlour, or withdrawing room for the family, called by tradition the "Carved Parlour."

The upper part of the Hall is marked by the oriel and the dais, and at the lower end is an elaborate and handsome screen of carved oak. We find, in relation to this screen, the old arrangement of the passage with buttery-hatch behind it, communicating with the offices, and there are openings in the upper part of the screen, which, taken in connexion with the peculiar design of the top of the latter, lead to the conclusion that above the passage there was the traditional minstrels' gallery, overlooking the Hall.

The ceiling of the dining-hall is designed with great intricacy, and is executed in plaster, with pendants boldly treated. The walls are wainscoted to a height of about 8 ft., and there is a large fireplace in the middle of one of the side walls. It was necessary for any person who wished to enter the house to pass through the Hall, though he might obtain access to some

parts of the building,—as, for example, the chapel, — by passing into, and through the internal court.

The chapel was evidently constructed in accordance with precedent, although it stands north and south, thus disregarding the practice of orientation. It has always been set apart for sacred uses, having been formally consecrated by Bishop Bridgman in 1635. Although of small dimensions, the chapel possessed much interest.

We may remark the division of the end farthest from the altar into two stories, one of which formed a gallery, an arrangement which was noticed on a former occasion, in reference to Mediæval buildings of the preceding centuries. The lower part under the gallery was screened off, as an entrance and ante-chapel, and in the gallery above it was the family pew, approached from the private apartments. The servants and others entered from the open court.

The chapel was of the same internal height as the Hall, and here we may notice another peculiarity in the distribution of the interior at Crewe. This is the introduction of an intermediate or mezzanine floor. The general design of the exterior indicates a ground story of considerable height. The large windows are evidently consistent with the existence of lofty apartments, and such are, indeed, the hall and the chapel, and, to a somewhat less extent, the "Carved Parlour." The rest of the story is, however, horizontally bisected by a floor; and on this floor were the bedrooms and private sitting-rooms of the family, placed on the same level as the gallery-pew of the chapel, with which they communicated. By this arrangement a great extent of accommodation was obtained.

On the two principal fronts, namely, the southern and the eastern, the existence of the mezzanine floor is masked. The windows are of similar height and design to those of the Hall, and the central division of the window is occupied by a panel, corresponding with the floor within. On the northern and western sides, the position of the latter is frankly recognised, and the two stories of ground floor and mezzanine have separate windows, arranged with distinct cills, in the ordinary way.

The semicircular window of the chapel is the most prominent detail of the north front, and in it we find the only trace of Gothic traditions, apart from the general adoption of mullions and transoms throughout the building. Although these details are freely used, all the lines of the windows are regular, and all the openings rectangular; but in the chapel, and there only, we find the windows with arched and trefoiled heads, the arch being semicircular, and the cusping in accordance with late Tudor examples. The old style had still, we may suppose, a flavour of ecclesiasticism, and thus could not be denied a resting-place in the chapel of the mansion.

I have before alluded to the staircases of the Transitional era as having interest and beauty, and Crewe Hall is rich in the possession of one of the finest of existing specimens. It is entirely of oak, elaborately worked and carved, and of excellent and sound design and construction. It is a newel staircase, built round a central well-hole.

The more ordinary plan of staircases was a system of long flights, few in number. Here we have a different principle, and it is interesting to notice again, that it is a principle commonly followed by Italian architects. They did not, indeed, form well-holes, as at Crewe. This is peculiar to the time and country, and follows naturally from the material employed. The Italians built, for the most part, stone staircases, with a solid central pier, and stairs around it, in numerous short flights. Here also, we have numerous flights; but the pier is replaced by a well-hole, with massive wooden newels at the four angles.

The staircase at Crewe is not only beautiful architecturally, but is also very easy and convenient. It occupies, moreover, but little space, being not more than 21 ft. square from wall to wall, while the height of the story is 20 ft. The shortness of the flights, and the frequency of the landings, secure great ease in ascending, and, from the compactness of the plan, no unnecessary distance is traversed.

I cannot advise young architects too strongly to study the planning and design of staircases. In domestic works, they will often be tied down strictly to the necessary expenditure, without much margin for indulgence in architectural display; but the staircase is a necessity, and there is always in it a resource for the skilled artist. Every one knows the ugly and inconvenient chicken ladders, which do duty as staircases in most modern London houses; and nothing, I think, marks more clearly than the design of the staircase the difference between an architectural composition and a builder's box.

The beauty of the staircase at Crewe has always been recognised by artists, and, I believe, the late Mr. Stanfield once adopted it as the subject of a great picture, which he painted for a drop-scene at Drury Lane Theatre. With its handsome newels, carved and panelled; surmounted by quaint animals with heraldic cognisances; its richly-wrought balustrade and picturesque arrangement; this staircase is certainly one of the most interesting examples of the skill of the builders of the seventeenth century, both in the art of design and the science of construction.

The staircase led to the great reception-rooms and principal guest-chambers. These were all on the first-floor, and looked outwards, in the English manner, commanding distant views. The whole of the northern side was occupied by the usual long gallery, a charming room, well adapted for reception, or for exercise. The other apartments were principally sitting-rooms, and were approached through each other, — an arrangement which our ancestors appear to have thought unobjectionable. There were a few attics and small bedrooms for servants, but most of the latter must have been accommodated out of the house.

The ceilings generally are of great elaboration, and in some cases of much beauty; and there are large and curious chimney-pieces reaching up to the ceiling. One of these, in a guest-chamber which the late fire did not reach, represents, in a rude manner, the murder of Abel by Cain,—not a very cheerful subject, one might think, for a nervous visitor, fresh from the perils of the road.

We find in the whole arrangement of Crewe Hall an amount of domestic comfort which was highly characteristic of the progress of the country in prosperity and attention to the liberal arts. The execution of the ornamental details was good, particularly the carpenter's work; and although the sculpture of the human figure was strained and uncouth, as was usual at this period, there was underlying the whole work a motive principle, the development of which, by workmen skilled in artistic taste, would have produced a result of a highly satisfactory character.

As it was, and notwithstanding all drawbacks, Crewe Hall was a splendid specimen of the taste of the Transitional epoch, a noble example of the mansion of the old English gentleman.

It is curious to notice the formality which had now taken possession of such structures and their adjuncts. It was the reaction, probably, from the picturesque irregularities of Mediæval work, although this quality in the latter is far from being as common as is often assumed. The Mediæval architects did not, indeed, shrink from irregularity, whether of plan or elevation, when circumstances naturally gave rise to it; but they did not gratuitously set themselves to work to design irregularities and invent picturesqueness, as many of their modern imitators would seem, by their practice, to fancy.

The Elizabethan style, also, did not forbid elasticity, although such buildings as Longleat and Crewe illustrate the taste for more formal design, which was becoming fashionable. It not only pervaded the house, but extended to the adjoining grounds. It displayed itself in formal plantations and terraces, following, very evidently, an Italian impulse. The terrace at Haddon exhibits some original details, but the Elizabethan architects usually borrowed balusters, terminals, and piers, from foreign models. Thus, at Crewe, we find a terrace with balusters of forms common in Italy, and divided into bays, according to well-known precedent.

The love of formality and imitation passed from the house to the garden itself, which was laid out in stiff forms and patterns, with terraces ranged one above the other, approached by steps, and decorated with balustrades. Formal enclosures were favoured with bowling-greens, labyrinths, and mazes, and it seemed the object of man to put nature in fetters. Even the plantations were to be reduced to obedience, and were clipped and tortured into fantastic shapes. Hedges became walls, and streams canals.

There is a very interesting example of an Elizabethan garden at Levens, in Westmoreland. Here the trees and shrubs are made to resemble every shape but their own, and the aspect of things has been maintained by the owners without alteration, from the time of the original foundation of the place. You will notice many instances of similar principles of formal arrangement of the grounds at Crewe; not, indeed, as it at present exists, but in the paintings of its original condition.

In these pictures, you find the stiff garden, with flower-beds of geometrical patterns; there are straight walks, a rectangular fish-pond, and high enclosure walls, instead of hedges. The offices are in detached buildings, each made to resemble the other. A straight walk gives approach to the house, through a square court-yard. A central flight of steps leads to the hall door, in the middle of the façade, while on the right and left there are regular balustrades, with stone piers, and ball terminals upon them.

At the other end of the straight walk, and at its point of junction with the park, there is shown in the picture an arched gateway of interesting design. The arch is semicircular, and the opening is closed by solid-looking and richly-moulded wooden doors. Detached columns flank the opening on either side, and the whole is surmounted by elaborate scrolls, into which are worked the heraldic cognisances of the family. On each side of the gateway are brick walls, extending to the right and left, so that the whole enclosure is about equal in width to that of the house. At the angles there are small buildings or outhouses, designed in strict accordance with each other.

These buildings, together with the archway and enclosure, have long since disappeared, and the grounds around the hall were laid out in a more modern fashion, some years ago, by the elder Nesfield. The arrangement of the forecourt could indeed scarcely have been retained as tolerable; for, as the archway was not wide enough to admit carriages, no one could have driven up to the front door; an arrangement not very suitable now, though it was probably convenient enough in the days of sedan chairs and running footmen.

At Crewe, as at Longleat, the Italian taste for symmetry had succeeded to the irregular picturesqueness of Gothic architecture, and these were but instances of what was doing elsewhere. In all parts of the country a similar movement was apparent, coupled with many lingering attempts to retain the beauty of the past,—to combine the Old with the New.

A taste for profuse internal decoration prevailed,—a decoration not of the true artistic character, which calls for the co-operation of the sister arts of painting and sculpture (and without which, be it observed, there can be no decoration worthy of the name); but a decoration of masons, plasterers, and carpenters, with much striving in the dark, and half realisation of good intentions.

The walls of rooms are handed over to the carpenter, and he covered them with oak panelling, generally extending from floor to ceiling. In many cases, as in the "Carved Parlour" at Crewe, he shared his task with the plasterer, and allowed his comrade space for a deep and elaborate frieze above the panelling. Here, accordingly, were Gods and Goddesses, or Vices and Virtues, displaying a splendid ignorance of the laws of anatomy and of the human form divine. There was, however, frequently much grace and skill in the design of the whole, both in its general composition and in the disposition of the parts, and when scroll-work was employed, it had a curious intricacy, and a characteristic elaboration, which produced a handsome effect.

The object seems to have been to cover the whole surface of the walls with constructed decoration. Nothing was left to the taste of the future occupants. The builders had everything their own way, and wished to turn out their work complete in its parts, a production *factus ad unguem*.

The taste for profusion of ornament is characteristic of the Elizabethan style. It passed away, and was by-and-by succeeded by the baldness of the Georgian era. Now indeed, amongst ourselves, the wheel has again turned round, and we hear of "decorative artists," "art manufactures," and "art workmen" in all directions.

Everything must now be reversed. Our ceilings must be black, and our floors white; balusters must be turned upside down; fires placed on the floor; our mahogany sideboards banished, and dressers, which seem to have been borrowed

from the kitchen, put in their place. Plate glass, we are further told, is not "æsthetic." If it cannot be avoided altogether, it must, at least, be degraded into small divisions, separated by clumsy and heavy bars. Better still if it can be altogether obscured by coloured patterns and devices. Cheerfulness and light are beneath the notice of the "artist-decorator"; but, as a compensation, he will cover every space with daisies and pomegranates, and will perhaps even persuade a whirling flight of birds of paradise to settle, in impossible positions, on walls, ceilings, shutters, and doors. Every space must be decorated, and nothing left for repose.

Now I will not for a moment defend the cold dreariness against which all this may be regarded as a protest; but still less can I regard such over elaboration as a healthy movement. It seems to be, indeed, something of an anachronism, a return to Transitional profusion, inconsistent with the claims of pure art, and the simple and refined manners of the best modern life. High-class paintings, engravings, and sculpture, are the true decoration of our dwellings; and no style of architecture can be permanently accepted, which does not provide a place for them, and receive them with a hearty welcome.

If the large sums daily lavished on commonplace decoration were applied with a higher aim, we might hope for a time when a school of mural painting and sculpture should arise among us, of sufficient importance to absorb into its ranks many a young artist of promise, who now may sigh in vain for an opportunity for the exercise of his powers, while he sees that which might be his legitimate province invaded by those who find it profitable to talk a jargon of art language, and make of fashion a profitable trade.

It is pitiable to think of the great opportunities for the employment of the highest forms of art, which are daily thrown away in connexion with our public buildings alone; and while this is the case, no amount of eccentric admiration for eccentric things wi l take away the reproach that we are still, as a nation, in the rear rank of artistic progress.

This, however, is a digression from my subject, and time warns me I must conclude. Let us, therefore, briefly review the progress we have made in the consideration of our subject. Having traced the gradual changes of domestic architecture in England, from Roman and Saxon days, we have noted its advance through the succeeding centuries, which marked the golden age of Gothic art.

This wonderful school gave us masterpieces of construction, and marvels of design. Nothing in the accessories of our architecture was neglected, and the same principles of design which ruled our churches, abbeys, and palaces, were illustrated in the textile fabrics and furniture of the day. Every part combined to give effect to the whole, and the custom of each period was as absolute in its sway as the dictates of modern fashion.

In the triumphs of Mediæval architecture, however, the sister arts had an inadequate share. Was this an accident only? Did it arise from any temporary paucity of artists? Or is the deficiency, in any way, a natural consequence of the governing principles of Mediæval design? This is too important an inquiry to be pursued at the end of a lecture; but it is one which must be faced, and must be answered satisfactorily, if our architecture of the future is to be based on lasting principles.

In our present inquiry, we have arrived, as it were, at a table-land of art; where we may pause, and whence we may look around us, before continuing our journey. We find in the Transitional architecture of the Elizabethan and Jacobean structures, a very battle-ground of opposing principles. It would not have been English if it had received new ideas, and parted with old customs, without a struggle. [Our fathers, like ourselves, liked to be masters in their own house, and thus we find old ways and habits asserting themselves in the arrangements of their architecture, even when foreign fashions were half-welcomed.

As the transition passed, compromise was abandoned. Foreign models were, more or less, absolutely followed, and our art became involved in a conflict of ideas, and confusion of practice, from which it has never emerged.

We may, perhaps, find something to deplore in a state of things which may appear to some an artistic anarchy; an anarchy, moreover, which, contrary to historic analogy, does not seem likely soon to submit to the sway of a dictator; but, it may be, we shall derive consolation from the reflection that independence is a necessary concomitant of freedom; freedom of mind and body,—freedom of science and of art,—a freedom for which men have fought and suffered, and which we could as ill relinquish as the air we breathe.

THE LAND.

SIX EXTRAORDINARY MILLIONS have soon to be paid into the National Exchequer. Though not absolutely a war-tax, it is a first instalment imposed under the pressure of possible warlike emergencies. All grades of the community will be more or less affected by it; for the lowest classes will feel the impost from an increase, trifling and imperceptible to others, in the price of provisions. The persons however upon whom the burden will fall heavily form that class to which the poor professional man, the highly-skilled artisan, and the small tradesman, may be said to belong. A landowner with a certain rent-roll of 40,000*l.* a year, will pay 100 times the amount that an architect with an income, precarious or uncertain, of 400*l.* a year will pay; but the latter will so feel the burden that he may be excused for wondering, as men in all countries have at times believed, why the poor should help to maintain what the rich enjoy. The exaggeration of such wonder or such belief is patent; but the increasing inequality, in actual taxation of property in land and of property in brains or hands, is much greater than many honest people suppose. In early times it was the land that paid to maintain its own integrity at home, and to guard itself from danger abroad. Less than 200 years ago it was the land-tax that enabled this country to prosecute a war by which eventually the power of Louis XIV. over England was entirely subdued. But when we go to war now, or take measures to avoid war, almost the whole nation is polled; and a small percentage of each returned income is paid into the Exchequer. That seems at first sight quite fair. But the slightest historical knowledge of what the ownership of English land once meant, of what the land-tax meant in the time of William III., will suffice to show that the hereditary holders of the soil not only pay relatively less taxes than the brain-worker and the skilled hand-worker, but they owe to their fellow countrymen a debt of honour which to be entirely discharged would almost bring pecuniary ruin upon them, or involve a political catastrophe. We are not referring only to the inevitable moral inequality of an impost like the Income-tax; we refer to the privileges and immunities of those now absolute owners of entailed lands who to-day pay no interest, or who pay insufficient interest, to the nation for territory originally intrusted to their early representatives under a bond of mutual benefit and specific obligation.

"THE BRAVE DAYS OF OLD."

The agrarian institutions of the modern European world have grown out of the ruins of Roman civilisation. If, about the period when the western mind was agitated with those doubts and discussions, with that discontent which led to the Reformation in England, some Cromwell had pointed to the misery and debasement of the many, he might have used these words:—"The wild beasts of *England* have caves to shelter them; the people who expose their lives for the national defence are allowed nought but the light and the air. Our generals mock the soldiers when in battle they exhort them to fight for their household gods; for amongst all that great number of *Englishmen* there is not one who has either a domestic altar or a sepulchre of his ancestors. They are styled the lords of the universe, while they have not a single foot of ground in their possession." But that was the speech of Tiberius Gracchus, who, about 132 years before the birth of Christ, attempted to alleviate the disorder and poverty occasioned by the non-observance of an earlier land-law. The patricians, who were rich and strong, had become possessed of lands which had been intended for the plebeians, their poorer countrymen; in doing so they had incurred fines and forfeiture. Gracchus proposed a measure which is described by Plutarch as a mild and gentle remedy against oppression. Yet said the rich:—"You would strip us of our lands, our inheritances, the burial-places of our ancestors; you would create unspeakable confusion, because our estates have been settled upon the wives and children of the possessors." The rich did not add, but the historian does, that the largest part of those estates had been acquired by robbery. Gracchus was called then a disturber of the public peace; and two thousand years after, many English boys are taught to consider him in that light. Though he succeeded in passing a resolution to enforce the old law, it was systematically evaded; and he succumbed to the vengeance of the rich and their adherents. Caius Gracchus, his brother, who, ten years later, held the same post of Tribune, made a similar attempt to enforce a loyal observance of the agrarian law; but in two more years he died for the same cause. "After the Gracchi," says the record, "there never arose a magistrate honest and generous enough to espouse the true interests of the people."

ROMAN ADMINISTRATION.

The story to which we have just alluded is told by Livy and Plutarch. The dissensions it disclosed sprang from the early Roman custom of dividing some of the lands obtained by conquest among the soldiers of the conqueror, as a reward for their services. Originally Roman conquest meant only the acquisition of lands in the vicinity of Rome; afterwards, as the dominion of the Republic and the Empire extended, the lands, taken from subjugated tribes, were administered by a hierarchy of officers appointed from Rome. A conquered country was called a province; Spain and France were therefore provinces. All provincial land was the property of the Cæsar, or, in other words, the State. The occupiers held their respective portions of it on lease, the lessor being the Crown, as the head of the State, which meant the Roman People. The "landowners," or, more properly, landholders, had what was called a *possessio*, that is to say, the usufruct or enjoyment of the land. Each province paid a fixed land-tax, in addition to tribute now and then exacted. Each province was required to deliver at certain times a fixed quantity of corn for the use of the ruling race. In the age of Constantine, when the empire included under one sovereign the East with its capital at Constantinople and the West with its capital at Rome, there were 116 provinces, each of which was governed by a separate establishment. Each was ruled by a governor who was intrusted with the local administration of justice and finance. Over the governors were four præfects: 1. The Præfect of Egypt; 2. The Præfect of Illyrium; 3. The Præfect of Italy; 4. The Præfect of the Gauls, whose jurisdiction extended over Spain and Britain. The Præfects, after the reform of Constantine, had no military power; they had the supreme civil administration of their respective territorial divisions. The cities of Rome and Constantinople were not included in the countries they ruled; each capital had its municipal præfect. The military rule of the empire was divided among a certain number of masters-general under whom at one time were thirty-five Dukes or leaders stationed in the provinces, and some of these were called Counts,—a designation said to have been invented, but more correctly adopted, by Constantine.

FEUDAL TENURE.

Of the Roman provinces, it wil best suit our purpose to take Gaul as an example. With the destruction of the Empire and the anarchy that followed, the forms of administration, though overturned, were not obliterated. The Gothic conquerors of Rome found in Gaul a people who for centuries had enjoyed a scientific mode of government. The Visigoths, the Burgundians, the Franks, having possessed themselves of what land they required, were doubtless not unwilling to acknowledge, after a generation or two, the traditional law or custom by which the Roman colonist or the previous possessor had held land under Imperial protection. Moreover, many of the ancestors of the barbarians, who overran the empire and settled in Gaul, had served in the Imperial armies. The destruction of Roman power was

to some extent as much the result of revolution as of conquest or invasion. The barbarians had previously been subjects of Rome; they had learnt some of the arts of their masters. What long afterwards developed into a system now known as feudal tenure, probably rose soon after the triumphant partition of parts of Gaul among those so-called barbarians. Indeed, something had already occurred to give them an idea of the advantages, in a territory where might is right, of the feudal compact. During the reign of Constantine lands had been bestowed upon deserving veterans as a reward for their services, and as a temptation to others to deserve a similar reward. They were bestowed under a certain condition: that the sons who succeeded to the inheritance should devote themselves to military service, or forfeit that inheritance. If, when the time came, the sons offered themselves, each with a horse, they had a right to serve in the cavalry; if one brought two horses he had other privileges accorded to him. That condition, says Gibbon, contains the first rudiments of the feudal tenures. The new masters of Gaul, checked or guided by no central authority, held their lands by right of force; and lands are said to have been held in absolute dominion from the end of the fifth century to the era of Charlemagne. But little or nothing is known of France or any other country during that period. The inroads of the Normans, at least in the north and west of France, doubtless precipitated the course of events. Where life and property are at the mercy of brute force, the weak proprietor must succumb to the strong, or he must bargain with the strong. Protection against attack and spoliation was obtained at the price of liberty: in due time rose the feudal lord. He was a territorial prince, whose sway extended over a vast domain. His own residence was the castle which, on the crown of an eminence, and often the hilly bank of a river, commanded and protected the country for miles around. Upon this territory a large number of small proprietors were located. Between them and their lord, the owner of the castle stronghold, there existed an unwritten bond of mutual service and obligation. The small proprietors brought corn and cattle to their lord; their lord defended them from external enemies or from each other. Some of their sons were received as soldiers within the castle; some of their daughters became the gentle attendants within the household; and both were provided for. Ultimately the relation of their lord, and of other territorial princes likewise, to a higher power of Duke or King, partook of a similar character. The grant of a tract of land at the time of the conquest of this island conferred nobility, at least in Normandy. That tract of land was transferable together with the dignity or title it conferred; if it were "sold" the purchaser acquired the dignity as well as the land and he was bound to fulfil the same feudal obligations. To that tract of land belonged a number of serfs or slaves who were transferred with the property; they were included in the fief, that is to say, in the loan of that land made by a Duke or a Count to his Baron on condition of receiving for it substantial service, and what virtually was the same as rent and taxes. The dignities and functions of Duke, Count, Baron, and the equivalent for Marquis, were well known in Western Europe before the Conquest of England. They were not honorary titles; they all denoted persons in authority having important and distinct duties of government to perform, and they are all derived from the names of offices held by Roman administrafors during the Lower Empire. Thus:—

DUKE.—This title is derived from the Latin (*dux*), and implied, under the Roman emperors, a military leader. On the soil of Italy itself the Doge of Venice was commander of the Venetian forces. The first Doge was elected by the people; president of the Republic, he exercised political as well as military power. Afterwards, in the fourteenth century, the Doge became part of a State pageant. He was no longer elected by the people, but by an exclusive and hereditary council; he was called "Mr. Doge," just as modern Frenchmen address "Monsieur le Duc." The Northern Cæsar or Czar was originally Duke of Muscovy. The Duke of Normandy, who became King of England, was virtually an independent sovereign within the confines of his Dukedom. So were the Dukes of Burgundy and of Aquitaine. But the title of Duke in this country has, from its first introduction in the fourteenth century, been a mere honorary distinction. For a time it was confined to princes of the blood royal. On the accession of Elizabeth only one English Duke existed: the Duke of Norfolk. At the "Restoration," when much of the letter, not the spirit, of the past was revived, the number was increased by Charles II., who, by conferring that title, ennobled his illegitimate offspring. Only three of the present dukedoms date from before his time. It is needless to add that none of the English dukes, now in existence, hold as dukes or leaders any office of vital importance in the constitution of this country; their duties to the sovereign and the people are—if we except attendance in the House of Lords—nothing more than honorary moral and social obligations.

MARQUIS.—This was a lord of the Marches or Marks,—that is to say, a lord of the country lying near the landmarks which defined the limits of a province, a dukedom, or a kingdom. Under the Lower Empire there were the French Marches and the Spanish Marches,* often mentioned in MSS. of the eleventh century. A Marquis, whose consort is still called a marchioness, held a border government much as the present Lieut.-Governor of the Panjáb holds "the five rivers" and governs in the name of the Empress under the supreme direction of the Viceroy. In England, Mortimer had the management of the Welsh borders or boundaries; he was called Earl of March. It is needless to add that, in this island, there are now no frontiers or border-territory to govern. At the present hour the honorary dignity of "Marquis" is conferred upon an Earl who has rendered service to the political party of which he is a member; or upon another who has acquired by reversion or purchase an increase of landed property; or the title is granted by caprice.

COUNT.—The same as "Earl," whose consort is a countess. The word is derived from the Latin (*comes, comitis*). There were Counts of the Imperial Household in the reign of Augustus. Before then, under the Republic, the count was an assessor, an officer who formed part of a provincial administration. The Counts (*comites*) of the Household sat in "committee" and pronounced judgment in matters referred to them by the emperors. Counts formed a council. According to Ducange, the "*comes sacrarum largitionum*" has descended through mediæval to modern times: he is now or, before the French Revolution, was, the "Grand Almoner"; the "*comes vestiarus*" is or was the Grand Master of the Wardrobe; the "*comes curiæ*" is now the Grand Master of the Ceremonies. Under the early kings of France, as under the Lower Empire, Counts were officers of Government. There was a Count of the Palace who, when the king, prince, or duke was absent, possessed the right of jurisdiction. There were Counts who ruled districts; there were Counts who, so to speak, were mayors of a municipality. The vice-count or viscount (*vice-comes*) was the sheriff. A Count often combined the powers of a judge, an assessor, and a general. He led the army contingent of his district or his town to the wars. On the continent of Western Europe he was the chief of a county; in England an Earl was often the head of a shire or of a municipality,—the term "Earl" being derived from the same Saxon root as "Alderman," or the cognate Danish title of "Eorle."

BARON.—This was not a title; even were it a dignity, it was barely more,—at least, at first,—than a legal and moral distinction. A "Baron" was a "Man," a person who held of a superior in exchange for service, who was bound to attend the court of that superior,—there to acknowledge himself the superior's man or baron,—and to assist in the transaction of judiciary or other business. The baron was a tenant; the tenants-in-chief of the Crown were barons to the king. During the Norman rule,—before the fourteenth century,—the Crown tenants-in-chief were the Barons of England; they are so described in history. The term or quality of baron had also a general signification. For instance, the Earl, the oldest title of English nobility, was the holder of lands entrusted to him by the king; he had also a number of persons sub-holding portions of those lands. The Earl as a Crown tenant was baron to the king; the Earl's tenants were barons to himself. The expression, "feudal tenure," may be properly defined as "feudal tenancy." Land was never sold in the modern meaning of the word, it was "let"; and the relation binding the vassal to his lord,—a lord was vassal to the king,—consisted of mutual interchange. The land was used or enjoyed for certain specified services of protection from the king or lord on the one hand, of service due on the other. Hence the original meaning of holding lands by barony. The term "baron" however did not apply only to holders of land. In early charters the citizens of London and York are denominated "barons." There were also the Barons of the Cinque Ports; these were the men or freemen of Hastings, Dover, Hythe, Romney, and Sandwich, who were barons to the king. As another example, the Barons of the Exchequer were the chief men of that Court, which was instituted almost immediately after the Conquest.

THE MEDIÆVAL "WAYS AND MEANS."

The Conqueror, as the head of the State, retained in his own hands large tracts of land. They formed parks and preserves; fortresses; head-quarters for the administration; farms; and also a reserve fund which was used not sparingly to reward services rendered by the Church or by the Army. Those lands, or what remains of them, now form the ancient Demesne of the Crown. Nothing, however, that the king "gave," in the shape of territory, was an absolute "gift." Services had to be rendered which practically conduced to the filling of the National Exchequer; to the maintenance of an army for offence as well as defence; to the free administration of justice, rude enough it is true, in the various districts; to the protection of one locality from the rapacity of another. The nobles were local governors responsible to the the king for their conduct; they were his immediate supporters when tumult, foreign or internal, menaced the general welfare. The tenants-in-chief of the king formed his council; without any form of voting supplies they brought with them, as their charters written or unwritten bound them to do, the ways and means to carry on the king's government at home and to defend it from aggression abroad. The services rendered were proportionate to the extent and value of the lands let; money also was paid, not as an annual rent, but in casual tribute. This form of taxation was a right of the king as lessor of territory. The services were (1) military service and (2) civil service. Firstly, a baron of the king, or king's man, was bound to bring with him to the Royal army a number of soldiers corresponding to the extent and value of his land. Secondly, he was bound to do duty in the royal household, to officiate on certain days, to keep a fixed number of horses, hounds, and hawks for the king's use. He was also bound to attend the king's court, to assist in the supreme administration of justice and to transact other official business. As the tenants-in-chief had to perform such services, so their sub-tenants were made to contribute in similar fashion. The well-to-do vassal of a king's vassal brought men, horses, corn, handiwork to his lord; these were taken—the quantity depending much upon circumstances as a rent or a tax for the enjoyment of his allotment and its produce. Many of the ruined ivy-hidden walls, which picturesquely break the English landscape, were the strongholds of the great Barons. There they held their courts, received homage, and what were virtually civil dues; there they transacted the business, military and judicial, of their respective territories. Those castles were to the surrounding tenantry what the Court of Westminster was to the tenantry-in-chief of the Norman kings. The tenants who assembled within the provincial castles to determine local disputes were called peers of the court (*pares curiæ*); in the King's Court the Crown tenants or barons were called the Peers of England, that is to say, pairs or equals in the Council of State, or, in the Shaksperian hyperbole, "pillars of the State."

THE REFORMATION.—THE REVOLUTION.

The present Prime Minister once made an effective speech in the House of Commons on the several subjugations of this traditionally tight little island. He emphasised the Dutch conquest by William of Orange; he alluded to the conquest by James Stuart, Sixth of Scot-

* In the best Roman times the frontiers of provinc were called "*Fines*"; towards the close of the Roma domination, "*Limites*"; and in the Middle Age "*Marchæ*."

land and First of England. He might also have enumerated those proceedings which took place in this country after the dissolution of monasteries and the fall of ecclesiastical power. The annexation of land at that period by the governing classes might well be described as a civil conquest. The historian Hallam is responsible for the undisputed assertion that the richest of the English aristocracy derive their possessions from the spoils of the Reformation. The feudal tie that bound the landholder to the State, and defined his duties as well as his rights, had been long loosening; the people, moreover, were beginning to desire an independence that the landholders could not fail to see was of pecuniary advantage to themselves. Until the reign of Edward III. they had regarded their burden of indirect taxation, so to term it, as rent for the lands they held. Not until that reign, according to Sinclair's "History of the Revenue," was personal property regularly taxed; and the first poll-tax was levied in the reign of Richard II. A considerable portion of the revenue was raised from personal property during the reign of Henry V. Nevertheless, at that time and until the Civil War of the seventeenth century, land was held by a species of military tenure, which, while it subjected the inferior tenants to what Blackstone has called slavery, placed the superior tenants under an obligation advantageous to the State. Then the land was said legally to consist of so many "knight's fees," or fiefs, that is, so many portions of land capable of supporting the dignity of a knight. He who held an entire knight's fee was bound by his tenure to follow his lord (the king, or the king's tenant, or the king's tenant's tenant, as the case might be), to the wars, and to perform forty days' service every year, or to send a substitute. In like manner, twenty days' service was required from the owner of half a knight's fee; ten days' service from the owner of a quarter of a knight's fee. The owner of several knight's fees, such as the tenants-in-chief of the Crown, were bound to send a knight to the king or the State in respect of each fief. Thus the nucleus of an army was quartered in all parts of the kingdom; an army could on the shortest notice be called together. When William III. tried to form a standing army and render it a permanent institution, the state of things was this: the hereditary aristocracy retained their lands, their military obligations had been abolished. Feudal tenure became allodial tenure by an Act, passed with the best intentions during the Commonwealth, and confirmed by the statute 12th Charles II., c. 24. That statute abolished tenure by knight's service, whether the lands were held from the Crown or from a tenant of the Crown. It abolished the Court of Wards and Liveries; it repealed, for ever and ever, wardships, liveries, primar seisins, values, and forfeitures of marriage, fines and pardons for alienation. It left a few of the old customs, sources of petty revenue; it inevitably left many of the feudal abuses. It also left to posterity the duty of providing money and men for the defence of the country, while it gave gratuitously to the landholders the capital whence that money and those men had originally issued.

It is necessary, however, to hark back to the time of Henry VII. in order to trace the course of events which encouraged the transfer of power from the Crown to the great landholders who nominally composed only the second estate of the realm. Before the Revolution that order proved too great for the king; after the Revolution, too great for the people. In the time of Henry VII. the nobility and the landed gentry multiplied. That wise sovereign, in the hope of strengthening the Crown, facilitated (4 Hen. VII., c. 24) the subdivision of the great fiefs or estates of the nobility. Bacon pronounced the measure to be profound and admirable, for it made "farms and husbandry of a standard, that is, maintained with such a proportion of land under them as may breed a subject to live in convenient plenty and no servile condition." But there was another view of the prospect which Bacon foresaw. "A great and potent nobility," said he, "addeth majesty to a monarch, but diminisheth power; and putteth life into the people, but presseth their fortune. It is well when nobles are not too great for sovereignty nor for justice; and yet maintained in that height as the insolency of inferiors may be broken upon them before it come on too fast upon the majesty of kings." The nobility did become so powerful that on the accession of Charles I. the English Constitution may be said to have failed. It had been the custom for the Parliament to grant what were called subsidies to meet extraordinary necessities. A subsidy was raised by a tax on the reputed value of landed estates; and they were assessed at, nominally, 4s. in the pound. But though the value of land necessarily increased, the early assessment and the primitive mode of assessment did not vary with the time. The subsidies fell, instead of increasing, in amount. Coke, in his "Institutes," describes a subsidy in 1566 as reaching the sum of 120,000*l.*; in 1598 a subsidy reached the sum of 78,000*l.*; in 1640 a subsidy amounted to about 50,000*l.* According to Macaulay a real tax of 4s. in the pound on land would probably have yielded 1,500,000*l.* in the time of Charles I. But that sovereign lost both his crown and his head for attempting to levy a tax founded on the principle that those who possess the property of the kingdom should pay for the protection of it,—a true principle, it may be said, where property confers specially legalised privileges.

The Long Parliament were wiser and more determined than their predecessors. The sum of money required from the landholders was fixed; it was levied within each county by a rate. During the Commonwealth the landed estates yielded to the National Exchequer from 35,000*l.* to 120,000*l.* A MONTH. At the same time, the Excise duties, passed in the year 1643, were in force; those duties were granted as a part of the revenue of the Crown by that same Act, 12 Charles II., c. 24, to which we have just alluded. Some time before, about two years after the death of Cromwell, there had been a debate in the House of Commons on the Court of Wards; during the debate,—it was the 21st of November, 1660,—a reference was made to the character of the Excise Duties. Mr. Annesley,—all honour to his memory!—understood the nature of an impost which was really the thin end of the wedge intended ultimately to relieve the land from taxation. "Every man," said he, "who earns his bread by the sweat of his brow, must pay excise to excuse the Court of Wards." It is probably due to such men as Mr. Annesley that, between the Restoration and the Revolution, the landholders were compelled to pay for the land they held. In 1689, 1690, and 1691 large sums were raised from real property. In 1692, the Legislature passed an Act for granting to their Majesties an aid of 4s. in the pound for one year for carrying on a vigorous war against France By that measure (4 William and Mary, c. 1), all manors, lands, tenements, yearly profits and hereditaments, were charged with 4s. in the pound yearly value. A new and more accurate valuation of estates was then made. That valuation was prepared in 1692. In 1798 the land-tax of 4s. in the pound, assessed according to the valuation made 106 years before, became *a permanent institution* — mark the irony — and those who were subject to the tax were permitted to redeem it at a trifling cost of ready money. The whole subject was minutely examined by the instrumentality of the Anti-Corn-Law League in the year 1842. Their first Tract was "A Plea for the Total and Immediate Repeal of the Corn Laws, with Remarks on the Land-Tax Fraud;" it called attention to the manner in which the landholders had exempted themselves from taxation. An argument of no mean ability on "The Constitutional Right of a Revision of the Land-Tax" was also published by the same League.* Twenty years ago Macaulay stated in his History that little more than a fiftieth of the ordinary revenue required in time of peace was raised by an impost once regarded as the most productive of all the resources of the State. Nothing has since changed in the situation, except for the worse. Estates throughout the country are still assessed upon the valuation made in 1692; and a great part of the tax has been cheaply redeemed, and is still being redeemed, under the advantages of the Land-tax Redemption Act. The estimated Revenue of the financial year 1876-77 amounted to 78,565,036*l.*, of which the tax on lands and tenements was set down at 1,078,068*l.* This has been collected on an avowedly imperfect valuation made 185 years ago, when the Lords composed the dominant estate of the realm. Though a large number of landholders have redeemed the tax, a few, upon whose land buildings have been erected, have not redeemed it; for it is annually paid by their immediate tenants. Such is the result of legislation concocted by Parliaments which, from 1660 to the year of Reform, 1832, made laws in the interests of the governing classes alone,—the only classes, be it said in justice, then understood or even recognised by either Commons or Peers.

* The question of the land-tax was discussed years ago in the *Westminster Review*. That periodical printed a well-considered criticism,—perhaps a little bitter and overcharged,—of certain tracts published by the Anti-Corn Law League. It will be found in the number for March, 1841. We are glad to make this reference, and even to have quoted, as we have here done, from a *Review* that has faithfully served and advanced the cause of art and artists in many an excellent article.

THE NINETEENTH CENTURY.

It is an honourable conceit among Englishmen, and facts speak for themselves, that in no other division of Western Europe is the natural suspicion of caste or class less virulent than in England. Here, during the course of this century, the great man has helped the poor, the poor man has loved the great. Some Republican cynic of 1989 may attribute it to the circumstance that, a hundred odd years before,

> "Then lands were fairly portion'd,
> Then spoils were fairly sold,"

so, consequently—

> "The *English* were like brothers
> In the brave days of old."

But it is impossible to regard the revolting misery, the abject poverty, the habitual pauperism, which eat into the very heart of municipal administration all over this island, without being impressed with the conviction that something must be amiss in the balance of the State. Many believe that *something* to lie in the canker of unjust immunity from the common burden among a powerful few, and in unequal taxation among the many. No foreigner regards the spectacle, unique in Western Europe, of wretchedness that disgraces London and the great English cities without assigning a cause for its existence. It may not be the true one, but it assimilates to the charge that was felt to be true some thirty-five years ago in the old Corn-Law rhyme:—

> "Thus twelve rats starve while three rats thrive,
> (Like you on mine and me),
> When fifteen rats are caged alive
> With food for nine and three."

The inference, we repeat, may not be just; to tax capital in land may react in a direction opposed to the true interests of the untaxed classes,—at least, we are quite prepared to listen to that view of the question. It is certain that even if a true assessment of the present value of land be made, the valuation cannot affect those who have redeemed the tax. A new tax imposed upon land would, of course, mean an increased ground-rent, probably a slight increase in the price of corn, and in the price of some provisions; but it would also mean an enormous addition to the National Exchequer. If the land had been fairly assessed at short intervals of years, if the contrivance of cheap redemption had not aggravated injustice, millions of pounds sterling would have been annually gathered into the coffers of the Exchequer from the pleasure-gardens and parks, the deer-forests, the wild cattle enclosures, the game preserves, the non-producing though not unproductive acres which, by the custom of entail, cannot be sold and rendered profitable to the many or to any. Poor Scotland would have returned vast sums without really hurting the noblemen and gentry who make the larger part of that country their hunting-ground. No sane Englishman indulges in the expectation that even the superfluous lands of hereditary holders can be confiscated; they however are insane who act as if Time ever finally condones injustice or legalises fraud. Redress may be long in coming, but it always comes. The hereditary holder of the soil ought to pay for the rights he uses; he ought to compensate the State for non-fulfilment of military services and of civil obligations: he ought to pay for his privileges. Entail is a privilege, and the privilege of one person encroaches upon the rights of all. Indeed, this is often admitted and explained. Apologists have said, for the last hundred years, that entails are necessary for the maintenance of a class whose privileges accrue indirectly to the welfare of government, and therefore the nation. But there is a wider aspect of the whole question. When the property of man in man existed, when the security of a landed estate depended upon its moral and material greatness, entails were not unreasonable; they were necessary. When the tenant-in-chief of the Crown was virtually a prince,—judge, general, organiser of an armed contingent,—it was right that the principality should descend undivided to the heir; it was right that the embodiment of power and

protection should be preserved from any chance of losing its patrimony. But the holders however exalted of real property, however extensive, do not now do the work of judges, the work of generals, or even the official work of government, unless they are paid for it; and by the whole nation. They no longer equip troops of horse or convoke bodies of infantry; they are capitalists with offices and warehouses, with staffs of clerks and workmen. They sell coal, make bricks, and manufacture goods. A few are the heads of banking firms; others are the supporters of commercial companies. The landed capitalist makes money out of farms, cottages, building operations large and small; even the sale of his game affords him a trifling revenue. Meanwhile, the whole nation pays millions of pounds annually to a host of functionaries who do the work for the present generation that the mediæval landholders did for the England of their time, in exchange for the usufruct or enjoyment of the soil. That soil, after the confusion of reformation, restoration, revolution, and usurpation, is now real property, to be so held for ever and ever; and in most cases, from the fact of its legalised redemption, untaxed for ever and ever,—or, at least, till the book of Domesday be revised by the fiat of an educated people.

A GERMAN REPLY TO AN ATTACK ON SCHLIEMANN'S "MYCENÆ."

WE have regarded from the first with so much interest, and attach so much value to the remarkable discoveries and writings of Dr. Schliemann, that we are led to depart a little from our usual course and print for the benefit of English readers a translation of an article by Professor Lindenschmidt in reply to an attack on Schliemann's "Mycenæ," written by Mr. A. S. Murray, of the British Museum, and published in the *Academy*. The article we have translated appeared in the supplement to the *Allgemeine Zeitung* of January 22nd, 1878.

Among the many works on artistic and historical subjects which have appeared on our table, we have one of much archæological talent and stirring interest in the long-expected account of Schliemann's excavations among the ruins of Tiryns and Mycenæ,—'Mycenæ: a Narrative of Researches and Discoveries at Mycenæ and Tiryns, by Dr. Heinrich Schliemann; with a preface by W. E. Gladstone.' This beautifully-illustrated book gives us at last an authentic insight into those much-talked-of treasures, for the discovery of which we have to thank the unequalled perseverance and self-sacrifice of one single man, and his enthusiastic ardour in inquiring into the Greek hero-tales and the scenes of their deeds.

We are enabled to recognise how these discoveries, unique of their kind, have, better than all former descriptions, made known the region of those monuments which we are accustomed to consider the earliest evidences of Hellenic culture and development, and there can be no further doubt that we now possess proofs of the remains of those dark ages, which, from our limited knowledge of their sepulchral relics, we have hitherto endeavoured to animate or shape either with the misty forms of primitive culture, or with the more certain representations of Egyptian and Assyrian art-treasures.

Even if these admissions should be withdrawn, or essentially limited by the discovery of these wonderful tombs, still we retain, by means of the last, the key to their direct interpretation in particular, and to their surprising combination of monuments of such different style and apparently inconsistent character in general.

There are knives and arrow-heads of obsidian, with bronze swords of the simplest form, but with hilt and sheath richly ornamented with gold. The simplest vessels in pottery moulded by hand, with the painted productions of the potter's wheel; primitive bas-reliefs beside gems and intaglios, the animated but crude representations of which offer a contrast to the remarkable technical finish of their execution. We also find gold and silver vessels, and innumerable gold ornaments, their decoration consisting, besides the adoption of rosettes, flowers, and leaves of plants, chiefly in spiral and cylindrical variations, exhibiting on the other hand a number of animal forms, insects, molluscs, quadrupeds, and their mythical relations, the griffin and the winged sphinx, while in the representation of human figures in terra-cotta or metal-work the first steps in art are scarcely reached.

Among the various vessels we meet with here and there are some already well-known forms and ideas, but the general appearance conveys especially the impression of great antiquity, and only in isolated features marks a later character of style in all the variety of the work in gold, jewels, amber, rock crystal, and ivory; not in the material alone, but in a greater or lesser proportion of taste and skill in the working.

These remarkable sepulchres offer the most attractive task of investigation, and they derive a much higher and more general importance from the place of their discovery, and the definite tradition of the Greek hero tales, which brings the tragic end of Agamemnon into the closest contact with them. All unite in pointing out to us that far-distant period, for the understanding of which the discoveries of science have hitherto afforded but limited and imperfect facilities.

In some measure the reserve of our learned circle is owing to this deficiency in the power of examining and comparing, but now we may shortly hope for the best results. The quick succession of the discoveries seemed only to increase the momentary want of judgment, and in a measure to stifle the sympathy for the newly-discovered treasures; so that, instead of having a unanimous, though severe, examination of the views of the discoverer, we only nourished indications of vague thoughts, rude refutations, and even suspicions of the age and genuineness of the discovery.

It is no wonder that a portion of our press was divided in the treatment of the question in this direction, and vied with each other in their contempt for this undertaking, which, in its energetic carrying out and in the importance of its result, far surpasses all former private attempts, and takes its place worthily by the side of those greater explorations undertaken at the expense of Government. The sensational gossip even busied itself with Schliemann's private affairs, and took no account of the large sums which this remarkable man sacrificed to the furtherance of science.

In short, we again witnessed that deluded zeal in full activity which with us is so frequently roused to crush as quickly as possible a countryman's exertions, which everywhere else would be zealously upheld for the honour of the nation.

At all events, this perverseness could not be spared the just shame of knowing that all foreign countries united in according the fullest credit to Schliemann, and also that Germanic scientific societies and learned men had hastened to express their esteem and appreciation. A general revolution in these views is the more surely to be expected, because the examination of the entire results of his undertaking is under discussion, and this examination will now afford a more certain foundation for the truth of his discoveries.

Whether Schliemann's explanation be essentially confirmed or not, and however the decision may agree with his wishes, yet so much the more comprehensive and extensive will be the gain which this inquiry will derive from these wonderful discoveries. Contradiction and opposite opinions in examinations of this kind are, by their very difficulty of refutation, welcome as a means of promoting the clearest comprehension, as long as they endeavour by scientific aid to arrive at an unprejudiced conclusion. But even expressions which do not fulfil these intentions offer frequently an instructive side, for they point out the false direction to which a thorough opposition to assertions and inquiry as to their value and importance may be led by the delusions of self-conceit and temper. This is confirmed in a striking manner by the latest notice about Schliemann on the part of Mr. A. S. Murray, in No. 203, December 15th, of the London paper the *Academy*, &c.

The only motive which induces us to devote any remarks to this critique is simply the fact of the author's position at the British Museum, which, as we already gather from the opinions of the press, gives a certain weight to his assertions and objections; as also our wish to put aside all confusing ideas in the anticipated investigation of the proposed question.

As such it must be considered if Mr. Murray asserts the graves in question to be of Germanic and not Hellenic origin, and finds in the famous sepulchral fields of Hallstadt the proof for this daring assertion. It is time for Germanic investigators to enter the lists against such a grave misconception.

Even if we admit from the foregoing question the sense in which these Alpine sepulchral fields are considered, yet it would be in vain to endeavour to prove a distinct parallel between the mode of burial and contents of the graves of Mycenæ.

First of all, Mr. Murray finds in the irregular position of the dead, and the burial of many skeletons in the same grave, an analogy to Hallstadt, and an important agreement in the mode of burial, without recognising that these peculiarities do not in the most distant manner avail as a distinctive sign, either for Germanic graves in general or for the old Friedhof in Salzkammergut. For here, among nearly a thousand graves, the regular interment of the dead so preponderates that only the few exceptions copied in Plate II. of Von Sacken's work, and described in pages 8-9, show an unusual position. These singular instances can be far differently accounted for than the position of the bodies in the 30 ft. deep graves in the rocky ground of Mycenæ. Just as little can the mixture of burial with partial cremation of the bodies be attributed entirely to Germanic custom; and, as Mr. Murray expresses himself, "according to the extensive annals of excavation among Greek tombs," is completely foreign to Hellenic usage, and especially, as the author in another place has occasion to point out, that these excavations have been made chiefly on sites long and well known to ancient history, and that results obtained from such sources cannot be expected to prepare us for everything that may be found in outlying places which did not share in the progress of the great cities.

We meet with the same poverty and deficiency of information in his reasoning on the resemblance of some discoveries at Mycenæ and Hallstadt, and in the conclusion he draws in favour of the difference in the style, and therefore later period of the Mycenæ excavations.

While Mr. Murray refers to two oft-repeated ornaments in gold-work, and two in bronze at Hallstadt, and lays great stress on their belonging to Classical ornamentation, he shows only his ignorance of the fact that many ornamental designs are not a necessary condition of the period, whether or not they have been adopted in the range of Classical ornamentation.

In this respect, besides the before-mentioned spiral and "meander" patterns, other ornament designs have remained in use from the most ancient down to a much more recent period, if not in art itself, yet in the tradesmen's and artisans' departments. The triangle and the square with its prolonged, flowing, and rolled-up angles, which are repeated much more frequently than the patterns Mr. Murray notices on the monuments of Mycenæ, go back, as is well known, to a very early age, and although excluded as an actually Classical ornamentation, appear on very old pottery and metal-work, like those of the Roman period, and have become remarkably conspicuous in the so-called vesica ornament of the Gothic.

It could never be imagined that we should be justified in placing a discovered relic into a later period, because of the use of this ornamentation. This relates chiefly to Mr. Murray's two elaborately-described designs, as well as to the lozenge of which the corners at the sides of the circle are rolled up; as also to those countless variations in the snake-like twinings of the ribbon pattern.

All these designs, although wanting in the classical ornamentation of Greece, are not specially Germanic or Northern. They appear in tombs on this side of the Alps, and further towards the north only on vessels, implements, and weapons, which, owing to the traffic of nations, were brought there from Italy, as an overflowing of the industrial produce of the South, and not from the more distant Greece. In both these countries, in the most ancient times, we meet with the same effect of foreign influence, a mixture of Egyptian and Assyrian style with the peculiar barbaric elements which at present cannot with certainty be specified as thoroughly native, and which show themselves more distinctly in Italy, because there, in the production of artisan industry, they retained longer a certain independence beyond the time in which the development of classical art in Hellas exerted its influence over the country.

A careful study of the Hallstadt cemetery, as well as of the Etruscan, antiquities to which this surely leads, gave occasion for the per-

verted notion of the nationality of the tombs of Mycenæ, and should impart, by reason of a number of facts, the most instructive significance for the examination of the affairs in Greece, and their peculiarities in the most ancient times.

We are not justified in considering the human and animal figures in the primitive style and mode of representstion as merely ordinary copies of better originals; for, in all Italy, as well as in Hallstadt, we find the pottery and metal-work executed as if by a child's hand, and in immediate proximity are evidences of a perfectly finished archaic style, which not only shows an acquaintance with Greek work, but also derives its origin from the same foreign sources as Greece.

The contrast in the tombs of Mycenæ which these crude animal-forms present in the conception and execution of the silver cow's-head has as little significance for the date of the numerous sepulchral discoveries as the incongruity of the doll-like human and animal figures in the large tomb at Cære has to those more artistic representations found in the animated drawing of the horsemen on the painted vases.

There is not the remotest reason for not recognising such work,—so superior in comparison with the other contents of these excavated tombs,—as a far-reaching indication of advanced culture, especially when, as in the vases of Cære, we have the most unmistakable evidence thereof.

But apart from the mixture of such manifestly incongruous elements, it appears further that, in order to criticise the similar appearances of such primitive times, the consideration of two possibilities is desirable to prevent our defining too rashly the signs that mark the date of the different styles of art. In the first place, we would mention the occasional more rapid development of any favourite branch of art under foreign influence; and secondly, that the diversity of the talents and training of artists and artificers would be more prominent at the time of the gradual development of a certain style than in the period of its complete command over all branches of art, which would be inconceivable without an equal training and education of all its members.

Should this wonderful silver cow's-head, with its great golden horns, afford us grounds for the proof of the later date of the Mycenæ tombs, it is a question how, and in what manner, it is brought into relation with the supposed Germanic mode of burial. From the reviewer we learn nothing further; and although he expresses himself decidedly against any mythological meaning of the work, yet, excepting a few ironical remarks about Schliemann's explanation, he tells us nothing beyond the assertion that here we have, not the head of a cow, but that of a bull.

Then of the golden death's-head mask, which, as well as the Germanic hypothesis, marks the adoption of a comparatively later date, he vouchsafes no further explanation. Also in support of a contemptible criticism on the sepulchral inscriptions of Mycenæ he attempts a comparison with the northern masons, which could scarcely be more unfortunate.

In those reliefs at Mycenæ one perceives quite marked exceptions in the skill in working patterns on flat surfaces to all other discovered relics, and there appears to be no better comparison for the style of these tombstones than the sculptured stones of Scotland; these, after long enjoying the reputation of incalculable antiquity, are now more properly assigned to a period between the tenth and thirteenth centuries, where local masons were set to reproduce designs from illustrated manuscripts borrowed from the monasteries.

It is simply incomprehensible in what way this comparison can help us to the understanding of those sculptures; even if one could place any confidence in the latter date, or in the paltry worth of both kinds of sculpture, or even on their value as copies of foreign designs, yet from the entire diversity of both objects of comparison no valid weight could be accorded them. The frivolity of such an assertion is so marked that it does not deserve a more detailed notice.

What chiefly concerns the want of originality in those sculptured stones in Scotland is the assertion that their design was entirely indebted to cloister manuscripts, and necessitates the acceptation that this peculiar ornamentation was originally invented only and solely for the decoration of books, while everywhere else, and in all ages only, a well-known flowing taste in design was employed for such purposes. This was also the case in the British Islands, and though it cannot be denied that this style of ornamentation is found on very ancient articles, and only consisted of outwardly-finished metal-ware, yet it may safely be concluded that it had a home in the whole of central Europe, and found universal application on objects of perishable material, such as wood, and appeared simultaneously, and in equal proportion, in all countries where their intercourse with the Romans had produced a more extended cultivation.

Of this every one may convince himself by the study of the treasures of the Anglo-Saxon graves, which agree with the great mass of sepulchral discoveries in the countries of the other Germanic races. Of these similarly ornamented vessels, the majority reach far beyond the time in which monks pointed their pens, and with the aid of compass and rule endeavoured to control, in some measure, the wild elements of the national ornamentation, and to change the snake-like, coiling ribbon-work, with its zoomorphic forms of birds and dragon-like figures, into a defined system of rhythmical, measured, caligraphic, volute work, and to render it useful and suitable for their purposes. If, however, it is understood that we are to consider the designs of these manuscripts as the only and last memorials of that more ancient style,—the offshoot, so to say, of the same,—it must at once be concluded that, in contrast to all other countries, the so-called taste in ornamention of the English people had already, in the tenth century, become so uncultivated and forgotten that, for the decoration of their tombstones, they sought the designs of their old books. Nevertheless, our present time is peculiarly one of strange predilection for general antiquities, and for erecting and adorning monuments in the taste of former times, or in the unsuitable style of national tradition.

The assumption is strong, however, that if those Scottish stones existed chiefly between the tenth and thirteenth centuries, either the old design was always preferred by the people, or that the erection of those stones was deemed a restoration of the forms of the older monuments of wood, which from some peculiar motive they were anxious to preserve in a more durable material.

But even supposing the assertion in question to prove correct in this single instance, where is the connexion with the sculptures of Mycenæ? To render a comparison in some degree admissible, we must first point out that in Greece an ancient, national art-direction attained a much higher development, unbiassed by, and independent of, every foreign influence, and that the monuments of this period were reproduced in rough copies.

However, enough has been said about this vain attempt to bring the discoveries at Mycenæ into relation with the antiquities of the north. If such relations really appear in a few instances they are found in far other forms, and are to be explained in a totally different way than with suppositions and comparisons which betoken a scientific point of view, and almost justify the looking down in a condescending manner on Schliemann as an *Autodidakten*.

Not in remote distance, but in the neighbouring countries, and upon the islands of the sea which washes the shores of Argos, are to be found analogous facts which explain the discoveries at Mycenæ; and just for this reason we concluded we might look for enlightening communications from the British Museum, as in that place is collected the greatest mass for the means of comparison, especially as regards the antiquities of the ancient *Borderasiatische* and Mediterranean people. We were the more justified in this hope, as we owe to Mr. Newton's extensive knowledge the conclusive information that the gems and vases from Mycenæ are identical in pattern with the like articles from Rhodes and Cyprus.

Thus, once for all, the apparent isolation of the Mycenæ treasures is removed, and they take their distinct rank with other discoveries. Their explanation is referred to those regions where the oldest traditions especially set forth the dominion of those seafaring, commercial, and artistic races which, from Syria to Asia Minor, planted the islands and coasts of Europe with colonies. That we must recognise in the early and local-prevailing names of these races those of *Karer*, *Kureten*, *Seleger*, and, above all, the Pelasgian, the Phœnicians of Herodotus, is an idea which for years in the war of genius and sagacity with book-learnedness it has been sought to prove, especially by Ludwig Ross, Raoul Rochette, and Julius Braun, which latter, on account of a few extravagances in his spirited and theological views, is so unreservedly accused of heresy.

If through the imperfection of the evidence of the monuments themselves it still remains undecided whether the elements of this active people on the Mediterranean shores, and the character of their style of art, are to be regarded as belonging to Asia Minor, or properly speaking to Phœnicia, the explanations which these investigators have arranged in such a stirring and convincing manner offer an enlightened view into the distant times when the transplanting of the most ancient culture into the semi-barbaric condition of the European people, and the first springing up of these plants from their newly-struck roots, occurred.

It is only while pursuing this same view with the object of attaining a wider and deeper insight in this direction, and within the same ground, that we can hope to arrive at a solution of all that is obscure in the discoveries at Mycenæ; and in this we should have been much facilitated if Cesnola's remarkable discoveries in Cyprus had not been given to America by art-investigating Europe.

With these we have lost the means of comparison of historical culture, which, in consequence of the importance of the excavations and of the possibility of ascertaining the probability of the date, and also in relation to the position of the Mycenæ treasures is not easily supplied. But even for these, there is assured the prospect of valuable information as a matter of honour to our learned investigators, and as the result of the discovery of further important monuments by the continued excavations of their unwearied discoverer.

'Science will follow Schliemann,' is said in the preface to a new Guide to Olympia. We only add, in the fullest acquiescence,—She follows him where she was unable to lead, and therein lies, in a few words, the great importance of Schliemann's efforts.

ART IN SHEFFIELD.

At the last annual meeting of the friends of the Sheffield School of Art, Mr. Charles Barry, F.S.A., delivered an address, and presented the prizes to the successful students.

Having referred to the small commencement of the school, Mr. Barry said:—Should he be considered to take a too Utopian forecast if he dared to look forward to a time when excellence and refinement, artistically, in the products of manufactures should be at least equal to the importance of those manufactures in a commercial and a national point of view,—when the workman should continue to take that interest in the goodness and honesty of his work which had been the foundation of the commercial greatness of the country, and which he fervently hoped was not diminishing, as some people feared,—when it should be as impossible to produce ugly work as badly-made work,—when every workman, if not actually an artist himself, should have had sufficient education to be able to appreciate artistic beauty, and therefore able and happy to work out with intelligence and sympathy the designs of those who have been vouchsafed that heaven-born faculty which enabled the artist to embody his imaginings in concrete forms? Why should they be amongst those who seemed to think that art in workmanship, in metal for instance, was dead?—that they were to look for it alone in centuries long past? Why should not Sheffield hope in this nineteenth and the coming centuries for a Quintin Matsys, its cunning worker in iron? or a Benvenuto Cellini, its goldsmith? He would remind them, too, that they ought not to do only what men in the past had done in that way; they should excel their ancestors. In the days to which he had alluded opportunities of travelling were few; power of reference to what had already been done was almost wanting to the art-workman; encouragement to his early attempts could only be given by a wealthy few, and not until his genius had asserted itself in spite of all these hindrances could he become known to his own age or to us in the way he deserved as a true art workman. Now, all this was different. Our workmen were educated. They were able to study in books the works of the past at one glance. A spirit was

happily abroad, and had for years been gaining force, that demanded art excellence, and that (by the schools of art) afforded opportunities for study and emulation, and, finally, of appreciation, that ought to provide the strongest and fullest incentive to effort that any one could require. Surely the remembrance of that fact would stir them to increased exertion, and with increased exertion there would come increased success. He asked them to let the names of the artists who had gone from Sheffield act as an incentive to the labouring student, and let the number of cherished names be increased and the individual genius largely added to. He hoped, however, that they would not misunderstand him. He did not take so visionary a prospect as to suppose that all students would achieve high distinction. In art, as in all other paths of daily life, having done their best, they would have to be content with the results. If all might not rise to the summit, all might feel they had some share in the foundation and stability of the edifice, and all might feel that real satisfaction which ever resulted from an effort to do their best, and an honest and contented endeavour to add to the general good and the general knowledge. It had been to some extent a national fashion,—might he say a national failing?—among Englishmen to look to other nations for those productions of high art which only were to be considered models for imitation, and to think over their excellence with almost a despair of their being equalled, still less surpassed. He need not remind them that England, too, had names which well might be worthy to be inscribed with the masters of ancient art. Need they forget the names among painters of Hogarth, Gainsborough, Reynolds, Wilkie, Turner, Landseer, and Maclise? Amongst sculptors, need they be ashamed of Nollekens, Flaxman, Chantrey, Baily, or Foley? And amongst architects, might we not point with pardonable pride to Inigo Jones, Sir Christopher Wren, Sir William Chambers, and, might he not add, Sir Charles Barry? And there were men still living whose names, he doubted not, would be honoured by future generations. But as he had said, all might not hope to achieve such great renown as these; but in the application of the art to all the daily surroundings in life in common things, could they not see that it was by accustoming the eye from childhood to beauty of form, harmony of colour, and refinement of composition, a new and pure source of pleasure would be opened? Life would become more enjoyable, coarseness of feeling would gradually disappear, and that divine fire which inspires the truly high artists should find the food it needed to nourish its early growth and help its longings, until from the humble and unknown art-student issued that mighty master whose works in painting, sculpture, or architecture should remain as a "joy for ever." As all superstructures must have a basis, so schools of art, like the one at Sheffield, offered a very solid basis for the superstructure he had attempted to shadow forth. Five-and-thirty years ago schools of art were unknown. The first efforts of their founders were looked upon even with dislike or at least with a compassionate tenderness, and with incredulity as to their having much national effect. Were not a very different feeling abroad now he should remember with regret how it was said that manufacturers in our great towns actually opposed such schools, fearing that they would interfere with their own uninstructed or half-instructed designers. Those ideas were fast being dissipated, and now they saw in all directions a sympathy for the effort once almost ridiculed; substantial progress made with schools of art, and substantial aid to them had happily come to be considered not unworthy of the attention of the State. That was shown by the aid now given to several hundreds of schools like that at a cost which year by year was ungrudgingly increased by Parliament. He cordially hoped and believed that that sympathy and aid would still increase; but it could only be expected to do so if earnest, persistent effort were continuously made in the schools. Unless they were able to show and maintain a strength almost enabling them to stand alone, they would not receive that final addition to their strength from State aid which would make their position sure. The question he had to ask them, and they had to ask themselves, was, "Were they doing all they could in that way in Sheffield?" With a population of nearly a quarter of a million, there must be very many thousands of working men engaged in those manufactures which were identified with the town, and into which a knowledge and appreciation of art and beauty should enter. Did the attendance there reach in numbers what it should do? Surely they would say, emphatically, "No." And even the progress that had been made in thirty-one years, from 180 students in 1846 to 394 students in 1877, was not enough to induce them to rest from their efforts. He regretted to observe a slight diminution in the total number of students since this time last year. It might be said that the depressed state of trade accounted for it. Perhaps it might; but surely it did not justify it, if they admitted, as they thought they must, that the number of art students here had never been so high as it ought to have been, in proportion to the number of workmen of Sheffield who ought to be art-workmen. When at Glasgow the other day he found there 1,300 art students in the school, from a population of 600,000. To be in like proportion, the Sheffield school should have its 600 students at least. All observers must thankfully acknowledge that marked progress had been made during the last few years in technical art and the art feeling of the British workman. While one was pleased to recognise that (in metal, for instance) many beautiful works had been produced, and were being produced, in Sheffield and elsewhere, they could not but admit they were still the exception among many ugly ones. That was the more provoking, inasmuch as they had also to acknowledge that in cost of manufacture there was little or no difference between the beautiful and the ugly. Let not, therefore, their efforts slacken; but while there were fresh fields of art knowledge to explore,—while many among them still scarcely knew what art meant, and still less the intense pleasure its successful study and results gave, not alone to the student or workman, but to the community at large, — let fresh and ever fresh exertions be made by those who had attained to that knowledge and those pleasures, to extend them to those who as yet had them not. In conclusion, Mr. Barry said that, looking that morning at the works produced by students during the past year, he could not help noticing how very few there were of studies of the living human form, and he learnt with surprise and regret that only some five or six students had attended that class. Now, he must consider that there was some mistake here. It could hardly be necessary for him to say that the study of the human form was not only the highest effort of art, but by far the most useful. A thorough knowledge of it would do more than anything to keep alive and vigorous the other branches of drawing and modelling. This may surely be seen from the effects produced abroad. In France, the life class was far more numerous than any other, and they saw the effect in the broad, decisive, and graceful way in which the French handled ornamentation of all sorts. There was a real vigorous life about their works which they failed to find among Englishmen, but in place of it were too often feebleness of conception, weakness of composition, and timidity of execution. He hoped that Sheffield manufacturers would do all in their power to increase the inducements to students to attend this class, by introducing well-composed sculpture into their manufactured works, which, indeed, they must do in their own interests, unless they are content ever to be behind the Frenchmen. While he rejoiced, and they all rejoiced, in the success of those to whom prizes had been awarded, let him enter a protest against the frequent belief that the number of prizes is the test of good, useful art-school work. The rage in this day for competitive examination was, he ventured to think, unwise; the real glory of a school like this was to turn out all its students with a knowledge of art, and with a love of art for its own sake. That could only be attained by steady, conscientious work, with no striving for a mastery over others, but with a fixed determination to gain a mastery over the difficulties, sometimes the discouragements, attendant on the work itself.

Mr. M. E. Hadfield, president of the school, Mr. Bragge, and the Mayor of Sheffield (Alderman Mappin) also spoke.

The Obelisk Model.—On Saturday and Monday workmen were engaged in taking down the model of Cleopatra's needle which had been erected at the Adelphi Stairs, preparatory to proceeding with the necessary work of concreting the foundation.

FIFTY-SECOND EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

IT is gratifying to observe here that artists are gaining a clearer apprehension of the true principles of their art,—that it is emotion rendered materially visible, and that its foundations rest upon the experience of daily life. The artist must be possessed of certain principles, and be guided by them, and although these may not appear in regular proportions, they must be governed by a correct judgment. So far, there is reason for congratulation,—the faculty of rendering correctly, in a visible form, the inward emotions, has been greatly advanced; but, on the other hand, although this visible language of emotion be grammatically correct, and not devoid of elegance of expression, it may not embody ideas worth rendering,—the body may be there, but the spirit absent; and it is in this respect that we think the majority of the works exhibited are defective. We look for fancy, and we find facts; for imagination, and there is the commonplace. The creative faculty seems wanting; the facts are there, but they are not poetically rendered,—the work is good mechanically rather than æsthetically.

As usual, the display is enhanced by a number of works which have been formerly exhibited in Burlington House. Amongst these we note T. Faed's "In Time of War"; the "Sword and Dagger Fight" of J. Pettie, and his "Disbanded" Highland soldier; F. W. Lawson's "Imprisoned Spring"; K. Halswelle's large picture of youthful British captives in Rome, of whom Pope Gregory said, "Non Angli sed Angeli," and a view of "Rome from the Sistina"; a "Scene from the Antiquary," by W. F. Douglas, — the most successful of his later efforts; a fine rural subject by G. H. Boughton, entitled "October," and a figure full of spirit and humour by J. W. Nichol, illustrating the line,—

"When a man's single he lives at his ease."

Of the works by Scottish painters, that which engages most attention is the production of W. E. Lockhart, Academician elect. The subject represented is that where the Archbishop of Granada dismisses Gil Blas from his service for criticising with "frankness and sincerity" a homily of the right reverend prelate, a lesson to be taken to heart by all critics addicted to "castigating the works of those older and abler than themselves." The dramatic action of the situation has been grasped with perspicacity. The pose of the archbishop is admirable; the head is especially good, and so is the arrange- of the scarlet robe. The twinkle in the eye of Gil Blas, and his action as he descends the steps — directly towards the spectator — are happily rendered. The manipulation is strong and vigorous, and the colour more equable than in former works of the artist. The same qualities appear in another of Mr. Lockhart's pictures,—a scene from the "Bride of Lammermoor"; but in it the faces of Lady Ashton and her daughter appear besmeared as well as woebegone. A few touches would remedy this defect, which has an unpleasing effect in an otherwise admirable work.

Sir Noel Paton comes to the front with one of his flights of fancy, "The Spirit of Twilight." A poet, clad in a crimson mantle, courts the Muse at even, on a rocky promontory, overlooking a calm lake encircled by purple hills. With arms outstretched he is ready to clasp the spirit, who, clad in gossamer, with dragon-fly wings and long, floating, rippling yellow hair, gently, and with a look of etherial sympathy, places her arms around his neck. It is "very much fine," especially the wings and the robe of the spirit, and so are the hyacinthine locks of the most exquisite poet. Like Maraschino, this is only to be partaken of at rare intervals and in small quantities.

From this ultra refinement we turn to "The Fisher's Landing," by W. McTaggart, where —

"The air and the water dance, glitter, and play";

and in it we find strength, with much less, almost none, of that patchy coarseness which used to mar the work of this artist. Here we have the maximum of light with the minimum of shade. The sunshine over the great expanse of water is really dazzling. It is not the warm light of summer, but one of those exceptional days in spring or autumn with which we are rarely favoured.

On a large canvas Corot has given the spirit rather than the reality of an "Italian pastoral,"

—a vista of tall trees, a lake with hills beyond, on the brow of one of which is a group of classical buildings. From Alma Tadema we have an Egyptian interior,—"The widow," who mourns over the mummy-case of the departed, whilst hired musicians perform a dirge upon strange instruments. There is great archæological knowledge shown in the architectural and other details, and it is these that engage the attention of the spectator, and not the sorrow, which makes all, of whatever land or time, akin. From the style of the work we suppose it to be an early production of the artist.

W. B. Hole is prolific this year. His best work, although not the largest, is, we think, that entitled, "The Last of the Bin," where two elderly gentlemen of the Georgian period are partaking with relish and discussing with gusto the rare qualities of the precious liquor in their brimming glasses.

We have never seen George Hay in better form than in the subject from the "Legend of Montrose," where he represents Sir Dugald Dalgetty and his fellow-captive encountering the Puritan divine in the chapel of Inveraray Castle as they are making their escape from durance. The obsequious manner in which the doughty soldier of fortune flatters the vanity of the preacher is happily hit off, and the ecclesiastical detail shows competent architectural knowledge. W. D. M'Kay is making sure and steady progress. "Field-working in Spring at the Potato-pits," and "An October Morning," are past rals rendered without exaggeration, and apprehended in the right spirit. It is genuine work, the foundation upon which a substantial superstructure may be raised.

Looking at the portraits, it is with pleasure we notice that the hand of the veteran Barclay has not lost its cunning; he has limned the present Duke of Athole with as much vigour and character as he did the last duke. Very charming, too, is the portrait in black velvet of Master Jamieson, by G. P. Chalmers, the versatility of whose genius is displayed in an effect of a downpour of rain over a moor, with a brook in the foreground, upon which the raindrops patter. There is a line of spectral telegraph-posts seen through the obscuring medium, and still more spectral appears a figure beyond, battling with the storm. Such work cannot be "painted on the spot," it must be studied, stored up, and produced at leisure when the recollection of the incident is vivid.

J. Faed shows unusual vigour in the figure of the ferocious-looking freebooter who, standing between two guards with scowling brow and clenched muscular hands, is asked to plead "Guilty or not guilty." But in delineating the two attendants and the details of costume the artist has reverted to his accustomed smoothness. It almost appears as if the central figure had been gone over by some one with a more muscular touch.

J. McWhirter delights in extending his experiences over different parts of the globe, and latterly he has been in America, and gives us his impression of a "Thunderstorm on the Prairie," which is very wonderful; but somehow it has a look of unreality, as if the artist had not laid hold of the true effect.

We have only room to notice the life-size figure in marble of Livingstone as he was, by Mr. Brodie; the Academic "Lady Godiva" of D. W. Stevenson; and, in contrast thereto, "La Sonnambula," of Randolph Rogers.

BIRMINGHAM NEW MUNICIPAL BUILDINGS.

These buildings were commenced in the spring of 1874, and the foundation-stone was laid on the 17th day of June, in that year, by Mr. Joseph Chamberlain, the then mayor, now M.P. The external stonework is now nearly completed. The dome has been erected, and the roofs are tiled.

The principal front (to Ann-street) has a length of 296 ft. The frontage to Congreve-street is 122 ft., and that to Eden-place 153 ft. The height from the ground to the top of the main cornice averages 65 ft.; the pediment over the central entrance rises to a height of 90 ft.; the stone cornice of the dome is 114 ft.; and the top of the finial, 162 ft. high.

The plinths are of Spinkwell stone, the walling is partly of Wrexham and partly of Coxbench stone; the cornices and most exposed portions are of Darley Dale stone. The dome (above the top of the stone staircase) is covered entirely with lead, and the terminal is of copper, gilded, the gilding being continued down the ribs on the roof of the lantern.

One reason for the adoption of a decidedly Classical character in the design was the desire that the new buildings, while being architecturally in advance of the other public buildings of the town, should yet so far accord with the adjacent Town-hall as to produce in combination a harmonious effect.

A columnar style being adopted, the fenestration has been kept subordinate to it. In the lower half of the elevation the piers are carried through the two lower stories, and emphasised with rustic channels, and have capitals and bases. In the upper part the columns and pilasters are likewise carried through two stories of windows, and the mistake of making window-dressings and columns about equally prominent in the design, which confuses and injures many examples of revived Italian, has been avoided. The capitals throughout are varied in design, and the main frieze is carved through the entire extent of the two principal fronts. The pediments are filled with groups of sculptured figures representing Manufactures, Commerce, Literature, Arts and Sciences, and to the central one Britannia rewarding the Birmingham Manufactures; and a figure-subject in mosaic is being prepared by Messrs. Salviati & Co. for the tympanum of the semicircular arch over the central entrance.

The building contains ninety-four rooms, of very various sizes, for the different departments of Corporation work or ceremony. There are four entrances for the public besides the central entrance, which is for the use of the council and for State occasions.

The basement, or "lower ground floor" as it is termed (the floor being above the level of the lowest part of the street pavement and of the courtyards), is devoted to various offices for the gas department, health department, weights and measures, &c.

The ground floor, as shown on the plan we publish, contains a central entrance-hall approached by a wide flight of steps under the portico, and with an inner flight leading up to the ground-floor level. Opposite this and under the dome is the main staircase, 33 ft. square, having marble columns to support the landing above, and a wide central flight of steps with marble handrails and balusters.

The principal corridor, 9 ft. wide, leads right and left through the building, and meets east and west corridors at right angles to it. Those on ground and first floors are arched over, and the floors laid with encaustic tiles.

Accommodation is provided for the gas department over the corresponding rooms below; also for the borough surveyor and town clerk, and there are three large committee-rooms; all the rooms on this floor being 15 ft. 6 in. high.

On the first floor in the eastern portion are rooms and offices for the borough treasurer, and in the central part are the reception-rooms, approached from the main staircase and corridor by massive doors of oak and mahogany, with oak dressings.

The reception-rooms occupy the height of two stories of the smaller rooms, and therefore have two ranges of windows; the upper and lesser range being above the internal cornice, and lighting the rooms through grained openings in the elliptical ceilings.

The west and east reception-rooms are each 64 ft. by 30 ft. The central one, divided from the western only by an open screen of marble columns, is 30 ft. square. These rooms have pilasters of Devonshire marble on all sides, and between them, on the side opposite the windows, are niches for statuary. An oak dado runs all round the rooms, and above the pilasters is an enriched plaster frieze and cornice. The ceilings are elliptical in section, with raised enriched bands and moulded panels in plaster. The extreme height is 30 ft.

In the western portion of the principal floor are the rooms for the accommodation of the town council, consisting of two ante-rooms, a large retiring-room, cloak-room, lavatory, &c.; and the council-chamber with a gallery for spectators, the access to which is by a staircase from the gateway entrance to the courtyards. On the south side of the council-chamber is a wide recess, in front of which are the seats for the mayor, town clerk, &c.; and behind them is a low gallery for the use of reporters, with a separate entrance from the reporters' room in the rear. The width of the council-chamber is 59 ft. The councillors' seats are arranged in a semicircular form, and behind them is a semicircular screen of coupled marble columns and pilasters with carved stone capitals dividing the council-chamber from the spectators' gallery, and giving to the former the form of a horseshoe on plan. Above the cornice over these columns is a range of clearstory windows lighting the chamber through a groined cove. The central portion of the ceiling is flat, panelled, and enriched in plaster, and about 32 ft. in height from the floor.

The four subordinate staircases go through from the basement to the upper floors, but the central stairs reach only from the ground floor to the first, or principal, floor.

Above the landing, pendentive arches are sprung across the angle of the staircase, and the square of the plan is brought to a circle, and above these is a hemispherical domed ceiling.

The large space in the drum and cupola of the dome above this inner vault is made use of for ventilation, and forms a chamber into which the vitiated air is conducted by flues from the principal rooms to escape through louvres in circular openings round the dome and through a shaft inside the turret.

The second floor of the building extends over the borough treasurer's department on the first floor, and over the smaller rooms in the western part of the building.

The third or upper floor extends over nearly the whole of the building, except the council-chamber, and contains at the north-east rooms for the borough analyst, and at the west end kitchens, &c.

In the centre are large rooms over the reception-rooms, one for use as a drawing-office and plan-room, the other as a muniment-room. The floors of these are carried on large iron girders, having arching of hollow bricks between them, over the whole of the reception-rooms, to lessen the spread of fire.

The tower indicated on the left side of the perspective view is not yet erected, as it belongs to the unexecuted portion of the complete designs for the frontages to the four streets, as shown on the ground-floor plan.

The northern half of the land was reserved with the intention, as stated in our number for February 21st, 1874, "that Assize Courts should be erected adjoining the Municipal Buildings as soon as Birmingham is made an assize town."

The original contract for the building was 81,120*l.*, but extensions have been made on the east side to accommodate the gas and water departments, in consequence of the Corporation having, under the enterprising leadership of Mr. Joseph Chamberlain, bought up the shares of the gas and water companies; and on the west side the accommodation for the Council has been increased and improved since the signing of the contract, so that when the fittings have been added the cost will probably reach 120,000*l.*

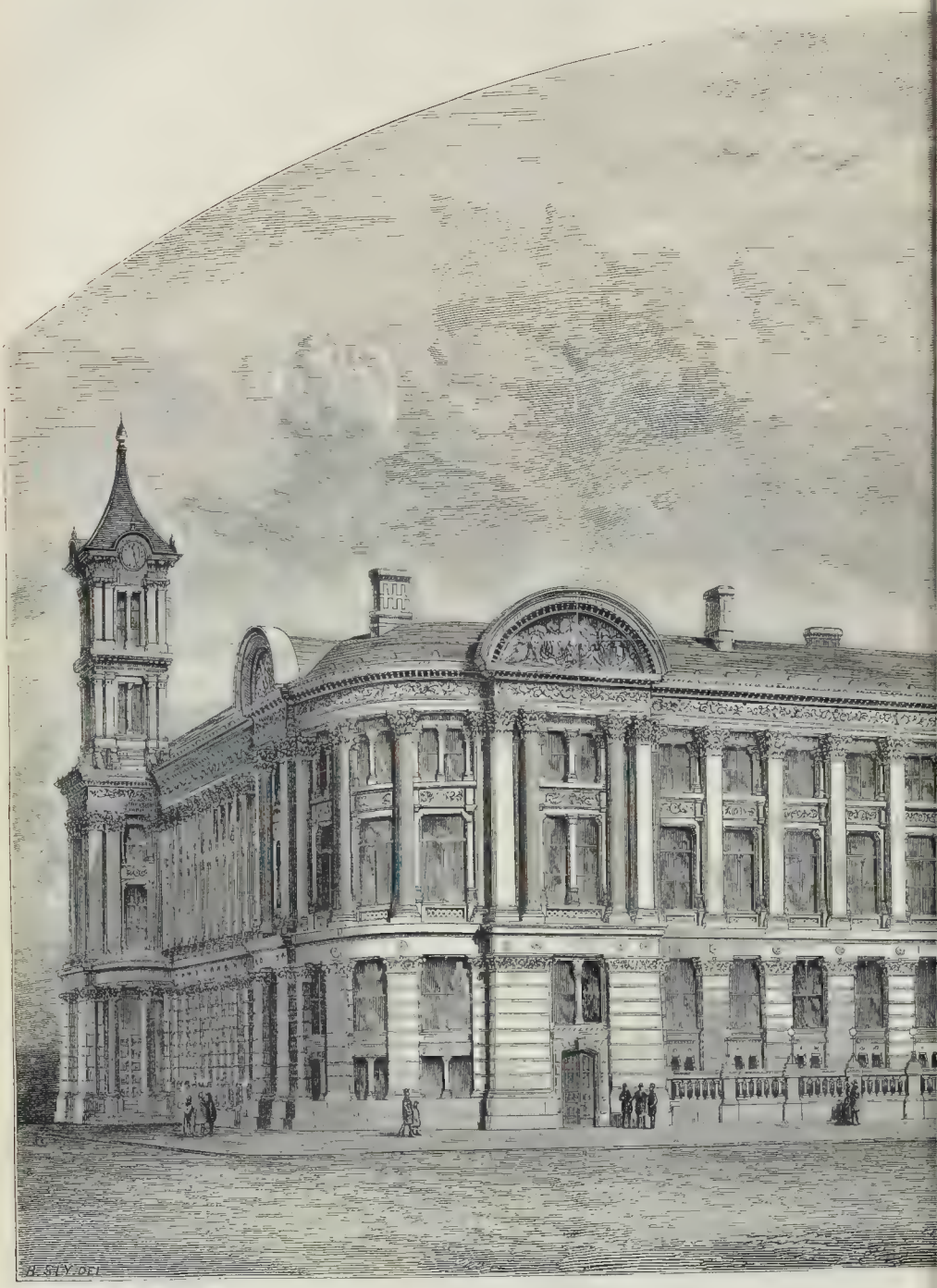
The contractors are Messrs. J. Barnsley & Sons, of Birmingham. The carving and sculpture are undertaken by Mr. R. L. Boulton, of Cheltenham. Mr. Josiah Allen has acted as clerk of works from the commencement.

The architect is Mr. Yeoville Thomason, of Birmingham.

At the last meeting of the Town Council, Alderman Osborne presented the report of the Estates and Buildings Committee. It stated that the contractors had undertaken to get the western wing finished in October; and they asked for power to purchase the requisite fittings. He moved, "That the Estates and Buildings Committee be authorised to provide the necessary fittings and furniture, and other requisites for the new Municipal Buildings." He hoped that the building would be ready for their reception in November, and that their next election of Mayor would take place there. He should estimate the cost of the provision proposed to be made by the resolution at 4,000*l.* or 5,000*l.* The proposition was carried *nem. con.*

A CORRECTION.

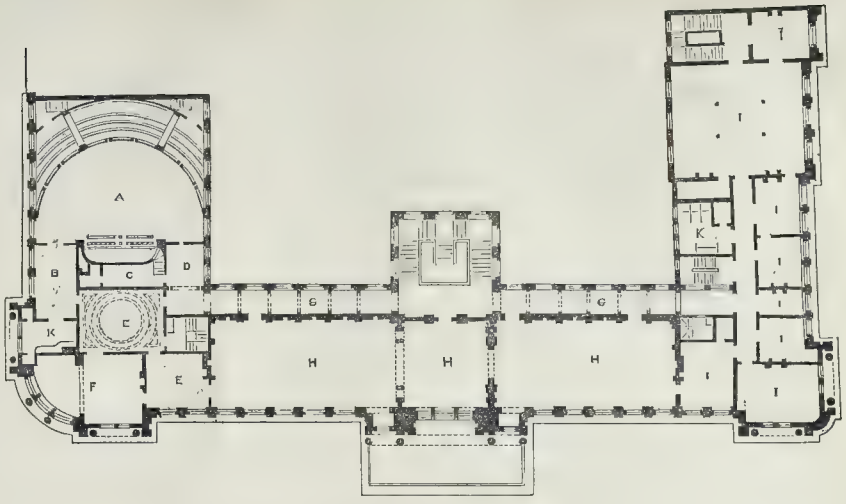
Sir,—In your report of the discussion on Mr. Brassey's paper on "Work and Wages in the Building Trades," at the Royal Institute of British Architects, my name is attached in full to a series of remarks which were made by Mr. Samuel Hill. Entertaining, as I do, very strong views *in fa our of* trade unions, wisely organised and administered, and editing a strictly independent paper, I am exceedingly anxious that the responsibility, whether for good or ill, should, in this particular instance, rest on the right shoulders. I am sure you will, with your own wonted independence, accord me the benefit of this correction in your columns. Alsager Hay Hill.



BIRMINGHAM NEW MUNICIPAL BU

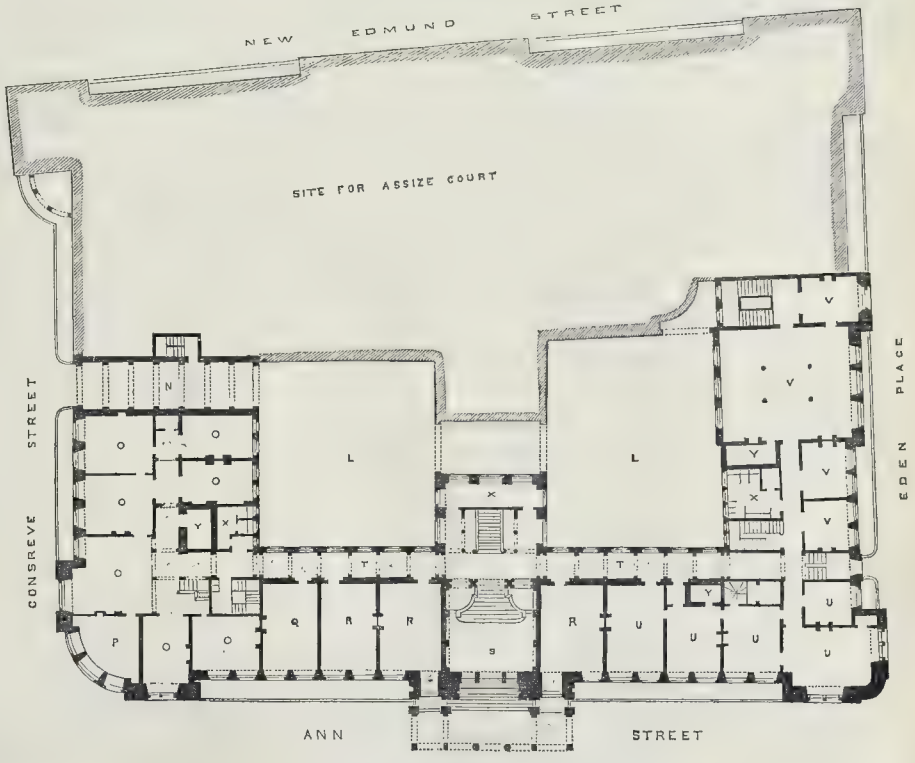


—Mr. Yeoville Thomason, Architect.



PRINCIPAL FLOOR





GROUND PLAN

Principal Floor.—A. Council Chamber. B. Cloak-room. C. Reporter's Room. D. Council Lobby. E. Ante-room. F. Retiring-room. G. Main Corridor. H. Reception-rooms. I. Borough Treasurer. K. Lavatories, &c.

Ground Floor.—L. Courtyard. N. Gateway. O. Town Clerk. P. Mayor's Offices. Q. Library R. Committee-rooms. S. Entrance-hall. T. Principal Corridor. U. Borough Surveyor. V. Gas Department. X. Lavatories, &c. Y. Strong Rooms.

BIRMINGHAM NEW MUNICIPAL BUILDINGS.—*Plans.*

THE TRUE FUNCTIONS OF TRADE UNIONS.

SIR,—It cannot fail to be a source of regret to every one who wishes the British workman well, that there should be amongst workmen an alarming want of information on topics of vital importance to them. Even in London, where educational institutions abound, there is, unhappily, great need of additional educational enterprise. The wedge of education has yet to be driven home, and the trunk of ignorance riven asunder; how to accomplish this in the best and simplest way is therefore deserving of serious consideration.

An uneducated workman may execute excellent work, so far as regards manual labour, but he does not bring to it the great power of mind, and thus he cannot rise above the man who, although his inferior in manual dexterity, surpasses him in quickness of perception, in powers of calculation, and in the application of the scientific methods of dealing with work to the best advantage; and from this it is evident that, for want of education, a good workman is likely always to remain a workman. If this be so, and if an educated man be a marked improvement upon an uneducated man, then it must be allowed that the introduction into the provinces of educational institutions for working-men cannot fail to be productive of great results. The problem is, how to place education of a practical nature within their reach, and make self-improvement a matter of easy and progressive stages, without making them dependent upon fussy philanthropists, for the British workman does not care to be patronised. The existing means of supplying this felt want are two in number,—night schools and schools of art,—but neither of them is exactly what is required. Many workmen attend night-schools during the winter months, and get a smattering of reading, writing, and arithmetic; and many attend schools of art and copy diagrams of that cut-and-dried type which reduces everything to a mechanical process; still, it is incontrovertible that the vast majority of workmen keep aloof from these places. What is really required is a system of education adapted to the wants of workmen, and it should be under the management of the responsible officers of the workmen's unions, who ought to be thoroughly acquainted with the best ways of applying the various kinds of education essential to the promoting of the efficiency of their members. Education is, beyond doubt, necessary to the real improvement of the workman; without it, he cannot excel, nor can his ability be fully developed.

Workmen contribute regularly to the maintenance of their societies. These societies possess great wealth, and I feel I shall not be overstating the case when I say that they hold this wealth in trust for working men, and that it would be both just and wise for them to expend a large portion of it in providing sound, practical instruction for their subscribers. Let a reserve fund be established for the purpose of fighting any unavoidable battle; but let the fiat go forth, with no uncertain sound, that, for the future, it shall not be with them a question of an additional penny an hour, or a further diminution in the hours of labour, but a question of the intellectual development and progress of the British workman. Let those who ostensibly act for the best interests of working men bestir themselves in right good earnest, and make their power felt in the cause of education and enlightenment. A great responsibility is resting upon them, which they cannot shake off. They are appointed to legislate for working men, and to do their duty thoroughly, they must have the welfare of working men at heart. Trade unions must themselves take in hand this matter of education, and deal with it promptly and effectively. The British workman is more highly paid than the workman of the Continent, and if Britain is not to be thrust out of the market, its workmen must, in addition to their manual skill, be well versed in all matters having a bearing upon their work. The trade-union leaders proclaim that they desire to improve the workman's position; but do they, in effect, make this the strong point of their policy, and endeavour to carry it out to a logical end? To labour for the improvement of the social position of the workman is very commendable; but to labour for his intellectual culture is much more commendable: and were the latter done, the former would ensue. The true functions of trade unions are to secure for the workman a fair remuneration for his labour, to protect him from unjust restrictions and exactions on the part of employers, to avoid imposing upon him any such restrictions and exactions themselves, to bring him into closer and more cordial relationship with his employer, and to educate him, and do all in their power to incite him to become, both in practice and theory, a master of his craft. Temperance, thrift, and improved dwellings will go a long way towards raising the workman; and trade unions, shorn of their objectionable features, and made to emit rays of light over all the land, may become national blessings. If, instead of defeating industry, they were to offer rewards for industry; and, instead of spending their funds in vexatious disputes, ruining trade, and sending work to the Continent, were to form themselves into a Council of Education, with a fair representation of employers, and devote their funds and their energies to the instruction of their members, granting certificates of ability to those distinguishing themselves in drawing, general knowledge, and excellence of workmanship, and appointing the most promising men to the most prominent posts, they would confer a lasting benefit upon society generally, as well as upon their members.

In every town in the United Kingdom an educational institution for workmen should be founded by the council, and a thorough course of instruction should be laid down, embracing everything having a direct tendency to extend their knowledge, and promote their welfare. What is really needed for the hitherto neglected workmen is not so much technical education as an ordinary, or a plain, sound education; for many men capable of executing work of the best description cannot understand an architect's drawing fully, or read the printing or figures on it. It would enable the mechanic who has qualified himself to fill the post of a foreman or clerk of works, so far as relates to practical ability and experience, to perform all the duties connected therewith in a highly creditable manner. It would also induce rivalry, which raises a man's latent faculties more effectually than aught else. Where there is no emulation they are not brought into action. The breath of life does not quicken them; they remain uncultivated and undeveloped; and their very existence is often unsuspected. This is one reason why workmen do not improve so rapidly as they might. There is nothing to break the listless course of their lives. There is nothing to fire their hearts, and rouse them to put forth all their energies. The object of having these institutions under the superintendence of the council is, because they would best know, and consequently be best able to meet, the requirements of workmen; thus only such instruction would be given as would produce a definite result; moreover, by being closely connected with the unions, it would be stamped as a genuine *trade* affair, and would, on that ground alone, be more acceptable to the great body of workmen.

The knowledge to be imparted should be divided into branches, so as to be adapted to the various grades of workmen. One branch should partake somewhat of the nature of a night-school, and be adapted for those efficient in their trades, but whose education has been sadly neglected. In years to come, when the results of School Boards shall have been manifested, there will be no occasion to continue it, inasmuch as it will then form the foundation of the mechanic; but it is requisite now, and there is no time like the present for the inauguration of a complete system of instruction for the British workman. A course of geometry and drawing should also be provided, although I am of opinion that, in this case, the plain education should predominate, inasmuch as no one, however skilled in other respects, can take any responsible position without its aid. A lad will obtain a clearer conception of practical matters by spending a few weeks in a workshop than by spending six months in a technical school; and this practical training of the workshop, under the improved system, would incite him to search closely into the meaning and nature of things connected with his work, and would thus, in itself, promote the study of geometry and the practice of drawing. It would be desirable to obtain masters conversant with the details of the trade followed by those they will have to instruct,—masters who will urge the necessity of observation and thought, not reducing their pupils to machines, but rendering them thoughtful, inquiring men. The impression upon the mind, through using thought, is infinitely more keen, vivid, and lasting, than if produced in the ordinary way. The great fault in English education is that sufficient attention is not paid to enforcing the exercise of thought. It is perhaps, owing to this that there are so few original geniuses. The majority of men who pass for such merely reflect a borrowed light, but if persons are trained to think, there will be a great increase in sterling mental power, and the bright catching intelligence often seen will ripen into ability of the highest order. The practical application of theoretical knowledge ought to be a salient feature in the teaching of workmen, and the practice of ready sketching should likewise be insisted upon, for the ready pencil to illustrate the apt idea will prove of the utmost service to them.

The other branch would be adapted for those who have passed the preliminary grades creditably, and are desirous of improving themselves still more. It should embrace drawing, the taking out of quantities from their drawings, the readiest ways of measuring up work, and of abstracting and billing items, and the study of treatises tending to perfect their knowledge of the science of building. Examinations should be held periodically, certificates of ability awarded, and registers kept of the most able students. Since these men would be admirably suited to fill such situations as clerks of works and builders' foremen, architects and builders requiring their services would, by applying to the council, obtain talented and reliable men,—provided, of course, a becoming remuneration were offered.* Low wages benefit neither masters nor men. They induce stagnation of body and mind, and the public lose far more than they gain by them. High wages, accompanied with real talent, are less costly in the end.

By adopting such a course as this, trade unions would be the means of raising up a band of men who could throw a lustre upon their whole body, and be the pride and boast of their land. But even education will fail to improve the British workman greatly, unless he is desirous of improving himself, and is willing to work for that end. God grant that he may be thus desirous! Industry and intelligence have made Old England what she is, and their continual exercise in the future will keep her in her proud position of the foremost of the nations. It may be said that this is Utopian, and beyond the scope of trade unions. Not at all. This is the real, the lasting improvement, which shall bear good fruit socially, morally, and intellectually, and ought to be their chief aim. An untaught man is not improved by being highly paid for his labour, for he jogs on in the old ruts, and does not take a greater interest in his work; but a man is improved, greatly improved, when all his powers of body and mind are once carefully tended and brought into action, raising on every side durable marks of his genius and skill. High wages would naturally follow such a state of mental culture, and the vessel of the State would nevertheless be trimmed, for money expended would secure its equivalent in the highest style of workmanship and finish; the effect upon the welfare of the nation would be immense, for it would then be not only a nation of free and resolute men, but also a nation of true and talented men; and international exhibitions would reveal to others, much more strikingly than at present, that British workmen are "foe-men worthy of their steel."

THOMAS BALES.

Wood Pavement in Knightsbridge.—At a meeting of the St. George's Vestry, held on the 21st ult., Mr. W. Walker moved:—

"That, looking to the fact that the surveyor considers the macadam roadway in Knightsbridge will require an immediate outlay of 500*l.* to put it in good repair, and that the Vestry has already determined to lay wood pavement in this thoroughfare, the Vestry, with the view of saving the outlay, give directions for the pavement of the Improved Wood Pavement Company to be continued from opposite St. George's Hospital, along Knightsbridge, to the boundary of the parish, provided a contract, similar to that already in force with regard to Piccadilly, be entered into; and that the pavement be laid and completed, as far as possible, during the Easter Vacation of the House of Commons."

Mr. Clement seconded the motion, which was carried by a considerable majority.

* With respect to this I must anticipate an objection. It may be urged that the most talented men often lack the commanding influence so requisite in a foreman. This is quite true. But if for this single failing they are compelled to remain in the ranks all their lives with the lazy, careless, and incompetent, does not the trade-union uniform rate per hour thereby stand condemned?

NEW LAW COURTS AND PUBLIC OFFICES FOR LIVERPOOL.

ON a large piece of land, which has for several years remained unoccupied, in the rear of the new Municipal Offices in Dale-street, Liverpool, there is about to be erected, by the Commissioners of Public Works and Buildings, a large and important building, intended as a new County Court, Probate Court, Inland Revenue Office, District Post-office, and Stamp Office. Some of these offices have hitherto been accommodated in the Revenue Buildings, erected on the site of the Old Dock; others in premises such as the County Courts in Lime-street, belonging to private owners; but all have been inadequate to the amount of business required to be transacted, and dissatisfaction has existed for some time at the fact that, while for the local government of the town there have been erected large and commodious edifices, the affairs of the Imperial Government are conducted in small, inconvenient premises in different parts of Liverpool. This will be remedied by the building now about to be begun, which, however, will require about three years for its completion.

The principal elevation of the new Liverpool Law Courts will be in Victoria-street, with side elevations in St. Thomas's-buildings on the west, and Crosshall-street on the east. While the principal entrance will be in Victoria-street (where there will be three doors,—one, a private door for the judges at the west end), there will be a spacious entrance in St. Thomas's-buildings; and between the back of the building and the Municipal Offices there will be a passage, and a back entrance to the courts. The area occupied by the building will be 200 ft. in length and about 130 ft. in width; but, as at present intended, the height will be only 60 ft. from the street level. This will not bring the new building into invidious comparison with the Municipal Offices, which have a fine clock tower, seen over a large part of Liverpool. The architecture is of a simple Classic character,—described as more Doric than Tuscan. The material of the external walls on three sides will be Portland stone, and a portion of the back wall will be of brick.

Internally the building will contain three floors, on each of which there will be about twenty windows to the front elevation. On each of these floors there is an open court, about 64 ft. long by 37 ft. wide. The basement at the west end will be occupied principally by the apartments of the resident caretakers and the laboratory of the Inland Revenue; at the other end there are strong-rooms and storerooms, and other incidental accommodation. The ground-floor at the west end, and about the main entrance, is taken up entirely by the Inland Revenue Offices, the rooms for which are all conveniently arranged, and easy of access. At the east end of this floor the Probate Registry is located, in three or four rooms. One of the large apartments at the back is appropriated to the Summons Office of the County Court, and in front, to the right of the chief entrance, there is accommodation for a district post-office.

The first floor is entirely taken up with the County-court and its adjuncts. There are four courts, one at each corner of the building, where cases can be heard; the dimensions of the two at the west end being 45 ft. 6 in. by 31 ft. each, and those at the east end 35 ft. 6 in. by 31 ft. each. If necessary, three judges and the registrar may sit simultaneously. The two principal courts communicate with each other at the west end. Distributed conveniently about this floor are rooms for the examination of witnesses, judges' rooms, offices, and the necessary conveniences. The internal fittings will be of a complete and substantial character; and the general object of the design is to give roomy courts and offices, with sufficient light and ventilation.

The roof will be plain, and devoid of any kind of ornamentation, but the wall will be surmounted by a balustrade, somewhat similar to that at the ends of the municipal offices.

Newsvendors' Benevolent and Provident Institution.—We willingly mention that the festival dinner of the Newsvendors' Institution will be held at Willis's Rooms on this Saturday, March 2nd, Mr. Wm. Lethbridge in the chair, supported by the First Lord of the Admiralty and Mr. Alderman Cotton, M.P. The institution deserves support.

HERALDRY IN ARCHITECTURE.

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association on the 22nd ult., Mr. Bowes A. Paice, president, in the chair, Messrs. A. Bromley, A. S. Hewitt, and E. O. Pickering were elected members.

On the motion of Mr. Hayes, votes of thanks were passed to Messrs. E. M. Barry, R.A., and J. P. St. Aubyn, for allowing the members to visit the new buildings in the Temple, as recorded in our last, and to Mr. Goodchild, the clerk of the works, for conducting them over the works.

Mr. F. H. Hummel, M.A., then read a paper entitled "Architectural Heraldry," of which the following is the substance:—

Heraldry I define to be the science which determines the rank and precedence of persons of gentle condition. In this definition I make no mention of armorial bearings; in fact, a science of heraldry might be quite possible without these pictorial adjuncts. But it is necessary to any science of heraldry that each of the individuals with whom it deals should be distinguished by some mark to identify the person and his family; and most nations with whose history we are acquainted have employed marks of the same nature as armorial bearings or badges. Observe, however, that none but *gentle* persons are subjects of the science of heraldry; consequently they only have the right to use any armorial devices. Nothing can be more difficult in the present day than to define what a gentleman is; I mean in the heraldic sense of the term; but its original application is evidently limited to holders by free tenure of a certain amount of land. Now the Assize of Arms informs us that holders of a certain amount of land were obliged to serve in the wars with shield and helmet for their defensive armour; a larger amount of land required heavier armour, a horse, &c., as is set forth in careful detail; but the one point that is important to us is that all holders of a respectable acreage were expected to bear at least the helm and shield, and these two pieces of armour distinctive of gentility became the vehicles for the display of two distinct classes of heraldic bearings,—the coat of arms, painted on the shield, and the crest, carved in wood or modelled in leather, bound upon the helmet. Besides these two there is a third class of heraldic marks,—the badges which the servants of great houses bore upon their sleeves, which are usually associated with the livery colours in which the servants were dressed. Thus we have three classes of armorial devices,—the shield of arms, the crest, and the badge, and the treatment of these constitutes that part of the science of heraldry which is called armory, which is the part with which we shall have most to do, though it is necessary also to have some acquaintance with the remaining parts so far as they affect the arrangement of various bearings.

Now the science of heraldry has appeared to most persons to be no more than one of the by-paths of archæology; and the accredited books upon the subject are crammed *usque ad nauseam* with puerile mysticism and nonsense drawn from old romances, and embody the office-slang of generations of draughtsmen in the precincts of Bennet's Hill. The consequence of this is that the grammar of the science is in a terrible muddle, and practical men are deterred from a study which should claim a chief place in the elementary education of an artist. I shall do my best in this paper to bring the subject into a clearer light.

I will commence with the proposition that as far as architects are concerned with it, heraldic art is to be regarded as a special mode of colour decoration. I say *colour*, for colour rather than outline is the essence of the individuality of an armorial device; and carving or relief, or imitation of relief by shading, is a matter of absolutely no importance to its representation. In support of this proposition I shall only need to point to the list of heraldic tinctures. These are of two classes,—metals and colours. The metals are two,—*or*, that is, gold or yellow, and *argent*, that is, silver or white. The colours are seven: *gules* (or scarlet), *azure*, *sable*, *vert* (or emerald green), *purpure* (which we should call violet), *murrey* (*i.e.*, mulberry), and *tawney* (or orange). The two last are scarcely ever used in English heraldry, except as livery colours. Now, the juxtaposition of these tinctures is controlled by a rule which is commonly called "the rule of metal and colour," and is usually worded:—"metal on metal or colour on colour is false heraldry." This wording refers primarily to charges upon a shield; but the rule is laid down for every case, extending usually even to livery colours, that a metal must always adjoin a colour, and a colour a metal. A review of old armorial bearings will show us that this rule is not always observed to the letter; but nearly all the exceptions consist of the juxtaposition of colours, of which *gules* (scarlet) is almost invariably one. It is obvious that the object of this rule,—an object not lost sight of in the exceptions,—was to render the bearings distinctly visible at the greatest possible distance: an important consideration when they were in actual use, to distinguish the gentleman or his troop in the *melée* of a Mediæval battle. Thus, the rule of metal and colour shows itself to be no mere academic concoction, but a result of observation on the properties of colours, and coincides with an accepted principle of decoration. Note also that almost all the heraldic tinctures are brilliant positive colours: those that are not so, *purpure*, *murrey*, and *tawney*, are very rarely used. Heraldic painting, then, introduced into a scheme of decoration, will supply a mass of positive colouring, both significant in itself and also arranged according to fixed rules, which ensure its brilliancy. Therefore, I say, whenever you employ heraldry as a decoration, let it be coloured in its right tinctures, for that is its use and is of the very essence of it. In external positions use your own judgment; but in internal work always colour your heraldry, even if it be carved in relief. As a corollary, never use heraldry, internally at least, where its colouring would be out of place. This rule, on the strength of uniform precedent, down to a very late period, should apply rigidly to all bearings that form part of the atchievement; badges and like devices, however, do not always depend on tincture for their individuality, and may often be employed with great effect and advantage in situations where colouring would be out of place. One word more as to the tinctures. In comparatively recent times a device has been invented of representing tinctures in engravings by means of arbitrary modes of shading. According to this scheme, a field or charge *or* is to be speckled as if it had the smallpox, anything coloured *gules* is to be shaded, regardless of artistic effect, with rigidly vertical straight lines, *azure* with horizontal lines, and so on. Now, this invention was a tolerably useful one for the purpose for which it was produced, but we must remember that that purpose was not artistic, but purely academic. It had always been the habit of heralds, when taking notes of armorial bearings, to make rough sketches in their note-books, and to write against or upon each part of them an initial to indicate the tincture. But though this style of shorthand is admirably adapted for hurried jottings in a private note-book, it can scarcely be reproduced when those notes come to be published, in such a form as the "Peerages," for instance. For this purpose, then, of illustration by engraving, but for this purpose only, the "tincture-lines," as they are commonly called, are to be used. The architect, in his use of heraldry, has nothing to do with them. It may be worth while to mention the opinion of some high authorities that these lines ought not to be employed for woodcuts inserted in the text, or, indeed, for any surface which will be capable of being coloured by hand after the printing. For copper or steel engraving, or for lithography in black and white on plate paper, they say, you may use this method if you like; but for any other medium, give your reader the outline only, and let him fill in the colouring by hand if he is so minded. It is usual with artists of this school to represent sable by solid black in the engraving, considering that the outline would be obscured if it were blackened over after printing; but this is not uniformly done, nor is it altogether in accordance with old precedent. But leaving this detail, let me say that these "tincture-lines" were not only never intended for use in decorative art, but they are, by their very nature, unsuited for such a use. If a mere drawing is intended, yet, supposing that drawing is meant to be artistic and not merely of the nature of a memorandum, who would consent to be bound without his own choice to a rigid straightness and a fixed direction for his shading, and to shade some parts that are not meant to be in shadow, and to leave blank some that are? More ridiculous still it seems for a sculptor to scratch and stipple his

carving all over with arbitrary marks, to the utter destruction of all effect, whether of relief or of flat surface. Nothing can be more absurd or contemptible than the modern practice of scoring these vile scratches upon stone carving: the man who does such a thing only shows that he knows nothing of heraldry, and still less of art.

As to the actual pigments for use, the simplest and brightest are the best. For decorative painting yellow and white are preferable to gold and silver in most cases; but gilding may often be effectively employed when it harmonises with the style of the adjoining decorations. Ochre is a very good yellow for that purpose. Vermilion for *gules*, cobalt for *azure*, lampblack for *sable*, and emerald for *vert*, will complete the list of colours in ordinary use. Brass can be enamelled in very good colours, but silversmiths' enamel comes out too dark for *gules* and *azure*. When anything is blazoned *proper*, i. e. of its natural tint, it should, if possible, be painted in one of the heraldic colours.

Besides these metals and colours there are other tinctures called "furs," being patterns copied from furs in actual use for lining and trimming garments. They are of two classes, *ermine* and *vair*, with their respective varieties. The ermine spots or tails in Mediæval heraldry are much fuller and more hairy than those of modern artists. The modern type is a group of three hairs, headed by three little dots, which is not particularly artistic in appearance. The Mediæval pattern is headed with a triple tuft not unlike a *fleur-de-lys*, and spreads out into a full tail with many hairs. This is a far more effective figure. *Ermine* is drawn with black tails on white; *ermines* is the same pattern counterchanged; *erminois* and *pean* substitute gold for white. *Vair* is the fur lately fashionable as a lining for ladies' cloaks, under the name of "squirrel." It consists of pieces of white and grey alternately, broad at one end, and rounded at the other. On the principle just mentioned, the grey is represented by *azure*. The same pattern in other colours is called *vairy*. In the books will be found several other patterns distinguished as "furs" by such names as *vair-in-point*, *counter-vair*, *potent*, *counter-potent*, *trianguly*, and the like. These are all fanciful ways of drawing *vair*, and their names are only draughtsmen's slang.

Let us proceed now to the consideration of the *shield*, the most important thing in armory. The shape of the shield is usually said to have varied at different epochs in the same manner as the shape of the pointed arch. This statement is tolerably accurate for the period during which English armoury was a living language. Now that it is a dead language, it is best to treat it as we treat Greek or Latin,—fix upon some one period as Classic, and adopt that as our own model for imitation, and as a standard of comparison for other periods. The shape of shield in common use at what we must consider the Classic period of heraldry,—the first half of the fifteenth century,—is the one nick-named the "heater-shaped." I have carefully measured the best examples I have been able to get at, and find that in the majority of them the curved parts of the sides are circular arcs, forming a reversed pointed arch, with the distance between the centres about half the width; the straight parts of the sides are vertical, and rather more than half the width. In the diagram (exhibited) I have taken the distance between centres as the unit; the width is double, the radius $1\frac{1}{2}$, the total height $2\frac{1}{2}$, making the height above centres about $1\frac{1}{12}$. It may be useful to note that the area is very nearly equal to the square of the width. But this rule must be regarded as elastic within certain limits; if you wish to vary from it, increase the height above the centres as you decrease the distance between the centres. Besides this shape I may commend to your notice the Tudor shield, with its wide base and engrailed top and bottom, and the spear notch in the dexter side, as a beautiful and strictly heraldic shape. This form is especially useful for a shield of many quarterings, for which the "heater-shape" is difficult to manage; but it is not adapted to all styles of decoration, and to no style of architecture except Late Perpendicular, whereas the "heater-shape" is available in any situation. Post-Renaissance periods, prolific of uglinesses, have given us various fantastic forms, all *un*heraldic and all execrable; especially loathsome is the long-eared monstrosity of the Georgian period. Ovals and other forms that are not shields at all are of course to be eschewed. There is a detestable custom of drawing a woman's arms on a lozenge, which is not absolutely without good precedent; but it was certainly usual in the Middle Ages to give the shield to both sexes alike, for if the shield is not feminine, no more are the bearings. Still, it is the custom; I wish it was not; and I hope you will depart from it as often as you can find an excuse for doing so, for a coat-of-arms scarcely ever looks well on a lozenge.

I need say very little about the *field* or surface of the shield; if not all of one tincture, it is parted by lines, named after the ordinaries of the same direction. In parting *per fess*, the horizontal line should come a little above the centres. Then there are fields *lozengy*, *chequy*, and *gyronny*. There are two figures which are in reality *chequy* of six or nine pieces, but usually blazoned in a clumsy way,—"*per fess* a *pale* counterchanged," and "a cross quarter-pierced." If in carving or in a drawing shaded to imitate relief, you treat these otherwise than as plain fields, you will find yourselves in a mess.

The old heralds, from whose nonsensical writings much of the matter of our text-books is drawn, seem to have had a superstitious veneration for the number 9,—possibly for the reason given in "Lorna Doone," that "nine is the crossest of all cross-numbers." So we are told that there are nine points of the escutcheon, and a shield is presented to us, bearing the alphabet as far as I, arranged upon its surface like a figure of geomancy. I have never, for my part, known more than eight of these points to occur in actual blazon; if any one can tell me of a Mediæval coat in the blazon of which it is necessary to mention the nombril point, I shall be grateful. It is simpler to say the top of the shield is called the *chief*, the bottom the *base*, the left-hand (to your left-hand, that is) the *dexter*, the right-hand the *sinister*, and the middle the *fess*. The actual use of the *honour-point*, just above the *fess*, for augmentations of honour, is modern. This sacred number meets us again when we come to speak of *charges*, for the first charges that we have to consider are the primitive ones, called *ordinaries*, and it seemed good to certain superstitious dreamers to select nine of these charges, to be distinguished by the title of "honourable ordinaries"; but scarcely two authorities are agreed which are the nine to be so distinguished. The real fact is, these charges are the most primitive of all heraldic forms, such as could be painted on the shield without any knowledge of drawing, most of them by a mere stroke of the brush from side to side; their characteristics are that they come to the very edges of the shield, and that their position is fixed by their nature, which is not the case with other figures. Of these, there are altogether fourteen: the *pale*, a vertical stripe down the centre; the *fess*, a horizontal stripe across the centre; the *bend*, a diagonal stripe, understood to be from dexter chief to sinister base, unless blazoned a *bend sinister*; the *cross*; the *saltire* (a figure of X); the *chevron*, consisting of two strokes thus (∧) from above the centre to the lower parts of the sides; the *fret*, in its Mediæval form a series of diagonal lines in both directions, though it has long been the custom only to extend its central lines to the sides; and the *label*, a stripe right across the upper part, with strokes drawn downwards, like the labels or strings of a mitre. These eight are the rudest possible devices, executed by simply sweeping a paint-brush over the shield, and in the oldest heraldry are very narrow. The rules for the sizes of ordinaries come from the College draughtsmen; but are not to be despised as a practical guide. Next to these slashes across the surface come paintings along the edge: the *chief*, along the top; the *border*, all round; and the *flanches*, at the two sides. Besides these there are others requiring a little more skill in shaping the outline, but still primitive in design; the *pile*, a long point coming usually from the chief; the *gyron*, a triangle with its base on the side of the shield and its apex at the centre; and the *quarter* or *canton*, a square in the dexter chief corner. (Note about the *canton*, that if it occurs in a shield with other charges, you must draw the other charges first, as if there were no canton there, and then put the canton over them, so as to hide any that may come within its area.) Well, if all these are not equally ordinaries, and equally honourable, I know not, at any rate, by what criterion to distinguish them.

The next class, called *sub-ordinaries*, are almost equally primitive, but have their shape without any reference to the shield, being geometrical figures, such as circles, squares, crosslets, &c. The *roundels*, or solid circular figures, have received special attention from heraldic dreamers, who have given them names varying with their tinctures; these are of course nonsensical, and we will not condescend to use them. I have something more practical to mention about them. It has been said that roundels *or* and *argent*, as representing coins, should be carved flat, and coloured ones, as representing balls or fruit, should be carved spherical. I have examined several Mediæval carvings, and find that all alike are usually carved flat; but there is no reason why any of them should not be carved spherical. Much ingenuity has been spent in devising many kinds of crosses, but most of them are purely imaginary. The cross *pattée* or *formé*, which is vulgarly miscalled "Maltese" (the Maltese cross is quite different), is usually badly drawn; the arms should start from the centre like a plain cross, and only widen at the very ends. The cross *patoncé* is of similar form, but with two notches in each end, giving it the shape of a paw, from which it has its name; it must not be confused with the cross *flory*, which is a plain Greek cross with a *fleur-de-lys* issuing from each end. The *saltire*, when used as a sub-ordinary, has its ends cut off horizontally, and not at right angles to their direction.

Before we go any further in the consideration of charges, a few words may be useful on the manner of placing them in the field. Charges are usually borne upright, unless any other direction is specified. This is true also if they occur on an ordinary, except the bend, and sometimes the chevron and saltire. On a bend the charges invariably follow the diagonal direction,—with the saltire and chevron it seems to be optional; but the upright position is rather the more usual with the saltire, and much more usual with the chevron, if the shape of the charge allows of it. The patterns of *vair*, *chequy*, &c., follow the direction of the saltire, as of the *bend*; the use is uncertain for the chevron, but the upright direction is preferable. A single charge will be in the centre of the field, unless the contrary is specified. Be careful not to make it fill the field well; nothing so stamps a bad design as for the shield to look too large for its charges. If there are several charges of the same nature, the blazon will usually tell you how to dispose them. A group of 3, 6, 10, or 15 charges are usually placed in the form of a triangle, the longest row uppermost. Avoid making the lower charges larger than the others to fill out the base of the shield; the triangular group, if properly placed, will fill the field sufficiently without this device, which gives an uncomfortable impression of perspective. Six charges with a *fess* between them, as in the arms of Beauchamp, would be disposed, three above the fess, and three below it; the three below may be either in triangle or in a single row, whichever best suits the field. A field *semé* of similar charges will have an indefinite number disposed in alternating horizontal rows all over it, regardless of the cutting off of some of them on the edge and of the hiding of others by a charge placed over them. These charges should be of a moderate size, and neither too crowded nor too wide apart: from 5 to 7 in the width will usually give a good gauge for the size. While I am talking of fields *semé*, let me add a word about *diapering*. In work to a large scale, and designed for richness of effect, diapering is a very useful adjunct. But caution must be observed in the use of it, for fear of obscuring the coat which it enriches. The colours used must not interfere with the tinctures of field and charges, but must be selected so as to brighten and throw them up; and the pattern of the diaper must not bear a resemblance to anything heraldic, must not be capable of being blazoned; or, instead of decorating, you will have altered your coat of arms.

The heraldic type of lion is in no wise a congener of the one who bears his name in the Zoological Gardens. Yet some modern designers still persist in trying to introduce into their heraldic delineations some tender reminiscences of Regent's Park, resulting usually in a hybrid creature most like a spaniel with a donkey's tail, with a smile on its face that seems to promise to "roar as gently as a sucking-dove." The Classic type of heraldic lionhood exhibits as its distinctive features the short nose; the widely-distended mouth with protruding tongue; the exaggerated separation of the toes, giving the foot a resemblance to a bird's claw; the tail, bushy in the centre, and with its terminal

tuft turned over *towards* the body; the wiry form expressing agility and strength by its attitude rather than by its bulk; these are universal characteristics of the lions of the best period. After this period the limbs become heavy and the attitude awkward, the animal often looking as if he were squatting down, or else as if he were hanged by the neck. In the sixteenth century we recover the notion of agility in the attitude, but the strength is still expressed by actual delineation of muscle. There are some noble examples of lion-drawing in engravings of the time of the Stuarts, but still of the heavy-limbed type. Having expressed my preference for the earlier type, I shall not blame any one who may prefer the Stuart model, which is certainly worthy of imitation in all respects except, perhaps, the needless emphasis with which its sex is marked. There is scope for the greatest skill and artistic power in drawing the lion in his various attitudes in the awkward spaces he often has to fill, elongating his body to occupy the length of an *ordinary*, or varying the attitude of his hind legs in a quarter near the base of a shield, yet throughout preserving the life and ferocity that should appear in every limb.

For animals generally, Mediæval types should be followed: even in the most awkard Mediæval drawings we may find hints for the conventionalisation that is an essential part of heraldic design. There is a series of animal drawings on the walls of the Chapter-house at Westminster that may be studied with advantage, though one can scarcely recommend them as models of the highest art; but for those who can obtain access to them, the illuminations of Mediæval MSS. are a mine of excellent drawing, and must be the real school of the heraldic artist. There is a joyousness and life given to these drawings by a conventional treatment that is most excellently adapted for our purpose.

The eagle is another charge that deserves special mention. The feathers of his wings should be carefully drawn individually, and separated from one another; if the scale of the drawing will admit of it, the quills should be shown. The tail must be widely spread, and fill the base of the shield, so as to balance the wings. Of other birds there is not much to be said. The martlet should not be deprived of his beak, as I have sometimes seen him in modern drawings: it is quite enough mutilation to take away his feet. The pelican of heraldry is, of course, not similar to the one in Regent's Park, but bears a closer resemblance to the swan, and is always presented in that attitude which, though based on a zoological error, has made it one of the sweetest of Christian symbols. Both this bird and the swan are often drawn, as the eagle is always, with the neck feathers prominently shown, so as to give a ragged outline, conveying an expression of fierceness. Ostrich-feathers must be drawn stiff and straight, except the very tip, which turns over. In a single feather, the tip falls to the dexter; in a group, the centre one to the dexter, the others outwards. It is not worth while to go into any particular description of most of the other charges used in heraldry, as I do not intend my paper to be a grammar of the subject. One or two more hints will be sufficient, where the ordinary style of drawing departs most widely from Mediæval use. Trees should be drawn with leaves and fruit carefully shown, not slurred over, as is too usual. In this treatment the leaves will of course be exaggerated in size, and must be characteristic of the tree. The rose has usually a double row of five leaves each, one within the other, and must show its *barbs* between the outer leaves and the yellow centre or *seeds*. Clouds must be represented with the outline nebuly; water must be barry-wavy, *argent* and *azure*. A fountain is a roundel barry-wavy of those tinctures, representing the plan of a well. Weapons usually have their points upwards or to the dexter, but note that arrows have their points downwards. Crowns are now commonly blazoned as "ducal crowns," and drawn carefully after the pattern approved by Charles II.; but in reality they are regal crowns, as worn before the introduction of the arches. The decoration of them is entirely arbitrary; they have usually three knobs or leaves shown, and these may be of any style of enrichment based on the trefoil. Late in the fifteenth century we often find them enriched with unmistakable Tudor flowers. Mitres must be drawn straight-sided, and labels or strings should hang straight down from the centre of the base. It can hardly be necessary for me to mention the maunch or sleeve, with its bent elbow and enormous depending cuff and shoulder tail, which is represented in many forms, most of them exceedingly picturesque.

I will now pass on from the shield and its charges to the *helmet* and its *crest*. And first let me say that a crest should never, for any decorative purpose, be represented without the helmet, of which it is the enrichment; still less should it be so represented and placed upon a shield. The one mistake may plead precedent; the other can only arise from gross ignorance. The first covering of the helm is the *lambrequin* or *mantling*,—a cover for the helmet only, observe, not for the body armour; that is protected by a surcoat. This mantling is susceptible of good treatment by representing the edges as jagged, and the ends of it curled into fantastic forms. The crest is fixed to the helmet either by a wreath or a coronet, or occasionally by a cap. The wreath is a twisted skein of two tinctures, usually the predominating metal and colour of the arms; but if a family have other distinctive livery colours, they should be preferred for the wreath. The coronet, it is necessary to observe, is not a distinction of rank, and is not to be blazoned or drawn as ducal. The enrichment of it, as I have already said of crowns when borne as charges, is purely arbitrary. The figures used as crests are of course the same as those used as charges, and demand the same treatment. The lion, however, when in a statant or *passant* position as a crest, should have his tail extended so as to droop over the back of the helm; whereas on a shield his tail would be held over his back. The same remark will of course apply to other beasts in the same position.

In constructing the atchievement, if there are no supporters it often looks well to set the shield in a slightly oblique attitude, with the upper part turned to the dexter. An angle of 60 degrees is a good inclination, and of course easy to draw. In that case the helm may, but need not, overlap the uppermost corner of the shield. The straps by which the shield hangs should show from behind the helm. The helm itself should in all cases be turned to the dexter, or nearly so. The rules for various shapes and positions of helmets are without ancient authority, and quite destructive of effect. If the atchievement is that of a peer, the shield would ordinarily be upright, held by the supporters, and with the coronet of the peer's rank set on the top of the shield, the helm issuing out of it. The favourite Mediæval plan was, however, to couch the shield as before mentioned, and to place the supporters as if standing on the shield to hold up the helm: this plan is productive of a much better effect, and saves the absurdity of setting lions, basilisks, or Chinese soldiers, to stand upon the motto-scroll. The Scotch heralds use a compartment for the motto, as affording better foothold to the supporters; but I doubt if it would be orthodox to do so in an English atchievement. Make your motto-scroll in bold curls, not in the niggling wavy style, and do not notch the ends. Whether you use Gothic or Roman letters for the motto, make them bold, and solid, and legible.

So far I have been laying down rules; now I come to the part of our science where the draughtsman's hand is freest. A badge may be used anywhere, for any purpose, whether to enrich a capital or to mark a pocket-handkerchief; and you may treat it as you please, so long as you retain its individuality. The glorious frieze of Henry V., at Westminster, will teach you more about the treatment of badges than an hour's lecture from me or even from Garter King of Arms.

There is little more that I need say: the rest of the subject pertains rather to the science than to the art of the herald. The arms of married people are to be impaled upon one shield, *baron* to the dexter, *femme* to the sinister. It is a bad practice for a widower to retain the arms of his first wife when married to a second: the triple impalement is incapable of good treatment, and is really meaningless. The escutcheon of pretence has not very good Mediæval authority for the present use of it, and should be avoided where the husband does not gain some substantial territorial athority by his marriage,—a manor, for instance. Eschew many quarterings except on very large shields; for smaller ones, select the four principal. And finally, if you can by any care avoid it, never execute for a man a coat of arms that does not belong to him.

The President (Mr. Paice), in inviting discussion, said that the paper was calculated to be of much use. Architects did not give sufficient study to the subject of heraldry, and therefore were unable to introduce it into stained-glass windows. Where a window was a gift, he thought that the arms of the donor ought always to be incorporated in the design.

Mr. Clarkson, in moving a vote of thanks, said he could not see why heraldic emblems, when carved in stone, should not, within certain limits, have the surfaces conventionally treated to represent differences of colour; notwithstanding Mr. Hummel's *dictum* that this was a wrong treatment, it was one which was sanctioned by very good (though modern) usage. Of course it would not be desirable, when animals were depicted, to cover them with lines or anything of the kind; but when such things as the saltire and the chevron were represented on a shield, why should not they be differently treated to the surface of the shield? It was all very well to say that the use of this distinctive kind of shading was a barbarism, but this simply meant that it was not in use when colour was used. If the science of heraldry was worth studying at all, it was presumably capable of extension and adaptation to modern requirements and methods. It was difficult to see why, when the use of colour was undesirable, as in external work and sometimes in internal work, the use of these lines denoting different colours should be prohibited. With reference to the general subject of the uses of heraldry, its capabilities of extension and future use, the desirability or not of its maintenance except as a section of archæology,—all these were points which demanded a philosophical breadth of treatment which he would recommend to the succeeding speaker.

Mr. W. H. White, in seconding the vote of thanks, said that when he entered the room he knew very little about heraldry; he had learnt something more about it from the lecturer. He had learnt that heraldry was the prerogative of *gentle* people,—people of gentle birth,—and that the test of gentility was the ownership of property in land; consequently, it must be inferred that there were very few *gentle*-people in England. He had also learnt that heraldry was a "dead language"; he thought that was something for a *neo*-Mediævalist (as Mr. Hummel seemed to be) to admit.

Mr. Ash drew attention to some bannerets in the model of the Sanchi Tope at South Kensington. One banneret had a St. Andrew's Cross, together with the *vertical* portion of a St. George's Cross; while the other banneret had a St. Andrew's Cross with the *horizontal* portion of a St. George's Cross. These bannerets, therefore, contained the elements of the English "union-jack." Under the lintel there was a complete St. George's Cross. He should like to ask whether the English "union-jack" could be traced to this source.

Mr. W. Hilton Nash agreed with Mr. Clarkson in thinking that it was desirable to use the "tincture-lines" in heraldry carved in stone-work, because, in his opinion, colour on stone was a very objectionable thing. It was all very well to paint wood, but paint on stone had an unsatisfactory effect. Mr. Hummel had not alluded to the careless way in which many of the figures in Mediæval heraldry were drawn and carved; these were by no means to be taken as models for imitation. Mr. Hummel had said nothing about mottos.

The vote of thanks having been passed,

Mr. Hummel, in reply, said Mr. Clarkson had challenged the soundness of his contention that the colour-lines ought not to be used in stone carving. In his paper he had expressly stated that his deductions were drawn from Mediæval authority, and there was no Mediæval authority for the use of colour-lines, which were originated for cheaply and readily illustrating specimens of heraldry by copper-plate engraving. He did not know whether Mr. Clarkson considered "tooled York" better than polished marble as a decorative surface, but to his (Mr. Hummel's) mind there was nothing particularly fascinating about a tooled surface. Mr. Clarkson admitted that the colour-lines did not look well on animals; why, then, should they look better on a cross? In reference to Mr. White's remarks, in heraldry, all descendants of *gentle*-people were gentle, and entitled to bear arms, though not themselves land-owners. There were, of course, a thousand other ways of becoming a gentleman in the strictly heraldic sense of the term. In reply to Mr. Ash, he had not examined

the model of the Sanchi Tope, and could not answer the question as to the origin of the "union-jack." He agreed with Mr. Nash as to the carelessness of drawing and execution in much of the Mediæval heraldic carving. He had said nothing about mottos, because although an architect might have to execute a coat of arms for a client, he would not have to choose the motto. It was very desirable, however, to see that the motto was correct in its language.

THE LATE GEORGE PAUL CHALMERS, R.S.A.

THE career of this gifted artist came to an untimely end, as most readers have already heard, on the morning of Wednesday, the 20th ult., from concussion of the brain, how produced remains a mystery. He was present at the opening dinner of the Royal Scottish Academy, upon which occasion he proposed one of the toasts. After the dinner, he, along with some of his brethren, adjourned to the Artists' Club, and about one o'clock a.m. he left the club alone, and about an hour thereafter he was found by a policeman lying insensible in an area not far from the club chambers. He never recovered. The Academy have offered a reward of 100*l.* for information which may lead to the detection of any one who may have assaulted the deceased. It is stated that he said he had been knocked down and kicked, but in the state in which he was it is thought that no great reliance can be placed upon that statement.

George Paul Chalmers was born in Montrose in the year 1836, and remained at school there till he attained the age of fourteen. From the time that he was able to hold a pencil he exhibited artistic proclivities, and these were fostered by his schoolmaster, who was himself an amateur painter, and produced works which he distributed as prizes amongst his pupils. After leaving school Mr. Chalmers entered the service of a surgeon, with whom he remained two years. He thereafter entered into an apprenticeship with a ship chandler, where, having plenty of paint at his disposal, he sometimes sketched from nature, and at others copied engravings, which he coloured according to his own ideas. After leaving the ship chandler he had a raffle of his works, about sixty in all, the proceeds of which enabled him to go to Edinburgh and prosecute his studies in the School of Design under the late Robert Scott Lauder.

As an artist Mr. Chalmers was possessed of a fine eye for colour, and his works are remarkable for depth and richness of tone; if he failed in any respect it was in uncertainty of purpose, arising from extreme fastidiousness on his part. After beginning a picture and carrying it forward almost to completion, he not unfrequently became dissatisfied with it, and altered it so much that the ultimate result was less satisfactory than if he had kept steadily to his original purpose. He was quite aware of his own weakness in this respect, but said it was in his nature, and he could not help it, he was striving after an ideal perfection which eluded his grasp, and he would rather sacrifice what he had done than put out of his hands what did not, to a considerable extent, satisfy himself. There remains in his studio a work the subject of which is taken from Sir Walter Scott's "Fair Maid of Perth," which he intended to send to the present exhibition of the Scotish Academy, but he was not satisfied with it at the last.

The first work of note produced by Mr. Chalmers was one entitled "The Favourite Air," showing a Breton peasant performing on the flageolet in his cottage to an audience who are variously affected by the music. After this he set to on a large canvas, having for his subject "The Legend," where an old lady in telling a strange tale to a number of children. Up to a certain point this picture promised to be fine, but all at once "a change came o'er the spirit of his dream," and what became of it we do not know. Latterly Mr. Chalmers took to portraiture, in which line he was very successful, receiving handsome prices from his sitters. One of these is in the present exhibition of the Royal Scottish Academy, and it will bear comparison with any other portrait there. Mr. Chalmers was unmarried, and is the only child of a widowed mother, with whom he resided.

Alas, poor George Paul! many an eye was dimmed when his untimely end was known; he was loved by some as if he had been "a brother of their blood."

GLASGOW INSTITUTE OF ARCHITECTS.

THIS body held its tenth annual dinner on the evening of the 18th ult., at Maclean's Hotel, St. Vincent-street, Glasgow. The president of the Institute, Mr. John Burnet, was in the chair, Mr. John Honeyman, vice-president, discharging the duties of vice-chairman.

The chairman, in proposing the toast of the evening, "The Glasgow Institute of Architects," remarked that the past year had again brought forward the question of architectural practice in competitions, and that question the Council had under consideration with a view to promote a high standard of honourable conduct in all professional relations. To influence parties offering subjects to restrict themselves to any important extent, was regarded in this quarter at least as hopeless. Should the members of the Institute, however, be able, by constantly urging the propriety of engaging a neutral eminent professional man as a guide in drawing up the conditions of competition, and reporting on the designs sent in, whatever the ultimate decision might be, much that was disagreeable in competitions would be avoided, and they might be entered upon by all with comparative pleasure. With regard to the model bye-laws relating to building operations, prepared by the Local Government Board, they would take up the consideration of the question on Scottish building art. The importance of such an art to the public could not be overestimated with respect to the acceptance by the Institute of the office of patrons of an association for surveying, classifying, and registering house-property, he feared that a Building Act, with compulsory powers, must be looked to for effecting the desired object, rather than an association resting on a voluntary basis. Reference was next made to an action raised in the Court of Session to compel the representatives of the late Mr. Bryce to deliver up the plans, specifications, and other drawings of Fettes College and the Bank of Scotland, and which it was considered involved a question of considerable importance to the profession. While the council considered the defence to the action a sound one, that an architect was entitled to retain the plans prepared by him, as they were his property, he would be bound to make copies or tracings for his employer at the expense of the latter. The case was compromised by delivering up the plans and drawings, Mr. Bryce's partner and trustees having the right of access to the same. The Institute and president this year continued their practice of offering each a prize for competition by the draughtsmen and pupils of the members. The subject for the Institute prize—a gold medal—was the best series of drawings and illustrative sketches from any of the following buildings. The Lady Chapel of Glasgow Cathedral; St. George's Church, Buchanan-street; the Royal Exchange, Glasgow; and the West Front of Paisley Abbey. For the President's prize, which is to be arranged to suit the convenience of the successful competitor, the subjects are,—The best series of drawings illustrating the archway forming the entrance to the Exchange square from Buchanan-street. The drawings were only sent in a few days previously, and had not been examined in detail; but it might be said of them that they are not inferior to those of former years.

Mr. Campbell Douglas having proposed "The Royal Institute of British Architects,"

Mr. Charles Barry (president of the Royal Institute) replied. He pointed out that the Royal Institute was not a metropolitan body in any sense. Its great object, like that of all local societies, as distinguished from the London society, was to advance the honour and dignity of the profession, and increase the public appreciation of it. As it was believed that an architect could not discharge the responsible duties that fell upon him between his client and the contractor without being an honourable man, it followed logically that that honourable position must be made clear to that section of the public who did not at present appreciate or give architects credit for having such a position to maintain.

Mr. Honeyman proposed "The Glasgow School of Art," coupled with the name of Mr. Greenlees, the respected head-master of the school, who responded.

The Chairman next said,—I have now the pleasure of proposing the health of our guest, Mr. Charles Barry, president of the Royal Institute of British Architects. The name of Barry has now for forty or fifty years occupied a high place in the highest circles of all who take an interest in our beautiful art, not only in this country but also, I may say, throughout Europe. I have the pleasing duty of informing Mr. Barry that the Council of the Glasgow Institute of Architects have unanimously resolved to pay him the highest compliment they can bestow, namely, to offer for his acceptance the diploma and medal of the Institute, which I now present to him.

Mr. Barry, in acknowledgment, referred to the great kindness he had experienced in Scotland, and expressed a sincere hope that he might have an opportunity in some way or other, either personally or publicly, of returning the kindly feelings shown towards him.

After some other toasts the company broke up.

THE NATIONAL INDUSTRIAL HOME FOR CRIPPLED BOYS AT KENSINGTON.

THE spacious new wing to the National Industrial Home for Crippled Boys at Kensington, which has been in course of erection since the early part of last year, has just been completed, and is now ready for the opening ceremony, which will shortly take place. The Home is situated in Wright's-lane, near the High-street Kensington Railway Station, and forms what in past years was an aristocratic mansion, so altered when the institution was established as to contain a range of workshops for 100 boys, where almost every kind of trade is followed by the inmates. In reconstructing the interior of the building so as to adapt it to the requirements of the institution, a spacious kitchen and a number of offices were erected. The wing, forming the new building just finished, consists of a dormitory for sixty boys, together with a large school-room, and also baths and lavatories designed for 100. The foundation-stone was laid in June last by the Princess Louise, and it may be incidentally stated that the ground on which the new building has been erected formerly belonged to Sir Isaac Newton. The architect is Mr. E. C. Robins, and the contractors are Messrs. Lucas & Sons. Further additions to the institution have been decided upon, when the necessary funds are at the disposal of the managers. These consist of a large hall for dining and other purposes, together with adjoining apartments. The name which will be given to the intended building is the Louise Hall.

OWEN ALMSHOUSES AND SCHOOLS IN ST. JOHN'S-STREET-ROAD, ISLINGTON.

PROPOSED NEW BUILDINGS.

THE Privy Council have issued a new scheme for the administration of the charities in St. John's-street-road, Islington, known as "Dame Alice Owen's Charities," under which important structural and other alterations are proposed. The charity buildings at present consist of almshouses occupied by fourteen widows, who also receive from the charity seven shillings a week each. There are also schools for 120 children, whose education is gratuitous. According to the provisions contained in the scheme, the whole of the existing buildings, including both schools and almshouses, are to be taken down, and the latter altogether abolished. On the site so cleared large new schools are to be erected to accommodate 600 children,—300 boys and 300 girls,—whilst in lieu of residing in the almshouses the fourteen widows are to receive twelve shillings weekly, choosing their own residence. One portion of the scheme provides that with the sanction of the Charity Commissioners the governors may, in their discretion, transfer a portion of the endowment from Owen's Charity to the Tower-hill Charity School. The present annual income from Dame Owen's Charity is 2,000*l.*

Eddystone Lighthouse.—In the House of Commons, last week, Sir C. Adderley, replying to Mr. B. Denison, said that the rock upon which this lighthouse has stood for 119 years had become undermined, and that, consequently, the foundations were seriously endangered. There was no immediate danger, but the tower could no longer be considered safe. The Trinity House had, therefore, determined to build another lighthouse upon a rock about forty yards distant from the present one, the cost of which would be borne by the Mercantile Marine Fund. Other accounts say that the old lighthouse is *not* undermined.

OPEN AND VENTILATED SOIL-PIPES.

Sir,—The strength of a chain depends upon its weakest links, and the soundness of Mr. Norman Shaw's system of "house drainage" depends upon its weakest points, which appear to me somewhat as follows:—

1. *The absence of an air-barrier (or trap) at the junction of the w.c. apparatus with the soil-pipe.*—After usage of the w.-closet (and I am now speaking of *valve* closets, as shown in Mr. Shaw's diagram, and I am sure he would not for a moment approve of the *pan* or *hopper* class of closet on his principle), the handle of the apparatus is often pulled up only just sufficient to discharge the contents of the basin into the soil-pipe, leaving the deposit, which escaped out of the basin, with whatever water there was in it, to stain its way down the sides of the soil-pipes to the drain. And in such cases there would be no large body of water accompanying it to scour out the pipe by friction, but the two gallons of water from the w.w. preventer,—which Mr. Shaw considers sufficient (!)—would come into the basin like many a would-be railway-passenger in time to see the train go off, but too late to go with it; and of these two gallons of water one would be retained in the basin, and the other would dribble down the overflow with just as much power to cleanse the soil-pipe as a schoolboy's syringe would have to cleanse the deck of a ship.

Again, the handle of a closet is often pulled up and closed in such a way as to catch part of the deposit under the valve, and then whatever water may come into the basin will leak through, leaving the house exposed to this deposit of an unclean soil-pipe and of a dry basin. In fact, until the next usage of the closet, a current of air would be blowing up through the soil-pipes right into the house,—a queer way of admitting "fresh" air into a house,—for where water leaks through air can come in. This discharging soil-pipe arm may only be a short length, it is true, but it does not require a *long* tobacco-pipe to be offensive to a non-smoker: a very short one betrays its presence in the pocket of a fellow-passenger, though unseen.

The joint, or junction of the apparatus with the soil-pipe, could never be depended upon unless made by a reliable workman. The joint would often be made with putty or red-lead, and might or might not, for the time being, be air-tight (the pipe is never full enough of water to show a leak), the cement would in time dry up, and allow the air in the soil-pipe to escape into the house, but this is only a minor matter as far as *valve* closets are concerned, as they are provided with lugs for screwing down to the floor, and a thick india-rubber collar could be used instead of cement, and with greater safety. The closet would at times need repairs, and during its removal for this purpose the house would often be left exposed to the soil-pipes; for if one man is careful another is careless, and the latter would forget, or not trouble himself, to cork the soil-pipe.

Now, an *efficient* trap under a water-closet apparatus stands there like a sentinel guarding the house from any air, good or bad, through the soil-pipe (I do not mean to say for a moment that it will shut out noxious gases,—the atmosphere should always have access both at the head or foot of all soil-pipes,—but it prevents a current of air passing through such pipes *into* the house). Of course the value of this trap depends upon its character, as much as the sentinel upon his. Round-pipetraps, or syphon traps, like weirs, clean themselves; D-traps, like ponds, retain their filth. It is not too much to say that the foulest things in use for sanitary purposes are D-traps, or, as they ought to be called, *collection-boxes*, unless *pan*-closets are fouler still. I notice that, though Mr. Shaw condemns all traps upon soil-pipes, he depends upon them to shut off drains, and further states that for "two years this trap has not been cleaned out, nor touched in any way." And this is our experience for a much longer period with efficient traps fixed upon soil-pipes.

2. *The absence of ventilation at the highest part of the arm of the soil-pipes.*—As hot water ascends in "circulating-pipes," so excrement gases ascend; therefore all soil-pipes and waste-pipes should be ventilated at their highest points. Mr. Shaw ventilates his soil-pipe at the lowest end of the arm, and, as he admits, he allows the soil-pipe at the highest point to ventilate itself *inside the house*; for, on pulling the handle of the closet, to use his own words, "the air can generally be felt to blow up the pipe." Now this discharging soil-pipe arm, whether long or short, must in time become coated over with excrement. The closet, we will say, remains idle during the sultry hours of a summer's day, and is used at night, and then directly the handle is pulled the stagnant air of this 12-ft. run of pipe (with the breathings from the vertical soil-pipe) rushes up through the closet into the house.

3. *The open ends of soil-pipes and receiving-heads.*—There would always be great difficulty in finding a safe place to put the heads at the head and foot of the vertical soil-pipe. For inconvenience would arise not only from the impure air from the vertical soil-pipe, which in many cases would have to be a very long length, but there would also be the odour from the deposit in its transit from the arm to the main soil-pipe, and again from the main soil-pipe to the drain. If in each case the deposit could be sealed up in a sort of a Captain Boyton's dress, and discharged through the pipes in that form, there would be no risk; but it is utterly impossible for the contents of a water-closet, especially when used by invalids, to pass into the drain on Mr. Shaw's principle without vitiating the air in some degree, and when windows or doors are near some of this air would be sucked into the house by the warmer atmosphere inside. Why does not the cook confine her cookery smell to the kitchen, and send it up the chimney, instead of allowing it to steal all over the house? The chimney was built over the range for the purpose of taking it away. Could a smoker send a puff of tobacco-smoke through the bowl of one pipe into the bowl of another, and through the second pipe into the third, without the smell of tobacco escaping? Nor can foul excrement giving off nauseous smells pass from the arm to the open vertical pipe, and again from the open vertical pipe to the drain, without emitting into the surrounding air some of its noxious qualities.

4. *The connexion of the overflow-pipe with the soil pipe.*—Part of the water in this overflow-trap would be at times syphoned out by the suction power of the discharge through the long arm of the soil-pipe, and the other part would evaporate when the closet remained idle for any length of time, and often untrap it. It would then depend upon the principle of the service-arm of the basin whether or no it got charged on the next usage of the closet, the air in the meantime finding an easy access through the soil-pipe into the house. Moreover, a closet is often used as a urinal, and the urine is allowed to run away down the overflow-pipe without any attempt to wash it out this certainly would not only smell, but help to foul the discharging soil-pipe as well.

5. *The exposed position of the soil-pipes, &c., in case of frost.*—Unfortunately, can be absolutely depended upon, and whether the closet be supplied by a supply-valve attached to the apparatus, or by a water-waste preventer—the latter being more liable to leakage than the former—it is sure, sooner or later, to leak. This may occur when there is a severe frost, and then, from the unsheltered position of this small-size soil-pipe (its smallness being, on the principle criticised, one of its chief merits), it would soon get frozen up at the discharging ends. The evils of such a state speak for themselves.

Only water-closets having *sealed outlets*, as *valve* closets, &c., could be fixed, not only on account of the air blowing through into the house, but from the danger of admitting rats as well.

Notwithstanding all I have said against this system, I should prefer it to the old method of *bottled-up* soil-pipes, D-traps, and *pan*-closets, though I think the houses are few where it could be adopted with absolute safety. In the country, where the closets would be more or less for private use, and seldom much used; where the wind from every point of the compass can blow upon it, there would not be much danger. But in towns and places where closets are for general use and are much used; where, to get rid of the nuisance of one house we run the risk of creating a nuisance in another; where the wind to blow away the smells from these soil-pipe ends and receiving-heads would have to be in a certain quarter, and take as accurate an aim to hit the place as a marksman would a bull's-eye,—it would be dangerous.

We may make a hobby of *simplicity*. Four plain brick walls, with a cement flat over them, would make a very simple house; but few would care to possess it. But we should seek perfection. It would be presumption on my part to speak to Mr. Norman Shaw of the value of perfection, even though some extra cost be necessary to obtain it. When a saddle-horse is wanted, 10*l*. more or less are as nothing compared to the weakness or soundness of its knees. And when it is possible, as I think it is, to make the sanitary arrangements in a house perfect by excluding not only "noxious gases," but *all air* from coming into a house *through* a soil-pipe, waste-pipe, window, or door, after it has once passed through any such pipes, it should be done. A stream of fresh air should be made to pass through all waste-pipes, soil-pipes, and drains; but the outlets should be away from all breathing-places. Having lately issued a work explaining at length my views upon this matter, I will not occupy more space except to say that the principle which I have advocated, like Mr. Norman Shaw's, is chained down by no patent, but is open to all the world.

S. Stevens Hellyer.

THE ISLINGTON NEW WORKHOUSE WELL.

Some interesting statistics were made at a recent meeting of the Islington Guardians respecting the well which was sunk a few years ago at the workhouse, for the water supply of that establishment. It was stated that the cost of the well had been 4,850*l*., and that the cost of working it last year was 105*l*. In 1871 they paid to the New River Company, for the water supply, 396*l*. In 1875, the well yielded 43,113,000 gallons of water, but the following year, 1876, was a failure. Last year, however, 650,900,000 gallons were raised. It was added that the water from the well was said to be of a much superior quality to that which they formerly received from the New River Company.

DEMOLITION OF ENGLISH PRISONS, AND HEAVY CLAIMS.

On April 1st, the Prisons Act, 1877, comes into operation, placing all county and borough gaols in England under the direct control of the Home Office. There are, however, several provisions in the Act closely concerning the architectural and building profession, and that appear as yet to have escaped the attention the subject deserves.

First and foremost is the fact that the Government have power, and intend to exercise it, of closing altogether a large number of prisons in England, and either erecting new gaols, or enlarging and improving the old prisons.

Another important clause is the 55th of the Act, that enables counties, cities, or boroughs to claim compensation from the Treasury for the value of land and prisons, and these claims are already giving the Home Office considerable unquietness, and will be an enormous charge on the Exchequer, the Chancellor of which is wishing the Prisons Act out of his jurisdiction.

As visiting justices to prisons will be defunct on March 31st, those officials have called special sessions of magistrates, to take time by the forelock as regards the probability of their prisons being closed, and also as to the value of the ground and buildings. In many instances the Quarter Sessions have become alarmed as to the discontinuance, and memorials have been sent to the Home Office.

The Home Office has also sent out to the various counties a series of questions as to probable extent of claims and compensation for gaols and land, and the visiting justices have in nowise abated the customary value placed on forced sales by Act of Parliament.

PROPOSED REMOVAL OF THE WHITECHAPEL HAYMARKET.

An effort is at present being made by several of the East-end vestries to have the Haymarket in Whitechapel removed, on the ground that although it is an old-established market it has become a great and constantly-increasing nuisance. It appears from the published accounts, that the receipts last year were 1,033*l*., out of which the Lord of the Manor received 445*l*., and the parishes 348*l*., whilst the expenses were 240*l*. The Mile-end, Bethnal-green, Limehouse, and some other vestries, support the movement, whilst others are opposed to it. The subject was brought before the Limehouse vestry at their last meeting, when it was stated that although the householders immediately adjoining the market got a sensible

discount on their rates for submitting to the nuisance, the business interests of London got no compensation for the great obstruction which existed. Mr. Potts, one of the members, said the market was an anachronism, and that the nuisance was doomed, and must go. Several members expressed a similar opinion, and, in the course of a discussion which followed, it was stated that a rumour was current that Lady Burdett Coutts would not be unwilling to have the market in the neighbourhood of the Columbia Market. At a meeting of the St. George's-in-the-East vestry just held, when the same subject was under discussion, it was stated that one of the principal streets in East London was blocked up three days in each week, and the traffic seriously interfered with, by the market.

SALE OF THE MATERIALS OF DRUMMOND'S BANK.

THE Government having relinquished all intention of acquiring the site of Drummond's Bank, in Charing-cross, for the purpose of erecting public offices, the rebuilding of the bank, as originally contemplated, is at once to be proceeded with, according to the designs some time since prepared. The hoarding in front of the bank premises has remained standing for more than twelve months, awaiting the final decision of the Government authorities, but this week the fittings and materials of the banking-house, together with those of four shops in Charing-cross and Spring-gardens respectively, have been sold by Messrs. Horne, Eversfield, & Co., preparatory to the site being cleared. The materials consisted of 162 lots, the sale occupying two days. It is understood that the new structure will present good elevations, both to Charing-cross and Spring-gardens. Messrs. Waller & Son, of Lisle-street, are the contractors for the new building.

FEMALE SCHOOL OF ART.

THE annual distribution of prizes to the students of the Female School of Art in Queen-square took place on Saturday last, in the theatre of the Museum of Geology, Jermyn-street, the Rev. Sir Emilius Bayley, bart., presiding. Mr. F. Bennoch, the hon. secretary, read the report, which stated that the school has in every respect during the past year maintained its high position, and that Her Majesty has granted an additional sum of 10*l.*, again raising the value of the Queen's scholarship this year to 50*l.* The number of awards earned by the school in the national competition with 141 other schools of art in the United Kingdom has been higher than any hitherto attained. Seventeen national awards have been won by the students of this school, which is a satisfactory advance upon last year, when only six were taken. Four out of the seven students in the modelling class sent up works to South Kensington, and they all obtained awards, one being a national medal. Two students had their work placed at the Female Artists' Exhibition last season. Three students, Alice Hanslip, Ida Lovering, and Catherine Benson, have been admitted this year to the schools of the Royal Academy. A former student, Blanche Macarthur, won the silver medal at the Royal Academy, for a head from the life. The rev. chairman then proceeded to distribute the prizes, consisting of books, boxes of colours, certificates, portfolios, &c., Miss Angela Mary Marshall taking the Queen's gold medal, and Miss Rhoda Carleton M. Holmes the Queen's scholarship of 50*l.*, two young ladies (Florence Reason and Catherine Wood) being both recommended for the subscribers' scholarship, while Miss Elizabeth Lovell had awarded to her an extra subscribers' scholarship. Referring, in conclusion, to the progress of the school, the chairman paid a well-deserved compliment to the zeal of the superintendent, Miss Louisa Gann, whose exertions have resulted in so much success, and to Miss Wilson, Miss Burrell, and Miss de la Belinaye, the assistants of Miss Gann.

Sunday-School Room, Clevedon, Bristol. For some time past the old schoolroom in connexion with the Copse-road Chapel has been felt to be too small and inconvenient, and last week a new room was opened. It has been built large enough to accommodate 300 persons, at a cost of 800*l.* Mr. Hans Price was the architect, and Mr. Wm. Green contractor.

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

THE rules of the National Association of Master Builders of Great Britain, which was formed and held its first meeting at Crewe on the 23rd of January last, have been circulated.

Representatives from London, Manchester, Liverpool, Birmingham, Leeds, Bradford, Wolverhampton, Bristol, Cambridge, Northampton, Lincoln, Dudley, Walsall, Bolton, Warrington, St. Helen's, Crewe, and Runcorn assisted in its formation. It seems that much difficulty has been found in ascertaining with accuracy the state of trade, number of hours worked, and rates of wages paid to workmen in various districts, and it is one of the objects of this Association to provide such information at regular intervals of time, so that when demands are made by the operatives, authenticated statements may be at hand to enable the masters to judge whether such demands are reasonable or otherwise.

The objects of the Association include,—"To secure united action and mutual support in dealing with demands made by combinations of workmen, especially in reference to hours of labour, piece-work, overtime, employment of non-union men, apprentices, use of machinery, &c." "To provide for the equitable arrangement of all differences between workmen and employers in the trade;" and "to obtain the recognition by architects and others of a fair and equitable form of contract between builders and their customers."

The committee have appointed as general secretary Mr. William Knox, of the Liverpool Master Builders' Association, 6, Lord-street, Liverpool, and Mr. Thomas Clay is the president.

MASTERS AND MEN.

Dundee.—A meeting of the operative masons of Dundee has been held, to consider an intimation from the employers that wages were to be reduced ½d. per hour. After consideration, it was agreed to submit to the reduction, and to request the employers to guarantee that no further reduction would take place for the next three months. The wages will now be 8d. and 8½d. per hour.

Bolton.—The master builders of Bolton have given notice to the carpenters and joiners in their employment that on and after the 1st of May their working-hours will be reduced from 52 to 48½ per week during the summer months, and to 43½ hours per week during the months of December and January; also that their rate of wages per hour will be reduced ¾d. during summer and 1¼d. during winter, thus making their wages 8¾d. per hour in summer and 9½d. per hour during winter.

Edinburgh.—General meetings of the masons of Edinburgh and Leith were held last week, when the proposal of the master builders to reduce the wages 1d. per hour was under consideration. It appeared that the conference between the masters and the men, held in the first week of February on the matter, was adjourned till the middle of April; but the men came to a unanimous resolution that they in the meantime intimate that they stand by the old agreement of 9d. per hour, and that that should be the rate of wages for the next twelve months. The masters, it seems, have stated that they are willing to submit the question to arbitration, and it was agreed by the men to hold another general meeting to determine whether they will submit the question to arbitration.

The "National Conciliation League."—The National Conciliation League has resolved to vigorously propagate the principles of the Association, which aim at the formation of boards of conciliation in all great centres of industry, for the amicable adjustment of disputes arising between masters and men. Among the members and promoters of the League are Mr. Samuel Morley, M.P., Mr. A. Macdonald, M.P., Mr. K. D. Hodgson, Mr. Thomas Halliday, &c. A congress to discuss the scheme will, it is said, shortly assemble in Bristol.

ELLISSEN *v.* LAWRIE.

SIR,—In the report of the case of Ellissen *v.* Lawrie in last week's *Builder*, "Messrs. Holland" are referred to as having executed some defective drainage works.

We shall feel obliged if you will allow us to state that ours is not the firm in question.

HOLLAND & HANNEN.

PUBLIC CLOCKS.

THE passers by the great western thoroughfare, Piccadilly, will, for the next month or two, miss their old familiar "time-o'-day" reminder, the clock of St. James's Church. By the 200 years' wear its huge mechanism had become so dilapidated that, for some time past, it has with difficulty been kept going at all; and its timekeeping was very uncertain. Its four faces had become so dimmed by accumulations of dust that their indications were scarcely distinguishable. Thus it had become evident that, if the public accommodation were to be continued, there must be a new clock. The circumstances of the case having been brought under the notice of the parish representative vestry, the Board at once unanimously adopted a proposition that the work of renewal should be done as a charge on the rates, and has accepted a tender for the works by the Messrs. Moore, of Clerkenwell-close. The "ting-tang" of the quarters on the renewed clock will be as formerly,—that is, on two small bells; but the hours, which heretofore were struck on a mere 3-cwt. bell, will be struck on a fine tenor bell of 22 cwt., which will consequently carry the hour record to a very much increased distance.

A FOUNTAIN FOR LIVERPOOL.

MESSRS. W. T. ALLEN & Co., of 2, Somerset-buildings, Lambeth-hill, have lately erected, in St. George's-square, a cast-iron fountain, the gift of Lieut.-Col. Steble. The shaft rises from the centre of a circular basin, 30 ft. in diameter, and is octagonal in shape, having at its base four pedestals, on which are seated four figures, representing Neptune, Amphitrite, Acis, and Galatea, and between these are shields, bearing suitable inscriptions in commemoration of the gift. At 12 ft. above the base, and 12½ ft. in diameter, is an octagonal basin, and above this a second basin about 8 ft. in diameter; in the centre of this last basin the shaft terminates in a representation of a rock, upon which rests a well-defined figure of a mermaid. The total height to the top of the mermaid is 23 ft., and the jet will rise to the height of about 30 ft., the water falling into the basins below, and from these passing into the lowest basin of all, in which are outlets for the overflow. In the sides of the two upper basins are placed eight masques of dolphins, alternating with eight ornamental roseaux, from which flow sixteen jets of water. The whole work has been carefully put together and is creditable to Messrs. W. T. Allen & Co., the castings being sharp and clean.

APPROPRIATION OF THE FUNDS OF TRADE UNIONS.

SIR,—In your issue of the 22nd of December, 1877, Mr. Nisbett, the Secretary of the Masons' Strike Committee, wrote the following:—"There is no society that spends anything like the amount of money in trade disputes as in administering benefits."

The circumstances which have prompted me to refer to those words are as follows:—

During the past year a praiseworthy effort was being made by a small number of bricklayers to bring about amongst the members of their craft a higher status of skill and technical knowledge, so as to enable them to become more efficient as journeymen, and to be able to compete upon more equal terms with the carpenter and mason branches for situations of trust. Classes were formed, and were well attended. But although the services of the teachers were entirely gratuitous, assistance was needed to meet the necessary expenses, such as rent and gas, printing, implements, &c.

Amongst other appeals for help was one to the Executive Council of the Bricklayers' Trade Society, the response to which was the following resolution, which I copy from their Monthly Report for September last:—"That we, the General Council of the Operative Bricklayers' Society, approve of the efforts to promote technical education amongst bricklayers, and wish the committee every success, but have no power to grant any sum of money from the funds for such a purpose, and recommend the members to help, and attend such classes when practicable."

In regard to that resolution I should have no remark to make: but I read in the *Daily Telegraph* of Saturday last, the 23rd ult., the following amongst the list of contributions

towards the support of the persons on strike, the Bricklayers of London, 150*l.*; a previous contribution of 10*l.* having been announced some few weeks ago.

I place these few facts before you without comment. A BRICKLAYER.

THE FALL OF BUILDINGS IN THE HAYMARKET.

ON Wednesday last Mr. St. Clair Bedford, the coroner for Westminster, resumed the inquiry into the cause of the death of Mr. William Baron, whose body was found beneath the *débris* of the buildings in the Haymarket, which fell on the 17th ult. The witnesses examined were Mr. George Vulliamy, the Superintending Architect of the Metropolitan Board of Works, who deposed that he was unable, from the examination of the ruins, to determine what was the cause of the accident; Mr. Robert Walker, the District Surveyor, who spoke disparagingly as to the quality of the cast-iron pillars and wrought-iron girders; John Sweetland, the foreman of the job up to the 29th of December, who suggested that the retention of the lower portion of the old party-wall between the new building and Mr. Baron's house was the main cause of the accident; and Charles Luke Gooch, the foreman in charge of the works from the 31st of December to the time the buildings fell, who gave some important evidence as to the condition of the old portion of the party-wall, which he stated to be tolerably sound, though out of plumb. It appears, however, that on the day that the building fell, a portion of the wall had been "dubbed out" in order to remedy its want of perpendicularity, and so as to fit it for carrying some stone steps. Notwithstanding, the witness said, he had no suspicions as to the safety of the structure. The inquiry was then adjourned until Friday (yesterday). We shall give a more detailed report next week.

Books Received.

The Bibles in the Caxton Exhibition, 1877. By HENRY STEVENS, F.S.A. Stevens, 4, Trafalgar-square.

THE catalogue of Bibles forming part of the late Caxton Exhibition, as prepared by Mr. Henry Stevens, was a laborious and excellent work, and must have made many wonder that such work could be obtained without fee or reward. Time having since given opportunity for even further revision and additions, this catalogue, as now before us, has become a bibliographical description of nearly 1,000 representative Bibles in various languages chronologically arranged from the first Bible printed by Gutenberg in 1450-1456, to the last Bible printed at the Oxford University Press, the 30th of June, 1877, and is most honourable to the author. Mr. Henry Stevens, though called "of Vermont," has long been known in London as an eminent bibliographer and lover of books, and what he has done in connexion with the Caxton Exhibition cannot fail to raise his reputation. The catalogue seems to us an entirely remarkable production.

VARIORUM.

"THE Timber Merchant and Builder's Vade Mecum," by Geo. Bousfield (Spon), is a useful compendium of tables. The fact that it has gone into a second edition shows that it was needed.——"The City of London Directory for 1878" keeps up to its mark; it gives information in the best form for reference, respecting all that is useful in connexion with the commerce of the City of London. A new feature of importance has been introduced in the shape of a complete list of bankruptcies and liquidations by arrangement for the year 1877. An officially corrected list of the members of Lloyd's is also a useful item not hitherto given. The Livery Companies section has been extended, and gives, as we have before now said, valuable details concerning the City Guilds. In fact, it is a very valuable directory.——"The Local Government Directory for the Year 1878" (Knight & Co., Fleet-street) is precisely what it purports to be, and is an absolute necessity for all concerned with local government Boards. The list of Local Government Books and Forms is of itself very valuable.——"Debrett's Peerage, Baronetage, Knightage, and Titles of Courtesy, Illustrated" (Dean & Son), is a fine fat, red book, with a reputation of many years to fall back upon. Dr. R. H. Mair, the editor, claims to have produced for 1878 not only a new edition, but a new and improved work that is incomparably superior to its predecessors. Having looked through it we willingly admit his claim. We would specially notice the intelligible manner in which is set forth the succession to peerages that will be separated on the demise of the present incumbents: *e.g.*, the dukedom of Buckingham will become extinct on the death of the present peer, but three of his minor peerages will devolve upon as many different persons, each of whom is referred to under one heading, as are also those who are heirs to other peerages similarly circumstanced, such as the Marquessate of Bute, the honours of which will be divided between two persons.

Miscellanea.

Egyptian Obelisks.—Mr. Basil H. Cooper, B.A., last week delivered a lecture in the hall of the Society of Arts on "Egyptian Obelisks and their Relation to Chronology and Art." The lecturer detailed the object and the mode of cutting and rearing Egypt's most characteristic monuments—her obelisks. These monuments were written, and therefore historical in the strictest sense of the term. After centuries of groping and guessing as to what the "picture writing" represented, the Rosetta stone was found in the ruined temple of the Egyptian God Tum, by M. Boussard, one of the *savants* who accompanied the French expedition to Egypt. This was the Archimedean fulcrum found, and the Archimedes who was to stir the unknown world was the Englishman, Dr. Young. But Young had shortcomings, and it was Champollion who thoroughly unravelled the Egyptian graphic system, and first made possible something like a restoration of the history of the Pharaohs. The able lecturer went on to dilate upon the discoveries which had been since made in chronology through the means of these monuments.

The Edinburgh Aquarium.—Contracts for the alteration of the west end of the Waverley Market, and the erection of the aquarium there, the architect of which is Mr. T. B. McFadzen, have been adjusted, and the works will be commenced forthwith. It is anticipated that the aquarium will be opened about the middle of June, and it is stated that the Princess Louise will be present at the inauguration. The following are the successful contractors:—Masons' work, Messrs. Galloway & Macintosh, Glen-street; carpenter and joiners' work, Mr. Thomas Smith, Upper Grove-place; plumbers' work, Messrs. Hunter & Walker, Thistle-street-lane; plaster and cement work, Mr. J. J. Fergus, St. David's-terrace; smith and iron work, Messrs. T. Gibson & Son, Bainfield Ironworks; glazing, Messrs. Ciceri & Co., Frederick-street; and slate work, Messrs. Field & Allan, George-street.

St. George's Union Infirmary, Fulham-road.—The new poor-law infirmary which has been for some time in course of erection in Fulham-road, Brompton, for the guardians of St. George's (Hanover-square) Union, was opened on the 20th ult. by the Right Hon. G. Sclater-Booth, M.P., president of the Local Government Board. The building, of which we gave a view nearly a year ago (vol. xxxv., p. 293, March 24, 1877), has been erected from plans by and under the superintendence of Mr. H. Saxon Snell, architect, at a cost of about 85,000*l.* It accommodates 830 inmates, and is the largest establishment of its kind in London. It is planned upon the "pavilion" system. Messrs. Wall Brothers were the builders, and Mr. Thompson, the clerk of works.

New Church in Holborn. — The new church of St. John the Evangelist, Red Lion-square, Holborn, was consecrated on Saturday last by the Bishop of London. The church, which has been erected at a cost of 22,500*l.* (including a clergy-house), was somewhat fully described in the *Builder* just a year ago (Feb. 24, 1877,—vol. xxxv., p. 190), on the occasion of a visit by the Architectural Association. It is somewhat remarkable in being vaulted throughout, the nave, 80 ft. long, having a span of 40 ft. Mr. J. L. Pearson, A.R.A., is the architect; Messrs. Dove, Brothers, were the builders; and Mr. Bubb was clerk of the works. The church contains sittings for 1,000 persons.

Fire at Bruges.—The fine reception-rooms of the Government House at Bruges have been completely consumed by fire, which is supposed to have originated from the overheating of flues preparatory to a ball which was to be given by the recently-appointed Governor of West Flanders. The destruction of property includes all the splendid furniture, plate, library, and paintings.

Horse Show at the Paris Universal Exhibition of 1878.—The French authorities have extended the time for making entries to this show. We are asked to say that intending exhibitors should apply for forms, which must be filled up and returned not later than the 20th of April next, to the Secretary to the Royal Commission, Canada-buildings, King-street, Westminster, S.W.

German Athenæum, Mortimer-street, Regent-street.—An exhibition of paintings in oil and water-colours, and drawings in black and white, by known artists, has been opened here.

Royal Society.—The President and Council will hold informal receptions at Burlington House on March 6th and May 22nd. The special *conversazione* of the season will be held on Wednesday evening, May 1st.

TENDERS

For the erection of a new dispensary, in West Ham-lane, Stratford, Essex, for the West Ham, Stratford, and South Essex Dispensary Committee. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Woods	£3,775	0 0
Killby	3,687	0 0
Cheffins	3,552	0 0
Norton & Son	3,497	0 0
North, Brothers	3,405	0 0
Knight & Dustow	3,386	0 0
Abrahams	3,387	0 0
Morter	3,379	0 0
Read	3,375	0 0
Hocking, Brothers	3,347	0 0

For the erection of a warehouse, on the south side of the Alexandra Dock, King's Lynn. Mr. J. S. Valentine, engineer:—

Martin	£11,074	0 0
Clare	9,652	0 0
Bardell, Brothers	9,2 0	0 0
Dawes	9,050	0 0
Cook, Skipper, & Bennett	8,800	0 0
Dye & Clack	8,778	0 0

For the erection of a Methodist New Connexion Chapel, at Gornal, Staffordshire. Mr. Charles Round and Mr. Henry Beddoe, architects. Quantities supplied:—

Everal	£1,935	0 0
Round & Bagnal	1,836	0 0
Holland & Sons	1,760	0 0
Jones & Sons	1,750	0 0
Peacock	1,744	4 6
Adams	1,720	0 0
Stockton & Son	1,677	0 0
Nicklin	1,550	0 0
Webb & Round	1,470	0 0
Exors. of Millward (accepted)	1,420	0 0

For alterations to the Duke of York, Church-street, Lisson-grove:—

Brewer	£292	0 0
Patterson	237	0 0
French (accepted)	218	0 0
Conway, Brothers	215	0 0

For 71 iron sashes, for Messrs. Gerrish & Ames. Mr. Jas. Gibson, architect:—

	Cast Iron. With Ventilators.	*Without.*
Burt & Potts	£137 4	£108 6
Soper	102 19	94 10
Millar & Sons	86 5	86 3
General Iron Foundry Company	93 14	78 4
Rownson & Drew	93 7	78 8
Temple & Co.	89 0	71 5
Coalbrook Dale Company	79 19	71 3
Gardener & Co.	70 5	59 16
M'Naught, Robertson, & Co.	61 14	51 15
Lindsay	57 4	47 8
	Wrought Iron.	
Miller & Sons	£388 5	£327 15
Gardener & Co.	2 0 6	161 19
Lindsay	144 10	107 7
Burt & Potts	128 11	90 15
Rownson & Drew	118 12	88 1
General Iron Foundry Company	118 4	88 0
Temple & Co.	117 0	86 0
Soper	104 11	94 13
M'Naught, Robertson, & Co.	99 1	— —
Lodwidge & Kingdon	67 3	62 8

For sewerage and making a new road near the Infirmary, for the Hereford Town Council:—

Cowdery & Sons	£517 15 0
Davies	333 0 0
Welsh	330 0 0

For the erection of a house, at Highbury-grove, for Sir Francis Lycett. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Morter	£2,015	0 0
Brass	2,029	0 0
Browne & Robinson	1,980	0 0
Gregar	1,950	0 0
Hobson	1,945	0 0
Woodward	1,900	0 0
Tarrant & Son	1,837	0 0
Scrivener & White	1,787	0 0

For restoration of malt-store, after fire, and addition of a new brewery to the present malting, at the Culverden Brewery, Tunbridge Wells, for Messrs. E. & H. Kelsey. Mr. Geo. Seamell, architect. Quantities supplied by Messrs R. L. Curtis & Sons:—

Walker	£5,892	0	0
Strange & Son	5,634	0	0
Mansfield & Son	5,510	0	0
Punnett & Sons	5,497	15	0
Wallis	5,495	0	0
Morter (accepted)	5,383	0	0

For the erection of Cowley's Trust Middle-class Schools, at St. Helen's, Lancashire. Mr. Henry Summers, architect. Quantities supplied:—

Boardman, Brothers	£12,450	0	0
Pemberton	12,350	0	0
Waizbom	12,320	0	0
Whittakers	11,677	0	0
Brown & Backhouse	11,200	0	0
Harris	10,498	0	0
Morrison & Son	10,440	0	0
Harrison	10,067	0	0

For rebuilding The Pindar of Wakefield, Gray's-inn-road. Mr. Charles Young, architect. Quantities by Mr. Francis T. W. Miller:—

Greenwood & Sons	£3,435	0	0
Colley	3,391	0	0
Outhwaite & Son	3,324	0	0
Auley	3,277	0	0
Lister, Brothers	3,260	0	0
Kirk & Randall	3,180	0	0
Bishop	3,170	0	0
Kirk	3,133	0	0
Lacable	3,103	0	0
Higgs (accepted)	2,975	0	0
Bar Fittings.			
W. Gibbs (accepted)	555	0	0
Pewtering.			
Warne	280	0	0
Beach (accepted)	267	15	0
Heath	259	0	0
Watts	249	15	0
Gasfittings.			
Winn	201	0	0
Beach (accepted)	168	7	0

For works of water supply, sewage distribution, land-drainage, &c., for the Oxford Local Board. Mr. W. H. White, engineer:—

Mackay	£6,751	0	0
Bugbird	6,666	16	6
Bell	6,377	6	8
Ottaway (accepted)	5,842	18	9

For the erection of stabling for forty-seven horses, and other works, at Chelsea, for Messrs. Carter, Paterson, & Co. Mr. Wm. Eve, architect:—

Nightingale *	£2,130	0	0
Heiser	1,760	0	0
Crabb	1,567	0	0
Salt	1,494	0	0
Sheffield & Prebble (accepted)	1,479	0	0

* Error afterwards discovered.

For the erection of cottage and stabling, at Stoke Newington, for Messrs. Carter, Paterson, & Co. Mr. Wm. Eve, architect:—

Devereux	£567	0	0
Heiser	547	0	0
Crabb	532	0	0
Sheffield & Prebble (accepted)	497	0	0
Salt	492	0	0

For extension of warehouse, at Millwall, for Mr. J. T. Morton. Mr. Wm. Eve, architect:—

Hubbie & Trott	£435	0	0
Sargeant	379	0	0
Heiser	370	0	0
Sheffield & Prebble	365	0	0
Salt	325	0	0
Saunders	316	0	0
High (accepted)	290	0	0

For fittings to Civil Service Stores, Oxford-street. Mr. Josiah Houle, architect. Mr. C. G. Mumby, surveyor:—

Sage	£4,450	0	0
Drew	3,855	0	0
Sewell	3,500	0	0
Langmead & Way	3,184	0	0

For alterations to the Pitt's Head, Mayfair. Mr. W. Ansell, architect:—

Langmead & Way	£750	0	0
Goden	715	0	0
Richards	620	0	0

For the glass tablets and decorations at the Queen Anne, West-street, Walworth, for Mr. James Bacon:—

W. Gibbs (accepted)	£226	0	0

For centre building and one wing of the Incurable Home, Cork. Mr. William H. Hill, architect. Quantities by Messrs. Gibbon & Butler:—

MacMullen	£7,838	0	0
Kenna	7,745	0	0
Longfield	7,250	0	0
Fitzgerald	6,689	0	0
Delaney	6,463	0	0
Flynn	6,443	0	0
Hill (accepted)	6,195	0	0

Jewin Welsh Chapel.—In list of tenders last week, Hobson, 6,216*l.*, *should be* 5,216*l.* Name is in correct place.

School for Imbecile Children at Darenth.—Messrs. Chandler & Sons' tender, amounting to 5,900*l.*, for sanitary fittings, steam warming and pipe work, &c., was omitted from the list of tenders sent to us by the architects (Messrs. A. & C. Harston), and published in the *Builder* of the 23rd of February.

TO CORRESPONDENTS.

J. W. S.—W. B.—H. J. W.—G. M.—J. D. S.—L. & M.—A. V.—T.—W. E.—T. E. K.—H. L.—W.—W. H. H.—F. T.—W. M.—J. W J. B. S.—C. B.—C. F.—W. T. A. & Co.—S. H.—B. H.—W. K.—T. B. M'F.—J. D. V.—T. S.—W. H. M.—H. S.—W. & G. A.—D. T. & F.—Mr. K.—K. W.—W. G. S.—H. P.—W. S.—R. C.—H. H.—W. H. B.—W. B.—A. H. H.—E. W. B.—P. C. O.—W. T.—F. N. (window-fastenings to answer the purpose are to be had).—G. A. W. (next week).—A. D. D. (shall appear).—S. S. (ditto).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

VOL. XXXVI. No. 1831. SATURDAY, MARCH 9, 1878.

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The Work of the Early Stonemason.

PROGRESSIVE development of the art of the mason forms the subject of a special chapter in the history of architecture. It is a chapter of no small importance; as its study will be found to extend to the earliest dates of human history, if not into pre-historic times. The facts on which any theory must be constructed are durable realities. And the special value of the investigation consists, not only in the fact that it endeavours to fill up a gap in the history of architecture, both as a science and as an art; but that it further tends to link architectural with ethnological progress, and to exhibit those steps in the history of various races which have been parallel in the order of national development, although not in actual time.

The subject has especial interest, as tending to throw some light on the noble pre-historic relics of our own island, as to which there is so entire a break with regard to any traditions of their origin. We do not forget the efforts that have been made to bring down this origin to the recent date of the Roman occupation of Britain. Without, at the moment, insisting on the weighty arguments opposed to this view, for some of which we may refer to our own columns, we think that it cannot be denied that to trace the development of the art of the stone-cutter is a method of research which cannot fail to throw some light on the question.

Masonry, as the term is now ordinarily employed, may be taken implicitly to include the idea of stonecutting, as well as that of the use of cement, or some artificial method of joining stones solidly together into a mass. But the definition given in the last edition of Johnson's Dictionary is "craft or performance of a mason." And a mason is simply defined as a "builder in stone." These terms cannot be bettered; for they include not only the most finished effort of a perfected art, but the rudest steps of its commencement. Such was the work to which we recently called attention at Tiryns, where vast unshapen stones are piled and fitted into walls, "with only occasional, and apparently later, marks of the tool."

It has, perhaps, escaped attention hitherto, that between the first stage of Cyclopean, or primitive stonework, and the second stage, in which, while the idea of the course of masonry is undeveloped, the sides of the several stones have been reduced to plane, though rarely vertical, joints, has intervened a step in human progress which is not due directly to the mason. We are apt to look at the succession in question as if it were the simple development of masonic skill. But we have no reason for assuming that the builder of Tiryns was unaware that it would have been better to dress his joints than to pile stone upon stone, fitted as best he could. Something was required beyond the wish to make the strongest wall possible. That something was a tool that would cut stone.

As to this, it is perhaps safer to put our views in a tentative form than to attempt to speak with a preciseness as yet unjustified. What was the first tool of the stone-cutter? How far was it possible to cut stone with stone tools; to dress joints by the use of axes of obsidian, jade, or any hard stone? The subject is worth a little experimental research. Supposing it to be shown that such a commencement of stone-cutting was a possible step in the art of the mason, we think that a certain distinction may by this means possibly be pointed out in the examination of ancient masonry. For while a stone axe might, we apprehend, occasionally be used, especially in the case of tufa, and of not a few descriptions of less compact rock, we are not prepared to admit the applicability of a chisel made of stone. If this be so, we shall find in the transition from axe-dressed to chisel-dressed stone a note of time which indicates at what period in his progress the mason was first indebted to the contemporary skill of other artisans for metal tools.

This brings us to another question, of no small importance, if thoroughly solved. To what extent was it possible to cut stone with a chisel before the introduction of iron? We are aware from literary testimony that the manufacture of iron dates much later than that of bronze. Not that the subject has been exhaustively treated; but still iron, when it first came into use, appears to have been the rarer and more highly valued metal. In Homeric times (whenever they date), bronze or brass was used not only for defensive, but for offensive arms. The earliest date to which we can with certainty carry back the proof of the use of iron is 5,400 years ago. In the Pyramid of Souphis (or Cheops) iron has been found in such a position as to leave no doubt that it had been in the possession of the builders of the pyramid, under the fourth dynasty of Memphite kings of Egypt. This significant discovery may perhaps throw light on another question of extreme importance as regards the history of masonry. That is,—how were the hieroglyphics cut? We shall be indebted to those learned men who are doing so much to unveil the written mysteries of Egyptian history for any definite statement of the date of the most ancient incised hieroglyphics; and also, as to the fact whether any appreciable differences in the style or mode of cutting is to be detected, and referred to known dates. The general impression produced by a study of the inscribed statues and *stelæ* at the Turin Museum, at the British Museum, and elsewhere, is, that as far back as Egyptian relics exist, the hieroglyphics were cut in basalt, green-stone, granite, or other hard stones, with a depth and a precision which are those of the gem-cutter rather than of the stone-cutter. As iron was known in the time of the fourth dynasty, steel might have been also known; or the use of iron of meteoric origin, or of extreme purity, may have given to the early inscribers the means of effecting their work. On the other hand, there is the possibility that some kind of drill was used for the inscriptions; and if corundum powder was employed, a soft iron or copper drill might have been sufficient for the purpose of the workman. Adamantine corundum, an excessively hard spar, occurs among the granite and mica schists of Egypt. Granular corundum, or emery powder, is found in Greece, and may very probably have been known to the early Egyptian artists. At all events, this part of the subject will repay research. At present we will only attempt to lay down the principle that the mode of cutting stone that was employed at any particular period, affords an index to the knowledge and use of metal tools possessed by the masons of that time and country.

In Mycenæ we have instances of the cutting of stones of the magnificent dimensions of nearly 30 ft. by 18 ft. by 4 ft. At Avebury we have stones, presumably once cut, of almost equal size. In the Great Pyramid we have examples of enormous stones cut so that the joints are impenetrable to a knifeblade. In the walls of the Haram or Temple enclosure of Jerusalem we have stones of the same giant family, some of which are not older than the time of Herod the Great, or the commencement of the Christian era. We have thus a range of certainly 3,500 years, during which the masons of Greece, of Egypt, of Syria, and possibly those of Wiltshire, cut, dressed, and set enormous stones. To how much earlier a date we may hereafter be able to push back the commencement of the art of stonecutting, which we think may be fairly associated with the presence of polygonal cut stones in a wall, we cannot attempt even to guess; but we have, at all events, something like a means of measuring the relative advance of various tribes or nations by the comparison of their works. Whether the builder of the Great Pyramid wrought 1,000 or more years before or after the builder of the walls of Tiryns, the former was certainly a much more educated and experienced mason than the latter. So again, by comparison of their works, we should conclude that the masons who built Stonehenge and Avebury were much earlier, dating by their professional knowledge, than those who built the Pyramid. Civilisation, we know, has often been narrowly localised. A high state of industrial perfection in one country may co-exist with a low condition in another at no very remote distance. If this were not the case we should have something approaching to the nature of proof that Stonehenge is older that the Great Pyramid. We are unaware of any good data for fixing the earliest possible period of the erec-

tion of the English megalithic temples, though reasons have been adduced in this journal for the opinion that marked geological changes have affected this part of Europe since those noble structures were completed.

Another very ancient evidence of the art of the stone-cutter is to be found in excavations of rock. Of these the examples in Egypt, in Eastern Syria, in Western India, and elsewhere, are not unfamiliar to the architect. Very generally they give signs of being of much later date than the megalithic buildings of which we have been speaking. A trabeate form of architecture has been imitated, in numerous instances, by men who wrought in the living rock. But there are two groups of stonework *in situ* as to which we are as yet only in course of receiving definite information. These are the military rock defences of Palestine, and the rock-cut tombs which abound in the Holy Land. The old sites of the Jewish cities are for the most part covered with mounds of rubbish, in which it is utterly vain to expect such surprising relics to be hidden as have rewarded the explorers of Mesopotamia. But very often the modern towns which bear the names, and no doubt stand on the sites, of Biblical and pre-Biblical cities, are surrounded by a scarp of rock artificially cut. "The most wonderful of these scarps," writes Lieutenant Conder, R.E., in the Quarterly Statement of the Palestine Exploration Fund for January, 1878, "is that at the south-west corner of Jerusalem, where a carefully-worked wall of rock, 50 ft. high, is traced for over 150 yards. Similar scarps, on a smaller scale, are not uncommon throughout the country." The account given in the Book of Samuel, of the capture of Jerusalem by David, 2,900 years ago, gives reason for the belief that the rock scarp was at that time in existence, even if it may have been carried to a greater depth later; as to which, however, there is no evidence.

The same explorer calls attention to another work of the stone cutter in the same country; namely, the excavation of rock-cut reservoirs and cisterns. "Bell-mouthed cisterns occur so constantly near, and in connexion with, Jewish tombs, that it seems natural to ascribe them to Jewish workmen, though they have no marks of date which will fix them so early." It is, however, evident that works of this nature must have been co-eval with the settlement of many parts of the district bordering on the Mediterranean. Those tribes which inhabited watered plains, or dwelt on pervious soils, in which they might find springs, or dig wells, had no need of the services of the quarrymen and the mason in combination. But where the soil is rocky and impervious to water, where the rainfall is unequally distributed throughout the year, and where the temperature renders a certain abundance of water a necessity of life, no permanent habitation of a country can be effected without the construction of cisterns.

Of like nature to the Syrian cisterns are the granaries or treasuries that are sunk in the soft, dry rock so prevalent along the Eastern versant of the Apennines. In the neighbourhood of Foggia, where rich crops of corn are secured in the summer months, the ground is, in some places, honeycombed with bell-shaped or conical excavations, in which corn is stored sometimes for many years. The form of those granaries so closely resembles that of the Etruscan tombs, in which the arch is anticipated by the progressive over-setting of course above course of small bedded and squared masonry,—set, in some tombs that we have opened, without mortar,—that it seems proper to associate the excavating with the building stone-cutters of *Magna Græcia*, and probably of other countries.

With regard to tombs, the explorations of Lieutenant Conder throw light on a very important mark of relative antiquity. Near to every modern village or ancient site of a town in Palestine, usually on some opposite hill, are to be found rock-cut tombs. They are hardly ever found within the ruins. They may be divided into three classes. Of these, the first bear the name of *kokim*, or oven-like tombs. They are formed by cutting small parallel tunnels, each of the dimensions proper to contain a human body, from the sides of a rectangular chamber. The *kokim* vary in number from one or two up to eighteen or twenty; and in size from the length of 3 ft. to that of 7 ft. There is no system of orientation. The entrance-door to the chamber is in the face of the cliff, and the chamber itself is excavated in accordance with the lie of the rock. The chamber may probably be regarded as the original provision for a family tomb; fresh *kokim* being cut from time to time, as wanted, of dimensions not larger than requisite for the sepulture of the individual for whom it was cut.

The proof that this form of tomb is the oldest in the country is definite. The second class of tombs is that containing *loculi*, or side receptacles, parallel with the walls of the chamber, instead of being at right angles to it as in the former class of tombs. The *loculus* arrangement is still adopted in mausoleums in Italy, as for instance, in the Superga, near Turin, where the members of the Royal family of Savoy are laid to rest in parallel niches, something like the berths in a vessel, the faces of which are walled up on the interment being made. That these tombs in Palestine are of later date than the *kokim* is shown by the fact that there are instances in which an outer chamber, containing the former kind of receptacles, leads to an inner chamber,—pierced further in the rock,—containing *loculi*. But no instance has been found in which the order is reversed.

Of the anterior limit of the date of the *kokim* tombs it can only be suggested that it may probably have been as early as the inhabitation of Palestine by a burying, as contrasted with a burning, race. That they were used by the Jews is shown by the description given in the Talmud, and by the occurrence of Hebrew inscriptions, and of a representation of the sacred candelabrum in certain cases. To others a traditional veneration is attached. But the substitution (in part or in whole) of the second for the first method of construction is shown to be older than the Herodian time by the references made by each of the Evangelists to the rolling stone with which the mouth of the tomb in the garden was closed. This arrangement is said by Lieut. Conder to occur almost invariably in the *loculus*, but not in the *kokim* tomb. An inclined groove is cut before the entrance to the chamber, and a cylindrical stone, like a millstone, is placed in the groove. To enter the tomb it is necessary not only to roll the stone up the slope, but to wedge it up, as it would otherwise descend with its own weight, and completely close the entrance.

The tombs belonging to the second group are more ornamented than those of the earlier system. Some of them have façades covered with a rude kind of imitation of Classic mouldings. "There is generally a portico, with a frieze above, supported by pillars cut in the rock, with Ionic or Corinthian capitals. The chamber is sometimes also ornamented within." If the attribution of a well-known tomb at Jerusalem to Helena, Queen of Adiabene, be correct, we have a dated instance of this kind of tomb in the first century of the Christian era, in accordance with the references to the rolling stone made by the Evangelists. The *loculus* tombs occur during the Byzantine period, but are not found in the crusading cemeteries.

The third class of tomb is the rock-sunk tomb, which is a shaft sunk in the rock, with an arched recess on either side, in which two bodies can be deposited. The earliest examples found by Lieut. Conder are connected with Byzantine monasteries. No indication has been found of the use of this kind of tomb by the Jews, unless it be taken from the account of the tomb of Lazarus, in the fourth Gospel, which is called a *spelæum*, with a stone that lay on it. The natives of Syria call this third group Frankish tombs.

The only relic of Jewish architecture further mentioned by Lieut. Conder (omitting for the present any question as to the sites of the high sanctuaries at Jerusalem and at Hebron), are the vineyard towers. "These buildings are generally about 15 ft. square outside, and the same in height. The walls are of unhewn blocks, 4 ft. or 5 ft. long; the roof, supported on a buttress, is of slabs 7 ft. or 8 ft. long. These solid and rude buildings occur near rock-cut wine-presses and ancient tombs."

The great works of Herod the Great at Cesarea, Samaria, Ascalon, Antipatris, Jerusalem, and Herodium have almost entirely disappeared. It is only at Jerusalem and Hebron that megalithic masonry, with the draft and dressing of the stones which are peculiar to Palestine, now occurs. The aqueducts attributed to the same period are of small masonry laid in excellent mortar. Exact information as to all these architectural points will be accessible when the memoir, now in course of preparation to accompany the Ordnance map of Palestine, is published. That work will be found to contain a perfect mine of information for the architect. Plans have been made of all ruins of any importance. The size and mode of dressing of the masonry has always been noted, with the character of the mortar, and other particulars. Mouldings of capitals, cornices, and bases have been measured, and sketches made of tracery. Photographs of architectural details have in many instances been taken.

The peculiar drafting of the enormous blocks forming the walls of the High Sanctuary at Jerusalem is known to most of those interested in the subject, from photographs. We must await the early publication of "Tent Work in Palestine," announced by Mr. Bentley, for more full description of this unique, or almost unique, masonry, and for a statement of the evidence as to its anterior and posterior dates. There is also a drafted masonry of the Byzantine epoch, between A.D. 326 and A.D. 636, during which period Palestine was covered with Byzantine monasteries and chapels. Of this there is a dated example in the walls of the fortress built by Justinian round Zeno's Church on Mount Gerizim. The masonry is, however, entirely different from that at Jerusalem. The draft is deeper and broader, irregularly cut, and finished with an entirely different dressing. Semicircular arches accompany this masonry, with narrow keystones, and broad voussoirs at the haunches. This is also the case with the tunnel vaulting of the churches, as in that of St. John at Beit Jibrin. Another peculiarity of this age of building is the use of a large and heavy lintel, generally marked with a cross, and almost invariably present over a doorway; although the weight is very usually taken off by a relieving arch above. In some cases these enormous stones are the only relics that remain to tell of the site of a former building. Sometimes these lintels were inscribed. At Khoreisa the surveying party found one bearing the Greek text, "This is the gate of the Lord."

The crusading epoch in the greater part of Palestine, as far as building is concerned, extends from the building of Toron (now Tibrin) in 1104, to that of the church at Nazareth in 1187. On the coast, however, there are later structures of Christian origin; the restoration of Cesarea dating in 1251. In the Eastern Crusading buildings, one of which is the hospital at Jerusalem, we find heavy mouldings and semicircular arches. In the Convent of St. Marie la Grande the arches are slightly pointed, and there is a dog-tooth moulding resembling those common in English churches. At Samaria the round arch has been used as late as the latter half of the twelfth century. At Beit Jibrin the remains of the Church of St. Gabriel, built about 1134 A.D., have slightly pointed arches, rising from heavy pillars and cornice. Imitations of Corinthian capitals occur in most of the earlier Crusading churches; and from the fact of their exact similarity to one another in the same church it is inferred that they were the work of the twelfth-century masons, and not the spoil of earlier buildings.

Growing later, the architecture becomes more light; beautiful clustered columns replace heavy pillars, and ribbed groining is introduced. The arches are always pointed, with distinct voussoirs. The Corinthian capitals are succeeded by others of an endless variety of form, leaves, varying from smooth to deeply serrated, being the usual ornament.

Diagonal dressing is one characteristic of Crusading work. At least, this mode of finish is not found at an earlier date. It was not always employed, however, by the twelfth-century builders. A rough kind of diagonal dressing is also found on Saracenic work, but it is possible to distinguish the two. The use of the toothed chisel prevailed, as was the case at the same date in France and in England. Masons' marks, including every letter of the alphabet except D, G, Q, and X, also abound in this work, as well as inscriptions. A collection of masons' marks is given in the Memoir. The exterior walls of Crusading fortresses are of massive ashlar. They are almost invariably drafted, with a rustic boss, which projects sometimes a foot from the draft. This work is perfectly distinct from both the Jewish and the Byzantine drafted masonry.

The Saracenic work is known by its small and less finely cut masonry, by the absence of masons' marks, by the pointed arches, and by the low relief of the ornamental designs. There can be no doubt that the publication of the Memoir to the Map of Palestine will be a very valuable contribution to the history of the craft of the mason.

EXPERIMENTS WITH IRON AND CONCRETE.

SOME of those who took part in the first Architectural Conference in 1871 may remember that the subject of fireproof materials and construction was then discussed in a very practical manner, and it was, perhaps, on that occasion that several materials commonly called "fireproof" were first openly discredited in regard to that pretension. On the same occasion, also, a method of construction was advocated as alone deserving to be called really fireproof. Our note at the time (*Builder*, June 3, 1871) records it thus:—

"Mr. Fowler brought forward, also, a specimen of new fire-resisting construction for beams and bearers, manufactured by Messrs. Allen & Sons. This consisted of a cement concrete formed of a small proportion of Portland cement and a considerably larger quantity of breeze (foundry refuse) worked up into the shape of a kind of concrete joist, with a stiffener of thin plate-iron in the centre. From the effect of the concrete in always keeping the plate of iron precisely on edge in the direction of its greatest strength, a very thin piece of iron might be depended upon for giving a great amount of stiffness. Only 10 ft. or 12 ft., however, was named as the maximum bearing for joists of this kind, and as the ends of these must rest on some larger (probably iron) beam, the question of stability of the construction against fire seemed, after all, to turn on the manner in which the main beam behaved."

Remembering, however, our impression at the time as to the really fireproof character of the method of construction referred to, and our doubt as to how far it would be practically taken up(for improvements of this kind are so often just mentioned and then forgotten), it is with some interest that we notice a small, thin, quarto volume, very well illustrated, which shows the results of a systematic examination of and experiment upon this very principle, only carried further and with important additions in regard to detail. The book referred to, which is printed for private circulation,* is by Mr. Thaddeus Hyatt, who has been for more than twenty years engaged in investigating the subject of fireproof flooring. Mr. Hyatt calls attention to the radical error which has long pervaded attempts at fireproof flooring, of leaving the main iron bearers or beams more or less exposed, so that the very main portion of the construction is liable to injury from fire; and it is in consequence of this that firemen have, as he assures us, and as we believe is the case, a dread of so-called fireproof structures more than of those which are not called so. That neither iron nor stone can rank as a fireproof material is indeed becoming a commonplace with constructors now; and it has been laid down by some of those most conversant with the subject practically that no material can be called fire-*proof*, only fire-*resisting*. Mr. Hyatt, however, seems to have actually solved the problem of a fireproof material. The question remains as to its suitability for extensive adaptation from an architectural point of view.

The chief specialities of the method laid down in Mr. Hyatt's pages are threefold: first, the *entire* encasing of the iron which forms the pith of the construction in concrete; both the main beams and the thin slips of iron which take the place of joists being completely imbedded; second, the employment of a new and professedly superior Portland cement, the systematic manufacture of which awaits at present the formation of a company to work it, but which is stated experimentally to be more unaffected by fire than any existing cement; and lastly, and by far the most important point in the book, the discovery that the iron can be used in combination with concrete as a *tie* only, and in tension, and that the concrete itself is sufficient to form the web and compressile part of the compound beam. This is a most important advance on the mere idea of a central iron core giving bearing power, and stiffened against buckling by the action of the concrete. Without reproducing some of Mr. Hyatt's diagrams, it would be difficult to render precisely intelligible the details of his experiments, and the reasoning deduced from them. It must suffice to say that he shows that, in theory, the compressive resistance of the amount of concrete which can be packed around and above a piece of bar-iron representing the lower flange only of an iron beam, is rather greater than the compressive resistance of the web and upper flange of the beam would be, in the ordinary proportions of sectional area; that, therefore, when the beam is thus imbedded, the upper portion, which is in compression, is waste strength, and can be dispensed with, the concrete doing its work. The advantage in economy of material and in fireproof character is of course obvious; and that the facts bear out the theory is shown by the statement, in diagrams and figures, of the results of a number of tests carried out for the author by Mr. Kirkaldy; the composition of the various beams, and the relative proportions of iron and concrete, are shown in good-sized diagrams, with the results of the tests, from which it is evident that the iron coring is proportionately stronger the more it is concentrated at the lower edge of the beam; in other words, the more completely it is in the position of *tie* iron. The most satisfactory beam, in regard to the relation between amount of material and results, seems to have been one in which the iron appears in the shape of a few thin slips 2 in. deep laid parallel at a distance of 2 in. from one another, on edge, the lower edges coinciding with the soffit of the cement beam, which is 8 in. or 9 in. thick. An increased depth in the iron raises the breaking load of the beam, but by no means in proportion to the increase of scantling in the iron. The concrete is held in position in the first instance by a series of transverse wires passing through and connecting the iron slips at right angles; and these wires also serve the very important purpose of mechanically connecting the metal and the concrete so as to incorporate them in one system, and prevent any sliding the one over the other when the beam is loaded so as to produce a sensible deflection. But will the two materials, thus forced into mechanical connexion, work together harmoniously under the influence of heavy strains producing extreme tension and compression? This question naturally occurs; and this is Mr. Hyatt's answer:—

"The compressibility and extensibility of cement were investigated by experiments with a bar of hard cement ten days old. This bar was made sufficiently long to admit of the insertion therein of two fixed points 50 in. apart, one of the points being the bent end of a rod lying upon the outside of the bar of cement and parallel with it, and which rod extended to within a short distance of the other point, thus leaving a space sufficiently small for accurate measurement on the cement being subjected to pressure. To prevent bending, the cement bar was placed in a frame fitting loosely about it, and yet sufficiently tight for the purpose. The load was then applied gradually by means of a lever, the actual compression from time to time being ascertained by tapering pieces, which were measured by Holtzapffel's thousandths gauge. In this way the compression was ascertained to amount to ·018 in 50 in. with a load of 1,000 lb. per square inch, the bar returning to its original length on removal of the load. This gives the ratio of expansion as ·00096 of length for 1,000 lb. per square inch, or say, in round numbers, the one-thousandth part of length; and if the ultimate compressive strength is taken at 2,000 lb. per square inch (which is perhaps the safe figure, considering that concrete in practice, and not neat cement, will form the compressive member of the compound beam) the final compression will be the $\frac{1}{500}$ part of its length. Now, as wrought iron is found to extend the $\frac{1}{10000}$ part of its length for each ton of strain per square inch, it follows that at 20 tons, or say prior to rupture, it will extend the $\frac{1}{500}$ part of its length, or about the same compressibility as cement; the effect of which in the compound beam is to keep the neutral axis at the centre line of the beam, the entire tensional strain being thus thrown upon the metal tie. The results of the Kirkaldy tests already alluded to confirm these conclusions."

There is another form of combination which Mr. Hyatt shows in some of his sections, in which the iron is arranged in two flat layers one over the other, as if the two flanges of the iron beam were left and the web removed, the concrete taking its place. This has advantages in certain positions, where it is desired to keep the thickness of the floor at a minimum. There are diagrams also of brick beams formed by square flat bricks placed on edge with their flat sides in contact, and the whole connected by iron tie-rods run through and bolted at either end, and taking the tensile strain, the upper edges of the bricks taking the compression. These do not appear to have behaved satisfactorily under tests nor should we have expected it.

We can only quote one more passage as to the resistance of the Portland cement concrete to fire and water: we presume the experiment refers to the new Portland cement mentioned by the author; the test is certainly severe. A tie-metal and cement floor, in gridiron form, was laid down, and a furnace formed under it; the floor loaded to the extent of about 300 lb. to the square foot over the surface, which caused a deflexion of about $\frac{1}{12}$ in. in a span of 12 ft. "The fuel was arranged to form an incandescent bed 6 in. thick at 12 in. below the under-surface of the concrete slab. The fire being kindled at six o'clock in the morning, had by eleven become an intense heat perfectly uniform over the entire surface, and the bottom of the concrete was also at a glowing red heat all over. At this intensity the fire was kept up until four p.m., a period of ten hours from the lighting of it. During this time the slab had deflected $\frac{3}{4}$ in. A stream of cold water was now thrown forcibly against the bottom of the slab for a period of fifteen or twenty minutes, by means of a garden force-pump, and the load then removed. On examining the underside of the section it was found uninjured; and the next morning, being then entirely cold, the deflexion had disappeared, the slab having returned to its former level. In order to confirm these results, a second trial was made; this time the load was left upon the slab, which, during the firing, deflected as before, but upon cooling returned to its original level, *lifting the load with it*. In proof of the heat of the furnace it may be mentioned that in the course of this experiment the faces of all the side bricks in actual contact with the fire were melted."

The book is an exceedingly useful and suggestive one; so much so that we rather regret that it has not been published in a manner to render it more available for general circulation. One mistake we noticed; on page 16, lines 6, 7, the test numbers "874, 844, 845, Plate C," do not correspond with the numbers of the enlarged examples on plates I, J, K, to which the reader is referred; there has been some error in the references.

* An Account of some Experiments with Portland-cement Concrete combined with Iron, as a Building Material, with reference to Economy of Metal in Construction, and for security against Fire in the making of Roofs, Floors, and Walking Surfaces. By Thaddeus Hyatt. London: Printed, for private circulation, at the Chiswick Press. 1877.

PROFESSOR E. M. BARRY'S LECTURES AT THE ROYAL ACADEMY.*

ITALIAN RENAISSANCE.

IN passing from the Transitional style, or rather mixture of styles, which existed in this country during the Elizabethan era, we shall now have to notice that which is called the Renaissance,—a new birth of light and freedom, according to some; a mischievous re-awakening of pestilent heresy, in the eyes of others.

During this lecture and the next, which mark the conclusion of the term of my office as Professor of Architecture, it will not be in my power to do more than suggest for your consideration some of the various principles which determined the course of the movement, and it must be left for other opportunities, and, perhaps, for another mind, to pursue the subject. Having pointed out to you the influence of various ages and styles on Domestic architecture, I wish, however, before the close of my addresses, to say something about the remarkable effect of the new taste, which made itself felt in every walk of life, and changed the whole course of the architecture of the time.

We have remarked that, in England, the process of change was slow; old customs were not easily departed from, and compromise was tried in almost Protean variety, before the old architecture of the Mediæval days was set aside, and the "Gothic manner" proscribed as unworthy of an age of enlightenment.

The chief impulse had come from Italy, that beautiful land which had ever been the chosen abode of art, even when most cruelly torn by domestic dissensions and by civil war. There, architects had long been engaged in working out the problems, which were now but slowly emerging into prominence amongst

* Fifth Lecture, delivered February 23, 1878.

ourselves. While English Gothic architecture was passing through the Tudor period, the great giants of the Italian Renaissance had been guiding what was, indeed, an artistic revolution. The quasi-Gothic Duomo in Florence had received its cupola at the hands of Brunelleschi. Bramante, San Gallo, and Michelangelo had been in conflict at Rome, a conflict ended by the triumph of the great Florentine; while Palladio at Vicenza, and Sansovino in Venice, had developed a manner of their own, from which all Gothic feeling was excluded.

The artistic influence of Italy was felt throughout Europe, and in considering its effect upon ourselves, it may be well for us to notice, before passing onwards, some of the leading characteristics of the Renaissance in that country, and the interesting state of things of which it was the result.

It must be borne in mind, that the Classical revival was not an artistic movement only, or even chiefly; it affected society in its relation to literature and philosophy, as well as art. When, therefore, we speak of the Renaissance, the term must be understood in a wider sense than one of architecture.

Hitherto we have been dealing with gradual alterations, not so much of style as of detail; and with successive eras of settled rules, developed each from its predecessors, according to well-understood laws and precedents.

Architecture was now to take a new departure. The revival of Classical literature in the fifteenth century marks an epoch of change; a change of religious and artistic thought; a Renaissance, or new birth of intellectual freedom; a discovery of the unknown treasures of an ancient civilisation. Hailed with enthusiasm in the land which seemed to be marked out as the legitimate successor to the glories of Greece and Rome, the new faith soon spurned its narrow boundaries, and set out as a peaceful revolution to conquer the world.

The Latin nations were easily subdued, and in France and Spain, the Renaissance had a speedy victory. In England, the resistance was more stubborn, and the result less certain. The adoption of strange forms in the architecture of this country were partial and hesitating; and it was not until the troubled days of Charles I. that the full force of the Classical revival in Italy was felt among us.

The change here was naturally more difficult to effect than it had proved to be in Italy, for our architects had been more fully imbued with Gothic principles than was ever the case with their Italian brethren. It was not possible for the Italian architects to be ignorant of the achievements of Classical antiquity. The glories of ancient Greece might indeed be unknown to them, save by some vague tradition, but the works of imperial Rome were at their doors. Amphitheatres and baths had their tale to narrate of departed grandeur. The Colosseum remained in its silent majesty, and all around, and under their feet, were relics of the treasures of ancient art.

The architects of Mediæval Italy, therefore, stood in a different position from that occupied by the English. They knew that; of which the latter were uninformed, and this knowledge had an influence upon their work, in the direction of eclecticism. In the earliest Christian buildings,—the basilicas,—traces of Classical influence are almost invariably found, as was, indeed, only natural, for the Christians, as they gained in power, were able to wrest the pagan basilica from its original possessors, and convert it into a church for their own use. In the long horizontal lines of the basilica, with its regular arrangement of columns and arches, the Italians scarcely broke with Classical precedents, and these influenced them, more or less, throughout their employment of Gothic architecture.

The difference between English and Italian practice is seen, not only in general composition, but in every detail of the work, as well as in the ruling principle, which underlies the whole. Take, for example, almost at random, any of our great cathedrals. There is a mystery about them; the whole effect, whether of plan or elevation, cannot be grasped at once; there is little reliance on particular features, still less on special ornamental details. We are conscious of an aspiring grandeur, seeming to direct our thoughts to heaven, and although research will discover much beauty of parts, it is the general effect of the whole which first affects us. We may trace the same principle throughout, whether in the varied treatment of the elevation, with its gradations of heights, its gables and pinnacles, its turrets or its spires, or in the solemn gloom of the interior, endless apparently in its vistas, mysterious in its arrangements of recesses and chapels, with an intricacy of piers and arches, like some vast grove of sacred palm-trees.

With the Italians, it was altogether different. A plainness of treatment was apparent. Simplicity of plan left comparatively little to the the imagination; everything was clear and open to the eye of the observer. In the same spirit, the exterior displayed large plain spaces of walls; the horizontal lines of Classic art were but half abandoned, and the high roofs of the Northern Gothic found no place. The pointed arch, moreover, the glory of Gothic architecture with us, in the use of which our artists revelled, and with which they dared so much, was but timidly adopted by the Italians. Often used in conjunction with the round form, it was but one feature among many, and not the ruling idea of construction.

In their fondness for plain surfaces, and breadth of effect, the Italians even seem to have regarded the arch as an enemy. It needed buttresses, and these would break up the surface, and thus were not acceptable. Rather than resort to their aid, arches were tied by iron rods at the springing, an expedient which would have been rejected with disdain by the more scientific builders of the North.

We see, then, that the English architects worked on different principles altogether from the Italian. They knew but one style, and made it their own; troubled by no traditions, except those handed down from fathers to sons, as to succeeding craftsmen, or such as were imposed upon them by ecclesiastical precedent. Speaking broadly, it may be said that their construction was marked by Mystery and Intricacy; while the Italian displayed Plainness and Simplicity.

The latter qualities, however, were not inconsistent with much richness of accessory ornament, and a frequent employment of the sister arts. The northern cathedral was complete, when the workmen left it. In the South, the artist found his opportunity, after the building was finished. The simplicity of the latter enabled him to regard it as a shrine, or frame, for the painters' and the sculptors' art. Colour and sculpture were lavished in mosaics, pictures, figures, shrines, metal work, and gilding; and thus it was that, while the great Gothic churches amongst ourselves seemed like the creation of one thought,—the realisation of a single dream; the Italian edifice was the result of a general co-operation of associated art, each man bringing his share of power, his artistic instinct, his skill and talent, to cast as an offering into the treasury of God.

We thus find that in Italy there was a greater *combination of art*, than with ourselves. The whole effect was less dominated by a single idea, or set of ideas. There was consequently less unity of purely architectural design; but a greater amount of general artistic wealth. The variety of outline, and picturesqueness of structure, of northern work was absent, and the lack of interest thus caused was supplied by the efforts of artists, working with much independence, each in his own class of work, whether frescoes, statuary, mosaics, bronze, or such-like accessories to the architecture.

A similar employment of the resources of art, in all their beauty, would have been impossible in our own Mediæval buildings, the architects of which shunned plain wall surfaces, breaking them up in every way by shafts and arches, large windows, buttresses, and recesses; and we all know how incongruous is the effect even of fine modern sculpture, when placed in a cathedral, such as Westminster Abbey.

To the Italians the union of the Fine Arts was merely a continuation of tradition; a development rather than a change.

They had never consciously abandoned such views of design, although in the early days of Christianity, they had, to some extent, turned their backs on art, as on an unclean thing, needing purification from heathen stains, before it could be admitted into the service of the Most High.

The first Christians found sculpture devoted to the sensual, and to them, revolting representations of the gods and goddesses of heathendom; personalities, with at best only human perfections; and displaying all the passions and weaknesses of men and women. This was not the art which the early Christian wished to perpetuate. He had not broken with the old worship, with its graceful mythologies of Nymphs and Dryads, to content himself with the contemplation of merely human perfections.

These were but the accidents of existence, and the deification of the body was to disappear in the life of the soul. What to him were these deities and heroes, their Fauns and Satyrs, all bearing the stain of a common degradation? The spirit of Christianity taught him to look not to the present, but to the future; to eschew pleasure, and even to welcome pain, in a rapt contemplation of the goodness and power of an unseen Presence; spiritual, omnipotent, and indescribable.

The old Greek sculpture, in its quiet repose, its well-satisfied acceptance of earthly things, seemed out of place to Christian men and women, who with the sincerest feelings of the heart disturbed, were crying with passionate eagerness for a new heaven and a new earth; a dispensation of Divine love, purity, and virtue.

To minds like these, the very beauty of olden art was an offence. Their worship must be spiritual, and the exquisite forms in marble around them were detested as incentives to idolatry. If art were to be admitted within the Christian sanctuary, it must at least be purged of all debasing associations. Christian disciples had not broken with the old Faith, to allow the new one to follow in its wake; the object of their veneration was no longer an image fallen down from Jupiter, but a mighty invisible Power, a deity not made by hands. From this time, therefore, all must be changed in art, as in religion. Henceforth, the saints would be portrayed as relying, not on earthly perfections, but on spiritual virtues.

Thus came about a complete revolution in art, and its effects were but slowly realised, by successive steps, until reaction set in, at the time of the Renaissance. Sculpture, hitherto, as being less flexible and adapted for the change, from Pagan to Christian ideas, had fallen, more or less, into disuse, while painting had more readily adapted herself to the new theology, and had even seemed to be invigorated.

The former was in a great measure limited to the work of decoration, and the sculptured effigies of tombs. Feelings of reverence, reserved the highest subject of all from the natural treatment belonging to Greek art; and a similar feeling of reticence enforced an alteration of treatment upon all plastic art, when devoted to the purposes of the sanctuary.

Painting was less trammelled. It had before it a larger field of selection of subjects, and a more elastic medium of expression. It is not a necessity of painting, to such an extent as it is of sculpture, that it should devote itself to pleasing representations of repose and physical perfection.

The whole tangled web of human affections, passions, and sentiment lies before the painter of genius. He is, therefore, at once more powerful and more versatile than the sculptor can ever be. He rose to the occasion. What the sculptor had been to the pagan temples, that would the painter now be to the Christian church. Starting from mythology and legendary art, he would delineate the loveliness of virtue, the hideousness of vice. At one time, his canvas might display the saint-like endurance of martyrs, and the anticipations of celestial joy; at another, the unutterable woes of the condemned.

If there were any wish to recur to the exhibition of human perfections, it could be gratified by the idealisations of purity and maternal love, in pictures of the Madonna; or manliness and constancy in those of St. Sebastian, St. Stephen, or other recognised saints. Painting, therefore, soon found for itself a home, in the altered state of society, brought about by the transition from the heathen mythology to the hagiology of the Christian church.

In the earlier times of the new faith we find art brought to bear on subjects, rather than on individuals; on the great mysteries of religion, rather than on detailed episodes. As we approach the Renaissance greater freedom is observable. The human form is again brought into prominence, and with something of a return to Greek traditions.

The change was a sign, amongst many others, of impatience of ecclesiastical control. Art would no longer submit to monastic leading-strings. It would insist on liberty, with all its far-reaching consequences. The Church had long claimed it as her own, only at last to find herself powerless to resist a movement, the aim of which was to restore that worship of beauty,

which she had ever regarded as an unholy bequest of Pagan irreligion.

Everything was therefore becoming unsettled, and ripe for change, when the Renaissance asserted itself in Italy. The Fine Arts, in all their branches, were so welded together, that all were in equal expectancy. Architecture, had never thoroughly separated herself from the old order of things. Sculpture had but unwillingly consented to a recognition below its claims, while Painting was displaying a freedom, in itself a herald of coming change.

The necessary impetus was found in the revival of letters, and the teaching of Petrarch and Boccaccio. The eyes of men were again turned to the records of Greece and Rome. Classical traditions were revived, and a new energy was everywhere apparent. Gothic architecture in Italy was declared an intruder, and a recurrence to the forms of ancient times, was demanded.

The revival was almost necessarily founded on Roman rather than Greek art. The Renaissance architects of Italy soon found out (as we have done much more recently), that Greek temples cannot be adapted to modern uses, without losing all that makes them exquisite in art. The pure and refined simplicity which forms their charm is lost in the endeavour to add a flexibility, opposed to the spirit of their conception.

The Romans had acted, from the first, on this conviction. Admiring the beauty of Greek art, they imitated it, indeed, as in their temples; but they did not acquiesce in the limitation of power, which exact imitation of these models would have imposed upon them.

Greek architecture dealt with large stones, arranged in the simplest manner. A single lintel reached from column to column. If we consider the construction a development of wooden precedents, we may say it was a system of beams of stone, instead of timber.

The Romans, like the Goths, delighted in the arch, and when the latter feature was accepted, the peculiar rest and repose of Greek architecture was gone for ever. In its place we have magnificence, daring, and power; an energy of construction, disdaining obstacles, and pressing science into its service. This may be seen in most of the great works of the Romans, which exerted a powerful influence on the style of the Renaissance architects.

The latter were unwilling, or perhaps unable, to break all at once with the past. Like the transitional builders, in our own country, they at first sought a compromise, and as a result, we have buildings like the Certosa at Pavia, a mixture of discordant details, combined with much fancy. Here is found imitation of Classical forms, with an exuberance of ornamental detail, altogether inconsistent with the refinements of true Classic taste. It was, however, a sign of the times,—an attempted blending of the Past and Present,—a breaking of the ties which connected the architecture of the day, with Gothic Mediæval art.

The same spirit of fusion may be noticed in the Florentine palaces, the windows of which are divided by shafted mullions, as of old, while the arches above are treated in a manner which recalls the days of tracery. Afterwards, came the more complete rupture with Gothic ideas, in the Renaissance palaces of Venice, the town-hall of Vicenza, and St. Peter's at Rome.

It has been customary to divide the Renaissance into three periods illustrated by the two types I have mentioned, and by a third, which marks its decadence. Starting from almost the commencement of the fifteenth, and lasting until the end of the sixteenth century, the Renaissance movement occupied nearly 200 years in its passage from birth to decay.

The periods of development have been variously styled. The first, which began early in the fifteenth century, and ended with it, was a time of experiment; old habits were modified, but not abandoned, and Classical ideas were clothed in Gothic dress. The severity of the latter style was passing away; there was a fusion of principles, an attempted reconciliation of Christian and Pagan ideas. The early Renaissance may therefore well be called the Transitional style of Italy, and it exhibits much of the same process which we have traced in the Transitional architecture of our own country, of which I spoke in my last lecture.

The second variety of Renaissance had not a long existence. It coincides with the first half of the sixteenth century; but although short in duration, it was a period of great activity, and to it belong some of the finest buildings of the revival, such as, in the case of secular edifices, the town-hall at Vicenza, and among churches St. Peter's at Rome. At this time the old Gothic traditions had faded away, the pointed arch no longer lingered, and the architects looked for inspiration to the works of the Romans, so that the phase of the style, used by them may fairly be called Roman Renaissance.

This was soon followed by the third method, which marked at once a more perfect study of ancient monuments, and a decay of originality; the one leading to a scholastic system of rules, the latter to poverty of detail and decay of the inventive faculty. We may call this the Pedantic school, and with it the history of the Renaissance, as an active and progressive movement, comes to an end.

Having thus classified the three periods, let us retrace our steps, and examine some of the peculiarities of each phase of the revival movement, although we can only do so briefly, on the present occasion.

You will remember my pointing out that painting was, in an especial manner, the art of the pre-Renaissance age in Italy. Both sculpture and architecture were reduced to subordination at the outset of the new movement, which culminated perhaps in the design of the Sistine Chapel, in which the painter is supreme, and the sister arts have scarcely a footing.

We shall find, further, that in the early school of Renaissance, the architecture was peculiarly of the type that has been termed Painter's Architecture. This title implies no disrespect to our painter brethren, but implies a tendency to rely on principles of design, which apply to painting, rather than to our less tractable art. Thus, a painter has a flat surface before him. It is for him to cover it with his subject. He has full mastery over his effects of light and shade, and is under no trammels as to materials. The architect, on the other hand, must design his effects, not as they appear on canvas or paper, but as they will be built up for him by the hands of others. He must always be thinking, so to speak, in "the round," and he knows that mere surface decoration, often charming in painting, will never make a fine building.

Raffaelle's beautiful arabesques enchant us in their proper place, painted in panels of the loggie at the Vatican; while similar designs, executed in stone, not only fail to satisfy, but even vex us by their obvious unsuitability to the material employed. At the Certosa, before referred to, the surfaces are covered with sculptures, which are merely copies of pictures of arabesques, executed in low relief. It is impossible not to admire in them much beauty of detail, but we feel that they are added to the architecture, and are not of it, and that they often even interfere with more legitimate effect. They are characteristic of the love of detail to which I have before alluded, in referring to the difference between Northern and Southern Gothic art.

The early Renaissance architects followed out these principles, and decorated their buildings with everything which the taste of the period could supply, until the building itself might almost be regarded as a case to contain art, rather than a work of art itself. Purity of architectural outline and detail thus suffered, and architecture was stifled by the well-meant caresses of her sisters.

How far this process had gone, and how much mischief it had worked to the architect, may be seen by a comparison of Giotto's campanile at Florence, with the front of the Certosa: the one executed as early as the beginning of the fourteenth century, the other a specimen of the Early Renaissance. Both are decorated as highly as seems to be possible, and although there are essential differences between them, no one can fail to detect evidences of a certain agreement in the principle which has governed their decoration. If the one may be called Gothic, with a dash of Renaissance, the other is no less obviously a fusion of Renaissance forms, with a reminiscence of Gothic traditions.

Both examples illustrate the method of design called Painter's Architecture, for both rely on surface effects; rather than on constructive forms, for architectural effect. In the Campanile, we find a superficial decoration of incrusted marbles; at the Certosa the ornament is also applied, in the form of panels, bassi-relievi, and an elaboration of detail, which, in its minute character, does not combine with the architectural lines. Again, we notice in both buildings the prevalence of horizontal forms, and this, indeed, is even the more strongly marked in the earlier example.

Giotto's tower displays, in a typical manner, the peculiarities of the Italian Gothic school. There is nothing in it of the vigour of the North; much of Southern softness, and voluptuous refinement. Bold projections, with strong contrasts of light and shade, are shunned, and even the shadows of the angle turrets, which serve as buttresses, are toned down by canting their sides. In its straightness from bottom to top, the structure gives an idea of instability. It seems as if it had suddenly grown out of the ground, rather than that it had been placed deliberately upon it.

The vertical effect thus produced, and which, at first sight, might appear to be truly Gothic, is marred by the prevalence of horizontal lines, which are, indeed, so marked, that the composition is divided into distinct stories, while at the top every vertical line is merged in a strongly-marked projecting cornice.

The beauty of the building is mainly dependent upon:—first, the proportion of the mass;—secondly, the graduations of the openings, and proportions of voids and solids;—and thirdly, the refinement of finish which pervades the whole. These are the points in which a painter architect of genius, such as Giotto, might be expected to excel, and they are here controlled by a purer and more severe taste, than the Renaissance artists of the Certosa possessed.

In the latter building, there is little beauty of form, and none of general proportion. The openings appear as if they had been pierced at random, having no relation to each other, in size, shape, or gradation. The harmony of lines observable in Giotto's Campanile is absent, and we have in the same front, arches and pediments; straight lines and curves; wide and narrow openings; large columns and small; arcades with mullioned windows, of all sizes and proportions. To harmony has succeeded discord,—to order, confusion.

The one work is a work of architecture, decorated in subordination to form and intention; while the other is architecture in name only; but, in reality, a peg on which to hang excessive and inappropriate decoration. It illustrates the dangers which beset the architects of the Renaissance, in their attempts at fusion. It was obviously impossible to carry them much further in that direction, and this was soon evident to artists of cultivated taste. They consequently soon began to seek for more purity and refinement of style, more appropriateness of decoration, and more constructive skill. The result was seen in the works of the second or Roman period of the Renaissance, rendered for ever illustrious by the names of Bramante, Michelangelo, Raffaelle, Sansovino, and Palladio.

Of the great achievements of the three first-named artists at St. Peter's and elsewhere, space would fail me to treat now; but it may help us to understand the spirit which was directing the Renaissance movement, if we turn our attention briefly to specimens of the works of the two latter architects at Vicenza and Venice.

At Vicenza, Palladio carried all before him, so much so, indeed, as to give his name to the later development of his favourite style. He lived to illustrate in his own works, the change of manners which was passing over the art, for between his latest achievements, and the great work of his early career, the Town-hall at Vicenza, there is a marked difference. This particular design of Palladio's is a fair specimen of the architecture which succeeded the more florid structures of the previous period.

It is also interesting as proving the completeness of the change which had passed over public taste. The central building, which is the town-hall itself, was and is Mediæval in its architecture; for Palladio did not build it, but only clothed it, so to speak, with arcades; and these he designed, in the then established Classic manner, without the least regard to the Gothic associations of the original structure. The success of his work serves to illustrate again all that has been said of the half-hearted manner in which Gothic architecture was received south of the Alps; for without asserting that there is real harmony between the old basilica and Palladio's arcades, the combination has, nevertheless, been admired by common consent, and certainly need not offend the most fastidious, by incongruity.

We may realise the difference between the hearty employment of Gothic architecture in England and France, and the way in which it was treaty in Italy, if we picture to ourselves

the result that would be obtained, if some modern Palladio were to surround Westminster Hall with Italian colonnades, two stories in height.

The work of Palladio, in this example, is so simple, that we are almost at a loss, at first, to decide in what its merit consists. In the first place, as it seems to me, its very simplicity is the first thing to be noticed with approval. The composition is clear and intelligible, the corridors are obviously convenient, and an appropriate adjunct to a public hall used by crowded assemblies. This instinctive recognition of appropriateness is at the very root of true principles of architecture, and applies to every real style.

Again, Palladio's arches are wide and spacious, and thus lightness of effect is produced. The proportion of width to height in these arches has been criticised as excessive; but in this opinion I am unable to agree. The charm of the arcades would indeed soon be lost, if a greater heaviness and solidity were imparted to them, by diminishing their span. Here, again, comes in the question of propriety, for as the arcades are, after all, nothing more than covered balconies, and have not to support any superincumbent weight, they require no more strength than is necessary to sustain themselves; and this, it is evident, they possess in abundance.

To those who object to the application of columns to Renaissance elevations, the use of the orders by Palladio will be an offence, but it is difficult to suggest how their place could be satisfactorily supplied, and we cannot, therefore, wish them away. They are applied, rather as a decorative detail than as a part of necessary structure, and, after all, they do but follow in the wake of the panelled arcades and applied shafts of Mediæval art. Taken altogether, this work of Palladio may be termed one of the most successful achievements of the Italian architectural Renaissance.

From Vicenza it is easy to pass to Venice, and here the better style of the period had also been making its way. The accumulation of wealth in the great Italian towns had led to palace building, and Venice was a city of palaces. Perhaps the example which is best known to us, as illustrating the period, is Sansovino's great work, the Library of St. Mark. Facing, as it does, the Doge's Palace, it marks, in the clearest manner, the contrast between the Gothic and the Renaissance architecture of Italy. Both buildings are thoroughly Italian, and at the time of their erection could not have been built anywhere else.

The great palace of the Venetian Republic has been surrounded by such romantic associations that it has asserted an influence over the imagination, which is scarcely sustained by a calm examination of its artistic merits. The stirring memories of Venice people its arcades with shadows, recalling the glories of the past, and perhaps kindling in Englishmen an especial interest in all that relates to the "Empress of the Adriatic," the mistress of the sea.

Nevertheless, if we abstract our minds from everything but actually existing architectural beauty, the Doge's Palace will, I think, fail to satisfy. At Vicenza we have noticed the weakness of Palladio's arcades, and justified them by the fact, that they have nothing but themselves to sustain. Here we have arcades, also weak, but above them is a mass of enormous, and as it appears, unnecessary weight. If the upper story had been kept back, as it is at Vicenza, and the arcades had thus become covered balconies, as they are there, the effect would doubtless have been more pleasing; but the front, in its present state, can only be regarded as an attempt at a great work, rather than a perfect result, successfully achieved.

I do not speak now of the charms of detail, which the building displays, and which, in itself, is enough to make it always famous; for such beauty is not enough to compensate for the grave defects of unpleasing proportions and suggested instability. It is, indeed, impossible to believe that the bald and box-like upper part of the palace can have been designed by the same mind which worked out the often exquisite details of the lower stories.

No one would, at least willingly, destroy his own work, and no skilful architect would place all his weight at the top of a building, and all lightness below. The design bears, I think, on the face of it, evidence of having been altered in its execution, and of being the work of different architects. Regarding the lower arcades separately, as perhaps the most beautiful examples of Italian Gothic art, we discover in them the same taste for regular and horizonial treatment to be found elsewhere, and in this respect they contrast in detail rather than in principle, with Sansovino's colonnades.

In the latter design we recognise to a great extent the same principles which guided Palladio in his arcades at Vicenza; we have the same superimposed orders, with arcades on each story. The latter are, however, compressed laterally so as to give a greater solidity of effect, suitable to a structure which is an actual building, and not an ornamental appendage only, like the open balconies of the Town Hall.

We may notice that, in his upper story, Sansovino availed himself of a favourite expedient of Palladio, by introducing a second and smaller order, subordinate to the principal order of each story. By so doing, he not only obtained variety, but also an effect of size; he, in fact, gave scale to the whole composition, which was all the more necessary from the position of the building, placed as it was immediately opposite to the great mass of the Ducal Palace, and exposed to be dwarfed by it.

The chief difference between Palladio's work and the library at Venice is to be found in the upper cornice and entablature of the latter; and although this feature is perhaps somewhat disproportionate, it serves to mark with dignity the completion of the building, and is highly decorated with sculpture. Sansovino's library is certainly one of the most beautiful buildings of its time, and displays an application of Classical detail to modern usage, which has influenced powerfully the architecture of our own days.

I have not left myself much space in which to allude to the third period of Italian Renaissance, which does not, however, call for lengthened description. I have termed it Pedantic, because it was a time of words and rules, rather than of living facts. The aim of its architecture was to be correct, rather than interesting; to repeat exactly ancient details and contours, rather than to catch that spirit of art, which vivifies all it touches.

Michelangelo, during his long career, witnessed the change which was approaching. His sympathies, however, were elsewhere; for his fervid nature could ill brook precision of rules. Moreover, his admiration of Bramante is well known, and Bramante occupies the foremost rank among the best Renaissance architects of the Roman period. Michelangelo, when called to St. Peter's, condemned any interference with Bramante's designs, and declared that it was "impossible to deny that Bramante was as great in architecture as any man has been, since the days of the ancients."

Bramante's mantle, however, had now fallen into inferior hands, and architecture was losing its character as one of the fine arts. The later achievements of Palladio did not realise the expectations excited by his earlier work at the Town Hall of Vicenza.

The strength of the movement seemed to be exhausted, and both in literature and art lassitude was creeping onwards in the minds of men. Scholarship had lost its zest and art its invention. Both were dull and lethargic, and corruption ruled over society, while, in public affairs, the gathering cloud of the Northern Reformation threatened the framework of the body politic.

In the later works of Renaissance architecture, the degenerate spirit of the times was visible. The researches of Vitruvius, and his precise directions of forms and proportions, were eagerly studied by Palladio, and the architects who formed his school; and thus an artistic renaissance which began in florid exuberance, ended in the cold formalities of an insipid pedantry.

The changes in architecture had corresponded with those of literature and the sister arts, with which, indeed, it must ever be connected. Architecture cannot, in truth, retain a place among the fine arts without such association. Without the traditions which cling so lovingly around each old monument of the past, without sculpture, and the assistance of the art of painting, architecture must soon become a matter of science alone, a question of putting bricks or stones together, so that they may not fall.

In literature, and in art, the revivalists sought at first to copy principles correctly, and when a certain measure of success had brought satiety, the copying of principles became a blind imitation of forms, and all richness of style and development of invention was lost. The once prized Latin literature ceased to please, and the pedantry of architecture was succeeded by the rococo extravagances of the past Palladian school.

Nevertheless, the Renaissance style of architecture cannot justly be said to have failed. It impressed its influence on the whole of Europe; it found a home in every civilised state; and we shall notice, in the next lecture, its operation in England.

We have of late years witnessed a recurrence to Mediæval forms, with what permanent results, it is perhaps too soon as yet to decide. Englishmen, however, will not readily proscribe a style which has given us the architecture of St. Paul's and Whitehall, of Somerset House, and the majority of our clubs, banks, and great commercial buildings.

Like all schools of art, the Renaissance had its extravagances, and by dwelling on these alone, it is not difficult to ensure its condemnation. But there must be something worthy of consideration, in a method of building, which has withstood all assaults, and still holds its footing, in spite of the passionate denunciations of sectional criticism.

Instead of resorting to the easy course of undiscriminating censure, it may be worth while for architects to consider, whether the artistic successes of our various revivals have been such as to justify us in shutting our eyes to a style which may yet be capable of great achievements; which craves and welcomes the assistance of the highest sculpture, and the most dignified painting; and which in modern times has been deliberately adopted by almost all civilised countries, for their most important works of architecture.

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THE subject of copyright in works of art, often and so far unsatisfactorily discussed, is likely to come a good deal into notice during the present year, when the report of the Royal Commission on the subject of copyright shall be published. Most of our readers are aware, probably, that such a commission has been for some time sitting, though it has not been clearly understood whether its investigations were confined to the more popular and better understood subject of literary copyright, or embraced that of other productions of the intellect. We believe, however, that we are correct in saying that the object of the Royal Commission has been the preparation of a basis for consolidating legally the whole subject of copyright, or the right of the authors and inventors of works in art or literature to reap the profit of the labour of their brain, and to protect themselves against dishonest reproduction or imitation.

In regard to literature, the justice and necessity of an efficient protection has been long and generally recognised, in theory at all events. In regard to works of art, there is a much less general consensus of opinion, except among artists themselves; and we have heard able and clear-headed practical men, who were not specially acquainted with artistic subjects, express the greatest surprise that painters or sculptors should demand copyright at all, and profess an inability to understand the footing upon which such copyright should be asked for.

Perhaps a few words on the subject may therefore be useful at present, the rather as we shall have to show that one art,—that of architecture,—with which we are the most closely concerned, has been almost entirely passed over and neglected up to the present time; and it is at least worth while to consider whether this undefended position of architectural design is or is not a necessary or a desirable consequence of the special conditions of the art, which no doubt stands on different ground, in some respects, from such arts as sculpture and painting.

That solid claims on the part of artists, for protection from piracy, have been recognised as reasonable in law and equity, is proved by the number of existing Acts relating to artistic property. It may be interesting to some of our readers if we give a brief summary of the Acts which have been passed in order to protect the producers of these works; a summary which will also give an idea of the confused and involved state of the law in regard to art copyright. The first Act of the kind was prepared (in 1734) at the instance of one of our greatest painters, Hogarth, not, however, in reference to his paintings, but to his engravings, which had been largely pirated and imitated; and it is worth notice that the engravers have taken the chie

part in the movement in favour of legal protection, far more so in general than the painters, who are usually less of business men, and averse to legal proceedings; and though (as we shall have occasion to observe), they have been at many times monstrously robbed and ill treated, they have contented themselves often with a kind of cynical and satirical grumbling against rogues who were too much fenced in by legal ambiguities and tortuosities to be reached without a great deal of annoyance and trouble to the prosecutor, of a nature peculiarly repugnant to the artistic temperament. And Hogarth himself got little satisfaction out of his own Bill, since, although the Bill (8 Geo. II., cap. 13) set out by denouncing in no measured terms the "printsellers and other persons who have of late, without the consent of the inventors, designers, and proprietors of such prints, frequently taken the liberty of copying, engraving, and publishing base copies of such works, and designs, and prints, to the very great prejudice and detriment of the inventors, designers, and proprietors thereof," &c., and provided that the inventor or designer of the plate should have the sole right of reproducing it for fourteen years from the first publication, it was shortly after "ruled" by a judicial authority that piracy from an engraving made *from* or *after* an original design was not within the jurisdiction of the Act, as the purchaser of the engraving from the original designer had no such property in the design as to entitle him to sue at law. The special object of this apparently futile Act was to protect the art of "engraving in the form of mezzotint or chiaroscuro"; and it provided that any one who should publish or expose for sale any fraudulent copies of a print should forfeit all the copies found on his premises, and 5s. per day in addition. The next Act (7 Geo. III., cap. 38) was also connected with Hogarth, for it was passed (1767) especially for the benefit of his widow, and was described in its heading as an Act "to amend and make more effectual" the previous Act already referred to. It extended the right of copyright ownership from fourteen to twenty-eight years after production, and extended the operation of the Act to all kinds of engraving ("the art of designing, engraving, and etching"); but it omitted the injunction against selling or exposing for sale, and consequently no penalties for selling pirated prints could be recovered under this Act, though the initial Act of producing the imitation or pirated copy is forbidden. The Act contains a special clause relating to William Hogarth and his widow, stating that the term of fourteen years was near expiring, and "base copies" of Hogarth's engravings had been published, whereby the sale of the originals had been greatly lessened, "to the detriment of the said widow and executrix," who was by the same clause given a sole right of printing her husband's engravings for a term of twenty years. It is not always that the law shows so much of personal charity in its dealings.

Ten years later it was again found that the legislation on the subject had been ineffective, and we have (17 Geo. III., cap. 57) "An Act for more effectually securing the Property of Prints to Inventors and Engravers, by enabling them to sue for and recover Penalties in certain Cases" (1777), the object being, as the title implies, to give greater facility for the enforcing of the provisions already made in previous Acts. It is noticeable, as one of the many sources of confusion in the copyright legislature as it now stands, that the clause forbidding that any one should engrave or etch in mezzotinto or chiaroscuro, or otherwise, "or in any other manner copy" any print which is protected, is still a matter of uncertainty in its application to photography, the law not having decided whether the words quoted cover copying by photography, or whether they can only be applied to modes of copying of the same kind as that of the original engraving. Inasmuch as the reproduction of engravings by photography is one of the most common and popular traffics of the day, it is apparent how inadequate is the protection afforded at present in regard to this branch of art.

The protection of sculpture first comes before us in (38 Geo. III., cap. 71) "An Act for Encouraging the Art of Making new Models and Casts of Busts, and other Things therein mentioned" (1798). The preamble sets out with the refreshing statement that "divers persons have by their own industry, pains, and expense improved and brought the art of making new models and casts of busts and statues of human figures, and of animals, to great perfection," and provides that every one who shall make or cause to be made (which seems to mean artist or purchaser) any such work, shall have the right to prosecute any one who copies it during a term of fourteen years, provided the name and date are put on the work. The difficulty of applying the methods of legal phraseology to the description of works of art is obvious in this Act, for it is really difficult to say whether it refers to original sculpture or only to making casts from life, and Lord Ellenborough remarked of it that the sculptors had better not "model" the next Act themselves. The said next Act (54 Geo. III., cap. 57) is, in fact, specified as an Act "to render more effectual" the previous one, "the provisions of the said Act having been found ineffective for the purposes thereby intended," and the special object of it was to extend the protection more distinctly to original design in sculpture,—"any subject being matter of invention in sculpture." An addition to the wording which is significant is that, after the provision of the last Act about any cast or model of the human figure, is added the phrase, "clothed in drapery or otherwise," from which we may gather that attempts had been made to evade the previous Act by the pretence that drapery or dress was not "the human figure." This Act (1814) left the term of copyright the same, but gave heavier penalties and more ready means of legal action.

The next Act we come to is that of "6 & 7 Will. IV., cap. 59," which, however, merely extended the copyright of prints and engravings to Ireland. We now come to the Victorian age, and find a very elaborate Act (5 & 6 Vict., cap. 100) "to consolidate and amend the Laws relating to the Copyright of Designs for ornamenting Articles of Manufacture," repealing a former ineffectual one passed in the second year of the same reign. In this Act the principle of registration of designs first appears, but it has really more bearing on manufactures, such as calico-print designs, than on art in the higher sense. It was amended and extended in its application by "6 & 7 Vict., cap. 65," but both these Acts lie rather out of our special subject in their application. Next comes an Act of some importance (13 & 14 Vict., cap. 104") "to extend and amend the Acts relating to the Copyright of Designs" (1850); important in this way, that, in a most illogical manner, sculpture was dragged into it (though the Act professedly is of the same class as the two last-named), and the application of registration to sculpture designs was then first made. Accordingly, sculptors get their protection from the joint operation of two rambling and ill-expressed Acts of Geo. III., and from a provision edged in sideways in a later Act having special and professed reference to quite another class of productions: and that is how the matter of sculpture stands to this day.

A further extension of the "Designs" Acts was passed in 1851 (14 Vict., cap. 8) with special reference to the protection of exhibitors in the Exhibition of that year. The next two Acts (21 & 22 Vict., cap. 70, and 24 & 25 Vict., cap. 73) are still occupied with the same class of work, "designs for ornamenting articles of manufacture," and it is not difficult to understand why art of this class, so nearly approaching often to the conditions of manufacture, and with which the interests of manufacturers and purely business men are so much bound up, should have received a larger share of legal attention than the Fine Arts. The next and last Act we have to name is for us at present the most important of all, that entitled "An Act for Amending the Law relating to Copyright in Works of the Fine Arts, and for Repressing the Commission of Fraud in the Production and Sale of such Works" (25 & 26 Vict., cap. 68). This Act, dated July 29, 1862, was the first in which the "authors of paintings," as apart from engravings, obtained anything like recognised legal protection. The fact of its being passed was in great measure due to the action of the Society of Arts, which formed a committee and took a large body of evidence on the subject, and also in some degree to that of Mr. E. M. Ward, R.A., who was, we believe, instrumental in drawing their attention to the subject, in consequence of the failure of his efforts to stop piracy and copying in relation to works in which he was specially interested. The main principle of the Act may be summed up in its first sentence,—"The author (being a British subject or resident within the dominions of the Crown) of every original painting, drawing, and photograph which shall be or shall have been made either in the British dominions or elsewhere, and which shall not have been sold or disposed of before the commencement of this Act, and his assigns, shall have the sole and exclusive right of copying, engraving, reproducing, and multiplying such painting or drawing, and the design thereof, or such photograph, and the negative thereof, by any means and of any size, for the term of the natural life of such author, and seven years after his death." That is what the Act professes to do; providing, however, that in selling a work of art the person disposing of it disposes *ipso facto* of the copyright also, unless he receives a written agreement to the contrary at the time. The term seven years is but a short one for the author's heirs and assigns to have the benefit of his intellectual work; if we consider the provision made for Hogarth's widow in the abovementioned Act of Geo. III., we must regard such a provision as this as a step backward in the legal view of the assignable value of an artist's productions. Otherwise the object of the Act, as stated in the above quotation, is comprehensive enough; and if we consider that previously to its passing the law recognised, as shown by a ruling in a test case, no property of copyright on the part of a painter except in the case of a picture "exhibited as a diorama" (!), we must admit that the Act of 1862 marks, or should mark, an important era in the legal protection of artists. Why it has not succeeded in its objects, in what principles and details the existing law fails, we may now attempt very briefly to indicate, partly with the view of showing what ought to be looked for at the hands of the Legislature in any new Bill which may be the result of the inquiries of the Royal Commission which is just, we believe, terminating its labours.

The fact that there are nine existing Acts in regard to copyright in works of art, all in force, and requiring in many cases to be taken in conjunction, before the artist can make out what his rights really are, is in itself enough to indicate a necessity for reform. That the subject involves no necessity for a complicated legislation was distinctly stated by an eminent legal authority on copyright, Serjeant Burke, in a paper read before the Society for the Amendment of the Law on the 1st of June, 1863 (only a year after the passing of the last Act). The whole French law, which is far more complete and more easily put into action than our copyright law, "would not occupy more than a page or two in print," whereas our laws would fill a volume, and, "with their provisoes, restrictions, and contradictions, seem to delight in marring the object they have in view."* The same authority shows very pointedly the unsatisfactory nature in detail of the present laws. Sculptors come very badly off. The Act, 54 Geo. III., cap. 56, "gives the sculptor fourteen years copyright, and fourteen years more if he be still living at the end of the first fourteen, and have not assigned. There is no registration, and nothing required to secure copyright beyond the name and date of the first publication to be engraved on the piece of sculpture, so that whether the author be living or not at the end of the first fourteen years, or whether he have assigned, are matters his copier may find out as best he can." On the other hand, those professors of "high art," as *Punch* used to put it, the photographers, get more favour than any of the real artists. The photographer can obtain summary justice in a police-court against any one infringing copyright in even so trifling a matter as a *carte de visite*. But if the photographer make a fraudulent reproduction of a valuable engraving, the fruit of some years' labour and the expenditure of hundreds or even thousands of pounds, the engraver can take no summary process, but can only proceed to legal action which may be almost indefinitely delayed by legal formalities and the difficulty of reconciling and applying the multifarious provisions of the law in regard to engravings. One salient instance of this difficulty, arising from the want of any provision for immediate seizure in our law, is

* One of the most amusing instances of this is in regard to what is half an artistic and half a literary subject, namely, dramatic copyright. Our International Copyright Act forbids the representation here of unauthorised translation of dramatic works represented in foreign countries, but adds that "*nothing contained herein shall be so construed as to prevent fair imitations or adaptations to the English stage of any dramatic piece or musical composition published in any foreign country.*" Considering the present relation of our theatre to that of France, it might almost be supposed that these words were deliberately written in a spirit of cynical satire.

mentioned among the evidence collected at various times by the Society of Arts. "With great difficulty, and at considerable expense, an eminent firm of print-publishers at length succeeded in finding out a manufacturer of pirated copies of their engravings. From adjoining premises they actually saw the process going on in the delinquent's garden, and yet the law afforded them no means of seizing the piratical implements and copies." This significant anecdote we extract from the "Reasons" printed by the Society of Arts to accompany a model Fine Arts Copyright Bill which that Society endeavoured to get passed a few years since, and which, had the attempt been successful, would have gone far to remove all necessity for further legislation or for the inquiry of the present Royal Commission. The Draft Bill and the "Reasons" are well worth the attention of those who are interested in the subject of art-copyright; copies of them can be obtained, we believe, from the Secretary of the Society of Arts.

The confused and intricate nature of our present art-copyright legislation, and the varied and apparently quite arbitrary terms of protection, in regard to time, extended to different arts, stand seriously in the way also of the very important question of the International Settlement of Artists' Rights. As communication between various countries becomes in every respect nearer and closer, the importance of some general International understanding becomes the more evident. In regard to the present state of things we cannot do better than quote and thereby give circulation to the following summary from one of the paragraphs of the Society of Arts' "Reasons" for a Fine Arts Copyright Bill, before alluded to:—

"The following appear to be the several terms of *Artistic* copyright allowed by the thirteen States with whom her Majesty the Queen has entered into international copyright convention. In *Prussia, Saxony*, and all the other German States, the term is for the author's life and *thirty years* after his death. In *France* it is also for the author's life and (by the new law of 1866, for *fifty* years after his death. In *Belgium* it is also for the author's life and twenty years after his death. In *Spain*, it is for the author's life and twenty-five years afterwards; and, in *Italy* it is (under the new law of 1865) for the author's life, or forty years from the date of publication, whichever may prove the longer term. But at the expiration of such forty year-, although any one may then make and sell copies of the work, the person doing so must, during a second term of forty years, annually pay to the proprietor of the copyright five per cent. (calculated at the *published* price) upon all copies sold by the person so making and selling such copies. As to France, her copyright laws are expressly extended to all her colonies; and, by the eighth article of her Majesty the Queen's copyright convention with France, dated the 3rd of November, 1851, *reciprocal* protection is agreed to be given in favour of copyright works *first* published "in the territories of France," or "in the British dominions." This appears to show that both States clearly intended that such reciprocal protection should extend to their colonies. It is also stipulated by the 7th article that "pirated works *shall be seized* and destroyed." Now the French law very justly declares the piracy of copyright property to be a crime (*délit*), and provides rapid and effectual means for enabling the proprietor of the copyright to seize both the pirate and the fraudulent copies, plates, &c., in his possession. Yet, according to the present state of the British Artistic Copyright Laws, no such powers of seizure, as expressly agreed by her Majesty the Queen's convention, exist in the British dominions; nor does any protection whatever for *artistic* copyright works extend beyond the United Kingdom; no, not even to the Isle of Man, or to the Channel Islands!"

Obviously, in such a case, the reciprocity is, as the Irishman said, "all on one side," or nearly so. It is worth remark that the Bavarian Government declined to enter into a copyright convention with this country, on account of the great difference in the term of years for which copyright property in works of art was assigned in the two countries; Bavaria giving, like Russia, a term of thirty years after the author's death. And our legislation is at variance even with itself. Our Engraving and Sculpture Acts, being founded by analogy on the Literary Copyright Act of 1710, gave the same term originally given by that Act, fourteen years, and subsequently increased it to twenty-eight years. But the Copyright Works of Art Act of 1862 allows it only for the author's life and seven years afterwards. Now the question of International relations in Art copyright is not only, we understand, one of those upon which evidence has been collected by the Royal Commission, but it has also occupied the attention of a special committee of the Social Science Association, formed in pursuance of a report of Mr. Carmichael, the representative of the Association at the International Art-Congress at Antwerp last year. There is therefore obviously likely to be a renewed awakening of interest in regard to the International aspect of the subject, but there cannot be much chance of getting very satisfactory relations with other countries until the machinery of our own law is put into better working order.

Two more words, in conclusion, in regard to the subject from the artist's point of view. We have referred to the fact that there are persons who seem unable to understand why artists should have copyright in their works. It must surely be admitted that if a poem or a novel, as the result of intellectual labour, has a claim to copyright protection, a painting or statue has equal claim. But it ought to need only a moment's consideration to show that the producer of works of this class, of paintings or drawings especially, has actually a claim beyond that of a literary producer, since not only his gains, but his fame also is in danger of material injury, by bad reproductions put forward in his name, and pretending to be his own work. In the case of the writer of a book, if his book is correctly reprinted, his fame is in no danger from a pirated edition,—it is even extended; the ideas are the same, whatever the "fount" of type used, or whatever publisher's name appears on the back: it is his pocket only that is picked. But it is otherwise with the artist. The maker of the pirated painting or engraving cannot really reproduce the artist's work; he can only pretend to do so, and persuade the public that his inferior work is that of the original artist. The latter may, indeed, apply Iago's celebrated reflection with added force,—

> "Who steals my purse, steals trash;
> But he who filches from me my good name,
> Robs me of that which *much* enriches him,
> And leaves me poor indeed."

He stands doubly in need of protection, and the rather that in most cases he is a man, from temperament and habits of life, much less qualified to look after his own interests than the literary man; a consideration which has been urged by the legal writer before referred to—Burke—as one additional motive for simplifying and consolidating the law of art-copyright. Genius, he says, is proverbially improvident; "the defensive structure, therefore, wherewith we are to shelter it should be of the plainest build and the readiest access: no labyrinth, no intricate paths should surround it." The recommendation comes with the more force from a member of a profession generally supposed to be so opposite in temperament to that of the artist.*

Our last observation is in regard to architecture. It is singular that no one of the writers and committees who have taken interest in the subject of artistic copyright seems ever to have thought of the architect as a person requiring protection of this kind. The only way in which architecture comes into our art-copyright law is in the provision against the fraudulent copying of engravings containing architectural subjects, among others. Even in the generally very complete draft Bill of the Society of Arts there is not a word about architecture. The author of an architectural drawing would of course have copyright in it as an original drawing; but we need not say that would be nothing to the purpose. There is really no provision, and no one seems as yet to have thought of proposing any, against any one copying stone for stone the building designed by another. Now in certain ways, as we have intimated, architecture stands on somewhat different ground from sculpture or painting. It is half a science, a practical matter; and even in regard to its artistic side there are differences of opinion among architects themselves as to the value or desirability of strongly-marked individuality in architecture. It is pointed out that among the Mediæval builders repetition of the same details, the same mouldings, of almost all the features and of the main idea of many of their leading buildings, was almost a matter of course. But it is the fact that, whether for good or ill, things are altered; and an architect is now a man who has an individual idea in regard to plan and elevation which he carries out in his own way; and as the law stands he is absolutely without protection. As a general rule, it may be said, conditions of site and wants of the owners vary so much that it is very seldom any one has any temptation to copy a building wholesale. Still, take a case which may happen, and which we know has happened: a house has been built in a certain district, and another owner intending to build, and thinking this house very picturesque, determines to build a reproduction of it for himself, employing the same contractor, who, of course, has copies of the architect's drawings. Is not the original architect in this case distinctly and nefariously robbed? And it is certain that he is utterly powerless to prevent it. We hope this portion of the subject of protection to artists will receive attention in any new measure that may be introduced pursuant to the inquiry of the Royal Commission; and as we know that the president of the Institute of Architects has been examined as a witness before the Commission, we may have reason to believe that the interests of the profession will have been properly represented in the evidence which, when published, will give us the latest and fullest information as to the present state of the subject of Art-Copyright generally.

* It is also, perhaps, in consequence of this very want of business habitudes of mind, that artists sometimes have not apparently been awake to the injury done to the purchasers of their pictures by the exhibition and sale of "studies," sometimes of as high elaboration as, though on a smaller scale than, the principal work. On this subject a curious correspondence between Miss Burdett Coutts and Mr. Faed, forming part of the evidence before the Society of Arts Committee of 1858 (and published in the Appendix to Underdown's treatise on "Art Copyright"), may be perused with advantage. It shows the misunderstanding to which the present state of the law may give rise on both sides, and the subject should certainly be considered in any reform of the present law. It is a startling, but not always an agreeable surprise, for a man who has paid a large sum for a picture by an artist of note, to find in another house a "study" of the same work, of which he thought himself the sole possessor, equal or perhaps superior in artistic merit and interest to the "original."

ARCHITECTURE AT THE ROYAL SCOTTISH ACADEMY.

NEITHER as regards the importance of the buildings, nor the architectural skill displayed in design, is there much calling for admiration in the drawings exhibited. There is a practical business-like propriety about them without any tendency towards Queen Anne or other vagaries. Even the churches are orthodox to a degree, and correspondingly devoid of interest.

A tamer and balder church we have seldom seen than the "Established Church, Portobello," as designed by T. B. McFadzen. It is a parallelogram with two tiers of lancet-windows on the flanks, without mouldings, and unrelieved by buttresses. There is a tower and spire at one angle, to procure which the remainder of the building has been sacrificed. Ecclesiastical architecture would not seem to be Mr. McFadzen's *forte*, but he has produced some mansions worthy of admiration.

The "United Presbyterian Church, London-road, Edinburgh," by J. Starforth, is a more satisfactory production; the spire is well developed, and not embarrassed by unnecessary buttresses, which have a tendency to narrow the apparent breadth of this feature. The side elevations have large three-light lancets under a retaining arch, there are double-gabled transepts, and the buttresses, although not well developed, are as much so as is generally the case in Nonconformist churches, and there is a tendency common to the designers of most of such churches to throw too much ornamentation into the principal front as compared with the remainder. There are schools at the rear of this church which group in well with it.

The design submitted in competition for the "Mayfield Church, Edinburgh, by Messrs. McGibbon & Ross," possesses many of the characteristics above enumerated, but in it the spire is buttressed, and the absence of transepts prevents much variety of outline.

Mr. Anderson's "Church at Stirling" displays his usual care and correctness; it is very graceful and thorough, but has not any peculiarities calling for remark, except it may be (what does not appear from the drawing), that whereas the exterior is of stone, it is proposed to line the interior with brick.

The United Presbyterian church at Stonehouse, designed by R. Thornton Shiells and Thomson, has the vestry-hall and schools arranged on either side of the principal elevation, so as to form a group and mask the body of the church, which, from the glimpse we get of it, appears to be of the usual parallelogram form. Where the church stands, amongst a row of houses, this arrangement is commendable, but it would rather appear from the drawing that this one stands in an isolated position, and, if so, from some points of view the grouping will be unsatisfactory.

A "church in brickwork" is a novelty in Scotland—that is to say, an architectural church designed in that material,—for there are many temporary makeshifts knocked up in inferior brick and plastered over. The "church at New Craighall," designed by Mr. Henry Hardie,

has considerable architectural pretensions, and is not without merit as a design; but the architect seems to have been unable to free himself from old practice, and the detail and general effect are such as could, with propriety, be produced in stone.

Messrs. Peddie & Kinnear send a different version of the "Craiglockhart Hydropathic Institution" from that exhibited last year. The style is the same,—rustic Italian,—but more emphasis has been given to the central tower, and the fenestration has more expression. The amended design will be more in harmony with the site (close to a hill) than the former one, with its narrow campanile.

Two villas at Grangemouth, designed by James MacLaren, are of considerable dimensions, and display vigorous treatment. They are in the Scottish Domestic style.

"Carelee, Peebleshire," is a residence which was designed by the late David Bryce, and now additions have been made thereto by David Robertson. As Mr. Bryce was a master in this department, Mr. Robertson was put to a severe test, and he has succeeded in making the additions in perfect harmony with the original.

"The Municipal and Police Buildings, Portobello," R. Paterson, is a not very satisfactory adaptation of the Scottish style, as applied to such buildings. The composition is stilted, the detail heavy, and every angle possesses its own little pepper-box turret,—a useless appendage.

Mr. F. T. Pilkington exhibits a view of the "Edinburgh Theatre, interior looking towards the proscenium," a memorial of its short-lived existence. It is a pity it could not be retained, as it was good of its kind, albeit decidedly French in character.

The tower of St. Giles's, Edinburgh, and its kindred, have taken deep root in the affections of a class of the Scottish architects. Something similar thereto is sure to be designed by them if opportunity affords; but, strange to say, few, if any, of these designs have reached fruition. The "Biggar Memorial Drinking Fountain, Banff," designed by J. Rhind, is after this manner,—rather heavy in appearance, but it requires something substantial to stand the sea breezes of the Banffshire coast.

"Ayton House, Fife," by David and John Bryce, is represented by a well-executed water-colour drawing,—a work of art in its way. The style of the mansion is distinctly English in character, and suitable to the situation, depicted as in a richly-wooded park. The flat red tiles used are a rarity in Scotland, and harmonise pleasantly with the foliage. The house altogether has a warm, comfortable aspect, very pleasing to look at.

Quite different, again, is the "Shooting Lodge, Loch Hope, Sutherland,—construction, chiefly Timber and Slate," William Fowler, architect. The situation is picturesque, on the slope of a wooded hill, and the lodge fits naturally into it.

The "Gillespie Memorial Hall, Kippen," designed by D. Robertson, must surely be intended to be used for ecclesiastical purposes,—it has every appearance of a chapel.

Messrs. Peddie, Kinnear, & Peddie have a thorough mastery over the Scottish Baronial style: "Kinmouth, Perthshire," is an example of their treatment of it, with which we are now sufficiently familiar. In the same style, and effective in grouping, is a block of street architecture at Portobello, designed by P. S. Deas; and good, too, although in a different style, is the block at Greenock, designed by Alex. McTavish, which has an effective line of dormers.

The "Fine Art Institute Galleries, centre of George-square, Glasgow, from designs by J. T. Rochead, prepared in 1850," is an academical reproduction of the Doric style, represented in a daintily-executed water-colour sketch. The greater part of the façade is hidden by foliage, but the portions shown indicate that the designer has a competent knowledge of the style with which he is dealing.

School Board Offices for Ipswich.—The Ipswich School Board has, after consideration, adopted a proposal to purchase the Masonic Hall (a red brick building erected about ten years ago at a cost of about 3,000*l.*) for the purpose of a board-room, offices, book-store, &c. The sum at which the building is offered to the Board is 1,350*l.* A portion of the buildings will be rented by the School of Art. The Town Council opposes the purchase.

ON SOME POINTS IN THE METROPOLIS LOCAL MANAGEMENT AMENDMENT ACT,

AND THE ERECTION OF BUILDINGS BEYOND THE GENERAL LINE OF THE STREET.

Considering how strongly Englishmen insist on vindicating all the rights of property, and how aggrieved people feel when Government, whether actuated by too fussy paternal notions or by the necessities of modern times, steps in and limits these rights, it is almost a matter of surprise that much litigation has not sprung out of the Acts for the management of the metropolis. But, on the whole, the local authorities, and those with whom they have had to do, have each been fairly forbearing one to another. But there is yet nothing more important than that persons should be acquainted with the actual state of the law, and the manner in which it has been developed. For it in no way takes away from the soreness felt by a disappointed and overthrown combatant to know that he is essentially in the wrong. The points on which we wish to touch in this paper are concerned with the 75th section of the Metropolis Local Management Amendment Act (25 & 26 Vict., c. 102), which it may be as well to set out with some minuteness. It runs thus,—"No building, structure, or erection shall, without the consent in writing of the Metropolitan Board of Works, be erected beyond the general line of building, in any street, place, or row of houses in which the same is situate, in case the distance of such line of buildings from the highway does not exceed 50 ft., or within 50 ft. of the highway where the distance of the line of buildings therefrom, amount to or exceed 50 ft. . . . . such general line of buildings to be decided by the Superintending Architect to the Metropolitan Board of Works; and in case any building, structure, or erection be erected or begun to be erected without such consent, or contrary to the terms and conditions on which the same may have been granted, it shall be lawful for the vestry of the parish or Board of Works for the district to make a complaint before a magistrate, who shall issue a summons, and if on the hearing of such summons this complaint shall be proved to the satisfaction of the magistrate, he shall make an order on such owner or occupier, builder, or person directing, of any such building, or as much as may be beyond the general line so fixed as aforesaid, directing the demolition of the whole of the building, or as much as the magistrate considers desirable."

Two prominent points arise in regard to the explanation of this rule. The first, as to the function of the architect's certificate; the second, as to the person to whom notice of the proceedings should be given. That is to say, in regard to the first head, whether, when the architect has certified as to the general line of buildings in the street, such certificate is final and conclusive, so that the magistrate is merely a ministerial person, whose only duty it is, as it were, to register the architect's decision; or whether he may form an independent judgment whether the architect's line is or is not the general street line. And with regard to this certificate, it is well to point out here that it has been decided that it may be given at any time before the case comes on for hearing, so that, in fact, if one architect gives a certificate at one time, and another at another time, it is quite possible that these two persons might have different views as to what constitutes the general line of the street. That, it will be obvious, is an important element in the understanding of the point, because it is clear that the magistrate becomes, in the latter case, much more of an umpire than if he had merely to decide whether or not a certain building, or part of a building, projected beyond a certain fixed and well-known line. The decision which finally set this question at rest, after it had been raised in two previous cases, was that of Simpson *v.* Smith (6 Law Reports, Common Pleas, p. 87), where a bay-window was erected in Stratton-street without the consent of the Board of Works. The Superintending Architect of the Board decided, by his certificate, the general line of buildings, and the bay-window was beyond the prescribed limit. Thereupon the case came before the magistrate, who considered that he was bound by the certificate of the architect.

But the Court of Common Pleas, consisting of four very able judges, came to the opposite conclusion, and held that "the certificate cannot be binding on the magistrate." The magistrate, therefore, becomes a judge of appeal from the decision of the architect; and we have in a previous case an instance of the way in which this procedure acts. We extract it, with some noticeable comments, from the judgment of the late Mr. Justice Willes:—"It seems," he says, "to be probable that it was meant that a small departure from geometrical straightness of line should not be subject to a penalty, and that in dealing with a question which was one merely of an eyesore and not a nuisance, the judge who had to decide should have some latitude in determining what had been done was merely a small matter coming within the rule *de minimis non curat lex*, or a substantial departure from the intention of the Legislature. The case of St. George's, Hanover-square, *v.* Sparrow is an instance of the reasonableness of this construction. The erection there complained of was a small glass conservatory on a balcony, which could have a very trifling effect on the beauty or uniformity of the street, and which a jury, certainly under the old law, would not have found to be beyond the regular line of the street. The architect who, in that case no doubt, conceived that the strict geometrical line of straightness was to be taken, decided that it was beyond the line. It is obvious that in such a case it is most wholesome that there should be some mode of correcting such a decision according to the dictates of common sense." These remarks are certainly sensible, and carry with them a good deal of weight. On the other hand, it is quite clear that the magistrate and the architect are persons of such an utterly different career in life that it is doubtful whether a magistrate, however learned in the law, is a good judge of appeal from the decision of an architect upon a question which is essentially part and parcel of the latter's business. We do not say that in the instance just given the magistrate did not arrive at a proper and sensible conclusion; on the other hand, it would be quite as possible that in another case the architect would be right and the magistrate wrong. *Primâ facie*, an architect should be a better judge, both of the actual line of a street and of deviations from it which do or do not mar or interfere with its beauty or regularity, than a lawyer. But such at the present time is the law, and if not wholly satisfactorily, it must stand for want of a better appellate tribunal than a magistrate. As it seems to us, a really satisfactory way of forming a proper tribunal would be in analogy to shipping cases, by allowing the magistrate to summon as his assessors two competent and independent architects to advise him, but not to form part of the actual tribunal. His decision then would be one which ought to carry with it all possible weight. Indeed, we venture to think that in matters wherein points of technicality are involved, assessors are not used enough in our Courts of Law. But this is not the place to go further into a question in itself of very considerable importance.

Turning to the second point, it will be observed to arise from the latter part of the section in question, where it speaks of "the owner or occupier of the premises, or the builder or person engaged in any work," &c. In the case of Brutton *v.* The Vestry of the Parish of St. George, Hanover-square, (41 *Law Journal* Reports, Chancery, p. 134), a Mr. Brutton was the lessee and occupier of a house in Mayfair, with a portico projecting beyond the front of the house, upon which was a wall about 3 ft. 6 in. high, at a distance of about 4 ft. from the drawing-room window. In the month of August Mr. Brutton contracted with a builder to erect on this portico a conservatory, and on the 15th of that month he began work. So long after as the 2nd of March of the following year the Superintending Architect of the Board of Works certified that the main front of the building in the street was the main line, and on the 4th of the same month the Vestry took out a summons against the builder, who had in the meantime gone away to Australia. It is not necessary to go through the intermediate steps, for they may form matter for some further observations on another occasion. Suffice it to say that the case came before Vice-Chancellor Malins for an injunction to prevent the Vestry from pulling down the conservatory, on this one, among other grounds, that the builder was not the proper person against whom to issue the summons. The judge very properly decided that the builder in the case was not the right person to proceed against, and he went so far as to say that he could not conceive a proceeding more unwarranted than that this summons should

have been served on the builder. "He had been paid for his work, and he had no more connexion with it after he went away, when his work was completed, than Mr. Brutton's footman, who might have been discharged on the same day." It is clear, indeed, that the Act in this respect must be construed with reasonable care, and that it is intended, as pointed out by the judge, that where there is a known occupier and builder the proper person to proceed against is the occupier or the employer of the builder, but not the builder himself. But the builder is named because, in some cases, the Vestry may not know who the occupier is or who employs the builder, and if the latter were not named there would be no person of any responsibility against whom proceedings could be taken. Moreover, it is equally clear that the builder in the above instance was not, and could not, be the person liable, since the Act expressly speaks of "the builder engaged in the work,"—not the builder who *has been* engaged, but the one who is at the moment occupied with the matter in question. And it is certainly surprising that a responsible body like a West-end Vestry, who can obtain the best professional assistance if they will pay for it, bearing in mind that a penny wise and pound foolish is the worst of all possible policies, should make such blunders as the whole of this case shows us. But to keep to the main point, it is evident that there is also a strong reason why the builder, where the occupier is not known, should be responsible, because if his building is stopped while at work he is prevented from earning his money, and will consequently communicate with his employer. But when the work is completed it might be actually advantageous to him that the house which he has just erected should be pulled down. Therefore we have this section,—one of immense importance to all persons connected with metropolitan buildings,—very fully interpreted by these two cases, which show with considerable force how carefully and prudently matters, which in any way intrench upon strict proprietary rights should be managed. These prohibitive statutes are absolutely necessary in an artificial and highly complex state of society, such as we see at the present time, where ignorance and bad taste are not far apart from the eccentricities of art. But they require careful handling; they are capable of working at times considerable injustice, and the courts of law have certainly leanings against those who, either without cause or without care, put them in motion. At any rate, however, this section of the Metropolis Local Management Amendment Act has been carefully explained by the Courts of Law, in regard to the two points as to the effect of the architect's certificate and the responsible persons in matters connected with buildings and structures which fall within the provisions of the seventy-fifth section, so that if these explanations are remembered future mistakes will not so easily occur.

THE GENERAL EXHIBITION OF WATER-COLOURS.

THE fourteenth general exhibition of water-colours, opened at its usual quarters in the Dudley Gallery this week, includes a good many beautiful and interesting drawings, the average being higher than usual, though there are not many works to pick out from the rest as remarkable or important. The exhibition is strong in landscape, but contains some good figure-subjects, among which may be mentioned especially the portraits by Mr. Clifford and Mr. J. C. Moore. Each of these artists has established a line of his own in water-colour portrait-painting, — the one in portraits of ladies, the other in those of children. Of Mr. Clifford's two portraits, which, as usual, are quarter length life-size (or nearly so), that of "Lady Margaret Compton" (106) is remarkably beautiful and effective as a picture, the artist having had a very fortunate subject for his powers. Mr. Moore's portraits of children present the usual characteristics of his style; a somewhat conventional and stiff treatment of his subjects in what is really decorative painting, in which a great part of the effect is derived from very beautiful and delicate harmonies of colour (or in some cases we might say of *tone*, rather than of positive colour) in the dresses of the figures, and in the artificial backgrounds of furniture, and hangings, and wall-paper, amid which they are set. We have before expressed an opinion that these works are somewhat too made-up in their effect, somewhat too deficient in the charm and freedom of nature to be considered thoroughly true to the highest aim of portrait-painting. They are, however, quite *sui generis*, stamped with the artist's own manner and genius; as colour-studies they are delightful; and in one of those exhibited this year, "Miss Daniel" (222), there is an exquisite grace and sweetness of expression in the portrayal of a young quiet girl just getting into her "teens." Another portrait which cannot fail to attract attention is that of "The Hon. Mrs. Lyulph Stanley" (308), by Mr. Walter Crane; a figure in warm yellow, approaching to orange, standing by a fireplace, in a room the furnishing of which goes to make a rich scheme of colour in harmony with the dress as the keynote; the drawing is very highly finished, and a success in every way, except in attracting interest to the countenance of the sitter, which, in fact, appears quite subordinate to its surroundings. His smaller work, called "A May Meeting," a young man and woman playing at lawn-tennis, amid the spotty foliage of a garden in spring, is full of talent and interest. Among other figure-subjects are some of Mr. MacCallum's coast studies,—figures and sea in bright sunlight, in which the treatment of the water, luminous as it undoubtedly is, seems to be getting a little like a trick of handling; we have it always the same. Mr. W. S. Coleman sends a pretty imitation of Tadema, in "Gold Fish" (262); Mr. Dollman's picture of "A Canine Æsculapius" (315) has real humour and brilliancy of execution; one or two heads by Miss Jennie Moore, in particular "Elspeth" (332), are good; and a large drawing called "Stranger in the Land" (501), by Mr. F. E. Cox, has merits which, to our thinking, might have claimed a better place in the hanging. Miss Kate Greenaway's various half-conventional studies of peasant children, to be found on the screens, must be recognised, no doubt, for their ability and humour, but they seem to us uninteresting, and in some instances too nearly approaching caricature. Compare them with Mrs. Allingham's little "Study of a Schoolgirl" (572), and their want of refinement and reality is obvious at once.

In landscape there are many beautiful and interesting drawings, more than we can undertake to name; and we notice with pleasure the predominance of works in which the sentiment of nature seems to be aimed at, besides the mere study of facts. A very beautiful and remarkable little work is that by Mr. Poynter at the top of the room, "Moonlight in Funchal Bay" (221), a most unusually real moonlight; and the manner in which the quiet but large swell of the sea, and the dip and roll of the ships, anchored in the middle-distance, are indicated, without disturbing the repose of the whole scene, is very fine. Mr. J. O. Long's "Frosty Morning on the Coast of Devon" is a suggestive study of somewhat similar type, though slighter. Mr. MacCulloch's "Harvest, Lochaber" (242), and Mr. Glennie's "Loch Eil and Ben Nevis" (263), are good specimens of drawings in which the effect of largeness of scale is obtained in comparatively small works. "A Moorland" (293), by Mr. J. Knight, shows some of his finest qualities, and Mr. Arthur Severn sends two really grand drawings, both dealing with remarkable and exceptional effects of nature; "Cromer after Sunset" (329), and "Sunlight effect over the Jura Lake of Geneva" (433); in the former we stand on a beach at the gathering of twilight, with a foaming surf rushing in, and the masses of the town standing piled against the last gleam of crimson in the sky; the Jura drawing is altogether an exceptional effect, one of those which perhaps we may say must be seen to be believed; but certainly its dazzling luminosity is most remarkable; comparing this with some other recently-exhibited drawings, however, we are tempted to express a hope that this gifted artist will not allow himself to be drawn away too much into attempting out-of-the-way and extraordinary effects—a kind of study which is very likely to lead to that worst evil in landscape-painting, a theatrical style. Mr. Pownall Williams sends a very interesting drawing, "In the Belfry of the Campanile at Torcello" (166), showing the shafts, with their heavy Byzantine-looking capitals, and below the straggling meanderings of the lagunes; his little drawing, "Through the Olive-yards" (173) has also much individuality. Among other noticeable bits among the landscapes are Mr. A. B. Donaldson's drawings, four in number, of which "Old Tower, Great Yarmouth" (13) is of special interest; one or two little things by Mr. Claud Hayes, which are full of feeling, especially a very small sketch on one of the screens (514); Mr. Ditchfield's "Near Boxhill, Sussex" (123); Mr. Grace's "Summer Afternoon on a Surrey Moor" (136); Mr. F. G. Cotman's "Quietude" (254), a small drawing in a very fine, broad style; and Mr. Napier Hemy's "Off for the Night" (401), a study of sea and fishing-boats, on rather a large scale, and up to his usual mark in excellence.

There are some good architectural subjects, among which may be named an admirable view of "Trafalgar-square" (229), by Mr. Herbert Marshall, in which topographical accuracy is combined with effect; and "A Yard in Rouen" (174), by Mr. Glennie, a capital study of old houses in strong sunlight. The exhibition is also rather strong in flower-paintings, among which "Yellow Chrysanthemums" (55), by Miss Constance Phillip, and "Blackberries and Blossom," by Miss Norman (608), may be mentioned; and Miss Angell's study of "Azaleas" (230), in a jar of very real and translucent tinted glass, making a fine bit of colour.

NOTES ON JAPANESE ARCHITECTURE.*

ALL Japanese architecture, until the employment of foreigners within the last few years, has been, with very few exceptions, entirely of wooden construction. In certain parts of the country, where stone lies to hand in boulders, or is otherwise naturally exposed, there are a few instances of its use in the construction of the walls of small houses and simple temples. There is a small temple near Nikko, about 14 ft. square, of which the walls are built of oblong blocks of stone, placed upon their narrow ends, forming the whole thickness of the wall, without bond, and having all the external joints covered with a large plaster-roll to keep out wet. The roof is also formed of large slabs of stone hollowed out on the surface and cemented at the joints in imitation of tiles. In addition to this there are to be seen several stone bridges,—large stone walls surrounding the principal cities, solid stone monuments to the dead, imposing flights of stone steps, with stone railings leading up to the temples, lamps of stone and bronze adorning the temple precincts, bronze statues of gigantic size; and stone is invariably found employed in the pavement of courts, and as a substructure to wooden buildings in order to form a stable and dry foundation. On account of the constant fires which occur in the large cities, particularly during the winter, there are not many of the ordinary street dwellings which have not been repaired or rebuilt within quite recent times. The temples, protected by their isolation, and in many cases by thick groves, also many important dwellings set apart by themselves, can boast considerable antiquity, but the ordinary domestic and street architecture is of comparatively modern erection. Some of these larger dwellings of the nobles have fallen a prey to treachery and wanton destruction, others have been burnt to the ground through the introduction of European heating appliances into wooden walls, without precautions and protection. The Tokio Foreign Office, one of the finest old Japanese buildings in the capital, which was entirely destroyed this year by fire, is said to have been set on fire through a stove-pipe running through a wooden wall without any protection whatever. It appears, nevertheless, from such representations as can be found in books, that the arrangements and general appearance of the ordinary houses have not altered since very early times. They are fragile wooden structures, never more than two stories in height. The walls are constructed of a vertical and horizontal framework of posts and beams mortised together, filled in with bamboo laths, laid crossing, bound together, and coated with mud in several layers, being finally plastered over. Sometimes the beams and posts show, being flush with or projecting beyond the plastered surface, and sometimes the whole is plastered over, framework and all. This latter method is employed in larger buildings, and in the "kuras," or godouns. A kura is often many months in building, the mud, which is taken from the bed of some river, being spread over the framework in a great number of layers, each layer being allowed a long time

* From a paper by Mr. Josiah Conder, Soane Medallist for 1876, and Professor of Architecture at the Imperial Engineering College, Tokio, Japan, read before the Royal Institute of British Architects on Monday evening last.

to harden. The projecting timbers at the eaves are also thickly coated with the same clayey mud, and to the small window-openings are hinged shutters coated to a very great thickness with the same material. The whole surface of the building is then plastered over, and finally covered with a coating of lacquer. These kuras often remain standing after street fires, but they are by no means thoroughly fireproof, for the mud often cracks and falls off with great heat, and even under ordinary circumstances they require constant renovation and repair.

In the ordinary houses one external wall or more, and most of the internal walls, are not filled in with plaster, but are open between the uprights, being filled in merely with light wooden screens sliding past one another in grooves formed in the heads and sills of the framework, so that the whole partition can be thrown open at any part. Where light is required these screens are formed of thin wooden framework, divided into rectangles of some simple design, and filled in with tough translucent paper, or in some cases in interiors they are covered with paper, decorated with patterns or paintings. Each room opens into the neighbouring rooms, and passages are seldom to be found, except in the largest of houses. Sometimes, however, the greater portion of a room will be raised about 12 in. above the level of the entrance, leaving an L-shaped space or passage on two sides. The raised portion is covered with mats, and used by the isdwellers as the room proper. In small rooms the whole floor is on one level and covered with mats. These mats are always manufactured of one dimension (namely, 2 ft. 11 in. by 5 ft. 10 in., being twice as long as their width), and a room is invariably built, measured, and described, not according to its actual dimensions, but by its number of mats. They are made of rushes, neatly woven upon a light wooden frame, are about 1½ in. thick, soft, slightly yielding, and warm. The houses of the highest and lowest, as well as all temples, have their floors covered with these mats, a little differing in quality. There is generally in one wall of a room a small recess formed in the framework, in which are placed one or two rows of shelves, moulded, polished, and lacquered. These shelves are generally arranged in some quaint unsymmetrical manner, and both form an ornament to the room themselves, and serve for the display of vases or small ornaments. Even the lowest classes of the Japanese show great taste in judiciously disposing small treasures of good shape and colour to the adornment of their dwellings. They convert the smallest strip of land into a miniature garden, which they plant with well-trained shrubs and flowers.

The simple habits of the Japanese, both as regards resting and feeding, renders but little furniture necessary for the complete comfort of the householder. Small low tables, more like what we call trays, are used for serving up food upon,—one being set before each guest. A metal-lined box, or sometimes an ornamental bronze receptacle, is used for the small charcoal fire, from which warmth is obtained in cold weather. A room is invariably provided with one or more folding screens, which, as the inmates sit or recline on the mats, do not require to be of any great height in order to secure privacy, and keep off draughts in cold weather. Small chests of drawers are to be found in private rooms for clothes, &c., and these, as well as the hibachis, tables, and screens, are mostly of some elegant shape and pleasing design. If a house be of two stories, the upper story is reached by wooden steps, leading up from room to room, being composed of two strings with treads and no risers, somewhat inconvenient in their slope, and generally without handrails. The ceilings of the rooms are wooden, consisting of the underside of the floor-boards of the room above, crossed by the small joists supporting them, and sometimes smaller ribs between, dividing the surface into squares; the whole is polished or lacquered. Probably, in early times, houses of this class were covered with thatched roofs, projecting considerably at the eaves, or were covered with boarding and wood shingle. In country parts there are now many roofs covered in such ways, but most of the houses in the cities have heavy tile roofs of great projection, with large ridge and hip tiles and terra cotta ornaments at the extremities. The roofs are often slightly concave on their surface, resembling those found on a larger scale in the temples, from which they are undoubtedly copied.

The Shintoo Temples, which are built in imitation of the earlier temples of that religion, prior to the introduction of Buddhism, have roofs of two plane sloping surfaces, very salient at the ends and at the caves; and it seems from this that the heavy curved and hipped roof, which now abounds so in Japan, was an introduction from Corea or China contemporary with the religion of Buddha. The tiles are always of a greyish black colour, and the joints are covered with a thick roll of white cement. One great peculiarity is the size of the ridge and hip ornaments, which are constructed of several courses of tiles and cement, forming quite a little wall along the ridge and hips, terminated by large terra cotta ornaments at the extremities. These ornaments are most of them very artistic in shape.

In houses of two stories the upper story is sometimes set back a little, the projecting portion below being covered by a small lean-to roof. There is often below this another flat roof, projecting some 3 ft. from the lower wall, to keep off sun and to protect the frail wooden entrances from wet. This roof is generally in part suspended from the roof above, and partly supported at wide intervals by light bamboo posts. Small gutters of bamboo are generally fixed to these lower eaves, with pipes of bamboo to carry off the water. In the hot season, "sudaris" (a kind of cane blind which admits air and permits outlook, and at the same time gives shadow from the sun) are hung from the eaves to the ground. The above description applies both to the dwellings of the lower and the middle classes, the latter being somewhat larger, more cleanly, and better furnished.

The tea-houses, or hotels, are on a much larger scale, and vary in their arrangements. They are very often planned on three sides of a little entrance-court laid out as a garden—a verandah, with a floor some 12 in. from the ground, running round these sides and serving as a passage from one room to another. The upper story also has generally a verandah covered with a salient roof, under the eaves of which paper lanterns are hung at night. In large hotels (called Yadoyas) there is generally a small interior court, in one corner of which cooking is conducted in the open air, the rest being laid out in some ornamental manner, with ponds, streams, shrubs, and stone lanterns. Round this is an interior verandah, and often miniature wooden bridges, enabling one to cross the court without dirtying the feet.

The dwellings of the higher classes, which are called "Yashiki" or "Miya," are considerably larger and more architectural. Their arrangement is very simple, being a group of somewhat low rooms, opening one into the other, having a lobby or hall at the entrance, and sometimes one passage from front to back. They are not more than two stories in height, and are covered with a heavy tile roof of wide span, with terra cotta ridge and hip ornaments, prominent eaves, often supported by a rich cornice of beams and brackets, and having elaborate carving displayed in the gable-ends. Over the entrance to the house there is a wide portico, supported upon strong posts, which are often moulded on the edges. The lintels, beams, and projecting rafters are also moulded on the edge, and carved with some flowing line of ornament, deeply incised upon the flat surface. Such ornament is very effective, being delicately and sharply cut, and can be seen from a great distance. The portico roof is either a continuation of the curved line of the large roof, or consists of a smaller roof intersecting this. In the latter case, a favourite form is that of a double ogee, convex at the ridge and concave at the eaves, forming a gable or semi-gable at the front. By this is meant that on the front, the curve of the roof is continued half way, and is then, as it were, cut off, showing the sides of the end rafters projecting, decorated with bronze clasps, and adorned with carved and pierced wooden pendants. In the large roofs the semi-gable is also a favourite form for the ends, in this case the upper portion being of the gable form, and the lower portion a sloping hipped roof. What I have called bronze clasps or belts correspond to what, if placed at the end of a beam, would be called shoes, being gilt and engraved plates of metal, placed in the centre of exposed beams and lintels, serving for no purpose but ornament. They are much used in Japanese architecture. The windows are generally greater in length than in height, being low oblong openings, filled in on the outside with thick wooden bars, arranged sometimes vertically and sometimes horizontally, the whole being open to the air. On the inside of these windows there are always sliding shutters or paper windows to keep out wet or cold in bad weather.*

THE ALEXANDRA PALACE BUILDING ESTATE.

IMPORTANT SALE OF BUILDING PLOTS.

THERE was a large attendance of persons interested in building at the Auction Mart the other day, on the occasion of the sale of several sites of building land forming portions of the Alexandra Palace Building Estate, the sale of which was legalised by the Act of Parliament obtained last session. The property offered consisted of twenty-one lots, and was described as the Muswell-hill site, comprising nearly four acres, this site being divided into ten lots, containing a little more than a quarter of an acre each; also the Wood-green site, containing nearly six acres, which was offered in one lot; and the Alexandra Park site, containing nearly ten acres, and divided into nine lots, containing about an acre each.

The first portion of the property offered was the Muswell-hill site, which was described as affording choice sites for residences. The conditions provided that a building line of at least 30 ft. from the road is to be maintained on this site, except at the flank sides of lots 1 and 10, where it is to be 10 ft. only. All the houses to be erected are to be private dwellings, and not more than two houses are to be built on each lot, the prime cost of which is not to be less than 1,000*l*. There was a spirited competition for each of the several lots, the first six lots being sold at an average of 600*l*. each. For lots 7, 8, 9, and 10, 450*l*. each was the highest offer, and they were withdrawn.

The Wood-green site, containing 5 a. 3 r. 27 p., was next offered. It was described as possessing a frontage of 1,575 ft. to Crescent-road, 40 ft. wide, which is to be finished at the sole cost of the vendors. It was stated to be well adapted for the erection of shops, or other business or commercial premises requiring space, and also for private dwelling-houses. After a close competition this lot was sold for 5,500*l*.

The last portion of the property offered was the Alexandra Park site, containing nine acres, three roods, and eleven perches. It was described as affording choice sites for villa and other residences, fronting a new 50 ft. road, which will be finished with the sewer at the sole cost of the vendors, and taken to by the Tottenham Local Board. A building line of at least 25 ft. from the road is to be maintained on this site, and all the houses to be erected are to be private dwellings only, and not more than five houses on each lot, the value of each house not to be less than 800*l*. prime cost. Of the ten lots comprised in this site, containing on the average about an acre each, the three first were sold at prices ranging from 1,200*l*. to 1,500*l*. The remaining seven lots were withdrawn, 1,000*l*. being the highest bid for each lot.

It will thus be seen that out of the entire number of twenty-one lots comprised in the property ten were sold and eleven withdrawn.

THE WANDSWORTH NEW VESTRY-HALL.

THE new vestry-hall which it is proposed to erect at Wandsworth is likely to be carried out on a novel principle, which has received the sanction of the Charity Commissioners. The estimated cost of the site is 2,000*l*., and of the building 5,000*l*., and it is expected that the building will, to a certain extent, be self-supporting, as it is intended to let it for public meetings and entertainments, as well as letting some of the rooms as public offices for the registrar of births and deaths. The original intention was to have defrayed the cost of the hall by a small rate, but it is now proposed, with the consent of the Charity Commissioners, that the trustees of the several parochial charities within the parish should purchase the land and erect the building, and then let it to the Vestry on a lease for ninety-nine years, with a clause in the lease providing that at the expiration of that period the Vestry should have power to purchase the hall at a small advance on the original cost. The proposed rental is to be 3½ per cent. on the amount expended. We understand that this arrangement will be carried into effect, and the hall erected under its provisions.

* To be continued.



THE TECHNICAL HIGH SCHOOL, STOCKHOLM.—PROFESSOR SCHOLANDER, ARCHITECT.

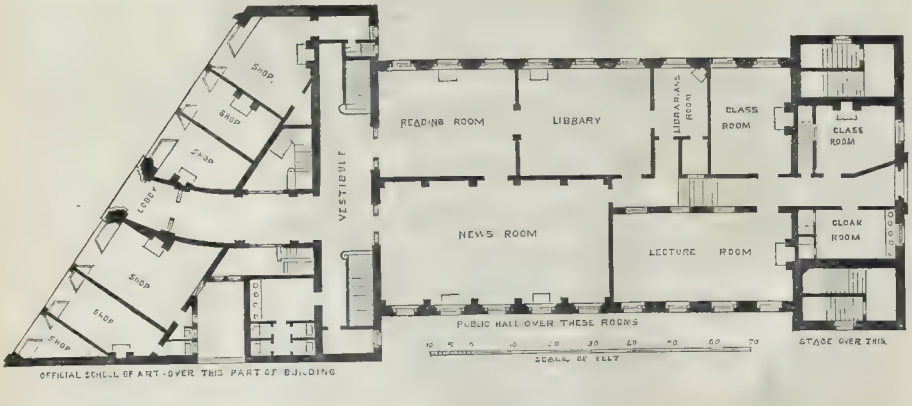
THE TECHNICAL HIGH SCHOOL, STOCKHOLM.

THIS institution, of which we give an illustration, lately celebrated the festival of its inauguration. This solemnity was the fiftieth anniversary of its existence as the Technological Institute; but it may be traced much further back.

One hundred and eighty years ago Kristofer Polhem established his Laboratorium Mechanicum, for which he received from the State a yearly subsidy of 1,500 thalers, silver currency. The Laboratory had to migrate from place to place. First it had a home at Kungsholmen, next at Riddarholmen, and finally it was transferred to the Castle. It was as unfortunate with regard to its subsidy from the State. In consequence of the wars during the reign of Charles XII. it lost that support. It then served only as a museum of models, and about 100 years ago a catalogue of its contents was printed. Together with the School of Mechanics, established in 1798, it was placed under the supervision of the Academy of Arts, and was shortly afterwards removed to Mäster Samuelsgatan, No. 43.

When the Academy of Agriculture was founded, both the School of Mechanics and the Museum of Models were placed under its care. By virtue of the royal order of June 8th, 1826, the school was changed into a Technological Institute, and the Museum of Models was transferred to it. The premises mentioned above, at No. 43, Mäster Samuelsgatan, received within their walls the new institution, and in June 1827 the Technological Institute was formally opened, after the completion of the necessary alterations, which had taken up a whole year. Twenty years later it was entirely reorganised, was still further extended at a subsequent period, and in 1861 was removed to the present premises, erected after the plans of Professor F. W. Scholander. In 1869 a building for the School of Mining was erected by the side of the Technical Institute, and this year the Institute was changed into a technical high school, the only one in the country. It has a staff of ten professors and eight other teachers.





BARNSLEY MECHANICS' INSTITUTE AND PUBLIC HALL.—MR. HILL, ARCHITECT.

BARNSLEY MECHANICS' INSTITUTE AND PUBLIC HALL.

THIS building covers a space of 2,500 square yards. The frontage reaches the height of 60 ft. The news-room is 53 ft. by 30 ft.; the reading-room, 34 ft. by 27 ft.; and the library, 33 ft. by 27 ft. The large hall, including the stage and gallery, is 113 ft. long by 58 ft. wide, and will accommodate between 1,700 and 1,800 people. The school of art comprises large elementary room, 80 ft. long by 25 ft. wide; antique-room, 34 ft. by 16 ft.; and painting-room 24 ft. by 16 ft.

Mr. Hill, of Leeds, is the architect; and Messrs. Boothman & Broomhead, of Leeds, are the contractors.



THE PALACE OF JUSTICE, PARIS.—M. DUC, ARCHITECT.

THE PALACE OF JUSTICE, PARIS.

The modern application of the word "palace" is often made, like many other similar things, a matter of fashion or caprice; but the word has not only a history, it has a meaning which becomes a nonsense or an indignity when qualified with places of entertainment like those of Sydenham or Muswell-hill, or, still worse, the public-houses of the metropolis and smaller English cities. The palace was the abode of the sovereign,—the "palatium,"—the eminence upon which the embodiment of power was raised, the enclosure within which the central authority was housed. Such was the Palace of Westminster, once the home of the English kings; that the name should still designate the halls and chambers of the legislature is perfectly consistent with tradition and fact. The king was the supreme judge upon earth of the people he ruled; in the palace of the king wrongs were heard and redressed, justice was administered. There was a reason for maintaining the English courts of justice at Westminster; there is equally a reason for giving the new Courts at Temple Bar the appellation of "Palace of Justice." The same argument applies with prior right to the Palais de Justice of Paris, for the new buildings, intermingled with the old walls and foundations of successive edifices, repose upon, within, around the precincts of the Palais, that is to say, the ancient residence of the kings of France. There, once upon a time, all the high business of the nation, regal, judicial, and official, was transacted. Once upon a time Paris was contained within the larger part of the island, partly occupied by the Palais, and now known as the Ile de la Cité. Lutetia stood upon one of five small islands, three of which have been incorporated by means of embankments and bridges. The Cité was the heart of mediæval Paris; the palace, the cathedral, the hospital still mark the site of the early capital. In the time of Henri IV. the completion of the Pont Neuf united the two western islands of the Seine with the Ile de la Cité. An equestrian statue of that king still adorns the bridge, which, unlike the other bridges connecting the Cité with the river banks, was never obstructed by habitations of any kind. The façade, which we publish in our present number, is the western front of the Palais de Justice facing, at a considerable distance, the statue to which we have just alluded. At the present moment tall houses line the road leading from the Pont Neuf to the *Place* recently opened in front of the new façade, and these houses are to be pulled down. A magnificent approach from the west will thus be completed, the eastern approach being from the Boulevard St. Michel, while the northern and southern façades front respectively the quays or embankments formed upon either shore of the island. The Palais de Justice is still an agglomeration of buildings of different styles and periods. Though its present successful isolation on the western side has been completed under the Republic the principal work of alteration, renovation, and reconstruction was done during the Second Empire. We have so repeatedly referred to the later additions that we can do barely more than string together descriptions already printed in this journal. For an idea of what the Palais was in the Middle Ages our readers ought to refer to the sketches published in M. Viollet-le-Duc's "Dictionary" (vol. viii., p. 4) under the head of "Palais." Very little if anything, except the Sainte Chapelle, remains of the mediæval buildings. The degradation to which, two hundred years ago, the Palais de Justice and similar buildings, in England as well as France, was subjected is well known. Boileau, in his "Lutrin," has described a part of that Palais which was probably rendered detestable to him by an uncongenial study of the law. In his time narrow passages and alleys led through tottering buildings now rebuilt, combined, and harmonised into one admirable whole; mendicants and street-hawkers established themselves in the old squares, under the old arches, and upon the old steps. Referring to the external stair of the Sainte Chapelle the author of the "Art of Poetry" sang:—

> "Par les détours étroits d'une barrière oblique,
> Ils gagnent les degrés et le perron antique,
> Où sans cesse, étalant bons et méchants écrits,
> Barbin vend aux passants des auteurs à tous prix."

Some long time afterwards, about a hundred years ago, the courtyard and façade towards the Boulevard St. Michel were begun by the architect Moreau; the interior of the building was remodelled during the reign of Louis Philippe, about the year 1834. On the 26th of May, 1840, a royal ordinance was published relating to the construction of a new Palais de Justice. The works already finished were made to form part of the new project, which referred principally to proposed buildings upon the Quai de l'Horloge and the Quai des Orfèvres, and to the façade, a view of which we are now giving. The group thus formed belongs partly to the Municipality and partly to the State. The Cour de Cassation which is included in the group is the property of the State, and M. Duc is the sole architect. The Palais de Justice is the property of the City or Municipality, and M. Duc has been assisted first by M. Dommey and afterwards by M. Daumet. M. Duc and M. Daumet, the son-in-law of M. Questel, are now the joint architects of the Palais. It should be remembered also that the architects of these as well as other equally important buildings in Paris are assisted by inspectors and sub-inspectors who are also architects. These inspectors (clerks of works) are nominated by the Minister or the Director of Civil Buildings, as the case may be; they are generally chosen from the more distinguished of the students at the schools of architecture in the capital. The relations of an inspector, a joint-architect, and the chief architect are often complicated,—at least they appear so to Englishmen. The inspectors at the Palais de Justice have enjoyed the right of private practice. M. Duc, the chief architect, was himself an inspector at the "July Monument" before he was appointed its architect. We are particular in enumerating these points, because they have much to do in rendering the public buildings of Paris the excellent works of art they mostly are, and they have probably contributed to make the Palais de Justice the comparative masterpiece it is.

The central portion of the façade in our view, is the Grand'Salle des Pas Perdus, about which so much criticism has been banded. It is a huge stone Hall, vaulted in stone. Entered from the external steps through three doorways,—the doors being of bronze,—it forms a vast approach to staircases of stone and marble leading right and left to the different parts of the building. The middle door of the Hall faces a central entrance reached by a few steps. This is a square-headed opening bordered by Ionic columns surmounting an entablature and a pedimented niche, within which is a seated figure of The Law, by M. Perraud; figures erect, one holding a torch, are placed upon either column. Beyond this opening, and seen from the Great Hall, is a figure of Justice, by M. Duret, placed in a niche at the foot of the staircases leading right and left. At each extremity of the Great Hall, and facing the doors at each end of the portico is an archway into a broad corridor leading through the building to that other Grand'Salle des Pas Perdus constructed by Jacques de Brosse, which was destroyed during the Commune, and thus gave rise to the report that M. Duc's building was a heap of ruins. Happily, however, the excited populace had the good taste to spare that portion of the Palais, which, of all buildings erected during the last forty years, offers the most vivid suggestions and discloses the greatest original efforts to inquirers willing and capable to see or comprehend the progressive art of their own time. Our readers must not misunderstand us. We do not refer with any approval to the newly-restored Galerie de Saint Louis, or, indeed, to any of the attempted mediæval effects which have been lately executed; any English architect of experience in early French and English architecture would have done better than M. Duc and his assistants have done in the Gothic parts of the work. We refer simply to the new Grand'Salle des Pas Perdus, to the staircases and passages leading out of it; and externally to the engaged colonnade with its broad flights of steps which, far from being the result of caprice, are necessitated by the fact that the floor of the second story of the Sainte Chapelle has been taken as the general level throughout the principal parts of the Palais.

We admit, at the same time, that the lines of M. Duc's Grand'Salle des Pas Perdus are unpleasing; we admit a preference for certain mediæval halls we could mention, for certain modern halls we could name. But that is not the point. M. Duc's Grand'Salle is a step in a new direction. The general arrangement of the entire hall; the coloured materials of the walls, columns, and balustrades; the vaults and arches of the roof,—should be conscientiously studied by the increasing number of men, young and old, who are trying to reconcile the opposing methods of by-gone art. All schools have agreed in praising the judgment which has heaped honours upon M. Duc, not for having conceived a beautiful work of high art, but for having done something that has not been attempted before. Even M. Viollet-le-Duc,—between whom and M. Duc there is a wide gulf both in the politics and the art of architecture,—has gone out of his way to praise the new Grand'Salle. In the second volume of his "Entretiens" he has added a foot-note of praise:—"La Salle des Pas Perdus, extérieurement et intérieurement," says he, "est un de ces monuments qui fera honneur à notre temps. Là tout se tient; tout est lié par une pensée claire. L'exécution, comme il arrive toujours, répond à la composition. Elle est belle et pure. On sent l'artiste, chose rare dans notre temps, qui respecte son art et le public." The conductor of the *Révue de l'Architecture*, M. César Daly, has accorded similar praise, and for the same reason. We ourselves, in an article* printed almost exactly two years ago,—at the time when M. Duc was nominated by the Council of the Institute of Architects to receive the Queen's gold medal,—gave our own reasons for heartily approving the selection. We declared that the New Grand'Salle by M. Duc was, though by no means a model of beauty, the great work of the day. We felt that, refined in all its details, it was, nevertheless, inelegant in outline. We said,—"There are modern works, even in England, more captivating in effect, and in which the superficial elements of beauty are more strongly marked; but since the revival of letters none have been erected which give, with greater decision, truthful expression to the thought and aim of the constructor than this one. . . . It is symmetrical without any forced regularity; utilitarian, and not crude; classical, yet devoid of pedantry. It proves not so much the genius of the architect as the pliability of orders, rules, and other antique *impedimenta*. The force of reason and common sense is there displayed in the manipulation of hard and cold materials, and its completion establishes a fact—promoted without a doubt by prolonged archæological researches in both Grecian and Gothic fields of art—that all the constructional forms of every country may be so adapted to the style and habits of the present time as to produce a harmonious result, provided always that the cognate principles of ancient and mediæval architecture be scrupulously followed and developed." We urged in fine that M. Duc leavened a profound knowledge of the ancient Greeks with an admixture of Gothic methods. He had thereby produced a scientific, truthful, and artistic building; and an innovation which a succeeding generation, working on similar principles, would be able to shape into beauty. Impressed with the conviction which we have just described, the judges awarded the Emperor's first and last prize of 100,000 francs to the author of the work we illustrate; and M. Viollet-le-Duc, whose own larger works, especially the restored Château de Pierrefonds, were cited against the single creation of M. Duc, afterwards admitted the justice of the award.

We should not describe with the same enthusiasm, or praise in an almost unqualified manner, this really great work of M. Duc were it not one executed under conditions totally ignored in this country and rare even in France. For nearly forty years M. Duc has been engaged in making designs and drawings for the Palais de Justice; and he has sacrificed the more than probable chance of a large private practice to devote himself almost entirely to this work. He is even pleased to make many, nearly all, detail drawings himself—no small task when it is remembered that everything movable and immovable within the building has been expressly designed and made. At the same time, the best workmanship that Paris can afford has been lavished upon the pettiest detail. A great deal of Echaillon, a very hard stone, veined, and susceptible of polish—only used of late years—has been introduced into the construction; and the so-called marbles of the Jura have also been employed. The joiners' work, which is of a very careful and beautiful description, has been executed by M. Mathérion; the old and well-known firm of decorators, MM. Huber, frères, have been entrusted with much of the internal ornamentation, the principal partner, M. Hamel, having devoted himself to the execution of wall

* See "M. Duc and some of his Colleagues," the *Builder*, vol. xxxiv., p. 181.

decorations of different kinds, as well as to models of all sorts for the architect's appreciation before the final completion of mouldings and sculpture. The plumbing and slating have been done by MM. Monduit and Bechet.

We have not yet heard whether the publication of a monography of the later portions of the Palais is in contemplation. Some excellent photographs of the Grand'Salle des Pas Perdus were presented to the Institute of British Architects more than ten years ago by M. Duc himself, and they may be found in the Institute Library. Those younger members of the profession who may chance to visit Paris during this year would do well to obtain an official introduction to some of the Inspectors engaged at the Palais, and so armed they would be sure of a cordial reception. They should ask to look over the working drawings in the architect's office, located in the building itself, before they diligently and modestly study the original points of M. Duc's development of nineteenth-century architecture.

ART CULTURE.

Some earnest efforts are being made to increase the means for the study of art and the enjoyment of works of art in Manchester. In connexion with these Sir Henry Cole, not long ago, delivered an address to the Manchester School of Art, and as we have now his corrected version, we print some portions of it:—

Great Improvement in Works of Fine Art applied to Industry.

I have pointed out that schools of art exist in this country to cultivate fine art,—that is, to train workmen to produce works of art for the benefit of the whole people. If genius be educed by schools of art, that is a happy accident. Schools of art, I repeat, are not intended expressly to create genius, because a genius, as I have shown you, is only produced once, it may be, in a hundred or a thousand years. Mr. Poynter was followed in his lamentations by the learned head of a college in Oxford, who said that schools of art are not operative, even for the object they have in view. You may recollect that in 1853 there was a "chamber of horrors" in Kensington Museum, which consisted of a collection of samples of decorations of the most costly kind, which had no principles of decoration about them. That chamber produced a startling effect; it was talked about even in Parliament. There was one manufacturer in Parliament who made hideous carpets, and thought it was a cruel impertinence on the part of any Government to form this chamber of horrors, and show that his carpets were not quite in good taste. In answer to the Oxford rector, I maintain that such a chamber of horrors could not be produced now; the costly inartistic specimens have disappeared. You may find an ugly cheap coal-scuttle, but the productions of our best manufacturers are now much more consistent with standards of good taste than formerly. Architecture has enormously improved in the last quarter of a century; whilst I admit it might at times be founded on a little more good taste and common sense. You cannot go about the country anywhere without being much struck with the improved architecture in public and private buildings. Compare the stone churches now built with those ugly brick things erected by churchwardens seventy or eighty years ago. About the year 1820, nearly every church and chapel, and bank and post-office, and park mansion was a wretched imitation of a temple of Diana, often in stucco. We do not fly to the goddesses and erect such nondescript things now; what we do is very much more defensible and in advance of all that. There are other indications of progress in art, such as the revival of terra-cotta. This country is, I believe, at the head of Europe in the use of plastic material for utility. The French are behind us; both Germans and Italians are, I consider, inferior in the use of plastic art. Then in the matter of stained glass, nobody can go into a church or chapel without seeing the immense advance in the making of stained glass; compare the windows painted after Sir Joshua Reynolds at Oxford with those now produced; almost every church and chapel, even Nonconformist, has now a jewelled window, and English glass, I venture to say, is more consistent with true principles of decoration than French or German glass. In furniture (especially for the million) also there has been great improvement; some eighty years ago you might have got a solitary piece of fine furniture made by Chippendale in England, or Goutière in France, but then you had to pay exorbitantly for them. In woven fabrics of all kinds, in pottery of all kinds, I think England may be placed ahead of the world. It is true that England does not commission our first artists to paint or model costly vases, as France and Germany do, but we could do it if we liked. In Paris a great artist may receive, at Sèvres, a commission for a vase to be given to an ambassador, but there the solitary thing ends. This is not our way of doing business; it is not the fashion here to urge the Government to order such works of art, but we could produce masterpieces if we commissioned Leighton, or Poynter, Walter Crane, or Moore to work; Minton and other makers of pottery are unrivalled for all classes of artistic productions made at commercial risks to be sold. Mr. Sparkes, who is attached to the Art Training School, has revived, or re-invented, a pottery known as Doulton's ware, which is much worked by women. I leave this subject by saying that in the Paris Exhibition of 1867, various kinds of British goods of a decorative nature were shown,—works in terra-cotta, majolica, bronze, mosaics of all kinds,—and competent judges declared emphatically that they were the finest things of the kind in the Exhibition. The next Paris Exhibition ought to show still further cause for gratulation in the display of English specimens of art applied to industry. The problem we have before us is how to utilise fine-art power and give it a decorative influence; how to unite the artist and the workman so as to gratify, not one person, but millions. I maintain that this is being done, and done successfully. Aristotle says of possessions:—"Those rather are useful which bear fruit; those liberal which tend to enjoyment." By "useful," he means, which yield revenue; by "enjoyment," that which proves of consequence beyond the using. Now, the possession of fine-art power and able handicraft is both useful and liberal, and it bears the fruits of both in money and enjoyment.

System pursued in our Fine-Art Schools.

Well, fine-art culture is taught in schools and museums, and the results of the system are shown in shop-windows and in our annual exhibitions, local and metropolitan. To those who decry our system,—and there are, perhaps, some three or four clever, cranky prophets who do it,—I may say that almost every European nation, including France itself, has adopted it; so have the United States, as well as our colonies. The system was partially started years ago by William Dyce in his excellent drawing-book, from which everybody can learn to draw. The system was methodised and extended by my colleague, Mr. Richard Redgrave, who, I venture to say, has not yet received from this country that recognition that he well deserves for his labours. His views of fine-art were catholic; he had a universal appreciation of beauty. He was no pedant who stuck to one method of working only for realising beautiful thoughts and feelings, and despised all others; he recognised the value of all styles and methods of drawing and painting; he fully appreciated the different cunning special ways in which Leonardo da Vinci, Mantegna, Albert Dürer, Raffaelle, Holbein, Michelangelo, Titian, Ostade, Gainsborough, Mulready, Meissonier, and many others worked. He did not say that any modern French method was alone to be followed, or was better than the German; or that the German was better than the Italian. He knew that mere size in execution was not necessary to develop genius, as poor Haydon thought. A Greek gem to him of the size of a barleycorn might be as fine as the Venus de Milo, 8 ft. high. He laid down no pedantic rules against vehicles, or enjoined a particular touch of the brush; or prescribed dogmas about lines or points, stippling or scumbling. He said, "Use any method that enables you to work best." He said, "Take beauty as your pole-star wherever you find it." Now that, in my opinion, is the true course for anybody to pursue who wishes to encourage art-culture in this country. You may go and look at the pictures and statues of the great masters, but do not try merely to imitate them. The teacher's duty is to make his pupils thoroughly catholic in taste and aspiration, and not to tell them to copy this or that painter's style or modeller's touch. The works of great artists are like flowers of nature, you may cull sweetness and beauty, and perfume and delight, from all of them.

Practical Effects of the Fine Art System.

Now, what has been the practical effect of this system? In regard to Manchester, there was a school of design here in 1851; and I may say, by the way, that from our ignorance of the French language at that time, we did not know that the *Ecoles des Dessin* of France simply meant drawing-schools; so we called our first schools (promoted chiefly by Mr. Ewart and Mr. Poulett Thompson) by the grand name of "Schools of Design"; and, so to speak, we started upon the wrong rails, leading our manufacturers to think the State was going to provide them with designs or patterns. In 1851 Manchester had a school of design with 250 students, paying 256*l.* in fees. In 1876, the students of the present school of art, which took the place of the school of design, had increased to 429, and the fees to 961*l.* In addition to that, you have now a second school of art at the grammar-school, which has 838 students, paying 549*l.* fees. Besides these, you have 586 students in small art-schools throughout the town, in night-classes, where the elements of drawing are taught; and you have also 7,129 children learning drawing in elementary schools. In 1851 the State paid 600*l.* a-year to help drawing, being at the rate of more than 2*d.* a student. Now the State contributes nearly 1,400*l.* a-year, or at the rate of only 2*s.* 2*d.* a student; whilst the public itself, through this impulse, is doing and paying five times what it did in 1851. I have no doubt that, with the activity of your committee, and the feeling for art which has taken root and is evidently growing in Manchester, you will soon double these present numbers.

General Results of the Art System.

A few words on what is being done throughout the country. In 1851 there were seventeen schools of design, which have now increased to 141 schools of art. I hope the young men present will, in twenty-five years, see them increase to 500; and I think they will, if Parliament will only give the people the right to spend their own money in supporting them. They have the right to the extent of raising a penny in the pound at present, but this is like dancing the hornpipe in fetters; they are not to be trusted to spend 1½*d.* or 2*d.*, or more. These 141 schools have 27,900 students; 883 night schools have 31,000 students; and there are nearly 4,000 elementary schools with 460,961 students. I have no doubt that before a long time has passed, the whole of the two million children who are now in elementary schools will learn to draw a little, at the same time that they learn to write, and with great advantage to their future occupations and refinements.

Museums: their Uses, and Necessity of Them.

Now I come to another subject,—that of museums. Mr. Poynter, amidst his several fallacies, said one or two true things about museums. Whatever errors and "risks" there might be about schools of art, he admitted that by means of museums "the truest principles of taste may be diffused among all classes." At a recent banquet in Manchester I ventured to express a conviction I hold strongly,—that it will be impossible to have a museum worthy of a population of 500,000 people, and in the neighbourhood of millions, unless you get the assistance of the Corporation. Of course, benevolent people will subscribe their money, but it will not be sufficient to do the work properly. A museum is a thing that must be liberally endowed, like a school or university, and even more liberally. Where would Oxford, and Cambridge, and Edinburgh, and Dublin, be without their endowments? The best chance of success you have here in Manchester is to go heartily with the people themselves, and teach them to be willing to pay for it. You might just as well talk of establishing a British Museum, or a Kensington Museum, or Owen's College, by eleemosynary assistance only, as a Manchester Museum worthy of the name. A museum is a sort of thing so above the ordinary appreciation of the great body of the people at present, that if you do not find secure and permanent funds to pay for it you will never get a proper museum. I venture to think that all your forces will have to be united. The school of art will have to enlist the sympathies of its constituency. I feel sure that members of the Corporation are sensitively alive to the votes of

their constituents, and the appreciation of their fellow townsmen. The work which the committee of the school of art have before you, is to hold meetings in every ward in this city, to teach the people what the school of art is, and what the art-gallery should be, and then to send petitions to the Corporation. I am sure the ex-Mayor, now present, judging by his looks, will be right glad to present and support them. This will be a piece of hard work, but you are responsible before Manchester to do it, you have taken good steps, and you must follow them up with the Corporation. The work will take you away from your business; it will tax your pockets as well as your time; and you may feel a little weaker physically after the work than you did before, but you will have the proud satisfaction of knowing that you have established an art museum in Manchester for the prosperity of the city and its district. I am happy to find that the work has been begun in Manchester, although in a very modest way, by means of the rates. I find from a return to Parliament that Manchester already has a museum supported by the rates; I was not aware of that till lately. Well, the Corporation having begun the work, you have only to give them a help on, and in time the Corporation will make it what it ought to be; I learn that the corporate authorities of Manchester opened a museum in Campfield in 1851; and this authentic Parliamentary document tells me that it was removed in 1864 to Queen's Park, wherever that may be. Go to Nottingham and see what that town is doing for a museum! The Corporation has obtained a private Act, and, assisted by a private subscription of about 20,000*l.*, it will have in six months the finest municipal museum in the Midland Counties. Urge the Corporation to get its Act,—to get permission from the Local Government Board to raise a loan if need be. Apply to the Lord President to obtain a public Act of Parliament, authorising the levy of rates for all purposes of science and art as freely as for primary education. You must allow me to go into the doctrine a little of the museums, which teach the student what the world has done before him; and unless you know the antecedents of fine things you flounder about in ignorance and waste time. A museum of art is absolutely necessary to the student, if he is to be well trained and educated; but it is most important to the public. The grown public are not children to go to a school of art, but will flock to museums, especially after church on Sundays, if they are made comfortable, well-ventilated, and warmed, well located, and with a little music in the evening occasionally: and thus they will be taught in a way that no other process of education will do. And then there is the great advantage of such training of taste in a commercial point of view; you create consumers for your art products, and the work, whilst proving beneficial not only to students of art, will wean millions from the devil's temptations in the beershops.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute on Monday evening last, Mr. Charles Barry, president, in the chair, the following gentlemen were balloted for and duly elected, viz.:—As Fellows: Mr. H. Jarvis, jun., and Mr. Thomas Verity. As Associates: Mr. A. T. Taylor, Mr. C. H. Purday, and Mr. W. H. Arber. As Honorary Associate: The Right Hon. G. Cavendish Bentinck, M.P. As Honorary Fellow: Mr. John T. Wood,—well known as the discoverer of the Temple of Diana at Ephesus.

Death of Mr. Joseph Bonomi.—Professor Donaldson said it was his sad duty to have to announce the death, early on Sunday morning, of Mr. Joseph Bonomi, the learned curator of Sir John Soane's Museum, who was most highly respected, not only for his attainments, but for his courtesy and kindness to all. As an officer of the Trustees of Sir John Soane's Museum he was most trustworthy and assiduous in the discharge of his duties, and was always to be found at his post until quite lately, when his illness had prevented his attendance. The Trustees had the fullest confidence in him, and in carrying out the arrangements for the proper care of the Museum, it was but right to say that he was ably seconded by Miss Martin, his sister-in-law, and daughter of the celebrated John Martin. Mr. Bonomi's character was well known, and he (Prof. Donaldson) could only bear testimony to the respect in which he was held by all who knew him. He was profoundly read in Egyptian antiquities.

The President said he was sure the meeting had heard the announcement just made with great regret. Mr. Bonomi had passed a long life, and had done a large amount of valuable work,—work that would always be highly appreciated.

Foreign Correspondence.—Mr. F. P. Cockerell, hon. sec. for Foreign Correspondence, said he had received a number of letters in response to the circular letter which, in accordance with annual custom, he had this year sent to the foreign members of the Institute. Amongst them were letters from the Cavaliere Fiorelli, Rome, offering facilities to students for visiting antiquities and museums, of which he is Director-General; from M. Lucas, secretary of the Société Centrale, Paris, announcing programme of International Congress of 1878; from M. L. J. Duc, indicating names of rising French architects who might be elected honorary and corresponding members of the Institute; from M. Morey, giving some notice of extensive works in the town of Nancy; from M. Coste, giving some account of schools at Marseilles; from Signor Poggi, announcing the death of Signor Alvino, of Naples; from Signor Selvatico, describing some interesting public works and improvements in Padua; and from Professor Meldahl, of Copenhagen; and M. Delsaux, of Brussels. Professor Meldahl's letter announced a work on Frederiksborg (presented at the last meeting of the Institute). The plates show parts restored by Professor Meldahl after the fire of 1859. Future additions to the work are promised. The Professor adverts to the supposed authorship of the Castle by Inigo Jones, and considers that he cannot be so. The plan is that of French châteaux. The façade is in the style prevalent in Holland and North-West Germany in the sixteenth and seventeenth centuries. Professor Meldahl considers form and details to be the work of a dilettante, perhaps of the King, Christian IV., to whom Inigo Jones may have given the plan after his (Inigo's) tour in France. Professor Meldahl promises further on the subject; also on the Castles of Kronberg and Elsinore,—the latter much like Scotch castles. The architect of Kronberg was probably Antony Obberger, who at the close of the sixteenth century went to Danzig, as architect to the city. He was a great artist little known. The letter from M. Delsaux (Brussels) expressed regret at the decline of art in Belgium, notwithstanding a great impulse in building. He laid the blame on the public press, and upon the great rapidity with which building is now executed. He considered that luxury and mechanical contrivances overstrained the population, and wore them out. He complained of the great height of private buildings, and of the extravagant extent of ecclesiastical corporation buildings. He expressed a strong desire for sumptuary laws limiting the waste of coal, and thought that gas-lighting should be limited, as God had not given daylight to be superseded.

Professor Donaldson said it appeared to him that some of these communications were very important, and contained a great deal of valuable information, and he ventured to suggest whether it would not be advisable, at the discretion of Mr. Cockerell and by the consent of the Council, to print these communications, or portions of them, in the "Transactions" of the Institute? They were likely to be of much utility and interest, and it was only due to the writers, who were at considerable trouble to send the information, that the Institute should show its appreciation of their kindness in this way.

The President said it had been in contemplation to do what had just been suggested, and after the favourable expression of opinion which the Professor's suggestion had called forth, he was quite sure that the Council would accede to the request.

Mr. Wyatt Papworth said that in reference to the Castle of Fredericksborg, it was found after the fire that the Government did not possess any drawings or engravings of the building. It was remembered, perhaps, by Mr. Hansen, the architect, that some few years before the fire an English architect, named Edward Falkener, who would be well-known to many in that room, had made complete drawings of the building, externally and internally. He was inquired after, and upon being communicated with he placed the whole of his drawings at the disposal of the Government. The King was, of course, greatly pleased, and sent him in return one of the orders at his disposal.

The Secretaryship.—The President said that at the last meeting of the Institute candidates for the secretaryship had been requested to send in their names on or before that day (Monday), which was to have been a special meeting, and to which the Council had hoped to have been able to place a name before the general body for approval. Considering, however, how very important the appointment was, and how very much it would affect for good or ill the future success and well-being of the Institute, it was advisable not to be in too great a hurry, and hence it had been determined to postpone the special meeting until Monday, the 18th inst., up to which date the names of candidates would be received. The Council had additional cause for postponement in the fact that they had received a requisition from eight Fellows of the Institute asking them to convene a special meeting to consider the advisability of having the secretarial work of the Institute done by two honorary secretaries, responsible for the performance of the work, but assisted by a paid officer, not necessarily a member of the Institute. The Council had therefore to announce that the special meeting in pursuance of the requisition would be held on the 18th inst. The Council also announced that the schedule of duties already issued to those who had applied for it was an imperfect document, and before the election it might possibly be amended or added to. He might add that Mr. Eastlake, with characteristic courtesy, had agreed to attend all ordinary or Council meetings so long as the Council thought he could be of any assistance.

City Churches.—Mr. Hebb said that some years ago a committee was appointed by the Institute for the Conservation of Ancient Monuments. From time to time, in the annual report, reference had been made to the work of the Committee, but he wished to ask whether the Council had any objection to state what had been the result of the labours of the Committee with regard to a large number of City churches which were threatened with destruction? He was aware that the Committee had made some progress in the matter, and had begun to collect a number of drawings of these churches, but he should like to have some further information.

Mr. Eastlake, in reply, said that some time ago a paper was prepared by some members of the Conservation Committee, and read before the Institute,* giving detailed information on some of the condemned City churches. That, however, was not the whole of the information which had been collected by the Committee; other notes were ready, notably some by Mr. E. B. Ferrey, but owing to the crowded state of the syllabus of papers this session, they could not be read. They would, however, be available for next session.

Mr. Horace Jones congratulated the Institute on having that evening elected as Honorary Associate the Right Hon. G. Cavendish-Bentinck, who some years ago was mainly successful in preserving the tower of the church of St. Mary Somerset, Thames-street.

The President announced that the Committee appointed by the Council had still under their consideration the Bill which had been brought in by the Metropolitan Board of Works for the amendment of the Metropolitan Building Act. He had hoped that the committee would have been able to present a report on the subject, but this was not yet possible, owing to the modifications and amendments which the Board had been making in the draft of the Bill. The subject was not being lost sight of, however, and it might be mentioned that the relations subsisting between the Institute and the Board continued to be of the most friendly character.

Mr. T. Roger Smith then read the paper by Mr. Josiah Conder on Japanese Architecture, of which we give a portion on another page.

Workmen's Club, Penn, Bucks.—A new block of buildings, to cost about 600*l.*, is in course of erection at this picturesque village, intended for a workmen's club and caretaker's house. The accommodation will include reading and news rooms, smoking-room, and other conveniences. The building is of brick and flint, with tiled roofs, in the Early Domestic English style, and the total cost has been sustained by Sir Philip Rose, bart., the High Sheriff of Bucks. The works are being executed by Mr. Z. Wheeler, of Penn. Mr. Arthur Vernon is the architect.

* The substance of this paper was given in the *Builder* last year (vol. xxxv., p. 403).

THE LATE JOSEPH BONOMI.

On Sunday last, at two o'clock, there passed away from among us a man who has long had his name associated with the architecture, sculptures, and hieroglyphics of the ancient land of the Pharaohs. The reputation of Joseph Bonomi has been long connected with these subjects, for a long lease of life had been granted to him. He was in his eighty-second year. His father had been architect of St. Peter's, Rome; but at the request of the brothers James and Robert Adam, the architects, he came to England and was employed by them for many years. He subsequently built some very noteworthy structures in England and Scotland, such as the Sardinian Chapel and Montague House in London; Eastwell House, the present owner of which is the Duke of Edinburgh; and Roseneath, on the Clyde, belonging to the Duke of Argyle. From this it will be seen that Mr. Bonomi's first breathings would be in an atmosphere of architecture and art. This is further evident from the fact that Angelica Kauffman and Maria Cosway were sponsors at the baptism of the infant and his twin sister, who were born on the 9th of October, 1796, which event occurred at 76, Great Titchfield-street, Marylebone. The father and mother were Roman Catholics, so the baptism took place in the Venetian Chapel. It may also be worthy of noting that the father was an intimate friend of Sir Joshua Reynolds, and it was the refusal of the Royal Academy to confer on him the honour of the R.A.-ship which led to Sir Joshua's rupture with that body.

Mr. Bonomi was chiefly educated in a school at Carshalton, Surrey, and then became a student at the Royal Academy, where he gained the silver medal for the best drawing from the antique, and also the best model from the same. After this he entered the studio of Nollekens, the sculptor, as that was the branch of art he had selected to follow. In 1823 he went to Rome, in order to prosecute his studies, and while there he formed an intimate acquaintance with John Gibson.

A gentleman, named Robert Hay, a naval officer, on a visit to Naples, came to Rome. He was a clever sketcher, and had a desire to do something in Egypt, and he was trying among the students to induce some of them to accompany him; but Bonomi was the only one that offered himself, and it was agreed that he would go, even although the remuneration which had been promised was small. This acquaintanceship was thus the turning-point in Bonomi's life, and affected the whole course of his after-studies in art. It was in 1824 that he left Italy, with Hay, for Egypt. Perhaps it should be mentioned that the most important of the objects in the collection which they formed were bought by the British Museum. Ultimately Mr. Hay left Egypt, but Bonomi remained. It is evident that he had taken a liking to the country and its people. He had adopted the Arab dress, and assimilated himself to their modes of life. He soon learned their language, and kept his donkey for riding about, after the custom of the country, and he learned to adapt himself to every condition of existence among the modern Egyptians. In one of the diaries which he kept there is mention of his coming to a halt in one of the towns on his route, and finding a quiet spot, he turned into it with his donkey and camel, and had his food in the street, where he also made his bed for the night. There was one great advantage he derived from these habits,—he was by them able to exist at a very small cost, and thus could, on his then limited means, carry on his studies in the field he had thus selected. He remained eight years in Egypt at this time, during which he was brought into contact with men of all kinds, who came to travel on the Nile; for Bonomi's experiences were of value to travellers. Among the acquaintances he formed was that of the Duke of Northumberland. When Mr. Bonomi returned to England he paid a visit to Alnwick. At this place he seems to have gone about at times in his Arab costume, and one day he was accosted by the manager of a travelling circus, who offered him an engagement, and he would be announced as "the Bounding Bedouin of the Desert," or some similarly-sounding phrase, such as caterers for the entertainment of the public delight in. Bonomi wrought at the hieroglyphics for some of the time with Mr. James Burton, and they even reproduced some of them by means of lithography in Cairo.

It was in 1833 that he made a slight change in the field of his work. In that year he went to Jerusalem with Messrs. Catherwood & Arundale. There was then a great risk in a European entering the Haram enclosure, for the Mahomedans might, on the slightest pretext, assault and murder an infidel for venturing into their holy places. Bonomi's Arab outfit, and familiarity with customs, enabled him to go in with comparative safety. This was the first time that correct drawings and details of the Mosque of Omar and the El-Aksa were taken; and it forms an important event, for it was upon these drawings that Mr. Fergusson founded his celebrated "Architectural Argument" in relation to the true site of the Holy Sepulchre. He also visited Sinai, as well as Damascus and Baalbek at this time.

After this he returned to England, and was at work making drawings of hieroglyphics in connexion with works on Egypt. He illustrated some work for Sir Gardner Wilkinson, and, along with Arundale, he made drawings for a work in which Dr. Birch did the literary part of it, called the "Gallery of Antiquities." This was in 1841.

In 1842 he was engaged to accompany the expedition which was sent out by the King of Prussia under Lepsius. This resulted from meeting at the British Museum the king, Fred. William IV. of Prussia, Alex. V. Humboldt, Bunsen, and Lepsius. The advantages to the expedition to be derived from Mr. Bonomi's long experience in Egypt, as well as from his artistic powers, were too palpable, and they induced him to go; and as the expedition was just starting he had to get ready in two days. It left Southampton on the 1st of September of that year. They had a dinner in the hotel before going on board, and Bunsen accompanied them to the ship to say good-bye. Mr. Bonomi had engaged himself for six months, but he did not return till 1844, thus gaining renewed experience of Egypt and its monuments. In 1845 he married one of the daughters of John Martin, the celebrated painter.

Shortly after this he was engaged working with Messrs. Warren & Fahey, the well-known water-colour artists, at "A Panoramic Picture of the Nile." The catalogue states "from drawings made by Joseph Bonomi." It was appropriately enough exhibited in the "Egyptian Hall, Piccadilly," in 1849. In 1853 he was at work with Owen Jones at the Egyptian Court of the Crystal Palace, where the figures and the hieroglyphics bear the evident mark of Mr. Bonomi's touch.

In 1861 Mr. Bonomi was elected curator to Sir John Soane's Museum in Lincoln's-inn-fields, the duties of which he has carried out till his death. His appointment to this office led to one very important work being done; that was the reproduction of all the hieroglyphics on the Belzoni Sarcophagus, which is one of the treasures of that museum, it being at the same time the most important monument of that kind which has yet been found in Egypt. It belonged to Oimenepthah I., and is of alabaster, and entirely covered outside as well as inside with hieroglyphics. By means of the work published by Bonomi, scholars are able to study these, and it has led to their having been interpreted, and a work on the subject was lately announced. The matter of the hieroglyphics is that of the funeral ritual, a point of study which has lately assumed considerable interest in connexion with Egyptology. The letterpress which accompanies this work was written by Mr. Samuel Sharpe, the celebrated Egyptologist, and who has been a *collaborateur* with Bonomi in many works.

It would be difficult to give a complete list of all the works Mr. Bonomi produced. Papers by him will be found in the Transactions of the Royal Society of Literature, Syro-Egyptian Society and its successor the Society of Biblical Archæology, British Association, &c. He was also a frequent contributor to the magazines, and many contributions, some of them small but valuable, will be found in the pages of the *Literary Gazette*, *Athenæum*, *Illustrated London News*, and the *Builder*, in whose pages some important communications by him appeared lately in reference to Cleopatra's needle and its proposed sites. He suggested long ago the propriety of getting casts made in bronze, of one of the best of the Roman obelisks, such as the one at St. John Lateran, and setting it up in London, to serve the purpose of a monument, and at the same time to give the public some notion of these ancient monuments, and of the hieroglyphics upon them. One of his works was a small text-book on the "Proportion of the Human Figure," a subject which his study as a sculptor no doubt led him into; but it also was the means of his inventing a machine for measuring the human body, by which the height of the person and length of the arms were simultaneously taken. This he was anxious for the army to adopt, and he urged it on the prison authorities as a means of identification. He often affirmed that if his machine had been in use in the army, and the young Sir Roger Tichborne had been operated upon when in the dragoons, the case of the Claimant would have been an impossibility.

The very varied experience which Mr. Bonomi had of Egypt, an experience of modern Egyptians learned during his long residence, and his knowledge of the ancient Egyptians, resulting from his drawing the monuments, was a very valuable acquisition, as all knew who had the advantage of Bonomi's acquaintance. He might be described as a Book of Reference in all things Egyptian, and a book whose value will be felt now that it is lost. It was always an open book to any one who wanted information. All who have ever met Mr. Bonomi will be able to bear out the statement as to the willingness he always manifested to answer questions and supply information to all who desired it. He did it, too, without fuss or vanity. He was not one who indulged in useless exhibition of his knowledge. His only desire seemed always to throw light on the matter which was brought before him. His power of drawing hieroglyphics has never been surpassed. All artists feel the difficulty of representing Egyptian figures, with the necessary absence of muscular development about the calves of the legs. This Mr. Bonomi, by his long experience, had learned to give with the greatest facility, but, then, he had a very true eye and a delicate hand to guide his pencil. Amongst his papers left are a great number of sketch-books full of hieroglyphics, and also valuable written notes. The hope ought to be expressed that something should be done to place such valuable gleanings within the reach of all who are interested in them.

THE LARGEST GASOMETER IN THE WORLD.

In connexion with the gas works near the Oval, Kennington, an immense new gasometer is at present in course of construction. The attention of the Lambeth Vestry was called to the structure, at their meeting last week, when Mr. Cox described it as "an erection of a most fearful character," which would be sure to be detrimental to the property surrounding it. It would block up the view, and interfere with the free current of air, and under these circumstances, he wished to know if the Vestry had any power to interfere with the "huge monster" which was being put up. The Chairman, Mr. Burrap, observed that it was the largest gasometer in the world. In reply to Mr. Cox's inquiry, the surveyor said he did not think there was any power to interfere, and that certainly the opportunity of interfering was now very doubtful, inasmuch as many thousands of pounds had been spent on the structure, which was now approaching completion.

Cement.—At the last annual meeting of the Central Association of Master Builders some communications were referred to which had been made with the lime and cement merchants, with a view to obtaining a more uniform standard of measurement, and it was finally arranged that in future the standard should be by weight instead of measure.

Ripley Public Buildings. — Seventeen architects sent in designs. At the last meeting of the Local Board the Committee had reduced the competitors to four, namely, Messrs. Trueman & Pratt, of Nottingham; Mr. A. Smith, Nottingham; Messrs. Giles & Brookhouse, Derby; and Messrs. Tait & Langham, of Leicester; but as they could not determine which of the two latter to place the first, they had sought the opinion of the engineer, whose report was read. Mr. Argile said both the designs were so excellent that he had written his report. He first pointed out, in his opinion, the excellences of Messrs. Giles & Brookhouse's in some nine particulars, and then the excellences of Messrs. Tait & Langham's in some eleven particulars, and finally declared, in his opinion, for the purposes of the Board, the latter was the best. The plans of Messrs. Tait & Langham were adopted.

THE FALL OF BUILDINGS IN THE HAYMARKET.

As briefly stated in our last, the adjourned inquest into the cause of the death of Mr. William Baron was resumed on the 27th ult., before Mr. St. Clair Bedford, coroner for Westminster. The body of the deceased, as will be remembered, was found beneath the *débris* of his premises, which, together with a new building adjoining, fell in on the 17th of January.

Mr. W. Wyke Smith watched the case on behalf of the Metropolitan Board of Works; Mr. N. Bazalgette represented the District Surveyor (Mr. Robert Walker); Mr. Poland appeared on behalf of Messrs. Newman & Mann, the builders; Mr. McColl represented the interests of the relatives of the deceased; Mr. E. Clarke appeared for the architect, Mr. W. Wimble, and the building owner; the Hon. J. De Grey for the owners of the house in which deceased lived; and Mr. Reid for Messrs. Shaw & Co., who supplied the iron work.

Mr. George Vulliamy, superintending architect, Metropolitan Board of Works, was the first witness called. He deposed that he had carefully inspected the *débris* of the fallen buildings, both before and after they had been partially cleared away, and during the progress of the clearing, but he was unable, as the result of such examination, to determine what was the cause of the accident. From what he could see of the foundations, so far as they were opened, they were altogether proper and right. He thought he had seen enough to determine his mind on that point. Before giving any further opinion he would like to hear the witnesses that were to be called, and he would be pleased to give his opinion on anything that might be asked him.

Mr. Robert Walker said he was district surveyor of St. Martin's-in-the-Fields, and that on September 26th last he received notice that Messrs. Newman & Mann had commenced on September 1st, a building at 24, Haymarket (the corner of Panton-street). Previously to that, on September 18th, he had visited the site and found the works were going on, no notice having been given. At that time the "underpinning" of the south party-wall (*i.e.*, the wall between the new building and Mr. Baron's house) was nearly completed. On the 26th (the day the notice was given) he again visited the works and saw the foreman. He then saw the foundations and concrete, which were of a first-class description. Since then he had seen the work from time to time, the last being about three or four days before the houses fell. During the progress of the building he had not observed anything to object to. He saw the plans of the building, which were on the works. They were the general plans of the different floors. He looked at them and there was nothing that required comment. So far as the buildings were carried out up to the time of the accident, the materials appeared to be of a good description, and there was nothing to strike him, as a district surveyor, as being wrong. The party-wall appeared to be a substantial wall, and not one which he should have condemned. He certainly considered it was strong enough to bear the weight of the new building that would be put on it. Like Mr. Vulliamy, he would not give any opinion as to the cause of the accident till he had heard the evidence. Some of the materials were very good, but the cast-iron columns were the worst he ever saw. The circular girder at the corner was of wrought-iron; the straight girders were also made of wrought-iron. He did not think the circular girder was put together in a workmanlike manner.

John Sweetland, general foreman of the new building up to December 29, said that when he left it, the building was ready to receive the roof.

The Coroner: During your foremanship did anything strike you as dangerous in the construction of the building?

Witness: Well, I thought it rather funny that they should leave the old wall and build on the top of it. The state of the brickwork was like a piece of sponge.

Asked whether he made any complaint about this, the witness said he spoke to Mr. Kellow, the clerk of works, several times. To the best of his recollection, Mr. Kellow made no reply at all, or else said, "We must allow some one else to know as well as we do." The old wall was takendown to the first-floor level, and the new one built on the top of it, under the direction of the architect and the clerk of works. About 22 ft. in height of the old wall remained. The height of the new wall put upon it at the first commencement was about 25 ft. The whole height of the new wall on the top of the old one was 46 ft. 6 in. The thickness of the new wall was 14 in.

Asked whether there was anything else that struck him besides the alleged bad state of the old wall, the witness replied: "It looked very funny to see the building standing on stilts." He explained that by stilts he meant columns.

Asked whether he could account for the falling of the house, he said it was his firm belief that if the old wall had been renewed throughout the building would have been still standing.

In reply to further questions, he said he assisted to take out the foundation. Some portions of it were good sound gravel, but others not. There were seven pier holes. Where the columns stood concrete was put in. From 25 ft. to 30 ft. in length of the old wall was left standing. He superintended the underpinning of the old wall; it was properly done in lengths of 3 ft. The wall was being raised simultaneously with the underpinning. The iron girders were put up by him. There was a detail drawing for the circular girder, and he put it up according to that drawing. It was put up in a proper and workmanlike manner. He thought the plan of the girder was a safe one. He did not superintend the bolting or riveting; that was done by Messrs. Shaw, who furnished the girder. Complaints were made by Mr. Baron that the doors in his house could not be shut; that was after the wall was rebuilt. He sent a carpenter in to ease the doors. He had been to the place since the building fell. He saw that several of the bolts of the circular girder were gone. There was no particular weight over the circular girder. There were window-openings all the way up. He had never been engaged on any building in which a circular girder had been fixed in the way indicated.

Charles L. Gooch said he succeeded the last witness as foreman on the new building on the 31st December. The roof was not then on. The party-wall in the Haymarket front was finished. Nothing struck him about the work as being of an improper or dangerous character. He continued foreman till the building fell. On the afternoon of the day that it fell a complaint was made that the front door of the next house would not close. He sent a carpenter to see to it. Witness, Mr. Wimble, and Mr. Johnson (Mr. Wimble's assistant) went into Mr. Baron's house, and all over it. They saw nothing to attract their attention. There was a crack in the staircase wall of the other adjoining house in Panton-street, but he did not see that till the house had fallen. His attention was not particularly called to the old wall, which looked tolerably good. It was cut into by his direction when they were going to fix the stone staircase. Before he did it he sent for the clerk of the works, but as Mr. Kellow was ill, he (Gooch) sent to the yard for instructions. The height of the place cut away* was 6 ft. 9 in., and the width 7 ft. It was done a little before four o'clock in the afternoon of the day that the building fell. It was intended to fill it up with new work, and two-thirds of the new work had been got in before the men left work. He thought it was a wall to which that operation could be safely applied. It was cut with a hammer and chisel. He saw it after it was cut, ready to brick up, and he thought it safe. Mr. Wimble sent for him between three and four o'clock, and asked by whose authority the cutting away had been done. He (Gooch) replied that he had sent for the clerk of the works, and that he was ill, and that he then sent for and obtained instructions from the yard. Mr. Wimble said rather than have had the wall cut he would have carried up two piers to support two rolled iron joists upon which to carry a wall into which the stairs could be fitted. The wall was cut away for the purpose of carrying a stone staircase from the ground floor to the first floor. The wall was leaning out of the perpendicular where it was cut away. The wall was, in fact, 5 in. hollow, and it was necessary to make the wall plumb before the stairs could be fixed. He was not constantly on the works. He had another job to look after as well. There was no one in charge when he was away. Mr. Kellow, the clerk of the works was there two or three times a week. He represented the architect. He (Gooch) was not there the whole day on the 17th, when the wall was being cut out. The wall was cut out 4½ inches at the bottom, and 1½ in. at the top. He did not think that would weaken it much. They did it so as to make it, when filled up again, flush, and to get a bite for the steps. The filling-up would add strength to the wall when it was completed. It was done with cement. The filling-in would give no strength till the brickwork had set. Being in cement it would set in three or four days.

The inquiry was continued on the 1st inst., when the first witness examined was Mr. Robert Baron, brother of the deceased, who deposed that he had assisted his brother in his business, and was at his brother's house every day from the time the new building was commenced until it fell down On the Wednesday before the accident, he noticed that the street-door shut very easily. Upon several occasions previously the door had to be cut. On the Thursday afternoon, the day of the accident, the door suddenly stuck, and could not be opened. The deceased asked him to try and find the carpenter in the new buildings, who had eased the door on previous occasions. He (witness) went in at the further end of the building in Panton-street, and saw some men knocking at the party-wall between the new building and his brother's house. He asked what they were doing, and they said, "Making you strong." He could not see the carpenter, but afterwards Mr. Wimble and Mr. Johnson came and looked over his brother's house. They went up-stairs and looked at the walls, and afterwards ordered the foreman to send the carpenter to cut a piece off the door. When that was done, Mr. Wimble said that the place was all correct. The chief indication of anything being wrong was the moving of a sink in the kitchen. That was on the evening of the accident. The sink was just behind the place where he had seen the men cutting away the wall on the other side. The sink was only just fastened into the wall, and rested on two brick piers; it appeared to sink where it was let into the wall, and to lift up in the front. One of the flagstones in the kitchen had been dropping on one side and rising on the other for about six weeks.

Mr. Wm. Wimble, the architect of the building, was the next witness examined.—He said that he was architect for the new building in the Haymarket which had fallen; he was employed by his client, Mr. G. M. Hughes. The building was intended for shops on the ground floors and residential chambers on the upper floors. In the design of the building he had paid careful attention to the weights that each part of the structure was to carry. It was usual to pay particular attention to the party-walls of buildings of this class, and for the architect to put himself in communication with the owners of the adjoining property. In accordance with the requirements of the Building Act, he served a notice upon the representatives of the owners of No. 23, and also upon the occupant, Mr. Baron. He was afterwards put into communication with Mr. J. T. Wimperis, a surveyor, who acted as surveyor on behalf of the freeholder of the old building, and for Mr. Baron, in respect to the party-wall. He and Mr. Wimperis examined most carefully the condition of the party-wall. After a consultation with Mr. Wimperis in July, it was resolved to take down the party-wall of the old house to the second-floor level. In July an agreement was signed by him and Mr. Wimperis nominating Mr. Robert Hesketh as surveyor to act as referee in case of any dispute arising between them on the matter, but no dispute arose. Subsequently it was agreed that more of the party-wall should be taken down. It was consequently taken down to about the level of the first-floor joists of the new building. He was continually at the building watching its progress, and he never saw anything to lead him to doubt the sufficiency of the remaining portion of the old party-wall for the weight it was to carry. He examined the under-pinning while the work was going on. It rested on a sound gravel base. He had not before heard that one of the flagstones in Mr. Baron's kitchen had been sinking, but such a thing would possibly happen, as there was always a slight settlement after under-pinning. On the afternoon of the day on which the building fell he saw that a portion of the face of the wall had been cut away. Before that he had no idea that any part of the wall was going to be cut away. When he saw that the wall had been cut away, he said to Mr. Johnson, who was with him, "What are they up to here?" He asked the foreman who gave him the orders, and he said

* In our brief summary of this witness's evidence last week (p. 237), it was incorrectly stated that the wall had been "dubbed" out; it should have been "cut out."

MYCENÆ.

SIR,—When I read Dr. Lindenschmidt's article in the *Allgemeine Zeitung* some weeks ago, I forgave him, assuming that he might not know English well, or could not see a joke. For, in truth, what I had said about a tribe of Germans having strayed to Mycenæ was surely very obvious chaff. And, remember, he makes this his strong point. To me it is not a little singular that when his own countrymen are regretting his performance, you should republish it here without apparently referring to the original sentence in the *Academy*, which he managed to misunderstand. As for the rest of his criticism, I should have been pleased to answer it if it had been intelligible. The German is bad enough, but the English is worse. It seems to be the production of a German who also may have an imaginary offence to resent.

A. S. MURRAY.

ARTESIAN WELLS.

SIR,—Knowing the interest your valuable paper takes in the question of water supplies for towns, large works, breweries, &c., and the source from whence obtained, and how obtainable, I beg to give particulars of the following satisfactory results that I have just arrived at from a boring in the Isle of Wight for Messrs. W. B. Mew, Langton, & Co., brewers to her Majesty the Queen (Newport), the increasing business of these gentlemen making it necessary for them to obtain an unlimited supply of pure water. Having been called in by Mr. Arthur Kinder, of Mansion House Chambers, Queen Victoria-street, consulting engineer to the firm, I commenced a boring some eighteen months ago, and after very great trouble and many difficulties, from the fact that the strata in the island are so peculiar and irregular,—in fact, to use a well-known phrase, "entirely upside down,"—I have, at the depth of 436 ft., achieved the results we desired. During the progress of this work, the opinions of eminent geologists and gentlemen acquainted with the water-bearing strata have been called in, and the results now arrived at put aside most of their calculations in consequence of the convulsed state of nature in that locality. Mr. Kinder and myself, with the gentlemen of the firm (the latter undaunted by adverse opinion), however, confidently believed that an unlimited supply would be obtained at about a depth of 450 ft. to 500 ft. below the surface. At 400 ft. we came upon a very thick bed of white marl and shells, with no trace of a spring, but at 436 ft. a water-bearing stratum was reached, and the water flows through the boring-tubes 9 ft. above the surface of the ground-line at the rate of 200 gallons an hour; and at 6 ft. below the surface, on testing the same, I found the supply to give 1,450 barrels in the twenty-four hours. The well, itself, I might observe, is sunk to the depth of 138 ft., with 5 ft. diameter, the boring being continued from that point to a depth of 461 ft. This is an eminently satisfactory result, considering it is a real artesian supply, and the water, from analysis, is found to be perfectly pure.

This affords a great contrast to the well that I bored at the New Post-office in St. Martin's-le-Grand to the depth of 636 ft., the water rising to 139 ft. from the level of Newgate-street, a sufficient success to make me believe a metropolitan supply of pure water may be obtained from other sources than the water companies. This latter well will yield something under 200,000 gallons per day from the chalk, but the supply could be increased by taking in the water from the sand springs that is now shut out by cast-iron cylinders to about 275,000 gallons a day. Again, at Victoria Park the one boring I there carried out to the depth of 514 ft. 6 in. in diameter, gives a large supply of fine water. At Tottenham, as you will know, the water supplied always stands first in Dr. Frankland's report, and this is obtained at a depth of 325 ft. from a boring I advised and carried out, taking the water thus obtained through a tunnel 55 ft. below the surface to an old well, and this supply is now giving water to about 30,000 inhabitants. As the question of bringing a water supply to London from different parts of the country, even from Scotland, has been discussed, it is my opinion it can be obtained from a much nearer source. Trial borings which I made at Braceborough Spar, near Errandine, Lincolnshire, prove that district to be charged with a water supply almost unlimited, as it flowed 14 ft. above the surface at the rate of 260,000 gallons a day, and this supply I believe is being made available for several large towns. Knowing the vast importance of our water question, I have ventured to trouble you with these remarks. My firm belief is that pure water is to be obtained in much larger quantities than at present supposed from artesian sources, and in my fifteen years' experience I have never had a failure, always successfully carrying out what has been desired.

W. BROWN, Engineer.

THE TEMPLE BUILDING.

SIR,—I have just noticed in the *Builder* of the 23rd ult. the following words:—"All the masons required have long since been obtained, and eight or ten applications per day are being made for work."

This incorrect statement is likely to do me harm in more ways than one; and I beg that you will allow me space to state that I am still in want of *superior* masons at these works.

It is quite true that many applications are made for work, but most of these are by masons who are quite unable to execute such elaborate workmanship as is required for these buildings.

G. W. BOOTH.

*** The statement in question was made to our reporter by Mr. Booth's manager on the works.

TRADE MATTERS.

SIR,—In your issue of February 16th, and under the heading of "Trade Matters," your correspondent, "Clerk of Works," has presumed to enlighten your numerous readers on a question of which he is evidently ignorant, inasmuch as it applies to my connexion in the matter, and, doubtless, equally so as respects Messrs. Taylor and Neal, and the "scores of others." If I had waited for the union to raise my position, I should have been sadly disappointed; it was only by striking out from that union, and taking independent action entirely in opposition to the interference with individuals (which is the plan of the union) that the foundation of my success was laid. And I say, that had I not taken this course, I should have been, as many of my then compeers are now, the submissive agent of a great and depressing system.

"Clerk of Works" would have been able to have obtained the true state of the case if he had taken the trouble to make inquiries of the parties he mentions, and I am sure there would be no difficulty in proving to him that it is not through the unions that any man has obtained a position, but, on the contrary, a union man can never rise, as it is quite incompatible with the rules of the association.

J. BASTOW.

WORK AND WAGES IN THE BUILDING TRADE.

SIR,—In my opinion, your columns were never put to a more important use than in the discussion of the above subject. Would that all members of trade unions carefully considered the question as presented in the *Builder*. I have had more than thirty years' experience in quarrying stone, and I can most confidently assert that quarrymen do not do so much work now at 5s. per day as was done when the wages were 3s. 6d. per day. I do not object to the advance of wages. A good quarryman ought to have 5s. per day; but the most vexatious thing to me, during the past few years, has been that the men should insist upon a uniform rate of wages to all men who appeared in the garb of stone-getters, though they knew well (and in some cases admitted the fact) that many of the men were not worth 3s. 6d. per day, but, forsooth, they must have 5s. per day, the same as the rest; hence it is the decadence in the work that has been the greatest hardship the masters have had to endure. The facts so clearly given by Mr. Lucas ought to make men connected with the stone trade open their eyes. The advance in stone, but more particularly the unreasonable demands of the masons, have been fraught with great evils to the men themselves; by their action they have done all they could to drive the stone trade away. In a correspondence I had some months ago with an architect, whose name frequently appears in the *Builder*, he says,—"I am sorry to have to also say that, as a rule, now I put the least possible stone in buildings, for the reason that the last two or three years such annoyance and inconvenience have been caused by the working masons as almost to compel architects to adopt this course. As soon as they are satisfied to work a fair day's work for a fair day's pay, that part of the building trade will be more encouraged."

STEPHEN SEAL.

The Earl of Rosebery is to be the next president of the Sunday Society, which seeks to obtain the opening of museums on Sundays. His lordship will deliver his address as president at the public annual meeting, on Saturday, May 8th.

ACTION BY A LOCAL BOARD SURVEYOR FOR SLANDER.

KELLY *v.* FITZPATRICK.

THIS case was heard before Baron Pollock at Liverpool the other day. The plaintiff was Mr. Wm. Kelly, surveyor to the West Derby Local Board, and the defendant was Dr. Fitzpatrick, a member of the Board in question. The action was brought to recover damages for slander. The allegation of the plaintiff was, that the defendant had used language respecting him at a meeting of the Board which implied that he was incompetent.

It appeared that the plaintiff had been directed by the Board to prepare a scheme for the drainage of the Derwent estate, which belonged to the district of West Derby, and that the scheme received violent opposition from the defendant and others, while Colonel Cox, one of the Government inspectors, reported in favour of the scheme. At a meeting of the Board, held on the 7th of August last, the defendant made a speech, and in the course of his observations he said Mr. Kelly was incompetent to give an estimate; that he did not know the value of a cube foot of stone, and that he did not even know the value of a brick. Other offensive personal remarks, not, however, reflecting on the professional ability of plaintiff, had been made by the defendant. The plaintiff did not sue for damages, but simply desired to vindicate his professional character.

It was pleaded on behalf of the defendant that the remark about the plaintiff not knowing the value of a brick was "a metaphor."

An apology having been tendered and accepted, the case was withdrawn from the jury.

We understand that Mr. Kelly sent in his resignation the day after the apology was made. His resignation was accepted.

CASE UNDER METROPOLITAN BUILDING ACT.

FIREPROOF SEPARATIONS.

AT the Hammersmith Police Court, on the 22nd ult., a summons was heard before Mr. Bridge, which had been taken out by Mr. Thos. E. Knightley, district surveyor, against Mr. Thos. Ayres, a pawnbroker, carrying on business in Hammersmith, for having let a portion of his premises without providing a proper fireproof floor, as required by Section 27, rules 2 and 3, of the Building Act.

The district surveyor stated that defendant was the owner of large premises in which he carried on business; he formerly occupied the whole of the premises, but recently had let a portion of the ground-floor to a person who carried on a separate business, he (the defendant) retaining the first floor and upper parts running over it. Two distinct premises thus existed in one building, each tenanted by different persons, no regard being paid to the means for checking the spread of fire (should such occur) from one to the other. In such cases the Act provided that the premises should be divided so far as they adjoin horizontally by party-arches or fireproof floors. He had met defendant on the spot, and suggested the best mode of constructing a floor such as he could pass. Had adjourned the present summons from time to time to afford fair and reasonable opportunity for carrying out the work; yet nothing had been done, and he now asked for an order to be made in the terms of the summons.

The defendant did not appear, and the magistrate requested the district surveyor to prove his case; whereupon he called his assistant, who spoke to the existence of the aforesaid defects, and produced copy of notice served upon defendant in respect of same; and after hearing this additional evidence, Mr. Bridge made the necessary order for the work to be executed forthwith.

Good News, if True.—The *Birmingham Daily Gazette* declares "the Ventilation Problem solved," and says:—

"Hitherto thorough ventilation has usually been attended by a thorough draught. A new principle, however, has been devised, and there is now no occasion for any one who is prepared to make an extremely moderate outlay to suffer, either in private residences or public assemblies, from the inhalation of vitiated air. The principle has been introduced with complete success, and at comparatively small cost, by Mr. T. Kenington, into the Birmingham and Midland Eye Hospital, the various departments of the *Daily Gazette* Offices, and into several institutions, manufactories, and other buildings, in which the test has proved absolutely satisfactory. The pure external air is admitted by a simple shaft, and ascends in a straight column to the ceiling, when it disperses itself, and, after gradually but certainly excluding the impure air, finds its exit, without having occasioned any draught whatever."

Is this, after all, only the system for which Mr. Tobin has sought, without success, to claim the exclusive merit?

LINCOLN MASTER BUILDERS' ASSOCIATION.

THE annual dinner of the above Association was held a few days ago at the Monson Arms Inn. Mr. W. Kirk, chairman of the Association, presided; Mr. Sims, secretary, filled the vice-chair, and over thirty of the principal local builders and others connected with the building trade also attended.

Mr. H. S. Close proposed the health of "The Chairman of the Association," to whom, he said, the members were much indebted. From the time the Association was formed, their worthy chairman had spared neither time, trouble, nor, in many cases, money, to further the objects for which it was established. It was no small matter to conduct the business of an association such as theirs, and though their secretary, Mr. Sims, had the bulk of the work to do, yet many duties devolved upon the chairman, and these Mr. Kirk was ever found willing to undertake. In proposing the toast, he (Mr. Close) was only preparing the way for a little surprise the committee had in view, and which Mr. Sims would no doubt make known to them; but he felt sure all would agree with what he had felt bound to say respecting their chairman.

Mr. Sims said it was about twelve years since the first meeting of the local master-builders was held, to consider some application from the operatives, and shortly after, on their casting about for some one to fill the post of chairman of the newly-formed Association, Mr. Kirk promptly undertook the office, and from that time to the present he had ably and willingly undertaken all the duties which fell to his lot. So impressed were the committee with the value of their chairman's services to the Association, that at one of their meetings it was suggested they should, as a kind of acknowledgment, present him with his portrait. It was ascertained that Mr. Slingsby had some time previously taken a photograph of Mr. Kirk, and as it was considered by them to be an admirable likeness, Mr. Slingsby was instructed to enlarge it to life-size, and paint it in oil.

Mr. Henry Barnes, on behalf of the committee, then handed the portrait to Mr. Kirk, who acknowledged it with much emotion. It is enclosed in a massive gilt frame, bearing the following inscription:—"Presented by the Lincoln Master Builders' Association, February 9, 1878, to W. Kirk, esq., chairman, in recognition of his valuable services."

Miscellanea.

A Group of Cases.—More than a hundred English intending exhibitors at the forthcoming Paris Exhibition have placed in the hands of Mr. Frederick Sage, of Gray's-inn-road, the manufacture of their various show-cases, and, with one exception, the design has been left to him also. Being principally of ebonised mahogany, with ornamental gilding, too great a similarity strikes the mind of the viewer as they are seen together. Whether there were any instructions from the Managers of the Great Show to this effect, we know not. But if so, a great mistake was made in not permitting a larger scope for colour, and the combination of various woods. One case for Messrs. Nettlefold, designed, we understand, by Mr. Chatfeild Clarke, although not in a sufficiently forward state to give any idea of the effects, is mainly of walnut and satin woods, and will, no doubt, attract the eye when placed among those described above. The manufacture of the whole does great credit to Mr. Sage, who has long made such work a specialty, and for the purpose has employed 300 men, spread over his workshops of many acres in extent, which are fitted up with all the latest and best machinery.

Mr. Lascelles and the Paris Exhibition. The intended exhibit by Mr. Lascelles in the Champ de Mars, as announced in our advertising columns, is so considerable and remarkable that we think it right to draw attention to it. It includes whole houses, works in concrete, decorations, furniture, and conservatories. When we add that the services of Mr. Norman Shaw, Mr. Alfred Waterhouse, Mr. Redgrave, Mr. George Devey, and Mr. Phené Spiers have been called in for designs, it will be seen that the term "remarkable" is not misapplied. It appears from the morning papers that H.R.H. the Prince of Wales, when in Paris the other day, was much interested in Mr. Lascelles's concrete building slabs.

The National Gallery Improvement Scheme.—At a meeting of the Vestry of St. Martin's-in-the-Fields on the 21st ult., the clerk (Mr. Dangerfield) reported that as the result of the deputation which recently waited upon the Hon. Gerard Noel, First Commissioner of Works, to urge upon him the necessity of pulling down the old workhouse in Hemming's-row, and widening that thoroughfare, which it was agreed eleven years ago that the Government should carry out as a part of the National Gallery improvement scheme, he had been in communication with the officials at the Office of Works, and was informed that a portion of the building was still necessary for Government purposes, and that it was an inopportune time to call upon the Government to do anything in the matter; but at the same time it was the feeling of the First Commissioner that the old building should be removed whenever there was a convenient opportunity. In reference to the widening of Hemming's-row, the First Commissioner did not think that would be of any service until Castle-street was widened. There was a good feeling at the Office of Works to assist the Vestry, although they could not hope for immediate action. He mentioned that the late fire in Castle-street had placed the Metropolitan Board of Works in a position to purchase the site towards the improvement.

The Late Mr. S. Smirke.—The will (dated January 12th, 1872) of Mr. Sydney Smirke, R.A., formerly of Regent-street and Grosvenor-street, Grosvenor-square, and late of the Hollies, Tunbridge Wells, who died on December 8th last, was proved on the 30th ult. by Thomas Lambert, Miss Margaret Jane Dobson, and Simon Adams Beck, the executors, the personal estate being sworn under 80,000*l*. The testator bequeaths all the honorary medals presented to him or any of his family in his possession, to his daughter for life, and then to the president and council of the Royal Academy, to be by them preserved for ever; his furniture and household effects to his daughters; to Mr. Beck, 200*l*. per annum, for managing his property; upon trust, for each of his daughters, Isabella Lange, Mary Octavia, and Margaret Jane, such a sum as will produce 650*l*. per annum; and upon trust for his son, Albert John, for life, 5,000*l*. in Consols; and the rest of his property he gives to his three sons, Sidney, Edward, and Alfred.

Cleopatra's Needle.—With reference to the action for salvage in the Admiralty Court, in accordance with the ordinary rule of the Court, affidavits of value were filed by the owners. The Needle was valued, at the weight of the stone, at 250*l*., and the ship at the same amount, its breaking-up value. The salvors being dissatisfied, filed a motion praying the Marshal of the Admiralty, Mr. R. G. Browne, to appraise and sell the Needle and case by public auction. The suit came before Sir Robert Phillimore in the Admiralty Division on Tuesday, an action having been brought by Mr. John Dixon, the owner of the vessel and its cargo, against Messrs. Burrell & Sons, the owners of the steamship *Fitzmaurice*, the salvors, for the purpose of obtaining a salvage award from the Court. The joint value of the ship and cargo was now fixed at 25,000*l*.

Cromwell House.—A distinguished party, including the Duke and Duchess of Teck and their children, were present on Tuesday afternoon last, to witness the representation of a new version of Mrs. C. J. Freake's charming "Allegory." With a beautiful scene, some very agreeable music, specially composed by one of Mrs. Freake's friends, and some appropriate dancing, the success was complete, and the hostess's guests were delighted. Special praise must be given to Mr. Brandram (*Christmas*), Mrs. F. Copleston (*Old Year*), Mrs. Brandram (*Old Time*), and Mr. Charles Colnaghi (*Will o' the Wisp*).

Architecture: Paris Exhibition.—The Committee of the Royal Institute of British Architects have carefully examined the architectural drawings and photographs, received at South Kensington by the Secretary to the British Commission. The entire number of drawings would have occupied 2,086 ft., while the committee had only 1,150 ft. of wall space, and a small screen to allot. It was obviously impossible to select for transmission to Paris more than about two-thirds of what have been offered, and the committee have been obliged to decline many excellent drawings, simply for want of room.

Birmingham Builders' Association.—Mr. Walter Clulee, of the firm of Bunkle & Clulee, public accountants, of Waterloo-street, Birmingham, has been appointed secretary to this Association, in the place of the late Mr. G. E. Jeffery.

Whitechapel Haymarket.—A correspondent, "H. W.," denies that the Vestrymen of Limehouse supported the proposed removal of the Whitechapel Haymarket. They divided on it, he says, as eight for and ten against.

St. Paul's, Covent Garden.—A correspondent, "R. P.," calls attention to what he terms the disgraceful condition of the exterior of this historical structure.

TENDERS

For Bengeo Water-supply Scheme, Hertford Union:—

Laidlaw & Son	£3,717 0 0
Fisher	2,490 0 0
Potter	2,280 0 0
Hunt	2,217 12 6
Bugbird	2,077 0 0
Painter	2,068 0 0
Pryke	1,999 0 0
Gray	1,990 0 0
R. Doowra	1,985 0 0
Rayment & Son (accepted)	1,950 0 0

For the erection of a pair of semi-detached residences, Christchurch, Ipswich. Messrs. Wright & Wright, architects:—

Luff	£1,288 0 0
E. & E. C. Gibbons	1,250 0 0
Grayston	1,135 0 0
Thwaites (withdrawn)	948 0 0

For the erection of Mission-room, Hornsey-rise. Mr. Alfred W. N. Burder, architect. Quantities supplied by Mr. George Sparrow Harrison:—

Staines	£1,866 0 0
Roberts	1,797 0 0
Hunt	1,795 0 0
Williams	1,725 0 0
Grover	1,653 0 0
Castle	1,595 0 0
Crocket	1,578 0 0
Nightingale	1,563 0 0

For house and studio, Finchley-road. Mr. Wm. Smit architect. Quantities supplied:—

Manley & Rogers	£4,298 0 0
Bayes & Allen	3,722 0 0
Dove, Brothers	3,450 0 0
Jarvis & Son	3,431 0 0
Stimpson & Co.	3,430 0 0
Patman & Fotheringham	3,375 0 0

For new pier, South Parade, Southsea. Mr. George Rake, engineer. Quantities supplied by Mr. H. P. Foster:—

Butterley Iron Company	£9,370 0 0
Dixon	8,000 0 0
Laidlow, Sons, & Caine	7,989 0 0
Young & Co.	7,916 4 6
Finch & Co.	7,770 0 0
Goddard & Massey	7,634 15 0
Shaw & Co.	7,490 0 0
Horsley Iron Company	7,480 0 0
Jukes, Coulson, & Co.	7,476 0 0
Goodenough	7,194 0 0
Head, Wrightson, & Co.	7,181 15 0

For house and stables for Mr. T. W. Fenton, at Farnborough, Hants. Messrs. Graves & Hulbert, architects:—

Veare & Co. (accepted)	£2,022 0 0

For alterations, &c., at St. Philip's Church, Arlington-square. Mr. Hugh R. Gough, architect:—

Grover	£1,360 0 0
Henry & Wallace	1,353 0 0
Dove, Brothers	1,295 0 0
Bayes, Brothers, & Allen	1,237 0 0
Hughes	1,147 0 0
Bishop	1,120 0 0
Danson	1,049 0 0
Smith & Son	889 0 0

For the erection of two detached residences on the Gunnersbury Estate, Gunnersbury, Chiswick, for Mr. A. Bassano. Mr. Richard Tomlinson, architect. Quantities supplied:—

Wilson	£2,200 0 0
Brunsden	2,040 0 0
Bailey	1,900 0 0
Nye	1,836 0 0
Simms	1,680 0 0
Esden (accepted)	1,590 0 0

For the rebuilding and reinstating of the Blackfriars Flour Mills, Blackfriars-road, after fire, for Messrs. H. R. Perry & Co. Messrs. Taylor & Locke, architects. Quantities supplied:—

Morter	£1,293 0 0
Yardley	1,248 0 0
Deards	1,168 0 0
Conder	1,098 0 0
High	1,090 0 0
Hoare & Son (acceptad)	1,083 0 0

For additions to Caldecote House, Bushey Heath, Herts, for Mr. C. E. Jones. Messrs. Batterbury & Huxley, architects:—

Chadwick, accepted.

For extensions to Messrs. Cleaver's Bleaching Works, Nottingham. Mr. S. Dutton Walker, architect:—

Harris	£251 0 0
Tynam	237 15 0
Stevenson	236 0 0
Bailey	235 0 0
Whitworth	226 0 0
Vickers	223 0 0
Bell & Son (accepted)	215 13 0

For alterations at the Duke of Cornwall Tavern, Lismore-circus, Haverstock-hill. Mr. J. R. Furniss, architect. Quantities supplied :—

Toms	£1,289	0	0
Williams & Sons	1,261	0	0
M'Lachlan & Sons	1,145	0	0
Schlater	1,139	0	0
Drew	1,113	0	0
Anley	1,097	0	0
Parker	945	0	0
Gas-fitting.			
Mescock	£50	0	0
Winn	43	0	0
Vaughan	41	10	0
Goldsworthy	35	10	0
Pewtering.			
Watts	£50	0	0
Grimes	34	0	0

For the erection of a new chimney-shaft and boiler-house at the Brewery, Caledonian-road, for Messrs. Alex. Gordon & Co. Mr. George Soamell, architect. Quantities supplied by Messrs. R. L. Curtis & Sons :—

Holland & Hannen	£1,190	0	0
Lawrence & Sons	1,182	0	0
Laurence	1,147	0	0
Mowlem & Co.	998	0	0
Kirk & Randall (accepted)	976	0	0
Scrivener & White	965	0	0

For the erection of cemetery chapels, lodge, fence-walls, &c., at Brimington, Derbyshire, for the Brimington Burial Board. Messrs. Rollinson & Son, architects :—

Wright & Boler	£2,898	0	0
Barber	2,854	0	0
Askew	2,837	0	0
Wright	2,820	0	0
Cropper	2,610	14	0
G. Stevenson	2,610	0	0
R. Stevenson	2,600	0	0
Fidler, Brothers	2,593	0	0
J. Fidler	2,510	0	0
Tutin (accepted)	2,349	0	0
Brown & Bailsford	2,180	0	0

For alterations at the Phœnix public-house, Union-street, Lisson-grove. Mr. Millar, architect :—

Wilson, Brothers	£594	0	0
Cole	590	0	0
Beale	547	0	0
Conway, Brothers	450	0	0
Patterson	380	0	0

For the erection of stabling, &c., for the London General Omnibus Company (Limited), at Bow Common-lane, Burdett-road, Bow. Mr. Alfred Tosh, architect. Quantities by Mr. A. J. Bolton :—

Julian & Co.	£7,514	0	0
Salt	7,055	10	0
Sampson & Parish	6,900	0	0
Gould & Brand	6,693	0	0
Crabb	6,600	0	0
Mason & Brisly	6,460	0	0
Niblett	6,397	0	0
Perkins	6,373	0	0
Aitchison & Walker	6,273	0	0
Resle	6,195	0	0
Kellaway	6,070	0	0
Hunt	5,978	0	0

For laying pipe sewers in Burlington-gardens, Acton, for Mr. J. C. Taylor. Mr. Edward Monson, Jun., architect :—

Taylor	£551	9	6
Serff & Stodard	518	0	0
Willis	514	0	0
Thompson & Son	444	0	0
Jackson	435	0	0
Pizzey	425	0	0
Torkington	390	0	0
Colson, Brothers	373	0	0
Warne	365	0	0
Blight (accepted)	349	19	6

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REPORT, 1877.

The 53rd Annual Report just issued, and the Balance Sheets for the year ending June 30 1877, as rendered to the Board of Trade, can be obtained at either of the Society's Offices, or any of its Agents.

GEORGE CUTCLIFFE,
Actuary and Secretary.

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The Builder.

Vol. XXXVI. No. 1832. Saturday, March 16, 1878.

ILLUSTRATIONS.

Ivory Coffer ornamented with Perforated Rosettes and Copper Clasps, Fourteenth Century; Ornament taken from the Bible of Louvigny; Japanese Porcelain Plate ornamented with the Symbolic Crane; Walnut Chest of the Fifteenth Century 265

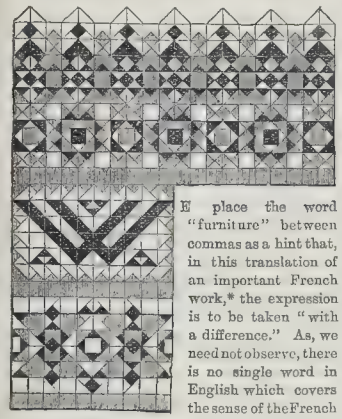
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Jacquemart's History of "Furniture."



E place the word "furniture" between commas as a hint that, in this translation of an important French work,* the expression is to be taken "with a difference." As, we need not observe, there is no single word in English which covers the sense of the French *mobilier*; and though "furniture" is the best word for the title-page of the translation, the book has a much wider scope than would be indicated by the title "history of furniture" in its ordinary English application; including every kind of movable ornament or article belonging to the garniture of a house, and even extending to personal ornaments, such as ear-rings and brooches. And this gives quite a different position to the book, from a reviewer's standpoint, from that which it would occupy as a history of furniture proper. It would be possible to give such a history, with considerable fulness and completeness, in the scope of a large and thick quarto volume of 450 pages. But it is manifest that to give anything in this space that could really be called a "history" of such a multifarious collection of subjects as are included in the index of this book,—furniture, hangings, bronzes, ivories, terra-cotta, arms, goldsmiths' work, jewelry, enamels, glass, pottery, and a great deal more,—would be utterly impossible. The proper title should be rather "Handbook" than "History." The book gives a general idea of the times and places in which each of the branches of work touched upon has arisen, and a certain degree of description and illustration of each; but that is all. A necessary consequence is that the book deals largely in generalities; its value, in fact, consists in combining in one volume a general comparative view of the subjects it treats of, and affording the means, as the writer says in the first chapter, of "glancing rapidly at the periods whence the connoisseur may seek, with some chance of success, the various parts of a choice set of furniture." This is very useful, no doubt, but it is not exactly history.

To English readers a word or two as to the author of the book may not be out of place. The name of Jacquemart has become more or less familiar among art-connoisseurs in this country from the brilliant and masterly etchings of M. Jules Jacquemart, who has devoted a great deal of his genius with the etching-needle to the illustration of articles of ornamental design in metal, glass, and ceramic art, with such success as to give quite an interest of its own to this application of etching, and leave us in doubt whether to admire most in his productions of this kind their fidelity and value as illustrations of beautiful objects, or their interest as specimens of what etching can accomplish in giving brilliancy and variety of surface and texture. It is not, however, the artist who is the author of the book before us, but his father, M. Albert Jacquemart, long known in Paris as one of the most painstaking students, and one of the most intelligent and eager collectors of objects of ornamental art; and this hereditary interest in subjects of this class serves to explain how it came to pass that an etcher so accomplished as the younger Jacquemart came to devote so much of his power to what, in comparison with figure and landscape study, might be disparaged as merely imitative or illustrative drawing, though he made it something more than this. M. Albert Jacquemart has been a frequent contributor on his favourite subjects to the pages of the *Gazette des Beaux-Arts*, and has brought out nearly forty separate works or essays in connexion with industrial and ornamental art, of which the most important have been,—"L'Histoire artistique, industrielle, et commerciale de la Porcelaine," and "Merveilles de la Céramique," followed more recently by "Histoire de la Céramique." These were all illustrated by his son; the "History of Porcelain" by etchings, that of "Céramique" by engravings. In the book before us we have what may perhaps be called a kind of "bird's-eye view" of the whole class of subjects over which M. Jacquemart has ranged during a lifetime of investigation, and the illustrations in this case also are furnished by the pencil of M. Jules Jacquemart. Some of these illustrations we have been able to reproduce for our readers.

The first chapter, which almost alone deals with what we call furniture, takes no regular chronological sequence and no formal distribution as to countries; certain types of furniture are named and classified, and their characteristics illustrated, and then it remains to remark generally in what time and place this type originated, and what country has most practised it. This, again, is not history in any very connected form, though the chronological and typographical history can be picked out of it more or less; but it is not a bad method of calling attention to and contrasting various principles and types in furniture-making, and the illustrations are typical in the same kind of way. As the book is by a modern Frenchman, there is of course a large, we might think a disproportionate, place given to Renaissance types of furniture; but these types are so well known and have been so fully illustrated that it is hardly necessary to refer to them specially or in any critical manner. There is a tolerably detailed account of the Boule method of workmanship and design, once so popular in France and England, now so scornfully scouted by *dilettanti* in this country at least; there are typical illustrations of the ebony cabinet incrusted, or carved and inlaid, and which the author seems to regard as a remarkably funereal species of furniture (a view in which we cannot agree with him); there is one of the more rare phase of furniture incrusted or inlaid with stones and marbles, and which always seems to us a method at variance with the real objects of furniture design, which should aim at producing something light in comparison to its mass, and easily movable. A cabinet inlaid with such materials as marbles, tortoiseshell, &c., has a cold, glittering effect, not conducing to the comfort of a room, and conveys the idea of being at once heavy and brittle. One specimen among the modern furniture which has a certain degree of interest, is a Chinese table of the eighteenth century, carved in ironwood, on the model of European Renaissance. The carving is very elaborate in design, and, we do not doubt, very highly finished in execution, but it is strange how utterly bad in taste it is, with legs consisting of scrolls butted one against another, and looking as if the first shake would send the whole thing down; it is an instance of the degradation of taste to which a people fall who have a really interesting and original style of their own, and neglect it to take up consciously with a foreign style which they think finer. The same kind of thing is at present going on wholesale with the Japanese, who are trying with our civilisation to adopt our art and costume, of course to the detriment of their own individuality of taste and style.

It is in the two or three illustrations of Gothic furniture that we find a certain special character more unfamiliar than the types of Renaissance furniture that are engraved in the book. The English architects and art-workmen of the generation which is now getting into middle age have, it is true, seen and designed and put together a great deal of Mediæval furniture, supposed to reproduce the essentials of Mediæval work; yet how completely distinct in character from all this is such an object as the fifteenth-century chest from the Queyroy collection, which we publish,*—how impossible to suppose it a modern production. An equally characteristic and richer design is the German fourteenth-century cabinet given on p. 9 of the book, which we have not been able to find space for. The distinction between modern Gothic work and the chest we have engraved is just the distinction, difficult to define in detail, between that which is Mediæval and that which wishes to appear so. No study will get over that final distinction. A part of the character of the thing depends in this case on the very point

* A History of Furniture: translated from the French of Albert Jacquemart. Edited by Mr. Bury Palliser, with numerous illustrations. London: Chapman & Hall. 1878.

* See p. 265.

which a modern-mediæval maker would have shunned, the unmoulded, unornamented lid; a modern workman would have felt under the absolute necessity of moulding the edge of the lid to make the whole complete. The small narrow centre panel under the hasp, not ranging with the rest either in width or height, is another characteristic feature. What more resembles modern Gothic church furniture, &c., is the German chair on page 11, and one or two other pieces of work of the same kind, neat and very weak. On the whole, we can hardly say that M. Jacquemart has illustrated Gothic furniture to the extent it deserved, even in a treatise necessarily so brief in particularising. With the exception of the one we give, and the German one we named, the Gothic examples are late and weak, and their paucity contrasts with the large number of drawings devoted to Renaissance designs, which for the most part are still later and still weaker. One of them, one of the very poorest in design, the French Armoire of the sixteenth century (on page 21), is interesting, however, as showing so completely the period of transition from the Gothic to the new Renaissance taste; for the open upper panels are filled with Gothic tracery, while the doors below are carved with Renaissance arabesques, between the buttress-like stiles. As nothing is said of the doors being of later date, we presume they are regarded as of similar date with the panels. The combination is perfectly possible, but unusual, and therefore the more historically interesting.

The second book of the History is occupied with "Hangings and Tissues," including a great deal of information, and a good many beautiful and well-selected illustrations of embroidery, figured silks, tapestry, stamped leather, &c.; and the third book is devoted to "objects of art derived from statuary." This includes things which to all intents and purposes really are statuary, such as bronze figures; though such figures, in the way in which they are generally made and regarded, are, as we have before observed, more like "furniture" than most objects in which the human figure is portrayed. Bronzes, in fact, are too often bought and scattered about a room merely to look "handsome," with little thought of their individual meaning or merit of execution. It is quite in accordance with French taste, refined but not deep, that we find our author eloquent in regard to the pleasing general effect produced by bronzes scattered about a room, "their sombre hue subduing the somewhat garish appearance of cases sparkling with glass gems, enamels, and all those smaller objects of art, now become so precious, since their history begins to be written." Bronzes, in fact, are *objets de luxe*, a phrase which in itself indicates that they do not form an appendage to the highest phase of domestic art, but are rather associated with that general glitter and costliness which is only to be realised by great wealth, and at which wealth unfortunately often stops short in its art-culture. But M. Jacquemart alludes to one important point in which the old Florentine bronzes differ in artistic value from the productions of the modern magazine of *bijouterie* and *vertu*. In the fifteenth century the state of the technique of the art was such that "each artist had to invent his own processes, and do everything for himself. While the exception of a few plaquettes of very low relief, which were formed so as to issue freely from the mould without altering its edges, all had to be cast *à cire perdue*,* a difficult and costly process, as, in order to repeat a statuette, the artist was obliged to prepare a fresh model. The consequence is that every Renaissance bronze is unique, because, whenever repeating his work, the artist, it might be involuntarily, modified either the details or the proportions, or else introduced some deviations suggested by his taste or fancy; here adding one accessory, there giving greater breadth to the folds of the drapery, elsewhere more grace to the support." This is an important characteristic of the bronze-work of the period named, and gives it quite a different value from the mechanically-produced bronze casts of our day, which almost invariably have a look of artistic mediocrity, a conventional smoothness and polish, which is quite foreign to the spirit of a real art, and reduces such works to the level of elegant ornaments for a chimney-piece or side-board.

As a material for an art of this species, half an art, half an ornamental workmanship, ivory takes a high place, and is not subject to the kind of mechanical use and abuse to which a material like bronze is open. It cannot be cast, at all events; and by its tone and appearance and the delicate finish of which it is capable, ivory appears specially suited to be the material for a miniature art half related in its character to *bijouterie* and personal ornament,—for which latter purpose, indeed, a good deal of the best ivory carving has been used. The material also has a peculiar suitability for small objects of use, such as little caskets, combs, &c.; and the fourteenth-century casket of ivory with copper clasps, which we engrave (p. 265), is an admirable and characteristic specimen of this kind of application of the material, and curiously illustrative of the Mediæval combination of ornamental effect with constructive means, in the frank and bold use made of the metal clasps which hold the whole together. How beautifully ivory was used by the Germans and Italians for sculpture subjects on a small scale every visitor to the Kensington Museum knows; and on the whole we are inclined to say that the Germans have the best of it, since they adopted a more characteristic treatment of the material. For there is a certain toughness and regular grain in ivory which makes it by no means so suitable a material for all-round cutting in high relief as marble and some other substances; and much of the Italian and some of the French ivory work is really marble sculpture imitated on a small scale. But the Germans almost invariably employ a rather flat treatment in which a great proportion of the original surface is left intact, the design being merely developed in low relief by sinkings sufficient for the purpose; and this is much more in accordance with the nature of the material than the Italian treatment. But no nation of artists has treated ivory with such piquancy and effect, and at the same time with such thoroughly true feeling for the nature and capabilities of the material, as the Japanese; and we entirely concur with M. Jacquemart in the judgment which gives to them the first place in this art at all events, however their work in other branches of art may have been exaggerated in value. In their minute carvings out of small cubes of ivory, in which the very most is made of the amount of the material and the least possible of it cut to waste, there is a combination of delicacy and minuteness of finish, with a largeness of style, which cannot be matched in any other work of the kind, and combines qualities apparently so opposite that the result is a kind of intellectual puzzle, and we hardly know whether to be amused at the humour and grotesque fancy of many of these productions, or to be impressed with respect for their dignity and power of artistic style and execution.

The chapter on wood-carving has some special points and some illustrations of unique and characteristic interest; and in the chapter on terra-cotta the author touches on a point of criticism in regard to the much-valued Della Robbia ware, noting how the enamel glaze, which he pronounces a strange idea, entirely opposed to the spirit of sculpture, "with its vivid lights, its reflections and harsh shadings, deprives the modelling of its harmonious transitions, the form of its pliancy. Luca himself was one of the first to feel this, and in his more choice works he spared the flat surfaces, enveloping the draperies only in the ceramic coating, choosing colours rather dead than bright, and using polychromy but sparingly even in the accessories and surroundings of his compositions. His example was not followed, and the other members of his family, his nephew, Andrea, and Andrea's sons, Giovanni, Girolamo, and Luca, carried the style to excess. Their figures assumed a hard and rigid look in contrast with the deadly whiteness of the flesh. The surroundings, overladen with flower, fruit, and foliage, acquired undue importance, injurious to the statuesque effect of the objects. In a word, ceramic statues or medallions ceased to belong to high art proper, and passed into the domain of purely ornamental work." This criticism is only what would certainly be that of any unbiased mind in studying the Della Robbia work; but it has been so much and so unhesitatingly praised that one must suppose some of its critics have been blind to these inherent defects.

We may note in passing that there is a short section devoted to pewter work, which the author considers was an important branch of ornamental work in table utensils, &c., at one time, though from the material not being either precious or durable in itself little of it has been preserved. The chapter on glass and ceramics gives a great deal in a short space, and is accompanied by very interesting illustrations, one of which we give, that plate with the conventionalised figure of the crane, which illustrates so well the genius of the Japanese in adapting animal and bird-forms (the latter especially) to decoration, by a kind of happy compromise between the natural and the artificial. In the chapter on gems occur one or two interesting illustrations of the art of the Chinese in treating really ungrateful and untractable substances, such as jade and chalcedony. The remark upon the way in which the Chinese artist turns to account the special accidents of the latter material is sufficiently interesting to quote. "By ingenious touches he will contrive to carve out a cup of light chalcedony, shaped like a pomegranate with brown stems, upon which is perched a bird of dull white hue, for which a vein of carnelian has been utilised, while further on are creeping snails found in the crystal nodules, or some of those green-winged crickets above mentioned. In all this there is something more than mere art; there is an audacity in facing and overcoming difficulties of a far more arduous nature than that needed for cameos of various layers. For has not the workman been compelled, day by day, hour by hour, patiently and bravely to adapt his imagination to the caprices of the raw material? In dealing with such materials, no design can be thought out beforehand, it being impossible to know whether the principal nodule will prove of regular form, or whether the veins accompanying it are constant or accidental. Ready for all emergencies, prepared to take advantage even of faults in the stone, the artist thus gropes his way for months and years over a pebble, whose real value he will ascertain only after the last stroke of the chasing hammer has been delivered. Such objects can accordingly have no appreciable market value. Each is a treasure in itself, the owner of which is confident that it can never be rivalled."

M. Jacquemart regrets, in regard to these objects of Chinese art, that no artist's name is ever found upon them. Other times and countries, however, have preserved the artists' names, and one of the features of M. Jacquemart's book is the collection of a schedule of all the known names of artists in each branch of work treated of, and their dates, as far as can be ascertained. This is a very useful addition to the book, which, as a whole, we commend to our readers' attention as a broad outline of the subject of an author who fully understands it both critically and historically. The only decided fault we have to find is in the translation, which is for the most part rather stiff and wanting in style, and in not a few places most awkwardly repeats French modes of expression in too-literal translation of phrases, instead of giving the proper English form of the phrase. This has a very clumsy effect. As a whole, however, the translation is adequate to its purpose practically, though imperfect in detail.

* That is, the mould had to be destroyed in order to release the cast.

SOCIETY OF LADY ARTISTS.

THE gallery in Great Marlborough-street, now open to the public, contains 797 pictures, which represent only a portion of those submitted to the committee. If the collection show fewer central works than has sometimes been the case here, there are fewer really bad drawings. We do not pretend to have looked at the whole 800, mostly small works, and will name but a few of the old supporters of the Institution. Mrs. Marrable is in force, as usual, sending fourteen drawings, of which, No. 220, "Ancient Larches on the Roseg-road, Pontresina, Engadine," may be called the most complete. Her daughter, Miss Edith Marrable, promises to become a flower-painter. Miss S. S. Warren has some excellent landscapes. Louise Rayner, Mrs. or Miss, is better even than usual; and the same may be said for Mrs. Paul Naftel. Miss Louise Swift shows that her skill is not restricted to the depiction of dogs, and in "Anything but Comfortable" establishes a new claim. "Fruit Gatherers" (226), by Mrs. Backhouse, "The Pest House, Reigate" (526), by Marion Croft; and an "Old Orchard" (685), by Alice Squire, amongst others, have good marks against them in our catalogue.

Artists' Benevolent Fund.—Lord Ronald Gower will preside at the approaching anniversary dinner, which is fixed for the 13th of April.

PROFESSOR E. M. BARRY'S LECTURES AT THE ROYAL ACADEMY.*

ENGLISH RENAISSANCE.

I HAVE now arrived at the last lecture of the term for which I have been honoured by the Royal Academy, with the appointment of Professor of Architecture.

In former sessions, we have traced together the developments of domestic work from Roman, and through Mediæval times, and have now arrived at the period, when the first skirmishes began, which heralded the commencement of the "Battle of Styles."

The subject is too extensive to be adequately treated in a single discourse, and all I can hope to do, is to arouse, if possible, sufficient interest in the question to induce you to inquire; and also to do that still rarer thing, namely, to think for yourselves.

I spoke last week about the Renaissance in Italy, and, before I end my course, I wish to say something of the effect of the new ideas of Classical revival on the practice of our own country.

I propose, therefore, now to resume the consideration of that question, and to notice the influence of the Classical revival abroad on the architecture practised in England, immediately after the Elizabethan age. In treating of the latter, we found, as you may remember, traces of Italian influence, in both plan and elevation; particularly in the case of Longleat, attributed, as it indeed is, to an Italian architect. We shall find that this was the beginning of a movement, which was for the time to carry all before it, and to break completely with the Mediæval architecture of England.

Hitherto we have had to deal with a fusion, a Transitional period of doubt and change; but in the days of our Stuart sovereigns, the Renaissance, which had started from Italy, gained a footing in England, which it has never lost. In dealing with the new state of things in England our minds naturally revert to two great artists, whose names are inseparably connected with the architecture of their time. I allude, of course, to Inigo Jones and Sir Christopher Wren.

With reference to Inigo Jones, our information is not as full as could be wished. Descended from Welsh parents, and born in 1573, he is believed to have been brought up as an artisan, and was apprenticed to a joiner. He must have been unusually intelligent, for on attracting the notice of a nobleman (Lord Arundel, or Lord Pembroke), the latter became his patron, and sent the young man to Italy to study. Here, he found the Renaissance movement in full activity.

Inigo is said to have visited Italy about 1612, when he was nearly forty years of age. His Italian tour was not a long one, for he had to return home quickly, in order to assume the office of surveyor to Henry Prince of Wales, which the influence of his patron had obtained for him. He reached Italy at a time of great architectural activity, and must have shared in the enthusiasm excited by the approaching completion of St. Peter's, the dome of which had been finished in 1590. He probably agreed in Michelangelo's admiration for Bramante, as he thenceforward cast in his lot with the architects of the second, or Roman period of the Renaissance.

On the return of Inigo Jones to England, he found favour and honour awaiting him. Society was stirred by the reports which came from abroad, of the success of the new manner of architecture. Latin and Greek literature was found in many cultivated English homes of the gentry and nobility. King James had already earned a name for scholarship, which entitled him to be known to history by the nickname of "The Royal Pedant." The Reformation had broken the continuity of tradition, and men were asking for change and novelty.

In such a state of things, the advent of an accomplished artist, fresh from what seemed the source of inspiration, a man, vigorous and earnest, and inspired with thorough confidence in his convictions, was an event of the greatest interest. Here was a great opportunity for the enthusiastic architect. Inigo Jones came as a prophet from afar,—a master demanding attention,—a lawgiver from some sacred mountain.

He speaks thus of himself:—"Being naturally inclined in my younger days to study the arts of design, I passed into foreign parts, to converse with the great masters thereof in Italy; where I applied myself to search out the ruins of those ancient buildings which, in despite of time itself, or violence of barbarians, are yet remaining. Having satisfied myself in these, and returning to my native country, I applied my mind more particularly to architecture." From this account we notice, first, that Inigo left England as a lover of art, but not as an architect; and secondly, that he underwent the same process which had led Italian architects to the Renaissance, by a study of the remains of their ruined buildings; relics of old Rome, and ancient Greece. Inigo Jones preserved throughout his life his original catholicity of taste, for he engaged in a variety of artistic pursuits, including designs of scenery and decorations for the favourite masked entertainments of the day; he was, indeed, poet, architect, machinist, and painter.

Rejoicing in Court favour, he became "Inspector-General of the Royal Buildings," and in that capacity, was called upon to design a new palace at Whitehall, of which a small fragment only has been erected. This portion of the design, which is known as the Banqueting-house, was commenced in 1619, and is said to have cost about 15,000*l*. There is some interest just now in noting workmen's wages in those days. Mr. Peter Cunningham tells us that at Whitehall they were as follow:—Master mason, clerk of works, or inspector, 4s. 10d. a day; masons, 1s. to 2s. 6d., according to skill; carpenters, the same; and bricklayers, 1s. 2d. to 2s. 2d. These prices were fixed by the authorities. No change was permitted during the progress of the building, and power was given to compel workmen to enter the works, if necessary. The age of legalised strikes had not yet arrived.

The reputed works of Inigo Jones are numerous, so much so, indeed, that we cannot accept, without hesitation, many that are ascribed to him. The Banqueting-house, Whitehall; St. Paul's, Covent Garden; a chapel in Somerset House, since destroyed; the great western portico at St. Paul's; and the charming little water-gate, now left with cupable neglect in a hole on the Thames Embankment, are admitted instances of his work in London.

Inigo Jones also designed the Duke of Devonshire's villa at Chiswick, Wilton House, and various houses of noblemen in the provinces. His prosperity was clouded by the troubles of the times, and he lived to see the son of his original patron, King James, step from the palace he had designed to meet death on a scaffold by public execution. The artist had fallen on evil days: a courtier, and a Roman Catholic, he was, in both qualities, obnoxious to the ruling powers. He had embittered his life also by personal quarrels, particularly with Ben Jonson, and a career which began with exceptional brightness, ended in gloom and disappointment.

The works of Inigo Jones generally exhibit both originality and taste. Although he had formed his style on that of the Italian architects, and notably followed Palladio, he did not at all blindly copy their works. Thus he was far less apt to use applied columns and pilasters than they were. At Greenwich Hospital, which has been ascribed to Inigo, there is an enormous order running through two stories, and coarse in its proportions; but it is very doubtful whether this was really his own, and in all probability it may have been the work of some follower, or would-be imitator.

We may notice in most of the designs of Inigo Jones an absence of affectation, all the more remarkable when we bear in mind the extravagances of the Transitional work of the Elizabethan and Jacobean architects, to whom he succeeded; such as might be seen, for instance, in Holbein's gateway at Whitehall. His buildings often display a dignified plainness, with orders used sparingly, for porticos or other important features.

The portico was so favourite a feature in Classic days, that it was only natural, in the first fervour of imitation, to seize upon and adopt it for all kinds of buildings, even in positions where it was very unsuitable. When it became necessary to repair the west end of St. Paul's Cathedral, before the Great Fire, the idea of adding a portico was suggested by Inigo, in accordance with the then fashionable taste. He had no sympathy whatever with the old Gothic cathedral. He fancied, probably, that so barbarous a structure, as it seemed to him, must soon be swept away by the advancing taste for the Revived Italian style, of which he was the advanced practitioner.

However this may have been, he proceeded to build, at St. Paul's, a Corinthian portico, of much grandeur, and, apart from its incongruity, of considerable beauty. It had eight columns, each 47 ft. in height, with a horizontal entablature, without a pediment. It perished in the Great Fire, with the building, to which it had been added, and the site was thus cleared for new St. Paul's, the great achievement of Sir Christopher Wren.

The Banqueting-house, at Whitehall, is in some matters, as in the free use of the orders, an exception to the usual principles of design which were followed by Inigo Jones, and it even exhibits points of detail, which may be referred to the influence of the freer Transitional styles, which have lately passed under our review. It was one of our artist's earliest designs, after his return from Italy; and although he never wavered in his attachment to Classical art, his practice was probably less firm and assured at this period than it subsequently became.

In his buildings, as a rule, the horizontal principle is made to prevail. String-courses, and unbroken cornices, are employed, and grandeur is sought for through simplicity. In some cases, bold roofs appear, simple and unbroken in outline, with projecting eaves and cornices, casting deep shadows.

At Whitehall, this is not the case. The whole surface is broken up with a multiplicity of projections, and the vertical principle prevails over the horizontal, in a manner, more appropriate to a Gothic than to a Classical building. With the exception of a partially unbroken basement, every detail of cornice and entablature seems to speak of action, rather than repose; and even the sky-line would have been broken by statues, if the building had ever been finished.

In criticising this example of the talent of Inigo Jones, we must, of course, bear in mind that it is only a very small fragment of a grand design, and if the whole had been carried out, the effect of the great mass would probably have tended to subdue any undue prominence of partial detail.

The great palace at Whitehall was indeed designed, on a scale, much too grand for adoption, by a country like ours, which is ever slow to entertain great artistic ideas. It would have been too much for the present day, and for the hard times of Charles I. was altogether inappropriate. The design remains to us, however, a magnificent conception of its architect, and if it had been executed, would have been one of the finest edifices in Europe.

The building would have been 874 ft. long, towards the river; and no less than 1,152 ft. in depth, with a great central court, about 750 ft. long, by 378 ft. wide. The river front would have been nearly the same length as the present Houses of Parliament, and the latter would have been greatly exceeded in depth, and total size, by Whitehall Palace. The whole conception showed the skill and taste of Inigo Jones: and the arrangement of the masses and the angles, and the disposition of openings and piers, with the play of light and shade throughout, would have produced a splendid architectural effect.

An original feature was the so-called Persian court, which was circular on plan. Here, statues were to serve the place of columns, as at the Erechtheum at Athens. There were to be two stories in height, and in the lower floor the Doric proportion would have been used, with statues of men; while on the story above, there were to be female figures and Corinthian details.

In the present Banqueting-house, we may see the nature of the work which the architect contemplated, but he intended part of the structure to have had three stories instead of two, so as to avoid sameness and monotony of outline. This fragment of the grand design illustrates the attention given to proportion by its designer, for the balance of voids and solids is one of its most pleasing peculiarities; while it is also handsome, as a whole, without being overdone in parts. I cannot now pass in review more of the works of Inigo Jones: suffice it to say, that they all show a sufficient amount of skill, and even of genius, to entitle him to be called the father of the English Renaissance.

In the troubled times of civil discord, the arts are not likely to flourish, and the office of Inspector-General of the Royal Buildings disappeared with that of Royalty itself. After the Restoration, however, arose a new period of building and improvement, and with the opportunity came the man. This was no other than Wren, who soon occupied the place vacated by Inigo Jones, and surpassed the latter in the number and importance of his architectural works.

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* Sixth and last Lecture, delivered March 7, 1878.

Unlike his predecessors, Wren had advantages of birth and education. He was an accomplished scholar and a learned mathematician. He was early appointed to take charge of St. Paul's, and was engaged in repairs of the fabric at the time of the fire. When this catastrophe occurred, Wren was abroad, studying, it may be presumed, the works then in progress on the Continent; but his journey was stopped at Paris by the news of the destruction of London, and he hurried back to England, without going further.

It is much to be regretted that Wren was thus deprived of the opportunity of visiting Italy, and of making acquaintance, like Inigo Jones, with the leading architects of the day. It was probably due to the calls made upon him, in consequence of the Fire, that Wren determined to apply himself to architecture; for his natural bent was certainly towards science rather than art. It was, in any case, unfortunate that he should have been thrown so suddenly into architectural activity, and have had cathedrals, churches, and other buildings innumerable, placed at once in his hands.

It was not possible for one man, however ably seconded, to do his best under such pressure, and it is very remarkable that Wren was able to produce results as satisfactory as he did. The story of St. Paul's is, doubtless, known to many of you, and as I dealt with it on a former occasion I will not repeat it here. Suffice it to say, that the result, as a whole, is a splendid evidence of Wren's genius. Hampered in various ways, with but little encouragement, and many difficulties, he gave us a building which, in some respects, is without a competitor.

St. Paul's has not the dimensions nor the internal magnificence of St. Peter's at Rome, but it far surpasses the latter in beauty of exterior. The dome of Michelangelo is splendid within, far more so than Wren's; but it has little external effect, and none at all from the Piazza, whence it is concealed by the rococo front of Carlo Maderno. At St. Paul's, the dome is lifted up in dignity. It is supported by the western towers, which contribute, by contrast, to its effect, and the whole external view of the cathedral is very striking and satisfactory as an architectural monument.

It must be borne in mind that Wren was called upon to undertake a task of no ordinary difficulty. The style of architecture which was fashionable was not the style in which men had been accustomed to work, and, least of all, were they prepared to see cathedrals and churches built in any other architecture than Gothic.

Wren applied the new Renaissance taste fearlessly to all buildings, and when he attempted any imitation of Gothic forms, his usual success failed him. Of such attempts, the western towers of the abbey at Westminster, are an example, and, at the same time, a warning.

At St. Michael's, Cornhill, at St. Dunstan's-in-the-East, at Warwick, and a few other places, Wren adopted Gothic details; but his heart was not in his work, and he was probably controlled as to their use by special circumstances.

Among his Classical designs for secular buildings, the library of Trinity College, Cambridge, deserves notice. It is simple in principle, consisting of two stories, each of which is arcaded, with an attached order. The upper story is devoted to the library, while the ground-floor is open, as a cloister. The design is appropriate for the purpose intended, and, notwithstanding its simplicity, is pleasing and dignified in effect.

Perhaps, however, the most peculiarly successful of Wren's works is the tower and steeple of Bow Church, in the City of London. The Renaissance was hardly a tower-building, and certainly not a steeple-building, style. Its application to such a purpose was consequently an experiment. Wren faced the difficulty, however, and produced a very beautiful work. Starting with a tower of much plainness, he made the base of his spire circular on plan, and surrounded it with columns, giving a great play of light and shade. Above this Corinthian peristyle a range of boldly-moulded trusses intervenes, as an introduction to the lantern above, which is, in turn, surmounted by a short spire.

The effect of the whole structure goes far to prove that, in the hands of genius, even an intractable style may be so handled as to produce beautiful results. The steeple of Bow Church is by far the best of the many similar structures designed by Wren, and it is, perhaps, the best of its peculiar style which exists anywhere.

That Wren was a scientific architect is manifest,—not only from the skill displayed by him in construction, as at St. Paul's, but also from the cleverness and ingenuity of his plans. Among the latter, the church of St. Stephen, Walbrook, holds a foremost place. Although the dimensions are small, the ingenuity of the arrangement of the internal columns is such, that a great impression of size is produced, together with great variety, and a most pleasing effect of chiar-oscuro. The columns in the body of the church support eight arches, so planned as to form an octagon, from which a dome springs. The latter is enriched by panelling, and is lighted by lunette windows, in the octagonal stage.

It is not easy to describe the merits of this very clever interior, and I strongly advise students to go and see it for themselves. Wren's weakness here, as elsewhere, was in detail; and this was probably the result, in many cases, of undue haste, and of the pressure of a large number of important works at the same time. In Grinling Gibbons, he was fortunate enough to find a most accomplished carver, and the amount of work executed by the latter was very great; but in many instances his assistance could not have been available, and the ornamental details of Wren's churches are often rough and crude, though seldom destitute of a certain boldness and largeness of effect.

Wren himself was an artist of grand ideas, as was shown when he was called upon to produce a plan for rebuilding London. The state of things previous to the Fire has been before described, with the wooden houses projecting story beyond story, and the narrow streets, inviting plague or conflagration. These had been destroyed, and a great opportunity had consequently arisen for the improvement of the metropolis.

Wren proposed a system of radiating streets, and a great river embankment. On the latter, he would have placed the rebuilt halls of the City companies, and would thus have lined the river with palaces. His general plan has been criticised as too formal, and as having a tendency to produce the dull monotony seen in some regularly-built cities, such as Turin.

In truth, however, Wren's proposals are scarcely fairly treated by such a suggestion. Although he would certainly have given us spacious and direct thoroughfares along the chief lines of traffic, he by no means followed any uniform treatment throughout, and the different levels of London would in themselves have been a great safeguard against sameness of effect; while, as regards the river, its curves and reaches would have exerted a similar influence.

On the whole, it is to be regretted that Wren's plan was abandoned, and that we have consequently been left to attempt to remedy, partially, and at enormous cost, the evils, many of which he would have removed, once for all. His plan shared the usual fate of all comprehensive schemes with us, and was abandoned in face of the opposition of the private interests, which it aroused.

Wren's scientific skill was apparent in all he did, from the often-abused cone in the dome of St. Paul's, to the cleverly-designed wooden roof of the Sheldonian Theatre at Oxford, where a space of 80 ft. wide is covered by a single span.

As to St. Paul's, the great external effect of the dome, apart from beauty of outline, is due to its height, while the internal dome is certainly quite high enough, and indeed perhaps too high for a quite satisfactory result. There is a difference of height between the inner and the outer dome of some 50 ft., and Wren filled the intermediate space with a brick conical structure to support the stone lantern above.

This arrangement of a double dome has been denounced as an unworthy expedient, and a constructional falsehood. What, however, was Wren to do? Was he to ruin the unrivalled effect of the exterior of the dome by lowering it? or was he to raise the inner dome, which is already too high? If he were able to avoid both horns of the dilemma, by an expedient of most ingenious construction, it is difficult to see why he should be blamed, especially by those who detect no impropriety in a Gothic spire or flèche, and who consider a high wooden roof, built over a stone inner groining, an admissible and praiseworthy manner of building.

In estimating Wren's claims allowance must be made for the circumstances of his time; the novelty of the application of Classic forms of architecture; the want of skill, in such work, of the artificers employed; and the sudden and immense demands on the architect's ability and taste. When these facts are borne in mind, the verdict of history upon the career of Sir Christopher Wren will not be doubtful. To him, and to Inigo Jones, the Renaissance in England owed its first vigour, and their works have not as yet been surpassed.

It must always be remembered that our two great English architects were placed at much disadvantage, as compared with the architects of the Italian Renaissance. The latter had not to look abroad for information or precedents; they were at home with Italian forms and manners; above all, they were part of a powerful and united band of artists, bound together by common associations, and by a popular enthusiasm for literature and the arts, whether painting, sculpture, or architecture.

In this country, the impulse towards the employment of Italian architecture, came from above. Inigo Jones was emphatically a courtier, and Sir C. Wren owed his great opportunities mainly to royal influence.

England has never seen a republic of art, in the same sense as Italy. It has been her lot to follow, and not to lead, and it was impossible for her to show the feelings of delight with which the Italians saluted Rome as "mistress of the world" in law, religion, and in art, with an outburst of sentiment, at once artistic and patriotic.

Although, however, the new manner was tardily adopted in our own country, it made its way surely and thoroughly, and, until times comparatively recent, our principal buildings have been designed in some form of Classical art. They have, however, almost always lacked the distinguishing merit of Italian work, the association of the arts. They have had no Michelangelo to make their, walls eloquent and their ceilings glorious. The charms of Raffaelle, and the grace of a Leonardo, have been denied them, and thus the English Renaissance has been but a movement, partially completed.

The Italians had always been accustomed to wealth of decoration, and even in their Mediæval buildings, as for example, the Cathedral of Siena, every part glowed with colour and decoration. The simplicity of Early Christian days had become transmuted into a system of gorgeous spectacles, with all that could attract the senses, engaged in the service of the Church. Holy things and relics were enshrined in gorgeous temples, and churches became artistic treasure-houses.

The Italians loved detail, and lavished their wealth of art on every separate part of the structure. At Siena, it is not the building itself, striking though it be, that delights the spectator, so much as the beauties of parts, isolated apparently, and full of variety, but contributing to a richness of general effect an amount of special interest, to be sought in vain in structures more dominated by a single mind.

As a contrast to such principles, we have but to consider our own St. Paul's. Here, we have the governing architectural thought made so clear, that nothing is left to the imagination. A few large and not very refined details are repeated, but not to a sufficient extent to give either the idea of space or mystery. Large as it is, the interior suffers in apparent size, from the want of detail.

A few features, however grand in themselves, can never produce the effect of small parts often repeated, as in the case of the Gothic cathedrals. This was one of the conclusions which the Renaissance architects were slow to accept, with the frequent result of comparative failure, particularly in their architecture of interiors. The absence of internal detail was, to a great extent, forced upon them by the painters. The latter required great spaces for their works, and dictatedtheir own conditions. Painting was emphatically the great art of Italy, and to it all was subordinated. It was to the Italians all that sculpture had been to the Greeks, and it ruled supreme over the Renaissance.

In England things were otherwise; not only had the Northern principle of Mediæval architecture varied essentially from that which prevailed in Italy, but the then existing circumstances of the country were altogether different. The scientific working out of a single design, in the great buildings of England, allowed a diminished scope for individual detail, whether of painting or of sculpture.

Although we had shared in the religious development which had everywhere filled the churches of the old faith with shrines, images,

and pictures, these artistic accessories to architecture had been less willingly accepted here than in Italy, and at the time of the Renaissance had been roughly thrust out by a burst of iconoclasm.

Wren was consequently not free to do his best, but had to reckon with the Puritan view, that art and religion were opposing foes. This is a creed which has ever had supporters, and it is well for us to ask, Is it true? If it be so, we might almost conclude, in all sadness, that a Christian man ought not to be an artist.

At the outset of Christianity, when the neophytes of a new faith hid themselves among the rocks, and crouched in catacombs, it was natural that the spiritual life should claim their entire thoughts, to the exclusion of all else. Revolting with their whole soul from pagan practices, all that savoured of them was of necessity odious.

The early Christians were engaged in a battle for existence; a mortal conflict, calling for all the patience of conviction, and even the energy of fanaticism. It was inevitable, therefore, that their attention should be concentrated on the invisible ruler of the world, rather than on its obvious beauties. The arts would thus easily come to be thought unholy, and it was left to other, and calmer times, to appreciate, in all its grandeur, the lesson that human nature is itself a Divine Creation, and that nothing has been created common or unclean.

The Renaissance was a movement of revolt against asceticism. It asserted freedom, and claimed the privileges of liberty. Artists would not be satisfied always to work within the narrow bounds prescribed by ecclesiastical traditions, they declined to walk any longer with monastic leading-strings. They did not, however, seek to break with the old system, but rather to develope it. They would still paint saints and sacred mysteries, but they would do so in their own way. All the resources of art should still be at the disposal of the Church, but they should be governed by Genius, working in a spirit of Freedom, rather than of submission to external authority.

There was no trace of Puritanism in the art of the Italian Renaissance,—rather, indeed, the principle was paramount of offering all that was costly and precious in the sanctuary. The love of natural scenery came later, and almost as a consequence. The conviction that it was lawful to indulge the senses reasonably allowed men to see beauty in everything around them, and it was not a pagan instinct which led them to look at snow-clad peaks, and smiling valleys, as temples of the great unseen Power, which the early Christians had approached in awe and tribulation.

Surely, it might be felt, this world of ours, with its infinite wealth of all that charms the sense of beauty, has not been so endowed in vain. We may seek to follow a guidance, felt, as well as seen, and an imitation of principle may even be regarded as an act of worship.

It seems to me a great error to class the Renaissance artists with those who appeal only to pride, ostentation, and such unworthy motives. Michelangelo, at any rate, was ever wooing the ideal, living in a world of his own, scorning and eschewing the pomps and luxuries placed freely at his command. Look at the grand old man, in failing health and strength, toiling at his immortal work at the Vatican, and say if he can be accused of displaying in his person, either weakness of devotion or meanness of principle. His intense enthusiasm, and his haughty energy in the worship of his art, through the wintry days of a long old age, have in them something startling, before which criticism may well shrink back, with a feeling of reverence in the presence of genius.

Turning again to England, we have to deal with architecture, temporarily divorced, as regarded ecclesiastical buildings, from painting, and, to a great extent, from sculpture also. The Reformation had broken with the old compromises between art and legend. Our churches had been ransacked, and images and pictures were alike forbidden.

The Renaissance in Italy had been a return to the glorifications of nature in art. In England, it seemed for a time to wish to drive from us the attractiveness of beauty, and to be content with half-realised suggestions in place of perfect artistic work. If, therefore, we find coldness and formality in the designs of our great architects, Inigo Jones and Wren, it does not follow that the result is due to their failings or to the deficiencies of the style in which they worked, but rather to the circumstances of their time, and the influences by which they were surrounded.

There is no doubt that Wren, at any rate, desired to see the interior of St. Paul's present a very different appearance from that which now exists. He knew, probably only too well, how hopeless was the struggle against the ruling dislike of colour and artistic decoration, and he was thus compelled to leave to others a task he must have longed to perform himself. There are many details in the interior, now obnoxious to unfavourable criticism, which might, in all probability, have been very differently arranged by Wren if he could have felt that the artistic imagination of others was ready to combine with his own in the production of a perfect monument.

The English architects had not the encouragement which was derived by the Italians from the enthusiasm of their countrymen. They worked, as we have seen, at the bidding of the Court and aristocracy, rather than to satisfy a public and general demand.

In Italy, success in the arts was an aim of patriotism. City vied with city in warm artistic jealousy, and we see Venice competing with Florence, and Rome with both, for the possession of Michelangelo. The great works of the day were chiefly those of public utility, paid for by public money, and devoted to the public use. They were thus essentially democratic achievements; for, although many were carried out nominally by despots, the latter knew that their position could only be maintained by complying with popular demands. These, in each little State, took the shape of recognising that their cities should shine, not only in works of usefulness, but also in treasures of artistic beauty.

In England, St. Paul's was an exceptional case, and the cost of it was paid by taxation; but in most instances we can only investigate the Renaissance amongst ourselves, in examples of palaces, and the private mansions of the nobility. The English assertion of individual freedom, passionate in its intensity, has too often seemed to obscure the duty of public co-operation, and the richest nation of the world is thus always found too poor for any comprehensive encouragement of art.

Millions upon millions are readily forthcoming for warlike charges, while the arts of peace are neglected, and even the great national buildings, which are absolutely necessary for public business, are starved of artistic completeness, and shorn of essential architectural features, at the bidding of a miserable self-called economy.

At the same time, and in the same breath, we are taunted with our inability to make bricks without straw; and it has even been declared to be an object of public policy to cease to employ the trained and practised architect in the service of the State, and to hand over our public buildings to the unknown and practically irresponsible clerks of a "Department."

The late Professor of Architecture in this place, Sir Gilbert Scott, recently complained at the Institute of Architects, that he had heard that "Government was thinking of renouncing the employment of architects, and of substituting officials and clerks in their place; if this were true it would show that our governors were incapable of appreciating the services rendered by architects to the country."

If this proposal is to be adopted generally, as it has been partially, we may point out that it is impossible to imagine a course of action more calculated to discourage genius, or the rising talent of a great profession; and the question may be well asked, Is it fair to the public? Have they not a claim to the very best which any profession can supply?

It is possible, of course, that the bureaux of our Government Offices may be, for the moment the places in which to look for unknown Wrens and Michelangelos, hiding their light under a bushel, and bending their necks beneath a clerkly yoke. Such cases, however, must be exceptional. Our Departments may for a time be specially fortunate, but in the end the inevitable result must be a reign over our public works of a system of tame, if safe, mediocrity, under a *régime* of clerks, recruited, ultimately it may be, from the ranks of "those who have retired from business, or from whom business has retired." Will such a result be just to the public, or encouraging to art?*

If the art history of Italy can teach us nothing else, it can, at least, show us a time when men cared about art; when Prince and people united to honour the artist; and when great cities turned out their thousands to walk in procession after a work of genius, or to follow a great painter to the grave.

The Renaissance also can indicate to us a path by which an advance may be made, even if we are unable to accept its principles unreservedly. It was a time of energy, an age of determination to carry out not only artistic decoration, but also the necessary public works of utility, demanded by the large populations which were beginning to gather in the fair cities of Italy. It was the great ambition of the artists of the time to improve and adorn their native places.

In this nineteenth century the state of our huge towns is too often an opprobrium not only to the architect, but to our public policy. I have, on other occasions, spoken to you about the houses of the poor, and the urgent need that exists for their improvement. Before we can even begin to hope for art progress, the first necessity is that the people should be supplied with pure air and pure water. The old Roman aqueducts have excited the admiration of ages, and the Renaissance architects had their examples to follow, while Leonardo da Vinci did not think it inconsistent with the claims of art to busy himself with the irrigation works of hydraulic engineering.

It is only of late that a tardy recognition of the importance of such matters has arisen amongst ourselves. Something has been recently done, by legislation, to improve the dwellings of the working classes, and, in reference to water supply, all must have noticed with satisfaction that no less a personage than the Prince of Wales has lately addressed the Society of Arts on the deficiencies, in this respect, of our great towns, and has requested the Society to bring about a discussion and consideration of this important subject.

Few more pressing or more difficult questions could claim the attention of the Heir to a Throne, based upon the affections of its subjects, and the occupants of which, in our own times, have ever displayed the warmest interest in the welfare of the humblest of the people. It is admitted that many modern problems are not easy to solve; but in this case, shall it be said that modern England quails before a difficulty, which was surmounted in the far-off days of ancient Rome, not to speak of the more modern history of the Renaissance epoch?

We have lately heard much of schemes for bringing water to the manufacturing districts, from quiet mountain lakes; and anxiety has naturally been aroused, lest such attempts should rob the latter of their tranquil charms. Man, however, is more than scenery, and for his needs water must be had. The ancient aqueducts already referred to had merits of their own, and did not necessarily injure the landscape. Let us hope, therefore, that some way may be found to reconcile opposing views, so as to provide a necessity of life for millions, without injurious interference with the sylvan beauty of lake or valley.

We may be sure that every artist, whether architect, painter, or sculptor, is interested in the cleansing and amelioration of the homes of the masses. Without such primary improvement, it is idle to talk of interesting them in art, or to dream of a regeneration of the national taste.

This may come later. In the meantime, architects should encourage, by every means in their power, all well-planned efforts to bring "Sweetness and light" to the dens and alleys of our densely-populated cities. When such good works have been done, we may hope for better things, while, for the present, we may at least decline to accept the conclusion that there is nothing for us to do, but to sink, with languid dismay, into a hopeless Slough of Despond.

We may surely ask, after the experience of both Mediæval and Renaissance days, whether our own nineteenth century can do nothing for art? Is it, indeed, too late to cleanse, improve, and adorn our grimy hives of industry—to bring culture and beauty to the homes of our

* On this point, consult the official evidence given in 1877, before the Committee on Public Offices and Buildings (Parliamentary Paper No. 312). It is to be regretted that independent witnesses were not examined, as to the true interests of the public, and those of the architectural profession, in this important matter. Rightly understood, these interests are identical. It is not the way to obtain good architecture to discourage a responsible profession by withholding from it the prizes of an honourable ambition. It cannot be for the public advantage, any more than is it fair to architects, to put out the designs of our public buildings, as it were, to contract, by a political department, supported out of the taxes, some of which (as the income-tax) press with special severity on the precarious earnings of professional men.—E. M. B.

vast population? May not our people, at least, be enabled to wash and be clean,—clean from the debasing associations of squalor and hideousness; clean from the stains of selfishness and greed; and thus become ready to combine to carry out those public improvements which exalt a nation, while they dignify society, and glorify art?

If we have much to do, we have also much wherewith to do it, and have not the excuse of the wagoner in the fable, for sitting like him idle, and with folded hands, lamenting, it may be, the degeneracy of the age, the faults of others, or anything rather than our own lack of determination and good will.

If Englishmen were really in earnest, what limit need be placed to their achievements in science or in art? Science, indeed, takes care of itself. It even seems to some of us to tend to thrust out art from its proper place in the affairs of men.

This danger, however, can only become formidable when art declines all sympathy with the aspirations of its age. Architecture, in any case, cannot take such a position, for her claim is to assimilate science, as well as to nourish art. The old buildings which surround us are scientific, as well as artistic; and the cathedral of our forefathers is often a truer example of science, than the hideous railway sheds, which we know, alas! so well. The difference between the two cases is, that the one was governed by the resolution to do the best that was possible; the other, by the obligation to obtain the quickest and the cheapest result.

The one was the chosen task of a community, obeying its recognised leaders, and working cheerfully, with high and disinterested aims; the other is the speculation of private persons, toiling painfully, with a natural selfishness, in the pursuit of gain.

All artistic progress in the future must be sought by enlisting public sympathies; the schoolmaster must show himself abroad, in art, as well as literature; and artists must know how to educate their critics. Modern legislation is all in the direction of free local government, wealth abounds throughout the land, and there is therefore no reason why our towns should not vie with each other, as did the Italian cities of old, in works of art, as well as in those of utility.

Then may we hope for a public feeling for culture, refinement, and for art, which may perhaps entitle some future chronicler to speak of the Victorian era as of another, and a better Renaissance, not of architecture alone: a Renaissance of all that purifies and gladdens the mind of man, and leads his thoughts to those higher and diviner aspirations which even an infinite future may seem too small to satisfy.

"THE LITTLE ARTS" IN THE PARIS EXHIBITION.

The French do not catalogue even their own display very methodically, and if the actual arrangement of the forthcoming Exhibition be not more systematic than the official description of it, the palace will be somewhat of a labyrinth to its visitors. Mountains of metal, timber, India-rubber, sponges, silks, cloths, and cannon appear as if heaped up around rich cases of diamonds and emeralds, opals and sapphires, with coral and other substances, the principal value of which is derived from the artistic workmanship employed upon them. Composed amid these, moreover, we find evidences of a growing taste for articles imitated from the antique or from the East, as in various suites of so-called Greek, Roman, Pompeian, Etruscan, and even Egyptian furniture, the chief part of which must be the merest guess work, authorised to some degree, no doubt, by a close study of what few examples have been illustrated by ancient paintings or sculpture. The ground is surer when we reach the Middle Ages and the Renaissance, whether in France or Italy, for England cannot be said to have been much influenced, in these matters, by those great movements of the human mind. There is a complete set copied from the beautiful Sauvageot collection in the Cluny Museum, with its ebony chests, carved into arches and pilasters, incrustations of ornamental stones, mosaic and ivory, and infinitude of secret drawers. Side by side the great firms of Rondillon and Fourdinois are not absent, with their almost monumental achievements in varnished and gilded pear-wood for which what is familiarly called a "rage" has set in within the last few years. That which strikes the imagination at once is the enormous size of the rooms destined to be adorned by these colossal cabinets and mirrors, doors and pedestals, and the wealth of the people who are expected to purchase these frames of jewelled Venetian glass, coffers covered with inlay, and porcelain sets in the style of Bernard de Palissy. With some allowable pride, we are promised a wonderful cabinet full of Algerian onyx, placed in an alcove sculptured in the same material, with figures of slaves whose flesh is silver, whose ornaments are gold, and whose garments are of the now famous black and brown African marble. This assemblage of objects wrought from one material is likely, at all events, to be sufficiently varied, including as it does elephants' heads supporting huge fonts, vases of every size and shape, basins for fountains, imitations of enamel clock-cases, watch-stands, and those thousand-and-one trifles that brighten the arcades of the Palais Royal. The Bacarrat glass, again, is said to be far more splendid, even, than it was ten years ago, when it excited universal admiration; but it will have this time to maintain a close rivalry with the fabrications of other houses which have since sprung up in the towns of the Meurthe and the Moselle. It is very justly remarked, in one of the prefaces, that glass, as an art material, labours under many and serious disadvantages. Even when coloured, its use in ornamentation is exceedingly limited, and never rises above mere gaudiness and glitter. The purest crystal itself can only be wrought into a limited variety of tasteful forms. Attempts were made, no doubt, in 1867, and are being made again, as we perceive, this year, to adapt some of the best blown qualities to the higher purposes of decoration; but all experience shows that, in statuary for instance, the most beautiful models become absolutely hideous,—a transparent human figure, above all, would be a monstrosity, though some ingenious Italian, it is to be remarked, has conceived the idea of representing the anatomy of a full-sized man by means of different tints and degrees of opacity in glass, an experiment likely to prove in the result more curious than admirable. For fruit and foliage, moreover, the material is almost entirely unmanageable; but, on the other hand, glass, if it can never be reconciled with art, in the strict sense of the term, approaches very near it on the engraved surfaces of goblets, and quite attains the standard in enamels and illuminated windows. We see a considerable number of specimens catalogued, with Egyptian vases in artificial crystal, a vast *bol à punch* in blue, figured all over with dancing satyrs and bacchantes, and surrounded by a cluster of drinking-glasses to match; imitations of the ancient Venetian manufacture in the Cluny Museum, and of the modern one at Murano itself, and, once more, that strange combination of glass with bronze, which is more satisfactory to some tastes than to others. However, it will be interesting to note how far an advance has been made in these and the kindred ingenuities of which so prodigal a show may be anticipated.

Of course, the celebrated fabrics of Sèvres, Beauvais, and Gobelins will put in their appearance on a grand scale; but in this department nothing new can be expected. It suffices if those unrivalled manufactures retain from one period to another their ancient pre-eminence; since we can hope for no fresh secrets discovered of "paste on paste," of porcelain moulding and painting, of "cameo-china," of "royal blue," or that inimitable green which Fragonard, among the artists of living generations, has best succeeded in reproducing. In respect of other pottery, the French editor confesses to anticipating that Limoges itself will succeed in establishing no superiority over Staffordshire, albeit that it enjoys the advantage of being the natural country of the most precious clay,—*le pays de kaolin par excellence*. But the two districts are hardly brought into any real competition, their products being for the most part essentially dissimilar, and we may look for the usual excellence from that poor Limousin region which can hardly be said to possess any other wealth, but which grows more and more ambitious in applying the process, comparatively new to its artificers, of putting colours on porcelain, and of giving it the lustre of enamel. The real rivals of Limoges, in France itself, will be represented from Berry, Melun-sur-Yeyvre, Noirlac, and Nevers,—all rising into fame, more or less, on account of their fictile manufactures, and aspiring to colour their paste without the use of the actual painting process, wonderful effects of sea-green especially, on a white ground, being thus produced. With china, as the French pretend to distinguish it from porcelain, many an interesting cabinet will be filled, imitative of those enamelled wares so much in vogue in the sixteenth century, and brought to such perfection by the celebrated makers of Rouen, Nevers, and Haute-Vienne. Judging, however, that which will be seen in the Exhibition by that which may be seen out of it, no modern revival has taken place in this sphere of art, and the yellow-browns of the latter half of the nineteenth century may no more bear comparison with the originals than those "Japanese" jars which never travelled further than a few miles from Paris. It seems impossible, whatever care is exercised, to keep out a certain proportion of trumpery, nor will the great Paris Exhibition of 1878 be, in this respect, exceptional,—with its long list of gilt lamps and clocks, flashy bookbindings, meretricious engravings, and whole galleries of photography, though this last is likely to show off to better advantage than some others. The English had their pyramid of gold in a former structure; the Belgians undertake to have their pyramid of silver in this, as, indeed, England will also; which the Germans intend to supplement with a pyramid of coal,—that is, unless they adhere to their original intention of not being represented at all, except in the art-galleries. Turkey proper is absent; but not so Russia, which is again to contribute her malachite trophies, though they hardly take rank in a catalogue of "The Little Arts," so dear to Parisian caprice,—dainty fountains of perfume from the Rhine, sculptured frames in a peculiar black wood, somewhat resembling ebony, from Baden, trinkets from Bohemia, pipes from Vienna, and toys from Switzerland. The Swiss, too, are conspicuous with their musical boxes; the Spaniards with earrings, statuettes, and guitars; and the Greeks with their daggers and swords. As usual, the manners of the Northern nations are illustrated by the collections of their unique popular jewellery, so to term it, in solid gold, while Italy, in addition to its Murano crystals, ancient and modern, mosaics studied from famous Middle-Age designs, and porcelains,—still imitations,—from Urbino, Faenza, Gubbio, and Pesara, is to have rich sets of furniture in the old Florentine style, large examples of marqueterie, in holly and orange, and ebony, besides numerous sculptures "in the solid" as decorations of cabinet-work. It is remarked by the French catalogue critics that the English generally dress up their "stalls" with fantastic figures,—as, for example, groups of statuary in soap, architectural effects produced by an ingenious arrangement of bottles, obelisks of wax, and arches of spermaceti. Leaving, however, these "little" for the finer arts, we shall meet with the familiar names, Carpeaux and Cabanel, Meissonier and Jourdan, Bellangé and Brion,—artists, dead and living, whose works will, in either case, be forthcoming, and fill the magnificent space which France usually appropriates to herself, with a perfect right to do so, in these matters. We are never likely to miss Gérome or Jourdan, Rousseau or Jalabert, from such a rivalry; but it is somewhat contrary to the principle of exhibitions that the same objects should be presented to view over and over again. Whether this will be the case next May, there are few means of judging beforehand, the catalogue of this department being, as yet, in a most imperfect condition. This remark does not apply, however, to another interesting branch of the great display, which is a comparative view, based to some extent on the model of 1867, of industrial and mechanical progress in all countries and ages, so far as the subject is illuminated by the relics, fragments, and illustrations that have come down to us. Every deeper glance, indeed, into the official recapitulation of the contents of the French Palace of Art and Industry in 1878, enlarges its promise of interest to all the world—all the world, at any rate, which is not too busily engaged in fighting. France, at least, is determined that nothing shall interfere with her favourite project.

The Journal of the Society of Arts states that the prize of 10*l*., and the silver medal offered by the Society for the best guinea set of blow-pipe apparatus, has been awarded to Messrs. Litchen, of St. Day and Camborne, Cornwall. The competition was sharp.

WHITBY.

ON the north-east coast, perhaps the truest type of an Old-World town, adapting itself to the changing circumstances of to-day, would be Whitby. It dates far back into the misty past, possibly occupying the site of an ancient Roman town, and certainly carrying memories back to the Saxon Streoneshalh. From about the time of the Norman Conquest, the place has been known under its modern name; and it is therefore one of the oldest of the north-eastern coast towns. Gradually its character has been changed; and down the stream of time it has known many trading mutations, quietly, however, pursuing the even tenour of its way. The alum trade has flourished and decayed in its vicinity; the Greenland fishery has risen and set; rope-making and other allied trades have passed their meridian; its wealth of shipping has fallen off in some degree; the iron trade, or rather the export of iron ore, grew and declined; and the jet manufacture, after attaining large dimensions, seems to be now receiving a check; whilst the character of the town as a health-resort is now increasing.

Forty years ago, Whitby was one of the chief northern ports,—certainly chief between Bridlington and Sunderland. It had then between 250 and 300 vessels, with a tonnage of some 50,000, and with above 2,500 seamen. Now, it has registered as belonging to the port 197 sailing and 26 steam vessels, the aggregate tonnage of which is 53,152 tons; so that, as regards ownership, it is stationary. The number of vessels entering the port varies much, but the tonnage of the sailing vessels that enter with cargoes is about 20,000; and that of the steam vessels 56,864 tons; the clearances with cargoes being larger of sailing vessels and smaller of steam vessels. Dealing still with matters maritime, it may be said that the old wood ship-building industry is now dead, but that iron shipbuilding has taken its place, and on the little river Esk there are yearly launched about five steam vessels, the tonnage of which in the latest year was 3,745. The Greenland fishery has departed, but the port of Whitby is still the place from which a large fleet of fishing-vessels hail: the number registered under the Sea Fisheries Act being 254, requiring 809 men and boys to work them. In the limits of the port 240 men and boys are classed as regularly employed in fishing, and 150 persons are said to be occasionally employed in that pursuit.

A curious chapter in the history of Whitby, and one little known, is its connexion with the development of the Cleveland iron trade. It is usually supposed that that trade was the result of the fortunate find of ironstone by a sportsman on the hills to the east of Middlesbrough. On the contrary, prior to that which has been styled the "commercial discovery" of the Cleveland ironstone, there had been a working of that iron at the southern part of Cleveland, and of the ironstone so wrought to considerable extent Whitby was the port of shipment. Although the iron trade of Cleveland is of comparatively recent origin, the existence of the beds of iron has been known for at least fifty years. There had been workings on the coast a year or two before, but practically the utilisation of that ironstone dates from the opening of the railway from Whitby to Pickering, which traversed some of the romantic Yorkshire dales, and in so doing laid bare ironstone. A company,—the Whitby Stone Company,—was formed, and it supplied ironstone to some of the blast-furnaces which had been built a few years before near the river Tyne. Gradually, as the folly of depending for supplies of ironstone found in the coal measures was learnt, the bulk of the proprietors of blast-furnaces on the Tyne arranged to procure their supplies from the South Cleveland district. The new trade for Whitby shared the varying fortunes of the iron trade for a few years, and in 1843 it fell off almost entirely, but in a year or two there was a revival, there was an increased demand for iron, the number of blast-furnaces in the north was enlarged, and the shipments of ironstone from Whitby rapidly rose in quantity. Ultimately, from the quarries of one firm some 30,000 tons of ironstone were sent yearly, and the total was only kept in check by the incapacity of the harbour at Whitby to accommodate a larger number of vessels. The change which was made in the position of the iron trade of Cleveland by the discovery of the iron in the north of Cleveland, and which was the result of a system of careful investigation, is tolerably well known. Although the dependence of the northern furnaces on the South Cleveland deposits was done away with, and although the dreams of the early pioneers that the Vale of Esk would become the centre of the Cleveland iron trade have never been realised, yet the iron trade has been established in that Vale, and has given to Whitby considerable support. The shipment of ironstone fell off, in part through the discovery of the immense iron deposits in the north of Cleveland, and in part through the wretched facilities for shipment Whitby afforded. After having given impetus to the search for the northern ironstone, and contributed to the development of a vast trade, Whitby now derives no direct advantage from it, but it still indirectly benefits from the mines and furnaces in its vicinity.

A peculiar trade in Whitby is its jet manufacture, which has now attained very large dimensions. Found along the coast and in the Cleveland Hills, the industry, as it is locally called, of "jetting," finds fluctuating employment for a good many men, and in Whitby the jet trade gives a considerable if varying number of persons work. It was estimated some time ago by a high authority, that the value of the jet found in the Cleveland Hills was about 20,000*l.* yearly, and it has since been stated that there was annually received in Whitby for the manufactured jet, and for the settings employed to display it, no less than 50,000*l.*; and this amount was, on the authority of those in the trade, said to be doubled five years ago, when it was also added that from twelve to thirteen hundred persons were employed in the trade, or about one-twelfth part of the whole population. Like most industries depending to some extent on the changes of fashion, the jet industry fluctuates very seriously, and since the time named, there has been a serious retrogression both in the manufactured and in the crude jet trade. There has been a falling off in the demand for the native jet, because foreign is, we regret to hear, procurable cheaper, and there has been a lessened demand because of the absence, up to this time, of any Court mourning in Europe. Hence there has been depression in this peculiar industry. Dependent upon the industries which have been glanced at, there is a population which at the time of the last census was stated at 12,460, whilst around it, and in some measure contributory to it is, in the union or registration district, one of 25,791 in the 82,237 acres. In that district also there are 646 paupers,—a considerable diminution on recent years, and one in proportion to population more favourable than in the bulk of the districts around it. In the course of its long existence, Whitby has fully gathered round it all the institutions which befit and are acquired by towns. Alike in matters physical, mental, and spiritual, it has the associations needed for the health of the threefold nature of man to the full that its size and importance give ground for expectation. In recent years, whilst developing some of its peculiar industries, it has more and more fitted itself to fulfil the mission of a health resort; and alike by reason of its accommodation, of its situation on the margin of the ocean, and in magnificent and varied scenery, it has attractions which give it no small claims. Not dependent wholly upon this, as are some health resorts, it adds to its revenue from this source the income which arises from its shipping, its shipbuilding, and its jet industries; and with its prosperity thus based on a more than triple support, whilst not expecting to attain the greatness some north-eastern towns have achieved, and which others have had thrust upon them, it should retain the importance it has acquired in centuries; and as it obtains fresh outlets for its trade, and inlets for its pleasure-visitors, its growth should be sure if slow, and solid if less marked than some of the towns to which it will shortly be brought, in point of time, nearer. The value of good art in developing its jet trade, often before now urged in these pages, and admitted by foremost spirits of the town, must not be lost sight of.

Hove, near Brighton.—At the Hove Police-court, a builder, named Lidbetter, appeared to answer four summonses taken out against him by the local authorities for breach of the bye-laws. The offences consisted of erecting party-walls to houses in Hove, not of the thickness and stability required by the bye-laws, and not allowing a sufficient air-space at the back of the houses, also a breach of the bye-laws. He was fined 15*l.* and costs in three cases, 5*l.* in each case.

PROPOSED NEW BUILDINGS IN EDINBURGH.

EDINBURGH has long been famous for its medical schools. The progressive increase in the number of students, and the additional requirements of the age have, as we formerly made our readers aware, necessitated the erection of new medical class-rooms for the University, which are to be carried out on an extensive scale at an expense of about 200,000*l.*

This proceeding of the University authorities seems to have stirred up the extra-mural teachers to greater exertion. They have hitherto been content with any accommodation which could conveniently be obtained, but a new enterprise is to be entered upon, and medical class-rooms, having the necessary modern requirements, are about to be erected, at a cost of 10,000*l.* A site has been secured for the new buildings from the City Improvement Trust, immediately to the west of the new Free Tron Church, in Chambers-street, and plans have been prepared by Mr. R. L. Henderson, architect, which await the approval of the Trust.

The design prepared by Mr. Henderson is in style and general effect nearly identical with that prepared by Mr. Cousin, the architect for the Trust. At the east end of the elevation there is a pavilion 20 ft. square, and 60 ft. high, which will balance the pavilion which forms the south-east portion of the Free Tron Church, which latter pavilion was insisted upon as an essential feature in the architecture of the street. In the pavilion, which is to consist of three stories and an attic, is to be placed the principal entrance, having a porch composed of two columns with carved capitals supporting a semicircular pediment. The remainder of the building to the west is to consist of two stories and an attic, and in the centre there is to be another doorway with a moulded entablature. The windows on the first floors are to be arched, and those above form a range of large dormers similar to those of the School of Arts, between which and the building we are describing there is to be formed a semicircular screen wall to shut out some unsightly buildings which partially obtrude upon the back line of street, and render that portion too narrow for building purposes.

The interior contains in the basement a house for the janitor, the heating apparatus, and a room for analysing gas. On the ground-floor there will be two lecture-rooms, seated for about 300 students, two museums, and other rooms at the rear, lighted from the roof; also a pathological and physiological library.

The first floor is to be devoted to the chemical department, and will have a laboratory at the the rear, 60 ft. by 30 ft.

The anatomical department is situated on the upper floor, and will embrace a dissecting room, 60 ft. by 40 ft., lighted from the roof and three sides.

A vacant stance, to the right of the Free Tron Church, has been applied for as a site for a new normal school. Mr. David Rhind, architect, has submitted an elevation, which departs in several particulars from that prepared by Mr. Cousin, the architect for the trust. Mr. Rhind proposes giving to the west end of the block, of which the school would form a part, a more distinctive and ornate character than the remainder. This departure from the original design has been remonstrated against by some of the proprietors of the remainder of the block, and the matter is now under the consideration of the improvement trust.

As we stated in a former notice, the directors of the School of Arts have secured the vacant site to the west of that institution whereon to erect an extension. There now remains only one site in the hands of the trust to be disposed of, and if this were taken up, and the museum of science and art completed, this fine thoroughfare might be considered as finished; but we are in the hope that some not very sightly old buildings, which were unfortunately allowed to remain at its western extremity, may yield to the pressure for improvement.

Immediately to the west of the ancient Magdalene Chapel in the Cowgate, the quaint tower of which forms a conspicuous object from George IV. Bridge, a Medical Missionary Institution has been erected as a memorial of the late Dr. Livingstone, the African missionary and explorer. The designs have been prepared by Mr. Robert Raeburn, architect, in a style similar to that of the chapel, which is of Late Fifteenth Century Gothic. It contains, on the ground floor,

accommodation for a porter and a resident surgeon, and also a consulting-room; on the first floor, a lecture-room, museum, sitting-rooms, and servants' accommodation; and on the top flat are bedrooms for students. The building is erected by public subscription, at a cost, including site, of about 10,000*l.*

The picturesque tenements of old Edinburgh are rapidly disappearing, sometimes yielding to the demand for modern requirements, at others to inherent decay. Some of the most picturesque of these, situated at the head of the West Bow, have become in so dangerous a condition as to necessitate their demolition, and they are now things of the past, gone for ever. Our ancestors did not always build in the most substantial manner, as is generally supposed. Occasionally these tenements are found to be constructed of materials which would not now be used for such purposes. The stones are often small and undressed, such as are now used for building fences, and the native timber is fitted up in the roofing in the roughest manner, and seems to have been used in a green state. When brought to light it appears extraordinary that these tenements should have held together so long; but there is a wonderful tenacity in stone and lime when fairly united. The building must have been proceeded with slowly and cautiously, for if knocked up at the speed with which such erections are now constructed, the whole affair would, most probably, have collapsed like a tower of cards.

At a public meeting held on the 28th ult.. it was resolved to constitute the Edinburgh Sanitary Protection Association, already mentioned in our columns, and an influential council was appointed.

THE BUSINESS OF ART IN NEW YORK.

PICTORIAL and what are here called "Art Exhibitions' follow one another so rapidly, that, if it were not for sufficient evidence to the contrary, one would be disposed to believe that the New Yorkers are especially interested in the fine arts.

How it has come about that one should be more pestered with art and artists in New York than in any other city that we know of, must be owing to the insane belief that has taken a stronghold of hundreds of otherwise useful people, that art may be followed as an exceedingly easy, pleasant, and profitable business. It is really sad to find so many young people embarking in a seriously hazardous undertaking before making some little more inquiry from competent persons how and when to exhibit the hasty products of their ingenuity. The time has certainly come, if it has not long since arrived, for the "facile settings-up" that "Aurora Leigh" so eloquently denounces, and one begins to fear that, in the short time it has taken us to grow tired of slipshod work, we are already wearied of painfully accurate commonplace transcripts, or photographically studied incidents of every-day life.

The business of art in America appears to have taken its rise very much about the same period that in England the present race of artists and critics were fascinated by Mr. Ruskin's "Modern Painters," and most of his difficult lessons have been readily accepted here, *minus* the excellent morality that he always endeavours to teach, and which, in reality, is the secret, or the key, that opens to the mind of those who read carefully a value in every word uttered or written by him,—a claim to our warmest admiration. But the business of art in America has very little to do with morality in any shape; plagiarism, gross imitation, haste, ill-conceived falsehood, in every shape, run through all that is done here, and since New York has become, or seems desirous to be thought, an "art centre," the immorality of trade and commerce seriously regarded is seen in full force, the two pursuits, that of trade and art, or fine art, being looked upon as almost rival industries.

Still, some Americans hope for the time so reasonably dreamt of by Mr. Morris, who believes that art has such sympathy with cheerful freedom, openheartedness, and reality, so much she sickens under selfishness and luxury, that she will not thus live surrounded by bad associations; as he truly says that on such terms as she now exists, he would rather that she did not live at all. There are men here, who, concerned in the business of art, again, like Mr. Morris, desire that all workmen will work more for the love of producing good things than with the love of disproportionate gain. They, like him, hope for a good time, when faith and beauty will eventually conquer a great part of the evil, and the discomfort and distastefulness of life, as it is now led, so that our streets may be made as beautiful as the woods, as elevating as the mountain-sides.

The business men concerned in the business of art in New York might well look up to Mr. Morris as a practical worker in beautiful and accurate theory; for he has combined, as most of us know, the pleasure of teaching with the profits of trade.

The business of art in New York is probably the most intolerable pursuit or vocation that the ingenuity of the arch-enemy could have devised, and the reckless manner in which the uncultured man of business enters into the wide field of fancy, possesses, from a philosophical point of view, an element of comicality not often to be met with in the sphere of philosophy or the realms of science.

It is only the few, the very few, acquainted with the history of art and the great lessons it has taught us, who are aware that a great country like America must acknowledge that, in order to arrive at distinction in any pursuit, certain elementary principles must be closely observed, which here, in matters of art, are altogether disregarded.

It was not until Italy had overcome in a measure the difficulties of ages of domestic troubles from without, that her rulers began to think of encouraging what we understand by the term "art," and at no age until this have the directors and instructors of the beautiful been left to the caprices of popular opinion, or to the altogether untaught idea of the many.

At no period of history has there been any variance of opinion on the subject of beautiful art; when doctors have disagreed, the right has always reposed with him whom time has shown to have been the best instructed or the most highly gifted, and the expert of to-day admires and esteems exactly the same art, with happily more to admire, as Pericles or the De' Medici, Arundel or Charles Stewart, down to the fastidious collector of our own day,—men who love more than ever the stupendous work of old art, and detest with hearty vigour the assumptive horrors of speculative modern work,—hate it the more because it is worse than useless, it is mischievous.

The business of art in New York is the more distressing because it is retarding a progress which in all likelihood may be alive in America, as it must be admitted to be in other parts of the world; but the progress in art, at least, if in no other affairs, is moving here at a rate so slow that the inclination towards right is little more than that divine momentum that guides in all things, while all human efforts towards an ideal are clearly erroneous.

As a business, it is surprising that Americans should have so seriously taken art into their ways of life; it almost seems to suggest that the "smart" inhabitants of New York have much of the provincial about them; that they should not have yet found out that art, successfully followed, does not admit of those ingenious combinations that the real artist in Wall-street so dexterously manipulates, a manipulation which has gained for the "down-town" artist a reputation that must be owing in a measure to the fact that most of them must be gifted with ambi-dexterity, a power among painters confined to very few,—to Velasquez, it is said, certainly to Landseer, and to some less gifted ideal workmen.

New York has no right, America has no reason, to expect to arrive at even partial distinction in art, without consulting the conditions through which other countries have obtained their pre-eminence; let there be in America at least a period when the value and importance of art is acknowledged with some show of warmth; let America go through a Renaissance, or, as this is difficult, a sincere enthusiasm for art, like that of the sixteenth century in Europe; let them have an epoch of splendid art-industry like that of the Dutch of the seventeenth century, or, if they please, a decadence of lovely effeminacy like the French art of the eighteenth century, or the Classical fad of the First Empire, or the beloved romantic school of the first quarter of this century, out of which the glories of the French art of the present day have sprung; let the Americans have all this, or something like this, before they can hope to rival or hold their own with ripe artists of Europe, who have been content, and are still contented, to live laborious and sparing lives for years before gaining the positions that excite the cupidity, rather than the emulation, of imitative speculators.

Notwithstanding that the business of art in New York, taken from the painters' and sculptors' point of view, holds forth but very meagre prospects of an ample reward, in all candour it must be admitted that much of the business of art, as shown by Harper's, and especially Scribner's Magazine for February, has led to the nearest approach to perfection that we have yet seen in any monthly illustrated publication.

The business of art in New York (we purposely confine our remarks to the "Empire city," as in Boston and elsewhere the subject is somewhat differently regarded), prominently as it appears to occupy a decided position, and notwithstanding the large capital that must be embarked in manufacturing popularity, must still have but doubtful hold on the affections or regard of the people; as a business out of which capital may be made, like the dry-goods business, speculative building, or cleaning the streets, it possesses a certain vitality, that in some degree connects it with other legitimate pursuits, but unless in the shape of monumental work, public statues, or fountains, the business of art is considered deficient in those attractive elements that seem to endear the more plastic traditionary arts of trade and commerce. Still, the business of art has not yet been carried out in New York to the perfection that it has arrived at in other great cities of the world, and there are here no professors or disseminators of art who are spoken of as millionaires, although many of them are fully qualified for a place in Congress, where they would doubtless carry a grace beyond the ordinary reach of their pursuit.

The business of art in New York is certainly not hampered by any legislative restrictions or State conservatism; the art societies here are "strictly private and confidential," taking on themselves all control and responsibility, and pocketing the doubtful profit and securing the uncertain credit attached to their exertions.

As a rule, however, the true business of art is carried on at a distance from New York, and the faithful American artist is to be met with, working well and quietly by the side of other artists, in Paris, in London, in Rome, and in Florence, from which centres they send forth to the world works that have at least an equal chance with other modern productions of becoming immortal.

> "While the manners, while the arts,
> That mould a nation's soul
> Still cling around our hearts,
> Between let ocean roll,
> Our joint communion breaking with the sun.
>
> Yet still from either beach
> The voice of blood shall reach
> More audible than speech,
> 'We are one!'"*

New York.

CLASSICAL ARCHITECTURE.

AT the meeting of the Society of Antiquaries, held on Thursday evening, the 28th ult., Mr. Edwin Freshfield, F.S.A., read a paper "On Certain Byzantine Adaptations of Classical Architecture."

His object, he said, was to draw attention to the effect of Byzantine influence, if he could call it by that name, in the Eastern Empire upon the architecture which up to that time had been prevalent throughout the whole of the Roman Empire. It had always seemed to him that the first purely Byzantine emperor was Justinian, whose reign was the starting-point of a new order of things; it was to him they were indebted for the code of laws which to this day had so important an influence upon the world, viz., the Civil Law. It was in his reign that the style of architecture which they called Byzantine originated and even culminated, because he (the lecturer) supposed that the finest developments of the style were the Churches of St. Sofia and of the Apostles. It was only certain architectural features that he proposed to consider. The particular feature was the effect of the Byzantine influence upon the capitals of the pillars of certain churches built in this reign. It was hardly necessary to say that of all architectural details, no class was more attractive than that of the capitals of pillars. Indeed, it might be said that in the Classic styles the capitals formed the distinguishing mark, and that the Doric, Ionic, Corin-

* Washington Allston.

thian, and Composite styles of architecture were better known by their capitals than by any other detail. Almost the only strictly architectural detail that they knew of, the Temple of Solomon at Jerusalem, was that Hiram, the widow's son of Napthali, ornamented the capitals of the pillars with network, lily work, and pomegranates. The same thing was seen in the Mediæval architecture of this and every other country, for he supposed by no other method could they so readily distinguish the date of a building and the style to which it belonged. The principal architectural buildings of the time of Justinian now remaining were the Church of St. John of Ephesus, the churches of the Lesser and Greater St. Sofia, the Church of the Monetes Choras, and perhaps the Church of St. Andrew, at Constantinople; a group of churches at Ravenna, of which St. Vitale was the principal; and the churches of St. Demetrius and St. Sofia at Salonica, the oldest being the Lesser Sofia.

The form of capital to which he proposed to draw their attention would be illustrated by several different examples. In all capitals of the Classical styles in which the acanthus was used as an ornament, the leaf clings to the capital with the stem, and then falls over the top. Somewhere about the age of Justinian the Byzantine architects modified this, and adopted a form of capital which differed both in shape and ornament from all Classical designs. In it the acanthus-leaf was greatly modified, and no longer falls; it clings to the capital, clasping it, and does not fall over it at all. He had called the leaf an acanthus, because they were accustomed to call it by that name. He did not think it was the leaf of the plant they called the acanthus. The capitals themselves also began to assume unwonted shapes, but it was more to the ornament than to the shape that he wished to call attention. It seemed to him that until the middle of the fifth century the falling leaf was used all over the East, and, indeed, perhaps later than this; but it was abandoned in the reign of the Emperor Justinian.

The last building of any note that they had in Constantinople before the age of Justinian was the Church of St. John of the Studium. In Salzenbury's book there was a picture showing the falling leaf, and it was very much of a Classical type, the building being the last Classical one in Constantinople. Salzenbury gave the details of two capitals from the Women's Gallery, as being there in his time, in which the leaf does not fall. Eighteen months ago, when he (the lecturer) went to Constantinople, he visited the church to look for the capitals, but did not find them. All the ruined capitals lying about had the falling acanthus-leaf. The capitals in the Church of Sergius and Bacchus were very peculiar; in them the falling leaf had disappeared altogether. The ornament was still a leaf, but the leaf had quite lost its distinctive acanthus character. There was no gradual change, but the architect had at once plunged into a style of decoration unlike anything the Classical world had seen before. The Christians had imitated their Pagan ancestors long enough, and were now going to strike out a new line for themselves. He had often tried to trace the shape of these capitals back to some Classical source, but without success.

Of the same age as the Lesser St. Sofia was the Church of St. Vitale at Ravenna, the capital of which was not of such delicate execution as its counterpart in the Lesser St. Sofia; still, the similarity was too striking to be casual. The capital had upon it the same sort of abacus as was seen in the upper story of the church of the Lesser St. Sofia,—very plain, except that upon the face of it there was a Byzantine monogram. In Ravenna, the churches immediately preceding St. Vitale in date,—viz., the Church of St. Apolonare at Classein and St. Apolonare Novo,—both had capitals with the falling leaf. As regarded the great Sofia at Constantinople, although the form was somewhat different, there was the same clinging leaf, and the falling leaf did not occur at all. There was a remarkable capital in one of the side chapels which might be compared with a very similar capital in St. Demetrius at Salonica. The capitals of the pillars showed some similarity to those in the upper story in the Lesser St. Sofia. In the Salonica church of Demetrius some of the capitals had the falling leaf and some the clinging leaf. In the capital which belonged to the Church of St. John, built by Justinian, the clinging form of the leaf was very well seen, and it might well be compared with the capital upon which it stood, which had a falling leaf. The plan of the church was the same as that of the imperial mausoleum, the Church of the Apostles. That the clinging leaf was in use in other churches in Asia he knew; because, once being at a village almost halfway between Lake Mermerah and Thyatyra, he found one there, and would have brought it home if he could have found a conveyance. At St. Sofia at Padua he found some capitals, which, though of different shape, they both carried out the idea of the clinging leaf, and resembled the Ephesian rather than the Byzantine form. So far as he knew, it was the only church dedicated to "the Divine wisdom" in any Latin place, and the very name showed that the dedication must have taken place during the time that the Greek influence prevailed there. The town of Padua was destroyed by Attila in the year 452; shortly after this time it was rebuilt, and about the year 600 it was taken by the Lombards and again burnt. One naturally looked round to see where this clinging leaf could have come from as seen in the examples of the great St. Sofia at Ephesus and at Padua; he could not say that there was not some trace to be found in earlier buildings that some such changes were coming. But nothing of the kind of thing seen in St. Vitale and the Lesser Sofia had he seen anywhere else. He thought up to this time he had shown that whatever alterations in the style might have been produced by it, it originated and developed in Constantinople, and that where it was found outside it was due to Byzantine influence. In this respect he differed from Mr. Fergusson, who would lead to the impression that the classical feeling was retained in the capital rather than in the provinces. Now, the result of his (Mr. Freshfield's) investigation would lead him to a contrary impression. If the larger capital from St. John's at Ephesus belonged to the Church of St. Justinian, it would appear that the Classic and new style had had a struggle for it, not altogether in favour of the new style. But if they would turn to the imperial city of Antioch, they would find this was still more the case.

There was a large and important group of churches in Syria within a short distance of the City of Antioch. Up to the date of Justinian, and even after that time, Antioch held one of the first places in the empire, and it was to Antioch that the East was indebted for its Liturgies. The principal group of these churches was in the neighbourhood of the monastery of the Church of St. Simeon Stylites. This church and the neighbouring churches had been drawn by the Count de Vogüé, and in the book they searched in vain for a capital with a clinging leaf. The exact date of the building could not, of course, be ascertained. St. Simeon Stylites died between the years 460 and 470, and the church certainly was not built during the lifetime of St. Simeon himself. He (Mr. Freshfield) should think it was impossible to find any more unclassical design for a building than this church, and Pocock correctly described it as being of the shape of a Greek cross, with a magnificent central octagon, but the designs were strictly Classic, and particularly that which they had been considering, viz., the capitals of the pillars; and in no instance was there a capital in any way approaching those they had seen in Constantinople. The particular style of capital to which he had referred seemed to have originated in Constantinople or the neighbourhood, and to have extended into Asia Minor, on the one hand, and to Salonica and the coast of Italy on the other. It was perfectly manifest that the architect of the Lesser and Greater Sofia were one and the same,—Anthemius of Tralles. He also built the Church of the Apostles at Constantinople, and the Church of St. John at Ephesus; and it was to him that they were indebted for this rapid change from Classical to Byzantine architecture in design and details. Once freed from the Classical style it was wonderful how the Byzantine architects improved on the idea. The Church of St. Vitale alone showed three different varieties, and the capitals deserved very careful study, showing a marked difference from any to be found in Constantinople. It was impossible to say that the acanthus was not there in some form, but it had grown now more into the shape of tracery. By a curious coincidence they would see that whereas in the upper story of the lesser St. Sofia the capitals remained more Classic than in the lower, in the upper story of St. Vitale the capitals still retained the falling leaf, while in the lower portion of the building there was not a trace of Classic feeling to be seen. As they would see, the form of the capitals was that of Justinian, but in the details the designer had wandered away almost entirely from the acanthus-leaf. At a later period, the ornament in low relief went through all sorts of variations, and both in the East and West it might be seen in many forms. The history of the effects of the successive waves of the Crusades on Western architecture had yet to be written. At present they had almost contented themselves with the knowledge that they imported by means of them, rosaries, the leprosy, and some few circular churches; but some day they would recognise the low relief capitals of St. Sofia, with the clinging leaf and the Classical drooping leaf, as being both represented in the Norman and Early English churches.

NOTES ON JAPANESE ARCHITECTURE.*

THE Japanese seem greatly to seek privacy, for their houses, even when they are placed in country districts, are mostly fenced in. They sometimes have an open loggia to the upper floor, as in the hotels, from which they can enjoy the surrounding view, but the approach to the house is invariably shut in, and the lower story hidden by high railings of bamboo. In houses of one story this fence often reaches as high as the eaves of the roof. The Yashikis are shut in in a similar manner, perhaps with a view to protection from treachery as well as the love of privacy. Not only are the whole grounds surrounded by a high wall on three sides, with a long range of buildings and strong gateway on the entrance side, but there is often a high wall or fence close up to the front of the house, through which the open portico projects. Between this and the outer gateway, with its range of buildings, there is a paved court, on the two sides of which servants' quarters, stables, and other outbuildings are situated. From the street the outer gate and its surrounding buildings present in many cases a very pleasing façade. The long horizontal lines of ridge and eaves, as well as the horizontal effect obtained by the lower story being constructed differently from the upper, is relieved by the vertical window bars and projecting bay windows on each side of the large recessed wooden gateway. The gateway itself is of very solid and strong appearance; thick posts, carrying heavy wooden lintels, which support the upper story over the gateway, form the framework of the heavy doors. Both the posts, lintels, and doors are lavishly shoed, belted, and adorned with plates of engraved and gilt bronze. There is in some of these a low mass of buildings, marking the approach to a Daimio's dwelling, a simple grandeur of line of proportion and balance of parts, reminding one as much of the repose and beauty of Greek architecture, as the Japanese decorative ornament in many of its forms, and in the beauty of its execution, reminds one of Grecian art. The walls are generally placed upon a base formed of two or three courses of stone. The lower story, instead of being plastered upon the outside, is sometimes covered with large tiles placed square or diagonally. They do not overlap, but are fixed to the laths, side by side, the joint being protected by a large roll of cement. The tiles being dark grey and the cement white, this treatment presents a somewhat curious, bold, chequered appearance. Placed symmetrically on either side of the gate are often two square projections, about 9 ft. by 6 ft., of one story, with an ornamental curved roof and carved gable. They correspond to our bay-windows, and command a side view of the gate, for porters or a guard who occupied these rooms. These projections have also a stone base, and are framed about 4 ft. from the ground, with window-bars and transomes placed very close together. They are protected when necessary by sliding shutters from within. Such windows also sometimes occur at the ends or the centre of the range of buildings on either side of the gateway. The other windows are either oblong openings, with thick wooden bars, or they are small projecting windows, framed out some few feet above the ground, and supported on carved or moulded wooden brackets at each end. This framework is sometimes perfectly open at the bottom, the whole front and sides being filled with close bars, and the top covered by a small curved lean-to roof. The

* See p. 238, *ante*.

inside is protected by sliding shutters flush with the inside of the wall of the room. In some Yashikis in Yeddo these projecting window openings are continuous, running nearly the whole length of the building, with brackets at intervals. The whole of the exposed woodwork (gate-posts, lintels, and windows) is often lacquered in black or a dull red colour.

The smaller and inferior Yashikis are often of one story only, and instead of being plastered or tiled, are frequently boarded with planks nailed on to the wooden framework, slightly overlapping at the lower edge to carry off wet. The whole is stained a dull black colour. The outer walls, referred to as being placed round dwellings of this class, are either fences made of strong wooden posts and beams, covered with planking and protected by a little tile roof supported upon brackets at the top; or they are of considerable thickness, constructed in alternate layers of tiles and cement, the cement being as thick in its layers as the tiles. The top is protected from wet and decay by a little projecting tile roof with ridge tiles and ornaments, similar to the roofs of small buildings. There are no instances of the walls of dwellings themselves being constructed in this way with tiles and cement. At the back of the dwelling within the surrounding walls are large grounds, generally laid out very prettily as a landscape garden. These Japanese gardens abound in grassy mounds and terraces, planted with an endless variety of trees and shrubs fantastically trained, with groups of large stone slabs and boulders, running streams, small lakes, fancy bridges, and stone lanterns.

The palaces of the Emperors appear to have been a collection of a number of detached buildings of the class just described, surrounded by a wall of great circuit with a number of entrance gateways. A Japanese book, which refers slightly to the subject of architecture, says:—

"Jimmu Tenno, the first emperor of the present dynasty in Japan, lived in Kashiwara no Miya, in Yamato, which was the first building of the kind called Miya in Japan. It is related in a book that, seven years after the ascent to the throne of Suiko Tenno, Siyotoku Tyshi proposed to build a Miya of a fixed size and arrangement, as the former Miyas were of different sizes. This was to be 365 ho. square (730 yards square), and to consist of 28 good *detached* himoki [name of wood] buildings, with the *bark of the tree used for the roofs*. Of these buildings, the 24th was to be for worship, and the rest for the affairs of government. One large building must have been in the same style as Hinosho-Ku [in China], having ornamental pillars and ceilings. O. Haruta no Miya was built according to this rule and arrangement. In the twelfth year of Yenriyaku a new Miya was built by Kuwan-Jun Tenno, in Yamashiro, and in the tenth month of the following year he removed from the south to the new Miya, the latter place being the present Kioto."

The name given to these large Miyas seems to have been Dairi or Dai Nairi, meaning imperial residence, as the writer goes on to say,—

"The complete plan of this Dai Nairi measured 36 cho. [4,32 yards] from north to south, and 20 cho. [2,400 yards] from west to east. It had the same arrangement as the Palace of Kanra ku, in China, having twelve gates in its circuit. About 160 years after this Dai Nairi was built, it was burnt down, and since that it has been rebuilt several times. After the Shoguns came into power, a small Dairi was built instead of it."

From a very rough print accompanying this description, supposed to represent the plan of the palace, each building being shown with four lines, it appears that the dwellings were arranged in a somewhat uniform manner, so that the whole group occupied a rectangular space. The buildings were separated by a number of wide walks crossing at right angles and leading to the numerous gateways in the boundary wall. The principal gates seem to be on the small sides, or what may be called the ends of the group, and on the centre or axis the principal buildings stand. On entering the centre gate, at one end there is an open court and then other gateways before reaching the first large collection of buildings.

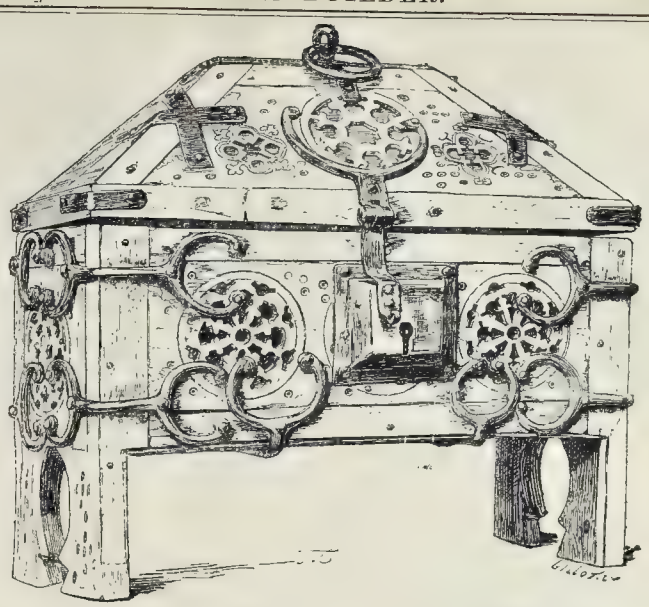
The military architecture of Japan seems not to have been much more substantial than the rest, though many cities contain large moats and the stone walls within which the castle buildings stood. The central portion of the city of Tokio is surrounded several times spirally by a deeply-cut moat with large grassy slopes. Towards the centre, this spiral forms a complete enclosure, and on the inside of this inner moat is a thick stone wall constructed in large polygonal blocks, which originally carried wooden defensive constructions surrounding the castle within. The larger number of these wooden constructions were pulled down some years ago, but those few that remain form, with the solid walls, deep moats, and strong gateways, an extremely picturesque feature of the city. Comparing these remains with a rough plan of a castle taken from a Japanese book, it appears that there were in the centre enclosure of these fortresses three principal buildings of a tower-like form. The most important and the highest of the three, called Homaru, was immediately under the chief in command, and for the use of him and his retainers; the second, which was somewhat lower, called Ninomaru, was devoted to the use of the second in command; and the third, lower still, to the third in command. This last was called "Sannonarn." These buildings were of two, three, or four stories, placed upon a solid battering stone basement similar in construction to the surrounding walls. Each story is set a little back within the lower, the projecting portion below being covered with a very salient roof adorned in some instances by little excrescent roofs presenting richly-carved gables. The top roof, which is generally hipped, is slightly concave, and has a very bold projection. The towers are often oblong in plan, and then the ridge of the roof ends in a small gable terminating in a hipped roof. These crowning roofs also carry little dormer gables, apparently used neither for light nor ventilation, but as ornament: they are generally little roofs of a curved form. In addition to these dormers the ridge and hip tiles are richly adorned with finials at the extremities, the ridge often terminating in a large representation of a dragon or fish with the tail curled upwards, executed in copper. The walls are thicker than those of ordinary houses, but are constructed of wood filled in with mud and plastered over, showing only the wooden window-frames, which are filled in with thick wooden bars set closely together.

Close to these three central towers is a cemetery for the dead, with a little temple enclosed. There are also within the castle wall six or more large yashikis, being the dwellings of the chief samurai, or officers of importance, and their retainers. In addition, a large mound commanding an outlook and several small Shintoo temples, the principal one being dedicated to Haceman, the god of war. The outside wall, constructed in large polygonal blocks of stone and backed with earth, is interrupted at intervals by large gateway constructions. The ponderous wooden gates are hung to heavy square posts with thick lintels above. These gate-posts, some 18 in. square, often in pairs, are shoed and belted with bronze plates, mostly gilt and engraved. The gates, too, are generally adorned with metal fittings. The approach is by a permanent wooden bridge erected over the moat. Upon the surrounding wall, built out for the purpose so as to flank those who enter the gateways, are erected towers similar to the interior keeps, though somewhat smaller; and also at all angles of the wall are two-storied towers. Between these buildings and the gateways a low building or shed covers the whole top of the wall, taking the place of the hoarding to our Mediæval battlements.

The temples of Japan are by far the most interesting and instructive buildings to be found in the country; set in the solemn shady quiet of their thick groves, approached by their avenues of lamps, both stone and bronze; with the grand sweeping lines of the roofs projecting boldly forward, upheld by a profusion of brackets; wooden carving tastefully disposed, sharply and beautifully cut, and the whole woodwork often decorated in well-harmonised colours with gilding and bronze ornaments. The principal temples are to be found in Nikko, Osaka, Kioto, and Tokio (or Yedo). The two principal groups of temples in Yedo are at Uyeno and at Shiba, and at both these places the large central temple has been destroyed by fire. The subsidiary temples, however, are so numerous and imposing that these sites still rank first in importance in the city as temple groups. But the Uyeno and Shiba temples may be said to have belonged to the late Shoguns. It was under their direction that they were built, and that the vast sum required for their erection was provided. Here were erected their shrines and the oratories attached to them, which are now the most splendid and attractive buildings to be seen, loaded with the richest profusion of decorative art. The shrines of the 1st and 3rd Shogun, both eminently illustrious in Japanese history, are at Nikko. Those of the 2nd, 6th, 7th, 9th, 12th, and 14th at Shiba, in Yedo, and the others at Uyeno.

The temples at Shiba are enclosed on three sides by a long wall with several gateways at intervals, and backed by a thick wood of fine old trees. The streets surrounding the walled sides consist of a continuous avenue of pine-trees, interrupted only by one large and two small gateways forming the approach to the sacred grounds. The principal entrance is a large and imposing wooden structure some 70 ft. wide and of about the same height. It is built upon heavy wooden pillars arranged so as to form one principal opening and two side ones, these wooden posts being tied together by horizontal beams tenoned to the posts, the sides of the entrances being filled in between this framework with panels of wood. Half way up, above the soffit of the entrance, which is formed of heavy beams, a tiled roof, slightly concave, projects forward and exhibits the ends and underside of numbers of rafters supported upon corbelled brackets. Above this roof the upper story is set a little back, and is surrounded by an open balustrade. This upper story is constructed of wide posts and horizontal beams, with wooden filling in, crowned with a cornice of wooden corbels assisting to support the double rafters of the roof. This roof has the heavy appearance, the concave contour, and the semi-gabled form at the ends which is peculiar to all Buddhist temples in the country. After looking at other religious buildings, where every part is painted, carved, or gilt, this gateway might be considered somewhat plain, as it has no carving, and is coloured with one uniform dull red colour; but it has more claim to grandeur of proportion and general effect than any other building which I have yet seen in Japan; its great size, good proportion, picturesque roof with ornamental crestings; also the numberless corbels, brackets, and rafters, some moulded at the ends so as to suggest the frowning face of a monster; also the deep red colour, bright where the sun strikes it and subdued in parts by the tree-shadows and the sharp deep shadows of its cornices and roofs;—all these help to fill the beholder with the liveliest feelings of satisfaction. Passing through this portal, we find ourselves in a large open space some 200 ft. square, in the centre of which the large temple stood, now burnt to the ground. Across this space, nearly opposite to the great gateway, is a little temple approached by steps leading to a paved ante-court containing a few tombs and an image of Daibutz in bronze. This ante-court is defended towards the entrance by a screen and low gateway. The most noteworthy buildings, however, are on the right-hand side of the open space just referred to. These buildings consist of the shrines of the 2nd, 6th. 12th, and 14th Shoguns and those of their wives, with the religious buildings attached. They were originally approached by two other gates, at some distance to the side of the great gateway, which belongs to the large temple now destroyed, but these small gateways are now closed. They are very similar, and it will be sufficient to describe one. The entrance forms the centre of three compartments divided by wooden pillars and connecting beams; the two side compartments form recesses for large wooden figures considerably larger than life, and indicative of exaggerated muscular strength and extreme hideousness. The face of one is painted bright red, and the other a livid green; the posts, wooden panels, and gates are carved and coloured in red, black, and gold, with diapers in colours in some parts. The name given to the gate is Nio Mon (Mon-gate), Nio being the name of the hideous janitor who is supposed to guard the entrance to Buddhist sanctities, and whose representation is placed in carving on each side of these gateways. Within the Nio Mon an open space or court is passed, containing several rows of stone lamps, being large stone lanterns placed upon circular pillars with heavy bases, moulded and carved, in all about 5 ft. or 6 ft. high. These were gifts from the smaller Daimios, being offerings to the Shoguns' shrines. Before some shrines there are long avenues of them, increasing in importance as they approach the temple. This court is enclosed by an ornamental screen fence, in which another richly-decorated gateway, with heavy folding-doors, leads to another court surrounded on three sides by a wooden screen wall, carved and painted, and protected by a tile roof.

At Uyeno, in the north of the city, there are the Haidens and shrines of the 4th, 5th, 8th, 10th, 11th, and 13th Shoguns, being grouped in threes, having one haiden to each three, viz., 5th, 8th, and 13th, and the 4th, 10th, and 11th. The arrangement is exactly similar to that of Shiba, but the stone and bronze lanterns are more numerous; the forms of the roofs, and details of carving and mode of colouring, are rather different. Black is much used in the decoration



Ivory Coffer ornamented with Perforated Rosettes and Copper Clasps: Fourteenth Century.



Ornament taken from the Bible of Louvigny.



Japanese Porcelain Plate ornamented with the Symbolic Crane.



Walnut Chest, of the Fifteenth Century.

[See p. 255.

of these buildings at Uyeno. The other gates are entirely black, with gilt and bronze ornaments, having the peculiarity of a roof covered with small wood shingle instead of tiles. Black is also much used in the decoration of the Haidens, which are otherwise richly coloured, as at Shiba. The shrines of the 4th and 5th Shoguns are of bronze, with their railings, gates, and bas-reliefs; the bronze has a dull, greenish colour, approaching to black. Though the arrangements and general mode of construction of these sacred buildings are so similar that to describe each involves much repetition, yet there is such a variety of details—such different treatment in points of decoration, both carving and colouring,—that there is in them an endless study for the artist.

The carving is generally cut in camphor-wood, and the colour is mixed with a kind of size which seems effectually to resist the action of the weather. The posts, beams, and all large surfaces decorated in one colour are coloured with the medium of lacquer, which is either left of a dead colour, or is polished to a great degree of brightness. The bronze shoes and other ornaments are deeply engraved, and filled in with black in the hollows.

The Japanese sculptors divide carving into three kinds—shallow, deep, and pierced. In the earlier work, such as the bronze tombs and gates of the earlier Shoguns, the relief is very shallow, —at the same time very sharp and effective. In the later work, nearly all carving upon the outside—such as in screens, gateways, and cloisters—is pierced in parts, being cut in a thick slab of wood, and can be viewed from either side.

A striking thing in sculpture of this kind is the extremely careful imitation of nature, leaves and flowers being carved with a delicacy and truth to nature that is marvellous, and coloured with the same care and beauty. Fruit is gilt, with red dashes of colour showing the ripeness; and the greens in colouring the foliage are varied in their tone. Fore-shortening is frequent and well rendered; and though the Japanese artist does not seem to have understood the principles of perspective, which are often violated when dealing with representations of buildings and rectilinear forms, the perspective of all natural forms is carefully noticed and imitated. In Japanese theatre scenery, I have also seen interiors of buildings represented correctly in perspective.

The third kind of carving—the deep carving, —occurs mostly in the interiors of buildings, when depth of effect is required, but at the same time no communication with the outer air, which would be obtained if pierced carving were used. Beams and posts are often diapered with shallow incised carving, the key pattern being a very favourite one, sometimes with the stem and leaves of a plant intertwining. Posts are round, round and reeded, square, or square with the corner slightly rounded or moulded. They are rounded inwards, and shoed with bronze, both top and bottom, and often a flat bell-shaped capital (similar somewhat to the Egyptian capital called "bell-shaped" by Mr. Fergusson, but flatter still), often resting on a stone base of similar form at the bottom. The projections of inter-penetrating beams are curled upwards and moulded, or are carved in the form of the fore parts of lions, elephants, or some animal real or imaginary.

New River Company's Charges.—The New River Company have raised an important question under the last Act relating to metropolitan asssessment. The last valuation was made in 1875, and was supposed to be in operation five years, but the Vestry of St. Mary's, Islington, claimed to increase the assessment, on the ground that during the two years subsequently to that rating the company increased its rental, owing to a large number of new houses being connected with its mains. The company resisted the demand, and the Court of General Assessment Sessions upheld their appeal, but it was agreed between the parties that a case should be stated for the opinion of a superior court. This will be looked forward to with interest, not alone in Islington, but also in the City, where (as our readers are too well aware) there have been loud complaints. As an illustration of the uncertainty with regard to charges, it may be mentioned that *there are builders who use the company's water by meter who are variously charged* 1s., 1s. 6d., *and* 2s. *per* 1,000 *gallons.—City Press.*

RUMOURS.

GOVERNMENT OFFICES AND METROPOLIS IMPROVEMENTS.

WE referred lately to the fact that the Government had relinquished an obscurely-formed intention of purchasing the site of Messrs. Drummonds' bank, and of erecting blocks of public offices between the Horse Guards and Trafalgar-square in accordance with Mr. Mitford's, or, perhaps, more correctly, in accordance with a plan prepared by Lieut.-Colonel Clarke in the years 1865-6. It may possibly be remembered that we gave in August of last year the complete STORY OF THE GOVERNMENT OFFICES, and we sketched the various schemes for continuing the erection of the many public buildings still required to house scattered officials of the Admiralty and the War Office, and other still houseless departments. The schemes submitted to the latest Select Parliamentary Committee were respectively the work of Sir Henry Hunt, Mr. Mitford, and Mr. Cates. From information that reaches us, Sir Henry's suggestion to purchase all the land not yet the property of the Government, between Parliament-street, Charles-street, the Park, and Great George-street, will soon be, to all intents and purposes, accepted. At the present moment quiet purchases are being made in the neighbourhood of Great George-street and Parliament-street. This will astonish no one who remembers how one plot of land and the buildings upon it,—in Parliament-street,—were quietly acquired some time ago, and how the consent of the House of Commons was asked after the purchase was made. We allude to the house occupied by the Messrs. Trollope. Of course the Government agents are quite wise in keeping their doings as secret as possible, but does her Majesty's Board of Works know exactly what is to be done with the land when the members of Parliament may have consented to pay the bill for purchases accomplished without their knowledge? Our own opinion upon the manner in which these purchases have been made during the last twenty years by Government agents was very clearly expressed last August. We said:—

"In the autumn of 1855, Sir James Pennethorne made estimates, and went through the necessary preliminaries, for acquiring all the land situated between the Treasury Buildings, the Park, Great George-street, and Parliament-street. From statistics which we remember having seen at the time, and from facts only recently presented to us, we confidently believe the whole of that land might *then* have been acquired for State purposes at a cost of less than 500,000*l*. That is to say, all the land upon which the new block of four public offices now stands, *as well as the adjoining land which Sir Henry Hunt now proposes to purchase for* 1,300,000*l*., might in 1855 have been purchased for less than half a million of money."

Our object in calling renewed attention to the above passage is to prevent further "tinkering" in the vexed matter of land for Government offices. The acquirement by the State of one little plot of land, or of one little house, increases indirectly the value of the adjoining house or the adjoining plot. We repeat, let everything be done openly; and let the country know what is to be built upon that site for which it will eventually be called upon to pay more than a million of pounds.

Another rumour, which has privately circulated during the last week, refers to the difficulty experienced by the Metropolitan Board of Works in satisfying the exorbitant demands of the Home Office (in relation to Mr. Cross's Act—the never-yet-tried Artisans' Dwellings Act), and in protecting the interests of metropolitan ratepayers. It is contemplated, if not proposed, to shelve the Metropolis Streets Improvements Act for three years. Our only consolation for this loss of time and waste of money lies in the hope that meanwhile a complete scheme for the improved communications of Central London may be prepared and submitted to public criticism—a scheme of improvement pure and simple, in which the Capital will show itself as far above the affectation of petty economy as the Legislature will rise superior to the traditional obstructiveness of a few privileged landowners.

THE CHURCH OF ST. MARY MATFELON, WHITECHAPEL.

THE building we illustrate in our present number is situated in Whitechapel High-street, and takes the place of an older building, the White Chapel, which probably gave the district its present name. The derivation of the title Matfelon is so doubtful that it is not worth while to discuss it here.*

The foundations of the church go to a considerable depth, the site proving to be unsafe until a level of some 20 ft. below the ground was reached. The new church seats about 1,300 worshippers.

The tower is brought forward towards the road, and is a very noticeable feature from Aldgate. The spire, from constructional reasons, is to be added hereafter; but the lower or square portion is carried up. The total height of tower and spire, when completed, will be nearly 200 ft. Through it is entered the nave, which is 109 ft. long by 33 ft. wide, and has aisles 13½ ft. wide, north and south, all being internal dimensions. The height of nave from floor to ridge of roof is 80 ft. At the western end is a baptistery, arcaded in brick and stone, the arcades giving support to a western gallery. The light to the nave is afforded mainly by a clearstory, which is carried on five bold arches, springing from cylindrical columns of Portland stone.

The nave roof is wagon-headed, close boarded for acoustical reasons. The nave and aisles are paved with solid wood blocks, bedded on concrete. The benches are of a simple character, in varnished deal; the passages are paved with black and white tiles in various patterns. Bold carved corbels project from the capitals of the columns of the nave arcades, representing the heads of the twelve apostles, and from these spring the stone shafts supporting the roof principals.

The chancel is 37 ft. long by 27 ft. wide, and is 68 ft. high from the floor to the ridge of the roof; the chancel roof is treated similarly to that of the nave. The eastern end is apsidal, and contains thirteen windows of lancet treatment. These windows are 30 ft. from the floor, thus giving a large area of wall, for which has been designed a system of mural decoration. Accommodation is given in the chancel for the choir and clergy, the stalls being of oak. The organ projects into the nave. The pulpit and lectern are of alabaster. The font is of Caen stone. The reredos, to be erected at some future time, has been approved by the Bishop.

In addition to the usual vestry accommodation, a church room, capable of holding 100 people, is at the south side of the chancel.

The material employed has been, for the most part, red brick; the walls, both internally and externally, being faced with this. The dressings are of stone, Doulting externally and Bath internally. The style is Thirteenth-century Gothic.

An old feature is revived in connexion with this building, by the introduction of an external pulpit. This occupies an angle of the building at the western end, and was used with great success during the last year throughout the summer and autumn months.

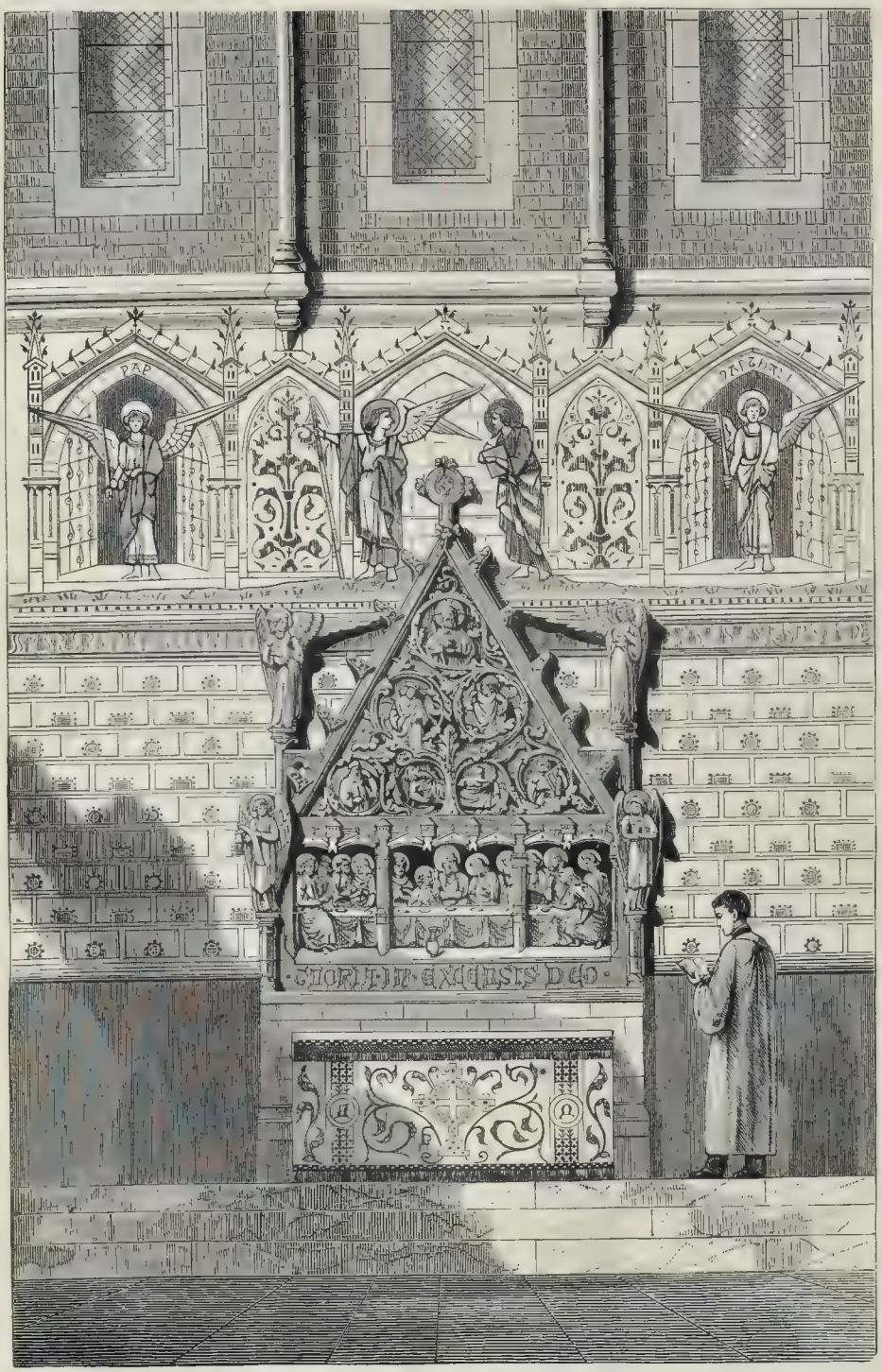
The windows will, it is hoped, be some day filled with stained glass. Nine are already fixed. Most of them are private gifts to the church, as also are the font, pulpit, lectern, altar-cloth, &c.

The stained-glass windows are from the designs of Mr. H. W. Lonsdale, and are executed by Messrs. Saunders & Co.

The warming apparatus was invented by Mr. George Jennings, who has presented the apparatus. The carving has been executed by Mr. Thomas Earp, except the lectern, which is by Mr. Seale. The mosaic pavement is by Messrs. Burke & Co.; the gasfittings are by Messrs. Richardson, Slade, & Co.; the chancel stalls are by Messrs. Cox & Sons; the block flooring is by Mr. Gregory; and the organ is by Messrs. Hill & Sons.

The general contract for the church, which has been exceeded by only 20*l*., was taken by Mr. Chappell, of Westminster; and the outlay, without the spire, is about 20,000*l*. The architect is Mr. Ernest C. Lee, of Bedford-row.

* The late Mr. W. H. Black, F.R.A.S., maintained that the appellation "Matfelon" seems to have originated in some custom of tolling a bell, or the performance of some ceremony on the approach of *felons* on their way from the City towards Execution Dock at Wapping whereby they were *mated*, that is, subdued, scared, or affrighted, by the tokens of their approaching death.



ST. MARY'S, WHITECHAPEL : THE REREDOS.



ST. MARY'S, WHITECHAPEL: INTERIOR, LOOKING EAST.—Mr. Ernest C. Lee, Architect.

COMMON-WEAL *v.* BRICKS AND MORTAR.

THIS was the title of a paper read by Mr. R. E. Pownall, architect, before the Civil and Mechanical Engineers' Society, on the 7th instant. The author remarked that so long as a man had a country or district to himself, he need please but himself with regard to what and how he built. Non-observance of structural, sanitary, or other laws would recoil only upon himself, and occasion harm to none beside. When, however, the limits of a person's holding became more circumscribed, errors of any magnitude committed by him possibly affected his neighbour also, and this in a rapidly-increasing degree as the population increased in density. In these facts lay the reason for the restrictions which have by law been placed upon the legal axiom, that "a man may do as he likes with his own." As a distinguished minister once said, we as a nation "submit the more readily to control in the use of our own that we in turn may the more readily control the vagaries of our neighbours." Although, therefore, theoretically, "a man's freehold is his from the centre of the earth downwards to the sky upwards," yet, practically, it has been found necessary to say that he shall only use it to that extent subject to certain regulations. The cardinal points in which laws affect building operations of the ordinary domestic and commercial class are naturally (1) from the sanitary point of view as regards suitability for occupation, by reason of site, size, light, drainage, &c., including other matters of ordinary convenience; (2) from the structural point of view, by so regulating the materials, method, and manner of construction that the building shall be sufficiently substantial as to be efficient for its purpose, and also so arranged as not to be subject to undue risk of fire, either in itself or to or from its neighbours' premises. From these it will be obvious that considerably greater latitude could of necessity be allowed in the free and open districts of the country than could by any possibility be permitted within the close confines of a city. So far as the metropolis is concerned, the management of these matters is entrusted to the various vestries and the Metropolitan Board of Works, under Acts known as the Metropolis Local Management Act, 1855, and the Metropolitan Building Act, 1855, and the various Acts since made amending both of these. Provincial towns and rural districts are governed in a somewhat similar way by various local Boards, answering at once to both vestries and the Metropolitan Board of Works. These local Boards are, however, subject to a higher authority, called the Local Government Board. The Act under which the whole operate (except the metropolis) is the Public Health Act, 1875, and Acts since passed amending and enlarging its powers in individual directions. There is, however, this difference between the Metropolitan Board of Works and the various local Boards. The one, although it has the power to make various bye-laws, acts mainly under exactly-defined and direct statutory powers. The others act in accordance with bye-laws compiled under their own direction upon somewhat similar lines to the Act of the Metropolitan Board, and sanctioned by the Local Government Board, the result being that though, throughout the country, they mainly agree in principle, there is the widest possible diversity in detail. The approval of the central authority seemed to be accorded to almost any set of rules without much difficulty, inasmuch as the rules of different local Boards vary greatly in stringency and requirements, and thus give rise to many great anomalies; what is perfectly legal on one side of a road, for instance, being illegal upon the other side by reason of a different jurisdiction. The inconveniences to the building world of such an uncertain state of things, to say nothing of the unfairness to individuals, together with the insufficiency of the sanitary and other rules mostly in force, having been prominently brought to the notice of the Local Government Board, an endeavour was made to draw up a code of rules or bye-laws which should be in a greater degree capable of general application throughout the country. The opinion of several public bodies was sought, and the proposed code was published in July last, and has since been subjected to considerable criticism. The Local Government Board apparently collected and collated the various bye-laws they had sanctioned, reconciled differences between them as much as possible, and presented them in the form of a code which has scarcely the elasticity of the previous rules in being applicable to varying circumstances. It is a kind of tentative measure, not at present capable of exclusive application, but evidently intended to be so after some little experience has been obtained of its working. However, as almost every district of the kingdom is at present regulated by some series of bye-laws or other (confirmed and agreed to by the Local Government Board), none of which are so stringent as those now put forth, it is not unreasonable to suppose that the new ones will not by any means be voluntarily adopted, but that additional Parliamentary powers will be required before the code can be brought into general operation. Mr. Pownall then proceeded to give a long and critical account of the ninety-nine "model bye-laws as to new streets and buildings" suggested by the Local Government Board for general adoption by urban sanitary authorities and others working under the Public Health Act, 1875, concluding with the following general remarks:—Admitting the necessity of legislation on building operations, it becomes a question to what extent such legislation should be carried, and how it should be effected; whether the State should provide a kind of outline specification, as it were, in terms sufficiently general and elastic to reach nearly all possible cases, and whether such document should endeavour to define all that is objectionable, and, in fact, state only what should *not* be. The Local Government Board have taken the former of these views, and, I think, rightly so. Leaving out questions of detail, there is, I think, only one matter which might with good effect be introduced if these "ninety-nine articles of building" ever pass into a general law; and that is with regard to appointing a special tribunal other than the local magistrates before whom disputed points could be adjusted. I am aware that this would be difficult in rural districts, but, speaking for London, I know the horror with which magistrates seem to regard cases brought before them by district surveyors, and the hap-hazard way in which such cases are often dealt with by reason of the redundance of technical terms which the Court does not "follow." The local surveyor under the new laws must of necessity be a man of experience; and I believe could safely, to a certain extent at least, be trusted with *quasi*-judicial functions in at once stopping works which were proceeding, in his opinion, contrary to the law. Such an exercise of power would certainly have saved us the recent disastrous case at Hackney, and would act with but little if any hardship to the individual builders, as the matter could be immediately referred to the proper quarter and set right before harm was done. The new bye-laws are peculiarly silent as to any system of construction at all calculated to be considered fireproof, even to the meagre extent mentioned in the Metropolitan Building Act. There can be no doubt, however, that buildings in different and separate occupation are rapidly becoming more and more placed one above another,—*i.e.*, in flats,—instead of side by side. Under the new bye-laws, in the latter case they must be separated by presumably fireproof divisions, while in the former they are under no such necessity, notwithstanding the fact that fire spreads far more rapidly upwards than laterally. In fact, in the new bye-laws a rather important omission occurs, considering the light in which the matter has been looked upon recently. Under the Metropolitan Building Act the corridors, staircases, &c., of public buildings have to be of incombustible materials. Neither this provision nor any substitute for it occurs in the new bye-laws. It is true that faith in stone and iron as safe fireproof building materials has long since departed; yet there surely is a greater element of safety in a means of communication which fails at a temperature of some 600 or 700 degrees than there can be in one which is itself in flames at a very much lower heat. Considering the means of escape from most buildings, and knowing how long, or rather sometimes how short a time it takes for a fire to get "well alight," I know which I would rather have to traverse,—that is, from an inmate's point of view; the fireman's side of the question is rather different. As to "exemptions," it is undesirable that, as the Building Act and bye-laws professedly provide only for the minimum of safety, any body such as the Metropolitan Board of Works should be endowed with dispensing powers. Break a rule for one, and the difficulty is to refuse it to others without injustice. There will no doubt always be certain conditions peculiar to locality, and differing in each individual place, which should be taken into account in framing a general Building Act; still, most of the questions involved in the management of town structures, such as those relating to drainage, proportion of covered to uncovered area, fireproof materials, principles of construction, and many others, must be essentially the same wherever the object is the same, viz., to secure the maximum of accommodation on a given space, together with good constructional and sanitary conditions. The by-laws in question certainly seem to be calculated more for town than for rural districts. Much inspection is provided for on the part of the local authorities, but no fees; this, I am afraid, is by no means unlikely to lead to implicit reliance upon the urban authority to superintend work by persons employing builders without the intervention of an architect or engineer, more especially as there seems to be no penalty attached to doing work not in accordance with the by-laws if it is remedied when complained of. No district surveyor could give the amount of supervision that would be required under the new laws for the present scale of fees. It is instructive to remark the manner in which these suggested bye-laws have been received. In London, accustomed to the restrictions imposed by the Metropolitan Building Act and other Acts, they have on the whole been received with favour as a step further in the right and proper direction. In the provinces, where the restrictions have to a great degree hitherto been but of the slightest, an alarming outcry is heard, almost universally, in their condemnation. Not that the general run of building is worse in the provinces: rather the reverse; but rather that we equably endure there inconveniences which in London we should condemn as an intolerable nuisance,—4½-in. brick or lath-and-plaster party-wall, for instance. Of course there are men who for their own credit's sake, if for no other reason, do all they do in the best and most suitable manner. It is not for this class that laws are made, but rather to govern those who, trusting to the ignorance of the public generally, can foist upon it bad work, and make it believe that the shadow is even more solid than the substance. I would suggest for discussion the manner in which iron fireproof building, and similar matters, should be dealt with by a Building Act; also the limitation of size of buildings, and how far the convenience of one person must give way to the safety of the many. The extent to which general laws should go into detail is a subject also well worthy of discussion. Of course, if all buildings were faithfully carried out from the specification of a qualified architect or engineer, and if architects and engineers constituted a responsible professional guild to which only competent men were admitted, then, and only then, could these details be omitted from building laws. What we seem really to want is, as the *Builder** says, "a fair start upon right and sensible general principles, with the power of local modification and application." The question of "alterations" to a building, not sufficient to bring it within the scope of the bye-laws as a new building, surely should have some recognition in them, so that nothing should be added to an old building but what is in itself in consonance with the new laws. Figures for the dimensions throughout the laws would have been preferable to the words in which they are given; in fact, altogether, they are in an unhandy form for ready reference. Nothing is said in them as to the maximum height of walls; although, if flats are to be the rage, they will need to go up more than 100 ft., as at Mr. Hankey's buildings in Westminster. There seems to be no power of reference under special circumstances, as in the Metropolitan Building Act. There are the Bye-Laws, and nothing but them, although it is evident that a multitude of further matters must arise. Building matters, especially those relating to sanitary requirements, are in a state of rapid progression; changes of method least expected occur almost daily. These are just the points upon which professional opinion and experience are required before the suggested bye-laws become an Act of Parliament.

Royal Academy.—It is stated that the following gentlemen will form the "Hanging Committee" for the next exhibition at Burlington House:—Mr. Sant, Mr. Wells, Mr. Calder-Marshall, Mr. Davis, and Mr. Redgrave.

* Vol. xxxv., p. 997.

ON THE DECORATIVE TREATMENT OF MODERN SUBJECTS FOR THE DECORATION OF MODERN BUILDINGS.*

The subject to which I am about to ask your attention appears to me of infinite importance at this time, seeing the great desire to have good and worthy buildings for public purposes, and the real and active endeavour to decorate the same; and it will be my aim, by argument and illustration, to urge a return to the true spirit of decorative work, as exemplified in the great remains of the past,—for I will at once disabuse your minds of the notion that the heading of my paper embodies an original idea. I assure you it is not so; its practice, if not "as old as the hills," is of the most remote antiquity; and the greater part, and certainly the most exact, of our knowledge of the people in their habits as they lived in that remote period,—in some instances *all* we know,—is derived from the remains of their decorative treatment of contemporary subjects. To put the matter clearly, I propose to maintain two points:—Firstly, that decorative work should be historical in the true meaning of that phrase. Secondly, that in public buildings it is imperative that it should be so. There are other methods of decoration, affording excellent scope for artistic skill, gratification of personal taste, or fantastic "fads," altogether harmless in their kind. Of those, at present I have nothing to say, but we will take the higher ground of asserting that it should be historical for national or municipal buildings; for in the past of which I shall speak, it would seem to have been the leading idea to identify a great national building (or, indeed, any other) with the people who built it, and thus to render its decoration a page of history, and a wonderfully-complete one too; and in contemplating their work you will remark the true artistic, or I may, perhaps, be permitted to say, republican feeling, by which the artists were actuated.

We not only see the ruler or king leading his armies or engaged in the chase,—and here you may notice a curious conventional touch in their treatment, for the figure of the king is always larger than the others,—but there is also an equally-faithful record of the occupations of the meanest of the people, matters of which, without such work, we should have no idea, for the history of literature only deals with kings and governors; and even if it were not so, such records in pictorial art are of infinitely more value than any written description could be. Briefly, their work bears indisputable evidence that their whole purpose was to "seize the life of life." And thus these artists worked; and if you would thoroughly sympathise with my feelings for their labours, go with this idea and carefully study the Assyrian wall-decoration in the British Museum, and afterwards seek out the pieces of Egyptian fresco paintings; and though you may perhaps smile at their occasional violation of the canons of art, you must remember that art was in its infancy,—that they were absorbed by the desire to represent truly what they saw, letting the method take care of itself, a witness of a true vitality in art. And as we depart with such infinite knowledge thus acquired, one thought may occur to you, as, indeed, it has painfully to me, whether, with all our present activity and resources in art, any work is being done which in the future will be such an eloquent record of our national life? To follow out truly a great principle in philosophy or chemistry, it is not necessary that we should use the language of the original discoverer, be it Greek, German, or any other; but this is precisely what we are doing in our art-decoration, for instead of portraying our people in their various occupations and costumes, and using them in the spirit of the great artists, we blindly miss their purpose in vain endeavours to emulate their method of expression. I said flowers, &c., but here I most gladly recognise a fellow-worker in the same spirit in the gentleman who recently gave you a paper on "Ornament."† I allude to Mr. Lewis Day. Particularly apropos of this, I will quote you a passage from that eloquent writer, Mr. Ruskin, who says:—

"What do you suppose your descendants care for our imagination of the events of former days? Suppose the Greeks, instead of representing their own warriors as they fought at Marathon, had left us nothing but their imagination of Egyptian battles! And suppose the Italians, in like manner, instead of portraits of Can Grande and Dante, or of Leo X. or Raffaelle, had left us but imaginary portraits of Pericles and Miltiades, what fools we should have thought them! How history we should have been provoked by their folly! Yet that is precisely what our descendants will feel towards us, so far as our grand historical and classical schools are concerned. 'What do we care,' they will say, 'what these nineteenth-century people fancied about Greek or Roman history? If they had left us a few plain and rational pictures of their own battles and their own men in their every-day dress we should have thanked them.'"

He further says:—

"Wilkie in his earlier days was an historical painter, and Chantrey an historical sculptor, because they painted and carved the things they saw, not men and things as they might have been or should have been. Etty and Fairman, on the other hand, though great artists naturally, were lost minds, the one painting dances of nymphs in red and yellow shawls, after the manner of the so-called grand schools, and the other drawing outlines of muscular men straddling behind round shields. Of all the men whom you have come to call the great masters, there was not one who did not confessedly paint his own present world plainly and truly. Homer sang of what he saw, Phidias carved what he saw, Raffaelle painted the men of his own time, and every man who has risen to eminence in modern times has done so by working in his own way and doing the things he saw."

"Doing the things he saw": that is the whole gist of it, and is of the most absolute value in decorative work, for I would here remind you of this great difference between proper decorative and pictorial art. Pictures may live,—indeed, it would be idle to say otherwise,—quite independent of their subject, simply because they are complete in the handling and other technical qualities of art workmanship; but decorative work, as a rule, is too far removed from the eye for such qualities to avail, and its value is simply for what it tells, and its art that it should be told agreeably in colour; for, as all know who have done decorative work, the refinements of execution proper to a picture are out of place in it, and indeed militate against its effect; and this consideration still farther bears out the idea that it should have something worth telling. And what can be better worth telling in most things than the truth?—truth in the matter represented? Such decorative work is real history-painting, for historical art so-called is really poetic representation; but we can get all round the life we are living, and with which we have an active sympathy, and by our special observance give delineations which by their art shall give delight to the present, and by their faithful record shall be of infinite value in the future. But what good can we do by repeating Classic or Mediæval work? It has been done as well as it could be done; such repetitions cannot add to our knowledge; indeed, it has a tendency to pervert it, for it is not uncommon for those who have grown wise by the labours of the past to add a little of their own, and overlook their masters. It may be copied, and fulfil the superficial purpose of decoration as a vehicle of colour, but I think you will agree with me that that is not sufficient for national work.

And now I will give you, in default of illustrations, some descriptions of national decorative work executed in the great times of the past, and, as accepted examples, the works of the Assyrians, Egyptians, and, greatest of all, the Greeks, as exemplifying to the fullest extent the principle I am endeavouring to establish. (The descriptive selections are from the works of Wilkinson, Layard, Lübke, and other writers on the subject.) Of the Egyptians is the following:—"Even in the earliest tombs of the old kingdom, about 3,000 B.C., the simple labours of agriculture and cattle-breeding, the relations and affairs of varied private life, are faithfully and fully depicted. On others we find incidents of private life, work and employments of various kinds, recreations and games such as are still in practice; cheerful, social doings and festive entertainments, as well as religious ceremonies, sacrifices, and other solemn acts. In various scenes of war all the different races are unmistakably designated by their characteristic physiognomy and costume. In all these representations an enlightened memorial of reality is always aimed at." Among the works from Nimroud, in the British Museum, and those from Khorsabadd, in the Louvre, as it was among the Egyptians, so here the decorative arts are chiefly applied to the delineation of active and contemporary life, such as their wars, hunting the lion and other wild beasts, "and all these incidents are depicted with great life and vigour. We perceive everywhere an enlightened, clear mind aiming at the simple grasping of the reality." Again, Greek art aimed not so much at the delineation of the inner life (or expression) as of outer circumstances or actions. For instance, "the incomparable frieze reliefs of the Parthenon exhibit the whole exuberance and variety of Greek life. In the great frieze by Phidias, of a procession, is seen all that was beautiful and excellent in Athens: the bloom of maidenhood, the fresh strength of their youths trained in gymnastic exercises, and the solemn dignity of the magistrates and other officers. In fact, the greater part is devoted to the vast sphere of true historical life, and the events and circumstances of the period." So Greek vases: though frequently decorated with scenes from the heroic legends, they are portrayed in contemporary costume, and (corresponding with the character of the period) delineations of every-day life in great variety. And it is especially so on the walls of temples and palaces, where we see depicted the events in the life of the ruler. On the walls of Thebes we see plainly represented all these incidents. And why are all these works so valued and so famous? Because, in addition to their beauty and skill as works of art, they are full of a sympathy with observed life (and, indeed, hold the mirror up to nature), affording us not merely an insight into a highly-developed civilisation, but also furnishing us with complete information of the nature and occupations of the people by whom they were executed. It is curious to remark the emancipation from tradition in all branches of art, with the exception of the decorative. Classic landscape has long given way to the vigour of naturalistic representation. It is the same with figure-subjects. Many of the most popular pictures of late years have been derived from modern subjects; and what sculptor designing a statue of a modern hero would venture, nowadays, to clothe it in Greek or Roman costume? And yet, years ago, such was the accepted practice, as witness the monstrosities in St. Paul's and elsewhere. That tradition should still be a spell on decorative art I attribute to the fact that the impulse towards its exercise is of recent growth, and that the mine of the past is not yet exhausted. But let us take heart in this business, for the time is certainly coming ready for the acceptance of true modern work. And, *apropos* of this, you will pardon my recalling to your memories an exactly parallel case of transition of opinion in the pictorial arts. All of you, I presume, know "The Death of General Wolfe," by West, but you may not remember the story in connexion with it; for, previously to that period, heroic deeds of battle of any time in English history had been represented in Greek or Roman costume. West had the courage to dismiss that pedantry, and went direct to nature, even to the cocked hats and blunderbusses, and his defence of this "heresy in art," as it was called, is so admirable that I will venture to quote it. He says:—

"When it was understood that I intended to paint the characters as they had actually appeared on the scene, the Archbishop of York called on Reynolds and asked his opinion, and they both came to my house to dissuade me from running so great a risk. Reynolds began a very ingenious and elegant dissertation on the state of public taste in this country, and the danger which any innovation incurred of contempt and ridicule, and concluded by earnestly urging me to adopt the costume of antiquity, as more becoming the greatness of my subject than the modern garb of European warriors. I answered that the event to be commemorated happened in the year 1758, in a region of the world unknown to the Greeks and Romans, and at a period of time when no warriors who wore such costume existed. The subject I have to represent is a great battle lost and won, and the same truth which gives law to the historian should rule the painter. If, instead of the facts of the action, I introduce fictions, how shall I be understood by posterity? The classic dress is certainly picturesque, but by using it I shall lose in sentiment what I gain in external grace. I want to mark the place, the time, and the people, and to do this I must abide by truth."

I must give you the sequel:—

"The Archbishop and Reynolds returned when it was finished; Reynolds examined the picture with deep and minute attention for half an hour. He then said, 'West has conquered; he has treated his subject as it ought to be treated. I retract my objections; I foresee that this picture will not only become one of the most popular, but will occasion a revolution in art.'"

The scene is one to be remembered in English art, for it was one of those moments so necessary at times in art, science, and morality when a brave blow is given to that blind and sometimes foolish giant, Dogma. Again, as touching a technical point of art, there are those who contend that the whole essence of decorative art is the representation of beautiful forms. That I contend against most absolutely, *for the primary effect of decoration is, or should be, a result of colour.* The appreciation of Japanese decorative work is now so general that I will

* A paper by Mr. E. Buckman (member of the Society of Painters in Water-Colours), read before the Architectural Association on the 8th inst.

† See *Builder*, p. 60, *ante*.

venture to say we all heartily admire it; but who would venture to say that its attraction is beauty of form? Indeed, the form, especially of their figure-work, is exceedingly grotesque, but their management of colour is superb, and it is to their greatness in this essential faculty, added to the marvellous vitality with which they seize the characteristics of every living thing, be it man or woman, bird, beast, or flower, and express it with an art of admirable simplicity and skill, unfettered by tradition, that its power is owing; indeed, they copy life with such fidelity, that they can hardly be said to "invent," so that looking at their work is like gazing out of a window on their daily life and doings. Yet their works have an air of so much originality that they attract those ignorant of art equally with those of culture; and this is precisely the influence the decorative work in our public buildings should have, and indeed would have, if done in the same spirit. In support of the general propositions I have laid down, you will pardon me giving a few extracts from my note-book,—quotations from various authorities. Professor Ruskin says:—

"The first element is the love of Nature leading to the effort to observe and report her truly. This is the first and leading element. Review for yourselves the history of art, and you will find this to be a manifest certainty, that no great school ever existed which had not for primal aim the representation of actual fact as truly as possible."

Again he says:—

"Now, therefore, you who wish to encourage art in England have to do two things with it; you must delight in it in the first place (that can certainly be placed to our credit), and you must get it to serve some serious work in the second."

The late Owen Jones, whom I believe you value as an able writer and sound authority on decoration, says:—

"I have endeavoured to show that the future progress of decorative art may be best secured by engrafting on the experience of the past the knowledge we may obtain by a return to nature for fresh inspiration. We should regard as our inheritance all the successful labours of the past, not blindly following them, but employing them as guides to keep the true path. . . . The principles discovered in the works of the past belong to us, not so the results. It is taking the ends for the means."

I shall conclude with a quotation from an admirable address on "The Decorative Arts," delivered recently by Mr. William Morris:—

"For your teachers, they must be Nature and History. As for the first, that you must learn of it is so obvious that I need not dwell upon that now. . . . As to the second, I do not think that any man but one of the highest genius could do anything in these days without much study of ancient art, and even he would be much hindered if he lacked it. If you think that this contradicts what I have said about the death of that ancient art, and the necessity I implied for an art that should be characteristic of the present day, I can only say that in these days of plenteous knowledge and meagre performance, if we do not study the ancient work directly, and learn to understand it, we shall find ourselves influenced by the feeble work all round us, and shall be copying the better work through the copyists and without understanding it, which will by no means bring about intelligent art. Let us, therefore, study it wisely,—be taught by it,—all the while determining not to imitate it or repeat it; to have either no art at all, or an art which we have made our own."

With this testimony, I will ask you, in conclusion, Is there any great building of our time which could supply such an authentic history as those of the past which we have reviewed? I know of none, yet noble national and municipal buildings are in existence, and are rising all over the land. Why, if they are to be decorated, should they be clothed with lies rather than the living truth? The time, I venture to foretell, is coming when such vicious practices will not be tolerated, but when art for such a purpose shall be truly exercised, and thus, contributing to historic record, shall in the future be as valuable as the works of those great nations of the past, so that the buildings we leave shall indeed be living stones, telling to our posterity and succeeding generations the manner of men we were in our day in the old time before them.

Mr. H. H. Statham, in proposing a vote of thanks to Mr. Buckman for his paper, observed that the whole subject was one of the most important, with regard to the artistic treatment of architecture, that could possibly be discussed. It really came to this,—whether the real interest of decorative art was to lie in adopting a kind of idealised treatment founded upon what was called "Classic" art, or whether it was to lie in copying directly from the life of the present day. On the whole, he was very much in sympathy with the lecturer's remarks on his view of the subject, but possibly he had unduly emphasised his views, especially on some points. In the first place, it had been laid down as a principle that the decoration of public buildings should be, before all things, historical, and it was perfectly certain that in Greek and Assyrian buildings that was the case. It might be urged, however, that the reason of this was, that there was an impulse to draw historical subjects because there was then no national literature, and therefore the value of ornament as history was much greater then than was now the case. Considering the means now taken for the preservation of literary records in the great libraries and museums, he thought that the importance of making decoration historical was not so great as it was in the days when popular literature did not exist. The question arose, how far could our modern costume be introduced into the decoration of our buildings? Everybody admired the Pan-Athenaic frieze, to which reference had been made, and which was simply a transcript of the scene that took place during the annual festival at Athens. It was slightly conventionalised, as in the horses, which were not quite natural, but the conventionalism was only such as to bring the whole within the conditions of sculpture. A real parallel to this frieze in modern life would be to decorate the Houses of Parliament with a frieze representing the Royal Procession, with carriages, horses, soldiers, and policemen, on the occasion of the opening of Parliament. If this scene were faithfully depicted, including the chimney-pot-hats and coat-tails of the bystanders, it was a question whether it would not be regarded as absurd. He believed that people had a sort of innate feeling for Classic art. The moderns were less child-like in their notions of art, and when they took figures to adorn a building they wished to have ideal representations in stone of abstract ideas, rather than exact copies of what they saw around them. One reason that might be urged in favour of the Classic style in decoration was that Greek costume was independent of fashion, whereas our own fashions in costume changed very much, and it was exceedingly difficult to attach a permanent architectural character to passing fashions. Greek decorative sculpture was really good, not because it was Greek, but because it was abstract. What we wanted was a kind of abstract poem in stone rather than what we actually saw. He agreed with Mr. Buckman in saying that Japanese work was beautiful in colour, but not always in form. Now, we admired the Pan-Athenaic frieze, not for colour, but for the beautiful lines of its sculpture; and regarding sculptural decoration in reference to its application to the exterior of buildings, form was more important than colour in this climate. The kind of decoration which would lend itself best to fine forms was more important than that which depended for its effect entirely upon colour. He would sum up in this way: if one had to decorate the exterior of a building with sculpture,—say a bas-relief,—what the majority of thinking people would admire would be, perhaps, portraits of contemporary persons as realistic in expression as they could well be; but there would be nothing incongruous in idealising their costume so as to separate it from the passing fashions, and give it a permanent value. In conclusion, Mr. Statham expressed his admiration of the way in which Mr. Buckman had illustrated his principles in his works.

Mr. W. H. White, in seconding the vote of thanks, said he laboured under a disadvantage in following so fluent a speaker as Mr. Statham, who had not only said many good things in his speech, but he had said them well. He (Mr. White) had come to the meeting with special pleasure, feeling that Mr. Buckman would instruct and delight with his pen as he had already done with his brush and pencil. He could only regret that the lecturer had not brought with him some of those admirable pictures which he had exhibited at the Royal Academy, such as "London Street Minstrelsy," and "The Tug of War," which were admirable examples of what contemporary decoration should be. Mr. Buckman's attempts had been very nearly akin to what only the ancient Greeks actually effected, viz., to portray on the walls of their buildings, in marble or stone, the customs and the costume of their own time and of their every-day life. And the Greeks appeared to have continued this at any rate during the earlier part of the Roman domination; he (Mr. White) doubted, however, from what he had seen on the painted walls of houses in Pompeii, whether the architecture there represented was really anything else but fantastic, for he could find nothing in Italy which resembled the wonderful columns of bronze or iron which occurred in many of the representations. He should hardly think, either, that all the pictures on the walls could be called representations of Pompeian life. In the Middle Ages, at least until the middle of the thirteenth century, Roman tradition continued, and with such power that it was difficult to believe contemporary manners to have been faithfully represented, either in sculpture or painting. It was impossible to avoid thinking that old pictures,—in the few early MSS. extant for instance,—had been copied and re-copied from generation to generation and from century to century. The question would arise, if we painted the walls of our sitting-rooms and dining-rooms with subjects of every-day life, whether after a few years they would not pall upon us. To be always looking upon the same picture, however beautiful, was rather tiresome, and it would be desirable, he thought, to be able to change the pictures occasionally. Another point to which he wished to allude was that while decorating rooms with paintings and bas-reliefs, there should also be introduced what the Assyrians introduced with such good effect into their sculptures, namely inscription-work. The lines of printing or writing upon Assyrian sculptures were very beautifully arranged, and such a mode of decoration had the further recommendation that it was calculated to be useful to posterity. If nicely and not too prominently arranged, inscriptions could be more usefully employed than a lot of meaningless mouldings. What would the Egyptian obelisk be worth if it had not its hieroglyphics to give it interest? Mr. White, in conclusion, asked permission of the president to say that he had been obliged to postpone the paper he had undertaken to read at the next meeting. He promised, however, at the beginning of next session a comprehensive paper on the Paris Building Laws; and he was sure that his friend Mr. Mathews would be able to devote the whole evening of the 22nd to the suggested "Model Bye-laws."

Mr. Holyoake congratulated Mr. Buckman upon having read a very excellent paper. He (Mr. Holyoake) came more especially to hear what arguments could be used against what appeared to him to be almost an artistic truism. The logic of the argument adduced by Mr. Buckman appeared to be so strong that although the remarks of Mr. Statham were very ingenious and thoughtful, they did not touch the real principle advocated. The objections raised were directed rather to evils that might arise if the principle were injudiciously carried out or exercised with insufficient discretion. Whether the subjects which Mr. Buckman had himself taken ought to be confounded with his principles was a question worth some consideration. There were, however, many contemporary subjects, which could be used for decorative purposes without objection on the score of ugliness of costume. It was clearly proved that there never had been an art, whether decorative or otherwise, which had held a permanent position in the world, which was not contemporary. The question whether modern costume could be treated with success for sculpturesque purposes was, he admitted, a very serious one; but whatever ingenuity might do towards the solution of the problem,—and it could do a great deal,—it was imperative that a contemporary fact should be the basis of every piece of contemporary decoration. How it should be treated would be matter for the discretion of the artist.

Mr. R. Phené Spiers said that the question how far the artist was justified in adopting modern costume in the representation of historical scenes was one which had often been taken up. He was almost entirely of Mr. Buckman's views on the matter. Mr. Walter Crane, who was, taken all round, the greatest decorative artist we had, had in his book-illustrations and other works shown how successfully modern costume could be treated and adapted to artistic purposes. The real difficulty in the way of the decoration of our buildings was that architects could not persuade their clients to allow them to call in the aid of painters and sculptors to work with them,—which was done very generally in France.

Mr. S. Flint Clarkson said that the history of West's painting of the "Death of Wolfe," referred to, bore on only one of the points which Mr. Buckman desired to establish. It was in itself an easel-picture, not intended as an integral portion of the decoration of a building, and was in full colour. Though it might be adduced in favour of the argument for fidelity and truth in

the representation of contemporary subjects, it did not bear on the question whether modern subjects should be exclusively selected for the decoration of modern buildings. As to the selection of modern subjects for decorative treatment, he believed that the things that would interest posterity were the very things that most interested ourselves.

Mr. Walter Crane said he agreed in the main with Mr. Buckman's views, though the very fact that the subject should need discussion showed that there was possibly something to be said on the other side. It was difficult to imagine the sculptor of the Pan-Athenaic frieze, for instance, discussing with himself whether or not he should represent his figures in the costume of the Egyptians. As to modern costume, it was almost as difficult to say what it was as to say what was modern architecture; in both it was difficult to say where the modern began and where the ancient ended. As to the treatment of decorative subjects, it all depended upon the aim of the decorator. If he intended to paint for the antiquary and historian, he might adopt Mr. Buckman's suggestions; but it was very probable even then that posterity would find in the pages of *Punch* the best records of our costume. As to the ceiling of the Sistine chapel, it could scarcely be wished that the figures should have been clothed in the costume of the sixteenth century.

Mr. H. H. Stannus said that Mr. Buckman had quoted words from Ruskin leading up to the dictum that every artist ought to paint pictures in the costume of his time; because an artist was not an archæologist. In Paolo Veronese's "Marriage at Cana," the figures were represented in the costumes of Venetian noblemen, gentlemen, and ladies, of the sixteenth century; but had Michelangelo represented his grand figures in the Sistine Chapel in contemporary costumes they would have been ridiculed by all posterity. The fact was that Ruskin had only stated half a truth. The painter should only depict the costumes of his own time, provided that he only painted scenes of his own time. If, however, he painted scenes in past history, he should take the best means of being archæologically correct in his costumes and accessories. He agreed with much that had been said as to the possibility of making existing costume presentable in pictures, and he thought that the coats and hats we wore now would be thought as picturesque a hundred years hence as we thought the coats and hats of a hundred years ago.

Mr. W. Scott said it seemed to him that the painters would have to exercise considerable discretion in the selection of modern subjects for purposes of artistic decoration. Many incidents of modern life were undoubtedly capable of artistic treatment, but it was difficult to see how the steam-engine, a subject pre-eminently associated with modern progress, could be satisfactorily treated if introduced into art decoration, for no decorative painting could be entirely satisfactory if the things depicted were themselves ugly.

Mr. R. E. Pownall said the subject of the paper was a wide one, and one in which architects, painters, and sculptors must work together harmoniously if satisfactory results were to be obtained. A notable instance in which modern subjects had been introduced into the decoration of a modern building was one with which, he was afraid, an architect had very little to do; he meant the Albert Hall, where in the external tile-frieze, engineering, iron-founding, the electric telegraph, and modern husbandry were depicted with great success, the costumes of the figures being all essentially modern. That people cared more for subjects of their own time than for antiquarian or historical subjects was, he thought, proved by the fact that in the Academy and at other exhibitions of pictures a great many more people crowded round such works as Mr. Fildes' "Casuals," and Miss Thompson's "Roll Call," than gathered round the most charming and interesting historical painting. The public taste in this respect was seen in the demand for illustrated newspapers, which were mainly devoted to the representation of passing events. In *Punch* the costumes of the figures represented were for the most part modern, but Mr. Du Maurier's pictures were always artistic, notwithstanding that the "claw-hammer" constantly figured in them. One point frequently lost sight of was, that there was a great difference between the treatment desirable for an easel-picture and that desirable for a painting intended as a permanent decoration. As to selection, the painter was surely under no obligation or necessity to paint anything which he felt he could not treat successfully.

Mr. L. F. Day agreed that it was a matter for the artist's own choice what subjects he painted, whether for decoration or for easel-pictures. The great difficulty was to get good artists to do decorative work, as they got such high prices for easel-pictures that they did not care to "lay themselves out" for it. As to the works of the old masters, he did not suppose any of the great historical works of painted decoration were painted by one man. The old masters had whole hosts of pupils working under their supervision, who, no doubt, did much of the filling-in of the works with which the name of the master-minds only were associated. To this division of labour was no doubt due the severity of treatment which characterised the works of which he was speaking, for it was necessary under such circumstances to dispense with delicacy of outline.

The vote of thanks having been put and carried,

Mr. Buckman briefly replied on some of the points raised in the discussion, his remarks being to the effect that while it was true that we had now special means for preserving books, and while, at the same time, we had a pictorial literature, it was very doubtful indeed whether such records of our doings would survive for two or three thousand years, as had been the case with the wall pictures of the Assyrians and Egyptians. Furthermore, many of the pictures in our illustrated newspapers, while giving a fair general idea of the event or scene depicted, were often either incomplete or absolutely incorrect in detail. He did not think it would be impossible to treat with good artistic effect in the form of a frieze the procession of the Queen to open Parliament or even the Lord Mayor's show, but to do either successfully would need, as in other things, judgment in the selection. As to modern costume, it was not unsusceptible of effective treatment. It was not absolutely necessary to "fix" the fashions. Some of the present fashions in women's dress were very pretty. As to the paintings in the Sistine Chapel, it should be remembered that the figures of the prophets and sibyls were abstract representations, and therefore it was, in his opinion, perfectly allowable that they should be clothed in Classic drapery.

THE DUCAL PALACE, VENICE.

SIR,—In his Royal Academy lecture, reported in last week's *Builder*, Professor E. M. Barry criticised the famous Venetian palace as essentially faulty in design; "no skilful architect would place all the weight at the top of a building and all the lightness below;" and he added that the design bore evidence of having been altered in its execution, and of being the work of different architects.

Every rightly-constituted architectural mind would concur in the soundness of the criticism, and the probability of the conclusion drawn; but, in fact, I believe there is no need for conjecture in the matter at all. If Professor Barry turns to the last-published portion of Yriarte's fine work on Venice, he will find in the chapter on "the Doge" a reproduction of an old engraving representing the ceremony of the wedding of the sea, in which the Ducal Palace is shown with a light upper story, pierced with good-sized windows, and totally different from the heavy mass of the present building which is the delight of "modern painters," and the object of criticism with modern architects. The engraving is not dated, but is crude in execution, and obviously of an early period, and there can hardly be a doubt that it represents the first phase of the Palace before the re-building of the upper portion. Attention is drawn to it in the review of Yriarte's book in the *Builder* of January 26th of this year.

H. H. STATHAM.

ST. BOTOLPH'S, BISHOPSGATE.

SIR,—Will you allow me, through the medium of your paper, to inform the citizens of London, and the public generally, that the fine old Church of St. Botolph, Bishopsgate, is now being decorated from my designs, and under my immediate superintendence?

My great object throughout has been to keep the general colouring suitable to the style of architecture, and to use my colours in such a way as to bring out the architectural features of the building.

J. T. CARTER.

THE FALL OF BUILDINGS IN THE HAYMARKET.*

THE inquest into the cause of the death of Mr. William Baron was resumed and concluded at the St. Martin's Vestry-hall on Friday, the 8th inst., before Mr. St. Clair Bedford, coroner for Westminster.

Mr. W. Wyke Smith watched the case on behalf of the Metropolitan Board of Works; Mr. Norman Bazalgette appeared for the district surveyor (Mr. Robert Walker); Mr. Poland for Messrs. Newman & Mann, the builders; Mr. M'Coll for the relatives of the deceased; Mr. E. Clarke for the architect (Mr. W. Wimble); the Hon. J. de Grey for the owners of the house in which deceased lived; and Mr. Reid for Messrs. Shaw & Co., who supplied the ironwork.

Mr. Charles Markham Chittick, examined by Mr. Reid, said he was a civil engineer, and partner in the firm of Messrs. M. T. Shaw & Co., engineers and ironfounders, of Cannon-street, E.C. His firm contracted for the supply of the whole of the structural ironwork required for the new building in the Haymarket. They contracted to supply both wrought and cast iron. On the 3rd of September last proposals were made to his firm by Mr. Lunn, the manager for Messrs. Newman & Mann, the builders, to supply them (Newman & Mann) with the ironwork required for the new building, as shown on the architect's drawings. On the same day he (Mr. Chittick) wrote to Messrs. Newman & Mann naming the prices at which they (Shaw & Co.) would be prepared to undertake the work, stating at the same time that the wrought-iron work would be manufactured by them at their Waterloo Bridge Wharf, and that the cast-iron columns would be procured by them from some London foundry. Their offer was accepted by Messrs. Newman & Mann, together with a suggestion made by them (Shaw & Co.) a day or two later, that to ensure accuracy of bearing one upon another the tops and bottoms of the cast-iron columns should be turned in a lathe, in accordance with their invariable practice in such cases, at an extra cost of 7*l.* 10*s.* for the entire job. In compliance with this arrangement, the wrought-iron girders and the rolled-iron stanchions and joists were supplied direct by them, and they commissioned Messrs. Horn & Co., engineers and ironfounders, of High-street, Whitechapel, to cast the columns, which were delivered direct on to the building works in the Haymarket by the founders, without being seen by or coming on to the premises of Messrs. Shaw & Co.

Mr. Nathan Solomon Joseph, of the firm of N. S. Joseph & Pearson, 34, Coleman-street, examined by Mr. Poland, said he was an architect and surveyor, and had been in practice for twenty-one years. He had known the firm of Newman & Mann for more than twenty years, and they had been the builders of a large number of structures of which he had been the architect,—to the extent of 80,000*l.* or 90,000*l.* They had obtained the whole of that work by competitive tendering, in the usual way. The day after the fall of the buildings in the Haymarket they consulted him, and requested him to make an examination of the *débris* in order to ascertain, if possible, the cause of the accident. He had no previous knowledge of the building. He had examined the remains, and also the plans and working drawings of the new building. The model [produced] had been made under his supervision, in exact accordance with those drawings, with the exception of the party-wall, which was shown on the plans as a new wall throughout. He had been many times to examine the remains of the building, and attended when Mr. Vulliamy, the Superintending Architect of the Metropolitan Board of Works, made his inspection, Mr. Wimble being also present. He (Mr. Joseph) had carefully calculated the weights that would be upon the different parts of the new building. Upon the old party-wall the weight per square foot on the part where it was cut away, *i.e.*, upon the balance of the wall which remained after the cutting away, would be 4½ tons per square foot, assuming that the quantity cut away was as much as was stated by Mr. Wimble. On the assumption that the quantity cut away was not more than was stated by the foreman, Gooch, the weight upon the portion of the wall where it had been cut away would be, roughly speaking, about one ton less per square foot. In his (witness's) judgment, a safe

* See pp. 84, 121, 175, 227, and 243, *ante*.

weight to put upon an old party-wall, if it were sound, was from 7 to 8 tons per square foot. If a party-wall were sound enough to be kept up, it ought to bear that load. An old wall was as good as a new one, if sound. He had calculated the weight which was borne by the iron stanchion which rested on a portion of the old party-wall next to Mr. Baron's house and carried one end of the longitudinal wrought-iron girder or bressummer which supported the Haymarket front of the new building. The total weight resting upon the stone base (which in its turn rested on a part of the old wall) would be 24½ tons, including the weight of the stanchion itself. The weight per square foot upon the old brickwork beneath the stone base would be 18½ tons. He had carefully examined the ruins of the old party-wall, which was completely crushed, with the exception of the underpinning, which was perfectly sound. From the condition of its remains, he should say that the old party-wall could not have been sufficiently sound to warrant its retention. The iron stanchion referred to had fallen nearly perpendicularly, and almost *in situ*, and was found leaning against the wall of the front basement area, thus, *f*. It had dropped down on its foot. The brickwork upon which it had rested was crushed away in a sloping direction, exhibiting a line of shear or slide in the direction in which the stanchion had fallen. In his judgment, the slide was caused by the compression and crushing of the old brickwork. The stone base upon which the stanchion rested was unbroken: it had simply slidden off. In his opinion, the old brickwork upon which the stanchion rested was insufficient to carry the weight put upon it. Judging from what remained of the old party-wall, he should say that it would not have been safe to put more than 7 or 8 tons per square foot upon it. The effect of the giving away of the stanchion would be to let down the horizontal girder supporting the Haymarket front of the building. The sticking of the doors in Mr. Baron's house would indicate some movement or settlement in close proximity, but such slight settlements very frequently happened when a tall building was erected next to a low one. The sinking of the flagstones in the kitchen of Mr. Baron's house, stated to have taken place about six weeks before the date of the accident, would not, he thought, have been due to the under-pinning of the party-wall done in August. He had carefully examined the position and condition of each of the iron columns, stanchions, and girders, and had prepared a plan [produced] showing their exact position in the *débris*. Not one of the columns in the basement was broken, notwithstanding that one of these unbroken basement columns was a very defective one. The columns in the basement would, of course, have to bear a much greater weight than those on the ground and upper floors. Altogether, there were five imperfect columns, three out of the five being broken. There were thirteen columns in which he could see no defect whatever: they appeared to be perfect. Of these thirteen perfect columns, four had been broken by the fall of the building. The breaking weight of each of the basement columns, supposing them to be perfect, would be about 500 tons. The breaking weight of the broken column on the first floor would be about 300 tons. The safe weight to put upon such columns was usually considered to be one-tenth of the breaking weight, so as to allow ample margin for imperfection in casting and for sudden jars. He did not think that any of the columns had broken from having to bear an undue weight, because those in the basement, which had to bear the greatest weight, were none of them broken. He believed that the columns which had broken were broken by the fall of the building. In his judgment the cause of the accident was the giving-way of the old brickwork beneath the stanchion at the end of the Haymarket front next to Mr. Baron's shop. He believed that when the stanchion slipped, the weight upon the bressummer carrying the greater part of the Haymarket front of the building caused it (the bressummer) to drop down at the end which had been borne by the stanchion, exerting an enormous leverage upon the centre column in the Haymarket front. The weight of the superincumbent brickwork and stonework carried by the bressummer in question was about forty-nine tons. The leverage exerted by this great weight broke the ground-floor column in two, and it fell in a northerly direction,—*i.e.*, in the direction of the frontage line towards the corner of Panton-street, the superincumbent masonry falling in the same direction, and carrying the whole of the building with it. He was led to this conclusion from the fact that, as shown on the plan he produced, all the columns had fallen in almost the same direction,—almost due north, or towards Panton-street. The longitudinal iron girder or bressummer supporting the Haymarket front was carried by the fall of the building in a straight line along the line of front for a distance of about 14 ft. from its bearings. He believed that the lower portions of both the Haymarket and Panton-street fronts fell outwards, and that the upper parts of both fronts fell inwards. He could account for this from the fact that the external faces of the front walls were of masonry, with thin joints 2 ft. or 3 ft. apart, while the interior of the walls was of brickwork, with the joints wider and much more numerous; consequently, the interior portions of the walls contained much more compressible material than the exterior, and this would, in his opinion, cause the walls to fall in the way he had suggested. The staircase trimmers being fixed in the party-wall were pulled over away from it when the building was falling, and the shock and pull thus imparted were the cause, in his opinion, of the fall of the party-wall. The party-wall had fallen almost vertically, *i. e.*, almost directly towards or upon its base. He did not think that the circular girder at the corner had anything to do with causing the accident. There was very little weight supported by it, there being window-openings all the way up the corner. If the old party-wall were out of plumb, it would of course have a considerable tendency to fall in. In his judgment, the primary cause of the accident was the crushing away of the brickwork under the iron stanchion at the end of the Haymarket front. In other words, the accident, he believed, had arisen from an error of judgment in resting a stanchion which had to bear a great superincumbent weight upon a small portion of the old wall. It was a decided error of judgment to put so great a weight upon so small an area, especially of old brickwork. Judging from the evidence he had heard, and from what he saw on carefully examining the *débris*, he should say it was a great error of judgment to build upon an old wall so much out of plumb as this was stated to be. He did not believe that the cutting away of the wall, as described by previous witnesses, had anything to do with the accident. His reason for saying this was that if the cutting away did cause the accident, it must be concluded that a weight of 4½ tons on the square foot *did* crush the old brickwork, while a weight of 18½ tons per square foot *did not* crush it, unless the wall failed at both points at the same moment, which was, in his opinion, quite contrary to and beyond the probabilities of the case. If the work had all gone together, the stanchion next to Mr. Baron's shop would, in his opinion, have been dragged over in the same direction as the iron columns, *i.e.*, in the direction of Panton-street. He should not have thought of inserting stone steps into the old wall.

Cross-examined by Mr. Clarke, the witness said that a wall which was out of plumb ought not to have been built upon. It was but a matter of common prudence to plumb an old wall before commencing to "raise" new work upon it. It was quite possible for a wall to be considerably out of plumb, and yet for such a circumstance to be unnoticed by the eye, unless the defect were looked for. It was frequently the case that old walls did not "string straight" from back to front: that they were found with a slight wavy or in-and-out surface. New work raised on such walls would necessarily "oversail" slightly in some parts, but such walls might generally be safely used unless they were out of plumb vertically. He did not think that it was wise to cut into a wall which was out of plumb; in fact, it would be dangerous to use such a wall as had been described, *à fortiori* to cut into it. It was a very great error of judgment to cut into the wall, but he did not believe that the cutting of the wall was the cause of the accident. The amount cut away was only one-forty-seventh of the entire area so operated upon. Did not think that the recess cut into the wall as described was a "chase" within the meaning of the Metropolitan Building Act. There was no definition of "chase" in the Act. He should define a "chase" to be a long groove built or cut in brickwork or masonry. He did not believe that a recess of the shape and dimensions of that described as having been cut in the wall was a "chase." He should say that to cut a perpendicular "chase" from top to bottom of a wall would weaken the wall more than the cutting away of such a recess as had been described, as in the former the bond would be more broken. He should not have used the old wall at all had he been the architect of the new building, and therefore it was useless to ask him whether he should have allowed it to be cut into. He adhered to the belief that the accident was caused by putting the stanchion referred to on the old brickwork, which, immediately underneath the stone base, was completely crushed. He believed that the iron girder or bressummer was not tied to the stanchion, but that fact would not account for the stanchion not being dragged over in the same direction as the rest of the ironwork. The iron stanchion had not been turned completely round, but was twisted at right angles to its original position; he could not say in what direction. He did not know the dates at which the various portions of the superincumbent structure had had their weight brought upon the stanchion. Assuming that the whole of the weight had been on for two or three months, it was quite possible that the work might have stood "by accident." Thought that it was an accidental circumstance that the small area of old brickwork under the iron stanchion was not crushed under its weight of 18½ tons per square foot much earlier than he believed it was. Could give no explanation of its having stood so long, comparatively, and then suddenly yielding. Presumed, however, that extra structural weight was put upon the building day by day, and understood one of the previous witnesses to say that a number of floor-boards and stone steps had been delivered on to the works, and stacked on parts of the building, within a few days of the building falling. If so, this extra weight would be felt at a weak point. Believed that the old brickwork under the stanchion must have been ready to crush at any moment. The cutting away of the recess would, no doubt, somewhat weaken the party-wall; but if, as had been stated, before the men left work the recess had been two-thirds or three-fourths filled up with new brickwork in cement, this, even in the four hours which elapsed between the men leaving work and the time of the accident, would have partially restored the strength of the wall. The crushing-weight of brickwork was from 20 to 30 tons per foot super., depending upon the nature of the bricks and the mortar or cement. There was great difference of opinion as to the loads which brickwork would bear, but it arose from the variableness of the materials; there would not be much difference of opinion upon identically the same bricks and mortar. In his (witness's) judgment the safe load for brickwork was from 8 to 10 tons per square foot.

The Coroner.—Believing, as you say you do, that the brickwork under the stanchion was liable to give way at any moment, do you think that the cutting of the recess would increase the tendency of the wall to give way?

Witness.—I do not think that the cutting of the wall accelerated its fall, because the nearest point at which the work was cut away was 13 ft. from the point where the stanchion rested.

By Mr. Bazalgette.—Would not say that the space cut away was in compliance, even as a recess, with the terms of the Building Act. Thought it was beyond the limits of size prescribed by the Act. Would not say that it was a recess in accordance with the rules of the Building Act. A recess ought to be arched over, but if the cutting into the wall was as shallow at the top as had been described by some of the witnesses, the arch, if there could have been one, would have had a soffit of only 1½ in., which was an impossibility. Had calculated the weights which the columns would bear by Hodgkinson's tables, taking the thickness of metal, diameter, and height specified, assuming that the castings were good ones, and in accordance with the specification. The accident had not altered his opinion that cast iron was a treacherous material.

Mr. Poland stated that he was prepared to call two more witnesses (Mr. E. A. Gruning and Mr. H. H. Collins) in support of the evidence given by Mr. Joseph, but as he understood that Mr. Clarke was only prepared to call one witness, he (Mr. Poland) would forbear.

Mr. Clarke said he would content himself with calling only one witness, Mr. Porter, seeing that Mr. Clifton and Mr. I'Anson, whom he had intended to call, were not present.

Mr. Reid said he was prepared to call Mr. Kirkaldy to give evidence as to the strength of the ironwork; but

The jury expressed their opinion that they had heard enough about that.

Mr. Frederick William Porter, examined by Mr. Clarke, said he was an architect, practising at 16, Russell-square. He had had great experience in building, and since the day of the accident he had inspected the plans and drawings from which the new building in the Haymarket was being carried out. He had carefully examined the *débris* of the fallen buildings, and had heard the greater part of the evidence given by the various witnesses. He attributed the accident to the failure of the party-wall, and was further of opinion that the wall failed by reason of something that took place immediately before the accident. Had heard the account of the recess which had been cut into the wall on the afternoon preceding the evening of the accident. Thought that the cutting away of the wall contributed very largely towards, if it did not altogether cause, the accident. In his opinion, the appearance of the remains was inconsistent with the theory that it was the sinking of the iron stanchion that brought the whole building down; for he believed that the iron stanchion in question was almost the last part to move, instead of being the first. Supposing that the weight resting upon the stanchion had crushed the brickwork below, the crushing would have been a gradual process, and some signs of its yielding must have been shown by the cracks in the superincumbent masonry of the Haymarket front. He was of opinion that if the stanchion were the cause of the accident, the building would have fallen over towards the south-west corner, *i.e.*, towards the point on which the stanchion had rested. The subsidence of the sink in Mr. Baron's kitchen was inconsistent with the theory that the slipping of the stanchion was the cause of the accident. With respect to the ironwork, he agreed in saying that the columns were very bad, and could not help thinking that the defective character of the ironwork must have contributed to the accident to some extent.

By the Coroner.—Thought that the party-wall was the first moving part, and that its movement caused an undue strain to be put upon the iron columns. Could not say whether, if the iron had been absolutely perfect, the building would have stood. Thought that even had the ironwork been all good, the shifting of the wall might suffice to bring down the whole structure.

By Mr. Poland.—Did not mean to say that the ironwork had nothing to do with the accident, but believed that the primary cause was the failure of the party-wall. It was only an act of common prudence to plumb an old wall before building upon it. Believed that it would have been better not to have rested the iron stanchion upon a piece of the old wall, as described, but he saw nothing in the remains of the old wall which would have led him, beforehand, to say that it was an improper thing to do. Thought that the cutting into the old wall, with the weight of new wall above it, was a most imprudent thing to do, and believed that it had mainly, if not entirely, caused the building to fall. Thought that if the wall had not been cut into, the building would have been standing now. To the best of his judgment the iron stanchion came down last of all. Thought that it was pushed out by the falling *débris*, and that the old brickwork had been crushed, as described, by what fell upon it.

By Mr. Reid.—Did not suppose that any ironwork, however good, would have sufficed to keep up the superstructure after the failure of the party-wall.

By Mr. Bazalgette.—The subsidence of the sink was consistent with the theory that the accident was caused by the yielding of the party-wall.

By Mr. Clarke.—The fact that the wall had stood for three months after the addition of a great mass of superincumbent weight, and exhibited no substantial alteration, would be, in his experience, presumptive proof that it was safe. Did not believe that anything would have happened to the wall unless it had been interfered with by being cut into. If the stanchion had been the first point where the building had failed, the brickwork beneath it would have been more thoroughly crushed than at any other point; but, as a matter of fact, it was at that point that the brickwork was least crushed.

Mr. George Vulliamy, the Superintending Architect of the Metropolitan Board of Works, was re-called, and, in answer to the coroner, said he had, at the request of the Metropolitan Board of Works, carefully examined the remains of the buildings. He had also heard the evidence which had been given by the various witnesses, and from what he had seen and heard he had endeavoured to form an independent judgment as to the cause of the accident, being in no way biassed by any personal considerations in favour of or against any one particular view, his sole desire having been to form a correct judgment, to the best of his ability, on the merits of the case. In his judgment it was a very injudicious thing to tamper with the party-wall at all; it was a question, indeed, whether the old portion of the wall ought ever to have been retained,—whether it ought not to have been entirely pulled down and rebuilt, as originally contemplated and shown on Mr. Wimble's drawings. He said that because, according to some of the witnesses, the wall was considerably out of plumb, although the evidence as to the quality of the wall was conflicting, some witnesses saying it was a decent wall, others that it was a tolerably good one, and others that it was a very good one, while another witness said it was "spongy." He (Mr. Vulliamy) could not say from the remains what sort of wall it was. If it were out of plumb, it was very indiscreet indeed to use it, and to raise upon it upwards of 40 ft. of new wall. Had he been acting for an employer, he should certainly have dispensed with the old wall altogether, and pulled it down entirely, in spite of temporary inconvenience to the adjoining occupier. The deceased seemed to have been anxious that the old wall should be kept up, in order that his business should not suffer; but it did not appear that the portion of the old wall was retained merely out of deference to his representations. He (witness) knew from experience in seeing that the law was carried out in connexion with the Dangerous Structures Act, that people would use almost any amount of persuasion and cajolery in the hope of prevailing upon himself and the district surveyors to allow old and dangerous party-walls and other unsafe structures to stand; but he always turned a deaf ear to such entreaties when he had any reason to suppose that a structure was unsafe. Having, however, kept the party-wall up, and raised new work upon it, it was a most injudicious thing to cut into it as it had been cut into according to the witnesses. Had it been absolutely necessary to cut into the wall at all, a careful and prudent man, before cutting out such a large recess with hammer and chisel, would have removed a brick here and there, and thrust his hand in with the view of ascertaining whether the wall was sufficiently sound to stand the operation,—whether the mortar was loose or solid, or whether it was "trembling." Supposing that from such an examination it might be fairly inferred that the wall would bear cutting into, before commencing to cut it, it should have been shored up on either side with raking shores, which should not have been struck for a week after the new brickwork had been filled in. He could not help thinking that the cutting away of the wall was the primary cause of the accident. The iron columns were certainly very defective; but even had they been perfect they could never have borne, and were never intended to bear, the undue and improper lateral strain which must have been thrown upon them on the supposition that the first movement took place in the wall. He could hardly speak positively as to the direction which the building took in falling: it was a scientific question, involving a consideration of the composition and resolution of forces. He could not divest his mind of the idea that the cutting into the lower part of the party-wall was the primary cause of the accident. He did not think the cause was the giving way of the brickwork on which the iron stanchion referred to was bedded, seeing that the stanchion had stood for a long time—some months—without showing signs of sinking, and without the appearance of any cracks in the face of the front wall; whereas the theory that the failure of the party-wall was the cause of the accident received support from the undoubted fact that the wall had been cut into only a few hours before the buildings fell.

The Coroner, in summing up, said what the jury had to determine was how the deceased came to his death. If they determined that he came to his death by the fall of the buildings, they would have to say, if they could, what caused the houses to fall. If they were of opinion that it was caused by the using or the cutting away of the old party-wall, it would be for them to determine whether any one, and if so who, was criminally responsible.

The jury then retired, and after an absence of fifty minutes, returned into court with the following verdict:—"We find that William Baron met his death by the falling of the houses in the Haymarket, caused through building a new wall on part of a defective old party-wall, and that great blame is attributable to both the architects and the district surveyor for permitting such wall to be built upon."

The Coroner.—I presume you do not mean criminally to blame?

The Foreman.—No, sir.

Thus ended this important inquiry, which would perhaps have been more thorough, as well as more speedily got through, if the coroner could have been assisted by a professional assessor. However conscientious and painstaking a coroner may be, it is hardly to be expected that he can readily grasp all the technicalities of building brought into prominence by such an inquiry; and much time must generally be lost in getting him to understand the technical evidence. Many of those who had to attend the inquiry had reason to anathematise the defective arrangements, for not only were there no seats for solicitors, witnesses, or reporters, but even standing-space was hardly obtainable, owing to the smallness of the room. With the two windows of the room opened the ventilation was very inadequate, and it was difficult to hear the evidence; when they were shut (as they were sometimes, on account of the noise of passing traffic) the heat was insufferable and the air pestiferous. It is not creditable to the authorities that such an important inquiry should have had to be conducted amid so much discomfort,—discomfort so great that the coroner more than once bewailed it, although, as the place was put at his disposal by the parochial authorities, he was thus compelled to seem so ungracious as to "look a gift-horse in the mouth."

THE HOOGHLY FLOATING BRIDGE.

THE INSTITUTION OF CIVIL ENGINEERS.

AT the meeting on Tuesday, the 5th of March, Mr. Bateman, president, in the chair, the paper read was on "The Hooghly Floating Bridge," by Mr. Bradford Leslie, C.E.

This bridge connected Calcutta on the left with Howrah on the right bank of the Hooghly, at a short distance north of the East Indian Railway terminus. Various projects had been from time to time proposed, but ultimately the preference was given to a floating bridge, as it could be more cheaply and expeditiously constructed than a fixed bridge. The design was prepared in 1868, when it was intended to be carried out by a joint-stock company; but after much delay, in 1872 it was undertaken through the agency of the Local Government of Bengal. The work was commenced in January, 1873, and the bridge was opened for traffic in October, 1874.

The present structure was the first, and, up to this date, the only one of its kind, affording headway for river navigation. It divided the port into two sections. The lower port was occupied by sea-going ships and steamers, and the inland craft and a few coasting vessels. As, however, the graving docks were above-bridge, it was necessary that an opening should be provided for the passage of shipping. The extreme rise and fall of the tide during floods was 20 ft., and at certain seasons there was a tidal wave 6 ft. in height. The maximum velocity of the stream was six miles an hour. The depth of the river at the site of the bridge was variable, the greatest depth at low water being 6 fathoms.

The bridge was 1,530 ft. long between the abutments, and the roadway was 48 ft. wide, with footpaths each 7 ft. in width on both sides, so that the total width of the platform was 62 ft. There were four main longitudinal wrought-iron girders, at intervals of 16 ft. in the width of the roadway, raised by timber trusses, resting upon pontoons, to a convenient height above the water for accommodating the boat navigation. The platform of the bridge was level for a distance of 384 ft. on each side of the centre, at a height of 27 ft. above the water. Thence it fell by inclines of 1 in 40 to a distance of 584 ft. on each side of the centre line, where there was a length of 20 ft. of level platform 22 ft. above the water. Between these points and the abutments were the adjusting-ways, the

shore ends of which were 32 ft. above low water. The approach on the adjusting-ways was by a descent of 1 in 16 at extreme low water, and by a corresponding ascent at extreme high water; but at ordinary times it was either level or only slightly inclined. The platforms of the adjusting-ways were supported on the lower flanges of three bow-string girders, the roadway being divided into two by the centre girder. The footpaths were carried on cantilevers riveted to the outer girders. The bow-string girders weighed 66 tons each. They were 160 ft. long between the end pins on which they were hinged, and had the usual trough-shaped upper and lower members. The shore ends of the bow-string girders were suspended on links, which was preferable to carrying them on rollers, even for fixed bridges, as being less liable to get out of adjustment, and tending always to restore the girder to its normal position at its mean temperature. The outer floating ends were hinged to pivot bearings, in order to admit of a slight drift up and down stream.

The floating portion of the bridge was carried on twenty-eight pontoons, coupled together in pairs to secure stability. With the exception of the two pairs in the centre, which supported the movable sections of the bridge, each pair carried 100 ft. in length of the platform. Each pair was coupled together, at a maximum distance of 48 ft. from centre to centre, by four timber cills, bolted to the decks of the pontoons at intervals of 16 ft. These cills constituted the bottom members of the four main longitudinal trusses, the top members being the wrought-iron girders carrying the roadway. With the exception of the upper girders, the whole of these trusses were of teak. The coupled pontoons were further connected by strong horizontal and diagonal bracing of bar-iron. The timber cills and the bracing being only 4 ft. above the water, the space between the coupled pontoons was not available for navigation, and floating fenders or booms were provided to divert boats from these openings. Ordinarily the main girders overhung the pontoons 21 ft., their ends being supported by the inclined struts of the trusses, leaving a width for navigation of 42 ft., partially obstructed by the raking struts. For the convenience of the country craft, there were two rectangular openings of 60 ft. clear span between the fourth and fifth pairs of pontoons, reckoning from each abutment. The roadway over these openings was carried on eight girders, each 2¾ ft. deep, and weighing 8 tons. They rested on saddles secured to the top of the cross-bearing girders, which were suspended to the ends of the ordinary main truss-girders. All the pontoons were 160 ft. long, by 10 ft. beam, with holds varying from 8 ft. to 11 ft. in depth, according to the dead weight to be carried. Each pontoon, excepting those of the movable sections, was accurately anchored by permanent moorings, laid exactly in line with the centre of the pontoon, the distance between the up and the down stream anchors being 900 ft. The strain on the chain cables varied from 5 tons to 25 tons; their great length afforded the necessary "spring," to allow for the rise and fall of the tide, but a few links were taken in during the dry season, and slacked out again during the flood season.

The 200-ft. opening for the passage of ships was one of the most difficult problems in designing the bridge. Owing to the strength and irregular set of the stream and eddies, ships could only be moved at or near slack tide; and it was a rule that all vessels of more than 200 tons must be moved by steam against the tide. The bridge was generally opened twice a week at high water, but occasionally at low water. The opening was effected by removing the two centre sections of the bridge bodily. These sections were connected with the fixed portions of the bridge by drawbridges, which on being run back left a clearance of 20 ft. on each side of the platform of the movable sections. By means of steel warps, laid to buoys moored for the purpose, these sections were warped up stream far enough to clear the rest of the bridge. They were then disconnected and sheared over, one on each side, leaving a fair way clear of all obstructions. The bridge was closed by reversing these proceedings. The ordinary time taken in opening the bridge was fifteen minutes, and in closing it twenty minutes.

There was a daily traffic of 6,000 tons of heavy goods, which were conveyed in bullock carts, besides foot and carriage passengers. The ironwork of the pontoons weighed 1,650 tons, that of the girders 875 tons. The whole of this, as well as the mooring-chains, was sent from England, and was erected and riveted up in Calcutta. The teak timber, which weighed 1,500 tons, was procured from Burmah.

ARCHITECTS' BENEVOLENT SOCIETY.

The annual general meeting of the Architects' Benevolent Society was held on Wednesday at the rooms of the Royal Institute of British Architects, Mr. David Mocatta in the chair, supported by Messrs. J. H. Hakewill, Horace Jones, G. Elkington, Wyatt Papworth, George Williams, J. D. Mathews, L. H. Isaacs, James Edmeston, T. Hayter Lewis, H. H. Collins, Geo. Godwin, Geo. Scamell, E. Nash, H. Saxon Snell, C. B. Thurston, E. A. Grüning, and J. Goldicutt Turner, hon. sec. Mr. G. J. J. Mair, F.S.A., treasurer, wrote to the effect that in consequence of family bereavement he was unable to be present.

The chairman read the annual report, of which the following are passages:—

"The Council desire to bring to your remembrance the substance of a few sentences uttered twelve months since. In them were summarised the facts that at the close of the year 1875 the hopes of the Society were scarcely realised, and that the finances were in so reduced a condition in 1876 that a special appeal had been determined upon and issued. The result of this appeal falls within the financial year 1877, and to which this Report relates.

The response which our professional brethren made was one gratifying to all concerned in sending out the circular of January, 1877; but the Council still considered that, having regard to the large numerical proportion the London brotherhood held over the provincial, they were inadequately represented in our ranks, and a further call was determined to be made to those in this metropolis who had not already responded; this was accordingly issued in November last.

In these two applications no less than 3,528 circulars in the former and 1,033 in the latter have been despatched, producing the following results to the Society:—74 new subscribers, 90*l.* 6s.; 49 new donors, 275*l.* 3s. 6d.; 5 old subscribers who have increased their subscriptions from 1*l.* 1s. to 2*l.* 2s. in amount, 5*l.* 5s.; 22 previous donors, who have again made benefactions to the extent of 118*l.* 17s. 6d.; or a total gain to the Society upon the year of 489*l.* 12s.

Death has told upon us with its usual unswerving hand, and has removed eight from our list, whilst other incidental causes have lost to us about nineteen more.

The cash at the bankers at the end of the year was 58*l.* 1s., as against 31*l.* 17s. 5d. in 1876, and the stock standing invested in the trustees' names 2,374*l.*, as against 2,188*l.* 15s. 11d. in 1876; this, too, has been achieved after paying all the working expenses, the costs of the two appeals, and distributing to applicants and annuitants 156*l.* more than was disbursed in the year previous.

The number of applications relieved during the past twelve months has been 27, against 21 in the previous year, and the amount distributed has, through the improved state of the funds at their disposal, enabled the council to treat each in a way more commensurate with the status in life the applicants had perhaps before occupied; thus, in 1876, the grants only worked out at the rate of about 13*l.* 15s. each, whilst in 1877 a similar test being applied gives a result of about 16*l.* 7s. 6d.

Amongst the number of those who have passed away from us during the twelve months we have to deplore the loss of the Society's first president, Sydney Smirke, R.A., and of Sir M. Digby Wyatt, M.A., who for some years has been one of the trustees. It is needless for the Council to remind you of Mr. Smirke's never-flagging zeal towards the Society, and of how courteously he took the chair up to almost the last of the general meetings; they can only add that that which was manifest to the public at general meetings he was in private at the different Council Boards. Sir M. Digby Wyatt, too, was ever ready to give his help at the Council, and his purse to the aims of the Society. You will be called upon to-day to elect successors to both these gentlemen.

The Royal Institute of British Architects has continued to lend its aid to the objects of the Society, in the substantial shape of providing accommodation for the meetings of both Council and general meetings, rent free.

In moving the adoption of the report, the Chairman said he thought it afforded much ground for congratulation, inasmuch as the result of the appeals which had been made showed the existence of a certain amount of vitality. The Society had, however, sustained a sad loss in the death of its esteemed president, Mr. Sydney Smirke, R.A.; and of its valued trustee, Sir M. Digby Wyatt.

Mr. E. Nash seconded the motion for the adoption of the report, and said that although the Society was now in a better position than it had yet occupied, nevertheless its funds were still very limited, and its operations were not nearly so extensive as they ought to be. The architects were a very numerous body,—perhaps too numerous,—and it was to be feared that in the future the Society would be called upon to render assistance far more frequently than had hitherto been the case.

The report was unanimously adopted.

The honorary secretary, Mr. J. Goldicutt Turner, read the balance-sheet, which showed that the total income on the general account for the year was 754*l.* 3s., including 9*l.* 8s. 7d. from the Pension account, 318*l.* 17s. 9d. subscriptions, 394*l.* 1s. donations, and 31*l.* 17s. 5d. balance from last year. The total expenditure was 696*l.* 3s. 9d., including 134*l.* 7s. 2d. for printing and stationery, postages, collector's poundage, and clerk's assistance; 178*l.* invested in the purchase of Stock (New Three per Cents.); and 38*l.* expended in gifts to applicants; leaving a balance in hand of 58*l.* 1s. The Pension account showed that 69*l.* 8s. 7d. dividends on Stock had been received, and 60*l.* paid in pensions. The amount of stock (New Three per Cents.) belonging to the Society is 2,374*l.*

The balance-sheet, which was duly signed by the auditors, Mr. T. E. Knightley and Mr. John S. Lee, was adopted, on the motion of the Chairman, seconded by Mr. G. Scamell.

The Chairman, in moving

"That Thomas Henry Wyatt, esq., past-president of the Royal Institute of British Architects, be elected President of the Society, in the room of Sydney Smirke, esq., R.A., deceased,"

observed that the Society could not possibly have a better president than Mr. Wyatt, whose activity, zeal, and courtesy had signalised his presidency of the Institute.

Mr. J. Edmeston seconded the motion, and expressed the opinion that the result of the appeals for aid which had been made on behalf of the Society was not quite satisfactory, seeing that only about three per cent. of the persons applied to had responded. The Society would need all the influence and aid which their new president could lend them.

The resolution was carried *nem. con.*

On the motion of the chairman, seconded by Mr. E. A. Grüning, Mr. G. E. Street, R.A., was unanimously elected one of the trustees of the Society, in the room of the late Sir Digby Wyatt.

The chairman moved that Mr. Waterhouse, A.R.A., Dr. J. S. Phené, Mr. Horace Jones, Mr. J. McVicar Anderson, and Mr. D. Mocatta be elected members of the Council, in the room of Messrs. John Gibson, T. M. Rickman, C. B. Thurston, F. W. Porter, and T. Hayter Lewis, who retired by effluxion of time.

Mr. Elkington seconded the motion, which was carried.

It was also resolved, on the motion of the chairman, seconded by Mr. Elkington, that Mr. George Williams and Mr. J. D. Mathews be elected auditors for the year 1878.

Mr. G. Fowler Jones, of York, who wrote regretting his inability to be present, was unanimously elected a corresponding member of the Council.

The officers of the Society were re-elected, and thanked for their services, a special vote of thanks being accorded to the hon. secretary, Mr. J. Goldicutt Turner.

Votes of thanks were heartily accorded to the Council of the Royal Institute of British Architects for their continued kindness in allowing the use of their rooms for the meetings of the Society; and to the Chairman, for his services in conducting the business of the meeting. It was incidentally suggested during the latter portion of the proceedings that it might be worth while to arrange for a public dinner to inaugurate the accession of the new president, and to bring the claims of the Society more prominently forward. The matter was left to the consideration of the council.

Amongst new donations were one of 3*l.* 3s. from the Worshipful Company of Dyers, and 10*l.* from Mr. Godwin.

Divided Contracts.—The recent establishment of a Builders' Exchange in Cincinnati, and the consequent increase of concert among the building trades, have led, among other things, as we have reported (says the *American Architect*), to a proposition to abolish the system of general contracts, and substitute the practice of letting out every kind of work in a building in a separate and independent contract directly to a man who is to do it. This resolution is sustained by a law that has been passed to regulate the conduct of public buildings, and there is consequently at this moment, or has just been, some confusion over a public building, which the authorities wished to let out "in the lump," unaware of the prohibition which exists. There is no doubt that the habit of giving out general contracts leads, where competition is keen, to a good many abuses. "But in private building, unless on a very large scale, there is so much advantage in the directness of responsibility and ease of superintendence due to having one contractor, whose duty it is to see that all things work together, that there is, and perhaps always will be, a very common preference for him."

OVERCROWDING IN WHITECHAPEL.

THE Medical Officer of Health here, Mr. John Liddle, whose reports are amongst the most valuable issued, again draws the attention of his Board to the subject of overcrowding, which, from the reports of the inspectors, prevails to a very great extent in this district; and not only in this, but in many other districts in London. The danger to the public health from this cause cannot be over-estimated.

It appears from the notes furnished to Mr. Liddle by the inspectors, that one cause of the overcrowding in this district is from the large immigration of foreigners, principally from Poland, who arrive here in a state bordering on destitution, and are received by their fellow-countrymen, who are not in a much better pecuniary condition; but who, nevertheless, allow them to occupy a portion of their only room, in which their own family resides, until the new comers can obtain work. The rents of the houses in many of the poor neighbourhoods, particularly those bordering on the city, are much increased, owing to such houses being in great demand. Many of them are in the possession of foreigners, who, in order to pay the advanced rent which is demanded, are compelled to crowd into each room as many as it will hold. A curious fact has been brought to light by the visits of the inspectors, viz., that the English and Irish, who formerly occupied these houses, have either been compelled to remove, or have left of their own accord in consequence of the advance of rent, although the accommodation is not improved. The result is, that they go a short distance from London and avail themselves of the early and cheap workmen's trains, or the tram-cars. It further appears, says Mr. Liddle, that the people of different nations do not harmoniously amalgamate; for we find that the English Jews, who are very numerous in this district, live together in certain localities, while the foreigners live together in other parts; the Irish are located by themselves, and so are the English.

"The question may be properly asked,—How is this state of things to be remedied? Every person, whatever his condition of life, and wherever his residence, is deeply interested in this inquiry; and it is in vain to assert that the question of overcrowding among the poor in narrow and confined places does not concern the wealthy inhabitants of cities and towns who live in well-ventilated houses, and which are surrounded by open spaces; but it, nevertheless, does concern the whole community, as is strikingly shown by the spread of many diseases which are, perhaps, in the first instance endemic, and confined to these overcrowded places, but which soon become epidemic and extend over large areas, attacking indiscriminately all classes."

Laws for the abatement of overcrowding will not suffice; and it is feared that unless the question is taken up with a spirit of love towards the poorer and more ignorant classes by the upper and middle classes, and measures adopted to give instruction to the poor in matters concerning their physical well-being, the existing state of things will long continue.

Mr. Liddle urges that voluntary societies should be formed in every district for visiting the houses of the poor.

THE ANCIENT MONUMENTS BILL.

THIS Bill has been read a second time in the House of Commons. Sir John Lubbock, in moving the second reading, said that its promoters had adopted all the improvements which were recommended by the select committee of last session. There had been two objections to the measure,—that it was unnecessary, and that it interfered with the rights of property. That it was not unnecessary was clear, as destruction was going on in many parts of England and Ireland; and as to interference with the rights of property, it did no more than railway and gas Bills did every year. But all that was desired was that those who possessed these monuments should give notice of removal and an opportunity to purchase them. But he contended that those who possessed these monuments should be the first to support the Bill. They were national heirlooms, and were not the exclusive property of the present proprietors nor of the present generation.

Mr. Plunkett moved that the Bill be read a second time that day six months, but acknowledged that the Bill was very much better than it had been in former years. But the machinery of the Bill was not required, and a schedule should be made of the monuments which were in want of preservation.

Mr. Raikes said that the Bill had been before a select committee, but was still open to the original objection as to the mode in which its provisions were to be enforced, viz., by giving extraordinary powers to a commission of private persons. He complained that any man who had an ancient monument on his property was, under the Bill, to write himself down as an enemy to the public and desirous of injuring that monument. If, however, the compulsory clauses were struck out of the Bill he would vote for the second reading.

Mr. Herschell hoped that the hon. baronet would not accept the proposition of the hon. member opposite, as if he did the Bill would certainly be inoperative.

Lord H. Thynne opposed the Bill, which he considered was more calculated to cause the destruction of monuments than to preserve them. The preservation of ancient monuments ought to be placed in the hands of the county authorities instead of individuals, as proposed by the Bill. It was not only a most confiscatory, but a most extravagant measure.

Mr. S. Lefevre referred to the destruction of Cæsar's Camp at Wimbledon, by the owner, although the people of London were willing to give him the full value of the ground, and said if a Bill of this kind had been law that most valuable relic of antiquity would have been preserved.

On a division, the numbers voting for the second reading were 64, against 56, leaving a majority of eight in favour of the second reading. The Bill was accordingly read a second time, and was ordered to be committed.

THE SCHOOLS OF THE ART DEPARTMENT.

SIR,—At the risk of being included in the category of that half-dozen cranky dissentients from the opinion of Sir Henry Cole, I venture to affirm that in his address at Manchester he entirely begs the question at issue. The real question is not whether the Department schools have done some good, but whether much greater good could not have been done by a very different application of those large sums of money which have been expended on their establishment and maintenance?

What is our aim? Is it to rival that pitch of art development which was attained in Greece and Italy, or some lower standard? If the former, would not the common-sense procedure be to inquire how that pitch of excellence was arrived at? And if we do inquire we find that it was attained by totally different means to those employed by the Science and Art Department. The ruling classes in Greece and Italy were practical; they spent what could be spared from the public funds for the encouragement and development of art in raising grand monumental edifices, and in embellishing these with painting and sculpture. They took the most direct means of cultivating art by employing artists on public works of great extent and magnificence. Every public building became a first-rate school of art. The leading artists had their scholars. These schools were of the most valuable kind. For in thoroughly carrying out the decorations of a great public building, the scholars learnt that most valuable lesson in art-education, viz., the adaptation of art to the various parts of a great whole. These ancient schools did make designers, whereas Sir Henry Cole confesses his schools do not. The Greeks and the Italians never dreamt of founding an art department and provincial art schools, and of standing aside to look on, with closed pockets, in the expectancy of a great art epoch proceeding from such means. The Greeks and the Italians knew that all that they desired would come out of a persistent and liberal demand on the exercise of artistic talent. The first grand essential towards a great art development is the existence of good taste in the upper classes, and the schools of the Department do not touch this class. A true taste for art really proceeds from a right kind of intellectual training, not from studying examples of art. Italy, as we have frequently had occasion to point out, was for centuries throughout its length and breadth one vast museum of the fine arts, without its art-treasures having the slightest power to arrest the decadence of art or to revive it. We seem to think that art makes civilisation, whereas history teaches us the very reverse. Art and literature are the most durable records of a nation's intellectual status; by their fragments a nation is judged by posterity.

Drawing should doubtless form an important item in education, as I pointed out before the "footings" of South Kensington were laid, not for the purpose of art-culture, but of technical training, because drawing is the best means of training the eye to correct observation, and the hand to dexterity in touch. The School Board Schools should be the great nurseries of technical skill. What the Science and Art Department have not effected may be gathered from the furnishing of private houses, and the contents of bric-à-brac shops, from both of which examples of the highest kind of taste are almost invariably absent. In fact, if you scratch the British taste of the present day with the scalpel of reason, you shall find the Tartar, "Inconsistency."

W. CAVE THOMAS.

ELLISSEN *v.* LAWRIE.

SIR,—My attention has only just been drawn to the report published in your issue of the 23rd ult. of the above case, which contained only the *ex parte* statement of the plaintiff's counsel. No evidence was taken except that of the plaintiff himself, which went absolutely to negative this statement. The plaintiff's counsel, after hearing his own client's evidence, probably thinking "discretion the better part of valour," acceded to the suggestion of the judge (made before the trial commenced), that the matter was one which should be referred to a barrister, assisted by a scientific assessor. This course was adopted against my wish. As I have a complete answer to the action, I must ask you to publish this letter, setting forth the above facts.

T. LAWRIE, F.R.I.B.A.

TRADE MATTERS.

IN reply to "Nemo," in yours of the 23rd ult., I am afraid he did not choose a branch of the building trade, such as a carpenter, bricklayer, or mason, but wished his son to be a pupil. If so, the premiums were small, as the lad would waste a good deal of the valuable time of foremen and others; and I have generally found, on the expiration of the articles, the pupils were half clerk and half joiner, but knew nothing well enough to get a living.

Some builders send the pupil as clerk to the foreman on the building, thus saving a clerk; but, on completion of his articles, the lad is neither a foreman nor a clerk, and if he succeeds he finds every day the want of that technical and practical knowledge an apprenticeship at the bench or banker can alone supply; but in too many cases *gentility* prevents the lad having this early training.

A CLERK OF WORKS.

THE SHEFFIELD BOROUGH SURVEYOR.

SIR,—A great injustice has been done the borough surveyor of Sheffield. He has been given three months' notice to quit his appointment on the finding of a secret committee, without having been given an opportunity of meeting the charges brought against him. The case is so bad a one, that, in the interest of every municipal surveyor in the country, it should be laid before the public in its true light. Will you ask for some explanation of the unfair act committed by the corporation, as reported in the *Sheffield Daily Telegraph* of the 14th ult.?

E. B. ELLICE-CLARK.

REBUILDING THE NORWOOD INDUSTRIAL SCHOOLS.

THE Lambeth Guardians have resolved upon the entire reconstruction of the Industrial Schools at Norwood, and from the statements made at the last meeting of the Board, when the subject was under consideration, the decision of the guardians to rebuild the establishment is by no means premature. It was stated that at the present time no less than 100 children in the schools are compelled to sleep in a wooden building of a primitive character, the only approach to it from the outside being wooden steps, and that in the event of a fire occurring many lives would doubtless be sacrificed.

PENALTIES AGAINST THE SOUTHWARK AND VAUXHALL WATER COMPANY.

CUTTING OFF THE SUPPLY.

THE Southwark and Vauxhall Water Company have just been mulcted in heavy penalties for illegally cutting off the supply of a respectable tradesman in the Borough. Last week, the company were summoned before Mr. Partridge, the Southwark police magistrate, by Mr. J. Bolton Ladbury, a draper, in High-street, Borough, for having refused to supply him with water, and cut off the pipes under the following circumstances:—It appears that for several years past Mr. Ladbury has paid seven guineas a year for his water, but that last year he received notice that the rate would be increased to 16*l.* 5s., although there had been no increase in his consumption of water. On his remonstrating with the company, the rate was reduced from 16*l.* 5s. to 11*l.*, and on the 11th of last month he received a notice demanding 5*l.* 10s., being two quarters' rent. In answer to this notice he forwarded a cheque for the amount, which was returned as "not being drawn for the correct amount," and on the 27th of February the company cut off the water, and he was without a supply for four days, although there were ten persons in the house.

The Company's defence was that the returning of Mr. Ladbury's cheque, and the subsequent cutting off the supply, were owing to a mistake; but Mr. Partridge, the magistrate, in giving his decision, said that although the mistake might be inconvenient for the company, neither the public nor the complainant must be damnified by the error of any officer in the water company's service. According to the evidence, there were ten persons who had been deprived of a supply of water for four days. "Now," said the magistrate, "it does seem to me that it is a very serious thing indeed, because in this case the water company have a monopoly. I do not know whether any other persons supply water within the district; but, at any rate, this is the Southwark and Vauxhall Water Company, therefore I suppose the public in this district draw their supplies chiefly from that company. It does seem to me a very serious thing, in a sanitary point of view, for a water company to deprive the inhabitants of a full and efficient supply of water, which seems to me as necessary as the air we breathe, for the purpose of health and in the interest of the public generally. It is no answer to say that one of the company's officials has been in error; they must suffer for their error; therefore I must impose the penalty of 10*l.*, and also award the sum of 40s. a day for four days. I see no reason in such a case as this, where there is a monopoly, and where the public require and are entitled to, and pay a high price for, their water, why there should not be a full and efficient supply."

PROPOSED CONVERSION OF LAMBETH OLD WORKHOUSE.

SINCE the opening of the new Lambeth Workhouse, about three years ago, the old building in Princes-road has been unoccupied, and the Guardians have had under consideration the propriety of disposing of the property. They have now the chance of carrying out this object, Miss Elliott, a lady residing in Cornwall-gardens, Queen's-gate, having written to the Board stating that she is desirous of purchasing the building for the purpose of adapting it as a home for needy and necessitous persons. Miss Elliott's offer is at present under the consideration of the Guardians.

Reredos, Sidmouth.—The new reredos at All Saints' Church, Sidmouth, has been unveiled. It is composed of finely-grained Corsham stone, and its central part consists of three panels, the middle one being cinque-foiled. In its recess it is diapered, and upon the diaper is a raised ribbon, bearing the injunction, "This do in remembrance of Me." On either side are triple-headed panels, in which are carved the wheat and the vine. The flanks of the reredos proper are diapered with ornament of geometrical form. In the centre of these panels occur the Alpha and Omega, in unbroken circles. A bold and deeply-moulded cornice runs the entire length of the upper portion. The work has been carried out by Mr. Harry Hems.

MYCENÆ.

MR. A. S. MURRAY, a letter from whom we inserted in our last with reference to an article by Dr. Lindenschmidt, a translation of which we published, complains further that the translation contains "offensive expressions which have no equivalent in the German." Mr. Murray mentions particularly that the words "a contemptible criticism" (p. 212) should have been *a contemptuous criticism*. Without stopping to say, in excuse for the translator, that in more than one German dictionary looked into the word "contemptible" appears in the list of meanings given to the German word used, we unhesitatingly express our great regret in respect of the slightest error of the kind that may have been committed. The translation came to us from what we considered a perfectly reliable source, and was made without a shadow of *animus* by one who knows nothing whatever of the parties concerned. We in like spirit printed it simply that our readers might know what was being said on the subject in Germany.

THE NEW GRAND HOTEL.

MESSRS. MERRITT & ASHBY, the contractors for the new Grand Hotel, which is about to be erected on the vacant land between Northumberland-avenue and Northumberland-street, opposite Trafalgar-square, have entered upon the work by enclosing the site with lofty hoardings fronting Charing-cross and the Strand, and Northumberland-street and Northumberland-avenue on the east and west. A substantial footway, enclosed by railings, has also been constructed immediately in front of the Charing-cross hoarding. The contract for the superstructure is 103,900*l.* This is independently of the cost incurred in the excavations and foundation-walls, which were executed by Mr. Reddin, and which are said to have involved an outlay of more than 10,000*l.* There were several tenders for the work which Messrs. Merritt & Ashby are about to carry out, the highest being a little more than 112,000*l.* It is stated that with the exception of the St. Pancras Hotel, belonging to the Midland Railway Company, the Grand Hotel will be the largest and most costly hotel in the metropolis. We understand that Messrs. Merritt & Ashby's contract is exclusive of the internal decorations, which are intended to be of the most elaborate character. Notwithstanding the size and magnitude of the hotel, it is expected that the building will be ready for covering in during the present year.

PROGRESS OF BUILDING AT PENGE.

A DISCUSSION which took place at last week's Penge Vestry meeting is illustrative of the rapid progress of building in that locality. Mr. Dodson, one of the members, drew attention to the desirability of forming a recreation-ground for the benefit of the inhabitants, and in the course of his remarks he said it seemed to him that the hamlet was now increasing so fast that in a very few years there would not be an acre of open space in the district. He, therefore, wished the Vestry to consider the matter, and, if necessary, to elect a committee, whose duty it would be to solicit funds, and to make an inspection of the various plots of ground in the hamlet, with the view of selecting one to be laid out for recreation purposes. The proposition was unanimously adopted, and a committee was formed to carry out the object.

The Proposed Asylum at Darenth.—At a late meeting of the Metropolitan Asylums Board, Sir E. H. Currie moved that the general ground-plan for the proposed adult asylum at Darenth, laid on the table, and which had been posted at the offices in Norfolk-street during the previous fortnight for inspection, be approved; that the same be sent to the Local Government Board, with a request for authority to raise a sum of 50,000*l.* on loan, for the purpose of carrying out the works. The buildings would cost 52,500*l.*, and it was proposed to accommodate altogether, if necessary, 1,596 persons. The motion was carried, as also was a subsequent proposal, that Messrs. Harston, the architects, receive 3½ per cent. commission on the whole undertaking, the same to be paid as the work proceeds.

SANITARY WORKS.

THE following statement of sanitary works devised and carried out for the improvement of the dock offices at Hull, by Mr. F. Hoole, of London, may prove suggestive to others:—

All internal waste water-pipes and soil-pipes were tested, and many leakages made sound. The soil-pipes were carried up above the roof, and their lower ends cut off from old drains, and, being carried through the walls, were taken into well-ventilated manholes built under the street pavement.

All foul drainage was diverted from the drains under the building, and the rain-water from down-pipes only allowed to run through them. These drains were well ventilated and trapped at their outlet. New drains well ventilated and trapped also at the outlet, were laid outside the building to take the foul drainage to the sewer, and the w.c.s were removed from the internal courtyard and placed outside the building.

A new inlet has been formed for the supply of fresh air to the heating chamber, and the iron-heating surfaces covered with glazed brick and Portland cement, so as to prevent the air from being scorched. Ventilators have been also put in nearly every window throughout the building, and vertical tube-ventilators in some of the principal rooms.

The chairman of the Hull Docks, Sir William Wright, states that the dock offices are now wholesome, whereas, previously they were most unwholesome and dangerous to health.

FALL OF IRON ROOF.

ANOTHER example of the insecurity of iron construction, as it is commonly used, is the fall of a roof in Cambridge, Mass. The *American Architect* says:—"The iron roof over the furnace-room of the New England Glass Works fell down suddenly without warning. It was 100 ft. long, and 90 ft. in span, put up seventeen years ago, and has lasted perhaps as long as with our present habits of construction any piece of ordinary iron-work can be expected to refrain from falling. Fortunately no one was under it, and since nobody was hurt, it is not likely that any great notice will be taken of the accident; but it is none the less a warning. The theories behind which ignorance takes refuge to avoid confession are fairly instanced in that which has been put forward in this case, viz., that the furnaces being out for some weeks, the iron girders (or trusses) had so contracted with the cold as to draw away from their bearings. A rough computation is enough to show the absurdity of such a supposition."

THE ATKINSON ART GALLERY AND FREE LIBRARY, SOUTHPORT.

THE new Atkinson Free Public Library and Art Gallery, which was presented to the town of Southport by Mr. William Atkinson, J.P., Deputy-Lieutenant for Cheshire, was opened on the 21st ult.

The building is in the composite Italian style, and is from the design of Messrs. Waddington & Son, architects, Burnley. There is a pediment in front, which contains a series of bas-reliefs representative of Homer as the genius of poetry, Æschylus of the drama, Thucydides of history, Apelles of painting, Phidias of sculpture, and Ictinus of architecture. Over the entrance there is a medallion of Inspiration, represented as a young girl. The sculpture is the work of Mr. G. W. Seale, of London. It is intended to fill in a space directly above the pediment, which at present is blank, with a group of figures, representing Inspiration surrounded by figures typical of the fine arts, literature, and commerce. The building is faced with Longridge stone, the back and side elevations being of brick, with stone dressings. The entrance-hall has a tesselated pavement in red and black, and leads into a lofty vestibule 12 ft. wide, where there is provided access to rooms which will serve as reading and news rooms. At the end of the vestibule is the library, with a circular counter on the same principle as that at the British Museum. The general reading-room at the left is the larger of the two, and is intended to be used as a lecture-room, it having a length of 63 ft. by 24 ft. The book-shelving in the library has been arranged to hold 40,000 volumes, although the space could be made available for many more if this were requisite. Both rooms are ventilated by upright fresh-air flues, the foul air being carried off by means of Pott's system of cornice ventilation. The place will be heated by hot-water pipes, in coils. All the upper rooms are devoted to the exhibition of works of art. There are three galleries in all, the main gallery being 67 ft. 6 in. by 26 ft. 9 in., and the other two 44 ft. by 25 ft. 9 in. each,

Two galleries are also provided for sculpture, each 21 ft. 9 in. by 18 ft. The lighting in these rooms is from the roof. The total wall-space available for hanging is 6,000 ft. The ceilings of the galleries are coved, and constructed in plaster, with plain guilloche ornaments.

The cost to Mr. Atkinson has been 8,000*l.* He was deservedly thanked by the Corporation for his sensible munificence; and again at the banquet which took place in the evening, when Mr. Councillor Picton, of Liverpool, said that the centre of all names that night was Mr. Atkinson's, and he could not mention that name without respect. They had heard a good deal of the progress of Southport, and, for his part, he thought that they would soon have occasion to institute a local Walhalla for the men who did so much for the town. The streets of Southport were a matter of envy, for those in Liverpool had been made in a crooked narrow style many years ago, and had been built much on the same plan since. In Southport, however, they had been fortunate enough to have such a fine street as Lord-street laid out at an early period of the town's existence, and that had served as a pattern for the rest of the streets which had since been built.

CENTRAL ASSOCIATION OF THE MASTER BUILDERS OF LONDON.

THE Committee just appointed for the current year held their first meeting at their offices on Tuesday, the 12th inst., at which it was resolved to issue the following circular to the members of the Association:—

"The committee appointed at the general meeting of the Association, on the 24th of February, have (on their first assembling) great satisfaction in finding that the strike of the Union Masons may be considered as virtually at an end. Every member of this Association is now supplied with as many masons as he requires, at or below the old rate of 9d. per hour.

The masons' strike committee has announced that any of the members of the union may now go to work at 9½d instead of 10d. as demanded, and seems to have abandoned altogether the demand for a reduction of the hours of labour.

It has, moreover, been intimated that if the unionists are unable to obtain 9½ per hour, they will probably be prepared to accept the old wages of 9d. While congratulating the members of this Association on the collapse of the Masons' Strike of 1877, the committee are very anxious to impress on the builders of London the necessity and justice of giving every support to the masons of all nationalities who are now employed by them. It has been the frequent boast of the masons' union that, as soon as the strike should be over, the members of the union would go back to work and oust the non-unionists from their employ. The masters' committee would regret very much that the unionists should be able in any instance to carry out this threat, and beg leave to caution the trade generally against the machinations (whether of foremen or others) which may be used towards this end. It will be a bare act of justice to retain all the masons now working, paying them the full value of their labour.

The Committee trust that the result of this struggle will be to abolish the rule of a uniform minimum rate of wages, and to promote a perfect freedom of contract between masters and journeymen as to wages and overtime, piece-work, and other matters, independent of the arbitrary and pernicious interference of shop-stewards and other trade union officers."

SCHOOL BOARD SCHOOLS.

Tetsworth (*Oxon*).—New Board schools for 100 children, with teacher's residence, are about to be commenced at this village from the designs of Mr. Arthur Vernon, architect, High Wycombe.

Bacon's Bottom (*Oxon*).—A new Board school, to accommodate seventy infants, has just been opened at this village. Mr. Wells, of Thame, was the builder, and the architect was Mr. Arthur Vernon, of High Wycombe.

Books Received.

The Dickens Dictionary. By GILBERT A. PIERCE, with additions by WILLIAM A. WHEELER. London: Chapman & Hall.

So thoroughly have the writings of Charles Dickens been absorbed into our national life, that facility of reference to them has become a necessity. His characters are as real to us as those of history: his phrases give point and flavour to our daily conversation, and thus ignorance of Dickens places a man at a great disadvantage. But the quantity he has left us makes it extremely difficult to find what is wanted at the moment, to assign allusions to the proper works, or to verify quotations. Hence something like that which has been done for Shakspeare, Milton, Pope, and Tennyson in the way of a concordance is needed, and that need is supplied to an extent in the book before us.

A concordance to Dickens would be so big an affair that probably it will never be undertaken. We cannot look for anything like an index to lines or phrases: a "key to the character of principal incidents" was all that was practicable, and for that we are grateful. There is significance in the fact that we owe even this to America. Our great humourist is, if possible, more popular in the United States than in his own country. He has long been published there in a very cheap form, and has circulated among the millions, and thus his name has become in a marked sense a "household word" there, and what he has written is familiar to everybody. Popularity like this justifies such a work as the "Dickens Dictionary," which has had a circulation amply repaying the authors for their labour of love. We in England get it a little late; but with the advantage of correction and revision greatly enhancing its value.

In a preface specially written for the English edition, the son of Charles Dickens, who has revised the work, expresses "a very favourable opinion of the singularly painstaking and careful manner in which it has been carried out." This, on the whole, we cordially endorse. It is a useful book exceedingly well done. More than this, it is an interesting book; for the authors have found it well within the dictionary scope to give outlines of the famous tales, and such extracts in support of them, that those who come to consult the volume will find themselves beguiled into much pleasant reading, and find it difficult to stop.

Of course, there are defects. It was inevitable that there should be omissions, though it is only fair to say that these are few. We have noted in passing, the absence of the name of Mr. Abel, the old bachelor in the "Old Curiosity Shop"; that of Mr. Grannett, the overseer of the workhouse, and Slout, master of the workhouse, in "Oliver Twist." Allusion might have been made to Mrs Corney's cats and dogs, Betsy Trotwood's donkey ("David Copperfield"), and so on. Another defect of the book as addressed to English readers is noteworthy. For all practical purposes, the early chapters of "Master Humphrey's Clock,"—among the most charming works Dickens ever executed,—have ceased to exist. The author was ill-advised, and cut them out, so that in no collected edition of his works will there be found any trace of them. In the American edition of Dickens, this lost matter is retained, and therefore reference to it forms naturally an integral part of the "Dictionary"; but is it not somewhat anomalous that while Messrs. Chapman & Hall hold themselves bound by the author's decision to suppress the clock machinery in every edition of Dickens, they should retain all that refers to it in what is designed as a key to those editions? Readers of this generation know nothing whatever of that which is lapsed and gone, but allusion to which is given, as a matter of course, to their extreme bewildermont.

This leads us to another point. The "Dictionary" references are to chapters, and this would seem to be a natural and useful arrangement. Reference to pages would necessitate consulting special editions: reference to pages no doubt struck the authors as absolutely satisfactory. Unfortunately they had not the "Illustrated Library Edition" before them, or their complacency would have received a shock. In that costly edition, not only are the page head-lines so carefully prepared by the author for the "Charles Dickens' Edition" omitted,—though these ought to be regarded as being as much part of the text as the rest of the page,—but the very chaptering has been altered, so that each volume may commence with "Chapter I." For example, the first volume of "David Copperfield" ends with chapter twenty-nine, and, properly, the second volume should begin "Chapter XXX.," but a re-numbering is, in fact, commenced which throws out all the rest of the chapters; and to make the "Dictionary" fit this edition every allusion to any character or incident after the twenty-ninth chapter ought to be altered with a pen! This would be terrible work, and we put it whether in preparing the book for the English reader cognisance ought not to have been taken of this eccentric edition?

These are points not to be disregarded in looking at the book from a critical point of view. They do not, however, materially affect its value in the hands of the ordinary reader, and undoubtedly it ought to find a place in the library of every student of Dickens. Popular as he is, people are constantly misquoting him, and nothing is more common than to find authors assigning the character of one work to the pages of another. It was probably the printer who made a writer in the *Examiner* a few weeks ago allude to Mrs. Fox, when he obviously meant Miss Tox in "Dombey & Son;" but errors as glaring are often perpetrated in the papers from sheer ignorance. A writer with the "Dickens Dictionary" at his elbow could set himself right on every detail in a moment, and with a high sense of the value in this as in many other respects we confidently recommend it.

VARIORUM.

UNDER the title of "Trade Unionism and its Results" (Lockwood & Co.), Sir Edmund Beckett has republished his five letters to the *Times*, with additions. It is a very important contribution to the consideration of the subject, and ought to have a wide circulation.——"Boiler and Factory Chimneys, their Draught, Power, and Stability," by Robt. Wilson, A.I.C.E. (Lockwood & Co.), is a valuable little book, to which we must endeavour to give further attention before long.——The first number of *Social Notes* (Hardwicke) is a good one. It includes Notes on Strikes, by Mr. F. R. Conder; On Abstinence, by Dr. Farrer; On Industrial Schools, by Mr. Sopwith; Bare Walls in Churches, by Dr. Irons; The Costs of Funerals, by Mr. S. C. Hall,—and all for a penny!

Miscellanea.

London Commercial Building Society.—The fourteenth annual meeting of this society was held at Doughty Hall, Bedford-row, on the 20th ult. The chair was taken by Mr. W. Hurran. The report and accounts showed that the receipts for the year amounted to 27,258*l.* 18s. 4d.; advances on mortgage, 8,615*l.*; deposits received, 11,704*l.* 11s. 5d. The net profit of the year's transactions was 971*l.* 19s. 3d., of which a dividend of six per cent. would absorb 913*l.* 6s. The Chairman, in moving the adoption of the report and statement of accounts, congratulated the members on the continued success of the society, there having been an increase in almost every department of the business. He feared that the members and the public generally were not aware of the advantages offered by the deposit bank in connexion with the society. He did not know how it was possible for a depositor in an incorporated building society to lose his money, since the society was only allowed to receive on loan an amount equal to two-thirds of the sum advanced on mortgage. He wished to impress upon small tradesmen the advantage of keeping a banking account, however small, on which they would receive five per cent. interest, and have the facility of making their payments by cheques.

The Houses in Hyde Park.—Sir Charles Dilke, in the House of Commons, asked the First Commissioner of Works, in reference to a statement made by him last year as to the erection of a house in Hyde Park, if he would further explain what was the purpose to which a second house now being built in the same portion of the park would be applied.—Mr. Noel said, in answer to the question of the hon. baronet, I have to state that the second house to which he alludes is no fresh encroachment on the park. Last year I asked the House to vote 500*l.* to pull down and replace the old storehouses in Hyde Park, which were in a most dilapidated condition, and totally unfit to hold the implements used in the cultivation of the park. This house, which is to replace the old store, is built on the identical site, and is no encroachment whatever.

Wycombe Marsh, Bucks.—New schoolrooms, to serve also as a workmen's institute, have been added to the Baptist Chapel in this village, and have been recently opened. The gift of the ground by Sir Philip Rose, bart., and many liberal contributions, have enabled the committee to carry out their enterprise quickly and successfully. The rooms are of brick and slate, in Early English style, and include a large reading-room on the ground-floor, and two class-rooms over, with convenient yard and range of out-buildings. The work has been completed by Mr. B. Taylor, builder, from the plans of Mr. Arthur Vernon, architect.

Fall of Buildings at Woolwich Dockyard.—A serious accident has occurred at Woolwich Dockyard, about thirty workmen being injured,—some, it is feared, without hope of recovery. When the War Department resolved, about a month since, to create a large reserve of victualling stores at Woolwich, instructions were sent to the Works Department to provide the necessary accommodation, and a contract was forthwith entered into with Mr. George Shaw, of Westminster, for the erection at the dockyard of sufficient warehouses on a site having 175 ft. frontage on the north side, by about 190 ft. in depth. This the contractor undertook to cover with a timber-built shed or sheds, roofed with glass and zinc, before the 31st of March. The building made rapid progress, but at half-past ten on Wednesday morning, the whole of the structure heeled over towards the south, and fell with a crash. An official inquiry was held at the Dockyard in the afternoon by Colonel J. H. Smith, R.E., Assistant Director of Works. The result did not transpire, but the accident is said to have been caused by the insecurity of the foundations and the neglect to provide proper struts and braces to hold the building together until completed. The damage is estimated at 2,000*l.*; but it is understood that the contractor will deny his responsibility, as he was working according to the specification and drawings of the Royal Engineers. The Engineers, on the other hand, contend that a builder is bound to take due precaution to prevent his work tumbling down.

All Saints' Church, Lambeth.—Replying to Mr. Cowper-Temple, in the House of Commons, Sir J. M'Garel-Hogg said,—On the 9th of May, 1876, an accident occurred in consequence of a portion of the stonework of the tower of All Saints' Church, Lower-marsh, Lambeth, falling to the ground, and the structure was afterwards reported as in a dangerous state, and the Metropolitan Board of Works incurred an expenditure of upwards of 100*l.* in executing the necessary repairs. Churches are expressly included within the Metropolitan Building Act, 1855, as "public buildings," and by the 73rd section of the Act of Parliament all expenses incurred by the Board in respect of any dangerous structure are to be paid by the owner of the building. On May 10, 1877, the magistrate at the Lambeth Police-court, after hearing the case, made an order upon the vicar for payment of 105*l.* 19s. 5d. and costs, and the Board has been advised that, as owner of the fabric, the vicar is personally liable to make the payment; but, in order that the question may be decided by the Superior Court, the Board, instead of requiring a distress warrant to issue in a summary manner, directed further proceedings to be taken in order to ascertain whether the vicar is personally liable. Until such liability is established by the Courts, it is not the intention of the Board to enforce the order of the magistrate.

The Temple Buildings.—In reference to a statement made in the *Builder* for the 23rd ult., as on the authority of Mr. Booth's manager, that all the masons required on these buildings had long since been obtained, and eight or ten applications per day were being made for work, Mr. G. W. Booth last week wrote (p. 252) impugning the accuracy of the statement. We are now informed that the statement made to us, though correct in one sense, needed qualifying, inasmuch as *superior* masons are still in demand on the works, and we willingly say so. We understand that in order to expedite the works arrangements are being made to have a quantity of the masonry worked at Portland.

The Masons' Strike.—Mr. Charles Goolder, secretary of the Central Association of the Master Builders of London, writes:—"There seems to be an impression in some quarters that the differences between the master builders and the masons have been settled by a compromise, whereby the latter are to be paid 9¼d. per hour. I beg to inform you that no such compromise has taken place; the masters' shops have been filled with good masons at 9d. per hour, at which rate of wages there is any number of masons to be obtained. I can find no firms requiring masons; if there are any such, they have only to apply to the Central Association of Master Builders."

Winchester.—Mr. Robert James Piper, of Dewsbury, has been appointed Assistant City Surveyor of Winchester. There were 103 applicants for the appointment.

National Portrait Gallery.—In a vigorous speech, Mr. Beresford Hope, in calling attention (in the House of Commons) to the present condition of the National Portrait Gallery at South Kensington, complained that the Treasury had broken faith with the trustees, and had condemned them to put their pictures in temporary buildings in which there was no adequate means for their display or their protection from fire. Colonel Stanley (secretary to the Treasury) admitted that the present accommodation was very defective, and promised to afford some relief by giving up to the trustees the portion under the present gallery in the eastern block of the south range of buildings. This would double the present accommodation, but he questioned whether it would meet all the claims likely to be made upon it in the future. At all events, it could be done at once, and he promised that it should. Mr. Beresford-Hope accepted the promise of the secretary to the Treasury, and withdrew a motion he had proposed.

Stephens's Parquet Stains.—Mr. Stephens, whose stains of various kinds are universally known, has introduced some so much stronger that patterns may be produced by them on floors and dados without "running," and with very agreeable effect. An ordinary workman can in a few days cover the floor of a room of medium size with an effective pattern by applying the stains according to some satisfactory design, and an extensive variety of effect can be obtained by mixing the stains in various proportions, and also by diluting them to produce lighter shades. After staining, the floor should be sized, and can be finished by varnishing, or by polishing with French polish or beeswax. The manufacturer recommends laying round a room a border of thin deal boards to a width of from 6 in. to 2 ft., so that the irregularities occasioned by the windows and fitted furniture may be brought within the "parquet" border, and a straight-sided space obtained for the carpet, which will then rest upon the edge (bevelled to meet the floor) of the border.

Fall of Wall.—On Tuesday morning three men, who had sustained serious injuries by the fall of a party-wall at Camberwell, were admitted to St. Thomas's Hospital. A number of workmen were engaged on a scaffold 25 ft. high, in forming a concrete party-wall at the side of a new building in course of erection in Westmoreland-street, Southampton-street, Camberwell, when one of them noticed that the wall was bulging, and immediately the whole mass fell, carrying with it the scaffolding and the men who were at work.

Testimonial. — Last week Mr. Wright, the late manager of Mr. Whiteley's Building Department, Queen's-road, Bayswater, was presented by some of the *employés* with a handsome testimonial of respect and esteem.

The Earl's Court Railway Station.—In our account of the new Earl's Court Railway Station, which appeared in the *Builder* of February 16, there is a typographical error which we are desirous to correct. It is stated that "30,000 tons" of Portland cement were used in the construction of the walls. It should have read "30,000 bushels."

TENDERS

For new centre block, Royal Free Hospital, Gray's-inn-road. Mr. William Harvey, architect. Quantities by Mr. H. Smith:—

Shepherd (accepted)	£8,030 0 0

For the Constable-street school, of the Kingston-upon-Hull School Board, for 759 children. Messrs. W. Botterill & Son, architects. Quantities supplied:—

Grasby	£7,970 0 0
Jackson & Son	7,861 0 0
Hockney & Liggins	7,801 0 0
Brown	7,777 0 0
Habbershaw & Son	7,706 15 0
Skinner	7,701 0 0
Sergeant	7,670 0 0
Musgrave	7,622 0 0
Stamp (accepted)	7,609 0 0

For the erection of a house, Hamstead-road, Handsworth, Birmingham, for Mr. T. Marsh. Mr. John P. Osborne, architect. Quantities supplied:—

Rhodes	£1,053 0 0
Elvins	895 0 0
Taylor	890 0 0
Simons	875 0 0
Edwards	873 15 0
Jeynes	870 0 0
Lee (accepted)	845 0 0

For alterations to "The Cricketers," Greenwich. Messrs. Thomson & Sandilands, architects:—

Jerrard	£597 0 0
White	470 0 0
Dixey (accepted)	370 0 0

For the erection of new bank premises at Cannock, for the Staffordshire Joint-Stock Banking Company, Limited. Mr. Samuel Loxton, architect. Quantities by the architect:—

Jones	£4,150 0 0
Whittome	3,531 0 0
Hall	3,366 13 4
Bethel	3,316 0 0
Biddle	3,210 0 0
Evans	3,148 16 0
Wiley & Filkin	3,140 0 0
Brewer & Son	3,107 0 0
Crisp & Son	2,965 0 0
Tatlow	2,740 0 0

For the erection of two shops and business premises, in Park-road, Hockley, Birmingham, for Mr. Edward Arsh. Mr. John P. Osborne, architect. Quantities supplied:—

Lee	£1,312 0 0
Rhodes	1,295 0 0
Taylor (accepted)	1,194 0 0
Hulbert	1,191 1 3½

For alterations and additions to 56, Chapel-street, N.W., for Mr. George Earley. Messrs. J. Saville & Son, architects. Quantities supplied:—

Sneed	£897 0 0
Roberts	895 0 0
Braid & Co.	768 0 0
Nightingale	763 0 0
Wicks	730 0 0
Hawkes	722 0 0
Gann	700 0 0
Temple & Forster	684 0 0
Smith	673 0 0

For wood-framed barn, cart-shed, and granary over, at Westham, near Basingstoke, for Mr. S. Peters. Mr. James Gibson, architect. Quantities supplied:—

Stone	£691 0 0
Sims	575 0 0
Pike	554 10 0
Fielder & Sons	550 0 0
Walker	540 0 0
Henderson	530 0 0
Talbot	520 0 0
Goodall	516 8 0
Sadler	511 10 0
G. Batten	495 0 0
Tugwell	487 10 6
W. W. Batten (accepted)	469 0 0

For clothing factory, Basingstoke, for Messrs. Gerrish & Ames. Mr. James Gibson, architect. Quantities supplied:—

	Part Basement.	Whole Basement.
Prout	£1,963 0	£2,167 0 0
Parker & Evans	1,734 0	1,934 4 0
Jones & Co.	1,740 0	1,872 0 0
Fielder & Sons	1,667 0	1,748 0 0
Bishop	1,643 4	1,758 0 0
Smith	1,549 0	1,683 12 0
Goodall	1,534 8	1,680 6 0
Simmons	1,530 0	1,644 0 0
Sims	1,496 0	1,638 9 0
Musselwhite	1,524 0	1,638 0 0
Henderson	1,512 15	1,617 17 6
Tugwell	1,499 10	1,594 4 0
W. W. Batten	1,454 10	1,577 10 0

For alterations to the Wellington Public-house, Goswell-road. Mr. G. Treacher, architect:—

Simpson	£1,041 0 0
Eaton	1,035 0 0
Beale	1,020 0 0
Cole	993 0 0
Andrews	970 0 0

For the erection of upper-class girls' schools, for the managers of St. George's School, Ramsgate:—
Duckett (accepted).

For alterations and additions to Conyngham House, Ramsgate, for Mr. C. H. Rose:—
Duckett (accepted).

For the erection of warehouses in Houndsditch, for Mr. T. A. Pibbits. Mr. B. Saxon Snell, architect. Quantities by Mr. Robert Griggs:—

Bamford	£4,950 0 0
Cooke & Co.	4,858 10 0
Wall, Brothers	4,813 0 0
Crockett	4,759 0 0
Mowlem & Co.	4,720 0 0
Brass	4,634 0 0
Nightingale (accepted)	4,253 0 0

For hot and cold water supply to the Holborn Union Infirmary, Upper Holloway. Mr. H. Saxon Snell, architect:—

Benham & Sons	£3,804 0 0
Potter & Sons	2,861 7 0
May, Bros. (accepted)	2,789 16 0

For gasfittings at the same building:—

May, Bros.	£1,200 0 0
Potter & Sons	1,050 0 0
Berry & Sons	956 0 0
Abercrombie & Sons	941 14 6
J. & W. Joel	743 0 0

For forming stone piers, curb, and foundations for iron railing at St. Luke's Workhouse. Mr. H. Saxon Snell, architect:—

Pask	£375 0 0
Hamford	344 0 0
Robage	341 0 0
Howard (accepted)	274 0 0

For wrought-iron railing at the same building:—

Elliott	£240 0 0
Benham & Sons	220 0 0
Potter & Sons	211 6 0
Richardson & Edson (accepted)	188 10 0

For alterations and additions to Teddington House, Teddington, for Major-General Vialls. Mr. T. Goodchild, architect. Quantities supplied by Mr. H. P. Foster:—

Carless	£1,789 0 0
Adamson & Sons	1,700 0 0
Messum	1,633 0 0
Harris & Bonell	1,480 0 0
Hurst	1,464 0 0
Piller	1,454 0 0

For alterations and decorations to 13, Talbot-square, Paddington, for Mr. D. Macfarlane. Mr. John Heath, architect:—
Vears & Co. (accepted) £410 0 0

For the erection of a villa residence in The Grove, Stratford, Essex, for Mr. J. Self. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—
Hoskings £1,597 0 0
Cheffins 1,562 0 0
Mansfield 1,570 0 0
Norton 1,567 0 0
Reed 1,375 0 0

For road-making at the Crouch-hill Park Estate, Messrs. W. Waymouth & Son, surveyors:—
Williamson (accepted) £850 0 0

For road-making at the Mercers' and Poynders' Estate, Upper Holloway. Messrs. W. Waymouth & Son, surveyors:—
Williamson (accepted) £357 0 0

For the erection of two shops at Donegal-place, Clapton. Messrs. W. Waymouth & Son, architects:—
Niblett (accepted) £1,210 0 0

For the erection of business premises, corner of Newgate street and King Edward-street, City, for Mr. John Mixer. Mr. James W. James, architect:—
Braid & Co. £4,618 0 0

For rebuilding the Barley Mow, Curtain-road, Shoreditch, for Messrs. Mann, Crossman, & Paulin. Mr. Charles A. Legg, architect:—
Hunt £1,075 0 0
F. & F. J. Wood 1,049 0 0
Hearle & Son 947 0 0
Walker 915 0 0
Atherton & Latta 915 0 0
Johnson (accepted) 868 0 0

For the erection of four houses in the Maybank-road, Woodford. Mr. S. Sanders, architect:—
List £370 0 0

villa residence at Wimbledon. Mr. Clarke, architect. Quantities by Mr. Follard:—
Cullum £1,280 0 0
Ruby 1,190 0 0
Garrett 1,143 0 0
Fares 999 0 0
Kellaway 973 0 0
Nichols 944 0 0

For rebuilding 67, King's-road, Brighton. Mr. Arthur Loader, architect:—
Cheeseman & Co. £500 0 0
Newsham 478 0 0
Bruton (accepted) 450 0 0

For additions to Primitive Methodist schools, Shoreham, Sussex. Mr. Arthur Loader, architect:—
Triggs £562 10 0
Bruton 500 0 0
Blaker 498 0 0
Gates & Burfoot 440 0 0
Willett 420 0 0
Burchell 400 0 0
Curd 369 10 0

For a vicarage-house and outbuildings, Kirbymoorside, York. Messrs. Armfield & Bottomley, architects:—
Oldfield £2,502 0 0
J. & P. Ward 2,097 0 0
Barlow 1,884 0 0
Kerr & Balton 1,855 0 0
Yeo 1,835 0 0
Barlow 1,760 0 0
Wood (accepted) 1,721 0 0

The accepted tender has since been increased to 1,936*l.* 18s. 3d., for boundary-walls, road-making, &c.

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	Schools.	Three Dwelling-houses.
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Dalton	6,055 8 9	1,697 0 0
Grange	6,367 0 0	1,703 0 0
Shaftoe & Barry	6,050 0 0	1,8 8 0 0
Lamb	6,162 18 0	1,750 12 0
Raper & Co.	5,840 0 0	1,760 0 0
Stephenson	5,748 0 11	1,614 9 2
Osborne	5,563 4 6	1,651 14 3
Kerr & Bolton	5,514 9 0	1,667 13 8
Nottingham	5,400 0 0	1,550 0 0
Johnson	5,320 0 0	1,602 0 0
Renshaw & Walker	5,410 0 0	1,443 15 0
Badge	5,354 0 0	1,442 0 0
Heckle, Bros.	5,304 0 0	1,310 0 0
France	5,090 0 0	1,565 0 0
White	5,201 0 0	1,448 0 0
Wilkinson	5,218 0 0	1,409 0 0
Boagey	5,271 0 0	1,342 0 0
Dickenson	5,100 0 0	1,567 0 0
Cass	5,200 0 0	1,382 7 0
Young & Cooper	4,989 10 0	1,476 4 6
Barton	4,977 0 0	1,400 0 0
Clark	5,310 0 0	977 0 0
Gladstone	4,977 5 3	1,390 10 0
Sturdy Bros. (accepted)	4,730 0 0	1,445 0 0
Haswell	4,667 0 0	1,280 0 0
Harrison & Son	4,750 0 0	1,153 0 0

For the Whole.

Hutchinson & Sedgwick	£6,725 0 0
Yeo	6,000 0 0
Cost of school buildings, including lavatories, galleries, cupboards, desks, and other fittings	£3,744 0 0
Tar paving to playgrounds	196 0 0
Boundary-walls and gates	569 0 0
Covered play-sheds, and conveniences fitted with Macfarlane's closet ranges	230 0 0
Cost per head of school buildings	4 10 0
Ditto, including boundary-walls, covered play-sheds, tar paving, and allfittings	5 13 6

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REPORT, 1877.

The 63rd Annual Report just issued, and the Balance Sheets for the year ending June 30, 1877, as rendered to the Board of Trade, can be obtained at either of the Society's Offices, or any of its Agents.

GEORGE CUTCLIFFE,
Actuary and Secretary.

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The Builder.

Vol. XXXVI. No. 1832. SATURDAY, MARCH 23, 1

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Architecture as "A Combination of the Arts."



THE fifth lecture of the Professor of Architecture at the Royal Academy, which was printed in full in the *Builder* for March 9, dwelt to a great extent, partly directly and partly by implication, with the question of the extent and intimacy of the relation between architecture and "the sister arts," as it is the custom euphuistically to call them. This aspect of the subject was a peculiarly suitable one, no doubt, for treatment before an audience who were to a considerable extent more directly interested in those arts than in architecture proper, and the opinions expressed on the subject by Professor Barry were such as are likely to be accepted without much question by painters. Architects would be apt, perhaps, to be a little more critical on some of the points raised, on some of which there exists a good deal of difference, not to say confusion, of opinion, which architectural criticism, whether amateur or professional, has certainly not always tended to clear up.

We may first observe that the expressions in the lecture, as reproduced in our columns, hardly seem in themselves quite consistent. The passages we refer to are as follow:—

"We thus find that in Italy there was a greater *combination of art* than with ourselves. The whole effect was less dominated by a single idea, or set of ideas. There was consequently less unity of purely architectural design; but a greater amount of general artistic wealth. The variety of outline, and picturesqueness of structure of Northern work, was absent, and the lack of interest thus caused was supplied by the efforts of artists, working with much independence, each in his own class of work, whether frescoes, statuary, mosaics, bronze, or such-like accessories to the architecture.

A similar employment of the resources of art in all their beauty, would have been impossible in our own Mediæval buildings, the architects of which shunned plain wall surfaces, breaking them up in every way by shafts and arches, large windows, buttresses, and recesses; and we all know how incongruous is the effect even of fine modern sculpture when placed in a cathedral, such as Westminster Abbey."

Further on in the same lecture we read:—

"The early Renaissance architects followed out their principles, and decorated their buildings with everything which the taste of the period could supply, until the building itself might almost be regarded as a case to contain art, rather than a work of art itself. Purity of architectural outline and detail thus suffered, and architecture was stifled by the well-meant caresses of her sisters."

These two sentences obviously tend in the same direction, and the conclusion the reader would draw would be that architecture, as such, suffered from the too unchecked intrusion of painting and sculpture on the field, and that the Mediæval buildings were architecturally the superior, as standing more on their own interest unaided by adventitious arts. But at the close the lecturer summed up obviously in favour of Renaissance architecture, and even appeared to assume that architecture could not alone be an *art*:—

"The changes in architecture had corresponded with those in literature and the sister arts, with which, indeed, it must ever be connected. Architecture cannot in truth retain a place among the fine arts without such association. Without the traditions which cling so lovingly around each old monument of the past, without sculpture and the assistance of the art of painting, architecture must soon become a matter of science alone, a question of putting bricks or stones together, so that they may not fall."

Now, putting this and the previous sentences together, it is certainly difficult to see where architecture gets to at all. It becomes merely a receptacle for the display of sculpture and painting, or it is reduced to engineering. We have not, however, quoted the above passages with the view of representing the lecture from which they are taken as specially defective or inconsistent, but only because they serve to illustrate the existence of a little confusion of thought as to the relation of architecture to what is more generally and distinctly called "art." If, in fact, we were to put together in a comparative manner a number of definitions of architecture from eminent architects and critics, we should find ground for making architecture almost anything from sculpture to iron construction. The two extremes would perhaps be represented, among really eminent critics, by Mr. Ruskin and Mr. Fergusson. The former has spoken in the most contemptuous terms of all architecture which is not mainly sculpture; the latter, though he has illustrated existing picturesque architecture so largely, has really in theory brought modern architecture very nearly to the frank treatment of construction. He, however, gives it a place, and a tolerably high one, in his scale of the Arts. Professor Barry's last-quoted sentence goes near to deny that in its practical aspect, as building, it can be an art at all. Many other more or less conflicting criticisms by more or less competent minds will occur to all who are in the habit of reading architectural literature. There must surely be a plain and logical central point of definition, if we could only hit it.

To take the last point first, is it a fair statement of the case of our client "Architecture," that without the aid of her "sisters" she would soon become a science alone, her function only a question of "putting bricks or stones together so that they may not fall"? This is an interesting question to ourselves in particular, because it touches upon an opinion that we have often advocated, that the connexion between architecture and engineering is, or ought to be, a great deal closer than is commonly supposed; that in fact, if both classes of works were carried out with ideal perfection, there would be no definite line of demarcation in general theory and treatment, and in regard to many works no possibility of classifying them separately on any ground. We can make the broad and obvious distinction between works carried out solely for utilitarian purposes, and in which such purpose alone is the object (such as embankments and breakwaters), and between works built solely for ornamental purposes, of which there are in modern times very few.* But between these opposite extremes it would be hard to find the means of defining a bridge as exclusively either "architecture" or "engineering," provided it were designed as a bridge ought to be designed,—that is to say, with regard to decorative expression as well as stability; or, at all events with pure truthfulness of constructive design and no attempt at false decoration or concealment of structure under decorative sham. In the former case it would be as distinctly a work of architecture,—if the word means anything,—as a cathedral; and in the latter case it would have all the elements which go to make a great deal of the interest and beauty of many works that are now universally classed as architecture,—solidity, mass, and a powerful expression of constructive stability.

This kind of architectural expression comes nearest to being a mere matter of science, of "putting bricks and stones together so that they may not fall." Yet even in this reduction of architecture to construction it appears to us that there may be combined with the mere constructive problem an element of "perception" (shall we call it?) which distinctly belongs to the artistic side of building. It amounts, perhaps, to little more than this; that, without any question of ornamental art, there is a way of putting materials together so as to gain a powerful and expressive result, without going beyond the requirements of structural efficacy; and there is a way of doing it which, without impairing structural efficiency, is weak and characterless in result. We might have two bridges, say, both purely utilitarian works, and built of the same class of materials, one of which would have picturesque character, and the other look simply utilitarian; and the difference would be directly traceable to the presence of a certain æsthetic element in the one case, and its entire absence in the other. So that even if we come down to the mere putting of materials together, we are still conscious of the possibility of an artistic element finding place in the work: an element difficult to define, but the presence or absence of which is clearly perceptible.

* A striking exception is the recently completed nave of Bristol Cathedral, which we refer to in this connexion, partly to quote a rather piquant bit of criticism which we happened to hear in regard to it, from a friend (a clergyman, by the way), who, after praising the work on architectural grounds, added, "and then it is *so delightfully useless*, too, that it is quite a refreshing protest against the utilitarianism of the day."

But when we come to buildings which, though in the first instance utilitarian, constructed for shelter, are also constructed with a view to effect, surely it is hardly possible for one moment to maintain that, in such a case, sculpture and painting are necessary to remove the work from the category of mere science. Remove the comparatively small amount of sculpture and carving from the exterior of St. Paul's; would it be then reduced to a mere means of covering in a certain space, and arranging the materials with stability? On the contrary, scarcely any of what gives its external impression would be lost. Nor, again, is the interior devoid of beauty and impressiveness, because it has little colour and no good sculptured and painted decoration, though the addition of these would be a gain. But if a cathedral is an exceptional case, then come down (if it is to be considered coming down) to the designing of dwelling-houses. Are we to say that there is no real art in this independent of painted and sculptured decoration? It is certain that the mere planning of a large dwelling-house so as to be not only comfortable, but interesting and effective in its interior, involves an effort of taste and invention which must be called art rather than science; it is, at all events, totally different from anything which engineering in the ordinary sense of the word demands, and perhaps the only reason this art of picturesque planning is forgotten or spoken lightly of, is because it is a part of architecture practically so neglected in its development, in comparison with what might be done with it in the way of originality and variety. But when one comes to think even of what has been done, it is somewhat curious to find a son of Sir Charles Barry telling an audience of art-students that, apart from the help of sculpture and painting, there is really little or no art in architecture. Surely, the Professor's words have carried him farther than he intended.

The independence of architecture is still more exemplified, no doubt, when we turn to Mediæval architecture; and this Professor Barry seems, in fact, to have implied in his observation as to the difficulty of making sculpture harmonise with a Gothic building. The demands of the architectectural details are too prominent and multifarious to allow of proper subordination to sculpture. It may be said that the west front of Wells Cathedral depends mainly on the sculpture: undoubtedly it does; a word on that just now; but, at all events, the exteriors of Lincoln or Westminster, the west front of Tewkesbury, and many other examples, do not: they are simply architecture. But when we come to consider the question of the combination of sculpture and architecture with painting, there are two ways of looking at it,—two different ends to be obtained. The one is simply to make the building the opportunity for painting, or for hanging on the walls the finest and most finished art which is attainable, and placing in convenient situations the finest and best sculpture. In this case the building becomes simply a picture and statue gallery,—a place for the exhibition and protection of works of art. This results really in the effacement of the architecture, its reduction to an utterly secondary, or less than secondary, position; the position which it, in fact, occupied at the period of the Renaissance. The typical interior of the Renaissance was an apartment with plenty of wall space to paint frescoes on, with little architectural effect apart from this. No one goes to the Sistine Chapel with any pretence of looking at the architecture. Mr. Fergusson has drawn special attention to this in the introductory chapter to one part of his History of Architecture, comparing the typical Gothic interior with the typical Renaissance interior, propounding it as an open question which was best worth having, the Gothic architecture without any high-class painting, or the Renaissance non-architecture with the frescos of the great painters. Perhaps the question can hardly be answered; we should be sorry to lose either. But it seems a little doubtful whether a criticism quite hits the mark which speaks of this Renaissance art as a "combination of arts," and at the same time characterises it as "less dominated by a single idea" than is the case in other architectural periods. The latter statement we accept entirely; but it seems inconsistent with anything that could fairly be called a combination of architecture and painting. The architecture was completely quashed; the painter and sculptor had it all their own way. Now, our idea of a combination of architecture and the other arts is one in which a central and leading motive and style runs through the whole assemblage of art productions, combining the whole, as if the product of one mind. Such a combination is possible, and has indeed been an idea very much favoured by a number of modern architects, chiefly of the Mediæval school, who have characterised their favourite phase of art as essentially a combination, in which all the painting and sculpture was designed for and subordinate to its place in the architectural design. This is a perfectly practicable, perfectly logical theory of the relation of architectere and the arts; but it is one not at all resembling their relation in the Renaissance period. The question is, whether this view of their position in regard to each other is or is not the best for all, the theory likely to lead to the best results.

We have referred to Wells and its sculpture as a typical instance. The combination is entirely satisfactory there, and the sculpture could not be divorced from the architecture without both suffering. But of what nature is the sculpture? In its way much of it is very fine, very deep in feeling, occasionally even very vivid in expression (or rather in expressive pose and action); but it is also for the most part very conventional, very similar in type, representing, in fact, a conventional type rather than individual or human character.* So with the stained-glass figures which used to form so important an adjunct to the interior effect of a Mediæval cathedral; so with the peculiarly architectural mosaics of the Byzantine school; and instances might be multiplied. Many of these works, it is true, were not intentionally conventionalised, in all probability; they were executed as well as the skill of the men who did them and the nature of the materials allowed; but that does not affect the question: it only comes to this, that the men who raised the Byzantine and Gothic structures were splendid building artists, but imperfect draughtsmen, consequently their architecture necessarily got the upper hand of their painting and sculpture, and they produced buildings in which these arts played a subordinate and decorative part, and this practice of decorative art, of a style of painting and sculpture subordinated to the architecture, is what a tolerably numerous modern school of architects and critics have wished to see revived or developed,—a feeling in which not a few painters and some sculptors also seem to sympathise. Why the architects should wish for this is very obvious. To have a building decorated with designs in other arts, which, nevertheless, are never allowed to rival in interest the total architectural *ensemble*, or to entrain the eye by any detail too vividly and individually interesting to transgress the balance of the whole; to make the architectural design the key-note and predominating influence of the whole,—is to give to Architecture most important added charms, without dethroning her from her seat as mistress of the scene. And it is possible to understand why some of the painters (the sculptors are less accommodating) should give their practical adherence to this theory. There is a completeness and system in the grouping together of artistic invention and decoration in a consistent whole, which in itself seems to lend an added dignity and purpose to the arts so employed. But it should be clearly recognised that this harmonious relationship is not to be established without a sacrifice; and it is fair to confess that the sacrifice is on the side of the painter chiefly. The combination talked of can only really be obtained when the painting and sculpture are kept so far from nature, so much conventionalised, as to harmonise with their architectural setting in a broad homogeneous style preserved throughout, and in which the decorative effect in regard to line and colour in their general aspect is more considered than the special expression and finish of each separate painting. Once go beyond this, and approach the intensity and pathos of actual life, and the painting starts from its place as decoration, and claims our direct attention as the leading interest. This is the place really taken by most of the great fresco-paintings of the cinque-cento period. To talk of Raffaelle and Michelangelo having been decorative painters in the sense in which the word is generally used now is pure nonsense. They were only decorative painters in the sense that they painted direct on the walls and ceilings, and not on canvas. In reality, their paintings were the object to which the architecture was sacrificed. In the real decorative system the architectural *ensemble* is the object to which the painting is sacrificed. It may be, as we have said, an open question which is the most permanently satisfying result, the general scheme with the painting and sculpture subordinated, or the display of painting and sculpture as matters of separate and primary interest behind which the architectural interest disappears. But the choice has to be made between the two; architecture and the other arts can only reach their highest efforts separately. In combination one or other must give up something, or the desired balance and consistency cannot be realised. That is the truth of the matter, which it is well to bear in mind. The combination theory has, to our thinking, had the reverse of a good effect on much contemporary painting, drawing away painters from nature to ideal conventionalism; though it may be admitted that it has given in the eyes of many, and not unreasonably, a new and stronger interest to decorative architecture.

* We except from this the remarkable series of resurrection figures on a smaller scale, and probably by Italian artists. But these when considered in regard to their connexion with the architecture really are an illustration in favour of our argument; for they have the least bearing on the architectural effect of any of the sculptures, while on the other hand their real merits are lost when seen from below; they could only be fairly studied and appreciated on a near view, such as could be got some time ago when the scaffolding was up for the repairs.

WEST-END RESIDENTIAL CHAMBERS.

HOW SOME PEOPLE LIVE.

THE wrongs of men, the rights of women, are soothed or mitigated by surrounding associations. Of the inherent truth of this proposition there cannot exist a doubt. The malefactor who beats his wife, the female scourge who abuses her husband, have but to let Society into the secret of their wedded liabilities,—to show the happy and well-to-do citizen their "homes,"—and Society will admit, indeed has admitted, that a good deal is to be said on both sides of the question. Has not a certain Earl publicly expatiated upon the Home as the unit of civilisation? Have not we ourselves, for a score of years, urged upon legislators the necessity of facilitating the improvement of house property? Have we not thrust upon architects the modification of house arrangement? And what has been the consequence? All grades of the community are convinced that until the homes of the poorer classes are improved, it is idle to talk to them about sobriety, domesticity, Sunday observance, Bible-reading, Christianity, or any other form of systematic morality. Furthermore, an Artisans' and Labourers' Dwellings Act is now in force. Official inquiries, the labour of many years, will, before the close of this century, convince the world that Mr. Cross's Act was neither uncalled for nor premature; and another age perhaps witness the practical fulfilment of its early promise.

But will it have soothed or mitigated the home sufferings of all the poorer classes? Are not the most deserving poor those of whom nothing is heard or known? These questions have been put to us by a correspondent; we are but faithfully transcribing the appeal, the remonstrance of one who represents a large half-useful half-ornamental and generally impecunious class of tax-abated citizens. Mr. Fitzurse Plantagenet has laid before us the story of his wrongs, and the best thing we can do to summarily dismiss the matter,—for, like all agreeable men, the Plantagenets are not easily unbooked,—is to relate what he has told us as nearly as possible in his own words.

People talk and write about property in land, property in coin, property in brains, property in hands; but nothing is said about that purely personal property which possesses none of these aforesaid things. The House of Plantagenet has inherited lands in seven shires; its income is counted annually by hundreds of thousands, but though the family name is attached to the land and the coin, Mr. Fitzurse Plantagenet derives no benefit from either. He has no patrimony, yet he is obliged to pay 50*l.* for his rooms, 150*l.* to his clothiers, while he can just do with 150*l.* for pocket-money annually. His name precludes the possibility of his earning a living in the way that Providence evidently intended. His occupation is not only restricted, it is gone; or rather it has never come. He cannot dig; for, though the family estates increase every year, they are so tied up, and every twig upon them so protected, that not even 6 ft. by 2 ft. of the Plantagenet lands can ever be conveyed

to him. Even if he were not ashamed to beg, no one would give him anything, while his appearance presents a delusive exterior of enforced prosperity. An analysis of that appearance at once proves his case. Item, hands; item, brains. The former is a mere Darwinian rudiment, beautiful undoubtedly, but of no use in bread-winning; employed for generations in wooing and winning of another sort, the Plantagenet hand is a sentiment, an æsthetic delight. The latter item is still more difficult to define, because for centuries the Plantagenets have not possessed what, in the rude unmannered language of nine-tenths of the world, is called brains. Yet this man must live; and, we are not joking or romancing, he must live because he is a gentleman, because it is necessary that the breed of gentlemen should be kept up,—a breed, too, which continues to improve in this island, while it is almost extinct in some Continental countries. Remember what a cultured gentleman thought and always said about the breed to which the Plantagenets have for ages imparted lustre. Cried Thackeray in his easy way, and long before he was comparatively rich from the labour of his brains,—"Good birth, that is, handsome well-formed fathers and mothers, nice cleanly nursery-maids, good meals, good physicians, good education, few cares, pleasant easy habits of life, and luxuries not too great or enervating but only refining,—a course of these going on for a few generations are the best gentleman-makers in the world and beat Nature hollow." Undoubtedly; and how does a hard world repay men for having undergone training of this description,—training which fits them to sit as models to the uncouth, the nervous, the undeveloped majority of their fellow-creatures? See in what homes many of these splendid and yet modest productions are housed,—themselves human centres of refinement, yet surrounded and enclosed by vile, coarse, and unappreciative company.

Mr. Fitzurse Plantagenet resides in Little Gaunt-street, at a short distance from that club, once a famous chocolate-house, in which the echo of his ancestors' voices has reverberated for seven generations. The house in Little Gaunt-street is an ordinary house, some 18 orthodox feet wide in frontage; it is four stories high, exclusive of a commodious basement and two roomy attics. Our hero, if we may use so flippant an expression, occupies the third story, consisting of a front room devoted to day purposes; of a back room, in which the hours of the night are consumed; of a small apartment without a fireplace, and reserved for the diurnal luxury of corporeal ablution, for the storage of boots, and the repose of washable linen. These three rooms unfurnished—all opening upon a common narrow stair, and forming part of a once private house,—are let to him for 50*l.* per annum, rates and house-taxes included. The quarterly acquisition of these rooms confers upon the tenant a right to the use of the staircase, of a closet beneath the same, and of the street-door; to the last is attached a key, which becomes the tenant's exclusive and absolute property during his tenancy. Many persons of different sorts and conditions are interested in, live upon, and make money by, the house in question. That tiny bit of Earth upon which the house reposes—property extending from the centre of the said planet up to heaven—belongs to the Plantagenets; that is to say, to Mr. Fitzurse Plantagenet's eldest brother, who is forty-two years of age, and to the latter's son, who is twenty-one. The *original* leaseholder of the tiny bit is dead; his heir is advertised for, every three days, in the assignation column of the daily newspapers, and other heirs, if the heir be not forthcoming, live in New Zealand. The *first sub*-lessee, residing in Great Gaunt-street, is a builder and decorator, whose late father, having acquired a short interest in the tiny bit of land, and consequently of the house that stands upon it, encumbered it with the successive rights of three mortgagees. The *second* sub-lessee, possessing a still smaller interest in the same, has boldly secured it against possibility of alteration by the chains of a "settlement" clinched upon the altar of Hymen. The *third* sub-lessee, who most nearly approximates to the house-*owner*, lives over a shop on the other side of the street which is on the Gaunt Estate; and this gentleman extracts from the house*holder* a rent enabling him to discharge his responsibilities to his immediate lessor with an exemplary margin of profit to himself. The house*holder* farms a few acres in Yorkshire, and takes the annual rent of the house after his agent's commission has been properly deducted. The house-*tenant* himself uses the ground story of the building for business purposes, which consist in adjusting differences in commercial accounts, balancing books, winding-up estates, recovering debts, and lending money. The house-tenant's *tenants* make their agreements and pay their quarter's rents to this gentleman, who resides at an unnumbered mansion in the north-eastern district. The house-tenant virtually ignores the existence of his tenants except for a week before and a week after each quarter-day. During the forty-four other weeks in the year, the real occupants of the building receive formal recognition from the members of a family located in the basement. To this family the house-tenant relegates the duty of guarding the street-door, cleaning and lighting the staircase, and generally keeping an eye over the superstructure he farms.

The name of these guardians is Stubbs. The principal male is in a Government office, and there employed from ten till four o'clock in the capacity of porter. The principal female, well known as Mrs. Stubbs the French and English laundress, takes in "washing." This, at all hours of the morning, descends the area in loose and shapeless bundles; at all hours of the evening it remounts in crisp and homely parcels to be conveyed by Stubbs senior, or Stubbs junior, or even by Miss Stubbs and her sisters, to the place whence it was brought. The original Stubbses, having early acknowledged the advantages of matrimonial co-operation, are blessed with a numerous progeny, which have all first seen the light of day from a patent reflector scientifically adjusted to the window of the back kitchen in the house we are attempting to describe. The two eldest boys are in the army, the two eldest girls are in service. Gwendoline Stubbs remains at home to superintend the dusting of the staircase and Mr. Fitzurse Plantagenet's chambers; two smaller female Stubbses occupy the pantry during the night and early morning, and the area steps from noon to sunset. One younger male Stubbs, of weak intellect, seldom quits the front kitchen during the hours of either night or day. The last baby Stubbs is tended partly by him and partly by his younger sisters. All the persons we have enumerated dress and sleep in the two kitchens, the pantry, the two cupboards, and the wine-cellar, which go to compose the basement story. As we have explained, the ground-floor is engrossed with the business offices of the house-tenant. On the first floor reside a gentleman's family, consisting of husband, wife, two children, and a nursemaid. The two drawing-rooms however cannot afford them sufficient accommodation; consequently the back-room on the second floor, and the roomier of the two attics, are let with the first floor residential chambers. Another less roomy attic remains; and that was intended for the use of the original Stubbses. Circumstances however have intervened; why divide one family? Why not let the less roomy attic? So it turned out that the charwoman, employed by the Stubbses to do the ground-floor offices, came to inhabit the less roomy of the two attics. She, finding the accommodation spacious, took a lodger, an elderly decayed gentlewoman, who does a gentleman's rooms in the Club Chambers close by, and who, ever since the death of her husband forty-three years ago, has received weekly relief from a grateful parish.

The thoughtful reader,—and indubitably all our readers are thoughtful,—will at once perceive that though the several occupants of the house are, so to speak, provided with accommodation, there remains unappropriated yet one room,—the front room and its extemporised dressing division,—upon the second floor. Moreover, Miss Gwendoline Stubbs has not had an apartment specially allotted to her use. Now, the second floor front room and its dressing division, though *en suite*, cannot be called "chambers": a card in the fanlight of the street-door therefore announces during the season that "bedrooms for gentlemen" are to be obtained within. The bedrooms are never unlet; there are always two gentlemen, who pass their days at a club, willing to sleep in the bedroom and its extemporised division. But Gwendoline, who, by-the-bye, is a pretty girl, with long golden hair cut to fall over her forehead—Gwendoline, who presides over the dust-pan, the coal-scuttle, Mr. Plantagenet's rasher, the letters and parcels for the first floor, and last, not least, the young man in the ground-floor office who aids in the recovery of debts, the adjustment of accounts, and the lending of his master's money—Gwendoline! where does she sleep? We have said that the ground story is entirely devoted to business offices, and such places, it is well known, are always vacated at five, or at latest six o'clock, in the evening: Gwendoline Stubbs *sleeps* upon a movable couch *in the front office*. An early riser, she destroys all evidence of her lair before the charwoman in the roomy attic above descends to do the house-tenant's offices.

It will thus be readily seen that Mr. Fitzurse Plantagenet's set of rooms is perhaps the best division extemporised within the unfortunate house. He, besides, possesses an ingenious means of cooking the rasher to which we have alluded; this is performed by Gwendoline in Mr. Plantagenet's sitting-room while the owner of the residential chambers is engaged at his morning devotions, or his morning ablutions, in another room. Thus he is more fortunate than his fellow-lodgers. All their cooking is done in the front kitchen, where Mrs. Stubbs washes, dries, and irons,—that is, gets up the fine linen that delights her patronesses. Mr. Stubbs takes his morning and evening meal enhanced with the odour of other meals in course of preparation for the intermediary tenants of the superstructure. Furthermore, the nursemaid from the first floor is often there to see her mistress's first meal prepared and cooked by the industrious hands of Mrs. Stubbs. At times,—once a year, and, unless unforeseen accidents happen, generally in September,—Mrs. Stubbs is precluded from cooking and washing, or even superintending household matters. Then Stubbs gets leave of absence from his chief, and from a post of observation,—either at the area-gate, the street-door, or the public-house parlour opposite,—directs the charwoman, who occupies the less roomy attic, in the performance of his wife's daily duties. The annual arrival of another Stubbs puts the machinery of the cooking arrangements a little out of gear, but only for a short time. The real inconvenience occurs when all the Stubbs family,—two from the army, two from service, Miss Gwendoline and her sisters, the boy with weak intellect, and the children,—are assembled in the front kitchen. Then, from purely chivalrous motives, Stubbs invites the charwoman and the decayed gentlewoman in the less roomy attic, together with the nursemaid on the first floor, to join in the common meal. Then the windows of the superstructure have to be opened an inch at the top and an inch at the bottom; it is found agreeable also to leave the street door ajar, so that a current of air may penetrate the staircase, which is the natural and inevitable ventilating shaft that dissipates any foul or heavy atmosphere generated by the Stubbses in the front kitchen. It is only, too, after these events,—family festivities indulged in at rare intervals,—that any moral inconvenience is felt in the passage up the common staircase of the charwoman, and the decayed gentlewoman, to their co-operative residence in the less roomy attic. Nevertheless Mr. Plantagenet complains that, because he is enabled to pay only 50*l.* a year for three unfurnished rooms at the top of an old house in Little Gaunt-street, he should be subjected to the too close proximity of neighbours with whom he has nothing to do; to whom he is not known; and who pay as many shillings as he pays pounds,— or nothing at all,—beneath the self-same roof. True he, a Plantagenet, does not pay the full value of the rooms he occupies, because it is a rule at the West End to let a top set of apartments cheap, or even at a dead loss, to a man of name or noble birth. It has been proved, not a hundred miles from St. James's-street, that the young bucks from Fenchurch and Walbrook used to put their names down for years in order to obtain a bedroom in the house where Lord Mark Thistlewood, a brother of the late Earl of Bareacres, held the attic story; and he held it rent free from Sherrick, the wine-merchant, who farmed the Chambers at an enormous profit principally due to the noble decoy located under the tiles.

The gist of Mr. Fitzurse Plantagenet's appeal, at least as far as we have been able to follow it, is consequently this:—

Here is a man, born and bred in the very lap of plenty and refinement and bearing a name rooted in the soil of this country, compelled to reside at the west end of town, yet unable to pay more than 50*l.* for rent and taxes; compelled to act and dress up to the standard of gentleness which is his own, yet unable to increase the scraps of income he obtains from the con-

science of his eldest brother, the weakness of a maiden aunt, and the charity of that order to which the heads only of Houses like that of the Plantagenets belong. A part of the argument affects posterity. If it be physically good for the country that people like the Stubbses should increase and multiply their kind, surely it would be physically better for so grand a production as Fitzurse Plantagenet to rear up progeny after his kind; or, perhaps it would be morally best if the heads of great Houses produced no younger sons. Fitzurse Plantagenet must nevertheless die a bachelor, not so much because his income,—which, he very properly urges, conscience, weakness, and charity, as aforesaid, may yet increase,—will not permit him to quadruple his joys, but because at the west end of a giant metropolis there are no houses in which a gentleman of small income can cherish his own wife in comfort or even decency.

DECORATIVE TREATMENT OF MODERN SUBJECTS.

THE fact of the above-named topic having been formally brought forward for consideration in the paper and discussion of the Architectural Association (printed in our last number, page 272, *ante*), is of some interest; but it may be doubted whether the lecturer, or his critics for the most part, quite hit the mark in regard to the real basis of the question. Mr. Buckman's paper, indeed, hardly went into the matter with the seriousness or completeness which its interest deserved; it was slighter than had been anticipated, and must be pronounced entirely one-sided. That this should have been so was, perhaps, natural; the reader of the paper being a clever and, we think, rising artist, who has had the felicity to strike out in pictorial work a line of his own, and, of course, was pre-disposed in favour of that particular method of treatment. But he did not attempt, on that occasion at least, to go into the philosophy of the subject of decorative art further than to say that all such art had been in former times concerned with contemporary subjects, and was, therefore, of historic interest; and to draw the conclusion that, therefore, if we wanted to give value to our own art for future ages, we had no course but to go and do likewise.

Now we very much doubt whether even the premises are quite according to fact; that the deductions Mr. Buckman made from them are open to question seems to have been felt by one or two speakers at the meeting. But taking first the statement that all decorative art in connexion with great buildings had been historical, that is to say, a representation of contemporary life capable of being referred to as a record of the life of the period, we really must take such an assertion with a good many grains of salt. Taking the Egyptian and the Assyrian art, as exhibited, for instance, in the British Museum specimens, which Mr. Buckman specially exhorted his hearers to consider in connexion with the subject, there is no doubt we have there a great mass of purely historical art, representations of every-day life, hunting scenes, social observances, every-day culinary and other operations, portrayed in a manner which is not intentionally conventional, but is probably as near realism as the authors of these sculptured and painted decorations were able to go. But in what spirit do we now go to look at these? Is it for their artistic beauty, for their portrayal of anything which is noble, beautiful, or pathetic? Surely not; we study them for what Mr. Buckman very truly says they possess, historic interest, as giving in a rough but faithful manner the actual life and deeds of the men who executed them. Is there, then, nothing in Assyrian or Egyptian art which strikes the imagination? It would be untrue to say that even of Assyria, limited as Assyrian art-remains are in comparison with those of Egypt. But what is the figure which in Assyrian remains really strikes our imagination as imposing and wonderful in its mysterious expression of superhuman powers,—which has furnished a gifted living poet (Mr. Rosetti) with the subject of one of his most interesting and thoughtful poems? It is that design of the winged bull, which has become to the modern mind almost the poetic symbol of Assyria. And is the winged bull historical? In the case of Egypt, again, there is no lack of poetic significance and grandeur in her architecture, independent entirely of sculptured or incised decoration; but taking the decorative work of Egypt, what is the one conception which beyond anything else sums up to us the poetry and mystery of the old and half pre-historic kingdom of the Nile? Surely it is the figure of the sphinx: that is the contribution of Egypt to the poetry of art; and, again, we ask, is the sphinx "historical" or "contemporary" art? No bones, no fossil remains of any sphinx have been disinterred from any geological deposit whatsoever;—it is a pure product of the imagination. Then we come to Greece, and here the celebrated Parthenon frieze is unquestionably a piece of historical art, only separated from real fact by a slight and necessary degree of conventionalism. But what of the metopes, the battles of the Lapithæ and Centaurs, which are as completely decorative art as the frieze? They are at least not historical, they are fabulous conceptions; but they are not so important to our argument, as they are in fact inferior in excellence and artistic interest to the frieze. But this cannot be said, at all events, of the great tympanum sculptures. And again we ask, are they, the Minerva and the Theseus and Ilyssus, historic? On the contrary, they are among the most abstract and ideal creations of sculpture.

We might follow out the argument through such works as those of Indian and of European Mediæval architecture, with pretty much the same result. We should find in both undoubtedly a great deal of realistic art, but in both also a great deal of ideal and imaginative sculpture, though, of course, of far less beauty and importance than the Greek art. Still we find in Indian architecture representations of beings of superhuman interest and power, though impressed with the distorted, grotesque, often obscene characteristics of Indian mythology; and in Mediæval art the representation of superhuman and ideal beings, imperfectly executed, but exhibiting in feeling and interest much of that aspiration and moral seriousness and earnestness which characterised Mediæval faith on its best side. In all these the portions which we now turn to for real enjoyment as art, as a source of refreshment or of intellectual interest to the mind, and not as matter for mere antiquarian study, are those portions which are more or less ideal.

In saying this we are not urging that the historical portions of ancient decorative art were not looked upon with the greatest interest by the contemporary people for whose delectation they were carved or painted. Undoubtedly they were. But to apply the reasoning direct to modern times; to say that because such work was of the greatest interest to the people by and for whom it was executed, therefore, in order to give a living interest to modern decorative art we must adopt representations of the life of our own day in its most familiar aspects, is entirely to forget and ignore the immense difference between ancient and modern life; not merely in regard to the existence of painting and literary records (a point which was referred to in the discussion that followed Mr. Buckman's paper), but the difference created by the modern self-conscious character which inevitably springs out of our vastly-increased historical knowledge and communication with other countries. It is utterly impossible to set this on one side; utterly impossible that we can be in the same mental position as those comparatively childish races of earlier history, in whose eyes all the daily facts of their life were of importance, because they had no larger interests. We have larger interests: we demand more of art, and it is useless to pretend that we do not, except in regard to the least enlightened section of the people. It is true enough, no doubt, that when common people, the *profanum vulgus*, look at either pictorial or decorative art, they are chiefly or perhaps only interested in representations of objects and actions that are familiar to them. But to argue that therefore decorative art should represent only such objects or actions, is really to say that because most people are comparatively stupid and prosaic, therefore art should become stupid and prosaic. But in reality that which is of highest beauty and interest in art has always been the possession of the few only, not of the many; and it always must be so until the many reach a far higher relative pitch of education and intellect than they have ever hitherto attained.

But it may be urged that if the winged bulls, the sphinxes, and the Greek gods and heroes, are not historical representations of contemporary life, they, at least, represent something which those who made them believed in or cared for; and that, for our own art to be real, it is at least imperative that it should represent what we care for, not what others once cared for. And this is entirely and indisputably true. But the application of the sentiment is a much wider one than is commonly supposed. In the first place, its application cuts away one of the very grounds that have been urged for restricting decorative art to contemporary subjects. It is urged that ancient art is always historically interesting, because it represents contemporary subjects and manners; and, therefore, that we should make our art a representation of contemporary subjects and manners, in order that it may be interesting to posterity as history. But it is quite overlooked that ancient artists represented contemporary subjects (so far as they did so), not because such subjects would make their art interesting to posterity, but because they were interesting to *themselves*; while we are exhorted to do the same, because thus our art will interest our descendants. But that is an obvious fallacy. We do not practise art primarily for posterity, but for ourselves; and if we take to doing what we think will interest our descendants chiefly, we are defeating even that end, for historical art is only interesting so far as it represents the real *bonâ-fide* tastes and preferences of those who execute it. What we have to do is what interests ourselves, if we can find out what that is. The difficulty of giving a concise answer arises chiefly from the fact that life is so much more complex in its interests in these latter days than it ever was before, and it is next to impossible that any one way of regarding it can be named as specially and universally interesting to the present generation. That Mr. Buckman's idea of figures, taken directly from the life of the passing day, would interest a majority of persons is very likely; but it is also almost certain that the majority would not include most of the persons representing the highest intellectual culture of the day. What such persons do, as we believe, care most for in art, is that which represents an abstract and poetical ideal above the smaller interests of every-day life, with its fluctuations and bustle. It is true that those who keep this taste for the poetic phase of art are in a small minority at present, for this is a prosaic age, and those who like prosaic and matter-of-fact art are not only a majority, but a noisy and self-asserting majority, and have, moreover, prophets who encourage them in their perversion of taste. In no other light can we regard that ill-judged and absurd sneer at Flaxman which Mr. Buckman quoted from Ruskin. Flaxman, we take it, knew a great deal better what he was about, and what his art was worth, than any critic of the realistic schools could have taught him; and we can only rejoice that he was left free to follow the bent of his own noble genius, and to give us those ideal creations in which Greek beauty is combined with modern feeling in a manner hardly attained by any other English artist, and which, perhaps, are about the best typical example of the class of decorative art (for nearly all his art is suitable for decoration, if not actually designed for it) which is likely to have the most permanent interest for the highest order of minds, besides being specially suited for an application of art which necessarily excludes literal reproduction of nature and demands conventio alism; for this is an imperative condition of decorative art, which, therefore, is *ab initio* less suited for realistic than for abstract subjects.

One word more, by way of concluding with a crucial test in regard to a special example which occurs to us. Three or four years ago there stood in the Sculpture-room of the Royal Academy Exhibition a group of decorative sculpture of remarkable excellence and power, the model, namely, of Carpeaux's celebrated group of "The Dance," designed for the exterior of the Paris Opera-house. This, as those who saw it will easily remember, was a group of nude figures dancing in a circle round a figure with wild and excited action, striking cymbals, or some analogous instrument, with upraised hands. The whole thing was full of fire and genius, and made everything else in that year's exhibition seem tame. Now, according to Mr. Buckman's principle, this was utterly false, and what Carpeaux ought to have done would have been to represent a troupe of ballet-girls in short skirts and awkward attitudes, as the representation of the actual contemporary operatic dance. We venture to ask the realistic school,—to ask Mr. Buckman himself, whose paper gave rise to these remarks,—whether he will for one moment contend that by such a treatment the work of

the great French sculptor would have been rendered of more interest as art, either to ourselves or to any future generation?

TRADE UNIONS OR TRADE DISUNION.

THE precise rules and maxims of administration of trade unions seem, curiously enough, matters of much uncertainty,—uncertainty as to their terms, or, as in the matter of single-handed bricklaying, uncertainty or dispute as to their motives. We do not, however, require to know either in a purely speculative inquiry. We need only consider what they might be likely to be on given assumptions, and what then would be their characteristics, and speculation can only deal with examples at once simple and extreme. The leading and all-pervading principle may be assumed to be what has been acknowledged as the very fair one to raise the rate of wages relatively to work done, estimated in quality and quantity,—to raise the price of labour. The obvious and logical process of effecting this must be, as we know, by regulating the ratio of supply and demand which regulates price,—that is to say, by reducing the proportion of labour relatively to the work to be done. In the first place it must be an object to restrict the number of workmen. In this direction something seems likely to be done by enforcing limits to the number of apprentices taken, and then by excluding from work all men who are not privileged by belonging to the union, and bound to conform to its rules. More may then be done to the same effect by limiting the amount of work which shall be done by the men who have the privileges of the union. This may be effected by rules as to the amount which each individual man shall earn, by continued protection of the slow or the idle, by exclusion of overtime, and of piecework, which would enable work done to be accurately gauged and assessed. Again, that a maximum number of men shall be employed to perform a minimum of work will be furthered by discouraging, and even fining, extra efficiency, and by reducing the hours of labour. If regulations can be generally enforced which will bring all these concentrated influences into flourishing and progressive action, it seems, perhaps, that it must be easy for the workmen to exact for their indispensable services almost whatever terms they please. The power depends chiefly upon very comprehensive enrolment and absolute discipline of the enrolled. Persuasion may be worked very effectively to bring this about; the law intervenes more or less stringently to limit the employment of persecution and terror. Certain inconveniences, however, and certain difficulties are obvious. It is clear that the scheme will not work to the contriver's entire satisfaction unless competition can be effectually excluded; yet, non-society men will take work at prices that suit them, though not the men of the union. And the worst of it is that the men who choose to be independent will not be the worst men, whereas the union is certain to have its full share of the incompetent and the skulkers. It is well if this opposition has not some ill fruits; does not lead to hard words and disputes, to expulsions and fines of recalcitrant members that may savour of arbitrary confiscation; in very unfavourable circumstances, even personal violence, damage to tools and property, and a system of terror even culminating in assassinations might ensue. Consequences such as these will be deprecated on all hands, but theory cannot neglect an obviously-possible development. Such is the force of *esprit de corps*,—of corporate spirit,—that it is not unnecessary to record a warning how men of genuine character may be led away by it to palliate, not to say to perpetrate, cruel injustice, and find themselves involved in crime.

So much for theoretical deduction; but as a mischief that would be more frequent under the supposed organisation, one class of workmen would be arbitrarily preventing others from raising themselves or their children from the condition of unskilled to skilled labourers, and bettering a somewhat hard condition of life. This, it will be allowed, has a look of tyrannous unfairness, and unfairness is a *casus belli* in which we know which side will one day get the worst. Again, even within the ranks of the privileged there would be men of energy, of talent for the finer work, of praiseworthy ambition and capacity of labour, who must needs be severe sufferers by the limitation set upon their right to earn as much as they were equal to earning. The solace of the hardest lot is the hope of improvement, and every lot becomes hard to men with other than the feelings of the slave, which shuts out even the possibility of such a hope. What happiness can be found in labour,—labour which should be the very substantial basis of happiness, which is paid equally, whether much or little, good or bad? It would seem that if such a system were really established it would constitute a tyranny of the idle and incompetent over their betters, and could only subsist by its pernicious influence gradually sapping the self-respect of these better natures, and reducing their native dignity to most uncongenial degradation.

If we pursue the consequences of this system, to again, perhaps, imaginary, but still to quite a possible extreme, we should find the cost of the results of such labour so much enhanced that the expenditure of the public, the grand consumers, who are the ultimate employers, would be diverted to other channels, and restricted in those which are so artificially controlled to the barest necessities. Or the supply of the public would be derived from abroad, and what was once manufactured at home would be imported. As regards the community in general, such a stimulus to foreign commerce is perhaps as little to be deprecated as the stimulus to economy and invention of labour-saving machines, but the unionists would not take this point of view. Then, in some cases, would ensue alarm of the home manufacturer, or contractor,—it may be an attempt to help themselves by introducing foreign labour,—or otherwise a stand would be resolved on, and a desperate trial of strength ensue between strike and lock-out,—that is, war. Fortunately, we have nothing to do with pronouncing on the rights or the wrongs of any particular dispute between capital and labour; we are restricting ourselves within the limits of general considerations of speculative theory. On this ground we have little hesitation in concluding that disputes which shall be prolonged with great obstinacy ought, in nineteen cases out of twenty, never to have broken out at all; in such instances there must have been evidence of facts, available at the first sufficient to induce one of the disputants to give way, or both to consent to a compromise, and the subject in dispute need only have been regarded and discussed dispassionately for it to have been decided at once upon the merits. The interests of both parties are so seriously bound up with the maintenance of co-operation, and a good understanding, that nothing but passion or gross misconception can be accountable for keeping them long apart, at the cost of infinite damage to both. Passion and misconception there may be on either side, and assuredly there are not wanting tendencies to over-weening pretensions on the part of capital from personal predispositions, but the party of labour is bound especially to stand upon its guard against being misled. It is the side of the large numbers, and large numbers are apt to give way to rash panics, and to be carried off by generous but false enthusiasm of loyalty to ill-selected leaders and advisers. The larger numbers are the less instructed and exposed to be acted upon to their hurt, not merely by dishonest and self-interested leaders, but by leaders of perfect good faith, whose discretion, however, is by no means on a par with their right-mindedness.

But how else than by union is labour to protect itself against capital? How else can the many grapple with the concentrated power of the few but by concentrating also, and putting themselves frankly and loyally under the guidance of those whom, to the best of their judgment, they adopt as the best informed and most loyal leaders?

Well, if our opinion,—we will not say advice,—is frankly asked, we frankly give it. Unite by all means, and by all means on fitting occasions which are quite conceivable, and which we are open to admit have occurred more than once ere now; unite to strike, unite and strike, after fair trial of the offered alternative of a certainly reasonable demand or a strike; but let labour put itself in the right with labour first; let it have faith in the principle of free trade in labour rather than in the imbecilities which ought to be obsolete of illiberal artificial protection. Let jealousy among fellows be banished for the mean thing that it is, and the maxim be adopted that made England merry England of yore, though it was in days when hard knocks were the current medium of exchange and the leading concern of industry,—"a fair field and no favour, and let the best man win." As regards the relation of labour to capital we have this to say: the terms ought to cease, and might cease, to imply an antagonism, if the artisan class did justice to itself and its opportunities. There ought to be no labourer who should not be himself more or less of a capitalist,—the possessor of savings, invested as savings now may be with absolute security,—and who, by virtue of such savings, should not be able to avail himself of those aids to economy by co-operative associations which, in various localities, have had admirable economical results. Glad, indeed, should we be, if the majority of the labouring (the artisan) classes possessed that happy guarantee of an established home,—a dwelling that is the occupant's own property. But, apart from this, the true basis of independence is to be sought in a sufficient fund for insurance against age and accidents and the casualties of employment; a fund not exposed to the contingencies of an entirely different purpose, and not liable to be squandered by an ill-considered strike, entered into at the suggestion of others, encouraged by false appeals to fellowship, and still falser to supposed hostility, and persisted in long after common sense has decided that more was being lost by it than even success the most favourable could ever replace. So it is that, analyse what social question we please, from the embroilments of nations to those of classes large or small, the best solution is dependent at last on knowledge partly, but, above all, on common sense conjoined with common honesty.

ROUND AND ABOUT THE BAR.

AFTER an existence of just over a couple of centuries, with terrible threats hanging over it for more than half that period, the Temple Bar of the second Charles's reign, 1669-1673, was finally demolished in the month of January, 1878. Few buildings had been associated with a greater variety of exciting incidents than this one during the time of its standing at the boundary of the cities of London and Westminster, and yet it is only in recent years, thanks to Mr. T. C. Noble's researches, that its real history has been told to the world.

We do not intend in this article to go into details about this City gateway. A reference to our earlier volumes will give ample information of its history and antiquity;* but it may be interesting to our readers to note a few facts not only illustrative of the building, but also of the celebrated houses which so long surrounded it, but which in their time have also been forced to give way to the march of nineteenth-century improvements.

The highway from London to Westminster was anything but a pleasant road to travel in "the good old times." It was truly countryfied and unpaved even as late as the sixteenth century, and still later the game of football was a favourite play in the open Strand, while in Fleet-street the monotony of seeing only occasional brisk road-traffic was enlivened by the 'prentice cry of "What dy'e lack?" from the tradesmen's shop-doors, and their rough-and-ready salute of a country cousin; for, according to a contemporary account of his visit to London,—

> "The Haberda-hers that sell hatts,
> Hit Robin Conscience many pats,
> And like a company of cats,"

scratched and worried him sorely.

The ancient aspect of the Strand may be gleamed from the fact that it is described in an official document as "full of pits and sloughs, very perilous and noisome," and yet in the reign of Edward III., amid the discomfiture of (we must suppose) an overflowing Thames, and a deep, muddy, and dangerous road in winter, there lived within a few paces of old Temple Bar, the Bishop of Bangor, in Shoe-lane, and the Bishops of Exeter, Bath, Chester, Lichfield, Llandaff, and Durham in the Strand, while two palaces,—Bridewell and the Savoy, not forgetting the Monastery of the Whitefriars, and the Sanctuary of the Templars,—add to the list of the Inns or residences of that day, which had pleasant gardens sloping to the river banks.

It was in 1634 that Captain Baily obtained permission to set up the first hackney-coach stand in London; and the spot selected was close to the scene of many a rural festive gathering,—the maypole in the Strand,—which stood nearly opposite Somerset House, on part of the site of the present St. Mary's Church. Poor

* See the *Builder* for March 12, 1870; Dec. 16, 1876; &

John Taylor, the water-poet, speaks of their introduction in this strain:—"After a mask or a play at the Court, even the very earth quakes and trembles, the casements shatter, tatter, and clatter, and such a confused noise is made, so that a man can neither sleep, speak, hear, write, or eat his dinner or supper quiet for them"! As a sample of our poet's complaints at that time, here is a copy of one preserved among the State papers:

"To the Right Honble the Lord Cottington,
The Humble Petition of His Majesty's watermen
Shewes that your Lordshipp is so well inclin'd
To pay us, that our order you have signed:
For wch we humbly thank you; tho' as yett
We sue and seeke, and can no payment gett,
We live in debt; we coyne and credit lacke,
And we do feare Sr Robert Pye is slacke,
Or els unwilling; therefore we implore
Your lordshipp to remember him once more,
And we shall pray unto the power supernall
To bless yor Lordshipp temporall and eternall.
JOHN TAYLOR."

As for Temple Bar itself, the earliest notice of it is dated 1301, but at that period it was nothing more than a bar or chain across the street. John Norden goes so far as to say that it was a gateway at the time of Wat Tyler's insurrection in 1381, but the first notice of it as a building is 1533, when, on May 31, "sweet Anne Bullen," passing along to her coronation, was gratified by seeing the conduit in Fleet-street (surmounted by angels, who with music made "a heavenly noyse") running claret and red wine, while Temple Bar was "newly paynted and repayred, where stood also divers singing men and children." Next "a good and substancyal newe payre of gates" was put up when Philip of Spain passed through the Bar in 1554, and the key was given into the custody of a tenant or keeper, who shut and opened them night and morning. The necessity of locking up the City at night in Queen Elizabeth's reign is shown by an entry in the books of St. Dunstan's parish in 1576: "We pr'sent Crowne Co^t in Chancery Lane for want of a gate by means whereof roges and idle persones have recourse out of the *feilde* in the night season through the said court in the high streete." Now, a reference to Aggas's map of London in 1560 will show that at that time Drury-lane was a bye country-road leading from St. Clement's to "Broad St. Giles." Chancery-lane had only a few houses at its Fleet-street end, while Temple Bar is a covered building, with a lane running from it northwards, called Shire-lane, which, in the reign of James I., was re-christened for a time *Rogue's-lane*. There were then *fields* close to the Bar, about which we shall have something to say presently; but the gates entering from the open country both into Shire-lane and Chancery-lane were often "presented" even to the middle of the same king's reign, "by reason that rogues and badd people in the nyght tyme" made it their business to pay prohibited visits through them, "whereby great harme and annoyance groweth to the neighbourhood."

In 1636, Inigo Jones was consulted about designing a new Temple Bar, but the design, which to our mind would have been a great ornament to the City, was never carried out. The Bar was evidently in a very shaky condition, and, like the Bar of our own time, lived long a threatened existence. The structure is shown in Hollar's seven-sheet Map of London; it is a plain erection, probably of wood, with slanting roof, gabled; there were three openings for traffic, and between these two columns with pedestals. Carvings of the Royal Arms were over the carriage-way, and those of the City over the footways, while a little foliage upon the pediment completes the description. And this building remained until 1670. An account preserved at Guildhall, and quoted by Mr. Noble, shows that between August, 1669, and March, 1673, there was paid by the City towards the erection of a new gate, a total sum of 1,397*l.* 10s. Of this amount, the four effigies (James I. and his queen, Anne of Denmark, often wrongly described as Queen Elizabeth, on the City side, and Charles I. and II. on the Strand side) were sculptured by John Bushnell for 480*l.* The architect of the modern Temple Bar was the rebuilder of London after the Great Fire,—Sir Christopher Wren, and the masons were Joshua Marshall and Thomas Knight. Marshall's Temple Bar has vanished, but there still remains a bit of his work,—the pedestal of the finest equestrian statue in London, that of Charles I. at Charing Cross.

The new City gate had not been in existence many years before its summit was made "the modern traitors' gate,"—to be "adorned" with the heads of those executed for high treason,—the last heads so honoured being those of Townley and Fletcher, who suffered for the 1745 rebellion. One of these fell down in March, 1772. How long the solitary tenant of the Bar's summit remained, history tells not,—a high wind must have carried it off its pinnacle years later, and ended for ever the most ghastly exhibition in London.

But while all this was going on, great outcry was made that Temple Bar was in the way, and in 1753, to pacify the agitators, the City ordered that the gates of this Bar, together with Newgate and Ludgate should be thrown open at night on and after the 1st of November. Still the cry continued, and in 1759, the Corporation actually gave the then tenants of the Bar notice to quit. Then came Alderman Pickett's proposals, and to him certainly the City was subsequently indebted for improvements, long before the New Law Courts were thought of; and yet, curiously enough, his new buildings here had to give place to this Palace of Justice, while his other buildings at Snow-hill had to give place at the same time to the Holborn-valley Viaduct. And now, Temple Bar, for the removal of which he made so many attempts eighty years ago, has at last been "improved off the face of the earth." Such then, in brief, are a few facts relating to the structure itself; all the remarkable events connected with it are far too numerous to be here detailed. But its neighbours,—the buildings which have for so many years surrounded it,—are of such an interesting character, that a note or two derived from original sources will probably prove acceptable to our readers.

The first house to be noticed is Child's Bank, which for nearly two centuries has been so closely connected with the Bar, that no account of the history of one would be complete without that of the other. This house is known as No. 1, Fleet-street, but a portion of the premises adjoined the Bar on the Strand side. Every one will recollect Dickens's description of its interior, but historically its rise and progress has lately formed a most interesting "Account of ye Marygold" (the ancient sign of the bank) by Mr. F. G. Hilton Price, and from which we learn many new and curious facts. When the ancestors of the house of Child & Co. first commenced business in this neighbourhood has never yet been satisfactorily established, although a William Wheeler, goldsmith, is generally supposed to have been the founder in the early days of Charles I. He was succeeded by Robert Blanchard, who in turn was succeeded by their apprentice, Francis Child, subsequently alderman of the ward, Lord Mayor of London, and President of Christ's Hospital. To this Francis Child and his partner, John Rogers, "ye executors of Madam Gwin"—the celebrated Nell Gwyn—signed an agreement in 1687 acknowledging that she had died in the debt of the bank 6,900*l.*, but that the Duke of St. Albans had paid 2,300*l.* off, and the sale of her plate had realised 3,791*l.* 5s. 9d. At that date the banking-house of Childs was one of the few of stability in the City, and its customers included Charles II., Prince Rupert, James, Duke of York, William and Mary, Prince George of Denmark, Samuel Pepys, Lord Chancellor Clarendon, Sir Peter Lely's executors, the Poet Dryden, Horace Walpole, Lord Keeper North, several dukes and members of the nobility, Mr. Speaker Onslow, &c. It would appear the "Marygold" was the sign of a tavern established "time out of mind" in St. Dunstan's parish, and the earliest notice of it found by Mr. Noble was in 1619, when Richard Compton, the landlord, was "presented" for disturbing his neighbours at night by keeping a disorderly house. As a tavern it ceased to exist before 1676, but the bank kept up the original sign, and it still hangs inside the front shop, and is represented in watermark on their present cheques. Now, it is a curious fact that the Marygold was a popular sign hereabouts, for in 1673 Mrs. Cox, a milliner, "over against St. Clement's Church," did business at a similar sign, while we have seen in a deed dated 1700, the sale by Henry Cole, wine-cooper, to Edward Hammond, vintner, a house described as being "in or near Fleet-street, in the parish of St. Dunstan's-in-the-West, London, *heretofore* called or knowne by the name or signe of the Marygold, and *lately* called or knowne by the name or sign of the Green Dragon, and *now* called or knowne by the name or sign of the Vine." On the earliest printed cheques of the bank,—we have seen one dated 1729,—is engraved a view of Temple Bar. These cheques are in the nature of promissory notes. Before then all orders to pay were written on small slips of paper of no regular size. We have seen one dated 1707 "To Sr Ffrancis Child, at Temple Barre, London," from "your humble servant and brother, John Child." Younger banking-houses than Childs, and yet each having no mean history, still flourish in Fleet-street,—all springing from the goldsmiths of old London, who were so cruelly robbed when Charles II. shut up the Exchequer. One of the most interesting documents in our possession is an assignment by Thomas Vyner, executor of Sir Robert Vyner, bart. (one of those robbed by the "Merry Monarch"), of a grant derived under the patent granted by the king in April, 1677 (in settlement of certain loans) of an annuity of 25,003*l.* 9s. 4d. out of the Excise "for ever."

The next noted house to Child's Bank,—but the site of which now forms part of their premises and the late Child's-place,—was the world-renowned Devil Tavern, immortalised by Ben Jonson. The tavern ceased to exist in 1787. In its earlier days, the wits and poets of the day resorted thither. The beautiful Duchess of Richmond's jewels were sold here in 1703; and here forty years later the Royal Society held its dinners; and Swift, Garth, Addison, and Steele met here, it being "a place sacred to mirth, tempered with discretion." A few doors from the "Devil" was another celebrated coffee-house known as "Dick's." It was established before 1681, and still exists at No. 8. The "Rainbow," No. 15, was the second coffee-house opened in London. Its proprietor in 1657, James Farr, a barber, was presented by the parish "for makinge and selling of a drinke called coffee, whereby in making the same he annoyeth his neighbours by evil smells," and setting his chimney on fire at night. At this house, about 1682, Dr. Nicholas Barbon, son of "Praise God Barebones"—as he has been called—established the Phœnix Fire Office. Almost opposite is the "Cock" Tavern, the head waiter of which has had his praises sung by the poet Tennyson. We have seen a letter addressed to "Mr. Latymer at his lodgings nere St. Dunstan's Church, at the signe of the Cock," 1600, but do not know whether this was the present tavern's predecessor. The landlord, in 1655, issued a token, and shut up his house and went into the country during the time of the Great Plague. Here in April, 1668, Pepys, the diarist, "ate a lobster and sang mightily merry" with his two lady friends, Mrs. Pierce and Mrs. Knipp,—a custom some of to-day would call the height of impropriety.

A few doors eastward of the "Cock" stood "once upon a time," another tavern called the "King's Head." It was "an elegant mansion" in the reign of Edward VI., and in 1586 its owner was indicted "for pouring bad water upon the people's heads below." Now the water must have been "bad" indeed, for at that time it was the ordinary way in wet weather for spouts thus to carry the water off the roofs, and deluge the passers by. In the seventeenth century taverns were not restricted to ground-floors: hence the fact of Richard Marriot, subsequently Isaak Walton's publisher, keeping a shop in 1665 under the "King's Head." Here in 1678—exactly two hundred years ago—met the Popish Plot conspirators, headed by Lord Howard; the house was pulled down to widen Chancery-lane in 1799.

On the 5th of July, 1493, "at the Temple Barre of London," or rather in a house close to it, Richard Pynson "fynisshed" his "Dives and Pauper," the first book in London printed with a date away from Westminster. It was he who introduced the Roman letter into printing. In 1525, he and another printer, Robert Redman, got into "paper warfare," Pynson telling him, "even as the devil made a cobbler a mariner, he made him a printer"! Where Butterworth's law-publishing house stands, No. 7, Fleet-street,—stood a house having the sign of the "Hand and Star," and where Richard Tottil kept his establishment as law-printer, by patent, to Edward VI., Mary, and Elizabeth. The house has thus been associated with the trade for more than 3·0 years. In fact, Fleet-street has been the great centre of the art of printing from the days of Caxton to the present time, for Pynson was one of his apprentices. Within shade of the first Temple Bar, the art flourished, and within a few hundred yards around the last Temple Bar the art has been the most powerful means of proving that world-renowned proverb, "knowledge is power." May the art long flourish!

At No. 17, Fleet-street, next door to the "Rainbow," and facing Chancery-lane, is a building stated on its front to have been formerly the palace of Henry VIII. and Cardinal Wolsey. This is an error. It was erected in 1611, probably by Inigo Jones. The upper portion of the house is very roomy, the staircase wide, and the first floor has an elaborately gilt ceiling, with armorial bearings and Prince of Wales's feathers in the centre, and monogram "H. R." These decorations are accounted for from the fact that the mansion was formerly the palace of Henry, Prince of Wales, son of James I. Mr. Noble tells us of documents he has seen among the State papers, dated 1618, "from His Highness's council chamber in Fleet-street," and in 1635, called, "a house in Fleet-street where the King's commissioners for his revenue when he was Prince of Wales usually met." Fortunately, the present tenant is a great lover of antiquities, and has preserved the building as far as he has been able to do so, considering that at the beginning of the present century the house was occupied by the celebrated waxwork exhibition, founded by Mrs. Salmon, in the reign of Queen Anne. But this was not the only exhibition within view of Temple Bar. From 1736 to 1798, Rackstraw's museum of anatomy flourished at 197, Fleet-street, and the giants at St. Dunstan's Church (similar to those in Cheapside) struck the bells and told the hour, and caused many a country bumpkin to lose his savings, and the London citizen his patience, while trying to elbow his way through the crowd. In Fleet-street, among "the sights" of the last century were—a great Lincolnshire ox, nineteen hands high, and four yards long; a child fourteen years old without thighs or legs, and 18 in. high; a Turkey horse, 2 ft. odd high, in a box; an Italian giantess, 7 ft. high, weighing 425 lb.; a mermaid (a similar exhibition stopped by the Lord Chamberlain in 1822); and last, but not least, here De Hightretight, the fire-eater, ate burning coals, swallowed flaming brimstone, and sucked a red-hot poker five times a day.

Temple Bar took its name from the adjacent home of the Knights Templars,—one of, if not the most, powerful of the ancient knightly bodies in Christendom, who fell at the end of the thirteenth century through wielding their power unlawfully. Their dress was a long mantle, on which was exhibited a cross, still kept in memory by the armorial bearings of the Middle Temple. The sister society,—the Inner Temple,—changed their arms in the reign of Elizabeth, from the Holy Lamb to Pegasus, or the Winged Horse. Anciently the Templars had their settlement on the site of Southampton-buildings, Holborn, but removed to their new estate—the present Temple, in the twelfth century, and here they remained until suppressed in 1310, the last prior dying in the tower, and the sheriffs completed their dissolution by taking possession of the property, including the present Temple Church, which was consecrated in 1185, and which is the largest of only four "round" churches in England. By Royal grant, the estate passed through the hands of the Earls of Pembroke and Lancaster, until in 1324 the king granted it to the Hospitallers, or Knights of St. John of Jerusalem, the gateway of whose more modern priory,—St. John's Gate at Clerkenwell,—still exists. St. John's Gate has been repeatedly stated by modern writers to be one of the ancient City gates; whereas, when this priory was in existence, it was "far away *across the fields*" out of the City, and *in the suburbs*. Temple Bar was therefore in reality the *last* of the City gates, or rather not the City gate proper, because the walls of the City terminated at Ludgate-hill, and Ludgate was pulled down about 1761, but any one may still see a portion of the old wall in the court facing the Old Bailey. When the Corporation obtained possession of the "liberty" between Ludgate and Temple Bar is unknown, but it is supposed to date back to the Conqueror's time. Any way, in 1222, the decree which terminated the ecclesiastical dispute between the Abbey of Westminster and see of London marks the boundary further westward in the Strand, and it was not until the reign of the Stuarts that the present jurisdiction was properly settled. The City, however, very early erected their barrier by the Temple, and so from time "beyond memory" this barrier, or bar, and subsequently a building and gate, was put up here.

Before the year 1440 the Temple became the home of students "learned in the law," for Wat Tyler and his rebels had sadly damaged it in 1381. When the *two* societies sprang into existence is unknown, but each paid 10*l.* to the prior of St. John's at the dissolution of that monastery in the reign of Henry VIII. In February, 1547, the Inner Temple ordered their chief butler to enter in a book the names and addresses of all members joining the society, and from that time to the present this has been done. It was James I. who granted the Temple *to the two societies jointly* by his deed dated 13th August, 1608, and yet made *each* society pay 10*l.* per annum. He reserved the right of appointing the master, and the Crown still retains it, although the freehold has long since become the sole property of the societies. As we have shown, the gateway opposite Chancery-lane was erected in 1611; and that nearer the bar called the Middle Temple gate, in 1684, by Wren (architect of the Bar) upon the site of an older building, erected by Sir Amias Paulet, as a fine imposed on him by Wolsey. By both entrances the Shaksperian rendezvous, the far-famed Temple gardens, can be reached.

It is impossible to say anything in this article about the celebrated persons associated with the Temple, yet we are prompted to note a fact which we have recently found about a very unworthy and yet historical character,—William Parry, who in March, 1585, was executed before the Parliament at Westminster for high treason, and after whose death special prayers were issued for a happy deliverance, &c. We find that this man resided in Fetter-lane, close to Temple Bar; was descended from a very poor stock, but that his father, after having sixteen children by one wife, and fourteen by another, died at the age of 108! William appears to have made friends with Lord Burleigh, and subsequently was actually pardoned by that statesman for having broken into the chambers of Hugh Hare, in the Temple, and attempting to rob that individual, and this, too, at a period when such a crime was death. After a series of the most impudent frauds this Parry got mixed up with the Scottish succession agitators, and as a result soon came to the gallows. We have seen the confession, in his own handwriting, which he addressed to the Queen from his prison in the Tower. Here is an extract from the extraordinary document:—

"The indignityes passed between yor Ma and the King Catholick are many. You have disquieted his state, mayntained his rebels, and do here with such as have robbed hym and his subjects. Many marchants are undone; some few are enriched; some bad humors pleased, and yrself dishonored. Yt may cost you dere; look to yt in tyme. There is possybality to repayr all. The Qn of Scotland is yr prisoñ; let her be honorably intreated, but yet surely garded. She may do you good; she will do you no harme if the faulte be not Englishe . . . Remember yr unfortunate Parry, chiefly overthrown by yr hard hand. Amen1 yt in the rest of yr servants, for it is past with me."

Let us now take a turn outside Temple Bar, if only to note a few facts only just come to our notice. They may interest many who have already dived into Mr. Diprose's interesting rambles in St. Clement's Danes. Where the New Law Courts stand, stood, in the good old times, such a nest of courts and alleys as were only to be met with in such a place as unreformed London. "Next door" to Temple Bar, on the north side, stood the well-known fish-shop to which Crockford, the gambler, succeeded, and whence he migrated to St. James's to play hazard, and build his club-house, at a cost of 94,000*l.* He there took his stand against everybody, and for years none could break him, although they tried as much as they liked. He became a millionaire, and retired in 1840. His celebrated club then died out, but the house still stands, although modernised, at the north end of St. James's-street. Facing the New Law Courts existed a tavern, called the "Rose." It was a noted "house of call" for politicians, and a century ago the site, and the adjoining Thanet-place, was sold by the Earl of that name to John Cooke, a bookseller, in Paternoster-row. But a few doors west is Palsgrave-place. Here formerly stood the notorious Palsgrave Head Tavern, and next door, at Heycock's ordinary, Andrew Marvell dined, and here he castigated the M.P.s who were in the pay of the Crown. Talking of those early times reminds us of the poet Sir John Denham, and his student chums, who in 1635, after a drunken frolic at the Griffin tavern, in Shire-lane, took a pot of ink and a plasterer's brush and blotted out all the signs between Temple Bar and Charing-cross! At No. 217, Strand (the London and Westminster Bank), was the banking-house of Snow, celebrated by Gay, and subsequently Strahan, Paul, & Bates. Then come Essex-street and Arundel-street, both occupying the site of those noble mansions, Essex and Arundel Houses. In the former was stored the famous Cottonian Library, 1712-30, and in the latter lived the Earl Arundel, who "brought out" Hollar, the engraver, and "old" Thomas Parr, the latter dying here, aged (so tradition states) 152 years odd months, simply because the Earl's house was more sumptuous to dine at than a Shropshire cottage.

St. Clement's Church, which stands now by itself, but which, in the last century, formed one end of an angle of houses known as "The Island," one side of which was called Butcher-row, from the numbers of that trade keeping shop there, is too well known to be described. We have, however, a very curious folio sheet before us, entitled "The Vestry: a Poem," 1701. It is descriptive of the "doings" of the parish at that date, and makes the parson say,—

"Next consider the hazards and dangers we all
Are continually in, lest the steeple should fall;
And judgment is given by those that are skill'd,
That it won't cost so much to *support* as to *build*.
I hope you won't follow the practice of many,—
Be fools by the pound to be wise by the penny."

Eighteen years after this was printed, Gibbs added the present tower and steeple to the old church.

Within view of old Temple Bar anciently existed "the fields," then truly fields and open country. We happen to have (by documents and original deeds) a complete history of the site hereabouts from 1638, which was years before Henry Serle or Nicholas Carey became possessors of the soil. Where the present New Square stands was originally a portion of Fickett's Field, and the houses were erected by Serle in 1697. A copy of a printed broadside (of the reign of Charles I.), in the shape of a petition, says,—"Whereas your petitioners, with other inhabitants, hath to their great comfort, health, and benefit, time out of mind enjoyed free liberty to walke, recreate, and disporte themselves with all kinds of lawful exercises, as likewise to train, muster, and dry cloathes in three *waste* common fields, called by the names of Purse Field, Fickett's Field, and Cup Field, adjoining to the west side of the Hon. Soc. of Lincoln's Inn, yet one William Newton, gent., for his own private lucre, contrary to statutes, proclamations, &c., hath by himself and his assigns, within five or six years last past, erected very many buildings on new foundations (inhabited for the most part by Popish recusants), and caused many thousand loads of dung and dirt to be laid in the said fields, now used as a common laystall, and made a common horse-pool therein," whereby the petitioners were prevented from walking, training, and drying their clothes. Some score years previously to this the benchers of Lincoln's-inn also petitioned to prevent Sir Charles Cornwallis erecting a mansion in the fields. In 1696, however, fifty-five of the houses then erected on the estate were sold for 27,000*l.* Of these, nine houses fronted Serle-street. We fancy the freeholds of these fifty-five houses would fetch a trifle more than this sum at the present time. Until the reign of the Stuarts, all the ground outside Lincoln's-inn was truly open country, and upon the wall of the Society's garden in Chancery-lane, otherwise Chancellor's-lane, worked none other than "Mr. Benjamin Jonson, bricklayer" and poet,—he, who, according to Fuller, combined two professions, "having a trowel in his hand and a book in his pocket!"

And yet, talking on the combination of professions, who could be a more celebrated neighbour of Temple Bar than the remarkable "Praise-God Barebone," who was a leather-seller near Fetter-lane, in Fleet-street, and the hero of Cromwell's Parliament. Many a time must he have passed under the Bar on his way to "the House" to meet the hundred and odd other members who composed the "Barebones Parliament." We have seen Cromwell's original summons to him, and as it is an historical document of more than ordinary value, a copy is here given:—

"Ffor as much as upon the dissolution of the late Parliament it became necessary that the peace, safety, and good government of this Commonwealth should be provided for; and in order thereunto, divers persons fearing God and of approved fidelity and honesty, and by myself, with ye advice of my council of officers nominated, to whome the greate charge and trust of so weighty affaires is to be committed; and having good assurance of yor love to and courage for God, and the interest of his cause and of the good people of this Commonwealth: I, Oliver Cromwell, Captaine-Generall and Commander-in-Chiefe of all the armies and forces raised and to be raised within this Commonwealth, doe hereby summon and require you, Praise-God Barebone, esquire (being one of the said persons nominated), personally to be and appeare att ye Councill-chamber in Whitehall, within the citie of

Westminster, upon the 4th day of July next ensuinge the date hereof, then and there to take upon you the said trust unto which you are hereby called and appointed, to serve as a member for the Citie of London; and hereof you are not to faile. Given under my hand and seal the Sixth day of June, 1653. O. CROMWELL."

Of Barebone's Parliamentary career, history gives us the fullest details, and yet, within seven years later, because he still remained true to "the cause," Pepys tells us he twice had his Fleet-street dwelling injured by the mob, a mob that lighted fourteen bonfires between Fetter-lane and Temple Bar in honour of the Restoration. His son Nicholas was a great builder and projector, was founder of the Phœnix Fire Office, resided in Crane-court, in that very house (subsequently the home of the Royal Society and the Scottish Corporation) only recently destroyed by fire. But why the name was called Barebones we have never been able to learn; one thing is certain, documents before us have the signature, "Nicolas Barbon," although history has quoted him as "Damned Doctor Barbone," but whether on account of his extraordinary building speculations and the order he gave to his executor not to pay his debts after his death, is a question not far from solution, and worthy of a little attention to those interested in such matters.

TURKISH COTTAGES.

ROUGH AND FINE ART IN TURKEY.

THE present not a little uncertain position of the Turk, and his very place in the European community of nations, must and certainly ought to rouse attention to his art and artistic doings, and to his position as a builder in Europe, surrounded as he is by so much that is remote from him, all ways looked at. Nay, the question concerns not him alone, as an Eastern man, but it involves that most curious of questions,—the inherent differences between the Eastern and Western races of men, differences so essential and so wide apart. In fine art and building, how much of diversity is there to be found between, say, Constantinople and "Middle-Age" London, to say nothing of our modern and rebuilt city. The cottage homes of Turkey and the cottage homes of England are wide enough apart, and are worth glancing at. How much do *we* not owe to the East, to use that general term, and what would the state of things be even here were but the "Eastern element" eliminated entirely from English home life? It would take many pages to catalogue this fairly, and truthfully, and not a few things and items might start up, a little to the surprise of those who look at passing events as but passing events.

It may, therefore, be of some interest to describe, as far as may be, the dwelling and cottage home of the Turk and the Turkish soldier, and its surroundings, and to picture for a moment the art to be found in and about these Eastern homes. We shall do this as simply as may be, and thus enable the reader to realise to himself the home of the common Turk and the Turkish soldier. It may clear up a mystery or two concerning him and his present work, and help to show how he has been induced to embark in it. Turkey proper, it is to be borne in mind, is an Oriental or Eastern country, and to be looked at as such to be at all understood. All nations and nationalities are not alike, and the broadest of distinctions is to be drawn between the "Eastern" and the "Western" man, for they are in reality all but separate creations. All is different. But for our present purpose the home of the Oriental man will serve sufficiently to distinguish him from those who in Europe surround him. He is an Asiatic in Europe, and his primitive home and place of birth was the East,—all that he now has, and his virtues, and his failings alike. And more than this, if he is to be "improved," as the term is, it will be in the end as an "Eastern." A curious question and problem indeed, and a hard one.

A Turkish village is a place *per se*, and the dwellings and cottage homes in it are things again utterly inconceivable to those who know only of our own cottages and humble country homes, even in the most out-of-the-way and forgotten places, and however neglected and forsaken. Turkish cottages, then, on the outside, are but simple square boxes; commonly they measure from about 12 ft. to 14 ft. The walls of them are built up of rough stones, as they are picked up, of all shapes and sizes, and are cemented together with *mud* merely. The roof is always flat, and is covered over with earth or thickened mud. This is supported on thick boarding, laid from wall to wall, over rough beams as cut from the tree. It is curious to note that on this flat and rough roof there is always a stone roller of small size, for the purpose occasionally of flattening and hardening the upper surface of it. To this simple abode *there is no window* whatever, the light coming in through the all-but ever open doorway. To the *door* there is no fastening even, but a billet of wood suspended over the top of it, which falls down when the door is closed,—when it is. Outside there is always hung a peg with which this inside fastening is pushed up when any one desires to enter the room. The walls on the inside are plastered over with mud, mixed with short bits of straw. There is no firegrate of any kind; but the fuel, commonly wood, is piled up under the large open chimney, often the ends of it appearing through the top of it outside, and thus visible from the street. On entering such a house, say the dainty travellers, it always appears to be quite dark,—and so, indeed, it is!

But there is some comfort to be found even here; and the Eastern man is not without his resources as well as his Northern foes and fellow-creatures. It must be noted that such a house as this is commonly wholly without what is here called *furniture* of any kind or sort. The Eastern man takes his furniture about with him. Richly-coloured carpets, which we in vain try to rival, either in colour or pattern, are spread on the mud floor, and a few nails driven into the mud walls of this humble room serve to hold up out of the way the articles of clothing and other matters not in use brought into it. Thus, with a bright, sometimes cedar-wood fire, and the perhaps faded and worn coloured carpets, or rugs, and "hangings" on the walls, this small tenement with, by the way, in addition, well-stuffed cushions to recline on, becomes not only a human habitation, but a comfortable *home*. However old and worn the carpets and hangings, they to the last retain more or less of their fine colour,—faded, may be, and worn, but there it is.

This, then, is the dwelling of the modern Turkish soldier, *when at home*, and it is the common and usual type of house or "cottage" all over the East, more or less; and what is most curious is, it has been so from a time stretching back to far beyond written record and history. In the sculptures, to be found more or less abundantly all over Asia, these small houses are to be seen, and the rock-cut "drawings" of them show that they are not to be distinguished from those built yesterday and *to-day*. It is wonderful, indeed, to find how, in spite of perpetual progress, the world holds to its own, and persists in doing what it always has done. Truly, a thousand years are but as a day; and yesterday, to-day, and to-morrow are one!

But there is more yet in these primeval cottages, for the antique Greek spirit has done its part in the designing and furnishing of them. One or two very curious items may be noted. We have spoken of the small roller used to flatten the mud roof. It is found in practice ineffectual to do its work thoroughly, so that much of the earth in the corners of the roof and near the edges is loose, and so favours the growth of grass and luxuriant weeds, and acanthus and other large leaves, and the consequence is that these appear above and hang over the low parapet surrounding the mud flat, and thus have given rise,—so Sir Charles Fellowes argues, and we must need agree with him,—to the scroll and leaf ornaments, cut in marble, to be found on the antique Greek samples, and often to be seen conspicuously on coins and bas-reliefs. What will *accident* not do? And this thought may well take us back in time to the *beginnings* of the Turkish hut building; for in Asia Minor, all over it, may be found bas-relief representations incised into the solid rock on the mountain-sides of such of these very cottages as are lived in by the modern Turkish soldier of to-day, when at home, and when his wars are done. Three thousand years back is but a moderate estimate, as it is most surely a safe one; and there is actually no difference between the cottage home of the working man and the soldier then and now. Of such huts as these, many, certainly, if not all, of the antique cities of Asia were in the main formed, and the streets of them, famous as they were and are in history and song, were lined with such as these, differing in details, but in the main the same. The walls and "defences" of the antique cities and the mighty art-filled temples made up all the solid and enduring work in them, and are all that has come down to us, or that remains to assure us of their past existence; for, as has been well observed, such slight structures as these houses could not have lasted a single century "except as dust," when once abandoned. From dust they came, it is certain, and to dust they have returned, and will yet again return, let who will be lord and master over them.

And there are other things and items in these rude cottages of the Turk, and the Turkish soldier, which might perhaps be sought for in vain in more favoured places and in more polished homes. We refer to the art to be found in the lamps, pots and pans, and plates and basins, and other and not a few articles of domestic economy. That these are different from things about us but few will doubt. Many of them are of true Classic type, and form, and origin, and transport the mind, in spite of other surroundings, to the days and doings of antique Greece. The common house-lamps are commonly of tin or earthenware, and the bottles, and ewers, and plates, are not only of Classic forms and ornamentation, but are carried about by the women and girls in just the same way as the like things were by the Greeks and Romans in antique and Classic days. We may, indeed, here see the past in the present, so that the Turk, as he is, is of interest in other ways than as a fighting man. The general tendencies of the time are towards a sort of settled uniformity, so that any evidences, even in out-of-the-way places, of originality, of art work in common things must be of more or less interest, and the Turk, with other Eastern nationalities, yet works on in the old way.

DRAWING IN ELEMENTARY SCHOOLS.

LAST week the drawing examination, so-called, took place in the elementary schools throughout the country that participate in the Government grant for education. The examination was interesting in itself, and in evidence of the enlarged scope, in a useful direction, of public elementary instruction and training. This was only one of the annual examinations conducted in these schools under the direction of the Science and Art Department, South Kensington; another for black-board and other work comes off in November in each year. Like most other educational examinations, whether of scholars or teachers, the drawing examination in elementary schools is conducted under rigorous conditions. It is held on the same day simultaneously throughout the country, obviously to preclude the possibility of copying, coaching, collusion, or special preparation. Examiners or managers are appointed to superintend the proceedings, who must not be connected with the school staff of teachers. To these gentlemen are consigned sealed bags containing the exercise papers to be used by the scholars, and instructions for the conduct of the examination. At sharp ten o'clock the bag is opened, and active proceedings ought to commence by the distribution of the drawing-sheets, but the examiners have first to read, mark, and digest the instructions which should have been in their hands for two or three days previously. The papers were sent to the "correspondent" on the 8th instant, but the responsible "examiners" had no chance of perusing the instructions before 10 a.m. on the morning of the 11th, when their immediate duty was to distribute the papers to the scholars, and set them to work. It would not be too much to let the examiners have draft copies of the instructions in anticipation of the examination, two pages of printed foolscap, one of them very closely printed, cannot be assimilated in five minutes, and it is their due to be apprised of the matter contained in "520a, see especially par. 4, ' before they "duly fill it up and sign it." They should also know something of "576a," and other matters referred to in the form ["F. & T. 5,000 1-78 2-21-39"]. As hitherto conducted, the "managers or superintendents" at these drawing examinations have been kept too much in the dark as to their functions and powers, and it may possibly become impossible to find gentlemen to accept an office in which they may find themselves neither useful nor ornamental.

To return to the examination. When the sealed bags of papers are opened, and during the execution of the exercises by the scholars, masters and mistresses of schools are interdicted from being in the room, but assistants and pupil teachers may be present to assist, and valuable service in this respect they render.

The exercises comprised freehand drawing, first and second grades; the first very simple, a *fleur-de-lis* ornament, for which forty minutes were allowed; the second-grade exercise was more elaborate, and an hour and a half, not a minute too much, was allowed for its execution. In addition, there were two grades of geometrical drawing, one in perspective, and two grades in drawing from models. The times allowed for the copies were forty minutes, an hour, and an hour and a half, according to the subject. The results of the examination will not be known for some time to come. The degrees of merit are "excellent," "proficient," "good," and "fair," and schools are credited and participate in the Government grant for every scholar who gives evidence of having been taught drawing. The second grades in freehand, practical geometry, model drawing, and perspective, are eligible to receive prizes according to their respective merits; these prizes include boxes of water-colours; of crayons; of mathematical instruments; drawing-board, T-square, and angles; copies of Cotman's pencil outlines; Wornum's "Analysis of Ornament"; Lindley's "School Botany"; Burchett's "Practical Geometry" and Burchett's "Perspective"; Binn's "Orthographic Projection;" Stanley on Instruments; Puckett's "Projection of Shadows"; Davidson's "Drawing for Machinists," &c.

The scholars presented at the drawing examination belong to standards two to five inclusive; the children of standard one, the lowest, are not taken. The freehand exercises have, in all cases, to be copies, enlarged or reduced, of the lithographed sketch, each paper being identified by the name, at full length, and age of the scholar, with the name and address of the school, all written at foot by the scholar himself. The exercises consist of vases, geometrical figures, Egyptian and Grecian ornaments, and elaborate artistic floral devices, embracing a great variety of curved lines. The concluding duty of the examiners is to count up the papers, the used and unused, to certify the numbers, seal up in the bags, and despatch to South Kensington by the first post.

LEFT-HANDED ARTISTS AND WORKMEN.

A POPULAR novelist in the pages of a daily contemporary has lately opened the question of left-handedness. It would be more correct, perhaps, to say that the novelist re-opened the subject, for it is one that has been treated of to some extent in the *Builder* in connexion with other unutilised resources.* The present writer had some words to say on the subject of left-handedness and its utility under every circumstance, and, if we remember aright, the conductor of this journal quoted the example of a well-known sculptor, now deceased, who lost the use of his right hand, and by practice managed to write and do other duties with his left with tolerable ease. We hold a strong belief that both the left hand, the left foot, the left shoulder, and left eye could be trained and educated in early youth to perform the same function as the right with equal facility, and no reason exists to the contrary why left arms or limbs, &c., should not possess equal strength with the right. What gymnasts, rope-dancers, acrobats, and others of that "kidney" can do by early training, architects, artists, craftsmen, and clerks could do; and further, what men could do, and have done, and are doing at the present time to some extent, women can do by training and practice. In the building branches the present writer knew, in the course of his experience, several workmen who could use the hammer, saw, plane, and other tools in a left-handed direction with equal facility to what they could do with their right hands. To be able to use the left hand with ease is an acquisition in several species of work in the building branches, and the want of the power has led to the necessity of supplying certain tools and appliances that could be done without, if the left hand were available in the instance of the workmen engaged. A left-handed carpenter, or one that could use the left hand as well as the right, is a very "handy man" in a different acceptation of the term from that generally used. In stone as well as timber work, in metal-founding or forging, in plastering as well as painting, in bricklaying as well as slating, the use of the left hand in various situations will be found a great advantage to the workman. The same may be written of the work of the builder's labourer or the farm or agricultural labourer. There are descriptions of farm or field labour where two men working in parallel furrows are unable o work exactly opposite to each other, on account of both being unable to use their left hands as well as their right. The consequence is that one labourer has to divide his portion of the work into short lengths, one man working with his face turned in one direction and the other in the reverse, instead of both working with their backs turned the one way. In many forms of field labour, digging, trenching, cutting furrows, or potato planting in ridges, the farm labourer moves backward. It is a mistake, we think, in any system of gymnastics in public schools not to train the youths to the use and exercise of the left hand and other almost dormant faculties in connexion with man's physical and mental nature. There is a lady not far from our elbow at the moment of our writing these observations, who can use the needle with the same facility with her left hand as with her right, and consequently sew and trim, and perform other operations. Owing to a sprain in her wrist some years ago, which for a time incapacitated her from using her right hand, the lady learned to write with tolerable facility with her left hand. At table she can utilise the left in performing several operations which would possibly appear awkward to other critical ladies. To cut a slice of bread or carve a joint with the left hand as well as the right is a useful acquisition, and ought not to be considered awkward. In parts of the sister kingdom there are kinds of one-shouldered spades (lefts and rights) called facks or fakes, which agricultural labourers use, and some old left-handed and right-handed hinds prefer these spades to the more modern pattern. In our boys' and girls' School Board schools it is well worthy of the attempt to begin a system of training for developing the general use of all our moral and physical faculties, left and right, so that in another generation or two, the loss of a limb or an arm would not become such a sore loss to the sufferer as it is at present. The sudden loss of a right hand to a City clerk, if he has made no provision, means indigence to him. Could he use his left as well as his right he could continue in many cases in employment without any loss to his employer. The writer has known instances of carpenters and joiners earning a good living who had lost the use of one of their hands. They became jobbing workmen, packing-box makers, and makers of general domestic articles. The loss of one arm was supplied by an iron appliance or rounded bar.

We even witnessed one of these iron-fisted "Chips" driving a brad or a nail home with a blow of his very handy, handless iron arm. We know a timber-legged, *i.e.*, one-legged workman in the jobbing building line, who could climb or mount a ladder with the greatest ease, and do a piece of bricklaying or slating work with the greatest safety on scaffold or roof, no matter how high.

What then?—Well, Mr. Charles Reade's "Coming Man" has long since come, but as he has missed his facilities, he is but imperfectly educated. His sons and daughters, and grandchildren and great-grandchildren, have alike been negligent, and content with a smattering of education and training, like their ancestor. The eye is still only half-educated, and the left eye particularly is weak, and both wink more than they work, and the eyelids are closed for too many hours of the precious 365 days. There is only one mouth to fill, while there are two hands to work, and two limbs to assist, two ears to hear, and be ravished, and two eyes to see and enjoy nature and art. Abstractedly, we could carry the subject to an indefinite length, but we are content for the present to give a short practical exposition of the value of left-handedness, so-called, and the necessity that exists for developing man's physical and other faculties, long dormant or little utilised.

* See Vol. for 1873 (xxx.) July 23.

Graving Dock on the Thames at Blackwall.—The new graving-dock for Messrs. R. & H. Green, shipowners and shipbuilders, of Blackwall, is now rapidly approaching completion, and is expected to be opened early next month. The dock is entirely faced with granite. The engineers for these works are Messrs. Kinipple & Morris, of Westminster and Greenock; and the contractors, Messrs. George Baker & Son, of Stangate, Westminster.

TELEPHONY.

THE progress recently made in the science of telephony, or that which is yet prospective, induces M. Henri de Parville to write in the *feuilleton* of the *Journal des Débats* a fantasy to the realisation of which, it must be owned, only technical difficulties seem to be opposed. In telegraphic practice, says the writer, an apparatus which leaves no traces of the despatch is considered inefficient. After the talking telephone, it is necessary that the writing telephone should be created. An instrument must be invented which automatically writes down a conversation, and, so to say, stenographs the words spoken within its reach. There are already phonographs which mark the sound. Each sound impresses itself upon a paper by a more or less curved line. But that is not sufficient; it is necessary that this writing should be readable, and that is not easy to attain. Even stenography, to be rendered into ordinary writing, involves some trouble, and greater requirements are made at present. Inventors are trying to solve a problem which appears at first sight extremely strange. It is the object to stenograph automatically all the words of a conversation held in a room, and to fix them for ever; and as it is always inconvenient to read complicated and confused writing, it is intended to perfect the improved telephone until it is able to read its own writing itself, and to reproduce the words fixed by its means. It is intended to invent a machine which listens to a speaker, writes down his speech, and later to reproduce everything he has said, word for word, preserving also the sound and expression of his voice. It is the intention, so to say, to have a speech or a conversation taken down, to preserve what has been written, and to reproduce at any chosen time, say ten or fifty or a hundred years later, the same speech or conversation. It is exactly the story of the frozen-in sound, related by Rabelais in "Pantagruel," only the science of modern physics intends making this story come true. Without entering into details, which would be premature, it may be shortly pointed out how it is to be arranged in order to put a speech, as it were, in one's pocket and to redeliver it without troubling the original speaker. In case it should be supposed that this is only a dream, it may be added that an eminent engineer, M. Marcel Deprey, has already made several remarkable apparatus for reproducing automatically the human voice; he continues to labour unceasingly on his project, along with M. Nepoli, and there is every probability that before very long it will be practically realised. A thoughtful inventor, Mr. Cros, has already proved that the solution of the problem is possible with the means at his disposal, and Mr. Edyson has constructed a first machine, with striking results. These talking-machines, it is said, will exceed by far the Faber machine, exhibited last year in the Grand Hôtel at Paris. The principle upon which the machines are constructed may be explained as follows. The operator talks against an apparatus containing a membrane sensible to vibration, as well as a point touching a strip of paper driven past by a clockwork. The voice causes the membrane to vibrate; this acts upon the point, and the latter draws upon the paper lines of various forms, and corresponding to the inflection of the voice. The variously shaped lines, consequently, represent the words: a new kind of stenography. Thus the sound of words would write itself down as we write down the different sounds of music, by special marks and symbols, and thus the eye would be able to read off the sounds of the words with all their details, elevation and depth, emphasis, &c.; and an experienced reader would be able to reproduce for himself the speech, in the same manner as the musician reproduces for himself the music when he reads the score. If this is attained, the word is rapidly seized, fixed, and may be stored; what remains to be done is to get it into an instrument which will give it back audibly at any time. Let us imagine, now that the graphic portrait of a speech is carved out in its lines like a stencilling-plate, that this pattern, conducted past the point, forces the latter to follow its outline, that the point acts upon the vibrating membrane: the whole proceeding would be reversed, and the telephone would speak, in consequence of the vibrations of the membrane, and be able to deliver a speech as a barrel-organ makes music. We should have the cast of the speech, and strike off copies as often and as many as we like. As already pointed out, the apparatus constructed by Mr.

Edyson performs wonders. The operator speaks by the side of it before a kind of speaking-tube. The vibrations take themselves down in the interior of the machine on a strip of stanniol, propelled at a regular rate by a cylinder. A simple arrangement cuts out the metal leaf by the lines drawn upon it, and thus the pattern is ready. If the latter is now conducted past the point, so that each cutting acts upon it, it is only necessary to put one's ear to the tube of the telephone in order to hear the whole speech recorded before. The voice is heard, the speaker is recognised, only the voice retains a somewhat nasal sound. If a conversation is recorded in this manner, each person taking part in it could be recognised. It will be seen that all this is founded on reality. The conversation recorded to-day might be held over again at any moment; the present taken from life, and handed over to posterity. Thus the eloquence of a speaker, the lecture of a *savant*, might be heard again, although the speaker or professor had long since peacefully reposed in his grave. It would be possible to preserve the voices of those dear to us, past life, and to hear them speak again, to recall them to life. The old portrait is there, silent and immovable; but now it speaks to us; its voice sounds as in life, and the great-grandfather will talk to his great-great-grandchildren. Who will say, then, that he ceases to exist?

AID WANTED FOR INDIA.

NATIONAL INDIAN ASSOCIATION.

MISS F. DAVENPORT-HILL has sent us the following extract of a letter from Mr. Sasipada Banerjee, of Barahanagar, Calcutta, January 11, 1878. We gladly insert it, with the hope that it may lead to what is desired:—

"It would greatly help the *Indian Workman** if you could send us blocks of engravings of men and women who have risen from the ranks by perseverance and devotion to work; of those who are devoting their life in the cause of the working-men's movement in England and other countries; of English sites and public buildings, engravings of machines, steam-engines, &c. We deal with all subjects (excluding religion and politics) which tend to the intellectual, social, and moral improvement of the working class. We endeavour to make it at the same time entertaining and instructive. When sending out the engravings I should like you to send me some pieces of raw block, not engraved, to be worked on here. Your committee can in another way help the movement, and that is by sending us books and reports bearing on the working-men's movement in England. Can you manage to send us regularly the *British Workman* and some of the illustrated papers intended for children. The size of the paper is royal 8vo. The engravings should not be thicker than printing types. Blocks showing works of art, &c., will also be acceptable.

About the nature of books we want, I beg to tell you that we are greatly in need of reference books. It is my object to make a collection of these in the Institute, and in this, I think, you could greatly help us. I was thinking of writing to Mr. Thomas to see if he could get for me a set of second-hand British Encyclopædia, and as you have kindly written to me on the subject I cannot do better than mention it to you. I have no idea as to its price, but should be glad to bear the cost if it is not too much. . . . . Novels, books of entertainment, and scientific books will be acceptable. But I should specially beg you to make a collection of reference-books, including a copy of "Men of the Time" for us, as these we are much in need of.

We have nothing like prize books in this country. You have in England prize books of various sorts, suited to men, boys, and girls, which, if sent out, would be most welcome. In our prize-givings, the books we give have no outward attraction, some have no binding at all, and there is nothing like the entertaining and instructive pictures in them which are to be had in such books in England.

Books of entertainment, giving a correct picture of English society, of what there is noble and grand, and what has given the English the position which they now hold are wanted. Such books sent to any part of the country, and circulated among our educated young men, would do a vast amount of good."

The magazine alluded to above is called the *Bharat Sramajibi*, or *Indian Workman*. It consists of eight pages, 8vo., with woodcut illustrations, price one pice a number, monthly. It is "an educational paper" in Bengali. Its object is to provide appropriate reading for the working classes. It is published at Barahanagar, a suburb town of Calcutta, where there are jute and other manufactories. Mr. Banerjee is the editor, and he promotes various schools and other useful institutions in the place.

Miss E. A. Manning, 35, Blomfield-road, honorary secretary of the Indian Association, would gladly undertake the transmission to Calcutta of anything sent to her.

* A small magazine.

MIDDLE-CLASS BUILDINGS IN FLATS IN KENNINGTON-ROAD.

"CLAYDON-BUILDINGS" is the title which has been given to a large block of new buildings in flats for the middle classes, which has just been erected in Kennington-road by Mr. Sansom, from designs furnished by Messrs. Fowler & Hill, architects. The site upon which the buildings have been erected is between East-street and Union-street, immediately to the west side of Kennington-road; and, with the view of improving the approach from Kennington-road, the owner has purchased property at the East-street end, which is to be taken down for the purpose of widening that thoroughfare. A low and dilapidated class of houses stood upon the site of the new buildings, and these were all cleared away before the commencement of the works. The site is angular in form, the buildings having two main frontages, one to the east and the other to the south, with an open area in front containing about 10,000 superficial feet, which is intended to be ornamentally laid out as a recreation-ground and garden. The east frontage of the buildings is 100 ft. in length, and that on the south side 90 ft., and the entire space on which the buildings stand occupies an area of about 14,700 superficial feet. The buildings are 55 ft. in height, and contain five floors, each floor, from the ground to the top story, having a uniform range of bay windows, with balconies and balustrades carried along the foot of each floor window, there also being similar balconies at the rear of the buildings. Projecting beyond the main face of the two principal frontages there are covered staircases, built of fireproof material in brick and cement, and the floors of the balconies are also composed of the same fireproof material. The main face of the several frontages is in stock brick with ornamental red brick bands, and stone window-dressings. The main cornice is surmounted by an ornamental iron railing, enclosing a flat roof, for the accommodation of the tenants,—not only for recreation, but for clothes-drying purposes. On a portion of the site a washhouse, 25 ft. in length and 10 ft. in width, has been erected for the general use of the tenants. It is provided with coppers, wash-tubs, and every other convenience for washing and laundry purposes.

Internally, the buildings contain thirty-five tenements in all, with accommodation estimated as equal to a population of about 300. Each tenement contains four rooms, in addition to a small kitchen, and an external larder, with access from the interior. The four apartments in each tenement consist of two living-rooms and two bedrooms, in addition to water-closets, and other domestic conveniences. The kitchen to each tenement includes a range containing oven and boiler, together with dresser and cupboards. There are likewise dust-shoots for each floor, which are fixed outside the building, and to which there is easy access.

DANGER TO TREES IN STREETS.

A STATEMENT was made a short time ago to the effect that several gentlemen had offered to subscribe considerable amounts for the purpose of having the Pentonville and Euston Roads planted with trees. Highly laudable as such a display of public spirit may be, as tending to change for the better the generally dreary aspect of London streets if the example thus set were extensively followed throughout the metropolis, it is to be feared that a great part of the funds and trouble expended would be wasted. A significant case has come under our notice. Visitors to Cologne will remember the numerous handsome elm-trees growing round that city and on its glacis. It is reported that a number of them, near the Harbour, as well as those between the Gereonsthor and the crossing over the railway on the road to the gasworks at Ehrenfeld, have died off. It was at first supposed that the cause of their "drying up" was the *Eccopto gaster*, a species of bark-beetle somewhat less dangerous than the destructive *Hylurgus*, *Bostrychus*, or *Strangalia*. Now, however, that the trees in question have been felled, and their roots and the soil from which the latter drew their nourishment have been examined, there is no longer the slightest doubt that the vicinity of gas-pipes is the sole cause of their decay. It has been denied that gas-pipes laid close to trees could injure them. It has been argued (for instance, in Berlin) that though coal-tar is injurious, gas is not. But gas cannot be made without the admixture of coal-tar, and some trace of the latter always remains with the gas, notwithstanding the care of gas-manufacturers to remove it. Any one who will take the trouble of looking on while old gas-pipes are being removed will notice the soil round them to be of a bluish-black colour—an effect of the coal-tar which has combined with the soil, testifying to its presence only too plainly by its smell. The pipes may be laid so low as to avoid their being affected,—i.e., contracted or expanded,—by changes of temperature, and prevent their joints ceasing to be air-tight; but for all the care taken in laying them down, they would still not remain so. Of course, we know that the iron pipes do not permit coal-tar to percolate in drops, but they allow of the escape of gas, because iron is porous; and gas contains coal-tar. But if this escape takes place in new gas-pipes, which are now all cast vertically, it must happen in a still greater degree in old ones, which were unfortunately cast in a horizontal position, and which are in consequence of uneven thickness and more uneven density.

In the case at Cologne, the gas-pipes are laid very close to the trees in question. In digging out the decayed trees, it appeared that the tar contained in gas, in the course of time, had penetrated the soil, and coloured it bluish black. The suctorial roots of course grew into this soil, and were killed. The larger roots growing downwards, and others reaching to some distance, were insufficient to supply the required nourishment to the tree, in consequence of which it gradually died off. The roots, on being examined, showed at a glance whether they had remained on healthy soil or had come in contact with coal-tar. The former, both outside and inside, are of a brown colour, and are easily broken. The latter betray by their smell the presence of tar, and exhibit the bluish black colour not only in their bark, but also in their woody fibres. The above facts demonstrate that a tree has to be protected not only against vermin but also against surroundings which would be injurious to the vital juices that circulate in it.

SYDNEY.

SAILING along an awful coast,—almost under beetling precipices, high above the masts of the ship,—many a score miles long, the voyager suddenly perceives a gap in the endless cliffs. Although this opening is nearly a mile wide it seems to require a pair of gates to bar the entrance to a scene of supernatural beauty. These cliffs resemble the walls to a garden, for the moment the vessel enters it can sail either to the right or left of the wall, or at right angles to the before mentioned coast of overhanging cliffs 300 ft. or 400 ft. high; but the scene that bursts upon the view can never be forgotten, and it is doubtful whether it can be surpassed upon this planet. The sun shines unmolested in a clear blue sky, a balmy breeze wafts the fragrance from a variety of never leafless trees which all around cover rounded hills 400 ft. high. Turning to the left, several capes and bays are passed on both sides, each with a single exception having steeply sloping shores. Nestling amongst the trees palatial residences can be descried, and at last one of the finest cities inhabited by the wealthiest, most contented, and most patriotic of the English people, is seen. It is situated all round three of the bays, where the shores are flat,—two of which are full of ships which sail from the metropolis to this beautifully-situated part of English territory; some of these ships perform the journey in forty days and some in eighty, but if they were eighty weeks performing it every Englishman ought to see the Queen of English cities,—Sydney. Landing at the bay known as the circular quay, we are at once in the midst of some of the noblest architecture in the empire. It is just ninety years since the first

party landed there, consequently all that we behold is modern. We can proceed four or five miles up either George-street, Pitt-street, Castlereagh-street, or Elizabeth-street, from this point and find no gaps in the houses on either side, but before one mile is reached our admiration of the architecture ceases. We travel some two miles up George-street before we reach the only railway station, but hundreds of 'buses and Hansoms are ready to carry us the distance, though we shall be jolted as we never were before, and if we are nervous old ladies we shall begin to count our beads, and rejoice greatly when our journey is ended. This, however, is not attributable to the vehicles, but to the atrocious roads, for there is neither wood pavement, asphalte, nor granite boulders—in fine, there is nothing but what nature made. The city is built upon a buff sandstone, which underlies nothing, but which soon goes to powder. Sydney is built of this stone, which works almost as easily as Bath stone, but which is never sawn. The few bricks that are used are of a dismal colour and bad in quality, so bad that all houses built of them are cemented over, and the quality of the workmanship would make any London jerry-builder blush, yet there are no speculating builders in Sydney; this bad work is because few architects are employed, and no clerks of the works. There are no Building Acts and no district surveyors. Your London carpenter, mason, and bricklayer would think their fellow-workmen were working for their lives could they see them, but all this high-pressure haste is fatal to sound workmanship: every scamping trick that man can invent is resorted to, even where the most vigilant architect is employed. These operatives get from 1s. 3d. to 1s. 6d. per hour, which is as good as 1s. 6d. in London, but it must be admitted that if they had worked as hard in London as they do here they would have earned as much there. For some miles the pathways are flagged with the same disintegrating stone as that with which the better buildings are erected; gutters are also formed with large blocks of it—gutters 2 ft. 6 in. wide and 1 ft. deep. When it rains these are filled with water, which at intervals disappears under stone bridges which cover large cesspools: in these the waters roar and thence find their way in subterranean channels to the harbour. As far as the rain which falls upon the ground is concerned, this is not objectionable; but immediately under the flags are laid pipes from the back parts of the houses which empty themselves into the open gutters, and whatever solid or liquid each householder likes to send through these pipes, he can do so with impunity, or he can deposit it in his cesspool. Now this is a state of things abominably intolerable in a city of Englishmen; but, perhaps, it is out-heroded by the fact that more than half the people have nothing to drink, or make other drinks with what rain-water falls upon the dirty roofs of the houses: these roofs are of corrugated iron, wooden shingles, or slates. The water is caught in cylindrical corrugated-iron cisterns, and as no rain falls for three months, the action of the atmosphere upon it, and what is washed off the roofs, make the drinking-water as unfit for that purpose as the liquid in the cesspools; consequently the death-rate of a city just hatched, as it were, and enjoying a most life-giving climate, is as great as it is in some murky, manufacturing Yorkshire town. Another result is that the houses and the air are crowded with visible and invisible life that owes its existence to filthiness and idle habits; mosquitoes, flies, "Norfolk-Howards," fleas, dragon-flies are terrible pests, and send many bimana back to the northern part of the empire. Where such creatures flourish, man withers; they are deadly enemies, and one must ultimately be vanquished. Is it to be man or not is a question of serious import to the welfare of the Australian colonies; if they are to be peopled these pests must be fought more vigorously, and the example set by England must be followed. The children must not vainly fancy they have more wisdom and experience than the parent. In the building business the conceit of the Sydneyite is particularly noticeable. The good example set by London is derided. In Sydney they go their own way about it, and make a sorry mess of it. The builder is not a capitalist; in fine, he is not a builder, but a journeyman mason, bricklayer, carpenter, and plumber who, out of his excellent wages, has saved a few pounds. He sees an advertisement that separate tenders for each of the above trades are invited by some architect; he goes forthwith to the architect, and is allowed to take the drawings and specifications away from four p.m. to ten a.m. the next day, and in this time he does what a London quantity surveyor would have 50*l.* for. He sends in his tender which may be 2,000*l.* or 500*l.*—for this difference is not at all unusual;—and if his be 500*l.* he gets the order to proceed, but if more he is surprised that he hears nothing about the job; and when he passes the office he calls in and asks for a list of the tenders. The architect laughs at this simplicity, and informs him that such breaches of faith never occur in Sydney, for the public would see what scandalous muffs Sydney builders are, as the highest tenders would be four times as much as the lowest; yet, in the very next list of tenders the builder who was the highest would be lowest. This is because he is only a young journeyman carpenter or bricklayer, and not a builder, in the London sense. He goes on for a brief period, and loses what he saved as a journeyman, as well as defrauding his creditors, and then he becomes a journeyman carpenter again. His timber-merchant and others get such enormous profits that they can afford to lose much in the shape of bad debts. The only competition amongst timber-merchants is that each tries to sell more than the other, but never at a lower price. Nothing is ever heard of standards of deal, or loads of timber: all is sold by the 100-ft. super., in inch thickness. A shipload of timber arrives, and its contents are advertised for sale by auction, in lots never below 100*l.* in value; so that the innumerable penniless builders are shut out of these auctions. The price it runs up to is, for colonial pine, never above 6s. 6d. per 100 ft. super. as inch, but it is retailed out to the builders at 18s. when sawn into boards or scantling. Another class of men besides timber-merchants are doing well in Sydney, viz., the auctioneers. There happens to be an allotment mania, such as probably never was seen in any country before. Some scheming speculator will buy a few acres of land covered with heavy timber,—as all the land is in the neighbourhood of Sydney. He gets a land surveyor to plot out upon paper streets 40 ft. wide and 300 ft. apart, and divide each side of each street into allotments of from 30 ft. to 70 ft. frontage, and number them; stakes are then driven in amongst the trees, and in a week the allotments are sold by auction, at prices ranging from 10s. to 10*l.* per foot frontage. The process in England is to make a good metalled road, with granite curbing, gutters, and sewers, but in Sydney the street will be built upon from end to end before a tree is cut down in it. The class of houses that are erected in these streets are generally devoid of architectural pretentions, except what emanates from the brain of the iron-founder, for about 5 ft. in front of the house is a cast-iron fence, and over it a cast-iron verandah, or rather balcony, with a corrugated verandah over that. All this cast-iron work is tastefully picked out with paint. There is a 9-in. wall between the balcony of one house and the next. The rooms are loftier than in England, and the doors hail from San Francisco, as every mail steamer brings some thousands of them; and the market is so glutted with them, that at the auctions,—where they are sold in lots of about 100,—they only fetch about what the material would cost in Sydney, and there is a duty of 2s. per door upon them. Two years ago the lowest price realised at auction was 15s., now it is 7s. We know that in San Francisco every building operative is now working for his bare board; but as this is a state of things that cannot last, they will soon desist from sending their doors here to be given away at auctions, when of course it will pay to make them in Sydney.

Some thousands of Chinese are located in Sydney, and their chief occupation is making furniture: this is much inferior to even that of Curtain-road, but it is much cheaper than the latter, and an export of it will probably soon take place from Sydney to London. It behoves London cabinet-makers, therefore, to avoid Sydney. The Government is giving free passages to cabinet-makers, carpenters, bricklayers, blacksmiths, masons, plasterers, brickmakers, navvies, bricklayers' labourers, and farm labourers. It was giving them also to engine fitters and drivers, foundrymen, weavers, and a host of other useless men in a colony, and there is no doubt that hundreds in this last category would be glad if there were any workhouses in the colonies. Many of them were sent out to country towns, where there was nothing but the cultivation of the soil for them to be employed at. A Birmingham button-maker will take to this just as readily as a horse will take to braying like a donkey,—which, by the way, is as scarce as the dodo,—and the farmers would rather have a draper than an artisan in iron. It is very unfortunate for them, as they happen to be at a discount all over the world. If they must emigrate, let them do so co-operatively, as has been set forth in the *Builder*, and eschew the colonial farmer altogether. There is no doubt they could by such a plan be metamorphosed from ironworkers to successful farmers, at their own expense, in a short time. It is deeply to be deplored that there should be so many idle men in the British Empire, whilst there are millions of acres of soil in it as ready for their labour as was Venus for Adonis's love. A horse knows nothing about cultivation, but he can be made very useful to the cultivator; so can an engine-fitter. It must, however, be admitted that employers in a colony have no prejudice against a man because he happens to be an engine-fitter or a weaver; but in England, if a man is born a weaver he must die a weaver: there is the workhouse, however, there. It is strange how saucy this institution makes the English workman; it makes him turn his hours of labour into pastime, and manfully resent any bullying from his foreman or master; but in a colony he has nothing to fall back upon, and he will put up with any brutal treatment from his master. This is the only personage he has to deal with, for there are no such middle-men as foremen, managers, estimating clerks, prime-cost clerks, and clerks of any kind. Nine out of ten of the builders keep their own accounts with a piece of chalk, and neither know nor care whether they can pay twenty shillings in the pound or not. "Harum-scarum" is the way of Sydney; and there is no reflection, no studying of posterity in anything. To make money is the guiding principle which is at the bottom of the infamous disregard to sanitary arrangements. So shockingly bad are the Sydneyites in this respect that the people are not commanded to carry the implement Moses imposed upon the Israelites. There is nothing at all paternal in the Government: adulterations, false weights and measures, and other meannesses to make money dishonestly are not exceptional, but the rule; in fine, it would appear the Palmerston Government cast these colonies adrift, just as a father might turn a child adrift whilst his years are units, and the consequence is, they are governing themselves as a child would; and when we compare them with England, we see what a sorry mess they are making, especially in Victoria,—a colony that is loudest in denouncing England as an old fogy.

Gargoyle.

Newcastle Trade.—On the 8th the steamer *Compton*, 2,800 tons burthen, built by Wigham Richardson & Co., of the Neptune Works, for the firm of Watts, Milburn, & Co., of this town, was tried at sea with a select party, and everything went off to the satisfaction of all concerned. Her engines, of 200-h.p., worked admirably, the vacuum being especially good, which was attributed to the peculiar form of the condenser-joint adopted by her builder, which, it may be remarked, allows of all the tubes being withdrawn, cleaned, and replaced in a single day. The air-pump and the circulating-pump are worked separately from the respective cylinders, and every appliance which the most recent experience can suggest has been supplied, as well as a most complete supply of spare gear. The *Compton* is intended for the American trade, which is now so largely passing into the hands of our Newcastle shipowners. One of the American shippers was present, and told a quaint "stretcher" to illustrate the value of spare gear. He said that crossing the American continent last spring from San Francisco to New York, he met in the cars the engineer of the line, who at one period of the journey volunteered the information that soon the train would reach Ashtabula, the scene of that deplorable accident when the bridge broke, and afterwards the *débris* and the cars took fire and burnt the hapless passengers. On being asked if the passengers would have to get out and change trains he said, "Oh no! the bridge is already repaired." "But surely," said his companion, "that is very sharp work, the accident happened only six weeks ago." "Wal, yes," said the engineer, "our company always keeps a *spare arch!*"

NEW BRIDGE OVER THE REGENT'S CANAL AT GLOUCESTER GATE, REGENT'S PARK.

THE new bridge, the builders of which are Messrs. Kirk & Randall (who built the additional baths and washhouses for St. Pancras, in Tottenham-court-road, and whose tender for the bridge at 13,500*l.* was accepted by the vestry after a public competition) is being constructed to the north-west of the old bridge. The width of the bridge between the parapets will be 60 ft. in the clear, the carriageway being 36 ft. wide, and two footways each 12 ft. wide. The span of the bridge on the square will be 50 ft., and the headway 15 ft. above the water level of the canal. The lines of the bridge and the canal intersect at an angle of about 71 degrees. The brick abutments and counterforts are built on a bed of concrete 3 ft. thick on the London clay; the brickwork, varying from 6 ft. 9 in. to 3 ft. 4 in. in thickness, is faced with red pressed bricks. The ends of each abutment will be finished and strengthened by panelled polygonal buttresses. A stone string-course runs along and round the abutment at a height of 6 ft. from the towing-path. The wing walls will be built on a concrete bed 2 ft. deep, and will be constructed with sunk panels, chamfered and moulded with various ornamental medallions. The panels will be faced with purple bricks. The parapets of the wing walls will be of open quatrefoil design, constructed of red Mansfield stone, extending to the tops of the slopes on either side of the canal, finished by polygonal-shaped pedestals, which will carry handsome bronze lamp-standards. The superstructure of the bridge will consist of ten wrought-iron web-plate girders, each 57 ft. 6 in. long, and 3 ft. 6 in. deep. The girders will be 6 ft. 5 in. apart from centre to centre, strongly braced together by wrought-iron diagonal frames. The girders will be bedded upon and bolted through Aberdeen granite blocks, 18 in. in thickness. The platform of the bridge will be constructed of half-inch wrought-iron curved floor-plates, on which will be laid creosoted paving on a bed averaging 7 in. in depth of bituminous concrete for the carriage-way; the footways of Val de Travers asphalte, 2 in. thick. The two outer girders carry the cast-iron parapet, which is of the same open quatrefoil pattern as that along the parapet of the wing walls. The outer face of the girders will be ornamented with cast-iron moulded string-courses, panels, brackets, cornice, and coping. The polygonal buttresses will be capped with red Mansfield stone panelled pedestals, of design in conformity with the parapets, finished with moulded base stones carrying three-light bronze lamps.

The old and unsightly bridge, with its hideous brick and bricked-up arches, has long been an eyesore at the Gloucester-gate entrance to Regent's Park. It was built across the Regent's canal in 1814, and may fairly be called a specimen of canal architecture. It is described as "a brick-arched structure, 23 ft. 3 in. span, and 25 ft. in width for roadway and footways." In the year 1835 it was "widened by the addition of two footways, each 3 ft. 9 in. wide, supported by three segmental brick arches, making the width of the bridge, as at present, between parapets, 33 ft. 6 in. The bridge was built after the designs of Mr. James Morgan, to whom also the widening of the bridge was entrusted in 1835." Such is the description furnished of the structure which, for threescore years, has spanned the canal at Gloucester-gate. It was left to the vestry of St. Pancras, intent on improvement, to supersede this unsightly as well as ill-adapted roadway, and to provide a more suitable approach to the Regent's Park.

The works are progressing favourably. The foundations of the abutments are laid and brought up above the canal water-level, and about three-fourths of the superstructure are built. The adjoining north-west and south-west wing walls are nearing completion.

Six of the ten wrought-iron girders are fixed, allowing the diversion of the traffic from the old bridge to pass over the west half of the new structure, and the work of demolishing the old bridge is commenced.

Under the peculiar circumstances of the bridge being a part of the only main route from the south-west to the north of London, and the only important access to, and exit from, the Regent's Park by Gloucester-gate, it has been the aim of the engineer not to stop the passage of vehicles for a single moment, and this has been successfully accomplished by the erection and shifting of suitable temporary roadways, flooring, and hoardings.

It is expected that the bridge will be completed and thrown permanently open for traffic in the month of June next.

The Chief Surveyor to the Department of Works, Mr. Wm. Booth Scott, M.I.C.E., designed the new bridge.

ANALYSIS OF THE WATER BILLS OF THE METROPOLITAN BOARD OF WORKS.

THE Bills for which the Metropolitan Board are applying to the present session of Parliament are of an importance to the inhabitants of the metropolis which it is not easy to exaggerate. This will appear from a brief analysis of the Bills in question.

The Metropolis Waterworks (Purchase) Bill was prepared and brought in by Sir J. M'Garel-Hogg and three other members, and ordered by the House of Commons to be printed on the 18th January. It is numbered 58 in the list of the Bills of the session. It recites that water is now supplied to the metropolis by certain water companies set forth in the schedule, and that it is expedient that provision should be made for the purchase of these undertakings by "the Board"; as the Metropolitan Board of Works is styled in the Bill. It provides that the Act is to be carried out by the Board; which may delegate its power to that effect to a committee. It then enacts that within three years the companies shall sell, and the Board shall buy, their respective undertakings. Failing amicable settlement of the consideration for the purchase, the amount is to be determined by arbitration: the Board of Trade to appoint the umpire.

Any company may, by the assent of three-fifths of the votes of a special general meeting, agree to accept payment of the consideration for purchase in "Consolidated Water Stock, created under the authority of the Act."

No provision is made in case the companies do not so agree to part with their estate in exchange for a mortgage upon it. Clause 12 demands especial notice. The expression, "the amount of the consideration . . . . shall be paid or issued as Consolidated Water Stock as the case may be," is vague, as it does not mention payment in money, and it is urged that the provision enacts that if the Company does not take this stock it shall be wound up as if it were insolvent. This is described in a counter petition as "a high-handed mode of dealing with private property, which has never been suggested to Parliament till the present Bill was deposited." If such was not the intention of the framers of the measure, it is at all events the construction which the owners of the property in question have feared would be given to the clause, if passed.

Existing mortgages on any water enterprise, "shall, on and after the transfer, become debts of the Board," not taking precedence of the Consolidated Water Stock. This is a new mode of dealing with mortgage securities. Debts, accounts, actions at law, and existing officers and servants of the companies to be taken over on transfer of the property.

The Board may borrow such money as they may from time to time require for the purposes of the Act, and are empowered to create a "Consolidated Water Stock" under Loans Acts of 1869 to 1871. *Provision as to limitation of amount is expressly excepted.* Payments of expenses are to be made *before payment of mortgage* or other interest. No limit whatever is imposed, either on the money which the Board may raise, or on the rates they may levy.

The Metropolis Water Supply Bill does not appear in Messrs. Hansard's list; and as difficulty has been found in obtaining a copy, it is probable that comparatively few persons are aware of its provisions.

It recites that it is expedient that a proper supply of pure and wholesome water for the drinking and culinary requirements of the metropolis should be provided, and constantly laid on; and that for the purpose of extinguishing fire, a supply of water constantly laid on at high pressure would be of great benefit to the metropolis. Further, that it is expedient that the Metropolitan Board of Works should be authorised to construct water-works, and to supply water, according to plans deposited with the clerks of the peace for Middlesex, Surrey, Kent, Essex, and Bucks. These plans comprise six wells and pumping-stations, and three reservoirs, together with nine aqueducts, conduits, or lines of pipe.

Clause 12 is so entirely without precedent, and in opposition to the whole history and theory of compulsory purchase, that it should be read *verbatim*:—"12. The Board may discontinue and stop up any and every road, street, and footpath in or over any lands described in the deposited books of reference, and acquired by them under the powers of their Act, and thereupon all rights of way over such roads, streets, and footpaths shall be extinguished." It is inexplicable how such a clause should have been put into print, as it would give to the Board the right to divide the metropolis, or at all events the outlying districts within the circuit of their pumping-wells, into districts unable to communicate with each other except by coming into London.

The estimate of expense of the undertaking deposited in the Private Bill Office states that the expense of constructing the works will be 1,647,000*l.*, and the further expense of distributing pipes and works will be 3,800,000*l.*,—making in all 5,447,000*l.* But there is no provision in the Bill for raising funds, nor any limit as to the expenditure to which the Board may go. Nor do the plans deposited give the size of the mains intended to be laid down, or the quantity of water to be obtained from each well, which are elements essential to allow any judgment of the adequacy of the estimate.

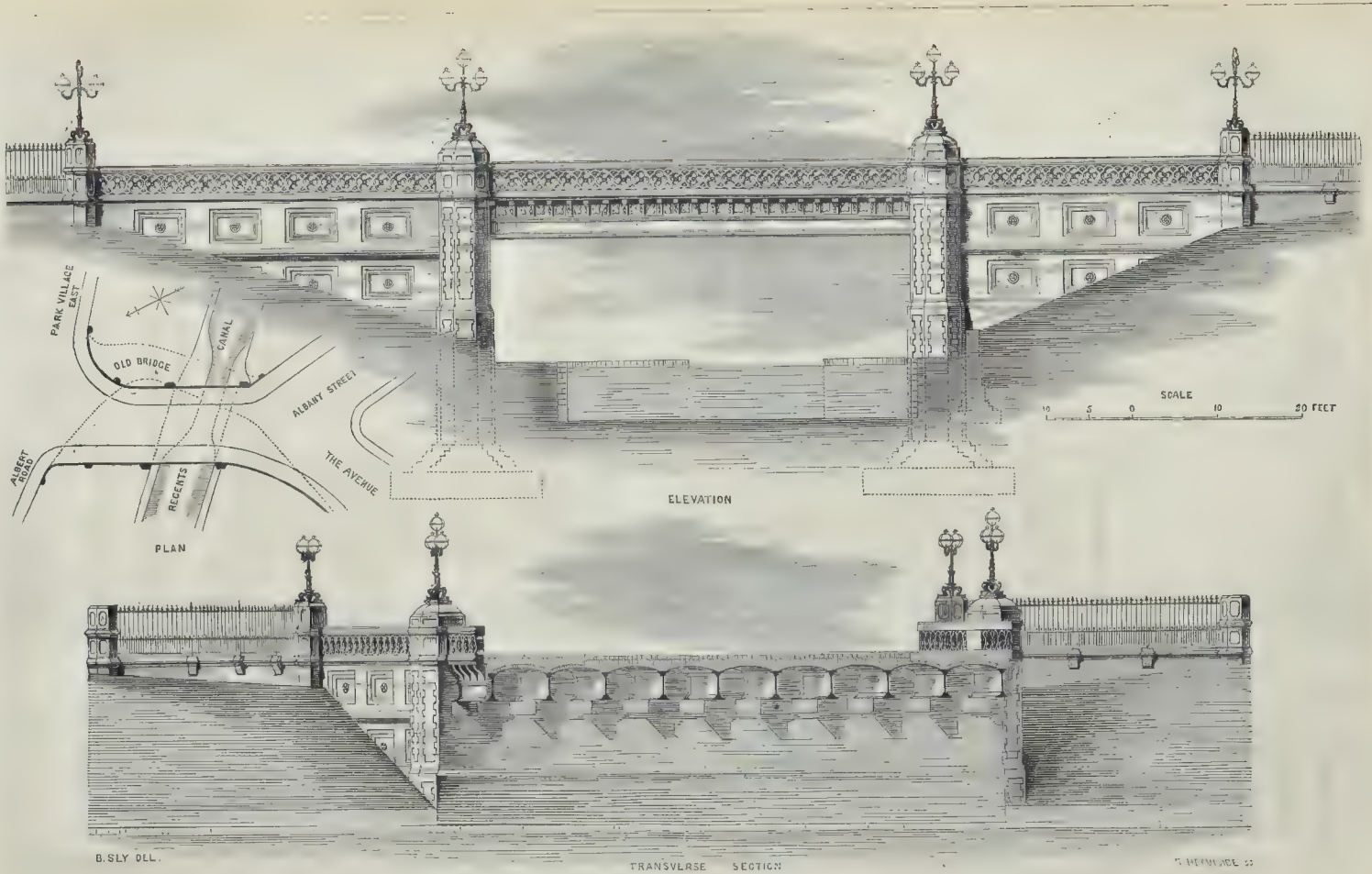
It should be noted that the Kent Waterworks Company, under letters patent dated in 1669, and a series of Acts of Parliament since the year 1809, have now power to supply a district of 120 square miles area (or more than the area under the jurisdiction of the Metropolitan Board of Works); only 29 square miles of which come within the latter division. They supply this district with water pumped from deep wells in the chalk at Deptford, Plumstead, Crayford, and Shortlands. The quality of the water is said by Dr. Frankland to be the purest possible. The quantity in the chalk is known to be limited. There are 80 miles of streets in London, supplied with mains on constant service, on which hydrants could at any moment be fixed by the Kent Company. The Metropolitan Board propose to sink two wells in the gathering grounds of the Kent Company, which would leave destitute the population which they now supply. Thus the Kent Company are now doing all that it is suggested that the best arrangements can effect, both as to quality and mode of supply of water. They are doing this 29 per cent. cheaper, taking the cost per house, than the average of the London water companies. The only certain result to the inhabitants of this large district, of the abstraction of the water, or the invasion of the Parliamentary rights of the company, would be the raising of their water-rents to at least thrice their present amount.

The Metropolis Water Supply Bill, clause 16, limits the domestic supply to be provided to dwelling-houses which are supplied with water from one of the existing water-works companies, or some other sufficient source. For the case of new houses not so supplied no provision is made.

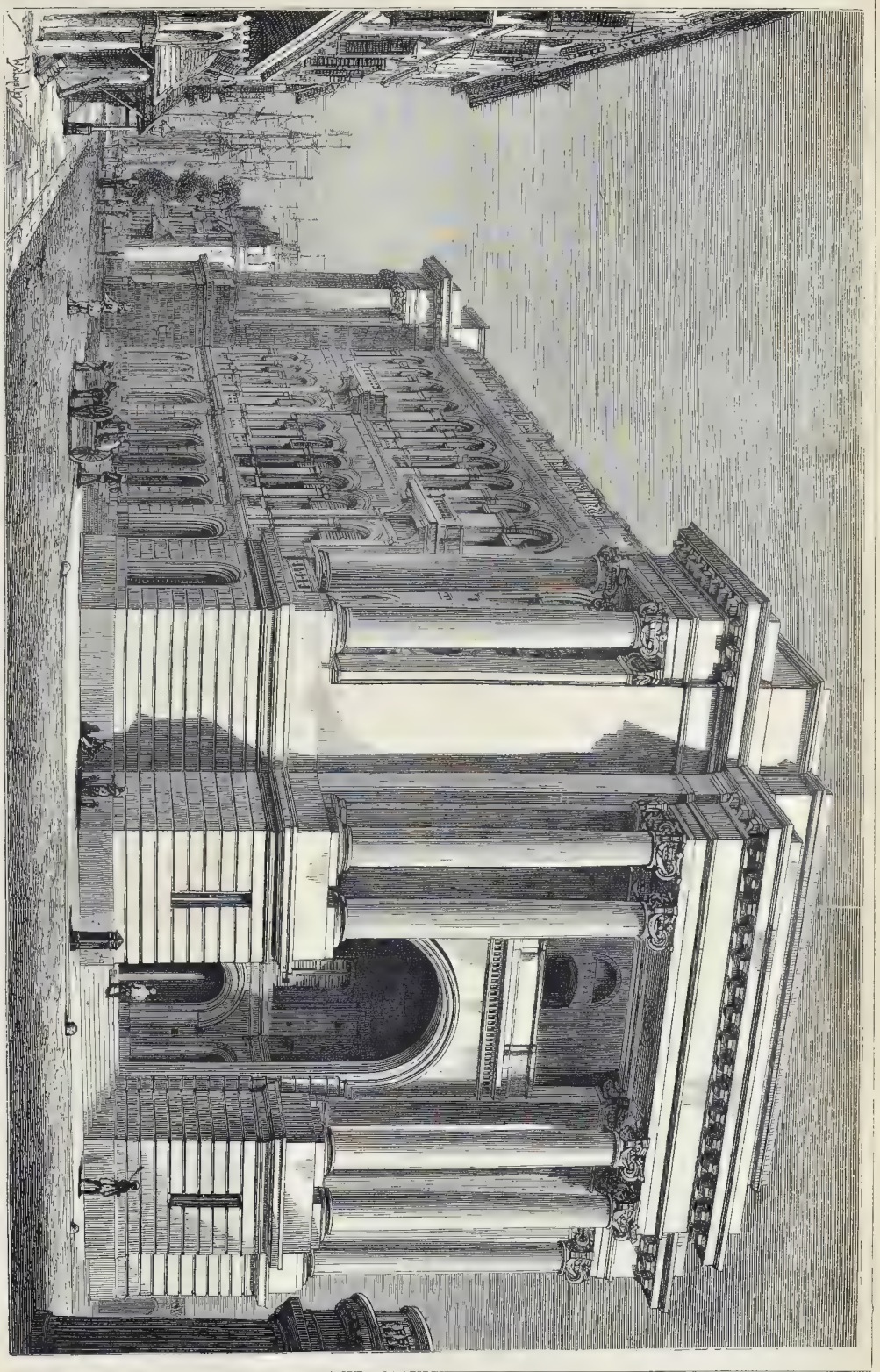
Power is given to break up streets, to enter houses for inspection, and to inflict penalties for non-repair of pipes for water, &c., not exceeding five pounds, besides renewing and replacing at the cost of the persons fined.

The New River Company have, since 1854, laid out about 800,000*l.*, and the East London Company about 700,000*l.*, in effecting improvements in their sources of supply. Both these companies petition against the Water Supply Bill, as applying the money of the ratepayers in order to appeal to Parliament to violate public faith. The Lord Mayor, Aldermen, and Commons of London, in Common Council, have petitioned Parliament against the Metropolis Water-works Purchase Bill, which they maintain to be financially most objectionable, as enabling the Metropolitan Board to increase, *ad libitum*, their already large and rapidly-swelling debt.

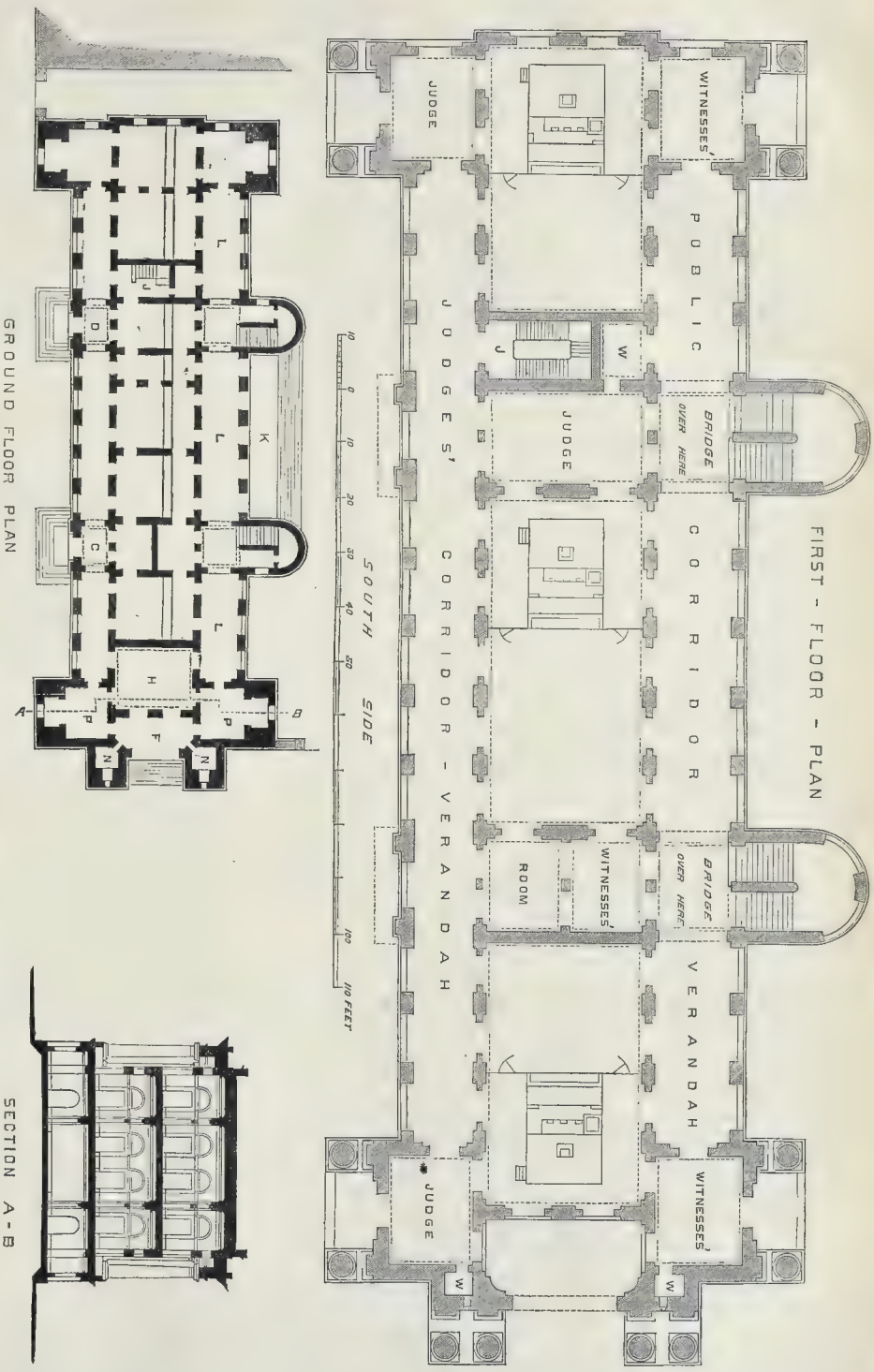
We may add that while the jurisdiction of the Metropolitan Board of Works now covers an area of 117½ square miles, the area comprised within the Parliamentary districts of the old water companies, which the Board attempts to replace, cover an extent of 533 square miles, and extends to the north as much as 23 miles, as the crow flies, from London Bridge.



NEW BRIDGE OVER THE REGENTS CANAL, AT GLOUCESTER GATE, REGENT'S PARK.—MR. WILLIAM BOOTH SCOTT, ENGINEER.



THE COURT OF SMALL CAUSES, CALCUTTA.—Mr. William H. White, Architect.



THE COURT OF SMALL CAUSES, CALCUTTA.—*(The small Plan and Section are drawn to a scale half that of the First Floor Plan.)*

THE COURT OF SMALL CAUSES, CALCUTTA.

THOSE who have never visited Calcutta or Bombay have probably but an imperfect idea of the size and importance of many public buildings erected during the last ten or fifteen years in the Washington and New York of our Indian Empire. Nor is it likely that professional men, who carry on an easy practice at home, would expect a high conception of architectural art from an official administration of Public Works in which the military element largely participates. Nevertheless, to have witnessed the difficulties under which the Indian engineer-architect labours,—difficulties which are greater and more numerous in Calcutta than in Bombay,—is to admit the injustice of any attempt, even, to compare the construction of buildings in either city with similar works in England or on the continent of Europe. Some time ago, in an article on the College of Indian Engineers at Cooper's Hill,* we freely admitted and defined some of these difficulties. We pointed out that the Indian system of government—which, as a rule, comprises the direction of all works of architecture and engineering,—favours a constant and ever-changing supply of steady well-to-do mediocrity. That, indeed, is an often-accepted peculiarity of the departmental system. The officers of Indian Public Works are, roundly speaking, their own architects for the design of a new building and their own builders for the execution of it; their own engineers to calculate the weight and resistance of materials, and their own surveyors to measure and value them. In India there are no libraries in which to study architecture, and no European precedents of any original value to guide an architect. Nor are there any native precedents to inspire him in the Capital itself. Furthermore, in Calcutta there are no building materials at his service more valuable or artistic than ordinary bricks and ordinary cement, while the sands upon which buildings, often enormous and of great weight, must rest are as treacherous as is the soil of a large part of Holland. Indeed, considering the slight means at the disposal of the Calcutta administration and the often ambitious character of the ends accomplished or proposed, the outsider who sees what is already done, and knows how it has been done, is likely to be astonished less at the palpable failures of construction that have occurred than at the many serviceable buildings which have lately risen under the auspices of Government servants.

The building, plans and a view of which we publish to-day, is a Calcutta Court of Justice, consisting of six courts, in five of which judges preside, and of public offices connected therewith. Erected in the years 1873-4, it was begun at the close of 1872, from the designs and working drawings of Mr. William H. White; and for the first few months it was executed under the immediate superintendence of Mr. Hugh Leonard, who is known as the father of Indian engineering, and who was then officiating Chief Engineer and Secretary to the Government of Bengal. The walls and even the columns are of brick, covered with a coat of cement; and though the exterior is thoroughly European in character, the arrangement of the courts and verandahs is Anglo-Indian, and, to some extent, peculiar to Calcutta. As may be seen from the plan, the building is completely isolated, and stands at the junction of two streets. The south façade fronts Hare-street, which runs from Dalhousie-square to the Strand or river-side; the east façade fronts Banksball-street, which runs at right angles to Hare-street. In Calcutta, unlike many other Indian cities and other parts of India, buildings must be placed with regard to aspect north and south; for during the hot season a refreshing breeze is carried from the south over the course of the Hooghly into the verandahs of the white parched city,—a breeze, by the bye, which "refreshes" only in the early morning and after the sun has set. Rooms opening into a south verandah are therefore the most healthy and agreeable; and the rooms in well-built houses are so arranged with doorways that a through current of air can be maintained from south to north. In other words, no matter how many rooms may be placed side by side,—two or three, as the case may be,—a free communication ought to exist between the south verandah and the north verandah of a house or public building. The problem, therefore, is to obtain the largest amount of external air with the least external heat; and, as light is heat, rooms in Calcutta are always sombre,—a ray of direct sunlight being not only disagreeable, but positively dangerous. Not only is it necessary to defend a window with a verandah, but every window opening has a kind of *persienne* or "venetian" made in casement fashion, and kept closed during the entire day. To all the window openings there are also glazed casements; and while the casement windows open inwards, the casement "venetians" open outwards. The windows, however, are rarely closed; that is to say, only when, during the hot season, a "north-wester" springs up, or at intervals during the heavy rains which fall from June to the end of October. A reference to our plan of the first story, containing the three principal courts, will serve to show how a free communication of air is encouraged from south to north; moreover, a similar communication has been rendered possible from east to west by openings left in the circular heads of doors and windows, and in the walls through the witnesses' and judges' retiring-rooms from court to court (see Section A B). The external arches of the the corridor verandahs are always open to the air; only the upper portion is fitted with a fixed *persienne* or "venetian," and this descends to within about 8 ft. of the verandah floor. The openings between the verandahs and the courts are glazed with French casements, and provided with the casement "venetians" or *persiennes*, to which we have alluded. During the greater part of the year the courts sit with the windows entirely thrown back, and the *persiennes* entirely closed; while in the hot season punkahs are swayed by invisible agency backwards and forwards alike in court or church, public office, or private dwelling. In the building we are describing each court has a judge's room and a room for witnesses; but no lavatories or closets, usually attached to such rooms in Europe, were provided in the original design. Such an innovation was attempted in the new High Court of Judicature and in other new buildings, but the older and probably more efficacious custom is still thought preferable, even though Calcutta is now endowed with sewers and a system of drainage. In this instance the closets, marked W on the plan, were intended for the ordinary commode, which a low-caste native servant is employed to remove when summoned; while the judges' retiring-rooms, which possessed no closet of the kind, were to be provided with small inclosures fixed between the columns outside the windows,—a method not only frequent but usual in the public and private buildings of Calcutta. Similar plans for public accommodation are provided in the "compound" (external yard) through which the ordinary public pass in order to reach the principal entrance at K, shown on the ground-floor plan. Passing thence into the corridor-verandah L L L, the public ascend to the courts,—three on each story,—by the apsidal staircases. The height from floor to floor of 25 ft. is scaled by fifty steps. The stairs are divided midway by a landing which, with a view of economising space, forms a bridge over the corridor. Another entrance, F, leads into a small hall, H, intended for the clients of pleaders,—a lower grade of advocate practising in the Court of Small Causes,—whose rooms are at P P. N N are porters' lodges. The hall, H, also serves as a communication between the public and private parts of the building,—the south corridor-verandahs being specially reserved for the judges, whose private entrance is at D, and whose private stairs are at J. The other entrance at C is for the exclusive use of clerks and other officials engaged in the business connected with the courts, or transacted across the counter in the offices on the ground story.

It was originally intended to erect porticos over the entrances C and D,—porticos which would have covered the steps and the pavement; it was also intended to arrange a portico for carriages in front of the broad flight of steps at K. But the Government of Bengal would have no porches or porticos. The then Lieut.-Governor, Sir George Campbell, was pleased to order the lopping off of all such expensive excrescences; yet few knew better than he that no European, while the sun is high, can stand unshaded on the pavement of a Calcutta street without risk even during the winter months. A reference was made to this fact in a paper* read before the Institute of Architects exactly four years ago. It was there stated that a want painfully experienced in Calcutta was a covered footway. Many Indian engineers admit that foot passengers, and others descending from carriages into shops and offices, ought to be protected by a covering similar to that of the Rue de Rivoli in Paris or the old Quadrant in London. "It may seem extraordinary," said the author of the paper, "to advocate such a thing for an Eastern metropolis, but it is still more extraordinary to find that nothing of the sort exists in the European quarter of any Indian city." It would seem, therefore, that under British rule a *quasi*-absolute Government like that of Bengal can no more initiate an improvement or start a necessary innovation than can constitutional government at home. It must, however, be admitted that Bombay, thanks to Sir Bartle Frere, did expropriate and improve itself. It was done, however, by enduring the strongest opposition and even reprobation from the supreme Government at Calcutta. Besides which Bombay now possesses public buildings of a character vastly superior to any that Calcutta, with all its "palatial" traditions, can equal, at least as far as the quality of their execution is concerned. This is due to two reasons; the first and chief reason being that excellent materials, similar to those used in Europe, are easily obtained; and, secondly, that the Bombay Department of Public Works has known how to employ, and to keep, officers educated and trained in England for the practice of civil architecture.

In Bengal the Government are less fortunate. There the Department of Public Works is presided over by a Chief Engineer, generally a military man. Under him are Superintending Engineers, who each control what is called a Circle. The Circles are cut up into Divisions; over each is an Executive Engineer. Under each Executive Engineer is an Assistant Engineer, and then come European Sub-Engineers, foremen, and others, who control the general mass of native workmen. To explain how buildings are, or perhaps were, erected in Calcutta, we quote another passage from the paper on "Government Architecture in Bengal" in which the building we have illustrated is mentioned. "During the thirteen months I was in the service of the Government," said Mr. White, "two large public buildings were commenced. The plans, sections, and elevations of one of them, with an approximate estimate, having been approved by the Lieut.-Governor, were sent by the Superintending Engineer of the Presidency Circle to an Executive Engineer, with orders to prepare an official estimate, and to commence the works without delay; at the same time he was cautioned as to the precarious nature of the soil and ordered to make plans and sections of the necessary foundations, the footings of which were to be calculated, as regards width and depth, according to the weight of wall they were intended to carry. The plans and sections of those foundations, with a careful estimate of their cost, were, in due time, sent to the Superintending Engineer, approved by the Chief, and returned to the Executive Engineer, with orders to begin. Those foundations were barely completed before a change was necessitated by unexpected circumstances. The Executive Engineer, who had given a great deal of conscientious labour to the study of them, and who was responsible for them, was suddenly despatched to the charge of a division distant 1,000 miles from Calcutta; another was appointed to the post thus vacated, and the works proceeded. Now it is clear that if those foundations fail, the original Executive Engineer cannot be called to account, because his mantle of responsibility was transferred to the shoulders of the colleague who superseded him; while each of the Executive Engineers who have continued the works can plead, in the event of the failure of any portion of them, that it is due to the foundations which their original predecessor executed. Another illustration of the difficulty," continued the narrator, "of defining responsibility is to be found in the New Imperial Museum of Calcutta, the original design for which was made by the late Mr. Granville. Some of the floors of that building were designed to be arched and the passages vaulted. Soon after the works were commenced, an order was issued to substitute iron girders in their place; and walls designed to receive continuous brick arches were weighted at intervals with enormous wrought-iron girders. The obvious consequences followed, and the building is ruptured in many places; while the public, with little means of learning the truth, believe that the

* See *Builder*, vol. xxxiv., p. 729.

* "Government Architecture in Bengal": see the Transactions R.I.B.A., March 23, 1874.

failure is due to the incompetency of the architect, who, if I am not mistaken, never saw the building after it emerged from the ground."

Such a system of manufacture often results, and very naturally results, in the construction of quite a different "compo" front to that which the original architect designed. In the case of this building, our illustration of which is taken from a photograph, the general exterior is pretty much as the designs showed it; but refinement or even accuracy of mouldings in the cornices and strings, the necessary entasis to the columns, are conspicuously absent. The balusters, rustications, and the arch-reveals, are by no means orthodox adaptations from the antique, or even the French architecture of the last century. The capitals of the columns, as executed, are singular examples of ingenuity, and, most likely, native ingenuity. In the original drawings, some of which were to a scale of half an inch to the foot, those capitals were shown in elevation, but not in plan. Though a perspective view of the building was made, the native workmen had undoubtedly no opportunity of seeing it. Instead of the ordinary French and English variation of the Ionic capital,—with four volutes set crosswise upon the circular shaft, the joint being concealed by a moulded necking, and a garland of leaves being suspended from volute to volute,—the native modeller has interpreted the geometrical drawing line for line; he has produced, instead of volutes, four things which seem to be a combination of serpent and dolphin, snake and fish, swathed in a bandage which encircles the capital. This, by the bye, is not an isolated instance of native attempts to produce an Ionic capital from a drawing. We remember having seen a colonnade at a house about a hundred miles from Calcutta, in which a similar misapplication occurred. Thus "the whirligig of Time" continues its revenges; the volute which has come to England through long centuries of appropriation and development by various peoples, is taken back by the English to Asia, only to be received by the Asiatic as an enigma or a snare. We, however, have presumed to show the columns and their capitals as they were intended to be, and not as they unfortunately are.

MODERN COSTUME IN DECORATION.

Sir,—Mr. Charles Reade, in his recent suggestive articles on the "Coming Man," shows that the spirit of nature revolts from the trammels of fashion, and that the Chinese female children persistently kick against custom and refuse to come into the world with fashionable feet. They little know to what pains and penalties this steadfast adherence to nature's ideal foot will commit them. Now, all fashions that interfere with nature's most perfect, beautiful, or ideal presentations, are akin to that Chinese perversity which dwarfs the feet of their children. The healthy and cultivated intellect instinctively revolts from all that is arbitrary and ephemeral in taste. Cruikshank, several years since, pointed out, either in pamphlet or in letter, the inconsistency of ghost-seers, who associate with the visions of their friends the disembodied spirits of silk dresses, lace cuffs and collars, and 17s. 6d. pantaloons, as they generally describe the spirits of their friends as putting in an appearance costumed as mortal bodies are wont to be in this sublunary sphere. This, when clearly stated, appears to be monstrously ridiculous. But why? Because our higher feeling and taste revolt from anything but the abstractedly beautiful being associated with the future state. Would any one tolerate a galaxy of angels painted in modern costume? This question goes to the very root of the matter under discussion, as it clearly indicates that our higher intellectual nature exalts the abstract, the ideal, and sets it far above the shifting conventions of fashion.

Mr. Buckman demands that our modern fashions, the offspring of the "nature" of tailors and dressmakers, should participate in the immortality of the productions of that higher nature, which is eternal,—in the immortality of the abstract, the ideal. Should the fashions or the everlasting nature of the mind and of the body be the chief concern of art? Mr. Buckman makes much ado about nothing. These clothes about which he torments himself so much are quite insignificant matters; their fashion may change to-morrow; they are but the trappings and the suits of folly, which are not worth handing down to the ragshop of posterity, wherein they would be very quaint and worthless old clothes indeed, answering no purpose whatever but that of satisfying an unprofitable curiosity.

The matter may be brought to a very simple issue. There are many modern athletic games which were also in vogue in ancient times: would the majority of painters and of cultivated persons prefer to see them portrayed in ancient or in modern costume? There are great subjects, too, which might, in so far as the telling of the story, be presented in modern instead of an abstract costume, or in that "everlasting" drapery, as Addison aptly terms it, using that term as a term of praise. But which of these modes would æsthetically be the preferable, the more accordant with that eternal nature which it is the highest object of art to study and to depict? When to use and when to avoid modern costume in art must be left, as it has been, to the discretion of the artist. It is clear, however, that the higher teaching of nature is that it should be avoided whenever it can possibly be avoided without being ridiculous.

The Assyrians, the Egyptians, and the Greeks were not, after all, so literal in their art presentations as Mr. Buckman would have us believe, for, according to his own showing, they made certain princely personages and heroes greater in stature than the *canaille*. Did they desire to mistrust or to mislead posterity by so doing? Does Mr. Buckman believe that the Elgin frieze is a literal and not an artistic representation of the procession in honour of Minerva. If he does, let him read an account of the social life of the Greeks, and how they were costumed in every-day life. In this frieze, too, there is an exaggeration of size in some of the figures, and the whole is kept strictly within the limits of architectonic treatment. If the ancients were capable of making those departures from the literal facts which Mr. Buckman admits, and which were their rude way of expressing the ideal, they were also capable of making other departures from fact to serve the purposes of art, and these it could be easily proved they did make.

It is not considered good form to enlist the dicta of the Scriptures in support of an argument upon any general topic, but it may not be altogether out of place to note that they are most emphatically against individualism or literalness in art. The command against graven images is that these shall not be made in the *likeness* of anything in the heavens above, in the earth beneath, or in the waters under the earth. This edict is manifestly aimed at individuality in art, against art in the *likeness* of any person or creature, and not against representations of the ideal or the abstract; for we know that sculptured golden cherubim were not only permitted, but were commanded to be placed over the Mercy Seat. This is final as regards the exalted nature of the ideal and the duty of rejecting the literal.

Meter.

THE DOLMENS OF FRANCE.

Sir,—In 1872 I saw at Saumur what is stated to be the largest and best preserved dolmen in France, being a chamber composed of huge blocks of unhewn stone set upright to form the walls, with others laid across them for a roof, in the manner of a house of cards. This relic is 64 ft. in length, and it consists of fourteen stones, four of which are on each of the sides and on the roof; one is at the west end, now closed; one at the east end, now overturned, being a threshold to the entrance. The largest of the blocks measures 24 ft. by 21 ft., and it is 2½ ft. in thickness at least. I saw, also, on a hill near Saumur, a dolmen, similar to Kit's Cotty House, in Kent, composed of six large stones. It is stated in Murray's "Handbook to France," p. 236, that at Poitiers, about 1½ mile out of the town, a little to the left of the road to Limoges, on a height, is a dolmen, known as *La Pierre Levée*. This relic is a block of calcareous sandstone, about 13 ft. long, and 3 ft. thick, which rests at one end on upright stones. Near Le Mans, at Connerre, in the hamlet of Duncan, I saw a large oblong dolmen, near the road, similar to Kit's Cotty House, and well preserved, it being composed of several large stones.

At St. Nazaire, near the railway station, I saw a large dolmen,—one large stone resting upon four supporters. At ten miles north-west of Brest I saw the menhir of Plouarzel, 35 ft. in height, mentioned in Mr. C. Weld's Brittany. The female peasants repair here praying for the boon of fertility. A similar custom is stated to prevail in Egypt with reference to the ancient obelisks.

Near Dol, I saw the pillar La Pierre du Champ Dolant, about 30 ft. high, also mentioned by Mr. Weld as a menhir. The "Guide-book" and some tourists state that from Rennes," at Essé, a stupendous dolmen, or *allée couverte*, can be visited in a day." I travelled by *diligence* to Janzy from Rennes, and thence I walked to Essé, about three miles eastward, and returned to Rennes in the evening. I found the dolmen on the left side of the road which leads from Essé, on the right as I entered the village, about two miles distant.

That valuable work, the "Archæologia Cambrensis," 4th series, vol. v., p. 323, contains an engraving of the menhir of Kerloaz, and another engraving of the menhir near Dol. As to the former, the writer, Mr. E. L. Barnwell, states that "on each side of it, about 3 ft. from the ground, is a round boss about 1 ft. in diameter. Against these, in the case of a newly-married couple, the man on one side, and the woman on the other, rub their chests, the man that he may be the father of boys only, and the woman that she may be the master of her husband and his house." In my note upon "Brittany Stone Monuments," in the *Builder*, No. 1811, pp. 1231-2, I omitted to mention these relics, and the prostrate menhir at Locmariaker, called Men Brao Sao, "the uplifted stone of the brave one." Kergloas means "the place of mourning." At p. 326 of this volume there is an engraving of the Saumur dolmen, described as 64 ft. long, consisting of fourteen stones. Each side formed of three, and the roof of four stones, one stone at the west end, that at the east end being prostrate. A road seems to have divided this dolmen, so that its original length cannot be ascertained. The largest of the fourteen stones is described by Mr. Barnwell as being 24 ft. by 21 ft., and nearly 4 ft. in thickness. At p. 237 the Essé dolmen is engraved, being "under two miles from the small town of Retier, and on a farm to the right of the main road to Rennes." Two engravings and a plan are given. No. 1 shows the dolmen generally, and No. 2 the enormous lintel stone, 17 ft. long, supported by two massive stone pillars. This dolmen includes five large cap-stones. The breadth of the interior is 13 ft. The stone at the west end is also 17 ft. long.

According to the plan the length of the dolmen is 64 ft., and it includes thirty-two stones altogether, besides the capstones, viz., on the south side, the high supporter of the lintel, two side stones, a cross stone, two side stones, a cross stone, one side stone, a cross stone, one side stone, then a vacancy of several feet and another side stone. Then a cross stone, two side stones, a vacancy of 2 ft., and two side stones, complete the south side. On the north side, commencing also at the east end, is the lintel support, then a side stone, and after a vacancy of 3 ft. a side stone. Then a cross stone, and a fallen stone. Ten side stones of various sizes, with the long west stone, complete this dolmen, which merits accurate inspection. There are no remains of any tumulus. It appears probable that the Saumur dolmen resembled this one originally, having four divisions. The cross stones at Essé appear to have been from 5 ft. to 6 ft. in length. Of the five remaining only two of them are opposite. An accurate plan, and a photograph of this relic, and of that at Saumur, would be useful and interesting. But the engravings in this volume are admirable; and as to the Saumur and Essé dolmens, I believe them to be the only views extant.

C. C.

The Fall at Woolwich.—The fall of the Commissariat store-houses at the old dockyard, Woolwich, having been quietly inquired into and discussed, it has been decided that the interests of the service render it inexpedient under present circumstances to enter into a controversy and possible litigation with the contractor. It is therefore understood that the loss will be borne by the Government, but it will not be so heavy as was at first imagined. Much of the timber can be used again, and already most of the uprights and some of the gables are in position. A great many additional workmen have been set on, and every effort is being made to finish the building within the contract time. The accident has not had, so far, any fatal results. There ought to be a public inquiry into the cause of the accident.

AMERICAN RAILWAY APPLIANCES.

THE INSTITUTION OF CIVIL ENGINEERS.

On Tuesday, the 12th inst., Mr. Bateman, president, in the chair, the paper read was "On Railway Appliances at the Philadelphia Exhibition of 1876," by Mr. Douglas Galton, C.B.

Although the first American railroad was only constructed in the year 1830, about 22,000 miles were in operation in 1856, and 74,600 miles in 1875. The difference between the American and the European railroad systems was very marked. In Europe the railway was originally looked upon rather as a means of diminishing distance by high speeds than as the universal road for traffic. In America, where the railway had been the pioneer road of the country, and the sole means of communication, circumstances prevented the investment of more capital than was sufficient to make a line adequate to perform the duty immediately required of it. But, whilst the first cost was thus limited, considerable expense had to be subsequently incurred in perfecting the line. On the early American railroads the sleepers were laid on the soil, with little or no ballast. Sharp curves and steep gradients were the rule, so that a short rigid wheel base was imperative. Again, a car resembling the saloon of a steamboat was adopted, rather than a development of the body of a stage-coach, as on European railways. The cars had central couplings, with end doors and steps, so that station platforms were unnecessary: and the traffic, until recently, had not demanded expensive signal arrangements. More responsibility appeared to have been thrown on the engine-driver, and improvement had been mainly in train appliances, such as brakes. It was believed that whilst the railways in Australia and other British Colonies and in India were still in their infancy, advantage would accrue from a careful consideration of the American system.

The subject was treated under the following heads:—1. Permanent Way; 2, Cars and Car Fittings, including (*a*) wheels, (*b*) axles, (*c*) couplings, (*d*) springs, (*e*) brakes, and (*f*) heating apparatus; 3, Locomotive Engines; 4, Railroads of 3-ft. gauge.

The great distances on American lines had led to the conversion of the passenger-cars into travelling hotels. The main advantage of the American form of car, which consisted of a long body supported at each end on a bogie truck, was the power of movement afforded to the passengers, and of access to conveniences. The disadvantages were, the mode of opening the windows, which slid up instead of being let down into the panels, and the difficulty of ventilation, but the latter had been overcome by a central raised roof, with clearstory windows. A car for sixty persons had a length of body of 48 ft., a width of 9 ft. 6 in., and a height of 7 ft. 10 in. at the sides, and of 10 ft. 3 in. in the centre. Such a car would weigh, when empty, 650 lb., and when full 783 lb., per passenger. Sleeping-cars for sixty-four persons were made with a body 61 ft. long, and weighed, when empty, 812½ lb., and when full 945½ lb., per passenger. A class of vehicle, recently adopted, seemed likely to come into greater use. This was the refrigerator car, by which the produce of California was brought to the Eastern States, and the delicate fruits of the South and fish from the Gulf of Mexico were taken to Chicago. These cars were fitted with ice boxes, and were of various patterns. A very efficient cooling surface was provided by two ice-chambers on each side of the car, or four in all, extending from the top to the bottom, and fed through hoppers in the roof. These boxes, being placed 3 in. from the sides, allowed a free circulation of air all round.

The use of chilled cast-iron wheels was all but universal on American railroads. Each wheel formed a single casting with the tire, and was cast in a chill, consisting of a rim of iron turned perfectly true, so that labour in turning was avoided. The necessary hardness in the chill was obtained by a mixture of charcoal iron, chiefly Salisbury iron, with broken-up wheels and castings. The comparatively high price of charcoal iron had led to the substitution for it, in part, of anthracite iron, with wrought iron or Bessemer steel.

Three axles were noticed, in each of which the object was to allow the wheels attached to them to revolve independently. The construction of the Miltimore axle—one of this class—was described in detail, as with it there was a marked diminution of friction in passing round sharp curves. The results of two experiments were recorded, which showed in one case that there was a friction of 13·15 lb. per ton in the Miltimore axle, as against 17·21 lb. per ton with an ordinary axle, while in the other case these figures were 13·67 lb. and 26·55 lb.

The Miller coupling and buffer, now generally adopted in the United States for passenger-cars, consisted of a spring buffer with a coupling immediately under the centre of the buffer. The brakes on American railroads were, as a rule, capable of being applied to a larger number of wheels in a train than in this country.

The method formerly in use in America for heating the cars was by open iron stoves, but these had been the cause of many frightful accidents from fires. The Baker Car-warmer seemed now to be in great favour. In this the heat was applied by hot-water pipes laid round the car on the floor-level, the water being heated by a coiled portion of the pipe being passed through a circular iron stove. The fire-box of this stove was of wrought iron, and this again was contained in a second covering of iron, which terminated in the chimney. No instance was on record of a fire having been occasioned in a train from these stoves. For the circulation, both ends of the pipe were inserted in a close cylindrical cistern on the roof of the car. The liquid used was a saturated solution of salt-water, as this solution did not freeze at ordinary low temperatures. The safety-valve had a compressible india-rubber ball, as the crystals of salt prevented a metal-seated valve from shutting tightly. The average allowance of heating surface in an ordinary car was 11 ft. of 1¼-in. pipe per passenger.

The striking fact gathered from the exhibition of railroad cars at Philadelphia was that, while the comfort of railway travelling had been practically stationary in Europe for the last twenty-five years, it had been rapidly developed in the United States within the last few years to a standard above that of Europe. The comforts were as much needed in Europe. The distances were as great; the cold was as intense; the populations to be accommodated were as numerous, and more wealthy. No doubt, the control exercised by Continental Governments had had some effect in stopping improvements; but the author believed the stagnation was largely due to the use of small carriages divided into compartments. These had actually prevented the development of comfort, while the larger American car had both suggested and afforded scope for improvement. Until European railway companies followed the lead of America, and adopted long carriages on bogie trucks, comfort in travelling would remain in its present unsatisfactory condition.

Within the last few years companies had been formed to build in America 8,000 miles of narrow-gauge lines, of which 2,700 miles were in operation at the beginning of 1877. The Denver and Rio Grande railroad was proposed to be 1,700 miles long, and between 200 and 300 miles had been completed. The promoters of this system contended that a mile of single line having a gauge of 3 ft. could be made for 1,904*l.*, with rails weighing 30 lb. to the yard, or for 2,144*l.*, with rails of 40 lb. to the yard, while the rolling stock might cost 758*l.* per mile, calculated for a length of 100 miles of road.

Dorchester New Bank.—Messrs. Eliot, Pearce, & Eliot's new banking premises are now complete, and form a feature in the fine old main thoroughfare of Dorset's county town. They are in the Italian Renaissance style of architecture, built of Bath and Portland stone; the main façade abuts the street. The lower story displays much ornamental masonry, and immediately above a carved cornice runs from east to west. This is stopped at either end by corbels. The floor above has much carving about its windows, and all is surmounted by the main cornice. It is carried by a number of carved cantilevers, and its various members are enriched by egg and tongue, leaf and dart, bead and roll, and other continuous ornaments. The carved work has been executed, from full-sized drawings prepared by the architect, by Mr. Harry Hems. The banking-room is of good proportions, and the bank parlour, strong-room, and other accessories satisfactory. The manager's apartments are contiguous with the rest of the building. The contract has been carried out by Mr. G. J. G. Gregory, builder, of Dorchester; Mr. G. R. Crickmay being the architect.

METROPOLIS MANAGEMENT AND BUILDING ACTS AMENDMENT BILL.

The Select Committee of the House of Commons appointed to consider and settle the clauses of this Bill, met for the first time on the 14th inst. Mr. Philbrick, Q.C., explained the provisions of the Bill at considerable length, and several witnesses were afterwards examined. We can refer only to a few of them.

Dr. J. W. Tripe said he was medical officer for the Hackney district. He had latterly closely watched the construction of houses in the district. The foundations of many of the smaller houses were very bad. In one district of ten acres in extent the houses had been built entirely on raised ground. In 1876 there were 1,662 residing on the estate, and in 1877 2,031. In 1876, the death-rate was 28·3 per thousand, excluding small-pox. Including small-pox it was 37·3, while the death-rate of the whole of Hackney was only 18·5, including small-pox. In 1877 the death-rate was 32·9, including small-pox, while the death-rate for the whole of Hackney was only 19·7. He did not attribute the whole of the increase to the unhealthiness of the site, but he had no doubt that it had largely contributed to the increase. The practice was to excavate and sell the sand and gravel; then to be paid for the privilege of shooting rubbish upon the excavated land, and then when the soil had been sufficiently raised by this means to build upon it. At present it was the custom to build houses in London of green wood and wretched mortar. He produced a sample of mortar taken from a house which had fallen down, and another of so-called sand, but he said it was impossible to detect any sand in it.

Dr. John Whitmore, of Wimpole-street, medical officer of health for the parish of Marylebone, said he had made infectious diseases a special study. He had been struck by the fact that in certain districts epidemics were constantly occurring. Upon inquiry he found that the houses in which these frequent outbreaks of fever occurred had been built to a considerable depth on animal refuse, and filth and rubbish of every description. He had come to the conclusion that the diseases of a zymotic character which arose in his own and other localities were attributable to the unwholesome character of the foundations upon which the houses were built.

Mr. J. D. Mathews, district surveyor of Stoke Newington district, said there were sixty-two district surveyors. They were all appointed by the Metropolitan Board, and were required to hold certificates from the Institute of British Architects. He had considered the propositions contained in the present Bill, and entirely approved of them. In his district there was a superior description of sand at a depth of 20 ft. or 30 ft. It was a constant practice to get out the sand for the purpose of sale. It was carted away from the place where it ought to be used and an inferior material brought in. In fact, it was found more profitable to sell the sand. As regarded mortar, the builders were not sparing of lime, but instead of sand they used garden mould, upon which the lime would not act. In point of fact, the mortar was nothing more than solid whitewash that would not bind. It was most important that the Metropolitan Board should have power to make bye-laws for the regulation of building operations. Of course it would be necessary to exercise the powers.

At the meeting of the Committee on the 15th, Mr. W. R. Selway was examined at considerable length. He stated that he had been a member of the Metropolitan Board since January, 1873, and was a member of the Building Act Committee. The functions of the Building Act Committee were to consider applications in respect to lines of frontage, laying down of new roads, and other matters relating to building operations. The clauses of the Bill which had reference to theatres and music-halls had been inserted in compliance with the recommendations of Sir H. Selwin-Ibbetson's Committee, which reported last year, after taking a large amount of evidence in regard to theatres. The Board asked for power to remedy any structural defects in the existing theatres that could be remedied at a moderate cost. In the event of the lessees being of opinion that the order was unreasonable, power was given to appeal against the decision of the Building Committee. The attention of the Board had been repeatedly called to the unhealthy nature of the sites that were now built upon in the metropolis. Deputations and memorials had been received

from Hackney, Woolwich, Camberwell, Battersea, and other places, calling upon the Board to take steps in the matter. Very recently he went down with the district surveyor to Peckham, and there he saw an extensive estate which had been built over a "slop shoot." The sand and gravel had been excavated to a depth of 30 ft., the space was filled in with road scrapings, filth, and garbage of every description, and dwelling-houses were being rapidly built over it. To give an idea of the nature of the soil, witness stated that in one of the back-yards he found some men levelling the soil for a garden. On examining the material he found it almost entirely composed of decaying animal and vegetable matter. There ought to have been a bed of concrete over the whole. There was a bed of concrete under the walls. The district surveyor had no compulsory powers, but he had persuaded the builder to do this in order to keep down the exhalations which would immediately arise on fires being lighted in the rooms.

By Mr. Round, who represented the Mercers' Company.—Was chairman of the Building Committee when the Bill was prepared. It was prepared last year, but at too late a period for introduction last session. It made provision that the bye-laws framed by the Metropolitan Board should receive the sanction and approval of the Secretary of State.

Mr. Philbrick pointed out that in the petition of the Mercers' Company no objection was raised to the bye-laws.

Mr. Round remarked that the Bill as at present drawn would affect the interests of the Mercers' Company to the extent of 100,000*l.*

Mr. Edward M. Barry, R.A., said:—During his professional career he had devoted attention to the improvement of London, and had carefully studied the Local Government Acts. He gave evidence on the Bill of 1874. He had read the present Bill, and was of opinion that the provisions it contained were very desirable in the public interest, and would remedy the evils complained of. The sooner legislation took place the better. The first part of the Bill dealt with the question of highways and the width of streets in the metropolis. Streets intended for carriage traffic should not be less than 40 ft. wide, and for foot traffic not less than 20 ft. wide. He understood that some difficulty had arisen with regard to the operation of the existing Acts in this respect, but he did not think any landowner would suffer injury by the enforcement. He had devoted much attention to the question of theatres and music-halls. As regarded the means of ingress and egress in times of panic from fire, each case must be judged upon its merits, but he had no doubt that in most of the theatres substantial improvements might be effected at a moderate cost. The proprietor was the person who ought to defray the cost. He was bound to make provision for the public safety, and if he refused he ought to be made to do so. As to the question of jurisdiction, the Metropolitan Board was a proper body to exercise the powers of supervision conferred by the Bill, and to control the structural arrangements of all new theatres. For sanitary reasons, and for securing stability of structure, the Board ought to have the powers they asked for in regard to general building operations. In many cases it was absolutely essential that the foundation should be covered with a bed of concrete before it was built upon. Even in the case of the National Gallery the remains of an old pit were discovered, and if the pit had not been covered with concrete the most unfortunate results might have followed.

The Committee met again on the 18th. Amongst those examined,

Mr. Whichcord, architect, and one of the vice-presidents of the Royal Institute of British Architects, said he had carefully examined the provisions of the Bill, especially those in regard to theatres and music-halls. He believed they could be fairly carried out without any interference with the Lord Chamberlain's department. From 7,000 to 8,000 houses were built in London every year, and he did not think it was desirable to call upon the architect in every instance to deposit plans and sections before erecting a house. It was, however, necessary that the plans of public buildings should be submitted to some supervising authority. He would not advise too minute an interference with building operations. At the same time there should be an absolute prohibition against the use of inferior materials, which, in many instances, rendered the dwellings constructed of them not only unsafe, but positively unhealthy. In these respects the provinces were regulated by bye-laws, and he saw no reason why bye-laws should not be laid down for the metropolis also. At present, if an old building were pulled down in London it was required to be put back to the general line of frontage in the street, and the owner was compensated for any land which he sacrificed. It was not proposed by the present Bill to alter the general law in this respect.

Mr. John Hollingshead, lessee of the Gaiety Theatre, stated that, including the very small places with the theatres and the larger music halls, which were worked under about six different jurisdictions, there was a total of 472 places of amusement in London. The first jurisdiction was that of the Crown. Under that there were two patent theatres, Drury Lane and Covent Garden, which were under no control whatever as to space. The Lord Chamberlain had no power to go into them except what was given to him by the courtesy of the managers. Then there were forty-five theatres licensed by the Lord Chamberlain, capable of holding in the aggregate about 80,000 persons. Ten theatres were licensed by the divisional magistrates, one of which was the Court Theatre at Chelsea, which was about 20 yards outside of the Lord Chamberlain's jurisdiction. Those ten theatres held altogether about 38,000 persons, because under that head he included the Crystal Palace, which contained two theatres and one concert-hall under the same roof. There were three first-class halls holding from 10,000 to 20,000 persons; six second-class halls, holding from 2,000 to 3,000; thirteen third-class halls, holding from 800 to 1,500; fifty-three fourth-class halls, holding from 300 to 700 persons. This made a total of seventy-five. There were 272 smaller places, which might be called public-house concert-rooms, or harmonic meetings. This gave to the Middlesex magistrates 347 places which they licensed. The Surrey magistrates, on the other side of the water, had a separate jurisdiction over fifty-eight places of a smallish type, three very large places, the Surrey-gardens, Canterbury Hall, and South London Music-hall, making altogether sixty-one, or 408 places altogether under those two branches of magisterial authority. The City of London had a separate jurisdiction, but it only licensed two places. He certainly thought that most of these places might be very much improved in their exits and entrances, and probably at a moderate cost. The Metropolitan Board of Works being a surveying body, and having a large staff of competent officers, such as builders and architects, at its disposal, would be competent to undertake the supervision of these buildings in the interests of the public. There was no objection to the survey of the Lord Chamberlain. It was more or less efficient, and it had always been exercised with a great deal of consideration for the interests of managers, and with due regard for the interests of the public.

Mr. Philbrick.—With regard to music-halls, do you think that many of them are structurally defective?

Mr. Hollingshead.—I should say, speaking generally, that the whole of the 425 music-halls are more or less structurally defective in their entrances and exits.

The Committee postponed the preamble of the Bill, and proceeded to consider the clauses. Upon clause 4, which prescribes the distance from the centre of existing roads at which new houses are to be erected.

Mr. Round, for the Mercers' Company, stated that his clients possessed considerable property in the City, and they objected to the clause, because, as it now stood, it would prevent the pulling down and re-erection of any building in most of the existing narrow streets, because if the line of building was to be thrown back there would not be sufficient space left to build upon. He contended that, as there was no compensation clause, this would virtually amount in many instances to the confiscation of the rights of the Mercers' and other City Companies.

After considerable discussion the committee decided that existing forecourts not built upon should be brought within the operation of the clause.

A fuller report of each day's proceedings will be found in the *Morning Advertiser*.

Wednesbury Free Library and Public Baths.—On Wednesday the Free Library and Public Baths were opened at Wednesbury.

MIDLAND COUNTIES ART MUSEUM: NOTTINGHAM CASTLE.

The Town Council of Nottingham are engaged on a very important undertaking, and want the aid of those who recognise the value of what they are doing. In consequence of the success which attended a loan exhibition in the town in 1872, the Council appointed a committee to take into consideration the desirability of providing a suitable site for the location of an exhibition, with a view to its becoming a permanent institution. It was ultimately resolved that Nottingham Castle and the adjoining grounds would afford a very eligible situation for the exhibition, and the Town Clerk was instructed to make inquiries of the agent of the Duke of Newcastle's trustees to ascertain if they were willing to grant a lease of the castle and grounds for a long term of years at a reasonable rent. The practicability of adapting the existing buildings was fully discussed, as was also the probable costs of the necessary work, which were estimated at the minimum sum of 20,000*l.*

The proposal of the committee received the hearty concurrence of the Council, and it was also resolved that, in the Improvement Bill to be promoted during the then next Session of Parliament, clauses should be inserted enabling the scheme to be carried out. The Bill has been successfully promoted, and clauses have been inserted enabling the Corporation to take, and the trustees of the Duke of Newcastle to grant, a lease of the castle and grounds for a term of 500 years,—the Council to use and maintain the same as a public museum and exhibition.

The Town Council are now the owners of Nottingham Castle and the grounds immediately surrounding it for a term of 500 years. The works of restoration have been proceeded with, and it is hoped that the castle will be formally opened to the public by their Royal Highnesses the Prince and Princess of Wales, at the end of the month of June or the beginning of the month of July in this year.

The castle is situate on an eminence close to the town, but entirely separated from it, in a most commanding position, and stands wholly within its own grounds, so that it is not liable to casualties from fires arising in other buildings. It is spoken of as early as the time of Alfred the Great, was rebuilt by William the Conqueror, and has a most interesting history. In more recent days William Cavendish, first Duke of Newcastle, bought the castle from George Villiers, second Duke of Buckingham, to whose grandfather Francis, Earl of Rutland, it had been granted by James I., and although in his eighty-second year, he, in 1674, commenced to remove the ruins of the old castle, and lived to see the present structure rise a yard above the foundation. It was finished according to his will, and by the model he left, in 1679, by his successor. The rebuilding of the castle was to him a labour of love, for in the memoir of his life, written by his wife, the Duchess of Newcastle, it is therein stated, as quoted by Mr. J. Henry Brown in a recently-published *brochure*, "Some of his lands could not be sold, being entailed, and some he sold in Derbyshire to buy the Castle of Nottingham, which, though it was ruined and demolished, yet it being a seat which had pleased his father very much, he would not leave it since it was offered to be sold." By the liberality of this noble family, so long and so honourably connected with the county, the Corporation of Nottingham have been enabled to acquire a lease for 500 years of this historical site and building, so inwoven with the history of the country; and having at an expense of upwards of 20,000*l.* restored it as a palace of art, it is to be hoped that its future history will be as pacific and civilising, as its past has been warlike.

Its walls are of enormous thickness, and the internal arrrangements are of special fireproof construction. It is asserted, and we believe correctly, that the alterations, when completed, will supply the finest art-galleries, considered in relation to situation, size, and proportion of rooms, lighting, and general suitability, to be found in the United Kingdom outside the metropolis. These, then, the council propose to fill with only those objects which are worthy of attention, and many promises of loans have already been received from some of the richest collections in the country. We shall be glad if some of our readers will help them.

The building consists of a ground-floor story

of seven rooms, the largest of which is of the size of 54 ft. by 26 ft., and the smallest is of the size of 25 ft. by 21 ft. The next story is approached by two spacious stone staircases, affording a large amount of valuable space for the exhibition of paintings and statuary. On this floor there are six galleries, the largest of which is of the size of 146 ft. by 26 ft., and the smallest 25 ft. by 21 ft. These galleries form a magnificent suite of rooms. The heating is by means of hot water: the lighting is from the roof, with an under-sash, and care has been bestowed on the ventilation.

The immense wall space at the disposal of the Council will enable them to give an ample margin to every picture; and it is the intention of the Castle Museum Committee to isolate every picture and work of art so as to give it room to produce its full and natural effect.

The Corporation have taken up the matter with great spirit, and are thoroughly determined to bring to a successful issue a local permanent Art Exhibition and Museum of a high character.

The Town Council have secured the services of Mr. George Harry Wallis, of the South Kensington Museum, as director and curator; and he will be assisted by Mr. Holbrook (the present secretary) and a sufficient staff. The present Mayor (Mr. W. G. Ward) is working heartily in the cause, and there seems every prospect of a great success.

ST. LAWRENCE, PEMBROKESHIRE.

THE above picturesquely-situated church was re-opened by the Bishop of St. David's on the 28th of February, after a complete restoration. The plan is rectangular, consisting of a nave, 30 ft. by 17 ft.; chancel, 21 ft. by 11 ft.; and south porch, 8 ft. by 7 ft. The north nave wall and the upper portion of the east wall of the chancel have been pulled down and rebuilt; the former, of more recent date than the other walls, had been erected with inferior materials badly bonded together: it therefore leaned very considerably, and when the roof was removed was in some danger of falling. These works were not included in the general contract, as it was hoped all rebuilding might have been avoided, the desire being of course to preserve as much of the old work as possible. The only new masonry is in the upper portion of the western double-bell gablet and the five new windows. The old windows were of the ordinary unhung-sash description, fit only for the humblest cottage homes, and as unfortunately not a trace could be found of the original ones, the style of the chancel and porch arches, which seemed to indicate the date of the church at about the fourteenth century, has been selected for the new work. The font, which was found huddled up in the north-western corner of the nave, is now placed on a new base on the west side of the entrance. A considerable improvement, both as to appearance and comfort, has been obtained by lowering and altering the slope of the footpath approach commencing at the road, thus enabling the original level of the floor and the internal height of the walls to be retained, and the steps down into the porch to be done away with. This lowering of the footpath has revealed the original proportions of the porch; and the nave walls, which were considerably underground, have been likewise unearthed, giving the sacred fabric a more imposing appearance, and at the same time securing it from damp, a channel, with drains below, having been formed round the walls. A bed of concrete, with a similar object, has been laid over the whole internal area. The porch and nave passages have been paved with slate, having Staffordshire tile borders to the latter, the chancel and sacrarium floors being laid with Webb's (Worcester) encaustic tiles, a portion of those in the latter being glazed.

There were traces on the east side of the chancel arch apparently of a rood-loft staircase on the north side, and of a hagioscope on the south side; both of these have been left untouched, a remark that also applies to the ceiling of the porch, its outer and inner arched entrances, and the chancel arch. These, with the font, were unfortunately the sole features of antiquarian interest remaining.

The roofs were of comparatively modern date, and have been constantly out of repair, and devoid of all architectural worth. They have been replaced by new ones of pitch-pine.

The number of worshippers now provided for in comfortable open pitch-pine seats on raised wooden platforms is 77; previously, the accommodation was for only 55.

It was found necessary to plaster the inside and point the outside of the walls generally, on account of the roughness of the old work.

The architect was Mr. E. H. Lingen Barker, and the builders were Messrs. T. & J. Lloyd, of Haverfordwest.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the special meeting of the members of the Institute, held on Monday evening last, the President (Mr. Chas. Barry) in the chair, it was, we understand, unanimously resolved to recommend the award of the Royal Gold Medal this year to Mr. Alfred Waterhouse, A.R.A., a recommendation which, it is hardly necessary to add, has our hearty concurrence.

The following gentlemen were named as the successful candidates for the various prizes given by the Institute:—

For the Soane Medallion (subject, a Convalescent Hospital for Sixty Patients),—Mr. H. M. Robinson.

For Sir William Tite's Prize (subject, Design for an Italian Façade of a Block of Buildings in a principal Street of the Capital),—Mr. Henry Tanner.

For the Grissell Medal (subject, Two Bays of a groined Cloister, Thirteenth-century style),—Mr. G. B. Lewis.

Only two sets of drawings were submitted for this prize, the second of which was so good also that a special medal of merit was awarded to their author, Mr. J. Martin Brooks.

The Institute Medal and 5*l.* 5*s.* were awarded to Mr. G. H. Shackle, for the best drawings illustrative of an existing building, the subject in this case being Markenfeld Hall. A medal of merit was also awarded to Mr. F. Pinches, for his drawings of Fountains Abbey; and Mr. B. Priestly Shires, the author of another set of drawings for the same prize, received honourable mention.

For the Essay prize only one essay had been sent in, which was not considered of sufficient merit to justify the award of the prize.

We may mention that twelve sets of drawings were sent in for the Soane medallion, three for Sir W. Tite's prize, and six for the Institute medal. A strong opinion was expressed by several members as to the high merit of the drawings as a whole, and the amount of work contained in them; and one or two suggestions were thrown out as to the advisability of placing in the Institute library some permanent records of the best of the drawings, in such cases, by means of photo-lithographs or otherwise, which we hope the Council will see their way to carry out.

Although the proceedings were officially private, it will hardly be any breach of confidence if we mention, for the information of members who were not present, that the requisition which had been made, to consider the propriety of returning to the old system of two Honorary Secretaries and a paid assistant, received hardly more than a formal consideration, and the resolution to maintain the present method of carrying on the business was carried all but unanimously; so that the Secretaryship, as an official post, remains *in statu quo*.

MESSRS. DOULTON'S POTTERY.

DURING two or three days of the present week the articles which are intended by Messrs. Doulton & Co. for the forthcoming Paris Exhibition have been on view (by invitation) in their fine new building on the Albert Embankment. It is with great pleasure that we give publicly our tribute of admiration to that which must have been privately felt and expressed by every visitor to the collection. As our readers know, we have on several occasions before given our testimony to the excellent and really artistic spirit in which the work of this eminent firm has been carried out, upon a system which encourages and stimulates individuality of design and workmanship, and is quite opposed to that system of mechanical production which has been the bane of modern art-workmanship. In the collection of objects arranged for transportation to Paris we have the pick of the result of their system, and a very beautiful and encouraging result it is. We find here fine and rich colour, fine texture, graceful and suitable form and outline, and an almost endless variety of design based upon nature, but sufficiently conventionalised to suit the condition of the material and the method of workmanship. The existence of a collection of art-work such as this, which is really equal in beauty and interest to almost any ancient work of the kind, is a refreshing proof that real art, in pottery at all events, is possible in our own day if we go the right way to get it. Those who work with Messrs. Doulton aim, however, at more than merely ornamental art. We have several times noticed, among the sculpture at the Royal Academy Exhibitions, the small designs in alto-relief in terra-cotta by Mr. Tinworth. This talented artist has produced a Doulton-ware fountain, which has been the central object of attraction in the collection on view, and is really remarkable for the beauty and interest of the work. It is in a circular-pyramidal form, and the water runs down a channel encircling the whole in a spiral inclined plane from top to bottom, while above the water-channel, along its whole course, are reliefs representing different subjects in Scripture history connected with water,—the finding of Moses; Gideon selecting his soldiers at the river side; Rebekah at the well; David pouring out the water brought to him by the three "mighty men," &c.; in this and other instances, the water poured out by the principal figure becomes a little rill falling into the principal stream in a very realistic manner. The historical subjects are interspersed with studies of different aquatic or river-side animals. We have rarely seen a specimen of modern work with so much of the piquancy and lively interest so characteristic of Mediæval art; combined, too, with modelling far superior to what was attained in Mediæval work. Many of our readers who have not seen it at home will, we hope, see it in Paris, where, we trust, Messrs. Doulton and the artists who work with them will obtain the credit they deserve for the work they send out, and the artistic spirit in which it is done.

FORMAL PRESENTATION OF THE NEWINGTON CLOCK-TOWER TO THE VESTRY.

THE clock-tower which has been erected on the site of the old Newington Parish Church, at the cost of Mr. R. S. Faulconer, and which has already been described in the *Builder*, was formally presented to the Vestry at their last meeting on behalf of the donor. The inscription on either side of the doorway, on panels filled with polished red granite, is longer and more historical in character than was originally intended, and runs as follows:—"This clock-tower, erected A.D. 1877, by R. S. Faulconer, Esq., formerly a Churchwarden of the Parish of St. Mary, Newington, probably marks the site of the Saxon church mentioned in Domesday Book, in connexion with Walworth, as it certainly does that of several churches which have been built in succession upon it. The last church upon this site was erected in 1793, and was removed under authority of an Act of Parliament in 1876, in which year, on May 1, the new Mother Church of St. Mary, Newington, in the Kennington Park-road, was consecrated." The clock has been manufactured by Messrs. Gillett & Bland, of Croydon. The hours are struck upon a bell of 9 cwt., and chimes at the four quarters on four other bells in proportionate weights, the arrangement of the musical notes being the same as at the Westminster Palace. The five bells weigh altogether about 23 cwt. There is a self-acting gas apparatus fitted to the clock for the purpose of turning the gas up and down, and so contrived as to suit the varying lengths of nights at different seasons of the year.

As has been already stated, Messrs. Jarvis & Son are the architects, and Messrs. Colls & Sons, of Camberwell, the contractors.

Value of City Property.—The corner plot of freehold land, situate in Watling-street and Bread-street, being part of the site of the late Church of All Hallows, and containing a ground area of 3,270 superficial feet, was offered to public competition at the Auction Mart, on Wednesday, the 20th inst., by Messrs. Fuller, Horsey, Sons, & Co., when, after some spirited biddings, the property was sold at the sum of 32,650*l.*, or at the rate of 10*l.* per square foot.

TOWN DRAINAGE.

LIVERPOOL ENGINEERING SOCIETY.

THIS society held its usual fortnightly meeting on Wednesday evening, March 13th, at the Royal Institution, Colquitt-street, Mr. Robinson Souttar, president, in the chair.

Mr. William Kelly read a very practical and instructive paper on "Town Sewerage and House Drainage," which elicited a good discussion. The author pointed out that in designing a system of drainage it is necessary to take into consideration, first, the area of the town or district; second, its rainfall; third, its physical outline; fourth, the present and probable future increase in the population; fifth, the water-supply of the district. Dealing with these primary considerations in order, the author next proceeded to describe, by means of drawings, the form of sewers best adapted to the requirements of town use, and gave the proportions suitable in practice. Good common bricks, set in carefully-prepared mortar, were advocated for the construction of town sewers, and very careful inspection was shown to be indispensable. The formation of junctions with pipe-sewers to private houses was next described and illustrated, and the use of lampholes, manholes, storm-overflows, and other necessary appurtenances was explained. Proceeding to house drainage, it was stated that imperfectly drained and sewage-reeking floors and walls cause a large proportion of the deaths among the cellar population of towns, and much blame is attached to those who neglect to thoroughly drain the sites of intended dwellings. The importance of disconnecting the inside of houses from the main sewer by traps was strongly urged.

THOUGHTS ON RESTORATION.

LIVERPOOL ART CLUB.

ON the 11th inst. a dinner and *conversazione* took place at the Liverpool Art Club, and a paper was read by Mr. George Aitchison, B.A., architect, entitled "Some Thoughts on Restoration." Mr. Aitchison criticised and ridiculed what he termed the "Restoration Mania," which was one of the features of the day. Restoration might be described as the outward expression of the living and rampant form of imbecility. He asserted that we could not restore, if we would, and he hoped to satisfy his hearers that we should not, if we could. In support of his view he asked his audience to suppose the case of a fine church, built throughout at one epoch, and adorned with carvings and sculpture. This had fallen into decay, and the process of restoration was commenced. He held that even though the best restorers might be employed on the work, the result would be false art. There could be but a plausible suggestion of what existed, or a copy of something found elsewhere. The original work was living art, the man who designed it did so because he thought it was beautiful in itself, and proper in its place; but the man who restored it put in his new work with a very different feeling. He did so because he thought his new work might be something like the old, and whether it was beautiful or ugly was no concern of his. The same principle guided his ornament; the restorer might never have taken the trouble to think that the ornament was once a transcript from nature, made to show the peculiar beauty that struck the architect or carver. The new piece was a copy of some other old piece; it had no connexion with the church, and it represented neither old art nor new. Restoration, in fact, was architectural forgery. It was false in principle, and, even if there were no other reason, it must be false, because it was impossible. Mr. Aitchison went on to say that people did not want true restoration; they wanted their churches put into something like decent and congruous fitness for their present purpose. A restored building looked very pretty to the vulgar, but what were the feelings of the antiquary who found, with disgust, that half the work was forged? He also deprecated the restoration of pictures. In the course of his paper he said he hoped to see, before he died, a grand picture, in mosaic, on a blue ground, placed under the portico of St. George's Hall, the finest modern Classic building in the world.

Shipton-Thorpe, Market Weighton.—The Ecclesiastical Commissioners are erecting a vicarage house in this new parish. The cost is 1,350*l*. Mr. W. M. Teulon is the architect.

CLARE COLLEGE, IRELAND.

MR. F. O'CONNOR has been appointed (by Dr. Ryan, the Roman Catholic Bishop) architect of the new College at Clare. The building will be erected on land situate on the road from Ennis to Clare. It will face the south, and will consist of a centre building with wings extending alike. The front will be 200 ft. in length; the wings 116 ft. each, and accommodation will be provided for 120 students. The building will be three stories high, the style of architecture adopted being domestic Gothic. The outer walls will be built of ashlar masonry lined on the inside with brickwork. The quoins, dressings of doors and windows, string-courses, bands, plinth, corbels, barge courses, &c., will be of chiselled stone. A clock-tower, 20 ft. square, and 120 ft. high, will be placed in the centre of the building, and pointed windows will be placed at each end of the corridors on the upper floor. The principal entrance will be through an open portico, into a large vestibule, on each side of which there will be waiting and reception-rooms. The principal staircase will be opposite the vestibule, and will be lighted by a large three-light window. To the left of the principal entrance will be the library, priests' dining-room, the large dining-hall, 50 ft. by 25 ft., kitchen, pantries, larder, &c., and the servants' apartments. On the right will be four large class-rooms, music-rooms, and the large study-hall of same size as the dining-hall. The entrance for day boys will be on the right wing next the Clare-road. In each wing there will be staircases leading to the upper floors. The staircases are placed near the dining-hall and study, so that the students will have easy access to these rooms. There will be forty single rooms on the first floor, and two large dormitories with lavatories, closets, &c., and also apartments, for the president and two assistant masters. On the second floor there will be thirty single rooms with two dormitories, lavatories, &c., and apartments for the vice-president and another priest, and also for two assistant masters; an infirmary, with nurse's room and surgery, is also provided on this floor, and in the event of illness the infirmary will be completely isolated from the rest of the building. Covered arcades will run round the inner play-ground, and a large open play-shed will be erected at the end of the ground. A cast-iron verandah will run along the front of the centre building, and will serve as a promenade for the priests during wet weather. The vestibule will be floored with Minton's encaustic tiles, and the large corridor on the ground-floor with coloured tiles. It is intended to fit up one of the large class-rooms as a chapel, until the Bishop is in a position to be able to build a large detached chapel. The outlay contemplated at present is about 15,000*l*.

DESTRUCTION OF RENFREW TOWN-HALL.

READERS know that the Renfrew Town-hall, one of the most imposing structures of the kind in the west of Scotland, was partially destroyed by fire on the morning of the 6th instant.

On sailing down the Clyde, or indeed in leaving Glasgow for the coast, either by rail, road, or river, the handsome tower of the Renfrew Municipal Buildings never fails to attract attention as a prominent feature in the landscape to the south-west of the populous city just named. The edifice, which did honour to Renfrew, as one of the royal burghs of Scotland, was a combination of the Baronial and Gothic style of architecture, and occupied a triangular site at the burgh cross, its dimensions being 100 ft. long, with a breadth of 40 ft. at one end and 60 ft. at the other. The frontage towards Hairst-street rose to a height of fully 60 ft., the north-east corner, surmounted by the clock tower, attaining an elevation of 135 ft. The roof of the building was flat-plated with lead. The erection of the buildings was commenced in 1871, the memorial-stone being laid on April 13th, 1872, and on October 17th, 1873, the building was inaugurated by Provost Gallacher, at that time head of the municipality. The architect was the late Mr. J. L. Lamb, of Paisley, the buildings being placed on the site of previous municipal chambers, erected in 1670, and to which a town-hall proper was added in 1826. The damage is estimated at from 12,000*l*. to 15,000*l*., covered by insurance to the extent of 7,000*l*. in the Scottish National Office. The resources of the royal burgh will not, however, be greatly impaired as the result of the disaster, as its present assets are 200,000*l*. and its liabilities only 27,000*l*. The ferry across the Clyde is said to yield alone an income of 1,000*l*. per annum.

INSPECTION OF THE TAY BRIDGE.

ON the 25th ult. General Hutchinson commenced his official inspection of the Tay Bridge. Six engines with their tenders, each weighing 75 tons, and which had been sent to the bridge by the North British Company for the purpose, were formed into a train, and the testing commenced by passing slowly over the structure to the north side. Notwithstanding the enormous weight of the train,—450 tons in all,—the vibration and deflection of the girders was observed to be very slight. The train was afterwards driven back at a greater speed, until it reached the most southerly of the large girders, where it was brought to a stand, the girder itself thus being subjected to the test imposed by sustaining the dead weight of the whole six engines. On this being done, the deflection of the girder was carefully noted. The testing of each of the larger, as well as the smaller, girders was carried out on the same plan, and the inspection was completed on the following day by running three engines coupled together over the bridge, the speed attained over the widest span being at the rate of forty miles per hour. The oscillation and vibration were found to be exceedingly slight, and we learn that General Hutchinson expressed himself as highly satisfied with the result of his inspection. As the station is not yet completed, some few weeks must elapse before the bridge is open for traffic.

THE METROPOLITAN BOARD OF WORKS AND THE NEW THOROUGHFARE FROM FARRINGDON-ROAD TO REGENT-CIRCUS.

AT a special meeting of the Metropolitan Railway Company, held last week, Sir Edward Watkin, the chairman, made reference to the new street which the Metropolitan Board of Works propose to make from Farringdon-road to Regent-street, but which, as will be seen from Sir Edward's remarks, has been postponed. He stated that the directors had been in communication with the Metropolitan Board on the subject, as they had got an impression that the Board would be disposed to make a fair arrangement with them, by which they would sell to the company for a fair sum the right of way under the new street, from Farringdon-road to Regent-circus. A railway between those points would open up a vast amount of new traffic, but the work was one of those undertakings which could only be done in the event of both bodies co-operating; and it had now been decided by the Board of Works that in consequence of their very numerous engagements, they were going to postpone the completion of the new street for a few years. Sir Edward then stated that in consequence of this decision the company's Bill for powers to construct a new railway from Farringdon-road to Regent-circus would not be prosecuted until the Board of Works were ready to proceed with the new street.

BRICKMAKING AT SITTINGBOURNE.

SITTINGBOURNE and Faversham, in Kent, are well known as places in which more bricks are annually made than almost any other district in England, and accounts from the locality state that the prospects for the future are even more promising than they have been in the past. It appears that some time ago it was feared that the brick earth in the neighbourhood of the Sittingbourne and Faversham manufactories was exhausted, and that the works would have to be closed, but it now turns out that very large quantities of brick earth have been found in fields near where the brick yards were first established, and it is believed that the supply is almost inexhaustible. This brick earth as it is got out, is now carted to the original brick-yards, and also to new manufactories which are in succession being established, and it seems that the landowners from whose fields the brick earth is being taken are making almost fabulous profits of the material. Some of these owners are said to have received for the brick earth got out of their land double and treble the sum the

land originally cost them, still, of course, retaining their ownership in the land.

Last season several of the brick manufacturers are said to have realised small fortunes, and as last year's bricks are reported to have been almost all bought up, it is expected that next season will again be a very profitable one The assertion is that during the present year more than 300,000,000 bricks will be made in the Sittingbourne and Faversham district.

INDUSTRIAL CO-OPERATION.

THE first of a course of four lectures on this subject was given at Exeter Hall on Saturday last by Mr. Thomas Hughes, Q.C. The lecturer at the outset described the co-operative movement as one of the schemes the object of which was the well-being of the many, and maintained that the time had arrived when that must be not only the true but the absorbing object of pursuit of all who identified themselves with it. It could not be classed among modern schemes, as it dated from the middle ages, when the movement found its home in the monasteries, in which groups of men gathered together against the wrongs of feudal barons on the avowed principle of brotherhood. It would not be denied that it was in the monasteries trade first raised its head in England; and he noticed it here because it was said that trade sprang from competition, and not from fellow-work. Between the years 1834 and 1846 co-operative life was beginning to stir in this country, in spite of the difficulties which beset it, and a considerable number of stores were registered as friendly societies, several of which remained so registered to this day. It was not, however, till the great revolutionary crisis of 1848-9 that any strong impulse was given to the movement in England. He did not suppose that the ideas of M. Louis Blanc, or the works of the provisional government, were known but in the vaguest way to the working folk in the North of England; but co-operation, nevertheless, took its root there, and stores rose rapidly The need of some sort of federation began to be felt, and conferences were held with a view to strengthen the societies, whose trade was hampered at every turn by the state of the law. In tracing the subsequent history of the movement, the lecturer dwelt upon the fact that the passing in 1852 of the Act relating to the condition of the working classes formed an important epoch in co-operative annals. The societies in the northern counties had been visited by individual promoters on several occasions. They were all by this time in communication with the London centre, and eager to turn the passing of the Bill to the best advantage. In the same year a conference met in London, and it was resolved that co-operative establishments should sell all articles exactly for what they knew them to be. No general conference was held for several years after, in consequence of the failure of the London institutions. Of the controversies which the revival aroused, their effect, said the lecturer, was to convince the country generally that the movement was neither revolutionary nor dangerous to property, and all those who cared to risk it found that it educated the working classes in the best sense, and opened up prospects to them which could scarcely be valued too highly. Turning to the establishment of those societies which had adopted the ready-money system, he believed they were, with two exceptions, registered as joint-stock companies, and had carefully confined their efforts to buying in the cheapest markets and distributing in the most economical way. One result of this was that the general public, instructed by the metropolitan press, had been misled, and taking this part of the movement as representative of the whole, had concluded for the present, as the *Fortnightly Review* said, that "co-operation concerns itself solely with the the redistribution of capital and its products; for the employment and duties of capital it has no word." The lecturer concluded by strongly recommending the particular form of the pursuit of the "well-being of the many" which he advocated to the most fastidious seekers for equality under the guidance of Mr. Matthew Arnold, as well as to the rest of the community. The lectures are given under the auspices of the Guild of Co-operators, which has been established for the purpose of spreading in the south of England a more general knowledge of the principles of industrial co-operation.

The remaining three lectures will be delivered on following Saturdays:—On March 23, Mr. Edward Vansittart Neale, M.A., will speak on "The Evils which Co-operation is specially directed to remedy"; Mr. Lloyd Jones and Mr. E. Owen Greening will follow. Admission is free.

NEW COVERED MARKET AT BURSLEM.

THE memorial stone of a new vegetable market at Burslem was laid on the 13th inst. by Mr. Robert Heath, M.P. The building, which was begun some months ago, will cover an area of 1,800 square yards, of which 420 will be occupied by six shops abutting on Queen-street. They will also have communications backwards with the market. Over them will be a series of offices for borough purposes, with entrances in Queen-street. The total length of frontage in this street will be 125 ft., and the height to the top of the central tower 96 ft. The market will be approached by two entrances from Queen-street,—one from Brickhouse-street and one from the Market-place. The lower part of the façade (in Queen-street) will be of Yorkshire stone, with small granite pillars, and the upper portion of red brick with stone dressings. The roof of the great hall will be of wrought iron, supported on twin columns, with ornamental capitals. The whole of the glazing will be done on the principle invented by Mr. W. E. Rendle, and which has been largely adopted by the Government and many of the railway companies. By this plan the panes are inserted in metal grooves, and putty is entirely dispensed with. The new building is in the Gothic style, and has been designed by Mr. E. M. Richards, the town surveyor. Messrs. H. & R. Inskip, of Longton, are the contractors for the brick and stone work; and Messrs. Hill & Smith, of Brierley-hill, supply the iron roof. The first of these contracts is for 13,959*l.*, and the other for 1,350*l.* The site cost 6,000*l.*, and the total outlay on the market when finished will be upwards of 25,000*l.*

THE CORPORATION OF SHEFFIELD AND THE BOROUGH ENGINEER.

SIR,—My attention having been directed to Mr. Clarke's letter on the above subject, I consider it my duty to state in reference thereto, that during the past year I have executed engineering works for the Corporation of Sheffield of the value of more than 100,000*l.* The chairman of the Improvement Committee challenged the council to appoint any eminent engineer in the kingdom to examine and report upon the work, and if he could estimate more than 100*l.* worth of defective work the chairman was prepared to give the council a check for the sum over and above that amount. As to this small portion of bad workmanship, I distinctly told the Highway Committee at the time it was being executed, that I would not accept any responsibility, as the work was done in accordance with a resolution passed by them in opposition to my expressed opinion and advice.

I have now been engineer and surveyor to the Corporation of Sheffield for four years, and this is the only charge which has been brought against me up to the present time.

A quantity of irrelevant matter was introduced into the discussion at the Council meeting, and statements made which I cannot recognise, as I have had no opportunity of explaining or contradicting them.

The above is the only reason which has been brought under my notice why the Corporation have resolved to request me to terminate my engagement with them.

P. B. COGHLAN,
Borough Engineer and Surveyor.

Sheffield.

*** From what we have been able to learn of the case it certainly seems to us that Mr. Coghlan has fair ground of complaint.

SIR,—Mr. Ellice-Clarke's letter with reference to the way in which the Borough Surveyor of Sheffield has been treated should be a caution to candidates for the office One can hardly believe that the Corporation of a large borough like Sheffield would behave so dishonourably towards an important public officer as to have condemned him unheard. It shows the necessity of having some protection from the Local Government Board. This the Association of Municipal Engineers and Surveyors has sought, at the hands of the Central Board, and I hope those who make the surveyor the instrument to carry out public health laws, will protect him in doing so, from the part-seeing and interested motives that so frequently characterise local governing bodies especially of small towns. E. BUCKHAM.

Town Hall, Ipswich.

THE HAYMARKET ACCIDENT.

CAST IRON COLUMNS.

SIR,—The Haymarket accident proves that a good architect, a district surveyor, and a competent foreman, can put up unsafe cast-iron columns without their being able to detect the defects of the casting. This does not astonish me, for I have long ago made up my mind that, though theoretically a hollow cast-iron column is the most resisting of supports, practically it is the very worst, because its defects are concealed. I have it from a man of great experience that he has often found hollow columns present, after fracture, an irregular section, in which one side of the ring was as thin as a sheet of paper, while the other was much thicker than it was designed to be. This is caused by the difficulty of keeping the core quite immovable when casting. I think that architects would be wise never to employ cast-iron columns where great weights have to be supported; but to prefer cross-section stanchions. They offer, it is true, according to mathematical principles, less resistance than annular columns containing the same amount of material; but they can be depended upon bearing what they have been calculated to bear, as all their surface is exposed to view, and can be thoroughly examined before they are used. Stanchions, I know, are avoided because considered ugly; but I contend they need not be; they are even more capable of artistic treatment than columns. I know of two examples which bear out this opinion. The balconies of the artisans' dwellings at Battersea are supported by stanchions, where the latter produce a very elegant effect of lines. Another very instructive example are the candelabra of the Conservative Club, St. James's-street, which are of cross-section ornamented with little cast-iron panels riveted on. The effect of these is very pleasing, and I believe it wants but a little goodwill for architects to develop this principle of construction and get beautiful results. LAWRENCE HARVEY.

VENTILATION.

SIR,—The *Times* alludes to the science of ventilation. Architects should study the chemical nature of the gases that compose the air, and the contrivances for warming and ventilating buildings.

In a workshop where pure air without draught was necessary, the air near the floor was kept warmer than that near the ceiling, as shown by thermometers, and single feathers suspended from the ceiling about the middle of the room, remained motionless. This test applied to private houses and public buildings, when in full use, will prove them to be healthy, because it involves openings at the top to let out the heat, and also to let in cold air without causing draught. SANITAS.

EXPERIMENTS WITH IRON AND CONCRETE.

SIR,—In your recent article under the above heading, you refer to the specimen of our artificial stone, submitted by Mr. Fowler, and you state 10 ft. or 12 ft. to be the maximum bearing, and that the question of the stability of the structure depended upon the behaviour of the main beam.

Will you allow us to state that by our mode of construction the columns and main girders are covered with our fireproof material, our practice being to protect the whole of the constructive ironwork with a covering of concrete, the whole of the ingredients of which have been previously calcined.

With regard to the size and position of iron in forming lintels, arches, &c., 2 in. stout hoop-iron on edge is cast in it as near the bottom edge as practicable, while for bressumers and girders to carry heavy walls we use 4 in. or 6 in. flitches, blocked and bolted 10 in. apart, and then filled in around and over with material the full thickness of wall, and 18 in. or more deep.

In forming roofs, landings, floors, &c., we have for the last sixteen years used bar iron 2 in. or 3 in. deep with small round rods running transversely through them, thus forming a network which is filled in and over to a thickness of 5 in. or 6 in., the top being finished with a fair face. Fire-proof ceilings are formed in a similar manner *under* the main girders.

In proof of the fire-resisting qualities of the material, we have used it for the crowns of

furnaces and covering for fines, and its behaviour in large fires has been most satisfactory.

In 1862 we took out a patent for fireproof construction, and we believe it to be the only thoroughly fireproof system now in use. As to the adaptability of the artificial stone for structural and architectural purposes, we have used it with advantage in every case where natural stone is ordinarily used; but it is very important that the cement should be of the very best description, and for years past we have used none but that manufactured by Messrs. Hilton, Anderson, & Co. M. ALLEN & SON.

PARTY-WALL CASE.

STANDARD BANK OF SOUTH AFRICA *v.* STOKES.

THE defendant, after giving the usual party-wall notices, and after the plaintiffs had appointed Mr. Blashill to act as their surveyor, and meet his surveyor, commenced to execute deep underpinning in order to obtain a sub-basement for his new building in Clement's-lane, City, no third surveyor having been selected, and no award made.

The Judge (the Master of the Rolls) reviewed the question of the right of parties at common law as tenants in common of a party-wall, deciding that each party might deal with the wall, even to the extent of pulling it down without giving right of action to the other party, provided his object was to improve one or both properties, and was carried out properly. (This seemed to be a question of doubt.) But as to party-walls in London, he held that the rights of each owner are fully set forth in the 83rd section of the Metropolitan Building Act, which by implication excludes all other rights. He held that though underpinning is not specially mentioned in that section, the word "raise" (in Clause 6) includes "underpinning," or *extending* a wall even in a downward direction! Also, that by the 11th Clause underpinning came within "other necessary work," even though there was no necessity beyond the defendant's wish to make an additional basement.

Finally, however, he decided that the defendant was altogether in the wrong in proceeding with the work without a third surveyor and an award, and condemned him in costs.

The matter is now to be settled by Mr. Blashill and Mr. Batterbury (the defendant's surveyor), and Mr. Clifton (chosen umpire), as referees under the Court, the Judge objecting, for some reason, to remit the matter back to the stage when the third surveyor ought to have been appointed, so that all should go on under the Act,—a course to which, it seems, both parties were willing to agree.

BREACH OF CONTRACT.

HURLSTONE *v.* COLLS & CO.

THE plaintiff, Mr. Hurlstone, is a revising barrister, of Slaugham, Sussex, and the defendants, Messrs. Colls & Son, are builders carrying on business at Dorking, Surrey, and also in the metropolis, and who had paid into Court 15*l.* in full satisfaction of the alleged breach of contract.

Mr. Hurlstone, the plaintiff, who was so crippled and infirm as to be carried into Court, arising, as he stated, from the breach of contract by his builders, appeared both as counsel and witness. He said that he was the owner of two cottages in the parish of Slaugham, one of which he sometimes occupied as his own residence. He contracted with the defendants to carry out specified repairs to both cottages, but after commencing the work, and carrying it on to a certain extent, defendant's men suddenly left off the job, and both houses were in an uninhabitable state when the workmen left off. He was then obliged to incur a considerable expense in putting the cottages into their original habitable condition, and was compelled, in September and October of 1877, to reside in an hotel in London in consequence of the inconvenience he was put to. By staying in one cottage a short time only he had contracted a severe cold, and by being compelled to apply for medical assistance this further added to the loss and damage he had sustained, and the doctor's bill made up the 5*l.* damages he now sued for.

The Judge asked the plaintiff to explain each item in his claim.

The plaintiff replied that, in consequence of the unfinished state in which the defendants left the premises, his building expenses were for mending holes, &c., in roof, 1 man, 66 hours at 7½*d.*, 2*l.* 1s. 3*d.*; labourer, 66 hours at 4½*d.*, 18s. 10*d.*; laths, hair, &c., 10s.; bricks, 1*l.* 5s. 6*d.*; cement, 4s. 6*d.*; plaster of Paris, 1s. 2½.; railway and cartage, 7s. 4*d.*; lime and sand, 18s.; slates, 1*l.* 16s.; boardings, &c., 1*l.* 9s. 1*d.*; carr age of ditto, 10s.; carpenters' work, 5s.; and shoot destroyed, 3*l.*; or, in all, 13*l.* 6s. 9*d.* for builders' work. In addition to this, he claimed for inconvenience, hotel, and medical expenses, and other items, which stated up to 50*l.*

The Judge.—If a man breaks a contract, he is liable to the injury he has committed. Did you call in another builder to ascertain the damage?

The Plaintiff.—I did not; for there is not one resident nearer than Horsham, or Cuckfield, and I took the work on my own hands. My hotel expenses arose from my being compelled to leave my cottage and stay in London.

The Judge.—But if you had lived in your cottage you must have paid for your dinner. That question as well as your doctor's bill, is merely one of law, which the jury will not have to deal with. If a man goes to live in a house and catches cold he cannot sue a builder for doctor's expenses, and, according to a case decided, such cannot be taken into account with the present question of damages. What the jury will have to decide is the amount of damage done to your property by breach of contract.

The plaintiff was then cross-examined by the defendant's solicitor as to his experience in building matters, prices of materials, &c., in neither of which could he give a satisfactory explanation, and admitted that no regular contract had been entered into, but the price left open.

A witness proved that defendant's men came to do the work on a Wednesday, and left on the Saturday, saying they should not come to the job any more.

For the defence, Mr. West was called, who said that last autumn he was in the employ of the defendants, and was sent down to plaintiff's cottages to superintend the job. He commenced, but did not finish, taking some plastering off the sitting-room and a few other jobs, but did not stay to finish as he was ordered to leave it. To put the premises in the state he found them would take a man seven or eight days, and he would gladly take the job in hand for 8*l.*

The jury eventually considered that the 15*l.* paid into court was amply sufficient, and the Judge said he quite agreed with the jury, and found for the defendants with costs.

It did not clearly transpire why the contractors gave up the job in so sudden a manner.

ARCHITECTS' ACTIONS.

HUNT *v.* THE WIMBLEDON LOCAL BOARD.

THIS was an action in the Common Pleas Division, before Mr. Justice Lindley, to recover about 200*l.*, the cost of preparing plans for the building of new offices for the Wimbledon Local Board.

Mr. Patchett, Q.C., and Mr. Walpole appeared for the plaintiff; and Mr. Marriott, Q.C., and Mr. Pattison for the defendants.

The plaintiff was an architect in Regent-street, and in July, 1875, he did the work now in question. The Board being in want of new offices spoke to their surveyor, Mr. Rowell, who was mainly employed in carrying out sewer work, but who had out one or two plans for buildings. He prepared some plans for the building, but afterwards he communicated with the plaintiff, who in consequence prepared other plans. Mr. Rowell's recollection of what passed was that he told the Board he was so much engaged with the sewers that he could not get out the plans for the new building. He told them he proposed to employ Mr. Hunt, and as there was no objection to his doing so he did employ him. The plans bearing Mr. Hunt's name were laid before the Board and examined by them.

The Rev. J. M. Brackenbury, the chairman of the Board, and other members of that body, stated that no authority was given to employ Mr. Hunt, and they did not know until recently of his employment. The building never was erected, in consequence of its being found too expensive, the lowest tender to build being 7,000*l.*, more than twice the amount of the estimated cost. Other plans were obtained from another person, and upon them the building was constructed. Upon this state of facts two heads of defence were raised,—one that Mr. Rowell had no authority to employ the plaintiff, and the other that the charge for the plans was to be calculated, not upon the tender price, but upon the estimated cost. Beyond this, there was the question whether the plaintiff could recover at all, the Board not having bound themselves by any contract under seal.

The jury, having considered the matter for half an hour, found that the Board had authorised the employment of the plaintiff; that new offices were necessary for the Board; and that to have the offices plans were necessary.

The verdict was for the plaintiff for 94*l.* 6*s.*

Mr. Justice Lindley said he should reserve his judgment until the question of law had been argued before him.

DANGEROUS STRUCTURES.

AT Marlborough-street the owner of Nos. 55 and 56, Great Windmill-street, was summoned before Mr. Newton by the Metropolitan Board of Works, for non-compliance with a notice served upon him requiring the removal of some blocks of stone which form the entablature of the new front wall.

Mr. Napier appeared for the Metropolitan Board, and a solicitor appeared for the defendant.

Mr. Kerr, the district surveyor, said that he had condemned the portion of the structure in question, and considered it dangerous to let it remain.

Mr. Walker, another district surveyor, happened to be in court, and he was asked his opinion by the magistrate. He said he had noticed the entablature, and considered it to be in an unsafe state, and that a heavy steam roller or fire-engine passing might bring it down.

For the defence, Mr. Dauch, surveyor, was called, and he said he considered everything quite safe, as the part complained of had been buttressed up by a cross wall.

Mr. Walker said if the matter was in his district he would not sleep comfortably while it remained in its present condition.

Mr. Newton, having ascertained what time might be given, made an order for the requirements to be complied with within fourteen days.

Barrow-in-Furness.—A block, including an auction mart and fine-art gallery, with lock-up shops on the ground-floor, has just been completed in this town. The fine-art gallery has an open-framed roof, with large lantern light, and the walls are lined throughout with boards, and covered with cloth. The works have been carried out for Mr. Richard Bailey, by Mr. James Ward, contractor, Mr. Howard Evans being the architect.

A "GREEK DRESS" PARTY.

LAST Wednesday there was given, not very far out of town, an evening entertainment of a rather unusual character, being a practical protest in favour of Greek costume, or at least the principles of Greek costume, for the fair sex; all the ladies appearing on the occasion in dresses modelled on the Greek type, in most cases pretty closely, though there were vagaries in both colour and form, which were hardly to be called Greek except by a stretch of the imagination. Some remarkably pretty combinations of tone and draping were to be seen, the effect depending, however, as may be supposed, a good deal upon the personality of the wearer. One lady, who, to the possession of remarkable natural advantages, had added a very complete realisation of true Greek costume, looked as if she had just stepped out of one of Mr. Leighton's best pictures; it was almost curious to see realised what one had only been used to see on the walls of a picture-gallery.

Several well-known archæologists, critics, and artists, were present to study the result, and it was understood that the object was, *bonâ fide*, to promote the commencement of a return to the Greek type of dress for women as the natural and normal form of dress, and therefore a refuge from the eccentricities of fashion. We should be sorry to throw cold water on an idea no doubt meritorious in its own way; but we fear this will not do. Admitting that it makes a very pretty dress for an evening party, what is to be made of it in the daytime and in open air, in this climate? Nor is it convenient, as some of our fair friends admitted that dancing would be impossible. Our own opinion is that the present type of ladies' dress in England is not at all a bad one to work upon, if we only had more variety and originality, and less of extreme developments,—the extreme of tightness, for instance, which is carried sometimes to a manifestly inconvenient and scarcely decorous point. And the modern English dress has, at least, this advantage about it, that it helps the main points of the figure, marking the waist especially, and making any tolerable figure into a good one. And dress ought to help the figure. In the Greek type of dress only an exceptionally fine, and at the same time rather full, figure has a chance; others simply disappear in the dress.

It is not the first time such an experiment has been made in London; we read not long ago in one of the many books of reminiscences that are published an account of a Greek dress reception in the earlier part of the century, but have forgotten names and particulars; only we remember an anecdote to the effect that a very distinguished statesman of the period who was present, said to one of the fair guests, "Lady ——, there is one question I should very much like to ask you; are you *really* as naked as you look?" and that the lady replied, with simple candour, that she was "very nearly." The story fits the early half of the century better than the latter half, certainly; and we believe ladies who wish to try correct Greek costume can do so without the experiment involving any such unsophisticated state of apparel.

When will some one give a party to improve the men's dress, which needs it much more? And what leading type would be taken in that case?

THE INHABITED HOUSE DUTY.

LAST week a deputation waited upon the Chancellor of the Exchequer to urge upon him certain points in connexion with the incidence of the inhabited house duty. Mr. Alderman Lawrence, on behalf of the deputation, said that what was desired was not the total abolition of this tax, but to bring before the Government points worthy of review. The question was of the highest importance to large commercial centres. If a professional man,—such as a lawyer, civil engineer, or architect,—occupied offices in a building, that building was liable to be charged 9*d.* in the pound. This anomaly would have before been removed, if it had not been for accidental circumstances. Mr. Hubbard and Mr. Goschen were now endeavouring to do it by the introduction of a clause into a Bill now before the House. The house-tax, which was imposed in a hurry, was the only tax that limited the mode of construction or manufacture of the article taxed. This tax did this in reference to the lowest section of the community. The buildings erected by Sir S.

Waterlow, the Baroness Burdett-Coutts, and the Peabody Trustees, escaped the tax by the designed mode of their construction. They had no front doors, but open staircases, with suites of rooms, the rental of each suite being under 20*l.* a year. It could not be said this style of artisan's dwelling was the best. Houses of this description might be built in a form better adapted to the wants of the people.

Mr. James Innes gave some practical illustrations of the anomalies of the tax; and Mr. Tomlinson pointed out its inequality in its incidence.

The Chancellor of the Exchequer, in reply, said that as we were now within three weeks of the time of bringing forward the Budget for next year, he should not find it very convenient at the present moment to enter at all fully into this question. He assured the deputation that what had been said in former years, as well as what had been said that day, had not failed to receive serious consideration, and he hoped it might be in his power, though it was not a very good year for anything of the nature of the remission of taxation, to make some proposal which would to a certain extent meet the wishes which had been expressed, or some of them at least.

COMPETITIONS.

The Rowland Hill Memorial, Kidderminster.—On the 13th inst. the Committee of Taste held a meeting, for the purpose of receiving the replies of sculptors who had been invited to send in models for the proposed statue. The hon. sec. stated that the following sculptors had signified their willingness to send in models for the statue:—Messrs. T. Brock, Thorneycroft, C. B. Birch, Homer, Bell, Fontana, Williamson, Mullins, and Wills. At the former meeting of the committee it was resolved that the statue should be of Carrara marble, and the pedestal of Aberdeen granite. Mr. Brock and several other sculptors pointed out that Carrara marble, while being much more costly than Sicilian, was not so suitable for an out-door statue as the other kind, and that to erect the pedestal of Aberdeen granite would absorb too much of the sum offered for the statue to enable the sculptor to devote much attention to the figure. He suggested that the pedestal should be made of Cornish granite. It was resolved to substitute "Sicilian" for "Carrara" marble, and "Cornish" for "Aberdeen" granite. Two prizes of 25*l.* and 15*l.* were offered by the committee for the best second and third models sent in by the sculptors.

Radcliffe-on-Trent Church.—The Church Restoration Committee, on the 11th inst., decided on the plan signed "Spes," for the restoration and enlargement of the parish church. The authors of the selected design are Messrs. Goddard & Paget, of Leicester. Honourable mention was made of the designs signed "'Keep Watch," and "Truthful."

THE SEATS OF THEATRES.

As there is now a Committee sitting in the House of Commons upon the new Building Bill, with regard to the alteration and supervision of theatres, &c., allow me to refer to the letter from me you kindly published (Vol. for 1877, p. 644), suggesting that as omnibuses are licensed to hold a certain number of persons, so should the theatres be restricted in the same manner, according to the area appropriated to the public. It would save a great misery to those who visit many of our theatres, more particularly in the upper boxes of the Haymarket and St. James's. Y.

CHARING CROSS.

Sir,—The tall hoarding just put up, continuing from the north end of Northumberland-street in the direction of and sweeping round to some way down Northumberland-avenue, entirely shuts out from public gaze the recently-resumed building operations going on within. It would be gratifying to the public to find, when the works are completed, that some consideration had been given to the convenience and facility of the foot-passenger traffic by increasing the width of the foot-pavement at this particular spot, as was suggested not so very long since in a letter to a daily contemporary (the *Times*), viz., from the Strand end of Northumberland-street to the Avenue turning, without interfering with or curtailing in any degree that of the carriage-way, which could ill be spared. Any additional width should be gained from the back. The original width, bounded as it lately was on one side by an open wooden paling, and by the stone curb of the carriage-way on the other, is very insufficient for the throngs of passers-by traversing it throughout the day, and most certainly before long will become much more so.

Spes.

MASTERS AND MEN.

Ballinasloe.—On the 14th inst. a large number of stone-cutters in the Ballinasloe Limestone Quarries went out on strike, in consequence of the employers reducing the wages from 32*s.* to 30*s.* per week. A deputation from the trade waited on the employers, but failed to come to terms. Subsequently, a largely-attended meeting of the stone operatives was held, when resolutions were adopted pledging themselves not to return to work till their demands were acceded to.

London.—The close of the masons' strike, which practically terminated on the 14th inst., leaves for the present (according to the daily papers) some 500 masons out of employment, who must be supported by the union until they obtain work at the old wages of 9*d.* an hour. The strike has now lasted thirty-two weeks, and is said to have cost the unionists, who have been aided to some extent by those of other trades, somewhere about 30,000*l.* On the other hand, it is thought that the master builders must have expended more than 10,000*l.* in the importation of foreign workmen, and the transport to London of men from different parts of the country.

Books Received.

Industrial Art: a Monthly Review of Technical and Scientific Education at Home and Abroad. Edited by T. H. Lamprey. Volume I. London: Hardwicke & Bogue.

This is the bound collection of the numbers from July to December, 1877, of a recently-started journal, concerned especially with the illustration of Industrial Art. The scope of the publication is tolerably extensive, as it includes description, if not illustration, of both the artistic and the constructive element in all kinds of work which come under the heading of industrial art, which may be defined to mean all objects which, though primarily for use, are capable of ornamental treatment, and which, in the words of the preface to the volume, "ally designing power with mechanical skill." We think the promoters of the journal are justified in their opinion that there has been a call for such a publication, and that it supplies a want. They complain that England gained no real lessons of experience from the Art Exhibition of 1851; that though a large number of Illustrated Catalogues issued since that time contain examples of Art Industry which have in some measure served as text-books for designers, "it is no less true that the slavish imitation of the patterns contained in these official records serves only to perpetuate the bad art of 1851." The writer of the preface proceeds to complain of the preference given in such books to bad types of Renaissance art, and to state that it has been their object in "Industrial Art" to search out and reproduce the finest bits of pure Renaissance wherever they exist. It would be a mistake to infer from this that the majority of the illustrations represent old examples, as, in fact, comparatively few of them are of this description, most of them representing modern designs, chiefly by German artists. These latter, though not immaculate, are superior to what our knowledge of German taste would have led us to expect; and those examples which are given of old Renaissance work are thoroughly good, some of them very fine and unusual, and all well engraved. The writing might be improved in style, but in a publication of this kind illustrations and definite information are, perhaps, of more importance than criticism. At all events, there is quite a sufficient average of merit and good intention in the publication to induce us to wish it a continued and increasing success; but we should prefer to see rather less of the German element in the modern work that is illustrated.

The Bedroom and the Boudoir ("Art at Home" Series). By Lady Barker. Macmillan & Co. 1878.

This is one of the series, other numbers of which we have noticed separately at more or less length, which professes to supply us with art for the whole of our houses, from kitchen to attic, or pretty nearly so. It is hardly necessary to say very much about it, partly, indeed, because it is rather better than some of its predecessors, which we thought it a kind of duty to deal with somewhat more at length, because their pretensions were so great and their performance so small, that it seemed desirable in public interests to show what the books really were which were put forth with such a magnificent flourish of trumpets. Lady Barker's book is somewhat less pretentious in style, and better in its illustrations than most of the others. Some of it can hardly be said to be about art, as it deals with considerations of what may be called nursery sanitation, which, however, is the practical basis of furnishing and adornment to a great extent. Lady Barker is quite right in her dictum about the bedroom, when used as a "sick-room," that everything should be plain and simple, and that "sick people detest anything like a confusion or profusion of ornaments or furniture." In feverish illnesses the pattern of a wall-paper will sometimes be the cause of continual and distressing irritation to the sufferer, more especially if it presents anything complex, which the sight is tempted to trace out again and again. The furniture illustrated is mostly pleasing in design, and in accordance with the theories expressed, which could not be said of some numbers of the series.

Miscellanea.

The Lambeth and Vauxhall Water Company, the penalties imposed upon which, for improperly cutting off a supply, were mentioned in our last number, received, in 1876–7, rather more than the average water-rental per house; the general average of the eight companies being 2·34*l.*, while that of the Lambeth and Vauxhall was 2·44*l.* The gross income of the company amounted to 9·78 per cent. on their capital outlay. The working costs came to 46·6 per cent. of revenue, which is 7·3 per cent. higher than the average of the eight companies. As this leaves a margin of 5·65 per cent. for dividend over all the capital expended, it may be questioned what justification the company has for the recent very considerable increase in their rates.

The Obelisk. — We understand that the South Kensington Museum, with the approbation of Professor Wilson, and the co-operation of Mr. Dixon, proposes to take a cast of the entire obelisk as soon as can conveniently be done after its removal to its site and before its elevation. Major Festings has been appointed by the Museum authorities to make the necessary arrangements for obtaining such a cast, and for its erection at South Kensington. It is considered that, in the event of the original being hereafter injured or defaced by the action of the London atmosphere, it would be of much interest to have such a cast, showing the exact state of the obelisk at the time of its arrival in this country.

Electricity and Street-Lighting. — Mr. J. A. Picton has informed the Liverpool Town Council that at a comparatively trifling outlay "it would be possible to light the town of Liverpool by electric light, without one farthing of expense to the ratepayers, the whole thing being done by the action of the rise and fall of the tide." A few evenings since Professor Tyndall presided at a meeting of the Society of Arts, and highly complimented Mr. St. George Lane Fox on the thoroughness with which he had worked out an idea which the learned Professor himself had entertained, viz., the simultaneous lighting of gas-lamps, whether in large buildings, or in the streets of our large cities and towns.

Archæology in Japan. — According to *Nature*, H. von Siebold, Attaché of the Austrian Embassy at Yeddo, and a member of the Japan Archæological Society, has lately published a *brochure*, which will serve as a guide for the systematic archæological study of the land; Von Siebold has lately made a most interesting discovery of a prehistoric mound at Omuri, near Yeddo, containing over 5,000 different articles in stone, bronze, &c. In a recent communication to the Berlin Anthropologische Gesellschaft, he describes the origin of the terra-cotta images found in old Japanese burial-grounds. It appears that up to the year 2 B.C. it was the custom to surround the grave of a dead emperor or empress with a number of their attendants, buried alive up to their necks, their heads forming a ghastly ring about the burial spot. At the date referred to the custom was abolished, and the living offerings were replaced by the clay figures, which have hitherto attracted so much attention.

Stony Stratford.—The parish church of St. Giles, Stony Stratford, has been re-opened, after undergoing considerable renovation. Externally little has been done, the principal portions of the work having been confined to the interior. It was deemed advisable by the architect to make colour the leading scheme for adornment. The walls and roofs of the nave and aisles are in monochrome, and the apse and quasi-chancel in polychrome. The old Perpendicular tower arch has, by the removal of an unsightly western gallery, been exposed to view, and the space intervening between it and the belfry filled with new timber framing, and new west doors to communicate with the vestry. The existing font has been raised on steps, and crowned with a spiral cover of oak, crocketed and suspended from a wrought-iron bracket. A new rood-screen of pitch pine marks out the *chorus cantorum*, and a new carved pulpit of the like material stands on the north side of it. The windows, formerly huge openings only, have been filled with varied geometric tracery in Corsham Down stone. The galleries, which, for want of space, could not be dispensed with, have been perforated and decorated. A new reredos, divided into three compartments, in the manner of a triptych, contains representations, on a gold ground, of the Crucifixion, with St. Mary and St. John in the centre, and angels bearing symbols in the sides. The panels in the screen, also on a gold ground, represent the Bishops of the Eastern and Western Churches, St. Giles, the patron saint, &c. In the windows of the apse are represented the twelve Apostles, with the Crucifixion in the centre, and the Resurrection and Ascension of our Lord in the side-lights; they are the gift of Mrs. Sankey and her son, in memory of the late vicar. The south quasi-transept window is being filled with stained glass to the memory of Josiah Michael and Ann Smith. The tile pavement in the chancel is from Messrs. Minton & Co. The carving is the work of Mr. Harry Hems, of Exeter. The wrought-iron gates of the screen and the front bracket are the work of Mr. William Downing. The reredos, screen, arcading around apse, font-cover, &c., were executed by Mr. W. Watson; and the painting and painted decorations have been carried out by Messrs. Plumb & Son, all of Stony Stratford. The stained glass is by Mr. J. G. Howe, London; the quarry glazing by Messrs. Pepper; the panels of the reredos are the work of Mr. E. M. Hale; and those in the screen are the work and gift of a lady visiting at the vicarage. The works and decoration have been carried out from full-size working drawings, and under the personal supervision of Mr. E. Swinfen Harris, jun., architect.

Eddystone Lighthouse.—A report from the Corporation of the Trinity House to the Board of Trade on the practicability of removing the Eddystone Rocks instead of rebuilding the lighthouse thereon has been presented to Parliament. The corporation is not prepared to advise any expenditure of public money having for its object the doing away with such a sea-mark as the Eddystone Light. The Elder Brethren explain that the use of the light is by no means confined to warning against an isolated danger, with whose removal its function would cease; but that the existence of that danger, in affording a platform for the exhibition of a light, has become not merely the means of giving a good lead into Plymouth, but of determining position and providing an essential link in that chain of general passing lights which, as defining a straight course up and down the English Channel, may be regarded as invaluable. It has been estimated by Mr. Douglass that to obtain the safe minimum depth of seven fathoms, which would be expedient, it would be necessary to remove about 100,000 yards of rock, or 1,750,000 tons; to which would have to be added the blasting of an inner danger that of the Hand Deeps, at presently sufficiently indicated by the lighthouse), computed at another 250,000 tons, making in all 2,000,000 tons of rock to be removed, at a cost which cannot be estimated approximately at less than 700,000*l.*

Ramsgate.—At the meeting of the Local Board on the 19th instant, the salary of Mr. A. W. Conquest, C.E., their surveyor, was increased to 300*l.* per annum, and at the same meeting the Board considered a report prepared by that gentleman for the disposal of the sewage of the district by gravitation through an intercepting sewer discharging into the sea at the North Foreland.

Fees of Cemetery Companies.—A special meeting of the Cemetery Masons' Defence Association, grave-owners, florists, and others interested in the abolition of the fees lately imposed by some of the metropolitan cemetery companies, was held a few days since to determine what steps should be taken to compel the companies to desist from making these charges. Mr. D. C. Preston occupied the chair, and in opening the proceedings said this was a large question, because the fees charged by the companies had not fallen on the trade, but on the public at large. The conduct of the companies was most vexatious and unjust, but the Association had at last found a client who paid a fee to the London Cemetery Company under protest, and afterwards brought an action for the recovery of the fee, the solicitor of the Association conducting the case. The action was brought in the Bloomsbury County Court, but, on the application of the company, was removed by *certiorari* to the Court of Queen's Bench. Since then the company had withdrawn from the action, and informed the solicitor to the association that the fee had been paid into court. This, therefore, settled the question as far as this company was concerned. Two other companies — the Kensal-green Cemetery Company and the Norwood Cemetery Company — had also charged those fees at the same time as the first-named company, and it would be necessary to take steps with a view of removing this grievance. It was monstrous that when a person became the owner of a grave, or erected a monument, he should be compelled to pay the company a fee each time the grave was put in order or the monument repaired. After considerable discussion, a resolution pledging the Association to take action against the Kensal-green Cemetery Company, in case the fees were still levied, was carried unanimously.

Proposed Agricultural Exhibition in Hyde Park.—On the 13th inst. a public meeting was held at the Mansion House to promote the holding of a great agricultural exhibition in London next year, under the auspices of the Royal Agricultural Society of England. The Duke of Richmond and Gordon said that it was thought right and proper to hold the meeting of the Royal Agricultural Society in the metropolis in 1862, and it was held in Battersea Park. From the influential character of the meeting that day and the remarks that had been made, he ventured to predict that during next year an exhibition would be held in London under the auspices of the Society which would have a far greater importance than had the former show in 1862. His lordship expressed his conviction that by the exhibition next year the United Kingdom would prove that, in regard to agriculture, it was behind no other country in the world. An influential committee was appointed, and a resolution passed that it was desirable to hold the show in Hyde Park. At a meeting of the committee on Wednesday last, however, it was stated that the idea of holding the exhibition in Hyde Park would have to be abandoned.

London Association of Foremen Engineers.—Lord Granville presided at the annual dinner of this Association, at the Cannon-street Hotel, on Saturday last, and in reference to foreign competitors in industry and commerce said,—"I feel very much inclined to agree with Mr. Walter in the cheerful view he took in speaking of the danger of competition from the United States, from France, from Belgium, and from Germany. There are a great many matters to be considered in regard to this competition. There is the geographical position of different countries; there is the cheapness or dearness of labour; there is the quality and propinquity of the minerals with which they have to deal; and there is one thing which I am certain in the race which is to come,—and in which I hope and believe we shall continue to be the champions and the victors,—it is impossible to overrate, and that is the importance of intellectual instruction, whether with regard to those who employ, the foremen, or the workmen of this country."

Architectural Association.—The two most recent of the Saturday afternoon visits in connexion with this Association have been to the City Liberal Club, Walbrook (Mr. Grayson, architect), and to the St. Pancras Baths and Washhouses, Tottenham-court-road (Mr. Horace Gundry, architect). These buildings have already been illustrated and described in the *Builder*,—the Clubhouse in vol. xxxiv., p. 539; and the Baths in vol. xxxv., p. 1224.

Messrs. Chubb & Sons' Works.—The manufacturers are showing to their friends and employers the works prepared for the Paris Exhibition. Amongst them Messrs. Chubb & Son have exhibited a number of fine specimens of what they can do. Several large door-locks, for example, from 18 in. by 13 in. downwards, some of polished walnut, teak, and other woods, with steel and gilt metal ornamental work on the front in different styles, viz.: English Gothic, Florentine Gothic, Queen Anne, &c.; and some with bodies of bright polished steel and gilt metal work on that, the backs of the locks being open, showing the works. Also two reproductions of ancient German chest-locks in gilt metal, with elaborate ornamentation; ornamental keys of nearly all sizes and styles; gold keys so small that they will fit into lockets or rings; one silver-plated lock, 13 in. long, in the shape of a fish, the chub (trade mark), which, when the key is turned the mouth opens, the tongue comes out as a bolt, and the fins all move. Messrs. Chubb will also exhibit several of their fire and thief resisting safes, notably one immensely strong safe, with a painted porcelain front. In another department they will send specimens of ornamental metal work for church use, art tiles, and so on.

Typhoid Fever.—The Kensington medical officer of health, Dr. Orme Duffield, has published his report on some recent cases of typhoid fever in that parish. He is unable to attribute the outbreak to the agency of milk, and assigns it rather to the evil sanitary condition of the houses. Dr. Duffield says:—"Had the outbreak depended on milk, I cannot but think there would have been larger groups of cases occurring almost simultaneously, whereas, though there were many children in some of the houses, no such thing happened. My own impression, therefore, is that the infective agency operating in the first cases was contained in, and conveyed through, the sewers and house-drains, and that the illness in the second cases in the same houses, and in second cases in the same streets, may have been due to the infected condition of the sewers; though, as before remarked, second cases in the same houses may have derived the infection directly from the first cases. In three of the streets, where eight cases occurred, the sewers have blind or dead ends, which always involve the risk of a heavy pressure of sewer-gas on the drain inlets of the adjoining houses, as I pointed out in a special report on the drainage of the Elsham-road and its vicinity (April, 1875)."

Bequests.—We are informed that the late Mr. Bonomi has bequeathed to the Royal Academy the portrait of his father, by Rigaud, and one of Prince Hoare, by Gainsborough. Both these pictures were exhibited in the International Portrait Exhibition at South Kensington.

Land.—Mr. Beal sold on Wednesday, at the Mart, fourteen acres and a half of land for 14,500*l.* The land is part of twenty acres bought in 1850 for the sum of 600*l.*, and is situated in Battersea parish, bordering Wandsworth-common.

Christ's Hospital.—The surveyorship here is vacant. Mr. E. Blakeway I'Anson, who has had much experience in similar appointments in connexion with his father, Mr. Edward I'Anson, is a candidate. Mr. Roger Smith also offers himself.

TENDERS

For the erection of a villa residence at Wellingborough, for Mr. B. Blott. Mr. J. Christian Hukins, architect:—

Hall	£1,878 0 0
Green & Hull	1,697 10 0
Marriott (accepted)	1,489 10 0

For additions to Congregational Schools, Lewes-road, Brighton. Mr. Arthur Loader, architect:—

Barnes	£652 0 0
Parsons	631 0 0
Newnham	524 0 0
Lockyer	488 0 0
Stenning (accepted)	420 0 0

For additions to schools, 7, Ship-street, Brighton. Mr. Arthur Loader, architect:—

Botting (accepted)	£245 0 0

For union, Sittingbourne, Kent:—

Pavey	£459 0 0
Harman & King	456 15 2
Jeffreys	448 10 3
Ames	441 15 4
Beaumont	439 0 5
Seager	429 0 6
Tidy (accepted)	399 10 7

For additions to the Grove, Barnes-green, for Mr. J. Cowland. Mr. A. Jowers, architect:—
Sale (accepted) £680 0 0

For new roads and sewers, Sevenoaks. Messrs. Walton & Vivian, surveyors. Quantities by Mr. C. W. Whitaker:—

Road No. 4.

Nobbs & Co.	£3,830	0	0
Botterill	2,769	0	0
Raynham	2,730	0	0
Owen	2,480	0	0

Road No. 5.

Nobbs & Co.	£878	0	0
Ives	856	0	0
Owen	810	0	0
Raynham	800	0	0
Botterill	753	0	0

Road No. 6.

Nobbs & Co.	£873	0	0
Ives	793	0	0
Owen	720	0	0
Botterill	690	0	0
Raynham	682	0	0

Road No. 7.

Nobbs & Co.	£1,102	0	0
Ives	1,028	0	0
Raynham	1,005	0	0
Owen	945	0	0
Botterill	912	0	0

For alterations at the Star & Garter Hotel, Kew Bridge, for Messrs. Fuller, Smith, & Turner. Mr. G. More, architect:—

Adamson	£954	0	0
Hunt	947	0	0
Nye	770	0	0
Lamble (accepted)	743	0	0

For rebuilding oil-mills at Weybridge, Surrey, for Messrs. Nias & Whittet. Mr. J. C. Kemp, architect. Quantities by Messrs. Whitmore & Kennard:—

Dickenson	£4,291	0	0
Crowder	3,948	0	0
Carter & Sons	2,997	0	0
Prout	2,897	0	0
Linfield	2,798	0	0
Bangs	2,779	0	0
Wood	2,648	0	0
Goddard & Son	2,349	0	0

For a pair of semi-detached residences on the Woodside estate, Wimbledon. Mr. J. Andrews, architect:—

Jones & Co.	£1,990	0	0
Robinson	1,960	0	0
Niblett	1,815	0	0
Warr	1,795	0	0
Parker & Evans	1,760	0	0
Laug & Co.	1,750	0	0
Linfield	1,748	0	0
Hobern	1,650	0	0
Wilcox	1,644	0	0
Cooke & Co.	1,625	0	0
Julian & Co.	1,598	0	0
Garrud	1,583	0	0
Kellaway	1,470	0	0
Bantock	1,464	10	0

For proposed house, &c., Muswell-hill, for Mr. Barlow. Mr. A. T. Barlow, architect. Quantities supplied:—

Adamson	£5,865	0	0
Bentley	5,766	0	0
Scrivener & White	5,734	0	0
Lathey, Brothers	5,497	0	0
Perry & Co.	5,400	0	0
Tyerman	5,115	0	0
Langmead & Way	5,047	0	0

For houses and shop on the flat system, White-street, Borough, for Mr. W. P. Griffith. Mr. Banister Fletcher, architect:—

Hobern	£3,673	11	0
Fairhead	1,759	0	0
Tyerman	1,725	0	0
Bayes, Brothers, & Allen	1,692	0	0
W. & H. Castle (accepted)	1,675	0	0

For additions, with coach-house and stable to house, Richmond-road, Barnet, for Mr. John Pratt. Messrs. Clark & Holland, architects. Quantities not supplied:—

Wall, Brothers	£2,050	0	0
Toms	2,047	0	0

For alterations at the Plough Tavern, Lordship-lane, Dulwich, S.E., for Mr. Charles Gould. Mr. W. McNaughton, architect:—

Matthews	£227	0	0
Shearing & Sons	225	0	0
Watson & Dennet (accepted)	222	0	0
For New Counter.			
Warne	£106	0	0

For the erection of a villa residence at Castle-hill, Maidenhead, Berks. Messrs. C. Cooper & Davy, architects. Quantities supplied:—

Cox	£1,165	0	0
Partlo, Brothers	1,123	0	0
Woodbridge	1,111	0	0
Kempsell, jun. (accepted)	1,095	0	0

For new wing and alterations to the Castle Hotel, at Hastings, for Mr. George Gaze. Messrs. Cross & Wells, architects:—

Harman	£4,770	0	0
Avard	4,715	0	0
Wood	4,480	0	0
Geary	4,479	0	0
Hughes	4,470	0	0
Cruttenden	4,395	0	0
Vidler	4,243	0	0
Rodda	4,185	0	0

For the erection of a manufactory at Millwall, for Mr. J. T. Morton. Mr. William Eve, architect:—

High	£1,487	0	0
Heiser	1,327	0	0
Sheffield & Prebble	1,089	0	0
Salt	1,089	0	0
Crabb (accepted)	1,050	0	0

For rebuilding No. 7, Fenchurch-buildings, Fenchurch-street, for Mr. T. N. Debenham. Mr. Robert J. Worley, architect:—

Revised Estimate.

Toms (accepted)	£1,776	0	0

For the erection of stabling, Brentford, for Messrs. Carter, Paterson, & Co. Mr. William Eve, architect:—

Sweet	£189	0	0
Brunsden	163	0	0
Mills	152	0	0
Nye (accepted)	137	0	0

For three cottages, &c, exclusive of haulage, and part of the materials, for Sir Stafford H. Northcote, Bart. Mr. Jerman, architect:—

Bennett & Stephens	£413	0	0
Gibbard	366	0	0
Berry	356	0	0
Blake	355	0	0
Dennis, Short, and Milford	295	0	0

For new Wesleyan chapel and schools, Cottingham, near Hull, York. Mr. William Ranger, architect:—

Dickinson	£3,812	0	0
Wilson, Brothers	3,772	0	0
Habbershaw	3,746	0	0
Bray	3,697	0	0
Allen & Son	3,671	0	0
Blackburn (accepted)	3,420	0	0
Stevens*	3,366	0	0
Higham*	3,312	0	0

* Withdrawn for error.

For new Wesleyan chapel, Goudhurst, Kent. Mr. W. Ranger, architect:—

Lovell	£445	0	0
Tanner (accepted)	389	10	0

All bricks are provided by the trustees.

For the erection of new premises in the Poultry. Mr. A. Bresson, architect:—
Wagner (accepted) £3,600 0 0

For rebuilding Nos. 13, 14, and 15, Mortimer-street, Regent-street, for Mr. R. Cripps. Mr. Augustus E. Hughes, architect:—

Burmingham	£3,585	0	0
Wagner (accepted)	3,550	0	0

For the erection of nine houses at Woolwich, for Mr. B. Hunter. Mr. Dovey, architect:—
Wagner (accepted) £3,333 0 0

For the erection of three shops in Bell-lane, Spitalfields. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Balstone, Brothers:—

Jay	£2,783	0	0
Bridgman	2,590	0	0
Abraham	2,530	0	0
Williams & Sons	2,530	0	0
Hall & Cooper	2,490	0	0
Sheffield & Prebble	2,444	0	0
Webber	2,390	0	0

For the erection of three detached villas at Thornton-heath, on the first portion of the Brigstock Estate. Mr. Daniel R. Dale, architect:—
Dale (accepted).

For alterations and additions to premises in Oxford street. Mr. Daniel R. Dale, architect:—
Morter (accepted).

For alterations and additions to No. 274, Oxford-street, for Mr. T. Linscott. Mr. Daniel R. Dale, architect:—
Hoare & Son £750 0 0

For the erection of a pair of cottages in the Southbridge-road, Croydon. Mr. Daniel R. Dale, architect:—
Peasend £550 0 0

For alterations and additions to the mansion, Stone Hall, Oxted, Surrey, and erection of a two-cone hop-oast at Greenhurst, Oxted, for Mr. G. Barker. Quantities provided. Mr. Daniel R. Dale, architect:—

Wallis	£3,298	0	0
Fetherstone	3,110	0	0
Hoare	2,853	0	0
Ward	2,789	0	0
Crabtree	2,595	0	0
Charlwood, Brothers (accepted)	2,523	14	0

For alterations at No. 99, Westminster Bridge-road, for Messrs. Christmas & Co.:—
Bambery & Stephens (accepted).

For pulling down and rebuilding the house and workshops, No. 93, Brick-lane, Bethnal-green, for Mr. C. C. Richards, M.D. Mr. William Reddall, architect:—

Kiddle & Son	£1,678	0	0
Eaton	1,665	0	0
Pritchard	1,629	0	0
Browne & Robinson	1,485	0	0
Cook	1,450	0	0
Higgs	1,157	0	0

For the erection of a villa residence at Haverstock-hill. Mr. R. Groom, architect:—
Nash (accepted) £1,850 0 0

For the erection of a chapel at Brondesbury, Edgware-road, in the county of Middlesex. Mr. Thomas Arnold, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

	Shortened.			Extended.		
Colls & Sons	£7,210	0	0	£1,125	0	0
Ashby, Brothers	7,154	0	0	1,110	0	0
Nightingale	7,069	0	0	1,089	0	0
Browne & Robinson	6,998	0	0	1,033	0	0
Harris and Wardrop	6,997	0	0	896	0	0
Morter	6,946	0	0	883	0	0
Dove, Brothers	6,900	0	0	835	0	0
Scrivener & White	6,643	0	0	826	0	0
Hill, Higgs, & Hill	6,480	0	0	780	0	0
Allen	6,299	0	0	—		

For the erection of a villa residence in the Grove, Stratford, Essex, for Mr. J. Self. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—
Read (accepted) £1,375 0 0

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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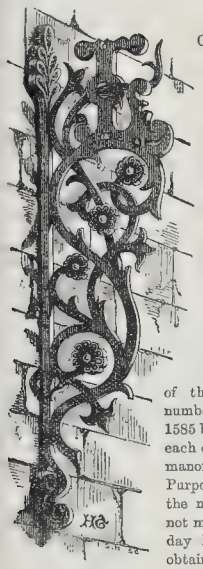
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Gray's Inn.

LONDON, unlike most capitals, is without an historical university, and such associations as naturally cluster round the quiet cloistered life must be sought among the resorts of the lawyers. Ben Jonson styles the Inns of Court, "The noblest nurseries of humanity and liberty in the kingdom," and in his day Gray's Inn stood at the head of the four Inns, the number of students in 1585 being nearly double each of the others. The manor of Portpool or Purpool immediately to the north of Holborn is not mentioned in Domesday Book, although we obtain from that document a picture of the rural character of the district now called Gray's Inn. At "Holeburne" the king had two cottagers who were under the charge of the Sheriff of Middlesex, and the Chamberlain rendered six shillings yearly to the King's sheriff for the land where the vineyard was planted. In Edward I.'s reign the manor was in the possession of Reginald de Gray, the first of that name whose connexion with the Inn has been recorded, and in 1505 Edmund Lord Gray of Wilton sold the property to Hugh Denny. Although this family retained the manor for so long a period, there is reason to believe that it had become the residence of the lawyers before the year 1370, and the first list of readers contains the names of William de Skipwith, Justice of the Common Pleas in 1359, Sir John Markham, Justice of the Common Pleas in 1396, and Sir William Gascoigne, Chief Justice of the King's Bench in 1400. The old manor-house was not very convenient, and although additions were made at different times, the accommodation did not keep pace with the increased number of the students. Even the Benchers were forced to lodge double, and in Henry VIII.'s reign Sir Thomas Neville accepted the Attorney-General (Sir Christopher Hales) to be his bedfellow. In the twenty-first year of Elizabeth, it was ordered that "henceforth no fellow of this house shall make choice of his bedfellow, but only the readers, the admission of all others shall be referred to the discretion of the treasurers." At this time the three courts into which the buildings were divided were named North, Middle, and South, but 100 years later these had become Holborn-court, Coney-court (so-called from having been built upon a rabbit-warren), and Middle-court (afterwards Chapel-court). The last two occupied the site of Gray's Inn-square, and Holborn-court of South-square. In Agas's map, the chief entrance to Gray's Inn is marked as situated in Gray's Inn-lane; but in Stow's time the gate leading into Holborn was built. The latter writes:—"In this present age there hath beene great cost bestowed therein, upon faire buildings; and very lately the gentlemen of the house purchased a messuage and a curtillage situate upon the south side of this house, and thereupon have erected a fayre gate, and a gate-house for a more convenient and more honourable passage into the high streete of Holbourne, whereof this house stood in much neede, for the former gates were rather posterns than gates." In order to build the Holborn gate it was necessary to purchase a piece of ground of Christopher Fulwood, whose name is perpetuated in Fulwood's Rents. About 1680, Dr. Barebone, the great builder, who was employed in all parts of London, bought the Red Lion Fields to build on, and the gentlemen of Gray's Inn, thinking this to be an injury to their property, went in a body of about 100 to stop the works, "Upon which the workmen assaulted the gentlemen, and flung bricks at them, and the gentlemen at them again; so a sharp engagement ensued, but the gentlemen routed them at last and brought away one or two of the workmen to Gray's-inn; in this skirmish one or two of the gentlemen and servants of the house were hurt, and several of the workmen."* The gardens, which were long the favoured resort of fashionable London, are the chief glory of Gray's-inn, and what is still more interesting to remember, they owe their origin to Francis Bacon. In 1597 Bacon was treasurer of the society, and on the 4th of July of that year it was "ordered that the summe of 7*l.* 15*s.* 4*d.* due to Mr. Bacon, for planting of elm trees in the walkes, be paid next term." In the following year a further supply of young elms was ordered, at a cost "as appeared by Mr. Bacon's account" of 60*l.* 6*s.* 8*d.* One of the great philosopher's Essays is on "Gardens," and it is pleasant to fancy the author carrying out his views in this (at that time) rural spot, although he had not the thirty acres to work upon which he demands in print. A catalpa-tree which, according to tradition, was planted by Bacon, is still preserved on the north-west side of the garden. In 1621, the gardens had grown into favour, and James Howell writing in that year from Venice to Richard Altham, expresses a wish to have his friend with him although he allows that the walks of Gray's Inn are the pleasantest place about London, and the choicest society is to be met there. Forty years later Pepys was a constant visitor to these gardens, and on May 4, 1662, he and his wife went there purposely to observe the fashions of the ladies, because Mrs. Pepys was then "making some clothes." We might go on multiplying extracts from the literature of the seventeenth and eighteenth centuries in praise of Gray's Inn walks, but will end with Sir Roger de Coverley, who, according to Addison, loved "to clear his pipes" in good air, which he found here. The place was familiar to Charles Lamb, who called Verulam-buildings accursed because the buildings had encroached upon and destroyed so much, "cutting out delicate green crankles, and shouldering away one of two of the stately alcoves of the terrace. The survivor stands, gaping and relationless, as if it remembered its brother." Elia adds "they are still the best gardens of any of the Inns of Court,—my beloved Temple not forgotten, — have the gravest character, their aspect being altogether reverend and law-breathing. Bacon has left the impress of his foot upon their gravel walks."

The gentlemen of the Inns of Court (those of Gray's Inn in particular) were formerly the great supporters of masks and revels. The earliest record of these entertainments is to be found in Hall's Chronicle, and an incident connected with it is of historic interest. At the disguising of Christmas, 1525, a piece, written by John Roo, serjeant-at-law, twenty years before, was played. The great Cardinal Wolsey was present, and supposed that certain passages were aimed at him. "In a great fury he sent for Master Roo, and took from him his coif, and sent him to the Fleet, and afterwards he sent for the young gentlemen that played in the play and highly rebuked and threatened them, and sent one of them, called Master Moyle, of Kent, to the Fleet; but by means of friends Master Roo and he were delivered at last." A few years after this high-handed treatment of a distinguished man, an order was made that fellows of the house who were at dinner or supper when revels were performed, "should not depart out of the hall until the said revels were ended, upon penalty of 12*d.*" In Edward VI.'s reign, a different spirit prevailed among the authorities, who endeavoured to check the representation of interludes by members of their society. When Elizabeth came to the throne this was again altered, and in 1565 the gentlemen of Gray's-inn presented her Majesty with "divers showes." In the following year George Gascoigne's prose comedy, *The Supposes*, translated from Ariosto, and his blank verse tragedy of *Jocasta*, from Euripides, were presented at the revels of Gray's Inn. On the 16th of January, 1587-8, a play, the hero of which appears to have been Catiline, and a mask, were represented in the hall before Lord Treasurer Burghley and other courtiers. Among the Lansdowne MSS. in the British Museum is a list of the characters endorsed by Burghley himself. In the following February the gentlemen of Gray's Inn presented before the Queen, at Greenwich, a tragedy, for which Francis Bacon and others prepared certain dumb shows. The induction was written by Nicholas Trotte, to whom Bacon (then an M.P.) owed 1,800*l.* in the year 1601. The debtor was unable to pay this large sum, and his creditor consented to allow him time on certain conditions.

* Narcissus Luttrell's Diary, June 10th, 1684.

About 1588 it was proposed that the four Inns of Court should produce a mask together, but the project came to nothing, and Bacon wrote to Burghley proposing that the gentlemen of Gray's Inn should perform it alone. In 1594 there were grand doings, which found an historian in the author of "Gesta Grayorum; or, the History of the high and mighty Prince, Henry, Prince of Purpoole, who reigned and died A.D. 1594." The costs of the entertainments were shared among the members of the Society. Every reader was to pay 10s., every ancient 6s. 8d., every utter barrister 5s., and "every other gentleman of this Society 3s. 6d." Beaumont and Fletcher wrote a masque, entitled "The Masque of the Inner Temple and Gray's Inn," which was performed at Whitehall in 1612. In the following year "The Masque of Flowers" was presented by the members of Gray's Inn in the old Banqueting-house in honour of the marriage of the Earl of Somerset and Lady Frances, daughter of the Earl of Suffolk. We find from this that Bacon still continued his interest in this species of entertainment, upon which by the way he wrote one of his essays. Chamberlain writing to a friend says,—"Sir Francis Bacon prepares a masque to honour this marriage, which will stand him in above 2,000*l.*, and although he have been offered some help by the house, and especially by Mr. Solicitor, Sir Henry Yelverton, who would have sent him 500*l.*, yet he would not accept it, but offers them the whole charge with the honour." An amusing incident occurred at Christmas, 1622-3, in connexion with these revels. A large number of chambers (or small cannon) were borrowed from the Tower, and in the dead of the night the gentlemen of Gray's Inn fired them off. The king awoke with the noise, and, starting out of bed, cried, "Treason, treason!" The whole court were raised, and the Earl of Arundel ran to the bedchamber with his sword drawn, so as to rescue the king's person. The barristers clung to their old practices, and the latest example of these time-honoured entertainments was of a peculiarly indicrous character. The following is from Mr. Douthwaite's valuable "Notes on Gray's Inn," to which we are indebted for much information in this article,—"The last record of these gay scenes and masques was in 1773, on the elevation of Mr. Talbot to the woolsack. After an elegant dinner every member of each mess had a flask of claret, besides the usual allowance of port and sack. The benchers then all assembled in the great hall, and a large ring was formed round the fireplace, when the master of the revels, taking the Lord Chancellor by the right hand, he with his left took Mr. Justice Page, who, joined to the other serjeants and benchers, danced about the coal fire according to the old ceremony three times, while the ancient song, accompanied with music, was sung by one Toby Aston, dressed as a barrister."

We have already mentioned Sir William Gascoigne, Sir John Markham, and Francis Bacon as distinguished members of the Inn, but there are many others who can be added to the list. Among these are Sir Anthony Fitzherbert, Justice of the Common Pleas in the reign of Henry VIII.; Queen Elizabeth's Lord Keeper, Sir Nicholas Bacon; the three Yelvertons,—Sir William, Justice of the King's Bench in 1443, Sir Christopher, also Justice in the same court in 1602, and Sir Henry, Justice of the Common Pleas in 1625; Sir John Holt, Chief Justice of the King's Bench in 1689; and in later times Lord Raymond and Sir Samuel Romilly. Besides these lawyers, several statesmen and churchmen of the highest order were members of Gray's Inn,—as Thomas Cromwell, Earl of Essex; William Cecil, Lord Burghley; Stephen Gardiner, Bishop of Winchester; and Archbishops Whitgift, Laud, and Juxon. Previously to the reign of James II. five dukes, three marquises, twenty-nine earls, and thirty-eight lords had been admitted as members of the Society. In the year 1580 Lord Burghley recommended Dr. Crooke as minister or preacher, and the appointment was forthwith made.

Some of the ancient orders of the Society are curious examples of the old sumptuary laws: thus, in the 16th of Elizabeth, it was ordered that no one should wear any gown or outward garment of any light colour, upon penalty of expulsion. Shortly afterwards it was agreed that a penalty of 3s. 4d. should be levied upon any member who went into the city or suburbs, or walked in the fields otherwise than in his gown. Another order was, "that no Fellow of the Society stand with his back to the fire." In these old rules we get an interesting glimpse of the manners of the sixteenth century; thus we find it was ordered in the 29th of Elizabeth "that the third butler should be at the carrying forth from the buttery, and also at the distribution of the alms, thrice by the week at Gray's Inn-gate, to see that due consideration be had to the poorer sort of aged and impotent persons, according, as in former time, he had used to do." The gate here mentioned was famous in later times, as the place where the eminent bookseller, Jacob Tonson, kept his shop. He was here about three years before his greatest author, Dryden, died. Here he published Addison's "Campaign," and he was here when, in 1706, he made overtures to Pope. There is still a little bookshop under the gateway. During the Gordon riots Gray's Inn was obnoxious to the rioters on account of the Roman Catholics who resided within its precincts, and Sir Samuel Romilly was under arms all night as a sentinel guarding the gate. The rural character of the inn was preserved even to Romilly's day, for in a letter to a friend, dated from his chambers, he writes: "My rooms are exceedingly lively . . . . the moment the sun peeps out I am in the country . . . . having only one row of houses between me and Highgate and Hampstead." One hundred years before this it was ordered "that the ground lying without the walks between the wall and the way leading from Gray's-inn-lane towards King's-gate in Holbourne, be fenced by inclosures, and the cattle and horses turned out at present, and that gravel be digged there for the use of this society." The place probably needed some attention, for Pepys reports that, on the 8th of March, 1668-9, Charles II., the Dukes of York and Monmouth and Prince Rupert, were overturned in the dirt at this gate. "The king all dirty, but no hurt. How it came to pass I know not, but only it was dark, and the torches did not, they say, light the coach as they should do." Kingsgate-street was an ancient way, but the gate and the street from it obtained their names from the fact that the king went through them on his way to Newmarket. Theobalds-row or road, at the end of Kingsgate-street, was so called because it led to James I.'s favourite hunting-place,—Theobalds, in Hertfordshire. While we write, most of the houses on the south side of this street are being pulled down. Portpoole, the old name of the manor upon which Gray's Inn has been built, survived in Portpoole-lane; and Windmill Hill kept in remembrance the windmill that once stood on the site, and is mentioned in the deed of transfer from Edmund Lord Gray, of Wilton, to Hugh Denny, already referred to. Before closing this short notice of some of the most remarkable matters connected with Gray's Inn, the neighbourhood of which is about to be greatly changed, it will be necessary to say a few words respecting the boltings and moots, for which exercises this Inn was particularly famous. Bolting was a conversational argument upon cases and questions put in private to a student by a bencher and two barristers sitting as his judges. When a student had passed through this ordeal satisfactorily and become an expert "bolter," he was admitted to the mootings where feigned cases put into the form of pleadings were debated by the students publicly before the Benchers. That these disputations were considered of great importance may be gathered from a record in 1631 where we learn that the butler was ordered "to be set in the stocks about noon for putting Mr. Frowle up to moot in his wrong" (*sic*). The moots were revived in the year 1875. In glancing at the history of the various Inns of Court we cannot but notice the persistence with which the lawyers have clung to the locality which they chose so many centuries ago. Since the gentlemen of Gray's Inn, Lincoln's Inn, and the Temple first possessed themselves of the district, which extends from the Thames to the north of London in a tolerably straight line, great changes have taken place in all parts of London; districts have been deserted by one class and occupied by others, but century after century the lawyers have stayed on, and now the Law Courts, which have long been separated, are to be gathered together, and located in this land of the lawyers.

A New Abbey has just been commenced at Stanbrook, near Worcester, for the nuns of the Benedictine order. Messrs. Pugin, Ashlin, & Pugin, of Victoria-street, Westminster, are the architects.

MR. BARRY'S ACADEMY LECTURES.

THE course of twenty lectures upon architecture which Mr. E. M. Barry, R.A., has just concluded,—a course spread over five years,—is of a character to demand more than the ordinary attention usually accorded to such a subject. Lectures, especially those upon Art, have come to be regarded by the majority of people who are of the world worldly, as the exaltation of theory by professors whose eyes are lifted, like certain philosophers of the satirist, above the snares of mundane practice. Mr. Barry, on the contrary, refuses us the privilege of such a reflection; he is not an artistic enthusiast, but a work-a-day architect; he has been a professor only to show himself a man of the world. Seventeen years before he was called to the Chair of Architecture at the Royal Academy, that chair had been vacated by Mr. Cockerell, and of the latter Mr. Barry was not only, like every one else, a respectful admirer but a diligent student. He had been evidently impressed with his elder's style of teaching or train of reasoning; he has succeeded in catching, or rather following, both without descending to copy or attempting to imitate his master. Altogether, these twenty lectures, which we have printed in their entirety, are well worth a careful reperusal; and, as we have afforded ourselves that satisfaction, perhaps a few words about them may not be deemed superfluous.

In the first place, Mr. Barry has sought to raise the character of architecture as a calling or a profession in the mind of his audience; and M. Viollet-le-Duc did precisely the same thing in his lectures which,—being foolishly precluded from delivering them,—he published in a book. "Architecture," said the Frenchman, "is an art, but not like the '*Art de vérifier les Dates.*'" Said the English Academician:—"It is surely something to have aims and aspirations independent of that money for which men lie and steal and murder." Banking, buying and selling stock, mercantile transactions of all kinds, if honourably conducted, are gentlemanlike occupations; but though they increase the wealth and consequently strength of a nation, neither the mode of procedure they involve, nor the results attained, are comparable to the mission of Science and Art, and the influence exercised by both upon the great mass of humanity. An engineer or an architect who has done a great deal of practical work, or who has promulgated theoretically a great many practical suggestions, cannot be said, among a progressive community, to have left the world in the world's debt. He has helped, even though infinitesimally, to make the world healthier, more loveable, and more comfortable, than it was before his generation; and the successful banker or merchant cannot claim with him an equal share of credit. That was what Cicero meant when he enumerated those professions that "involve a higher degree of intelligence, or a greater amount of utility, such as medicine, architecture, the teaching the liberal arts," which he said they were taught to regard as honourable and worthy means of acquiring wealth. Cicero has incurred a great deal of respectable obloquy for that and other remarks in the 42nd chapter of his first book of "Offices" from commentators of every description. But too many have judged an era of civilisation, when the property of man in man was at its height, with the experience of our time, when human equality is acknowledged though not acted on. It is, therefore, all the more interesting and important to hear from a modern Academic chair the reiteration of ancient doctrine, confirmed as it is by the deductions and experience of ages, and enhanced with the admonitory caution,—thought necessary even by the Roman philosophers, and, therefore, how much more necessary now need hardly be added,—against the allurements of mere fashion or caprice. Throughout, Mr. Barry has argued and fought, to put it strongly, in the cause of his brethren; and he spoke better even in the fifth than in the first year of his course. He showed how in architecture the practical worker of the present day is trammelled by the exigencies not only of fashion but even of science, and by the many vacillations of public taste; how the architect, let alone the engineer, has scientific and sanitary problems to solve which were never dreamt of by his predecessors, and how both engineer and architect are implored by opposing schools to proceed in opposite directions.

Last week we ventured to differ with Mr. Barry because we thought that a paragraph in

the twentieth lecture contradicted the spirit of his argument throughout, and particularly of his fourth and fifth lectures; these referred to the great Florentine, Michelangelo, architect, sculptor, and painter. The first lecture delivered in 1875 touched upon the outside criticisms of architecture and architects by writers such as those who, under the shield of the *Quarterly Review*, used to mislead the public judgment with imperfectly based argument and unsupported assertion. Both in that lecture and on many subsequent occasions Mr. Barry treated of current topics of discussion,—topics which academical traditions have often excluded from the consideration of students; and he was generally happy in a passing allusion to something that a short time before had occupied public attention. Thus when, two years ago, the most popular new buildings seemed to excite admiration, principally because of the eccentricity they displayed, the Academy lecturer explained that the mission of architecture was not to startle, but to satisfy! "Nature," said he, "is never loud; and you should eschew loud architecture." On the same evening he introduced the subject of London Bridge, which was then the cause of much controversy; and he alluded to the long-debated and ever-deferred improvements of unfortunate London. He claimed for architects an influence on the solution of all such questions as the planning of new streets. His opinion is that Regent-street and its accessories are the best laid out thoroughfares in London. "They are well worthy," said he, "of consideration as you walk along them from Charing-cross to Portland-place. They were, of course, designed before the traffic had become what it now is. The architecture of the houses is not in accordance with prevailing taste; but I am not asking you to admire or criticise it. I do wish, however, to call your attention to the care and design shown by the general scheme, and we may remember with some satisfaction that it was the work of an architect."

Again, his repetition of a liberal remark made more than once by others elsewhere came with redoubled force from the walls of the Royal Academy: "While architects have been restoring, engineers have been inventing." The disputed question of restoration was treated in the fifteenth lecture, the first delivered this year; and the arguments used strengthened the common sense side of the difficulty. On another occasion, when referring to old customs and laws, he alluded to Epping Forest, then just saved from inclosure; he instanced the mutability of circumstances wherein the old forest laws of the Normans had been used for the advantage of the people by the Corporation of the City. He actually mentioned the cry of "tenant-right" which might yet cross the Irish Channel and astonish more than one privileged landowner. He had something to say about houses of several stories and houses-in-flats. He happily denounced the "chicken-ladders" of the approved London shape and material, adding that "the design of a staircase marks the difference between an architectural composition and a builder's box." The last lecture delivered last year also treated of equally practical matters connected with town architecture and modern problems.

We propose to dwell for a few minutes upon the suggestions made in that lecture, printed in the *Builder* (April 7, 1877)—suggestions having reference to the principle of co-operation, "which in our clubs," said Mr. Barry, "gives to the member who enjoys a mere pittance of income comforts and luxuries such as only the possessor of thousands can command in his own house." He thought, as many others have thought and said—think and say—that the actual sympathies of reformers are due not to the artisans, but rather to a class just above them in the social scale; and then he went on to make a statement which, if he only reach the ordinary span of life, we firmly believe he will see practically refuted. Mr. Barry, while he admitted that the separate house system was of necessity wasteful and expensive, doubted whether the flat system was capable of very extensive development in this country. He ignored the fact that the majority of houses in Central London are already, and have been for many years, let in extemporised "flats"; and he spoke of the *general* application of the flat system. That system, as we continue to point out, is intended only for the heart of a capital city. Mr. Barry, however, wished to correct some of the present objections to a vertical house; he supposed it possible to erect (in the heart of London? where tall houses at least will be inevitable) a Square of about seventy houses for middle-class families. His description may be condensed as follows:—"Each house would be complete as at present in respect of the sitting and bed rooms. The kitchen and offices common to all are placed beneath the garden in the square which, with the exception of a small space in the centre, would be planted in the usual way. The kitchen is in the open central space. It is covered with a skylight, and has abundant provision for ventilation. It would be invisible from the houses, as it would be surrounded by a glazed conservatory. . . . . The square would not have equal sides, and the houses at the narrow ends of it would be built in the garden, with which they would communicate by means of terraces. By an arrangement of the levels such terraces might be raised sufficiently to allow of the construction beneath them of rooms built above the ground and with windows. These would serve as living-rooms for such of the servants of the establishment as might be required to live on the spot. . . . . The kitchen is surrounded by the other offices radiating from the centre, and passages lead outwards in four directions to the four sides of the square. These passages pass under the roads, and establish a mode of optional communication with the basement of each house." Thus, Mr. Barry's scheme, which was very ingeniously worked out, offered houses built and arranged on the old system, with one co-operative kitchen to fifty, sixty, or seventy houses, as the case might be. Obviously, houses arranged round a Square in the heart of town would not be let at rentals low enough to suit a grade of the middle class "just above artisans in the social scale." Nor would the problems of how to make valuable land profitable to building investors, and how to lodge the non-resident shopkeeper, the non-resident professional or business man, and the resident middle-class family, upon a restricted area, be thereby solved. It is, however, a great advantage that the Professor of Architecture at the Royal Academy should have publicly discussed this subject. If he will go a little further in his inquiries, and confine his schemes of reform to some particular district in Central London, we are convinced that he will accept the only practical remedy for the actual evils of habitation in the heart of town. He will then admit that the Parisian and the Viennese blocks of shops and dwellings, erected during the course of this century in the more crowded parts of Paris and Vienna, are right in principle though some of their details are undoubtedly objectionable.

Not the least valuable lectures of Mr. Barry's course are those devoted to the domestic life and manners of the ancient Greeks and Romans; nor, in spite of the many books which treat of the subject, can we regard without satisfaction his other lectures upon domestic and military architecture in the middle ages. They were rendered extremely interesting by the incidental descriptions and anecdotes which, though to be found in different books, were wisely and instructively put together for the advantage of the students; and he summed up his researches—as most of the thinkers of to-day sum up similar discourses—with the conviction that if artistic considerations were properly regarded in our own days, perfect utility need not and should not be inconsistent with architectural beauty; nor scientific devotion necessarily opposed to æsthetic culture. Moreover, a healthy confidence in the future and just appreciation of the present pervaded Mr. Barry's remarks. He did not deplore the fate of living men, or regret his deferred existence in a century of railways and telegraphs. He thought "the London and North-Western Railway was as marvellous a work as the Great Pyramid of Gizeh;" he advised architects to carefully consider the signs of the times as regards engineers, and to accept readily the conclusions to be drawn from them. In fine, we do not hesitate to say that the lectures are suitable for all sorts of people, and particularly for amateurs who take an interest in architecture. The author should revise and publish them. Some little re-arrangement would be necessary, and a skilful editor could, by massing disjointed portions of the lectures, and by condensing all, make them into a popular book.

Chippenham Fountain.—A competitor in this competition, which was advertised last September, wants to know how the matter stands.

ANCIENT BUILDINGS AND THE RIGHT TO SUPPORT.

THERE is no subject of greater importance to owners of property, and especially of town property, than the right which they possess to have their buildings supported by the adjacent soil; and we propose in this paper shortly to discuss the present position of the law on this point. For a decision has recently been given by the Queen's Bench Division of the High Court of Justice, which must long remain a leading case on this branch of law, and must always be considered remarkable from the historical criticism, the elaborate judicial reasoning, and the infinite labour which are apparent in the judgments of Lord Chief Justice Cockburn and Sir Robert Lush.

But it will be well first of all to clear the ground by showing shortly what are the general undisputed propositions of law upon this subject. The first is, that generally speaking land is entitled to the lateral support from adjacent land; and the second that an action will lie against a neighbouring landowner who has caused damage to houses erected on adjacent lands; if the land on which these houses were built would have sunk in any event from the neighbouring works. That is to say, that the injury consequently done to the house is an element in estimating the damage, but not a cause of action in itself. But coming to the point immediately before us as to ancient buildings, the law hitherto considered applicable has thus been laid down in the standard work on the subject, Gale on "Easements," 5th edition,—"Where, however, anything has been done to increase the lateral pressure, as where buildings have been erected, it appears to be clearly settled that no man has a right to such increased support *unless the building or other thing which makes it necessary is of ancient erection*" (p. 370). The words in italics are the important ones, and it will be observed that the writer of this work lays down an absolute proposition, and he subsequently in the following pages supports it by various decisions and dicta such as that of Baron Parke in Hide *v.* Thornborough, 2 Carrington and Kirwen, 250, where that judge said,—"If there was twenty years' enjoyment by the plaintiff of the support of the house from the defendants, and it was known that the defendants' land supported the plaintiff's house, that is enough to give him a right of support." So that we have the chief proposition that an ancient house was entitled to support, and that an "ancient" building meant one which had been erected for the space of twenty years, and there is no doubt that such was the general idea, and that any builder or architect would have told an owner of a house that if his mansion had stood on a certain spot for twenty years it was entitled to support from the adjacent land; and we believe,—considering the general tenor of judicial decisions,—that nine lawyers out of ten, speaking without going into details, would have said the same. Let us now turn to the noticeable case which has laid down an entirely different view of the law, or at least has so qualified the above proposition, that in the form in which it has hitherto been accepted it is incorrect as a legal dictum. The case is that of Angus & Co. *v.* Dalton and the Commissioners of her Majesty's Works and Public Buildings (47 *Law Journal* Reports, Q. B. D., p. 163), and the simple facts are as follow. They are, indeed, so brief that it will be well to put them shortly before our readers:—Angus & Co. were the owners in fee of a coach factory at Newcastle-upon-Tyne. Dalton was a builder employed by the Commissioners of Works and Buildings, under a contract, to take down a house adjoining to the plaintiff's factory, and to erect in its stead a building to be used as a Probate Office. The action itself was brought for excavating the soil of the property adjoining that on which the coach-factory was built on which the Probate Office was to be erected to such a depth as left the foundation of that part of the coach-factory without sufficient lateral support, and thereby causing the factory to fall. The two houses were apparently built at the same time, and were estimated to be upwards of a hundred years old. In the year 1849, however, being about twenty-seven years before the accident, the plaintiff's predecessor converted his house into a coach-factory, and made various alterations in the structure,—and this is an important point in the case, because when this was done and additional weight was placed on ground on which it was built, more lateral support was required than heretofore. And since

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no grant was made by the owner of the adjoining premises of any kind of lateral support, unless such grant could be inferred from his taking no steps to resist the acquisition and enjoyment of such an easement, the nature of this easement became essentially different, and the owner of it rested his claim purely on the fact of support having been afforded for twenty-seven years. Thus, the question as to the right to support of so-called ancient buildings was raised in a clear and precise form.

At the conclusion of the case, after some weeks had been taken by the judges in the preparation of the decision, the Lord Chief Justice and Mr. Justice Mellor considered that the plaintiff could not recover damages in this action, Mr. Justice Lush that he could. The actual result of the case, therefore, is to lay it down as law that ancient buildings have no *primâ facie* right to support from adjoining land. But this proposition, though it must be taken as a rule until this decision has been overruled, if it ever is overruled, by a Court of Appeal, must be to some extent looked at with the exceptions which attach to it. These exceptions are that, when contiguous buildings have stood for many years, especially when they appear to be of equal age, the presumption of a reciprocal easement of lateral support ought to be made. Because in such a case it may reasonably be inferred that they were built under circumstances from which at the present time a grant would properly be implied. For instance, by way of illustrating this exception, it may be pointed out that these buildings may have been built by one owner or under a common building lease, or if built by different owners, some arrangement for mutual support might have been come to. Of course, if an express grant of such an easement exists *cadit questio*. Thus, in this very case, if the original building had remained in its former state, when the work for the Probate Office was commenced, and had in consequence of that work fallen, it would have been reasonable to make the presumption of an implied grant of an easement of support. But as this presumption is one which is open to be rebutted, when it was acknowledged that the premises had been rebuilt within twenty-seven years, and when it was also proved that no direct grant of, or assent to, the easement in question had been given by the defendant's predecessors upon the erection of the coach-factory: then at once the presumption which a hundred years' acquiescence might have established could not exist, and consequently there could be no right in the owners of the coach factory to have their building supported by the neighbouring lateral soil. The reasons which establish this state of the law are twofold: firstly, because, previously to the Prescription Act (2 & 3 Wm. iv., c. 71), the presumption of a grant was open to be rebutted; secondly, because that Act has not affected this particular easement. And in considering this question the reader must be careful to bear in mind the distinction which exists between the right to support by land itself and the right to support by buildings on land. The first is a natural right inherent in the property itself; a proprietary right which the very nature of the property makes an absolute ingredient and element of such property. But the second is a right attaching to an artificial mass superadded by the owner of the soil, which in its natural state it would never have to bear, and which mass, also in its actual state, does not possess any inherent right to be supported by the neighbouring soil. Therefore, the analogy which at first sight seems to exist between this easement and the right to light falls to pieces when closely examined, and this decision in no way touches upon the well-established rules which regulate the right of soil to be supported by adjoining soil.

It is, indeed, somewhat curious that this important and widely-interesting point has never been directly decided before the year of grace 1877. Previously to the Prescription Act there were apparently only two cases in which the point was raised. One of these occurred in the year 1803,—Stansell *v.* Jollard (Selwyn's "Nisi Prius," vol. i., p. 435, tenth edition), which is thus described in the MS. of Mr. Justice Laurence:—"In an action for digging so near to the gable end of the house of the plaintiff let to a tenant that it fell, Lord Ellenborough held that where a man had built to the extremity of his soil, and enjoyed his building above twenty years, by analogy to the case of lights, &c., he had acquired a right to a support, or, as it were, of leaning to his neighbour's soil, so that his neighbour could not dig so near as to remove the support, but that it was otherwise of a house newly built." From this language it would seem that Lord Ellenborough had no doubt as to the law which he ought to lay down; but, on the other hand, it was a case decided in the hurry of a *nisi prius* trial. There is only a short note of the case in the papers of a contemporary judge, and it cannot therefore be relied upon as an undisputed proposition of law. The other case was still more ancient, being that of Palmer *v.* Heshels (Siderfin's Reports, p. 167), in the reign of Charles II., and the decision upon this point was not directly called for, since the action itself was one for obstructing light; but in the course of the judgment the judge, as was often the case in those days, laid down a string of judicial propositions, or, more properly speaking, resolutions, and among these was this, thus quaintly expressed, "that if a man being seised (possessed) of land leaves 40 ft. to A, to build a house thereon, and 40 ft. to B for a like purpose, and one of them builds a house, and then the other digs a cellar in his land, which causes the fall of the first and adjoining house, no action will lie, for every one may deal with his own to his best advantage, but semble that it would be otherwise if the wall or house were an ancient one." But no definition of the term "ancient" is given. All the other cases in which this question arose to any extent were complicated with points in regard to negligence in working upon which the decisions ultimately rested. We have said that the Prescription Act does not affect this easement, because in easements arising from grant they were liable to be defeated in the way in which they could have been before the passing of this Act, and secondly it does not fall within the term "a claim of right." We do not propose to say more on this point of the Prescription Act, because it is one of a highly technical nature, and cannot be adequately discussed without going through the Act section by section. So much for the law in regard to the right of ancient buildings to support. Let us look for a moment at the results of this or a contrary decision. It is obvious that to presume an assent to such an easement from anything but a really ancient tenure would be highly unfair to a neighbouring landowner, for against the acquisition of such an easement the adjoining owner has no remedy or means of resistance, unless, indeed, he should excavate in his own immediately adjacent soil while the neighbouring house is being built, or before the easement has been fully acquired for the purpose of causing the house to fall. He may also be ignorant whether that house or other building is supported by his soil or not, and to say that being unable, by dissent or resistance of any kind, to prevent the easement from growing up, he should, at the end of twenty years, be bound to afford the neighbouring house support, seems to be repugnant both to common sense and justice. On the other hand, there appears something of an anomaly, as Mr. Justice Lush points out, in the fact that a title to a house can be acquired within a certain period of time, but not a title to that which is essential to its existence. But the reasons given above as to the impossibility of preventing such an easement accruing if time is to make it valid, seem to answer sufficiently this objection. There are few cases, indeed, in any grades of life, or in any kind of business, where some drawbacks do not exist to every view. And it would clearly be a serious burden on property if, after twenty years, a building, however heavy or vast, was entitled to the support of the adjoining land; it might, in fact, render that land absolutely useless to its possessor. On the other hand, it may be answered, that it is equally disastrous that the owner of adjoining houses may not be certain whether his neighbour, in the exercise of a legal power, as the law now exists, will not let down his house whilst erecting a new mansion for himself. But this objection, plausible as it may at first sight seem, can, we venture to think, be satisfactorily replied to. In the first place, the man who erects his new buildings knows what support they will require, and sets to work with his eyes open, or at least should do so; and, in the second place, he can always obtain an express assent to support from the adjoining landowner; or, as we have shown before, in some cases it may be implied from the nature of the estate, as when a builder erects several houses on a plot of building land, and therefore the decision upon which we have been commenting does, on the whole—allowing for necessary drawbacks to every state of the law,—fairly do justice to the owners of house and of land, and is also, as it appears to us, completely sound in point of law; and it must be remembered that it must not in any way be supposed that it would palliate the results of negligent work on neighbouring land. It is a legal maxim of high standing that a man must use his own property so as not to injure that of his neighbour, and therefore, whilst he may be absolved from the effects of injuries done to neighbouring houses, when the work has been done with all due and proper care, yet, if such damage is caused by negligent work, within legal limits the man who has done this injury will be responsible for it, even if the injured building were only erected the week before.

We have dwelt at some little length on this topic, because the decision in Angus *v.* Dalton is a very noteable landmark in the history of property, and because, what is more interesting to the readers of the *Builder*, it is one which is of immense practical importance to every class of the community whose duties or rights are affected by this question. Land and house owners, architects, builders, lawyers, are all affected by it, and it is one of which none of these classes of men can afford to be ignorant.

THE PROPOSED MODEL BYE-LAWS ISSUED BY THE LOCAL GOVERNMENT BOARD,

IN RELATION TO PUBLIC HEALTH, SAFETY, AND COMFORT.

ARCHITECTURAL ASSOCIATION.

AT a meeting of the Association, held on Friday, the 22nd inst., the following paper was read by Mr. J. Douglass Mathews:—

You are aware that with comparatively few exceptions, building operations in towns and their suburbs are regulated by certain bye-laws, which are drawn up by the Local Board of Health or other body based generally upon the bye-laws in operation in some other places, with such additions or omissions as may be required to suit local circumstances or opinions, and these, when decided upon, are submitted to the Home Secretary for his confirmation and thereafter become law in accordance with the powers given by the Public Health Act. The result of this is, that around large cities and towns where there are many local Boards, each with its own bye-laws, it is almost impossible to know what are the requirements of each place, and what is in accordance with the regulations of one place is in direct opposition to those of another: thus through ignorance, expense and annoyance are often caused to intending builders.

The necessity of an Act which shall apply generally throughout the country was prominently brought under the notice of the profession by Mr. Honeyman, of Glasgow, in a paper read at the conference of architects in 1876, which, after discussion, resulted in a resolution being passed urging the Council of the R.I.B.A. to consider the subject of general building regulations for the United Kingdom, and to communicate with the architectural societies and the Local Government Board. A copy of this was forwarded to the Local Government Board, who at the time were drawing up some model bye-laws. In due course an invitation was given to the Council of the Institute to consider the draft, promising that any suggestions should receive attention. A committee was appointed, of which I had the honour to be a member, and after several meetings and much careful consideration, many alterations were suggested, and the draft as amended was forwarded to the Local Government Board. These were doubtless carefully considered by the Board, and shortly afterwards the Model Bye-Laws in their present form were published. Although altered in many particulars there are yet some clauses which remain in their original form, and will, I think, be found to be unworkable.

According to the announcement, my paper is to treat of the bye-laws in reference to public health, safety, and comfort; but, as the latter depends in a great measure upon the two former, I will omit special reference thereto; and as most of us are acquainted with the Metropolitan Building Act, upon which the bye-laws as to buildings have been based, reference will from time to time be made to that Act.

It will be as well to consider the subject under the following heads, viz.:—

1. Construction of streets.
2. Foundations of buildings.
3. Construction of walls, chimneys, and roofs, for securing stability and prevention of fires, and for purposes of health.
4. Space about buildings to secure a free circulation of air and ventilation.
5. Drainage of buildings.
6. Construction of water and earth closets, privies, ashpits, and cesspools.
7. Notices and drawings for carrying out the works proposed.
8. Mode of administration.

The first section applies to *streets and roadways*, and allows 36 ft. as the minimum width, instead of 40 ft. as required in the metropolis, and in cases where a street is less than 100 ft. in length it may be 24 ft. in width. One end, at least, of every street shall be open, and of the full width of the street. Permission is granted for passages or approaches for the purposes of removing ashes, soil, &c.

The want of definite and adequate powers in the metropolis to require really *good and sound foundations for houses* has led to special clauses in the second part; and as so much depends, not only for the stability of the structures themselves, but also the health of the inmates, on proper foundations, anything to remedy the present defects must be looked upon with satisfaction. The requirements are that every wall shall rest on the solid ground, or upon a sufficient thickness of good concrete, or upon some solid and sufficient substructure as a foundation. The two adjectives are important, both being omitted in the Building Act. This clause will also deal with the strength and arrangement of girders, bressummers, story-posts, and columns, all of which ought to have as much supervision as foundations.

The desirability of keeping the damp from entering a dwelling-house is generally admitted, and therefore the clauses requiring a damp-course in the walls, and a layer of asphalte or concrete over the whole surface or site, is good; but a thickness of 4 in. as a minimum instead of 6 in. would, I think, suffice, especially as Portland cement concrete is insisted upon, but this is hardly necessary, when the substructure is rock, or even hard gravel.

The position of the damp-course requires better definition. At present, it is required that it shall be beneath the level of the lowest timbers, and not less than 6 in. above the surface of the ground adjoining such wall; but if the house has a basement surrounded by earth, the damp-course under the wood floor would be of little service.

I think a clause requiring that all stories below the ground level shall have on the outer sides open areas or sufficiently ventilated and drained dry areas, or the walls coated with asphalte, or other material impervious to damp, should be inserted.

To prevent houses being built on sites which have been made up with rubbish containing animal and vegetable matter, such as the contents of dust-bins, street-sweepings, &c., it is provided that no building shall be erected on these sites until all such matter is removed. This requirement would, I fear, in many cases be found impracticable, as it would prevent the utilisation of many sites, and besides, would not meet the desired purpose. As, for instance, a basement might be excavated, and the foundations carried to the solid, but the lower story, surrounded on its four sides by most injurious matter, which would at once defeat the object in view. I could instance rows of houses built upon rubbish filling, which is not the worst foundation structurally.

It appears to me that if a good layer of concrete, say 12 in. thick, be spread under the house, and an open area all round, say 2 ft. wide, walled and paved with concrete, or in the cases of houses built in a row at the back and front only, the case would be met, and with better results.

In the construction of walls it is enjoined that they be of good bricks, stone, or other hard and incombustible materials, properly bonded and solidly put together with good mortar, composed of good lime and clean sharp sand, or other suitable material, or with good cement, or of cement mixed with clean sharp sand. This definition is an improvement on that in the Building Act, which simply requires that walls shall be put together with mortar or cement, leaving the matter open as to what is mortar. And as we all know that mortar may be good and bad, it oftentimes causes a district surveyor much anxiety as to whether he can prove to a magistrate that, although the material may be bad, it is nevertheless *not* mortar.

A difficulty in the Building Act which requires footings to be in height half the thickness of the wall at its base, is overcome by requiring them to be two-thirds of the thickness, *e.g.*, a one and a half brick wall need only have footings 6⅔ in. high by the Building Act, and some ingenious builders have endeavoured to obtain this by means of two courses, whereas by the alteration three courses are a necessity. In the case of a new wall abutting on an old one, the projection of the footings on that side may be omitted. This is an advantage in one respect, as it gets over the difficulty of easement on a neighbour's land; but whether it is good for the new wall is a question.

The definition of a party-wall is very important. In the metropolis, a wall is only party where it divides buildings on each of its sides; but it is now proposed that if a wall is used as a separation of adjoining buildings in *any* part it shall be a party-wall its whole length and height, by which means all windows beyond the back walls, or above the roofs of adjoining buildings, will be prohibited. Doubtless, the provision is a good one as a guard against the spread of fire, but one that will greatly interfere with the utilisation of some buildings in towns that have already easements over other properties.

Another important alteration is the definition of a cross-wall, which is required to be carried up to the top of the topmost story, instead of, as at present, two-thirds the height of the external walls. This appears unnecessary, as in the case of rooms in the roof the cross-wall would have to be carried to the tie of the roof, whereas its use for strengthening the external walls would cease at the wall-plate. The cross-wall has also to be solid for two-thirds its area in each floor instead of one half.

The schedule for the thickness of walls is generally somewhat in excess of that required by the Building Act. The necessity of this is not apparent, as it is very rare that an accident occurs from the insufficiency of the thickness of a wall if built in accordance with the tables, but generally from the materials used in the construction; and therefore if these are improved the walls may be considered to be of greater strength than now required. No more than two stories is allowed for walls 9 in. thick, whereas the Building Act permits 9-in. walls to be carried to a height of 25 ft., which affords the opportunity of forming three low stories within the height.

For some reason, not apparent, the heights of the stories are measured from floor-line to floor-line, which, besides making the set-off at an inconvenient place, will limit the height of stories inclosed with 9-in. walls to 9 ft. 3 in. or thereabouts, instead of 10 ft.

The definition of a topmost story is "the uppermost story in a building, whether constructed wholly or partly in the roof or not, and whether constructed or adapted for human habitation or not." The effect of this clause would be that in every queen-post roof with a height of 7 ft. between tie and straining beam, or in any roof with the same height between the feet of rafter and the collar, but where there is no intention or probability of its being used for habitable purposes, the walls would require to be of the thickness sufficient for one story higher than the number of floors. In buildings of the warehouse class, which includes all buildings not used for dwelling, the least thickness prescribed for the walls, whatever their length, is 13½ in. at the base. This appears unnecessarily stringent, as small one-story workshops or stables, and even small lobbies and porches to public buildings, hardly need walls this thickness for the purposes of stability.

A clause especially serviceable for mills and factories requiring a large area of light provides that the thickness of walls exceeding a certain height and width, or where stories are beyond the prescribed height, may be obtained by piers properly distributed, amounting to one-fourth the length of the wall, or, if preferred, in the nature of buttresses with a greater projection and less width, so long as the sectional area be the same, provided that the projection does not exceed one-third of the width of such pier.

Another clause provides that if the openings in each story exceed half the area of the wall sufficient piers or other supports be provided, and also that in case of corner buildings there shall be proper supports, either at the angle or not more than 3 ft. from it. There is, however, nothing to show as to who is to define what are sufficient supports, but more of this subject hereafter.

Provision is made for concrete construction, if deemed a suitable material, in which case the walls may be the same thickness as if built of brick. In the case of rubble walling, the thickness to be one-third more than brickwork. Considering the increasing use of concrete as a building material, it would seem desirable that the subject had been treated in a more definite form, as under this clause lime concrete could be used in walls no thicker than would be required for cement concrete.

An important deviation from the Building Act is that walls built within 15 ft. from any other building must be carried up to form a parapet with a gutter behind. This will in a great measure do away with overhanging eaves, and the object is, of course, to prevent the spread of fire; but my experience is that the less of lead or zinc gutters in cheap houses the better, as they are generally of the poorest material and soon become leaky, causing damp walls and attendant illness. I think the result would be obtained by forming the eaves of fireproof material.

The importance of keeping walls dry has evidently been felt, as it is required that every parapet wall shall be coped to prevent the wet from running down the sides of such parapet, or soaking into any wall. Another clause for the same purpose provides that the party-walls of warehouses and public buildings shall be carried to a height of 3 ft. above the roof, instead of 15 in., as required by the Building Act,—a good provision, doubtless, in case of fire, but one which will create difficulties of treatment in design.

One more clause to prevent the spread of fire is that the open space inside any partition wall, or between the joists, shall be stopped with brickwork, concrete, pugging, or other incombustible material, at every floor and ceiling. I presume this to mean in the depth of the joist and between the ceiling of one story and the floor of another. It may, however, mean that the interstices between the quarters in partitions are to be so filled, which would become a serious matter.

The Building Act is very ambiguous as to intermediate supports for bressummers. The bye-laws meet the difficulty by requiring that, if necessary, other story-posts, iron stanchions, or piers of brick or stone, in addition to those at the ends, shall be fixed, sufficient to carry the superstructure; but wooden story-posts are omitted, although referred to in another place.

With a few exceptions, the requirements as to chimneys, flues, &c., are much the same as the Building Act, but the provisions are not so numerous, as they are more especially defined in another Act. It is very desirable that this should be incorporated, or at any rate printed, with the bye-laws, as it is of the utmost importance that a builder should have all the requirements before him in as concise a form as possible.

The chief differences from the Building Act are as follow:—

That a chimney may be corbelled out from a wall at any story, instead of only above the ground story.

That all flues in connexion with furnaces, or close fires and all cooking ranges or apparatus for hotels, eating-houses, &c., shall be 9 in. thick for at least 10 ft. above the floor, and that all chimney openings in all kitchens shall have the backs 9 in. thick 6 ft. above the chimney opening, instead of 1 ft. as now required.

The use of stoneware pipes or copper flues externally and internally is prohibited. All flues carried on arches shall be supported by means of wrought-iron bars. As the clause stands, this would apply to all arches under flues; whereas it was intended only to apply to flues carried by arches from a lower to a higher building externally, and especially when they are built as an addition.

No mention is made as to the distance at which pipes conveying hot water or steam shall be fixed to woodwork. This to some extent is an advantage, because the distance, viz., 3 in. required by the Building Act, is too much for hot-water pipes at low pressure. At the same time steam and high-pressure water-pipes should be kept at a distance of say 4 in. from all combustible materials. Pipes for conveying smoke or other products of combustion must be fixed at a distance of at least 9 in. from woodwork.

Passing on to the fourth head of my subject, viz., *space about buildings to secure a free circulation of air and ventilation*, there are several things that require consideration, for, although doubtless good from a sanitary point of view, if insisted on may materially interfere with the utilisation of property.

The first requirement is that there shall be a clear space of 24 ft. at the least from the front of every house to the opposite side of the street, or to the boundary of any lands or premises immediately opposite.

It is provided that there shall be in the rear of every domestic building an open space of not less than 150 square feet, free from any erection above the ground. The Building Act only requires 100 ft., and gives the option of the area being at the side or rear. The reason for this difference appears in the following clauses, which require that the open space shall extend the entire width of the building, and be in no case less than 10 ft. wide, and if the building is more than 15 ft. high, the area shall in all cases be as wide as the building is high. The effect of this is, in an ordinary town-house and shop, with rooms built beyond the back wall three stories high, the yard shall be 30 ft. wide behind the addition. This requirement would not be so arbitrary if the space were only measured above the ceiling of the ground-floor, but, as it stands, the covering of yards for the extension of business premises is effectually prevented; and I see no reason why, if the ground-floor is lighted by skylights, and the basement made use of only as a store, and not as a dwelling, the area should be continued to the ground, especially as it often happens that the domestic portion of the building is above the ground-floor, and the yard is required on this level rather than a lower one.

I doubt whether this clause will be found to fulfil the expectations of the framers, as it often happens that in the additions behind the house there are sometimes two or more rooms on each floor. The result would be that, whilst the furthest back room might look directly out into a wide yard and be well lighted, the other room and the back rooms in the house proper might look only into an area 30 ft. deep and 4 ft. wide. I can hardly think the clause means that the open space at the side shall be as wide as the adjoining building is high. If so, houses with two story additions must have a frontage of at least 32 ft.

Every habitable room must be lighted by a window or windows equal in area to one-tenth part of the floor area, and in all cases the upper part of the windows must be made to open.

In rooms not supplied with a fireplace, an air-shaft shall be provided for ventilation, of not less than 100 square inches in area.

The cause of much sickness and mischief will be remedied by the requirement that under every boarded floor in the lowest story of a building there shall be a clear space of at least 3 in. under the bottom side of the joists thoroughly ventilated. The space might be with advantage increased to 6 in., as rubbish will speedily accumulate.

It is much to be regretted that in provisions to secure health, no definition is given as to materials to be used in the composition of plastering mortar, as I am convinced much of the illness caused to persons occupying new buildings arises from the animal and vegetable matter contained in the earth, and other materials employed instead of clean sand. Great care has evidently been bestowed in framing the clauses relating to the drainage of buildings, which forms the fifth division of our subject, but they are in many cases so arbitrary that, in the present unsettled state of sanitary science, it is almost certain that much difference of opinion will arise, and if they are adopted as they stand will cause great difficulty in properly enforcing them.

The general requirements are that all damp subsoils shall be drained by earthenware field pipes. The lowest stories of all buildings must be capable of being drained into a sewer. All pipes to be of glazed stoneware not less than 4 in. diameter for sewage, and laid on a bed of solid concrete as far below the ground as will equal the diameter of the pipes. All drains passing under any building to be embedded in concrete 6 in. thick, which will often involve a needless expense, as many clays would be quite as impermeable as concrete, and in case of stoppage or repair easier to be got at. Means of ventilation are to be provided at each end of the drains, and all main drains to have a suitable trap as far distant from the house as practicable, before entering the sewer, and no junctions to be at right angles with the drains.

For the purposes of ventilation, every building is to have at least two untrapped openings to the drain, one being at or near the level of the ground as near the main trap as possible, and covered with a grating equal in area to the diameter of the pipe, and the second by carrying a pipe or shaft as far distant from the other point as practicable to a height sufficient to prevent any foul air from entering the building, and of an area equivalent to the drain. Soil-pipes may be used for this latter purpose if of sufficient size.

No drains inside a building to have any inlet other than for a water-closet apparatus or slop-sink, and all waste rain-water and overflow pipes are to discharge outside the house over an open channel, 18 in. distant from a trapped gully-grating. All soil-pipes to be connected directly with the drains without a trap.

Whatever may be the opinion as to the perfection, or otherwise, of these requirements, I fear that so long as the system of drain-laying remains in the hands of ordinary labourers it will always be unsatisfactory. However carefully they may be overlooked, it is impossible to vouch for accuracy in laying and jointing. I have before stated in this room my opinion,—that until the laying of drains and the works in connection with them is in the hands of men who shall make this work their sole business, and take the responsibility, subject to a penalty in case of failure from bad workmanship or materials, this most important matter will never be satisfactorily dealt with. Considering the comparatively small outlay involved in the drainage of an ordinary house, and the immense and growing importance of perfect drainage, it would be money well laid out to pay a responsible man a moderate percentage beyond the actual cost, as a guarantee of their perfection. If this were done, I doubt not that there would soon be found men in large towns who would be quite ready to take up this branch of business; or, as the whole matter of drainage is as much a public as a private question, I see no reason why the local authority itself should not execute the private as well as the public drainage at the cost of each owner. This would then place the whole matter in the hands of one officer, and be of advantage to all concerned. If, however, this plan were considered too great an interference with private rights, then both systems might be combined by the local authority granting licenses to certain reliable tradesmen, so, although not taking the matter out of the hands of respectable builders, it would enable the Board to ensure proper drainage to houses built by careless or ignorant builders.

One great advantage would be derived by the adoption of either of the latter suggestions; viz., that plans of the drains of all buildings would be possessed and registered by the local authority, so that in addition to the owner knowing that in the case of repair the works would be properly done, the constant source of expense in searching for the drains would be avoided.

Closely allied to the construction of drains is that of water and earth closets, and the by-laws provide that all closets shall adjoin an external wall, and have a window not less than 2 ft. by 1 ft., with adequate means of constant ventilation by an air-brick in the external wall or other effectual method. This clause prohibits closets in any place with roof or top ventilation, which is unfortunate, as, in public offices, I invariably place the closets in the top story of the building, for the double purpose of economising valuable space and avoiding the inevitable annoyance to the rooms in the lower portion. All water-closets are to be supplied with a separate cistern or other means to prevent direct communication with any service pipe to other parts of the premises.

It is required that closets shall be furnished with a pan or basin, or constructed as to allow all filth to fall free of the sides; also that there shall be no container under any pan, and that no D-traps are to be used. These restrictions, if enforced, will effectually annihilate ordinary hopper and pan closets. Much may be justly said against the use of the former, which are invariably objectionable; but the total prohibition of pan closets and D-traps is so arbitrary and unreasonable, that I doubt not the manufacturers of these articles will themselves strongly protest against the continuance of the clause. Speaking from my own experience, whatever objections there may be (sentimental or otherwise), I have found no closet so simple and so little likely to get out of order with hard usage, and so easy of repair, as a good strong pan-closet. I do not, however, say it is perfect or cannot be improved upon, and possibly the attention now called to the subject may be the means of introducing a better article.

No less than nineteen clauses are devoted to the construction of receptacles for fresh earth-soil, the distance of privies, cesspools, and ash-pits from houses, and matters affecting their construction; all of which appear to be of value; but as these are matters which do not intimately concern us as architects, I will not take up your time by detailing them.

After conferring powers on the Sanitary Authority to close buildings unfit for habitation, the remaining clauses deal with the giving of notices, deposit of plans and sections, inspection of works, and powers to remove, alter, or pull down works in contravention of the bye-laws.

In the case of streets, a notice accompanied by plans showing the names of the owner of the land through which such street is intended to pass, the level and width, intended mode of construction, name, size, and number of intended building lots, and sites, height, class, and nature of the proposed buildings, and height of the division and fence walls. For what purpose the detailed particulars as to the proposed houses and division walls are required for the construction of the road is not apparent, and it would be difficult and dangerous in many cases for an owner to pledge himself until he sees the nature of the property such road is likely to accommodate.

As to buildings, it is required that with the notice shall be deposited complete plans and sections of every floor, drawn to a scale of not less than 1 in. to 8 ft., showing the position, form, and dimensions of the several parts of such buildings, and of every water and earth closet, cesspool, well, &c. Also a block plan, showing the position of buildings and appurtenances of properties immediately adjoining, the width and level of street in front and rear, and all particulars as to drainage, and, in addition, a description in writing of the materials of which the building is intended to be constructed, and the water-supply.

These being matters which personally concern us as architects, I think that we should strongly protest against such requirements, many of them being quite useless to the Sanitary Authority. Others being better known by the Authority than the intending builder, and causing a needless expense.

It is most desirable that a block plan showing the proposed system of drainage, the distance from road and adjoining properties, also the levels of the ground and basement floors, should be submitted and deposited; but it is too much to expect the position of buildings and appurtenances of the properties immediately adjoining to be shown, which could often only be obtained by special permission of adjoining owners, who are not always friendly disposed towards new comers. There is no apparent reason why a written description of the materials to be used in the execution of the work should be sent, as, with few exceptions, the bye-laws do not affect them, and the clause as it stands would enable the sanitary authority to demand a pretty full specification; and, lastly, I fail to see what advantage complete plans and sections, with dimensions of the several parts, are to the sanitary authority; nor why the owner is to be compelled to submit all details of his proposed buildings to the curiosity and criticism of his neighbours, which must be the case if deposited with a public officer; nor why the architect should send copies of his drawings, which might be made use of by any of the officers or members of the Local Board for their own purposes if they were so disposed.

As it is evidently anticipated that all buildings will be inspected from time to time during their progress by the surveyor, there can be no more need for these particulars to be furnished than there is for the same information to be given to every district surveyor with the builder's notice, and, indeed, I think there would be more responsibility attaching to the surveyor to see the building carried out in accordance with the deposited plans than in visiting the building from time to time to ascertain whether the bye-laws were being properly obeyed.

We have now arrived at the last division of the subject, viz., the administration of the bye-laws.

The Local Sanitary Authority is the body with whom is entrusted the carrying out of the bye-laws, and the recognised officers are the clerk and the surveyor. The Board have powers, upon the representation of the surveyor, to cause the laws to be properly carried out, and in default the person so offending shall pay a penalty for each offence, and a further penalty for each day in the case of a continuing offence, after written notice being given by the sanitary authority; the infliction of the full or a reduced penalty to be at the discretion of the justices or other court before whom complaint is made.

One thing is evident, if the bye-laws are to be properly carried out, much more supervision than is usual or possible for the majority of surveyors to Local Boards must be given, and therefore, in large towns especially, a considerable increase in the surveying staff must be made, and a corresponding increase in salaries. The system adopted by the Building Act for each builder to pay a fee is far more equitable than the expenses of supervision being thrown on the general rates. I would suggest that, if this principle is established, the fee should be deposited with the notice, or else the certificate of completion withheld until the fee is paid.

Although somewhat diverging from my subject in mentioning certificates, I take the opportunity of referring to two papers read at the last Conference of Architects, by Messrs. Parsons and Sellars, on classification and registration of buildings, a subject which I regret to say has been almost lost sight of.

The suggestions made in these papers were briefly that houses should be divided into classes, and that a standard specification, more especially relating to the carcass, should be prepared, in accordance with which the houses should be built, for which purpose the district surveyor would visit the building from time to time, and give his certificate at the completion of the works.

I feel convinced that nothing would tend to stop the present unsatisfactory state of speculating building sooner than this. If before selling or letting a house the certificate was bound to be produced, the public would have some safeguard as to its construction; and all the ornamental plastering, expensive stoves, and chimneypieces, would not atone for bad building, if the certificate was not forthcoming.

One important matter is, I think, entirely omitted from the bye-laws. Those of us who have to practise much in the metropolis, notwithstanding the latitude of the Building Act in many things, know the value of that section of the Act which gives to the Metropolitan Board of Works power to consent to buildings to which the Act does not apply; and without some such loophole the Act would, in many cases, prove so severe that it would seriously interfere with the carrying on of certain trades, and in many other ways be most oppressive. If this license is so necessary within the metropolitan area, how much more so would it be in enforcing the bye-laws throughout the country; and therefore, although they would apply generally, there must, of necessity, be matters of detail that local circumstances will render compliance with difficult, and unless there is some authority constituted as a court or board of appeal, I fear the intentions of the framers of the Act will be in a great measure defeated.

It is considered that to delegate to the local authority power to remit or alter the bye-laws would in the future, as it has often proved in the past, be very undesirable, as it is proverbial that local influence has great weight, especially in small towns. A Central Authority in London as a Court of Appeal would be so cumbersome and expensive a machinery to put in motion, that, except in the most important matters, it would be of little avail, and therefore, in all probability, irregularities would be overlooked rather than run the risk of the expense and trouble of such an appeal. This might be simplified by the appointment of independent surveyors in each county or district, whose duty it should be to report all the circumstances of the several cases for the decision of the Central Board; or else that Board should be constituted in large towns, with delegates from the surrounding Boards, to meet at short intervals, such Boards to have powers similar to those possessed by the Metropolitan Board of Works.

And now I will bring this dreary paper to a close. However true the adage, "Every man's house is his castle" may have been in former times, I fear that if the house is anywhere within a reasonable distance from a town or another habitation, it will not apply now. When, as in former times, a house stood in the midst of a large estate, approached only by roads made by an ordinary track, or by a few bushes or branches of trees thrown down, and when, in case of fire, defective building, or absence of drainage, no damage could arise, or fault could be found, by any one outside the estate, a man might do as he pleased; but this is now well nigh an impossibility.

One great result of civilisation is, that persons live more in communities, and, indeed, the mutual dependence one on another renders this a necessity; and consequently there must be such laws made that will conduce to the common weal. It is essential that every house should have a proper approach; and if the foundation and maintenance of the road were to depend on each owner of property abutting thereon, there would be many who, from a selfish or mean disposition, would be indisposed to fulfil the requirements, and therefore, unless some authority took charge of the roads as a whole they would in parts be impassable, and great damage would accrue to neighbouring properties. So in sanitary matters. There are persons who have an utter horror of the name of sanitary improvements, and argue that privies and cesspools and water derived from wells in their immediate vicinity, have satisfied their forefathers, and wonder why they should trouble themselves to have them altered. There are others who, although not quite so obstinate, have their own ideas on some points which are at variance with actual facts, and unless there was some authority to compel compliance, the result would be that, in case of an infectious disease attacking their household, the close proximity of other dwellings would render it almost a certainty that the disease would spread; and so the carelessness or wilfulness of one person might produce disease and death in a neighbourhood; and thus cause the innocent to suffer for the sin of the guilty.

So also with buildings. Whatever inclinations or whims a person may satisfy in building a house for himself only, it is necessary that, if the house be situated in a thoroughfare, the public shall be protected from being killed or injured by defective construction, or that, in case of fire, the neighbours may have some security against its spreading, and perhaps devastating a whole street. But as in most cases houses are built by a tradesman to sell for other people to inhabit, it is only right that those who have no means of ascertaining the way in which the houses have been built should be protected from danger to life and limb by imperfect construction or bad materials.

It is therefore for the general welfare that there should be some authority to regulate these matters, and although it is very difficult to draw the line between what may be considered public requirements and private interests, without sacrificing the former, or interfering with the latter, still the less must give way to the greater, and if the neighbourly spirit were more general, no difficulty would be experienced by local Boards in carrying out all that is required for public health, safety, and comfort; and to assist them to this, the Local Government Board have drawn up certain laws which it is required should be rigidly enforced; and although the system of centralisation is rapidly growing, often at the expense of local interests, a central authority has many advantages in obtaining information not possessed by smaller bodies, and the power to require compliance with its regulations throughout the country. If the administration of these bye-laws is properly carried out by the local Boards, there will be little need of the interference of the central authority, and the result will be an improvement in the general health of the people, greater safety to life and limb, and an increase of comfort in the houses and streets in all towns.

THE MODEL BYE-LAWS AND THE BUILDING ACTS AMENDMENT BILL.

THE following remarks are not to be taken as opening the discussion on Mr. Mathews's paper, which is to take place on a future occasion; but simply as supplementary of the analysis so well accomplished by Mr. Mathews.

The model bye-laws issued by the Local Government Board for the use of sanitary authorities throughout the provinces, are comprised in a series of pamphlets, nine in number.

No. 1 is devoted to cleansing of footways and pavements; removal of house refuse; cleaning of earth-closets, privies, ashpits, and cesspools.

No. 2. Prevention of nuisances, arising from snow, filth, dust, ashes, and rubbish; prevention of the keeping of animals on any premises, so as to be injurious to health.

No. 3. Common lodging-houses.

No. 4. New streets and buildings.

No. 5. Markets.

No. 6. Slaughter-houses.

No. 7. Hackney-carriages.

No. 8. Public bathing.

No. 9. Public baths and washhouses, and open bathing-places; duties of the officers and servants.

Of this series of papers or model bye-laws, our attention is at present confined to No. 4, "On new Streets and Buildings," in the compilation of which the Local Government Board were assisted by a very comprehensive and elaborate statement of the views of the Royal Institute of British Architects. All of them, as you are aware, are the outcome of the supposed requirements of the provisions of the Public Health Act of 1855, the enforcement of which is the duty of the Local Government Board.

In considering these bye-laws, reference will naturally be made to the Metropolis Management and Building Acts Amendment Bill, which has just passed through committee.

Primarily, it is to be observed that the Public Health Act is a very comprehensive one, as the numerous bye-laws indicate, and represents for the provinces what in the metropolis is the subject of several Acts. It is at once the Sewers Act, the Local Management, the Nuisances Removal, and the Building Act for the entire country. And, this being the case, it is most important that while its provisions should have their fitting local qualification, they should, as far as possible, speak with certain voice, and its bye-laws should be uniform in principle, if not absolutely identical in practice.

I have jotted down in a superficial manner the differences observable between the model bye-laws and the practice which obtains in London.

Streets.—Why streets for carriage traffic should only need be 36 ft. wide in the provinces, and 40 ft. wide in the metropolis, it is difficult to imagine, since land is less costly out of London than in it. And why streets, not being carriage-ways, should need to be 24 ft. in the country, and only 20 ft. wide in town, is also difficult to explain.

But the Metropolis Management and Buildings Bill proposes to give authority to the Metropolitan Board to vary the widths at pleasure.

Foundations.—With respect to foundations, a great innovation is made, and not only do the bye-laws require that the walls, or concrete under them, should be carried down to the maiden earth, but that the whole area occupied by the building is first to have any earth impregnated with animal or vegetable matter removed, and then a layer of asphalte or of cement concrete, 6 in. thick, is to be laid over every part. On turning to the Metropolis Acts Amendment Bill, this is not required, but it may be implied, for powers are sought with reference to sites and foundations of an indefinite character, which need not be codified in permanent bye-laws, but are to be left to the judgment of the Board.

Surely the removal of the objectionable subsoil should be sufficient; and if any such subsoil were not to be removed, then that a layer of concrete should be laid. But unless the ground is full of moisture the need for cement concrete is not apparent.

Dry Areas.—A much more serious matter alluded to by Mr. Mathews is only partially met by the bye-laws,—the saturation of walls by the close proximity of earth without the intervention of either closed or open dry areas. A damp-course to prevent damp rising in the wall from its base is provided, but where there are wholly or partially underground stories, the one is ineffective without the other.

Underpinning.—No provision is made in the model bye-laws or in the Metropolis Acts Amendment Bill for underpinning walls, and yet it is notorious that great care is required in such operations. Even in the case of party structures, the Metropolitan Building Act is silent, and in the previous Act the word occurs but once, but then it is only mentioned as a contingent necessity, where an external wall is to abut another of less depth, in which case the latter is to be underpinned.

It was only last week that the Master of the Rolls gave a solution of the ambiguous clauses in the present Building Act, and by him it was

ruled that the right to raise a party-wall included the right to deepen it, in like manner, indefinitely by the process of underpinning.

Size of Bricks.—Where bricks are invariably in use, a uniform size is very desirable, and especially in thickness, so that the inner and outer faces of a wall may settle equally. The model bye-laws require bricks to be not less than 9 in. long. The Metropolitan Building Act says they shall be 8½ in., and not more than 9 in.

Thickness of Walls.—With reference to the thickness of walls for *dwelling-houses*, the model bye-laws carry up the extra thickness of each story as it rises at least a story higher than in the Building Act for London.

There is but one conclusion possible: either the London Act requires too little, or the model bye-laws too much. The difference in cost is considerable. An Act should err on the side of safety, but surely the London Act has had a good long innings without failure attributable to this cause.

The thickness of walls for *warehouses* does not materially differ, except that the London Act allows walls to be of the same thickness for a much greater length (about one-fourth more).

Partitions.—The pugging or brick-nogging between the studs of partitions is a good provision.

Drainage and Ventilation.—I dare not venture on this subject now, but enough has been said by Mr. Mathews to rouse discussion.

EDWD. C. ROBINS.

RED-BRICK AND BROWN-STONE FRONT HOUSES IN NEW YORK.

THE delicate line which divides respectability from the less responsible classes in New York, is not drawn here with that nice distinction established by the famous witness (so amusingly limited in his social ideas) who defined a gentleman as a man who kept a horse and gig.

Here, in New York, residing in a brown-stone front house qualifies the unfortunate individual to a rank in the social scale sufficiently defined and progressive as to render his wildest hopes of distinction possible.

Nevertheless, it is somewhat difficult, surrounded as we are in all directions with the very reddest brick houses of pretentious depth and altitude, and living, by the way, in a red-brick house ourselves, it is difficult, we repeat, to accept in all its force the dogma that there exists in New York an incompatability between red bricks and worth of character, or even that red bricks and insufficient incomes, or, what is much more material here, narrow credit, should be necessarily associated; but so it seems, and here in New York, by all appearances, the happy time is not far distant when all the good Americans who have not yet reached Paris will live in what they felicitously call "Twenty-five-feet-front four-story first-class brown-stone houses."

Even in these "hard times" for all but builders and real estate owners,—the hardest times, it is said, and painfully felt, yet known in America,—there appear to be many speculating on what they call "liberal building loans"; and "temporary improvements" (very temporary and very questionable improvements) are proceeding at an alarming rate, it not being an uncommon thing for a rain storm or ordinary shower to wash away the foundations of an unfinished "block," causing the frame of the house and all its other hasty work to fall into a scarcely less unsightly heap of bricks and other rubbish.

One builder here, who is known to represent a very strong combination of capital, enjoys in this country a really enviable reputation for "rattling up" a row of houses with the utmost rapidity, and his pride is that his opportunities in this way are of the largest, and of course the most reckless description. Our English builders could learn much in this way from their American cousins, although to the credit of this country, slight and imperfect as the work is in all directions, the country is not made hideous by rows upon rows of semi-detached residences, such as abound in England, to the utter destruction of nearly every rural district.

The present building operators here aspire to deal in "brown-stone first-class houses," and the enormous majority of these ill-built and ill-designed places to grumble in are really utterly deficient in every quality that is becoming and fit for an honest man's residence.

Goodness knows, that it is not alone the red-brick and brown-stone front houses that present themselves as studies for the pessimist in this city; they in many ways are suggestive and typical of much in the lives of those who dwell within, and when we read the description of the house of a well-known banker who is now, we venture to say, in much more comfortable quarters a long way off, we are not surprised that smaller people on a less scale should endeavour to imitate the envied leviathans of Wall-street.

We are told of a house not very far from New York, the inside of which is so costly and elaborate, that labour and money have been lavishly expended to adorn it. Lace curtains are spoken of at 200*l.* a pair, electric bells in every room, and what are here barbarously miscalled "frescoed" ceilings, and massive chandeliers everywhere. The stairs and balustrades rich with ebony and other precious woods; bronzes and statuary filling ill-placed niches; "Old Masters," as they are called, adorning the walls; marble floors and "hallways"; solid black walnut doors "4 in. thick," and mouldings and cornices of the heaviest (and the worst) description; furniture imported from Paris, wildly rococo, and of the most gorgeous description; gas for lighting the house "made on the premises"; and enormous cisterns, supplying every room with water pumped to the roof by a steam-engine.

Still, it is fair to own that, odd as it may seem, it is not unlikely that, counted one by one, there may have been more houses built recently in New York than in London,—more houses combining all those modern ways and thoughtful means of comfort and health, of beauty and fitness, such as our advanced civilisation demands; and there exist here, and have existed for a century or more, many happy homes, where the tastes and surroundings of the inhabitants have been at least equal to that domestic standard of comfort and beauty which makes a dear old English residence,—well kept up, well dusted and polished by the sturdy arms of our comely housemaids,—an ideal place to live in, such as most of us are, or ought to be, contented with.

Alongside with these "brown-stone front" houses in town, and these pretentious palaces in the country, may be found, if we may be allowed to wander a little from New York, most delightful places for our admiration. Where can one see a pleasanter house than the late Mr. Ticknor's at Boston, or the Schuyler House, on the Hudson, or many others that we could name? But these appear not to have in the slightest degree impressed the modern speculative builders. With them example fails to supply its beneficent influence, and too much precept and teaching in this country appears to weaken the healthy growth of right.

There is one "brown-stone front" house well known here,—the Height House, that is all but perfection in its arrangements; but whatever objections can be reasonably raised against the manner of living in houses arranged on what is vulgarly called the "flat system," these objections do not exist when properly considered by the true *cognoscenti*; on the contrary, when this system becomes perfectly understood in England (for here lies its difficulty), it will be found to add an element to happiness that will make England additionally favoured, and a still more delightful place to live in.

In Paris, where there is that providential mode of supplying comfortable quarters for the narrow circumstanced and the affluent alike, we can understand and fully appreciate the force of the objections that many people may justly bring against the mode of living "in layers"; and perhaps, fully to enjoy the comfort of residing "on a flat," one ought to have experienced the delight, after passing the early days of our existence in a small London house, of finding oneself on a *primo* or *terzo piano* in a Roman or Florentine *palazzo*, or with all one's windows in a line looking on to a Venetian canal, where, ever after, we sigh for those days when perhaps we were less susceptible to draughts, and more indifferent to the proverbial comforts of a snug corner.

In New York the "flat system" just escapes being carried out to perfection. They have, of course, yet much to learn; but New Yorkers acquire some information rapidly, and certainly they are on the way to a perfect knowledge of all that happiness which can be secured by the utmost devotion to a knowledge of what constitutes material comfort.

Unfortunately for the American, for all his great lessons in this direction, he is dependent, or is willing to be dependent, upon foreign teaching, and the instruction he so readily receives from a distance, and the habits imported from other climes, do not exist healthily in a climate so utterly uncongenial; so that, like many other choice and precious importations, the Americans can never possess for more than a few weeks a sturdy chimpanzee or a lively gorilla.

In a house in New York, well arranged on the "flat system," if any inconvenience is experienced, we have but to pause and think a little to recall all that has been, or that may be, done, to add to the convenience of this manner of living, to find that somewhere or other in New York the want we miss is to be found; but New York is probably, nay certainly, the most uninteresting city in the world, regarded from a point of view less important than that taken by thinkers whose time is occupied by subjects less or more abstruse than that of the building interests; but, regarded by the ordinary standard of comfort and propriety, the utmost the builders and such people here can, or seem to be willing to do, is to closely study the best possible means of rendering, as far as it is possible, their houses habitable for persons who are firm believers in Dr. Cumming and his architecturally-fatal theories.

New York.

ANCIENT AND MODERN GYMNASTIC EXERCISES IN THEIR BEARING ON HEALTH.

IN our last volume we dealt with the question of gymnastic exercises in their ancient aspect, but more particularly in connexion with the Greeks, their use and abuse, and decline. Like Gothic architecture, the modern system of gymnastics has had its revival in the memory of men still living; but, apart from a system, we have had always in the British Islands a number of national sports which, when moderately indulged in, were productive of much of the benefits ascribed to gymnastic exercises as a defined system. Our present national sports, and some of those which went out of fashion in the last century and the earlier portion of the present, are not, and were not, all indigenous to the soil, though time and practice have naturalised them. Archery is a very old British exercise, and in former times, when practised for military purposes, it was really, as a drilling discipline, conducive to quickness of eye, strength of arm, muscular energy, and health. The long-bow was the favourite weapon of the English from the thirteenth to the sixteenth century. It was at one time the principal missive weapon in all the armies of the world, and it may be said its origin and use in one form or another were coeval with history. There were several enactments passed in this country in respect to the bowmen or archers, and the civic records contain many ordinances and regulations in reference to them. A precept of the reign of Edward IV. commands that every Englishman and Irishman should have a bow of his own height, and butts were ordered to be set up in every township for the inhabitants to shoot at. Any one neglecting was subject to a fine. Latimer, in one of his sermons before Edward VI., strongly enforced the practice of archery-holding. It was "a godly art, a wholesome kind of exercise, and much commended in physic." Long after archery went out of use for military purposes, the exercise was practised in the British Islands; and during the eighteenth century we had in London, Dublin, Glasgow, and Edinburgh distinguished archer clubs, supported by gentlemen of note, who, in their practice, adhered to much of the original bracing drill. Our present-day archery has dropped into a mere pastime, and, as witnessed in our public parks and other grounds, it is little more than a fashionable exhibition for passing time, instead of affording a bodily exercise for health or strength.

Quoits is a very old British sport still practised, and it is a healthful exercise. The eye is educated by it in gauging distance, and the arm in unison in adjusting and calculating a required force. Wrestling in its purity, apart from modern inducements, which have made it and other sports a gambling transaction and a bitter strife instead of an exhibition of manly agility, has much to recommend it. We cannot close our eyes to the fact that, in the present century, wrestling, even in the provinces, among the

agricultural population, has been associated with many abuses and brutal exhibitions. Provincial wrestling matches in parts of England, and generally over Ireland, began with football matches, the picked men of one county, town, or barony, arrayed against another. After a game or two of football, a ring was made, and the principal rivals entered, with their backers keeping watch and ward. We witnessed some of these matches in our juvenile days, where the object was not to throw an adversary by suppleness of foot, but by a process of maiming. The wrestlers were more intent on giving a good kick to each other's legs than overturning an adversary by an inside or outside "crook." Across the sole of the shoe under the toe, and extending down 1 in. or 2 in. on either side, were fastened square slips of iron, much of the same calibre as what are called iron heeltaps. Sometimes the iron coping was an angle-piece extending across under the toe of the shoe and down a portion of the inner side of the sole. These iron fastenings were expressly forged at the village smithy for kicking purposes, and they answered their purposes too well. When toecaps of iron were not used, the combatants had otherwise the sole of their shoes well paved with hobnails, a section of their serrated claw-heads overlapping and ranging evenly with the edge of the sole of their boots. We have witnessed the blood from repeated kickings oozing through the thick worsted stockings of the combatants. Hundreds of country-folk, young and old, stood by and witnessed these wrestling exhibitions, and it was not unusual to see the fathers and mothers of the combatants among the spectators, who, we suppose, took a pride in their sons' "manly" appearance and prowess. Not seldom those provincial wrestling-matches ended in a fight, and the appearance of the "peelers," who were afraid to interfere. Football by itself is a lively, exciting, bracing, and healthful game, and of late years it has become very popular around the metropolis in our public parks in winter-time, and in our provincial towns. The sport has undergone modifications in its conduct, has its set rules, and differs much from the simple football matches of our country districts. We find in the 12th Henry IV., 1411, a proclamation against wrestling within the Sanctuary of St. Paul's, to the effect, "That no manere man ne child of what estate or condicioun that he be, be so hardy as to wrestell, or make ony wrestlyng within the Seintuary ne the bounds of Poules, ne in no other open place within the Citee of Londone, up peyne of emprisonement of fourty dayes; and makyng fyn unto the Chaumbre, after the discrecioun of the Mair and Aldrmen." Previously, in the same reign, 1409, there is a proclamation forbidding "Lokkyng foteballe and cockthreshyng" on certain days, within the City and suburbs, upon pain of imprisonment or a fine, at the discretion of the mayor and aldermen. Nearly a century earlier, in 1314, a proclamation had been made against playing at football in the fields near the City. No doubt there were certain abuses, even in those early days, associated with these sports, besides that of levying money for their promotion, a practice which the proclamations were intended to prevent.

Despite of what has been written in our time in praise of the "manly art of self-defence," the patronised once of princes and nobles, we would prefer to say but little about it. It has its patrons and defenders still, but we are not among them. One of our latest encyclopædias speaks of boxing as "an exercise which brings every muscle into action, gives elasticity to the limbs, improves the play of the lungs, gives quickness to the eye, and accuracy in measuring distance." On the other hand, it may be said that it destroys all these, and its practice in England for the last couple of centuries has debased instead of elevating the British character. It was time that a practice fraught with all the evils that men living remember was relegated by law to the limbo of brutal exhibitions. Though the prize-ring as a so-called national sport is put down by law, boxing still exists *sub rosa* for purposes of gain, for personal ends, or exhibition sights. If health could not be promoted and every muscle brought into action without boxing and the evils it encourages, we should indeed be a fallen race, bankrupt in physical and mental culture. Before passing from this part of our subject, we will mention an incident that happened in the earlier years of the present century in the sister kingdom, as it well illustrates the pride that even parents took in the pugilistic prowess of their sons. When the once famous Dan Donnelly beat his English antagonist on the Curragh of Kildare,—a fight in which the former was backed by some of the *élite* of the country gentry,—an ovation followed in honour of the conquering hero. The wagon that conveyed Donnelly and his rejoicing friends to Dublin was hung with evergreens and other foliage, music was provided, and numerous vehicles brought up the rear. Seated in front of the wagon, that all might see her, sat the proud exulting Celtic mother of the pugilist,—prouder in her bearing than even the mother of the Gracchi,—and as she looked left and right with glistening eyes, greeted with cheers as the procession moved along the highway through the village, she ever and anon slapped her uncovered bosom with her hand, exclaiming, "Here is the breast that suckled him." Such a picture of maternal affection in such a cause is not likely to be witnessed again. The unlettered Irish mother showed her feelings perhaps in the only way that she could on the occasion; but the second decade of the present century was far different in tone from the eighth that we are living through.

It is scarcely necessary to dilate on the advantage of walking, running, leaping, or swimming. When pursued with moderation, and not as ends for mere gain through organised exhibitions, each of these exercises has its own peculiar advantages for strengthening the limbs and the lungs, giving suppleness to the joints, and elasticity to the whole frame. Swimming in itself, when judiciously practised, is a cleanly, bracing, and wholesome habit. It is a natural exercise, and ought to be as common to man as to animals beneath him. Rowing, skating, cricket, and other kindred field sports are, from a health point of view, admirable exercises, but, unfortunately, of late there is a tendency to run into extremes in swimming, rowing, and pedestrian exercises. There is a limit to bodily powers of endurance, and when once this limit is passed injury is done and disease engendered, instead of health being obtained and maintained.

Long before Ling's system of modern gymnastics was promulgated, we had English laymen, churchmen, and physicians who recommended certain British sports and exercises as a necessary medicine or physic. George Cheyne, M.D., F.R.S., a noted physician in his day, belonging both to the seventeenth as well as the eighteenth century, wrote a book entitled "An Essay of Health and long Life," at the instance of the famous Jekyll, Master of the Rolls, who distinguished himself in the reign of William III. In this book, which is divided into several chapters, Cheyne, under the head of "Exercise and Quest," writes,—"Of all the exercises that are or may be used for health (such as walking, riding a horseback, or in a coach, fencing, dancing, playing at billiards, bowls or tennis, digging, working at a pump, ringing a dumb-bell, &c.), walking is the most natural, as it would also be the most useful, if it did not spend too much of the spirits of the weakly. Riding is certainly the most manly, the most healthy, and the least laborious and expensive of sports of any; shaking the whole machine, promoting a universal perspiration and secretion of all the fluids (to which may be added the various changes of the air through which they so quickly pass, every alteration of which, as it were, a new bath), and thereby variously twitching the nervous fibres, to brace and contract them, as the new scenes amuse the mind." Cheyne goes on to a considerable length on the subject of exercises, what to enjoy, how to enjoy them, and what to avoid, according to the constitution of the body. George Cheyne was certainly a sanitarian in his day, as may be seen by his book, which is even still well worth reading. His book is worthy of digest, and we are glad to find, as far as his lights allowed, writing towards the end of the seventeenth or early in the eighteenth century, he was a thorough advocate for pure air and general cleanliness. Here is a passage from his work, which shows he was of an observant mind:—"It is also very agreeable to observe how the several different organs of labouring men are strengthened and rendered brawny and nervous as they happen to be most employed in their several vocations, let them be otherwise ever so small or weakly. The legs, thighs, and feet of chairmen, the arms and hands of watermen, the backs and shoulders of porters, grow thick, strong, and brawny by time. It is certain that speaking strong and loud, without straining, will strengthen the voice and give force to the lungs. Our nails and hair, the more they are cut and shaved they grow; and we may promote any one evacuation so far as to weaken and starve the rest. Using any organ frequently and forcibly brings blood and spirit into it, and so makes it grow plump and brawny. And if due pains were taken by the labour proper to them, the organs of all the functions of the animal economy might be strengthened and kept in due plight." True, very true; but respectable mothers in the present day snub their chubby little sons and daughters, and tell them that it is vulgar to speak loud even in the nursery. The food we should eat, and how to regulate its quantity, was a subject that received attention in Cheyne's book, and we are glad to perceive that he was an advocate of cold bathing under proper conditions, and the use of the flesh-brush. He considered the use of the flesh-brush a most useful exercise, as appears, he said, by its advantages to horses: hence he reasons it ought not only to be used on human bodies, but also on such animals as we design for our food. From our own experience, we could supplement Cheyne's list of labouring men, chairmen, watermen, and porters by divers examples of artisans in the building and cognate trades who were made healthy and strong by the ordinary and constant pursuit of their callings. We have known many instances of delicate and unpromising youths apprenticed as carpenters, masons, bricklayers, smiths, and others, grow up to be robust young men. The exercise of the arms, limbs, and bodies in the workshops, building, and at the anvil, worked a surprising change in the constitutions of many of the youths that came under our notice. Boys that were considered stunted in their growth, after a few years suddenly grew apace in height and in size of body and limb. If the constitution is not radically diseased, with temperate habits health and strength in mind and body are always possible. An intelligent artisan engaged at a healthy trade, if he does not overwork himself, will at the conclusion of an ordinary and honest day's work, be in better health and spirits often than when he commenced his labour. Work and wholesome exercise enliven the mind, give activity to it, and under this influence the mental power of many a studious workman is utilised to his advantage at the close of his day's labour, bringing increased pleasure to him instead of weariness.

Gymnastics proper, as understood in our public schools, and as may be practised in several of our public parks and open places, is a system almost free from violent exertion, and may be indulged in with profit. The general appliances used in Ling's system are pretty well known, and can be recommended if they are used with moderation. These exercises have a beneficial effect on the mind and body, while those adopted by our modern pugilists and wrestlers have no such influence for good, either upon the mind or body, but quite the reverse, like that which we have described in our first paper in relation to the boxers and wrestlers among the Greeks. Gymnastics proper, taken in connexion with a number of our national British sports, and a fair observance of sanitary principles, afford the youth of the present day sufficient facilities for becoming healthy and strong. Prudential exercise of body and limb, recreation and temperance, are part and parcel of our education. To neglect the care of the body is to neglect the culture of the mind, and what tends to the debasement of the one can never assist in the elevation of the other. Exercise properly understood is healthy life.

National Water Supply.—A letter has been addressed by the Council of the Society of Arts to a select list of authorities on the question of water supply, in which they say:—"It is intended, some time in the month of May, to hold a congress for the discussion of the subject, as suggested in the letter of his Royal Highness the Prince of Wales. The Council would, in the first instance, venture to ask you to state briefly whether you believe a large and comprehensive scheme of national character, as suggested, to be practicable. If so, I am to ask you to state as briefly as convenient to you the broad features of such a scheme. The Council hesitate to tax your kindness too much, but they would be gratified if you would, with a view to such a discussion, prepare a short sketch embodying your views, which might be printed, and which you might amplify by speaking at the meeting."

HOW PASSENGERS TRAVEL.

FOR some years there has been a very rapid growth in railway passenger traffic, but the growth has not been by any means equal in the various divisions of traffic. When the concession of third-class traffic by all trains was made, there was a very large bound in the numbers travelling by the lowest class, and since then there has been a diversion of traffic from a higher to the lowest level. The amount of that diversion has varied on various lines, but either in a falling-off in the numbers of one or both of the upper classes, or in a falling-off of the monetary yield, or in both these modes, it has been known. And in the most recent years the depression in trade has given an increased momentum to the downward movement. In some measure it has specially affected the intermediate class, and on several of the large railways the number of second-class travellers is less than it was a dozen or so of years ago, whilst the number of travellers by the other classes has been considerably increased in the one case, and immensely enlarged in the other. It may be interesting, in view of this movement, to show by a series of examples the recent rate of change and the proportionate number of passengers travelling in each of the three classes. For the period of comparison, six months is the most convenient time, and if corresponding halves of different years be chosen, the figures will give a reliable index to the extent and the nature of the change in the interval between. Such figures are to be found in the official reports of the various companies, and the citation of the chief of these will comprehend the great bulk of the volume of English passenger traffic. Three out of four chief lines of railway have coterminous half-years, and these may be chosen, but as the fourth does not terminate its year at the same time, it must be excluded. There may be added to these two or three others, representative of the smaller but still important lines, care being taken to give some of those on which the passenger traffic preponderates. First, then, let us look at the first-class traffic, and notice the change which has taken place on the railways named in a year, the figures being in each case for six months only, and for the last six months of the years named. The first-class traffic, then, on several of the chief lines was as follows :—

	Numbers		Amount.	
	1876.	1877.	1876. £	1877 £.
London & N.-Western	1,611,328	1,575,696	359,118	344,086
Midland	1,312,881	1,267,381	211,442	203,801
North-Eastern .. .	691,237	659,034	126,803	117,740
Great Northern	554,824	567,270	112,74	109,617
South-Eastern	1,014,749	984,737	169,166	162,419
Manchester & Sheffield	235,852	242,421	21,2[illegible]	20,173

The above statistics show clearly the general but not the universal declension which is known in the first-class traffic; in every instance, with one exception, there is a numerical decrease, and in every case there is a financial falling off, which is both actually and relatively large. Turning now to the second-class traffic, and taking the same companies, with the exception of the Midland, we have for the same two periods of six months, the following numbers of second-class passengers, with the receipts from that source also given :—

	Numbers.		Receipts.	
	1876.	1877.	1876. £	1877. £
London & N.-Western	3,095,263	2,9 9,976	298,669	286,567
North-Eastern	1,023, 33	819,249	88,312	83,078
Great Northern	1,4[illegible]4,49[illegible]	1,524,102	106,510	105 0 5
South-Eastern	1,388,662	1,410,506	1 9,456	113,818
Manchester & Sheffield	368,501	351,132	2[illegible],711	19,205

In this class the fall where it occurs is much larger than in the higher class; but it will be seen that there are two exceptions to the rule, so far as numbers are concerned, but in one of these the larger number carried give a smaller revenue, so that it is evident that the increase is one due to passengers for shorter distances. The fall is very great, it may be seen, on the North-Eastern Railway, and though in this, and in one or two other cases, it may be partly traceable to the effect of the action of the Midland Company on through traffic, yet it is unquestionably chiefly due to the dulness of trade in the districts served. There are indications, however, that some of the passengers who travelled previously long distances by the first class have more recently travelled for these long distances second class. When we come to the third-class traffic we find, generally, a different state of affairs to that in the two upper classes, for there is a general, but not a universal increase of third-class passengers. Taking the same lines of railway as in the first table, and the same two periods of six months each, we have the following as the numbers of and receipts from third-class traffic :—

	Numbers.		Receipts.	
	1876.	1877.	1876. £.	£
Lond. & N.-West. ..	19,536,145	20,215,635	989,287	1,026,485
Midland	13,000,698	13,058,113	688,310	693,[illegible]88
North-Eastern	14,113,351	14,944,175	808,866	858,472
Great Northern.....	7 569,851	8,077,326	344,551	347,858
South-Eastern	9,983,230	10,119,014	330,367	337,441
Manches. & Sheffield	5,431,226	5,455,9 3	157,123	156,437

We have, then, with the one exception of the North-Eastern, an increase in the number of third-class passengers on every one of the railways which are fairly typical ones. The North-Eastern finds its numerical decrease reflected in a financial decrease also; and one other company is similarly affected, so far as the receipts are concerned. In all the other cases the increased numbers give increased receipts in a normal proportion. It should be added in explanation, that in no case is the contract or season-ticket traffic added to the numbers for any class, nor to the receipts.

Were the contrast attempted to be carried over a series of years, it would be more startling. For instance, on two at least of the railway systems named, the second-class traffic is now both numerically and financially much less than it was fifteen years ago, when the respective lines were less than they now are by a considerable mileage. Coupling facts such as this with those summarised and tabulated above, we have a fair indication of the tendency of travel at the present time to gravitate towards the lowest level, and we have also a proof of the increasing receipts from the lowest class. It should, however, be borne in mind that this increased traffic, —increased, generally, in the total,—is from a mileage larger than it was, and that thus the normal growth in the volume of traffic is not so great as it was. The conclusion irresistibly flowing from the facts adduced in so condensed a form, then, is that the dulness in trade is now reflected on the travelling habits of the public by a check to the continual growth of railway travel, and this and the increased facility for cheaper travel are now lessening both in numbers and in payments the higher classes of traffic, and more especially the intermediate class.

THE MIDLAND RAILWAY COMPANY'S EXTENSIONS AT SOMERS TOWN.

IMMENSE DEMOLITION OF PROPERTY.

UNDER their Act of Parliament, obtained in 1875, the Midland Railway Company are preparing to carry out extensive new works of a varied character in Somers Town, immediately on the west side of the St. Pancras Station. By their Parliamentary powers they have acquired property in this locality which covers an area of upwards of sixteen acres, extending northwards from the Euston-road (where they have a frontage of upwards of more than 600 ft. westward, to the east side of Ossulston-street, nearly opposite St. Pancras Church), to Phœnix-street, stretching to a depth of more than 1,200 ft., or nearly a quarter of a mile in extent. This large area contains several streets in which it is estimated that there are more than 2,000 houses, with a population of upwards of 10,000 persons, all of whom will necessarily have to be displaced in consequence of the property coming down to make way for the new works about to be erected on the site. The property to be removed includes the whole of the houses on the north side of Euston-road between the west side of St. Pancras Station and Ossulston-street, and when this property is cleared away the Midland Company will have a frontage in the Euston-road, including their present station and hotel, extending from St. Pancras-road on the east, to Ossulston-street on the west, the entire length of this frontage being upwards of 1,000 ft. Already a large number of the houses in the streets situated between the Euston-road and Phœnix-street have been demolished, and as the leases and tenancies fall in the work of demolition proceeds, and at the present time the site is being cleared at the rate of about 200 houses a month. Within the last week or two large numbers of the occupants of the houses have become mutinous, and there has been much disturbance, several of the tenants refusing to leave until the houses were unroofed by the workmen. The residents allege that the company have not complied with their own Act of Parliament, the 24th clause of which provides that "the company shall, not less than eight weeks before they take in any parish fifteen houses or more, occupied by labouring classes as tenants or lodgers, make known their intention by placards and notices placed in public view, or within a reasonable distance of such houses, and shall not take any such houses until they have obtained the certificate of a justice that it has been proved to his satisfaction that they have so made known their intention." The next clause also provides that before displacing any of the tenants on the property to be taken under their Act, the company shall provide sufficient accommodation elsewhere, unless a mutual agreement has been previously entered into between the several tenants and the company. It is alleged that these clauses in the Act have not been complied with, and within the last few days placards have been extensively posted in the neighbourhood, stating that a public meeting will shortly be held for the purpose of calling the attention of the Home Secretary to the manner in which the company are evicting thousands of the working-classes in Somerstown, contrary to the provisions of their own Act of Parliament of 1875. We are not in a position to state how far these charges may be correct, or whether the company may have placed themselves in the wrong as alleged, but a visit to the spot would be sufficient to convince the most sceptical that a more dilapidated or disease-breeding block of hovels does not exist in any part of the metropolis than are to be found in the houses on this site. In many portions, moreover, whole streets may be regarded as dangerous structures, with wide cracks and openings in the walls, plainly indicating that if they are not shortly taken down they will require no labour to effect their destruction.

In carrying out their intended works the company will construct a new street on the west side of the station, upwards of 70 ft. in width. This street will run northwards, from the Euston-road, and form a junction with Old St. Pancras-road and Great College-street, leading on to the Camden-road. We understand that on the site which is being cleared the company intend to erect a large new goods station and warehouses, together with a wholesale vegetable market.

A RIVAL TO THE "GREAT EASTERN" STEAMSHIP.

A NEW steamship of enormous dimensions is about to be built by Messrs. John Elder & Co., of Govan, Glasgow, as an addition to the Guion line of American steamers trading between Liverpool and New York. With the exception of the *Great Eastern* this vessel will be the largest merchant steamship ever built. She will be nearly 600 ft. long, being in this respect almost equal to the dimensions of the *Great Eastern* herself, whose length is a little more than 600 ft., the average length of the large Cunard, Inman, and other of the great American liners being not more than from 400 ft. to 450 ft. The new vessel will be from 5,000 to 6,000 tons burthen, and will be fitted with powerful engines. She is intended to be clipper built, and when completed and on the station is expected to cross the Atlantic in a shorter space of time than has ever yet been effected.

Equestrian Statue of the Prince of Wales.—On Saturday a colossal equestrian statue, in bronze, of the Prince of Wales, in commemoration of the visit of his Royal Highness to India, was cast at Messrs. Young's foundry in Eccleston-street, Pimlico. A view of the statue, which has been given to the city of Bombay by Sir Albert Sassoon, appeared in last year's volume of the *Builder*, p. 787. The sculptor is Mr. Boehm. The whole work will cost Sir Albert Sassoon about 10,000*l*. The plaster model of the statue, with a model of the pedestal and *relievos*, will form a prominent feature in the Indian Court of the Paris Exhibition. It may be mentioned that a colossal statue of Lord Northbrook, for Calcutta, is at Messrs. Young's foundry, the model also being the work of Mr. Boehm.



NEW CHURCH AT LONIGO, ITALY.—Professor Giacomo Franco, Architect.

NEW CHURCH AT LONIGO, VENETIA.

The foundation-stone of the handsome church forming the subject of our illustration was laid on the 24th of June last, in the presence of the civic and ecclesiastical authorities and a large concourse of people. The new church in course of erection is situate on the Piazza dei Cavalli, where formerly the old castle stood. The architect is Professor Giacomo Franco, of the Academy of Venice.

The style of the building is an adaptation of the Romanesque of the eleventh century, of which there are numerous examples, the most notable of which, among others, being the churches of St. Michele of Pavia, of St. Andrea of Venice, and St. Zeno of Verona.

Its principal façade is divided into three parts by flat buttresses, the two outer sections, supporting the towers, being of smaller, the centre division of larger, proportions. In the central compartment are three doors; two openings, each crowned by a horizontal architrave enclosed in an exterior arch, supported upon two columns, form the smaller doors. In the principal entrance, however, are four columns supporting an arch, richly moulded, and surmounted by a tympanum.

The cupola, which from the outside appears as an octagon and in two stories, springs from the place where the nave meets the transept.

The total length of the church, which, when completed, will have seven altars, is 229 ft. 6 in., its breadth 98 ft. 6 in.

A NEW TOWN HALL FOR BOOTLE.

The corporation of the young borough of Bootle, near Liverpool, contemplate the erection of a new town-hall, the present municipal offices being inadequate for the transaction of the business of the council; but a difficulty has arisen with respect to the site. The Earl of Derby, who, as lord of the manor, is owner of nearly the whole of the land within the area of the municipal borough, some time ago offered the corporation a site in Strand-road, one of the leading thoroughfares in the borough, at 7*s.* 6*d.* a yard; but, subsequently, an application was made to his lordship to give them another site in a part of the borough which was considered more eligible, and negotiations have for some time been going forward on the subject. At a special meeting of the council, held last week, to consider the matter, a communication from Lord Derby's agent was read to the effect that, if it was the intention of the corporation to include a police-court as part of the municipal offices, his lordship must decline the exchange of sites, unless requested to do so by all the owners of property in the neighbourhood of the proposed new site. If the buildings were, however, not to include a police-court, he would endeavour to meet the wishes of the corporation. The plans of the council contemplate a police-court as a portion of the intended buildings, and in consequence of his lordship's objections, the probability is that the new town-hall will be erected on the site originally offered, where it is understood there will be no obstacle to a police-court forming a part of the buildings.

ARCHITECTURAL AND SOCIAL QUERIES.

WHEN did the word "restoration" first creep into architectural literature? Who first used the term in England, and what were the equivalents in use antecedent to what is called the Modern "Gothic Revival" movement?

Has the word "restoration," as now understood in connexion with architecture, become an acknowledged standard noun; and if so, how long will it be before it is included in our dictionaries, technical manuals, and architectural glossaries (Parker's included)?

At what date in the present century did the terms "re-edification" and "beautifying" cease to be used, and were they for a time applied indiscriminately to reparations in connexion with Gothic as well as Classic churches?

Was there not an interregnum of some years between the cessation of the Roman or Italian and Greek styles adopted in our church architecture, and the "Gothic Revival," during which interval what was previously termed the Debased Gothic style was again introduced and practised?

Were not several of the churches built previously and subsequently to the "Gothic Revival," in the early part of the present century, built in a debased Gothic style, jejune in design, semi-Gothic and Classic, with their door and window arches of depressed curvature, or of a very obtuse lancet shape?

Did not the so-called Queen Anne style exist in full vigour during the reign of William and Mary, and have we not brick mansions in the country still standing built in this style which were erected in the reign of James II., and even in that of Charles II.?

Could not an ordinary domestic residence or large country mansion, even if entirely original in design, be built by oral instruction? And supposing it could, and further supposing that very large houses have been built in the past without paper plans, are we to infer from this that no plans of any kind, inscribed upon stone or baked clay, or in the forms of models, were prepared for the use of the several workmen engaged?

What did Martial, the Latin epigrammatic poet of the first century, really mean when he wrote the following about the choice of a profession, given as advice to a friend concerning his son,—"Don't make him a poet or an orator, he will more quickly learn to play on the lyre or flute, and thereby enrich himself. But if the young man is dull and heavy, make him an architect"? Why? Is it because the study of architecture, while it ripened the faculties in old times, impoverished the professor, and still continues to do so, on the principle that "many are called, but few are chosen,"—in *competitions*, at least?

Would it not be well for the Government or the Metropolitan Board of Works to hold a certain class of speculative builder-architects responsible for their works, as was done in ancient Rome,—"to warrant their private buildings for ten years, and their public ones for fifteen, every accident arising from bad construction during these periods was to be made good by them or their heirs; if they were unable to make the necessary repairs, they were *whipped, shaved, and banished?*" (*Hic jacet* Jerry.)

As two-thirds of the domestic dwellings now being built are "run up" for sale, in the outlying suburban districts of the metropolis, and as these cannot, even under the amended Building Act, be properly supervised, would it not be advisable before they passed, as the majority of them do pass, under the auctioneer's hammer, that their examination should take place, so that they would be duly registered as fit for habitation? And if this plan were adopted, would not a small registration fee per house fully cover the expense, besides securing for the unprotected community sanitarily constructed and healthy dwellings?

Is not any and every Building Act that ignores the practices of the freeholders of building land now being parcelled out around London an imperfect, nay, a dangerous Act; and should not some decisive steps be at once taken, in the interest of common humanity and public health, to equally divide the responsibility that should belong to the promoters and the putter-up of bad buildings?

If it be an accepted proverb that the receiver is worse than the thief, where is the line to be struck in the case of the land leaser and usurer, who is guilty of a double wrong, and who sets a certain machine in motion, which is cumulative in untold miseries and disasters for generations yet unborn?

If weeds encumber the land and choke the crops intended for man's sustenance and that of animals necessary to man, should they not, according to Scriptural wisdom, be rooted up and destroyed? And is it not an acknowledged fact that certain classes of houses encumber the land, and are destructive to human life, and will be always destructive, so long as they are permitted to occupy the land, to the exclusion of healthy nurseries for men, the nucleus of a moral and robust population?

Is it not absolutely certain that if the number of deaths exceeded the number of births in a country for a series of years, such a country would rapidly decline in wealth and strength, and if the rate of mortality became chronic the country would eventually be depopulated? Admitting this, is it not criminal to destroy or endanger human life, within our homes or without, by conscious ill-doing and reckless artifices?

Is not every true modern architect a sanitary and social reformer, and one who if building well leads to the saving of thousands of human lives; is not the architect by priority a representative of the healing art and a doctor of preventive medicine?

Is it not very difficult to exactly define the boundary between educated and highly-skilled handicraft and art-workmanship, and does not the practice of the finest of the fine arts involve human manual labour as well as mental study?

Are not or may not all forms of honest human labour be dignified, and is it not the character and the worth of the man that establish the dignity of labour, skilled or unskilled?

Pendent to the last query, can anything be more senseless and absurd than for any craftsman in the building branches to assert or think that his particular trade is superior or more respectable than that practised by his brethren?

If a building "strike" in any particular branch (supposing it to be a just one) is met by a "lock-out" in all other branches, would not the outside public condemn the severity of the employers, and stigmatise the action as unjust; but if all the branches of the building trade struck against a particular employer for not discharging a particular workman against whom no crime could be alleged, save that of working for his own valuation of his labour, would not the single employer under these circumstances be entitled to both the sympathy of his brethren and the outside public?

As "strikes" or "lock-outs" are, under all circumstances, injurious, even where they may not be unjust in themselves as modes of passive resistance, would it not be well that they should be dropped by common consent, and conciliation or arbitration by law made compulsory with proper safeguard, securing equality of representation for rival interests?

Are not all thoughtful architects conscious of the cumulative evils of continued trade disputes, and is it not reasonable to suppose that it would be to their interest as to that of their profession to uphold fair wages and good workmanship, rather than to encourage builders or their clients to unjustly oppress their workmen by acts of coercion; and is it not a fact that many architects do uphold the interests of workmen, though they are often credited with doing the reverse?

Are not the foregoing queries, or a portion, entitled to some consideration on the part of others as well as architects, as upon their faithful answering depends whether our homes are worthy of our country, our labour worthy of our position, and whether our actions bespeak an advance real and continual in all that constitutes national greatness?

Peel Park Museum, Salford.—The new wing, including the Langworthy gallery, is fast approaching completion, and preparations are now being made for an appropriate opening, with exhibitions of loan and local artists' paintings, and works of art generally. The Museum Committee are looking a-head also to acquire works of high class for the permanent collection of paintings. The great acquisition of the museum is in having secured two widely-known paintings by E. M. Ward, R.A., "The Last Sleep of Argyll," and "The Execution of the Duke of Montrose." These works were purchased from Mr. Brogden, M.P. Several large groups of sculpture have also been purchased, one by Imhoof, of "Hagar and Ishmael."

NEW INFECTIOUS WARDS, ROYAL BERKSHIRE HOSPITAL.

NEW infectious wards have recently been erected as a small detached building in the grounds of the Royal Berkshire Hospital at Reading, and form the subject of the accompanying illustration.

The accommodation is for three males and three females, in separate wards, which, with their adjuncts, form wings of the new building, the main body being occupied by the corridors, and the kitchen and offices, which are centrally situated. Separate entrances for males and females give access to corridors, from which each ward is approached through an inner lobby. The corridors are well lighted, and opposite windows give cross ventilation therein, while the inner lobby is lighted and ventilated by swing sashes above the level of the flat roof of the corridor. Each ward is 24 ft. long and 18 ft. wide, and the average height is 15 ft., and as accommodation is provided for three beds there will be 2,160 cubic feet per bed. At the end of the wards a door gives access to a lobby which has windows at each end for cross ventilation, and opening from this lobby are the patients' water-closet, a sink-room for the use of the nurse, each with double windows affording cross-ventilation, and a closet for foul linen, so arranged that the linen may be removed from the outside. At the opposite end of the wards, next to the entrance, are the bath-room and nurses' room, the latter having a closed window of one sheet of plate glass to admit of supervision over the ward, while the door is in the lobby and not in the ward, so as to admit of the room being kept as sweet as possible, and free from the unpleasantness which direct communication with the ward would probably result in.

In the centre of the block of buildings, equally accessible from the male as from the female ward, at the end of the corridors, is the kitchen, 15 ft. 6 in. by 13 ft., and 11 ft. high, with a small scullery and store-room attached. In each of the kitchen doors is a serving hatch. The water-closets approached from the corridors are for the use of the nurses only.

The walls are built of Bath stone ashlar, backed with brick, and are rendered internally with polished Parian cement. The ceilings are formed of tile arches, and are also rendered with Parian cement and polished. The joiners' work is of pitch pine, all French polished, and the floors of the wards, closets, nurses' rooms, bath-rooms, and lobbies are all laid with 1-in. teak, in very narrow widths, and the joints iron-tongued. At the edge of the floor against the walls a hollowed skirting of teak is laid tongued to the floor, and the polished Parian cement finishes flush upon it, so that any angle for the possible lodgment of dust is avoided. The windows of the wards are formed of double sets of sashes.

Special care has been taken in the arrangement and execution of all the works, and particularly with the joiners' work, to prevent open joints or places for the settlement of dust or secretion of germs of infection. The ventilation is by means of vertical air-shafts for the admission of cold air in the wards and every other part of the building where marked E upon the plan. An arrangement has been made on the outside of the wall to secure the air fresh and free from dust. The vitiated air is taken off by means of pipe flues built into the walls, and carried above the roof with the chimney-shafts, and in addition there is a Howorth's ventilator fixed above the ceiling, in the centre of each ward, with means of closing at pleasure.

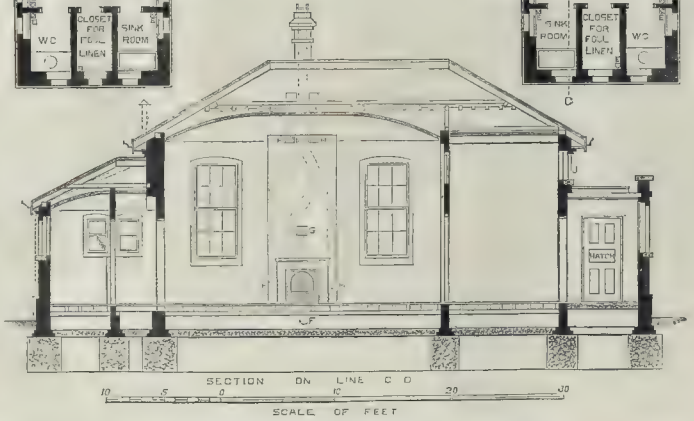
The warming of the wards is by means of Shillito & Shorland's Manchester grates, which have an arrangement for the admission of fresh warmed air.

The works have been executed by Messrs. Sharpington & Cole, builders, of London, from the designs, and under the supervision, of Messrs. Morris & Stallwood, architects, of Reading.

The architects desire it should be mentioned that in designing the building they conferred with, and received many useful hints from, Dr. Shea, the Medical Officer of Health for Reading, who is also one of the medical staff of the Royal Berkshire Hospital, to which these wards are attached.







E. Vertical fresh-air shafts.

F. Fresh air to supply warm-air grates.

G. Grating to supply heated air from back of grate into wards.

H. Shafts for carrying off the vitiated air.

I. These windows have double sets of sashes.

J. Swing sashes above corridor to light and ventilate ward lobby.

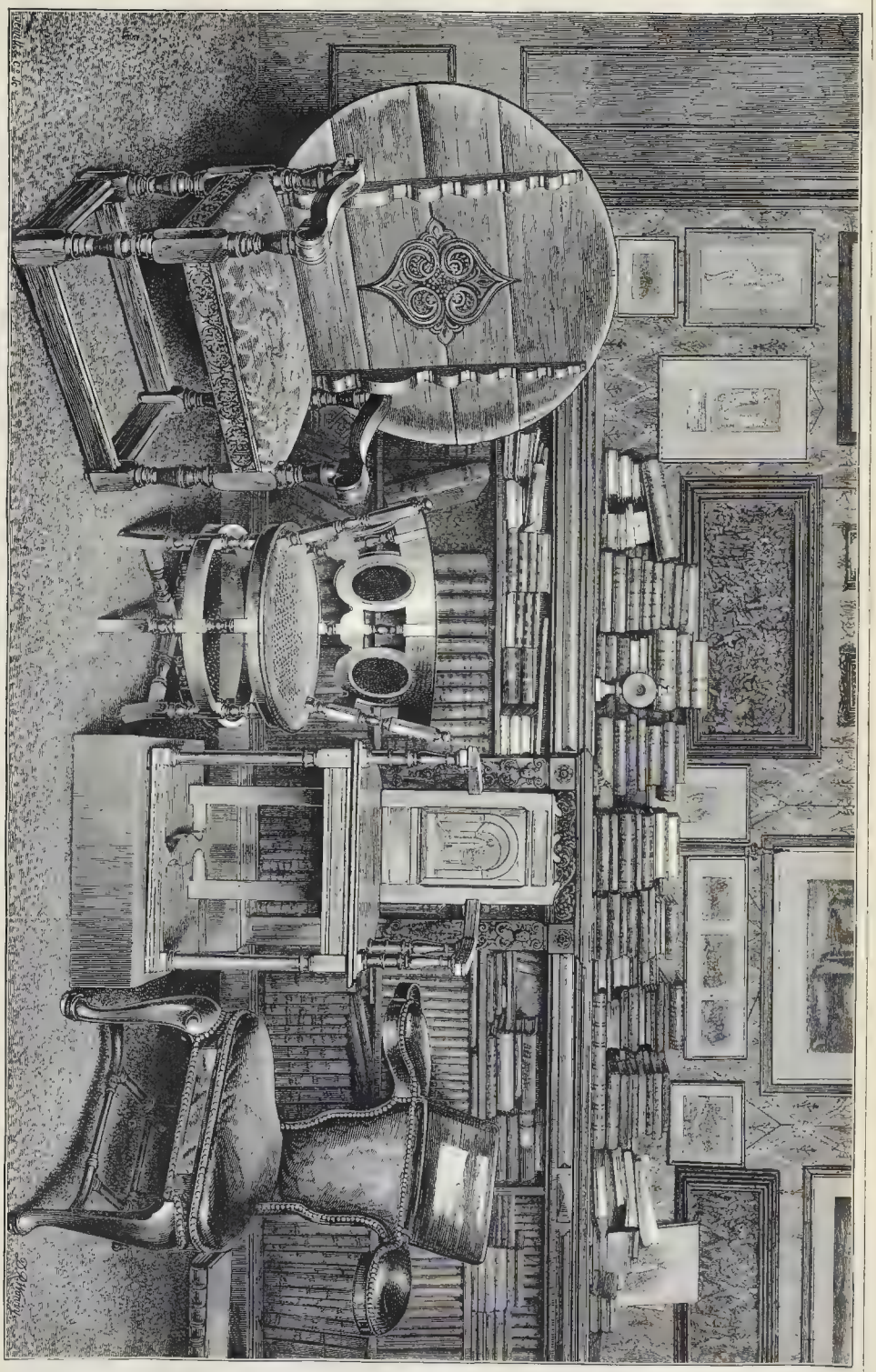
K. Howorth's 12in. ventilator.

L. Ventilated open trap to receive bath waste.

M. Shirley & Shorland's warm-air grates.

N. Nurse's inspection window fixed. Ceilings are formed of tee arches, and these and also the walls are rendered with Parian cement, and painted.

NEW INFECTIOUS WARDS, ROYAL BERKSHIRE HOSPITAL.—MESSRS. MORRIS & STALLWOOD, ARCHITECTS.



Theodore Hook. *Bulwer Lytton.* *Shakspeare.* *Gay.*

SUGGESTIVE FURNITURE.

SUGGESTIVE FURNITURE.

SOME few years ago we purchased from a well-known firm in Bond-street, Messrs. Morant & Co., the writing-chair of our great essayist and novelist, the late W. M. Thackeray, which he had either given away or exchanged, probably on the occasion of his removal to Kensington Palace Gardens. Having at the time two or three similar memorials of eminent persons, a nucleus was formed, around which have been gathered others, constituting in the whole a little collection not without interest in the minds of those who admit the value of associations. This is a theme which might be an excuse for an essay, and it would not be difficult to show, if it were necessary, the importance attaching to suggestive memorials of those who have taught or delighted the world, and that amongst such memorials the chair habitually used must hold a high place:—

"Lull'd in the countless chambers of the brain,
Our thoughts are link'd by many a hidden chain;
Awake but one, and, lo, what myriads rise!
Each stamps its image as the other flies."

This, however, is not the line we propose to take just now. The majority of the pieces of furniture to which we are alluding happen, apart from the associations which belong to them, to be interesting and suggestive specimens of their kind, and it has been urged more than once that we might usefully give a representation of them. Here, then, in consequence, we present a view of four of them,—the chairs used by the poet Gay, Theodore Hook, Bulwer-Lytton, and Shakspeare, and add some lines of description and identification as to each, using the words of others, when the chairs have been previously described, rather than our own.

A sketch of *Gay's Chair* was given in the *Illustrated News* for October 27th, 1849, with these particulars:—"The identical chair of the poet Gay is a pleasing relic, and a very curious specimen of ingenious adaptation of means to an end, forming not merely a seat, but also a desk for writing, or a cabinet to hold papers, and a complete receptacle for the holding of pens and ink, and at the same time having sconces for candles. The accompanying illustration shows the originality of these several appliances to produce the above combination. Under the arms of the chair are drawers, with the necessary implements for writing; each drawer turns on a pivot, and has attached to it a brass candlestick. A leaf, or flap of wood, may be raised at pleasure. Under the seat is a drawer for books or paper, and behind this is a secret drawer, in which were found some MSS.; and amongst the papers in the drawer was a commission appointing a relative of Gay to a post in the army. The drawer is ingeniously fastened by a small bolt, not perceivable till the larger drawer is removed. The chair is made of very fine-grained dark-coloured mahogany; the seat, back, and arms stuffed, and covered with brown leather, ornamented with brass nails. The chair, considering its antiquity, is in pretty good repair. Some years since, this curious relic was sold among some of the effects of a lady named Williams, niece of the Rev. Joseph Baller, and who, by a previous marriage, had been the wife of the Rev. Hugh Fortescue, of Filleigh, near Barnstaple; [Gay's birthplace.]. The families of Fortescue and Baller were, by marriage, related to Gay; his sisters, Catherine Baller and Johanna Fortescue inheriting his property at his decease. After Mrs. Williams's death, this chair came into possession of Mr. Clarke, of High-street, Barnstaple, and at his demise, again passed under the auctioneer's hammer." These notes scarcely make it clear that the chair is used by sitting across it with the face towards the back, on which the desk is hinged.

Theodore Hook's chair is very peculiar. It is of the Cromwell period, and may be used also as a table, the circular back turning down and resting solidly on the arms. It came from Hook's house at Fulham, where we once saw him in it. It was after dinner, and he made some wild jokes on his double-purposed throne.

Lord Lytton's chair is circular, of walnut wood, and apparently Jacobean in date; its late distinguished owner always considered it so. Lord Lytton presented it to the late Mr. Thomas Aston Baylis, then of Pryor's Bank, Fulham. Wonderful revels do we remember, in very early days, with Pryor's Bank for the scene, and Hook, William Jerdan, Crofton Croker, Barham, and others amongst the merry actors, Baylis and Sir George Whitmore for most hospitable managers. We will let Mr. Baylis tell his own story about the chair, which he does thus in the letter we received from him with it:—"The chair which accompanies this note was a favourite chair of my late lamented friend Lord Lytton. In it, at Craven Cottage, Fulham, he wrote many of his earlier works. I exchanged a Town House I had in James-street, Buckingham Gate, for Craven Cottage, Fulham. We gave each other many *souvenirs* at the time, amongst them he gave me this chair! and a copy of his works up to that period. I congratulate you, my dear Godwin, sincerely upon having perhaps one of the best relics of my late very dear friend Lord Lytton." In another note he writes,—"Independently of the interest attached to it as belonging to Lytton, the chair itself is a curious one, and remarkably comfortable to sit upon; the very thing for an author. You can turn about and give yourself comfort however fidgety you may be. It is the very chair for a writer, for when a happy thought hangs fire turn yourself round and off it goes, as I have often found."

We come now to the crown of the collection, the small, stiff, square arm-chair of oak, perched up in the view on an improvised daïs, the chair in which *William Shakspeare* wrote many of his immortal plays:—

"Only a wooden chair! And yet no royal throne
Has e'er held sceptred monarchs whose imperial sway
Possess'd such mighty power o'er hearts and minds of men:
They mostly but the puppets of a pageant were
That the effacing hand of time has swept away;
But this man's wondrous power beyond the tomb lives on
And grows for evermore."

Framed and glazed behind the back of the chair, in a hand now nearly illegible, is found a part of its story, and it reads thus:—

"When Garrick was intending to celebrate the Memory of his ever-to-be-remembered Author Shakespear, in praise of his superlative Genius, He heard that Paul Whitehead, the poet laureat, had a chair in which he, S., sat when he wrote most of his inimitable Plays. He requested the favor of me to call upon Whitehead, and ask his permission that he, G., might be indulged with the Loan of the said Chair on the occasion, from which He thought He should be enabled to make his Oration with more peculiar animation. I without Hesitation undertook the business, and waited upon him at his house upon Twickenham Common, and addressed Him in as mild and as modest terms as in my power, when He abruptly and absolutely, with a considerable degree of Ire, refused it, saying that Garrick was a Mountebank, and was by no means a fit person to be trusted with so valuable a Gem, upon which I retired greatly confused and discomfited. Soon after, however, Mr. Whitehead died, and His furniture, &c., coming to the Hammer to be sold, I asked Mr. Ben Bradbury, a neighbouring resident, to purchase It for me, with which He complyed, made the purchase, and afterwarde made me a present of it, without permitting me to know to what amount it was sold, and it has ever since been in my possession in the genuine state in which it was bought, and shall so remain, barring accidents, for the Residue of my Life.—J. B."

Other writing below certifies that the initials J. B. stand for John Bacon, of Fryern House, Fryern Barnet, and shows the hands through which the chair afterwards passed. Mr. Bacon makes a little mistake in his statement in describing Paul Whitehead as poet laureate. William Whitehead, of another family, was poet laureate at that time, having been appointed to the office when left vacant by the death of Colley Cibber. The Paul Whitehead of Twickenham-common named in the anecdote, although a poet and political hack, was never laureate. He was a very disreputable person, and with reference to him Churchill wrote,—

"May I (can worse disgrace on manhood fall!)
Be born a Whitehead and baptised a Paul!"

Gossip of this kind, however, would take us too far afield just now. We return to the chair only to note that tradition speaks of a letter from Sir William Davenant, in which it is specially referred to.*

Around the chairs already mentioned have been gathered similar memorials of Byron, Moore, Lady Morgan, Mrs. Siddons, Macready, Anna Bullen, and others, some of which we may hereafter illustrate, should our present little bit of upholstery-work find favour.

* The drawing (by Mr. Warry) which we have engraved, was made from a singularly good photograph produced by Messrs. Bedford, Lemere, & Co.

WHAT ROAD ARE WE GOING?

FURTHER contributions upon the question of the styles might at first seem undesirable since the subject has been so often and so variedly treated. But this question can never receive too much attention, particularly since many writers present the subject under a false light, encumber it with false arguments, and finish by dismissing the whole matter with the phrase that the public taste will decide it. These writers have before their minds the idea of a radically *new style*, different from anything there has been heretofore. But more than this, they are confident that this new style will sooner or later make its appearance, only they tell you that the great social and political revolutions which are necessary have not yet commenced, and that public taste and feeling have not experienced the consequent change.

Most of the writers who hold these opinions are of the Gothic tendency. There is a secret harmony in that. The disciples of the Gothic school seem to feel the want of life, capacity, and resource of their style when applied, even in modified forms, to our architectural wants. Unlike their sarcastic Renaissance friends, therefore, they are not content with developing their style and suiting it to our times. No; they do not practise Gothic for the sake of Gothic, they practise it for the sake of some imaginary new style that is to deliver the world from all evil. In contrast therewith, Renaissance artists love and practise their style for its own inherent life and beauty. They feel and they see from facts of history, philosophy, and refined good sense, that it contains in boundless variety all the elements for the easy, graceful, practical, and perfect solution of the problems of our modern times. Thus, Gothic writers, feeling the weakness of their cause, naturally turn to external arguments to enlist the sympathy of the public at large. To the political and social revolutions they add first of all the idea of nationality in art. What a delight to have a national architecture! They forget, though, that nationality has never held an important place in art development. Since Christianity united all European nations under one religious sentiment, progress and culture have assumed a cosmopolitan and uniform character that has ever proved stronger than national tendencies. History shows that all European nations have thought and worked in the Romanesque to the thirteenth, and in the Gothic to the sixteenth century, since then in the Renaissance, the differences wrought by nationality being unimportant, a variation only of the same theme.

The second of the help-mate arguments is the flattering phrase about the importance of public taste and feeling. The assertion is a direct contradiction of the manner in which progress must necessarily be made. The public to lead the artist! Indeed, a fine leader this, that distinguishes himself principally by not knowing his own mind. In all history, and outside of the art department,—in politics, religion, science, philosophy,—the few lead the masses. The masses go on quietly, fulfilling, without a higher aim or purpose, the exigencies of their lives. But these few born master-minds, born leaders, endowed with superior quality of *physique* and intellect, they stop to inquire the why and the wherefore, and devise means to improve and develop the general aspect of life. In the cases of great warriors, great statesmen, great philosophers, great religious teachers, the principle is universally recognised, and it holds equal sway over art and over every phase of human efforts. What a volume of facts could we not adduce from the biographies of great leading artists. Some of them have carried along with them, by the might of their genius, their own time and the whole world for centuries thereafter. Others have been unappreciated, have been slighted in their time by the sensitive contemporary public, to be raised to the highest realms of praise by future more enlightened generations. How, then, is it that public taste and feeling, if they are to create the artist, the art, and the style, cannot comprehend their own product?

Another pet recommendation of the advocates of Gothic, and of a new style, is the study of nature. They call her the inexhaustible fountain of all art-life! Very good. Let nature be the mother of art; but as many sons are far superior in quality to their mothers, so art is immeasurably superior to nature, and its

value increases just in proportion as it departs from her. Truly, we ought to study nature to become acquainted with the wealth of animal and vegetable forms that are applicable in art. We ought to study nature,—not to become her slave, but to become her absolute master. Yes, we must master nature, take from her what we can use, but change it, transform it, modify it to our purpose; we must elevate, idealise nature; we must, in short, turn her into art! Copying nature can never be art. Still, some wise people think so, and they call themselves naturalists. Their ideas applied to art-industry are the very perfection of absurdity. In decoration proper they are equally inadmissible, and we often feel like counselling these doubtful artists to go to the next woods and there cut the oak branch with which they mean to decorate an object. For since we are not to have art, we might as well have nature in a manner that there can be no doubt about it.

But to come to the question. We have as yet no distinct style, because we have too many styles. Such a profusion of co-existing styles shows that we have no settled ideas on the matter. Everything is mixed together, and our work appears like a perfect artistic mince-pie, indigestible to any reasonable mortal. But how shall we get out of this dilemma? Where is the tree of knowledge? Architecture returned towards the end of the last century to that other and far truer fountain of art-life,—the works of immortal Greece. The draught was deep, but not warm enough to completely regenerate Classic art-feeling. The draught was taken *par ordre*, and worse, *par ordre de l'empire*. Enthusiasm, if there ever had been much, died off, and an inclination for Gothic commenced. It was well that Gothic and Romanesque art should be studied. But there was not the end of it. The Gothic enthusiasts wanted to bring back not alone the art-form, but the whole of the Middle Ages, the tyrannising church and the characteristic narrow-mindedness of the age. But these periodic revivals of Classic and Gothic art have very little to do with the manner in which we are to solve our architectural problems. For us the question is simply this one,—which form of art corresponds the most with the spirit of our modern life?

It should really be no longer necessary to put this question! The answer to it has already been given by the greatest artists of the Christian era,—Brunelleschi, Bramante, Michelangelo, Raffaelle,—an answer that stands in incomparable works, as convincing as ever, before our minds. They returned to the antique world-governing art of the Romans, because they recognised that it offered a beautiful solution to all their problems. But more, they did not blindly copy; they developed this art in the spirit and according to the requirements of their time. They thereby made their architecture, and the productions of their elaborate art-industry, the eloquent expression of the character of their age. But this very character of the Renaissance age was embodied in the ambition to free man and society from the tyranny of the Church and from the narrow-minded institutions of the Middle Ages, and to place them upon the ground of search for the true, the beautiful, the natural, the human!

Are we still to ask whether our times approach nearer to the bony traditionalisms of the Romanesque and Gothic eras, or to the sparkling time of investigation, reform, and progress of the Renaissance?

Our road lies clear and open before us. It shall be our highest ambition to take possession of the intellectual inheritance of the Renaissance, and to develope and perfect the programme thereof in all directions. It is an eminently human, philosophical, worldly art, and in perfect harmony with the spirit of our own time; which, in its tendencies for luxury, for comfortable living, for love of power, wealth, refinement, sensual enjoyment approaches nearest to the brilliant periods of Roman might, sentiment, and culture, from which, Renaissance art and spirit have themselves taken life. No other style so thoroughly satisfies the demands of every-day existence. In the Middle Ages the general circumstances of the individual neither called for nor afforded the possibility of such an elaborate artisic enunciation as our times do. People had simpler tastes and habits, fewer necessities, and fewer pleasures. There is no merit in saying that we are too sensual and not as hardened as our venerable forefathers. Good or bad, we do like comfort and luxury, and amusement, and our Gothic friend likes them not the least. But he does look a little comical as he sits in a comfortable rococo fauteuil, sipping coffee from a cup of Dresden porcelain, and enjoying the soothing qualities of a Havannah cigar, while he is declaiming against the tendencies of the age and the heathen character of the Renaissance, and praising the superior qualities of the Christian, heavenward-pointing Gothic style!

How charming are the arrangements of dwelling-houses of the Renaissance? We refer not alone to the serious-looking palaces of Florence and Siena, to the majestic ones of Rome, to the light and graceful dwellings of Venice, to the extensive ones of Genoa. We wish simply to recall the lovely, cheerful-looking houses of the middle-classes in Florence, Montepulciano, Siena, &c., and the numerous smaller castles scattered all over France, Germany, in Alsace particularly, and over England of the Elizabethan period. There is a picturesque charm, full of the finest art, in the detail about the habitations. They look comfortable, refined, home-like, and they offer us a wealth of pure enjoyment, from the entrance through the fine-wrought iron gates to the massively-carved doors, enriched with metal ornaments, to the spacious halls and staircases, clad in wood wainscots; the ceiling resplendent with sculpture, colour, and gold; to the furniture and smallest household objects; and just in regard to these latter things the often defamed rococo has been full of fruitful ideas, in taking the curved line as the principle of furniture compositions, the line which, in regard to convenience, gives the best practical results.

In pottery, glass, gold, and silversmiths' wares, the Renaissance has been equally productive, though not without often departing from a good line of taste. There is too much idea, too much fantastic ornamentation, and all at the expense of legitimate form. Nowhere are the laws of form, such as they logically result from the nature of an object, its material and manner of making, so rigid, so clear, and self-evident as in ceramic art. But the remedy for the Renaissance exaggerations is near at hand. Our museums are filled with the perfect productions of the Greek. From them and from their architectural works we can study the intelligent *language of the profiles* as invented by Greek genius, to demonstrate to the eye with astonishing clearness and precision the inherent physical, mechanical, and æsthetic character of an object, a language universal in principle and application, from the designing of a stone temple to the forming of a vase, or of a spoon, or of a table-leg! This language of the profiles classifies itself into commencing, uniting, separating, supporting, crowning members, and constitutes in its endless combinations the alphabet of Classic art. This language is imperishable because it is natural, logical, radiant with conscious intelligence and genius. It is, indeed, the paramount factor of all art of forming and uniting together, its presence or absence determining whether the forming and uniting together have been artistically done. Thus, the art of the classic profiles determines, in quantity and quality of its application to an unthought-of extent, the art value of a style! To try to be *new* in this regard is simply absurd. It means as much as to try to make a new alphabet, while we simply need learn how to express our new thoughts with the old one.

The want of a series of systematic and well-defined profiles in the Gothic style is a peculiarly characteristic fact. Of course, the Classic profiles are not applicable to it. They revolt in their perfection of form against the hard, sharp, cold, crystalline character of this style. To conceive of a Greek mind worshipping his gods in a Gothic cathedral is decidedly beyond the power of any one who has the least idea of the spirit of Greek culture. But it is equally difficult and impossible even for the most enthusiastic Gothic disciple to conceive of a Gothic opera-house. A Greek,—the brave Achilles, for instance,—worshipping Pallas Athene in a Gothic cathedral! A great opera with a fine-limbed ballet, with ravishing music and grand decorations, in a Gothic opera-house!

Of the inconsistencies between Gothic art and spirit on the one side, and Classic, Roman, and Renaissance art, and modern life on the other side, there is no end, and the above two comparisons are as eloquent as Grecian profiles.

Let us found our architectural and art-industrial efforts upon the Renaissance. Besides its own wealth of forms, there is the world of antique and Roman works at our command for study and inspiration. And, as the artists of the Renaissance found in the application of the principles of Classic art a beautiful and harmonious solution for the problems of their age, so shall we be able to develope from these combined elements an art that will be characteristic and worthy of our modern thought and institutions. On the continent of Europe architecture has long found its way to the art of the modern Renaissance, and the principal cities of France and Germany are resplendent with new works full of vigour and genius. England alone seems to be hesitating; she has, indeed, never enjoyed a fine period of Renaissance art, and St. Paul's stands out painfully lonesome amid this hard and merciless Gothic world.

But the new star is gradually rising. The Gothic style has been found perfectly inapplicable, and its successor, the Queen Anne, although hardly fairly entered upon, shows already its inadequacy. When attempted upon extensive works, it completely fails. It is a style with less resource than the Gothic; there is no life-capacity in it. The Queen Anne is simply no style; it is now, as it has originally been, a form of transition. The Queen Anne, though, must be respected, because it is a step towards Renaissance. Gradually more character, more composition, more shadow, more profiles, stronger and purer forms, more decided and refined proportions, curved lines, &c., &c., will enter upon, modify, and develope this style towards a true Renaissance. Fifteen to twenty years more, and the hideous sham-mask will have worn away, and the bright and healthy face of an intelligent art will present itself with a smile full of promise and enchantment.

Z.

THE ÆSTHETIC CLUB.

SIR,—The above club was formed for the express purpose of enabling a few select individuals to hold forth and disseminate their ideas upon art matters generally, both as regards the purely artistic and practical phases of the subject. The members of this club occasionally read original papers; but our evenings are more frequently devoted to the discussion of the contents of the various professional journals. We hold our meetings at the Star and Garter, Slopperton, and all discussions immediately follow the reading of the paper for the evening. By this means the knowledge and abilities of our members are severely tested, and we should summarily eject any member who proposed that he be allowed a week to prepare himself for a critical disquisition. Any *Noodle* (that is our chairman's expression) could go home and in the space of seven days wade through a whole library of adverse opinions, and then produce them at the next meeting as original criticisms. The origin of our club was not a little remarkable, and arose out of a dispute between two tradesmen in Slopperton. A, who had a tumble-down erection, decided to rebuild, but discovered that if he pulled down his house he would jeopardise the property of his next-door neighbour, B. B threatened proceedings, and the matter was ultimately referred to the arbitration of several influential gentlemen, who decided that as B's house was in as wretched a condition as A's, the best thing he could do was to follow his example, and rebuild. To this B demurred; but the town surveyor settled the matter by condemning both houses. A and B, agreed to divide the cost of the party-wall; but here another difficulty arose. B wished his house two stories higher than A's. A objected, on the ground that before the demolition of the property his house was higher than B's, and that he had a gable-end with a window overlooking B's roof. This matter being settled, a contention arose as to the external appearance of the houses. A wanted something original; B was earnest in his advocacy for Queen Anne, mainly upon the assumption that one of his ancestors had established his business at Slopperton in that august lady's reign. Frequent disputes of this matter resulted in the formation of the Æsthetic Club of Slopperton, to whom all matters of public importance, as regards street improvements, style of buildings, and artistic embellishments, are systematically referred.

Many practical suggestions emanate from our club, not only with reference to the decoration of our unsurpassed cathedral, -for which purpose a large sum of money has already been subscribed,—but we even condescend to remonstrate with tradesmen upon the deception of

which they are guilty in the display of their merchandise. The town council of Slopperton invariably invite the co-operation of the Club in discussing any schemes brought before them. The first paper read at the Club was by a retired architect (this is the first time I ever heard of one), entitled "Is the Supervision of Street Architecture by the Corporation desirable?" Our architect advocated such supervision, upon the ground that the "street architecture of Slopperton was a heterogeneous jumble, and that uniformity was an indispensable condition of beauty." He maintained "that the people of Slopperton should be taught consistency. The Gothic or Italian or Grecian styles are dissimilar in all their leading characteristics, and are governed by principles as distinct and wide apart as the countries that produced them." "It is, therefore, as ludicrous to see Edwardian Gothic and Periclean Greek within a foot of each other, as it would be to see a blooming English maiden escorted down the High-street of Slopperton by a youthful Chimpanzee, notwithstanding the affinity which the Darwinians assert exists between them." "He did not wish to drive the Classic styles from English shores, but he must deprecate such indecorous proximity as was at present sanctioned." He advised, "that in new localities where it is usual to mark out the ground in blocks, the first erection put upon any particular block should be as regards style the key-note for the remainder." This he believed would be a "consummation [æsthetically] devoutly to be wished for." The desirability of having a fixed arbitrary line drawn as the height of cornices to shop-windows was also raised, the height in any block to be regulated by the first shop built. The author of the paper was of opinion that the two styles should be kept at least the width of a street apart, although he did not maintain that one side of the street should be a *replica* of the other. This paper was adopted without a single dissentient, and the chairman hoped that the suggestions made by our architect would be religiously adhered to by the inhabitants of Slopperton.

Many other matters have been discussed at our weekly meetings, amongst which "A Site for the Obelisk," and the remarks made by the *Builder* upon this proposal, have given universal satisfaction to the members of the "Slopperton Æsthetic Club."

A paper read by our sanitarian, upon "Public Fountains," advocated mixing disinfectants with the water as preferable to pouring those disinfectants down the street gullies. If public fountains were placed in all open spaces, and the water charged with odoriferous disinfectants, not only would the noxious air be rendered pure, but at the same time cool and grateful to the senses. The author of this paper alluded to a practice carried out by the Chinese, which, although not bearing directly upon the subject, is nevertheless suggestive. According to his account, the *Celestials* mix pepper powder with their plaster, which not only causes a pleasant odour to pervade the various rooms, but is likewise a certain check upon the ravages of insects, particularly the white ant. He also mentioned that the interior of St. Sophia, Constantinople, is perceptibly perfumed with the odour of musk; large quantities of which were mixed with the mortar at its original construction.

Might not some such method be adopted at the present day in order to prevent the ravages of vermin, and at the same time disinfect the atmosphere of our living rooms? A Frenchman has recently discovered that saw-dust used for plaster is preferable to sand for interior work; and as the dust from many woods has a peculiar and not unpleasant odour, the air of our rooms may yet appeal to the nasal organ through other means than that of sour paste. A design for a drinking-fountain was recently submitted to the club, where dolphins and ugly nondescripts spurt forth the water from their ears, nostrils, and mouths. This design was unanimously pronounced unfit for the purpose; as it was admitted that no one would in reality drink water ejected by such animals as were depicted. A number of similar examples of bad taste were alluded to and highly censured.

The members of the club were regaled at a sumptuous repast a few days ago, at the expense of the chairman, who took advantage of the occasion to treat us to his views upon the decoration of domestic crockery. He advocated for this purpose the Arabesque or Persian characters; but in any case a more conventional treatment than is at present in vogue. He illustrated his remarks by observing that "the dainty morsel which he held upon his fork he had just taken from the depths of an umbrageous forest." In fact, we were all cutting up our victuals in the most ludicrous positions,—from the midst of landscapes, farmyards, battles, heroes, and so forth. I constantly found myself taking succulent morsels from the tip of great Cæsar's nose, as a portrait of that renowned individual adorned my plate.

Another member read a paper upon tramways, in which he suggested that in streets occupied by private dwellings the lines should be laid down close to the curb of the pavement, so that the passengers could enter and alight as from a railway platform. This would permit the ordinary street traffic to monopolise the crown or the centre of the road. I am afraid, sir, that I have already trespassed too much upon your space; but I shall be pleased to give you another account upon some future occasion as to the further proceedings of our club. I am quite sure that, if the influential inhabitants of various localities were to form themselves into æsthetic clubs, they would, by promulgating the principles of true taste, and encouraging original suggestions upon practical matters, do much towards embellishing and improving their districts, and be as great a benefit to their respective communities as our club is to Slopperton.

ÆSTHETIC.

PROPOSED SINGLE-SPAN HIGH-LEVEL BRIDGE ACROSS THE THAMES.

At the meeting of the Metropolitan Board of Works on the 22nd inst., a report of the engineer, Sir J. W. Bazalgette, to the Works and General Purposes Committee on the proposed new bridge over the Thames, was presented. In the course of this report the engineer said:—I reported to the committee that, in my judgment, Little Tower-hill, between the Tower and St. Katherine's Wharf, on the north side of the Thames, rather more than half a mile below London Bridge, was the position best suited for the new bridge, and that the approaches to any other bridge at a lower point would be very inferior to those obtainable near the Tower, and would be seriously interrupted by the St. Katherine and London Docks, with their opening dock entrances. The width of the river at the proposed point of crossing is about 850 ft., its surface is to a large extent occupied by vessels moored in tiers, and so far as has been ascertained, about 24 masted vessels per diem pass up and down the river between the Tower and London Bridge; about two of these have masts reaching over 80 ft., four over 70 ft., and six (or one-fourth of the whole number) over 65 ft. above the water level. To enable these ships to pass up the river to London Bridge the new bridge must either have an opening, in order that the vessels may pass through it, or it must be constructed at such a high level that they could pass under it. After considering the objections raised by Mr. Leach, engineer to the Thames Conservancy, against a low-level opening-bridge, such as that designed by Mr. Barnett, the engineer goes on to say:—The interruption of the road-traffic over the bridge during the passage of the vessels would be a very serious inconvenience; and though the time occupied on each occasion of clearing the traffic off the opening section of the bridge, opening it, passing a ship through it, and closing it again, has been estimated at a few minutes only, the time would frequently exceed that estimate, and the uncertainty as to time attendant upon such stoppages, occurring forty-eight times daily for the passage of the vessels, would be a very serious drawback to the utility of any leading metropolitan thoroughfare. An opening-bridge would be bad for the navigation and bad for the street-traffic. These conditions have rendered it necessary to consider the practicability of constructing a high-level bridge, and its comparative advantages and disadvantages; and it appears that if the masted vessels which have topmasts exceeding 65 ft. above the water level, being one-fourth of the total number, would lower their topmasts, a high-level bridge might be constructed which should give a clear headway for all ships to pass under it, and which might be provided with convenient approaches and gradients. On December 5th last I had a conference with the City architect, who showed me his plans for a low-level bridge, with an opening for the passage of vessels through it, in accordance with the conclusions of the Special Bridge or Subway Committee of the Corporation, dated May 17th, 1877. The City architect did not wish those plans to be considered as his matured and adopted views, but rather as forming part of his own studies in working out the subject. I am unable, therefore, to report to the committee upon them. In order to enable me to comply with the portion of the resolution directing me to report generally my own views upon the subject, it has been necessary to prepare plans and estimates of various designs for solving this important engineering problem. The City architect, in his report to the Special Bridge and Subway Committee, of May 2 last, has shown that the descent into a tunnel under the river opposite Tower-hill would be equivalent to the ascent to a high-level bridge, with a clear headway of 82 ft. 6 in., and that its cost would be from 1,500,000*l.* to 2,000,000*l.* Now, unless it can be shown, as it cannot in the present case, that a subway presented considerable advantages in its approaches, or in cost, over a bridge, or that a bridge could not be formed without serious interruption to the navigation, it would be difficult, if not impossible, to justify the carrying of one of London's main thoroughfares for more than a quarter of a mile through a tunnel, the ventilation and lighting of which must be more or less defective. The steepest road approach to a high-level bridge, such as I should propose, would be on the Surrey shore, the inclination of which would be 1 in 40. On the north side the inclination would be 1 in 50 to 1 in 60. This approach would rise from King-street, over Little Tower-hill, and would give direct access to the river by the shortest route from the Minories, Royal Mint-street, and all the northern and eastern main thoroughfares in that neighbourhood. The roadway would be 40 ft. in width, and a footway 20 ft. wide would rise by the side of it from Little Tower-hill up to the bridge. The southern approach would commence at the Board's Tooley-street improved thoroughfare east of Queen Elizabeth's Grammar School, thence it would rise by taking one turn and a half round a spiral curve, about 300 ft. in diameter, at the back of the Anchor Brewery, and thence on to the bridge at Hartley's Wharf. By this arrangement the traffic over the bridge would start from, or be delivered on to, a wide arterial thoroughfare about to be formed close to the river, by which it would be placed in communication with all the other parts of London in the most convenient and direct manner. The length of a direct route from Tooley-street on to the bridge would be 240 yards, whereas the length round the spiral road would be 714 yards, or 474 yards, which is about a quarter of a mile longer, so that it would occupy carts travelling at the rate of three miles an hour an extra five minutes, or cabs travelling at the rate of six miles an hour two minutes and a half more than if the road were level and direct; and it must be borne in mind that it is only in travelling from south to north that the rise would have to be surmounted, and that on the return journey it would be a descent. Foot-passengers would go by the direct and shortest route, ascending at an inclination of 1 in 14, which is rather easier than the footway approach to the south side of Charing-cross Bridge. At other points footway communications would be made by steps between the bridge and various adjoining wharfs. There would be an actual saving in distance travelled on the double journey of a mile and a quarter for all the carriage traffic coming from the east by Upper East Smithfield and Royal Mint-street, and going east, taking the new route instead of going round by London Bridge. Carriages would, moreover, have a clear route and avoid the constant blocks in Great Tower-street, Eastcheap, London Bridge and Tooley-street, and at the same time all those streets would be relieved of the additional crowding from traffic which is foreign to them, and which, by being carried through them is unnecessarily destructive to the despatch of business within the City and beyond it. The traffic by the London Bridge route has now, moreover, to be drawn at about a fifth of a mile with gradients as steep as from 1 in 20 to 1 in 45, 430 ft. of this being 1 in 20. For traffic coming from the north and north-east of Aldgate, by way of Fenchurch-street and Gracechurch-street, and going east of Tooley-street, the above conditions would remain the same, excepting that the actual distance saved on the double journey by the new route would then be only a little over six-tenths of a mile. Taking Aldgate as an intermediate point between the

two bridges on the north side, and the Bricklayers' Arms Station as the intermediate point on the south, the route travelled would, so far as distance is concerned, be practically the same over either bridge, and the traffic would have the choice of two routes. By London Bridge the vehicles would pass over a steep gradient for a short distance; by the Tower Bridge, over a better gradient for a longer distance. By the dispersion of the traffic into two separate routes the crowding would become halved, and both routes would thus be rendered more useful; and it would be difficult to devise other means by which the crowding of the arterial lines which pass through the City would be more effectually relieved. The saving in time would be far greater than the mere saving of the distance travelled. The saving in distance to foot passengers in the first case would be about a mile and three-quarters; in the second instance over a mile; and in the third case about half a mile, because they would not travel round the spiral curve, but go direct. These approaches would be available for any description of high-level bridge, and as the formation of them, and the purchase of the property occupied by them, form the most serious items in the cost of the bridge I have availed myself of the kind assistance which Mr. Vulliamy offered me, and have obtained from him an estimate of the cost of the purchase of the property required, viz.:—Net cost of property required, 700,000*l.*; cost of forming approaches, 150,000*l.*,—total cost of approaches, 850,000*l.* The accompanying plans show the position of the bridge and its approaches, and of the tiers of shipping in this part of the river. Such a bridge could be formed in three spans, with two piers placed in the river in the line of the present tiers of shipping, so as to give a clear width of navigable waterway, in the centre of the river, of 444 ft., and two side openings of 184 ft. each, or the river could be crossed in one span of 850 ft. I have considered the relative suitability of various forms of bridges, viz., suspension bridges, girder bridges, and arched bridges, and of the material of which such bridges could most advantageously be constructed. I am of opinion that a trussed girder bridge of one span, in an arched form, with the roadway carried across the arch, and suspended from it, will probably afford greater advantages than any other sort of bridge. I estimate that the cost of a bridge of 60 ft. wide, of three spans, including the cost of forming approaches and the the purchase of property required, would be within 1,000,000*l.*, whilst the cost of such a bridge in one span, which I should prefer, would be within 1,250,000*l.* The Works Committee of the 4th of March having directed that I should add to foregoing report some designs for the proposed bridge, I submit herewith three designs for consideration. The new design is for a braced arched bridge, crossing the river by one span of 850 ft., having a rise equal to one-eighth of its span, the roadway passing through the arch, and being partly above and partly below its soffit. The two other designs are for a bridge of three spans, and are of the straight girder form, one being a trussed girder bridge, and the other of a composite cantilever and girder construction, the central span in each case being 444 ft. I recommend the adoption of the one-span bridge, subject to such modifications of its details as may hereafter be deemed desirable.

With reference to the above the Works Committee reported:—"We are of opinion that the design for a bridge of one span, being No. 1 in the report of the engineer, is the one most suitable for the purpose, and recommend that it be referred back to them to consider and report as to the ways and means to be adopted for carrying out such a work."

Mr. Roche moved the adoption of the report.

Mr. Munro seconded the motion, pointing to the large increase of population in the districts of the proposed new bridge, and expressing a hope that the adoption of this report would prevent the Corporation from disfiguring London Bridge, which he described as a beautiful structure.

Mr. Richardson predicted that in course of time they would have to add to the number of the eastern bridges over the Thames.

Mr. Tolhurst, like the last speaker, supported the report, adding that the gradients of the approaches to the new bridge would be less than those of Tooley-street, near London Bridge.

Mr. Rogers believed the public and the engineers of London would approve the design of Sir Joseph Bazalgette for this bridge.

Mr. Fairclough bore testimony to the necessity for the proposed bridge.

After some observations by Mr. Lloyd, Mr. Freeman, and Mr. Runtz,

Mr. Deputy H. L. Taylor remarked that the report of the engineer did him great credit; and went on to say that the question was one only of ways and means. Mr. Roche had omitted to say that the Corporation had taken great interest in this subject; and he thought that if the two bodies acted together there would be no difficulty with regard to it. There was a disposition on the part of the Corporation to appropriate a portion of their funds in providing an eastern bridge. He sympathised with the member who expressed a hope that the Corporation might find it unnecessary to disfigure London Bridge in the way contemplated.

The motion for the adoption of the report was agreed to.

THE JUBILEE OF ST. LEONARD'S.

The "Belgravia" of the borough of Hastings, St. Leonard's, Sussex, has just celebrated its Jubilee, and if its founder, the late Mr. James Burton, architect, could but have realised the fact of his desert of fifty years back becoming the seat of palatial mansions, imposing terraces and streets, as well as an important and thriving town, that distinguished man would have felt proud.

Some interesting facts came to the surface upon the occasion of the Jubilee. The site upon which this modern city-upon-the-sea is built formerly belonged to a family named Lewes, from whom it came to the Eversfields. Of these latter Mr. James Burton, with a prophetic eye to the prosperity of the future, purchased the land; and, although then considerably on the shady side of sixty, proceeded to put into operation as bold a scheme of building as perhaps was ever attempted in those days.

And about Mr. Burton's selection of St. Leonard's as his new town, there is recorded this extraordinary circumstance, that he was moved to the venture by a dream which he had had, and which is well authenticated from the founder's own lips. Mr. Burton for some time had had a desire to plan out and build a town by the seaside, according to a cherished idea. One night, while possessed of the notion, he had a singular vision. He dreamt that he had found the long-desired site. He rose from his bed with the dream so vividly impressed on his mind, that he at once proceeded to plan upon paper the outline upon which St. Leonard's was subsequently built. Mr. Burton went some time after this upon his summer tour along the south-coast of England, and arriving at the desert west of Hastings, fixed upon the very spot as the veritable site of his dream. At this time Hastings was shut out of the view of the site of the desert of the west, by the cliff known as the White Rock, about a mile in length, and at certain tides the road was impassable from incursions of the sea. It was Mr. Burton's object to create a separate and distinct town, and the rock or cliff, as well as the sea, favoured his views. These obstacles have, however, since disappeared, and Hastings and St. Leonard's are now conjoined as though they were one.

A very serious matter tended to mar the pleasure of the Jubilee, and which threatens, at the next great storm on the coast, to do immense damage to Mr. Burton's marine city. It appears that for three months past there has been a gradual thinning and narrowing of the beach off St. Leonard's, until the foundations of the sea-wall have become injured in several places; and had some of the great storms that frequently visit the Southern Coast have occurred this winter, the breaches already made would have led to disastrous consequences. Measurements taken by the editor of the *St. Leonard's Gazette*,—to take only one point as an illustration,—show that before the new west marine wall was built the width of beach between the parade wall and "stone foot," just eastward of the archway, was over 60 yards. It is now reduced to only 18 yards!

Society of Painters in Water-Colours.—The following gentlemen were elected Associates of the Society of Painters in Water-Colours at their annual general meeting on Monday:—Messrs. W. E. Lockhart, R.S.A.; Tom Lloyd, Norman Tayler, and Henry Wallis. Mr. G. H. Andrews has been elected a member.

THE VENTILATION OF LAW COURTS AND OTHER BUILDINGS.

The writer of the article in the *Times* of the 16th inst., upon the above subject, appears to have decided for himself, and would fain impress upon others, that the only proper system for admitting fresh air into a crowded room is that of Whitehurst, published in the year 1794,* and reported to have been successfully used at St. Thomas's Hospital and elsewhere. This system has recently been patented and re-introduced by the late Mr. Tobin, and is asserted to have been most satisfactorily applied at St. George's Hospital. The strong family likeness between the diagrams and descriptions of the publication of 1794, and the specification of recent date, not to mention the circumstance of each being introduced to the public through the medium of a noted London Hospital, are suggestive, at least, of close relationship. That the so-called Tobin system owes very much of its popularity to former favourable notices in the leading journal is not to be doubted, and my object in writing to you, sir, is to protest against the assumptions in the article of the 16th inst. That the vitiated air of a crowded room or court having risen with its deleterious gases and objectionable odours to the upper part of the room is not to be permitted to follow its inclination, and escape by suitable up-cast channels, passes my apprehension. The provision of such channels supplemented, if need be, but only in exceptional cases, by artificial heat, to increase their exhaustive powers, should be a matter of no difficulty whatever in designing new buildings, and it is hard to conceive any insuperable difficulty in dealing with buildings already erected. To direct upwards into this heated mass of impurities cold streams of air, with the admitted object of bringing them down for a second inspiration, does appear to be a most unscientific mode of mitigating,—certainly not of overcoming,—a great and poisonous evil. Now the introduction of this system, with partial success, into rooms wherein the provision for ventilation has either been wholly neglected or attempted upon wrong principles, must not be taken as proof of its superiority over other long-tried and efficient systems.

It appears to be admitted by the writer of the article referred to, that the efficacy of this vertical system of cold air supply depends upon the difference between the external and internal temperatures, and it follows that its best results will be attained at the moment when a crowded room is at its hottest and most objectionable condition. But as the object should be, by a continuous supply of fresh air, to prevent such condition arising, it would seem, to use the writer's own illustration, that the incoming air would then "curl over the mouths of the inlets, and, falling to the floor, cause draughts."

The author of the article in question is perfectly right in stating that artificial warmth, no less than filtration, should be administered to the incoming air. But neither of these requirements can be efficiently combined with this system of vertical tubes supplying cold air. Both, however, have been applied to many buildings with more or less efficiency, and it would seem desirable that the persons employed by Mr. Gerard Noel should investigate and report what improvements are capable of being made upon the best arrangements extant. In so doing it is to be hoped that they will not be misled by the erroneous views of the writer in the *Times* regarding "the whole system of exhausts," or the "sinking down of carbonic acid by reason of its great specific gravity, as soon as it loses the heat which it received from the body." I am no chemist, but I remember many years ago one of the most distinguished of that profession ridiculing an argument for the withdrawal of vitiated air from the *lower part* of a room,—where the air is usually the purest,—upon any such fanciful theory.

Those who have had the largest experience in the ventilation of crowded rooms will admit that the chief difficulty is not in the "exhausts," which are always most properly placed at the highest part of a room, and which may be rendered more efficient either by direct fire heat or by that from steam or hot-water pipes, Bünsen gas and air burners, &c. But the admission of a really sufficient quantity of fresh air without draught, and at a proper temperature, demands the greatest care, and regard being

* Observations on the Ventilation of Rooms, from papers left by John Whitehurst, F.R.S. By R. Willan, Bent, Paternoster-row. 1794.

had to the dispositions of persons within the room, and their occupation, the more widely the fresh air is distributed, as a rule, the better the result.

Consideration for your space constrains me from enlarging upon the fatuity with which even educated persons submit to have holes punched in external walls, handsome windows disfigured by ventilators and other contrivances, in the hope of expelling hot air from the upper parts of rooms. If these be the "so-called exhausts" of the writer in the *Times*, small blame to him for deprecating them! How frequent, too, is the observation,—"This large room cannot require a special air supply"; the objector ignoring the obvious fact that every foot of air exhausted by a chimney or other ventilator must first find entrance to the room. Forgetfulness of this self-evident fact, coupled with tight joinery, causes many smoky chimneys in new houses. This is frequently proved by the subsequent shrinking of the woodwork, and consequent supply of the needful air producing satisfactory chimney-action. How many unsightly chimney-tops might be swept away, if, before resorting to them, people would first remove *the many impediments* which seem to be introduced solely to prevent the fulfilment of Nature's law, that heated gases will freely rise unless by ignorance obstructed. D. O. B.

LAMPLIGHTING BY ELECTRICITY.

THE paper recently read by Mr. St. George Lane Fox, before the Society of Arts, is deserving of more than the cursory notice devoted to it in the brief paragraph on p. 308 of our last week's issue. The lecturer said that when the subject of automatic gas-lighting was first taken up some years ago, it was known that a fine platinum wire rendered incandescent by the electric current would ignite a stream of gas, and it was naturally thought that there would be no difficulty in applying this agent to the lighting of street-lamps. The sunlights in many large buildings were lighted by a current of high tension electricity conveyed to the burner by means of insulated wires, and in all such cases the gas was turned on and off at the main by a separate process. When, however, it was attempted to convey a high tension current to any great distance the greatest difficulties had arisen with respect to the insulation of the wires, and as therefore the method was not available for producing a large number of incandescent platinum wires in circuits of great length, and of accordingly high resistance, the system was found to be impracticable for street-lighting. Various ingenious experiments had been made without success, but the method which he proposed was to apply and utilise electricity alone as the agent for turning on, lighting, and extinguishing gas. To do this a small compact apparatus was required for each of the lamps, which would all be connected with an insulated conductor, so that, starting from a central station, a wire would travel through each of these machines and back again to the station. He had succeeded in producing the ignition of gas at numerous points and at considerable distances by accumulating and storing the electric current in a condenser, composed of glass plates and tinfoil, in alternate layers, and then suddenly bringing the whole of the power so stored upon the circuit, by which means all the lamps were instantaneously lighted. The process of turning on the gas by the same current was simple. He made use of the soft iron core in the centre of the induction-coil to produce a reciprocating horizontal motion of a permanent magnet suspended upon needle-points just above, and this was connected with a stop-cock, turning upon a surface lubricated with glycerine or oil of bitter almonds, so that the gas-supply was at once acted upon, and by the reversal of the current the magnet was moved in the contrary direction, and the gas turned off. The whole of the apparatus was enclosed in an air-tight metallic case, about 2½ in. in diameter by 2½ in. high, and which was screwed on to the supply-pipe in the lamp, the insulated conductor or line of wire being carried down the interior of the lamp-post, and laid underground, except in such cases where an overhead line was admissible. He believed, from the results of the experiments he had been enabled to carry on at the Fulham Gasworks, with a large number of lamps, in a circuit of half a mile in length, that there was no reason why the system should not be applicable to the lighting of the lamps in large towns. In any district of, say, 2,000 or 3,000 lamps, there should be a central station, from which the wire would proceed in every direction, so as to command a number of distinct circuits, and all that would be necessary at the central point was the machine for producing an electric current by mechanical means, and from which a powerful discharge could be obtained by simply turning a handle, and then by a switch arrangement the current could be applied separately to each of the circuits.

In the course of the discussion which ensued it was elicited that about 30s. or 40s. would cover the cost of applying and maintaining the apparatus to the street lamps, and even with this preliminary expense it was expected that a large saving would be made if the system was universally applied in any large district. A public exhibition of the process would shortly take place in Pall-mall, as it was intended to fit up the lamps in that thoroughfare, and to light and extinguish them by the means advocated by the lecturer.

Professor Tyndall, in proposing a vote of thanks to Mr. Lane Fox, said that when that gentleman first mentioned his ideas on the subject some years ago, he (the professor) had said that the idea would require much working out, and he had hardly expected to witness that evening the success of the scheme. He congratulated the lecturer upon the knowledge and mechanical skill which he had brought to bear upon the subject, and he believed that the meeting that night was disposed to give every encouragement to the extension of the system, and that even those gentlemen who had urged that a more economical application of the scheme was necessary had not done so in any carping spirit of objection. The successful nature of the process was demonstrated by a number of the lamps fitted up in the lecture-room, and which were lighted and extinguished by the electric current.

THE LATE SIR G. GILBERT SCOTT, R.A.

WE write these words with extreme regret, as well on private as on public grounds. Sir G. Gilbert Scott died at his new residence, Courtfield House, South Kensington, on the 27th inst., in the sixty-seventh year of his age. In our next we shall give some particulars of his life and works.

THE EXCAVATIONS AT OLYMPIA.

FROM the latest report of Dr. Treu, respecting the excavations at Olympia, we learn that numerous discoveries in the way of inscriptions and architectonic monuments have recently been made by the German party engaged there. In the west front of the Temple of Zeus another Centaur head, and numerous small fragments of the group on the west gable, have been dug up. Numerous fragments of the statues of the gable and many bronzes, have been found after turning over the large blocks which had fallen down from the temple and been scattered over the ground, and after the spots on which they had rested were dug up. One of the most valuable pieces found is a bronze inscription dating from the sixth century, B.C. It is in the dialect of Elis, and relates to the rights of citizenship being conferred on the "Chaladrians," a race hitherto unknown. This inscription is the oldest of all yet found at Olympia.

A telegram despatched from Pyrgos on the 21st inst. announces another important discovery at Olympia. It says:—"In front of the Exedra a large marble bull with dedicatory inscription of Regilla for Herodes' aqueduct." This is a decisive confirmation of the statement in Lucian that the Sophist Herodes Atticus had built a splendid aqueduct for the Olympian games, as well as for the ordinary daily requirements of Olympia. Whether the bull stood in architectural connexion with the great exedra which was likewise built by Herodes, and which was discovered last year, and yielded up a treasure of sixteen marble statues, remains for further investigation to settle.

PROJECT TO CONNECT BERLIN WITH THE BALTIC AND THE NORTH SEA.

AT a recent sitting of the Berlin Polytechnical Society, amongst other matters, the latest of Dr. Stronsberg's projects, which consists in making Berlin an inland port both of the Baltic and the German Ocean, gave rise to a lively discussion. Unlike many of the great speculator's high-soaring plans, the practicability of such a project met with general recognition. Technical difficulties of an insurmountable nature would not have to be encountered in a canal from Hamburg to Berlin, and thence to the Baltic. The Berlin pavement lies 105 ft. above the Baltic, and the difference of the levels of the two seas is not so very great. The ships would have to ascend about 95 ft. from Hamburg to Berlin. Such a rise in sluices could easily be overcome by modern engineers, especially as the sluices might be concentrated at certain points. There would be no want of water, and the distances are not so very great. The only question which requires careful investigation is, whether the canal would pay. This has already been answered in the affirmative, for Berlin is now the centre of an important commerce. For these various reasons, it was considered unwise to reject the project without further consideration.

DORSET INDUSTRIAL EXHIBITION, 1878.

THE county of Dorset is to have an Industrial Exhibition. Lord Shaftesbury has consented to be president, and nearly all the nobility of the county have given in their names as patrons. The rector of Melcombe Regis has given his consent to hold the Exhibition in the Melcombe Regis School-rooms. A schedule of prizes, varying in amount from 5s. to 4*l.*, has been prepared, with silver medals for manufacturers. The Exhibition is strictly confined to the county of Dorset, and we think it is likely to promote industry and frugality. The prizes offered for competition are in value 400*l.*, and a guarantee fund of 200*l.* has been raised in case of a deficiency. The general secretary is Mr. W. Mordaunt, Thiselton. We heartily wish the Exhibition scheme every success. It is proposed to hold the Exhibition from July 24th to August 7th, at Weymouth.

THE GREAT NORTHERN COMPANY'S NEW STATION AT KING'S CROSS.

WIDENING THE LINE.

THE construction of the new station of the Great Northern Railway at York-road, King's-cross, which has just been opened, has involved a heavy amount of engineering work, and absorbed a large area of land and property on the east side of York-road. The new station and approaches to it, together with the cab-stand, occupies an area of about an acre in extent, which had to be excavated from the level of York-road down to the railway level, a depth of 20 ft., several thousand cubic yards of earthwork having been removed before the works were commenced. The station buildings are about 400 ft. in length, and in addition to spacious booking-offices, contain a general waiting-room, ladies' and gentlemen's waiting-rooms, cloak-rooms, together with several offices for the servants of the company. The main platform is 650 ft. in length, having an average width of 25 ft., the northern portion of the platform being 40 ft. wide, and extending to the mouth of the new tunnel running parallel with the old Maiden-lane tunnel, which has been constructed in order to provide an additional double line of rails for the accommodation of the main line and suburban traffic. The platform is covered in to its entire length by an ornamental flat roof, supported on iron columns and brackets, about one half of the roof being of glass. The roof of the station building, which is a neat structure in white brick, is also flat. The station is approached from York-road by an inclined plane, and on the east side, in the centre of the building, there is an open area through which the platform is reached from the cab-stand for the purpose of conveying passengers' luggage to and from the trains. On the west side of the Great Northern Company's line, immediately opposite to the new station, there are large gasworks, with access from York-road by a roadway across the station supported on iron columns and piers, upon which

rest massive iron girders, and in the construction of the new station this roadway has had to be extended eastward to the extent of more than 50 ft. in length. The new tunnel is entered immediately on leaving the station northwards. It is 627 yards long, and passes under the Regent's Canal and the company's potato market, emerging near the goods station, where it forms a junction with the main line. The construction of this tunnel and the new York-road Station will considerably relieve the main line station at King's-cross, as the suburban traffic is intended chiefly to be despatched from the first-named station.

The whole of the works have been designed by Mr. Johnson, the company's chief engineer, and carried out by Mr. Claringbull, the resident engineer, the contractors being Messrs. Firbank & Co.

NEW RAILWAY STATION AT BIRKENHEAD.

ON Monday next (April 1st) there will be opened for traffic, at Birkenhead, a new terminal railway-station, which may rank among the most extensive in the kingdom. For about forty years the terminus for the Birkenhead and Chester Railway, which rendered the system of the Great Western accessible to Liverpool, was at Monk's Ferry. The station was, in regard to its accommodation, perhaps quite adequate at the time of its erection. Birkenhead was then little more than a large village; it is now a Parliamentary borough, and a very populous incorporated town. The premises at Monk's Ferry were, further, dark and gloomy in appearance, and inconvenient and dangerous besides. These defects were rendered more conspicuous by the splendid accommodation recently supplied at the neighbouring ferry at Woodside,—one of the finest ferries, perhaps, in the country,—the "port," so to speak, of Birkenhead, and the point to which most of the cross-river raffic converges.

The new buildings erected by the joint railway companies, that is to say, the Great Western and the London and North-Western, occupy a site which will afford much greater railway facilities to the borough of Birkenhead, and materially improve the service of trains communicating between the counties of Lancaster, Chester, and North Wales. The station has appropriated the whole of the south side of the Birkenhead approaches to Woodside ferry, as far as Chester-street. It covers more than four acres of ground, and has a frontage of about 350 ft. The ground was purchased from the Birkenhead Commissioners, and was formerly used by Messrs. Clover, Clayton, & Co., for shipbuilding purposes. Owing to the contour of the street, the building has a slight curve at its western extremity. It is built of pressed faced bricks, manufactured at Ruabon, whose bright red finds effective relief in the whitish yellow of the facings, which are of Stourton stone. The Gothic style has been followed in the design of the building. The covered portion is about 380 ft. in length, and the height in the part appropriated for offices for the engineer, secretary, and other officials, is 33 ft. The building, indeed, dominates all the other erections in its vicinity, and is a prominent object, viewed from the Liverpool shore. The interior walls are diversified throughout by pilasters and their interspaces, and by many circular and other designs in chiselled stone.

The roof is a light ornamental one, of two spans; one 98 ft. across, and the other 91 ft. broad. The main principals are in the form of a segment of a circle, with suitable bracing and tie-rods to relieve the walls and columns carrying the roof from pressure, and to resist the straining caused by heavy gales and storms,—the situation being much exposed. These principals are placed at a distance of 25 ft. apart, and between each are a series of purlins and intermediate principals for carrying the covering of the roof. The principal feature of the roof is its alternate longitudinal sections of skylights. The glazing was done by Mr. W. E. Rendle, of Westminster, on his patented system, which does away with the use of the ordinary vertical sashes, all of them being horizontal, with a lap-joint. The alternate skylights and the zinc-covered boarding form an arrangement which admits to the interior an ample supply of natural light. The iron columns which support the arches at their meeting-point in the centre (resting at the other end on the walls of the ling) are of a decorative character.

The platforms are very spacious; there are five of them, each of which is 580 ft. long and 25 ft. in width. They enclose two central sets of rails, each containing three pairs of lines, a siding-line being placed along the west wall of the building. Near the same wall a space, 25 ft. wide and 200 ft. long, has been appropriated to the purposes of a cab-stand. A new approach-road, or walled descent, 20 ft. wide, has been constructed from Rose-brae, adjoining some graving-docks, and over a portion of it a roof has been erected, under which carriages and cabs may set down passengers, without exposure to the weather. In the open space between Church-street and Rose-brae, to the south of the main departure-platform, are the requisite horse and carriage landings, with a large turntable for turning the engines.

On the southern side of the station are ranged the booking-hall, first-class and second-class refreshment-rooms, engineers' offices, lavatories, and rooms for officials; the telegraph and stationmaster's offices being located in the eastern end of the station. An immense clock-face is a conspicuous object in the upper part of the south-eastern wall.

The booking-hall is one of the principal features of the station, being handsomely decorated and elaborately finished. It is 73 ft. long and 37 ft. in width, and displays the same pleasant contrast of red brick and lighter stone-dressing as the station itself. The roof is arched. Several gas-pendants, of chocolate-colour picked out with gold, have been supplied by Messrs. Freeman & Collier, of Manchester.

Both refreshment-rooms have been let to Messrs. Browning & Wesley, of Paddington, London.

The station and its approaches have been in course of construction for the past three years. In the earlier stages of the work much time and labour were spent in excavation; the solid rock had to be broken and dug out for a considerable distance, and in this operation some unavoidable delays occurred. In order to give stability to the structure a depth of 40 ft. was gone to, in order to rest the foundations upon a rock. In the construction of a tunnel required, delay was occasioned by the collapse of a portion of the road under which it passed. Only one or two fatalities have occurred during the progress, and these in the latter stages of the work.

The works were designed and executed under the superintendence of Mr. Robert E. Johnston, C.E., of Birkenhead, the engineer to the joint companies. He has been assisted by Mr. J. Atkinson, second engineer. The contract for the station has been carried out by Mr. Edmund Gabbutt, of Liverpool; that for the tunnel by Mr. S. C. Ridley, of Birkenhead; and that for the roof by the Bridge and Roofing Company of Darlaston, South Staffordshire. The plumbing, painting, and sanitary arrangements were undertaken by Mr. A. Wilby; while Messrs. Braby & Co., of London and Liverpool, executed the zinc-work. The station has been inspected by Major Marindin, for the Board of Trade, and the whole of the works have been formally passed.

A FEW GOOD WORDS FOR THE CARTERS.

OF late years, contractors, builders, stone-masons, timber-merchants, and other kindred trades, have vied with each other in the quality and value of their draught-horses, hundreds of which in the metropolis are magnificent beasts to view, both for immense size, good looks, valuable strain, and elephantine strength. Many of these horses have been bought from the Lincoln, Yorkshire, and Norfolk breeders, as well as Flemish, at an average cost of 100 guineas. These horses are unlike the old-fashioned slow plough-horses of two to three miles the hour, urged along with the whip and "Gee along, Dobbin,—come up and gee woa." The present race require no such incentives, but step out with tons weight behind them at a walking pace of four to five miles the hour, and can trot home with empties from six miles to eight miles the hour, so that double the work is got out of these valuable cattle at the same working cost of a lazy slow horse of former times.

To tend these horses a superior class of carters is necessary, and the care and pride most of these men take in their horses are well known in London. The cattle are well groomed, and their coats are as sleek and clean as carriage-horses. The corn and hay, if allowanced by masters, are not stolen from the stables, as in former times, but the proud carter, out of his own pocket, gives his horse carrots, apples, bread, lump sugar, and aniseed. He buys his cattle blue ribbons, Oxford or Cambridge, and decks his favourites like unto a recruiting sergeant. His whip may be heard to smack, but not on the flanks or buttock of his horse,—it is the concussion of the lash through the air. His horse knows what is wanted of him by his carter, and cheerfully and intelligently obeys his master.

If he reaches a steep hill with a heavy load—watch him at Highgate or Hampstead Hills—the good carter waits at the foot until a team comes down, and out of his own pocket stands a pot of beer for the loan of a horse or two to help draw up the hill. No acts of cruelty to horses by carters now come before the police-courts, or very few are reported. And all this humane feeling arises from pure love of horse-flesh, not from regard to the interests of employers, who think more of their horses than they do for their carters, who are at stables an hour earlier than other labourers, and who, wet through and tired out, have to stable the cattle long after other men have reached home. And all this for an average wage of 22s. to 25s. a-week. On the Sundays, too, half the day is spent at stable. The harness is then polished up for the week, and, may be, the wagon as well. As a whole, carters are a temperate, intelligent, civil, and honest body of men. They must know town well, railway-work, crane-work, loading and unloading. Is it too much to hint that builders' carters deserve more kind consideration than sometimes falls to their lot?

BUILDING ON PARISH LAND AT PLAISTOW.

THE Rotherhithe Vestry are the owners of a considerable area of ground at Plaistow, consisting of several acres, for which at the present time they only receive a comparatively small rental. The land is favourably situated near the Plaistow railway station, where building is now taking place on a large scale, and as the lease of the land is about to fall in the vestry think that the time has arrived for letting it for building purposes, by which they will obtain a much higher sum for it than they have hitherto received. At the last meeting of the vestry it was proposed that steps should be taken to let it on building leases, and it was suggested that a number of six-roomed houses would be the best adapted for the purpose. It was resolved to issue advertisements to let the land by tender, and the surveyor was directed to prepare a plan of the class of houses requisite.

THE DERBY FREE LIBRARY AND MUSEUM.

THE Free Library and Museum for Derby, which is being erected at the cost of Mr. M. T. Bass, one of the members for the borough, at an outlay of 8,000*l.*, is fast approaching completion, and will shortly be formally presented to the town by the generous donor. This is not the only public building which Mr. Bass has erected and made a present of to the borough, having already given free baths and a recreation-ground, in addition to which he has promised to subscribe 1,000*l.* towards the cost of a public park. The hon. member's liberality has likewise been shown in the building of a church at Burton-on-Trent, and he is now erecting a working men's institute in the same town. This is the way in which capital oppresses labour!

New Railway Station, Penzance.—The Great Western Railway Company is about to build a new station at Penzance. The main roof will cover the two platforms, and three lines of rails in the centre. This roof will be of iron, covered partly with glass and partly with zinc, having a raised lantern the whole length of the building for ventilation. The roof is designed in the shape of a semi-ellipse, having a span of 77 ft., and a total length of 250 ft. The difference in the levels does not admit of any pretentious style of architecture facing Market Jew-street; accordingly, nearly all the principal offices will face the company's new road. These offices will be built of "nobbled" stone-work, with a free use of granite quoins, and the roof is of wood, covered with Duchess slates. The work is to be completed in fifteen months from the signing of the contract.

THE FALL OF BUILDINGS IN THE HAYMARKET.

At the meeting of the Metropolitan Board of Works, on the 22nd inst., the Building Act Committee reported, with reference to the subject of the fall of two houses, Nos. 23 and 24, in the Haymarket, on the 17th of January, 1878, that they failed to see that any blame attached to the district surveyor, who, so far as any information had reached the Board, appeared to have properly discharged the duties imposed upon him by the Metropolitan Building Act, 1855.

Mr. Furniss moved the adoption of the committee's report, and the motion was seconded by Mr. Carr; but after some remarks from Mr. Fowler,

Mr. Roche said he regretted that this subject had not received more attention at the hands of the committee. If it was not a district surveyor's duty to see that houses did not tumble down in the manner in which these two houses tumbled down in the Haymarket, the sooner there was some alteration in the law, and the sooner district surveyors were made to understand the law, the better. Under the 31st section of the Act of Parliament, every building, and every work done to, in, or upon any building, was subject to the supervision of the district surveyor, and in this particular case he contended it was distinctly the duty of the district surveyor to have seen that the old party-wall, which was the cause of the accident, was of sufficient strength to bear what was put upon it. He for one would be no party to the "whitewashing" of the district surveyor in the way proposed.

Mr. Cuffin thought the whole system of district surveyors was becoming a scandal and a bye-word in the metropolis. A prevailing feeling was that it was simply an institution for the collection of fees.

Mr. Selway said it was just such remarks as those advanced by the last speakers as were likely to bring the system of district surveyors into disrepute. He warmly defended the conclusions arrived at by the committee in this matter, and contended that no blame could be imputed to the district surveyor in respect of the discharge of his duties within the scope and spirit of the Act of Parliament.

The motion for the adoption of the committee's report was carried on a show of hands by nineteen votes against five.

THE BUILDING ACT AND BUILDING ACCIDENTS.

Sir,—The powers and the duties of a district surveyor appear to be imperfectly understood by the general public,—these, I think, may be defined to be a "limited supervision" of buildings, so as to cause the rules and regulations of the Act to be carried out. He is not understood to perform the functions of a private surveyor, as regards details of construction or mode of construction, nor would this be practicable.

There is, I am afraid, a strong element of danger in trusting too exclusively to iron supports, as this material cannot be relied on; and to make a lofty superstructure depend on such supports is an indication of the public desire in the case of shops to have nothing to obstruct the view,—a very questionable proceeding.

To suppose that building operations can ever claim immunity from risk such as attend almost every operation of life, is an absurdity, but we reasonably desire to reduce that risk to a minimum. And in the investigation of such accidents it is most important that skilled and scientific persons only should form the jury, and that legal assessors should assist at the inquiry; some value might then be attached to such inquiries, which those of an ordinary common jury would not possess.

F.R.I.B.A.

Proposed new Railway in Wales.—A scheme is being matured for a new line of railway, to commence at Denbigh Station, run along the back of the town, and take several important villages, as well as the town of Bettws-y-coed, and terminate at Llanrwst. A distance of seventeen miles would be saved in the run to Chester. Quarries abound in the neighbourhood, and the traffic to Denbigh is now great; and, as this would be a most attractive route for tourists, it is believed the benefit to the district would be considerable, and the line a profitable one.

CASTS FROM THE ANTIQUE.

In reply to the Earl of Wharncliffe, who asked what answer had been given to the memorial presented by the Duke of Westminster to the First Lord of the Treasury recommending the establishment of a Museum of Casts from the Antique, the Earl of Beaconsfield said the Government had thought it best, as much inquiry would have to be made, that a Select Committee should be appointed to examine into the question of museums, and to which the consideration of the subject which had been brought under notice might be referred. His noble friend might be satisfied that the subject was under the attention of the Government, and should not be neglected. The noble earl asked him also whether a treaty had been made for an exchange of casts. Allusion had been made to what had been described as a convention for the purpose, to which his Royal Highness the Prince of Wales, who always took a leading part in the encouragement of art, gave the first impulse. That was not quite so, but a memorandum was drawn up in 1868, and was signed by sixteen princes of the reigning houses, who bound themselves to act as much as possible to exchange Classic and Mediæval works of art; and to some extent that purpose had been effected. There was no treaty, however, and he should think the object could be accomplished by diplomatic arrangement without treaties.

The desirability of establishing such a gallery has often been urged in the *Builder* and elsewhere.

KEYNSHAM CEMETERY, BRISTOL.

The mortuary chapels, which are now completed, are approached by a winding roadway, and are designed so that the carriages may stop under a large covered asphalted archway to put down the mourners, the Episcopal and Dissenters' Chapels being on either side. Above the archway in the roof is a bell-tower, 20 ft. in height.

The building is Gothic, built of Hanham stone, with Bath stone dressings. The roofs are covered with red and dun-coloured plain tiles; the lobbies and hearths are paved with encaustic tiles; the internal walls are plastered and distempered; the windows are glazed with stained glass, the four principal ones having angels in the centre portion of tracery; the chimney-pieces are of Caen stone.

The whole of the work has been carried out by Mr. Henry Sheppard, builder, of Keynsham, under the superintendence of Mr. Edward T. Boston, architect to the Burial Board.

CASES UNDER BUILDING ACT.

CHIMNEYS.

James Watson, a builder, was summoned at Hammersmith, before Mr. Bridge, by the district surveyor of Hammersmith, to show cause why he should not take down two chimney-breasts on the north side of Davisville-road.

The Surveyor said the defendant had built two stacks of chimneys against an old party-wall. The new work had separated from the old, causing a gap between of about 4 in., which had been plastered up with mortar.

The defendant said the chimneys were properly secured. The Surveyor saw them building, and allowed the roof of the house to be on two months before he complained.

The Surveyor explained that the fault was no developed until the brickwork settled, and then the new work separated from the old. It was not properly bonded together.

The defendant called Mr. John Scantlebury, a builder, who said he knew the requirements of the Building Act. He inspected the work that morning, and thought it was done very passable. He had seen work better done, and worse. There was no fear of it separating any further.

Mr. Bridge observed that an inch only would cause all the evil, as the work ought to be joined together. He ordered the chimneys to be pulled down, as prayed, within a month, and the defendant to pay 4s. costs.

ORANGE PEEL AND ITS DANGERS.

Sir,—It is unfortunately too well known what a thoughtless practice is carried on at this time of the year, of throwing orange-peel upon the footpaths and street pavements, and I cannot help thinking that if persons who are in the habit of doing so only knew what mischief they might possibly be causing to life and limb, they would desist from continuing it. There is scarcely a day passes now when I walk along the streets that I do not see large quantities of this dangerous material scattered about the footways; and I make it an invariable rule to constantly knock it into the road, and I think if pedestrians would follow out my plan in doing this little act, danger would be lessened.

Nathaniel Wateball.

SUB-CONTRACTORS.

At Guildhall, Messrs. Tilney & Moody, stonemasons and contractors, were summoned before Alderman William Lawrence, by John Martindale, under the Masters and Servants Act, for not paying him 1*l.* 15s., wages due. There was also a summons taken out by William White against Edward Leech on the same ground.

Mr. Knight appeared for Messrs. Tilney & Moody.

John Martindale said that he was employed by Leech to do work on some buildings opposite Liverpool-street station the week before last. He worked for a week, and his wages came to 2*l.* 5s., but on Saturday last Leech paid him only 10s., and promised him the rest on Monday. On Monday he and the rest of the men refused to go to work until they were paid.

Alderman W. Lawrence.—And quite right too.

Witness.—Leech then referred him to Mr. Tilney, and said that he was only Mr. Tilney's foreman.

Mr. Knight said that the defendants were the contractors for the building in question, but they had sublet the contract, for the labour only, of fixing the staircases, to the defendant Leech, and that it was he who had employed the two complainants.

Alderman Lawrence considered that it was a very hard case for these poor men to be deprived of their wages.

Mr. Tilney said he felt very sorry for the poor men. The facts were that they gave a sub-contract to Leech for the labour only of the staircases, they (Tilney & Moody) supplying the material. Leech employed the men, and he had overdrawn his account so much that they would not let him have any more, and he had not paid the men out of the money he had overdrawn. On Saturday last, when he received his money, he told the men he had not got any, when he had plenty to pay them. Finding the men would not work, they were obliged to take the contract out of Leech's hands and give it to another.

Alderman Lawrence said he should like to see Mr. Leech, and he was called on his summons, but he did not answer.

The Magistrate said that he had no alternative but to dismiss the summons, as it was clear that Leech was the responsible party; but there would be a second summons against Leech on the complaint of White, for his claim.

Mr. Knight, under the circumstances, did not ask for costs.

Mr. Tilney added that he sincerely sympathised with the men.

TRAMWAY COMPANIES' ROAD LIABILITIES.

ACTION BY A BUILDER.

Last week, in the Exchequer Division of the High Court of Justice, Mr. Barker, a builder, carrying on business at Stepney and Leytonstone, brought an action against the North Metropolitan Railway Company, to recover the sum of 16*l.* as compensation for injury to a van and its contents, whilst being driven from Stepney to Leytonstone in February. Whilst going along the High-street, Stratford, the hind wheels of the van "skidded," and were wrenched off, and it was alleged that the injury was caused by the defective state of the tramway.

The company's defence was that the accident had been caused by the negligence of the plaintiff, the van being defective and overloaded, and they denied negligence on their part, and also disputed the extent of the injuries sustained.

After hearing evidence on both sides, the jury gave a verdict for the plaintiff for the full amount claimed.

Fires.—At the Crown Lucifer Match Company's premises, 5, Bow-common-lane, Bow, a fire was caused by the overheating of a stove, and a drying-room, 20 ft. by 14 ft., was burnt out.—At St. Ann's Church, Birkenhead, when the Rev. Canon Knox was about to preach, it was observed that a portion of the roof was on fire, supposed to be caused by a defective flue. At the desire of the Canon the congregation quickly left the building, the only sign of panic being among the children, who were frightened by the flames. Some men mounted the roof, broke the slates, and poured water on the flames, but it was nearly three o'clock when the firemen had subdued the fire. Considerable damage was done to roof and walls by fire and water.—The "Engineer of the Work" writes to the *Times* of Saturday, as to the fire at Lord Petre's mansion, near Brentwood:—"The practical part of the work, including the flue, was completed last week, and the fire of the apparatus lighted for the first and only time on Thursday, the 14th inst. I have been upon the works this morning (Saturday), and may state that the fire was discovered in a floor two stories above the furnace, which makes it impossible that its origin can be be traced to either the hot-water furnace or its connecting flue. Supported by these strong proofs, I am convinced that some other cause must be sought for to account for the calamity."

THE SECRETARYSHIP OF THE INSTITUTE OF ARCHITECTS.

Sir,—As it is known to a good many members of the Institute that I was one of those who applied for the post of Secretary, I shall be obliged if you will allow me to mention that my application was withdrawn, and that I declined to attend before the Council as a candidate in consequence of the publication by them of a "second edition" of the Secretary's duties, attaching to the office conditions with which I did not feel prepared to comply.

I can only regret that, in consequence of this unexpected proceeding of altering, almost at the last moment, a statement which had been formally issued as authoritative some weeks before, a good many kind friends (yourself included) have been led into taking a great deal of trouble to bring before members of the Institute my claims to a position which I should certainly never have applied for had the full conditions been issued at first, as I think, they ought to have been; the rather as they involve restrictions which have never, I believe, been formally insisted on before. H. H. Statham.

*** We understand that Mr. William H. White has been nominated by the Council for election to the appointment on the 1st of May next.

ST. MARY MATFELON.

Sir,—In reference to the derivation of the title Matfelon, as applied to the Church of St. Mary, Whitechapel, a description of which appeared in your paper of the 16th inst., will you allow me to give one which I have taken from a book in my possession?

"*St. Mary Matfelon.*—This term, applied to the church in Whitechapel, is derived from the Hebrew or Syriac word, 'Matfel,' which signifies a woman that has lately brought forth a son, therefore dedicated to Mary, delivered of a son."

A. B.

CHURCH WARMING.

Sir,—Some time ago I saw in Northamptonshire several churches heated on a system closely resembling the old Roman hypocaust. There were apertures in the aisles, covered by perforated iron plates; and I understood that these apertures were the receptacles for the fuel, the smoke being conveyed into flues in the gables.

In the churches where I saw this system in operation it was said to answer well; but they were small,—perhaps not more than 70 ft. long and 25 ft. high.

Can any of your readers say whether this system has been tried in larger buildings, say buildings of double the dimensions above stated; and if so, whether it has been found to answer?

Inquirer.

OUR FARMS AND HOMESTEADS.

Sir,—My opinion is based on much observation, that if the Cattle Diseases Bill had been a Bill to improve the "shelter afforded to cattle," and the drainage of farms generally, it would have proved a solution to the "cattle plague," so generally and erroneously ascribed as proceeding from foreign countries.

The foot and mouth disease is nothing more nor less than cattle standing to their fetlocks, if not their knees, in "muck and mire," in place of dry, well-ventilated shelter-places. Want of clean water supply and periodical cleansing of hoofs and feet. "Mirabile Dictu."

NEW BRIDGE OVER THE REGENT'S CANAL, GLOUCESTER GATE, REGENT'S PARK.

In the report accompanying an illustration of this structure in our last issue, we omitted to state that the designs for the lamp-standards have been considerably modified. They will form important features, being of considerable height, and enriched with foliage projecting boldly from the angles the whole height of the shaft. They are in gun-metal, and each one weighs over half a ton. Messrs. Gardner, of Charing Cross, have been entrusted with the modelling, casting, and complete execution of the work, which, we are informed, may be inspected by architects and others interested in art-metal work, at the new *atelier* and factory of Messrs. Gardner, 112, St. Martin's-lane.

ST. HELEN'S AND ST. MARTIN'S OUTWICH.

Sir,—At a Vestry held on the 27th, the churchwardens and parishioners of the united parishes of St. Helen's and St. Martin's Outwich decided upon carrying out the restoration of the exterior of the church, and so completing the improvements which the additional area recently thrown into the public way has effected. As a commencement, some of the cement rendering has been removed by Mr. Poole, of Westminster, so as to ascertain the condition of the masonry underneath.

In doing the above-mentioned work, the old west doorway of the nuns' quire, which is shown on some of the earlier prints* of the church, has been opened out, after having been bricked up and closed for at least 100 years. The old oak door, with its fillets and embossed-headed nails, still remains *in situ*, and the whole, it is hoped, will be properly restored, together with the west doorway, at present opening into the church.

Messrs. Barton & Sayer, the churchwardens, will be happy to receive contributions in aid, both from parishioners and the public at large, who may feel an interest in what may be considered as the abbey of the City in historical interest. Wadmore & Baker.

DR. BAREBONE.

Sir,—In your very interesting paper last week on Temple Bar you express a doubt as to the origin of the name "Damned," applied to "Doctor Nicolas Barebone." His father, "Praise-God Barebone," had a brother named "Christ-came-into-the-world-to-save-Barebone," and "Praise-God Barebone," in an incautious moment of fanaticism, called his son, "If-Jesus-Christ-had-not-come-into-the-world-to-save-sinners-thou-hadst-been-damned-Barebone." This son found that people dropped all the first part of this rather cumbrous name, and called him, for short, "Damned Barebone"; so he changed it to Nicholas.

I think Noble mentions this. The name "Barebone" was probably of French origin, and was Anglicised from "Berbon"; and it is not unlikely that the celebrated member of the Short Parliament of 1653 was descended from a Huguenot refugee. Arthur Pye-Smith.

FULHAM UNION VAGRANT WARDS COMPETITION.

Sir,—I should like to put on record through the medium of your widely-circulated journal a few facts in connexion with the above competition which may be of interest to the profession, and a means of "showing up" the very unfair, if not illegal, course of procedure which has been adopted by the Fulham Board of Guardians in the choice of designs.

These gentlemen, through their clerk, forwarded to intending competitors a plan of site, accompanied with strict instructions that the plans be drawn to a scale of one-fourth of an inch to a foot, and of the fourteen competitors all but one complied. This exceptional gentleman found or deemed it better to draw his plans just half the size, that is, to a scale of one-eighth of an inch to a foot; and, although his design is considered complicated and expensive, an extremely moderate estimate of the cost accompanies it. You will, I think, be surprised to learn that he has received the first premium (50*l.*), but the second successful competitor receives 10*l.* only. Ought not the first to be thrown out, and the second competitor receive the 50*l.* instead?

The winner of the first premium is Mr. A. C. Bean, surveyor to the Fulham District Board of Works; and the second winners, Messrs. Messenger & Robinson, practising architects, who, along with other able gentlemen confining themselves strictly to their own profession, have been rejected by the guardians in favour of the local surveyor. No professional advice seems to have been sought, and the ratepayers have small assurance that the plans selected are the best and cheapest.

I have no stake in the competition, and no feeling against the local surveyor, who is quite a stranger to me; but, as a member of the architectural profession, I should like, along with others, to see this matter taken up on its legal merits. Fair Play.

P.S.—I enclose my address.

Testimonial.—On Saturday evening, March 23rd, a number of the clerks and foremen in the employ of Messrs. W. Cubitt & Co., Gray's-inn-road, met at Anderton's Hotel, Fleet-street, and presented to Mr. John Loughborough, one of their fellow foremen, who had been with the above firm for upwards of forty years, a "Testimonial" (in the form of a very handsome gold watch and chain), on his retirement, as a mark of the high esteem in which he has been held by them all.

* There is in the Guildhall Library a south-west prospect of St. Helen's Church, engraved by Toms, and published by R. West, A.D. 1736.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

A paper on "Railway Brakes" was read before this Society on Thursday, the 21st inst., by Mr. Edward Perrett. The author, although acknowledging the superior promptness in action of the Westinghouse automatic brake, gave his preference to the steel McInnes brake as possessing a much greater simplicity of construction. The Smith vacuum brake was commended for its simplicity; but the author pointed out that, as it had no reservoir of power under each carriage, it could not hope to compete with the others, although many of the railway companies would probably prefer it to other more complicated, but at the same time more efficient arrangements. In the discussion which followed, Mr. Burrell exhibited drawings of a chain-brake patented by himself and Mr. Meakin more than twenty years ago, in which the salient features of Clark & Webb's brake were clearly indicated.

WATER COMPANIES.

Sir,—In your last number you gave some figures with reference to the income, expenditure, and dividend of the Lambeth (Southwark?) and Vauxhall Water Company. The exorbitant charges of this company are a matter of notoriety, and it is not surprising that they should be desirous of maintaining their dividend in the face of the Metropolitan Board of Works Bill.

Perhaps it is not generally known that the company in question, by their arbitrary dealing with the long-suffering parish of Richmond, have lost between 7,000*l.* and 8,000*l.* per annum, besides having sunk a capital of some 50,000*l.*, the greater part of which is still beneath our roads in the shape of disused cast-iron pipes.

Sydney J. Rogers.

CHURCH-BUILDING NEWS.

King's Langley.—The Bishop of St. Alban's opened, at All Saints' Church, a new chapel, which has been built under the direction of Mr. Clarke, for the reception of the monumental tomb containing the remains of Prince Edmund de Langley, Duke of York, fifth son of Edward III., and his first wife, Blanche, of Castile, and their infant daughter Constance, of Castile. Mr. Gregory, of Clapham Junction, was the builder employed.

Hitchin.—St. Ippolyt's Church has been re-opened after restoration under the direction of Mr. Clarke. The nave and north aisle have been almost entirely rebuilt on new foundations, re-using such of the old stonework found good. New vestry and organ-chamber have been added, and new open roofs executed in pitch-pine, to the whole of the church, except the chancel. The floors are paved with White's wood-block paving on concrete, and the building is heated by Porritt's underground stoves. The whole of the works have been carried out by Mr. Thomas Gregory, of Clapham Junction.

South Mimms.—The parish church of South Mimms has lately been re-opened, after a complete restoration. The work has been carried out under the direction of Mr. Street, R.A. Every point of interest has been preserved, and the church has been made suitable for divine service. The restoration of the old chantry-screen, and the erection of a new rood-screen, form features of the work. The contractor was Mr. Burford, of Hampstead.

Ashbourn.—The work of restoring the chancel of Ashbourn Church—a work which is nearly approaching completion—is about to be extended by the repair of the external stonework of the Cokayne Chapel, in the north transept, the monuments in which have been recently restored. The foundations, which are in a bad state, will be underpinned and made good; and the mullions and tracery of the large window in the north end of the chapel will be taken out and re-erected, new stone being introduced where necessary. This work—as was that of restoring the monuments of the family and the clearstory windows—is under the arrangement of Mr. Andreas Edward Cokayne, of Congleton, and is being carried out at the expense of Mr. George Edward Cokayne, of the College of Arms, London, the head of the Cokayne family; and under the superintendence of Mr. Clark, the clerk of the works employed by Sir Gilbert Scott in the chancel restoration.

New Malden.—Christ Church, New Malden, after being enlarged, and with the addition of the new chancel, erected in memoriam by the family of the late Mr. John Coysgarne Sim, has been re-opened by the Bishop of Rochester. The entire cost of the work was over 2,000*l.*, the architect being Mr. Ewan Christian, and the builders Messrs. Goddard & Sons, of Farnham and Dorking. The seating and furniture of the chancel were provided by the Rev. G. B. Twining, and other friends and relatives of the late Mr. and Mrs. Sim; the communion plate was given by Mrs. Earle, sister of Mr. Sim; the lectern was the offering of a friend who prefers to be unknown; the new pulpit was presented by Mr. and Mrs. Barton, in memory of their only child, York Chantler. A font ewer was given by Mr. and Mrs. Child, and the entire cost of the new gas standards and fittings was met by Mr. D. Watney.

Egton.—The foundation-stone of a new church at Egton, near Whitby, was laid on the 14th inst. The work of restoring the old church at Egton was let, in the spring of last year, to Mr. W. Barton, builder, Whitby, who commenced the restoration from the designs and under the superintendence of Mr. E. H. Smales, architect, Whitby, and the old chancel and part of the nave were taken down and rebuilt, the work being carried out in the same style of architecture as the old, and the details of the masonry were exact copies of the old work. During the last summer the works made good progress, and by the autumn the walls were nearly ready for the roof, when Messrs. Foster made an offer to the building committee of a new site free of charge, on their estate adjoining the parsonage and schools, which was in every respect more central for the parish than the old one, and they agreed to take down the newly-erected walls, and re-erect the building on a new site, and be responsible for all additional outlay that would necessarily be incurred. The vicar and the building committee and the parishioners accepted the Messrs. Foster's offer at once, and plans for the new church were immediately prepared by Mr. Smales, and a new contract taken by Mr. Barton. The new church was to be designed on the original model of the old one, and all the materials of the old church were to be re-set in their original positions, and the fine Norman arches of the old church were to be the prominent feature in the new one. A lofty tower, in the Norman style, is to take the place of the old porch, and form the entrance to the building. The church will stand nearly due east and west, and the west front will face the highroad from Egton to Egton Bridge. The nave will be 52 ft. long by 17 ft. wide, with north and south aisles, each 52 ft. long by 9 ft. 6 in. wide. The chancel will be 31 ft. long by 17 ft. wide, with vestries and organ-chamber on the north side, and the tower will be at the south-west end of the south aisle. The accommodation will be for about 300, which will be about 100 more than the old church. The style of architecture adopted for the nave, aisle, and tower is the Early Norman, with semicircular headed windows, doors, arcades, &c., with the free use of the zig-zag, chevron, and other ornaments peculiar to the style. The chancel arch is Early English, and the chancel and vestries are to be carried out in the Tudor style, as it was thought by Messrs. Foster that this would be the most satisfactory way of perpetuating the memory of the old building. The roofs of the naves and aisles will be all open timbered, and the chancel roof boarded in pitch-pine.

Hern-hill. — The Church of St. Michael, Hern-hill, near Faversham, was re-opened on the 27th inst., after restoration. The church consists of a chancel, nave, north and south aisles, porch on north side, and tower at west end. The general architectural features belong to the Early Perpendicular period. The church has been restored and reseated, under the direction of Messrs. Newman & Billing, architects, by Mr. Naylor, builder, Rochester. The church contains an old oak rood-screen consisting of five bays, each again being subdivided into two, and filled in its upper part with tracery, and deeply-moulded cornice and small columns with caps and labels. This has been restored, and a new screen erected where the old wooden vestry was. Portions of the ancient colouring of the walls still remain, also a small portion of old Norman carving in the north wall of the tower. Coincident with the restoration a memorial triple-light window of large size, in memory of his mother, has been inserted by Mr. E. S. Dawes, of Mount Ephraim. The window is by Messrs. Powell & Co., of Whitefriars. The three subjects are Lois and Eunice teaching Timothy the Bible, Dorcas feeding the poor, and Priscilla and Aquila instructing Apollos in the faith of our Lord Jesus Christ.

Burgh (Norfolk).—The chancel of Burgh Church, next Aylsham, which dates from early in the thirteenth century, has just been restored. In the lower part of the inside of the south wall there still exist ten stone arcades, and above them six larger arcades which are pierced with single lancet light windows. On the north wall similar arcading occurs, with a very fine Early English archway, formerly opening into a north chapel, which was destroyed probably in the sixteenth century. When the present rector, the Rev. E. T. Yates, was instituted to the benefice about four years ago, he found the chancel in a most deplorable and wretched condition, and the roof rotten throughout. He determined to restore it, and also to rebuild the north chapel, which had for so many years been a ruin. He called in the assistance of Mr. Phipson, the Diocesan architect, and hearing that Sir George Gilbert Scott was likely to be in the locality, got him to meet Mr. Phipson and consult as to what was best to be done. The result is that the chancel has been carried out to its original length, so far as could be ascertained, and a three-light east window, with a circular light over it, has been erected, all worked out to correspond with the old details. Buttresses of Early English character have been built on the south side in the place of some rough brick modern buttresses, which had been put up for the support of the walls. The north chapel has been rebuilt in a precisely similar style to the chancel, and the blocked-up archway opened. A new oak roof, of Early English character, has been substituted for the rough sixteenth-century one over the chancel. There are two small stained glass windows in the north chapel, the work of Mr. King, of Norwich, and the gift of Mr. J. H. Holly. The entire works have cost upwards of 1,000*l.*, all of which, with the exception of the money for dilapidations and some minor contributions from Mr. Holly's family, have been borne by the rector. Messrs. Cornish & Gaymer, of North Walsham, have carried out the restoration.

Donington.—It is proposed to restore and enlarge the interesting old church of the parish of Donington, near Albrighton. The tower and some other portions of the structure date as far back as the thirteenth century, and has, during the intervening period, undergone considerable changes and additions. The church being in a dilapidated condition, it is proposed not only to repair but to restore and enlarge it, also to remove two galleries and the old high box-pews which prevail, to furnish the nave with comfortable seats, and erect a new south aisle, which will contain sixty-two new sittings. At a parish meeting, held in the Donington School-room on the 21st inst., the plans, which had been prepared by the architect, Mr. John Norton, were approved.

Connah's Quay.—The Church of St. Mark, Connah's Quay, Cheshire, was re-opened on Monday last, after renovation and additions. The church is modern, and consisted, previously to the alterations, of a nave, with tower at the west end, and chancel, with a small vestry on either side. The chancel, which was exceedingly short from east to west, and quite inadequate for the requirements of the church, has been taken down and entirely rebuilt, being made wider, and about 17 ft. longer. The side vestries have also been removed, and in their stead has been built on the north side an organ-chamber, and on the south side a suitable vestry. The walls of the chancel and other additions have been built of local stone, plastered inside, and the interior dressings of the windows and chancel arch, &c., are of Cefn stone. The body of the church has been re-seated and re-arranged, the new arrangement giving a passage up the centre of the church, with seats on either side, and aisles next the outer walls. The seats are of pitch pine, simple in design. The whole of the floors are new, and have a system of ventilation under. The cost of the whole of the work, exclusive of pulpit, font, and reredos, will be about 1,800*l.* The whole of the church has been fitted with hot-water apparatus by Mr. C. Seward, of Preston. Mr. John Douglas, of Chester, is the architect; and Mr. John Roberts, of Chester, was the contractor for the whole work.

DISSENTING CHURCH-BUILDING NEWS.

Newton-le-Willows.—A new Congregational Church at Newton-le-Willows was opened on the 20th inst. The building is Early Decorated in style, and the west elevation, fronting Crow-lane, consists of a massive tower and spire on the south side of a large nave gable, pierced with two lofty double-light windows and marygold window over, flanked by the north staircase and approached by a large projecting western porch. The walls of the building are faced with York shoddies, and the dressings to doors and windows are of light red freestone. The body of the church is 70 ft. long by 50 ft. wide, divided by means of cast-iron columns with caps of wrought-iron foliage into nave and aisles of five bays, the whole covered over with open roofing constructed with longitudinal and transverse arches. The gallery extends round two sides of the church and over the large vestibule at the west end, and, with the ground floor, is seated for about 850 persons. The work has been executed by Messrs. Wells & Sons, from the designs and under the supervision of Messrs. W. & J. Hay, architects, Liverpool. The gasfittings and ornamented ironwork were supplied by Messrs. Smith, of Birmingham; the front railings by Messrs. Nuttall & Son, Golborne; the heating apparatus by Mr. Grundy; the carving by Mr. Rogerson; and the churchyard was laid out and planted by Mr. Unsworth, of Earlestown. Mr. Randle was clerk of the works.

Pentrobin.—A new chapel for the New Connexion Methodists, at Pentrobin, Buckley, was opened on the 18th inst. The chapel, which has been built and designed by Mr. Williams, at a cost of about 600*l.*, is capable of seating 250 persons.

SCHOOL-BOARD SCHOOLS.

Wolverhampton. — New Board Schools in Brick-kiln-street, Wolverhampton, wese opened on Monday. The new buildings, which have been erected on a site containing about three-quarters of an acre, are arranged along the sides of the land facing the two roads, the space behind being kept clear so as to allow ample playground for the children. The schools are divided into four departments, all on the ground floor, giving accommodation for 977 children. The boys have a main room, 54 ft. 6 in. by 22 ft., with two class-rooms, each 24 ft. by 17 ft. The accommodation for the girls is the same as for the boys. The infants have a main room, 40 ft. by 28 ft., with one class-room, 30 ft. 6 in. by 20 ft.; and the fourth department,—which is for boys and girls over six years of age who have passed the first standard, and will be under the control of a mistress,—have a main room, 57 ft. 3 in. by 22 ft., and two class-rooms, each 23 ft. by 17 ft. 6 in. Each department is provided with separate lavatories and hat and cloak room. The buildings are erected in red brick, simply treated; the roofs are covered with blue slates. The use of stonework has been avoided, except where necessary for constructional purposes, whatever ornament is introduced being in moulded brickwork. The schools are heated by Messrs. Shillito & Shorland's Manchester school-grates. The gas-fittings have been supplied by Mr. Eaton. All the passages and lavatories and hat and cloak rooms are paved with Val de Travers asphalte, and all the walls internally are lined with white glazed bricks to a height of 4 ft. 6 in. from the floor line. The work has been erected by Messrs. Dawson & Bradney, at a total cost,—including desks, galleries, and other fittings,—of 6,960*l.*, from the designs and under the superintendence of Mr. Fleeming, architect to the Board.

Cleopatra's Needle.—We are glad to see that preparations have been commenced for taking down the upper portions of the two massive granite pedestals which stand on each side of the spot on which Cleopatra's Needle is to be erected. A space has been excavated, and will be occupied by a floor of concrete of great solidity and strength, destined to support the weight of the obelisk and its massive granite pedestal. The expense of making this foundation will be borne by Mr. Dixon, the contractor. The other expenses will be paid by the Metropolitan Board of Works, including 1,500*l.*, the cost of two sphinxes, which are to be placed on the lowered granite pedestals at each side.

MASTERS AND MEN.

Perth.—A meeting of the master masons has been held in Perth, at which it was unanimously agreed, in consequence of the work in hand, to recede from their resolution to reduce the wages by ½d. per hour; and so the men, who have been on strike for a fortnight, will resume work. The wages remain at 8d. and 8½d. per hour.

Dundee.—The master slaters of Dundee intimated some time ago that the wages of the workmen would be reduced ½d. per hour on May 25th, and that if no intimation of agreement to the change were received by Monday morning last a lock-out would take place. The men have declined to agree to the change, and therefore the whole of the yards, with the exception of Messrs. Ramsay & Reid's, were closed on Monday.

Bristol.—The Bristol plasterers and plumbers have notified the Master Builders' Association for a general advance. The former body demand 1d. per hour extra, the plumbers ½d., both sections receiving at the present time 9½d. per hour. Although the men are committed by their trade unions to strike work if their demands are not acceded to, it is thought probable that the matters in dispute may be settled by a Board of Conciliation. In consequence of requests made by employers of labour from all parts of the country, the National Conciliation Congress, which was to assemble at Bristol in May, is adjourned until the beginning of June, "so as not to interfere with the opening of the Paris Exhibition."

Books Received.

Palliser's American Cottage Homes. By George and Charles Palliser, Architects. London: Trubner. New York: Bicknell.

American architectural books are becoming numerous, and their prevalence seems to indicate a great deal of activity, a great deal of intention to improve and make the best of their domestic architecture especially, both in illustrating old (comparatively) houses and planning new ones. We do not precisely make out the *locus standi* of the authors of the present work, who are described on the title-page as "architects," but appear to have business relations with "the trade" which we should hardly understand on this side of the water. However, that does not affect the character of the book, which is put forth with the special aim of supplying, as the authors say, a demand in the States for practical designs of low and medium-priced houses, suited to "the masses" in that country. The designs are mostly of the type which used to be called "villas" in England, rather small houses with a determination to be picturesque, with multifarious gables and very projecting eaves. They are, however, apparently solid in design and construction, and not characterised by any gew-gaw extravagances of showy barge-boards &c. They mostly exhibit a plain wooden construction, in some cases built upon brick as a ground story, but in not a few cases of timber only. The design with most character in it is perhaps that on plate xix.; some others are pretty and picturesque, and all are quiet and in good taste, though a good many of them are a little commonplace, to our thinking. That for a seaside residence, on plate xl., is also a good one, and has individuality of style. Most of the plans, we fear, are rather deficient in arrangement, especially in the method of managing the entrance. As in some other cases we have noticed, the book would hardly attract much attention as an English one, as we have better things of the same kind; but it is interesting as coming from the States, and indicating the prevalent ideas on middle-class domestic architecture there.

Mr. Ellis A. Davidson.—We are sorry to learn that Mr. E. A. Davidson died on the 9th inst., after a lingering illness. One of the first art teachers under the Science and Art Department, he was for many years at the Chester Diocesan Training College, under the Rev. Arthur Rigg. After this he was art-master at the City Middle-class School, and when he resigned his post he devoted himself almost entirely to the superintendence of the various technical publications brought out by Messrs. Cassell, Petter, & Galpin. He was also the author of several technical works reviewed in our pages at the time of publication.

Miscellanea.

Proposed Memorial to James Brindley, the Engineer.—The committee appointed to carry out the rebuilding of Newchapel Church, Tunstall, as a national memorial to James Brindley, the engineer, met last week. The Chairman (the Ven. Archdeacon Sir Lovelace T. Stamer, bart.) laid before the meeting the draft of a circular which it was decided to issue to the engineering profession as an appeal for support to the project, it being thought that the civil engineers of the present day would be glad to contribute towards the cost of a worthy memorial of one who was so distinguished an ornament of the profession, who was born in 1716, was engineer for the Bridgwater Canal, 1759 to 1767; was engineer to the Grand Trunk Canal, 1766 to 1770; and who died at Turnhurst, in the parish of Newchapel, 27th of September, 1772. Mr. Lewis, architect, reported that he had received tenders from five builders for the erection of the proposed church at Newchapel; the lowest was that of Mr. N. Bennett, the amount being 6,628*l.* for the church complete with nave, chancel, tower, and spire. Divided as directed, into separate amounts for nave, chancel, with tower, and spire, it was as follows:—Nave, 4,181; chancel and tower, 1,781*l.*; spire, 801*l.* In answer to a suggestion from Mr. Heath, M.P., Mr. Lewis explained that if brick were used instead of stone, it would make a reduction in the estimate of 25 per cent. A reference to the amount of subscriptions promised and payments made showed that even for a brick nave a sum of 1,600*l.* would yet require to be raised. It was resolved that until a considerable portion of this was subscribed the church could not be commenced; and the feeling was expressed that if the committee adopted a brick instead of a stone building, they must drop the term "Brindley Memorial," and simply call themselves a committee for rebuilding Newchapel Church.

The Bournemouth Sewage Outfall.—The Bournemouth Improvement Commissioners having applied for sanction to borrow 13,000*l.* for works of sewage outfall, Mr. Thornhill Harrison, one of the inspectors of the Local Government Board, held a public inquiry at the town-hall on the 15th inst. The Commissioners had decided on having two outfalls, one running under the pier, and proposed to be carried 1,350 ft. out to sea, and the other at Boscombe. The cost of these two outfalls had been estimated at about 8,500*l.*, but, in order to allow for all contingencies, they resolved to ask for the larger sum. Dr. Compton and others were called, and stated that no injurious results would take place by the double outfall scheme being carried out. Mr. Creeke, the surveyor to the Commissioners, however, said he was decidedly opposed to the scheme, and that the sewage would pollute the water and make it unpleasant for bathers, and that if this scheme were adopted one-third of the proposed new pier would be erected over the rankest polluted water. Several medical men were examined, all of whom condemned the carrying out of the sewage under the pier, even though it were taken 400 ft. beyond the pier-head; and contended that if the scheme were adopted it would damage the reputation of Bournemouth. The people of Boscombe objected to the Bournemouth sewage being emptied there, and it was suggested as a compromise that there be one outfall between Bournemouth and Boscombe for the two places. The inspector recommended that the sewage be clarified before being allowed to be passed into the sea.

Bridging the Danube. — The Warsaw papers state that a strong iron pontoon bridge, complete in every detail, left there recently for Roumania. The pontoons composing the bridge were manufactured in Germany, Belgium, and Poland, and when put together on the Danube will be the strongest of their kind yet thrown across that river. A number of engineers belonging to the garrison at Warsaw accompanied the train.

Another Theatre Gone the Old Way.—About five o'clock on Wednesday morning the Elephant and Castle Theatre, New Kent-road, was found to be on fire, and was speedily "burned out." The theatre had only been built some four or five years. A great deal of damage was done to the platform of the adjoining station of the London, Chatham, and Dover Railway Company.

The New Channel Twin-Steamer "Express."—This new vessel, which has been built at Messrs. Leslie & Co.'s yard at Hebburn, has just run her trial trip, which was very satisfactory, the speed attained being upwards of fourteen knots. She has been built somewhat on the model of the *Castalia*, with the important exception that she may be said to be a vessel with two distinct hulls instead of two half-ships, as in the case of the *Castalia*. Her designers are Messrs. Andrew Leslie and Mr. Parker. She is intended to carry 1,000 passengers, and will be put on the Dover and Calais station during the Paris Exhibition. The general dimensions of the *Express* are as follows:—Length over all, 300 ft.; beam, 61 ft.; beam over sponsons, 63 ft. 6 in.; depth of each hull (moulded), 14 ft. 6 in.; height of superstructure, 8 ft.; width of each hull, 18 ft. 3 in.; clear width between hulls, 25 ft. 6 in.; draught of water when ship is complete, and with ninety tons of coal, 6 ft. 7 in. forward, and 6 ft. 8 in. aft. The consumption of coal will amount to about six tons per hour. The engines and boilers are the work of Messrs. Black, Hawthorn, & Co., engineers, Gateshead. To enable the vessel to attain a high rate of speed, it was indispensably necessary that the engine power must be very great, whilst the weight must be reduced to the lowest possible degree. By using only the very best material,—cast steel, gun-metal, and wrought iron predominating.—and the most skilful workmanship, Messrs. Black, Hawthorn, & Co., succeeded in providing the immense engines, boilers, &c., with a horse-power of 4,200, which weigh altogether only 500 tons. The heaviest castings in connexion with the machinery were the cylinders, weighing 11 tons each, which were supplied from the works of Messrs. W. Black & Co., North-Eastern Foundry, South Shields. The engines are constructed on the diagonal inclined principal, with two cylinders in each ship, each pair working upon one crank pin. The four cylinders are each 63 in. diameter. The stroke of each piston is 72 in., and they travel at the rate of 480 ft. per minute. The engines, with forty revolutions per minute, have indicated up to 4,200 horse-power. Each cylinder is complete, having its own condenser, air-pump, and feed and bilge pumps. The paddle-wheels, which are perfectly independent of each other, so that one can be working ahead whilst the other is going astern, are fitted with patent feathering floats. The diameter of each paddle-wheel, over the floats, is 24 ft., and there are ten floats to each paddle, measuring 10 ft. 6 in. long by 4 ft. 9 in. deep. The steam is obtained from four boilers, each 15 ft. diameter and 19 ft. long, fired from both ends by means of six furnaces, making in all twenty-four furnaces and eight stoke-holes. The working pressure of the boilers is 30 lb. to the square inch, which is fully maintained when the engines are running forty revolutions per minute.

Cutting off the Water Supply.—At the Wandsworth Police-court, on the 13th inst., the occupier of a house at Wimbledon attended before Mr. Paget, to complain of the Southwark and Vauxhall Waterworks Company cutting off his supply. He said he had made three applications to the company, but he could not obtain any reply. He did not owe the company any money, but his next-door neighbour had refused to pay an overcharge. There was one supply for the two houses into a tank which stood on applicant's premises. Mr. Paget inquired whether the applicant had tendered the whole amount for the two houses? The applicant said he had not. Mr. Paget told him that he must do so before he would be entitled to a supply of water. Another man living in Battersea also attended to complain of the company cutting off his supply. The company had cut off the water next door, and as one pipe served both houses his supply had been stopped. He did not owe the company any money. Mr. Paget said the applicant must tender the money for the present quarter, as the company were not bound to trust him. If the company refused to supply the applicant after he had tendered the money, he could apply to him again.

Conservative Club, Ardwick.—It is intended to build a new club-house for the Conservatives of Ardwick. Mr. S. C. Thompson has prepared the plans, and estimates the cost of the building at 2,500*l.* A site has been secured fronting Higher Ardwick and Park-place.

Sculpture in Rome.—The *Times* correspondent says,—"Although the Italians in oil colours are still, even in their decline, great masters of execution, their preference is for marble as a medium of thought and feeling, and their best sculptors now, abandoning the mere *nude* of the figure, which had led to an intolerable multiplication of Eves, Hebes, and Venuses, are studying bare realism in the features and expression of countenances taken by preference from every-day life. It is the fashion, with a certain class of English critics, to run down Canova and the classical style to which he gave rise, as an emasculate, nerveless, and soulless school of art; but those who utter such opinions can never have seen Canova's bust of Napoleon I. in the Pitti Palace, or its duplicate at Chatsworth [Qy. Apsley House?]. The perfectly overpowering, crushing genius, and character given to the man in that face is something the like of which one would vainly look for in the whole row of the Cæsars of antiquity. That was hardly the Napoleon whom God had made. It was the hero such as he appeared in the heated imagination of the sculptor and his countrymen during the short lapse of years before Arcola and Marengo, and before the disenchantment of the Imperial period set in. Mere Goth as I am, I am bold enough to challenge any man to produce such an expression of mind and soul in a marble face as that is; and, although anything approaching that may never be seen, I think that such young artists as Monteverde exert themselves to come near by their Columbuses and Mazzinis, and strive after a success which is not wholly undeserved."

Carpenters and Joiners.—The 18th annual report of the Amalgamated Society of Carpenters and Joiners, the head-quarters of which are in Manchester, shows that the society comprises 330 branches and 16,829 members, with a cash balance of 74,248*l.*, against 317 branches, 16,038 members, and 70,109*l.* balance at the end of the previous year. The income of 1877 was 42,231*l.*, and expenditure 38,092*l.* The largest item of expenses is under the head "Trade Privileges," which comprises strike-pay, conciliation and arbitration expenses, law expenses, and other costs of trade movements. The sum thus expended was 13,168*l.*, or 15*s.* 7*d.* per member. The general secretary remarks that last year was a year of trade disputes and strikes. "The trade and commerce of this country as a whole has undoubtedly been in a very depressed condition, and our employers have contended that the building trades were also experiencing a period of bad trade, and that their profits would not admit of any advance in the wages of their workmen. We dissented from this opinion, and hence several severe and protracted strikes have occurred during the past year. The great majority of the public seem to believe that in such disputes the employers are always right, and the workmen invariably in the wrong; but there are a few who agree with the late John Stuart Mill when he says that 'experience has at length enabled the more intelligent trades to take a tolerably correct measure of the circumstances on which the success of a strike for an advance of wages depends.'"

A Trade Outrage Unpunished.—At the Manchester Assizes on Saturday, William Acton, William Hughes, and John Hodson were indicted for throwing against the house of Robert Hammett, of Cheetham, Manchester, some explosive materials, with intent to murder him. Mr. Hamnett, in partnership with another, carried on business as brickmakers at Pendlebury. Up to a short time ago they were operatives, and members of the Brickmakers' Union, and shortly after commencing business they introduced steam machinery. This gave offence to the operatives, and in consequence of an outrage being apprehended, Mr. Hamnett's house was watched by the police. On the 19th of January, however, during the temporary absence of the police, early in the morning, a tin can, supposed to have contained an explosive liquid, and a bottle full of gunpowder, pieces of lead, &c., were thrown at the fanlight, but striking some woodwork, they fell into the street, and two violent explosions occurred, which awoke the inmates. The prisoners were members of the Union, and were arrested, but there not being sufficient evidence to convict them, they were acquitted.

At Pemberton, a new Catholic Church, to seat 500 persons, will shortly be commenced. Messrs. Pugin, Ashlin, & Pugin, of Westminster, are the architects.

The Defoe Memorial Manse, Tooting.—In 1688 Daniel Defoe founded the Nonconformist church at Tooting, and supplied it with a minister. In 1874 a committee was formed for the purpose of erecting the "Defoe Memorial Manse," for the use of the minister for the time being. The Rev. John Congreve, M.A., the rector of the parish, expressed his readiness to co-operate in the erection of a memorial so thoroughly in harmony with the spirit and work of the far-famed Defoe. "If Daniel Defoe were alive and amongst us," said Mr. Congreve, at a public meeting, "it is certain he would greatly desire to see the successive ministers of his church provided with a house suitable to their position and work." In 1875, an ample freehold site was purchased from the British Land Company, in the most conspicuous position in Tooting, at an unremunerative price, in consideration of the object for which it was required. The Manse, of which an illustration is given in the *Mid Surrey Gazette*, will be a substantial building in the domestic Gothic style, from designs by Messrs. Tarring & Sons, architects. Near the front door, between two of the buttresses, it is proposed to place a life-size statue of Defoe, under an enriched canopy. The memorial is expected to cost 1,500*l.*

Royal Aquarium and Summer and Winter Garden Society.—An extraordinary general meeting of the above society has been held at the Aquarium, Westminster, for the purpose of confirming the following resolution, passed unanimously at an extraordinary general meeting, held on the 7th inst.:—"That 5,000 six per cent. preference shares of 5*l.* each be raised in lieu of the 6,000 six per cent. preference shares of 5*l.* each proposed." Captain Molesworth, R.N., the chairman of the Board, presided, and, in moving the confirmation of the resolution given above, said that, without any pressure whatever, 23,000*l.* had been taken by the shareholders, and the remaining 2,000*l.* there would be no difficulty in placing. He moved the confirmatory resolution, which was seconded by Mr. Jewell, a shareholder, and carried unanimously, without discussion. The chairman then stated that the door receipts were going on in the most satisfactory manner, and that they had every reason to be satisfied with the progress of the institution. A vote of thanks to the chairman and directors was then proposed, seconded, and carried unanimously; and in returning thanks the chairman said he hoped they would show on a future occasion that they deserved it.

Fall of Concrete Wall at Camberwell.—We referred a fortnight ago (p. 281) to the fall of a concrete wall at some new houses in Sedgmoor-place (formerly Westmoreland-street), Southampton-street, Camberwell. At the last meeting of the Metropolitan Board of Works, the Building Act Committee reported on the subject to the effect that the work had been carried out in accordance with the terms of the Building Act, and that the accident was to be attributed to the shaking of the work while green,—such shaking being caused, we believe, by [some rather rough "larking" or "horse-play" on the part of some of the workmen while on the scaffold.

Royal Italian Opera, Covent Garden.—Mr. Gye announces that the opera season of 1878 will commence on Tuesday, April 2nd, and states his intention to produce two, at least, of the following works:—For the first time in England, Bizet's opera, "Carmen," the principal *rôle* by Madame Adelina Patti; an entirely new opera by M. De Flotow, entitled "Alma"; Herold's opera, "Le Pré aux Clercs"; and, for the first time in England, Victor Masse's opera, "Paulo e Virginia," the chief character by Mademoiselle Albani. Several new artistes are engaged, and all the old favourites. Everything promises well.

A Citizen of Eisenach, in Germany, who has already built and presented to his native town a large schoolhouse and barracks, is about to erect a splendid theatre in that place, with the intention of likewise handing it over to the town as soon as it is finished.

The Artisans', Labourers', and General Dwellings Company.—The annual report of this company for 1877 shows a net revenue of 13,011*l.*, out of which a dividend of 2 per cent. is recommended, leaving 1,304*l.* to be carried forward.

The Queen has been graciously pleased to accept a copy of Mr. J. Dafforne's illustrated volume, "The Albert Memorial: its History, Description, &c.," recently published.

At the Royal Albert Hall, on the 27th inst., the two cantatas, "The Ancient Mariner," by Mr. J. F. Barnett, and "Fridolin," by Signor Randegger, were performed by Mr. Carter's choir. There have been some capital evenings here lately.

TENDERS

For painting, distempering, &c., at the Poplar and Stepney Sick Asylum. Messrs. A. & C. Harston, architects:—

Harrison & Wood	£1,890 0 0
Coleman	1,326 0 0
Robey	1,158 0 0
Whitford	995 0 0
Derby (accepted)	957 0 0

For the erection of St. Dunstan's Church, East Acton, for the Worshipful Company of Goldsmiths. Mr. R. Hesketh, architect. Messrs. Franklin & Andrew, surveyors:—

	Church.	Vicarage.
Scrivener & White	£13,020	£3,436
Conder	12,900	3,468
Rider & Sons	12,580	3,532
Chappell	12,830	3,420
Dove, Brothers	11,995	3,250
Browne & Robinson	11,938	2,955
Higgs & Hill	11,070	2,964
Adamson & Sons	10,541	2,869

For new schools, Fleet-road, Marylebone, for the London School Board. Mr. E. R. Robson, architect. Messrs. Northcroft, Son, & Neighbour, surveyors:—

Manley & Rogers	£13,998 0 0
Perry & Co.	13,929 0 0
Bielfield & Frebble	13,878 0 0
Scrivener & White	13,767 0 0
Thompson	13,700 0 0
Higgs & Hill	13,695 0 0
Cox	13,674 0 0
Brass	13,625 0 0
Aitchison & Walker	13,590 0 0
Williams & Son	13,550 0 0
Grover	13,535 0 0
Wall, Brothers	13,450 0 0

For new schools, Silver-street, Notting-hill, for the London School Board. Mr. E. R. Robson, architect. Messrs. Northcroft, Son, & Neighbour, surveyors:—

Stimpson & Co.	£8,740 0 0
Brass	8,345 0 0
Hobson	8,338 0 0
Downs	8,252 0 0
Higgs & Hill	8,198 0 0
Tongue	8,142 0 0
Wall, Brothers	7,989 0 0
Grover	7,964 0 0
Rankin	7,950 0 0
Thompson	7,928 0 0
Hook & Oldrey	7,890 0 0

For new wings to school buildings, Jonson-street, Stepney, for the London School Board. Mr. E. R. Robson, architect. Mr. T. M. Rickman, surveyor:—

Scrivener & White	£8,991 0 0
Aitchison & Walker	8,987 0 0
Cox	8,903 0 0
Tongue	8,890 0 0
Brass	8,879 0 0
Wood	8,769 0 0
Thompson	8,670 0 0
Higgs & Hill	8,540 0 0
Hobson	8,443 0 0
Jerard	8,295 0 0
Sheffield & Co.	8,279 0 0
Atherton & Latta	8,050 0 0

For the erection of a villa residence for Mr. T. Cooksey, Tunbridge Wells. Mr. R. Adolphus Came, architect:—

Mansfield & Sons	£2,440 0 0
Strange & Sons	2,090 0 0
Longley	2,079 0 0
Edwards, Brothers	1,993 0 0
Thorogood	1,937 0 0
Elwig (accepted)	1,611 0 0

For alterations at No. 101, Wood-street, City. Messrs. J. & W. Wimble, architects:—

		Allow for old Materials.
Ashby & Horner	£1,975	£30
Ramsey	1,948	20
Brass	1,597	55
Falkner	1,528	33
W. & F. Croaker	1,413	27

For rebuilding 189, Drury-lane. Messrs. J. & W. Wimble, architects:—

Morter	£3,273 0 0
Hoare & Son	3,273 0 0
Falkner	3,223 0 0
Brass	3,193 0 0
Kilby	3,120 0 0
Ashby & Horner	3,030 0 0
Sewell & Son	2,986 0 0
W. & F. Croaker	2,921 0 0

For the construction of a new sluice, the completion of eastern main sewer, and branch sewers in the Strand, &c., for the Town Council of Ryde. Mr. F. Newman, engineer:—

Coker	£6,800 10 6
Jolliffe	5,450 0 0
Sibley	4,095 0 0
Meader	3,700 0 0
Groves (accepted)	3,622 0 0

For alterations and additions to the Plough Tavern, Bloomsbury, for Mr. S. O. Carlton. Mr. W. Paice, architect:—

Treble & Son, builder's work.

For alterations and additions to the Royal Naval Hospital, Great Yarmouth, Norfolk, for the Lords Commissioners of the Admiralty.

Gibbon & Mitchell (accepted).

For alterations and additions to St. Marylebone Workhouse, and the erection of casual wards. Mr. H. Saxon Snell, architect :—

Temple & Foster	£12,298 0 0
Mowlem & Co.	11,390 0 0
Chappell	11,248 0 0
Nightingale	11,150 0 0
Crockett	11,030 0 0
Wall, Brothers (accepted)	10,836 0 0
Perkins	10,533 0 0

For three warehouses, Southwark. Mr. Henry S. Legg, architect. Quantities supplied :—

Allen & Co.	£4,700 0 0
Browne & Robinson	4,368 0 0
Hill	3,905 0 0

For house, conservatory, stables, &c., at Farnborough, for Mr. Thos. Fox. Messrs. George & Peto, architects :—

Perkins	£8,600 0 0
Dove, Brothers	8,325 0 0
Arnaud	7,886 0 0
Punnett	7,224 0 0
Payne & Balding	7,061 0 0
Tongue	7,013 0 0

For farm-house and farm buildings, Cadham, for the Right Hon. Earl Stanhope. Mr. Martin Bulmer, architect :—

Punnett	£3,596 0 0
Dartnell	3,525 0 0
Bridge	3,306 0 0
Payne & Balding	3,208 0 0
Calmnd	3,100 0 0
Leslett (withdrawn)	2,993 0 0

For house at Shirleys, Orpington, for Mr. J. Brooks. Mr. G. H. Pierre Harris, architect :—

Grover	£1,974 0 0
Ward	1,843 0 0
Hollox	1,776 0 0
Payne & Balding (accepted)	1,737 0 0

For new schools for the Willenhall School Board :—

Gough	£3,536 7 3
Wistance	3,473 0 0
Lovatt	3,342 0 0
Inwood	3,198 0 0
Teece	3,152 0 0
Fishaw	3,139 9 0
Sansome	3,138 0 0
Hunter	3,114 0 0
Dawson & Bradney	3,098 12 10
Wiley & Filkin	3,042 0 0
Trow & Sons	2,985 0 0
Jones & Son	2,850 0 0
Horton	2,841 0 0
Tallow (accepted)	2,735 0 0

For the erection of a new Wesleyan chapel and school, Huntingdon. Mr. Robert Hutchinson, architect. Old materials included :—

Pattinson	£2,568 0 0
Priest	2,479 0 0
Lord	2,423 0 0
Coates	2,422 0 0
Howard	2,420 0 0
Tewvetrees	2,389 0 0
Smith & Allen	2,350 0 0
Maile	2,281 0 0
Wade	2,230 0 0
Cade	2,250 0 0
Saint & Son	2,235 0 0
Cade & Wildman	2,168 0 0
Richardson	2,067 0 0
Thackray	2,057 0 0
Bunting	2,035 0 0
Dunkley	1,998 0 0
Balmer	1,940 0 0

For the erection of a villa residence, Neville's Cross, near Durham. Mr. George Ord, architect. Quantities by G. D. Irwin :—

Elliot	£2,035 0 0
Scott & Son	1,903 18 9
Allison	1,879 17 0
Hutchinson & Sedgwick	1,853 5 11
Sanderson	1,842 0 0
Dixon	1,625 11 1
Burton	1,595 15 0
Robson & Son (accepted)	1,525 0 0
Ainsley & Mowbary	1,512 6 4
Craig	1,475 17 6
Gardner	1,322 10 6

For painting the outside, and frosted inside, of the Seamen's Hospital, Greenwich :—

Pearce	£515 0 0
Hatfield & Sons	495 0 0
Rowe	465 0 0
Surridge	310 0 0
Challis	288 0 0
Williams	280 0 0
Chapman (accepted)	237 10 0
Higgs & Hill*	237 0 0

* Exclusive of two new notice boards.

TO CORRESPONDENTS.

J. G. T.—C. M.—W. W. L.—Rev. W. L.—J. D.—Rev. Mr. W.—A. L.—W. N.—J. F. M.—J. B.—F. P. P.—H. R. B.—R. C. R.—E. M. S.—W. & B.- M. (Stone).—T. R. B. (no).—T. R. (next week).—J. B. (adjoining neighbour must not lessen the light heretofore enjoyed) —W. P. (should send list and amounts, not single name).—W. C. T. (beyond our lines)

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication

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Manufacturers of
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COLLINGE'S PATENT HINGES, LEVER, SCREW, & BARREL BOLTS,
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VOL. XXXVI. No. 1885. SATURDAY, APRIL 5, 1878.

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George Gilbert Scott.

LAST week brought to a somewhat sudden and unexpected close what must be called, all things considered, the most successful architectural career of modern times. It did not, indeed, fall to the lot of Sir Gilbert Scott to carry out any one building so central and unique in its interest, so completely national in its associations, as that great structure on the banks of the Thames upon which mainly rests the one architectural reputation of modern England which can fairly be paralleled with his. But the Houses of Parliament was an opportunity such as comes to architects once in an age only; and if with Barry there remains, therefore, the crowning and central architectural achievement of his age and country, with Scott there remains the most extended and multitudinous success which perhaps any one man has ever achieved in the career of an active professional architect. As was observed by a speaker at the Institute meeting on Monday evening, he was "everywhere" within the circuit of Great Britain; besides carrying out, beyond the limits of his own country, works of sufficient magnitude and importance to establish a reputation in themselves. To the English public, so careless and mostly so ill-informed about the art and the profession of architecture, Scott was almost the one name which every one seemed to know,—we may say probably the only one the eminence of which was generally admitted by common consent and as a matter of course. In matters of art, as we all know, the verdict of the *vox populi* is by no means to be necessarily accepted; but the fact that a member of a profession so little popular and so little understood in England should have compelled average Englishmen to believe in him so thoroughly, is in itself a fact the significance of which must not be underrated. But it is not merely as an exceptionally-successful professional architect that Sir Gilbert Scott will be remembered. His architectural career has a wider and more permanent interest from the fact that he is identified, in a degree and in a manner in which no other man has been, with the most remarkable movement in the history of modern architecture since the Italian Renaissance. When the history of English architecture in the nineteenth century comes to be written, it will be recognised that what the name of Palladio in common parlance is to the Classic Renaissance in Italy in the sixteenth century, the name of Scott is to the similar and equally-remarkable movement which may be called the Gothic Renaissance in England in the present century. We say "in common parlance," because in real truth Scott has had a wider and more important influence on his own day than Palladio had on his; and it may be also added, a healthier influence as an architect, since he was always an advocate for truthful and solid construction as the basis of all architectural design, whereas his Italian prototype was lamentably indifferent on this head, and was content with elaborating a Classic architecture much of which was little better than a whited sepulchre, a sham exterior executed in perishable materials. The avowed object of Scott, as expressed in one of the earliest of his few literary productions ("A Plea for the faithful Restoration of our Ancient Churches") was to *awaken* an art indigenous to the country, which he regarded as having suffered a temporary lapse. And whatever opinion may be held as to the value or reasonableness of such an attempt in the abstract, it must be admitted that if it were to be made, no one could have gone into it with a more thorough basis of archæological knowledge, or on more thoroughly sound principles in regard to the relation which such a revival should bear to the demands of actual modern life. In the words of ancient Pistol, "if he had tidings," he "delivered them like a man of this world"; if he preached the art of the fourteenth century, he did so in the language of the nineteenth century. In this respect the practical character of Scott as a revivalist comes out strongly in comparison with that of the earlier apostle of Gothic, Pugin. The latter was a man of genius and a noble enthusiast from his own point of view; but he was simply a revivified Mediævalist, a disbeliever in modern life altogether; and his ultimate failure, comparatively at least, was inevitable from that very fact. Whether such a movement can ever be a real success,—whether the attempt was worth making,—are questions we put on one side for the moment; but if there can be value in a revived architecture, it must be conceded that Scott came nearer the mark than any one else has attained: and that what he intended to do he did, and did thoroughly.

It would be of much interest, considering the subject of our article in this connexion, if we could know whether any special influence turned his attention in early years to the special style of architecture which he afterwards studied, and worked out with such success. On this point we have no definite information; but, from the analogy of similar cases, we should surmise that the bent of Scott's mind towards the Gothic style was what, so far as his training was concerned, might be called accidental, and that, in fact, he was carried along in obedience to that unaccountable impulse by which, as it seems, at certain stages in human history, there arises a general fervour in behalf of some particular phase of artistic or intellectual development, the precise origin of which it is impossible to trace. The secret of the success of Scott's career was, that he, partly from inherent talent, partly from the fortunate circumstance of entering on his professional life on the flood-tide of the new spirit in architecture, was the man able above all others to take advantage of that tide, to turn it fully to account, and to sail into prosperity on its current. Almost every such movement in art and science finds out such a man,—the man best qualified at the moment to make the most of it. Railway engineering would have progressed far more slowly than it has done but for George Stephenson; but, on the other hand, it is quite possible that, had not Stephenson been born just at the time when everything was ripe for the great new experiment in locomotion, he might have passed through the ordinary term of life unknown to fame; and so we may perhaps say of Scott and the modern Gothic revival. The movement owed much to the man; but the man also probably owed much to the movement.

We have, however, evidence that Gilbert Scott commenced at a very early age to draw and sketch from buildings, and we distinctly remember that on one occasion, which we are unable to fix more particularly at this moment, he himself mentioned, either in writing or in an address, a characteristic trait of his early admiration for Gothic architecture; namely, that when on the way to and from his school the coach stopped at York, he always contrived to get a run round the Minster during the short time allotted for the stoppage; and he has also himself stated that from the earliest time he began to sketch, he always drew by preference from Gothic buildings, though no one had told him or advised him to do so.

In the brief biographical statements which have appeared in some of the daily papers, one point of interest in regard to his family history and connexion has been overlooked. That he was born in 1811, at Gawcott, near Buckingham, that his father and grandfather were clergymen, and that the latter was the Scott who wrote a once famous "Commentary on the Bible," are biographical facts which it is right also to put on record in these pages; and perhaps the fact of his clerical descent may have had an hereditary influence in determining his taste towards what was in its original form a specially ecclesiastical architecture.* But what is much more to the point is, not that

* It must be remembered, however, that Scott himself was much averse to hearing Gothic architecture spoken of as especially a church form of architecture. His position was, emphatically, that it was *the* English style, suitable for all purposes equally.

his ancestor wrote a Commentary which had a high standing in its day, but that the said author of the Commentary was a man of remarkable self-denial, application, and firmness of purpose, who rose from a comparatively humble position, carried on his studies as a youth along with farm duties, and achieved the opportunity of securing his degree and ordination at the expense of unremitting toil and rigid economy. Those who are interested in tracing the subject of hereditary character, upon which so much light has been thrown recently, may see in this trait of the grandfather the forerunner of the firmness of purpose and concentration of study which enabled the grandson to build up his fame and success.

In consequence of his boyish interest in sketching architectural subjects, Gilbert Scott was placed with an architect, Mr. Edmeston, father of the gentleman of that name who is now well known as a practising architect in London. It does not appear, however, that his special taste in architecture received at this time much development or encouragement from outside. The articles were signed April 10th, 1827, a time when "Stuart and Revett" was in the ascendant, and we must conclude from the rather meagre information at present available in regard to his early life, that his continued study of Gothic architecture was carried on in response to his own predilection, coupled with the vague but growing preference for it which was then gaining ground in so many quarters. Professional practice he commenced on his own account in partnership with Mr. W. B. Moffatt, a fellow student at Mr. Edmeston's, and it was whilst the "firm" was still carried on that he designed the work which first brought him into notice at all prominently, the Martyrs' Memorial at Oxford. This was in 1841, and a year or two after he built the new church at Camberwell, and was by this time already gaining esteem as a "church architect" in connexion with the great movement for church building which was then in its earlier stage. His wider reputation, however, dates from the time when in 1842 he gained the competition for the rebuilding of the great church of St. Nicholas at Hamburg, a success which, being gained over architects of all nationalities and in a foreign country, gave him at once a higher position than even an equal success on native ground and over English competitors only could have given him. It is curious also that his next large commission came also from over the sea, but this time from far in the opposite direction, being a commission to design a cathedral for St. John's, Newfoundland. These large and important works were in progress for many years, and the latter is still unfinished. An important point in his professional career was the re-building, some years afterwards, about 1851, of the great parish church of Doncaster, which was the largest and most important work he had yet carried out on English ground; and owing to the public interest felt in the matter,—the old church, a large one, having been destroyed by fire (that great friend of the architect),—and the remarkable and up to that time unprecedented success of the new building as a modern reproduction of fourteenth-century architecture, it is probable that this work had a great effect in extending his reputation, and that its acknowledged success was some compensation to him for the vexation he endured from the continual attempts which we know to have been made during its progress to interfere with his views, and to deprive him with the public, if possible, of the credit of his own work.*

In 1849 Scott was appointed architect to the Dean and Chapter of Westminster, an appointment which gave opportunity for, and led to, two of the most interesting works which he accomplished in the way of literary illustration and of restoration respectively; namely, his valuable book called "Gleanings from Westminster Abbey," containing a mass of curious and interesting information in regard to the architectural and archæological history of the building, and his restoration of the beautiful chapter-house. This latter piece of work may be truly called one of national interest; and the contrast between the chapter-house as it was, a dilapidated chamber lumbered with shelves and presses, and its present state as one of the most beautiful of ancient Gothic interiors, ought in itself to go far in reply to what has been urged against him in regard to his having injured the value of Mediæval monuments by restoration; but on this head a word just now. So far as our biographical notes go, we cannot here do more than touch in succession upon the leading incidents of Sir Gilbert Scott's professional career; anything further is precluded by considerations of space and by the want of detailed information which could only be procured from private sources more at leisure. The next important step we have to note is his election as an Associate of the Royal Academy in 1855; and the same year brought him double honour, since he again gained a competition open to architects of all nations, for the Hôtel de Ville and Senate House for Hamburg; which buildings, however, have never as yet been carried out. In 1859 occurred the competition for the Foreign Office designs, an unhappy example of the strange way in which such things are mismanaged and worked up into all sorts of confusion in this country, through wire-pulling and private influence with legislators. The whole case must have been a distracting one to those most concerned; and that Scott's health and spirits suffered painfully from the anxiety and contention over this matter we know well. He in the first place got the third premium for the design, but nevertheless was selected to carry out the work; in fact, there seems to have been something strange and uncanny about the whole of the arrangements, for the first-premium design never had a chance, we believe, of being actually carried out. Then, after Scott had thus, to all appearance, come off victorious, ensued that remarkable display of æstheticism on the part of a certainly not essentially artistic Prime Minister, which ended in the architect being forced to abandon the style in which he had worked all his life, and to which he had pinned his faith, and to take up one to which his whole artistic conscience and sympathies were opposed; and, to add insult to injury, he had the gratification of seeing Lord Palmerston thanked by a special deputation for the part he had taken in opposing the Gothic design. He felt this fact very sorely, and always declared that the "deputation" was a got-up thing,—only procured by canvassing. The carrying out of Scott's original Gothic design,—which had great merit, and points which were then especially of some novelty in English Gothic, and some of which (his external treatment of the stairs, for instance) have been imitated since,—would have been an interesting example of the application of modern Gothic to a civil and partially domestic building on a great scale; and even if doubts had been entertained as to its success in this application (and whether we ourselves agree with Lord Palmerston in principle or not), it could not have failed to be more successful than the building which Scott produced, as one may say, against his will, and contrary to his judgment. There are, however, originalities of detail in the Foreign Office as it stands which are worth attention; and the Parliament-street front, it must be remembered, has never received the finish over the angles which the architect intended, and which would materially improve its appearance from the street side.

In 1861 Scott was elected a Royal Academician. In 1866 he was selected as one of the architects invited to compete for the greatest building that has been carried out since the Houses of Parliament,—the New Law Courts. His selection as a competitor was, it need hardly be observed, a matter of course; and though he was not successful in this, which would have been the greatest single professional prize of his life, there can be no question that the place he took in the competition, especially in regard to design, was one by which his credit was increased in the eyes of those best able to judge. His design had remarkably fine points: the Strand front was very dignified and grandiose in effect, and, moreover, showed some very new and original feeling in the treatment of Gothic architecture; and it is within our knowledge that its merits elicited warm admiration from members of the architectural profession who had generally posed as his opponents or rivals, both among those who were and those who were not competitors. It may be worth while to mention that the library of the Institute of Architects contains a handsome volume of photographs from this set of drawings, presented by their author.

Soon after he was made an Academician, Scott was selected, by the special wish of the Queen, to design the memorial to the Prince Consort,—one of the works which has brought him most prominently before the popular mind, as it has, in fact become one of the recognised "sights" of London. It followed naturally upon his connexion with this work that he should have the honour of knighthood conferred upon him, and there can be no question that the position he now and for some time previously had occupied in the profession rendered him the most fitting recipient of an honour which in such cases is to be partly regarded as conferred upon the whole profession in the person of its most distinguished member. In 1873 he was elected President of the Institute of British Architects,—an honour which we thought at the time he might have fairly expected at an earlier date. He filled the post for two years; but his health at this time was rather failing, and he had to be a good deal abroad in search of renewed strength. This he in a great measure acquired, and he was able again to enter the lists successfully in a large and important competition, that for the new Cathedral for Edinburgh, which is now in progress from his designs. His death, which, as already mentioned in our last, took place on the 27th ult. (at Courtfield House, South Kensington, where he had recently purchased property and taken up his residence), was very unexpected, and took place after a very short illness which had appeared to threaten nothing serious at first. The evening before his death he was in excellent spirits, and discussed with a confidential assistant some contemplated changes and re-arrangements in the office. It is worth noting, too, that the last thing he wrote was a cheque to relieve the distress of a brother architect. Sir Gilbert had married, it may be here mentioned, in 1838, Miss Oldrid, daughter of Mr. John Oldrid, of Boston, Lincolnshire. Lady Scott died in 1872. Two of Sir Gilbert's sons, Mr. George Gilbert Scott and Mr. John Oldrid-Scott, as most of our readers are aware, follow their distinguished father's profession, and have already gained a name and place in the ranks of rising architects; the first-named gentleman, it may be noted, has left the Mediæval flag under which his father fought, and become an apostle of a school of revival of a different tendency.

In estimating the position which Sir Gilbert Scott takes as an architectural artist,—his artistic success as distinct from his merely professional success,—there are two phases of his work to be considered, and which must be regarded separately; his work as an original designer, and as a restorer of ancient buildings. Of the latter portion of the subject we have as yet said nothing, because his work in this way was so multifarious, and so much of it went on simultaneously, that it would be exceedingly difficult to "place" a great deal of it chronologically. But it was, without a doubt, as a whole, the most important portion of his professional career, that of which the results have the widest and most national interest, and that which has excited, especially of late, the greatest amount of controversy; and it is our duty to say a word in the way of impartial criticism in regard to the subject, as between the late architect and his rather unscrupulous detractors. By the latter, who have formed themselves into a Society to protest against restoration, it has been recently asserted that Sir Gilbert Scott had all but ruined the interest and value of the greatest architectural monuments of the Middle Ages in this country by practically making new buildings of them. Now, in so far as that we would not see a stone of an old building touched that could be preserved, we should be with those who are adverse to anything like wholesale uncalled-for restoration. That Sir Gilbert Scott did carry out an enormous amount of restoration work; that he felt peculiar interest in it, and wished for opportunities of restoring old buildings, is indubitable. But before deciding whether he carried this to an unjustifiable extent, it is only fair to his memory to consider his relative position in regard to the subject. Now the fact is, that in the early part of his career Scott was actually the conservative man of the day in this respect. He first put forth, in his pamphlet entitled "A Plea for the more faithful Restoration of our Ancient Structures," a strong and urgent appeal against anything like careless and ignorant tampering with buildings which were a part of architectural history, and probably did more than any one man to promote cautious and careful treatment of them in this respect. He did not start the restoration movement; it was started by others, under clerical

* We have letters from him, in which he asserts that nothing would induce him, with his eyes open, to undergo again the amount of vexation and annoyance to which he had been subjected during the building of that church.

influence chiefly, in accordance with the spirit of ecclesiastical revival, which was then beginning to pervade this country; and the first part which Scott took in the movement was one of protest against the manner in which restoration seemed likely to be carried out, unless some strong opposition were made. The position which he took in the matter will perhaps be best illustrated by one or two of his remarks in the course of the pamphlet in question. He pleaded, in the first place, for a most rigid adherence to the original design and details whenever they could be ascertained; complaining that "the restorer too often preserved only what he fancied, and altered what did not quite suit his own taste." In reply to those who argued that the Mediæval architects pulled about the buildings just as they wanted them, and with no respect to the work of their predecessors, he urged that "our position was totally distinct from that of the ancient architects; they were irresistibly impelled onwards in the "creation of a new style"; we, on the contrary, were striving to awaken an old one. This argument might be questioned on the ground that the method of proceeding which led to the development of architecture in former days, would lead to its further development now; but, at all events, the logic is not that of a destroyer but of a preserver, and he, undoubtedly, carried out himself what he demanded of others. His knowledge of Mediæval architecture, of all its details, its plans, its arrangements, the probabilities and possibilities of every corner of a cathedral, was something quite unequalled (as his most brilliant and successful professional contemporaries will be the most willing to admit); and the manner in which he would traverse an ancient building which had been plastered and galleried and whitewashed up, and point out where something of interest would be found concealed, had all the appearance of intuition;* and where the original design or intention was not so obvious, no pains were spared to get at the meaning of the decayed and half-obliterated stones, to compel the building to yield up its secret; and in this kind of investigation it is only fair to say that he had the good fortune to be assisted by most clever, painstaking, and loyal servants among the clerks of works on his restorations, many of them men who had worked with him for years, till they had become imbued entirely with his feeling and interest in the work, and whose practical sagacity in deducing ancient designs from fragments, seemed, in some instances, to have been completely caught from himself, and almost to equal his own. If, therefore, it were admitted that it was desirable to arrest the progress of an ancient design towards decay, and to re-work it while there were yet data left for ascertaining accurately the nature and intention of the original detail, it can hardly be pretended that Sir Gilbert Scott was not equal to this task in a degree in which no one else was. And we may add our implicit belief, founded on our personal knowledge of him, that he was incapable of putting on to an old building any feature which was a pure invention of his own; for the authenticity of which he did not believe that he had found satisfactory evidence. The question is, of course, how far was it desirable to do this at all? Was it, as his opponents say, a wanton removal of the real value and truth of the ancient buildings as historic and archæological records, a confusion of genuine Mediæval work with imitation work, such as would tend to falsify them for future generations and injure their poetic interest for contemporaries? And a calm judgment must admit that to the latter part of the question it is difficult to give an answer in the negative. As regards the present, there is no doubt that to the artist and the poet, to those to whose minds the great Mediæval buildings are hallowed as genuine records of the work of generations long since passed away, a restored building has lost the greatest part of its interest, at least when the restoration is so extensive as to amount, for example, nearly to a re-casing of the building. It is probable that in process of time the restored work, although its distinction from what is unrestored is perfectly marked while the work is new, will be liable to be confounded a good deal with what is not restored, and that the very excellence and exactness of the reproduction will tend to this result; but at the same time, we must point out what has been rather unfairly overlooked, that in his later restorations especially, Scott was very careful to preserve, in all cases, such portions of the original moulding or ornamental detail as were least dilapidated, as evidence of the original work and authority for the restored portion. Coming, however, to the abstract propriety of the proceeding, we say at once that in the case of a building ruined and no longer of any practical use, the only justifiable course is to prop it up and preserve it *in statu quo* as well and as long as possible. But the case of our cathedrals and churches is different from this. Those one-sided people who would apply to them the same treatment which would be right in the case of a ruined monument, seem persistently determined to ignore the fact that these buildings are still in practical use; that, owing to a modern movement, the reality and extent of which are unquestionable, they have actually come much more into use than they have been for two or three centuries; and that, therefore, it becomes a perfectly legitimate object not only to keep them in repair, but to beautify and revivify them. The objection that all this re-decorating and restoring of churches is contrary to the spirit of the present day, is utterly futile, for the fact that the country has been willing to spend millions of money on it is itself an indication of "the spirit of the day," and a proof that what has been done is what a great proportion of people (rightly or wrongly) wanted to have done. The cathedrals would have been restored whether Sir Gilbert Scott had existed or not; but without his learning and care they would in most cases have been much worse, and much more incorrectly restored than they are; and if the views of those who object to all restoration were carried out to the letter, a great many of the ancient buildings would by this time have been lost altogether, and others would be so in no very long time. That Scott carried restoration further than was really necessary or desirable in some cases, we do consider; but we deny altogether that, in doing so, he was actuated by the selfish motive which uncharitable opponents have imputed to him. We know of no reason for thinking thus of him, except the accusations of persons who were jealous of his position, and who would, perhaps, have been glad to have themselves some of the commissions which they satirised him for carrying out. Our impression is that the key to Scott's action in this matter of restoration was really his intense enthusiasm in the cause of Gothic revival, and an over-mastering interest in the unquestionably fascinating work of putting new life and brightness into an ancient and mouldering structure; forcing it to tell its secret, and acting as its interpreter to the modern world. That he did this in a most remarkable degree in many cases every candid person must admit. Under his hands the history of a cathedral came out stone by stone; relics of previous structures, the existence of which was never before suspected, emerged to the light, and special means were taken to preserve them, and render them accessible and obvious to future generations, so that the history of the various stages of the building could be read like a book, in a manner that was never before possible. And as to the actual process of cutting out and renewing old work that was decaying, we have not a shadow of a doubt that could Scott have found any infallible process for preventing any further decay, he would thankfully have used it in preference to substituting new work. Among his numerous letters to us we have one calling our attention to the chemical process employed twenty years ago for arresting decay of the stone in the Royal monuments in Westminster Abbey, and expressing his hope that in due time he would be able successfully to press upon the chapter "the importance of applying it to the interior of the building itself, or at least to its decayed portions, which in a very few years will be so far gone that the workmanship will be obliterated." This did not look like the recommendation of a man who wished for a great "job" in restoration merely for its own sake, which is the character that some of his critics have not scrupled to give him. That his work on an ancient building not unfrequently brought out not only archæological facts, but architectural beauty long hidden under a veil of defacement and degradation, we have no hesitation in asserting. A striking instance of this was afforded in the case of the interior of Tewkesbury Abbey, of which the eastern half was restored first, while the greater part of the nave was left in the condition to which the neglect and whitewash of the eighteenth century had brought it. Any one who could study the nave as it was (and we believe still is), and then walk round into the choir and transepts, and survey their effect after Scott's restoration process, and not feel that the architectural effect was heightened and brought out beyond all comparison, must have been beyond the reach of argument: and indeed argument has hardly been the strong point of his opponents. They have dealt more largely in declamation, at times somewhat hysterical in character, at times ill-natured, abusive, and, in the case of some persistently repeated journalistic attacks, we should say distinctly and emphatically libellous, and redounding only to the discredit of those who employed it. Of his many works in restoration we cannot now speak more particularly: all the principal ones have been from time to time recorded and commented upon in our columns, and many of them illustrated by us. They included the cathedrals of Ely, Exeter, Worcester, Peterborough, Salisbury, Hereford, Lichfield, Ripon, Gloucester, Chester, Rochester, Oxford, Bangor, St. David's, and St. Asaph. Among these, Exeter and Worcester have always appeared to us to be among the most completely successful restorations which he accomplished. At the time of his death Scott had been for some years employed over the gradual restoration of St. Alban's Abbey, in which he was greatly interested, and which presented unusual practical as well as architectural problems for solution. His boldy conceived plan for forcibly putting the walls straight has yet to be carried into execution.

In estimating the position of Scott as an architect of original buildings, we cannot but see that in the early part of his career he was really in the main almost entirely a reproducer of ancient Gothic work. So far was this the case in his earlier career, that the possession of real architectural genius has been sometimes denied to him, even by those who had a strong admiration for his achievements as a restorer. And there is some foundation for this idea even in the style of those later and more important works in which he went out of the groove of mere learned imitation. We remember hearing a piquant criticism by an architect who thought that Scott's design in the Law Courts competition had not received due appreciation, to the effect that the design had far more dignified qualities than some which had been put before it; that, in fact, its author only "wanted a little more *devil* in him" to be the greatest architect of the day. The blunt expression indicates what was, at all events, a characteristic of his work, whether we regard it as a deficiency or not. Ruskin's "wolfish" element had no place in Scott's Gothic design. In fact, the majority of his original designs, for public buildings especially, are so symmetrical and balanced in style and effect, that it might be said that his architectural feeling was in some respects rather Classic than Gothic, in spite of his generally faithful adherence to Gothic forms and details. Thus, his Hamburg Hôtel de Ville design recalls to us a little, by the proportion and form of its spire, built on a square plan, the Halifax Town-hall of Barry, in which this form of spire was applied to a Classic building; and really, if we compare the two buildings, we find that the design of the Gothic architect, with its central spire and tower, and absolutely corresponding wings, is almost the more "Classic" of the two in general grouping and outline, more so, certainly, than the Classic Barry's Houses of Parliament, to which, nevertheless, Pugin denied the title of Gothic, calling it "Tudor details on a Classic body." It is, on the whole, with gratification that we call attention to this symmetrical and balanced character in Scott's architecture, since it is a practical contradiction of an idea which has been too much favoured of late, that Gothic architecture necessarily means wild and irregular design, and a complete sacrifice of uniformity, and the stateliness of character which arises from it. Yet, when treating a small building to which the picturesque element seemed naturally suitable, he could alter his method and adopt the picturesque, as in his charming little Cottage Hospital at Savernake, one of the prettiest little buildings of the kind that we know. In turning over the works by Scott that have been illustrated in our pages (a complete list of which will be found further on), we note, among these,

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* On the other hand, the fact that *any* study of buildings so far removed from our own day does enable a student to predict their peculiarities in this almost unerring manner, is a remarkable illustration of the spirit in which architecture was carried on when these buildings were erected,—the almost entire absence of individual caprice in their design and arrangement. What future restorer will ever be able to predict what was intended in any half-ruined or defaced building of this generation?

interesting suggestions and memoranda of his course in the development of his art, and of the gradual changes in his manner of designing which are found towards the later portion of his career; and which, though not strongly marked or violent, are, nevertheless, sufficiently important to make it manifest that his method had undergone a continuous development. In his early churches he had evidently a settled partiality for the Decorated style, just at the period when the geometric window tracery had become elaborated, but was still geometric. In this style, in its pure form, Doncaster Church was designed; and the Gothic Foreign Office design was based upon Decorated work, but with less employment of tracery than he would have used in a church. In Walton Hall, Warwickshire, however, built in 1860, the pure Gothic type was abandoned, and a modified form, which may be called Modern Domestic Gothic, with square-headed windows, was adopted. This building, coming only two years after the publication of his book on "Secular and Domestic Architecture," may be taken as an example of his way of putting into practice the object which he theoretically propounded in that book, viz.,—"the construction, on a Gothic basis, of a new palatial style" for residences; it is not quite on a large enough scale, certainly, for the word "palatial" to apply in its fullest meaning, but still it is a good example of his application of Gothic to a large modern residence. The book just referred to has, we fear, lost its interest: writing was at no time Scott's strong point, and his view of the all-sufficing capabilities of Gothic architecture, and still more his entire depreciation of the Classic mansions of England, as forbidding in appearance and unsuited to their surroundings, must have appeared one-sided, even when the book was first published, and would be thought doubly so now. Among his more recent churches that of St. Andrew's, Hillingdon, Middlesex (1864), is a specimen of a change of manner, a partial concession to the prevalent feeling in favour of a more Continental type of Gothic, and of the employment of an earlier (thirteenth century) phase of Gothic architecture. The divergence is, in fact, so far marked, that those who knew Scott mainly by earlier designs would hardly have attributed this one to him. We notice, also, in the Law Courts' design, a great deal of admixture of French Gothic feeling in the detail; it was hardly possible, in fact, that any one practising Gothic architecture in England of late years could be entirely free from this influence. In the large chapel of St. John's College, Cambridge, it is most marked; though in the design for the Edinburgh Cathedral, one of the finest and most thoroughly satisfactory things which Scott ever produced, the English type is returned to in a great measure, but no longer the full Geometric style; this Scott seems to have almost entirely discarded of late years, like so many of his compeers, in favour of the simpler and more solid form characteristic of Early Gothic. In the design which he submitted in 1875 for the German Parliament House, in which he obtained one of the five premiums offered, he struck out quite a new and original path, aiming confessedly at the development of a German style which had never really appeared, a fully-matured Pointed style founded on German elements, and representing what he considered German architecture might have arrived at, had it followed a course analogous to that which English architecture followed, working out a Pointed architecture from the Round architecture, instead of allowing its course to be interrupted by the incursion of the French style which the Germans adopted, and spoiled in the adopting.* His own remarks on this interesting and original suggestion will be found on page 774 of our volume for 1875, accompanying a large engraving of the design, which is a very fine and impressive group of building on a great scale, with a grand cupola as the central feature; the combination of this feature with Gothic architecture being a subject which had great interest for him in the latter part of his life. Some very fine drawings of this design were in the Royal Academy Exhibition in 1876, and received due notice from us. It appears to have so far impressed the German authorities that they—selected him to carry out the work: No: but they advertised a second competition, to be confined to German architects.

Besides the great buildings we have briefly alluded to, Sir Gilbert Scott not only executed an immense number of smaller works, but was largely employed in more strictly ornamental design: on such works as monuments, reredos, metal-work screens, &c., for various churches. A number of these, some of which were of very beautiful and elaborate design, have been illustrated by us at various times. Among these may be mentioned the reredos in Westminster Abbey (which has from its position commanded much attention, but which we do not ourselves consider to be one of his most admirable works of this order), those of St. George's Chapel, Windsor, of Lichfield and Exeter Cathedrals, the screen at Worcester Cathedral, besides organ-cases, and many other adjuncts of church decoration. In his reredos designs he usually worked in conjunction with a sculptor, for whose figure-designs he furnished the architectural framework. His central and crowning effort in decorative design was, of course, the Albert Memorial, in which his object was to produce a "shrine" on a great scale, and to combine in this work the assistance of all the arts and methods of decoration which may be regarded as subsidiary to architecture. This gave a great impulse at the time to art-workmanship, and much beauty of decorative and coloured detail is doubtless embodied in this work; but it is our duty, as representing the interests of solid and real architectural design and construction, to say that, in this one instance, Scott, who usually so piqued himself upon truthfulness and solidity of constructive design, made a decided lapse in erecting a monument which would be unstable if its construction were really what it appears to be, and which is in reality kept in safety by concealed iron girders. It is difficult to us to understand what strange momentary aberration of the true architectural faculty induced Scott to adopt such an expedient; it was one of the two decided mistakes in his great career of success: the other being his giving way in regard to the style of the Foreign Office. No doubt, in the then temper of the Government, had he stood out he would have run a strong probability of losing the building altogether, and it may be said that it was not in human nature to do this. That is as it may be; but the argument goes for nothing, because in his own best interests it would have been his wisest course. He could well have afforded the risk of losing it; and in standing to the artistic principles he had proclaimed all his life, at any cost, he would have established a principle and gained a degree of honour and credit which would have far more than compensated him for any pecuniary loss. The fact of his giving way was never forgotten by many, and was quoted to his prejudice to a degree which was not fair, considering how very few would have done otherwise. Still, we always regretted that he did not take advantage of his position in the profession to make a stand, which would have been a noble example, if he had made the sacrifice, to his successors in the younger generation of architects, for whose benefit alone we here for the last time refer to the point, to convey a moral lesson; for it is a curious fact that this building, erected against its architect's own strongly-enforced principles, has been an unfortunate one in every way, and is the only one of his works of which such an assertion could be made. Before quitting our remarks on his professional career, we may note the fact also that Scott was concerned in important buildings of a practical nature as well as in those of which the interest was more purely architectural; the Leeds Infirmary and the Preston Town-hall may be mentioned among these: the former is a very good example architecturally of the application of a simple type of Gothic to a building of this class; and its planning and sanitary arrangements have received a fair amount of commendation. Among his smaller works of the more artistic class, Exeter College Chapel, Oxford, was one of the finest, and was a great favourite with its architect, who, in a letter written to us at the time, referred with great pleasure to the warm praise which the building had elicited from Sir Digby Wyatt, not generally an enthusiast in regard to modern Gothic work.

In referring to Sir Gilbert Scott's literary efforts in illustration of his art, we ought not to omit mention of his lectures delivered at the Royal Academy. These were delivered in short courses, and at rather scattered intervals, owing, probably, to the little time available to him for preparing lectures. The first course was delivered in 1868, on Early English architecture; another course in 1870, chiefly on vaulting; and the last, a very interesting course, in 1873, on the dome; specially interesting as the thoughts of an essentially Gothic architect on a grand feature in architecture which is generally regarded as more specially classic, but which Scott considered as the greatest feature in architecture, and as essential to the final completion of a great style; and the possibility of its successful adaptation to the pure Gothic style was a favourite subject with him. All these courses of lectures are to be found reported in full in our volumes for the respective years above named.*

It is almost needless to observe that Sir Gilbert Scott's office in Spring-gardens was the centre of a great deal of architectural activity represented by the younger and rising members of the profession. To have been in Scott's office was a very important step to a good position for a young architect starting on his own account; and unless the disciple were really very deficient in ability (in which case, however, he would probably hardly have found his way into the Spring-gardens Academy), the claim to the respect of his clients was founded on something more solid than the mere name of having been with a distinguished architect. The office became, in fact, a kind of school of clever young men, a good many of whom are now honourably known in the profession, and some of whom have attained a very high position in it. It will be seen in our report of the special meeting at the Institute on Monday evening, in what terms some of the old pupils spoke of the kindness and courteous demeanour of their then master to them. And in connexion with this subject we may allude to the mistaken idea, as we have good reason to believe it to be, that Scott in his later days, and when he was so full of important work, did a large portion of his work by proxy, and that, in fact (as some persons we know imagined), when you went to Scott for a building of ordinary size you merely got the work of Scott's head draughtsman for the time being. There are no doubt stories, one or two of which we believe are authentic, of the eminent architect seeing a building which had been his own work and not knowing it. But we could cap this in other branches of study, among people who have played a large part in the world. Only the other day we heard of a very eminent man of science suggesting to another scientific friend in conversation, as a new point, something which he had worked out in one of his own early publications and had quite forgotten. Those who sneer at the idea of Scott not knowing his own building do not probably realise what it was to have buildings going on all over the country at once for a whole lifetime. But we have indisputable evidence from those who have the very best means of knowing, that Scott looked personally after all his works in the office, even if he hardly had time to visit them all; and that even comparatively insignificant detail drawings passed under his eye and received his approval or corrections.

In personal appearance and manner Sir Gilbert Scott did not convey the idea of a man who was playing so large and busy a part in professional life as he actually did. Of middle height, he had a fine head with a squarely-formed chin, indicative of firmness of character; but his manner might be described in the epithets in which Goldsmith described that of Reynolds (also, it may be noted, a great worker), as "gentle, complying, and bland"; and we remember often wondering how he could preserve a manner so quiet, easy, and undisturbed in the midst of all the enormous amount of work he was doing, and which would have kept some men in a continual hurry and bustle. This becomes the more extraordinary when we consider that he was, as we had ample means of knowing, in reality a peculiarly sensitive, and what is vulgarly called a "thin-skinned" man, and suffered keenly, not only under the public attacks and criticisms which every public

* It is worth notice that Mr. Fergusson also laments over this interruption of the development of German national architecture by "French invasion," but that this regret is that the Germans did not mature a complete *round*-arched Gothic style.

* These lectures are shortly to be published by Mr. Murray, who now has half to the press, and the delay before the two volumes can be issued will be caused solely by re-drawing the remaining illustrations. Mr. W. S. Weatherley writes from Sprug Gardens:—"For more than a year Sir Gilbert has superintended this work. Scarcely three weeks ago he revised and added notes to his eighteenth and last lecture. The afternoon before he died he saw fifty or sixty illustration proofs, to all of which he gave his unqualified approval, desiring me to inform Mr. Murray of this the next day."

man must expect, but under the annoyances and trials of that perhaps worse evil, of private and meddlesome "patronage." Some of those who considered themselves his friends and admirers, or who at least have assumed that attitude since his death, we may perhaps charitably hope never suspected the intense vexation and pain which they had caused him at different critical periods during the carrying out of some of his most important works. On the other hand he made, we believe, many warm friendships, and was a gentle and kindly-hearted man. Of his simple and naïve kindness of feeling the very last among the many letters the conductor of this journal in a private capacity received from him is an interesting instance; it was called forth, as will be seen, by a threat of depriving the young people in his neighbourhood of one of their recreations; and we give it entire, with the rather oddly interspersed notes of interrogation, &c., which indicate the strong feeling with which he wrote:—

"Courtfield House, Collingham-road, S.W.
Jan. 22, 1878.

I only last evening heard, to my dismay, that a movement was being made to induce our ground landlord to forbid the gardens of Courtfield-gardens being used by the more youthful inhabitants for lawn tennis!

As holder of the leases of two of the houses, I take the liberty of expressing to you, in the most emphatic manner I am able, my heartfelt dissent from such a proposal!

I seldom myself enter the gardens, but having after many years' residence in more rural positions come to live at South Kensington, these gardens, as viewed from my windows, are (so far as country reminiscences go) my 'sole remaining joy,' and one of my greatest pleasures is to see how thoroughly they conduce to the happiness and enjoyment of the younger inhabitants, whose innocent and elegant disports it is always a solace to witness.

I do not envy the man who would desire to deprive a number of young people of this almost only semblance of country pleasures which our overgrown city affords—the one thing which it retains in common with the country! What! are smooth, untrodden grass-plots to be preferred to those which are well trodden by the light feet of our children and grandchildren?! Are gardens made only to be looked at, and not to be enjoyed?! Shame—shame! on the man who would advocate so selfish a doctrine. I *do trust* it will be treated as it deserves, by one who has done so much for the public as you, my dear Mr. ——."

While looking over his letters, to one or two of which we have previously referred, we may quote another, written a good many years ago, which is interesting as showing that, like most other able and successful professional men, he had thoughts and interests beyond the limits of his profession:—

"Sea View, Near Ryde,
July 28th, 1856.

I send you a communication quite of a different kind from those with which I have heretofore troubled you. If you think it out of place in your pages, will you kindly return it. I believe the fact that the moon's motion would be equally accounted for by a rotation round any other parallel and travelling axis as round its own is new to the public, though, of course, not to the *savans*; and it is obscurely hinted at by Professor Airy. I only pointed it out to show that the usual deduction from her complicated motion is not self-evident. My attempted explanation of the origin of the moon's "nutation" may be an old story, but I have not seen it suggested in this controversy. It seems to me the most probable and straightforward hypothesis. You may be surprised at my dabbling in such questions; but, though not an astronomer, I am an old geologist, and have long amused myself in speculations on cosmogony."

Sir Gilbert Scott's portrait is to be found in the *Builder* for 1869, p. 626; but we feel bound to admit that our artist was not so successful with it as with some others of the portraits of leading architects which we gave at that time. That which was painted by Mr. Richmond for the Institute of Architects, and which at present occupies the post of honour over the presidential chair, is a good likeness; the best, perhaps, in that not very satisfactory gallery of portraits.

Among the Institutions in which Sir Gilbert Scott took the greatest interest was the Architectural Museum in Tufton-street, which, in fact, almost owes its existence to him; and at which he on several occasions took great trouble and interest in lecturing upon the casts and explaining them to audiences of working men, who were delighted with his simple and unaffected manner of addressing them on subjects which he had made so thoroughly his own. Unaffected and simple, indeed, he always was; and there are few instances of men achieving so brilliant a professional success and assuming so little on the strength of it. We must now, however, close our *in memoriam* comments on the man and his career; but we make this reference to the Architectural Museum the last, because it leads to a suggestion with which we may very suitably close, viz., that no way of specially commemorating him as an architect could, as it appears to us, be more suitable and more useful, and in accordance with what he himself would have wished, than the expenditure of a sum of money in rearranging, enlarging, and improving the Architectural Museum in which he took such interest, and extending its scope and its usefulness, with his name attached to its title. This idea was suggested casually at the Institute meeting, though not on that occasion formally canvassed. It seems to us by far the best which has been proposed, and we give it our cordial support, and hope the idea will be adequately carried out as a perpetual commemoration of George Gilbert Scott and his life's work.

The following is a complete list of the works of Sir Gilbert Scott which have been illustrated in the *Builder*. The figures in parenthesis denote the dates of the volumes, the other figures are those of the pages on which the illustrations will be found.

Additions to Churches.—Chancel of Camden Church, Camberwell (1854), 363; Porch of St. Michael's, Cornhill,—in conjunction with Mr. W. A. Mason (1857), 175.

Albert Memorial, Hyde Park (1863), 371; (1873), 926.

Albert Memorial Chapel, Windsor (1875), 620.

Bishops' Thrones.—Chester (1877), 210; Oxford (1877), 810.

Cathedral Church of St. Mary, Edinburgh, now in progress (1873), 106, 167; (1874), 1032; (1875), 51

Churches.—Ealing, Middlesex (1852), 441; Rugby, Holy Trinity (1853), 345; Hamburg, St. Nicholas' (1858), 439; Richmond, St. Matthias' (1858), 535; Stoke Newington, St. Mary's (1858), 619; Doncaster, St. George's,—rebuilt after fire (1858), 695; Halifax, All Souls', Haley Hill (1859), 729; Hillingdon, St. Andrew's (1864), 633; Kensington, St. Mary Abbotts (1870), 11; (1872), 927; Croydon, St. John's,—corbel and gurgoyle (1871), 761; Walcot, St. Andrew's, Bath (1874), 395.

College Chapels and University Buildings.—Chapel of Exeter College, Oxford (1859), 441; (1862), 497; Chapel of Wollington College, Sandhurst (1861), 773; Chapel of St. John's College, Cambridge (1863), 225; (1869), 386; Glasgow University buildings (1870), 967; additions to New College, Oxford (1872), 827; the Sir Cowasjee Jehanghier Hall of the University of Bombay (1876), 13.

Hospitals.—Leeds Infirmary (1864), 117, 154; Cottage Hospital, Savernake, Wilts (1873), 186.

Monuments.—Westminster Column, Broad Sanctuary, in memory of the Westminster scholars who fell in the Crimea (1858), 694; Duchess of Gloucester's monument in St. George's Chapel, Windsor (1860), 233; Earl of Ellesmere's monument in Worsley Church, near Manchester (1860), 593; Viscountess Canning's monument, Calcutta (1864), 953; Earl of Elgin's monument, Calcutta (1868), 913; Conington monument, St. Botolph's Church, Boston (1873), 606; Bishop Wilberforce's monument in Winchester Cathedral (1875), 416; Clarkson monument, Wisbech (1875), 909.

Public Buildings.—Rathhaus, or Hôtel de Ville at Hamburg (1856), 63; Competition design for the Foreign Office, to which a premium was awarded, also for the Foreign Office (1857), 495; Design for proposed new Foreign Offices (1859), 537, 601; New Foreign Office, park front, as erected,—in conjunction with the late Sir M. Digby Wyatt—(1866), 525; Preston Town-hall (1862), 621; Design for the New Law Courts (1867), 225; New Colonial and Home Offices, Parliament-street (1874), 525; Premiated Design for German Parliament House, Berlin,—in conjunction with Mr. John O. Scott—(1875), 776, 820.

Pulpits.—Doncaster Church (1862), 910; St. Matthias's, Stoke Newington (1868), 410; Croydon, St. John's (1871), 766; Worcester Cathedral (1874), 988; Durham Cathedral (1876), 1048; Chester Cathedral (1877), 1006.

Reredosses.—St. George's Chapel, Windsor (1863), 189; Lichfield Cathedral (1864), 865; Boxgrove Church, Sussex (1867), 451; Westminster Abbey (1867), 821; Worcester Cathedral (1868), 731; (1874), 373; Gloucester Cathedral (1873), 147; Exeter Cathedral (1874), 10; Chester Cathedral (1876), 904; Salisbury Cathedral (1877), 239.

Screens.—Choir screen and gates, Ely Cathedral (1851), 451, 498; iron screen and gates, Westminster Abbey (1856), 558; chancel screen, Exeter Cathedral (1876), 463.

Miscellaneous.—Infant Orphan Asylum, Wanstead,—in conjunction with Mr. Moffatt,—(1843), 458; Entrance to Messrs. Gray & Davison's Organ Factory, New-road (1853), 747; Houses in the Broad Sanctuary, Westminster (1854), 115; Walton Hall, Warwickshire, the seat of Sir Charles Mordaunt (1860), 561; Chapter House, Westminster, as restored (1872), 107; Chambers, Lincoln's Inn (1873), 947; choir-stalls, Exeter Cathedral (1875), 975, organ gallery and case, Chester Cathedral (1876), 760.

On another page, at the cost of some little repetition, we have given a complete list of all the buildings with which Sir Gilbert Scott had been connected since 1847; previously to that date no materials for such a list, as we are informed, exist.

KENSINGTON AND ITS GARDENS.

"Rus in Urbe" was the motto which the Duke of Buckingham fixed in golden letters on the garden front of his house in St. James's Park; and in a similar spirit Lord Lanesborough inscribed on his house at Hyde Park-corner (now St. George's Hospital) the quaint couplet:—

"It is my delight to be
Both in town and country."

There is but little rural appearance in either of these places now, and we must travel farther from the centre of London to find such a union of town and country. The *rus in urbe*, however, is to be found in its most agreeable aspect in the glades of Kensington Gardens, and when the trees are in leaf, it is not easy for the visitors to its walks to imagine themselves near a great city. Kensington is a village of considerable antiquity, which appears to have been in Saxon times the mark or allotment of the family of Cenesingas, and is mentioned in Domesday Book as *Chenesitum*. It retained its ancient aspect until quite late years, and gloried in the name of the "Old Court Suburb," but since the time of the Exhibition of 1851 the builder has been encroaching upon its precincts, and new lofty mansions take the place of the quaint old houses. The two chief houses of the district still remain; these are Kensington Palace and Holland House. We might almost add Campden House, because although it was burnt in 1862, the old character of the place was retained in the rebuilding. Holland House was built in 1607 by the celebrated architect, John Thorpe, for Sir Walter Cope, whose son-in-law, Henry Rich, was created by James I. Baron Kensington and Earl of Holland. From this earl it obtained the name which it still retains, and from which Henry Fox took his title. Addison lived here after his marriage with the Dowager Countess of Warwick, widow of Robert Rich, Earl of Warwick and Holland; and Tickell, in his elegy on the death of the great essayist, apostrophises the beautiful site of the house:

"Thou hill, whose brow the antique structures grace,
Rear'd by bold chiefs of Warwick's noble race;
Why, once so loved, whene'er thy power appears,
O'er my dim eyeballs glance the sudden tears?"

The interesting associations of Holland House have largely grown around it since it came into the possession of the Fox family, which it did in 1762, when Henry Fox, first Lord Holland, bought it from William Edwardes, Lord Kensington. Walpole called it "a brave old house," and Macaulay said that it could "boast a greater number of inmates distinguished in political and literary history than any other private dwelling in England." Campden House was built about 1612, by Sir Baptist Hicks, a mercer of Cheapside, and afterwards Viscount Campden, who bought the property from Sir Walter Cope, the proprietor of Holland House. Tradition reports that it was not actually bought, but won "at some sort of game." Both houses were used by the Republican party during the Commonwealth. In 1649, just after the Earl of Holland had been beheaded, the Lord General Fairfax made Holland House his head-quarters, and the Sequestration Committee sat at Campden House. The widow of Lord Holland was soon allowed to have her house back again, and it became noted as the chief place for plays to be acted at when the theatres were closed. In Wright's *Historia Histrionica*, 1699, we are told "afterwards, in Oliver's time, they (the players) used to act privately, three or four miles or more out of town, now here, now there, sometimes in noblemen's houses, in particular Holland House, at Kensington, where the nobility and gentry who met (but in no

great numbers) used to make a sum for them, each giving a broad piece or the like."

Pepys visited Campden House with his patron, the Earl of Sandwich, and afterwards went to Holland House, but it was not often that the Diarist journeyed so far from London as the little village of Kensington. It is clear from this that the place was not considered of much consequence until William III., seeking a healthy air, bought Nottingham House and turned it into Kensington Palace, and Macky, in his valuable "Journey through England" (1724), writes,—"Kensington was a small poor village till the Court came there, but now it is become a large town, and in its squares are houses fit for the entertainment of the greatest quality."

In 1652, the house and grounds belonged to Heneage Finch, who became solicitor-general at the Restoration, and was afterwards Lord Chancellor and Earl of Nottingham. In March, 1662, a grant was made to him "of that ditch or fence which divides Hyde Park from his own lands, with the trees, &c., thereto belonging, 10 ft. by 150 roods, from the south highway leading to Kensington to the north highway leading to Acton, with the disparking the same." Finch was not a popular man, and his contemporaries called him *Old Dismal*, from his tediousness and rueful countenance. Dryden drew his character in very dark characters:—

> "At the bar abusive, on the bench unable,
> Knave at the woolsack, fop at the council-table."

King William's asthma prevented him from sleeping in the town with any comfort, and he found at Kensington an air that he could breathe. One of his first acts was to form a broad highway through Hyde Park and St. James's Park, so that he might easily get to Whitehall and St. James's Palaces. At night lanthorns were lighted along the whole length of road, an illumination that gave great delight to the Londoners of that day. When the King and Queen went to Kensington, the Princess Anne followed them, and dwelt for five years at Campden House. Here her son, the Duke of Gloucester, formed a regiment of boy-soldiers that were drilled with great regularity, and kept on constant duty. William III. was not content with Nottingham House as it stood, and he soon began extensive alterations. The building was re-arranged and added to from the designs of Sir Christopher Wren, Surveyor-General, and Nicholas Hawksmoor, clerk of the works. Kent designed the east front, the cupola-room, and grand staircase, the walls and ceilings of which he also painted.

Very shortly after the king had taken possession of his new palace, and while the alterations were being proceeded with, a fire broke out which did considerable damage. This was on the night of the 10th of November, 1691, and the king and queen had to escape from their beds into the garden while the flames were being extinguished. Queen Mary died of small-pox in the palace in December, 1694, and her husband William followed her from the same place in March, 1702. Queen Anne and Prince George of Denmark now took possession of the palace and its gardens. The queen ordered the erection of the Temple or Banqueting House to the north of the palace, from the designs of Sir Christopher Wren, and then gave parties in it to all the fashionable world of London. Kensington Palace was settled upon Prince George:—

> "Or Kensington, sweet air and blest retreat
> Of him that owns a sovereign though most great;"

and here he died in 1708, six years before his wife. Sir Richard Steele, as one of the prince's attendants, sat by his corpse, and afterwards received an annuity of 100*l.* from the widowed queen, who herself died in the same place on August 1st, 1714. Queen Caroline, the wife of George II., who was a great improver both of Kensington Gardens and Hyde Park, died here on November 20th, 1737, and her husband on October 25th, 1760. He was the last king who inhabited the palace.

George III. did not care to live in it himself, and he gave up the house to various members of the royal family. The Duke of Sussex in after years occupied apartments in the palace, where, as President of the Royal Society, he gave receptions to men of science and scholars. The unfortunate Queen Caroline, wife of George IV., lived here for a short time, as did the Duke and Duchess of Kent. Her Majesty the Queen was born in the palace on May 24th, 1819, and when Lord Eldon returned home after attending at the birth in his official position as Lord Chancellor, he took down a volume of Shakspeare and recited these prophetic lines from "Henry VIII.":—

> "This royal infant,—Heaven still move about her!
> Though in her cradle, yet now promises
> Upon this land a thousand thousand blessings,
> Which time shall bring to ripeness:—she shall be,
> But few now living, can behold that goodness,
> A pattern to all princes living with her,
> And all that shall succeed" . . . . .

The princess was privately christened by the Archbishop of Canterbury on June 24th, 1819, and, as a curious illustration of the above quotation, it is said that the Duke of Kent wished to name his child Elizabeth, that being a popular name with the English people; but the Prince Regent gave notice that he would stand in person as one godfather, and that the Emperor of Russia was to be the other. At the baptism, the Prince, when asked by the Archbishop to name the infant, gave only the name of Alexandrina. The father requested that another might be added. "Give her her mother's also, then; but it cannot precede that of the emperor." The princess was still living at Kensington Palace, with her mother, when, at the death of her uncle, the throne devolved upon her, and here she held in 1837 her first council. The Queen, on her accession, commanded that she should be proclaimed as Victoria alone. The gardens of Nottingham House only occupied about 26 acres, and these were laid out by William III., according to the artificial taste then in vogue. The yews were cut, and holly hedges taught to imitate the lines, angles, bastions, scarps, and counterscarps of regular fortifications, and the result was known as the *Siege of Troy*. Messrs. London and Wise, the once famous gardeners, laid out the grounds, and Addison, in the *Spectator*, styles them "our heroic poets," adding, "It must have been a fine genius for gardening that could have thought of forming such an unsightly hollow into so beautiful an area, and to have hit the eye with so uncommon and agreeable a scene as that which it is now wrought into." George London was apprenticed to Rose, the Royal gardener, and at the Revolution was appointed superintendent of the Royal Gardens. His reputation was very great, and he acted as a kind of director-general of the gardens of England, most of which he visited once or twice a year. Henry Wise was gardener to Queen Anne and deputy-ranger of Hyde Park, and he laid out the beautiful grounds at Blenheim. In most books London is spelt Loudon, because of late years there has been a famous horticulturist of that name, and this persistent misuse of *u* for *n* reminds us of a good story, the hero of which was the great Duke of Wellington. C. J. Loudon wrote to the Duke asking to be allowed to see the beeches at Strathfieldsaye, but his letter was not very clearly written, and the Duke, not knowing Loudon, thought he had a letter from C. J. Blomfield, Bishop of London. He also misread breeches for "beeches," and at once wrote to the Bishop to say that he was surprised at the request, but should be happy to show his breeches whenever the Bishop chose to call upon him. Queen Anne added thirty acres to the north of the palace, but it is to Queen Caroline, the wife of George II., that we owe the gardens as they are at present. She added 300 acres of ground, and formed the round pond and the beautiful vistas of trees that radiate from it. Each of these avenues had its distinct name, as Old Pond Walk, Bayswater Walk, &c. The groves were filled with squirrels, and a large number of tortoises, presented to the Queen by the Doge of Genoa, were distributed about the grounds. Deer remained in the gardens for some time after the commencement of the present century, and we learn from a minute of the Board of Green Cloth, dated 1798, that foxes were hunted here.

Bridgman was the gardener employed in planning the alterations, and he cannot be too highly praised for the result of his labours. He invented the sunken fosse that divides Hyde Park from the gardens; the novelty became very popular, and was called a *ha ha*, from the exclamation of surprise which was supposed to issue from the lips of the pedestrian as he came upon so unexpected a stoppage to his walk. This fosse was partly filled up at its southern end, in 1868. Alterations and improvements have been made in the gardens at various times, by "Capability" Brown, Humphrey Repton, and W. Aiton.

It was not until long after the time that the court ceased to reside at Kensington that these gardens became a public park, and were freely thrown open to pedestrians. Before then they were considered strictly as appertaining to the palace. In the reign of George II., Queen Caroline held a court on Sundays, after morning service, and an elegant rendezvous took place upon the green or lawn in front of the house.

> "The dames of Britain oft in crowds repair
> To groves and lawns, and unpolluted air.
> Here while the town in damp and darkness lies,
> They breathe in sunshine, and see azure skies;
> Each walk, with robes of various dyes bespread,
> Seems from afar a moving tulip-bed."

When the court went to Richmond the gardens were opened to the public on Saturdays, but the company were expected to appear in full dress. Even as late as the year 1795 no one wearing a silk necktie or leather breeches without top-boots was admitted, and private soldiers and sailors, and servants in livery, were also excluded from the sacred enclosure. Kensington Gardens have continued to be used as the fashionable Sunday promenade to the present time, but different walks have been so appropriated. Faulkner, in his "History of Kensington," says "the great south walk leading to the palace is crowded on Sunday mornings in the spring and summer with a display of all the beauty and fashion of the great metropolis, and affords a most pleasing spectacle not to be equalled in Europe." Now the walk from the Bayswater-road to the Kensington-road, across the Serpentine Bridge, is the favoured spot, and it would appear from some amusing lines by Sheridan that this was the case in his day too:—

> "Yet though 'tis too rural,—to come near the mark,
> We all herd in *one* walk, and that nearest the park;
> There with ease we may see, as we pass by the wicket,
> The chimneys of Knightsbridge and footmen at cricket."

It has been suggested in these pages that a large number of the trees should be cut down and more care be taken of the remainder. In the winter, when the boughs are bare of leaves, the decayed condition of some of the timber is very perceptible, and this evil should be remedied; but the clearance should not be so great as was proposed, for one of the chief charms of the place consists in the close forest of trees. When the leaves are out it is possible to fancy oneself far away from town in some country park, as Mr. Matthew Arnold sings,—

> "Scarce fresher is the mountain sod,
> Where the tired angler lies stretch'd out,
> And eased of basket and of rod,
> Counts his day's spoil, the spotted trout."

Hyde Park and Kensington Gardens are distinct in their characteristics, and each sets off the other's fine points. We hope, therefore, that it will be long before the trimness of the flower-garden is introduced in place of the natural beauties which now pervade Kensington Gardens. All lovers of scenery must admire them, and "bits" for the painter are to be found in every direction.

The round pond, with the various avenues radiating from it, and the warm glow of the ugly but picturesque palace of Kensington as a background, is specially pleasing. Then how attractive is the position of the picturesque ivy-covered lodge near the bridge, particularly when its garden is rich with beautiful flowers!

Chateaubriand loved, when here in exile, to stroll along the walks and talk to the French priests from Kensington House. The amount of written praise of the place is large, but we need only make two quotations here. Haydon wrote "in Kensington are some of the most poetical bits of tree and stump, and sunny brown and green glen and tawny earth," and Mr. Matthew Arnold, whose "Lines written in Kensington Gardens" we have already quoted from,—

> "In this lone open glade I lie
> Screen'd by deep boughs on either hand;
> And at its head, to stay the eye,
> Those black-crown'd, red-boled pine trees stand.
> Birds here make song, each bird has his,
> Across the girdling city's hum.
> How green under the boughs it is!
> How thick the tremulous sheep-cries come!"

We must now leave the gardens, and notice rapidly, in conclusion, a few of the numerous celebrities of Kensington. One of the earliest of these was Charles II.'s mistress, the Duchess of Portsmouth, who lived at Kensington House, where the king is said to have visited her shortly before his death. After a long interval, Elphinstone, the spelling reformer, who translated Martial into an "uglyography" of his own, kept a school here from 1776 to 1778. Then came the Jesuits, at the time of the French Revolution; and Mrs. Inchbald died here in 1821, when it was a Roman Catholic boarding-house. Kensington House and Colby House, with many houses, were cleared away to make room for the enormous building erected by Baron Albert Grant.

Swift lived occasionally at Kensington, and

wrote familiarly of the locality in his ballad of "Duke upon Duke," in which he ridiculed the quarrel between Lechmere, the lawyer, then living at Campden House, and Sir John Guise:—

> "Back in the dark, by Brompton Park,
> He turn'd up thro' the Gore,
> And slunk to Campden House so high,
> All in his coach and four.
> The Duke in wrath called for his steeds,
> And fiercely drove them on:
> Lord! Lord! how rattled then thy stones,
> O kingly Kensington!"

When Sir Isaac Newton was in his last illness, he went to Kensington for the benefit of the air, and at Bullingham House, Pitt's Buildings, he died.

Gore House, which with the adjacent land was bought by the Commissioners of the Exhibition of 1851, and formed the nucleus of the South Kensington estate, has two most incongruous associations. Wilberforce lived in it for thirteen years from 1808 to 1821, when it was the head-quarters of anti-slavery leaders, and the centre of the Low Church party. The Countess of Blessington followed Wilberforce in the occupation, and stayed for the same number of years. She gathered around her a brilliant circle of friends of a very different character from those of Wilberforce. Not far off was Hamilton Lodge, Kensington Gore, where Wilkes occasionally lived. At Kingston (afterwards Listowel) House died, in 1788, the notorious Elizabeth Chudleigh, Duchess of Kingston, and in 1842 the Marquis Wellesley also died there. Talleyrand and James Mill both lived in Kensington-square, and Wilkie painted some of his best pictures in Lower Phillimore-place. Two of our great modern authors are especially associated with Kensington. Thackeray, who has drawn the best picture of the village in "Esmond," died in his own house in Palace Gardens, and Lord Macaulay at Holly (now Airlie) Lodge. This charming retreat, in a bye-lane of Campden-hill, is delightfully described by Mr. Trevelyan in his life of the great historian.

The ugly old church of St. Mary Abbots was taken down, and a handsome new building erected in its place, by the late Sir Gilbert Scott, in 1875–77; the tower, indeed, is still unfinished. Here are monuments to the Earl of Warwick, who was to learn at Addison's bedside how a Christian should die; to the three Colmans, and to James Mill. In the churchyard Elphinstone, the translator of Martial; John Jortin, the vicar; the son of Canning; and Mrs. Inchbald, are commemorated.

Thomas Walker, author of the *Original* writing in 1835, says,—"At Kensington, within the memory of man, on Sunday evenings a bell used to be rung at intervals to muster the people returning to town. As soon as a band was assembled sufficiently numerous to ensure mutual protection, it set off; and so on till all had passed." This was probably about the time that stage-coaches were stopped by highwaymen in the King's-road, Chelsea. Now the traveller on the knife-board of a Hammersmith omnibus seems to be living in times divided by centuries from such an unsafe period.

SANITARY AND STRUCTURAL IMPROVEMENTS IN THE CITY AND EAST QUARTER OF LONDON.

A considerable amount of activity, both as regards the structural improvement and the sanitary requirements of the City of London, is shown to have occurred, during the past year, by the report of the Surveyor and Engineer to the Honourable the Commissioners of Sewers. In seventy-five cases the district surveyors have reported on the dangerous condition of structures. That these reports have had a prompt result appears to be proved by the fact that no single case has been brought before the magistrates. Ten buildings have been shored up, and twenty-four cases of repairs have been certified by the district surveyors as complete. The total number of premises drained within the year was 280; and the detail of this drainage is drawn upon 160 plans, which are deposited in the office of the engineer. 1,579 ft. of sewer have been constructed during the year; of which 920 ft. were upon the line of old sewers.

Improvements of roads by the setting back of frontages, and arrangements for similar improvements, have been so numerous, that the reader who wishes for the details must consult Mr. Haywood's report. The question of the widening of Walbrook at its northern end has met the attention of the Commission; but the subject has been dropped, in consequence of the refusal of the lessee of the vacant ground to name a price for the land required for the improvement. A petition of the wards of Bishopsgate and Portsoken, praying the Commission to form a new street between Bishopsgate-street and Aldgate, upon the line of the Metropolitan Railway Extension, has been refused, upon financial grounds.

The widening of the Poultry having been completed, the Val de Travers compressed asphalte carriage-way pavement, laid in 1871, has been taken up, and replaced with new. The same material has also been used in repaving the carriage-ways of Lothbury, Bishopsgate-street Within, Moorgate-street, and Fenchurch-street. Other streets have been re-paved with asphalte, wood, and granite. The surveyor reports that as most of the main streets of the City are now paved either with wood or asphalte, and the further extension of noiseless pavements seems probable, a large reduction has been made in the number of men who for many years have been employed by the Commission in stone-dressing.

The cost of the public lighting of the City is not stated in the report. This omission might be advantageously supplied on future occasions. From the accounts of the Metropolitan Gas Companies for the year 1876, we derive the information, by means of a little time spent in abstracting the details, that the annual cost of the public lighting of the streets of the metropolis is 251,000*l.* per annum. The prices now charged to the City by the Gas Light and Coke Company for public lamps are 4*l.* 13s. 3d. for lamps of a square shape, consuming 5 cubic feet of gas per hour, and 4*l.* 17s. 6d. for lamps of a circular shape, with the same consumption of gas. The cause of the difference of cost is the greater expense of cleaning and maintaining the circular-shaped lanterns. Connected with this subject is the invention to which we have more than once called attention, of the electric mode of lighting and extinguishing lamps, patented by Mr. St. George Lane Fox. At the discussion at the rooms of the Society of Arts of the paper, of which we gave an abstract in our last number, attention was particularly called by Mr. Brakwell to the very important question of the pecuniary saving to be effected by the invention. It is no discredit to a young engineer that he has been anxious to put forward the scientific, rather than the economical, features of his invention in the first instance. For the ratepayer, however, what is of chief interest as an engineering question, is the certitude of the action of the apparatus. That this may be assured we see no reason to doubt. The sensible plan of dividing a district into a certain number of circuits, the first and last lamp in each of which should be within view of the regulator of the apparatus, seems well adapted to secure this aim. Then, as to cost, Mr. Bennet and Mr. Chadwick have each spoken of the possible saving of one-twelfth of the quantity of gas now consumed. This, however, is supposing that, on the existing arrangement, it takes an hour from the moment of lighting the first to that of lighting the last lamp every evening, and the same time for extinguishing them in the morning. The gas companies can best tell how much time is thus occupied. Supposing the last lamp to be lighted, and the first to be extinguished, at the true moment, as regards the requirements of street illumination, half the time occupied both in lighting and in putting out multiplied by the number of lamps will give the saving of gas to be effected by the successful adoption of Mr. Lane Fox's method. Even if we take the time in each case at only thirty minutes, and thus obtain a mean saving of one twenty-fourth instead of one-twelfth of the gas consumed, we have a very considerable economy. We have just seen that the price per lamp paid by the City to the Gas Light and Coke Company is, on an average, 4*l.* 15s. 6d. per lamp per annum. Of this sum, gas, allowing 5 cubic feet per hour, for an average of twelve hours per diem throughout the year, at the price of 3s. 3d. per 1,000 cubic feet, would come to 3*l.* 11s., leaving 1*l.* 4s. 6d. as the cost of maintaining, lighting, cleaning, and extinguishing. Mr. Chadwick has stated 14s. per lamp as the cost of lighting, which gives a considerable margin as compared with the former figures. If we take our above rough estimate, we find that the cost of gas alone, exclusive of manufacture, is 74 per cent. of the total annual charge. At that rate the cost of the gas burned annually in the street-lamps of London is about 185,700*l.* A saving of one-twelfth would thus amount to 15,500*l.* per annum, and that of one twenty-fourth, of course, to half that sum. On the other hand we have the balance of 26 per cent., now paid for manipulation; by far the larger part of which would be saved by an automatic process of lighting and extinguishing. In the accounts of the companies, however, we find only the sum of 41,750*l.* entered as the cost of lighting and repairing public lamps, which is about 16 per cent. of the charge to the public. If such be the case, there is a profit of 25,000*l.* per annum, over the price of gas at 3s. 3d. per 1,000, on their contracts. If three-fourths of the actual cost of lighting and repairs be saved, which seems a not unfair estimate, we have a possible economy, in this particular, of 30,000*l.* per annum. There then remains the doubtful sum of 25,000*l.* above indicated. Thus, allowing 2s. 6d. per lamp per annum for interest and depreciation on the apparatus which will have to be added to the existing lamps, we shall still find that a total saving of some 50,000*l.* a year to the ratepayers of the Metropolis might be effected by the introduction of a reliable mode of automatic lighting. One objection to the system as at present proposed if we may judge from what is being done in Pall-mall, is the disfigurement of the streets by the apparatus affixed to each lamp, and more wires.

Another point which is brought forward in Mr. Haywood's report bears upon the utility of the invention in question. The Commissioners of Sewers have been anxious to provide the means of lighting London during fogs: a matter of no small importance to public safety. The gas companies having been communicated with on the subject, replied that there would be great difficulty in providing the staff necessary for the sudden contingency, the lamp-lighters being, during the day, scattered all over London, engaged in other vocations; and therefore that it would not be possible to rally them, occasionally only, in time to be of use to the public. This is, no doubt, a fair view of the case, and it is one of serious disadvantage to the whole of the metropolis. But the introduction of an automatic mode of lighting would at once dispel this difficulty. The only question that would then remain open in case of fog would be the ability of the gas companies to provide for the continuous consumption of an extra number of hours. They are at this moment subject to the immense draught made upon their resources by the use of private lamps during fog, which is much more considerable than any that could be made for street-lighting. The total gas sales of the six companies united amounted to more than 2,900,000*l.* in the year, which is considerably more than tenfold the sum received under public contracts. This difficulty, therefore, is reduced to the minor inconvenience of requiring the gas companies to provide a sufficient supply of reserve gas to be used in time of fog, a matter well within the limits of the rightful requirements of their customers. In case of any unusually prolonged fog, some check should be put by patriotic feeling, and, if necessary, by other means, on unusual private consumption, so as to ensure, at all events, the due lighting of the street-lamps. We commend the study of the question to the consideration of the Commissioners of Sewers and of their able and provident surveyor and engineer.

In the matter of water supply, the amount paid by the Commission during the year was 1,563*l.*, including supply to urinals, flushing sewers, street-watering, washing courts and alleys, drinking-fountains, and stand-pipes. The courts and alleys inhabited by the poorer classes were, between the 2nd of July and the 27th of October, washed twice a week with jet and hose, and sprinkled with a solution of carbolic acid, in addition to the daily sweeping. Every court, thoroughfare, and alley in the City is swept once daily; and in wet weather the main lines of thoroughfares are swept a second time during the day. The street-orderly system is, in addition, applied to all the main thoroughfares; and 120 orderlies are employed. Thus an almost continuous street cleansing is carried on throughout the City. The footways are swept once daily, at least so the report says, and in wet weather those in the main streets are cleansed repeatedly during the day. The Commissioners think fit to remind the inhabitants that they are not relieved by their

legal obligation to cleanse the footways in front of their premises. But it is clear that the work is best performed by a central authority, as is actually the case.

For other items of the provision made by the Commissioners of Sewers for the health and comfort of the inhabitants and visitors of the City, we must refer to Mr. Haywood's report, which is lucid and unpretending.

There has been, however, within the past few days, a new scheme brought forward bearing upon the great difficulty of the choking of the City thoroughfares, as to which we hope that the public will have the advantage of an early report from the City Surveyor. We refer to the proposed single-span high-level bridge across the Thames, concerning which we gave some particulars in our last number. We are disposed to look with favour on the plan, if the data, when thoroughly sifted, prove such as to support its applicability. We have repeatedly called attention to the serious engineering danger of throwing any additional weight on the existing foundations of London Bridge. It is no disrespect to the memory of Sir John Rennie to say so. We are convinced that, were he alive, he would be the very first to assure the authorities of the City that it would be very perilous to throw more weight on a structure of which a portion has been once on the move. The line of the bridge was adopted in spite of the advice and protest of Rennie. The foundations were rendered less absolutely reliable than might have been wished, in consequence of the vicinity of the deep hollows excavated in the bed of the Thames by the current through the old bridge. The Southwark abutment was actually on the move, and, when the subsidence ceased, remained 11 in. out of level. It will be temerity without excuse to risk the recommencement of the movement; and no engineer who values his reputation will take upon him to say how small an additional weight might do this.

More, there is the fact in evidence that there are fewer stoppages on the bridge than occur in an equal distance on any thoroughfare with at all a similar traffic. We entertain no doubt that a widening of the bridge would be of little or no advantage whatever, without a corresponding widening of the approaches, a matter of which the cost is quite prohibitory. For these, amongst other reasons, we have more than once intimated the opinion that the attention of engineers ought to be directed to the crossing of the river below London Bridge.

Architecturally considered, a bridge of a single span over the Thames might be made a great ornament to London, and a work of which not only the designer, but the country, might well be proud. The abnormally low price of iron, and the great improvements lately introduced in the manufacture of steel, are such as to make the present time unusually suitable for that structural novelty, a great steel bridge.

Thus far we are disposed to go with Sir Joseph Bazalgette. There is, however, another order of considerations, as to which we do not say that we oppose his views, but we do say that a very full investigation is necessary. This is, of course, the question of how far the river-side traffic, or the traffic which has to cross the river, would be likely to avail itself of a crossing at so considerable an elevation above the surface of the soil. The report speaks of inclinations of one in fifty and one in sixty on the north side. That, no doubt, is a moderate and practicable incline; but the question of the actual height to be surmounted has an importance independent of the question of inclination, or of the rapidity with which that extra work has to be done. To reach any portion of the 40 ft. general contour line, to which a descent of 31 ft. would bring the level of the approach, we must go more than half a mile from the river; and to reach that portion of the north road which occupies such a general level more than a mile has to be traversed. Between the Cheapside, Lombard-street, and Whitechapel, main line of road and the river, the level of the ground is very low. On the south bank, again, the 40-ft. contour line runs to the south of the Old Kent-road; and a large area, extending to two miles and a quarter from the river, falls within the 10-ft. contour line.

We might be able to speak with more certitude if the plans and sections which accompany the report of Sir Joseph Bazalgette had the vertical dimensions written. It is impossible to ascertain these with any accuracy merely by scale. It appears, however, that some 10 ft. are to be gained by a double incline over the bridge, meeting in a point at the centre. This would, however, only give a nominal headway, and would be a disadvantageous arrangement, in point of fact. A level platform is a great desideratum for a bridge; and although 3 ft. or 4 ft. might perhaps be gained at the ends of the platform, the advantage of a single span would not be fully gained if the soffit rose from both abutments to the centre. The proposed arrangement seems to us only to increase the height to which the loads must be raised, without securing any material advantage to the shipping.

The new feature of a spiral approach (which is indicated in an impossible way by two concentric circles on the plan) is said to have a rise of 1 in 40 for a length of 714 yards.

The resistance of gravity, on that gradient, is equal to 56 lb. per ton. The ordinary resistance to a wagon, on a good road, is stated, according to Sir John MacNeil's experiments, at 44 lb. per ton. Thus 127 per cent. would be added to the work of the horses the moment they began to ascend the spiral road. That extra work may be within the power of ordinary cattle for a spurt; but it may be questioned how far they would be likely to keep it up for a dead pull over 700 yards. The question would not be one of pure mechanics. We should have to consider the power of the horses, the ordinary amount of the loads they draw, and the amount of spare power to be obtained from them for a given time or distance. In addition to this we should have to study the opinion of the drivers and horse-owners. It is very questionable how far this would prove to be in favour of the spiral approach—especially when we bear in mind the extreme aversion of the working classes of the country to novelties, however ingenious. It would, therefore, require some inducement more obvious than that of a saving of 1,000 or 1,100 yards, we fear, to divert traffic to the new line.

We must not be understood as wishing now to express a definite opinion on the subject. But we think it is evident that it requires to be more thoroughly thrashed out than has yet been done before it will be advisable to decide on the expenditure of more than a million of money by way of such an experiment. It is possible to compare, with considerable accuracy, the amount of mechanical power that is demanded for testing a given weight over either route. This we observe has not been done. But even more important than the actual outcome, in foot-tons, of such a comparative calculation, is the correct appreciation of the mode in which the work can most conveniently be done by animal power. The two questions are not necessarily identical. It is possible that the usual proportions of load to horse power, the rough and ready mode of attaching harness, or other considerations, would be such as to prevent an experienced driver or horse master from making use of a route which was not only the nearest, but the one demanding the least exertion of power. It might be the case, for example, that an addition of 50 or 60 per cent. to the usual load would be as much as the horses of any particular vehicle were capable of dealing with. If so, they would not take a spiral ascent of 1 in 40, however much would be the saving in distance, or even in total mechanical work effected, if they could take that route. There is obviously much yet to be considered before the proposal in its present form can be accepted.

Of the three rough designs proposed, that of a single span of 850 ft., of which the idea seems to have been suggested by the high-level bridge at Newcastle-on-Tyne, is the one which affords more scope for a truly architectural treatment. Of such treatment, however, there is no indication in the design itself. We have many instances in the country of the happy combination of structural strength and architectural beauty. On the other hand we have noted examples, not fifty miles from the Tower, of the attainment of the first by the baldest and commonest design, without the slightest attempt at the second. There is a want of architectural *coup d'œil* in the design as it at present stands, which a man of genius would know how to remedy. The engineer should always consult the architect in a work of this nature and magnitude.

Halifax Flour Society Competition.—Competitors are inquiring what has become of the drawings. Perhaps the secretary will tell us.

THE FRENCH AND FLEMISH GALLERY.

The twenty-sixth Annual Spring Exhibition in Mr. Wallis's well-known gallery is not remarkable for any works of the highest quality of genius, but there are some of special excellence, and not of the less interest that some of them are by artists of comparatively new and rising repute. Among these is F. A. Kaulbach, the bearer of a name brilliant in the annals of German art, and which its present possessor bids fair to keep in honourable repute. When first we saw this artist's works on the walls of the gallery, and were naturally attracted to them by the familiar name, they struck us as weak and colourless, and pervaded by a rather affected sentimentality. Subsequently there was an improvement; the subjects were less ambitious and less sentimental; but in the painter's two works this year, "A German Lady of the Eighteenth Century" (10) and "Summer Roses" (177), there is a long stride in advance of anything he has exhibited before, and he seems to have all at once found the secret of rich colour and a fine broad masculine style. The two subjects named are both painted from the same model,—a blonde woman, with a very fine and interesting countenance; the first is a bust only, the head attired in a voluminous and rich head-dress, consisting of a wide-brimmed hat, beneath which the hair behind is gathered up into a great bunch, and done up with gold braiding. The painting of the face is very successful, remarkably soft and flesh-like in texture. In the second-named work the face is not quite so good, but the pictorial effect and treatment of the costume is beautiful, sufficiently realistic yet entirely free from "paintiness." Herr Kaulbach is still a young man, and after the proof of his capability of advance which these studies afford, we shall look with interest for his future works. It is pleasant in itself to meet a new and distinct variety of studies of female heads in the gallery; we have pretty well run the round of Bouguereau and Schlesinger and Goupil, and know most of what the two former at least can give us, who are represented here in their usual form; Goupil, indeed, is more exceptional, and his study, called "L'Attente" (28), though its excellence is almost purely material, is fine, and different from much of the artist's previous work.

The four cardinal points of the room are occupied respectively by Van Marcke's "Source of the River Neslette" (21), Meissonier's "The Savant" (74), Billet's "Faggot-gatherers" (124), and De Neuville's "Struggle at the Styring Railway Station" (167), an incident of the Franco-Prussian war. This last will certainly attract most attention of the four, although it is perhaps the least meritorious, and certainly the least refined as a work of art; but it has that brilliant dash and reality which French painters of battle-scenes are able, beyond all others, to impart to such a scene, and the incident is such as to be very telling in a picture. The Germans had seized the railway buildings, and the French soldiers on the railway in the foreground are making the most of the cover afforded by some of the rolling stock; some crouch behind a wagon, or lean round the end to steady their guns over the buffers while firing; a large covered van and a train of trucks are being drawn forward from the rear under the orders of the officers, to afford more effectual cover; men are falling in every direction: it is hot work. The buildings and the effect of the smoke from the musketry are admirably real; the painting of the figures spirited, but a little coarse and hasty; and the reds of the uniforms rather crude; in short, De Neuville does not by any means equal his brother artists Detaille and Phillipoteaux in artistic treatment of such scenes; he gives all the "go" of the action, but without pleasing our æsthetic sense. Billet's large work has some of his finest characteristics; his group of peasant girls standing or reclining in the foreground may be said to represent classic attitudes and pose in rustic dress and character; though their personality is quite in keeping with the subject, the figures are in their way noble-looking young women, and their apparently unstudied attitudes very fine and expressive. Meissonier is not altogether himself in his production, a work on a larger scale than is usual with him, and a little melo-dramatic in character; perhaps it may improve on acquaintance, and of course its want of success is only comparative; but as "a Meissonier" it is not up to the mark altogether. Van Marcke's painting, the least interesting in sub-

ject of the four, is the most entirely successful; it is a splendid study of cattle under the shade of a great tree, which fills up most of the canvas; to the left is a bit of distance that might have been painted by Constable, whose claim to be regarded as the direct progenitor of modern French landscape-painting could hardly have stronger corroborative evidence than parts of this work afford; the cattle, however, are such as were quite beyond Constable's powers in that line.

Among the other works which we are obliged to glance at in a more miscellaneous manner those of Kauffman (another rising artist) are among the best; his "Special Correspondent" (78), a flunkey playing the great man amid a collection of boors in a tap-room, is admirable in its way, though it is almost painful to contemplate the studied painting of utter vulgarity and utter stupidity in contrast; one wants some relieving character or incident of less disagreeable stamp. His "Daybreak after the Fair" (71) is more pathetic and less repelling, and perhaps equally clever: he is at least a painter who does not do things by halves. There is one Israels, which, like the Meissonier, would be thought more of under another name; it is not equal to the painter's fame. Among the realistic pictures of which certain recent French painters have set the fashion, Berand's "Sunday at St. Philippe-du-Roule, Paris" (58), succeeds thoroughly in its aim, not a very high one; the portrayal of the outsides of a conventional fashionable congregation. C. Seller sends two palpable attempts to rival Meissonier, "Halberdier" and "Standard-bearer" (68, 81), by no means altogether unsuccessful even from that point of view. C. Haag and Seignac, again, in their child pictures, seem too much like repetitions of E. Frère; but the latter is a gifted artist, and runs his model very hard, to say the least. Among the landscapes is a fine little work by the late N. Diaz, others by Daubigny, Windmaier, and other well-known names; one or two of those marvellous winter scenes, by Munthe, which are very like each other certainly, but each new specimen of which leaves us with the impression that this is positively the very best one the artist ever painted. No. 33 in this collection is extraordinary; it is impossible that realism in landscape could go further; we could walk into it, we feel the cold as we look at it. Some landscapes by Heffner, whose name is not so familiar, should be noticed, especially "A Study from Nature" (34). Among things that do not please us are the two works of Madrazo, whose brilliant gifts, with a strong dash of vulgarity, we noted the first time his work appeared in this gallery; unluckily the brilliancy is much less evident, the vulgarity much more so, in his recent works, and his colour is an absolute annoyance. We can put up even with these, however, better than with the religious charlatanism of Gabriel Max, whose "Sancta Julia" (85) finds a place here. Time was when such clap-trap would not have been admitted into this exhibition, and we can only hope the proprietors will keep their walls clear of it for the future.

ETCHINGS BY MR. SEYMOUR HADEN.

During the latter part of last week Messrs. Hogarth, the printsellers of Mount-street, had on view a small collection of the etchings of Mr. Seymour Haden, including more especially a series of twelve new etchings partly executed during the past year. The private exhibition of these, the latest proofs of Mr. Haden's genius as an etcher, offers a suitable opportunity for us to say a word in recognition of a most remarkable amateur artist. Considered as an etcher, there is, in fact, nothing whatever of the amateur about Mr. Haden, in one sense of the word at least; his works may bear comparison with those of any landscape artist who has made etching a specialty; his amateurness, if we may so put it, consists in the rather extraordinary fact that this beautiful work is only the recreation of a busy professional life, and that he is able to keep up a large medical practice and yet to produce etchings in such abundance and of such rare excellence. The explanation may partly be found in the fact that etching, though emphatically an artist's art rather than an amateur's, is not a form of art involving very lengthy processes of production and elaboration; that success in it depends upon innate genius rather than labour; and this innate genius Mr. Haden possesses in a remarkable degree.

The twelve etchings specially mentioned consist of small plates containing subjects from Nature (*i.e.*, if we understand rightly, etched on the spot), selected with a true appreciation of their suitability for this particular form of artistic treatment. For there are subjects that are to be etched, and there are subjects that are not to be etched, or at least not without a difficulty and labour out of proportion to the result. The peculiar value of etching is that it enables the artist to seize and fix permanently, with great freedom of execution, transient effects and expressions in nature, and to reproduce these in considerable numbers; though by no means with the ease, rapidity, or certainty of engraving, for taking off the impressions with success is a very delicate piece of work; the result is much affected by the individuality of the worker (a fact which of course increases the separate value of each impression), and in general only a proportion of the impressions are quite successful or satisfying. Still, there remains the fact of the multiplication of the results; and that etching is the only process in which a free and direct transcript of effect in a sketch form can be reproduced or multiplied by a process not wholly mechanical, and with a beauty and subtlety of tone and atmosphere which hardly any other kind of engraving can equal.

What is to be desired in a typical subject for etching (a landscape subject at least, with which alone we are here concerned) is that it should present strongly-marked and predominant feeling or *motif* which can be realised fully apart from any elaboration of detail. As far as landscape is concerned, etching is, in fact, rather metaphysical than physical in its objects; its aim is to give the essential feeling and poetry of the scene: this, at least, is what it can accomplish with greater force and success, in proportion to the means employed, than any other form of art: it is an interpretation rather than a reproduction of nature. Looking at the matter in this light, we should select for special admiration, among the twelve new etchings, not the rather highly finished and elaborated scene, "On the Test," beautiful as it is, but some of the apparently much slighter productions which show such a thorough knowledge of the special resources of etching, such a complete certainty as to the meaning and effect of every touch, and such a concentrated feeling. Among these we were especially struck with "The Moat-houses" and "Windmill Hill" (Nos. 9 and 10 of the set); the latter is a sketch of a most simple subject—a dip of slightly undulating common land with only just enough incident in it to make a foreground and define the distance, yet with a vague imaginative charm about it which it is not easy to define, but which draws one back to it again and again. It is more easy to define the interest attaching to the powerful little study called "Grim Spain," a sketch of black gloomy buildings, and a waste landscape, in the outskirts (apparently) of Burgos; and that of "Purfleet," a harbour view in which the picturesque force of the foreground with its medley of objects serves to emphasise more the calm and light of the expanse of water, the surface of which is merely defined by a line or two, and by the point of contact of the ships which float upon it. The freedom and effect with which the sky and clouds are indicated, purely by etched lines, and very few of them, is remarkable. This plate is a good example also of one of the qualities in a scene which renders it specially suitable for etching, the existence of an abundance of light, which leaves to the etcher only the task of duly emphasising the points of shadow to bring at once a flood of brilliant light over the scene: the manipulative problem being the very reverse of that which characterises engraving, in which the "hard work" is all in the lights.

Other works by Mr. Haden were on view along with those we have been mentioning, most of them more or less known to those who keep an eye on artistic work, and exhibiting various types and degrees of finish; we may particularly allude to one which was published by the Etching Club, and of which only a few impressions, we believe, are to be had; a study of trees in Kensington Gardens, the delicacy and beauty of which it would be almost impossible to exaggerate. Of the recent etchings we have been mentioning, some will no doubt be seen in Gallery IX. of the approaching Royal Academy Exhibition.

Municipal Courtesies. — On Wednesday evening the Lord Mayor entertained the members of the Metropolitan Board of Works.

ON THE ORIGIN AND PROGRESS OF WOOD ENGRAVING.*

Wood-engraving, from its very beginning, was essentially a popular art. It was created to supply the many, not the chosen few. It has thus done more for the world in these latter ages, and conferred more pleasure than, perhaps, any other. Who does not remember his first picture-alphabet, in which he was taught to associate letters with things, by means of coloured wood-cuts? Or his first book of animals? Or, perhaps, if the memory goes further back, our recollections linger over certain quaint story-books, as quaintly illustrated, a Watts's Hymns, a Bewick's Fables, or, mayhap, an old Bible, the woodcuts of which are even more vividly remembered than the text. Nor is the art a whit less popular in this stirring nineteenth century of ours, so prolific of new ideas and new inventions, than it was 400 years ago. On the contrary, the greatly extended study of art in all its forms, and the spread of education, has so increased the love for illustrated works, that the art of the wood-engraver is now more necessary to us than ever. Every blank wall is made picturesque by his productions, to which colour-printing has added a new charm. Our admirable illustrated newspapers could not exist without the wood-engraver, our *Punch* would be insipid, and even the "Penny Horrible" would lose all its attractions for the gaping crowd if deprived of its ghastly wood-cuts. A short account, then, of this truly popular art, its origin and progress, may be acceptable to many, especially if it enable them to appreciate better the magnificent collection, of which a catalogue is subjoined.

First, then, what is a wood-cut? It is an engraving, printed from a wood block, in which all the parts intended to be white in the impression, and, therefore, not drawn on the block, are cut away, or dug out, while all the portions to be dark in the print, and which are drawn on the block, are left intact, uncut, and therefore *standing up in relief*. When such a surface is inked, the cut-away portions are untouched, and are left white in the resulting impression. Now, engravings from copper and steel plates are obtained by a process which is the reverse of this. All the parts that are to be left white in the resulting print are left untouched in the plate, while all the portions that are to print black are engraved, cut out, or else corroded away by acids. Such a plate is first inked, and then wiped clean; it is only the ink left behind in the engraved or lowered portions which, when pressed against the paper, gives the impression.

The modern wood-engraver uses, for all fine work, blocks of the hardest box-wood, cut across the grain. These are necessarily of small size, and, for large engravings, he is obliged to join several blocks together. The early wood-engravers used pear-tree and other woods cut like planks in the direction of the grain, which gave them much larger pieces, but altogether excluded delicate engraving.

A block thus prepared can be inked and printed from just like type. It can be inserted into a mass of type, set up to make a page of a book, and printed from at the same time, so that the text and the illustrations are produced at the same moment, and completed together. It is this which constitutes the peculiar advantage of wood-engraving. The copper, and the steel plate, since they require a totally different mode of inking, must have their engravings printed off on separate leaves from the text, or at a different time. But the peculiar charm and value of illustrations are best obtained when they are inserted into the text, and, for this purpose, there is nothing like wood-engravings.

Upon the origin of this art a great deal has been written, which may be found in the works of Papillon, Heineken, Jackson and Chatto, Weigel and Zestermann, and A. F. Didot, but all that is certainly known may be told in very few words. Carving in wood, and, consequently, the use of wooden stamps, must have been practised and used before the dawn of history. We know that the ancient Egyptians and Assyrians employed such stamps to impress their primitive characters upon soft clay, and specimens of them actually exist in our museums. The Romans also used them; though, to brand their slaves, they were obliged to employ brass ones. No further advance was

* The Liverpool Art Club have arranged a loan exhibition of wood-engravings (a fine collection), and preface the catalogue with the following memoir, which deserves circulation.

made until the twelfth and thirteenth centuries, when engraved blocks began to be used for giving off impressions in colour on to the smooth surfaces of silk and other fabrics. Weigel gives no less than ten illustrations of printing from wooden blocks on coverlets and garment fabrics before and during the fifteenth century. Such imprints increased considerably during the thirteenth and fourteenth centuries, when liturgical vestments and choice draperies were often thus elaborately adorned. Linen, silk, satin, and even leather received such impressions in various colours, sometimes in gold. Here was the germ, certainly, yet it grew not into the art. Down to the end of the fourteenth century no mention has been found of wood-engravings. Boccaccio and Petrarch, and our own Chaucer, are silent about them. Even Richard de Bury, Bishop of Durham, in the reign of Edward III., in his curious Essay on the Love of Books, says not a syllable about any other illustrations but those painted by hand. There is not a single wood-engraving existing which there is any reason to attribute to an earlier date than the beginning of the fifteenth century.*

At length we tread on firm ground. Some eighty years ago Heineken, a most indefatigable hunter after book rarities, discovered in an ancient Convent at Buxheim, near Augsburg, a large coloured wood-engraving of St. Christopher, with the date, 1423, distinctly cut underneath. It was pasted inside the right-hand cover of a manuscript book, finished in 1417. Another large engraving (the Annunciation) was pasted inside the left-hand cover, and both were coloured by stencilling. This volume is now in the magnificent collection of Earl Spencer. Many other single wood-cuts have been discovered, which may be somewhat earlier than these, but the St. Christopher still remains the earliest wood-cut, about the date of which there is no dispute. In this famous cut, the gigantic saint, who was 12 ft. high, is represented as performing his usual penance, that of carrying pilgrims across a stream where there was no bridge. Amongst others he carries over the child Christ, and for the first time finds that, in spite of his great strength, he is unable to carry him any further. To prove to St. Christopher who he is, the child tells the tottering saint to plant his staff in the ground, and it grew at once into a palm tree, bearing fruit. This miracle converted thousands. Such is the legend embodied in the picture, beneath which are two lines of wood-cut text:—

"Cristefori faciem die quacunque tueris
Illa nempe die morte mala non morieris,"

which may be thus translated:—

"Each day that thou the likeness of Christopher shalt see
That day no evil death shall make an end of thee."

This alludes to a popular belief, common at that period to all Catholic countries, that the day on which any one regarded a figure or image of St. Christopher, he would not meet with a violent death, nor die without confession. To this popular superstition, Erasmus alludes in his "Praise of Folly"; and, thus believing, the Squire, in Chaucer's "Canterbury Tales," wore

"A Cristofre on his brest, of silver shene."

Another of these earliest wood-cuts represents St. Bridget, in pilgrim's garb, writing an account of her visions, and at the top is an inscription:—

"O Brigita, bit Got fur uns!"—"O Bridget, pray to God for us!"

Such, then, were the earliest productions of the art; and we may fairly conclude that wood-engraving, like printing, was discovered at that time, because it was greatly needed. It was a natural outcome of the spirit of the time. A great revival in religion and learning was setting in, and the spirit of the coming reformation already stirred the great heart of Germany. Something more was expected from the Church than it had hitherto afforded to the common people; and the religious instinct was satisfied for the time by the distribution of these large coloured wood-cuts as aids to devotion. The preaching friars found them of service, and many a dull sermon was lightened by a picture and a legend. They were, at least, better than the old mountebank tricks of the friar, whose sermon is reported by Boccaccio, and who exhibited to his gaping audience a feather from the wing of the archangel Gabriel, and a box filled with the coals over which St. Laurence was grilled! It became the custom to distribute figures of the patron saint, at churches and shrines, to those who visited them; and many a pilgrim, possessed of his picture—to which he attached a magical efficacy—returned on his way rejoicing.

The next step in the progress of wood engraving was to print a connected series of large woodcuts, having at top or bottom of each an explanation of the subject of the picture, and to bind them together as a book. Several of these block books still exist; of which the best known are:—1. Apocalypsis; or, Scenes from the Life of St. John and from the Revelations; 2. A History of the Virgin Mary, as it is supposed to be typified in the Song of Solomon; 3. The so-called Biblia Pauperum, which consists of Typical Figures of the Old Testament, followed by their Antitypes in the New; or, the History of Jesus Christ pictorially represented. This, the most popular of the block books, was rather a Biblia Pauperum Predicatorum; or, Poor Preacher's Bible—a series of woodcuts to warm the preacher's imagination, and provided with texts to assist his memory. In an age when copies of the Bible were mainly confined to the libraries of the great monasteries—when reading and writing were things unknown to the mass of the people—and when many a priest could scarcely spell his breviary,—these block books, foolish and childish as we may think them, must have been of great service, and have helped not a little to diffuse some knowledge of the Scriptures amongst the people. At least, we know that they were highly popular, for five editions of the Poor Preacher's Bible alone are known. The cuts in all these early works are executed in the simplest outline manner; there is not the least attempt at shading, by means of inner lines—cross or parallel—to be perceived in any of them; and the most difficult part of the engraver's task must have been the cutting of the letters. All the earliest woodcuts, probably until the invention of printing, were taken off by laying paper on the inked wood block, and rubbing the back of it gently, as wood engravers do to this day in taking off their trial proofs. Each leaf was printed on one side only, and, to make a number of them into a block book, the backs of the leaves were often pasted together.

But all these advances were soon to be cast in the shade by the discovery of the art of printing. The illustrious Gutenberg, one of the greatest benefactors of the human race, was engaged for many years in labouring to perfect the divine art of printing. During that time he expended all his own fortune, and as much money as he could borrow, over his costly experiments. Like other great inventors, however, he reaped neither profit nor glory from his great discovery; for, just as he had finished the first printed book, and the first printed Bible, a magnificent proof of the perfection to which he had brought the new art, the entire impression, with all the type, presses, and other materials, were seized by Fust, a goldsmith, who had lent him money, and in Fust's name, as printer, all the earliest printed books were issued. Gutenberg died blind and comparatively neglected in 1467. And yet this man had built up the art of printing from the lowest beginnings to a very high standard of excellence. He commenced by taking a hint from the wood engravings which so suddenly sprang into demand, and had letters cut in wood, with holes through them, by which they could be strung on wires. These were, no doubt, soon thrown aside for types made of some lead alloy, cast in brass matrixes, as appears from the records of a trial he had in 1139, from which we also learn that he had invented a press, and that this was one of the secrets of the "wonderful art" to which Gutenberg already laid claim.

By the invention of printing a wonderful stimulus was given to wood engraving, and the two inventions progressed hand in hand together, in a union that bids fair never to be disunited. Thenceforth the block books were usually multiplied at the printing-press, and, in the last of the series, the "Speculum Humanæ Salvationis," which first appeared about 1460, the wood-cuts are taken off by friction as before, the back of the leaf being left blank, but there is an accompanying text printed at a press from movable type. And now, by the rapid diffusion of printing, the two arts spread over Europe. In 1461 appeared the first printed books of Fables, illustrated with rare woodcuts, and within twenty years from that time quite a series of illustrated Bibles had been produced. The two inventions had, indeed, exactly met the wants of the age. For a thousand years the world had been supplied with books solely by the monkish scribes, but the demand, even at the end of the fourteenth century, had outgrown the supply. Already guilds of writers and illuminators had been established at Bruges, Paris, and elsewhere, whose sole trade was the multiplication of books, and many works of poetry and romance were perpetuated by them which would scarcely have agreed with the air of a monastery. All these MSS., both secular and religious, owed much of their attractions to the work of the illuminator, who, after the volume was written, added pictures, capital letters, and borders, elaborately painted in colours and gold. The sumptuous beauty of many of these works may be judged of from the specimens exhibited.

Was it likely, then, that the book-buyers of an age in which even religion was nothing if not picturesque would be content with the dull regularity of a printed book? It would have left on their minds an aching void, which print could never fill. But the art of the wood-engraver supplied the want. He furnished capital letters of elaborate design, often enclosing pictures, which were sometimes printed in colours, as blue and red; also borders, to set off each page. No doubt these were occasionally cut in brass, from which casts in type-metal could be made. But the majority were from wood blocks, as were also the numerous pictures with which so many early-printed books were embellished, and which are increasing in value every year from the light they throw on the costumes, manners, and customs of their time.

In spite of the vast stimulus given to wood-engraving by the invention of printing, there was no improvement, to the close of the fifteenth century, in the technic of the art or in the designs engraved, and the best of the cuts of that period are decidedly inferior to the best of those in the early block books, or even the still earlier ones, such as Earl Spencer's. One only exception can be made, viz., the beautiful title-page to the Latin edition of "Breydenbach's Travels," printed at Mentz in 1486, which, both in design and execution, is the finest woodcut that had been produced to that date, and renders this, the first printed book of travels, doubly interesting.

But now appeared the greatest artist who ever drew on a wood-block, the all-accomplished Albert Dürer. He was born in 1471, in the glorious old city of Nuremberg, then the greatest manufacturing town in Europe, the Birmingham of the Middle Ages, but, unlike Birmingham, the highest qualities of art were displayed in its metal work. Adam Kraft, the famous sculptor of the "Sacraments Hauslein," in the Church of St. Laurence, was a townsman and neighbour; as was also Peter Vischer, the bronze-worker, who made the shrine of St. Sebald—works which, for richness of design and delicacy of execution, are scarcely equalled by the finest monuments of Italy.

"In the valley of the Pegnitz, where, across broad meadow lands,
Rise the blue Franconian mountains, Nuremberg the ancient stands;
There, when Art was still Religion, with a simple, reverent heart,
Lived and laboured Albrecht Dürer, the Evangelist of Art."

His father was an able goldsmith, and Albert was his favourite child. "My father," he says, "took special delight in me. Seeing that I was industrious in working and learning, he put me to school, and, when I had learned to read and write, he took me home from school, and taught me the goldsmith's trade." But Albert longed to be a painter, and at length he was apprenticed to Michael Wohlgemuth, the principal painter of Nuremberg. Wohlgemuth's establishment was probably the largest picture manufactory of the time. With the help of his numerous assistants, he supplied, at a moderate price, oil paintings, of which the usual subjects were scenes from the life of Christ and of the Virgin Mary, or martyrdoms of saints, commissioned by mercantile corporations or private persons to decorate their chapels in the churches. He also executed a vast number of designs for the wood-engravers, especially for the numerous volumes continually issuing from the presses of Antony Koberger, the most enterprising printer, not only of Nuremberg, but of Europe, and Dürer's godfather. In Wohlgemuth's workshops, therefore, Dürer had plenty of practice in drawing

* Playing cards are said to have been introduced into Europe by the Saracens towards the close of the fourteenth century, and some have endeavoured to trace to them the first impressions from a wood-block on paper or vellum. But it is now known that the earliest cards existing are all hand-painted or stencilled.

for wood-engraving, and thus obtained that inclination for the work which has been as fortunate for the world as for his own fame. His paintings, which might have given him a name equal to the greatest of the Italian school, have nearly all perished; the numerous drawings which he executed are shut up in Imperial museums, or in the cabinets of a few wealthy collectors; but his engravings and woodcuts exist yet by thousands, and have carried his fame to all the world.

After the usual travels (*wanderjahre*) of a German youth, he returned to Nuremberg at his father's bidding, in 1494, to be married, and settled down at once to hard work. In 1498 appeared his earliest wood-cuts, the sixteen great designs for the Apocalypse; and it will be most instructive for the reader to contrast the similar designs of his master, Wohlgemuth, as seen in the *Nuremberg Chronicle* and "Der Schatzbehalter," with those of his inspired pupil.

The Northern mind had long dwelt with eagerness on these mysteries of things to come, and among the earliest block books produced in Germany is an edition of the Apocalypse, with rude figures. But Dürer not only transcends all efforts made before him in the representation of these strange promises, terrors, and transformations, these thaumaturgic visions of doom and redemption; the passionate energy and undismayed simplicity of his imagination enable him, in this order of creations, to touch the highest point of human achievement. The four angels keeping back the winds that they blow not; the four riders; the loosing of the angels of the Euphrates to slay the third part of men; these and others are conceptions of such force, such grave or tempestuous grandeur in the midst of grotesqueness, as the art of no other age or hand has produced. From this time till his death, in 1528, he continued to pour forth, with a creative energy that never seemed to flag or to repeat itself, an incredible series of designs, of which nearly two hundred have been fortunately preserved to the world in the popular form of wood-engravings. These include, besides the Apocalypse series, the "Life of the Virgin," in twenty large woodcuts, the most generally pleasing and popular of all his productions; the twelve folio cuts known as the "Great Passion"; the series of thirty-seven smaller ones, distinguished by some writers as "The Fall of Man and his Redemption through Christ," but which Dürer himself always called the "Little Passion"; also many single subjects, amongst which are some of his finest designs; and, lastly, the gigantic works which he executed for the Emperor Maximilian. This great monarch, fired with a hundred ambitions at once, was anxious that the best artists of his time should be employed to represent him as a hero of romance, successful alike in the chase, in love, and in war, as a wise king, a patron of all the arts, and a successful general. For this purpose he employed, during several years, Hans Burgmair, Hans Schaufelein, and especially Albert Dürer, in executing vast designs for wood engraving of triumphal arches, cars, and processions, which, doubtless, he expected would transmit his glory and his fame to future generations. We may form some idea of the labour involved in these designs from the "Triumphal Arch," which consists of ninety-two separate wood-engravings, each more than 1 ft. square, all drawn by Dürer, and which form one large composition about 10 ft. 6 in. high by 9 ft. 6 in. wide. The whole subject is a kind of pictorial epitome of the history of the German empire, representing the succession of the German Emperors, and the more remarkable events of Maximilian's reign, with illustrations of his descent, possessions, and alliances. On this task, so unworthy of his genius, Dürer was engaged, more or less, from 1513 until 1520.

It is difficult to avoid lingering over the life and works of one so personally attractive and so marvellously endowed, but for the present we must refrain, and consider him only as connected with wood-engraving. Until his time wood-cuts were little more than mere outlines. With Dürer they at once became finished drawings, in which the light and shade and colour were fully expressed. The numerous engravings and etchings on copper which he executed with his own hand are unrivalled for marvellous delicacy and minuteness of detail, but he adopted an entirely different style in his drawings for the wood-engraver. The material then used was pear-tree wood, cut, like planks, in the direction of the grain. Large pieces could thus be obtained, but delicate wood-cutting on such a substance was quite out of the question. This necessitated a large and bold style of drawing, coarse, indeed, to our eyes, yet very effective. Dürer's works, both on copper and wood, were greatly popular from the first over all Germany and Italy. Raffaelle introduced some of Dürer's figures into his finest paintings, and a famous Italian engraver, Marc Antonio, copied his wood-engravings by wholesale on copper. It was partly to check these piracies of M. Antonio that Dürer made a journey into Italy in 1505.

To the casual observer it may appear strange that nearly all the great works of Dürer and his contemporaries were religious, and yet that they reproduced literally in their pictures the secular life of their own time. Thus, the "Birth of the Virgin," were it not for the splendid apparition of the angel above, swinging a censer, might be taken for the accouchement of a burgomaster's wife at Nuremberg, in the year 1510. But a moment's thought will remove the difficulty. They could not embody in their pictures costumes and modes of living which, in those untravelled times, they had never seen or heard of. Doubtless they followed pretty closely the models and costumes that they saw in the religious plays so popular with the multitude. Again, in an age of despotic governments, with no politics, no literature for the masses, the main strength of art was enlisted on the side of religion. There were many reasons for this. The Roman Catholic Church was then at the pinnacle of power and wealth. Its churches were miracles of art in many forms, glittering and bright as an illuminated missal. If there was any lack of the spiritual element in its worship, the senses at least were gratified in a thousand ways. Religious pilgrimages, processions to shrines, miracle-plays, the exhibition of relics and pictures, and the gorgeous church ceremonies, were all so many schools for art, and studies for pictures; whilst the literature of the Church, its elaborate Lives of the Virgin and the Saints, abounding in strange and picturesque incidents, lent itself naturally to pictorial illustration. Nothing was left for faith, but all was represented by pictures, figures, or living actors, from Adam and Eve to the Mystery of the Trinity. Dürer records frequently, in his diary, the intense delight with which he witnessed, and the care with which he studied, these living pictures. Thus, during a visit to Antwerp in 1521, he witnessed a grand procession "from Our Lady's Church on the Sunday after the Assumption of Our Blessed Lady." All the trades and guilds of Antwerp were represented, each with its appropriate flags and banners. Then followed the religious orders in their characteristic costumes. Next the Canons of the Church, "and twenty persons bore our Lady with the Lord Jesus ornamented in the most costly manner, to the honour of the Lord God. Then followed the Prophets all in order; next, scenes of the New Testament, as the Salutation of the Virgin, the Three Holy Kings on their camels, and other rare wonders, beautifully represented; also Our Lady fleeing into Egypt, very piously set forth. Next followed St. George, very handsome, with his squire; and last, a great dragon, led by St. Margaret and her maidens by a girdle, which was particularly pretty, and the procession was more than two hours passing our house." As we read this, we can understand the sources whence Dürer derived the infinite variety of costume and character which are seen in his compositions, each figure being often stamped with the most intense individuality. All these characteristics are well seen in the splendid series of his woodcuts exhibited on the present occasion, and which would of themselves justify the eloquent panegyric of Professor Sidney Colvin:—"He has every gift in art, except the Greek and the Italian gift of beauty or ideal grace."

Hans Burgkmair, of Augsburg (1473–1531), deserves the next place to his greater rival of Nuremberg, not only for his merits as an artist, but, also, because he is admirably represented in the present collection. That superb procession, the "Triumph of Maximilian," consisting of 135 large wood-cuts, the greater part, if not all, of which were designed by Burgkmair, would, of itself, stamp him as an artist of uncommon richness and fertility of invention. He was engaged on this great undertaking from 1513 to 1519, when the emperor died. The work was at once suspended. The wood blocks were cast aside and forgotten, until they were accidentally discovered, worm-eaten and injured, and some impressions taken from them in 1796. Such is the vanity of human hopes and aspirations! Burgkmair is a very unequal artist; he often displays great power and originality, but he has not the careful handling and refined touch of Dürer. If, however, some of his pieces are bad, others are superlatively fine, especially "Death and the Lovers," which combines his usual picturesqueness and energy with an Italian feeling for beauty and grace, most rare in early German woodcuts. This is also one of the earliest specimens known (it is dated 1510) of the chiaro-scuro, or tinted wood-cut; an attempt to increase the capabilities of wood-engraving, and to imitate more nearly an artist's drawing, by printing in colours, or tints, from several wood blocks. In this one of Burgkmair's three have been employed. Another fine chiaro-scuro by him, the "Emperor Maximilian on Horseback," is printed from two blocks. Burgkmair was also the chief designer employed in the production of "Der Weiss Kunig," the Wise King, another work intended to hand down to future generations the learning, wisdom, and adventures of the Emperor Maximilian, but which remained unpublished until nearly 300 years after his death.

Hans Schauffelien, another great artist, who was apprenticed to Dürer, was the designer of the large wood-cuts in the "Romance of Sir Theurdanck," the only one of Maximilian's artistic publications that he lived to see completed. It was first published in 1517. Schauffelein's powers, however, are better seen in his "Great Passion," a series of wood-cuts published at Nuremberg in 1507, in a book entitled "Speculum Passionis," &c. Many of the designs have a striking resemblance to those of Albert Dürer. The work, however, which best sustains his reputation is "Les Danseurs des Noces," the figures in which are drawn with great spirit and vigour.

Lucas Cranach (1470–1553) is said to have been the first inventor of the chiaro-scuros, and several most valuable specimens of these earliest tinted wood-cuts are in the present collection, with other fine examples of his skill as a designer.

Lucas Van Leyden (1496–1533) is better as an excellent engraver on copper than as a wood-cut designer; but some excellent and rare specimens of this quaint artist are in the present Exhibition.

Hans Sebald Beham (born at Nuremberg, 1500; died, 1550) was a free and bold designer, worthy to be classed in the school of Albert Dürer. He is well represented in the present collection by the curious series representing the influence of the planets over human passions and destinies.

We now come to Hans Holbein (born at Augsburg, 1494; died in London, 1543), the last of this great school of artists, who was not only an admirable painter, but also one of the best designers that ever drew on a wood-block. This great master ranks next to Dürer in artistic ability, natural genius, and fertility of invention. Nay, in some respects he surpassed Dürer, as he had a much higher feeling for beauty of form. It has been most truly said of him that none has equalled Holbein in composing an action with the smallest number of figures, and in the smallest possible space.

This is well seen in the "Bible Pictures"; but especially in the "Dance of Death," a fine selection from which will be found. These tiny pictures deserve a careful study. They are wonderful for their infinite variety, the dramatic energy of the figures, and the sharpness of the satire. It is a pity that the smallness of the scale on which they are drawn detracts somewhat from their effect. Most fortunately these little gems of design have been cut in the wood with a perfection that has never been surpassed. Of the many able copies made by modern engravers, none approach the originals. They have all the spirit of the master. The drawing is very simple, but every line tells.

Many other designs for a "Death Dance" will be found in the present collection. The subject appears to have had a peculiar fascination for all classes in the fifteenth and sixteenth centuries. It appears in the border decorations of the printed Books of Hours (a most un-Christian idea in manuals of devotion), and occurs frequently in other forms. In these strange compositions Death is represented under the most repulsive aspects, as a skeleton, or a half-decayed body, triumphing over all classes, from the Pope and the Emperor down to the beggar, and forcing all to join in the common dance to the grave. A horrible subject! What

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could have been the cause of its general popularity? May we not find it in the commencing reaction against the accumulated miseries of the feudal ages? The vast mass of the people were ground down and oppressed by a hundred forms of tyranny, spiritual as well as temporal, and they saw in death the universal leveller, who recognised no class distinctions, no exclusive privileges, and who, in his own time, would tyrannise over their tyrants, and in some degree avenge their wrongs.

Other remarkable specimens of Holbein's skill are in the present collection. The title-pages he designed are very fine. One,—the title to the "Great Bible" of 1539,—has a special interest for Englishmen. This, the third English Bible, was secretly printed at Paris by some friends to the Reformation, and Holbein's title was designed to secure the favour of Henry VIII., by representing all classes as singing his praises. Part of the impression was seized by the Inquisition and destroyed.

Of the later German artists who made designs for wood-engravings, we may mention Virgil Solis, whose Bible cuts are in the present collection, and Jost Amman, whose graphic representations of costumes and fashions, trades and professions, in his time, are much esteemed.

The art of wood-engraving was early introduced by the Germans into Italy with that of printing; but no native works of any ability are known to have been executed before 1490. From that date until about 1560 the Italian presses produced many beautifully-illustrated works, with designs full of grace and elegance. Fine specimens of these are the "Romance of Poliphile" (1499), the "Epistles of St. Jerome" (1497), and the two Missals. The illustrations in these books are worthy the best period of Italian art.

The second place after Germany must, however, be awarded to France, for the number and excellence of its early wood-cuts. Throughout the fifteenth century Paris was the chief centre for the trade in manuscript books. There dwelt those numerous artists and scribes who wrote and decorated the vast number of beautiful Books of Hours, Psalters, and other devotional works, which made the French school of illuminators so famous, and of which many copies still exist. The Paris publishers early applied the new arts to furnish cheaper substitutes for these expensive volumes. They had the most exquisite models to imitate, and abundance of artists to furnish the requisite designs; and so well did they employ the advantages they possessed that, in a very few years, Paris was the great centre whence Europe was supplied with Prayer-books, which have never been surpassed for the beauty of the printing and the decorations. A series of fine specimens will be found in this collection, ranging from 1490 to 1530. They were usually printed on vellum, in imitation of the manuscripts which they supplanted; and, to increase the resemblance still further, it is not uncommon to find copies in which all the pictures have been painted over in colours and gold, so as to look like miniatures. Lyons and other towns became also great centres for the production of admirably illustrated works, and worthy rivals to Nüremberg, and the other cities of Germany, in the book trade.

When Caxton introduced printing into England, and set up the first press at Westminster, about 1476, he brought with him also the new method of multiplying pictures for book illustration. But, though he employed it largely, the best cuts in his books are foreign productions, and the rest such rude things as any clever lad might draw and then cut with a penknife. Such, also, are the embellishments to the works of Wynkyn de Worde and the other early printers. The same may be said of nearly all English books down to the time of Bewick (1753—1828), before whom no school of designers or wood-cutters existed in England. Thomas Bewick was, indeed, the father of wood-engraving in this country. Nothing could be lower than the state of the art when he appeared. Himself no mean artist, possessed of extraordinary mechanical dexterity, he devoted all his energies throughout a long life to improve his art. He thoroughly understood all its capabilities, and knew how to produce the greatest possible effects with the smallest amount of labour. Some of the birds,—as the partridge, the woodcock, and the common duck,—in his Land Birds, are wonderful things in their way, for the perfect fidelity with which he has expressed the plumage and general texture of the bird. Yet his pupil, Jackson, tells us that he would execute such a cut in less time than a modern French engraver would take to execute the delicate cross-hatchings necessary, according to French taste, to denote the grey colour of a soldier's coat. Much might be written, also, on the humour and spirit of the numerous head and tail pieces which he designed; but they are better seen than described. He also trained quite a school of eminent wood-engravers, to whom we owe the present advanced state of the art in England. The productions of Bewick and his followers are admirably represented in the present collection.

In the great social progress of the last fifty years, the wood-engraver has played almost as prominent a part as the printer. It is difficult for the present generation to realise the enormous advantages they enjoy over their fathers in the attainment of knowledge. Contrast the infinite variety of books and periodicals now supplied for children, well written and admirably illustrated, communicating information in a thousand pleasant ways, with the miserable trash, scanty in amount and wretchedly illustrated, that was supplied to the children fifty years ago! The fountain of wisdom and knowledge in those days gave forth nothing better than Histories of Jack Sprat, his Wife, and his Cat, Tom Tucker, Mother Bunch's Fairy Tales, and so on. And thus matters had gone on for hundreds of years! But a new era commenced with the publication of the *Penny Magazine* in 1832, followed by the other attempts of Charles Knight and the Society for Diffusing Useful Knowledge to produce a cheap illustrated literature for the people. In 1842 the *Illustrated London News* was started. And these works were the pioneers of that vast illustrated literature which we now enjoy. The enormous demand that has thus been created for designers on wood has been well met; for it has produced such artists as Sir John Gilbert, Gustave Doré, John Tenniel, Harrison Weir, and Birket Foster. What, indeed, can be better fitted to express the myriadfold mind of the time,—struggling to express itself in new forms of act and thought,—than that intimate combination of woodcut illustrations with text which forms so large a part of our current literature? Happy the men who are born under such influences: such multiplied means of knowledge! Let them prove themselves worthy their opportunities.

John Newton.

CONCRETE HOUSE IN GERMANY.

Mr Liebold, an architect of Holzminden, has published in the *Deutsche Bauzeitung* an account of a dwelling-house of concrete, lately built by him in Vorwohle for a gentleman engaged in the manufacture of Portland cement. The *American Architect*, quoting this account, says:—"Although the house was quickly built, it yet seems to contain a *tour-de-force* of almost every constructive form for which concrete can be employed. The rooms are covered with various kinds of vaults, many of which have a very considerable span. Over the vestibules of the different stories,—spaces 13 ft. by 17 ft.,—three vaults are superimposed without the use of iron, and depend solely upon the vaults of the adjoining rooms for a counteraction of their side-thrust. The original and striking feature of the building is the great cloister-vaulted roof, which, resting on the four principal corners of the structure, rises through a story and a half. At its base, the concrete of which it is formed is 1 ft. in thickness; at its summit, only from 4 in. to 5 in. It is to be regretted that it has received no architectural expression on the exterior; the objectionable Mansard is excused by Mr. Liebold on the ground that it was desired by his client. The outer walls of the house are 1 ft. thick; division-walls and partitions being from 8 in. to 10 in. thick. In the cellar these dimensions are increased by 4 in. The walls are anchored at suitable points, and were built above-ground by means of adjustable wooden boxes, into which the cement was poured. Below-ground, the cellar and foundation-walls were cast in trenches, the cellar itself not being excavated until after their hardening. The trenches, consequently, were dug to the depth of the cellar below the level of the earth, plus that necessary for the foundation below its floor. This total depth must have been between 7 ft. and 8 ft., and can only have been obtained in firm soil.

The concrete employed was composed of one part cement to seven and four parts respectively of gravel and sand. The stairs have treads of slate, and are cast so as to measure on the string 4 in. at the re-entrant and 7 in. at the outer angle of each step. In them a coal-slag was substituted with good effect for the gravel; the weight of the concrete thus prepared being but from one-half to one-third that of the concrete made with stone. The cornices, window casings, steps, &c., were formed of three parts of sand to one of cement, and were ready to be walled, or rather cast, into the walls, as the building advanced. The entire cost of the house, which is in effect a cube with a side of between 50 ft. and 55 ft., was $4,300, gold. From the itemised account it appears that all the interior vaulting cost $420; the stairs, $82; and the roofs and the platform, $438,—all in gold. The cost of the concrete walls, including the wooden forms, &c., was 13½ cents per cubic foot. The building was completed in four months, and its construction may be regarded as thorough in every respect. Immediately after it was roofed in, the inspector of buildings ordered the floors throughout the house to be weighted with 65 lb. to the square foot. This great weight did not produce the slightest hurtful effect on the vaults,—not even a crack in the plasterings. As a preliminary experiment, a pair of concrete vaults were built last year in Vorwohle over a space 13 ft. or 14 ft., the length of which was divided into two equal parts by an iron I beam; the walls, also of concrete, were 12 in. and 8 in. thick. The centre of this vault was weighted on a space containing 31 square feet with a weight of five tons, that is to say, over 330 lb. to the square foot; yet there was no displacement or crack either in the walls or vaults. As a further example of rapid construction, a bridge was built of concrete, and prepared for use in six working days, which was 21 ft. long and 12 ft. wide; and a smaller concrete dwelling-house, 43 ft. by 30 ft., was entirely completed in seven weeks. It is to be hoped that the official experiments now being made by the Polytechnic of Brunswick upon the strength and reliability of concrete will soon be made public, as their results bid fair to be surprising."

ALTAR, ST. MARY'S ABBEY, STANBROOK.

The altar, illustrated in our present number, was designed by the late Mr. E. Welby Pugin, architect, and is erected at St. Mary's Abbey, Stanbrook, near Worcester. The materials used are Caen stone for the body of the work, marble pillars to support canopies, marble shelves to super-altar, and granite columns to altar-table. The tabernacle is wrought in alabaster. The work was carried out by Mr. Boulton, of Cheltenham.

BROAD-STREET WARD FOUNTAIN.

A design by Mr. J. S. Edmeston has been approved by the Wardmote, and will doubtless be worthy of the Ward.

The base, with four basins, will be of red and grey granite of different tints, and the whole polished. Messrs. Freeman, of Penryn, have the work in hand, and promise to have it ready to fix by May 1st.

The canopy will be of bronze, wrought in the best manner, and is contracted for by Messrs. Hart, Son, & Peard, the art metal-workers.

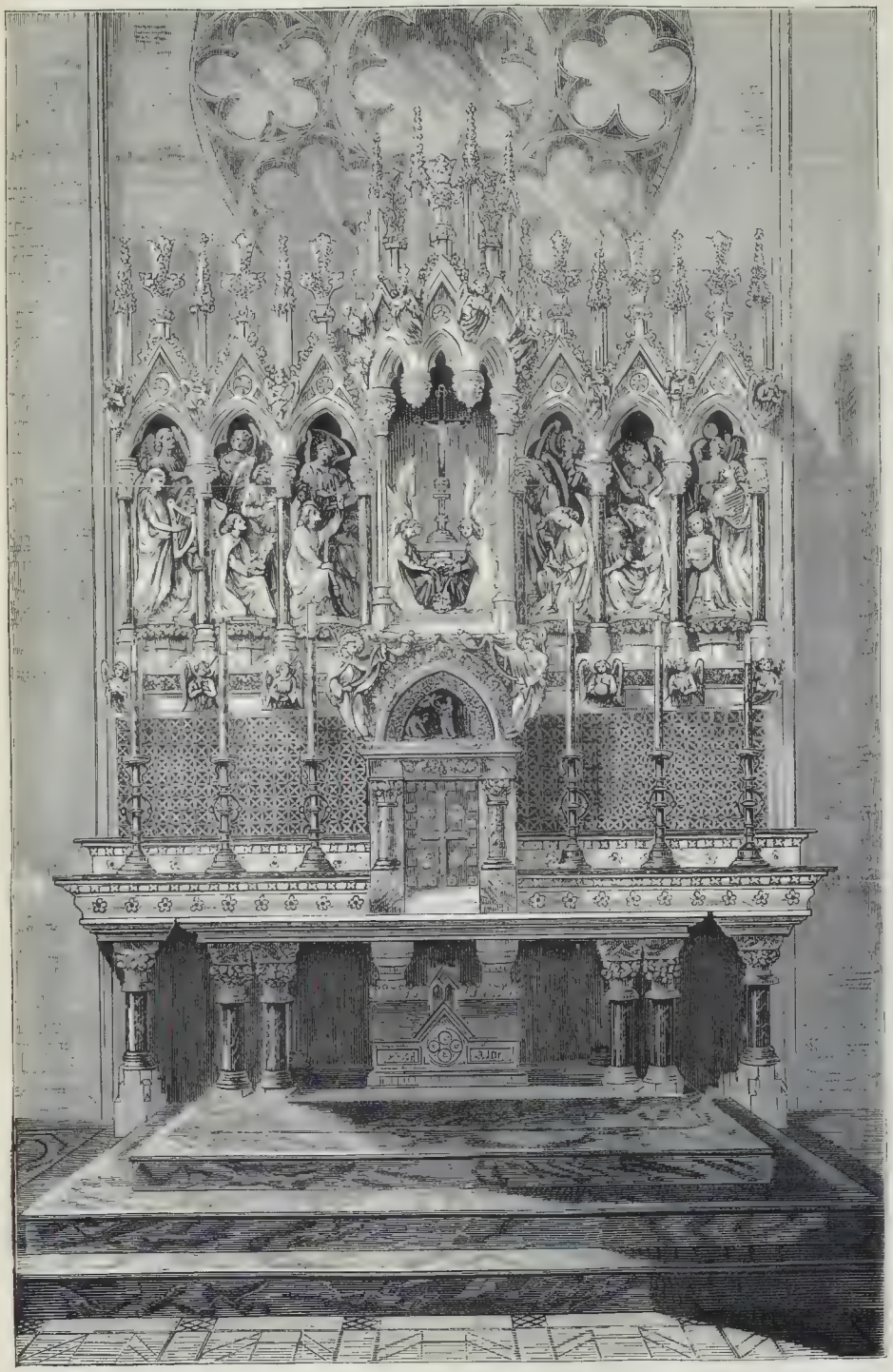
The group of statuary in white marble, called "Charity," has been modelled by Mr. Dalou, the well known sculptor, and may be seen at his studio, Glebe-place, Chelsea.

"The Drinking Fountains Association" have shown their interest in the matter by undertaking to supply all the hydraulic work, and to set up the fountain without charge.

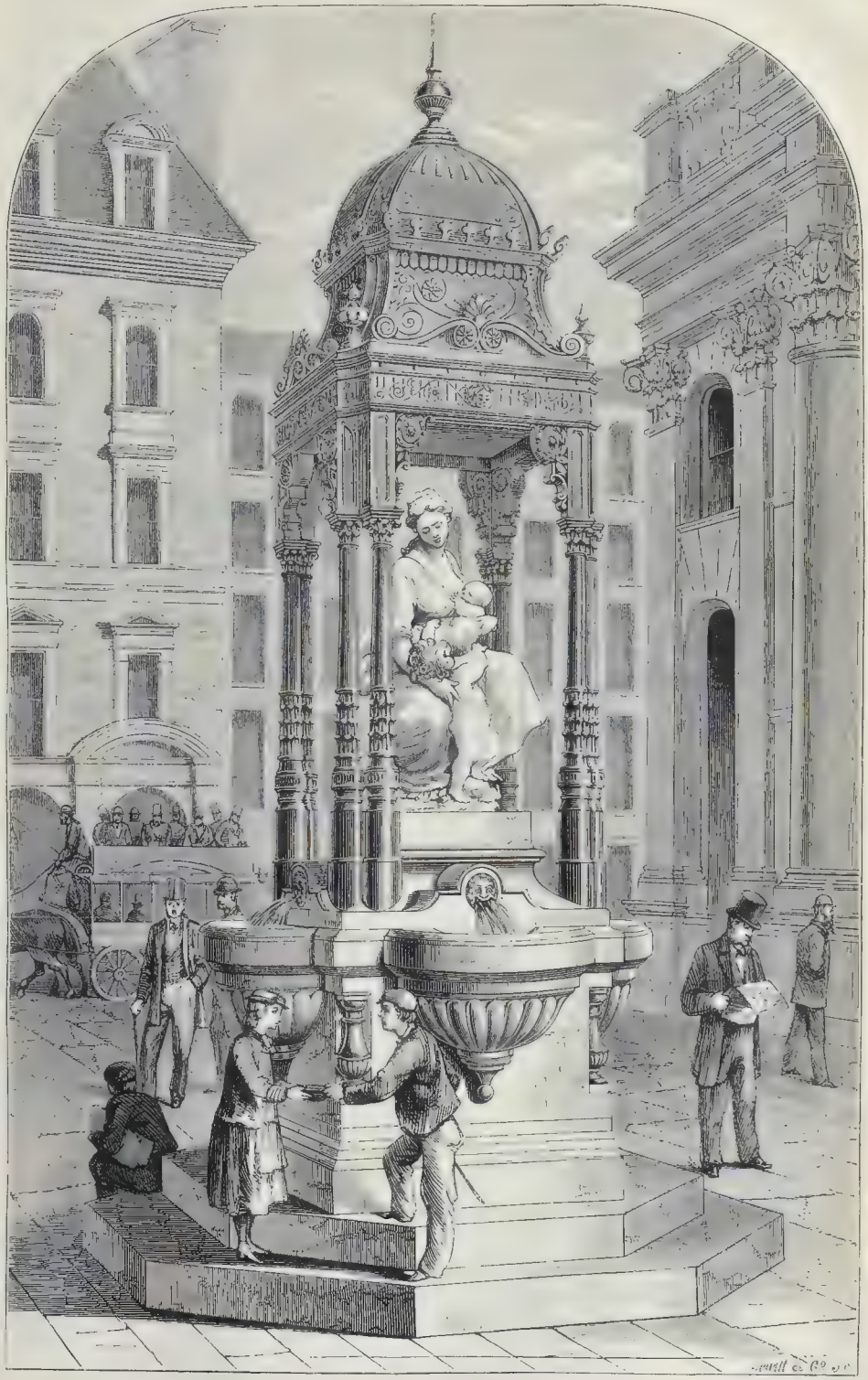
The cost of the base and canopy, and some incidental expenses, will be 500*l.* Towards this Mr. Alderman Ellis contributes 150*l.*, Mr. Deputy Hartridge gives 50*l.*, and the Wardmote has voted 200*l.*

The alderman has also promised 50*l.* towards the group of statuary, which will cost 300*l.*; the deputy, 25*l.*; and the wardmote, a further 50*l.* The remainder, it is believed, will be readily made up by some of the leading corporations in this, the richest of the City wards, which includes within its area the Bank of England, London and Westminster and other leading Banks, several of the chief insurance offices, and other wealthy institutions.

Mr. Alderman Ellis is treasurer of the fund.



ALTAR, ST. MARY'S (R.C.) ABBEY, STANBROOK.—The late Mr. E. Welby Pugin, Architect.



BROAD STREET WARD FOUNTAIN, LONDON. —Mr. J. S. Edmeston, Architect.

THE LATE SIR G. GILBERT SCOTT, R.A.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

In consequence of the sudden and lamented decease of Sir George Gilbert Scott, R.A., past-president, the ordinary general meeting of this Institute announced for Monday evening last did not take place, but the President and Council convened a special general meeting of members only* "for the purpose of considering what steps should be taken to do honour to Sir Gilbert's memory."

The President (Mr. Charles Barry) said the members were acquainted with the sad circumstances under which they met, and he did not think it was necessary that he should make any apology for putting off the ordinary meeting and calling a special meeting under the circumstances of the loss which had so unexpectedly and so sadly befallen them. Early on Thursday morning last he received a notification of the death of their distinguished and dear friend, Sir Gilbert Scott, from his eldest son, Mr. George Gilbert Scott. It was as follows:—

"Courtfield House, Collingham road,
South Kensington, March 27th, 1878.

My dear Sir.—It is my painful duty to inform you of the death of my father, Sir Gilbert Scott, which occurred early this morning. My father had been slightly unwell for the last few days, but there had been nothing to cause any anticipation of danger.

I am, my dear sir, yours very faithfully,
G. Gilbert Scott, Jun.

To the President of the Royal Institute of British Architects."

To that note he had replied, expressing his condolence and that of the members of the Institute. Having consulted with Professor Donaldson and others of his colleagues, he had taken the steps already mentioned on his own responsibility, and the Council had condoned his proceedings. What the meeting had to consider was how the members of the Institute might, in the short space of time which intervened between that evening and the end of the week, take such steps as he was sure they would desire to take to show their personal appreciation of the great loss which they had all sustained. They were not met for the purpose of taking any permanent measures with respect to their departed friend's memory,—such considerations would be premature at that moment,—but to occupy themselves with the sad preparations which all of them felt they ought to make for taking part in his funeral. Sir Gilbert Scott was to be interred in Westminster Abbey, on Saturday next, at twelve o'clock, and the Council had appointed a small committee to take the necessary measures in order that the Institute might be properly represented at the funeral. In his letter of condolence to Mr. Gilbert Scott, he suggested that the Institute would very earnestly desire that Sir Gilbert's burial might take place in the Abbey with which he had been officially connected for so many years, and which was on other grounds so fitting a resting-place for so distinguished a man. At the same time, he wrote a private letter (inasmuch as he was not officially authorised to write) to the Dean of Westminster, expressing the same desire. That letter was as follows:—

"March 28, 1878.

Dear Mr. Dean,—I am sure you will pardon my writing to you, as President of the Royal Institute of British Architects, to tell you that a very wide-spread hope is entertained by its members, with whom I need hardly say I fully sympathise, that our departed illustrious friend, Sir Gilbert Scott, should find his last resting-place in the Abbey he loved so well. I have summoned a meeting of the members of the Institute for Monday afternoon, and I should be very grateful to you for a few lines on the subject to show them.

I have the honour to be, yours very faithfully,
Charles Barry.

The Very Rev. the Dean of Westminster."

To that note the Dean had replied as follows:—

"Deanery, Westminster, March 28, 1878.

My dear Sir,—I fully concur in the purport of your note. On these occasions I endeavour to make it a rule not to take the initiative, but to wait till I receive a request from the distinguished members of the department to which the deceased belonged. In this case, owing to my absence from home, and also considering the close official connexion of Sir Gilbert Scott with the Abbey, I ventured to break through my own rule, and to make the offer at once to the family, who have gratefully accepted it. I should still, however, much prefer that the members of the Institute should present me a request (signed by any other distinguished persons that occur to you), which should be my public warrant for the interment, which on personal grounds I am entirely willing to sanction. Being very desirous of paying the last tribute of respect to our respected friend, I have asked the family to delay the funeral, if possible, till Saturday, the 6th, when I trust that my medical advisers will allow me to be present, as well as to preach on the 7th.—Yours very faithfully,
A. P. Stanley."

The following reply was received from Mr. Gilbert Scott:—

"Courtfield House, Collingham-road,
South Kensington, March 28, 1878.

My dear Sir,—The Dean of Westminster has written to me proposing that my dear father's remains should be interred in the Abbey. He says that he usually prefers to wait for some sort of requisition from distinguished men in the department of life to which the deceased belonged, but that my father's special relation to the Abbey has led him in this case to act upon his own responsibility. He will, therefore, be particularly gratified to receive from the Royal Institute the assurance that the step he has taken is in accordance with the wishes of the Institute and the profession. I need not say how gratifying the proposal which your letter indicates is to all our family. My dear father would have appreciated nothing so much as this recognition of his worth by the members of the profession he loved so well. I have written to the Dean, mentioning the purport of your letter.

I am, my dear Sir, yours very faithfully,
G. Gilbert Scott, Jun.

P.S.—I will take care to inform you at the earliest moment of the day and hour fixed. I believe it will be Saturday, the 6th.

To Charles Barry, esq., President of the Royal Institute of British Architects."

Mr. Barry went on to say that it had appeared to the Council that there were two points to which the members of the Institute ought to direct their attention at that meeting. The first was to testify to their personal appreciation of the great abilities which had secured for Sir Gilbert Scott his great fame, and to put upon record their deep sense of the great loss which the Institute, the profession, and the country had sustained by his decease. The second point was to take into consideration the arrangements to be made for enabling the Institute in its corporate capacity to take part in the obsequies at the Abbey. With regard to the last point, a circular letter would be sent to every member of the Institute inviting him to attend the funeral, and giving all necessary particulars. The ante-service would probably take place in the choir, to which, of course, only a limited number could be admitted, but the Abbey was large enough to contain all the members of the Institute and Sir Gilbert Scott's numerous friends outside of the profession, and he (Mr. Barry) felt sure that the members of the Institute would form no small part of the assemblage, both on the day of the funeral and on the occasion of the Dean's sermon on the 7th. He might mention that he had written to the Royal Academy, asking what steps that body had already taken or proposed to take to be represented at the funeral. In reply, he had received a note from Mr. Eaton, the secretary, stating that the Council would meet on Wednesday, and would then decide what they would do in the matter. He had also received letters from Mr. Beresford Hope, M.P., the president of the Architectural Museum, expressing his desire to co-operate with the Institute in paying the last tribute of respect to their deceased friend, from Lord John Manners, and from the First Commissioner of Works, who regretted his inability to attend, but expressed his desire that the Office of Works should be officially represented at the funeral, hoping to be able to represent it in person. Letters had also been received from Mr. Thomas H. Wyatt, past-president (who was in Ireland, and, therefore, could not be at the meeting), and from Mr. Benjamin Ferrey, who wrote to say that nothing but his serious ill-health could have kept him away from the meeting. [While speaking, Mr. Barry received a note from Mr. Gilbert Scott, saying that the procession would assemble in the Jerusalem Chamber at half-past eleven on Saturday, the interment being fixed to take place at twelve o'clock.] The Council had appointed, as a sub-committee to carry out the necessary arrangement, the two secretaries and himself (the President), inasmuch as it was thought that a small executive would be sufficient to act in such an emergency. With regard to the desire which he was sure existed on the part of the members of the Institute, individually and collectively, to place on record their feelings on the present sad occasion, the following letter had been drafted, and would, if approved of by the meeting, be at once sent (signed by the President, and bearing the corporate seal of the Institute) to the family of Sir Gilbert Scott:—

"The President, the Vice-Presidents, and the Council, the past Presidents, and the Members of every class of the Royal Institute of British Architects, hereby desire to record their due appreciation of the loss sustained in the death of their colleague and past-president, Sir George Gilbert Scott, R.A. They humbly deplore that it was not permitted him to complete even the seventy years of man. But that his life, comparatively short, was busy and eventful, his works remain to attest: half the cathedrals of England, and many an English village, preserve some memorial of his genius. New and important buildings in London, Edinburgh, and Glasgow; in other parts of this country; in Hamburg, Newfoundland, and Bombay, bear witness to his skill. His great reputation, earned and closed by unremitting industry, is the growth of forty years. If, during that time, lost links in the chain of building tradition have been recovered, it is largely due to his diligent investigations. Efforts, in which he was zealously aided by many who survive him, and by a few who are gone, were, it is true, mainly concentrated upon methods of *architecture* which he deemed *national* to England; but they have resulted in the advancement of all art by fostering the study of every style. To-day the archæologist who delights in the works of our Mediæval countrymen is not less eager in research among the older ruins of Europe than among the traces of habitation in Egypt and Asia. In the kindling of such enthusiasm Sir Gilbert had a prominent share; in forming and directing the taste of students, who rarely sought his advice in vain, he was earnest and successful. Opponents, inevitable in the struggle for professional fame, but never personally other than friends, join in this imperfect homage to merit. That merit, it is our consolation to remember, did not remain without formal acknowledgment. At a time when the competition for conspicuous eminence is great and various, he has honourably worn the prizes of professional life. The Queen's Medallist in 1859, a Royal Academician in 1860, he became our President in 1873. He left the chair in 1876, strengthened by the kindliest sentiments of brethren and friends, whose wish and endeavour it has been, now death has deprived them of a foremost man, that his mortal remains might repose in Westminster Abbey, with which for a score of years he has been identified. United in the grave with great colleagues who have preceded him, he will there rest amid associations he helped to render popular, and beneath the shadow of walls which to him were as an open book in the history of architecture.—Charles Barry, President."

The Council (Mr. Barry continued) felt that the above address would be esteemed by Sir Gilbert's family as an heirloom. All that he had said so far was in his official capacity as President of the Institute, but personally he felt very deeply indeed the loss which he, in common with the rest of the members, had suffered by Sir Gilbert's death. They had come into competition more than once, but professional emulation had never interfered with personal friendship, and that friendship had continued, most thoroughly and entirely, up to the last. He had occasion, a short time ago, to give an address to the Sheffield School of Art, and in doing so he ventured to make a remark to the effect that our students of art, whether in architecture, painting, or sculpture, need not go for inspiration abroad, and incidentally he instanced, amongst others, the works of Sir Gilbert Scott as those of a living architect, and as worthy of study. Little did he (the speaker) think that Sir Gilbert would so soon cease to be with them. He was quite sure that when the history of architecture came to be recorded in future times, the name of Sir Gilbert Scott would occupy a foremost place in the glorious roll of those who had served their art and generation. It was their duty and privilege to take the first step in doing honour to the memory of Sir Gilbert Scott as the leader of their art, by adopting some such address as had been read. He would say no more. His feeling was strong and his heart was full, and he knew that there were other gentlemen present who were anxious to give emphasis to what he had ventured to say.

Mr. A. J. B. Beresford Hope, M.P., said that, like the President, his heart was full. He was sure that the suddenness of the event must have appalled them all. He first heard of it when in one of Sir Gilbert's own buildings,—the Foreign

* Although the meeting was "special," it was, in view of the public nature of the subject to be discussed, very properly determined to suspend the rule (written or unwritten) which precludes the attendance of reporters at "special general meetings," and, more than this, reporters were specially "invited to attend." The rule in question might have been usefully relaxed on some previous occasions without disadvantage to the Institute.

Office. He was remarking to a young friend who accompanied him that the building was by Sir Gilbert Scott, when some one said, "Sir George Gilbert Scott is dead!" The news greatly shocked him. Within the sixty-six years of Sir Gilbert Scott's life an amount of work had been crowded which few men of longer years could look back upon. It was a great and distinguishing peculiarity of Sir Gilbert Scott that he was not only an indefatigable worker, but one all of whose work told. He never hit "wild,"—he knew what he meant, and carried it out. He was, moreover, a great administrator, and was a potent influence in a great movement. He was a centre of thought and action, and was distinctly speaking a representative man. That was a much-abused phrase, but in his case it was peculiarly and curiously appropriate. What some of them knew, and what the world did *not* know, was that, with all the weight of work upon him, he possessed a determination to carry out what he believed to be right,—for with him work and art meant duty, and he did what he did from a conviction that he was doing right, and from a conviction that the eternal order of things combined form and proportion in things material as well as in things beyond the material. That was a great characteristic of their lost friend. With all his knowledge, they knew how truly modest he was: if anything, he carried that to a fault. He was ever anxious to do his best, and was, perhaps, over-sensitive to the criticism of others, feeling hurt at what he could have afforded to laugh at. Those who had not the privilege of his personal acquaintance very little appreciated the amiability of his character. With all his zeal, all his earnestness, all his strong convictions, he never bore malice. He would take blows and give blows, as a man should do, but he never bore malice. The real greatness, genuineness, and affectionateness of his nature kept him clear of the petty clouds and cyclones of the active and turbulent art-world in which he lived. He was quite sure that it was the instinctive feeling of them all when they realised the extent of their loss, that Westminster Abbey, not only as the great historical type of that architecture which Scott so loved, but as the place which he had made his own by tender care, patient exploration, and judicious restoration,—that only could be his fitting resting-place. In the few lines which he had addressed to Mr. Gilbert Scott he said that Sir Gilbert's last resting-place ought to be the Abbey, and he was quite sure that the enormous majority of the letters which Mr. Scott had received would, on examination, be found to express the same opinion. He thanked the President for having given him an opportunity of sharing in the privilege of being present at that meeting and of taking part in its deliberations. He well remembered what he believed was the first funeral of a great man he ever attended in Westminster Abbey. That was the funeral of one who was a great architect, unhappily called away before he had filled the chair of the Institute. The members of the Institute looked upon the present President as worthily filling that chair, not only for his own deserts, but as his father's fitting representative. He begged to move the adoption of the address which had been read, with thanks to the Council for having prepared it.

Professor Donaldson, who rose to second the motion, said he was unable to say much. It was not easy, nor was it necessary, to find words in order to show the depth of the feelings he experienced. No words could describe how greatly he felt the loss which was common to them all. Sir Gilbert Scott commenced his career as a pupil of Henry Roberts,—a pronounced Classicist. He passed through his pupilage and the early phases of professional life with great credit, and gradually, by perseverance, arrived at the eminent position which he was so well worthy to occupy. There was much in the personal character of Sir Gilbert Scott which endeared him to his friends. He was kind and generous, although to a degree reserved. He deeply deplored the death of a man who was so much and so deservedly honoured, not only for his work but for his personal character.

Sir Edmund Beckett, Q.C., said he was thankful for the invitation which had been sent to him to take part in that meeting, for he had had the pleasure of knowing their departed friend for the last twenty-five years. Just a quarter of a century ago they were both engaged in one of the greatest works in England with which Sir Gilbert's name was identified, namely, the rebuilding of Doncaster Church; and since that time down to the present day they had been closely associated in some way or other, sometimes in private works, sometimes in public works, and latterly they had been much in contact in connexion with the work in progress at St. Alban's. Of Sir Gilbert's public works it was unnecessary to speak. It was said of Wren, "Si monumentum requiris, circumspice"; and it might be said of Scott, in a wider sense, "Si monumentum requiris, circumspice Britanniarum." There was now in existence a school of anti-restorationists, and if the members of that school would take themselves back thirty years, and consider what would have been the state of things now with regard to churches had their ideas prevailed during that period, and had there been no Sir Gilbert Scott, perhaps they would find reason to moderate their views. He believed that Sir Gilbert Scott had been seriously affected by the writings and doings of that school, although he replied to them with effect; indeed, though his replies were unanswerable, those attacks upon him made him extremely timid even as to matters on which there could hardly be two opinions. Sir Gilbert Scott had done more than any other architect of his day, not only in restorations, but in new buildings, but he (Sir Edmund Beckett) believed that he would be more remembered for his restorations, for the simple reason that almost everybody who had a grand building to restore immediately went to consult him. Of the thirty-five millions which, according to a Parliamentary return, had been contributed by Churchmen for church-building and restoration within recent years, it would be interesting to know how much of it had been subscribed owing to the public confidence in Sir Gilbert Scott,—a confidence which prompted people to subscribe tens of thousands of pounds at a time when they knew he was to be the architect entrusted with the particular works in which they were interested. When people had come to him (Sir Edmund Beckett) to ask his advice as to employing Sir Gilbert Scott, he had replied, "If you employ him, you are sure to have nothing vulgar,—nothing in bad taste; you are sure to have everything preserved that is worth preserving, and so far as your building can be made equal to what it was before, it will be made in his hands." It was a curious fact that his largest work in England was not in his own style, and that the largest work he ever had was not in this country. Many of his new works, such as Doncaster Church and the Chapel of St. John's College, Cambridge, would individually have made the fame of any architect. There was a singular beauty in his private character. A wilful man like himself (Sir Edmund) did occasionally differ in opinion with Sir Gilbert, but he had never known a professional man of any kind who was so thoroughly candid, so ready to listen to what could be said against his views, and so ready to confess to a mistake when he found he had made one. He was always anxious to avoid taking credit not thoroughly belonging to him, and withal, he was most kind and unassuming, never taking undue advantage of his position or knowledge, though his very modesty sometimes led others to under-rate his abilities. He (Sir Edmund) once heard some one say, "I can't think Sir Gilbert Scott is a man of genius." Sir Edmund asked why not? The reply was, "Listen to his talk!" Sir Edmund said, "Well, listen to his talk! There is no clatter, there is no overwhelming you with noise, but behind his quietness of demeanour there is vast thought and learning, and he always imparts to you something you did not know before." He had many marks of a man of genius, and he was the most honest, the most candid, the most forbearing, and, in every sense of the word, the pleasantest man he (Sir Edmund) had ever met with. In conclusion, Sir Edmund suggested that if it were desired to commemorate the achievements of so distinguished a man in some tangible form, they could hardly do better than promote a fund for the purpose of restoring the west end of St. Alban's Abbey, in which he took so much interest up to the last moment of his death, and into which he had been pursuing careful investigations for some time past at his own cost. He (Sir Edmund) believed that if it were possible by any means to ascertain Sir Gilbert's wishes as to the shape which any memorial to him should take, he would attach supreme importance to the west end of St. Alban's Abbey. The work in question could be carried out for about 9,000*l.*, according to a rough estimate given by Sir Gilbert himself. Such a memorial would be far more lasting and appropriate than the erection of a separate memorial.

The President remarked that, in the last portion of his speech, Sir Edmund Beckett had entered upon a subject not then under consideration. No doubt the Institute would subsequently have the subject before it, and if Sir Edmund would put into writing any proposals or suggestions he had to make, and forward them to the Council, they would be duly considered at the proper time. He had just received a note to say that her Majesty the Queen intended to send a carriage to join the procession.

Mr. A. B. Mitford, of her Majesty's Office of Works, said he attended that evening not only on his own behalf, but on behalf of his chief, the First Commissioner of Works, who desired him to say that he regretted his inability to attend owing to his Parliamentary duties. To him (Mr. Mitford) it would always be a melancholy recollection that, on the first occasion on which he was able to avail himself of the privilege of attending the meetings of the Institute, its members should be mourning for the sudden extinction of so great a light in architecture; and the recollection would be still more sad from the fact that, when he was a candidate for admission to the privileges of an Honorary Associate of the Institute, Sir Gilbert Scott was one of those who were good enough to stand his sponsors. The connexion of Sir Gilbert Scott with the Office of Works had been one not of recent years, but of long standing, and it was a connexion which could only have been severed by death,—for it would have been impossible for the Office of Works to cease to avail itself of the ability of a man like Sir Gilbert Scott, so long as that ability was at its service. Having had access and having had to consult the records of the Office of Works for many years past, he could say that so far as they related to Sir Gilbert Scott they were one tribute to the uprightness and nobility of his nature,—to his intense trustworthiness and loyalty in business. He (Mr. Mitford) had been that morning talking over the lamentable event with one who had been associated with Sir Gilbert Scott for more than forty years, and who testified that he had never come across a more perfect type of a truly Christian gentleman than Sir Gilbert. It was the wish of the First Commissioner of Works that the Institute would allow him to be associated with them in any arrangements they might make to do honour to so great a man, and he hoped to be able to attend the funeral.

Mr. G. E. Street, R.A., said he felt unable to say much, but inasmuch as he was one of the first of those who had taken their earliest lessons in architecture from Sir Gilbert Scott, he should be sorry to lose the opportunity of saying how greatly he deplored the death of that great and good man. His knowledge of Sir Gilbert extended over thirty-three years. It was thirty-three years ago since he entered Sir Gilbert's office, and as he remained with him for some years he was able to bear testimony to the extreme courtesy, kindness, and considerateness displayed towards the, in some cases, troublesome young men he had in his office. His modesty was a marked characteristic of his nature. The profession and the country had sustained a great loss.

Mr. Bodley, as an old pupil of Sir Gilbert's, endorsed all that Mr. Street had said.

Mr. Joseph Clarke said he had been for a great many years associated with Sir Gilbert in connexion with the work of the Incorporated Church Building Society, and latterly they had been also associated in connexion with the work of the Architectural Museum, in which Sir Gilbert took so great an interest. Only last week he had been considering arrangements for the delivery of some lectures to workmen, in connexion with the Museum, in the Chapter-house: so that whatever might be done at St. Alban's or elsewhere, he was quite sure that a most fitting memorial to Sir Gilbert's memory would be for the profession to do something for the Architectural Museum, which was greatly in need of succour. The Institute was to be congratulated on the possession of the fine portrait of Sir Gilbert by Richmond.

Mr. Ewan Christian said he, too, had known Sir Gilbert for a great many years, and knowing what interest he felt in the Architectural Museum, it was greatly to be hoped that some-

thing would be done to perpetuate his memory in connexion with the Museum. The exceedingly kind manner in which Sir Gilbert was willing to meet classes of workmen, and to give them all the information he could while conducting them over the Museum or some old building, would be remembered with gratitude. Those who knew the history of the Museum knew how hard he worked, from its establishment to the end of his life, to forward its interests, for he attached very great importance to the work it was calculated to do if properly appreciated and supported. As to his personal qualities, he was the kindest and pleasantest man he had ever known, and was a delightful companion for a visit to an old abbey. He was full of knowledge, sympathy, and enthusiasm for his art up to the very last moment of his life.

Mr. Nevill said that, as an old pupil, he should like to add his testimony to what had been said by Mr. Street and others as to Sir Gilbert Scott's consideration for his pupils. Everybody, indeed, who had been in his office would say the same thing. He was most kind in directing them as to what books and buildings they should study. He had a marvellous capacity for work, and was most conscientious in all that he did. Nearly every drawing for every single detail and moulding went through his hands, receiving revision where necessary, which generally happened to be the case. It had been sometimes imagined that, with his very large practice, a great deal of work was done in his office of which he knew very little, but such was not the case. The amount of work he got through was marvellous,—many hours that other men devoted to social pleasures being spent by him at home in going through drawings of the works he had in hand.

The President said that under the great loss they had sustained he was quite sure that all criticism would be silenced. There were, however, some gentlemen present who had taken part in the discussions which Sir Edmund Beckett had alluded to as having caused some pain to Sir Gilbert's sensitive nature; but he was quite sure that Mr. Stevenson would say that although professional differences existed between him and Sir Gilbert, personal differences never did.

Mr. J. J. Stevenson said he could only say that his old friend Mr. Gilbert Scott wrote to him informing him of Sir Gilbert's death. The intimation filled him with astonishment and sadness, but he thanked Mr. Scott sincerely for including him among those who were sorrowing for the great loss they had sustained.

Mr. J. T. Micklethwaite, as an old pupil of Sir Gilbert's, and one who had worked under him for nearly twelve years, reiterated what had been said by previous speakers as to Sir Gilbert's personal qualities, and said Sir Gilbert Scott possessed a knowledge, such as was probably never equalled, of the details of English architecture.

Mr. Charles L. Eastlake (late secretary) said,—I greatly regret that the first meeting of this Institute which I attend since my retirement from office should be convened for so melancholy a purpose as the present, and that the first discussion in which I take part, as an ordinary member, should relate to so painful a subject. It is especially painful to me when I recollect that I was Sir Gilbert Scott's guest at Ham, some years ago, while he was attacked by a sudden illness,—perhaps the first indication of that infirmity which has terminated in his death, though, until quite lately, there seems to have been no great cause for alarm. I should be sorry to leave this room to-night without saying a few words, by way of respectful tribute on my part to Sir Gilbert's memory. His professional talents, and indeed his private virtues, are so well known, and have met with such ready recognition from all present, that I could add but little to what has been already said on those points. But I trust that, as your late secretary, I may be permitted to refer, very briefly, to Sir Gilbert's position as our former president, and to acknowledge, as I do most gratefully, the uniform kindness and courtesy which he showed to me throughout all our official relations. There are, as we know, many occasions when, in acting under instructions, or in carrying out the policy of the governing body of such a society as this, the secretary requires the support,—the steady and outspoken support,—of its president. Such support Sir Gilbert Scott, notwithstanding his natural diffidence and characteristic reserve, never failed to accord, and I can truly say that both during his term of office, and subsequently, I found in him what no one can prize too highly,—the generous adherence of a staunch and loyal friend. It is gratifying to find so unanimous an adoption of the council's judicious proposal, and I hope we shall all unite next Saturday in paying the last sad honours to our late esteemed and distinguished colleague.

Mr. R. W. Edis having said a few words,

Mr. Edmeston said he wished to correct a mistake which Professor Donaldson had fallen into. Sir Gilbert Scott did not serve his articles with Mr. Roberts, but was articled (as was also Mr. Moffatt) with his (Mr. Edmeston's) father.

The President having formally put the motion, it was carried unanimously, and the meeting closed after the announcement that the ordinary general meeting which would otherwise have been held on that evening would take place on Monday next, when Professor Donaldson will read his promised paper on Egyptian obelisks.

THE DRAINAGE AND STATE OF IPSWICH.

In the report for 1877, on the sanitary condition of the borough and port of Ipswich, the medical officer of health, Mr. G. Sampson Elliston, says,—"The question of thoroughly draining the borough of Ipswich has been so frequently discussed by you during the last two years, and the absolute necessity for carrying out a complete plan so well known, that it is unnecessary for me to again bring under your notice how much of the past and present defective sanitary condition depends on the want of sewerage. The Town Council have unanimously adopted Mr. Bruff's plan, a plan that has stood the test of twenty years, and one that will, no doubt, immensely relieve the town when completed. The state of some of the principal thoroughfares has become worse and worse, and Tavern-street, as well as St. Matthew's-street, cannot possibly go through another summer without something being done for them. The nuisances that came under my notice at some of the premises in those streets last autumn were positively dangerous, and often on sultry nights, when the inhabitants were asleep, I have noticed the air heavy with mephitic odours." Half the sewage of Ipswich goes into dead-wells and half into a system of old sewers. Half a million gallons of sewage go into subsoil every day. The Corporation has only been twenty years deciding whether Ipswich should be properly drained, and although it was decided to make the main outfall sewer nearly three years ago, it is doubtful whether the works will be commenced this year. During this time valuable lives have been lost, including one M.P., from fever.

LIVERPOOL ENGINEERING SOCIETY.

At the usual meeting of this society, held on Wednesday, March 27, Mr. Robinson Souttar, president, in the chair, Mr. W. W. Squire, hon. sec., read a paper "On the Manufacture of Portland Cement," giving a detailed account of a visit to the works of Messrs. Peters, Brothers, situated on the Medway, about five miles from Rochester, and of the various processes seen in operation there. The chalk-pit was first described, with its two distinct strata of chalk, the upper, or white, being used for lime, while the lower, or grey, is especially valuable for Portland cement. This grey chalk is incorporated with about one-fourth its weight of clay in a pug-mill supplied with warm water, and is then run off to a settling pond or "back," where the superfluous water is gradually drawn off from the top. The sediment, or "slurry," is next dried on a floor especially provided with flues for the purpose, and is then burnt in kilns, and finally ground between millstones to a high degree of fineness, when it is ready for use as Portland cement.

Lowestoft.—At a meeting of the Lowestoft Improvement Commissioners, held on the 25th ult., a resolution was passed to the effect that application be made to the Local Government Board for permission to borrow the sum of 2,000*l.* for the purpose of constructing a main intercepting sewer and other works, according to plans and estimates prepared by their surveyor, Mr. R. H. Inch.

SEA WALLS.

The floods in the Thames, which from time to time have recently attracted public attention, used to have something abnormal about them. Unfortunately, they appear from various causes to be things which we must be prepared to deal with as of constant, or at least not infrequent, occurrence. But in some of the eastern districts of England there has existed for many centuries an absolute necessity to keep out the water of estuaries or of the sea from the neighbouring lands. We, dwelling in more inland parts, have little need to trouble ourselves with this matter, but it is one which has been and is of considerable importance to those who live in districts where the force of the sea or of rivers has to be constantly combated. One means of defence against what in an ancient statute were termed "the outrageous flowing surges and course of the sea," is by the erection or the preservation of sea-walls. Callis, who published his well-known work on sewers (meaning by that term any kind of drains and their concomitants), in 1824, holds that there is a distinction of some importance between sea-walls and sea-banks. For the former, he contends, being purely artificial in construction, and composed of stone, rock, or other materials not likely to be found in the exact spot where they are erected, are the property of the person who was bound to make them, whereas the latter, being generally created out of the soil on the spot, belong to the owner of the land on which they stand. As a matter of fact, however, the sea-wall of the present day appears generally to be a bank of earth and stones about 25 ft. broad at the base, and sloping to a width of about a yard at the top. They are often covered with grass; and as most tourists know who have been in counties where banks abound, the cattle scramble about them to graze on the grass. Thus, from these and similar causes, they need what is technically known as "topping" from time to time, in order to keep them in a proper state of repair, so as to resist the action of tides and floods.

And this protection of certain districts and their inhabitants from the power of the water was, in Mediæval times, regarded as a very high and important duty; indeed, in an ancient case, in the time of James I. (10 Coke's Reports, p. 141), the judges declared that by the ancient common law of the country, "the king ought of right to save and defend his realm as well against the sea as against the enemy, that it should not be drowned or wasted." For this purpose it may be fairly said, from time immemorial what have been known technically as commissions of sewers have been issued to certain persons, to empower them to erect walls and do all things necessary for securing lands of a low level from the ravages of seas or rivers. But the first actual statute for this purpose (6 Henry VI., c. 5), the first beginning of much subsequent legislation, was passed in the year 1427. Then, more than a century later, came the chief statute which has touched on this matter, and always known as the Statute of Sewers, 23 Henry VIII., c. 5, passed in 1531. Various other Acts were passed from time to time to enlarge or increase the powers of the commissioners of sewers who were from time to time appointed under these enactments. Of the latest, perhaps the two most important were 2 William and Mary, sess. 2, cap. 8, and 3 and 4 William IV., cap. 22, which set at rest any doubt which previously existed as to the power of the Commissioners to erect new walls, as well as to keep those in repair which had been previously erected. Therefore, broadly stated, the law now stands that where there is a public wall, or a wall erected by public funds to keep out the sea, the Commissioners have power to keep such wall in repair by means of the assessment which it is in their power to levy over the inhabitants of the district which is benefited by such wall; and where it is necessary to build a new wall they have power so to do. But it may also happen,—as indeed it frequently does,—that the wall which protects the property of a number of persons is on private ground, and has been from time to time repaired by the owner of the soil on which it rests. Then comes this very important question: is the owner of such land bound to repair this wall when necessary? And as a corollary on this primary question hangs the other, supposing that he fails to keep it in repair, and in consequence the sea or the river rushes on to his neighbours' land, and does more or less damage, is he liable for

such damage? A case which was recently under the consideration of the Court of Appeal (Hudson *v.* Tabor, 16 *Law Journal Reports*, Q B., p. 463) has thrown a great deal of light on this point. If there is sufficient evidence to show a liability to repair a sea-wall by prescription, that is to say, if it is clearly proved that the owner of the wall in question has been aware of the claim, and has acquiesced in such claim, then on such evidence he would be bound to keep the wall in repair, and would be liable for any damages caused by his neglect to do so. But very strong evidence will be needed for this purpose, and the mere fact that one man whose property fronts the sea has always kept up the wall, and that his neighbours have got into the habit of relying on his so doing, will not found a prescriptive right by such neighbours to have the wall kept in repair by the frontage owner. As Lord Chief Justice Cockburn remarked,—"The fact that something which a man does for his own benefit may incidentally benefit his neighbour, is not sufficient to warrant the inference that he has bound himself to continue to do the thing in question so as to render him liable in damages if he omits to do it." Therefore it is clear that there is no absolute right existing against a frontage owner to keep up and in proper repair a sea-wall on his property, even though for his own convenience he has long been in the habit of doing so. But then there is the above-mentioned exception, that in some cases it is possible to prove that the owner is liable by prescription. But there can be no doubt that large numbers of persons do fancy, because a landowner has been in the habit of repairing a sea-wall which protects his own and their property, that accordingly they have an absolute right to have it kept by him in a good state of repair. And it is equally plain that landowners and the owners of houses and property in places where sea-walls exist, should clearly ascertain the actual rights and liabilities in regard to such walls, if they are not already under public control, and if there is any doubt about the matter, "the proper remedy," again to quote Sir Alexander Cockburn, "is to procure the issuing of a commission, in which by an equitable adjustment (*e.g.*, of the cost of repair), the interest of all parties may be secured." By so doing grievous and unexpected losses may be easily prevented.

IMITATED ARCHITECTURE.*

Architectural art is one of the grandest and most lasting records of the skill and taste of the age in which it flourishes. When the highest aspiration of architecture is to become the provider of fancy dresses in brick and stone, it is a bad sign of the taste of the age, and of the sense of the architect, and it is also very bad for all the arts which are enrolled in the service of architecture, or of which it is the frame or the setting; but I feel bound to say that I think the fault,—if fault it be,—or the misfortune, is rather with the public than the architect. If they were true, he must be true; if they appreciated and dearly loved beauty, he must provide it; and he has a skill now that has rarely been surpassed. What is dying or is dead is architectural invention and the subsidiary inventions; I mean that sort of invention that is employed in making useful things beautiful. At one time every household utensil was made beautiful to the eye at least of the man who made it, and probably to the eyes of those who used it; but neither the mechanic nor the user thinks of such a thing now, and if perchance the user does, the mechanic refers him to a designer or an architect. Supposing them to be able men, the user may get something that some former age considered beautiful, provided the article was used in former times; but if the thing is new, and the material is also new, both architect and designer will be hopelessly at fault, and the best chance that remains is that the user gets an imitation of something that was once considered beautiful, and of an entirely different material. Take cast-iron, for example. I have seen this beautifully treated as a building material in imitation of old carved wood or of old chiselled bronze, but never beautifully according to its own requirements. But to return from my digression. The architect comes out from the public, must for many years be imbued with the general spirit of his day, and though he may swim against the stream, still he is only behind his fellows: the stream carries them all on together. Do not fancy that the hypocrisy of your age will not be detected by succeeding ones, and if you have no taste for the beautiful, do not pretend to have it, for anything is better than imposture. I think it is a most unhappy thing that the sense of beauty is not developed and cultivated by all; it is the one free gift that nature offers alike to the rich and to the poor. Wherever there is earth, air, and water; sun, moon, and stars; trees, flowers, and grass; men and animals; there is the opportunity of cultivating a taste for beauty of form, of colour, and of expression; but if you will resolutely shut your eyes to these lessons, then let your architecture show the tasteless generation you are.

The copied, imitated, or paraphrased art of another age is not art at all. Art is the expression of the amount of pleasure you can take in things beautiful, and no art at all is a better foundation than a sham one. I believe, too, that Greek simplicity is more akin to the tastes of this age than the coarse complexity of Gothic. I ask of you, when you have anything built, first to have what you want for utility, and for every moulding ask yourself, does this give me more pleasure than a dead wall? If it does not, do not have it. Swift said, "A good style is proper words in proper places," and if you substitute things for words, it is a good architectural style too, but it is not an elegant one. Whatever beauty you have expressed it must be shown wherever *you* can see it. It should be done not to excite envy in your neighbour, but pleasure in yourself. A symmetrical elegantly proportioned front, delicately moulded and enriched, accompanied by a bare raw back and flanks, with holes for windows put haphazard, does not show your taste, but your ostentation.

If you can get to love the beauty of anything, have that beauty expressed by the sculptor according to the exigencies of the place and the materials; love truth, elegance, and simplicity; and if you love the beauty of any natural object, and can afford it, let the best sculptor you can get carve it on your walls. No matter how small or how limited the bit may be, cram all your spare riches there; and do this, too, where it can be seen. You owe, Mr. Garbett says, your neighbour and the passer-by something for the damage you have done them by depriving them of the light and the prospect, and you pay them back as well as you can for the nature lost by a bit of art.

If you have never admired and appreciated the beauty of any natural object, all ornament is thrown away on you; and if you have any, it will probably be bad; but be it ever so beautiful, its only possible use is to please some educated passer-by who can appreciate it. Country people are always surrounded with the beautiful things of nature; but even the dwellers in towns must have often before them the plant in the pot or the flower in the vase; they must have seen the sparrows on the roof or on the window-sill; the cat on the rug or the gold-fish in the bowl; and if you love the beauty of any of these, let the sculptor carve them on your house.

Do not let me, however, by encouraging truth, encourage the swagger of ignorance. You can know nothing of the simplest art without study, much less can you know of so complex a one as architecture. I want you to feel that you should devote attention to it; not that you should boast that you know and care nothing for architecture, painting, poetry, sculpture, and music.

It is not a reason for boasting, but for shame, that some people are only judges of port wine and blue cotton pocket-handkerchiefs. Architecture is in a most deplorable state; and being the great central art, around which the other visual fine arts cluster, they suffer with it and through it; and the restoration mania greatly helps to keep it in the wrong track, though the fundamental fault of the age is an entire lack of the sense of beauty, or at any rate this sense is so feeble that it will tolerate every form of ugliness in its utensils and surroundings, every form of harshness and discord in the colour of its dress, its rooms, and its hangings. Perhaps this is not very surprising, as the great discoveries in science, the great inventions in machinery, and the great new wants, have habituated mankind to do without beauty; the problem in machinery and in the great engineering works being, not how can such things be made beautiful, but how can they be done at all. Nevertheless, architecture, to be a fine art, must represent the yearning for the beautiful in the living nation, while restoration is turning the attention to what the dead people of other days thought beautiful. The cultivated of to-day think many of their forms ugly, and, whether the forms be beautiful or ugly, they cannot represent our taste. You hear people,—you hear architects,—say what would they have thought beautiful in the thirteenth century, or what would a thirteenth-century architect have done? while the question should be, what do I love, what does my employer love, what does the nation love? Now, though there may be more awe, more grandeur, and more sublimity produced by architecture than by any other visual fine art, yet more interest, more exquisiteness and more touching emotions can be excited in mankind by the arts of the sculptor and the painter. Though our painters and sculptors may fall short of the perfection of the Greeks or of the golden age of Italy, I think the works of the best of them may vie with those of any other period, but their best work will not harmonise with Gothic; so that, in lieu of having your best artists on your best buildings, you must have the work of botchers and daubers, or of men whose "poverty but not their will consents" to do bad imitative work instead of good work of their own.

Under the grand portico* of St. George's Hall (the finest modern Classic building in the world) I hope before I die to see a grand picture in mosaic on a blue ground; and our best artists will not have to hold their hand or give their worst work lest they should spoil the building.

Every epoch (up to the period when architectural art ceased) enlarged or restored its buildings congruously with the best art it had, and in these buildings we can trace the improvement or decadence of the arts. I say congruously, because, looking at such alterations, additions, or furniture, they have mostly been designed so that, in their general outline or mass, they do harmonise with their surroundings, although the main principles of their style, as well as of their details, may be entirely opposed to the style of the building. But in the present day our alterations and restorations are mere forgeries, in which there is not even the best work we can command, and in which there can be no conscious enshrining of our best thoughts, our greatest knowledge, or our highest aspirations.

If a man will tamper with a will he will hardly hesitate about forging a letter; and if you will allow imitation new work to be put in an old building, you will not hesitate to have an imitation house, castle, church, or cathedral built.

The best criticism on the architectural taste and invention of our century is to be found in a topographical dictionary, particularly where the author wishes to be complimentary. "The Town-hall was built in the early part of the century, and is of the Ionic style; the capitals are those of the temple of Ilissus. The gaol is in the Norman style, but executed before the importance of preserving the purity of style and the accuracy of details was felt. The bank is Italian renaissance; the member's house is a Scotch castle, adapted to present exigencies by a conservatory from the turret and a bay window in the curtain. There are three new churches,—one Early English, one Decorated, and one Perpendicular; the cathedral is being restored with the utmost fidelity to the middle period of the thirteenth century; and in the suburbs several villas in the style of Queen Anne are just completed." From these buildings how can any future beholder gather what was the architecture of the nineteenth century?

The satirist who described his hero as,—

> Not one but all mankind's epitome,
> * * *
> Who, in the course of one revolving moon,
> Was chymist, statesman, fiddler, and buffoon,

did not mean to compliment him. What will the verdict be? The nineteenth century had nothing of its own to say, but it could copy with more or less accuracy the thoughts of all others.

Let me, before I finish, point out another evil engendered by restoration, quite apart from any question of style or art. A house, a castle, a church, or a cathedral built in Gothic times was most admirably adapted to its purpose by some of the most skilful men that ever lived. The cathedral was built mainly for the clergy. It was where they went to church. It was also

* From a paper on "Restoration," by Mr. Geo. Aitchison, B.A., architect, read before the Art Club, Liverpool, and already briefly alluded to.

* The front opposite the Lime-street Station.

for grand public ceremonies. There were the aisles for processions, where the treasures and the relics were shown to the people; there were the chapels, dedicated to special saints, to whom prayers were offered and masses said; there were mortuary chapels, where people prayed, and where masses were said for the souls of the departed; there was the lady-chapel, where special masses were said, and special prayers offered for her intercession; there was the rood-loft, where the crucifixion was represented; and the whole nave was open, so that there might be room for the multitude to fling themselves down on the elevation of the Host; and the whole cathedral was built in a cross form, as a symbol of the faith. Churches were much the same on a smaller scale. Most of the reasons for these forms have passed away, and the cross form, with naves and aisles, is perhaps the very worst form for hearing that could be devised.

Again, castles were to resist sieges as well as sudden attacks, with conveniences for sallying forth, and everything was admirably adapted to the purposes of war in those days; but new ones are simply ridiculous in this peaceful country as dwelling-houses. Every house, too, was adapted to the special wants of its age, which are not the wants of this.

From what I have said, you must have gathered that novelty is the very life of art, because, if it be art, it represents the new knowledge, taste, skill, and aspiration of the generation in which it arises; but it is but a new graft on the old stock. Now our old stock, architecturally speaking, is a dead wall with some holes in it, and you have but to get your architect to make this as graceful, as elegant, and as subtle as he can, your artists to carve or colour it as richly and as profusely as your pocket and your love of the work will admit; but do not let any of them give you copies or paraphrases of what was art two hundred or two thousand years ago; rather have Touchstone's pride, "An ill favoured thing, sir, but mine own; rich honesty dwells like a miser, sir, in a poor house, as your pearl in your foul oyster."

VENTILATION OF PUBLIC BUILDINGS.

Sir,—On the 16th of March there was a leading article in the *Times* on the ventilation of the Law Courts and other public buildings, and in your paper of the 30th of March are some judicious observations on the *Times* article, in a letter signed "D. O. B.," and pointing out some of the fallacies contained in the *Times* article. With these remarks I entirely agree. But it appears to me that the fallacies in the *Times* article are of so pernicious a tendency that their erroneous character requires to be still more strongly exposed.

There is not a more difficult or complicated question than the proper mode of ventilating public buildings. But the writer in the *Times* states, *ex cathedrâ*, that "it is an exceedingly simple matter as long as the external and the internal temperatures differ to an appreciable degree"; that "nothing is needed but an inlet and an outlet"; that "there can be no doubt that a draught, by carrying away a large amount of bodily heat, often produces catarrhal affections in those who are exposed to it"; that "nearly a century ago it was discovered that *all draught might be prevented* by giving to the entering air a vertical direction, and that this discovery was again brought prominently before the public three or four years since by a gentleman who was thought to have been its originator, until the validity of his patents came to be seriously investigated." We are further informed that "any room can be effectually ventilated by a direct communication with the outer air, and terminating within the room in a vertical tube . . . . and that this air ascends in a compact vertical column until it reaches a height . . . . which may vary from 3 ft. or 4 ft. to 14 ft." By this employment of vertical tubes the ventilation of every room in any ordinary building may be accomplished with the *greatest facility*, and no draught is ever experienced." The article then goes on to describe how, in certain cases, the incoming air, "being colder, and consequently heavier, than that into which it comes, it curls over the mouth of the inlet opening, and falls towards the ground . . . . and in its downward course it is felt as a draught by those who are seated in its track."

The fallacy and contradictory character of these remarks might be safely left to their own refutation, were it not for the importance they obtain by forming a leading article in so powerful a paper as the *Times*; and, further, at the present moment there is so strong a feeling on the subject of ventilating our Law Courts and other public buildings, that the general outcry for something to be done may induce the adoption of any system, however fallacious, provided only that it is pressed with sufficient pertinacity.

Some years since, when the ventilation of the Houses of Parliament was the subject of investigation by Parliamentary Committees, one of the witnesses stated that after an expenditure of 200,000*l.* on the experiments, it appeared to be proved that the best way of ventilating them was by opening the windows! It is to be hoped that the ventilation of the Law Courts may be a little more satisfactory than this, at rather less expense.

The ventilation by vertical tubes, so praised by the writer in the *Times*, was first invented by Mr. Whitehurst, about the year 1784, and was, after his death, described fully in a pamphlet published in the year 1794. The plan appears only to have had a very limited application, and shortly to have fallen into total disuse. It was patented by Mr. Martin Tobin in March, 1873, and has been variously praised and condemned in many quarters. However the plan might have succeeded a hundred years ago, when the requirements, both for public and private buildings, were so utterly different to what they are at the present time, it is perfectly certain that the introduction of *cold air* into the crowded halls, courts, and buildings of the present day is perfectly inadmissible. When it is remembered that such men as Count Rumford, Sir Humphrey Davy, Dr. Desaguliers, Michael Faraday, Marquis Chabannes, and many others almost equally eminent, utterly failed in their experiments on this subject, it is not to be wondered that the matter in question is beset with difficulties. Whatever may be the true solution with regard to our public buildings, it is certain that the plan of Mr. Whitehurst of 1784, and revived in 1873 by Tobin, is not the one that will meet present requirements. The largeness of the openings required for the admission and emission of the air is most imperfectly recognised. It is not quite "so exceedingly simple a matter as long as the external and the internal temperatures differ to an appreciable degree," as the writer in the *Times* imagines. Among the palpable contradictions contained in the article in question, none are more to be condemned that the idea that *cold air* can be introduced in large assemblies of people, requiring oftentimes 10,000 or 20,000 cubic feet *per minute*, without causing such dangerous and life-destroying draughts as to render such plans utterly impracticable. Even with warmed air, if the velocity of extraction and injection be too rapid, owing to the outlets and inlets being too small, the effects produced on those in the line of the draught are not only most unpleasant, but most dangerous. Whenever the air is moved in a room at a greater velocity than about 2 ft. *per second*, a disagreeable draught is certain to be felt. No plan of *spontaneous* extraction of the air can possibly succeed in the large and crowded assemblies of the present day. Artificial means of extraction, either by a *vacuum* or by a *plenum* action, are indispensable. There are many extensive buildings thoroughly ventilated on these principles at the present time; but the difficulty of the case principally arises from the method of ventilation being passed over until a building is nearly completed, and then it becomes almost impossible to form sufficiently large openings and channels for the introduction and extraction of air in sufficient quantities, without causing a most inconveniently rapid motion of the air. No inconsiderable part of the difficulty of the subject arises from treating it, as the writer in the *Times* does, as "an exceedingly simple matter." There is scarcely a more difficult problem in practical science; and the more this view of the subject is realised, the more likely are we to have our public buildings ventilated with some degree of success.

Charles Hood, F.R.S.

Gainsborough.—A new Primitive Methodist Chapel here was formally opened on the 23rd ult. The chapel stands at the junction of Etherington-street with Trinity-street. It is in the Italian style of architecture, capable of seating 1,000 persons, and is built of red stock bricks, with Ancaster stone quoins and dressings, and granite shafts to the front entrance.

DESTRUCTION OF THORNDON HALL, ESSEX, BY FIRE.

Thorndon Hall, the seat of Lord Petre, was destroyed on the 22nd ult. by fire. The mansion was, according to the *Chelmsford Chronicle*, erected in 1766 by Lord Robert Edward Petre, from designs by Paine. The north front consisted of a centre, flanked by two wings, connected by circular corridors, while the south front was relieved by a portico, supported by six fluted Corinthian columns, rising from stout stone arches. The material used in the construction was white brick, with stone dressings. The great feature of the ground floor was the hall, 40 ft. square, the roof supported by eighteen columns cased with marble. On the west side of the hall in the south front was the billiard-room, and to the west of this were the strong room and a library principally devoted to a collection of ancient works, illuminated missals, and the literature of Mediæval days, the servants' apartments and offices taking up the remainder of the ground floor. The central apartment on the first floor in the south front was the saloon, 60 ft. long by 30 ft. broad, which has never been finished. To the west of this were the state or king's rooms, and the remainder of the floor on this front was taken up by his lordship's room and study, her ladyship's room and boudoir, the day nursery, and the armoury. In the north front, on the first floor the boarded hall or ball-room occupied the central position, flanked on the west by the dining-room and cardinals' room, and on the east by two drawing-rooms, the larger one, at the extreme end, being a handsome apartment, 38 ft. by 36 ft., and thoroughly re-decorated only two or three years since at a considerable cost. The second and third floors were devoted to bedrooms and nurseries. The upper apartments were approached by the grand well staircase rising in the centre of the mansion, this being supplemented by other stone staircases. The east wing consisted of the little Roman Catholic chapel in which the household worshipped, and which was most richly decorated. Above the altar-piece was a large painting of the Nativity, by David; the Agony in the Garden, and the Ascension; and on the sides were two little gems, brought from Rome. The western wing formed one of the most extensive blocks of stabling in the country, but the largest stable had been recently transformed into a spacious and handsome skating-rink. A considerable amount had lately been expended in renewing and improving the mansion. In addition to the rehabiliment of the principal drawing-room, the cornice last year was renewed throughout the whole length of the south front, and on the sides, at a cost of some 1,500*l.*, and during the past few weeks the drainage had been improved. Simultaneously with the latter, the old system of heating the hall, corridors, and some of the apartments by means of smoke-flues running through the building had just been partially done away with on account of the inefficiency of the system and the danger of such flues, and had been substituted, as far as regards the hall and staircases, by a complete set of hot-water apparatus. This had been fixed by Mr. T. H. P. Dennis, acting under the direction of the family architect. The boiler for supplying the pipes and the furnace was erected in a small apartment on the ground-floor near the grand staircase, the brick flue from the furnace leading into an old chimney from the armoury at the back of the king's room, and which still stands. The flue from the new furnace, extending about 15 ft. from the furnace-room to its attachment with the old chimney, is all underground, bedded in cement, covered with slabs of stone, and, with the furnace-room, will, it is thought, be found under the *débris* intact. The distance, following the lines of chimney and floor from the point of attachment to the place where the fire was first discovered, is about 30 ft. Coke only was used in the furnace. The new furnace and boiler displaced three furnaces used for heating the old flues on the same principle on which greenhouses are often warmed. These flues warmed the hall, staircases, armoury, and billiard-room. They were all underground, covered with slabs of stone, and in the case of the rooms, outside their respective walls. They were large enough to admit the body of a man, were separated from ends of rafters by only about 9 in. of brickwork, and, as before stated, must have been both ineffectual and dangerous. The old system of heating would still have been

used for the corridors, their respective furnaces being in cellars under the chapel and kitchens. It was also in contemplation to secure a supply of water from the South Essex Waterworks Company, in place of the old system of forcing the water from a well at some distance into a reservoir, but unfortunately that scheme had not been carried out, and the building was, like so many others of its class, lost for want of water. It does not appear that the origin of the fire had any connexion with the new heating apparatus.

NEW BUILDING REGULATIONS FOR GLASGOW.

The Town Council of Glasgow, at a meeting held on Tuesday in last week, resolved to apply for a provisional order and statutory powers to effect certain alterations and amendments on those sections of their Police Act relating to buildings.

The proposed changes would give additional powers to the Dean of Guild Court, and affect the rights of property in various ways; yet the Council has decided upon their adoption, after about half an hour's discussion, without any of the parties most likely to be affected having had an opportunity of considering them.

Several members of the Council protested against this indecent haste, and pointed out the difficulty of forming a just estimate of the effects of such regulations on various interests without mature consideration; and Mr. Salmon, F.R.I.B.A., entered his protest against the resolution which was adopted. The majority, however, carried matters with a high hand, and rejected even the moderate proposal of Mr. Walls,—"That instructions be given in the meantime to prepare the provisional order, and that that order be submitted to the meeting this day fortnight."

Considering the magnitude and complexity of the interests involved, it is to be hoped that the Government will see it to be its duty to protect the public from such crude and hasty legislation.

BREARLEY, NEAR HALIFAX.

In transforming the shell of the old Baptist chapel into houses, Mr. Patchett, architect, of Halifax, has introduced an arrangement of his own, whereby the dwellings are rendered better in a sanitary point of view than houses of a similar type are usually made. The partition-walls dividing the tenements are built hollow, having gratings placed at each end in the outer faces of walls, allowing a free circulation of air to be kept up, with the view of stopping sound, as well as the spread of vermin and contagious diseases. The chimney-breasts and fireplace, jambs and backs, are also built hollow, and fresh external air introduced into same, which, after traversing backwards and forwards, is allowed to escape through ornamental gratings fixed in the chimney-breasts, about 6 ft. above the level of flooring, thereby helping to prevent smoky chimneys, and furnishing each apartment with a supply of fresh air, rendered warm in winter by the fires usually kept up for the comfort of the inmates. In addition there is a special foul-air duct provided for each room, and carried up adjoining the smoke-flues, discharging the bad air immediately above the level of the bases of chimney-stacks, but below caps by through slits between smoke-flues. The sinks are disconnected from the drains, the waste-pipes discharging their contents over gratings at the outside of the building, all drain-pipes being on the exterior of the structure. By arranging buildings on these principles little extra cost is incurred at the time of erection, but the occupiers are greatly benefited as to health and comfort.

County Bridges, Essex and Suffolk.—At the Suffolk Quarter Sessions, the county surveyor reported that part of the flooring of Cattawade Bridge had given way at the Essex side. The Essex surveyor had inspected the bridge at both ends, and found the whole flooring very much decayed, there being only ¾ in. thick of sound wood. He proposed that the whole should be covered with Portland cement concrete 9 in. thick. The bridge was 168 ft. long, and supported on 48 timber piles, which had been reduced from 14 in. square to 8 in. square by the action of the water. About 150*l.* had been spent for repairs to the bridge during the last twelve years.

LIST OF WORKS BY THE LATE SIR GEO. GILBERT SCOTT, R.A.

We are enabled to give the following list, by the courtesy and pains of Mr. George Wood, Sir Gilbert Scott's private secretary. It does not go back beyond 1847, information before that date failing; and it is necessary to note that in some few cases nothing was done beyond a Report, and that Restorations are not distinguished from actual Buildings:—

Cathedrals.—St. Asaph, Aberdeen, Bangor, Chester, Chichester; Christ Church, New Zealand; Canterbury, St. David's, Durham, Ely, Exeter, Edinburgh, Gloucester, Graham's Town, Hereford, Lichfield, Manchester, Norwich (Report), Newfoundland, Oxford (Christ Church), Peterborough, Rochester, Ripon, Salisbury, Sydney (pavements), Wells, Worcester, Winchester.

Abbeys.—St. Alban's, Bath, Crowland, Dorchester, Hartland, Kirkstall, Malvern, Rievaulx, Tewkesbury, Westminster and Chapter-house.

Minster.—Beverley.

Priory Churches.—Brecon, Bridlington.

Churches.—Alford, St. Asaph (parish church), Arundel, Ashburne, Abergavenny, All Saints', Hereford; Anstey, Aylesbury, Atherstone, Abergwilli, Ardorby, Arksey, Adderbury, Aston Sandford, Adel, Abingdon, Ambleside, Ashley, Agarkirk, Aconbury, Alderney, Ackworth, Acton, Bushey, Barnstaple, Bilton, Buckingham, Bath (Walcot Church), Bowen, Bishopsbourne, Bowes Manor, Beverley (St. Mary's), Bledlow, Belgrave, Brownsover, Brereton, Bradford-on-Avon, Broughton (Banbury), Bilton (Yorks), Branston, Barnsbury (St. Clement's), Bury St. Edmund's, Birstall, Bebington, Beckenham (Mr. Hoare's private chapel), Bournechurch, Buslindge, Bromborough, Bishop Auckland, Brancepeth, Broughton Giffard, Burcott School Chapel, Bridge, Bowmoor, Bingham, Bottesford, Bulkington-Ciban, Berkeley, Bushridge, Barrack School Chapels for H.M.'s Government, Buckley, Cannes (France), Croydon (St. John's), Chester (St. Thomas's), Chillenden, Croudall, Chester (Boughton, St. Paul's), Clapham, Cornway, Colchester (St. Nicholas), Campsall, Clayworth, Coventry (St. John's), Cirencester, Cawood, Churchover, Chetwood, Cleobury Mortimer, Croxton Kerrial, Chesham, Camden, Cheddleton, Croydon (St. Peter's), Cradley, Claydon (Middle), Caverswell, Chiffen Hampden, Chilwick-green, Camberwell, Cambridge (St. John's), Chetwode, Coventry (St. Michael's), Colney Hatch, Crewe-green, Cornhill (St. Michael's, London), City-road (London), Chesterfield, Chippenham, Cambridge (St. Mary's), Cambridge Cemetery Chapel, Cattistock, Caythorpe, Cobham (Kent), Castock, Cossington, Cottingham, Chiswick, Cambridge (St. Mary's-the-Less), Castle Ashby, Chester (Holy Trinity), Cowtham, Calcutta (St. James's), Darlington, Derby (St. Andrew's), St. Deny's (Southampton), Dacre, Dyserth, Dundee (St. Paul's), Dundee (Old Tower parish), Ditton, Dorking, Dover Castle, Doncaster (parish), Danbury, Dudley, Dun's Tew, Dawish, Decham, Dowdeswell, Edinburgh (St. John's), Edgcott, Datville, East Claydon, East Winch, East Marsham, Edlesmere, Easby, Edenham, Ealing, Englefield, Elsan Loch, East Woodhay, Ellington, Eversholt, Ely (Holy Trinity), Erivarton, Eccles, Ellington, Frankton, Filleigh, Faversham, Farncombe, Farnborough, Fulnes, Fering (Organ), Fulham parish), Findon, Plaindon, Forest-gate, Frome (Christ Church), Finley, Fleet Marston, Fremington, Glasgow (St. Mary's), Gosforth (Newcastle-on-Tyne), Great Horwood, Gloucester (St. James's), Green Hammerton, Godstone, Godalming, Guyhirn, Granborough, Grantham (parish), Glastonbury, Godshill (I.W.), Great Grimsby, Gawcott, Goldsborough, Gazeley, Heston, Houghton Conquest, Hamburg (St. Nicolai), Hull (Holy Trinity), Hanwell, Hartshill, Higham, Henley (Upton-on-Severn), Hawarden (and Reredos), Hales Owen, Holy Head (St. Cybi), Hayes (Middlesex), Hartshead (Yorks), Halifax (parish), Hardwick (Oxon), Holy Trinity (Micklegate, York), Harrow (parish), Highclere, Hatch Beauchamp, Hampton Lucy, Horndea, Houghton (Hants), Hexham, Hitchin, Hythe, Huckfield, Harrogate, Hedge Hill, Huddersfield, Holbeck, Halstead, Holme, Hampstead, Hepie (Hull), Hayley Hill (Halifax), Huntingdon, Hawkhurst, Hereford (St. Peter's), Harewood, Haldenley, Heanor, Hungarton, Highgate, Horstead, Hull (St. Mary's), Iver, Ickleford, Islington, Itchingfield, Icklesham, Jarrow, King's Sutton, (Kensington (St. Mary Abbotts), Kirby Moorside, Kirby Hill (organ-case), Kirtlington, Kinver, Kingsley (St. John the Evangelist's), Kelso, Henley, Kirk Hammerton, Kelsey Chapel, Keston, Kilk Hampton, Liywell, Long Marston, Latton, Lynn (St. Nicholas's), Lee (Kent), Lynn (St. Margaret's), Landport (All Saints), Leicester (New St. Saviour's), Loughborough, Ladbroke, Leeds (Hook Memorial), Llangurig, Leominster, Leamington, Hastings, Llanidloes, Lydford (Devon), Leicester (St. Matthew's), Lugwardine, Lutterworth, Lothbury (St. Margaret's, London), Ludlow (parish), Ludlow (St. Nicholas), Latimer, Leafield, Llandough, Lewisham, Leeds (St. John's), Ledbury, Leith, Little Stewkley, Laughton-en-le-Morthen, Leicester (St. Margaret's), Lowdham, Luscombe, Leicester (St. Andrew's), Llan-y-Bettws, Lanxton, Little Horsted, Long Marston, Mirfield, Melton Mowbray, Marston Moretaine, Mold, Mitton-Stourport, Middleton Tyas, Merthyr Tydvil, Mansfield Woodhouse, Malvern Link, Middleton Cheney, Melbourne, Muswell Brook, Newcastle-on-Tyne (St. Nicholas's), Northampton (St. Sepulchre's), Nottingham (St. Mary's), Nocton, Newcastle-under-Lyme (St. Giles's), Newark (parish), Newent, Nantwich, New Romney, Norton (St. Philip's), Northampton (Asylum Chapel), New Brighton, North Aston, Norbiton, Olney, Owston, Oxford (St. Mary's), Orchardleo, Oundel, Oakham, Ottershaw, St. Olave's (Hart-street), Pershore Holy Cross, Pattingham, Patshull, Plymouth (St. Andrew's), Prestbury (Cheshire), Padbury, Pembroke, Petworth, Peterstow, Pensburst, Pitminster, Preston (Sussex), Patrixbourne, Polebrook, Pantrebola, Penpont, Ryde, Roxeth, Rhyl (St. Thomas's), Rhuddlan, Raunds, Rotherham (parish), Richmond (St. Matthias, Surrey, Rochester (St. Bartholomew's), Ruislip, Raunmore, Richmond (Yorkshire), Rodheath, Saffnall, Stretton, Selby Abbey Church, Shackleford, Stafford (St. Mary's), Stepney, Southgate, Sudbury, Spalding, Saxby, Stowford, Stafford (St. Chad's), Skirbeck, St. Lawrence (Isle of Wight), Steeple Claydon, Shangai (China), South Weald, Sandwich (St. Bartholomew's), Stratford-on-Avon (Holy Cross), Salhouse, Sawbridgeworth, Sale, Sarratt, Salisbury (St. Edmond's), Stourbridge (chapel, Cambridge), St. Alban's (Wood-street, London), Southampton (Highfield), Silverstone, Shilton, Staveley, St. Ives, Stoke Newington, Sandbach, Swindon (Old town), Swindon (New town), St. Michael's (St. Alban's), Swainswick, St. Alban's (1858), St. Barnabas (Ranmore-common), St. Hilary, St. Sepulchre's (Snowhill), St. Stephen's, St. Alban's, Southgate New Church, Shalstone, Shilton, Skipton (tombs, Duke of Devonshire), Streatham, Spalding (Old church), Shapwick, Stoke Talmage, Stroud (parish), Sherborne, Temple Balsall, Totnes, Tandridge, Twickenham, Tinnsbury, Thriplow, Tadcaster, Tavastock, Taplow, Treinant, Trenifall, Turnham-green, Tneddingworth, Tedstone Delamere, Taunton (St. Mary's), Tydd St. Giles, Taunton (St. John's), Twistleton, Traherne (Mistress, restoration of church), Upton, Uxbridge (New), Uxbridge (parish), Under-river, Upnor, Upton Bishop, Worcester (New), Whitnash, Wirksworth, Whixley, Wakefield (parish), Winterton, Wraste, Warmington, Woodbastwick, Watermoor, Westminster (St. Margaret's and St. Matthew's), Warlingham, Wye (Kent), Wingrave, Waltham (Little), Wellford, Wingham, Wilburton, Windsor (Chapel Royal, and Wolsey Chapel), West Meon, Whittlebury, Wolverton, Worsley, Wilmerton, Windsor (Horse-shoe Cloisters), West Ham, Weston-super-Mare, Worldham, West Drayton, Woking, Wimbledon, Windsor (parish), Woolwich Dockyard Chapel, Wescott, West Derby, Wakefield (Chapel on bridge), Westminster (St. Peter's), Wembly (St. John's), Wakefield Asylum Chapel, Wanstead (Christ Church), Whittlesey, Woolverstone, Welton, Welshampton, Weston (St. Mary's), Woodhay (East), West Walcot, Yewsley, Ylvesley (New), Yarpule.

Schools.—Ardrossan, Dorchester, Green Hammerton, Hayes, Harrow, Fulney, Oxford Divinity, Barcott (Chapel), Nocton, Southampton, Sudeley, Doncaster, Ashley, Forest Gate, Hartshill, Peterborough, Rugby (and Masters' Houses), Swindon (and Houses), Streatham, Middleton Tyas, Trefasnt, Stafford, Lyniburst, Glastonbury, Tothill-street (Westminster), Burton Abbotts.

Almshouses, &c. — Godstone, Sudeley, Blackfriars, Croydon, Stafford Asylum.

Parsonages Great Bricet, Hayes, Hillesden, Houghton Rectory; Derby (St. Andrew's), Howes Manor, Fulney, Hall (St. Mary's), Staveley, Mirfield, Ashley, Clifden Hampden, Bridge, Ealing, Leafield, Leicester, Hartshill, Stoke Newington, Trefasnt, Kilkhampton, St. Andrew's, (Leicester), Leith.

Monumental Works.—Albert Memorial, Earl of Aberdeen's Bust, Countess of Loudoun's Memorial at Ashby-de-la-Zouch, Hook Memorial Pulpit and Tomb, Chichester; Hook Memorial Tomb, Leeds; Lady Lucy Calvert's Memorial Cross, Mortuary Chapel, Chichester (Jervoise Smith, esq.); Bishop of Brechin's Memorial, Dundee; Dean Howard's Monument; Memorial Cross, St. Mary's Cathedral, Edinburgh; Monuments for Sir William Fraser and Mr. Freshfield; Bishop Hamilton's Monument, Mrs. Kaye's Monument, Lonsdale's Memorial, Lord Lyttelton's Tomb, Van de Weyer's Tomb, Archdeacon Moore's Monument, Scarsdale's (Lady) Memorial, Prince Albert's Tomb, Wolsey Chapel; Willercrove Memorials (several); Wilberforce Tomb, Winchester Cathedral; Rotherham Monument (Mr. Yates's); Clarkson Memorial, Wisbeach; Green Memorial, Penshurst; Bird's Monument, Mrs. Bradshaw's Monument, Professor Conington's Monument, the Countess of Exeter's Tomb, the Hon. and Rev. Mr. Pinnce's Tablet, Hereford Tomb, Colonel Pease's Mortuary Chapel, Colonel King's Monument, Keble Memorial, Professor Maurice's Memorial, Mrs. Mainwaring's Monument; St. Neot's Monument (G. O. Newton, esq.); Toulmin Tomb, Stephens Memorial, Edwards Memorial, Franklin Memorial, Monument to late Dean of Ripon, Ramsamawr; Martyrs' Memorial, Oxford; Reading Gaol and Abbey Gateway; Westminster Crimean Memorial; Elgin Tomb, Calcutta; Lady Canning's Tomb, Waterford Memorial; Winchester Cross; 30th Regiment Tomb, Ely Cathedral; Major Otway Mayne's Monument, Mrs. Schuster's Tomb, Colonel Fairleigh's Monument, Godley Memorial, Hereford; Mrs. Johnson's Tomb, Sir H. Smith's Memorial, Southam Monument, Hon. E. Twistleton's Monument.

College Chapels.—Cambridge (King's College, St. John's College, and University Chapel), Exeter, King's College (London), Harrow, Oxford (All Souls' College, New College, and Magdalene College; Wellington College.

Colleges Dorchester Training, Welsington, Magdalene (Oxford), New College (Oxford), Edinburgh Theological, Brighton, King's (Cambridge), Merton (Hall and Library), Oxford Convocation House, Cambridge University Library, Exeter, Jesus House (Liverpool), Mr. Marriott's house (Staveley Hall), Mr. Southall's house (Worcester), Walton Hall (Warwickshire), Luton Hoo, Llanhydrock, Canon Swayne's house (Salisbury), mansion at Yarm, Dunsany Castle, Duncombe Park, Pradell Court, Colchester Castle, Hatodemes, Broughton Castle, Holdenby (Lady Chiffen), Artington House, Alten Manor House, Belper House, the Professors' houses (Glasgow University), Leigh Priory House, Mitton Hill House, Pippbrook House; Sir Francis Scott's Lodge, bridge, and boat-house; Wootton House, Westminster houses (Broad Sanctuary and Abbey Precincts), Kingston Grange, Polwhele House, Sudeley Castle, Trevelyn Vean, numerous houses for Canons of Westminster (Dean's-yard), St. John's Lodge (Cambridge), Sir E. Antrobus (Westminster House), Caton Hall (Lodge), Capesthorne Hall, Scott's Hall and Smeeth, Weston House.

Sundries.—Brighton, Pulpit; Coventry, Reredos; Cobham (Kent) Reredos; St. Alban's, Fountain, Clock Tower, and Abbey Gateway, Dundee, Albert Fountain; Eccleshall, Cross, Hereford, Cross; Shipton, Reredos; Bombay, Fountain; Lovesdon, Reredos; Hull, Fountain

Royal Birmingham Society of Artists. The Spring Exhibition of this Society is now open. Nearly a thousand works are on view, many of them by artists of repute.

PORTLAND CEMENT AND TEMPERATURE.

The extended use of Portland cement in many countries since its first production in England has led to the institution of many important experiments. A paper on "The Use and Testing of Portland Cement," by Mr. W. W. Maclay, C.E., submitted to the American Society of Civil Engineers, occupies a whole part of their "Transactions." The experiments are tabulated. We condense a portion of it.

One series of experiments is intended to illustrate the effect of mixing up Portland cement, both neat and ganged with two volumes of sand, in extremely cold weather; also, under the same conditions, the effect of heating the cement, sand, and water, in order to hasten the setting. The results deduced from these tables are clearly marked, and some of them are quite at variance with prevailing ideas among the profession. They show, almost indisputably, the very injurious effects of heating mortar in cold weather (under the false impression that the setting of the cement is thereby accelerated), and that the greatest amount of evil is accomplished when this heated mortar is immersed directly in cold water. They also show how comparatively little the strength of Portland cement mortar is injured by being mixed up in extremely cold weather, provided the materials are not heated. All of the tests from which these tables have been formed were made of Burham cement, tensile strength, neat, seven days old, 278 lb. per square inch; weight, per struck bushel, 119 lb., and containing not more than 15 per cent. of particles over $\frac{1}{76}$ in. in diameter. In order to have the conditions as nearly as possible the same, two sets of briquettes were generally made at the same temperature, in the open air,—one in which the mortar or cement paste averaged about 40°, and the other in which the cement, water, and sand were heated up to 100°. These two sets were kept in precisely the same manner, and broken together on the same day, so that any change in temperature during the seven days would necessarily affect them alike. As soon as the cement had set sufficiently to allow removal from the moulds, part of the briquettes were placed at once in the North River, temperature from 31° to 33°; part of them were left out of doors, exposed to the action of the weather; part immersed in water, maintained at 70°, during the seven days; and the remainder were kept in air, maintained at 70°, during the same time. The averages show that of the briquettes mixed up cold, the tensile strength was the least with those exposed during the seven days to a heated atmosphere, and that it was the most with those immersed in heated water during the same time.

The results of placing the briquettes in the cold river-water, and of exposing them in air outside during six days to the action of the weather, were about the same.

The briquettes of pure cement made by heating the materials until the cement paste stood from 96° to 98°, with the temperature of the air in which they were mixed varying between 13° and 19°, and being exposed for six days to the action of the weather, only proved to be from 7 per cent. to 16 per cent. as strong as when they were mixed up without heating, or with the temperature of the mortar at 40°. When the air in which the cement paste was ganged varied from 32° to 37°, the briquettes made with hot materials proved to be 20 per cent. as strong as the cold, and when the temperature of the cement paste of the heated briquettes was only brought up to 70° instead of 96°, they reached 72 per cent. of the tensile strength attained by the cold ones.

When, instead of ganging the cement neat, two volumes of sand were added, with briquettes made under the same conditions as the preceding, the tensile strength per square inch, at the end of twenty-eight days, in those in which the mortar had been heated to 98°, only attained 30 per cent. of the strength shown by the briquettes made from cold mortar, which in this series of experiments stood at 40°.

In all these comparative experiments as to the merits of heating the materials in cold weather, whenever the briquettes made from hot mortar or cement paste were immersed in either cold water from the river or in warm water in the testing-room, they invariably dissolved into shapeless lumps, which subsequently set in a partial manner, although, from having lost their shape, it was never possible to break them in the testing-machine, and so compare their strength directly with that of briquettes made from cold materials. However, by breaking lumps into pieces with a hammer, at the end of five or six months, their value was found to be scarcely anything as compared with the briquettes made up cold. From this we should conclude that, while mixing the mortar up hot, for use above water, in extremely low temperatures, greatly reduces its normal strength, to immerse it directly in cold water under these conditions is to destroy its value almost entirely.

Calling 100 the tensile strength per square inch of the briquettes, ganged with neat cement, and with two volumes of sand, and mixed up cold, in temperatures from 13° to 22°, for mortars heated to 98°, the briquettes, at the end of seven days, rarely exceeded 10, or at the end of three months, 30. These per-centages are deduced from averages from a large number of experiments. In the same manner, calling 100 the tensile strength per square inch of briquettes ganged neat and mixed up cold, in temperatures from 32° to 37°, when heated to 70° the value of the briquettes fell to 72; when heated to 100°, their value became 20.

Having given the percentage of injury done by the heating of Portland cement mortars, intended for work above water, when mixed up in temperatures varying from 13° to 37°, taking the strength of cold mortar, put in under the same conditions, as 100; in order to make the comparison complete, it only remains to give the values of cements mixed up, without heating, from 13° to 70°, which may be summarised by saying that the effect of mixing up mortar in temperatures varying from 32° to 37°, is to reduce the tensile strength at the end of seven days, which they would have had mixed up in a temperature of 70°, by about four per cent.; to mix them up in temperatures varying from 13° to 22° is to make this reduction about 14 per cent., and for any of the intermediate temperatures, between 70°, 32°, and 13°, the reduction would vary between 0—4 and 14 per cent. The above figures are deduced almost entirely from seven-day tests, and their relative values have been found to hold good, with slight variations, up to an age of three months. For longer periods the briquettes have not yet been broken.

This series of experiments was commenced (1876-1877) while the writer was building a concrete arch, the piers of which were situated in a rapid tideway, and had been built up to low-water mark. It was feared that if the work was not continued, the centering would be carried away by the ice, immense fields of which were daily coming in contact with the piers. The question arose, should the concrete, which was made of Portland cement, be put into the work hot, and should it be put in at all during exceptionally low temperatures? It was decided that the concrete intended for under-water work should be put in cold; above water, hot; and that the work should be carried on whenever the concrete could be mixed up without freezing on the shovels of the concrete-mixers. Concrete (by volume one part cement, two parts sand, and four parts broken stone) was frequently put in the work when the temperature of the air was 25°, to be submerged by the tide after the lapse of an hour or two, the temperature of the salt river water being 31°. When the work was exposed at the next tide, the concrete was found in good condition. In the same manner, above the action of the tides, concrete was frequently mixed up and put in the work, with the thermometer standing at 25°, and upon one occasion when the day's work terminated the thermometer stood at 23°. Granite was also set under the same conditions, and levels taken upon it the ensuing spring showed no settlement.

In the commencement of the winter the concrete above the tide was heated. For this purpose portable furnaces or heaters were used for the stone and sand, and steam for the water. This practice only continued a short time, however; for, as the experiments with the hot and cold briquettes progressed, the surprising superiority of the cold mortar was so clearly shown that the heating was at once abandoned, except to thaw the frost out of the stone and sand, which were frozen so hard during the nights as to be unfit for use in the morning when the work commenced without heating them. The concrete which had been put in hot was very carefully examined when the weather was sufficiently warm, by cutting test-holes several feet deep into the mass, exposing the layers that had been put in under the two systems—hot and cold. Very little difference could be detected by this examination: the concrete which had been put in hot in very cold weather being apparently as hard and difficult to cut out as that which had been put in cold. The writer accounts for this apparent non-confirmation of the experiments by actual practice by the following explanation:—The concrete made by heating stone, sand, and cement, separately, from a scarcity of heating apparatus, never rose in temperature much above 50°, which in air at 25° appeared much hotter than it really was. Heated, therefore, to 50°, the concrete was but very little weakened; for, as it has been shown in discussing this table, with the temperature of the air at 32°, and the mortar at 40°, 70°, and 100°, the tensile strengths stand 100, 72, and 20. In other words, this weakening would not be discovered by any examination except that of breaking the specimens in a testing-machine. Fortunately, none of the concrete submerged by the tides was put in hot; for, as it has been previously stated, this is the most unfavourable condition under which Portland cement-mortar can be prepared in cold weather. This fact seems to be but little known among the profession, and by some of our engineers has been entirely ignored in their practice. From the experiments on this subject, it seems very conclusively shown that no good work can be done under water in winter if the mortar is heated; and where such work has been done, if subjected to careful examination, signs of failure will probably be detected.

In the above experiments, all the briquettes of mortar mixed up cold seemed to set, and not to freeze even in as low temperatures as 13° and 14°, except when the day was windy. With the briquettes made of hot mortar, on the contrary, they all invariably froze, as was proven by their getting soft again whenever the temperature rose. This fact probably accounts for the hot briquettes, when placed in water, always dissolving: its higher temperature causing them first to become soft and then to separate. The peculiarity of Portland cement setting in a low temperature, in which another cement would freeze, has been noticed by most writers on Portland cement, but no limits assigned to this action. M. Ed. Leblanc, in a note written in Boulogne in 1865, says, "Among the number of remarkable properties of Portland mortar, it is necessary to notice that of not being destroyed by the frost. 'Portland mortar does not freeze,' our masons say; which permits the execution of Portland masonry works in the latter part of autumn, and even in winter in urgent cases. Thus cakes of Portland mortar that we have exposed to the frost immediately after they were made, before they set, cracked deeply and in part became disintegrated; but the detached fragments after they thawed, even to the smallest, were found perfectly hard."

Part of this experience of M. Leblanc is different from that of Mr. Maclay; for none of the briquettes, mixed up cold, cracked in the slightest degree when exposed to the lowest temperature, which, in some of the above experiments, went down to 11°. That the mortar should become hard after thawing is, however, in complete accord with the results deduced from the experiments, and also with the prevailing opinions upon this point; for example, Mr. J. Dutton Steele, in a recent note published in the correspondence of the Society, says, "Cement mortar is not seriously impaired by being laid in frost, as its property of setting is simply held in suspense during the time it remains frozen." This is true with Portland cement mortar, as with all other mortars; only, with Portland cement it takes a very much lower temperature to freeze it.

The Charities of Dowgate Ward.—Mr. George Mitchell, who occupies premises in this ward, has published a list of the numerous charities which belong to it, and says, "as the natural increment of this property must have made it a hundred times as valuable as when it was bequeathed to the poor, there must be either enormous sums of money given away yearly to the Dowgate poor, or there must be a considerable amount of property in private hands, which does not yield its fair quota to the legitimate recipients." He asks pertinently, "Who are the favoured individuals in possession of house-property belonging to these charities at a peppercorn rent; who let the property to them, and under what circumstances?" Some of the officers of the ward should answer these questions.

THE DETERIORATION OF OIL PAINTINGS.

Dr. R. Liebreich took this as the subject of a recent Friday evening's discourse by him at the Royal Institution. Oil paintings, he said, are subject to various kinds of changes, which may be considered as diseases, requiring different treatment according to their different nature. A science needs to be formed,—a pathology and therapeutics of oil paintings. The pathology would have to describe those diseases and their progress, and to develop the methods by which a correct diagnosis could be arrived at in each individual case. The therapeutics would teach the remedies which might be applied either to cure or alleviate the disease, or at least stop its progress. A hygiene would follow which would have to teach how to avoid pernicious influences, and which, besides, while giving precepts for the technical process of painting, would have to forestall those constitutional diseases which, even in cases where no noxious influences can be traced, are the causes of decay after a comparatively short period of existence. As medical science is, above all things, based on anatomy and physiology, so the exact knowledge of the structure of a picture would have to be acquired previously to any study of its disease. Unfortunately direct investigation alone can procure no such exact knowledge; on the contrary, we are obliged to enter upon a minute historical investigation of the material as well as of the technical methods adopted by artists of different schools and different periods. The excellent works of Cennino Cennini, Mérimé, Sir Charles Eastlake, Mrs. Merryfield, and others, have already furnished most valuable material; but still the field for investigation remains unlimited, for in order to enable us to secure the conservation of each valuable painting, we ought to know exactly how it was made. The artists of the present time would spare infinite trouble to the investigators of future times if, along with their works, they would leave the account of their practice in the case of each picture. A treatment without exact knowledge of the normal condition as well as of the nature of the disease is as dangerous for the picture as it would be in the case of living beings. In studying this subject, we have to consider—first, the material on which the artist has painted, which, so far as oil-painting is concerned, is generally wood or canvas; secondly, the priming, that is, the substance with which the surface was prepared in order to make it fit for painting; thirdly, the painting itself, that is, the pigments and vehicles used for it, and the liquids that were added during the painting, the mediums, the siccatives, varnish, essential oils, &c.; fourthly, the coat or coats of varnish spread over the picture. Firstly, the wood on which a picture is painted may either warp, get chinks in it, become worm-eaten, or even altogether rotten. The remedies for these Dr. Liebreich described. Canvas may be subject to holes, rents, or the whole may be ragged and tattered. The remedies in such cases are either patching, or the entire removal of the old canvas, and the substitution of fresh. Secondly, the changes in the priming may be grouped under two heads—the distemper and the oil priming. The diseases arise either from cracks in the priming itself, the severance of the priming from the painting, or the severance of the priming from the wood or canvas. The third disease is by far the most frequent. Thirdly, the painting itself. It is often supposed that the old masters were in possession of pigments the knowledge of which has been lost, and that this accounts principally for the difference between the oil-painting of the fifteenth and sixteenth centuries on the one hand, and that of the eighteenth and nineteenth on the other; but this is a great mistake. We know perfectly well the pigments used by the old masters; we possess the same, and a considerable number of new ones, good as well as bad, in addition—good and bad, that is, as regards durability. From this point of view pigments may be grouped under three headings:—1. Those which are durable in themselves and also agree well with the other pigments with which they have been mixed. 2. Such as, when sufficiently isolated, remain unaltered, but when in contact with certain other pigments change colour, or alter the others, or produce a reciprocal modification. 3. Those which are so little durable that, even when isolated from other pigments, the mere contact of the vehicle, the air, or the light, makes them in time fade, darken, or disappear altogether. The old masters used without reserve only those belonging to the first of these categories. For those belonging to the second they imposed on themselves certain limits and precautions. Those belonging to the third they did not use at all. That some of the modern masters have not followed these principles is not owing to a lost secret, but to the fact that they disregarded those well-known principles, and even consciously acted against them. It seems pretty certain, however, that the pigments themselves play only a subordinate part in the deterioration of oil-paintings, and that the principal part belongs to the vehicle with which the colours are ground. Reference was made to a table given by Pettenkofer of the relative amount of oil different pigments require. They vary from white lead, of which 100 parts require 12 parts of oil, to raw terra sienna, which requires 240 parts. The principal enemy of oil-painting is oil. The old masters made their apprentices spend three years in learning how to mix. After a reference to several pictures in which the different effects of oil may be studied, Dr. Liebreich suggested the following rules:—1. The oil should in all colours be reduced to a minimum, and under no form should more of it than is absolutely necessary be introduced into a picture. 2. All transparent colours which dry very slowly should not be ground with oil at all, but with a resinous vehicle. 3. No colours should be put on any part of a picture which is not yet perfectly dry. 4. White and other quick-drying opaque colours may be put on thickly. On the contrary, transparent and slowly-drying colours should be always put on in thin layers. Lastly, the varnish, the last layer of the picture, often cracks, or may be discoloured, and it is then necessary to remove it. Numberless works of art have been irreparably injured by restorers, who in their eagerness to remove dirt and varnish have attacked the picture itself.

NEW BUILDING FOR THE NORFOLK AND NORWICH HOSPITAL.

At a special meeting of the governors of the Norfolk and Norwich Hospital, on the 23rd ult., the Building Committee presented a report, from which we cull the following passages:—

"At a meeting held 7th July, 1877, the General Board, adopting the recommendation of the Building Committee, appointed Messrs. Wyatt & Boardman architects for the proposed new hospital.

At a meeting of the Building Committee, held October 13th, 1877, instructions were given to the architects to prepare alternative plans (A and B) adopting in both the H form of general arrangement, but showing in A the adaptation of the east wing of the present hospital to the purpose of an out-patients' department and nurses' institute, and interposing the administrative department between it and the hospital proper; and in B, providing accommodation for nurses in a detached building, to be erected at the east angle of the site, and placing the entire administration with the out-patients' department in the centre of the space between the limbs of the H.

At a meeting held 1st December, plans A and B, in accordance with these instructions, were submitted, and approximate estimates were furnished by the architects as follow:—Plan A, preserving the east wing of the present hospital, 36,000*l.*; plan B, involving the total demolition of existing buildings, 37,900*l.*—to which the architects desired to add for contingencies in either case at least 1,500*l.*

After lengthened discussion, at a meeting held on the 8th December, the committee decided by a majority in favour of recommending plan B to the Board of Governors, but inasmuch as considerable difference of opinion had been manifested, and the vote in favour of plan B had not been carried by a majority of the entire committee, it was felt that further opportunity of testing the relative merits of the plans might with advantage be given, and the committee resolved to call in Dr. F. de Chaumont, Professor of Hygiene at the Army Medical School, Netley, to inspect the plans and site, and furnish a report which it was hoped might be conclusive.

Professor de Chaumont having undertaken this duty, and expressed in an elaborate report his preference for plan B, the committee passed a resolution confirming their previous vote in favour of that plan, and in pursuance of the resolution so confirmed now beg to submit plan B, with Dr. de Chaumont's report in illustration of its merits, for the consideration of the General Board."

Plan B is in the Italian style of architecture, to be built of red brick, with stone dressings; is arranged upon the pavilion system, and consists of four main blocks of buildings, viz., two double pavilions, administrative and operating blocks. The pavilions are two stories high, and set out on the site at right angles with St. Stephen's-road. The south-west pavilion consists of four large wards, each containing twenty-four beds, and each having a "double-bed" ward and nurses' room, with detached projections at each extreme angle, containing bath and lavatory accommodation. The north-east pavilion is of a similar construction, but contains more smaller wards. These pavilions are connected with the administrative block by a corridor, 12 ft. wide. The administrative block is placed centrally between the two pavilions, with a façade of 94 ft., and has a *porte cochère* to the central main entrance, and a clock-tower rising from the central roof, and consists of a basement, containing kitchen, scullery, and store-rooms, with corridor to the pavilions, arranged with lifts for raising coals, &c. The ground-floor contains entrance-hall, library, Board-room, secretary and matron's rooms, &c., and completely separated by a wall is the out-patients' waiting-room, with surgery, physicians' and surgeons' rooms, and entrance and exit perfectly distinct from the hospital. This waiting-room will also be used for patients' visitors. At the end of this waiting-room is the dispensary, which is to supply the out-patients, and is equally distant from all the wards. The first and second stories contain the resident officer's sitting and bed rooms. In the rear of this is the operating-block, one story high, containing theatre, consulting-rooms, four double-bed wards, nurses' accommodation, baths, &c. Between the operating-block and the pavilions is a general bath-room on one side, and a nurses' dining-room on the other. At the north-eastern extremity of the corridor is the chapel, and beyond that the museum and *post-mortem* and waiting rooms. Detached from the hospital, and forming the north-east building, is a residence for nurses off duty, covered shed for carriages, &c.

The recommendation of the building committee is still under discussion. Party feeling between the adherents of the respective plans seems to run in strong currents, judging from a report, several columns in length, in the *Norfolk Chronicle*. The hope was expressed by Sir F. G. M. Boileau that at the next meeting the alternative elevation of plan B, the Queen Anne elevation,—would be placed before the governors.

BRICKBURNING BY A NEW PROCESS.

Messrs. J. & C. J. Foster, of Normanton, Yorkshire, are the patentees of a kiln for burning bricks, suitably called "The New Patent Tramway Brick-kiln." The kiln, in appearance, very much resembles a brick tunnel above ground; it is 108 ft. long, 8 ft. wide at the bottom, and measures, in the centre of the arched top, about 11 ft. in height; near to the entrance-end is the chimney-shaft, and the furnaces, of which there are four on either side, are midway between the inlet and outlet ends of the kiln. At the mouth or entrance end is an iron slide fitted into grooves, which is elevated and lowered as the load of "green bricks" is admitted, and a pair of iron folding-doors at the outlet end. The tramway is formed of two lines of ordinary railway metals, with the same gauge as is used on railways, and passes through the kiln and extends beyond it at both ends, and a loop line outside for the trucks to pass to the entrance end when discharged. The truck upon which 5,000 green bricks are stacked is 12 ft. long and 8 ft. wide, and the load when stacked is shaped to correspond with and fit the inside of the kiln; each truck consists of four wheels and an iron bottom with a covering of fire-clay. On either side of the kiln is a fillet ingeniously contrived so as to fit a groove formed on the outer sides of the bottom of the truck; by this arrangement cold air is admitted under the bottom, thus preventing the iron from damage by the heat, and preventing cold air from entering the inside of the kiln. The ends of the trucks are rabbeted, so that one truck-bottom overlaps the other about 3 in.; and when the kiln is full, forms a continuous air-tight floor, having nine divisions coupled together extending from one end of the kiln to the other, each truck or load consisting of 5,000 bricks, the total number in a kiln of this size being 45,000. The heat passes from the furnaces in the middle to the inlet end, thus five truck-loads of bricks are more or less brought into contact with the heat, the load immediately opposite the furnaces being the hottest; in fact, the bricks as seen through the furnace-holes are at a red or white heat, whilst the load of green bricks last admitted is only gradually drying; also, the truck-load which has passed the furnaces is gradually cooling, and gets colder as it passes towards the outlet. Each truck-load is retained from six to eight hours opposite the furnaces, and for the same period of time is either passing the stages of increasing heat or cold as it approaches towards or passes from

the furnaces. It therefore follows that one load of 5,000 bricks is admitted and 5,000 withdrawn every six or eight hours, and from 15,000 to 20,000 bricks are burned in every twenty-four hours.

ST. LEONARD'S.

With reference to the concluding paragraph in our article last week on the Jubilee of St. Leonard's, we are asked to say that the municipal authorities, through their surveyor, are engaged in extending that system of sea defence which has been mainly instrumental during many years past, in defining the boundaries of sea and dry land in the borough; and that, while the new Parade wall affords at once a stout bulwark and a fine promenade, additional groynes may reasonably be expected to be the medium of collecting at the extreme east a like amount of beach to that they have been the means of providing towards the west end of that modern creation of which we wrote.

"GYMNASTIC EXERCISES."

Sir,—I read with interest your article in last week's number on "Ancient and Modern Gymnastic Exercises," containing much that is suggestive and true, and quite in keeping with the objects of a journal which is concerned in all questions relating to health.

But I regretted to read a sentence, in reference to the development of the voice, casting a slur on those who would "teach their children that it is vulgar to speak loud," &c. I am most strongly of the opinion that nothing in manner is more pleasing, and more indicative of really gentlemanly character and bringing up, than a quiet and restrained manner of speaking; "an excellent thing in woman," our great poet says; an equally excellent thing in man, I venture to suggest; and a habitude which children will not acquire, perhaps, unless inured to it early. When I hear children noisy and speaking with loud and sharp voices, I always set them down as badly brought up. The quiet voice is an old tradition of "the gentle life" in this country, and one that is now only too much neglected and undervalued. Z.

THE COST OF THE MANCHESTER JOINERS' STRIKE.

A few days since, the united trade committee of the Manchester and Salford Carpenters and Joiners' Association issued a report, in which they state (according to the *Manchester Courier*) that it is with extreme regret they are again compelled to report the strike in Manchester and Salford still unsettled; but they are happy to add that many more favourable signs of success appear than have been apparent for several months past. On the 4th ult. a general meeting of the trade, which was attended by nearly 2,000 members, was held, and after hearing the report of the committee, it was unanimously decided to continue the demand of the associated builders until they are prepared to meet the committee of the workmen, sign the rules, and make a reasonable concession in respect to wages. The committee was also empowered to make terms with the unassociated builders by permitting them to employ men at 9d. per hour, on condition that they gave their concurrence in the improved working rules agreed to twelve months ago. Accordingly the committee have visited, either personally or by proxy, nearly 200 employers, all of whom have agreed to the new arrangement. In every instance the men not connected with the union have been discharged before the society men resumed work. The committee are in negotiation with several other employers, and have great faith in the results of the new movement, which had given the most unqualified satisfaction to all their best friends in the trade. Its success was, perhaps, proved by the following figures:—In the week ending March 9th, there were on strike 468 men connected with the general union, and 425 men connected with the amalgamated society, total 893; and on the following week the figures were respectively 436 and 388, showing a decrease of sixty-nine society men; and the numbers of the non-society men connected with the associations also show a decrease in equal proportion. The committee expected a much larger decrease during the current and following weeks until the end of the strike. The report concludes as follows:—

"Surely when the employers see their members and friends seceding from them in this manner, and obtaining the next summer's contracts, which under other circumstances would belong to them, they must open their eyes and throw off the stupid dogmatism with which they have previously received all our overtures, and meet us with a reasonable concession, and thereby put an end to the struggle which has proved more disastrous and costly to them than it could possibly be to us."

In the eighth balance-sheet the committee state that 311*l.* 9s. have been received in subscriptions in aid of the strike fund from other trades; 5,787*l.* 5s. 3d. from their fellow-tradesmen in other towns, and 5,800*l.* 19s. 11d. in the form of local levies subscribed by members of the associations who are at work in Manchester and neighbourhood. The total expenditure had been 11,863*l.* 8s. 8½d., leaving a balance in hand of 36*l.* 5s. 5½d.

A STRIKE AND ITS RESULT.

Sir,—It seems that the masons' strike has come to an end. It will increase the present ill-feeling existing between labour and capital, unless some centripetal force be put in action to harmonise the contending parties.

Some time since Professor Barry urged the working men and the trade societies to the erection of houses suitable to their requirements. Mr. T. Brassey, M.P., has also written in favour of co-operation, since which time one of the Messrs. Lucas has spoken in favour of the same organisation. On the side of labour, Lloyd Jones & Co. are co-operators. Were it possible to establish a manufacturing co-operative society, with some of those individuals on the committee proposing to pay 6 per cent. on transferable shares, both classes would feel an interest in its success. To the manufacturer the committee would act as a buffer, lessening the shock of contact, and possibly forming a kind of Conciliation Board. The high interest proposed as a first charge might attract capital, and the bonus on labour might attract the workman. Were the experiment tried on a small scale it might be best, and a good and national object would be the erection of a temperance hotel, with lecture-room, baths, and stabling attached. At Aldershott each of those things is needed at that central depôt, for our soldiery and the visitors at the camp, as nothing of the kind exists at the present time. The advocates of total abstinence might also aid if they found others willing to help. J. Cretien.

CHANGES IN IRON.

Sir,—It is a well-known fact that the very best puddled iron becomes granulated after a long series of blows or shocks. The fibrous nature becomes crystalline and brittle. A Birmingham manufacturer, who uses a large number of small steam-hammers, tells me that he found the very best iron, when used as piston-rods to his hammers, became granulated and broke after being in use about two months. The damage and loss consequent upon the breakage was very serious. This he now obviates by annealing his rods every six weeks or thereabouts, which he says restores their fibrous character.

We have always been taught by scientists that the crystalline character of cast-iron and steel was due to a percentage of carbon in combination with the iron; but in the above case that can scarcely be. It also appears singular that annealing should have the power of re-uniting the atoms of iron after crystallisation.

I call attention to the matter in the hope that some reader of the *Builder* may be able to explain the phenomenon. E. G.

"SUB-CONTRACTORS."

Sir,—In the report in your last issue under the above heading, the statement there made by Mr. Tilney is so incorrect that I trust you will allow me to make the following explanation public, it being calculated to do me much harm.

Being away from home, I was not aware that proceedings were being taken till I found, on my return, on Monday, the 25th, that the proceedings which you report had been taken, or I should most assuredly have been there, and had the following facts elicited:

When Mr Tilney made the statement that "on Saturday last when I received my money, I had told the men I had not got any, when I had plenty to pay them," he surely knew he was stating what was not correct, for instead of sending my money, as promised, he sent word for me to see him at twelve o'clock, at his yard, for my money; this being the time men leave work. I went to see him, and had to wait two hours, when he said he could not let me have any money, as he had not received any from the builder. He, however, eventually gave me 5*l.* to pay wages amounting to 11*l.* 5s. (I distributed the 5*l.* amongst the men, as in evidence.) I have since ascertained that Messrs. T. & M. had received an advance the previous week the very day he asked me to put on more men, so that he could make a show, and get an advance, and he promised me I should have 15*l.* the following week.

As to my account being overdrawn, I obtained a summons for money due, but on coming on for hearing, the Court had no jurisdiction, and referred me to the County Court, where, no doubt, I shall have an opportunity of further explaining away the slur on my character.

E. Leech.

CHURCH-BUILDING NEWS.

North Cerney.—During the last two years considerable works have been effected in the very ancient and interesting church of this parish. The survey of the church made by the diocesan architect, Mr. Waller, of Gloucester, on the appointment of the present rector, the Rev. P. Goldsmith Medd, disclosed an unsafe condition of the east wall of the chancel, which has therefore been entirely rebuilt. This gave the opportunity for the restoration of the beautiful Early English east window, traces of which remained in the pointed arch on the inside, and in portions built into the masonry of the late wall, which was of the date of Elizabeth. The new window, together with its beautiful stained glass, by Messrs. Hardman—subject, "The Manifestation of the Risen Saviour to St. Mary Magdalene in the Garden," is the gift of Mrs. Dawson Allen, in memory of her husband, the late rector. The carved oak reredos, to be completed hereafter with suitable panelling for the whole space within the communion rails, is the gift of Mrs. Medd. The choir stalls are those designed by Mr. Butterfield for the first temporary chapel of Keble College at Oxford. In the body of the church, and in the north transept, comfortable open benches of good pitch pine have replaced the high pews. The space at the west end under the tower, formerly occupied by the children, has been converted into a vestry, and the children are now seated in the north transept. The organ has been removed from the west gallery to an organ-chamber recently built at the western angle of the north transept. The works have been carried out by Mr. Clutterbuck, builder, Gloucester.

Dagenham. — On the 25th ult., a vestry meeting was held at Dagenham, for the purpose of considering the plans submitted by Mr. Lee, architect, for the restoration of the parish church. The Vicar, in reference to a proposal which had been made to carry out a portion only of the works, said that there were several persons who would only contribute on condition that Mr. Lee's plan was carried out in its integrity, and the gallery removed. Mr. Lee, the architect, explained the plans, and said the main points were the seats and the gallery. The gallery was now a thing of the past, and if left up it would appear rather ridiculous. Mr. Lee explained that the accommodation at present was 353 seats, and that he should by his plan get 354, and there would be practically an increase of twenty-five, as none of them would be only suitable for children, as was the case with the seats in the west gallery. On the question being submitted, there were sixty-three votes for the retention of the gallery, and fifty-six for its removal. A poll was demanded by those who favoured the removal of the gallery.

Ilchester.—The fine old parish church of Ilchester, near Yeovil, is about to undergo restoration, at a cost of above 3,000*l.*, towards which nearly 400*l.* has been already raised. Messrs. Wilson, Willcox, & Wilson, of Bath, have prepared the plans.

Woodhouse (near Loughborough).—This parish church is about to be re-renovated by taking out all the old closed-up pews, and by being re-seated with open ones; and the church is also to be enlarged by the building of an additional north aisle. The cost of all will be defrayed by the generous gift of the widow of Mr. William Perry Herrick, Beau Manor Hall, near Loughborough.

Clifton.—A faculty has just been granted to the churchwardens of Holy Trinity Church, Clifton, by the Consistory Court, to enable them to carry out certain improvements which were decided on at a vestry meeting held in February. The proposed improvements consist of a new pulpit, reading-desk, lectern, additional means of exit, and the completion of the alterations which were commenced four years ago. The estimated cost of these works is about 500*l.*

North Wales.—The parish church of Aber,

North Wales, is on the eve of completion. It has cost under 3,000*l.* The architects are Messrs. Pugin, Ashlin, & Pugin, of Westminster.

Miscellanea.

Walsall Sewerage.—A special meeting of the Walsall Town Council was held on the 27th ult., for the purpose of taking into consideration the draft provisional order proposed to be issued by the Local Government Board with respect to the lands required for the proposed sewage works. The Local Government Board, in one of their letters, wrote:—"The Board consider it may be open to question whether the scheme of the Town Council will sufficiently purify the sewage before its discharge into the river to comply with the requirements of the Rivers Pollution Prevention Act, 1876: but, having regard to all the circumstances of the case, they have determined not to refuse the issue of the provisional order applied for by the Town Council. At the same time, it must be understood that, if the requirements of the Rivers Pollution Prevention Act are not satisfied, the Town Council will have to provide more effectual means for the purification of the sewage." It was resolved, "That, in view of the doubt raised by the Local Government Board in their letter, it is the opinion of this Council that no further proceedings should be taken in respect of the provisional order, the draft of which has been read, but that the whole subject be referred back to the Sewage Committee for further consideration, and that a copy of this resolution be sent to the Local Government Board." In the course of the discussion, Alderman Brownhill said Mr. Hawksley in his report merely expressed his belief that the tank system and treatment with lime would purify the sewage matter sufficiently, but that, if it should not do so, then the use of sulphate of ammonia would effect the desired end. Mr. Hawksley, in his estimate, however, put down only 1,500*l.* as the cost of the chemicals. The lime would cost half that amount, but the sulphate of ammonia, used on the scale named by Mr. Hawksley, would cost 10*l.* per day, or the enormous sum of 3,650*l.* per annum.

The Electric Light.—An exhibition of the Gramme electric light was given at the Rosehill Bridewell on the evening of the 27th ult. for the information of the Watch Committee and other members of the Town Council of Liverpool. The invention was shown by Messrs. Hartley & Talbot, the local agents for Messrs. C. Ball & Co., London. The light was shown in the large parade-room. The machine used on this occasion gave a light equal to 6,000 candles or 600 gas-burners. The cost of working it, as explained by Mr. Hartley, is 2¼d. per hour working without power, and 4¼d. per hour working with the requisite engine power. It is claimed for the machine that it excels all other similar inventions with regard to the degree of light it gives in relation to the weight of power it absorbs. The invention is largely used in France for lighting factories and large buildings, and is also in use on board British men-of-war. *The Daily Courier* says that the impression on those present was that the electric illuminator would, provided the cost was moderate, be advantageously employed in lighting the public buildings and thoroughfares. The invention will probably be further tested in Liverpool. An electric light was exhibited in the central hall of the House of Commons on the night of the 28th ult. It is not the Jablochoff candle, but a new magneto-electro light, which has already been tried in Paris. The Speaker came to witness the experiment, and the First Commissioner of Works spent some time in inquiring into the matter. So far as brilliancy is concerned, the light is said to have been in every way satisfactory, though it was dazzling from its very intensity; but it was exceedingly unsteady, owing, it is said, to the engine being without a governor.

Value of City Property.—The freehold ground-rent of 1,350*l.* per annum arising out of the premises situate at the corner of Gracechurch-street and Cornhill, and known as 59 & 60, Cornhill, covering an area of about 850 ft., has been sold by Messrs. Harvey & Davids for the sum of 33,750*l.* This is at the rate of nearly 40*l.* per foot superficial, and in round numbers 1,700,000*l.* per acre.

Washing in Saltaire.—Saltaire, the town Sir Titus Salt reared as the great seat of the alpaca manufacture, covers an area of over fifty acres, and provides accommodation for nearly 5,000 alpaca-workers and their families. It consists of twenty-two streets, containing 775 houses, besides forty-five almshouses for the aged. The streets are wide and regular, the façades of the houses neat, and the interiors fitted up with every accommodation. The baths and wash-houses, which stand about the centre of the town, are a great public convenience. Labouring men know the misery of washing-day in a small cottage; but the inhabitants of Saltaire are free from this domestic plague. There the working man's wife takes her clothes to the public wash-house overnight, and prepares them. Next morning she finds the three steam-engines, with their steam up, ready to drive the washing-machines. When washed, they are transferred to an immense Cornish boiler, 18 ft. by 6 ft., and when they have been rinsed they are placed in the centrifugal wringer, and in a few seconds they are nearly dry. These wringers consist of a huge circular trough, the sides of which are perforated by many holes, and it is made to revolve very rapidly by a shaft driven by steam. The clothes placed in it quite wet are driven against the sides of the trough with great force, and cling tighter and tighter as it rushes round, so that the water is squeezed out, escapes by the holes, and is carried away into the sewage-pipes. By this means a tubful of clothes is wrung almost dry in a few seconds, without any labour to the washerwoman. Next, stretching them on "horses," she wheels them into the drying-closet, and in a few hours from starting she brings them home pure and clean, neatly folded and mangled, be the day fair or foul.—*From "Great Industries of Great Britain."*

Chetham Hospital Blue Coat School, Manchester.—The old buildings of this school having been found to be totally inadequate and unsuitable for the purposes of the modern system of teaching in elementary schools, the governors determined, with the sanction of the Charity Commissioners, to erect a building which would meet all their requirements for educational purposes, and one that would also be in architectural harmony with the fine old pile of buildings of which they are, for the time being, the custodians. Accordingly, they secured the professional assistance of Mr. Alfred Waterhouse, A.R.A., architect, and he, acting under their instructions, in the early part of 1873 prepared designs and advertised for tenders for the erection of the new school buildings. Eventually the contract was entrusted to Mr. George Clay, who engaged to do the work for the sum of 3,840*l.* The building is in the Tudor style, and comprises a school-room, 72 ft. by 24 ft.; a class-room, 16 ft. 9 in. by 15 ft.; and gallery recess, 22 ft. by 12 ft. It is situated a little in advance of the fine old Chetham Library, on the north side, and adjoins the Palatine Hotel on the west.

Institution of Mechanical Engineers.—The next meeting of this Institution will be held at the Institution of Civil Engineers on the 11th and 12th inst., when, amongst other business, the following resolution, unanimously passed by the Council, will be submitted to the meeting for confirmation:—

"That three thousand pounds be voted from the funds of the Institution to Mr. William P. Marshall, in recognition of his valuable past services, subject to confirmation by the members in general meeting."

New Cattle Market, Darlington.—The Darlington corporation has now provided a place wherein the cattle-dealers who periodically visit the town can transact their business, without transforming the main street into a public fair-ground. The new market lies to the south of Victoria-road, close to Bank Top Station, thus being conveniently near the town and pretty easy of access from all directions. The area at present laid out with pens, roads, lairs, alleys, &c., is 21,384 square yards. Within the enclosure, however, there is besides a space of 3,245 square yards. The whole is surrounded by a brick wall and iron railings. There are, also, 5,800 square yards of land, the property of the corporation, which will be available for building purposes. The accommodation of the market provides for the reception of 694 fat, 745 lean, and 1,010 Irish cattle; 4,140 lean and 3,500 fat sheep (the provision for sheep including pigs and lairs for 56 cows).

Lime-street Station, Liverpool.—On the 27th ult. the somewhat difficult and delicate operation of moving the ponderous staging erected in one piece at the new extension works at Lime-street Station, Liverpool, was successfully performed without the slightest hitch occurring. This piece of framework weighs 540 tons, and is 201 ft. long by some 30 ft. broad, and about 60 ft. high. The structure serves as the scaffolding or platform for the workmen engaged in erecting the iron girders for the roof of the new station. It is the handiwork of Mr. E. W. Ives, contractor, who has also roofed the new station at Woodside. Nineteen large parallel girders in all have to be put up, and by means of the staging two are placed in position at a time. The staging is then moved on to the space that will be occupied by the next two spans, leaving those finished to stand alone, and so on till the nineteen are all in place. The base of the enormous structure rests on grooved wheels running on rails. With twenty-seven men using pinch-bars or levers to the wheels the staging was moved 33 ft. in the space of thirty-eight minutes, leaving clear the two first spans.

War and Pestilence.—It is feared that widespread pestilence may follow the recent horrors of the war in the East. Typhus fever is reported to be increasing at Constantinople, and is said to be very prevalent at Bucharest. A telegram from Vienna says that the Austrian Delegation have unanimously adopted a motion to refer to the Common Ministry a petition of the association of officials and various insurance companies praying the Government to take steps for disinfecting the battle-fields of the late war. The Delegation, at the same time, requested the Ministry to use their endeavours to arrest, by means of an international understanding, the danger which threatens the general health of Europe from the vast number of corpses lying unburied in Roumania and Bulgaria, and with this view to take steps for immediately organising an international Sanitary Commission. A later telegram from Constantinople says that a Sanitary Commission has arrived at Erzeroum from Tiflis, and is deliberating upon the best means of preventing an epidemic, whether by the cremation of the unburied bodies, or by consuming them by means of quicklime.

New Industries for the Iron and Coal Districts.—In a sketch under the heading of "A Run up the Rhondda," a writer in the *Western Mail* last week drew attention to the absolute necessity of starting new industries in the coal and iron districts. One part of the Glamorganshire coalfield, he says, is well-known to be approaching exhaustion, and fifty years again will see every ton of the 4-ft. seam in that district exhausted. There will still remain, however, an area of inferior coal. What, then, is to be done? A correspondent of the *Mail* points to two industries which should at once be started—patent fuel manufactory and tin-plate. With regard to patent fuel, it is thought that a manufactory in close proximity to the collieries and close to a railway centre ought to pay if properly managed. Enterprising capitalists are stated to have visited Merthyr a few days ago, with a view of setting on foot some new industries, prompted to do so principally by the abundant and cheap labour that is now in the market. The place has also the strong recommendation of being well placed for railway access to all parts of the kingdom.

Liverpool Land Company.—The sixteenth ordinary general meeting of the shareholders of this company was held last week. The report of the directors stated that, after paying last year's dividend and an interim dividend of five per cent. in September last, the balance to the credit of profit and loss was 26,635*l.* 17*s.* 5*d.*, out of which the directors recommended a farther dividend of 15 per cent., absorbing 5,248*l.* 8*s.*, making 20 per cent. for the year, and leaving in reserve a balance of 21,392*l.* 9*s.* 5*d.* The chairman (Mr. Henry Tate), in moving the adoption of the report, said he had been asked how it was that they could pay such large dividends. The fact was, that they commenced on the good principle of never putting any extra value upon their land, and it now stood at the same price as it did fourteen years ago. They had still a great many acres of cheaply-bought land, which would yield them handsome profits for some years to come. On the motion of Mr. Picton, 1,000*l.* was placed at the disposal of the directors for their services.

Society of Engineers.—At a meeting of the Society of Engineers, held April 1st, in Victoria-street, Westminster, Mr. J. Bernays, vice-president, in the chair, a paper was read by Mr. W. Schönheyder on "Equalising the Wear in Horizontal Steam Cylinders." The author, after noticing the large extent to which the horizontal engine was used at the present time, in preference to the older type, the beam-engine, explained that one objection to its use was the great and unequal wear of the cylinder, which was due to the weight of the piston continually rubbing backwards and forwards on it, and to the difficulty found in lubricating it sufficiently, especially when the cylinder was kept hot by the now universal steam-jacket. After enumerating the evils resulting from the unequal wear of cylinders and pistons, the most important expedients for preventing it were described, and the author's reasons given why they could not fulfil their purpose in practice. The author then gave a description of his method of remedying the evil. This was stated to consist in making the piston-rod with a camber or upward bend, in such a manner as that, when loaded with the weight of the piston and placed in the cylinder, it assumed a straight line, and transferred the weight to outside guides. Special tools are used, which render the production of these rods easy and certain.

Pumping Engines.—At the meeting of the Institution of Civil Engineers, on the 26th ult., Mr. Bateman, president, in the chair, the paper read was on "Direct-Acting or Non-Rotative Pumping Engines and Pumps," by Mr. Henry Davey, C.E. The author discussed some new forms of direct acting pumping-engines and pumps, as a question of relative cost and efficiency, illustrating his arguments by practical examples. The direct-acting engine had a wider sphere of application in mining operations than elsewhere, and experience had proved it to be the best type for deep mine and heavy pumping. Until lately, the Cornish had been the only direct-acting and expansive engine. It was a very economical machine under favourable circumstances, but its range of expansive working was limited. Compound rotative engines had been made to do a higher duty than Cornish engines. In the early days of pumping, Hornblower, Trevethick, Woolf, and Sims experimented with compound Cornish engines in Cornwall; but these attempts had failed because the engines were single-acting, and the distribution of steam was such as to lead to great thermal loss from the cooling influence of the condenser. From these and other practical defects the engines fell into disuse.

The Growth of Bristol,—"Where is Bristol going to end?" asks the *Times and Mirror*. "We read, a day or two ago, that sixteen acres of land, the property of Mr. Langton (the new member for Mid-Somerset), situate between the race-course at Knowle and the Brislington railway-station, are to be laid out for building. The city is outgrowing its old municipal garment on all sides. The leap in the population from some 30,000 in William III.'s time to more than 130,000 in the mid-year of the present century, threatens to be surpassed in progressive proportion the next time we come to number up the people.....If sanitary arrangements and some little regard for structural appearances only go hand in hand with building enterprise, so long as there are folks to fill the new tenements, we suppose we ought to rejoice in our increasing dimensions."

Currall's Patent Ventilators.—The advertisement says, and we have reason to believe correctly, that these ventilators are very simple, efficient, and cheap; a regular supply of fresh air without any perceptible draught, and the removal of the vitiated air, are effected by the two forms,—the inlet and the outlet. The inlet is made suitable for doors, windows, and walls; the outlet for chimneys and walls. The principle is that of giving an upward current to the air admitted through an orifice in a convenient situation. Messrs. Tonks, of Birmingham, are the manufacturers.

Kent.—A collection of prints, illustrating the antiquities, buildings, &c., of the county of Kent, is being formed for the Archbishop's Library, Lambeth Palace. Those who have duplicate or other impressions are kindly asked to contribute. The ancient records of the See, further elucidated by Kentish books and prints, will then make this portion of the library at once valuable and unique.

Liverpool House-Painters' Association.—On the 25th ult. the annual tea-party and ball of the Liverpool House-painters' Association took place at St. George's Hall. Upwards of 800 persons attended, and the chair was occupied after tea by Mr. R. D. Holt. The annual statement was read by Mr. John Tatlock (the secretary), and it set forth that in case of accident members received 15*s.* per week, and 10*l.* was given in case of death of a member, and 8*l.* in case of the death of a member's wife. The payments for accidents during the year had amounted to 192*l.* 6*s.*, and the payments in cases of death had reached 160*l.* Assistance was also given to members who left the town in search of work, and during the past year upwards of 30*l.* had been expended in that direction. A widows' and orphans' fund had been established last year, and the tea-party and ball then held in aid of the fund produced 61*l.* Of that amount 46*l.* had been paid out. The benefits paid away during the last financial year amounted to 428*l.* 9*s.* The number of members at present in the Association was 1,600.

Caerphilly Water Supply.—At a recent meeting in Caerphilly, Mr. George A. Lundie, C.E., propounded his scheme for the supply of water to Caerphilly. His proposal is to take the supply from the Cwm Ivor stream, a tributary of the Aber brook, to convey the water from thence by means of glazed socket-pipes to a reservoir and filtering-beds, to be situated on the hill side, about a quarter of a mile to the southward, whence the water would be carried by gravitation in pipes to all parts of the town. The gathering grounds of the brook, above the point at which it is proposed to abstract the water, are over 150 acres in extent, and in the driest seasons the stream has never run dry, being fed by numerous springs at the higher levels. The water is soft. The total cost of the works, including land, law, engineering, payment for mill rights, &c., is estimated at 3,000*l.*

New Infirmary at Consett.—A much-felt want at Consett has been supplied by the Consett Iron Company, who have built a new infirmary. The old building was merely two or three cottages thrown together. The new building is in Parliament-street, the company having set apart nearly an acre of land for the purpose. At the south end there is a ward, 40 ft. by 20 ft., which will be supplied with eight beds. The centre block contains nurse's room, front entrance, store-room, stairs, and hall, with three bedrooms and linen-room on the first floor. At the north end of the centre block is a convalescent ward, operating-room, and a ward for two beds, the latter being intended for severe cases, and isolated from the principal ward. Proper lavatories, bath-rooms, and other conveniences have been provided. The wards, &c., are to be heated by Dinning & Cooke's hot-water apparatus. The cost of the building, exclusive of the fittings, will be about 2,800*l.*

A Coincidence.—The *Halifax Guardian* says that the sudden death of Sir Gilbert Scott will be much regretted in Halifax, seeing that the work of restoration at the parish church is just on the eve of commencement. "It is a singular coincidence that the late Sir C. Barry had the designs for the Halifax Town-hall for one of his latest works; and now Sir G. Scott leaves the restoration of our parish church to be completed by others. Fortunately, the plans are in such a state of completeness that the work can be faithfully and efficiently carried out."

Art-Work for the Paris Exhibition.—From Exeter Mr. Harry Hems sends the beautiful oak chest exhibited at Philadelphia, and there awarded a medal. The beam out of which it was made formed part of Salisbury Cathedral. Mr. Hems's sculptured group in alabaster of our Lord and the infant, entitled "Safe in the Arms of Jesus," which also took a medal at Philadelphia, will go. Since it left America, the figures have been re-studied and several alterations made, which will go far to make it the more successful at Paris.

TENDERS

For the erection of a villa residence at Wood-green, for Mr. S. Standring. Mr. H. Saxon Snell, architect:—

Wall, Bros.	£833	0	0
Bamford	790	0	0
Larter & Son	760	0	0
Pocock (accepted)	740	0	0

For alterations and additions to the Presbyterian Church, Tullamore. Mr. Hector Harding, architect:—

Egan (accepted)	£207	0	0

For additions, &c., to Messrs. Goodbody's Tobacco Manufactory, Tullamore. Mr. Hector Harding, architect:—

Brien (accepted)	£560	10	0

For re-building No. 40, Cheapside. Messrs. Ford & Hesketh, architects:—

Adamson & Sons	£4,879	0	0
Morter	4,837	0	0
Scrivener & White	4,821	0	0
Shaw	4,806	0	0
Patrick & Sons	4,795	0	0
Bangs & Co.	4,769	0	0
Perry & Co.	4,649	0	0
Nightingale	4,647	0	0
Brass	4,599	0	0
Browne & Robinson	4,457	0	0
Downs & Co.	4,375	0	0
Ashby, Bros.	4,259	0	0

For re-building No. 42, Cheapside. Messrs. Ford & Hesketh, architects:—

Patrick & Sons	£5,380	0	0
Morter	5,367	0	0
Shaw	5,364	0	0
Adamson & Sons	5,359	0	0
Perry & Co.	5,229	0	0
Nightingale	5,228	0	0
Brass	5,205	0	0
Scrivener & White	5,203	0	0
Bangs & Co.	5,169	0	0
Downs & Co.	5,066	0	0
Browne & Robinson	4,984	0	0
Ashby Bros.	4,817	0	0

For re-building Nos. 45 and 46, Cheapside, and premises in Bread-street. Messrs. Ford & Hesketh, architects:—

Shaw	£10,679	0	0
Morter	10,649	0	0
Patrick & Sons	10,660	0	0
Adamson & Sons	10,606	0	0
Nightingale	10,474	0	0
Scrivener & White	10,434	0	0
Perry & Co.	10,431	0	0
Bangs & Co.	10,400	0	0
Brass	10,366	0	0
Downs & Co.	10,283	0	0
Browne & Robinson	10,108	0	0
Ashby, Bros.	10,204	0	0

For Wednesbury Bank. Messrs. Banks & Doubleday, architects:—

Nelson	£3,990	0	0
Bethell	3,950	0	0
Bighams	3,800	0	0
Horsman & Co.	3,650	0	0
Brailsford & Brown	3,500	0	0
Stockton & Son	3,370	0	0
Crisp & Son	3,250	0	0
Dawson & Bradley	3,162	0	0
Trow & Sons (accepted)	3,100	0	0
Tatlow (withdrawn)	2,980	0	0

Quantities were supplied.

For stabling, Palmerston-yard, Kilburn, for the London General Omnibus Company, Limited. Mr. Alfred Tosh, architect. Quantities supplied by Mr. A. J. Bolton:—

Bowman & Scowen	£367	0	0
Beale	358	0	0
Aitchison & Walker	342	0	0
Mason & Bristy	320	0	0
Perkins	317	0	0
Gann	315	0	0

For the erection of a painting-room, &c., at the Royal Aquarium and Summer and Winter Garden, Westminster. Mr. A. Bedborough, architect. Quantities supplied by Messrs. H. L. Curtis & Sons:—

King & Green (accepted)	£888	0	0

For two villa residences at Forest Gate. Mr. George McDonell, architect:—

Page (accepted)	£1,050	0	0

For cast-iron pipes and special castings, for the Droitwich Water and Sewerage Works. Contract No. 2. Mr. B. Pritchard, engineer. Quantities by Mr. E. J. Purnell:—

Hopkins, Gilkes & Co.	£1,627	9	6
Haleys	1,448	0	0
Read & Co.	1,343	5	9
Platt's Clay Cross Company	1,274	0	0
Cochrane & Co.	1,269	0	0
The Horseley Company	1,255	0	0
Frimstone	1,225	0	0
Roberts (accepted)	1,217	0	0
Richards & Glaskin	1,195	0	0

For the construction of reservoir, pumping-station, tanks, outfall works, laying and jointing sewage and water-pipes, for Droitwich Water and Sewerage Works Contract No. 4:—

Krauss	£19,100	0	0
Bush	15,600	0	0
Miles	14,509	0	0
Bourne	13,616	0	0
Hilton & Co.	13,400	0	0
Dickson	12,110	0	0
Meats, Bros.	11,037	12	0
Law (accepted)	10,777	0	0

For St. Luke's National Schools, Barton Hill, Bristol. Messrs. Hay & Oliver, architects. Quantities by Mr. Arthur Deane:—

Lewis & Edbrook	£1,991	0	0
Hill & Prior	1,966	0	0
Banner & Co.	1,964	0	0
Howell & Son	1,960	0	0
Church	1,950	9	0
Hatherley	1,938	0	0
Humphries	1,935	0	0
Wilkins & Hill	1,909	0	0
Veals	1,885	0	0
Gorvett	1,839	0	0
Stephens & Bastow	1,799	0	0
Davis & Son	1,775	0	0
Hayes & Son	1,751	18	0
Beaven & Son	1,716	0	0
Cowlin	1,716	0	0
Hill	1,699	0	0
J. Ferries	1,687	0	0
Eastabrook & Sons (accepted)	1,683	0	0
Phillips	1,604	0	0

For additions and alterations to "The Palmers," Elstree, Herts, for Mr. O. E. Dawson. Quantities by Messrs. Batterbury & Huxley:—

Kiddle & Son	£3,723	0	0
Newman & Mann	3,707	0	0
Ashby, Bros.	3,659	0	0
Greenwoods	3,614	0	0
Linzell	3,500	0	0

For alterations at the "Union Arms," Panton-street, Haymarket. Mr. E. Clark, architect. Quantities by Messrs. Pain & Clark:—

Purkiss (accepted)	£1,655	0	0

For a villa residence for Mr. Geo. Groome, Queen's-road, Finsbury Park. Mr. E. Clarke, architect. Quantities by Messrs. Pain & Clark:—

Purkiss (accepted)	£1,505	0	0

For additions to Messrs. Moses & Sons' premises, 34, Monkwell-street. Messrs. Joseph & Pearson, architects. Quantities not supplied:—

Killby	£746	0	0
Browne & Robinson	670	0	0
Langmead & Way	643	0	0
Williams & Sons	638	0	0

For the erection of new offices at the Kilburn Brewery, for Messrs. Michell & Phillips. Mr. R. Barker, architect:—

Norris	£790	0	0
Yerbury	630	0	0
Pryor	560	0	0

For alteration, sanitary works, &c., at Grange House, Upper Norwood, for the Rev. J. Rice Byrne. Mr. John Pugh, architect:—

Baker & Son	£259	0	0
Norman	248	10	6

Messrs. Comyn, Ching & Co.'s estimate for heating apparatus was accepted.

Mission Room, Bath-lane. Messrs. Austin, Johnson & Hicks, architects. Quantities not supplied:—

Lourys	£2,331	10	0
McEwans	2,100	0	0
Foggin	1,897	0	0
Robson	1,828	0	0
Whichello	1,769	0	0
Elliot	1,695	0	0
Leighton	1,658	5	6
Grisdale (accepted)	1,635	0	0
Miller	1,605	0	0
Lambe	1,493	17	6

For the erection of Salisbury Congregational Church. Messrs. Tarring & Wilkinson, architects:—

	Deduct if tower and spire be omitted.			
Stevens & Son	£6,834	0	0	£1,489 0 0
Lawkins	6,585	0	0	1,556 0 0
Stevens & Bastow	6,323	0	0	1,523 0 0
Jones & Co.	5,849	10	0	1,450 0 0
Tryhorn	5,761	10	0	1,413 10 0
Goddard	5,685	0	0	1,310 0 0
Hall & Sons	5,585	0	0	1,302 0 0
Crook	5,435	0	0	1,215 0 0

For Byker Schools, for the Newcastle-upon-Tyne School Board. Messrs. Austin, Johnson & Hicks, architects. Quantities by Mr. Henderson:—

Forster	£10,134	9	5
Lourys	9,986	13	0
Nicholson	9,783	4	6
Robson & Son	9,417	0	0
Thompson	9,040	10	0
Reed	8,930	15	7
McEwans	8,900	0	0
Harbottle	8,885	0	0
Shotton, Bros.	8,838	0	0
Younger & Pattison	8,591	0	0
White & Sproat	8,500	0	0
Whichello	8,500	0	0
Hudspith	8,481	5	3
Elliot	8,465	0	0
Harrison & Horn	8,332	0	0
Westgarth	8,274	16	0
Harvey	8,186	3	11
Pattinsons	8,117	10	1
Miller	8,110	13	3
Leighton	8,061	9	0
Harrisons	8,022	2	0
Grey & Humble (accepted)	7,866	16	3
Robson	7,328	16	8
Hutchinson & Sedgwick	7,183	6	0
Received too late:—			
Bell	8,883	19	4
Huntley	8,716	4	6
Simpson	8,626	4	4
Atkinson	7,109	16	0

For front wall and railing to new Cemetery Chapels, Bromley, Kent. Mr. George Truefitt, architect:—

Kinnor	£630	0	0
Taylor & Son	493	0	0
Smith	455	0	0
Riches	427	10	0
Stone	425	0	0
Copping	415	0	0
Hobern	391	0	0
Dover, Bros.	385	0	0
Cottam & Co. (accepted)	379	0	0

For the erection of public buildings and market-hall for the Rugeley Local Board of Health. Messrs. Foulkes & Ryland, architects. Quantities by Mr. W. A. Phipson:—

Whittome	£7,963	0	0
Gee	7,055	0	0
Loughton	6,996	15	0
Steel	6,990	0	0
Trow & Sons	6,700	0	0
Bethell	6,523	10	10
Gosling	6,520	0	0
Dawson & Bradney (accepted)	6,100	0	0
Matthews & Heath	6,290	0	0
Crisp & Son	6,055	0	0

For re-building No. 35, Bow-street, Covent Garden, for Mrs. May. Mr. John T. Woodard, architect. Quantities not supplied:—

Howard & Co.	£2,493	0	0
Colls & Sons (accepted)	2,382	0	0

For constructing new roads and sewers upon the Drew Estate, Barnet. Messrs. Farebrother, Ellis, Clark, & Co., surveyors:—

Anderson	£5,845	0	0
Docwra	5,587	0	0
Norris & Ford	4,896	0	0
Culverhouse	4,800	0	0
Keeble	4,488	0	0
Killingback	4,382	0	0
Plowman	3,995	0	0
Hiscox	3,870	0	0
Nowell & Robson (accepted)	3,800	0	0

For road-making and sewers for the British Land Company (Limited), on their estate at Sydenham:—

Crockett	£6,750	0	0
Richardson	6,500	0	0
Thompson & Son	6 487	0	0
Keeble	6,421	0	0
Killingback	6,350	0	0
Jackson	6,333	0	0
Dunmore	6,303	0	0
Harris	6,300	0	0
Pizzey (accepted)	6,275	0	0

For seven-story warehouse at Sharpness Point, for the Severn Ports Warehousing Company:—

Howell & Son	£7,800	0	0
Robertson	7,277	0	0
Baker & Son	6,993	0	0
Gazzard	6,733	0	0
Brock & Bruce	6,553	0	0
Stephens & Bastow	6,334	0	0
King	6,097	0	0
Moss	5,955	0	0
Thompson & Roberts	5,830	0	0
Jones & Co. (accepted)	5,785	0	0

For Salisbury Congregational Church:—

Stevens & Sons	£6,834	0	0
Sawkins	6,585	0	0
Stephens & Bastow	6,323	0	0
Jones & Co.	5,849	0	0
Tryhorn	5,761	0	0
Goddard	5,685	0	0
Hall & Sons (accepted)	5,585	0	0
Crook	5,435	0	0

The Brunswick Rock Asphalte Paving Company have taken Contracts for Wellington-road, Albion Gardens (Fulham Board of Works), ½-in. asphalte and 3 in. concrete; Wellington-street, Aldershott, ½ in. asphalte, and 3 in. concrete, and they expect to commence at once. When these are completed, it will make thirty-six streets in three years.

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The Builder.

Vol. XXXVI. No. 1836. Saturday, April 12, 1873.

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*Lake Dwellings.**

READERS of that admirable piece of humour, "Knickerbocker's History of New York," will remember that two opinions were in debate as to the site to be chosen for a metropolis by the fathers and founders of the then infant State. The one party suggested that piles should be driven in the sea for the foundations of the houses. The other party advocated the digging canals inland in order to form a watery highway for the city. In genuine humour there is almost always to be detected an instructive lesson. The solemn fun of Washington Irving might have served to awaken attention to the question, how did that extraordinary method of building which prevails in some of the great Low Country cities, and which lends so unique a charm to Venice, originate? It is less than a quarter of a century since the commencement of those discoveries which for the first time have enabled the archæologist to give a definite reply to so natural and so important a question.

In the year 1829 an excavation was made at a place called Ober Meilen, on the shore of the Lake of Zurich, for the sake of deepening the harbour; and old piles and other relics of human workmanship were discovered in the process. The facts did not awaken the attention of any antiquary, and no information is now accessible as to the details. The earth excavated, with all its contents, was filled into boats, taken away from the shore, and discharged in the deepest part of the lake. Thus, Dr. Keller tells us, the matter was allowed to rest for some years.

In the winter of 1853-4 extraordinary drought and long-continued cold produced an unexampled effect in the Alpine districts. The rivers shrank to the smallest proportions, and the lakes subsided to a level unknown in the memory of man. The water-mark of the year 1674 on the Stone of Stäfa was regarded as the lowest made in historic times. In 1853-4 the water was 1 ft. below this mark. Islands before unknown appeared in the lake, and a large area of the shelving shores was exposed as dry land. On the banks of the Rhine, the Aar, and the Limmat, the remains of Roman buildings became visible; and at the same time the attention of antiquaries was called to relics which must have been buried beneath the Lake of Zurich when Rome herself was young.

The inhabitants of the banks of the lake between Ober Meilen and Dollikon took advantage of the low state of the water to recover a certain portion of the shore. They enclosed a space with walls, and commenced filling up the area with mud, excavated from the neighbouring part of the bank. As their work proceeded, they came on the heads of numerous piles, and found a number of stags' horns, as well as implements of a construction previously unknown in the locality. The attention of the Antiquarian Society of Zurich was at once called to the spot, and careful records were made of the progress of the discoveries.

Three superposed strata, or beds of deposit, were exposed by the excavation. Of these the upper (which appears from the drawing to lie about 4 ft. below the ordinary surface of the lake) is from 1 ft. to 2 ft. in thickness, and consisted of yellowish mud, containing numerous rounded pebbles. The bed is of the same nature as the greater part of the shore of the lake, and contained no traces of piles or of animal remains. The time of its deposit must thus have occupied the period which elapsed since the final abandonment of the abodes which we are about to describe. And future observations may perhaps convert the inches of depth into decades or centuries of time.

The second bed was from 2 ft. to 2 ft. 6 in. deep. It consisted also of sandy loam; but from the presence of much organic matter, had become of a black colour. In this bed the heads of piles, and other relics, testifying to human handiwork, are found. The German name Cultur-schicht has been happily rendered by Mr. Lee by the term "Relic-bed." Below this bed an undetermined depth of mud or loam forms the bottom of the lake. It contains the lower part of the piles, but no other relics that have as yet been discovered.

The piles were made of oak, beech, birch, and fir, and are from 4 in. to 6 in. in diameter. Some few of them are whole trunks, but these are the exceptions; the majority consisting of stems of trees split into three or four parts. All the piles discovered in the first excavation had been charred, and the marks of the tool which they presented were such as to lead to the conclusion that they had been hewn by stone axes. The rows of piles, which are approximately regular, commence several fathoms from the shore, and extend until the lake suddenly deepens. The original lengths of the piles must have varied. Some which were dug out were not more than 7 ft. or 8 ft. in the soil. The ends of others were not reached at 9 ft. or 10 ft. below the lake bed. The wood was so soft and rotten that it was easily cut with the spade. The rows of piles ran parallel with the shore, and in close lines at right angles. The average distances apart are from 12 in. to 18 in. A few beams were found lying horizontally, which apparently had formed part of a platform or scaffolding supported by the piles.

Passing over, for the present, the full and well-illustrated account of the implements discovered in this relic bed, we will endeavour to trace the varieties in structural arrangement that prevailed in different cases, more than a hundred of which are more or less fully described in the volume under notice. The importance of the inquiry is heightened by the accumulating evidence of the wide area over which the habit of erecting lake dwellings formerly extended. There is some not very intelligible error in the sentence (p. 475). "Similar remains are found in nearly every suitable lake from that of Bourget on the east to Asia Minor on the west." But in the map which is referred to as explanatory of the paragraph in which this sentence occurs (and which is unprovided with a scale, or any indications of latitude or longitude), the sites of lake dwellings are indicated in various localities from the lake of Bourget, near Chambery, on the west, to Ischl on the north, and Laibach on the north-west, of Trieste. To the north are marked sites at Buchau, not far from the banks of the Danube, and Starnberg, a little south of Munich. To the south two sites are marked skirting the high-road from Piacenza to Bologna; one a little north of Parma; one near Modena. It is curious to remark that no indication of the lacustrine nature of Venice is given on this map. The comparatively modern origin of that place of refuge from the ravages of the barbarian invader of Italy is no doubt the reason. But it is remarkable that this most famous modern instance of water-cradled architecture should be so near the ancient sites of pile-supported villages. One of them is marked at Vicenza; and two in the Lago di Garda. A note at the close of the volume brings the industry of the pile-driving builders nearer home, by referring to an account given by Major-General A. Lane Fox, F.R.S., of the discovery of the remains of pile-villages on the site of the old Moor Fields, formerly a marsh outside the northern wall of the city of London. The crannogs or crannoges of both Ireland and Scotland afford instances of a transition from the pile-supported dwelling to the insular town or fortress. In Scotland, as well as in Ireland, raths are found in the vicinity of lakes containing crannogs. The pursuit of the Morini to their marshes by Cæsar, and of the Caledonii by Severus, are indications of the possession by their tribes of lake or marsh places of refuge, which there is little reason to conclude to be other than crannogs.

The lake dwellings, according to Mr. Lee, may be divided into two classes,—viz., what may be called pile-dwellings, which are those of the usual form, consisting of upright piles driven into the bed of the lake and supporting a horizontal platform, on which the huts were erected; and what may be called "fascine structures." In these latter forms of building, piles have been driven, not for the purpose of direct support, but to serve as guides. In fact, they very strongly resemble the gauge piles, or first commencement of a piece of coffer-dam, or other pile-work of the present time. Layers of faggots and brushwood are laid parallel and crosswise, one over another, between these piles; the lowest layer resting on the bottom of the lake and a clay and gravel floor having apparently

* "The Lake Dwellings of Switzerland and other Parts of Europe." By Dr. Ferdinand Keller, President of the Antiquarian Association of Zurich. Second edition, greatly enlarged. Translated and arranged by J. E. Lee, F.S.A., F.G.S. Illustrated. London: Longmans. 1878.

been formed over the brushwood. These fascine foundations have been adopted in lakes of small depth, where the bottom was of too boggy and yielding a nature to afford a hold for piles bearing the weight of the structure. Such dwellings were more simple, and more easily erected, than those borne upon piles. The commencement of the work must have been the chief difficulty. Layers of faggots, brushwood, and gravel, occur in the case of Niederwyl, near Frauenfield, to a depth of 12 ft. to 14 ft., with as much regularity as if the structure had been reared on dry ground. Mr. Lee supposes that the guide piles having first been driven, the faggots were arranged between them by means of a raft, then covered with brushwood, and then loaded with a sufficient quantitity of gravel to sink them, and that successive masses were thus added till the required height was attained. In support of this view, it is remarked that the part above the water would naturally have been the most carefully executed. The upper beds of fascines, in fact, lock into each other at the ends, and form one continuous mass, and no large chinks filled with clay, gravel, branches, or brushwood, such as are frequently found in the lower layers, occur in the upper beds.

The mode of joining the timber-work by mortise and tenon, the pottery and other implements found, and the indications of the state of agriculture, agree so closely in the two classes of dwellings as to preclude the idea that they were otherwise than contemporaneous. "Niederwyl differs from the allied structure of Wauwyl by the arrangement of the layers of wood above the water being much more symmetrical, and also by the general use of split stems, and of actual boards, 2 ft. broad and 2 in. or 3 in. thick, the making of which must have been attended by much labour." The floor of the huts in the former village consisted of layers of thin unpeeled stems, 2 ft. long, laid parallel to one another, the spaces between being carefully filled up with clay and rushes. The interior was enclosed with boards standing on edge, between upright posts. The space between the posts in all these lake dwellings, is said to have been filled in with wattle-work, coated with clay. The roof was formed of layers of straw and rushes. The dwellings were rectangular, standing in regular rows, some 2 ft. to 3 ft. apart, and averaging 20 ft. by 12 ft. In the corners of some of these were found slabs of sandstone, which had been used as hearthstones, and which were found still covered with charcoal and ashes. No other trace of burning was found in this settlement; so that it is concluded that it was not destroyed by fire, but voluntarily abandoned. Among the objects found was an oaken mallet, 14 in. long, which had evidently been used for driving the piles, and which shows signs of having been fashioned by a stone hatchet.

It is the conclusion of Mr. Lee, from the study of the large number of detailed facts which his volume presents to the reader, that these buildings were all formed originally at some little distance from the shores of the lakes which afforded them sites; the flooring platform, whether borne on piles or resting on fascines, being raised a few feet above the level of the water. They thus resembled the fishermen's huts which are even now to be seen on several of the Swiss lakes. At p. 499 is inserted a woodcut, taken from Cameron's "Travels across Africa," in which a platform, covered with a gabled thatched roof, without any vertical walls, and supported on piles, one of which is furnished with projections intended to serve as a ladder, is given as the ordinary form of a hut on Lake Mohrya, about 7° 20′ S. latitude and 25° 40′ W. longitude.

On the actual structure of the lake dwellings so much light has been thrown by the researches of which Mr. Lee has presented us with a lucidly-arranged summary, that the questions of the height of the apartments, and of the size of the doors and windows, are almost the only ones that are left altogether open. As to these, moreover, it is probable that changes of fashion may have occurred in the long period of time during which this mode of habitation was in use. But it is not on the single element of structural arrangement that we seek, and that not in vain, for information. The ethnographical illustrations are of more magnitude and variety than the architectural data. The race, the period, the habits, the arts, the implements, the agriculture, the weapons, the clothing of the prehistoric dwellers over the lake bottom, are all subjects important to be studied by those who inquire into the dawn of history; and on each and all of these points unexpected information is forthcoming. On some points the discoveries now announced are strikingly novel. Such are those as to the burial of the dead of the lake villages, in rough stone tombs very closely alike to the well-known form of the cromlech, although intended for more numerous burials in the same locality. The remarkable feature of the deposit of the body in a kneeling or crouching attitude is here present, and, as in our own cromlechs, no attention appears to have been paid to the orientation of the sepulchres.

The range in ethnographic time, however far we may yet be from being able to convert this into its astronomical equivalent, is wide and ample. It reaches from nearly, if not quite, the commencement of the palæolithic period, down to the time when iron had become an article of common use. Mr. Lee gives the wise caution that although the division, according to the grade of civilisation, into the stone, the bronze, and the iron periods is, in general, clear and convenient, yet, in determining isolated cases, a dependence on that sequence may tend to erroneous conclusions. He reiterates remarks in accordance with many which have appeared in our own columns, to the effect that the marks of succession have only a relative value, and that though the civilisation of man ran through these successive stages, "it is certain that the bronze period of Northern Europe by no means agrees in time with the middle and southern parts of this continent." Again, the relics found in burying-places and other repositories are usually mixed to such a degree as to serve only to indicate the latest date. The stone celt, the characteristic implement of the stone period, occurs in all stages of the bronze age, and is not unfrequently found associated with iron weapons and instruments.

A remarkable instance of this confusion of the implements of widely-different dates occurs in the pile dwellings of Lübtow, at the northern end of the Lake of Plöne, in Pomerania. Late in the last summer three sides of a strong quadrangular wooden building were there found at a depth of 3 ft. under the former lake-bottom, resting on solid hewn double piles, and indicating a period of construction when the water of the lake was at least 4 ft. lower than in 1859. Chisels and hammers of the stone period were found among these piles, and also one bronze celt. But the main characteristic of the place was the abundance of iron weapons. "Swords, arrow-heads, stirrup-irons, spurs, lance-heads, and knives abounded among the piles; while a helmet, greaves, knives, arrow and spear heads, and spurs were found in the wooden dwelling. In both places a large number of the hollow tiles were found which are known by the name of 'monks'; they belong to the thirteenth, if not to the fourteenth, century. The spurs with rowels, and the greaves, indicate the same date, if not later." A prick-spur, of the ninth century, found beneath the water of the Lake of Paladru, is figured on page 640. On the other hand, "the lake-dwelling of Schussenried, so far as it is known at present, belongs to the oldest period of the neolithic age, which is bounded, as it were, on one side by the period of polished stone implements, and on the other by the absence of the reindeer, the cave bear, and the mammoth." A very interesting paper is contributed by Professor Rütimeyer, of Basle, on the animal remains of the lake-dwellings. The latest discovery, in Aurignac, gives "evidence of a European population who used as food, not only the urus and the bison, but also the mammoth and the rhinoceros; and who left the remains of their food to be gnawed, not only by the wolf and the fox, but also by the tiger and the hyæna." "It is manifest that the people who inhabited the grotto of Aurignac were older than the extension of the glaciers, and consequently witnesses of this mighty phenomenon. . . . The last gap between geological and historical time is filled up by the discovery at Aurignac."

The mention of these savage denizens of the country surrounding the lake dwellings, when compared with the proofs afforded that "the lake dwellings were inhabited during the whole year, and cattle were stalled upon them" (p. 527), appears to us somewhat to militate against the opinion of Professor von Hochstetter, which is cited with approval by the author, to the effect that "The people must have had their chief settlements on land, and the lake dwellings must have been used for some special purpose. It does not appear to me that safety from wild beasts had anything to do with their erection." Mr. Lee remarks that when we speak of wild beasts in the Alpine regions, we can only refer to bears, lynxes, and wolves. To these by no means despicable assailants we see that tigers and hyænas have to be added. It is conceivable that these animals, however numerous, might be unlikely to attack human dwellings, if man formed the sole prey which tempted their rapacity. But as soon as the presence of stall-fed cattle is added to the contents of the settlement, the case is altered. Especially during the dark nights of winter a furious onslaught could hardly fail to be attracted by the tempting smell of a farm enclosure of cows and other cattle. The distance of a few fathoms of water, which is all that seems to have interposed between the lake villages and the shores, would have been a certain defence against wild beasts, cutting off the scent as well as the means of access. Against human enemies the protection would have been doubtful. Canoes or rafts would have furnished a ready mode for assailing a lake village on every side, and at any moment; and the special facility offered by a framed, timbered, and thatched series of dwellings for destruction by fire is alone a consideration in favour of the view that it was not from the hand of man that shelter was sought by the pile-builders.

The second volume of "The Lake Dwellings" consists of 206 lithographed plates, which, without being commendable for any great elegance of execution, give a very fair idea of the forms and sizes of most of the objects recovered from the sites of the lake-houses. They comprise a map, plans, and sections, and one or two views. The quaint forms of some of the early bronze knives and swords bear much the same sort of relation to the shapes familiar to the cutlers of the present day that the palæotherium does to the horse. In fact, the use of buck-horn for the handles of our pocket-knives may be regarded as a survival of the fashion that sank the stone celt in a haft of horn, which, in its turn, was inserted in the club-shaped handle of wood. The greatest permanence of type is found among the implements of the fishermen. Bronze fish-hooks from Ueberlinger See have the very form, even to the barb and the recurved eye at top, of some that we now purchase, made of the best steel, at a London fishing-tackle shop. An implement formed from the top of a young fir-tree, with the branches springing from the upper end like radii, which is not at all uncommon in the deposits at Robenhausen, on the Lake of Pfaffikon, is exactly similar to the one now used by the fishermen of the river Arve, for the purpose of dragging for and recovering the night-lines which they are in the habit of setting. This primeval drag is known by the name of *arpion*. It is weighted by leaden rings. At Robenhausen perforated stones are found, which probably served for the same purpose as the later expedient of metal. The very numerous implements figured in the plates call for a practised skill, such as that which has arranged the anthropological collection of weapons at Bethnal-green Museum, to display them in their true order of affinity. Among the most interesting may be mentioned a yew bow, 5 ft. long, and notched at both ends, for fastening the string, found at Robenhausen; and a shorter specimen, 3 ft. 6 in. long, which may have been a boy's weapon for the chase. Again, the clay and stone moulds for casting bronze knives and other implements, and the earthenware cups or ladles which have been used as crucibles for melting the bronze, are evidences of the progress in metallurgic art attained by people who made their own bronze implements, though they appear to have imported from the east the knives, chisels, and other instruments of jade, which were the most valuable that they possessed before the discovery of the art of the coppersmith.

Another most interesting paper is the abstract of the treatise on the plants of the Lake dwellings, by Dr. Oswald Heer, of Zurich. The charcoal and ashes that give a black colour to the relic-beds of the lakes, have preserved, in the forms of seeds, nuts, and stones, botanical evidence of a nature that would have delighted Linnæus. All the cultivated plants have come from countries connected with the Mediterranean. The small-grained, six-rowed barley, and the small Lake-dwelling wheat (*Hordeum hexastichum sanctum*, and *Triticum vulgare antiquorum*) appear on the monuments of the earliest Pharaohs, and abound in mummy-cases in Egypt, as well as in the relic-beds of the Swiss lakes. "The Lake colonists had, therefore, the same

cereals as the Egyptians. They were also clothed in the same manner; for in Egypt flax took the first place among the plants used for spinning and weaving." The presence of celts, formed of what is called noble nephrite, which is found only in the East, is an indication of the same nature as the occurrence of the Egyptian wheat, the Cretan catch-fly, the oil-yielding poppy, and the glass beads, found at Wauwyl, which were either of Egyptian or Phœnician origin. On the other hand, no trace has been found either of rye, which the people of Eastern Europe cultivated in the bronze age, or of hemp. Portions of the twigs, and remains of the leaves, of mistletoe, the sacred plant of the Gauls, were found at Robenhausen. We are here not only on the track of ethnographical discovery of the utmost interest, but find light cast on the long-vexed question of the origin of our present cereals. "I consider," says Dr. Heer, "the small lake-dwelling wheat as the primitive form from which have sprung, by cultivation, the different forms with the axes not fragile, and with the grains easily detached, as they are all very near to each other in character, and no important and decisively distinctive marks are to be found between them." In the same way the common, the two-rowed, and the rice-barley are supposed to have been derived, by cultivation, from the small six-rowed barley of the lake dwellings. "The *Flora* of the lake dwellings, consequently, announces to us that all the plants that come in contact with man become changed up to a certain point; and thus man participates in the great transformations of Nature, while the wild plants which surround us at the present day still grow in the same forms as they did three or four thousand years ago, and do not exhibit the slightest change.

Neither Dr. Heer nor Mr. Lee pursues this most luminous discovery to the next step, which is one of no slight philosophical importance. The change in the cereals has been effected under the hand of man, as measured by the known chronology of Egypt, within, at the utmost, 6,000 years. During an equal or a longer period the corn bluebottle (*Centaurea cyanus*) and the Cretan catch-fly (*Silene Cretica*), which have lived not as the *protégés*, but as the unbidden guests, of the farmer, have been unchanged. This may be regarded as a sort of protest from the lake dwellings against the doctrine of modification of form by "Natural Selection."

Mr. Lee's work, for which he modestly only claims an exemption from great errors, is a valuable contribution to the history of architecture, of industrial art, and of the human family. It will be an indispensable volume in the library of the archæologist. Not a page can be found that is not rich in information. The arrangement of the plates, and the references given, in the list of plates, to the text, is a feature which much facilitates the study of the work.

"THE HOUSE" ON THE LOCAL GOVERNMENT OF LONDON.

The debate which took place in the House of Commons last week upon Sir U. Kay-Shuttleworth's resolutions,* though it ended in the record of a considerable majority against the immediate acceptance of his motion, may, we hope, be taken as a stage in the progress of conviction in the minds of our legislators, that London government stands in absolute need of reform, or rather of reconstruction. As far as our own columns are concerned, the story is an old one. We have repeatedly urged, what is obvious to every competent observer who thinks for himself, that London is, absolutely speaking, one of the worst governed towns in the kingdom; and that, relatively to its immense extent and its importance as a capital city, the state of its administration is almost ludicrously defective and anomalous. We have a city corporation with great privileges and endowments, but whose jurisdiction is confined within what are now, considering the enormous and unexpected growth of the capital, absurdly narrow limits. We have outside those limits a Board of a very heterogeneous character, and whose members have very diverse interests; a Board which is not a direct representation of the public, but is elected from and by the vestries, who are proverbially the representatives of small views and petty local interests, and who retain their own authority and power of action (or inaction) in regard to many practical and sanitary matters quite independently of the Board of Works, which naturally has little power to control or influence bodies by whom officially it "lives and moves and has its being." From this state of things naturally follows the confused and divided action in regard to administration and public improvements, of which we are all only too conscious, from the absurd spectacle of the repair of two sides of the same street by different vestries at different times, and its double trouble and expense, to the more serious affair of the undertaking, by a practically almost irresponsible Board, of works on an immense scale, the principle of which has not been properly considered, and the results of which amount in some cases (as in that of the sewage outfall) to the throwing away, or worse, of enormous sums of money in elaborately doing the wrong thing. The fact that seventy-three members of the House of Commons deliberately registered, in division, their dissatisfaction with this state of things, is in itself something; and it must be remembered that the fact of a majority of forty the other way is not to be taken by any means as a protest to that extent in favour of "non-intervention." There is no doubt, from the tone of the debate on the 6th, that part of this majority consisted of those who regarded the resolutions of Sir U. Kay-Shuttleworth as too vague and general to do much good in reference to a question which demanded a Bill,—which had, indeed, been the subject of previous Bills of a somewhat elaborate nature; and, in fact, the tendency of the remarks made in debate was so generally in one direction as to draw from Mr. Stansfeld the observation that it had been a "onesided" debate, since, up to the moment of his addressing the House (immediately previous to the Home Secretary's speech in reply) not a single speaker had appeared in defence of the existing administration from any point of view.

The two alternative theories, as we may call them, which have been suggested as the methods of improvement on the present state of things, have been the extension of a central system of authority on the lines of the existing City Corporation, and the formation of a variety of sub-corporations of districts in federation with or affiliated to the City. The merit of this latter arrangement with those who recommend it is, we suppose, that it gets rid of the bugbear of centralisation of power which has been in some quarters regarded as so formidable a danger. But other merit (if this be one) it has not, that we can see. It would only be repeating the evil of the partial and local legislation of the vestries in a more systematised manner, leaving, perhaps, more direct responsibility to public opinion than is now the case, but otherwise affording plenty of scope for partial and local administration on possibly conflicting principles. Against the other scheme of extending the jurisdiction of the City and giving it a revised and extended representative constitution, there has been urged the danger of such a constitution gaining too great political power; becoming, in fact, what is called a "bureaucracy," with a practical power to do pretty much as it liked. It appears to us that this apprehension is unfounded; at all events, that it would be easy to frame a constitution providing sufficiently against such a danger by tolerably frequent re-election, and that direct public representation would offer opportunity in itself of making it far more immediately responsible to public opinion than the Board of Works has ever been. The objection that a body would be created too large to do its work, or charged with too multifarious and complicated a work for any one body to accomplish, is one which could only be put forward on grounds which really constitute a complete begging of the question. It is a universally accepted proposition that the most work is got through in the best manner in a given time, by organised division of labour, the want of which is precisely what is complained of now. The question is simply reduced to this: can the administration of London be best carried out by a great central body with sub-departments all acting under one head and on one harmonious system, or by two bodies of utterly different constitution and with no official connexion, and a number of little vestry-boards each with its own hobby and its own view of the way of doing things, constituting a practically independent "third estate" in addition to the other two? That is really the plain way of putting the question; and, putting it in that way, to make a question of it at all seems almost absurd. The Central Board would not need to be nearly so strong numerically as the aggregate of existing City authorities, Board of Works members, and vestry representatives, and it would have the enormous advantage in economy of time and means which must necessarily result from a methodically-organised system. And this very concentration of work would be rendered the more effective by the extent and power of the proposed municipal government, which (under proper constitution) would, in place of being dangerous to our "liberties," be all the more able to carry out the necessary schemes for the public good in virtue of its importance and weight. Sir U. Kay-Shuttleworth did not omit to point this out in his speech in bringing forward his resolutions. Referring to what he called "the old bugbear" as to the Municipal Government meddling with politics and interfering with the Imperial Government, he observed that though a great municipality would undoubtedly be more powerful and independent than any other form of local government, that very fact "would surely be of very great benefit to London. In the case of other municipalities it was found that the bigger they were the better they were, and that those against which most could be said were the very smallest." The half-dozen persons who constitute the "Corporation" of Muddleton Parva are in all probability, as far as their powers go, the most autocratic, self-interested, and deficient in real public spirit of all corporations, and the most comparatively wasteful of time and money. And it is only just to say, on behalf of the Board of Works, that the fears entertained when it was constituted, that it would discuss politics as well as sewerage, have been shown to be perfectly groundless. What charges we have to make against them are rather of deficiency than of supererogation; of leaving undone that which they ought to do rather than doing that which they ought not to do.

And, in our opinion, the real origin of some of these deficiencies of the Board of Works is one that is inherent in the elements of its constitution, and one which the formation of a larger and more central administrative body elected by the ratepayers would in itself tend greatly to remove. The Board of Works had its defender in the debate we are speaking of, in the person of its Chairman, who, as was right and fit, spoke up for the body which he represented, and maintained its industry, ability, and energy in dealing with practical problems. Now, in regard to the industry and application of members of the Board of Works we raise no question at all. The statistics quoted by Sir James Hogg show how regular in attendance on their duties the members are, and that they do not make their office anything in the way of a sinecure. Nor are we in any way disposed to dispute what their chairman said as to the ability and standing of the professional advisers whom they employ. We admit the capability of these gentlemen, and believe that the Board take every trouble to get the best men. But we all know that in such cases it is not in the end the officials who move the Board, but the Board which moves the officials. And it must be obvious to all who are competent to judge that the Board of Works has not shown the largeness of scientific view, the impartiality or the public spirit in regard to great works of public improvement, which we ought to find in a body trusted with such immense responsibilities on such a very irresponsible footing. The Board has shown a predilection for going its own way, for making *coups* in financing operations, for undertaking great and costly measures on an insufficient scientific investigation; and a disposition at the same time to shirk the difficulty of schemes that were urgently called

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* It may be worth while to put on record here the wording of these resolutions, as one of the steps in an endeavour after a reform, which is bound to be carried out sooner or later. They were as follow:—

1. That in the opinion of this House, the present state of Local Government in London is unsatisfactory, and calls for reform.

2. That the whole metropolis should be united under one administrative authority, directly representing the ratepayers, and so constituted as to command general confidence.

3. That these conditions are not fulfilled under the present system of administration, partly by Vestries and District Boards, partly by the Metropolitan Board of Works, partly by companies trading in water and gas, while the functions of the Corporation are confined within the narrow limits of the City.

4. That the ancient Corporation of the City, if extended over the metropolis, and re-modelled in accordance with present wants, would best achieve the purpose of a municipality for London.

5. That this reform should be undertaken by her Majesty's Government without delay.

for, but which did not hit its humour or its theory of its duty to the public.

The attitude of the Board of Works in relation to the pressing question of the Thames floods has gone far to show us how little we can trust to a body, constituted as it is, for action in such cases of urgency. And what do we mean to blame in the constitution of the body? we may be asked. Simply this, that owing to the manner of its election, that class of men are not, for the most part, placed upon its roll who would be most large-minded in their views, and most independent in their judgment. This point was touched upon gently in the speech of Sir U. Kay-Shuttleworth; and it was obvious that it was not unfelt by the chairman of the Board, who made a bid for the applause of a part of his audience in certain remarks to the effect that, if some of his colleagues were butchers and bakers, the more credit was due to them for having raised themselves to a position of eminence, and that if men of high position and rank did not choose to direct their leisure and their talents to the public service, the discredit attached to those who did not do the work, and the credit to those who did it. This is just the sort of sentiment which is sure of a "Hear, hear," from some one or another in any large audience. But what is the truth of the matter? We do not wish to speak unkindly of any class of persons; but do we not know very well that the position of a member of the Metropolitan Board of Works is coveted by tradesmen who have been successful in their business as a matter of personal pride and satisfaction,—something to talk about to their friends and customers, to whom they retail the opinions of "Sir James 'Ogg," as they call their chairman? Is not the very fact of their entertaining royal personages at dinner the subject of jokes in *Punch*? And, to look at the more practical side of it, is it not notorious that the English middle-class tradesman, whatever his solid virtues (which we are the last to question), is of all existing persons the most utterly and radically "parochial" in his notions and his way of looking at things? And can it be expected that, the constitution of the Board being what it is, any number of "men of culture and position" are likely to be willing, or even to be allowed, to become members of it? Yet it is only by a Board composed mainly of such men that we can hope to see public improvements treated in the broadest and most comprehensive public spirit. This is exactly the merit of the House of Commons so far, that, to whatever level that assemblage may unhappily be destined to sink, it is still in the main composed of independent gentlemen who either have no private purposes to serve, or who are sufficiently public-spirited to put them entirely on one side. This is the quality which above all others seems to have struck some eminent Continental visitors who have examined into our Parliamentary Committee system,—its absolute and high-toned impartiality in dealing with subjects of public interest. And it is by the establishment of a great central authority, the members of which would be elected by the widest public suffrage, and be responsible directly to public opinion, that such a spirit in our local administration would be most likely to be attained. Under such circumstances an entirely different class of men would put themselves forward for election from those who now constitute the bulk of the Board of Works, and a correspondingly wider and more intelligent spirit in the administration of public works would be realised; and it would be worth while, for this object alone, to engage the interests and abilities of a superior class of representatives, that such a change in the administration of London local government should be brought about.

In regard to the centralisation of such a Government in the City Corporation, with extended jurisdiction over a greatly increased area, there may be a good deal of practical adjustment required; but we see no theoretical objection. As was remarked by one speaker in the debate (Mr. Ralli), "London had grown, but its central authority had not"; and to enlarge the powers of that central authority would simply be to return to the normal state of things; and we had the opinion of Sir Sydney Waterlow, who should know something of that matter, that the City would not be opposed to the carrying out of the changes which would be necessary to make it the administrative centre of the metropolitan system. No doubt these changes would be considerable; they might even be called by the favourite epithet of the opposers of reform, "sweeping." The Home Secretary said, indeed, that the meaning of Sir U. Kay-Shuttleworth's second and fourth clauses would come to this, that we ought to take the *prestige*, and property, and everything else belonging to the ancient Corporation of the City of London, alter them entirely, so as to meet modern requirements, and then extend them to the whole of London. That is a somewhat abrupt way of putting it, though in the main correct; but we hardly see how the *prestige* of the City would be destroyed, it would rather be added to. It is exactly because the ancient Corporation has such a *prestige*; because we cannot afford, even as a matter of association, to see it swamped or set aside; that it is proposed to make it the real centre of London instead of the pretended centre only. It would be a great piece of machinery to arrange and keep in working order, no doubt, but it would achieve the object which is in view with a completeness that no other arrangement yet suggested would realise; and this conviction was by far the preponderating feeling of the speakers in the debate. We therefore look to see the subject revived in a more systematic manner at no very distant date, when we hope that such a proposal will not only find a majority in votes, but a Home Secretary prepared to treat such an important topic with less of levity and indifference than Mr. Cross showed in replying on the debate in question.

ROUND CRIPPLEGATE.

Cripplegate Church is one of the shrines of London; and wherever the English language is known, St. Giles's is honoured as the last resting-place of our great poet Milton. It has, however, other claims to our regard, and the district in which it is situated is so full of interesting associations that we propose to gather together some notices of the chief of them in the present article.

The ground to the north of the City was originally a great swamp, impassable to the ordinary traffic, so that in the earliest times of London history no gates were required in the northern walls. The more adventurous of the inhabitants, however, objected to journeying round to the eastern or western gates, and postems were therefore opened in the wall for their convenience. This was the case with Cripplegate, which is supposed to be named from the cripples who congregated about the place in order to beg from those that passed in and out. The earliest notice of the gate is referred to the year 1010, when the body of King Edmund the Martyr was carried into London through this entrance. The chroniclers relate that miracles were wrought by the body, and those who were lame departed upright from the Cripples' Gate. In a charter of William the Conqueror, confirming the foundation of the college of St. Martin's-le-Grand, the place is also mentioned. "I do give and grant to the same church, and canons serving God therein, all the land and the moore without the postern, which is called Cripplegate, on either side the postern." Stow, following Fabyan, tells us that the gate was rebuilt by the brewers of London in 1244. If so, it must have been by some private agreement, for the brewers were not incorporated as a company until the sixteenth year of Henry VI.'s reign Like several of the other gates, Cripplegate was used for a time as a prison, and it appears, from a writ of Edward I., that it was so appropriated in his reign. Edmund Shaw, goldsmith and mayor, 1463, left directions for his executors to rebuild Cripplegate with the old materials, at an expenditure of 400 marks, and this was done in 1491. It was repaired in 1663, and in 1760 was sold to the Commissioners of City Lands for 911., and pulled down in 1762. A barbican, or watch-tower, was built to the north of the gate, as an outwork for observation and defence, and the little village, with its Fore (or chief) street, which grew up outside the walls, was sheltered behind it. The care of this important position was naturally given to trustworthy persons; and there is an interesting little story connected with it. Edward III. appointed Robert Ufford, Earl of Suffolk, keeper of the barbican, and from him it descended in course of time to Catherine, daughter of William, Lord Willoughby de Eresby, who married, firstly, Charles Brandon, Duke of Suffolk, and secondly, Richard Bertie. Bertie and his wife, the duchess, were Protestants, and, in Queen Mary's reign their lives were in such great danger that they had to fly from the country. Between four and five o'clock on the morning of January 1st, 1554-5, the duchess began her adventurous journey, in a thick fog. It was her intention to proceed from her house in the Barbican, with her little daughter (a child of a year old) and a small party of trusty servants, to Lion Key, near Billingsgate, where she expected to be able to embark for the Continent. She had to escape with the greatest secrecy, for no confidence could be placed in the bulk of her dependents, but in spite of all precautions, her departure was discovered. After she had descended as noiselessly as possible, and passed into the street, she was alarmed by the appearance of a person issuing from the house, bearing a torch in his hand, and evidently bent upon discovering the cause of the unusual bustle at this early hour. The Duchess was standing up under a gateway, and the light of the torch might at any moment be thrown upon her so as to reveal her hiding-place to the man. She therefore left her luggage and provisions and fled, but her pursuer was close at hand, when she suddenly turned into Garter House (of which we shall have more to say further on). The man seeing no one, retraced his steps; on his return he discovered the baggage, and while he was examining its contents, the duchess again issued forth. She dared not pass into the City through Cripplegate, but walked on to Moorgate. Thence she proceeded safely to Billingsgate, and there found her husband. All these adventures are related in a ballad sung to the tune of "Queen Dido," and entitled,—"The most rare and excellent History of the Duchess of Suffolk, and her husband Richard Bertie's Calamity."

"The Dutchess of Suffolk seeing this,
Whose life likewise the tyrant sought,
Who in the Hopes of Heavenly bliss
Within God's word her comfort wrought;
For fear of Death was forc'd to fly,
And leave her house most secretly.

That for the Love of God alone,
Her land and goods she left behind,
Seeking still that precious stone,
The word and truth so rare to find;
She with her husband, nurse, and child
In poor array their sighs begual'd.

Thus through London they pass'd along,
Each one did take a several street,
And all alon escaping were long,
At Billingsgate they all did meet,
Like people poor, in Gravesend barge,
They simply went with all their charge."

It was some time before they were able to quit England, and abroad they had months of travelling in constant fear of capture. At Wesel the duchess gave birth to a son, who was named Peregrine, from the circumstance of his being born in a foreign land, and during the wanderings of his parents. This child grew up to be one of Queen Elizabeth's greatest generals, popularly known as "brave Lord Willoughby." In 1586 this lord's agent wrote to him in the Low Countries "from your own open gallery" in the Barbican; and ten years afterwards Willoughby himself was living at Willoughby House.

We have already mentioned Garter House, which stood close by the Barbican. It was built by Sir Thomas Wriothesley, Garter King-at-Arms, and uncle to Thomas, first Earl of Southampton; and the house was long kept in remembrance by the name Garter-place. The mansion afterwards came into the possession of the Bridgewater family; but in April, 1687, it was burnt down, and the two eldest sons of the third Earl of Bridgewater, with their tutor, lost their lives in the fire. Bridgewater-square (which Hatton thought to be pleasant, and Strype called handsome and very delightful), and the dirty Bridgewater-gardens, mark the site of the house and its grounds.

Beech-lane, Barbican, either took its name from the beech-trees that once grew there, or, as Stow guesses, from Nicholas de la Beech, Lieutenant of the Tower of London, who was put out of that office in the thirteenth year of Edward III. Here was formerly the mansion of the Abbot of Ramsey, intended to serve as his town residence. Afterwards it was called Drury House, from being the residence of Sir Drew Drury. Subsequently to the Restoration, Prince Rupert occupied the house, and it appears that on one occasion the ringers of Cripplegate Church bells were paid a guinea by the parish for complimenting Charles II. with a peal when he visited the Prince.

It is not known at what time the Barbican was destroyed, and Dryden wrote:—

"A watch-tower once; but now, as fate ordains,
Of all the pile an empty name remains."

This, however, is not true, for the street called the Barbican will ever be famous as the residence of the great antiquary, Sir Henry Spelman, and the still greater man, John Milton. The poet's name has been given to the notorious Grub-street, which is now a thing of the past. Perhaps, as the street has been almost entirely rebuilt, and the old timber-fronted houses have left their mark only at the Fore-street corner, it is well that it should be re-named; but it is impossible not to regret the disappearance of a name of such world-wide fame as Grub-street. In spite of the ridicule that has been heaped upon it, a goodly roll of its distinguished inhabitants might be drawn up. Fox, the martyrologist, was one, and John Speed, the tailor and historian, another. One of Fox's neighbours rebuilt his house so as to darken the poor author's windows, and a letter is extant in which Fox expostulates with energy on the injury done to him. One Hopkinson "an obscure and simple man for worldly affayres, but expert in all the left-hand tongs," lived in Grub-street and drew to himself there many learned men, one of them being no less a person than Lancelot Andrews. James Whitelocke, a merchant tailor's boy, who gained honour at Oxford, and was afterwards Justice of the King's Bench, went through a course of Hebrew with Hopkinson. Even after the Great Fire the street was not in disrepute, for we find that the Goldsmiths' Company met here temporarily in the house of Sir Thomas Allen, grocer, and Lord Mayor in 1659. As Thackeray justly observes, it was Pope "who brought the notion of a vile Grub-street before the minds of the general public; he it was who created such associations as author and rags—author and dirt—author and gin. The occupation of authorship became ignoble through his graphic description of misery, and the literary profession was for a long time destroyed." The first use of the term "Grub-street," in an offensive sense, has been traced to Andrew Marvell.

Some of the houses in this neighbourhood were formerly well inhabited and handsomely decorated: thus in Hanover Court or square (a turning out of Grub-street) General Monk is supposed to have lived in the reign of Charles I. The house, which was principally built of oak and chestnut, was pulled down in 1821, and three brick houses were erected on its site. In another court called Sweedon's-passage was an old wooden building traditionally said to have been the residence of Sir Richard Whittington, in the reign of Henry IV., and of Sir Thomas Gresham in that of Elizabeth. It was pulled down in March, 1805, and three small houses now occupy its place. J. T. Smith inspected the so-called Gresham House in 1791, and has left the following description of it in his "Ancient Topography:—"It must have been the mansion of some opulent person; and Sir Thomas Gresham, who is said to have been an inhabitant, might have altered it; for of all the houses I ever inspected in London, none were so substantially built. The timbers were oak and chestnut, and used in the greatest profusion. The lower parts of the chimneys, on the ground floor, were of stone, in some instances blocked up, and in others considerably lessened. The rooms had been contracted, as the wainscot portions in three instances divided the ceilings, which, when whole, must have been ornamented in a regular manner, as large masses of the cornice were visible in some of the modern closets."

Not the least interesting of the streets of Cripplegate is Golden or Golding lane, in which the Fortune Theatre (a square building of lath, plaster, and timber) was built by Henslow and Alleyn in 1599-1600. On Dec. 9, 1621, this building was burnt down, and a new circular theatre, of brick and tile, was immediately erected on the site. It was here that Alleyn made a large part of his property, and amused the town by his fine acting. In 1649, the inside of the theatre was destroyed by a company of soldiers, incited by those who wished to put down all theatrical entertainments, and in 1661 the ground was advertised to be let for building purposes. Close by was the *Nursery*, a school established for the education of children for the stage after the Restoration, which is mentioned in Pepys's Diary, under date Aug. 2, 1664:—"To the King's Playhouse, and there I chanced to sit by Tom Killigrew, who tells me that he is setting up a nursery; that is, going to build a house in Moorfields, wherein he will have common plays acted."

Redcross-street takes its name from a red cross that formerly stood there. Close by was a large plot of ground called Leyrestowe, or the burial-place, which was the only spot where the Jews could bury their dead, until they were permitted, in Henry II.'s reign, to have a special place assigned them in each of their quarters. After the Jews had been expelled from the country the place changed its character, and in course of time houses were built upon the old cemetery; the remembrance of which, however, was kept alive by the name of Jewin-street. It is not quite clear whether the form "jewin" is a plural of *jew*, as oxen is of *ox*; or whether it is an adjective like "golden" and "wooden," from *gold* and *wood*.

Having noticed some of the chief features of Cripplegate, we now come to the consideration of the history of the parish church. Ben Jonson makes use of the simile,—

"As lame
As Vulcan or the founder of Cripplegate;"

but his authority is not of much value in this case and the received opinion that the gate obtained its name from the cripples who congregated around it is the more probable. When Alfuin, the almoner of St. Bartholomew's Hospital, built the first church outside the gate, about the year 1099, he dedicated it to St. Giles, because that worthy physician and bishop, who wrote a poem on paralysis, was the patron saint of the lame. Little or nothing is known of this old church, which was burnt in 1545, and history begins with the new one, which was soon after erected. The first vicar mentioned in Newcourt's list is Robert Crowley, the printing parson, who did much good in his day, but was always getting into hot water. He held the vicarage for a very short time, being deprived and prohibited from preaching or ministering the Sacraments within twenty miles of London by Archbishop Parker. He had a great aversion to the surplice, and is reported to have said that "he would not be persuaded to minister in those conjuring garments of popery." It appears that Crowley and his curate expelled from the church divers clerks who were there in their surplices to bury a dead body. The clerks alleged that it was the custom, and that "my Lord of London" had commanded them to wear surplices within the churches. This gave rise to some tumult, and when Crowley appeared before Parker to answer for his behaviour his conduct was such that the archbishop "could do no less" than order him to be imprisoned in his own house. The Lord Mayor also lodged a complaint against Crowley, but the accused answered that he would not suffer "the wolf," as he called the "surplice man," to come to his flock. At another time he quarrelled with the singing men about the "porters' coats," and said he would set them fast by the feet if they broke the peace. The authorities were too much for him in the end, and although he boasted that he would preach until deprived, and that he would be deprived by order of the law, the Archbishop "dulled his glory." Another vicar was Lancelot Andrews, Bishop of Winchester, who died at Winchester House, Southwark, in 1626, and was buried in St. Saviour's Church. After Andrews came Dr. Buckeridge, Bishop of Rochester in 1611, who was translated to Ely in 1627, through the influence of his sometime pupil, Laud. William Fuller D.D., was sequestered from his church, in 1642, and imprisoned for his loyalty. He lived obscurely in London, where he died, and his body was conveyed to St. Vedast's, because it was refused burial in his old church.

St. Giles's has been repeatedly restored. In 1682 the steeple was raised 15 ft., and in 1791 the clearstory, which contains seven modern windows with pointed arches, was rebuilt with brick. The walls are filled with monuments, and as a large number of worthies have been buried here, several are of considerable interest. That to the memory of Fox, the martyrologist, who is described in the Register as "Householder and Preacher," is one of these. He was accused of heresy, and expelled the University. Sir Thomas Lucy, of Warwickshire, then received him into his house as tutor to his children. Other monuments record the names of "skilful Robert Glover," as Stow calls the Somerset Herald, who died in 1588; of John Speed, the tailor and topographer; of Margaret Lucy, second daughter of Sir Thomas Lucy; and of Constance Whitney, grand-daughter of the same. The remains of the distinguished mariner, Sir Martin Frobisher, also found a resting-place here, as did those of "John Milton, gentleman." The honour of erecting a monument to our great poet was left for Samuel Whitbread, who placed a bust, by Bacon, and a tablet, on the walls, in 1793. Still another great man is associated with the church, for on August 22, 1620, Oliver Cromwell and Elizabeth Bourchier were married here. In the latest alterations of the church the gallery was cleared away, and the monuments can now be seen more easily than before. The Sunday congregations tolerably fill the church, and all round the building are seated the charity boys and girls. The beadles carry maces before the clergymen, one being surmounted by the figure of St. Giles, and the other by the representation of Cripplegate.

In the churchyard is a buttress of the old City wall, and the houses over the entrance-gateway are of a date anterior to the Great Fire. Close by Cripplegate was Aldermanbury postern,—a small gate in the wall which led into Moorfields, the name of which is still retained for a street. Aldermanbury was so called from the City Court-hall, which was situated there before it was transferred to Guildhall. Stow found the place mentioned in the first year of Richard I. (1189), and writes,—"I myself have seen the ruins of the old Court-hall in Aldermansbury-street, which of late hath been employed as a carpenter's yard."

The most interesting relic of that part of the ward of Cripplegate within the walls is the piece of the burial-ground of St. Alphage, which has been retained as a garden, and railed off, so as to preserve a bit of the old City wall that still remains. The church, an ugly building erected in 1777 by Sir William Staines, is on the opposite side of London-wall. The original foundation was the old Hospital or Priory of St. Mary the Virgin, "for the sustentation of one hundred blind men," called Elsing Spital, after William Elsing, the founder and first prior.

In Norden's map of London, 1593, the church is called St. Taphyn's, a curious form of the name similar to Tooley for St. Olave and Tanthony for St. Anthony. St. Alphage was bishop of Winchester in the year 984, and Archbishop of Canterbury in 1006. He was taken prisoner by the Danes, and murdered at Greenwich. His name appears in many forms, such as Alfege, Elphege, Alphy, and Alfin.

A portion only of Elsing Spital (viz., the priory church) was used by the parishioners of St. Alphage, and the remainder, with the garden, was purchased by the executors of Dr. Thomas White, vicar of St. Dunstan's-in-the-West, in order to found a college and library for the use of the clergy of London. Sion College, with its interesting buildings, still remains, in spite of damage done by the Great Fire, a truly picturesque bit of Old London. Cripplegate, until lately, contained libraries for the Church of England and for Dissenting Ministers, but Dr. Williams's Library in Redcross-street has now been removed to Grafton-street, Tottenham-court-road. Thomas Fuller inhabited chambers in Sion College while he was collecting materials for his church history. Not far off is Wood-street, famous for its Compter or prison. Here lived in the reign of Richard II. Sir Henry Percy, son and heir of Henry Percy, Earl of Northumberland, and in his house he received the king, the Dukes of Lancaster and York, the Earl Marshall, and others at supper.

We must now close our notice of some of the interesting features of Cripplegate,—a portion of the City that has still more of the appearance of antiquity than many other parts; but even here the builder is moving on, and the old houses are being rapidly replaced by the new.

Hooton.—On the 24th ult. the ceremony of blessing the foundations of a new Catholic church was performed at Hooton. Since the Hooton Hall and estates passed away from the Stanley family, the Catholics, who used to worship in the domestic chapel of that family, have had to find some other place of worship. For a considerable time they went to Paddington Chapel, also belonging to the Stanleys. However, the present baronet, Sir John Stanley Errington, has begun a new edifice on a plot of ground which was purchased from the representatives of the late Mr. James Craven, within half a mile of the Hooton Hall, and twenty minutes' walk from the Hooton Station. The building will be in the Early English style, from designs by Mr. E. J. Tarver, architect, London. The dimensions are:—Length, 75 ft.; width, 29 ft.; length of nave, 51 ft.; height, 38 ft.; and to finial of bell-cot, 54 ft. There will be two side chapels, besides vestry.

AMERICA AT THE PARIS EXHIBITION.

WE heard in Paris, more than a year since, and announced in these columns, that the Americans intended to make a great show at the forthcoming Exhibition, and that all kinds of American industrial and artistic objects might be expected to adorn the palaces of the Champ de Mars and the Trocadero. The great figure of Liberty (we have forgotten how "tall") was to be erected at the highest point, and was to hold in its hand a light, to illuminate the whole of Paris, while pictures and statuary of more than usual skill and beauty were to surround the enormous emblem, the reality of which had enabled the Americans to accomplish so much. Then came a time,—months and months of prudent silence,—those moments so much prized by Americans in matters of business, during which, they say, they keep better than any other people "a stiff upper lip," and now thought and work are beginning to show the result of their laborious wisdom.

Without this happy association of capitalised thought, not all the monetary combinations in Wall-street and the Five Points, manipulate them ever so deftly, or all the quiet schemes elaborated during weeks of reflection in the Tombs or other reformatory establishments, can succeed in astonishing the rest of the more modestly laborious world.

So we now hear of several ships of the United States' navy having already sailed almost overladen with the magnificent result of the last year's artistic and other labours of this great country. All having been gathered together, we are told, by Commissioner M'Cormick's energetic labours, that have removed the host of difficulties which have stood in his way, and the vessels under his command are now carrying cargoes to France, which cannot fail, so the papers declare, "once more to win the acknowledgment of the world for American skill and enterprise."

"Every branch of manufacture and fine art," it is said, "will be represented," on a scale even larger than usual, and not easily to be overlooked by the wickedly envious world.

We ungrudgingly give our warmest admiration to the only object we have seen here purposely constructed for the Exhibition, a huge tramway-carriage, destined ultimately, after receiving the admiration of the united world at Paris, and the award of the judges, to adorn the line of tramways running between Moorgate-street in the City and the Green-lanes at the north-east of London; that is, if some lover of American landscape art do not purchase this triumphant car in order to secure the panels on which have been brightly painted, by the skilful hands of their best craftsmen, picturesque American landscapes, wherein may be seen the brighest tints and the highest waterfalls that the untravelled can realise.

Eighty pictures have been sent by American artists, chiefly from New York state, and, as is usual, when commissioners and committees are employed to select works of art, the dissatisfaction amongst the artists here is distressing. Whether the gentlemen who appointed themselves as judges have done their work well, will be seen when the pictures they have selected are arranged underneath the banners that will decorate the apartments, and we are inclined to the opinion that, so far from their having exercised any narrow illiberality in their selection, had they confined their desire for distinction to that which is obtained by absence they would have been more likely to gain honour; the American artists, who rarely fail to combine a shrewd knowledge of business, will find no difficulty in obtaining an opportunity to show somewhere in Paris those pictures that they here think should have been seen in the Champ de Mars.

It will really become a curious fact if it should be shown by the Americans at this year's Exhibition, that they have contributed one single American-born object of really beautiful art; for such a result would inevitably lead to some novel ideas as to how the growth and attainment of true art are developed, and would certainly become some evidence that it is a correct theory which so many of us hold, that the nearer to savage barbarity the greater the perfection of the design.

But American artists do not appear desirous of displaying their native powers of ornamentation, and so far the real North American art will make but a poor show this year in Paris. The true artist in the distant wigwam is relaxing his interesting labours, and is only too glad, like his friends in Washington, to adorn his household and his person with the products of the European *ateliers*.

But in the absence of real North American art, cultivated or not, we shall, indeed, be amply compensated by the presence of that charming school of Franco-American artists who, residing altogether in Europe, are beginning to show, if they have not already done so, that American painters and sculptors are unsurpassed by any other nation in that exquisite perception of the real associated with the ideal, of that delicacy of perception which constitutes good art.

With the exception of Professor Edison's phonograph, which we are now told, and told correctly, was suggested as far back as 1865 by an Italian mechanic of the Val d'Aosto (Signor Manzetti), and published in the *Diritto* of Rome in its issue of July 10, 1865, and in the *Petit Journal* of Paris, November 22, 1865, and with the addition of a marvellous stocking-loom, we hear of no contrivances calculated to gain for the Americans fresher laurels, or more chances of niches in the Temple of Fame; but the world may safely look forward to a contrivance or two, an adulterating mixture, a help in some way or other for which we may have to be grateful, and to not a few easier ways of doing imperfectly henceforward many things that some of us were just on the point of beginning to do tolerably well without the aid of machinery.

We may expect to see some really useful furniture. We can certainly promise a kitchen-table combined with the convenience of an ironing-board, the price of which will satisfy the poorest European. Of ornamental furniture, whatever America sends that may prove to be really good will be the production of some exiled German or Belgian art-workman.

India-rubber in every shape will, of course, be well represented, for the Americans are prepared to erase everything, and are contriving to do so with a facility equal to that of the pugnacious public schoolboy represented by the immortal Leech,—in the character, by-the-bye, of your present Prime Minister,—who, on being asked what he intended to do next half, replied he was prepared to "smash everybody."

Buckwheat and corn, "in all styles," are expected to secure the glorious distinction they so well merit; and American "wines, watches, and even chocolate," are said to be likely to beat even the famous manufactories of Paris.

There can be no question that Americans intend to exhibit and compete with other countries at the Exhibition in May in the nicer industrial arts long before they are prudently warranted in doing so, judging by the condition of their own home affairs.

On no just principles whatever can any good art emanate from a people until they have shown a little more earnestness to condemn, and a great deal more detestation of the vicious conditions of so many existing evils that shock one here in every direction.

If art could be successfully followed in an agricultural village, away from large towns and rapid transit, of a silver currency and combinations of capital for building purposes, then might there be as good a prospect for the arts in this country as there may exist at present in Cental Africa or the North Pole; but so long as New York prides itself on its present triumphs, and is content with the peculiar organisation of its society, it will assuredly have to continue to rely for its art on the imported manufactured merchandise that it now receives.

Preparations are being made by all the steam-packet companies to carry passengers this May at scarcely cheaper rates, and with the favoured lines the rate of passage has been increased; but it is expected that, notwithstanding the hard times, Americans will "show" in Paris to the extent of some fifty thousand or so, a force strong enough, supposing the half of that goodly number are feminine, to win the world's admiration for their personal beauty, and its envy, we hope not its imitation, for its lavish methods of adornment.

New York.

Proposed New University.—A movement has for some time been on foot for the establishment of a new university in the North of England, and the Corporation of Bradford have been invited to adopt a memorial to the Privy Council in favour of the proposal.

YORK.

NEAR the centre of the great county of which it is the capital is York,—by no means the largest, but certainly one of the most notable towns in the wide county. With its origin incapable of being accurately traced in the by-paths of ancient obscurity, but known to date back its reliable record for over 1,600 years, the old city might have been excused had the dimness of age, or the decrepitude preceding decay, been observable in it. It had its troubles from the days of the Romans down to those of the Conqueror, who wrathfully revenged himself upon it for a stubborn defence. Down through the brawling centuries since, it has been a place of historic note, now furnishing the meeting-place for the first Parliament, now earning notoriety for the massacre of the Jews, now erecting its superb cathedral, now receiving civic dignity beyond that of any other English city save the metropolis,—honoured and honouring it has passed a busy career, as became a city which has been "heir to all the ages in the foremost files of time."

Unquestionably the notoriety has been in part due to its situation, and in part to other causes; and its commercial importance is also due to a variety of reasons. As the centre of a vast district, it has become an agricultural mart; as the head-quarters of one of the four chief English railways, it acquires importance and wealth therefrom; and in other modes its situation ministers to its growth. It has acquired much greater commercial importance in late years; its industries have become larger and more varied, and it has lost to a large extent the air of dignified and idle repose upon past laurels which in bygone years characterised it. When two score years ago, gazetteer compilers had to describe it, it was in a mode much as did one of the best at the date named; the "city is not signalised by numerous or eminently-important manufactures," the chief enumerated being the linen, flax, and bleaching trades, the manufacture of combs and gloves, with tanneries and old-world industries. But the principal trade was "retail, which is generally pretty brisk, supported by the many genteel and opulent families resident in York and its respectable vicinage." These days are gone, and York, adapting itself to a changed age, is no longer content with a "retail trade."

In 1831, the population was only 35,362, but in two-score years it had advanced to 50,765; and though the rate of increase is small compared with that of some Northern towns, it is considerable when the peculiar circumstances of the city and its previous comparative freedom from manufactures are taken into account. Unquestionably the chief factor of the increase has been due to the growth of the railway system. When the railway system reached York, its importance now could scarcely have been imagined, nor could it have been credited when, so late as 1853, the capital of the York and North Midland was 5,600,000*l.*, that the time would come when its successor would have a paid-up capital of 54,000,000*l.* Of that vast capital invested in lines and working stock, York is the brain, and it claims no small portion of the revenue of 6,500,000*l.* it yearly brings in. Chief amongst its industrial establishments are the various works of the paternal railway company which has taken York into its keeping. It "maintains" between 200 and 300 locomotive engines used on that part of the system converging towards York; it constructs in ordinary years 100 carriages and nearly 3,000 wagons, and it repairs about 22,000 of the latter and nearly 3,000 of the former yearly in "good times." In the works needed to do this, and in the oversight of the permanent way, there are ordinarily close upon 2,000 workmen employed, and the weekly wages bill for these workmen was about 2,800*l.*; but it and the numbers have, in these times of depression, undergone reduction. Add to even the reduced figures the number of officials of a higher grade, and it will be seen that, the contribution, financial and numerical, of the North-Eastern Company to York is large indeed. Other industries have become important: its glass manufactures especially and exceptionally so; some of the older trades have attained a larger growth, and its miscellaneous trades have also grown. But its situation, at some distance from the mouth of the river, and away from the workings of the great stores of mineral treasures which go so far to build up Britain's greatness, and which give rapidity of increase to her cities and towns,—that situation prevents

the planting of the more prominent industries of the North in York. Her skies are freer from the smoke and the gloom attendant on factories and furnaces, and her river runs tolerably pure. Although, as we have seen, manufactures are fixing their seat there, yet perhaps York is better known for its being the junction-point of so many railways; and instead of the lumbering old coaches which traversed the town, at least 130 trains from North, South, East, and West, enter its noble station daily.

From the position to which the ancient city has attained in episcopal matters, it might have been expected that there would have been a considerable number of churches, and this is so, in addition to the chief ecclesiastical pride of the city,—its noble minster. Nor is Dissent much behind its mitred sister; for in numbers, in influence, and in the beauty of some of their sanctuaries, the Dissenters are prominent, and in other edifices the city is fully equipped. It owns a magnificent railway-station, certainly without any superior out of the metropolis for commodiousness and stateliness of structure; and though some of its public buildings are in the garb of by-gone days, yet there are others which would do no discredit to towns of larger population and of greater pretensions in architectural matters. York has all the tokens of a large population, and it has others not so invariably associated with it. It has, as the county town too often has, the representatives of the criminality of the populace, and it has other tokens of the evils in which humanity struggles. Its lunatic asylum holds 167 inmates, and thirty-two admissions thereto are yearly made, to recruit the unhappy numbers thinned by death and by other causes, and in the same city a more private asylum holds those connected with one of the religious bodies who have been similarly afflicted. With its known wealth, York has much also of poverty, and the inmates in its union workhouse vary from 500 to 600; whilst outdoor relief is given to from 600 to 700, as well as to from 100 to 200 vagrants. Although criminality in the city has diminished, as it has generally in the North, yet there are from 300 to 400 persons charged with crime in its bounds yearly still, and of these over 200 are "drouthy clay." It has its suffering, also, and its dispensary has in a year nearly 6,000 patients under treatment,—some ninety-seven being admitted weekly. Its School for the Blind gathers in those from whom light is shut out, from various parts, and over eighty of such are inmates of it. And generally it may be said that of the various institutions for the relief of suffering, for the promotion of social and secular improvement, and for the advancement of philanthropic objects, York has its full share. Like most ancient towns, it has its reminiscences of the past, alike in look and in institution; but in the former respect much is being done to efface this, and in the latter something has been done to modernise them. The position of the city naturally helps those movements; for the continual stream of traffic pouring through any place, by coach and by rail, has an inevitable tendency to obliterate in some degree the traces of singularity or of old-fashionedness in manners, appearance, or institution.

As the advance of York has not been so rapid as that of some of the younger towns in the great county of which it is the capital, so its future does not shadow forth any probability of great increase. But its commanding position, its natural facilities, and the acquirements which it has become heir to, give it a position entitling it to the prospect of a solid progress,—meeting not with the checks which perhaps are the inevitable accompaniments of those bounds in the race of development known to towns in the centre of great deposits of coal or iron. Round it there is a wide and fertile agricultural domain, and it is not only the mart of the produce of this, but it is also its source of supply for much needed by the earth to enable it to bring forth "fruit after the kind" of each. It is the practical centre of a vast system of railway which holds a monopoly of the greatest iron, coal, and lead-producing districts in the country. Its industries are varied, if not in every case extensive; its public buildings,—cathedral, churches, station, and some others,—are erections worthy of its fame. Its citizens have a public spirit which often displays itself, combined with a caution allied to that of the proverbial character of the denizens of England's largest county. It has, unquestionably, some of the slowness to move so often known in ancient places; and it has not those opportunities for the creation of gigantic industries which other northern districts have. But there remain in it undeveloped possibilities, which the future may transform into facts, and the transmutation of which is rendered more easy by the facilities it has acquired of late. It has wealth and influence,—vast motive powers; it has also unquestionably advantages, given by its railway facilities and position, and these it is not slow to make the best of; and it has the benefits naturally accruing from its county position and its central state. Altogether, looking to the greatness to which it has been born, to that which it has achieved, and to that which has been thrust upon it, the future of York should be one which it may contemplate without envy of its more quickly-developed neighbours, and with some amount of pardonable pride.

WESTMINSTER ABBEY AND PRECINCTS, PRESENT AND FUTURE.

In a map before us, drawn during the first years of this present century, it is curious to note how much we miss of what is now called *London*. By comparing it with a quite new map of to-day, it seems hardly possible that it can be the same town we are looking at. And this difference does not lie wholly in the mere *size* of the City, but in its details every here and there, and in the alterations and improvements,—to use that, perhaps too wide term,—visible everywhere, and in no spots so markedly as in what are called "open spaces," and in the green spots of grass-covered ground. This, we say, is to be noted everywhere; but nowhere, as we think, more so than in and about Westminster Abbey, or the Abbey "Precincts,"—a somewhat exclusive spot, and in very many ways one *per se*. It is yet a bit of *Old London* even as it is, in spite of all improvements and modernisings. No lover of the picturesque and of art can be otherwise than attached to the Abbey and its surroundings, and all must feel that to preserve it is not to keep things out of use and because *old*, but to retain memorials of a past state of things and remembrances,—of those especially who have gone before us in the work of this world. We wish to refer here more especially to the wide open space to the *north* of the Abbey,—to that spot of ground on which the "obelisk" *was* to stand. We would hint at a better purpose for it.

No one can pass through London streets and squares, and open spaces, without being struck by the sight of divers "statues" of eminent and illustrious men,—from the statue of Nelson, on the top of his column, where he cannot possibly be seen, to that of Cobden, somewhere or other in Camden-town! These "effigies" are put about in all sorts of ways, and without reference as to what the living originals did in this world of ours when in it. But few, perhaps, even more than glance at them, not pausing even to look at their names. Would it not be an improvement, at least in the future, to bring such memorials together into one space, as at Westminster, clustering round the old Abbey, and thus to make of this empty space we have referred to a *Campo Santo*, and a place to go to, to find the memorial of a remarkable man,—whether of the State, or in science, art, or literature? Here they would certainly be seen, and note made of them. Some attempt, too, might perhaps be usefully made to group them together, and to show *historically* what the men of England have accomplished for it and for the world. Some thought and care would here doubtless be required, but these could in such a place hardly fail. It would be difficult to make note of a want, looked at in many ways, more urgent than this, for it always seems to be a puzzle to those who have the management of the details of a public memorial to know what to do with it when ready.

In thus looking at the ground on which this Abbey is built, we must not forget that we are not travelling beyond the ground on which the Abbey and its buildings once stood, as its Precinct was much larger than now, as may be seen by reference to the plan attached to Dean Stanley's book. It is painful to think of the destruction that has occurred beyond all help, but we must need look at things as they are, and make the best of them. The plan in Dr. Stanley's book is of the date 1535, and shows things different indeed from those we have seen in our map of 1810; different as *that* is from the present state, all ways looked at. That once on a time grim old fortress the Sanctuary is gone for good and all, with the belfry close to it. The Almonry is as much a thing of nought as the elm-trees are, near which it was built. Westminster Hospital and the National Schools now occupy this ground, and have succeeded the now-a-days useless Sanctuary, but the mere building might perhaps have been spared, if only to read a lesson to the curious.

"Not, surely," says the eloquent author of the "Memorials" of his Abbey,—"not surely in vain did the architects of successive generations raise this consecrated edifice in all its vast and delicate proportions, more keenly appreciated," he says, "in our own day than in any other, since its first building, designed as it is to lift us Heavenward, and to things unseen!" And if so, and few doubt it, then must the extension and enlargement of such an idea be worthy of all effort. The Abbey, as we have said, is not a church only, but a vast sepulchre,—a part of a Campo Santo, but not large enough. And thus it is that such extension of it, and so to speak guide to it, would, we cannot doubt, be joyfully hailed by all who feel interest in such a building and its purposes. Well might the now vacant and all but useless ground, be worthily and attractively occupied, as such like spots are in so many of the Italian cities; the famous Pisan Campo Santo, for example, founded in the year 1108, though nothing of that early date is now visible there. The present structure which grew up on its foundations and ruins, and built by Giovanni Pisano, might furnish some useful hints. We forbear details; we would but direct attention to the bare ground,—to a want of the day,—and to the opportunity there now is for at least a little timely thought about it.

THE FINE ARTS, INSPIRED BY THE LIVING SCHOOLS OF NATURE.*

"There is but one presiding principle which regulates and gives stability to every art. The works, whether of poets, painters, moralists, or historians, which are built upon general nature, live for ever; while those which depend for their existence on particular customs and habits, a partial view of nature, or the fluctuation of fashion, can only be co-evil with that which first raised them from obscurity."—*Reynolds.*

In every country where the fine arts are now cultivated, to copy nature, to study the antique, are directions impressed on every student.

Reynolds correctly asserts that Bacon studied brevity to excess, and therefore his meaning was sometimes doubtful. If Bacon meant that beauty has nothing to do with rule, he is mistaken; there is a rule obtained out of general nature, to contradict which is to fall into deformity. Nature is, and must be, the fountain which alone is inexhaustible, and from which all excellences must originally flow.

Frequent exercises in drawing and modelling are necessary in academies, with living models before the eyes, where nature can be imitated, or rather translated according to certain conventional modes and forms.

The student must

> "Keep Nature's great original in view,
> And thence the living images pursue."
>
> *Horace.*

A close examination of nature is an excellent preparative to the study of art, and enables the student readily to comprehend the principles on which his predecessors worked, and to render their labours available to himself.

The knowledge of nature is the first ingredient towards a just estimation of the merit of art; the eye which is well instructed will unquestionably be agreeably affected at the sight of an elegant statue, picture, or design; and if such an eye be not attracted, it is a probable proof that the performance does not combine, in any high degree, the requisite qualities of excellence.

To assist the imagination a happy selection of nature, seen in her best moments, has been suggested,—as the poet expresses it,—

> "To snatch a grace beyond the rules of art."

Recourse may also be had to the various effects of accidental causes, which show themselves in objects around us.

The skilful painter has the penetration to discern the character of nature, which varies in all men. Hence the countenance and gestures of the persons he paints continually vary.

The excellence of every art consists in the complete accomplishment of its purpose; and if, by a false imitation of nature, or mean ambition of producing a picturesque effect or illusion of any kind, all the grandeur of ideas

* By Mr. W. Pettit Griffith, F.S.A.

which this art endeavours to excite be degraded or destroyed, we may boldly oppose ourselves to any such innovation.

Whether at home or abroad, in the streets or in the fields, every object that presents itself is to the student a lesson. He regards all nature with a view to his profession, and combines all beauties, or corrects her defects. He examines the countenance of men under the influence of passion, and often catches the most pleasing hints from subjects of turbulence or deformity; and he improves upon the fanciful images that are sometimes seen in the fire, or are accidentally sketched upon a discoloured wall. Some years since an artist was painting the "Judgment of Solomon," and just as he was about to begin the mother agonised for fear her child should be cut in two, in passing Temple Bar he saw an interesting boy killed by the kick of a blood-horse, and the mother rush in agony to her son. The artist went home to his work, and painted at once the mother in "Solomon," transferring to his picture the agony he had seen in life.

In original letters to and from Dr. Isaac Watts, Sir Edward Walpole, and others, in the *Gentleman's Magazine*, 1816, the adornment of Burleigh House is alluded to. Cheron and Laguerre were employed on different apartments. At their arrival, Cheron opened his chest of drawings after the life, such as Academy figures, draperies, &c., and Lord Exeter, observing that Laguerre produced nothing of this kind, asked him where was his box of drawings, Laguerre, pointing to his head, answered, "I carry them all here."

Haydon, in his lectures on painting and design, alludes to the controverted subject as to whether the Greeks dissected. "No," says John Bell, "they did not dissect, because the gymnasium was open to them;" "No," says Sir Anthony Carlisle, "they did not dissect, because their figures were all in repose." "No," says Payne Knight, "they did not dissect, because they never obtained anatomy." "No," say the most eminent scholars, "they did not dissect, because there is no allusion to art and anatomy in their medical literature." "No," say all, "they could not have dissected, because—first, the body was held in sacred awe; secondly, there were laws against dissection; thirdly, their poets speak of a dead body with religious and delicate feeling."

Hippocrates, however, dissected apes, thereby a certain amount of knowledge of man's anatomy was gained. The Greeks in all probability studied more from the external development or anatomy than from dissections. The gymnasium offered a living school of nature; the sculptors and painters here received their lessons from the wrestlers, boxers, often naked, dancers, &c., exhibiting running, leaping, throwing the quoit, and other games. The study of all these exhibitions culminated in a perfect knowledge of external anatomy, as portrayed in the Elgin marbles.

Pliny, in his long enumeration of excellent artists in every kind, and of masterpieces of art, does not mention one Egyptian. From all that can be gathered of Egyptian art, it does not appear that painting ever flourished in that country, or that other nations were much indebted to Egypt for their knowledge of the art. It was, therefore, in Greece, whether at Corinth, Sicyone, Athens, or in other cities, that painting attained its perfection. It is believed to be of later date than sculpture, because Homer, who often speaks of statues, relievos, and carved works, never mentions any piece of painting or portrait.

Phidias is considered to have been the first who gave the Greeks a taste for the Fine in nature, and taught them to copy it. His works were universally admired, and he, perhaps, is the only one that ever united so much facility with such perfection. His talent lay principally in representing the gods. He did not copy from any visible objects, but formed an idea of true beauty, to which he continually applied himself, and which became his rule and model, and directed his art and execution. Polycletus, in his statue of a Doryphorus, united all the proportions of the human body so happily, that it was called the Rule; and sculptors came from all parts to form in themselves, by studying this statue, a just idea of what they had to do, in order to excel in their art. Lysippus used to say that the Doryphorus of Polycletus served him instead of a master. But the painter Eupompus directed him to a much better and more certain guide, viz., Nature herself. He afterwards studied her solely, and made great improvements from her lessons. The chief point in sculpture, as well as in painting, is to follow and imitate nature. Lysippus and Praxiteles were reckoned to have copied nature best. Demetrius, however, was reproached for confining himself too scrupulously to truth.

Apollodorus, of Athens, who lived in the ninety-third olympiad, discovered the secret of representing to the life, in their greatest beauty, the various objects of nature, not only by the correctness of design, but principally by the perfection of the distribution of shades, lights, &c.

No doubt the earliest efforts of sculpture and painting were rude attempts at imitating nature, long before design or composition was thought of. There are several well-known stories of close imitations of nature. Zeuxis painted grapes so exquisitely, that birds were attracted; Parrhasius, a curtain, that he imposed on Zeuxis; and Appelles a horse so well that horses neighed; and in recent times an artist had in his studio the Elgin horse's head high up over his chimney; in leading a fine blood-horse into the room to paint from, the horse looked up at the Elgin head, and neighed with the greatest delight.

This singular fact of an animal being impressed with a work of art as with the reality of nature, may be confirmed by an anecdote related by Jesse of a dog who had been used to be taken up in his mistress's lap, scratching a full-length portrait of her by Sir Godfrey Kneller, standing on the floor, as if soliciting the usual indulgence; and the same gentleman has mentioned a still more extraordinary fact of a dog of a trainer who was extremely attached to a race-horse at Newmarket. The horse was sent to Russia, but a picture of it was taken before it went, and to the picture of the horse the faithful animal attached itself.

A lively sketch of nature was portrayed by Parrhasius in his representation of the "People or Genius of Athens," which shone with a thousand elegant and surprising beauties. In regard to his Hercules, he said that he had represented him exactly, feature for feature, such as he had often appeared to him in his dreams.

The school of nature should combine the simple and ideal true, which have a surprising effect. The painter must seek all the assistances which history can afford him, as regard manners, habits, and dress. The minutest particulars must be observed, as a cap, helmet, shoe, or slipper. Pliny says that Nealces, having to represent a sea-fight between the Persians and Egyptians by the river Nile, to show the scene of the action, drew an ass drinking upon the banks, and a crocodile watching his opportunity to devour him. Mistakes in the minutest things in nature have been censured by the most celebrated artists. Apelles was blamed for drawing his horses with eye-lashes upon the lower lid, whereas there is no such thing in nature. It is said that when Le Brun was going to paint the battles of Alexander, he sent as far as Aleppo for the exact shape and size of the horses of the country.

In representing the gods, all signs of mortality and decay were studiously avoided,—for instance, a grey beard; this, perhaps, is the reason that in the fine statues of the heathen deities the veins are never marked.

The first who united erudition with painting was Pamphilus. He confined himself to mathematics, and more especially to arithmetic and geometry; maintaining strongly, that without their aid it was impossible to carry painting to its perfection. Protogenes was very exact in his representations, and copied nature with the greatest nicety, and this was blamed as a fault by Apelles. In the Temple of Peace was placed the most valued of all the works of Protogenes, *id est*, the hunter Jalysus with his dogs and game. What was most admired in this piece was the froth at the dog's mouth; the fall of the sponge upon the picture accidentally producing in the most natural manner the froth of the dog.

In more recent times accidental causes have produced successful effects. Sir Joshua Reynolds once put a portrait of a young lady to dry by the fire; some soot fell down and covered all her neck. Sir Joshua snatched up the picture, and, saying it would make a capital half-tint, rubbed the whole into the neck and made a beautiful colour. The vitality ever constant in the works of nature, and perceived by an educated eye, was first exhibited by Aristides, a contemporary of Apelles. He established unerring rules for expressing the soul, that is to say, the inmost workings of the mind. He excelled as well in the strong and vehement, as in the soft and tender passions; but his colouring was harsh and severe. Another of nature's disciples was Arellius, a renowned painter; Pliny says he loved a life to be painting of goddesses, and those were ever drawn by the pattern of his sweethearts whom he courted.

The first painter of his age who threw off the trammels of Byzantine art, and "held, as it were, the mirror up to nature," was Giotto. Then, also, did architecture struggle as it were from the Byzantine into the Gothic forms, "like a mighty plant putting forth its rich foliage and shooting up towards heaven." For the stiff, wooden limbs, long lean fingers, and motionless figures of the Byzantine school, Giotto substituted life, movement, and the *look*, at least, of flexibility. From the beginning of his career he not only deviated from the practice of the older painters, but stood opposed to them. He not only improved, he changed; he placed himself on wholly new ground. He took up those principles which Nicolo Pisano had applied to sculpture, and went to the same sources, to nature, and to those remains of pure antique art which showed him how to look at nature. Even in sculpture a drapery is not estimable, unless its folds are contrived to indicate the *parts* and *articulations* of the *body* it covers.

The first academy of design was established at Florence in 1350, and at the close of the same century sculpture was once more firmly established throughout Italy, and its itinerant sculptors, not unskilful in their art, wandered from thence over Germany, France, and even England, where their works have been traced in the sculptured ornaments of Gothic edifices.

The labours of the fifteenth century in all the elegant arts will ever hold a distinguished place in history. Respecting this age, it has been justly said that modern sculpture attained its culminating point. A character of truth and simplicity, faithful imitation of nature, and just expression, visibly begin from the time of Nicolo Pisano, whose own style was remarkable for sweetness and absence of pretension. In the succeeding century the style becomes more elevated but not less true; the execution at the same time is bold and felicitous, and the imitation is faithful to nature.

Anatomy is indispensable to the sculptor and painter Leonardo da Vinci exhibited great anatomical knowledge in his model of the grand statue of Francesco Sforza; this was considered a masterpiece, although never finished. Some years afterwards, when Milan was invaded by the French, it was used as a target by the Gascon bowmen, and completely destroyed. The profound anatomical studies which Leonardo made for this work still exist. Dr. Hunter described his anatomical drawings as the most wonderful things of the kind, for accuracy and beauty, that he ever beheld. In the Royal library at Windsor there are three volumes of MSS. and drawings, containing a vast variety of subjects,—portraits, heads, groups, and single figures; fine anatomical studies of horses; a battle of elephants, full of spirit; beautiful and accurate drawings of plants and rocks, to be introduced into his pictures.

Michelangelo in designing, avoided all superfluity of ornament, and studied philosophically the perfect constitution and disposition of natural bodies; he restricted himself to the simple reality of his thought. Michelangelo had many rivals; but his greatest enemy was a stern inflexible temper, which caused him much trouble, and even personal injury, his nose being flattened to his face by Torregiano, a fellow pupil. In the representation of the "Last Judgment," on the wall of the upper end of the Sistine Chapel, in the Vatican at Rome, he has placed in the centre the figure of the Messiah pronouncing the sentence of condemnation,—"Depart from me, ye accursed, into everlasting fire," the figure, expression, and attitude, are all vulgar; "there are profaneness and vulgarity both in representing the merciful Redeemer of mankind, even when he comes to judgment, as inspired merely by wrath and vengeance, as a thickset athleta, who, with a gesture of sullen anger, is about to punish the wicked with his fist. Michelangelo devoted his whole attention to the definition of form, and the expression of life and power through action and movement; he regarded the illusive effects of painting as meretricious and beneath his notice, and despised oil painting as a style for women and children. He, however, did not improve upon Nature, and

always exhibited her vulgarly in her wildest movements; wonderful as his talents were, they were misapplied, through not possessing either taste or sentiment, as evinced in his picture of the "Last Judgment."

Titian was pre-eminently the painter of nature; but to him nature was clothed in a perpetual garb of beauty, or, rather, to him nature and beauty were one. Andrea Vesalio, who has been called the father of anatomical science, the particular friend of Titian, was his instructor in anatomy. He was falsely accused of putting a man to death for anatomical purposes, and condemned. We are told that with an instinctive feeling, prophetic of his future excellence as a colourist, he used the expressed juice of certain flowers to paint a figure of a Madonna. It was Bartolomeo's opinion that every object should be painted, if possible, from nature; and for the better study and arrangement of the drapery, he invented those wooden figures with joints, called lay figures, which are now to be found in the studio of every painter, and which have been of incalculable service in art. Rubens had recourse to living models for those hunting-pieces, and other representations of savage animals, which have never been surpassed. He painted several lion and tiger hunts, and similar works, entirely with his own hand, which he did not permit to be seen until they were completed. He painted everything from nature, and painted horses often,—he had some of the finest breed in his stables. It has been suggested that Rubens might have soared higher if, instead of copying the corrupt and degenerate taste of the Italians, he had chosen to form himself on the model of his native Netherlands,—on Van Eyck, for example, so rich in art, yet true to nature, with others equal to him in genius.

From 1540 to 1590 the Venetians were the only painters worthy of the name in Italy. This arose from the elementary principle early infused into the Venetian artists,—the principle of looking to Nature, and imitating her, instead of imitating others and one another. Thus, as every man who looks to Nature looks at her through his own eyes, a certain degree of individuality was retained even in the decline of the art.

Claude was a diligent observer of nature. Rome, and its environs, the banks of the Tiber, and the broad Campagna, supplied his imagination with the best food, and his pencil with inexhaustible materials. He was accustomed to spend whole days in the open air, not only studying nature in her permanent aspects, but making memorandums of every accidental and fleeting effect which presented itself to his observation; he entered minutely into detail, and made drawings of trees, shrubs, and herbage, marking all their peculiarities of shape, growth, and foliage. Rembrandt was another of nature's scholars, in drawing any object which caught his notice. Nature was his preceptress, and his academy was his father's mill. There he found those unique effects of light and shadow which distinguish his pictures from all others. Descamps says that he owed his genius to nature and instinct alone.

Bernard Lamy, in 1702, says, "Could a painter be excellent if he knew not a man? I mean the outside of a human body, and what may appear on that outside; the veins, the muscles, and the tendons; he ought, therefore, to be perfectly well acquainted with the anatomy of the outside of a human body. Those who apply themselves to the painting of beasts ought to make the same inquiry. To paint a horse well it is convenient to know the anatomy and most esteemed proportion of his parts."

Gainsborough, also, among others, had a habit of continually remarking to those who happened to be about him, whatever peculiarity of countenance, whatever accidental combination of figure, or happy effects of light and shadow, occurred in prospects, in the sky, in walking the streets, or in company. If in his walks he found a character that he liked, and whose attendance was to be obtained, he ordered him to his house; and from the fields he brought into his painting-room stumps of trees, weeds, and animals of various kinds; and designed them, not from memory, but immediately from the objects. He even formed a kind of model of landscapes on his table, composed of broken stones, dried herbs, and pieces of looking-glass, which were magnified and improved into rocks, trees, and water.

Canova's profession constantly engaged his thoughts. He sought the living schools of nature in the public amusements of spectacles and theatres. Whatever was interesting in expression or striking in attitude occurred on those occasions was retained as an unerring precept in guiding his future practice. Even in walking the streets he used to stop before the workshop of some artisan to remark the forceful, yet easy, positions into which the body was thrown in different occupations, admire the well-formed trunk or sinewy limbs of a porter in powerful exertion at a wharf. Canova was wont to remark, "Our thoughts may be expressed in various ways. One speaks; another writes. I also have my peculiar mode; in my chisel I find words and letters." To retain with precision appearances thus hastily caught, for future study, requires a quick and energetic apprehension of material beauty, and a ready fidelity of hand in describing its contours. And although an artist cannot at all times and in all places paint or draw, yet the mind can prepare itself by laying up proper materials at all times and in all places.

The secret of the sculptor's art is not to be found in books and public lectures, but in the science of anatomy. Correggio studied anatomy under Lombardi, a famous physician of his time. To attain fidelity, Canova is said to have made repeated studies from nature, so much so that in sculpturing his Theseus he pressed a living horse to the ground by external violence.

In the remains of the later and better eras of Grecian taste, the Graces are represented without drapery, thus indicating the true source of grace in the absence of art, and in the ingenuousness of nature; not

> "Like painters, thus unskill'd to trace,
> The naked nature and the living grace,
> With gold and jewels cover ev'ry part,
> And hide with ornaments their want of art."

The union of material beauty with intellectual elevation constitutes the true ideal of Grecian sculpture. In the masterpieces of antiquity, the scattered perfections of living nature are combined in one harmonious whole. Works of merit are produced by a laborious and accurate investigation of nature, upon the principles observed by the Greeks—first, to make themselves thoroughly acquainted with the common works of nature, and then, by selecting and combining, to form compositions according to their own elevated conceptions.

One of the principal objects of the present paper is to distinguish the excellence of the fine arts, from the *abuse* which sculptors and painters have made of it. Sculptors and painters have often had great disputes among themselves upon the pre-eminence of their several professions; the first founding their preference upon the duration of their works, and the latter opposing them with the effects of the mixture and vivacity of colours. It is painful to contemplate the perishable nature of the productions of the painter's genius.

Poetical works and MSS. are not liable to the many accidents of fire and water, the weather, or damp walls, to which paintings are particularly subject. Apelles would not draw any pieces but what were portable and removable; and Pliny says that Protogenes used to work in a little cell in his garden, at a distance from his house, that his works might be exempt from such calamities. Leonardo's picture of the "Last Supper of Christ and his Disciples" was so defaced by time and the weather that much of it has been repainted.

Painting is said to have been too soon abandoned to the caprice of private patronage and judgment, and could never compete with sculpture, whose labours were publicly dedicated to the renown of the good, the learned, and the brave. One hundred and sixty-nine sculptors are mentioned by Pausanias, while he has only recorded the names of fifteen painters; and after three centuries of spoliation he found in Greece 3,000 statues, not one of them a copy, while he describes only 131 paintings.

In treating of the living schools of nature, which consist in representing what is agreeable to truth, and opposed to the vicious and blameable licences of painters in general, too much attention cannot be directed to the inexcusable liberties they have taken; such as uniting things that are repugnant and contradictory to each other, entirely inconsistent and incompatible, coupling wild and tame creatures together:—

> "Painters and poets our indulgence claim,
> Their daring equal, and their art the same,
> I own th' indulgence—such I give and take;
> But not through nature's sacred rules to break,
> Monstrous to mix the cruel and the kind,
> Serpents with birds, and lambs with tigers join'd."
> *Horace.*

Also introducing in the same picture persons who never existed together, or jumbling and confounding the fashions of different nations. Learned men and judges require a greater exactness of conformity with truth. Longinus says that the excellency of a painter consists in representing what is agreeable to truth. Vitruvius's opinion is that no painting ought to be approved of that doth not agree with it. Some have carried the matter so far as to assert that even beauty, which is so essential a part in a picture, ought to give place to probability and truth. This Philostratus illustrates by the horses of Amphiaraus, which appeared covered over with dust and sweat. They would have been much finer, saith he, without this dust and sweat, but not so agreeable to truth. Purity and simplicity of design disappear in proportion as grandeur and novelty are pursued. Every deviation from nature and from simplicity is exaggerated in the sculpture of the seventeenth century, the grandeur of preceding art was lost in the prettinesses of affectation, and nobleness and strength in forced attitude and unideal expression.

A great part of every artist's life must be employed in collecting materials for the exercise of genius. Invention is little more than a new combination of those images which have been previously gathered and deposited in the memory.

> "Those rules of old discover'd, not devised,
> Are nature still, but nature methodised;
> Nature, like liberty, is but restrain'd
> By the same laws which first herself ordain'd."

He who has laid up no materials can produce no combinations. An artist who has his mind filled with ideas, and his hand made expert with practice, works with ease and readiness. Excellence is attained by laborious efforts. "The steep where Fame's proud temple shines afar" is not to be gained at a bound. All artists have to study the antique as well as nature, but the living school must be sought in the latter, which makes no summer of another's green, and robs no old to dress her beauty new.

Finally, the establishment of a philosophical school of painting would be a great boon to society, and institutions generally. The students should be well instructed in anatomy, mathematics, geometry, and perspective, and taught to improve upon and perfect Nature, and not to vulgarise and distort her. Truthful painting would immortalise history, and tend to facilitate education; religion might be treated in a more reverential manner, and our cathedrals, churches, and art galleries rendered more instructive to the people by portraying the memorable events in Scripture history in a simple and truthful manner, instead of creating vulgar sensational paintings of popes, prostitutes, and pagan deities.

True religion abhors all licentious sculptures and paintings.

> "Woe to the man! whose vicious pencil taught
> In grateful tints to urge a guilty thought:
> Our fathers' homes ne'er own'd these noxious arts;
> No crimes were painted on their walls or hearts."

THE ENGINEERS AND THEIR FRIENDS.

If the engineering profession is the one which, as we think may be fairly said, has done the greatest practical work of any profession in the present century, it has also been exceptionally fortunate in receiving cordial recognition of its labours. At the annual dinner of the Institution of Civil Engineers last week the laudatory tone of the speeches, coming from highly influential quarters, was, even with due allowance for post-prandial conditions, somewhat remarkable. The two most eminent Liberal statesmen among Lords and Commons respectively vied with each other in their description of the triumphs of the profession, and the exceeding value of its achievements; the Minister for the United States told how in the country which he represented 80,000 miles of railway had in half a century been constructed at a cost equal to our national debt; the Prince Imperial, responding for the visitors, reminded the meeting that the late Emperor of the French had been a member of the Institution, and taken part in its debates; and Mr. Lowe, in half apologising for the somewhat extravagant terms in which he had on one occasion lauded the engineers, practically repeated his offering of incense on their altar. Mr. Lowe's speech is the only one with which we have the slightest fault to find. He has been pleased to take the engineers under the wing of his somewhat petulant and capricious patronage, and to attri-

bute to them every virtue under heaven, probably not so entirely from admiration for them as from dislike of everything that is poetic or sentimental, of which they are supposed (perhaps with rather too good reason) to be the opposite pole. In his ardour Mr. Lowe forgot, in fact, that there are even any other scientific men in the world than engineers. He spoke, and spoke well, and with point, of the glorious mission of making nature subservient to the benefit of mankind instead of engaging in fratricidal contests,—of the "holier warfare" which we carry on against the powers of nature in wringing from them that which they never refuse if properly pressed; but his assumption that the engineering profession first taught us this is so absolutely absurd that the more thoughtful and moderate among its members might well desire to be saved from their too enthusiastic friend. For our own part, we had really imagined that there had been such a thing as literature,—that the invention of printing, among others, had played a part in substituting peaceful for warlike honours;* we had imagined that there had been astronomers, geologists, physicists, students of natural forces, who had suggested to us a higher aim than fighting; we might even be pardoned (except by Mr. Lowe) for supposing that the type of thing called "art" had not been without its influence in ameliorating human nature, and that even that branch of it known as architecture was of some importance in rendering life pleasanter and happier. However, Mr. Lowe says the engineers have done it all. If so, they doubtless deserve all that even his eloquence can say for them.

Coming down from hyperbole to fact, however, the great and deserved influence and credit enjoyed by the engineering profession in the present day is partly to be explained from a point of view which some, both of the speeches and the speakers at their dinner last week, suggest. If engineering does not exactly, in Bacon's phrase, "come home to men's business and bosoms," it at least fulfils the first half of the phrase,—it comes home to the business feelings of most men in some way or other. In saying so we are not for a moment overlooking the great abstract interest, in a scientific and even to some extent also in a poetic sense, of the problems with which engineering deals, and the methods by which they are surmounted: indeed, so far from overlooking these, we have always urged the great interest from even a general point of view, of engineering work, and have in some special cases done all in our power to defend its professors against the far too sweeping and often unreasonable charges made against them of spoiling the picturesque of nature with their works. Indeed, we are distinctly of opinion that persons who talk thus of engineering, and regard engineering works as mere nuisances, perhaps necessary but always odious, show themselves to be, *ipso facto*, a narrow-minded and imperfectly-educated set of people. But in general the interest in the profession on the part of outsiders is a practical one, founded on their commercial sense. The relevancy of this way of putting it in regard to the speech of the noble Earl at the head of "her Majesty's Opposition" is probably well understood by many of our readers, in spite of Earl Granville's entirely light and sportive manner of dealing with the subject *en amateur* at the dinner. But Mr. Gladstone made no scruple of bringing his practical motives ostentatiously to the front. Referring incidentally to the Channel Tunnel project, he asked, not unreasonably, why such a great undertaking had not been made the subject of experiment on a smaller scale in tunnelling under some of the large rivers and estuaries of England, and thus forming direct routes of communication of this kind the possibility of which, both in an engineering and a financial point of view, would be much less doubtful, and the practical benefit much more certain, immediate, and tangible. Coming more completely to the point, Mr. Gladstone put himself forward as a suppliant to the profession, as a person connected by interest and property with North Wales, and said, "We want you to connect us with Liverpool as our capital. North Wales has got minerals in abundance, but it does not raise food enough for its own population. We are exporting stone, slate, iron, coal, clay, and articles of various descriptions. Such is our capacity for exporting, that if you only come there you may in time export the whole of North Wales. Do not compel us to send these things round twenty or thirty miles, and you will establish a claim to be remembered in the hearts of the Welsh people, who, I assure you, are most grateful." And he further observed that 5,000,000*l.* had been expended in connecting the docks of Birkenhead with Liverpool (by a circuitous route crossing the Mersey a good many miles higher up); but if there were a tunnel, the docks of Birkenhead would be the docks of Liverpool. As to this particular scheme, plans have been made for it more than once, we believe, but we imagine engineers have not been able to persuade capitalists of the probable success of the undertaking as an engineering scheme, or it would surely have been done before now: its financial success would not admit of a doubt; indeed, there is perhaps hardly any one engineering scheme which could be proposed in England at this moment which would have, in proportion to the extent of the work done, so large an influence over business and value both of land and of products. In that respect it is a very good instance of what it is which makes the engineering profession of such peculiar interest, among scientific professions, to the average practical Englishman.

The scale on which the engineers' entertainment is given, and the publicity which attaches to it, are not without suggestion to the architectural profession. The Institute of Architects can at present hardly feel strong enough to do that kind of thing on the same scale, and in such a way as to compel so much public attention. One reason is, that the engineers are unquestionably a much wealthier and better-paid profession than the architectural, which, perhaps, cannot be helped; but another difference is, that they obviously pull together much more closely and generally than the architects do; and that we can help, or some of us can. The Institution of Civil Engineers is, in short, much more really a representative body of that profession than the other Institute in Conduit-street is of the architects: which is the fault, not of the Institute of Architects, which has (lately especially) been doing all that it well could do to improve and render complete its organisation, but of the large proportion of the profession who stand aloof from indifference, party spirit, and want of *esprit de corps*. If the architects would combine more heartily to strengthen the hands of the central organisation, they might have the satisfaction and advantage of seeing the profession able to take its stand as well before the public on public occasions as the Institution of Civil Engineers unquestionably does.

There is, however, another kind of public interest apart from dinner-giving and speech-making, which architecture certainly does seem to excite, though it is usually of a less demonstrative kind. The amount of interest felt in architecture as a matter of historic study and artistic interest, among the less merely practical and more cultivated section of English people, is probably much larger and more extended than is generally supposed. We were led to this reflection by an occasion of recent interest, the funeral of Sir Gilbert Scott last week. The crowd which this sad ceremonial drew, and the evidence of respect and interest in the dress and demeanour of so many persons, obviously belonging to the upper section of society, may have been a surprise even to those who knew how large was the late architect's connexion. And we may perhaps be pardoned for the reflection, as a set-off to Mr. Lowe's rather ill-judged adulation of his pet profession, that after all the hard things that Parliament and newspapers are so fond of venting (with more ill-nature than knowledge) against architects, it is perfectly certain that not a single engineer now exists in England whose death would produce the effect on the public mind which that of Scott did, or whose funeral obsequies would draw such a retinue.

"**Bricklayers' Technical Education Classes.**"—At the committee meeting of these classes, held at 5, Great Queen-street, Westminster, on Monday evening last, Mr. Frank E. Thicke in the chair, it was resolved that the second annual examination should be held on the 30th inst., and that a fortnight afterwards the President of the Royal Institute of British Architects should be again requested to distribute the prizes. Amongst recent contributions to the classes is that of the Fishmongers' Company, 21*l.*

* In accordance with Quevedo's celebrated *mot*, that "ever since so much lead had been wanted for type, there had been much less to spare for bullets."

ON OBELISKS: THEIR PURPOSE, PROPORTIONS, MATERIAL, AND POSITION.*

The generous patriotism of Mr. Erasmus Wilson, and the skill of Mr. John Dixon, C.E., have triumphed over the half a century of England's indifference, and now the monolith of Alexandria is in the Thames only awaiting, after much discussion and difference of opinion as to its proper site, to be erected in the very centre of our metropolis as an evidence of the grand ideas of the ancient Egyptians in regard to monumental art. Considering how intimately obelisks are connected with our pursuit, I have felt that it would hardly become our Institute if such an historical fact were unnoticed in our annals, and if some attempt, however brief, were not made by us to get together the leading points connected with the general subject of obelisks, their purpose, proportions, material, and position, treated from a strictly architectural point of view, without encumbering ourselves with the questions relating to precise dates, or intricate calculations of dynasties, or to hieroglyphics.

They are the most simple monuments of Egyptian architecture, and among the most interesting that antiquity has transmitted to us, from the remoteness of their origin and the doubt in which we still are as to the period when first set up. The oldest, which now remains to us, is still standing at Heliopolis, near Cairo,—the On Ramses or Beth-Shemesh of the Hebrew Scriptures. Abraham was unborn, the Pentateuch of Moses was not written, when the inhabitant of Heliopolis adored his gods in the Temple of the Sun, and read upon the obelisk, still in its place, the name of Harmachis and that of King Osirtesen, who then reigned and reared it, and to whom Mariette Bey assigns the date of 2851 years before Christ. He was a powerful Pharaoh, whom eleven royal dynasties had preceded, and who was followed by twelve more, when Alexander the Great, about 380 B.C., came to consult the oracle of Ammon, and to found at Alexandria, the capital of his future Egyptian empire. They are supposed to have been principally dedicated to the sun-god Horus, of whom the hawk was a symbol, on account of the elevation to which this bird extended his flight, and of the faculty, which the ancients considered it to have, of looking at the sun with a steady gaze.

Obelisks have been, from the earliest periods of antiquity, regarded as remarkable monuments of the skill and perseverance of remote ages. They must ever be considered as valuable records of the ancient history of the Egyptians and of the skill of those periods; monumental evidences of their sovereigns and of their warlike exploits. Extracted with vast labour from their quarries as monoliths, conveyed six or seven hundred miles down the Nile, and erected with difficulty in front of their temples, they are emblems of the perseverance and love of glory of the Egyptians or their rulers. Overthrown by earthquakes or the violence of conquerors, buried in the sands, or encumbered by the enormous blocks of stone piled up to great heights, the city of Thebes, even in its dilapidated state at the present day, is the marvel of the traveller for the extent and dimensions of its ruins. The ancient city, divided in its middle by the Nile, as London is by the Thames, presents two gigantic towns with remains of immense temples, which in all their accompaniments and parts are colossal, whether in the dromoi or avenues leading up to their entrance portals, their statues, their courts, and colonnades, in the hypostyle halls, and last, though not least, as objects of wonder, in their stupendous obelisks. These were lofty pillars of granite set up by the kings in front of their temples, to commemorate their victories and record their various names and titles. I am not aware that they have as yet been found in front of tombs, as suggested by Mr. Basil Henry Cooper, in his learned paper recently read before the Society of Arts. They were monoliths consisting of a square shaft gradually diminishing towards its summit up to about nine diameters high, where the faces suddenly receded up to a point, their upper portion being called a pyramidion, from the similarity of its general form to that of a pyramid, though much more rapidly sloping. I have said receding up to a

* From a paper by Professor Donaldson, past-president of the Royal Institute of British Architects, read before the Institute on Monday evening last, as elsewhere mentioned.

point, but the fact is, that there is authority for assuming that sometimes the pyramidion had a seated figure on its top.

The Egyptians set great value upon the size of their monoliths, and if a large block were extracted from a quarry not quite corresponding in all its sides, whether as to size or form, they would without scruple use it for their immediate purpose, or shape it as near as possible to the object they had in view, without diminishing its size. The consequence is that many of their obelisks, pedestals, and sarcophagi even, where one would have supposed the most scrupulous attention to uniformity should have existed, are irregular in shape. In like manner some of the huge blocks intended for obelisks came out of the quarries mis-shapen at the smaller end, and to remedy this defect they covered it with a metal capping of the required shape rather than reduce its length by cutting off the rugged portion.

The summit of the Parisian obelisk was irregular in shape, and left quite rough. There was at the bottom of the pyramidion a channel and fillet, then a surface setting back, and the granite presenting an uneven face. It was in the same state previously to its being lowered by the French. There must have been something to cover this unsightly appearance. Our obelisk has an inscription, translated by M. Chabas from the transcript of Burton's "Excerpta Hieroglyphica," pl. 51. In it is the following line:—

"He erected two very great obelisks capped with gold."

Mariette Bay mentions that round the lowest part of the obelisk of Hatasou runs an inscription in horizontal lines covering the whole of its four sides, which states that the summit of the obelisk was covered over with pure gold, taken from the chiefs of the nation; and he observes that, unless this expression simply implies an apex overlaid with a casing of gilded copper, as the top of the obelisk must have been, this inscription possibly refers to the sphere of gold (?) which is represented on certain bas-reliefs at Sakkarah. He further says: "The obelisk was no doubt gilded from top to bottom." In examining closely, one may notice that the hieroglyphs were carefully polished, and, moreover, that the plain surface of the monument was left comparatively rugged, from which it may be inferred that it had been covered with a coating of white stucco, as so many Egyptian monuments were, which alone received this costly embellishment of gilding, the hieroglyphs themselves retaining the original colour and actual surface of granite. Dr. Birch mentions that the tombs in the Libyan range behind Gournah and El-Assasif "are full of scenes of the reign of Thothmes. Two great obelisks of 188 cubits high, with gilded tops, are recorded in these sepulchres." Mariette Bey also says that "the inscription further states that the two granite obelisks of Heliopolis were actually completed and erected in seven months from the very beginning, when first extracted from the quarry in the mountain." This use of bronze caps seems to justify the practice in modern times, as the ancient Romans possibly adopted in certain cases the same practice; and this has been handed down traditionally to our period.

When the pyramidion was perfect in its shape, and required no artificial capping, it was sculptured in sunk relief, with a representation, as on the Alnwick obelisk, of the god to whom the monument was dedicated, before whom was the king kneeling and presenting his offering, or by a group consisting principally of a sphinx on a pedestal in front of a deity seated on a throne. A very fine example of the apex of an obelisk, at Karnak, is to be seen in the full-sized cast of one side of a pyramidion, on the landing at the top of the staircase leading to the Egyptian Room, in the upper gallery of the British Museum. Imposing from its size and execution, it shows the bold depth of the hieroglyphs and rounded surface of the sunk character, polished, as Mr. Erasmus Wilson suggests, like the delicate carving of a gem.

The next division of our subject relates to the shaft of the obelisk. The sides were not always equal in their width, varying a few inches. In the exceptional instance of the obelisk of Biggeg or Crocodilopolis in the Fayoum, called by Mr. W. R. Cooper, in his able book on this subject, an obeliscoid monolith, the faces are 6 ft. 9 in. broad, the sides only 4 ft. thick. Our London obelisk is at the base 7 ft. 10·3 in. by 7 ft. 8 in.; at the summit, 5 ft. 1·3 in. by 4 ft. 10·25 in.,—an inappreciable difference. The four sides or faces of obelisks were usually square, but occasionally they are convex; a fact proving the nice perception for effect, which prevailed in the minds of the ancient Egyptians, as thus the light was much softer upon the surface, the shade less crude, and the angles less cutting. Whether there is in any an entasis in the upright line has not yet been precisely ascertained, but perhaps this fact may now be set at rest in respect of our Alexandrian obelisk. Usually obelisks had one, two, or three vertical lines of hieroglyphs. Originally it may be assumed that only one central series was contemplated by the original Pharaoh; but it appears that his son, successor, or successors, added a line on each side; and it is remarkable that earlier hieroglyphs were much deeper cut than the more recent ones. Occasionally some of the hieroglyphs have been altered or erased, more or less deeply cut, and the names of other gods or Pharaohs have been substituted, like the inscriptions upon some of the Roman triumphal arches. I just now noticed the mention made by Mariette Bey of the faces of obelisks having been gilt, the hieroglyphs themselves retaining their original colour and actual surface of granite. It is not impossible that occasionally the hollows of the hieroglyphs may have been filled in with some coloured substance, in like manner as we see on the frescoes the hieroglyphs painted in different colours, like those preserved in the Egyptian Hall of the British Museum. These inscriptions are generally trivial and meaningless, recording little more than the names and patronymics of the king, his relationship to the gods, and list of his virtues, and of the peoples he may have subdued in battle; sometimes with maxims and blessings of the gods.

We have now to consider the dies, pedestals, and steps upon which the obelisks were anciently raised. On this subject we have very little reliable information, for the bottom portions of those now left standing in Egypt are encumbered and surrounded by huge fallen blocks of stone, preventing their full size from being ascertained; and on those transported to Constantinople, or Rome, or elsewhere, from their original sites, no reliance can be placed. Our late friend, Mr. Joseph Bonomi, may be considered a great veteran authority on the subject of obelisks, as he made it a special object of study when in Egypt and in Rome; and there is a very complete enumeration and analysis of existing monoliths by him in vol. i. of the Second Series of the Transactions of the Royal Society of Literature, 1843, and a description of the Alnwick Obelisk, p. 170 of the same volume. By his liberality the Institute possesses two fine models of obelisks at Karnac and Luxor. In a private letter to myself he says that he had seen the upper part of the block of granite on which that of Karnak stands—"It is cubical; on two sides the surface is vertical, on the two other sides the surface inclines very much, but the exact angle I do not know, nor do I know how high the block is, for the lower part is encumbered by large masses of stone." The model was made for the late Duke of Northumberland (Algernon Percy). This divergence of the faces of the die is a remarkable confirmation of my previous remark as to the irregularities existing in large blocks of granite, from the desire of the Egyptians to retain, as far as possible, the cubical mass entire. Mr. Bonomi concludes his note by stating that he had measured and drawn the base of the obelisk at Luxor; that it was composed of several pieces of granite, and on the north and south sides had four statues of monkeys cut out of two or three blocks of granite in *alto relievo*. On the east and west sides are sculptured in Egyptian *cavo relievo* (hieroglyphs) figures of Nilus bringing in the productions of the country. This extraordinary mode of embellishing the pedestals of obelisks seems almost incredible, were it not for this instance, which is illustrated and detailed by M. Le Bas, the engineer, who transported the Luxor obelisk to Paris, where, however, the original pedestal forms no part of the present composition in the Place de la Concorde. This obelisk, as described by M. Le Bas, deserves our special notice, on account of its individual peculiarities.

Ramses II., whose reign began 1388 B.C., extracted the monoliths from the quarries of Syene, and transported them to Thebes, and partly incised the hieroglyphs of the middle column. His brother and successor, Sesostris, whose reign began 1328 B.C., completed the inscriptions. It thus appears that the hieroglyphs were executed before the erection; for Ramses II. set up the obelisks 1388 B.C., and had his name engraved on the base as an historical record. The total height of the shaft is 75 ft., at its base, 8 ft. wide, with an average of 5 ft. in width. In its elevation the opposite faces in their height have a different curvature,—on the one side being convex and the other concave, to the extent of about a couple of inches, an imperceptible difference from a straight line; but it is remarkable that the two obelisks coincide in this detail. I imagine that the first block must have been irregularly marked out and worked, and the second one compelled to follow the faulty line in the quarry. The pedestal of each obelisk is composed of two distinct parts, its base and its die. The base or plinth resting on the pavement consists of three horizontal blocks of three courses of sandstone; the central die is a granite monolith, supporting the weight of the obelisk, and has on two of its sides four projecting monkeys in high relief, the other sides being plain, with the exception of incised hieroglyphs. One side of the die with four of the monkey figures was a slab-facing of the die, and it consequently did not contribute to its solidity. The entire monument was erected on a grey stone paving, and was sunk into the paving-blocks a few inches. Such is the very remarkable construction and decoration of these, I presume, very exceptional instances. As to the pedestals of the obelisks, we may infer that in other cases the monoliths rested on one or more steps, and that they did not rise at once without any superstructure or plinth from the level of the pavement. Sometimes bronze balls or other supports at the angles raised the monolith a few inches above the slab or block beneath. Mr. Dixon discovered an inscription engraved in Greek and Latin on the bronze crabs supporting the standing obelisk of Alexandria, having the words "Anno VIII. Cæsaris, Barbarus Præfectus Ægypti posuit; Architectore Pontio" (see Erasmus Wilson's "Cleopatra's Needle," p. 11). This explains the reason why some of the obelisks at Rome have the like angular supports.

The erections on the banks of the Nile were constructed of the sand and limestones extracted from the quarries near. The pink granite was only used for the obelisks, statues, sarcophagi, casings of the pyramids, sanctuaries in temples, and linings of some special tombs, and for other precious or sacred purposes. The position of the quarries of Syene must have been of the utmost importance in facilitating the application of that fine material. Situated below the rapids, or, as they are generally called, the cataracts, —when once the masses were extracted from their beds, no obstruction presented itself in their course down the river to their destination, whether to Memphis, Heliopolis, or the Delta. Mr. W. R. Cooper states that twenty-seven of the forty-two obelisks now known were from Syene, and they are doubtless the largest. An unextracted block still remains at Syene, 95 ft. long by a diameter of 11 ft., with the quarrymen's marks upon it. Sir Gardner Wilkinson mentions that the final operation of extraction, when three sides of a mass had been worked round, was by cutting a groove or channel about 2 in. in depth, and kindling a fire along its whole length. When the stone was intensely heated, cold water was poured into the groove, and the block detached itself with a clear fracture. Wedges of wood were also inserted, saturated with water, then exposed to heat, and the expansion rent the mass asunder. Thus detached, it was drawn down to the river, where it was encased, or upon a galley or raft floated down the Nile to near the spot where it was ultimately to be set up. From the river-bank it was hauled to the propylæ in front of which it was to be erected. We have no hieroglyphs or painting on the walls of the pyla or tombs showing how the obelisks were raised and placed in their final position. That the erection of the monolith on its pedestal was a most critical operation is sufficiently obvious, and its difficulty is illustrated by an anecdote related by Pliny:—Ramses erected an obelisk 140 cubits high and of prodigious thickness. It is said 120,000 men were employed on the work. To ensure the safety of the operation by the extremest skill of the architect, he had his own son fastened to the summit while it was raised. On a small illustration before you there is represented a mural painting in a hypogee, or underground tomb, at Gournah, with three men polishing a column of no great size; but that may be conventional. The column rests on blocks; the

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polishers are astride, or seated on the column, with rubbers rubbing the surface. Another, from the same tomb, shows a colossal upright figure surrounded by scaffold-poles; five artisans are chiselling, rubbing, and polishing the surface. Another small illustration represents a mason carving a many-coloured sphinx; he is chiselling the paw of the animal; he has a wooden mallet in his right hand, and in his left a steel chisel, unmistakably indicated by the deep blue colour of the tool. We know not whether emery or what other powder was used by the polisher.

I have not yet alluded to the masons' and carvers' operations of cutting the hard materials used in their obelisks, statues, sarcophagi, &c., such as the pink and black granite, black marble, basalt, &c. Hardly any iron tools have been preserved among the relics of the tombs. With what materials did the ancient Egyptians carve with such refined delicacy and exquisite sharpness the mouth, eyes, and other features of their statues, or what Mr. Erasmus Wilson calls the gem-like surfaces of the *in cavo relievo* of the hieroglyphs? I do not know that we are possessed of any process by which brass may be sufficiently hardened for the purpose, and we have not specimens enough which have survived the oxidation of the iron to satisfy us on the point as to that material. Could they prepare and soften the surface by some chemical application on the harder elements of their hard stones? No one as yet has been able to inform us; but the secret mystery of the execution of the Egyptian sculpture still evokes our wonder and admiration of their skill. Our own granite merchants have achieved wonders, by means of steam machinery, in working out by rotary motion the shafts and bases and caps of certain columns and circular pedestals; but the refined sharpness of the lips, eyebrows, and other delicate features of the Egyptian heads, as they appear even upon the lids of the sarcophagi or the busts in the British Museum, has yet to be attained.

I have before observed that the Egyptians were less careful as regards any fixed proportions of their monoliths, but were more anxious to use up the blocks as they came from the quarry, whether as to the height or uniformity of shape. The sides of an obelisk rarely corresponded exactly to the breadth of its face, or the height of the shaft to any fixed relation with the width at the base; and there is a like disregard in the height of the pyramidion, which, however, was high-peaked, and never stunted. Nevertheless, we may generally assume that the shaft varied from eight to nine diameters high up to the pyramidion, which was from sixty to seventy-five hundreds of the breadth at the base. Too few of the pedestals, plinths, or steps have been ascertained or measured to afford any general law of proportion, whether as to their breadth or height.

The positions of obelisks were before the gigantic pylons, which formed the entrance gateways to the forecourts of their temples, and they were, I think, without exception, always in pairs. At Karnak the situation of the two lofty ones erected by Queen Hatasou (one of which still stands, and is, according to Mariette Bey, 108 ft. 6 in. high, the loftiest one known) was between two lofty pylons only 40 ft. or 50 ft. apart! Those in front of the outer pylon are not so distant in advance of it. Consequently the Egyptians disregarded the immediate proximity of a lofty wall backing them up, and none are known situate in wide open spaces. I have grouped together in a drawing the various objects which occupied the approaches to the temples and formed an assemblage that was calculated to impress with awe the dignity of the fane of their god. The sacred way led up from the river flanked, on each side with variously headed sphinxes. At Karnak the dromos is one mile and one-third long, with a line of sphinxes on each side. Approaching nearer, the worshipper finds two obelisks on the right and left, not necessarily of the same height. At Luxor one is 7 ft. or 8 ft. higher than the other, and to diminish the appearance of disparity in size, the shorter one is raised on a lofty pedestal and brought some feet in advance of its companion. Attached to the face of the pylon are six sedent gigantic statues of kings, majestic as to size, and seated in the hieratic posture. Lofty coloured poles, similar to the standards at Venice, are inserted in sinkings chased into the walls, surmounted with the expanded banners of the kings or heraldic bearings of the temple floating in the wind. The pylon itself, perhaps 200 ft. wide and 100 ft. high, forms the back-ground of the whole, crowned by its cavetto cornice, and its surface covered with coloured sculptures of the victorious Ramses, in his chariot, with upraised arm slaying his enemies, trampling them under his horses' hoofs, and also dispersing them in flight, —a grand scene of one of the dramas in the reign of a victorious monarch. In the centre of the structure is the portal, 56 ft. high, and through it the sacred or triumphal procession in all its gorgeous majesty to within the sacred precincts, there to observe the ritual ceremonials of the mysterious Egyptian cult of one or more of their eight great divinities or animal gods.

Having thus given a slight sketch of the architectural magnificence of the Egyptians, allow me to offer a tribute of respect to a brother architect: his name, as given by Mariette Bey, is inscribed on the Temple of Edfou. It was Ei-em-hotep Oer-si-Phtah Imouthes, the great son of Phtah, the only one yet discovered on the monuments of Egypt. I am afraid we are too late for its insertion in the colossal Architectural Dictionary of our time, unless it finds its way into an appendix.

The chronology of the Bible, as assumed by some learned men, gives the age of the world before the Christian Æra as 4004 years. Mariette Bey (p. 22) *under reservation*, founding the calculations upon dates afforded by inscriptions upon tombs, temples, obelisks, and other monuments, gives the date of the Egyptian empire alone and its dynasties as 5004. Bunsen assumes a still remoter period, and my friend Lesueur, our Honorary and Corresponding Member, in his "Chronologie des Rois d'Egypte," commences with 20,000, which latter is to be considered as an imaginary datum from which to start in computing the history of the world. But adopting Mariette Bey's comparatively moderate number of 5004 for the beginning of the Thinite dynasty, as the historic date of the commencement of Egypt's national existence, it fills one with wonder when we consider how many gaps occur in the continuous rule of Egypt's autonomy. How could the very existence of her nationality and arts be maintained, even with periods of more or less purity, when we know that for about 1,200 years, or nearly one-fourth of her existence, she was at various times ruled and overrun by the hykshos or shepherds, the Ethiopians and the Persians, under Cambyses, Darius, and Xerxes? At last she was conquered and ruled for 332 of those years by the Greeks and Romans from the time of Alexander and his successors to that of the Romans. Could any other people under such crushing circumstances have maintained their identity on their own native soil?

I cannot but think that the arrival and erection of the Alexandrian obelisk among us may produce very notable results in regard to our knowledge of ancient Egyptian history, connected as it is with our Bible. The old Greeks and Romans, the classics of our boyhood, have had their annals duly chronicled and reduced to elaborate histories by the learned. These, it is true, have been turned upside down by recent erudite inquiries, substituting a different and new chronology, and an assumed rational statement of facts. Egypt till very recently had no consecutive accepted history in our language, that I know of, until our learned Dr. Birch, of the British Museum,—a name honoured and esteemed by all Egyptologists, whether British or foreign,—compiled for the Christian Knowledge Society his summary of the ancient history of Egypt from the monuments, putting together with vast knowledge and most critical acumen an admirable history. There cannot be a doubt that our countrymen, as they pass by our obelisk, will have their curiosity excited by the sight of hieroglyphs which may have been seen and read by the Jews in the time of Moses, or when our Saviour was taken by his parents to Egypt as a place of refuge from Herod's rage. They will seek in Dr. Birch's book the solution of the mysteries revealed in those enigmatical sculptures, and the history of that ancient people.

The Funeral of Sir Gilbert Scott.—We learn,—too late to include the information in our special report,—that the following gentlemen, representing the Royal Institute of British Architects, acted as volunteer doorkeepers at the Abbey, viz.:—Messrs. Charles Fowler, F. T. Dollman, J. S. Edmeston, jun., Lacy W. Ridge, R. C. Page, H. H. Stannus, and W. G. Davie.

SOCIETY OF BRITISH ARTISTS.

This Society has opened its exhibition for the present season (the fifty-fifth), in the ground-floor rooms at 9, Conduit-street; but the hope we had indulged that their removal into rooms with a less extent of wall space would lead to an improvement in the average quality of the exhibition, by rendering possible a more exclusive selection, is, we are sorry to say, not realised so far. There certainly are a few nice things to be picked out, by Messrs. J. B. Knight, Grace, Marsh, and one or two others; and Mr. A. B. Donaldson's picture of "The Pier Band" of course has ability, but in aim and feeling it is not refined. But of the collection, on the whole, it is really impossible, with all the stretch of goodwill, to say anything complimentary. We can only hope that things may be better next time. We may point out to artists that the new rooms have a much better light than the old, and are very well fitted for the advantageous exhibition of works of cabinet size.

ST. JOHN'S COLLEGE CHAPEL, CAMBRIDGE.

In the course of recent notices of the late Sir Gilbert Scott, allusions have been made to the chapel of St. John's College, Cambridge, the interior of which must rank amongst his most successful works of that character. In 1869, when the new chapel was opened, we gave some illustrations, interior and exterior.* We now add a view of the exterior from the east end. The chapel proper is 145 ft. long by 34 ft. wide, and ends in an apse of five bays. The ante-chapel is 78 ft. by 32 ft. The tower, 42 ft. square outside, is somewhat short, 140 ft. to the top of the parapet, and 163 ft. to the top of the pinnacles. Messrs. Jackson & Shaw were the contractors, and the internal decorations, which are very considerable, were executed by Messrs. Clayton & Bell.

ST. SAVIOUR'S CHURCH, WATERFORD.

This church has recently been erected for the community of Dominican monks in this city. The plan is based on the basilican arrangement. The nave, 28 ft. by 111 ft., is separated from the aisles, which are 16 ft. wide, by arcades of six arches, carried on monoliths of polished grey granite from Messrs. Freeman's quarries, Penryn, Cornwall. The aisles are arcaded for side altars and confessionals, but without windows in their outer walls. The nave arcade has Corinthian capitals, freely treated in the Florentine spirit, after sketches by the architect, by Mr. Pearse, of Dublin. A niche carried on consoles occupies each spandrel, and a continuous clearstory, glazed with strap-work glazing in three tints, in rolled glass, lights the whole structure in a perfect manner. This glazing is by Messrs. Wailes & Strong, of Newcastle. The roofs are open-framed work, richly moulded and panelled, with corbels and arched braces and pendants. The choir arch, 37 ft. high, has two fine monoliths of 16 ft. each, the pedestals panelled in red Irish marble, and over the arch a large escutcheon of the arms of the late Pope, and sculptured wreaths and panels fill up the space. The choir itself is vaulted with a circular dome, and lighted from lunettes and a top light. It is intended to erect a very sumptuous altar and reredos beneath the dome, of marbles and sculptured and gilt oak work. The stalls of the monks will be behind the altar, and following the curve of the apse. Right and left of the choir are side chapels, and spacious sacristies, &c., are arranged beyond. Exteriorly the building is simple in character. The principal façade, however, towards Bridge-street has a lofty order of Corinthian pilasters, and is adorned with niches, a large escutcheon of the Dominican armorial bearings and panels of polished red granite. At the angle formed by Bridge-street and Queen-street rises a lofty campanile, with Corinthian pilasters, an arcaded belfry story, and a domed roof, altogether a little over 100 ft. high. The work has been carried out by Messrs. Ryan & Son, builders, of Waterford. The cost of the fabric, exclusive of fittings, will be about 11,000*l*. Messrs. Goldie & Child were the architects, the design being by Mr. Goldie.

* Vol. xxvii., pp. 384, 386, and 387. In an earlier volume, xxi., p. 225, will be found Sir Gilbert's original design for the chapel, afterwards changed.



ST. JOHN'S COLLEGE CHAPEL, CAMBRIDGE.—The late Sir G. Gilbert Scott, R.A., Architect.



ST. SAVIOUR'S DOMINICAN CHURCH, WATERFORD, IRELAND.—Messrs. Goldie & Child, Architects.

FUNERAL OF SIR G. GILBERT SCOTT, R.A.

SERMON BY DEAN STANLEY.

The remains of the late Sir George Gilbert Scott, R.A., LL.D., F.S.A., &c., were interred with befitting honours on Saturday last in the nave of Westminster Abbey. The procession started from the residence of the deceased, Courtfield House, Collingham-road, South Kensington, shortly after eleven o'clock, in the following order:—

The coffin on an open funeral car;

Carriage containing Sir Gilbert's sons: Mr. G. Gilbert Scott, Mr. J. Oldrid Scott, Mr. Alwyn G. Scott, and Mr. Duckinfield H. Scott;

Carriages containing members of Sir. Gilbert's family; followed by

Carriages containing Dr. Seton, the Rev. R. W. Forrest, D.D., Sir Gilbert's valet, Sir Gilbert's staff of assistants and pupils, and office-bearers of the following public bodies, viz., Royal Academy, Royal Institute of British Architects, Society of Antiquaries, Architectural Association, Royal Architectural Museum, Royal Archæological Institute, Ecclesiological Society, London and Middlesex Archæological Society, Society of Builders' Foremen and Clerks of Works, and representatives of other societies and institutions with which the deceased was connected.

The occupants of the carriages containing the office-staff were:—No. 1, Mr. George Wood (chief practical assistant, and private secretary to Sir Gilbert), Mr. J. M. Bignell (chief draughtsman, and senior), Mr. C. R. B. King (practical assistant and draughtsman), and Mr. John S. Lee (surveyor). Carriage No. 2, Messrs. J. Bignell, A. Baker, J. Medland, and — Barker (draughtsmen in order of seniority,—the first three in office-charge of works). Carriage No. 3, Messrs. Tonge, Jones, Turner, and Weatherley (draughtsmen in order of senority,—the last three in office-charge of works). Carriage No. 4, Messrs. Norton and Perkins (draughtsmen), and Messrs. Batters and Monkton (pupils). Carriage No. 5, Mr. Broughton (office-messenger and clerk), W. Strugnell (office-boy), and Mr. Godfrey (clerk of works to Mr. G. G. Scott).

The Royal Academy was represented* by Messrs. G. E. Street, E. M. Barry (treasurer), Alfred Waterhouse, J. L. Pearson, C. W. Cope, P. H. Calderon, R. Redgrave, G. Richmond, E. W. Cooke, E. Armitage, C. Landseer, A. Elmore, J. Sant, E. J. Poynter, G. D. Leslie, J. C. Hook, H. T. Wells, W. Calder Marshall, F. R. Pickersgill (keeper), W. F. Yeames, W. W. Ouless, H. H. Armstead, H. W. B. Davis, F. A. Eaton (secretary), and R. Phené Spiers (master of the Architectural School).

The following deputation from the Royal Institute of British Architects followed from Grosvenor Place, viz.: Coach No. 1, Mr. Charles Barry (president), Mr. J. Whichcord (vice-president), Mr. G. E. Street, R.A. (vice-president), and Mr. A. J. B. Beresford-Hope, M.P. (past-president). Coach No. 2, Mr. E. P. Ferrey,—representing his father, Mr. Benjamin Ferrey (vice-president), Professor T. Hayter Lewis, Mr. Henry Currey, and Sir Edmund Beckett, Q.C. Coach No. 3, Mr. John Gibson, Mr. Alfred Waterhouse, A.R.A.; Mr. E. I'Anson, F.G.S.; and Mr. George Godwin, F.R.S. Coach No. 4, Mr. Ewan Christian, Mr. Horace Jones (the City architect), Mr. G. Vulliamy (Superintending Architect of the Metropolitan Board of Works), and Mr. J. L. Pearson, A.R.A. Coach No. 5, Mr. A. W. Blomfield, M.A.; Mr. David Brandon, Mr. J. Edmeston, jun., and Mr. Arthur Cates (who also represented the Architectural Publication Society). Coach No. 6, Mr. Octavius Hansard, Mr. F. P. Cockerell (hon. sec. for Foreign Correspondence), Mr. J. Edmeston (also representing the Architectural Union Company), Mr. C. L. Eastlake (Keeper of the National Gallery, and late secretary to the Institute), and Mr. W. H. White (secretary-elect).

The following among other members of the Institute, met in the Chapter-house and joined the *cortége* at the Abbey, viz., Professor Donaldson, Messrs. W. Burges, F. C. Penrose (Surveyor to the Fabric, St. Paul's Cathedral), J. Douglass Mathews, T. Chatfeild Clarke, H. Dawson, T. Roger Smith, H. H. Stannus, James Neale, E. J. Tarver, E. R. Robson, R. W. Edis, Edwin Nash, E. C. Robins, J. Hebb (Assistant Architect, Metropolitan Board of Works), T. Blashill, Lacy W. Ridge, C. H. Cooke, H. C. Boyes, T. H. Watson, J. T. Micklethwaite, T. W. Cutler, J. T. Wood (of Ephesus), Wyatt Papworth, E. G. Hayes, J. McVicar Anderson, H. H. Collins, W. G. Davie, Charles Fowler, F. T. Dollman, J. J. Stevenson, Ralph Nevill, Somers Clarke, T. G. Jackson, W. White, F.S.A., and M. Wyatt, together with Mr. S. W. Kershaw, M.A., the librarian at the Institute.

The Society of Antiquaries* was officially represented by Mr. Frederick Ouvry (president), Lord Rosehill (vice-president), Mr. F. W. Burton (Director of the National Gallery), Mr. George Scharf (Keeper of the National Portrait Gallery), Mr. George Richmond, R.A., Mr. W. Chappell, and Mr. C. Knight Watson (secretary). Many other members of the Society met in the Abbey.

The Architectural Association was officially represented by Mr. Bowes A. Paice (president), Mr. T. W. Cutler (senior vice-president), Mr. J. Douglass Mathews (treasurer), and Mr. E. G. Hayes (senior hon. sec.). The following members of the Association met in the Chapter-house and joined the *cortége* on its arrival, viz.:—Mr. J. Sulman (vice-president); Messrs. H. C. Boyes, S. F. Clarkson, H. L. Florence, E. B. I'Anson, C. G. Vinall, A. Webb, W. Scott, and H. Tanner (members of committee); R. E. Pownall (hon. librarian); R. C. Page (hon. sec.); and the following past-presidents, viz.:—Messrs. T. Blashill, R. W. Edis, Rowland Plumbe, R. P. Spiers, T. H. Watson, L. W. Ridge, and G. H. Birch.

The Royal Architectural Museum† was officially represented by Mr. A. J. B. Beresford-Hope, M.P. (president), Messrs. Joseph Clarke and Maurice B. Adams (hon. secs.), and Mr. J. M. Lomax (assistant-secretary).

The Royal Archæological Institute was officially represented by Colonel Pinney (vice-president), the Rev. J. Fuller Russell (member of Council), the Rev. Canon Venables (Lincoln), Mr. Fairless Barber, Mr. Rivington, Mr. J. N. Foster, and Mr. Albert Hartshorne (secretary).

We give elsewhere the names of the official representatives of some of the other societies mentioned, the information not having been sent to us in time to be given here.

The route taken by the *cortége* was through the Cromwell-road, by Queen's Gate and Knightsbridge-road to Wilton-crescent and Grosvenor-place, thence *viâ* Grosvenor-gardens and Victoria-street to the Abbey. At Grosvenor-place the procession was joined by her Majesty's private carriage and a long line of other private carriages, among the occupants of which were: Mr. John Thompson, contractor, Peterborough; Mr. W. Brindley, sculptor, London; Mr. F. A. Skidmore, metal-worker, Meriden, Coventry; Mr. R. Coad, architect, and formerly pupil of the deceased; Messrs. Dove, Bros. (three), contractors, London; Mr. G. W. Booth, contractor, London, and Mr. Booth, jun.; Mr. Longmire (of the firm of Longmire & Burge), contractor, London, and Mr. Longmire, jun. In all, twenty-two mourning coaches and sixteen private carriages followed the funeral car.

On arriving at the Abbey, at about a quarter past twelve, the *cortége* drew into Dean's Yard, whence the body was carried through the cloister into the nave, and thence to the bier in the choir, preceded by choristers and the clergy of the Abbey (represented by Archdeacon Jennings, Canons Prothero, Duckworth, Leighton, and Farrar, and Minor Canons Cotton, Price, and Flood Jones), and followed by the occupants of the carriages, two and two, and by the large number of noblemen and gentlemen who had been in waiting in the Chapter-house. Amongst those not already named who joined the procession at the Abbey, were the Duke of Westminster, K.G., Lord Houghton, Lord Crewe, the Right Hon. W. Cowper-Temple, M.P.; Lord Henry Lennox, the Hon. C. L. Wood (president of the English Church Union); the Deans of Canterbury, Chichester, and Rochester; Archdeacon Emery; Archdeacon Balston; Canon Moore; the Rev. R. M. Blakiston (secretary of the Incorporated Church-Building Society); the Rev. W. J. Lawrance, rector of St. Alban's; Mr. H. G. Ellis, hon. sec. of Exeter Cathedral Restoration Fund; Colonel Akroyd, Mr. E. Freshfield, Sir E. H. Lechmere, M.P.; Mr. C. Brent, Mr. Butterfield, Mr. G. G. Adams, Mr. C. Luxmoore, the Right Hon. A. S. Ayrton, Mr. Lewis Angell, and Messrs. Clayton & Bell (artists in stained glass).

The following were among the clerks of works present, viz.: Mr. Irvine (Lichfield Cathedral), Mr. Morgan (Edinburgh Cathedral), Mr. Chapple (St. Alban's Abbey), Messrs. Roome (two), Hannaford, Saville (Midland Station), Kaberry (Lincoln's Inn), Sheffield (Home and Colonial Offices), Prosser, H. R. Snelgrove, and many old clerks of works who had served under Sir Gilbert Scott, and whose names we have been unable to obtain.

Representatives of the following contractors were also present, viz.: Messrs. Silver & Son, Maidenhead; Mr. Luscombe, Exeter; Mr. Collins, Tewkesbury; Mr. Higham, Wolverhampton; Messrs. Cooke & Co. London; Mr. W. Carruthers, Reigate; Mr. T. Whiteley, Leeds; and Messrs. Dennett & Co., concrete-arch patentees, London.

The Turners' Company (of which Sir Gilbert was a member) was represented by the Master (Mr. R. L. Loveland), the Upper Warden (Mr. Charles Hutton Gregory), the Renter Warden (Mr. J. T. Holtzapffel), the Chaplain (the Rev. J. Light, M.A.), Mr. Shirreff, Mr. John Jones, and Professor Tennant.

The pall-bearers were: Mr. A. B. Mitford, Secretary, Office of Works (representing the Right Hon. Gerard Noel, M.P., First Commissioner); the Right Hon. Lord John Manners, M.P., Postmaster-General; Mr. R. Redgrave, R.A. (representing Sir Francis Grant, P.R.A.); Mr. Charles Barry, F.S.A., President of the Royal Institute of British Architects; Mr. Frederick Ouvry, President of the Society of Antiquaries; and Mr. A. J. B. Beresford Hope, M.P., President of the Royal Architectural Museum.

The initiatory sentences of the Burial Service were read by Archdeacon Jennings. A full choir was in attendance, and Dr. Bridge presided at the organ. Purcell and Croft's Musical Service was used, together with Dead Marches by Beethoven and Handel. Canon Prothero having read the Lesson from 1 Corinthians xv., the body was borne from its temporary resting-place to the grave, followed by Dean Stanley (who had throughout the foregoing part of the service occupied his stall in the choir), and the vast concourse of sorrowing relatives and friends. The grave is situate in the nave, in close proximity to that of Sir Charles Barry, and immediately in front of the pulpit erected from the designs of the deceased. The coffin, covered with crosses and chaplets of flowers, having been lowered into the grave (which was only some 5 ft. or 6 ft. deep), the concluding portion of the service was impressively said by Dean Stanley, whose voice, though tremulous with emotion, must have been distinctly heard by all present, not excepting those who looked down from the triforium upon the solemn scene. Handel's funeral anthem, "His body is buried in peace, but his name liveth evermore," having been sung by the choir, the service was brought to a close, and as those who had known Sir Gilbert Scott in life passed out of the Abbey, after a last look into his grave, the organ pealed forth the solemn strains of the "Dead March" in "Saul." The coffin was of polished oak, with brass fittings. On the lid was a large brass cross springing from a pedestal, on the base of which were the words

MEMENTO MEI DOMINE JESU.

On a brass plate beneath the base of the cross was the following inscription:—

GEORGII GILBERTI SCOTT, EQUITIS
VIRI PROBI ARCHITECTI PERITISSIMI
PARENTIS OPTIMI RELIQUIÆ HIC
IN FIDE JESU XTI RESURRECTIONEM
EXPECTANT. OBIIT 27° DIE MARTII
ANNO SALUTIS 1878° ÆTATIS 67°.

The Abbey was crowded with spectators, who were, with scarcely an exception, attired in mourning. The undertaker was Mr. Sworn, of Ebury-street.

* In giving these lists of names, which we have endeavoured to make as complete as possible, we are unable to distinguish, in all cases, the gentlemen who followed in coaches from those who joined the procession in the Abbey. Some of the names are, for the sake of completeness, mentioned in connexion with more than one institution.

* Sir G. G. Scott had long been a Fellow of the Society of Antiquaries, and had frequently been a member of the Council. He was to have read a paper before the Society on the 4th inst.

† Sir Gilbert Scott was treasurer of the Museum, and one of its founders. He wrote a guide to, and compiled a catalogue of, the objects in the Museum.

The Very Rev. A. P. Stanley, D.D., Dean of Westminster, preached on Sunday afternoon. Taking as his text the first verse of Psalm cxxii., "I was glad when they said unto me, Let us go into the house of the Lord,"—he said:—"The house of the Lord": it is an expression which we at once recognise as figurative, because even the heaven of heavens cannot contain Him, much less this "house"; nevertheless, like all familiar metaphors, it is an expression which has a deep root in the human heart and mind, and is the germ of all religious architecture. This is the reason why the most splendid buildings in the world have been temples or churches. This is the reason why even the most spiritual and even the most Puritanical religion clothes itself with the drapery not only of words and pictures, but with wood, stone, and marble. It is the consciousness of the intimate connexion between the spiritual and the material temple, between the grandeur of religion and the grandeur of its outward habitation, which gives a living interest to that which I would this day bring before you, the religious aspect of the noble science and art of architecture. We yesterday laid within these walls the most famous builder of this generation. Others may have soared to loftier flights, or may have produced special works of more commanding power; but within the last thirty years no name has been so widely impressed upon the edifices of Great Britain, past and present, as that of Gilbert Scott. From the humble but graceful cross, which commemorates at Oxford the sacrifice of the three martyrs of the English Reformation, to the splendid memorial of a Prince who devoted his life to the service of his Queen and country; from the Presbyterian University on the banks of the Clyde, to the college chapels on the banks of the Isis and the Cam; from the proudest minster to the most retired parish church; from India to Newfoundland: the trace has been left of the loving eye and the skilful hand that are now cold in death. Truly was it said by one who from the distant shores of a foreign land rendered yesterday his sorrowing tribute of respect,—"In nearly all the cathedrals of England there must have been a shock of grief when the tidings came of the sudden stroke which had parted them from him who was to them as their own familiar friend and foster-father." Canterbury, Ely, Exeter, Worcester, Peterborough, Salisbury, Hereford, Lichfield, Ripon, Gloucester, Manchester, Chester, Rochester, Oxford, Bangor, St. Asaph, St. David's, Windsor, St. Alban's, Tewkesbury, and last, not least, our own Westminster, in which he took most delight of all the buildings in all the world,—all are the silent mourners round the grave of him who loved their stones and dust, and knew them to their very hearts' core. But it is good on these occasions to rise above the personal feelings of the moment into those more general lessons which the career of the departed suggests. It was the singular fortune of that career that it coincided with one of the most remarkable revolutions of taste that the world has witnessed. That peculiar conception of architectural beauty which we name Gothic was totally unknown to Pagan or Christian antiquity. It was unknown alike to the builders of the Pyramids and the Parthenon, of the Roman basilicæ, and the Byzantine Sta. Sophia. Born partly of Saracenic and partly of German parentage, it gradually won its way to perfection by a mysterious instinct which prevailed over Europe in the Middle Ages. It flourished for four centuries, and then it died as completely as if it had never existed, and other styles took its place. By Catholic and by Protestant it was alike repudiated. By the hands of French and Italian prelates, no less than by English and Scottish Reformers, its traces were obliterated. Here and there perhaps a momentary tribute of admiration was paid to the "high-embowered roof" or stately pillar, but as a general rule it was regarded as a lost art. Our poets and painters of the sixteenth and seventeenth centuries make no more allusion to it than if they had been born and bred in the Pacific Isles. In the first half of this century a new eye was opened in the mind of man. Gradually, imperfectly, through various channels,—in this country chiefly through the minute observations of a Quaker student,*—visions of a strange past arose before a newly-awakened world. The glory and grace of our storied arches, our stained windows, our recumbent effigies, were revealed as they had been to no mortal eyes since the time of their erection. To imitate and preserve this ancient style in its remarkable beauty was the inevitable consequence, I might almost say the overwhelming temptation, of this new discovery. The hour was come when the Ecclesiastical architecture of the past was to be roused from its long slumber, and with the hour came the man. We do not forget that splendid if eccentric genius,* who gave himself, though not with undivided love, to the service of another communion. We cannot but remember the gifted architect † who raised the stately halls and commanding towers of the Palace of the Imperial Legislature, and who was laid long years ago—in fitting proximity to his own great works—within these walls, and where, yesterday, he was followed by him of whom I would now speak. For there was one who, if younger in the race, and at the time less conspicuous than they, was destined to exercise over the growth of Gothic architecture in this country a yet more enduring and extensive influence. When in this Abbey the first great note of that revival was struck by the erection of the bastard Gothic canopies in the place of the Classic altar-piece which was relegated to a distant country parish, a boy, fourteen years old, watched the demolition and reconstruction with a curious vigilance, which from that time never flagged for fifty years. That was the earliest reminiscence which Gilbert Scott retained of Westminster Abbey; that was the first inspiration of that Gothic revival which swept away before its progress not only the plaster reredos of this Abbey, but a thousand other crudities of the same imperfect period. He became the impersonation and incarnation of the taste of the age. Antiquarian, as well as artist and builder, he became to the fossils of Mediæval architecture what Cuvier and Owen had become to the fossils of the earlier world of nature. It may be that others will succeed to whom the marvellous bounty of Providence shall bestow other gifts, but meanwhile we bless God for what we have had in our departed friend and his fellow-workers. The recovery, —the second birth,—of Gothic architecture is a striking proof to us that the human mind is not dead, nor the creative power of our Maker slackened. We bless the Power which breathed this new inspiration into the men of old, and which has, even from their dry bones, breathed it once again into the men of these later days. But it is not enough that a great gift should be resuscitated or a great style imitated. We ought to ask wherein its greatness consists, and in what relation it stands to the other gifts of the Creator. There are many characteristics of Mediæval architecture, as of the Mediæval mind, which have totally perished, and which ought never to be revived,—which represent ideas which for our time have lost all significance, and purposes which are doomed to extinction. The Middle Ages left on the intellect of Europe few, very few, enduring traces. Their chronicles are but the quarries of later historians; their schoolmen are but as an extinct species of a dead theology. Two great poems and one book of devotion are all which that long period contributed to the universal literature of mankind. But their architecture still remains eternal as Ararat, and the reason of its continuance or survival is, that in its essential features it represented thoughts, aspirations, and ideas of religion which are eternal. As in Mediæval Christianity there are elements which belong to the undeveloped Protestantism of the Western churches, so also in Mediæval architecture there are elements which belong to the churches of the Reformation as well as to the churches of the Papal system. Its massive solidity, its aspiring height, its unbounded space,—these belong not to the tawdry, trivial, minute, material side of religion, but to its sobriety, its grandeur, its breadth, its sublimity. And therefore it was that when this revival of Gothic architecture took place, it was amongst the Protestant churches of England, rather than in the Roman Catholic churches of the Continent, that its first growth struck root. The religious power of our great cathedrals, as has been well remarked, has not lost, but gained. Our worship has become more solemn, more simple, more reverential, more comprehensive. To these greater and nobler effects of religious architecture, he who is gone was on the whole a faithful witness. There is, it is sometimes said, a cloud of superstition which, with the latter half of this nineteenth century has settled down over a large part of the ecclesiastical world; but the last places which it will reach will be the magnificent architectural monuments which he guarded with scrupulous care, and which he and many of his compeers approached with such intelligent discrimination. The great architects of this century are too well acquainted with the aims of their noble art to allow it to be the handmaid of sect, or party, or the instrument of a senseless proselytism. This leads me to one more tendency of the revival of which he who lies in yonder grave was the pioneer and champion. For the first, or almost for the first, time in the history of the world, the architecture of the nineteenth century betook itself, not to the creation of a new style, but to the preservation and imitation of an older style. With perhaps one exception, every age and country down to our own has set its face towards superseding the works of its predecessors by erecting its own works in their place. The Normans overthrew the churches of the Saxons. Henry III. in this place totally swept away, as of no value whatever, the noble abbey of the Confessor. Henry VII. built his stately chapel in a style in marked contrast to the rest of the building. The great architects of St. Peter's at Rome, and St. Paul's in London, adopted a style as totally different from the Mediæval style as it was from the Grecian architecture which they admired. And now in our own time, the whole genius of the age threw all its energies into the reproduction of what had been, rather than perfecting what was to be. This was a work which, in the case of the illustrious departed was exceedingly congenial. The man to carry out this striking retrospect was found in one whose inborn modesty used to call the colour into his face at every word of praise,—whose reverential feeling led him instinctively to admire and understand. And yet in him this very tendency took so large and generous a sweep as to counteract in large measure the excesses into which minds less expansive and less vigorous are sure to fall. Because the bent of his own character and of his time led chiefly to the restoration of Mediæval art, he was not on that account insensible to the merits of the ages which had gone before, or of those which had succeeded. With that narrow pedantry which would fain turn out from the Abbey of Westminster all the monuments and memorials of the last three centuries he had no sympathy. He regarded these as the footprints of the onward march of English history, and whilst, with a natural feeling of regret at the inroads they had made into the earlier glories of Plantagenet or Tudor times, he was willing to prune away disproportionate encroachments, he cherished their associations almost as tenderly as if they had been his own creations; and he would bestow his meed of admiration as freely on the modern memorial of Isaac Watts as on a Crusader's effigy. It was this loving care for such heterogeneous elements of the past, it was this anxious, unselfish devotion to all their multifarious details, which made him so wise a counsellor in the reparation, conservation, and glorification of the edifices committed to his charge, and which, amidst his absorbing professional duties, it is not too much to say he made his first love, his chief, his last, his enduring interest. Such is the loss which the Church and the country deplore, and which we in this place mourn perhaps most of all. We cannot forget him. Roof and wall, chapter-house and cloister, the tombs of the dead and the worship of the living,—all speak of him to those who know that his hand and his eye were everywhere amongst us. This very sense of what he did for us ought to render us more alive to do what we can for him. His memory must stimulate us to carry on with unabated zeal those works in which he took so deep a concern: the completion of the Chapter-house by its long-delayed and long-promised windows of stained glass; the northern porch, which he desired, above all things, to see restored to all its former magnificence; and the new cloister which he had designed as a burial-place for the illustrious dead of the future. So long as these remain unaccomplished, his grave will continue to reproach us who survive him; when they are completed they will be amongst the most glorious monuments of him whose requirements of what was due to this national sanctuary were so exacting. It has been sometimes said that it was by a strange irony of fate that the great leader of the revival of Mediæval architecture

* Rickman.

* Pugin. † Sir Charles Barry.

should be the grandson of a commentator who belonged to the revival of what was called Evangelical religion. Yet, from another point of view, it is a fitting continuity. It is always well to be reminded that the revival, or, as I may better put it, the increase of sincere religion, belongs to a period long anterior to the multiplication of those external signs and symbols of which our age has made so much. In the deep sense of that inward religion, that simple faith in the great Unseen, the grandson who multiplied the visible sanctuaries throughout the land was not an unworthy descendant of the grandfather who endeavoured, according to the light of his time, to draw forth the mysteries of the Book of Books. We in this place, who knew him and valued him, and leant upon him as a tower of strength in our difficulties,—who honoured his indefatigable industry, his child-like humility, his unvarying courtesy, and his unbroken candour,—who know how he loved and valued the place we also love and value,—must all feel that in him we have lost one of those gentle, guileless, upright souls who in their lives have helped to elevate, and in their memories may still elevate, our souls heavenward. And when we speak of the work which such a career bequeaths to those who remain, let us remember that, although the shell, the framework, of a great building like this is an inestimable gift, and that though its creation and preservation pertain to the noblest functions of human genius and of national enterprise, yet upon us to whose charge it is committed depends in no slight measure its continuance in the future and its usefulness for the present. There are those who openly avow their desire and intention to suppress all the expressions of worship or of teaching within these or like edifices, and to keep them only as dead memorials of the past,—who would like to see such grand buildings reduced to the state of the silent and ruined vaults of Tintern, rather than that they should resound with the music of the Psalmist or the voice of the preacher. Verily it is for us so to fulfil our several duties, it is for us so to people this noble sanctuary with living words and deeds of goodness and wisdom, that such dreams of the destroyer may find no place to enter in, no shelter, and no excuse in our neglect or ignorance or folly. The grave of our great architect is close against the new pulpit which he erected to commemorate the establishment of services in the nave, which were first set on foot by my predecessor,* and which have since spread throughout the country. This ought to remind us, the guardians and keepers of this place, of the kind of service we may render. Every one of us has it more or less in his power to increase the fame, to strengthen the stability, and to ensure the perpetuity of this Abbey. That is the best memorial we can raise, that is the best service we can render, to all those, dead or living, who have loved, or who still love, this holy and beautiful house, wherein our fathers worshipped in the generations of the past, and wherein, if we be but true to its glorious mission, our children and our children's children shall worship in the generations that are yet to come.

The eloquent discourse of which we thus give so full a report, was listened to with rapt attention by an unusually large congregation. The choir, transepts, and sacrarium were crowded to their utmost capacity, many hundreds of ladies and gentlemen having to stand throughout the service, which lasted nearly two hours. Many of the architects already named, and innumerable contractors, clerks of works, and foremen, were present. As the congregation dispersed, the "Dead March" in "Saul" was performed on the organ.

At the ordinary fortnightly meeting of the Architectural Association on the 5th inst., the arrangements which had been made for the Association to be represented at the funeral were explained, after which,

Mr. J. Douglass Mathews moved the following resolution, which had been drafted by the President, Mr. Bowes A. Paice:—

"That the president, committee, and members of the Architectural Association desire to express their very great regret at the loss the whole body of the profession has sustained by the death of so distinguished a member as Sir Gilbert Scott, and to offer to his family their most heartfelt sympathy in their bereavement."

Mr. Mathews said the resolution would need no remarks that he could offer in commendation of it. The loss of Sir Gilbert Scott was a loss not only to the profession, but to the public generally. Sir Gilbert was well known to many of them, and by everybody who knew him he was thoroughly respected. The members of the Association had not latterly had the pleasure of seeing Sir Gilbert amongst them so frequently as in former years, but he was always ready to do what he could for them. Some years ago he read a paper to them on "The Arts accessorial to Architecture," the result of which was to encourage study on the part of younger members of the Association, and to lead to the formation of some of the classes held for some time in connexion with the Architectural Exhibition, although, unfortunately, those classes did not meet with the support which had been expected. Sir Gilbert was ever ready to do everything in his power to promote the study of architecture by every one engaged in it, and therefore his loss would be deeply felt. He was a man thoroughly wrapped up in his profession, and sincerely respected both inside and outside of it, and the least the Association could do was to record its deep sense of the loss it had sustained.

Mr. W. Todd, in seconding the resolution, said that the profession had been highly-gifted in having such a man as Sir Gilbert Scott in its ranks. He had, by his talents, raised the noble art of architecture in the estimation of the public. To realise what he had done by his never-tiring efforts, it would be necessary to look back and see how low the art had sunk just about the time he commenced his career, and then to look at its position in the present day. While nothing could grieve them more than the death of so noble a scion of the profession, on the other hand nothing could gladden their hearts so much as that his fame should stand upon as high a pedestal as it deserved in recognition of his labours in raising the art in which they all gloried.

The resolution was carried by acclamation.

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* Dean Trench, now Archbishop of Dublin.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute held on Monday evening last, Mr. Charles Barry, president, in the chair, the following gentlemen were balloted for and duly elected, viz.:—as Fellows: Mr. T. Mellard Reade, of Liverpool, and Mr. H. Heathcote Statham, of Queen Anne's-gate. As Honorary Associate: Mr. William Tipping, of Brasted Park, Sevenoaks. Amongst the nominations for the Honorary Associateship of the Institute was that of Sir Edmund Beckett, Q.C.

Several donations to the library were announced. Amongst the donors was Mr. James Fergusson, F.R.S., who presented his new work on "The Temples of the Jews, and other Buildings of Jerusalem." The library now, by the kindness of Mr. Fergusson, possesses copies of all his works.

The President, in moving a vote of thanks to the donors, said that special recognition ought to be made of Mr. Fergusson's kindness. He believed that the work which Mr. Fergusson now presented was the one upon which the author considered that he had spent more care and research than he had expended on any of his previous productions. If that were the case, the present work, judged by its forerunners, must be valuable indeed. Mr. George Aitchison had presented some pamphlets, including one entitled, "How can Art be Introduced into the Houses of Persons with Limited Incomes?" Nobody had better succeeded in practically answering that question than Mr. Aitchison himself.

The vote of thanks to the various donors having been accorded by acclamation,

The President said he had received the following letter from the Queen approving of the Institute's nomination of Mr. Alfred Waterhouse, A.R.A., as this year's Royal Gold Medallist:—

"Buckingham Palace, 29th March, 1878.

Sir,—I have to acknowledge the receipt of your letter of the 23rd inst., announcing the recommendation of the Institute of British Architects that the Royal Gold Medal should be conferred on Mr. Alfred Waterhouse, and having submitted this award to the Queen, I am commanded to notify to you Her Majesty's approval of it. I have the honour to be, sir, your obedient servant,

Charles Barry, esq." THOS. BIDDULPH.

The President said that before they came to the business of the evening, there were one or two things of which they would be glad to be informed. They would be aware that the Architectural Conference took place this year, the last having been held in 1876, and with the increased activity and growth of the Institute he ventured to hope and believe that this year's Conference would be even more successful than those which had preceded it. Some earnest of success would, he thought, be found in the fact that Professor Hayter Lewis had undertaken to serve as acting chairman of the Conference, and he would have, as honorary secretaries of the Conference, two most valuable coadjutors in Messrs. Arthur Cates and R. Phené Spiers. He hoped that many of those members who had the welfare of the Institute very much at heart would show their desire to promote its welfare and that of the profession generally by intimating their willingness to contribute papers to be read at the Conference, and by offering suggestions which would tend to promote the success of the gathering. Of course, the Council were, *ex officio*, the committee for making arrangements for the Conference, but the gentlemen named had taken the labouring oar in the matter, and they would gladly welcome the co-operation of any other gentlemen in organising the Conference.

The President also said he desired to press upon the attention of the members the earnest wish of him whom they all so deeply mourned that members who had it in their power should contribute to the Institute's collection of "Drawings of Ancient Buildings recently Restored." The late Sir G. Gilbert Scott, in his presidential address, November, 1874, said:—"Our [the Institute's] rooms ought to be the 'Public Record Office' of all which relates to the ancient and perishable relics of our own and of the collateral arts." The Council entirely endorsed that sentiment, and had invited members to contribute to the collection. In response, there had been several contributions, but not so many as might reasonably have been looked for. The principal contributors so far had been Mr. R. H. Carpenter (whose drawings of Earl's Barton and Brigstock churches were capital illustrations of the kind of thing desired), Mr. J. P. Seddon, Mr. R. J. Withers, Mr. J. W. Hugall, Mr. E. J. Tarver, and Mr. R. M. Fulford. [Some of the drawings presented by these gentlemen were hung on the walls for inspection on Monday evening.] The Council would like to see the collection largely added to.

Mr. J. T. Wood, the discoverer of the Temple of Diana at Ephesus, thanked the members for the honour they had done him in electing him an Honorary Fellow.

The President called attention to Mr. James Neale's valuable and exhaustive work on the Abbey Church of St. Alban's. It would be remembered that Mr. Neale read a paper before the Institute not very long ago,* and exhibited some of the numerous and beautifully-executed drawings which had been reproduced in the work. On that occasion their lamented friend Sir Gilbert Scott, who had architectural charge of the Abbey, bore his testimony in the most laudatory terms to the industry and ability of Mr. Neale. He (the President) was sorry to hear that with the number of subscribers already obtained† there would be a rather considerable loss on the production of the work. This ought not to be the case, for the book would ever be a cherished volume in every architectural library.

Mr. R. Phené Spiers said that the Institute was honourably associated with the work, because it had rewarded Mr. Neale for the drawings which formed its basis with the Pugin Studentship. A few members of the Institute had voluntarily subscribed for a copy, and presented it to the Library.

Mr. Cates said that last year considerable attention was aroused by what were called by some, "illicit commissions," and by others, "frauds by fiduciary agents." At that time some, unwarranted imputations were made upon architects generally as being amongst those who were in the constant habit of receiving such illicit commissions. Those unfounded charges were met in a most excellent manner by the President of the Institute, by Mr. Street, and by Mr. E. M. Barry. He thought it was desirable that the Institute should follow up the subject. He noticed that in the House of Commons the subject was alluded to on the 12th ult., when Mr. Burt asked the Home Secretary "the result of his investigation of the question of frauds by fiduciary agents, the practice of solicitors receiving a part of the commission from stockbrokers, auctioneers, life assurance

* *Builder*, vol. xxxv., p. 1299.

† The price of the work to subscribers is 4*l.* 4*s.*

offices, &c., on business introduced by them; and whether a Bill had been drafted by the law advisers of the Crown to punish briber and bribed in these and similar cases; and if so, when the Bill would be brought forward in the House." Mr. Cross, in reply, said he had consulted the Attorney-General, who was of opinion,—and that was also the opinion of the Government,—that the question of frauds by fiduciary agents was one that deserved careful consideration, and they had come to the conclusion that it would be advisable to introduce a Bill on the subject. Mr. Cates went on to say that he was informed by Sir Edmund Beckett that such a Bill had been drafted, and had met with the approval of the Attorney-General, and it would be satisfactory to know what steps the Council had taken in this stage of the subject.

The President said the announcement made at the beginning of the meeting that Sir Edmund Beckett desired to be admitted as an honorary associate of the Institute showed that he had entirely exonerated the members of the Institute from participation in the practice of receiving illicit commissions, and which practice he had so strongly denounced. He believed that Sir Edmund was completely satisfied with the unqualified disclaimers which he (the President) and other members of the Institute had made. The Institute had since taken action with reference to the proposed Bill. The committee appointed by the Council had to consider, not how they might purify the Institute,—for that were a work of supererogation, and long before Sir Edmund Beckett had thought fit to attempt to cleanse the moral atmosphere, the very constitution of the Institute was designed to be a safeguard for purity of action, and such a safeguard it had proved,—but what action they could take at the present juncture, and had quite consistently, when public attention was called to the abuses which existed in some quarters, waited for an opportunity to come when the Institute might publicly and corporately, in the name of the members, intervene. Directly they had seen the announcement by the Home Secretary that a Bill would be introduced, they directed the following letter to be written:—

"Royal Institute of British Architects,
21st March, 1878.

Sir,—The Council of this Institute have observed with great satisfaction that it is your intention to introduce in Parliament a Bill for the prevention of frauds by fiduciary agents. The alleged acceptance of illicit commissions by architects has for some time past engaged the attention of a Committee appointed by this Institute to investigate the subject; and as the object which that Committee have in view would necessarily be attained if your proposed Bill passed into law, our Council wish to assure you of their support and concurrence. Under these circumstances, our Council beg that you will kindly favour them with a copy of the draft Bill, in order that its details may be considered with reference to our profession and its relations to the public, and that the Council may have an opportunity of considering any points on which, with your approval, they may venture to offer suggestions. Meanwhile, I am requested to send you the enclosed copies of Declaration forms which Fellows and Associates of this Institute are requested to sign on their election, and by reference to which you will observe that one of the absolute conditions of membership of our body is a pledge that no such commissions as those I have referred to shall under any circumstances be received. I have the honour to be, sir, your obedient servant,

F. P. COCKERELL, Hon. Sec.

The Right Hon. Rd. Assheton Cross, M.P.,
Secretary of State, Home Department."

In reply to that letter, the following communication had been received:—

(61921) "Whitehall, 28th March, 1878.

Sir,—I am directed by Mr. Secretary Cross to acknowledge the receipt of your letter of the 25th inst., asking that the Council of the Royal Institute of British Architects may be supplied with a copy of the draft of the Illicit Commissions Bill, in order that its details may be considered in relation to the acceptance of such commissions by architects. I am, sir, your obedient servant,

S. F. O. LIDDELL.

The Secretary to the Royal Institute of
British Architects, 9, Conduit-street, W."

The President concluded by saying that as soon as the draft of the Bill came to hand, further action would be taken in the matter.

The discussion then took place on Mr. Josiah Conder's paper on "Japanese Architecture."* A report will be found following this.

The President said he was sorry to make the announcement that their respected friend, Professor Donaldson, was unable to be present to read his paper on "Obelisks." He was very unwell, having caught a severe cold, no doubt in consequence of his attendance at Westminster Abbey in connexion with the sad event which was in all their minds. They could only hope he would soon be better.

* See pp. 238, 263, *ante*.

Under these circumstances, Mr. W. H. White, the secretary-elect, read the paper, of which we give the substance elsewhere.

The President said that the author of the paper had started a number of interesting questions, ideas, and theories more or less recondite and interesting. The solution of some of those questions might be hoped for in the course of the discussion on the paper, which would take place on Monday next, the 15th inst. He hoped that on that occasion they would have the presence of Mr. John Dixon, who would perhaps explain to them the mode which he proposed to adopt for raising our obelisk on to its pedestal,* as compared with the methods adopted by the ancients, so far as they were known.

Mr. Charles Fowler moved a vote of thanks to Professor Donaldson for his interesting paper.

Mr. Hansard, in seconding the motion, said that perhaps if Mr. Dixon could attend next week he would bring the model exhibited at the *conversazione* of the Institution of Civil Engineers, showing how he proposed to raise the obelisk. He also hoped that they would have the presence of Dr. Birch on that occasion.

The motion having been carried by acclamation,

Mr. John Dixon said he should have pleasure in attending next Monday, as invited, and he should be glad if, on that occasion, the members of so eminent a society as the Royal Institute of British Architects would come prepared to discuss, rather more in detail than Professor Donaldson had discussed it in his paper, the forms of pedestals and bases which had been adopted for the European obelisks, because, from an architectural point of view, the successful erection of an obelisk in a new country, on a new base, and in a new position, must be one of the most interesting matters to which they could direct their attention. He sincerely hoped that the members of the Institute would be able to afford him some hints on the subject. He would bring with him a model or drawing,—perhaps both,—of the base which had been determined upon, after due consideration, as being the one most accordant with the circumstances in which the obelisk would be placed.

Mr. R. Phené Spiers moved a vote of thanks to the President, for the great trouble he had taken and the eminent services he had rendered in insuring due honour and respect to the memory of their lost friend, Sir Gilbert Scott. He understood that the Council had already passed a vote of thanks of that nature; but he was quite sure that the members generally would like to express their deep obligations to the President.

The motion, having been seconded by Mr. C. J. Phipps, F.S.A., was carried by acclamation.

The President, in acknowledgment, said he was quite sure that in what he had done he had interpreted the desires of the members generally, but he could not trust himself to speak on so sad a theme, as the circumstances of Saturday last had vividly recalled to his mind a former occasion on which he had been present at a funeral in Westminster Abbey.

The meeting terminated with the announcement that, after the discussion on Professor Donaldson's paper on "Obelisks," on Monday next, Mr. Thomas Blashill will read a paper on "The Vexed Question of Oak or Chestnut in Old Roofs."

* This was explained in a lecture, by Mr. John Dixon, to the Civil and Mechanical Engineers' Society, reported in last year's volume of the *Builder*, p. 326.

† "On Some Ancient Examples of Japanese Architecture." See *Builder*, pp. 238, 263, *ante*.

THE ARCHITECTURE OF JAPAN.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute, on Monday evening last, Mr. Charles Barry, president, in the chair, Mr. Josiah Conder's paper† on this subject was discussed,

Mr. Kidner, of Shanghai, said he could testify to the extreme accuracy of the descriptions which Mr. Conder had given of Japanese buildings. He (the speaker) had resided a good many years in China, and had occasionally, by way of holiday relaxation, gone across the water to Japan. On those occasions he had not pretended to make any connected study of Japanese buildings, but, being an architect, it was impossible for him to avoid noticing their principal points both as regarded construction and design. He had been particularly interested with the very good description of the temples of Shiba which was contained in the paper. Mr. Conder had apologised for what he was modest enough to call his deficient means of observation, but such an apology was unnecessary, as his observation had been most discriminating. His account of those buildings was as exhaustive and as accurate as it could be. To realise the accuracy of the descriptions given, the buildings referred to must be seen. An extreme artistic feeling pervaded the country generally. It did not matter where a building was, however small, however unimportant its purpose, however inexpensive, it was sure to be characterised by great artistic feeling. There was one little point of detail in the paper which he (Mr. Kidner) discovered, as it were, and that was that in all Japanese timber work the timbers that were rectangular in section—and they were chiefly so, though some were round—were all absolutely square, whether employed for rafters, joists, pales, or what not. The variety of ways in which the Japanese combined these square timbers was beyond the conception of those who had not seen their work; it would hardly be believed that so much artistic effect could be got out of square sticks of timber. The architecture of Japan was chiefly wooden, but not because of any want of skill or ability on the part of the natives to work in stone. The buildings were chiefly of wood to meet the inexpensive habits and modes of living of the people, and to withstand the disturbing effect of shocks of earthquake. He knew of nothing in Japan which struck him more forcibly than the extreme beauty of the town gateways, which were of stone, finely tooled. As to the origin of the style of architecture in Japan, as to which Mr. Conder seemed to have some doubt, he (the speaker) had no doubt in his own mind that it came from China. In all essentials the style was the same as that of China, but it had been modified by the greater artistic vigour of the Japanese. One of the chief advantages that might be hoped for from the reading of Mr. Conder's paper would be to impress the Japanese with a due sense of the beauty of their own art-work. At the present time the country and its art were being revolutionised by Western ideas. He (Mr. Kidner) could recollect the country in its old days very well, but the introduction of Western institutions had not been productive of unmixed good. To the beautiful bronze work to which Mr. Conder had referred they seemed to attach little or no value, for he (Mr. Kidner) had seen hundreds of tons of it in Yokohama broken up so that it might be exported without paying the customs' dues. One marked characteristic of the Japanese builders and workmen was that they kept to no contract or time: they seemed to have little or no notion of business. Artistic always, they were nothing more.

Mr. Hansard asked if Mr. Kidner could explain the meaning of the symbol on the tomb or monument of double trabeated form which appeared in nearly all the photographs exhibited.

Mr. Kidner said the common explanation of it was that it was a monument erected to virtuous widows,—*i.e.*, to those who did not remarry or who committed suicide on the death of their husbands, the latter alternative being considered the most meritorious thing to do.

Mr. Phené Spiers said that in speaking of "Japanese architecture," he was reminded of the story of the man who wrote a book on Ireland, and who after heading one of his chapters "On the Snakes of Ireland," wrote "There are no snakes in Ireland." Although Mr. Conder's paper professed to treat of Japanese architecture, he (Mr. Spiers) was afraid that, as a matter of fact, there was no architecture in Japan,—*i.e.*, no architecture as we in Western Europe understood the word. Whatever we might learn from the Japanese in such matters as costume and decoration, we should learn scarcely anything from Japanese architecture. The fact of the country being subject to earthquakes, to which Mr. Kidner had alluded, was quite sufficient to account for the absence of anything which could be called architecture. Of the stone architecture of Japan, that was to say of the walls and foundations, there were only three kinds: firstly, the roadways and foundations of the temples, which were only a few feet in height; secondly, the fortifications, which sometimes rose to a height of 40 ft.; and thirdly, the bridges, of which there were two kinds. There was one known as the "spectacles" bridge, which consisted of a bridge, 20 ft. across, in which there were two large holes, circular in form. In these bridges the

vousoirs of the arches were perfect in form, and therefore it was quite clear that the Japanese were very well acquainted with the arch, although they never carried it out in ordinary constructions. The model on the table had been kindly lent by Mr. T. W. Cutler, in illustration of Mr. Conder's remarks on the construction of Japanese buildings. The "kuras" or "godouns" seemed to be somewhat inappropriately named, seeing that during a fire they were very often the only buildings that did *not* "go down." These buildings were used by every Japanese person of wealth, who had one somewhere about his house in which to store away his valuables for greater safety in case of fire. That was the reason why visitors to Japan were often disappointed in their expectations of seeing in the houses they visited the wonderful artistic products which we imported into this country. Mr. Conder's paper contained the following description of the constructions referred to:—

"The walls are constructed on a vertical and horizontal framework of posts and beams morticed together, filled in with bamboo laths, laid crossing, bound together, coated with mud in several layers, and finally plastered over. Sometimes the beams and posts show, being flush with or projecting beyond the plastered surface, and sometimes the whole is plastered over, framework and all. This latter method is employed in larger buildings, and in the "kuras," or "godouns." A kura is often many months in building; the mud, which is taken from the bed of some river, being spread over the framework in a great number of layers, and each layer being allowed a long time to harden. The projecting timbers at the eaves are also thickly coated with the same clayey mud, and to the small window openings are hinged shutters coated to a very great thickness with the same material. The whole surface of the building is then plastered over, and finally covered with a costing of lacquer. These kuras often remain standing after street fires, but they are by no means thoroughly fireproof, for the mud often cracks and falls off with great heat, and even under ordinary circumstances they require constant renovation and repair."

In conclusion, Mr. Spiers said that the paper seemed to him to be extremely complete. It was, indeed, the only real account we had yet had, by an architect, of Japanese architecture.

Mr. Wyatt Papworth said that if Mr. Kidner could give information on one or two points the value of Mr. Conder's paper would be greatly enhanced. There were two measurements referred to in the paper, the "ho" and the "cho"; could Mr. Kidner inform them what these measurements were, and what were their relations to each other? If, too, Mr. Kidner could add a short table of Japanese chronology it would greatly add to the value of the paper.

Mr. Kidner said he had not the least idea what the measurements in question were. Possibly one of them was the same as the Chinese foot (equal to ten of our inches), for the Japanese copied the Chinese in many such points as this. He had not the remotest information as to the chronology of the Japanese.

The President, in proposing a vote of thanks to Mr. Conder for his paper, said that the author had shown that, even though, as Mr. Spiers had said, the Japanese had no architecture, they had, at any rate, a great deal of fancy and imaginative power; and if, instead of being a self-contained people, knowing nothing of other nations, they had had, in ages gone by, opportunities of knowing what the people of Europe and other parts of the world had done, we might now have seen the outcome of all their imagination and fancy, for it could not be supposed that their faculties in that respect would have remained undeveloped or unmodified under the influence of foreign intercourse. As the Japanese nation had of late years shown a great desire to cast off their self-containedness, we might possibly look forward to such a development of architectural art in Japan as only travelled experience could give.

In putting the vote of thanks, which was carried by acclamation, the President coupled with the name of Mr. Conder that of Mr. Cutler for his kindness in lending the model referred to.

Furniture and Woodwork.—A Special Loan Exhibition of Furniture, Cabinet-work, and Ornamental Woodwork used in the interior of dwellings is to be held in the Bethnal-green Museum during the summer months, commencing on the 1st of May. It is understood that the manufacture of household furniture is largely carried on in the East of London, hence the proposed exhibition will be of special interest in that district. H.M. the Queen has directed that a selection from the furniture of the Royal Palaces shall be included in this Exhibition. If some of our old work be compared with some of the new, the men of to-day will not have much to crow about.

THE PROPOSED MODEL BYE-LAWS OF THE LOCAL GOVERNMENT BOARD.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association on Friday, the 5th inst., Mr. Bowes A. Paice, president, in the chair, the papers* read at the previous meeting by Messrs. J. Douglass Mathews and E. C. Robins on the subject of the proposed model bye-laws issued by the Local Government Board, in relation to public health, safety, and comfort, and with reference to the Amendment of the Building Acts, were discussed.

Mr. Thomas Blashill said Mr. Mathews's paper was so exhaustive, and his criticisms were so practical, that there was very little to say. One or two points, however, had not been much touched upon. One of these was with reference to ground floors, with reference to which it was stipulated by the fifty-sixth clause or law, that every ground floor in a new domestic building should have the earth below it covered with a layer of concrete 6 in. thick, between which and the lower side of the joists there was to be a clear space of 3 in. That was all very well in its way, but it assumed that the ordinary mode of constructing ground floors was the only one possible. It was his firm conviction that of all things which tended to make houses unwholesome and unhealthy, an open space under the ground floor was the worst. Both in official practice as a district surveyor, and in private practice, he had seen a great many old floors taken up, and the filthy condition of the spaces beneath them was indescribable. Of course, the purpose of the open space was to prevent dry rot in the timbers, but even when it succeeded in doing this, the filth which it caused to accumulate was something abominable. The provision of a bed of concrete under such floors was a great step in advance, of course, but the retention of open spaces at all under floors was a great mistake, and it would be much more desirable, on all accounts, to have solid floors of concrete, brick, or stone, covered where required with solid wooden blocks or parquetry, so that the floor should be absolutely solid from the upper surface downwards. This would not only be a healthier mode of floor construction, but he thought it would be a more economical method, looking at the quantity of timber saved. Another great evil of ground floors with hollow spaces beneath them was that they harboured vermin in the shape of rats and mice, from which even houses where a cat was kept were not always free. He had nothing to say against what had been poetically called

"The harmless, necessary cat,"

where the cat was necessary, but he preferred to dispense with its assistance, if possible. Another point to which Mr. Mathews had drawn attention was the question of parapets, which, if the bye-laws were to become law, would have to be built to nearly every town-house. Now, there was no more prolific cause of damp walls than parapets, even with all the precautions that could be taken in the way of good workmanship and materials. Why, then, should they be insisted on, when the spread of fire could be equally well, and perhaps better, prevented by the use of iron gutter eaves, &c.? On the general question of building bye-laws, one great object should be to attain uniformity, and when once a code of rules had been adopted, the rules should be "stuck to." It was, he knew, very difficult to persuade some architects of the importance and value of making themselves acquainted with such rules, and sometimes all sorts of roundabout methods were resorted to in order to evade them, in consequence of mistakes made through imperfect knowledge of them at the outset. Some young architects seemed to scoff at the very idea of making themselves acquainted with the Building Act, but, nevertheless, he recommended the younger members of the profession to read it through from time to time, as they would derive much practical information from it. In conclusion, Mr. Blashill expressed the hope that in future the surveyors to towns and local boards under whose direction the new Building Bye-Laws would have to be enforced, would be more generally chosen from the architectural profession than was at present the case, for many mistakes and difficulties in working would thereby be avoided. To put the overlooking of building plans into the hands of persons who may have been "nothing at all," and who at the very best were highly-respectable and competent engineers, with no special knowledge of building, was a great mistake.

Mr. E. C. Robins said he proposed to say a few words with regard to the clauses or bye-laws which referred to the drainage of houses and the ventilation of drains. The summary made of those clauses by Mr. Mathews was very concise and clear, but he did not express any opinion,—did not say whether he approved or disapproved of them. He said that "Whatever may be the opinion as to the perfection, or otherwise, of these requirements," he feared "that so long as the system of drain-laying remains in the hands of ordinary labourers," it would "always be unsatisfactory." Mr. Mathews then went on to advise that more efficient men should be employed to lay the drains,—that, in short, the drains should not only be well devised, but well laid. He thought it would be a good plan to adopt a system of granting certificates as to the proper and efficient drainage of buildings, but he did not think it desirable that public bodies should have charge of the private drains of houses. There should, however, he thought, be some competent and thoroughly reliable official to overlook the connexion of all private drains with the public sewers. Clause 60 of the proposed bye-laws stipulated that all drains laid in the basement of a house should be embedded in concrete; but, as Mr. Mathews had very properly pointed out, the extra difficulty which would be entailed in obtaining access to the pipes under such circumstances would not be compensated for by any corresponding advantage. By the 65th clause it was stipulated that there should be provided at least two untrapped openings to every drain passing beneath a dwelling-house, in connexion with a tall and a low shaft under such conditions and in such positions as to form a kind of syphon through which the outer air would flow from end to end. He had practically carried out that plan, and it had been most successful; he was, therefore, glad to see it introduced into the bye-laws. It was too often forgotten that, in ventilating any space, whether a drain, a soil-pipe, or a room, it was necessary to provide an inlet for the fresh air as well as an exit for foul air. He agreed with Mr. Blashill when he said that it was very undesirable to have hollow spaces under basement floors, particularly as it was possible to have solid floors at a very cheap rate. As to the officials whose duty it would be to see that the bye-laws were enforced, he had years ago, as a member of the Metropolitan Sanitary Association, objected strongly to the provisions in the Act of 1855 which gave to medical officers of health discretionary powers, as to materials and construction, which ought only to be entrusted to architects and surveyors. Medical officers of health were very conscientious men, but they could not be expected to supervise technical operations without making great mistakes.

Mr. Rowland Plumbe said that Mr. Mathews had treated the subject so exhaustively that there was little further to be said. It should not be forgotten, however, that the code of bye-laws under discussion purported to be a Model Building Act for all Sanitary Authorities, and as it was likely to be very largely used, it was desirable that it should be made as perfect as possible, and free from all vagueness and ambiguity. Now, the bye-laws constantly referred to the "person who shall erect a new building," —in fact, everything that was to be done under the new bye-laws was to be done by the "person who shall erect a new building." But it seemed to him that the bye-laws could be evaded with impunity in the case of alterations or additions to old buildings. Another point in which the bye-laws were deficient was that they contained no provisions as to the scantlings of timbers. In many parts of the country it was the custom to allow the joists and the main supports of floors to be carried by wooden partitions, hence the seriousness of the omission to specify the dimensions of timbers. It would be a very simple thing to devise some simple rule as to scantlings. It was also to be desired that such a code of bye-laws should take some notice of the subject of plastering, which was often a source of great danger. In cases where the under surface of the floor was uneven before being plastered, the ceiling was made even by putting the plaster on 3 in. or 4 in. thick in

* See pp. 314-317, *ante*.

places. This plaster was often bad, containing but little hair, and when put on in such masses, was apt to fall down. He knew of one such case in which an occupant of a house nearly lost his life. He thought the bye-laws ought to require that the ceilings should be fairly levelled, the laths put on in a proper manner, and the plaster laid on only in moderately thin layers. Where a house was built on "made" ground, composed of objectionable or decaying materials, it was not sufficient to stipulate that the house should be built on a continuous bed of concrete; there should be, in addition, a dry area all round it. The provision contained in the bye-laws as to "footings" was, he thought, a good one. With regard to thickness of walls, the requirements of the bye-laws were in excess of those of the Metropolitan Building Act. One important omission in the bye-laws was that nothing was said by them as to party-walls, except that in clause 32 it was stipulated that no timbers should be inserted at a distance of less than 4½ in. from any party-wall. The result of that would be that in a building with walls only 9 in. thick no timbers could be inserted in the brickwork at all. He was most strongly of opinion that no party-wall whatever should be less than 14 in. thick. A 9-in. party-wall was not sufficient to save a house if the adjoining house once got thoroughly on fire. Clause 92 ought to be strongly resisted by the architectural profession, inasmuch as it stipulated that complete sets of drawings of every new building erected should be supplied to the local authorities. That was a very serious matter, especially as no possible sanitary advantage could accrue from so needless a requirement. The only drawing which could fairly be demanded was a block-plan showing the arrangement of drainage. In addition, it was stipulated that something very like a complete specification of every new building should be supplied to the local surveyor? Why? He would surely never read it! One important collateral consideration was as to the ability of the builders themselves, for it was not of much use having bye-laws, however stringent and complete, if the builders who had to work under them were incompetent. A common occurrence in London was that when a man could not do anything else, he got some money advanced by a solicitor, and "set up" as a builder. It was notorious that many of the class of "speculative" builders were utterly incompetent to act as builders. Was it anything more than reasonable that the Legislature should, for the sake of the public health and safety, demand some guarantee of competence from those who built our houses? Were such a condition enacted, we should probably get better building. As a corollary to compelling the builders to pass an examination of fitness, the public would naturally expect the architects themselves to pass an examination in order to show their fitness to follow their profession. Such a requirement the Association would, he knew, be glad to see insisted on.

Mr. R. E. Pownall said he agreed with nearly all that Mr. Mathews had said in his paper. He saw one great difficulty in the way of the speedy and general adoption of the model bye-laws, and that was that nearly every district or local board had already its series of bye-laws, sanctioned by the Local Government Board, and without a special Act of Parliament, the local boards, composed, as they often were, to a large extent, of speculating builders and property-owners, were not likely to adopt the model bye-laws voluntarily: compulsion would be needed. To his mind, one serious defect in the proposed bye-laws was that they followed the Building Act and other Acts in exempting from their provisions palaces, gaols, railway stations, &c. On what ground could these exemptions be defended? Surely not because they had no sanitary or structural requirements. Of course, completely-isolated buildings might very well be exempted from the rules which were designed to prevent the spread of fire. Why, in the new bye-laws, should it be stipulated that the minimum width of carriage-roads should be 36 ft., and that the minimum width of a street not a carriage-road should be 24 ft., as compared with the relative minimum widths of 40 ft. and 20 ft. under the Metropolitan Building Act? Mr. Pownall, in the course of some further remarks, showed the contradictory nature of some of the bye-laws, and demonstrated the absurdity of others. He pointed out that they did not define what was "a new street." Was a mews to be considered a street? If so, in building a new mews, was it to be 36 ft. wide? Some might say, "yes," because it was surely a carriage-road. But where were the paths to be, and where the dung-pits? As to party-walls, he held that no party-wall should be anywhere less than 14 in. thick, and that even then no flues should be allowed to be carried up in the thickness of the walls, but in separate "breasts" or projections built against the wall, as was the case, he believed, in Paris. The absurdity of demanding that a party-wall should be of a minimum thickness, and then allowing the minimum to be reduced by one-half or more just at the very point where thickness was necessary, — viz., in the flues,—would be apparent at a glance. It would also be curious to know what, within the meaning of the bye-laws, were "projections intended for architectural ornament." The requirements as to the position of damp-proof courses with reference to the relative positions of the joists and footings would also, in some cases, render it necessary that a tradesman's shop could only be entered by ascending three or four steps! As to parapets, some of the bye-laws would only have the effect of increasing the danger they were intended to guard against, for in the case of a high building in close contiguity to a low one, the burning brands from the high building would inevitably fall on to the roof of the lower building, and set it on fire, being retained by the parapet, which it was, under the bye-laws, imperative to provide to the low building (instead of sliding off, as they would do, from a building with eaves). It was also obvious, he thought, that in buildings of the warehouse class, or in any buildings of large cubical capacity, the parapet walls should be higher than it was usual to make them, for the reason that when a large building was thoroughly on fire, the body of flame had a tendency to curl over a low parapet, and to attack adjoining property.

Mr. E. F. Law, architect (and present mayor of Northampton), said he had been much interested in the discussion, which had very clearly shown the inconsistency of some of the bye-laws. He had been in practice forty-four years [incidentally the speaker referred in feeling terms to the death of Sir Gilbert Scott, whom he used to meet in competition forty years ago], and in that time he had necessarily witnessed a great many evils resulting from imperfect building legislation. One great cause of bad building in the present day was the undue haste with which they were run up. There was no time for the builders to bestow any thought upon them, even were they able to do so, for they were run up, so to speak, in ten minutes or a quarter of an hour. He thought that the proposal to lay a bed of concrete under each dwelling-house was a good one, and if properly done, it would effectually prevent dry-rot. He quite agreed with Mr. Pownall and other gentlemen as to the thickness of party-walls, which ought never to be less than 14 in. thick, and no flues ought to be built in the thickness of party-walls. The non-observance of these conditions nearly resulted in the destruction of some large buildings he had erected at Southport, and from that time he had made up his mind never to erect a party-wall of less dimensions than those he had mentioned. A great deal had been said about supervision, but he advised young architects never to trust to clerks of works alone, but to pop in and out of the buildings frequently and at odd times, and if they discovered anything wrong "to be down upon them [the culprits] strong." Incidentally, he also strongly advised young architects to put all their buildings into perspective, if they wished to see how they would look when erected, and instanced, in illustration, an amusing case where some one who had put up a large iron ogee cupola found that when viewed from the street the lower portion of the "ornament" completely obscured the upper part. He expressed surprise at the smallness of open space which the Metropolitan Building Act allowed behind or at the side of a building, stating that in Northampton the minimum space was 180 ft.

Mr. Todd having made a few remarks,

Mr. Douglass Mathews replied on some points raised in the discussion, and the meeting terminated with the announcement that to-day (Saturday) a visit will be paid to the building now being erected on the site of the London Tavern, Bishopsgate-street, for the Royal Bank of Scotland, from designs by Mr. T. Chatfeild Clarke. The building was illustrated in our volume for last year, p. 884.

A GENERAL VIEW OF THE CABMEN'S SHELTER MOVEMENT.

The following well-authenticated details have been obtained for the *Builder* under special and exceptional circumstances:—

ENGLAND.

London.—The third annual report of the committee of the Cabmen's Shelter Fund shows that a marked success has attended the movement in London, financially and otherwise, and that eighteen shelters under the control of the committee have now been placed in various parts of the metropolis. One of them is that in Palace-yard, facing Westminster Hall, 22 ft. long by 9 ft. broad. The report states that a large shelter has been placed at Waterloo Railway Station, and that another at Paddington Great Western Railway Station will soon be opened. There have been no complaints by the police as to misconduct at any of the shelters. Applications have been made to the committee for information as to the erection of shelters from Vienna, Lisbon, Berlin, and Montreal. The attendants at the shelters are in most cases old cabmen, who eagerly seek after the appointments. Each shelter becomes self-supporting as soon as erected. Of the eighteen shelters, nine have been erected by individual effort. In consequence of a remark made by Mr. Ellison, magistrate of the Lambeth Police-court, the committee have offered to undertake the erection of shelters in the various localities of the southern district. For this purpose 500*l.* will be requisite. Mr. J. Dennistoun, of the Union Club, S.W., is still the able honorary secretary of the London movement.

Liverpool-street, London.—This is a shelter erected by the Great Eastern Railway Company, and is probably the most complete shelter ever built by a railway company. The following testimony to its usefulness is very encouraging:—It is "a great success," and "the introduction of it is well worth imitation."

Liverpool.—Liverpool may be said to have been the birthplace of the shelter movement, though most shelters are now built on the model of the Birmingham rests. It was in 1869 that Mr. J. J. Stitt, of Belmont-grove, Liverpool, drew the attention of the public to the necessity of providing cabmen with some protection, and the result was the erection of St. George's Pier shelter, the first in this country, it is thought. It cost 150*l.*, and could accommodate twenty drivers. "The experiment" (says a competent authority) "was highly successful, was promptly appreciated by the drivers, and was speedily followed by the erection of two similar shelters on other stands."

There are now four shelters in Liverpool in operation, two being movable. The Corporation, in consequence of requiring the site for public improvements of one of the stationary shelters, has substituted a large movable shelter for it. "The benefits" (says the same authority) "of the shelters to the drivers have been most palpable and gratifying, contributing as they do to their comfort and health. The sobriety of the men has been greatly promoted."

Manchester.—There are nine shelters in this city, seven of which are small. The other two are of much larger dimensions; being, in fact, miniature restaurants. One of these is in Piccadilly, and is a handsome structure; and from the way in which it is conducted it is expected to be a great success. The other one is near All Saints. The following testimony is from a competent observer:—"I believe they will do an immense amount of good by keeping the drivers from public-houses." The honorary secretary is Mr. Walker, of Piccadilly, Manchester.

Birmingham.—This is the head-quarters of the shelter movement, where there are numerous, well-managed, and highly useful rests. They are all under the Local Town Mission, whose chief manager is the Rev. M. Hill. The last report of that mission states that the committee have decided to let the panels of their rests for advertising, and to devote the proceeds to a fund for the benefit of cabmen when sick or disabled by accidents.

Hull.—The movement in Hull has not been without serious difficulties, but the committee, in March, 1877, reported that the shelters in Park-street, Beverley-road, and Anlaby-road, were well kept, and appeared to be valued by the men. The Committee discuss the important question whether the Town Council should not take in hand the movement, but so far as can be

ascertained, no such amalgamation has taken place as yet.

York.—The movement in this city is in its infancy. The city council has sanctioned the placing of the first shelter in Blossom-street. The builder is Mr. Creaser, of the Crescent, who has contracted to deliver it entirely finished for 36*l*. Mr. C. G. Padel, of York, is the honorary secretary. The shelter is almost ready for use.

Huddersfield.—There are two erections for the shelter of the cabmen. One in John William-street is a cabmen's shelter on the pattern of Leeds and Birmingham; the other is a room in the railway station provided by a railway company. The two shelters appear to give great satisfaction to the drivers, and to be very helpful to them. Their children and wives are now able to leave victuals in the rest if they are away on duty.

Sheffield.—There are three shelters in Sheffield, and here also difficulties have arisen; but a highly competent authority assures us that two of the shelters are much appreciated and exceedingly well managed. Each is fitted with gas, stove, &c. Mr. H. J. Wilson, of Pittsmoor, Sheffield, is one of the principal pomoters.

Bath.—There are two shelters in this city, both the generous gifts of ladies. They are stated to be quite a success, the men appreciating them very highly.

Guernsey.—The *café* and cabmen's rest, under the local auxiliary to the Church of England Temperance Society, in its entirety has been a great success, and is quite self-supporting, upwards of 966*l*. having been taken during the first year of its inauguration. The cabmen, by special reasons, are not easily able to frequent their rest, but they are amongst the best customers to the house.

SCOTLAND.

Glasgow.—There are two shelters in Glasgow largely used by the drivers. The *Glasgow Herald* has stated that the temptation to visit the publichouse has been lessened by them, and that "intemperance has greatly diminished in consequence." The shelters are open day and night. The late Mr. George Burns was the founder; and at present Mrs. John Burns, of Castle Wemyss, N.B., directs the movement. At the annual *soirés* and concert of the Glasgow cabmen, held on the 18th of March, it was stated that the Glasgow shelters are self-supporting, and that the cabmen had formed among themselves a Temperance Association.

Dundee.—There is one shelter in this town; the cost was about 120*l*. As regards drunkenness, the shelter has indirectly lessened that vice, and decidedly less drinking goes on, owing to the influence of those cabmen who have become total abstainers. Mr. A. H. Moncur, of Dundee, is one of the promoters.

Aberdeen.—There is no shelter in this town, but the matter has been brought before the Town Council, which has sanctioned sites for two rests. No operations have been as yet commenced. The Aberdeen cab-drivers are described as a very steady class of men. Mrs. Lumsden, of Ferry-hill-house, Aberdeen, is one of the principal promoters.

IRELAND.

Dublin.—We have been unable to obtain any information about cabmen's shelters in Ireland, with the exception of Dublin, and the report from that city is thoroughly encouraging. The Dublin Cab and Car Men's Shelter Association, in its report for 1877, says that the inaugural meeting of the Association was held on March 3rd, 1875, at Mr. S. F. Adair's residence in Fitzwilliam-square; and that the Dublin Total Abstinence Society having since offered the Shelter Association to take over the shelters and manage them upon condition that they would be permitted to sell refreshments to the general public, while the shelters should not be removed from their sites upon cab-stands, the Shelter Association agreed to hand over to the Total Abstinence Society the Great Brunswick-street and Sackville-street shelters, subject to certain conditions, one of which was that the Shelter Association reserved the right of resuming possession upon giving three months' notice. The Shelter Association states that it has learned with satisfaction that the shelters are now largely frequented by cabmen and others and are self-supporting. From the report of the Total Abstinence Society we further learn that there are six shelters and coffee-stands in the city (two of which shelters were handed over by the aforementioned Shelter Committee), and that they are steadily increasing in public favour.

Sir,—*Apropos* of Cabmen's Shelters, may I introduce for discussion in the *Builder*, whether in certain thoroughfares of large towns it would not be feasible to have shelters for the general public, where tea, &c., could be had, something similar to the Dublin coffee-stands?

I have often thought, whilst waiting for 'buses and tramcars, that a waiting-room, as above described would be very convenient. Of course I do not wish to deprive cabmen of their shelters; but merely to suggest the extension of that movement in a more general manner for the benefit of all persons who have to wait in the open air for conveyances. The construction that I plead for would be about the same width as a cabmen's shelter, but longer; and, if desired it could be divided off into two parts,—one for cabmen, and the other for the passengers by 'bus. It would thus combine the Cabmen's Rest and general waiting-room and restaurant.

I have no doubt that the sale of tea and provisions would render the concern self-supporting, and that the best organisation to work the scheme would be a Cocoa-house Company, if the tramcar authorities refused to risk any money on it.

Every little railway station has some kind of waiting-room: I think it is time that the public should demand something similar when exposed to rain, snow, and storm whilst waiting for 'buses and tram cars in the streets.

A Friend of Cabmen.

THE PUBLIC PROPERTY OF DOWGATE WARD.

Sir,—At a meeting of farm labourers, whose cause I have for some time espoused, I was speaking of the way in which local charities were misapplied, when a farmer interrupted me by saying,—"You needn't 'a come away from the City of London to find out that. Look at home." I thought there was a good deal of sense in the remark, and though it did not prevent my continuing to complain of the misappropriations of charity property in the country, it stimulated me to also "look at home." Now, Dowgate happens to be my ward, and I, therefore, think there is nothing like "beginning at Jerusalem": so just as a commencement, I printed and distributed a leaflet containing an account of some of the Dowgate charities, and a few comments thereon. These charities are shrouded in mystery, but not so much so, perhaps, as some of the officials hope,—not so much so, I trust, but that we shall yet penetrate the darkness of past dealings of some of them. From what I have seen, I have no hesitation in saying that if the charities of Dowgate had been properly administered by the right parties there would not have been any poor people in or near Dowgate but had become comfortably circumstanced through the rich charities of the ward. But, sir, it is distressing to see the poor half-starved people hanging about the banqueting-halls of the great companies, waiting for the crumbs that fall from the rich men's tables. There are four or five large halls in and about Dowgate Ward. I have no objection to banquets; but let the rich pay for them, and not use the increment of property left for the encouragement of trade and for the poor, for the encouragement of *delirium tremens* and gout in the stomach. Had the stewards of all the City property been faithful to their charge, there would be sufficient funds to feed, clothe, and educate all the poor of the metropolis, without a farthing rate ever having to be made. But there is a matter referring to the public property of Dowgate Ward, the discussion of which is perhaps more germane to your columns than the charity question. I ask the officers of my ward, through your columns, what has become of the six or seven free landing-places in the ward, which existed a generation since and have now no existence? Who is it that has enclosed them and driven the poor watermen from the riverside? One of the Common Councilmen of Dowgate said in a speech the other day that he had known the ward over fifty years, and never knew a free landing-place. He forgot that within that period those halfpenny steamboats, the *Bee*, the *Ant*, and the *Cricket*, used to land their passengers from the Strand within the precincts of the Ward of Dowgate. Where is that wharf now? Where are the riverside places where the boys used to play twenty-five years ago One of them has been covered in for the business purposes of a grandee of the ward within a few weeks, without consulting me or any other ratepayer. On what grounds has he been allowed to do this, and who has given permission for the closing up of all free access to the river Thames? I should like to ask upon what land the Monument Bonded Tea Warehouses (Limited) stand? Is not a part of the premises of that company built over a roadway, and, having retained a passage in deference to the rights of the watermen, have they not lately erected a barrier in order to gain a future right of closing this passage altogether? I strongly recommend the watermen and others interested to batter down this barrier, and light their fires with it. But certain brick walls have been built in the vicinity which will have to come down also. Sir, if you were to examine an ancient map of Dowgate Ward, and make a new one now, you would find streets built upon, lanes stopped up, and public property quietly turned into private property. If the public property of Dowgate Ward which has lapsed into private property were put up to auction, it would fetch considerably over 100,000*l*., and might reach seven figures! Now, sir, as a citizen, I ask what our Lord Mayors, Aldermen, and Common Councilmen have been doing all this while? If they are the guardians of the City of London, who is to guard citizens from such guardians? What have all the tribe of highly-paid City officials been doing all this while? It looks to me as though they have been better sheep-shearers than shepherds, and that when they have enough wool they hand over the patient animal to be skinned alive. But, sir, the citizens are to blame for their supineness and their toadyism to the grandees, who mostly study municipal politics for the sake of paunch and pouch. The majority of well-to-do citizens do not trouble themselves about public matters. Business and pleasure take up all their time and thoughts, forgetting how they are deprived of both by these unjust stewards.

Here we are in Thames-street, rented, rated, and taxed to the amount of half our earnings perhaps, and yet we must go a mile to load and unload our goods or submit to all manner of extortion,—and we must bear this for all time, because our free landing-places have been stolen, or sold for turtle soup and champagne!

I have not the slightest objection to improvements being effected in any ward; but when streets and alleys are built over, and the very paving-stones, flags, and gratings, are used up by private individuals, and all this is done in a corner, it is time for citizens to bestir themselves and inquire who are the parties that order these things to be done, and who get the benefit of them? I happen to know that one common councilman, of Dowgate Ward, has proposed, seconded, and carried, important measures alone, he being the only one present. I hope the time is not far distant when there will be much more equitable assessments of property in Dowgate Ward. I am very much afraid that assessments go by favour now, and I see no other plan for equitably assessing property but a Government assessment *ad valorem*.

Depend upon it, sir, the city of London is not going to remain much longer misgoverned. The vote in the House of Commons last week upon the Municipal Government Bill shows that if so small a number of the friends of corruption can be mustered together to batten up civic rottenness now, the days of the corporation of London are numbered: but, anyhow, let us save what public property they have left us.

George Mitchell.

THE TEMPLE CHURCH, 1588.

Among the Burleigh State Papers in the Lansdowne Collection, there is a very interesting agreement between two celebrated individuals of the days of Elizabeth,—an agreement which, in the nature of a "wager," has more than ordinary value, not only on account of the time (the season of the Spanish Armada excitement); but also that it exhibits a custom then prevalent of appointing some well-known public building,—in this case *the font of the Temple Church*,—for the payment of the "bet." It also gives us a very curious picture of pedestrianism 300 years ago.

As you have been good enough to mention my labours in connexion with the "History of the Temple and Temple Bar District" (in the

Builder of March 23), this memorandum may be worthy of printing, as a supplement thereto:—

"Be yt knowne unto all men by theis presents that I, Sr Robert Sidney, of Penshurst, in the county of Kent, Knighte, do hereby covenante and graunte for myself, my heires, executors, and administrators, and with Robert Carey, Esquire, sone of the Right Honorable Henrie Carey, Baron of Hunsdon, his executors and administrators, That yf the said Robert Carey at any tyme hereafter shall *in persone* goe and performe a jorney *on foote, from the Citie of London to the towne of Berwicke-upon-Tweede, within the space of twelve daies* entier, and they successivelie followinge one an other next after anie of the said Robert Carey his attempt and settinge forthe of the cittie of London to pforme the said Jorney wthout fraude or guyle, and after the said Jorney so gone and performed, shall thereof give publique notice at the usuall place appointed for the payment and receipt of money in *the Royall Exchange in London*, That then he, the said Sr Robert Sidney, his heirs, executors, administrators, or assigns, or some one of them, shall and will, within the space of one moneth then next followinge, well and trulye paye or cause to be payd to the said Robert Carey, his executors, administrators, or assigns, or to some one of them, the full sume of *one hundred pounds* of good and lawfull money of England, *at the font-stone in the Temple Church*, neere fleet streete, London, without fraud, covin, or further delay. To which covenant, well and trulie to be performed, I, the said Sr Robert Sidney, do by theis presents binde me, my heires, executors, and assignes to the saide Robert Carey, his executors and assigns, in the sume of one hundred and twentie poundes of like currant monie of Englande. In witness whereof I, the sayd Sr Robert Sidney, have set my hande and seale the 25 of January, 1588, in the xxxjst year of the reigne of our Sovereigne Ladie Elizabethe, by the grace of God Queene of Englande, ffrance, and Irelande, Defender of the Faith, &c.

R. SYDNEY.

Signed, sealed, and delivered, in the presence of H. SEYMOUR,
GEORGE CAREY."

Of the individuals concerned in this curious document little need be added. Their names are already widely known to all readers of history.

Sir Robert Sidney was the second son of Sir Henry Sidney, "the brave soldier, the consummate general, the able counsellor, the wise legislator," the eldest son being the equally-renowned Sir Philip Sidney, who, in writing to Sir Francis Walsingham, in 1581, describes Robert as "a younger brother of so yonglie a fortuned famlie," and adding, "he is more stored with discourses than monie." However, our hero, Robert, was created successively by James I. Baron Sidney of Penshurst, Viscount Lisle, and Earl of Leicester; was grandfather of the ill-fated Algernon Sidney, and ancestor of the present owners of Penshurst.

Robert Carey was the youngest son of Henry, first Lord Hunsdon, and was created by James I. Lord Carey, of Leppington, Yorkshire, and Earl of Monmouth. He died 1639, and was succeeded by his son, Henry, who, dying issueless, in 1661, the title became extinct, but was revived by Charles II. in 1663, in the person of his natural son James, the mother of whom was the historically famous Lucy Walters. The title is now one of those borne by the Duke of Buccleuch.

Of the two witnesses I believe the first to have been the celebrated Admiral Lord Henry Seymour, who had charge of the coaster ships at the time of the Armada; while the second was, without doubt, Robert Carey's brother, George, who, as eldest son and heir of Henry Carey, first Baron Hunsdon (who was created January 13th, 1558-9, and died 1596), succeeded his father as second Lord Hunsdon, became a K.G., and died in 1603.

It is somewhat curious that there was another George Carey living at the same period, who was of more than ordinary importance, viz., Sir George Carey, of Cockington, co. Devon, and of the Inner Temple, who was M.P. for Dartmouth 1586, for the county of Devon 1588, and died 1615.

I may also mention that it was Sir Robert Sidney, who, on the 8th of February, 1600-1, with a strong force under the Lord Admiral, besieged Essex House in the Strand, and called upon the rebel earl to surrender, and that Sir Robert Carey, on the death of Queen Elizabeth, and against the order of the Council, took horse at Charing-cross between nine and ten of the clock in the morning of Thursday, the 24th of March, 1603; rode that night to Doncaster, about 160 miles; the next day to Widdrington, another 135 miles; and did another 50 miles the next day; but a stumble of his horse prevented him reaching Holyrood House (another 50 miles) until the day following, when, wounded and weary, he knocked at the Castle Gate, and informed the Sixth James of Scotland of the death of Elizabeth, and heralded him personally as her successor!

T. C. NOBLE.

DOING THE LEAST FOR THE MONEY.

I HOPE the experience gained by the late "masons' strike" will not be lost upon either the masters or the men.

In the matter of interest in the men, the masters have duties to perform which they have neglected,—in the matter of apprenticeships especially. What is the system by which artisans are instructed to become skilled workmen?

In the matter of sympathy with the masters, the men have yet to learn to do as much as they can, and not as little as will pass muster for the wages they receive.

When through their representatives they say that they believe they are only doing as others do, when they give the least they can for the most they can get, they cut at the root of all progress, and effectually extinguish all sympathy for their side of the case.

No one ever succeeded in life who acted on that principle, and no body of men ever will. The truth of this statement as regards the men is often called in question, but it remains the fact. The day before yesterday I received this letter from a well-known firm of builders, who are executing works under me. I inclose their names, since they are prepared to prove the statement by showing their books:—

"Knowing that you are somewhat interested in the cost of masons' work, we venture to hand you a statement of the prime cost of two separate jobs, both executed out of the London district. They were carried out by the same foreman, and in many cases the same men. The one job was finished during the strike in soft freestone, and cost 8s. per foot cube, labour only. The other was finished eighteen months before the strike, in similar stone, but cost little more than half that sum. Yet the latter had quite twice the amount of work on it."

Now, sir, I am earnestly anxious to promote technical education throughout the country, but such facts as these take away the interest which otherwise would be excited in favour of the men.

EDW. C. ROBINS.

MASTERS AND MEN.

SIR,—Our attention has been drawn to a paragraph in your paper of March 30th, under the heading "Masters and Men," where it states that the plasterers of Bristol are seeking an advance of 1d. per hour, also that we are receiving at the present time 9½d. per hour. This portion is not correct, as you will perceive by the enclosed memorial, which was sent to the employers January last. We should esteem it a favour if you would correct the same. By so doing you would oblige,

THE UNITED COMMITTEE.

*** According to the memorial we have received, the plasterers are now receiving only 7½d. per hour.

NEW ASSIZE COURTS FOR BEDFORDSHIRE.

THE present Assize Courts at Bedford, at which the business for that county is transacted, having for many years past been found to be inconveniently small and in every respect unsuited for the discharge of the Assize business, the Court of Quarter Sessions sitting at Bedford have just decided to purchase land and obtain plans for a new county-hall, to include assize courts amongst other public rooms and offices. The site of the present courts is in St. Paul's-square, almost in the centre of the town, and in close proximity to the well-known Harpur Schools; but the probability is that the site selected for the new courts will be in a more suburban part of the borough.

THE NEW HOSPITAL FOR CONSUMPTION AT BROMPTON.

IT will be remembered that, some time ago, a large sum of money was left by a lady for the purpose of extending the Hospital for Consumption in Fulham-road, Brompton. The legality of the bequest was contested, but, after some litigation, was confirmed, and the works in connexion with the new building are about to be commenced, the preliminary step having been taken during the present week in the sale of the first portion of the materials of the buildings standing upon the intended site. The property so to be cleared away for the new hospital is amongst the most valuable of that in Fulham-road. It consisted of fourteen houses and shops, having an aggregate frontage to the road of about 160 ft. in length, and extending a considerable depth backwards; together with a mews having stabling for thirty horses, with coachhouses and dwelling-rooms over them. There were a very large number of lots, the sale occupying two days. Another sale for the further clearance of ground for the new buildings will shortly take place.

ST. MARGARET'S CHURCH, STANFORD-LE-HOPE, ESSEX.

THIS church has just been restored, from the designs of Mr. M. H. Linklater, architect (now the Rev. M. H. Linklater). Much of the church is of very early date. The building consists, in the main, of nave, and north and south aisles, and chancel. It is entered by a south-west porch and west door, and the structure is built of stone and flint. The chancel walls have been rebuilt, and there are new windows in other parts of the church. The apices are surmounted by worked stone foliated crosses, and the shallow-pitched roofs are covered by tiles, in light and dark bands. The south aisle, however, is covered with lead. The tower buttresses are in, but otherwise the tower is not carried up. The stone used is firestone, from near Reigate, a material much like the clunch found in the Midland Counties. It is intended to introduce large belfry windows into the tower, and carry up a turret at the angle. The ground upon the south side of the building has been lowered to the original level, and hence the true proportions of the old church are brought out. The main part of the building is Decorated work; but the remains of the original Norman church are still quite perfect, and part of its arcade, together with a couple of windows, still remain. The old rood was carried upon two prominent stone corbels, which have been preserved. The nave and chancel roofs, and that of the south chancel aisles, are new, panelled and moulded, and with embattled wall-plates. The floors in the nave and aisles are laid with Mr. W. White's patent herring-bone wood flooring, and will be seated with chairs. The arcades are fine, and there is an interesting piscina in the north-east corner of the aisle. The three-light east window contains painted glass by Messrs. Lavers, Barraud, & Westlake. A brass plate let into the wall on the north-west side of the chancel-arch records the fact that it is inserted "in memory of John, son of Lieut.-Col. Hay, born August 19th, 1837, died June 19th, 1870." The old altar-rails now do duty as a dwarf chancel-screen. The altar is gained by three steps of polished Genoa marble. A parclose screen, of very late workmanship and somewhat peculiar detail, exists, and so do a good Early English sedilia, credence, and piscina. On the north side of the sanctuary is an Easter sepulchre. The Purbeck marble of this is partially new, and has been restored by Mr. Harry Hems, of Exeter, to whose hands the re-fixing and restoration of the Early English font was also entrusted. The reredos is of stamped leather, and has been presented by the Sisters of All Saints, Margaret-street, Cavendish-square. There are four cherubim in panels, and a large cross in the centre, with spear, sponge, and a reed, and five triple nails. The effect of it is not successful. The old chancel-stalls have been utilised. The church contains some fine monuments of the early part of the eighteenth century, and the remains of several old brasses. On the north side of the west end a so-called Leper window has been discovered and opened out. It looks directly up to the altar in the chapel of St. Nicholas, in the north-east end of the north aisle. The builder is Mr. Gregory, of Clapham Junction. His resident foreman is Mr. Newton. Some old tombs exist in the churchyard. One,

a Purbeck slab, is to the memory of a Lord Mayor of London, named Champion, who died about 1600, and was buried there. The addition of tower, pinnacles to west end, &c., will cost about another 2,000*l.*, and it is hoped that Dr. Sedgwick, D.D., the vicar, will soon find these funds forthcoming, and complete worthily the work he has begun.

SIR GILBERT SCOTT AND SIR DIGBY WYATT.

DEAR MR. EDITOR,—Amongst my poor brother's papers I found a letter from the late Sir Gilbert Scott, addressed to him in 1868, on the completion of the India Office, on which they were jointly engaged.

I send you a copy of that letter, for I think it has now assumed such a melancholy interest since the last of these two distinguished men and past friends has passed from amongst us, that I believe its publication will have an interest for architects, and cannot fail to do honour to both. It conveys to all of us a useful lesson as to the charm of faith and honour in all professional engagements. If you agree with me, this letter is much at your service.

T. H. WYATT.

20, Spring-gardens, S.W.,
16th May, 1868.

MY DEAR SIR DIGBY,—Allow me to take the opportunity of the last act of our connected engagement on the "India Office" having been completed, to express to you my thanks for the exceedingly kind and agreeable circumstances which have uniformly attended our connexion on that work.

I entered into the arrangement with you at a time when, as I imagined, my position was strong; and when, shortly afterwards, and during a lengthened period, it unexpectedly became very much the reverse, you adhered with all possible truthfulness to the arrangements made under different conditions; nor have you throughout flinched from them, or evinced any but the most friendly feeling of equal and loyal co-operation.

Allow me to repeat my congratulations on the honour which you have attained, at a moment coincident with the happy termination of this work, on which we have been mutually engaged, and to wish you and Lady Wyatt the long enjoyment of that distinction.—I remain, my dear Sir Digby, ever yours most sincerely,

G. GILBERT SCOTT.

Sir M. Digby Wyatt.

WORKS BY SIR GILBERT SCOTT.

SIR,—On looking through the enumeration, in your last, of works that were executed by the late Sir Gilbert Scott after the year 1847, I find that from memory I can add the following to that already copious list.

J. DRAYTON WYATT.

Churches.—Bibury, Bourton, Bushley, Cadeby, Coventry (Holy Trinity), Doncaster (St. James'), Donnington Wood, Eastnor, Gamston, Great Malvern, Greenstead Green, Halton, Hawkstone, Hillingdon,* Northampton (St. Peter's), Norton (St. Philip's), Okeover, Queenhill, Sprotborough, Tamworth, Turvey, Wood Green, Woolland.

Monuments, &c.—Queen Katherine Parr (in Sudeley Castle Chapel), late Duchess of Gloucester* (Windsor), Earl Powis, Earl of Ripon, Earl Somers, Lord Hotham, Dowager Lady Leigh, Rev. Dr. Mill.

"T. E. W." adds St. Andrew's Church, Ashley-place, Victoria-street, Westminster.

SIR,—During a professional tour which I made in the North of Italy with the late Sir Gilbert Scott, I had good opportunities of knowing the many valuable traits in his character, referred to in your able article of last week.

I fully agree with what you say regarding his connexion with the Foreign Office. You dwell most correctly upon his indomitable perseverance and untiring energy, which I have often witnessed,—working early and late.

I perceive that in the list of his buildings quoted by you, Wells is mentioned. Now, I think it due both to his memory and my own position, to state that the committee for the restoration had full confidence in me; but, as Scott was then engaged on many other cathedrals, they thought it would increase their funds to have his name associated with the work. To this I gladly consented. His reply to the request was most gratifying. He declined, expressing himself in the most eulogistic terms of myself, and stating that the work could not be in better hands than mine. *This* is his connexion with Wells. I mention this as the allusion to his work in your summary might give rise to an erroneous impression.

BENJAMIN FERREY.

* These were included in the list (p. 343) of Sir Gilbert's works illustrated in the *Builder*.

OPENING OF THE LAMBETH NEW INFIRMARY.

THE new infirmary for the parish of Lambeth, which has been erected at a cost of about 75,000*l.*, and which is the largest building of its kind in the metropolis, was formally opened last week. The general external architectural features and dimensions of the building have already been described in the *Builder*. The four blocks, of three lofty stories each, containing the wards for 650 patients, are intended, if necessary, to be still further enlarged, by the erection of an additional story, which would provide accommodation for 217 more patients, bringing the entire number of beds up to 867. The interior arrangements of the several wards vary, a portion of them being what are termed double wards for aged sick patients and chronic cases, whilst the narrower and smaller wards are for acute, ophthalmic, infectious, and surgical cases. The wards throughout are warmed by low-pressure hot-water pipes, in conjunction with Galton's stoves, the pipes being of a medium size, and encased in an ornamental iron covering, having trellis panels on the front and top, with other arrangements for regulating the warmth and admission of fresh air direct from the external atmosphere. The large kitchens and culinary department are at the rear of the administrative block, and are fitted with machinery and appliances for cooking by gas, which is to be the system exclusively adopted throughout the establishment. The separate laundry block, of one story in height, is likewise fitted up with machinery of a varied character, for the purpose of carrying out the work of this department, and consists of two steam boilers and an engine of eight horse-power, the building containing, in addition to the boiler-house and engine-room, a steam wash-house, ironing-room, steam drying-closet, and dirty and clean linen stores. The boiler-setting is faced with white enamelled bricks. The drying-closet is heated to a temperature of 230 degrees Fahr., by steam passing through a coil of piping. The outer walls are all double, to economise the heat, and are provided with inlet and outlet ventilating valves. The whole of the engineering work for the establishment, including the engines, boilers, machinery, and iron-work arrangements, as above described, was carried out by Messrs. A. McLaren & Co., ironfounders, engineers, and contractors, of Upper Thames-street, under the superintendence of Mr. R. A. Quain, consulting engineer to the firm. We reserve any opinion as to the planning and sanitary arrangements of this costly establishment.

THE "CLEOPATRA" SALVAGE SUIT.

JUDGMENT.

IN the Admiralty Division of the High Court of Justice, Sir Robert Phillimore gave judgment on Saturday in the case of Dixon *v.* Burrell, which was an action brought by the contractor for bringing "Cleopatra's Needle" from Egypt to England against the owners and crew of the screw steamer *Fitzmaurice* to ascertain the amount of salvage remuneration which should be paid for the recent services of the defendants in the Bay of Biscay.

Sir Robert Phillimore, in giving judgment, said the ingredients of a salvage service were, firstly, the enterprise of the salvors, to go out during tempests and on other occasions, risking their own lives to save life and property of their fellow-subjects; secondly, the position of the saved property at the time it was found,—that is, whether it was in immediate peril; thirdly, the amount of labour which was expended by the salvors; and, lastly, the value of the property saved. The peculiar character of the property saved in the present case presented some difficulty in the application of the last of these elements. In ordinary cases the marketable value was easily ascertained; it was estimated and appraised by skilful persons. It could not even be said that the property before the Court was not marketable property, inasmuch as it was stated in the affidavit of Mr. Burrell that the city of Glasgow and other cities would be glad to pay large sums for such objects. Then, apart from the consideration of the mere marketable value of the obelisk, it was undoubtedly of great antiquity. It would be as absurd to consider the value of the obelisk only depended upon the value of the piece of granite as such as to estimate the price of a Michelangelo according to the value of the canvas upon which the painting was depicted. So, after taking into consideration all the circumstances connected with the present obelisk, he fixed the price at 26,000*l.* The obelisk had been recovered under circumstance of great peril, and if the *Cleopatra* had been left in her derelict state she would certainly have sunk, which was an element to be considered in addition to the peril caused to other ships if they had come into contact with her. He considered that, under the whole of the circumstances, salvage remuneration of 2,000*l.* should be paid to the defendants.

LIGHT AND AIR CASE.

Barker v. *Lindsay.*—The plaintiffs in the action thus intituled (High Court of Justice, Chancery Division, before Sir R. Malins) were the firm of Savory and Moore, chemists, carrying on business at 143, New Bond-street, and the defendant was Sir Coutts Lindsay, the proprietor of the Grosvenor Gallery.

The plaintiffs, on the 6th of December, 1876, instituted the present action, complaining that certain premises in their occupation in Grosvenor-mews, being premises in the rear of, contiguous to, and in communication with, their shop in New Bond-street, would be deprived of proper access of light and air by reason of a wall the defendant threatened to build on the site of the Grosvenor Gallery; and they claimed an injunction restraining the defendant from erecting such wall of a greater elevation than the elevation of former buildings on the same site; they also claimed damages. Since the institution of the suit the defendant had, by permission of and arrangement with the plaintiffs, erected the wall in question, and the matter now came before the Court on final hearing and with respect to damages. The plaintiffs had been forced to discontinue the occupation of their premises in Grosvenor-mews, and had consequently been put to considerable cost. They also complained that they had been obliged to move at a time when they were unusually busy in carrying out a contract with the Government for the supply of medical stores to the first army corps.

Mr. Bristowe, Q.C., and Mr. T. A. Roberts, were for the plaintiffs; Mr. J. Pearson, Q.C., Mr. Kemp, Q.C., and Mr. Watson were for the defendant.

On the suggestion of the Vice-Chancellor that the matter was a proper subject for mutual arrangement, and that a sum of 50*l.* would meet the damages suffered by the plaintiffs, it was ultimately arranged that the defendant should pay such sum to the plaintiffs in satisfaction for all demands and damages, and should further pay the costs of the action.

BRICKYARD CHIMNEYS.

SIR,—We have at the present time a brickyard chimney to repair, and are at a loss to know what would be the best material to form or finish the top of the chimney with, to be able to resist the acid which accumulates in the chimney, and completely destroys the mortar and cement, and bursts the chimney-cap open. We have tried at different times all kinds of stones, but none of them were of any use; the acid always adhering to and completely destroying them. We shall be exceedingly glad to hear what would be the best thing to top the chimney or finish with in the room of stone.

M. & S.

HALIFAX FLOUR SOCIETY.

SIR,—In answer to "Competitor's" inquiry, I beg to say that with two exceptions the drawings were at their proper destinations six weeks ago; that is, the successful drawings which became the property of the Society are at this office, except those that gained the third premium, the author of which requested his drawings in lieu of 25*l.*, which the directors granted, and his drawings were returned. All the unsuccessful were returned at once, except two, under motto,—"Mantura" and "Je vive en Espoir," having no address; I did not know where to send them, but will do so at once on receipt of address.

Bailey Hall Mill. WM. KERSHAW, Secretary.

CAUTION TO BUILDING ARTISANS.

INFORMATION has reached London of a heartless swindle.

A well-dressed, plausible fellow, giving the name of Webb, has for the last six weeks been visiting several provincial towns representing that he is the head of a large firm at Chicago, United States of America, and that he is in quest of a number of artisans and labourers, and that the wives and girls can also find suitable employment, the men at the rate of $3 a day, and the women $2, on a yearly agreement. A printed form of this bogus agreement being signed, the "firm" agreeing to pay all travelling expenses, a sovereign is drawn from each intending emigrant as a "token of good faith."

At Crewkerne, Somersetshire, forty heads of families were found simple enough to believe the fellow's story, and these poor people broke up their homes, sold their furniture, and everything they could not take with them, and many of these families are now homeless and comparatively destitute. In the meantime this

Chicago rascal "went on business" elsewhere, promising to return and take the emigrants to Liverpool.

The same fraud, we are told, has been practised at Plymouth, Walsall, and other places.

As this notice will meet the eyes of many building artisans at work in country towns, a little inquiry on their part might lead to the apprehension of the rascal.

Books Received.

The Index to our Railway System and our Leading Lines. A Comprehensive Analysis of Railway Property. Second number. A Handbook for Shareholders and Investors, and all who are interested in Railway Administration and Management. By WILLIAM FLEMING. London: McCorquodale & Co. 1878.

It is not too much to say of Mr. Fleming's laborious and lucid index, that it justifies the claim of its title. Not only will it be found a useful hand-book for shareholders and investors, but it may be called an indispensable aid to all those who, regarding railway property not as mere occasion for gambling speculation, but as serious investment, are anxious to learn for themselves those facts on which the values of each special stock essentially depends. Such value, we need hardly say, is frequently very inadequately represented by the market price, which will rarely be found in accurate accordance with the earning power of the several lines. It is this which it should be the first object of the investor to understand.

The main foundation of this index is the Blue-book of "Railway Returns," annually published by the Board of Trade, which contains the whole of the information that each railway company is bound to furnish to that authority. On this summary statement the annual report to the Board, which for so many years was furnished by Capt. (now Sir Henry) Tyler, and which is still drawn up on the same stereotyped model, is framed. It unfortunately happens, however, that the precise particulars of information which would complete the "Railway Returns," and thus enable the writer of the Board of Trade report to give a summary that would be, not a literary curiosity only, but a document of really instructive value, are carefully eliminated from the returns made by the companies. Mr. Fleming remarks with great justice,—"It is unfortunate that the Board of Trade returns give no details of the capital expenditure whereby an analysis of its application could be made. In this, and in other fundamental respects, the official returns of the Board of Trade are lamentably deficient. The question is one not only affecting shareholders and investors, but is so intimately connected with the social and commercial progress of the country that information commensurate to the interests at stake should be forthcoming. The returns of the railways of India and of some of our colonies far outstrip in useful and essential data those of the home lines."

The same fundamental concealment of the essential elements occurs with reference to the respective net earnings of the different classes of traffic, that is above pointed out with reference to the distribution of capital. As to passenger, goods, and mineral traffic, while gross receipts are given under each head, and total mileage of trains under the two heads of passenger and non-passenger traffic, neither fares, rates of freight, nor average distances for each class of traffic, are given. "There is consequently," remarks Mr. Fleming, "little meaning to be derived from, or value to be attached to, such superficial results as can be arrived at." Year after year will be found, in Captain Tyler's successive reports, a similar complaint. "Whilst the receipts of goods and passenger trains are supposed to be kept separately, no attempt is made to separate the expenses of goods and passenger trains from each other." That sentence is repeated in the Reports of 1873, 1874, and 1875. The Board of Trade admits the ineffective character of the control which the publication of such defective accounts enables either the Government, or public opinion, to exercise over the railway companies.

The only means by which, in the present state of things, it is possible to attain a little daylight on the subject of the respective value of the several branches of traffic, is that afforded by a comparative statement of the earning power of different lines. Of these some carry almost exclusively passengers; one or two are mainly mineral; while the stocks which most attract the attention of purchasers are those of the long trunk lines which carry both passengers and mineral traffic. Mr. Fleming's tables show at a single glance how much superior is the earning power of the former to that of the latter class of railways. With regard to the exceptional cases of such lines as the Taff Vale and the Festiniog, they do not come within the number of the twenty leading lines analysed by Mr. Fleming.

One source of information which has been neglected by the Board of Trade reporters is supplied by Mr. Fleming, with regard to seventeen main lines, from the reports of the companies. This refers to the proportion of capital laid out in plant, and also to the amount annually charged to revenue, and the amount annually debited to new capital for the maintenance and repairs of stock. Here "it will be observed that the proportion of the capital cost of the working stock to the total capital of the passenger lines is very much less than on the goods lines, the extremes being the Metropolitan District, with 2·50 per cent. of its total capital invested in working stock, and 3·20 per cent. on the Metropolitan, as against 16·92 per cent. on the North Eastern, 14·95 per cent. on the Glasgow and South-Western, and 13·39 per cent. on the Caledonian; the first being the extreme of passenger lines, and the others the heaviest mineral carriers." Looked at in another light, we find that while the Metropolitan lines earn nearly double the cost of their plant every year, and while the Brighton and South-Eastern earn 16 and 17 per cent. more than the total cost of their plant each year, the North-Eastern and the Glasgow and South-Western earn 30 per cent. less than such value, and the Caledonian 36 per cent. less. This is an inquiry which it is of extreme importance to pursue. In the case of the Metropolitan lines 92·88 per cent., and in the case of the Brighton and South-Eastern 71·19 per cent., of total gross revenue is derived from passenger traffic. In the other three lines only 32·21 per cent. of gross revenue is thus earned. In the first case 100*l.* spent in stock earns 19*5l.* per annum; in the second case, it earns 116·5*l.* per annum; in the third case, it earns only 68*l.* per annum. And it is hard to see in what other way the total capital can be apportioned to the different kinds of traffic. Although it may be remarked that from the greater speed of the passenger trains, the way and works of the three last-mentioned railways will be occupied for considerably more than two-thirds of the twenty-four hours by heavy traffic, against one-third by light.

Mr. Fleming has drawn up and included in his book a draft form of Board of Trade Railway Returns. It is a form which no company ought to find it difficult to fill up. We may go further. No company, unless it be one that has to boast so steady and steadily-augmenting a flow of prosperity, evinced by rising dividends, that it may safely neglect the rules of book-keeping,—if such there be,—can be safe, that is unable to fill them up. On the other hand, they give all that the shareholders, the public, or the Government, have any right to require. The actual solvency of every company, the honesty of its declared dividend, and the wisdom with which its concerns are managed, would emerge so distinctly from an analysis of two or three years of returns such as those of this draft, that no question as to either of these disputed points need ever after arise. Unfortunately there are many companies now existing the managers of which are instinctively aware that the less that is known as to such facts, the better face they can put on them. To such managers, chairmen, and directors,—would that there were fewer of them!—Mr. Fleming must appear in the light of a very formidable antagonist, or, in their own language, a mischievous busybody.

VARIORUM.

MESSRS. W. & G. AUDSLEY, of Liverpool, have commenced the publication in parts of two important works,—"Outlines of Ornament in all Styles," selected from executed ancient and modern works, and intended to be a hand-book for the architect and decorative artist; and a "Popular Dictionary of Architecture and the allied Arts: a Work of Reference for the Architect, Builder, Sculptor, Decorative Artist and General Student; with numerous Illustrations from all Styles of Architecture, from the Egyptian to the Renaissance." One part of each work is published. Each of the books will have our attention when further advanced. In respect of the second work, the commencement of the prospectus will probably be regarded as an impeachment of the Architectural Publication Society's Dictionary:—"There is probably," they say, "no work more required at the present time than a good Dictionary *raisonné* of the numerous terms used in the Fine Arts. Such a work, strange to say, does not exist, notwithstanding the countless demands which have been made for it during late years. Numerous learned treatises have been published on all departments of the fine arts, replete with technical terms and allusions to artistic details which they do not pause to to describe."——We opened the 28th volume of the "Sussex Archæological Collections," recently issued, at a paper "On the Archæology of Sussex Cricket," by the Editor (Mr. C. F. Trower, M.A.), and could not look at any other paper till we had finished it, so full of information and pleasantly written it is. It is Mr. Trower's own fault, therefore, that we have time only to say that the indefatigable Mr. Mackenzie Walcott, Sir George Duckett, Mr. H. Simmons, and others, concur to produce a very useful addition to the long row of volumes issued by the Sussex Archæological Society.——"Boiler and Factory Chimneys: their Draught, Power, and Stability, with a Chapter on Lightning Conductors," by Robert Wilson, A.I.C.E. (Crosby Lockwood & Co.), contains valuable information of the subjects on which it treats. We quote a few practical paragraphs:—

"A chimney-shaft is made up of a series of steps or courses, one above another. Each step is of uniform thickness, but as we ascend, each succeeding step is thinner than that which it rests upon, so that the bed joints between the steps, where the thickness changes, have less stability than the intermediate bed-joints, and it is only these former to which it is necessary to apply the formulæ in determining the strength and stability of the structure. The height of the different steps of uniform thickness varies greatly according to the judgment and practice of the architect or builder, and the custom in different districts. If we take the safe load that can be borne by good brickwork, at 20,000 lb. per square* foot, and the weight of brickwork with little mortar at the joints, at 115 lb. per cubic foot, we have 20,000 ÷ 115 = 170, approximately, as the extreme height in feet, we should make any single division, or length, of uniform thickness. This length is very seldom approached, even in the tallest shafts, as the brickwork has also to bear the weight due to force of wind acting against the opposite side of chimney, in addition to the chimney itself. The steps, or courses, should not exceed 90 ft. in height, except in cases where the chimney-shaft is inside a tower which protects it from the wind. In chimneys from 90 ft. to 120 ft high, the lengths vary from 17 ft. to 25 ft., the top height being one brick thick; in chimneys from 130 ft. to 150 ft., the lengths are from 25 ft. to 35 ft.; in chimneys from 150 ft. to 200 ft. the lengths are from 35 ft. to 50 ft., the top length being one brick and a half thick, and in very tall chimneys, that is, from 200 ft. to 300 ft., and over, the lengths vary from 50 ft. to 90 ft., the thickness of top length being one brick and a half. The binding of the masonry† is often increased by laying at intervals hoop-irons, tarred and sanded, in the bed-joints, the ends being turned down into the side joints. The length of the hoop-iron in each joint should be twice the circumference of the chimney at that part."

——"Unclaimed Money: Handy Book for Heirs at Law, Next of Kin, and Persons in Search of a Clue," by Edward Preston (1, Great College-street, Westminster), is not unamusing, and may in some cases be useful; but woe to the man or woman who gets set on such a chase as that in question.——General Sir Arthur Cotton, in the *Leisure Hour*, bears out what we have often asserted in respect of *Irrigation in India*.—"What is now wanted to provide against famine is, first, to put the tens of thousands of tanks in complete order, to enlarge them, and, wherever possible, to supply them from the great rivers; secondly, to connect the various patches of navigation already executed in the different works of irrigation, and complete the lines of main canal throughout the country, for this is perfectly practicable throughout India; and thirdly, to extend irrigation to every district according to its capabilities. It is most certain that in this way not only can all India be secured from famine, if it pleases God to continue the seasons as hitherto,—that is, without more severe failures of rain,—but its wealth and prosperity can be increased far beyond the change which has passed over Godavery, for that district is still isolated and cut off from sharing in the coal and other productions of distant districts. It will be seen by what Mr. Leslie says about the canal from Calcutta to the

* As the crushing strength of ordinary brickwork is much less than 99 tons to the square foot, the strength of the bricks used in very high structures should be ascertained by experiment.

† The bond usually adopted is one course of headers to four of stretches. In circular chimneys a uniform bond for the outside course of brickwork is sometimes recklessly adopted.

Ganges, that the grand desideratum is cheap transit; even in a short distance, as of 130 miles, 1½ millions may be saved per annum. How much more must it be needed in great distances of 1,000 or 2,000 miles? With respect to the general results of the great irrigation works executed by our Government in returns to the Treasury directly from water-rates alone, Mr. Thornton, the head of the Irrigation Department in the India Office, said, at a meeting of the Society of Arts, that the lowest return was four and three-quarters per cent., and the highest forty, for all the works in operation."——The new number of *Night and Morning* (edited by Dr. Barnardo) says:—"Referring to the workhouse infirmary, Mr. Peek quotes from the writings of a lady who has had great experience of workhouse life,—'The assortment of strange bedfellows in a workhouse ward is such as poverty and the Poor-law could alone bring together. Men in convict-looking clothing are sitting on the sides of the beds; faces are amongst them on which one dare not look again. Strong, bad men are dying here, after lives of sin and shame: wild animals tracked to their lair, dying savage to the last. Children are here; the little pale-faced boy of ten years old has been two years in that bed; the dying tramp lies quiet beside him; a burglar is in one bed, in the next a boy of sixteen with an innocent face.' This is no exaggerated picture. Indeed, we can add our personal testimony to that of Mr. Francis Peek, and assert, without fear of contradiction, that the workhouse system, as applied to children of the State, is in itself a most prolific source of that pauperism, wretchedness, and crime, under which our land groans. Were it not for the various Homes, certified and voluntary, which have been established for the rescue and training of destitute children, the condition of these poor creatures, bad as it is now, would be infinitely worse."

CONDITION OF THE SOUTH KENSINGTON SCHOOLS OF ART.

Sir,—I sat down yesterday to pour out to you a string of grievances as to the sanitary shortcomings of the Schools of Art, South Kensington; and I was stopped by the welcome news that workmen had been there during the day to put in new ventilators. So it appears that, things having got "to the worst," are about to fulfil the old proverb, and "mend," and thus one trouble may be over. But I have little faith in the completeness of the remedy, without your help.

Things have, indeed, been pretty bad, and are so still in some respects. There are over 200 young women in the rooms devoted to their use; they are working daily from a quarter past nine, or thereabouts, until four. The windows are closed, and the students are forbidden to interfere with them. [Perhaps wisely, for when, in a suffering moment, one of them ventured to open a window, the whole thing fell in, or out, to the evident risk of those beneath it.] These windows only open by a swing pane at the top, so that even in the hottest summer's day, a very limited portion of fresh air can be obtained from them. During the luncheon half-hour, a man comes round, and tests the heat of the rooms by the thermometer. If it point above 60°, he ventilates the room for a few minutes. But if it be only airless and close, the windows remain sealed. There have always been ventilators, but they have been as often as not covered over.

In the retiring-room there are eight compartments, and only one window to ventilate the whole, and this one often shut,—the fault, partly, of the students themselves; but there should be a superintendent. In the lavatory there are four basins and five towels provided for the daily use of these ladies,—let me remind you, over 200 in number,—forty persons to each towel.

A room beneath the Science School has been set apart for those young women who are studying anatomy. Under this room there runs a pipe, which is so charged with offensive matter of some kind, that the room is untenantable, unless the window be *kept open*.

There are those who argue that there is nothing unwholesome in this pipe; but the fact remains that it is quite insufferable, and that the constant draught is more than delicate people can bear in winter. The result is cold, and worse. There has been a recent case of typhus and death, and without wishing to press the matter too closely, there seems little doubt of the primary cause.

I began by saying that these daily troubles are likely to be in some degree remedied. If you will give your aid and influence, *all* may be set right. Will you give another "Blow for Life"? To many of these young women their study is a matter of vital importance from a monetary point of view. Others only work from love of art and to improve the talent with which they are gifted. But how can *either* hope to excel under such baneful influences? I can testify to headache, nausea, weariness of mind and body, work abandoned in midday from sheer inability to bear the discomfort any longer, discouragement and dissatisfaction, even where there is a strong will and a wish to persevere. What must it be to those who have only just begun, and have the whole struggle before them? It seems to me that the schools were arranged for a certain number, who have been more than doubled without any increase of accommodation.

If you will take the matter in hand, you will win the gratitude of many a weary worker, and add one more to the many heartfelt obligations of yours very faithfully,

A Lover of Fresh Air.

Miscellanea.

London and North-Western Railway Extension.—The new main section of the London and North-Western Railway Company, in course of formation, which will give to Northampton increased advantages with regard to railway accommodation, is (according to the local *Herald*) progressing rapidly, so far as the preliminary earthworks are concerned. Commencing at Roade, where the line will eventually join with the present permanent way, the work of excavating has been exceedingly heavy, owing to the depth of the cuttings necessary in that neighbourhood, and the hard nature of the earth. On leaving Roade, there is a cutting measuring 344,000 cubic yards, while about a quarter of a mile distant is another of almost equal proportions. From this point, however, the work is comparatively light, until the Lady Brook, at Milton, is reached. Here has been constructed a large and substantial bridge, with three arches, the structure itself being completed; and the work of levelling is now proceeding. At Hunsbury-hill there are extensive works for the excavation and formation of the tunnel, which, when completed, will measure 54 chains. At different points shafts have been sunk, and the progress at present is stated to be very satisfactory to the contractors, Messrs. Meakin & Dean. At Northampton, where the main line will cross the Peterborough branch, a large bridge has been built. Immediately adjacent to this the canal will be spanned by a bridge. The loop line, with the Peterborough and Harborough lines joining between Bridge-street Station and the level crossing gate, is nearly completed, as is also the diversion of the canal just below the bridge, already mentioned. The chief engineers are Messrs. Wm. Baker & Stevenson, and the works are being superintended by Mr. Trench, engineer for the London and North-Western Railway Company, and Mr. Strover, contractor's engineer.

Metropolitan Street Improvements.—On Wednesday that portion of the new street in course of construction by the Metropolitan Board of Works from Shoreditch to Bloomsbury, which lies between Wilderness-row, Clerkenwell and Farringdon-road, was publicly opened. At half-past two in the afternoon, at Foresters' Hall, a procession was formed, consisting of Sir J. McGarell-Hogg, and other members of the Metropolitan Board of Works, followed by members of the Clerkenwell Vestry, who marched down the new thoroughfare to Farringdon-road, back to St. John's-square, where the opening ceremony took place. The proceedings concluded with a luncheon at the Foresters' Hall. The new street passes within a few yards of St. John's Gate.

Coal Mines in China.—A statement comes from China of a scheme about to be launched for working coal-mines some 120 miles west of Chefoo. A Taoutai, named Chang, has, it is said, got permission to form a merchants' company to commence operations with all the modern scientific appliances. The scheme includes a tramway to the sea, with Chefoo as the principal depôt.

Sheffield Work for the Paris Exhibition.—Messrs. Steel & Garland, of the Wharncliffe Works, in this town, have prepared a selection of goods for the Paris Exhibition which will uphold the reputation which Sheffield now enjoys for the manufacture of grates and fenders. There are in all eight grates, with fenders, ash-pans, tile-hearths, and standards. Conspicuous amongst them is one of the old style of hob-grates, which has been made from a special design for the Exhibition. The grate is square in form, and the outer mouldings are of iron, dead bright. In front of the hobs are let in two embossed and engraved brass panels; and following the line of the moulding is an embossed polished brass concave canopy. The fire-bars fit into a semicircular opening, with brass panels, and the back of the grate is fitted up with encaustic tiles. Then there is a grate of an entirely different character. It is one of the old Stephens pattern, made of burnished steel, for which this firm have been noted. Round the canopy is a very rich ormolu moulding and bead. The canopy is engraved with a florid Italian design, and nickel-plated. Next is a class of grate in the "Queen Anne style." One of these has a series of polished brass-reeded mouldings, with hand-painted art tiles up the sides of the grate and across the top. They form a frieze, and represent Martin's "Œdipus and Narcissus," painted in Indian blue, in panels. Polished brass forms a marked feature in the goods of this exhibit. The firm have recently opened show-rooms on the Holborn Viaduct, London.

London and Middlesex Archæological Society.—This Society was represented at the funeral of Sir Gilbert Scott by Mr. J. Green Waller, vice-president (in the place of the president, Lord Talbot de Malahide, who was unfortunately unable to be present), Mr. Alfred White, F.S.A., Mr. E. W. Braybrook, F.S.A., Mr. J. E. Price, F.S.A., and the hon. sec., Mr. George H. Birch. Sir Gilbert had been associated with the Society from the very commencement, and contributed several papers, which have been published in the Transactions. He held the position of vice-president, and at the time of his lamented decease was making arrangements for reading a paper at one of the evening meetings of the Society.

Plumbers on Strike.—The plumbers of Edinburgh, to the number of 200, went out on strike on Saturday, in consequence of a notice issued by the masters that the men would be required to walk to their jobs, when within city boundaries, in their own time.——Last week the plumbers of Nottingham "turned out," owing to the masters refusing to pay an advance in wages, which, it is alleged, they had promised the men. Last October the men, who were paid at the rate of 9d. an hour, agitated for a rise of 1d. per hour. After a good deal of discussion the masters, it is said, agreed to pay an immediate advance of ½d. per hour, and promised a further similar rise on the 1st of April.

Theatre Burnt.—On Saturday, the 6th inst., the Theatre Royal, Oldham, was burnt to the ground. The building, which would hold between 2,000 and 3,000 people, was the property of a limited company, and was insured. The origin of the fire is not known, but it began near the stage and must have been smouldering all night. The wardrobe and orchestral instruments were consumed. The People's Music-hall was also discovered to be on fire on Saturday, so that the fire is supposed to have been the work of an incendiary.

The late Mr. Rochead, Architect.—We hear with regret that Mr. John T. Rochead died on the 7th inst. in Edinburgh. Mr. Rochead was for many years a leading architect in Glasgow, and designed many important buildings: the Bank of Scotland, Park Church, Knock Castle, and West Shandon and many other large houses. He was also one of the successful competitors in the Foreign Office competition. After a severe illness about ten years ago, he gave up practice and retired to Edinburgh.

Provident Institution of Builders' Foremen and Clerks of Works.—Sir Gilbert Scott was for many years a patron and liberal supporter of this Institution. Too late to be included in our report of Sir Gilbert Scott's funeral, we learn that the Institution was represented thereat by Mr. R. Johnson (president), Mr. J. Hutchings (treasurer), Mr. W. Miller (librarian), and Mr. J. W. H. Bedford (secretary).

The Simon Testimonial. — When Mr. Simon retired from the office of chief medical adviser in her Majesty's Privy Council, a proposal was made to raise a subscription in order to present that gentleman with some testimonial in token of his efforts on behalf of the medical profession, and of sanitary science in particular. On Saturday last, a meeting of the committee of the fund was held at the rooms of the Social Science Association, Adelphi, Sir James Paget in the chair, when a report was presented, stating that the amount of money required had been liberally subscribed. Resolutions were passed adopting the report, and thanking the subscribers, and Mr. Woolner for so successfully carrying out their wishes, in the preparation of a bust. Its ultimate destination is the Royal College of Surgeons.

Concrete Girders.—Mr. Henry P. Holt, C.E., writes,—In reading the *Builder* of March 9th, at page 231, I find a description of some concrete girders combined with wrought iron as a tensional member, and Portland cement concrete forming the upper or compressional member. I can add my testimony as to the economy and efficiency of this method from a four years' experience in its use and construction. I shall be glad to forward you sections and information should you wish it.

A Church on Fire.—During service on the morning of Sunday, the 24th ult., a portion of the roof of St. Anne's Church, Birkenhead, was found to be on fire. Mr. Benson, plumber, who was in the church, got outside upon the roof with a number of men. They found that an iron flue, which proceeds from the heating apparatus, had become red-hot nearly to the top, and had ignited the woodwork. The fire, which was soon extinguished, did damage to the extent of 100*l*.

Gas-lighting by Electricity.—It is announced that the gas-lamps in Pall-mall will be lighted by electricity this Saturday evening between five and seven o'clock.

TENDERS

For four shops in Burdett-road, at the rear of the "Royal," Bow-road, for Mr. Alfred Yates:—

Boyce	£3,274 0 0
Thorpe	3,200 0 0
Steel	3,175 0 0
Marr	3,108 0 0
Blow	3,105 0 0
Atherton & Latta	3,100 0 0
Cocks	2,997 0 0
Peters	2,926 0 0
Pratt & Wiseman	2,900 0 0
Russell	2,673 0 0
Barrow	2,579 0 0

For alterations at the Sol's Arms, corner of Drummond-street, Hampstead-road. Mr. J. R. Furniss, architect:—

Schlater	£707 0 0
Shapley	660 0 0
Eyers	650 0 0
Bishop	627 0 0
Gould & Brand	569 0 0
Auley	580 0 0
Benstead & Sons (accepted)	559 0 0

For premises, Nos. 45 and 46, Charlotte-street, Finsbury, for Mr. J. K. Farlow. Mr. R. P. Notley, architect:—

Hart (accepted)	£2,813 0 0

For villa residence, St. James's-road, Tunbridge Wells. Mr. James Blundell, architect:—

Beeching (accepted)	£1,255 0 0

For road-making and sewers for the British Land Company, Limited, on their estates at Wimbledon and Tooting. Mr. H. B. Michell, surveyor:—

Harris	£568 0 0
Jackson	560 0 0
Peill	500 0 0
Iles	498 10 8
Clarke	485 17 6
Pizzey (accepted)	481 0 0

For alterations at the Imperial Arms, King's-road, Fulham, for Mr. Lunnis. Mr. Lamborn, architect:—

Bridge	£391 0 0
Bigwood	375 0 0
Lamble (accepted)	365 0 0

For alterations at the King's Head, Acton, for Messrs. Fuller, Smith, & Turner. Mr. G. More, architect:—

Lamble	£275 0 0
Chamberlain	272 0 0
Hunt	263 15 0
Nye (accepted)	260 0 0

For building embossing and glass-writing works, for Mr. Wm. Gibbs, at 397, Kingsland-road:—

Auley	£326 0 0
Keen	230 0 0
Harris	227 0 0
Crabb (accepted)	195 0 0

For two houses at Walmer, near Deal, for Mr. R. S. Mason. Mr. W. B. Catherwood, architect:—

Lawrence	£4,843 0 0
W. & T. Denne	4,150 0 0
Trollope	3,981 0 0
Cottew	3,928 0 0
Paramor	3,838 0 0
G. H. Deane	3,719 0 0

For alterations at the White Horse, Brentford. Mr. G. W. More, architect:—

Nutt	£205 0 0
Spicer	190 5 0
Nye	187 0 0

For the erection of gas-works, at Darenth, Kent, for the managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, architects. Mr. E. Jones, consulting engineer:—

Miller & Sons	£8,750 0 0
Wilson & Douglas	8,248 0 0
Porter & Co.	7,845 0 0
Lake Hook Green	7,835 0 0
Strode & Co.	7,600 0 0
Cutler & Son	6,542 0 0
Bower (accepted)	6,237 0 0

For the erection of three cottages in the West End-lane, Kilburn, for Mr. Chester Foulsham. Mr. C. Foulsham, architect:—

		Deduct if owner removes top-soil.
Mark	£1,814 0	£30 0
Yerbury	1,612 10	39 0
Whitelaw	1,438 0	67 7
Cohen	1,350 0	46 0

For brick and pipe sewers for the Lewisham Board of Works:—

Ilcs	£1,588 0 0
Thompson	1,560 0 0
Hubbard	1,500 0 0
Woodham	1,430 0 0
Pizzey (accepted)	1,400 0 0
Woodham	1,190 0 0

For warehouse and shops in Wilton-road, Pimlico, for Mr. W. Hudson. Mr. H. E. Wallis, architect. Quantities by Messrs. Selby & Rogers:—

Patrick	£18,520 0 0
Lucas Bros.	17,609 0 0
Abrahams	17,497 0 0
Shaw	17,430 0 0
Adamson	17,298 0 0
Walker	17,137 2 5
McLachlan	16,939 0 0
Chappell	16,721 0 0
Nye	16,370 0 0
Macey	16,280 0 0
Perry	15,6?3 0 0
Peto Bros. (accepted)	15,500 0 0

For the erection of annexe to the Criterion, Piccadilly. Mr. Thos. Verity, architect. Quantities by Mr. W. S. Plimsaul:—

Trollope	£11,134 0 0
Holland & Hannen	11,125 0 0
Lucas Bros.	10,757 0 0
Webster	10,350 0 0
Peto Bros. (accepted)	8,927 0 0

For laundry and kitchen fittings at the School for Imbecile Children, for the Metropolitan Asylum District, Messrs A. & C. Harston, architects:—

May Bros. (accepted)	£2,239 0 0
Joinery Fittings in Laundry and Kitchen.	
May Bros. (accepted)	£254 0 0

For the enlargement of a manufactory at Millwall, for Mr. J. T. Morton. Mr. Wm. Eve, architect:—

Woodward	£1,122 0 0
Sawyer	1,070 0 0
Heiser	999 0 0
High	930 0 0
Crabb	923 0 0
Salt	895 0 0
Sheffield & Prebble (accepted)	837 0 0

For new schools for the London School Board. Mr. E. R. Robson, architect.

Gillespie-road, Highbury:—	
Scrivener	£12,277 0 0
Tongue	12,209 0 0
Perry & Co.	12,147 0 0
Hobson	12,063 0 0
Roberts	12,040 0 0
Williams & Son	12,039 0 0
Thomson	11,998 0 0
Boyce	11,994 0 0
Brass	11,991 0 0
Grover	11,894 0 0
Wall Bros.	11,595 0 0
Jerrard	11,577 0 0
Pritchard	11,565 0 0
Lawrence	11,567 0 0
Berger-road, Hackney:—	
Thomson	£13,597 0 0
Hobson	13,534 0 0
Tyerman	13,400 0 0
Brass	13,324 0 0
Hook & Oldrey	13,291 0 0
Williams & Sons	13,230 0 0
Higgs & Hill	13,190 0 0
Perry & Co.	13,178 0 0
Sheffield & Co.	12,973 0 0
Sargeant	12,673 0 0
Boyce	12,583 0 0
Roberts	12,577 0 0
Grover	12,384 0 0
Effra-parade, Brixton:—	
Tongue	£7,680 0 0
Jaffrard	7,657 0 0
Brass	7,657 0 0
Tyerman	7,651 0 0
Pritchard	7,643 0 0
Boyce	7,594 0 0
Nightingale	7,583 0 0
Thomson	7,270 0 0
Kirk & Randall	6,993 0 0
Dowes	6,973 0 0

For alterations, and fitting-up offices in pitch pine, at 92, High-street, Kensington, for Messrs. Herbert Clarke and Rickett Smith. Mr. John Groom, architect:—

Stimpson	£400 0 0
Sharp & Everett	360 0 0
Frost & Knight	327 17 6
Nicholls	284 6 6
Whitby (accepted)	275 0 0

For building new Primitive Methodist Church and schools, &c., at Cliftonville, Brighton, for the Rev. W. Dinnick. Mr. T. Womacott, architect. Quantities supplied by Mr. W. H. Brayshaw:—

Lidbetter (accepted)	£1,395 0 0

For erection of new school buildings and appurtenances, in Clarkson-street, Canning-town, for the West Ham School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Reed	£4,804 0 0
Abrahams	4,643 0 0
Hoskings Bros.	4,357 0 0
Norton & Sons	4,234 0 0
Gregar	4,172 0 0
Knight & Dunston	4,142 0 0
Morter	4,091 0 0
North Bros. (accepted)	3,950 0 0

For residence at Blackwell, Bromsgrove, for Mr. Henry Taylor. Mr. John Cotton, architect. Quantities supplied:—

Smallwood & Co.	£2,477 0 0
Davies Bros.	2,413 0 0
Wood & Sons	2,375 0 0
Mountford	2,333 0 0
Brazier & Weaver (accepted)	2,215 0 0

For new buildings for the London Salvage Corps, Southwark Bridge-road. Mr. Wm. Wimble, architect:—

Hook & Oldrey	£7,244 0 0
Morter	6,943 0 0
Scrivener & White	6,878 0 0
Grover	6,875 0 0
Braid & Co.	6,828 0 0
Abbott	6,820 0 0
Laurence	6,738 0 0

For new stables, &c., at Westow-hill, Upper Norwood, for Mr. J. Selwin Tait. Messrs. Power & Wheeler, architects. Mr. Wm. Barnett, surveyor:—

Tarrant & Sons	£4,100 0 0
Peacock Bros.	3,809 0 0
Lathey Bros.	3,778 0 0
Buckland	3,778 14 0
Bayes Bros. & Allen	3,854 0 0
Boyce	3,575 0 0
Braid & Co. (accepted)	3,674 0 0
Pearson	3,555 0 0

For pulling down part and enlargement of the Parish Church, Radstock. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. A. Deane:—

Long	£3,137 10 0
Mann	2,933 0 0
Bird	2,932 17 6
Bladwell	2,869 15 0
Hatherly	2,684 0 0
Brown	2,657 4 0
Jones & Co.	2,649 0 0
Davis	2,570 0 0
Wall & Hook (accepted*)	2,518 0 0

* Subject to a few omissions.

For house, stables, &c., for Mr. Beall, Banstead. Mr. F. J. Dibble, architect:—

Harda	£1,780 0 0
Taylor	1,569 0 0
English	1,450 0 0
Heal	1,305 0 0

For school and teachers' house, Raydon, Suffolk. Mr. Frederick Barnes, architect:—

Thwaites	£1,457 0 0
Welham	1,302 10 0
Laff	1,236 0 0

For underdraining Low Hall Farm, Walthamstow, for the Walthamstow Local Board. Mr. John H. Swan, engineer. Quantities by Mr. T. Deacon:—

Pound	£1,850 0 0
Pearson	1,647 0 0
Wilson	1,570 0 0
Horsey	1,363 0 0
Jackson	1,350 0 0
Pizzey	1,310 0 0
Wilson	1,250 0 0
Bloomfield	1,171 0 0
Bugbird	1,165 0 0
Taylor	1,155 0 0

For erecting tanks, outfall works, and main brick and pipe sewers, for the Walthamstow Local Board. Mr. John H. Swan, engineer. Quantities by Messrs. Hovenden, Heath, & Berridge, and Mr. T. Deacon:—

Wilson	£24,873 0 0
Munday	24,706 0 0
Cooke & Son	24,327 0 0
Botterill & Co.	24,146 0 0
Phillips & Co.	23,600 0 0
Winsford & Co.	22,706 0 0
Pearson	22,569 0 0
Bugbird	22,350 0 0
Pizzey	22,305 0 0
Jackson	22,100 0 0
Taylor	21,618 0 0
Bloomfield (accepted)	19,818 0 0

For altering and enlarging the laundry and bakehouse at the Union Workhouse, Woolwich-road, Greenwich, for the Guardians of the Greenwich Union. Mr. W. Wallis, architect:—

Sampson	£2,787 0 0
Downs	2,738 0 0
Johnston	2,697 0 0
Hart	2,695 0 0
Hatfield	2,440 0 0
Tongue	2,428 0 0
Kellaway (accepted)	2,312 0 0

TO CORRESPONDENTS.

G. M.—Dr. B.—R. A. Y.—W. R.—R. M.—T. H. W.—D. A. W. B. & Co.—R. K.—B. F.—Mr. B.—J. S. G.—T. M.—H. M.—H. & C. T. D —Ecclesiologist —J. H.—W. P. G.—J. N.—W & S—J B. A. P.—J D —A. A. Danzig (shall have attention).—W. P. (dft.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

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The Structural Provision for the Discharge of the Rainfall of London.

THE serious damage and discomfort inflicted on so large an area of London by the rain of the night and morning of the 10th and 11th of April afford a subject of very serious contemplation to all who are engaged in building, or in dealing with that first duty of the architect, the art of keeping houses dry. It is satisfactory to find that the first account which was published of the bursting of a main sewer in the Brixton-road has been subsequently contradicted, and that it was not to the failure of any portion of the Main Drainage works, in as far as their structural strength was concerned (that is to say, as a question of strength, apart from the question of capacity), that so serious a misfortune is to be attributed. At the same time, it can hardly be argued that the inhabitants of a city like London ought to be exposed to those floods and watery disasters which have of late been but too common in the southern portion of the metropolis. Convulsions of nature, indeed, may be beyond the forecast of human wisdom to prevent or to render harmless. The bursting of a water-spout, or the violent down-pour occasioned by a tornado, may throw on a low-lying district a mass of water that will for a time choke up the best engineering arrangements for outfall. The rain of the night of the 10th of April, however, was by no means of so altogether exceptional a kind as to be called a meteoric phenomenon. It was heavy, continuous, and prolonged, rather than sudden and violent. Its fall was stated at 2 in. in London streets (and as much as 3 in. at Greenwich) in about nineteen hours, a quantity which, while giving a quantity of 200 metric tons per acre, is not so great that it should overtax our means of discharge. Double the former depth of rainfall was gauged in some parts of England in the wet time some two years ago. At all events, it is an amount of rain for which experience tells us that we ought to provide, and the possible occurrence of which was distinctly referred to by the engineer of the Main Drainage works as having been regarded as possible. It would be a deplorable outcome of the engineering science of the nineteenth century for us to be told that when 2 in. of rain falls within twenty-four hours, or when an east wind comes at the back of a high spring tide, the inhabitants of a large part of London are to resign themselves to partial submergence, with all the damage to property, as well as to health, involved in such a calamity. But unless the recent disaster be taken up by the public and by the press with rather more persistence, as well as with rather better information than was the case with regard to the last floods, little practical good will be derived from so costly a lesson.

The subject is so immediately connected with the primary structural and sanitary question of the proper method of securing an outfall for storm-water, that it may be instructive to glance at the physical features of London, immediately to the south of the Thames, and at the change in the course of the outflow of rainfall that has been effected by the Main Drainage works. The river Thames, from the confluence of the Wandle at Wandsworth to that of the Ravensbourne at Deptford, makes an irregular triple curve, or series of three loops, to the north, running at an extreme distance of as much as 2½ miles from the chord of this compound arc. There are reasons for supposing that the ancient bed of the river took a more direct line than that of the present channel. At all events, the whole area which we have described lies below,—some of it as much as 16 ft. below,—the contour line of 10 ft. above Trinity high-water mark of the year 1800, —a level which high tides now not unfrequently surmount. The ground was marsh, so recently as the Restoration; and is represented as such in an engraving of the entrance of King Charles II. into London, which exists in Mr. Gardner's remarkable collection of drawings, engravings, and other publications illustrative of the history and architecture of the metropolis. Gradually, as the progress of population covered this marshy site with building, the house-drainage became a source of more and more disquietude. The low-lying area above indicated covers as much as twenty square miles. It is in places as much as 5 ft. or 6 ft. below high-water mark. The sewers which, since the year 1815, were gradually constructed so as to run mostly in an easterly direction, into the Thames, had but little fall, and, except at the period of low tide, were tide-locked and stagnant. After long-continued rain they became overcharged, and were unable to empty themselves during the short period of low water. Many days, therefore, often elapsed during which the rain accumulated, and the sewage was forced into the basements and cellars, to the destruction of much valuable property, and to the great loss of health among the residents.

There is no doubt that a considerable benefit has been conferred on this district by the works of the main metropolitan drainage, even though these works have proved inadequate to the discharge of a steady rain like that of April 10th, 1878. It was the design of the works to arrest the torrent water before it descended into this low-lying district. For this purpose two lines of sewer were constructed, one approximately parallel to the course of the river, and the other approaching the line of the first at an acute angle. The first, or main line, commences at Clapham,—the second, or branch, at Dulwich. Between them they drain an area of about twenty square miles, including Tooting, Streatham, Clapham, Brixton, Dulwich, Camberwell, Peckham, Norwood, Sydenham, and part of Greenwich.

It was stated in the original report as to these main sewers that they were of sufficient capacity to carry off all the flood-waters, so that they would be entirely intercepted from the low-lying districts, which were thus to be protected from floods. The falls of the main line are 53 ft., 26 ft., and 9 ft. per mile to the Effra sewer at the Brixton-road, and thence to the outlet 2½ ft. per mile. The old course of the Effra fell into the Thames near Vauxhall Bridge. The diversion of this torrential channel so as to flow into the Thames at Deptford is in accordance with the principles of outfall drainage laid down and followed out by the Rennies, and by the most able and distinguished engineers. But the combination of a torrential diversion with a main sewerage drainage is another matter. As a question of quantity alone, it is now manifest that the sectional area, varying from a barrel of 7 ft. in diameter to a section of 10 ft. 6 in. by 10 ft. 6 in. with a circular crown and segmental sides and invert, is not adequate to the discharge of a quantity of rain which is not more than half of that which has been known to occur in some parts of the country, in twenty-four hours, within the last two years. The sectional area of a 7-ft. barrel is, say, 40 square feet. We may take that of the larger section as about 80 square feet. A fall of 2 in. of water, in twelve hours, over an area of twenty square miles, gives a flow of 2,085 cubic feet, or 13,000 gallons, per second, which would require a velocity of about sixteen miles per hour in order to be discharged through a culvert of the larger of the two sections named,—a velocity which is practically impossible. This calculation must be confronted with the fact that in proposing to turn the storm water of London into the main sewerage, the engineer considered that a rainfall of ¼ in. per day, in excess of the maximum flow of the sewers, was all that had to be provided for. Sir J. Bazalgette, in his report on the Main Drainage system in March, 1865, stated with perfect truth that "there are, in almost every year, exceptional cases of heavy and violent rain storms, and these have measured 1 in., and sometimes even 2 in., in an hour." The maximum flow of sewage is estimated, in the report cited, at a volume equal to that produced by a rainfall of 80·01 in. per hour, or, as above mentioned, 0·25 in. in twenty-four hours. As a rule, then, the area of the sewers has been doubled, in order to provide for an arbitrarily restricted quantity of rain, amounting to less than an eighth-part of that which was known occasionally to occur.

"But," the report continues, "exceptional rain storms must be provided for, however rare this occurrence, or they would deluge the property on which they fell."

This brings us to the point of which the due appreciation is rendered so urgent by the disaster of the 10th of April. The question of the provision for storm-water, or excessive rainfall, is one of the most serious that can demand the attention of the architect or of the engineer, especially in the case of a large city. In those parts of the world where rain of from 1 in. to 2 in. or even more per hour, is not uncommon, the architect is compelled by necessity to look facts in the face, and to provide for the safe discharge of what would otherwise prove destructive floods. Thus in the south of Europe the streets of the principal cities are so constructed that they offer ready and efficient channels for the torrents that spring up in formidable volumes after an hour or two of rain. In Turin, in Naples, and in other cities, the arrangements for this purpose are very effective. It is true that they are not complicated by being mixed up with the scavenger drainage of the cities. But that is the very point at issue. The question is, Ought the rainfall to be turned into the sewers?

In cases where no regular artificial water supply is provided for a large collection of dwellings, but where the sewage of the houses is carried off by underground culverts, the utilisation of the rain water, at least in part, for the flushing of the sewers is indispensable. That much may be freely admitted as necessary in the interests of sanitation. But one of the main objects in the supply of a volume of water varying from 25 to 40 gallons per head of the population per diem is to provide a regular and adequate amount of water carriage for the removal of the sewage. The most that can be said in favour of the admission of storm water into the sewers, as far as the sanitary service of the population is concerned, is that it will not materially affect the regularity of the daily discharge. With such a supply of water as we have named, there is no need for flushing at irregular and uncontrollable intervals. The two systems are not only different, but inconsistent. When rain is depended on for flushing, an arrangement is proper that differs materially from that which is suited to the discharge of a regular daily quantity of diluted sewage. When the latter is properly provided for,—when the inflow of the water runs through a well-devised system of pipes, and the outflow of the same water, bearing with it the refuse products of city life, is carried on through a proper series of pipes and culverts, any capricious excess of quantity, such as that arising from storms, only complicates matters. If, on the one hand, the sewers be provided so large as to deal with, not only the ordinary but the extraordinary rainfall, their dimensions must be so large as to cause an enormous expense. The figures above given will show that something like sixteen times the sectional area that is required for the daily regular service must be added to that section in order to give anything approaching certitude as to dealing with storm water; although the occasions on which that section would be filled will be very rare.

We are not about to pronounce an *ex cathedrâ* opinion on a subject as to which different views are entertained by professional men of experience; nor do we wish to offer any criticism as to details of the existing arrangements. It is rather our object to elicit general principles as to the truth of which debate is unnecessary; and to point out the practical result of the application of these principles. Such, we conceive, is the useful and important function of the scientific press; and such the line which should divide the remarks of a public writer from the report of a consulting engineer.

It is certain that, in providing for the drainage of a town or city, one of three courses must be taken. Either the rainfall and storm-water must be excluded from the sewers, or it must be accommodated by them, or there must be a more or less perfect combination of the two systems; that is to say, part of the rain will be, and part will not be, carried off by the sewers.

Of these three methods, the second, which is the simplest, is supposed to be excluded from consideration on account of its expense. In the case of London, for example, instead of being designed of a capacity, as at present, to carry off twice the maximum flow of sewage, the sewers, in order to be efficient under any stress of weather, must be of a size to carry off at least seventeen times that volume. Even this considerable additional cost, however, is not the main difficulty. Sixteen times the discharging area of channel would not imply sixteen times the cost of construction, although it would no doubt involve 2½ times as much outlay, or even more. But the real difficulty, in the case of London, lies in the fact that the entire extra volume has to be pumped up for a height of 26 ft. in order to enter the Thames. There is, indeed, an outfall for storm-water provided at Deptford, but there is, even at that point, a lift of 18 ft. from the low-level sewer. If we take the smaller lift alone, we still find that either the capacity of the pumping apparatus must be so arranged as to enable it to deal with a sixteen or seventeen fold quantity of water, on a sudden emergency, or that the enlarged sectional area given to the sewers would be of no value as a protection to the district. Practically, therefore, the provision for the whole of the storm-water by the sewers is pretty well out of the question.

If we take the opposite view, namely, that the storm-water should be excluded from the closed system of water supply and of sewage, we commence with the advantage of a diminution of cost, and better sewers as respects sewage alone. Both as regards the culverts themselves, and as regards the pumping apparatus, half the actual provision would on that system have been adequate.

The question, however, would then have arisen, How to deal with the rain? But this very question is no less important, and, we must be allowed to say, is not brought much nearer to a satisfactory solution, under the adoption of the present plan, which is one of a mixed character, accommodating a part of the rainfall in the ordinary sewers, and providing (or rather, as it seems, not providing) for the remainder by supplementary works.

It is well to observe that the suffering caused by the flood of the 11th of April is by no means confined to the district drained by the Metropolitan Board of Works. The area of the rainfall was limited. Although it rained during the night over large part, and probably over the whole, of the water-shed basin of the Thames, it was only on approaching London that the traveller became aware of anything like a phenomenal rainfall. More rain fell on the north than on the south of London. The river Wey was not unusually full, at a time when the rivers Colne and Brent were bringing down exceptionally high floods. The Medway also was greatly swollen. Thus, if we take the case of Brixton as one most fit to be examined, it is not to be thought that the diversion of the Effra is a sole cause of difficulty; although it may afford an unusually forcible illustration of the operation of the mixed system of outfall at present in vogue.

The principle of the existing works for the drainage of London is thus stated by Sir J. Bazalgette. "As it would not have been wise, or practicable, to have increased the size of the intercepting sewers much beyond their present dimensions, in order to carry off rare and excessive thunderstorms, overflow weirs, to act as safety-valves in times of storm, have been constructed at the junctions of the intercepting sewers with the main valley lines. On such occasions the surplus water will be largely diluted, and, after the intercepting sewers are filled, will flow over the weirs, and through their original channels into the Thames." How far this plan has been adhered to in the case of the Effra line of drainage we shall, perhaps, learn from the report which Sir J. Bazalgette has been directed to prepare. But the report of 1865, from which we are quoting, says further, "The old Effra sewer, which fell into the river near Vauxhall Bridge, has been diverted, through this (the intercepting) sewer to a new outlet at Deptford, and the old line has been filled in and abandoned." There seems to be some contradiction between these two passages of the report; and we are thus unable at the moment to ascertain how far the principle of allowing an overflow to take the course of the original outfall has been carried out in the case of the Brixton sewers.

Whatever be the arrangement in this particular instance, it is evident that the safety-valves provided have been entirely inadequate to carry off an amount of rain that may at any time descend on London. This, however, is, in our opinion, by no means the most important part of the question. It is one thing to have drainage that works very well on ordinary occasions, but that breaks down in a storm, and another matter to have a system that adds to the mischief of a storm that of a widespread pollution by sewage. The expression "the surplus waters will be largely diluted" contains the marrow of that to which we object, on sanitary as well as on economical grounds. If a system of sewers is so constructed as to be capable of conveying only a fraction of an unusual rainfall, it ought to be the care of the engineer that no excess over that fraction should be allowed to enter the sewers. By entering in detail the contributory drains, sweeping them of their contents, filling the intercepting lines, and then overflowing not only through streets but through houses, the rain takes the most mischievous and disastrous course into which it can possibly be turned.

We confess that this consideration has very great weight in inclining us to the opinion that, all things considered, economy, as well as public health, would be consulted by the systematic exclusion of the rainfall from the sewers. It is certain that if the whole of the rain be turned into this channel of discharge, and if the latter proves at times totally inadequate to carry it off,—the worst kind of evil remains. The limitation of the ingress of the rain is a more difficult matter than its total exclusion.

The question then would arise, it may be urged, how to provide for the rainfall? But this is the very question which is involved under the mixed system. The mixed system provides, let us say, for 364 days out of the year, but breaks down under a deluge on the 365th. Somehow or other we are bound to provide for that exceptional 365th day. The question is, can we not most surely, most thoroughly, and most economically, provide for the entire discharge of the rain, whether normal or abnormal, without turning it into the sewers?

We prefer to put this question as a suggestion. We take it for granted that London has the right to claim an effectual protection from floods, whether arising from the Thames, or poured down from the surrounding water-shed. At the present moment there can be no doubt that the expenditure of nearly eleven millions sterling in drainage and embankment works has placed large districts of London in a far worse position, when exceptional floods occur, than they were in fifty years ago. It is stated in the report by Mr. Redman, to which we have before referred, that the height of the Thames floods has been increased by the Embankment on the north of the river. It is clear from the reports of the late disaster that the action of the southern drainage works has been such as to pollute the torrent water that overflowed streets and houses with sewage. These are results of a mixed system, which, to our minds, has a fatal flaw. It is that of being a fine-weather system alone. Would it not be better to look foul weather in the face? Would not a system that should provide specially for rainfall, whether it be 0·01 in. per hour or 0·25 in. per hour, fully and simply, without choking the sewers, or overpowering the pumping engines as soon as the lower dimension was much exceeded, be the most economical, as well as in all other respects the best?

For the discharge of rain, not by the sewers, two modes are possible,—which, of course, may be combined according to circumstances. One is the original method, which is capable of very admirable management, of making the roadway form channels, or a channel, for the rain. The other is that of constructing special subways, or culverts, for that purpose. The city of Turin is subject to violent rain. Storm-clouds collect over the Alps, and after two or three days of intense heat often burst in a sudden deluge on the city. The violence of the rain is far greater than any to which we are accustomed in this country. But the architects and surveyors of Turin have made such provisions that the rain comes as a friend, not as a destroyer. The streets are carefully paved, for the most part with broad lines of dressed stone for the wheels to run over, and intermediate pitching for the horses; edged with raised footpaths, and pierced with gully-holes at certain appropriate points. It is by no means unusual to see from 2 in. to 3 in. of water running over one of the main streets of Turin after half an hour's rain. But all that follows is, that for so many minutes a clear bright stream of that depth runs along the road. By the time that the storm has ceased, and pedestrians and carriages can venture forth from the shelter to which they were driven, the rain has run off as rapidly as it at first rose, and a clean street is all that remains to tell of the downfall.

In Naples more formidable torrents find their way through the city in storms, owing to the greater

amount of catchwater area which intervenes between the city and the crest of the Apennines. The sirocco, a southern wind, brings a tropical fall of rain, not only over the city, but over the country for miles round. To protect the city there is a large intercepting *fosse*, or moat, which is practicable as a road in dry weather, but which becomes a veritable river in storms. Besides this, the streets are arranged in accordance with the lie of the land, so as to carry off the water. In some places pavement, as in Turin, leading to culverts at proper places, prevents any permanent inconvenience from the results of a tropical downpour. But in others, and notably in the great road leading into Naples from Caserta, a wide street dips gradually towards the centre, in which is a paved open channel, dry, except in time of rain, and readily carrying off any moderate quantity of water. But when a sirocco deluge comes on, a vast body of water seeks this channel. The inclination of the sides of the streets is such as to allow the gradual widening as well as deepening of the torrent, in proportion to the exigencies of the moment. In the utmost volume of the rain the sides of the street remain above the flood, and light iron bridges, under which it is easy to drive in fine weather, afford means of crossing to pedestrians when the central part of an important thoroughfare is converted from road into river.

The conditions of the Italian cities are far more severe, as regards liability to floods, than any that prevail in England. For that reason Italian architects have been obliged to look flood in the face, and to provide for its ready discharge. For that reason no one in Naples or in Turin suffers any inconvenience from violent storms, beyond the risk of a wetting if he ventures out in them; for an umbrella is but a child's toy if opposed to an Alpine storm or to a sirocco shower. That similar arrangements might be introduced into the streets of London cannot be questioned by men of foreign experience. That by a thorough consideration of the worst possible case, the means of providing for the discharge of an inch of water in an hour, London might be rendered perfectly safe against a rain-flood, will not be doubted by any who give attention to the subject. That a due consideration of what is needful in extreme emergency would lead to a provision that would at all times be efficient, and that would take a great load off the whole system of sewerage and of pumping, is the thesis that we submit for consideration. As we must provide for the worst,—under penalty of extraordinary loss,—is it not bettter to do so in the first instance, and at the same time to arrange for the discharge of all our rain-water, whether it be an inch, or a hundredth of an inch, in an hour, without inflicting on the works of the sewerage a duty that may at any moment rise to the double of the necessary amount of work, and which, as soon as it exceeds that double, commences the work of disaster?

A GALLERY OF CASTS.

WE do not wish to let slip, without a word or two in season, the fact that the proposition which we have several times put forth for the formation of a complete illustrative gallery of sculpture has recently received new attention at the hands of the Legislature, though in a manner which, for the present, has led to nothing definite. We are convinced, however, that the definite result must come sooner or later; the sooner in proportion as we and those who think with us succeed in convincing the influential portion of the public of the advantages of such a foundation. Let us attempt a word more in that direction now.

It was on the 25th of last month that the Earl of Wharncliffe inquired in the House of Lords what reply her Majesty's Government could give to the memorial which had been presented by the Duke of Westminster recommending the establishment of a museum of casts from the antique, in accordance with a scheme that had been proposed by Mr. Walter Perry at a meeting at Grosvenor House on May 16th, 1877; asking, at the same time, whether the Government would be prepared to ask for a vote for that purpose, and also what treaties existed in regard to the exchange of casts with other Governments. Lord Wharncliffe anticipated at the same time some criticisms, which have since been made with regard to the subject, by pointing out that though we had the British Museum, with its collection of Elgin marbles and other antique sculpture, we were, nevertheless, in want of a complete chronological arrangement of casts for the purpose of systematic study.

Though nothing came of the question, one or two remarks a good deal to the point were elicited by it. The Earl of Morley, while observing that the greatest interest in such a scheme was felt by persons conversant with the subject (a small minority, unhappily, in England!), contrasted our neglect of it in this country with the efforts of Germany, which not only possessed fourteen such museums, but had recently paid large sums to the Greek Government for the exclusive right of obtaining casts of the statues discovered at Olympia. He was supported by the Earl of Carnarvon (to whose remarks we will return), and Earl Cowper added a word as to the enormous advantages of such a school to sculptors, together with the probability, or at least possibility, "that by degrees some of the lower classes might be able to appreciate the beauty of the forms exhibited,"—a hope which we may join him, perhaps, in entertaining as far as his very cautiously-worded expressions carry us. The reply to all this was, as our readers will mostly remember, a deferring of the matter to a more convenient season, in Lord Beaconsfield's courteous and apologetic style. It was not so easy to settle those questions as his noble friend the Duke of Westminster (from whom he had received a special memorial) had supposed. At the first blush everything seemed delightful in such a proposal,—"It was charming in its design, and economic in its practice" (though we cannot find that any one suggested it to be specially economical); but the Government had a difficulty in dealing with museums at that moment: museums abounded, some *in esse*, some *in posse*: some with a local habitation without a name, some with a name without a local habitation; inquiry was necessary to bring order out of chaos; and the infallible receipt of a special committee followed. We believe the committee is not yet appointed, however. Whenever we get the result of its inquiries, we shall no doubt obtain a large body of information about existing museums and schemes for museums; we must do the Parliamentary Committee system the justice to say that a committee seldom or never sits without collecting valuable and sometimes very new and unexpected evidence on the subject in hand. At the same time, there seemed to us to be evidence enough before the House already to take action upon; but there is the chance, no doubt, that after full investigation it will be possible to obtain a larger vote, and do the thing in a more complete manner.

The immediate sequel of the House of Lords conversation (for it was hardly a debate) on the subject was that two or three critics assured the public that we had all that was wanted now, and that it would be absurd to go to the expense of making a fresh collection of casts from sculpture when there was such a collection of original remains in the British Museum, and such a collection of casts at Sydenham. Mr. Redford wrote to the *Times* so strongly in regard to the claims of the collection of casts at the Crystal Palace to fulfil all our needs, that he afterwards thought it desirable to explain that he was not an official of that establishment, but had only been concerned in organising and arranging the collection at the time, it was brought together. At the same time, this gentleman spoke in favour of the British Museum as a collection which contained sufficient examples for the purpose, or which could be very readily supplemented with casts to fill up gaps in the chronological representation of the art of sculpture, and would then afford such a complete school that it would be waste of money to build the gallery suggested. We must suppose that Mr. Redford was actuated by motives of pure and unadulterated love of economy in the abstract; otherwise there seems no special reason why he should be so desirous to prevent the formation of a new museum of the kind contemplated.

Now as to the correctness of this plea that we have already got what we want. Taking the case of the British Museum first: a moment's consideration ought to show that the collection there cannot be made to fulfil the object contemplated. In the first place, it seems to be admitted on all hands that the British Museum collection of ancient sculpture is not complete for purposes of historical illustration and systematic study, though it is urged that it might be made so by the addition of casts. Now, this expedient would not and ought not to be permitted; and we are satisfied that the Museum authorities would resist it to the utmost. It would be introducing an entirely new and inferior element into the establishment. The British Museum is a depository of precious and unique remains, not of copies; and its *prestige* would be at once lowered if casts were admitted. But, then, supposing the casts introduced and the chronological links complete (which would require much more extensive additions than most people suppose), we should then have to contemplate an entire rearrangement of the whole collection to bring out the desired chronological and progressive illustration, which is one of the most important elements in the proposed scheme from an educational point of view. Who is to do that, and how is the space to be found for it? At present, the objects of ancient art in the Museum are grouped according to the locality from which they come; or in some cases the gifts of a special donor, or the constituent elements of a special purchase, are kept together nearly independent of date; the only chronological distribution arises accidentally from the grouping in different rooms of Asia Minor marbles of earlier date and Attic marbles of later date, &c. And a museum of that kind could hardly be grouped otherwise; and assuredly it would be impossible to carry out a complete chronological arrangement, even if it could be arranged *ab initio*, in a collection which is liable to receive important additions such as would render the re-arrangement of a great portion of it necessary, in order to fit in the new specimens in their proper sequence. Nor is it to be expected that the British Museum officials could undertake this classification in addition to their present responsibilities, even if the building afforded scope for them, which it does not.

We must, therefore, give up the British Museum as furnishing a reply to the demand; and the Crystal Palace need not detain us long. That a great deal of expense and care was gone to, and a great deal of first-class ability brought into requisition, in getting together the Crystal Palace collection of casts, need not be denied. But the Palace was in any case emphatically a holiday place, not a resort for students; the very fact of its distance from London emphasised this, for though people will go some distance for a holiday, they will not do the same for mere study, and indeed the journey and the time expended would take away a great deal of its value in that respect at the best. But the Sydenham authorities have further put themselves out of court as keepers of an art-gallery by the degree to which, unavoidably perhaps, they have catered for lower and frivolous tastes, devoted their premises to foolish exhibitions, and finally almost sold themselves, little by little, into the hands of the great refreshment-stall interest, which threatens to swallow up everything. No one would think of going for serious study to a place which has got the kind of name and association which the Crystal Palace now has. Besides this, although a good deal was done, and done well, for the systematic illustration of architecture at Sydenham, the casts of sculpture were not, so far as we can judge from results, got together upon any such systematic principle; their object has been mainly decorative; they include the most popular rather than the most artistically or historically valuable specimens; and at the present moment, if we walk down the nave of the Crystal Palace, we come upon a colossal figure of some saviour of his country, in top-boots and spurs, at one turn, and a life-size Venus without spurs or anything else at the next turn; and the incongruity is most absurd. In short, a visit to the place would convince any one who may happen to have forgotten the Crystal Palace precincts and decorations, of the futility of regarding it as a place offering any special facilities for the study of sculpture. There is, however, one way in which its collection of casts might be useful in contributing to the purpose in hand; the best of them (and many are very good) might be bought for the proposed gallery of sculptural illustration: we can hardly question that the company or their master, the refreshment-stall keeper, will be glad of the money, and the bargain be satisfactory to both parties in the transaction.

What we desire, therefore, is a gallery or set of galleries given up to the systematic historical illustration of sculpture, by means of a full and complete series of casts of the sculptured remains of all ages and countries, so far as now

obtainable, along with facilities for practical study in drawing and modelling from them. Such a collection, if adequately arranged, would be something very different from what some of the speakers and correspondents who have discussed the subject seem to have been able to conceive. We should be able in its series of specimens to trace out the connexion of Egyptian with early Greek art, to see placed in their true historical relation and significance those archaic specimens of Greek work which are scattered about in the British Museum, and to supplement the chain with specimens from other collections, or from new discoveries; to trace out thence the development of Greek sculpture to its highest point of grandeur, and further to its decline into grace and elegance, and finally into something like meretriciousness, and to connect with this the commencement of Roman sculpture, and its achievements in an inferior grade of artistic feeling and execution, though with characteristic power and historic interest of its own. But our scheme would certainly not stop here. Some of those who have (usefully) assisted to ventilate the subject seem to have limited their idea to a consecutive illustration of Greek and Roman art. We should certainly not suggest so limited a scope. No doubt Greek art includes what is greatest in sculpture; but it is by comparison with other human efforts at representation in the round that we become most able to appreciate critically the peculiar excellence of the highest work. But beyond this there is the very highest interest in having the means of comparing the different aims and methods of different nations in endeavouring to represent in sculpture what they saw in nature. We should, therefore, desire to see included specimens, even of Indian art, so far as it deals with natural forms and not with monstrosities; it is as good, and almost as significant historically, as Etruscan art. We should most decidedly include a large amount of typical specimens of Gothic sculpture, which repeats itself very much, no doubt, but which in its own way is of great value as illustrating the attempt at spiritual expression in sculpture by artists deficient in technical power and in the perception of physical beauty. Then the rise of the Italian school of sculpture is, of course, second in regard to beauty only to the Greek, while in interest and suggestive value arising from its almost unique blending of Classic with Christian feeling, it is second to none. And in following it to its decay, even a specimen or two of the school of Bernini might be worth something as a warning, and to show by what stray paths bathos and vulgarity are reached. Again, should we omit from such a collection the modern schools of sculpture? We might, at least, introduce sufficient specimens of the most gifted modern artists to show typically their method of working, and their aims and attitude in reference to their art. The interest of comparing Dalou and Phidias, in contiguous apartments of the same building, and contrasting the wide diversity of the two both in moral feeling and in facts, with their real sympathy and similarity in artistic feeling, would in itself be most suggestive in extending the ideas of the modern sculptor as to the varieties and possibilities of his art.

Now to return, as we proposed just now, to the remarks of the Earl of Carnarvon in the debate, which were exceedingly sensible and to the point. He showed that if anything like a complete collection of casts of works of merit were to be attempted, the proposed gallery of 350 ft. by 30 ft. or 40 ft., the dimensions which had been suggested in the memorial to the Prime Minister, would be by no means sufficient; in fact, that double the space now assigned to sculpture in the British Museum would be insufficient; and he was no doubt right, so far as mere wall-space is concerned, or at least mere length of wall. And therefore he thought that at a very early stage of the business the question would arise, was the collection to be a comprehensive or a merely typical one. Lord Carnarvon's views obviously leaned to the typical side. He thought that "a comparatively few statues well chosen would be worth 500 crowded together in a manner that made it impossible to examine them critically and artistically"; and no doubt he was so far right. We do not, of all things, want them to be crowded together. But we should desire to see something more comprehensive than his few typical works. It is in the minor differences of many different specimens that much of the historic instructiveness of such a collection would come out; and it must be remembered also that if the proposed museum is to be practically used for students engaged in modelling and drawing, it is desirable to have a sufficient number of works to give them all the chance of room to work and to take their turns at the "big things," and at the same time have useful and instructive employment in the interim over the smaller ones.

In fact, this question of the opportunity for students to work is one of the most practically important in connexion with the subject, and the one which of itself disposes of the pretext that Sydenham and the British Museum can supply our wants. Any one in the habit of visiting the Museum may see in how comfortless a way the painstaking students mostly have to work,—all in each other's way; obliged to take up with a bad light or a good one as it chances (and many of the figures are in such a light and such a position, in regard to surrounding objects, as to preclude working from them at all); and liable to the constant annoyance of impertinently curious spectators, who seem not to be in the least deterred by the printed notices, which request them not to look over the students' drawing-boards. As to Sydenham, we never knew of late years of an artist going there for serious study, but in one case, where the object was the details of Greek architecture, as exhibited in the Greek Court, and in regard to which we had a vivid description from the artist who attempted this labour under difficulties of the unpropitious nature of the place for study. If, therefore, such a museum of casts is to be realised, and to be of practical use, it must be built and planned, not only with a view to exhibition of the works, but with a view to facilities for study. This has obviously not been taken into consideration in the case of a crude proposal in the columns of a contemporary literary journal, advocating an assemblage of square rooms, with a central light in each. It is impossible to have all the works in an equally good light in such a case, and a square room with a central area and casts all round is one of the worst of forms for the accommodation of students, who are sure to get in each other's way in such a room, while the plan involves more certainty of waste space than any other. What would be wanted would be a series of galleries compactly arranged so as to get as much into a given area of ground as possible; galleries with a light all one way, with the casts arranged on one wall, and the space for workers opposite to them; or, if this were regarded as not sufficiently economical of wall space, it might be done this way; the large works, which have to be studied from a certain distance, could be arranged against the wall opposite to the working space, and small details and bas-reliefs, admitting of close inspection, on the wall in the rear, with perhaps a special subsidiary light to show them properly. Something like this we throw out as an idea, which would be capable of, and might perhaps receive from us, further working out in detail. It has, we venture to think, at all events more of scientific and logical idea in it than that of a suite of square rooms lighted anyhow, and surrounded with casts.

In regard to some remarks that passed in the discussion in the House of Lords as to the cost of a proper building for the purpose, it may be observed that the extraordinary discrepancy between the 67,000*l.* of one speaker, and the three or four thousands for which it was asserted by another that the thing had been well done in Germany, no doubt arose from the fact that in the one case the building was included, in the other case the expenditure named was merely that for the purchase of casts. Probably a large sum would have to be spent in providing a building and filling it; but we may add that there is no need, and it would be no wisdom, to attempt a palatial building; an elaborate and costly exterior would, in fact, be somewhat out of place for an edifice which was purely for utility, and contained only plaster casts. What would be necessary would be that the building should be really well and scientifically planned for its purpose, and that the collection should be as full, complete, and representative as possible. We hope to see the consideration of the subject resumed before long by the Legislature, and that it may eventually result in a students' museum of sculpture on so complete a plan as not only to remove the reproach levelled against us, that our sculptors have to go abroad to study, but even to become a means of attracting students from other countries to avail themselves of the exceptional advantages we might then afford them.

THE DIPLOMA GALLERY AT THE ROYAL ACADEMY.

There has recently been opened to the public a gallery which will have for very many far more than the passing interest which each new exhibition of pictures carries with it. This is the Diploma Gallery of the Royal Academy, which, though we may regret that it is placed so very near the top of Burlington House, is yet, when the long and wearisome ascent of staircase has been overcome, well worth a visit. It embodies in itself a kind of pictorial history of the Academy since the day of its foundation, and of the many distinguished men,—painters, sculptors, architects, and engravers,—who have since the year 1768 been Royal Academicians. For it may be mentioned in passing that each associate of the Academy, when he is elected as one of the forty Academicians, has to present to the Academy some work from his own brush or chisel as a mark at once of his membership and as a monument to his successors when in the years to come other artists fill the vacant places. The Academy was founded in the year 1768, and therefore by this time there is a goodly collection of works of art of a varied character to be seen in this gallery. It will be remembered that the Academy, though from the first it received royal patronage, was in its early day but poorly housed. First of all, it was in Dalton's print-warehouse in Pall-mall; then, in 1771, it obtained some apartments in old Somerset Palace; then, in 1780, it removed to the renovated Somerset House, thence to the National Gallery, where it remained till it came to its present abode in Burlington House. But it is evident that until this last local habitation was completed it was impossible that what may be termed the heir-looms of the Academy could ever become a familiar sight to the English public. The practice of requiring diploma pictures or sculpture did not, indeed, actually become an invariable custom until the year 1780, but, nevertheless, before that date the nucleus of the present collection had been formed by voluntary gifts from the leading members of the Academy, but from this year they became not mere willing offerings, but works absolutely required from every newly-created Academician.

It would take considerable space to enter into detailed criticisms of the various works which are to be seen in this room, and in some respects it is not so much from the intrinsic value of each particular work of art that this gallery has its interest, as from the fact that it contains, as we have said, a record of the men who have created the English school of painters, and from the various social traits, and artistic incidents which it necessarily calls to mind. We have first of all, for instance, among the earliest of the pictures, Sir Joshua Reynolds's fine portrait of Sir William Chambers, the architect. In the harmony of its colours, in the life-like way in which the subject of this picture is portrayed, we have in itself a valuable work of art. But it is also a memorial of the first President, and of the most distinguished artist who has yet occupied the presidential chair. It recalls the genial host, the unvarying and kindly friend, the man who among the Court intrigues, the social scandals, and the bitter political struggles of the eighteenth century, kept himself in the world, yet uncontaminated by it, and remained at once the friend of men politically and by nature so different as Burke and Johnson. In its subject, too, we have a man intimately connected with the history of the Royal Academy, for it was Sir William Chambers who planned Somerset House, for a long time the home of the Academy. Then, hanging not far off, we have the works of the two ladies, likewise contemporaries of Sir Joshua, who alone have ever attained, — we will not say alone been worthy of, — the honour of being Royal Academicians, Angelica Kauffman and Mary Moser. The first is represented by a female figure at work upon some kind of artistic labour, and is in the fair Angelica's usual pseudo-classical manner, and with one of her usual allegorical titles, for it is called "Design." Mary Moser, on the other hand, has contributed a group of flowers,—a kind of work which she chiefly followed, and which has always been more a favourite branch of art with women than with men. Passing on we come to one of

Benjamin West's ambitious attempts, "Christ blessing little Children." We may regret, indeed, that this painter's high aspirations were not crowned with greater technical and artistic success, but we cannot disguise the fact that West steadily and constantly attempted to attain to a very high level of art, and to prevent it from being degraded to vulgar or common-place uses. At no great distance we come across Turner's impressive landscape of Dolbaddern Castle, North Wales,—a deep ravine in the mountains surrounded with precipitous crags, above which stands in solitary desolation the ancient castle. Soon a picture equally remarkable, but wholly different is reached,—Sir David Wilkie's "Boy digging for Rats," which is brimful of life and instinct with the brightness of boyhood, and though not painted with the delicacy of some of Wilkie's work, is an admirably characteristic example of the style of the great Scottish artist, who in his particular walk of art has never yet been equalled. Approaching yet nearer to the present day, the eye will be struck by two grand examples of the English landscape school, Sir Augustus Callcott's "Morning,—A Farm Scene," and Constable's "Lock." In the one there is a picture of English home life—the house, the women, the children, and the denizens of the farm are all significant of the home; in the other, the dark lock, the bubbling water, the trees bent by the wind, and the sunbeams shining from between the swift clouds, tell of a wilder phase of English country life. Then, approaching still nearer to the end of the collection, we observe the work of a late president of the Academy,—Sir Charles Eastlake's careful and distinct work, "Hagar and Ishmael," showing in every line industry and wide cultivation of mind; and near it Sir Edwin Landseer's touching piece of animal life, "The Faithful Hound"; and so we reach our contemporary artists whose pictures are so frequently before the public view as not to require mention in this paper.

In the centre of the room will also be noticed some fine examples of the engraver's art, such as Mr. Lumb Stocks's "Claude Duval," after W. P. Frith, R.A., executed for the Art Union of London. Here also are the diploma works of the sculptors who have been members of the Royal Academy, few in number, but by no means small in the matter of interest. We naturally turn to the gift of the greatest of English sculptors, Flaxman, who is represented by a small bas-relief of Apollo and Marpessa,—a very favourable example of this artist's classical productions, but which does not show one of the most significant sides of Flaxman's work,—his treatment of what may be termed Christian art, in which he introduced the purity of Greek work without losing the religious spirit. To observe this adequately, the collection of his works at University College, London, should be several times visited. Again, Nollekens's bas-relief of "Cupid and Pysche" is very characteristic of this clever sculptor,—the fat little children are admirable in their technical execution, but they show no signs of anything like intellectual power or vivid imagination in the sculptor. Yet in this very way they are characteristic of this badly-educated artist, who, though he could execute portraits and busts with vast skill, yet considered the chief work of his life certain commonplace figures of Venus,—a subject which he was utterly unable to execute with success. Such are some few of the works grouped in this room, and as we follow them chronologically through the past century, it must be admitted that they show how during that period an English school of art has sprung up. And when we consider the work done during this time which these examples necessarily recall to our mind, and when we think over the painters and sculptors of whose personal presence these works of art are the monuments, it must be admitted, though they may not vie with the greatest of the Italian masters, that they are a band of whom any country may well be proud, whether viewed as artists or simply as men.

So far we have excluded architects from this notice, because it is absurd to consider a design for a building on the same footing as a picture or a piece of sculpture. The diploma works of the architects are in truth the buildings of this and other great cities. Yet we may mention as things which will interest the professional observer the sketch of King's College Chapel, Cambridge, the diploma work of Mr. W. Wilkins (R.A. 1826); Sir Robert Smirke's (R.A. 1811) remarkable design for the restoration of the Acropolis at Athens; and among modern works, the late Sir Gilbert Scott's "Design for Government Offices." But, as we have already said, greater interest attaches to the works of the painters and sculptors of the past century than to the bare designs of the most distinguished architects, which cannot do adequate justice to these authors' actual productions.

CARLISLE.

To few northern towns does more interest attach than to "merry Carlisle." An ancient city, dating back ages, associated with many important events, respectable in point of trade, and the centre of an important district, it is associated with other than things material, for its name and its district carry back the mind to the old ballad days when "might was right," and when they took "who had the power" and they kept who could. It was in "merry Carlisle," according to the old ballad, that King Arthur lay, before he went his famous hunting in Inglewood forest; it was to that city that the "courteous child" came with the famous mantle; it was to Carlisle Castle that "bauld Kinmont Willie" was taken; there "gude Lord Græme" met Sir Robert Bewick, and "drank till they were baith merrie"; and in other instances the old Border city brings back the thoughts of the time when raids were common, moss-troopers and "limmer thieves" as frequent, and when the Eden ran often red with the blood of the Border men. The fair city loses its history in remote antiquity, but from the days of the Romans we have more definite records of Luguvallum, and of the Saxon Caerluel. To William Rufus its first restoration is due; to the first Edward the city owes some of its early prominence, for he summoned a Parliament to meet there. It was in the civil wars harassed and battered; it was besieged by its rebels, and its walls were the hanging-places of some leaders. It has other remembrances that keep it out of the cold shade of oblivion, for there one of the fairest queens was imprisoned; and near it traces yet exist of the famous wall of old. Coming from the misty and troubled days of old down to the days of stern fact, we may notice the change which is being known in and around Carlisle by a contrast of some of its prominent points two score years ago and now.

A little more than forty years ago, Carlisle had its government partly in commissioners of police, and partly in the hands of its old corporation. It had two Members of Parliament, but the votes recorded for the one elected highest on the poll were only 478. Its manufactures embraced the weaving of checks and ginghams; cotton twist and hats; calico was printed: there were large foundries, the ship canal to the Solway had been recently formed, and the railway was in course of construction. Gilsland supplied it with "excellent coal"; the cotton trade on a scale of some magnitude was located at Dalston and other villages near; there were coaches, many departing from it,—the "Royal Mail," the "Express," the "Standard," the "Independent," the "Invincible," the "North Briton," the "Royal Sailor," and others. The union newsroom and the infirmary had just been opened; a new custom-house was in progress; and there were other indications that in the pre-railway days Carlisle was progressing,—though overweighted with "two coroners, a sword-bearer, three sergeants-at-mace," and many other officers. It has continued to increase; the population of 15,476 in 1821 became 20,006 in 1831; and swelled to 31,049 in 1871, whilst its increase has unquestionably affected many places outside its own boundary. Its trade has in some degree been affected by the changes in the mode of travel, and by the difference in the times, and its chief industries have been summed up in those of "cotton-spinning, coasting, fishing," but the summary is partial and incomplete. Its name figures amongst the list of the ports, but it was for the insignificant total of some twenty vessels of 2,147 tons only; as to fishing, there were registered in the limits of that "port" some twenty-two boats, employing forty-six men and boys, and fifty persons "other than regular fishermen, employed in fishing," additionally. Hence its industrial rank, so far as these are considered, cannot be high,—putting aside for the time the question of the limits of that port. But it has other trade claims to be noticed. In the cotton and other textile trades it attained much higher rank, and its glory has not fully departed; in the iron trade it has attained some eminence —the productions of its engineers and its foundries being noted more than locally, whilst in its peculiar biscuit trade the excellence of the products of its ovens has given to it a fame bounded only by the habitable globe. It is by the variety of its industries, rather than the extent of any one of them, that the old Border city is best known. It spins and dyes, bakes and brews, casts and moulds, and by the variety of the processes it carries out proves that all is fish that comes to its net. Its position as a railway centre contributes to the variety of its trades, and adds its quota to the largeness of the population that passes through a city, giving the visitor the impression of a larger population than the figures would convey. Thus, though it cannot be said to have attained greatness in any one respect, so far as it is dependent upon mere bulk of trade, it has in it the conditions of growth, and less of the elements of wide-spread depression than most cities.

There are not only the indications of the ancient life of the city and of the descent of older institutions, but there are the tokens of its present extent. It needs, according to the estimate of its School Board, accommodation in its elementary schools for 5,530 children; and it has actually room for 5,742. Its infimary has frequently over 90 patients, besides more than that number of out-patients. On new workshops for the blind, nearly 4,000*l.* is being spent; its fever hospital knows the extent of the disease of the town, which this year has in some weeks risen temporarily to the rate of 34 per 1,000 annually. It has its share of pauperism, the estimated expenditure of the Board of Guardians for its union being at the rate of 14,944*l.* yearly; whilst its pauperism may be said to be, in-door, 322, and out-door, from 1,000 to 1,100. It has, however, institutions and other tokens of a large population to present a more favourable aspect. It is provident, for of one large friendly society in its district, there are no less than ten lodges with above 1,100 members, and a capital of over 26,000*l.* It has some of the characteristics of devotion, for one of the branches of the Methodist family registers in its Carlisle station chapels valued at 2,670*l.*, and providing accommodation for 10,810 persons, as well as other less fixed places of meeting. And there are abundant places of worship for other denominations, from the stately and ornate abodes of the Establishment, down to the plainer structure in which the Society of Friends has long gathered its peculiar people. It has literary tastes, and one of the means for their gratification, its Working Men's Club, has a membership of 743; and there are in abundance, not only those institutions which town life almost invariably calls up, but those also which are rendered necessary by the position of Carlisle as head of a see, as the county town, and as the centre of a wide tract of country. To recognise its value in the latter capacity, it should be seen when the hirings pour a throng of lusty life through its irregular streets, and choke up the approaches to its anything but palatial railway station. As a railway centre, Carlisle has grown from the days when the old Newcastle and Carlisle line gave it railway accommodation. The great leviathan of railways,—the London and North-Western,—runs through it in its course due north. That most enterprising company, the Midland, has, at immense cost, extended to the Border town its northern branch across a country dreary and rugged almost to sublimity; and the North-Eastern retains the hold it acquired in the old line that connected it east and west. In addition to these, the Maryport and Carlisle, the North British, and other companies, pour their passengers through its station; and not before it was needed has the Joint Station Committee agreed upon a plan for enlarging Citadel Station to meet the requirements, and to extend its too short platforms.

The future of Carlisle will unquestionably be moulded by its position. It is not in the centre of large mineral fields, and cannot therefore look to the marvellous advancement which some towns even in its own county have known. Still, its contiguity to the coal and iron deposits of West Cumberland affects it, and affects it favourably. It will keep, too, the *prestige* which attaches to cathedral and county towns, and it will further grow from the effect of its having become a large railway centre. Except in so far as these give it impetus, it does not appear that there will be a growth of any one industry into a dominant position. But there are the

indications that the industries located will grow with the growth of a great district and the development of its resources. The whole of the north-western district has very materially benefited by the upgrowth of metallurgical industries in recent years; and although the rapidity of that upgrowth has been checked, the stoppage is only temporary. There are ebbs and flows in the tide of industrial progression; and this remark applies with especial force to those great metallurgical industries for which science has recently done so much, and has yet so much more to do. Carlisle did not participate so fully in the golden stream which flowed from a past era of prosperity as did places more immediately dependent exclusively on these industries; and it has not felt so keenly the era of depression which seems to succeed as surely as did the years of famine to the years of plenty of old. Nor will it, when that depression passes away, reap so fully the harvest of the future; but as it has unquestionably derived benefit from those industries in the past, and does do so in the present, so will it in the future, —benefit affected by its proximity to coal and iron beds, and to the lesser towns and villages which subsist thereon. Dependent, however, on varied industries and influences, the old Border city should hold on the tenour of a way of even growth,—changing, indeed, its industries with a changing age and varying needs. Tapping, in some degree, large districts by great trunk lines of railway, it may become more of a mart than a manufactory, but its growth seems likely to be secure if slow. And as its history in a stormy past was one shaped in large degree by the victories of war, so the victories of peace should mould it in a future which like the present will benefit by companies rather than castles, manufacturers rather than monarchs, and travellers rather than troopers. The "age of bargaining" has come; and towns and cities do best who adapt themselves to altered circumstances, and to the altered age, as the grand old Border city has in part done, and is still doing.

THE QUESTION OF OAK OR CHESTNUT IN OLD TIMBER ROOFS.*

Twenty years ago a paper on "The Assumed Use of Chestnut Timber in the Carpentry of Old Buildings" was read before this Institute by Mr. Wyatt Papworth,† whose careful research had brought him to the conclusion that the assumption was unfounded. It was an idea that had become very prevalent during the sixteenth and seventeenth centuries. Evelyn believed in it, stating that the wood was much sought after by carpenters and joiners; and Wren's statement that it had been used in Westminster Hall, the Abbey, and other buildings, is well known. The theory was that the timber had been obtained from Normandy, though that province lies north of the chestnut-producing districts of France. About a century since the Hon. Daines Barrington questioned the truth of these stories, and received answers in which quotations and rumours were made to do the work of proofs. Indeed, the idea so grew on the public mind that by-and-by the Society of Arts offered premiums to encourage the planting of chestnut trees as tending to uphold the naval supremacy of this country. The repeated contradictions which have since then been given to stories about chestnut roofs have met with no better reception, for at the present time, perhaps, a majority of builders and workmen, and even many architects of experience, believe in them. An excellent paper in our Transactions for this Session‡ records the conviction of the author that the greater part of the roof-timbers of St. Alban's Abbey are of chestnut, particularly as "the ancient forests of Hertfordshire abounded in chestnut trees." In the Museum at Kew Gardens there has long been exhibited a piece of the most palpable oak (which by the courtesy of Sir Joseph Hooker I hope to show you), labelled as "Spanish Chestnut from an old beam in Windsor Castle." Finally (which gives the matter its importance for us) the trees planted so patriotically seventy years ago are now mature, and their timber is being sold as oak, or at least as equal to oak; it has, indeed, actually been used, and has failed in positions where only oak could have been expected to stand.

If the idea is, as I am forced to believe, a delusion, in support of which "the ancient forests of chesnut trees" have been evolved out of slender materials, it is a very singular one; particularly as it has been long abandoned by men of science, and has been often exposed in scientific books, while it is now held by persons who are specially, not merely theoretically, but practically, connected with carpentry. It is curious also that, while Wren and Evelyn thought chestnut to be perishable, the popular belief now makes it quite equal, or even superior, to oak. Hardly an important Mediæval building exists in this country the roof of which has not been confidently stated to be chestnut, and the same statements have been circulated in France with respect to their finest cathedrals. In Normandy, where no old groves of chestnut exist, the belief is that their roofs came from England. A sufficient collection of these various rumours may be found in Mr. Papworth's paper. I shall, therefore, only say that, after many years' search, I have never been able to find the least foundation for any of them; while such as it was possible to investigate have been proved to be untrue.

In order that we may have a clear idea of what chestnut timber really is, I have collected specimens sufficient to show its characteristic marks, as well as specimens of oak timber from ancient and modern work. I venture to suggest that neither the existence of chestnut forests in this country, nor the use of chestnut timber in the place of oak, ought to be admitted, unless it can be proved by the clearest evidence; and I think that no one ought to make assertions as to the old chestnut roofs which he has seen unless he has taken pains to make himself acquainted with the wood of the chestnut-tree as it is now felled and brought to market.

The chestnut timber, about which these disputes have arisen, is of course that which is now called the Spanish or sweet chestnut,—the *Castanea vesca* of botanists,—which is said to have been introduced into Italy by the Romans from Castanea in Thessaly. The horse-chestnut, so much valued for its early foliage and long spikes of flowers, was not known here till the middle of the seventeenth century; its wood is white and of no utility in building. The sweet chestnut grows in great abundance in Italy and Spain. Immense forests of it clothe the slopes of the Apennines. Milton must have been impressed, as are all modern travellers, by those leafy groves. He tells how the fallen angels lay,—

> "Thick as autumnal leaves that strew the brooks,
> In Vallambrosa where the Etrurian shades,
> High over-arched, imbower——"

It is the tree which Salvator Rosa used to paint: its curious habit of twisting the stem giving to old specimens an extremely wild and picturesque appearance. It abounds all over the South and centre of France, wherever the vine grows, and, like it, ceases to flourish in the Northern provinces. In Perigord and Limousin whole communes are covered with it; and in that vicinity alone there exists a million and a quarter acres of chestnut woods, producing fruit to the value, in some cases, of 33s. per acre. In fact, it has always been grown in those southern countries as a fruit-tree. Virgil could boast of his "ripe apples and soft chestnuts." In France it has been estimated to produce 100th part of the native food of the people. As regards its use as timber, one meets with the most contradictory statements. Buffon denied that it was used in ancient roofs, recommending it, as most writers do, for casks. The general opinion is, that it is very durable under water; but inferior to oak in ordinary construction, particularly if enclosed in masonry.

The scarcity of the chestnut in northern latitudes is owing to its not there perfecting its fruit, so as to compete with such trees as the oak. In the Bôcage of Normandy I have observed great quantities of young chestnut-trees planted in the hedgerows. Magnificent chestnut avenues exist in England, as at Betchworth Park, Surrey, and Croft Castle, Herefordshire: isolated specimens of very great age exist here and in Scotland, and most large estates contain chestnut amongst the ornamental timber. It is very likely that the Romans planted it in this country, and our long connexion with the South of France would be likely to favour its introduction as a tree in the Middle Ages. I believe, however, that nothing like a natural forest exists here, nor any reliable evidence of an ancient one, and that such of the wood as now comes into the market is mainly due to the stimulus which was given to the planting of chestnut-trees about seventy years ago.

As a growing tree the chestnut shoots up straight, and soon forms a good large trunk. Trees of forty years' growth are generally sound, but they afterwards become liable to decay, owing to the habit which the tree has of twisting, so as to split the trunk and admit moisture. Mr. Gladstone, speaking as a woodcutter, says: "the pleasantest timber to cut is Spanish chestnut, because it comes away so freely, the grain breaking easily." It has a remarkably small amount of sap, only about three of the rings of annual growth consisting of sap-wood; a large beam of mature timber can thus be cut from a comparatively young tree. The annual rings in chestnut are distinctly wider than in oak; the wood cuts much more easily, and is so much lighter in the hand that this test alone would be sufficient to distinguish it. Of two specimens which I have weighed, the oak shows 43½ lb. per cubic foot, and the chestnut 33 lb. As to colour, when the two woods are used side by side there is at first no material difference, but the chestnut ultimately becomes light brown; the oak more of a dark grey. There is, however, one clear distinction, attention to which will make it impossible to mistake one wood from the other. The medullary rays, which in all timber shoot out from the pith towards the bark in exceedingly fine threads, are in the oak collected together, so as to form thin plates, which are very conspicuous in the end section of the wood. In beech, yellow pine, and some others, there is a slight indication of the same thing, while in chestnut, elm, ash, and other woods used in building, these fine threads remain distinct and evenly distributed, so as to be quite indistinguishable by the naked eye.

The plates formed by the medullary rays in oak are exceedingly strong and tough, and appear to add materially to the strength and durability of the timber. They bind together the annual rings, and resist their tendency to split apart, which we often find in other wood. As timber is usually cut, the cracks which take place in seasoning are perpendicular, and do not materially weaken the beam. The plates also run in the same direction as the tenons and mortises, and render the wood better able to resist the rending strain at these spots. The plates remain unaffected by decay long after the woody fibre between them has perished, and when the wood is attacked by the worm we find the medullary plates untouched, except where passage-ways have been made through them. When the wood has been subject to great wear, as in the handrails of public places, the edges of the plates stand up above the general surface.

The best known effect of the medullary plates results from cutting the timber as nearly as possible in lines which pass through the pith. The plates, being not perfectly flat, are crossed many times by the cut, and their hard bright section produces the pattern which is so much valued in wainscot panelling, known as the flower or silver grain. In American oak, the plates are further apart and more flat, so as to be less frequently exposed by the cut, and the flower is much less conspicuous. In some specimens of English oak, particularly in the variety called *sessiliflora*, the plates are very thin and wide apart, and such specimens are often mistaken for chestnut, but a very clean end section will always render the plates visible. Though usually lighter than the rest of the wood, they are often dark, and such specimens have also been mistaken for chestnut. A careful examination of the oldest specimens of oak, such as that from the Irish bogs and from the piles of old London Bridge, shows the same characteristics.

As it is perfectly certain that no sign of a medullary plate exists in true chestnut timber, whether old or young, and no flower or silver grain on its planed surface, it may be asked how it happens that persons, many of whom are practical workmen, fall into the error which I venture to point out. In the larger number of cases, assertions are made either recklessly, or for the purpose of winning a wager, or on the authority of quotations from old books, none of the parties concerned having ever seen a genuine piece of chestnut wood. I have, however, met with some architects and builders who, having been taught that certain marks are indicative of chestnut, have carefully explained them to me, and by their kindness I am able to describe what we may call the traditional or imaginary

* From a paper read by Mr. Thomas Blashill before the Royal Institute of British Architects on Monday evening.

† *Builder*, vol. xvi., pp. 496, 528.

‡ "On St. Alban's Abbey," by Mr. James Neale. See also *Builder*, vol. xxiv., p. 1299.

chestnut, and compare it with the real. The following description of this supposed chestnut was given me by a country builder of great practical experience. He says:—

"It is of a dead chocolate colour; decay commences in the interior of the timber, accompanied with large quantities of powder, which is seldom found in oak; the worm-holes are larger, and the timber gives way by breaking straight across the fibres instead of splintering as does oak. It is of a dead nature, and yields to the chisel uniformly in every direction. It does not ring when struck; there are no star-like rays in the knots; the sawdust is dark and of an unpleasant smell."

Some would add to these particulars that the silver grain in chestnut is dark in colour, but all seem to think that the wood they call chestnut is inferior to oak, thus differing from the mere retailers of gossip, who think all the best work is chestnut. I need hardly point out that every one of these supposed distinctive features is quite consistent with such specimens of oak as we find, depending on some slight difference of growth, or upon the stage of decay which it has reached, and that none of these specimens will bear comparison with a piece of genuine chestnut-wood.

If chestnut-wood really existed in old buildings, it might be expected to have come under the notice of the late Sir Gilbert Scott, who last year told me in a letter that he knew of none, nor yet of any record of its use. M. Viollet-le-Duc says, in his Dictionary (vol. vi., p. 346), that during the Middle Ages, at least in France, oak was exclusively used for the joinery of buildings. I am informed indirectly that he knows nothing of its use in roofs; and although I have heard of some instances, the accounts are so vague as to make it probable that even in the district where chestnut-wood was most abundant it was not anciently used in the best carpentry work.

Upon the whole, I think we may be certain that, of all available woods, only one can be considered fitted, by its strength and durability, for work of the highest class, and that wood is oak. But the question remains as to the value of chestnut, especially as it is likely to become more plentiful. In Normandy, the wood is used for making roof shingles, which, from their silvery grey colour, are very much more beautiful than shingles of oak. In this country the wood has been hitherto used chiefly in the repairs on those estates where it is grown. One of the largest firms of London builders, whose collection of specimens is very extensive, has no specimen of chestnut. My own specimens of chestnut have been taken direct from the estates where it grew, and where I have occasionally used it for many years. Its clean grain and pleasant working make it very suitable for joinery, and there is no fear of its durability, being equal and probably superior to that of any wood except oak. About twenty years since a large bridge was built of chestnut timber, in three spans, over the River Wye, at Hoarwithy, near Hereford. It was recently taken down, having been for some years in a crippled condition. This may have resulted partly from the design of the bridge, but was clearly owing also to the decay of the timber at the numerous joints, where the water could lodge. This decay could not have taken place in good sound oak in so short a time. Yet the great bulk of the wood, after standing for nineteen years—some of it being painted—was perfectly sound; and this seems to show that, for ordinary work not subject to damp, the timber may be very useful. Although I cannot admit its occurrence in ancient roofs, it may be suitably used in preference to deal and pitch pine, and in church furniture it would probably in course of time take a colour which would be far better than the stained woods now so much used.

In concluding, I desire to draw particular attention to some specimens; among them are oak and chestnut in various conditions. There are also several specimens of oak, sent to me by persons of experience under the impression that they were chestrict as well as chestnut, which was actually on sale as oak. I wish to draw special attention to some specimens of chestnut found in Old Shelswell House, Oxon, where they seem to have been used as far back as 200 years ago, or about the time when the stories of ancient chestnut roofs began to be prevalent. Mr. G. Wells, the clerk of works there, being well acquainted with this wood, has kindly enabled me to lay some of it before you. I hope that further information may be elicited as to the use of chestnut wood in the South of Europe, and if in the discussion some well-authenticated case of its use in this country in the Mediæval period be brought forward, it will throw a light upon a very important point in the history of our ancient buildings.

INSTITUTE OF PAINTERS IN WATER COLOURS.

The forty-fourth exhibition of this society which was opened this week, is not marked out in any special manner from previous exhibitions, except, perhaps, for the fact that some of the best-known contributors are rather more in the background than usual; and that one or two whose names have not been prominently connected with the Institute are a little more conspicuous. Mr. Aumonier exhibits one or two beautiful drawings, which, however, are carefully hung so as to be kept as well out of the way as may be; while things indescribable, the work of orthodox members, find place on the line. "Milking Time" (150) is a beautiful and most poetical work, to see which the visitor is obliged to go on hands and knees; but this is the way an original landscape is generally treated, until public opinion has so far recognised the artist as to render it imperative to treat him with due respect. Mr. Aumonier is, perhaps, not far from this "kingdom of heaven" of the artist, and can afford to wait a little. Mr. J. D. Linton, one of the few really high-class figure-painters in water-colour, sends a work which contains, as may be expected, very fine qualities, but which is rather eccentric in colour, and hardly explains itself sufficiently in subject. It is entitled "Emigrés" (148), and apparently represents a party in disguise endeavouring to get helped out of the country by a bribe to a boatman. The male figure is a forbidding-looking gentleman with lank hair and the well-known "choker" of the Directory period covering the chin; the woman with the baby who sits by him is doubtless his wife. She is, in face and dress, so low in colour as to be practically colourless, the artist having carried to extremes in this instance his favourite device of a *crescendo* of colour from one side of the composition to the other. The warm extreme of colour is supplied by the young man in sailor-like costume, who receives the bounty of the gentleman in the cravat. The drawing is altogether somewhat of a puzzle, and we rather wish that an artist of such exceptional power as Mr. Linton would avoid mystifying us and be a little less vague in his story-telling, for in this, as in other cases, the vagueness interferes with our enjoyment of the work: we ask what it is all about, and get no satisfactory answer.

Among other regular contributions Mr. Hine is quite equal to himself. His "Cliffs at Cuckmere, Sussex" (118), is a most beautiful work. We regret seeing no large work by Mr. Collier, who in one or two smaller ones keeps up, however, his character as a master of pure broad water-colour style. Mr. Wimperis is quite up to his usual mark as a landscape-painter; Messrs. Orrock and Syer are somewhat slightly represented, but well as far as they go; the "Rough Pasture" (141) of Mr. Wimperis is a very fine drawing; and Mr. Hargitt has some works which are of special character and interest, especially the view "From the Hills above Dochfour, Inverness" (126), an unusual panoramic subject very finely treated. Among figure-subjects we find an exceedingly clever work by Mr. C. Green, "Sailor's Hornpipe" (161), which is danced by a fine strapping young sailor, in the middle of the composition, to the tune of a fiddle played by a very characteristic old fellow; the dancer's sweetheart looks on more than approvingly, with a sentimental expression of interest; on the left another couple gaze with an air of calm and superior criticism; the face of the feminine half of this group is an admirable and really very subtle study of expression. There is one Israels, a sketch for a larger picture (28); Mrs. Elizabeth Murray is abundantly clever in her studies of Eastern figures, especially "Music in Morocco" (106); Mr. Towneley Green sends a very graceful study of ladies of three generations ago assisting at "A Musical Party" (136); Miss Gow's "Children's Garden Party" (81) is pretty; and every one looks at Mr. Tenniel's "Pygmalion" (98), and wonders how Pygmalion came to fall in love with such a figure, and why his own legs look as much like stone as that of the statue. Miss Marion Chase and Miss Helen Angell are very successful in flower subjects; the "Chrysanthemums" (111) of the latter is admirable; and Mr. Wolf takes us to a less attractive branch of the lower grades of life in his study of "White Falcons" (138), which, in the matter of texture and detail of execution is unsatisfactory, but, in the realisation of the manner of the big bird in the foreground, executing a kind of awkward war-dance, with wings and feet, on seeing the approach of another bird with booty, shows qualities which only a close study of the animals from nature could have enabled him to realise. Mr. E. M. Ward, R.A., contributes a pleasant little drawing of "The Old House at Eton" (128), and Mr. Chase, whose conventionalities we have in general objected to highly, shows to advantage as a minute painter of architectural and masonic detail in his two drawings of "Nether Hall, Roydon," and "Hurstmonceaux Castle" (92, 194). Mr. Andrew Gow's "A Loyal Bird" (217), on the screen, is well worth attention. There are other good drawings, and also the usual amount of what we venture to call "drawing-masters' art."

FOREIGN WORKMEN IN ENGLAND.

During the continuance of the masons' strike a great many hard things were said of those who employed foreign workmen instead of English hands. The subject of foreign labour in this country has therefore of late become an important and interesting question not only to those who may have directly to compete with foreign workmen, but to the public at large. For the labour question indirectly, at any rate, affects nearly every one of the community. It is worth while, therefore, to consider for a moment some of the aspects of this question, looked at without regard to the issue of any particular conflict between capital and labour.

In the first place, we do not think that it can be disputed that in the abstract, at any rate, it is perfectly right and legitimate for a foreigner to seek employment outside the country of which he is a native. Nationality, at any rate, in these days cannot seek to confine a man's labour to his own country, and in practice we see this principle that the world is a universal labour-market constantly acted upon. From the French governess to the French head cook at an hotel, down to the German clockmaker and the French hair-cutter, there are instances of this rule. It would probably be found on investigation that scarcely a single hair-cutter's shop of any size in this country, or at least in the large towns, is without one or more French *employés*, and in the clock trade the natives of the Black Forest are very numerous in London. On the other hand, in various countries we shall find Englishmen employed, but it must be admitted that as between England and Continental nations, the number of Englishmen at work in a foreign country, except for some special purpose, as the construction of a railway, is infinitesimal compared to the number of foreigners in this country. But both theory and practice have now made it clear that foreign workmen have a right to get paid for their labour, and to seek a market for it in this country just as much as in their own land. The question then naturally arises if foreign workmen in ordinary times and under ordinary circumstances may work for their living in this country, is there any exception to the rule in the case of the existence of a strike in the country to which the foreigner goes. For it must be borne in mind that an English workman, if he finds it profitable, has just as much right to go to America as the American has to come to England.

Now when a strike takes place there is an enforced absence of labour, and the labourer hopes by means of the natural laws of supply and demand to obtain the thing which he desires. For if other labour cannot be obtained the master must eventually give in. But by the very principles on which strikes are based it obviously is legitimate for the masters to seek for a supply of labour where they can obtain it. The labourer relies on the pressure of a certain law, and if he omits in his calculation the fact that foreign labour is available, even though it may be inferior in quality, he obviously is ignorant of one of the elements which are in existence to regulate supply and demand in the labour market. For it is quite clear that a strike makes no difference in the propriety of employing foreign labour. If A, the hair-cutter, employs B, a Frenchman, because he does his work better and at a less rate of wages, and C, the Englishman, does not object thereto, but

straightway goes to some other trade, it is equally clear that if D, the builder, cannot get E, the English mason, to work for him at a certain rate of wages, and he can get F, the German, to do so, there is an absolute analogy between the two cases. So much for the principle of the matter, which, briefly formulated, is that it is legitimate in ordinary circumstances for an English master to use foreign labour, and that the fact of a strike being in existence forms no exception to this rule. But it is clear that the recent masons' strike forms a very remarkable point in the history of capital and labour in this country. For it is the first time that foreign labour has ever formed a really cardinal element in the struggle. But it is clearly an element that in future must be carefully considered. Every day the facilities of proceeding rapidly and cheaply from distant points in distant countries become greater, the telegraph can give notice in five minutes to the labour market of a distant city, and in five days the railway will convey men from very distant points. The labour may not be so good, and consequently dearer than home labour, but there is a demand for it, and it creates a supply, and consequently the main ground upon which a strike can succeed is cut away. In a noticeable paper in a recent number of the new and much-to-be-recommended Italian weekly journal, *La Rassegna Settimanale*, there was an account of, and some remarks on, the extensive Italian emigration which takes place every year, from which it was pretty clear that, for many years to come, from Italy at any rate, there will always be a large supply of labour available to fill gaps in other countries.

There, therefore, are only two ways in which this foreign element can cease to become available as a pressure against strikes in this country. One is by the extension of a universal trade-unionism among workmen of every nation and language under the sun; the other is by the creation of so strong a demand for labour in some country other than that in which a strike is taking place, that the foreign labour cannot be obtained here for love or money. We have from time to time heard a great deal about the International society; but we venture to say that the time is yet some centuries distant when trade combinations will be so universal, and workmen be filled with such brotherly love one towards another, that workmen not on strike will not compete with those who are on strike. It is much more probable indeed that the increase in the facility of communication which, having regard to what has taken place in the first half of the present century, may be reasonably expected in the last, and the knowledge which will exist among workmen of the possibility of improving their condition by competition, will increase in a greater degree than the combinations of workmen of all nationalities. Then as regards the second point, it is almost as certain as anything human can be certain that the conditions of trade in all parts of the world, except in the country where a strike is taking place, will not be so flourishing or so similar as to prevent the possibility of obtaining labour to take the place of that which can be but will not be available in such country. These, as it seems to us, are the main features in regard to English and foreign labour relatively to the existence of strikes.

These are only, of course, the broad aspects of the case, and the elements in question may be varied in force by particular circumstances, such as the locality of the strike and the nature of the employment of those who are on strike. Thus the masons' strike in London was one very favourable to the competition of foreign labour. Masons are to be found all over the world, and London is within very easy reach of the Continent. A strike of miners in Clydesdale might, on the other hand, be far less influenced, by foreign labour. But now that the animosities, unfortunately the natural consequences of combats of any sort, have had time to cool down, it certainly is desirable that every one should quietly, and if we may say so, judicially consider in his mind this question of foreign and English labour,—that is to say, first of all, is it ordinarily right that a foreigner should compete with an Englishman? Secondly, do strikes alter the propriety of such competitions? Thirdly, assuming that the thinker agrees with our answers to these questions, is foreign labour an element which is only an ephemeral one in this matter, or is it one which must for a long space of time, at any rate, be taken into consideration?—which last question, as has been seen, we answer in the affirmative. We have endeavoured in this paper to put this question before our readers in a suggestive rather than a didactic form, for it is one which should not be turned aside from by any one who has a direct or indirect interest in or influence on the struggle between capital and labour, which is continually taking place.

ARCHITECTURAL CRITICISM.

Sir,—An eminent statesman has said that "critics are individuals who have failed either in art or literature." I will not assert that this is strictly accurate of architectural critics; yet the animadversion bestowed by them upon all contemporary architecture conveys the idea that their indefatigable industry is prompted by a feeling less praiseworthy than a *disinterested* love for art.

The key-note of architectural criticism, which is perpetually sounding its doleful monotone, consists of the charge of *imitation* brought against the modern practitioner.

I have been prompted to draw attention to a few inconsistencies indulged in by this class of critic in consequence of some observations made in a recent paper published in the *Builder*, entitled "Imitated Architecture."

A small minority of the architectural profession have taken upon themselves to set the majority of their brethren right upon the theory of art, and draw conclusions from erroneous premises, which frequently render their deductions little short of ridiculous.

They deplore the inability of modern architects to invent a new "style," and yet, themselves, admit the impossibility of such a consummation without the aid of inspiration derived from the advent of a new religion or a grand social revolution. In other words, these critics would have us believe that, when the wished-for crisis does arrive, new geometrical forms and combinations will be invented, which will become the symbolical representations of the ideas generated by the new era, in the same manner that the figure of the cross and triangle are so inseparably connected in their symbolical relation with the Christian religion. Architectural critics are profuse in their censure and condemnation of all modern buildings, and for no better reason than that they are modern. They will be rapturous in their admiration of old and dilapidated structures; but deprecate with all the caustic criticism at their command any attempt to reproduce in modern dress the very art upon which they bestow all their eulogy.

If we apply this system of criticism to other branches of art, it becomes reprehensible to have duplicates of any work of art, whether painting or sculpture. No dramas should be written after the manner of Shakspeare; Tennyson must not adopt the measures of the ancients when composing poetry; musical composers must not score their symphonies in any of the methods used by Handel; but each individual must invent systems of blank verse, poetical measures, and musical notations of his own. Such in reality is what these critics appear to advocate; and this seeming absurdity arises from the fact that they confine their observations to the mere arbitrary forms of architecture, and not to the principles which govern those forms. They imagine that a new style is to be obtained by the invention of new forms, whereas the very reverse would be the case. A new style must be the outcome of a new system of construction. The forms which characterise the different phases of architectural art are governed by the system of construction; the system of construction is not made conformable to the arbitrary forms of the art.

Invent a new system of construction, and, as a natural result, you will have a new style of architecture. The word "style" is a very ambiguous expression when used by the generality of architectural reformers, being applied by them to every slight deviation from an original system or principle. Thus they speak of the Early English style, Decorated style, Perpendicular style, and, lastly, Queen Anne style! In reality, the world has only produced two styles of architecture,—the Grecian and Gothic styles, resulting from the only two *perfected* systems of construction, the trabeated or beam system, and the compressile or arch system. Style in architecture is not the result of peculiarity of ornamentation, but arises from constructive unity, and this is only to be found in Grecian and Gothic structures.

The three Greek orders constitute one style, although each order is recognised by its characteristic decoration, and in this respect are analogous to the three periods or phases of Gothic art in our own country. It would be as inconsistent to assert that, when an individual changes his attire he becomes another man, as to maintain that because a system of architecture admits of three several degrees of enrichment, it therefore constitutes so many distinct styles. The critics to whom I allude are continually crying aloud for novelty, and by wilfully shutting their eyes, they fail to discover that at no period in architectural history was variety so rampant and novelty so much sought after as at the present time. Examine the works of their "pet" Periclean age, and try to discover a precedent for their desire for, and love of, novelty. The whole resources of Grecian art were lavished upon temples dedicated to heathen gods, and were all, with perhaps few exceptions, erected upon one general and simple plan. When these are compared with our present municipal and national buildings; to which nation, I ask, must be given the palm for boldness of conception and variety?

Examine the principal erections of Mediæval times, and it will be found that they, like the Grecian temples, are based upon one stereotypd form of plan—the Latin cross,—which, when compared with the intricacies of plan involved in modern buildings, sinks into comparative insignificance. In this respect the modern architect surpasses all that has been accomplished by the ancients. If the majority of those who attempt to criticise modern work would familiarise themselves with the first constructive principles of the art, they would be less prone to denounce as plagiarists all architects who use the pointed arch.

Another of the self-imposed burthens under which these critics are groaning, is the fear that their contemporary architecture will not be recognised as nineteenth-century work, when Macaulay's New Zealander squats upon the ruins of London Bridge. Personally, I do not suffer these pangs, neither can I commiserate with them in their anxiety, for I conceive our architecture to be sufficiently characteristic of our age not to be confounded with that of any preceding era. Whatever architecture may have been, it is not necessary that it should now be an historical building art, for we are in possession of a more universal and at the same time more lasting method of transmitting information to posterity than even "stony chronicles," viz., literature. Architects are reprimanded for their deference to the opinions of their ancestors in art, but our critics err equally in the opposite direction by being too solicitous as to the good opinion of posterity.

I would ask the advocates of historical architecture to name one building of antiquity which, if deprived of its inscriptions, would by its architecture alone pronounce the period of its erection? I venture to think that this solitary example cannot be found.

What should we have known as to the date of ancient buildings had it not been for mural inscriptions and contemporary writings and traditions handed down from age to age?

In the paper already referred to, it is there stated that "novelty is the very life of art." This is the first time I have heard this doctrine seriously advocated, as it is opposed to all the ordinarily accepted rules of art. What is fashion but a seeking after novelty? It is against this desire for change, this love of novelty, that Sir Joshua Reynolds spoke when he said that works of art which depend for their existence upon "the fluctuation of fashion can only be co-eval with that which first raised it from obscurity." Seeking after novelty diverts the mind from the one grand principle, and debasement necessarily follows. Had the Grecian and Gothic artists been continually hankering after novelty, the system of trabeated construction would not have been perfected by them, nor would such magnificent results have been achieved by the Mediæval masons. Observe the voluptuous luxuriance and inconsistency displayed in combining two systems of construction in Roman architecture resulting from an insatiable thirst for novelty.

It is for this reason that St. Paul's Cathedral, as regards *constructive unity*, will not compare favourably with many Gothic churches. Had Wren, when designing this basilica, adopted one of the two systems of construction, and carried it consistently throughout the entire edifice, St. Paul's would then have been without exception the most magnificent structure in the world.

"Architecture is in a most deplorable state," says the author of "Imitated Architecture," "and being the great central arch around which the other visual arts cluster, they suffer with it and through it." This argument, I believe, is not tenable. The interest evinced in art-productions has never been so universal as at present. All classes show their desire to patronise art as far as their means will allow. The amount expended yearly upon art in England would represent a fabulous sum, and when we consider that, as a rule, people do not lavish their money upon that which neither interests nor gives them pleasure, it is a hopeful sign favourable to a growing appreciation for architecture and art generally, and tends to negative any supposition as to the decay of art or laxity of patronage.

If the assertions of critics are correct, and architects are to imitate the ancients in having a style of their own, we must adopt some eccentric mode of construction wedded to peculiar ornamentation, and then proceed to erect all our buildings upon this new and improved plan for the remainder of the nineteenth century. If this their idea of architecture is carried out, where, I ask, is that novelty and variety they so strenuously demand? Would that I could imbue these critics with hopeful conceptions for the future of architecture, and so dispel their gloomy anticipations, which I feel confident they will never see realised.

I will conclude this letter by desiring our unhappy critics to follow the example of one who has just been taken from us, and whose loss is sincerely deplored by the whole profession,—one who was ever hoping and striving to accomplish better and more beautiful results with the art he loved so well. If those who are now endeavouring to depreciate the efforts of such men as he to whom I allude, were to work with the same fervour and enthusiasm at the art, we should have better architecture and fewer attempts at useless criticism, and all would then join in the tribute paid to the great architect by Dean Stanley, when he said that "those who knew Gilbert Scott and valued him, who leaned upon him as a tower of strength in their difficulties, who honoured his indefatigable industry, his child-like humility, his unvarying courtesy, his noble candour, felt that in him they had lost one of those gentle, guileless, upright souls, who in their lives have helped to elevate, and in their memories must still elevate, their souls heavenward."

James Geo. Buckle.

MATERIAL PROGRESS ABROAD.

Whilst much has been deservedly written of the material progress of Great Britain of late years, we have heard little of how our neighbours in this respect are progressing, and a recent Blue Book,—a statistical abstract for the principal and other foreign countries,—comes in very opportunely as a reminder. It may be interesting to condense some of the facts, and to present a summary of the most interesting of the tables. Taking first the merchant navies, we find that in nine or ten years there has been a very general increase, more especially in the steam vessels. In Norway the tonnage of the vessels rose from 870,145 sailing and 8,376 steam in 1867, to 1,355,784 sailing and 47,009 steam in 1875,—the number of vessels being only slightly increased. Sweden, at the earlier date, had a tonnage of 302,676 in the total, and at the later, one of 507,049; Denmark raised its from 170,164 tons to 244,100; Hamburg from 183,157 tons rose to 219,698 tons; Holland from 510,352 to 526,524; France had at the earlier date 915,521 tons of sailing vessels and 133,158 tons steam vessels, and it increased the latter to 218,449 tons, the sailing vessels falling to 792,836 tons; and the experience of Austria and Greece was in the same direction. The United States had in 1867 sailing vessels registered with a tonnage of 1,187,714, and enrolled and licensed 1,646,821, tonnage which increased by 1876 to 1,394,594 registered and 1,712,492 enrolled and licensed; the steam vessels were,—registered, 165,522, and 957,458 enrolled and licensed in 1867, and in 1876 they were 198,227 and 974,145 tons respectively. Without presenting the very lengthy shipping returns which show the entrances and clearances of vessels from the ports of the chief foreign countries, it may be said that in nearly every case there is an increase in the tonnage of the home-owned vessels, and a still larger one in the foreign vessels, but subsequent tables show that these chiefly arise from the steam shipping. In ten years Norway has nearly doubled the values of her import and export trades, and Sweden has more than doubled hers; the returns from Denmark are very incomplete, but a fair progress is shown in those given. The imports of Belgium are very greatly increased, but the exports are still more strikingly enlarged. France has a very considerable increase in the value of her imports, and that for the exports, though enlarged, is not in so great a proportion.

The incomplete returns of Spain and Portugal, and the full tables of the United States, show more fluctuation, but on the whole a steady increase. As to the classes of the imports, Russia takes vast quantities of raw cotton, engines and machinery, tea and wool; and she exports increasingly corn, wood, flax, and linseed. Norway has large imports of coals, rye, spirits, and wine; and large exports of beer, brimstone, fish, and wooden wares. Sweden takes large quantities of coals, coffee, raw cotton, machinery, and unrefined sugar; and sends out a great deal of grain, bar iron, wood, matches, and paper. The imports of Denmark are largely coals, cotton manufactures, and metals; her chief exports flour, coffee, and provisions. The German empire has an increasing importation of grain and flour, machinery and raw wool, but its large importation of coal is barely maintained; and it exports coal, cotton, glass, and iron largely. A strong resemblance is noticeable in the classes of goods imported, and it is in the exports that the trade of the country and its productions are shown. Thus, we have the exports of Belgium largely composed of arms, glass, iron, machinery, and manufactures; France exports spirits, grain, millinery, and wool; Spain, fruit, lead, oil, and wine; Italy, fruit, lead, and silk; and Austria, glass, grain, and fancy wares; whilst the United States is especially increasing her exports of fire-arms, breadstuffs, and provisions. Russia chiefly trades with Great Britain and Germany; Holland with Great Britain and Prussia; Belgium, with France, Germany, and England; France, with England and Belgium; Italy, with France and Algeria; and the United States with the United Kingdom.

As to the capacity of production of the several countries, it may be said that, taking wheat as the basis, Russia produced 157,938,000 bushels; Sweden, 2,892,033 bushels; Norway, 254,600 bushels; Denmark, 4,460,466 bushels; Prussia, 86,640,000 bushels; Belgium, 14,203,000 bushels; France, 357,000,000 bushels; Italy, 142,400,000 bushels; and the United States, 292,136,000 bushels. But much more interesting is the estimated average yield per statute acre, and this may be illustrated as follows:—The number of bushels of barley produced per statute acre was—Russia, 8·0; Norway, 30·3; Denmark, 31·6; Prussia, 26·7; Holland, 44·3; France, 20·6; Italy, 16·0; Austria, 13·5; and the United States, 20·6. As to the number of live stock, Russia, with sixteen millions, has the largest number of horses; the United States, with 9,735,000, and France, with 2,747,000, following. The United States heads the list with cows, owning 11,000,000 against 7,340,000 owned by France, and 5,000,000 by Prussia. Russia has the most sheep and lambs,—48,131,000, the United States owning 35,000,000; but the latter heads the list of pig-owning countries. There are full details as to the railways owned. Norway has raised the length of mileage owned from 223 in 1871 to 345 in 1875, and she now carries over 1,675,000 passengers yearly; Sweden has 2,275 miles of line, and carries over 6,500,000 passengers; Denmark, on 777 miles, carries 5,640,000 passengers; and in the German Empire there are now 17,000 miles. Belgium owns 2,223 miles, and carried 45,000,000 passengers; France owns 12,273 miles, and carried 131,311,000 passengers; Italy, 4,771 miles, and 28,255,000 passengers; and, finally, in the United States, the length of mileage of railways is 74,658, and the number of passengers 191,000,000,—all of which numbers are proportionately far below those of the railway system of the United Kingdom. The telegraphic tables show that Russia has a length of line of 50,686 miles, and 3,800,000 messages yearly; Norway, 4,020 miles, and 717,400 messages; Sweden, 4,936 miles, and 993,000 messages; Denmark, 368 miles, and 762,000 messages; Germany, 22,175 miles, and 11,000,000 messages; Holland, 2,136 miles, and under 2,000,000 messages; Belgium, 3,079 miles, and 2,800,000 messages; France, 7,600,000 messages, and 51,614 miles.

A series of miscellaneous tables are also given, from one of which we learn that in Russia the Crown revenue from mines is decreasing, but that from post-office and telegraphs is increasing, and this is the case with the total, but the expenditure is increasing much more rapidly. As to Denmark, there is a slow increase in the public revenue, and a decrease in the expenditure. The emigration of this country is beginning to fall, more especially to the United States; and from Germany there is also a decrease in the number of emigrants. The revenue of France is increasing with satisfactory rapidity; but there is a corresponding enlargement in the expenditure. France gives us a table of her fisheries, from which we may gather that the number of men employed in the distant fisheries is less than it was, the contrary being the case in the home fisheries. The produce of these is considerably increasing in value. Tables show also that the produce of indigenous sugar in France is falling off, as is also the production of iron, but that of copper, lead, antimony, and manganese is very considerably increased during the years over which the table extends. As to the French railways, the growth may be gathered from the fact that in 1860 there were 3,142 locomotives, and in 1875, 6157. In 1860, 263,500,000 letters were posted, a number increased by 1875 to 367,443,837, whilst the number of newspapers, circulars, &c., is more than doubled. The gold and silver money coined in the latest years is also very largely increased. Belgium gives elaborate tables of her revenue and expenditure, and it is remarkable that although her income is largely increased, yet her debt has been increased fifty per cent. in the last twelve years. All the postal statistics of Belgium show an increase; in twenty-five years the letters rose in number from 10,894,536 to 60,522,771; in fifteen years the newspapers rose from 26,358,020 to 65,480,000, with an increase fully as large in printed papers, circulars, &c. In telegraphy, the number of messages of all kinds rose in twenty-two years from 52,050 to 2,871,890. Whilst, therefore, we do well to record and remember our own great material progress, the facts recited are sufficient to remind us that there is accompanying it a Continental progress as remarkable, and frequently as great, and one of which it is yearly more and more impossible for us to overlook the consequences.

GOTHIC IN THE PAST AND IN THE PRESENT.

So much has been said, and so many books have been written, on the subject of Gothic architecture, generally and in particular, that it would seem to be all but impossible to add much more to it, or indeed to do much further than to study and to endeavour, as far as may be, to copy and imitate it. But it is not so. The deeper we go into any one art or science the more we are perpetually finding out about it, and the more we know the more yet there is found to lie hidden away and waiting to be discovered and analysed. Gothic architecture is no exception to this rule, for not only is there much yet to find out and make record of, and to put in its due place, but there is a more momentous thing still to be inquired into. It is all but a new fact, though at first sight an almost obvious one. It is this: that Gothic architecture, from first to last,—we confine ourselves to English Gothic for the sake of unity and simplicity of idea,—from the first beginnings of it in the Early English Gothic, to the very latest of it in the Perpendicular English Gothic, the Decorated English Gothic coming between them, was from first to last a *growth*, not a copying or repetition of details and architectural ideas, but a continuous springing forth of new art ideas out of those which preceded them; as, to cite an example, the growth of the latest of "Perpendicular" *mouldings* out of, in three centuries' time, the earliest Early English.

There is, indeed, no single fact in the whole course and history of art and architecture more noteworthy than this of the growth of a style without even any attempt or thought of copying. It is not confined, as we know, to Gothic art practice, but is common to all the primitive and original styles of architecture, *e.g.*, the Egyptian and the Greek. It may be a little difficult at first sight to see clearly what is here indicated consequent on the somewhat strange fact of there being nothing now-a-days in archi-

tecture which thoroughly and clearly exemplifies it. But in the old Gothic days this difficulty did not exist; the method pursued was the universal one, and that to which there was no exception. Let us take an example or two by way of making the way clearer. We will pass by for the present the passage of the Romanesque or Norman into the Early English, its gradual disappearance, and the substitution of the Early English Gothic, with its pointed arch, in the place of the round, with its new mouldings and ornamental details, and new carving, and tracery, or interlacing of forms. But coming at once to the perfected, and fully developed Early English, we would note how steadily it changed, and "progressed," if that term may be used. There is no *copying* of the forms of the previous year by the designer of this year, choose what special year or date we will; but each architect or builder would seem to have carried about with him, all ready for immediate and any use, the materials he needed, or rather the mental capacity to get at such materials as he needed then. He did not copy what he had done yesterday, still less what he had done during the last year, and still less again what either he himself, or others, had done in the century before; but, going to work as with a dictionary of words, he wrote a new stone book,—in the same language, it is true, but how diverse, and how always new! There is nought more curious and worthy of attentive study than this momentous fact of the practice of a style of architecture without any thought of copying or repetition of forms. Take any building, to make things still clearer,—as a small church, say, in the style of the commencement of the Early English, and then compare it with another small church built during the close of it, and note the differences and the changes which have taken place in the details of them. We do not refer here to the plan or general arrangements of the buildings, but to the details of the architecture. Had the forms been copied this could not have been,—all would have remained pretty much alike; but, as it was, the style grew and finally passed away, the Decorated, to use that well understood though somewhat ambiguous term, gradually coming into use and taking the place of it, the Early English in the end finally altogether disappearing, no man then, as it would seem, ever dreaming for a moment of in any way reviving it, or reproducing it, or copying any of its forms, however attractive or beautiful. How, we might ask, was all this done, all over England, thus leaving Early English Gothic churches and chapels, and other buildings everywhere, as evidences of the strange fact?

We might thus go on to almost any length and trace the gradual changes through which the English Gothic architecture, as exemplified in our cathedrals and village churches and secular buildings, went and passed through. We have named the Early English, but it was the same with the style of Gothic which followed it,—the Decorated,—and with it the introduction of forms copied directly from nature: as flowers and leaves, and even animal forms, quite literally rendered from nature, and as taking the place of the conventionalised forms common in the earlier and preceding style: a really wonderful process, and worth attentive study and analysis; for little or nothing has been done as yet in this direction, take what style of art and architecture we will.

And now for a moment to contrast this past mode of work with the system now in vogue, and which has been, as all know, in universal practice since the great Gothic Revival in the last generation. Mainly it has consisted in the copying, as literally and accurately as possible, of the forms and details of the several phases of the Gothic styles. "Ancient examples" have been the models, and the more accurately and literally these have been reproduced, and the letter and spirit of them caught, the better has been the work, and the more successful the architect of it. Nay, so far has this principle been carried, that, where possible, casts have been taken of the old details, and the new stone has been worked on from them, and the copy thus made as accurate and near as would seem to be possible. In short, the whole work of the thirteenth, fourteenth, and fifteenth centuries has been literally revived and re-produced in new materials, and made to suit new and modern conditions, and the final result has been regarded as more or less perfect in precise proportion to the nearness of its resemblance to the antique forms both in outline and in details. Very easy work, many may think, but it is not so, but quite the reverse of it, for it may well be questioned whether, in the long list of copied Gothic buildings, there are any which could for a moment be mistaken for the old work itself,—certainly not by an educated and practised eye, the *modus operandi* being so unlike.

But with all this there is no more curious and significant fact in the history of art and architure than this of the revival of a past style of art; and its adaptation to new and modern requirements. And this without reference to the style of art. The Greek, as we know, has had, and yet has, its turn; so has the Roman. Even the "Arab" architecture of Spain has its exemplifications, and it is to be found here and there in colour as well as form. At the Renaissance, which has left so comprehensive a mark on modern art and architecture, and examples of which are seen in every direction, we need but glance; for, without it, it would be difficult to say what there would or could have been after the final end and death of the Gothic forms in the Perpendicular. And there must needs be a something especially attractive in this Italian art, for the Gothic, with all its attractiveness, has not been able to supplant it, or indeed to materially make much impression on it. Miles and miles of houses and smart villas surrounding London are in the style of this Renaissance, or Italian, or in a something that is meant for it, with but here and there a Gothic ecclesiastical building to notify the fact of the existence, even nowadays, of that Gothic art and architecture which was in its day all in all, and was the art and architectural language of it, *per se*.

These few thoughts on the subject of Gothic art would seem just now to be of some more than common interest from the ever-to-be lamented passing away of one who, more certainly than any other, did most to bring back again into life, and active use and wont, the great Gothic ideas and forms of the past centuries and generations, not only generally, but in detail,—and not for one purpose only, but for all. And not only did he seek to revive the best of the Gothic of past days, but he did more than any other to *restore* what had been lost or *hidden away* under other art forms; indeed, to lay bare to modern eyes what others centuries ago saw so clearly and truly with their own when new and fresh from their hands. That too much was at times done here there can be no doubt. We can but wonder at the number of the old Gothic buildings so restored, and at the new buildings, after their model, built during a life's practice,—memorable monuments, and memorial ones, too, if there be such anywhere. To add to these, and to emphasise them most seemly, nothing better could well be done than to increase the usefulness of the Museum he took so keen an interest in; for, most surely, without Scott it could never have become a reality. *How* best to do this calls, however, for some thought.

GREENOCK POOR-HOUSE AND ASYLUM.

A few years ago the building used as a poor-house and asylum by the Parochial Board of Greenock was condemned by the authorities as unsuitable, and that led to the erection of the handsome pile now approaching completion on the lands of Smithston, about a mile and a half to the south-west of the town, and which, when completed, will be one of the finest structures of the kind in Scotland. The site, which consists of 80 acres, cost about 7,000*l.*, and the plan selected was that prepared by Mr. Starforth, architect, Edinburgh. The style of the main buildings is Scottish Baronial, with crow-step gables and corbelled windows and turrets, the materials used being red sandstone from Mr. Kennedy's quarries, Wemyss Bay, with roofs of Cumberland slate. The buildings occupy about 5 acres, the main portion being divided into three sections, viz., the asylum to the east, the administrative department in the centre, and the poor-house to the west. The north front faces the Inverkip-road, and is prominent in the view from the Weymss Bay Railway. The length of this frontage is 336 ft.; the asylum being 108 ft.; administrative department, 138 ft.; and the poor-house, 90 ft. The east front of the asylum and the west front of the poor-house occupy 290 ft. respectively, but the administrative portion runs back 350 ft. The whole of the north front is two stories in height, except the centre portion, which rises to three stories, and is surmounted by a tower, 90 ft. in height. Towers, also, rise to a height of 70 ft. from th east and west wings respectively. A simila arrangement as to height has been carried ou in the plan of the east front, the centre havin corbelled projecting chimneys and oriel wi dows, while a small tower, 50 ft. high, orn ments the south end. The height of the poo house is three stories, two towers rising from th centre to an altitude of 90 ft. The interior e each of these towers has been available for th construction of tanks capable of storing 15,00 gallons of water. The asylum will shelte 150 lunatic patients, and the poor-house 45 paupers; while the accommodation for th officials is ample and complete. Such system of classification has been adopted i the poor-house that the dissolute will be di sociated from what may be termed th virtuous poor. The dimensions of the pauper dining-hall are 66 ft. by 36 ft.; of the asylum 54 ft. by 30 ft., the ceilings of each being 23 f in height. The kitchen, which is to be fitte with the best modern appliances, is 31 ft. b 31 ft. 6 in., while the arrangements of the da rooms, school, and dormitories are well adapte to secure the comfort of the inmates. Corrido run north and south through the poor-house o each flat. The infirmary, which stands to th west of the poor-house, and provides accomm dation for 100 patients, is a two-story buildin 156 ft. long, with towers at each corner risin 52 ft. above the ridge. Communication unde cover is arranged with this building, and wit all parts of the main house. Twenty feet furthe west of the infirmary stands the detached cor tagious department, which will accommoda twenty patients, while to the south-east of th asylum is the probationary house, a two-stor building for housing forty persons. The entir buildings are heated with hot air, while bath lavatories, and out-offices are so arranged as t complete the plans. The contractors for th masonry work are Messrs. J. Coghill & Sons, an the buildings, the progress of which has bee somewhat impeded by strikes and disputes, wi be ready for occupation in a few months. Th estimated cost of the new poor-house and asylu is 80,000*l.*, to which there has to be added a additional 10,000*l.* which the Parochial Board expending in the erection of a suite of new offic at the corner of West Stewart-street and Nicholson-street, Greenock. Mr. McLellan architect, Greenock, is superintending the erec tion of the buildings at Smithston, which ha recently been visited officially by the chairma and committee of management.

RAIN-WATER.

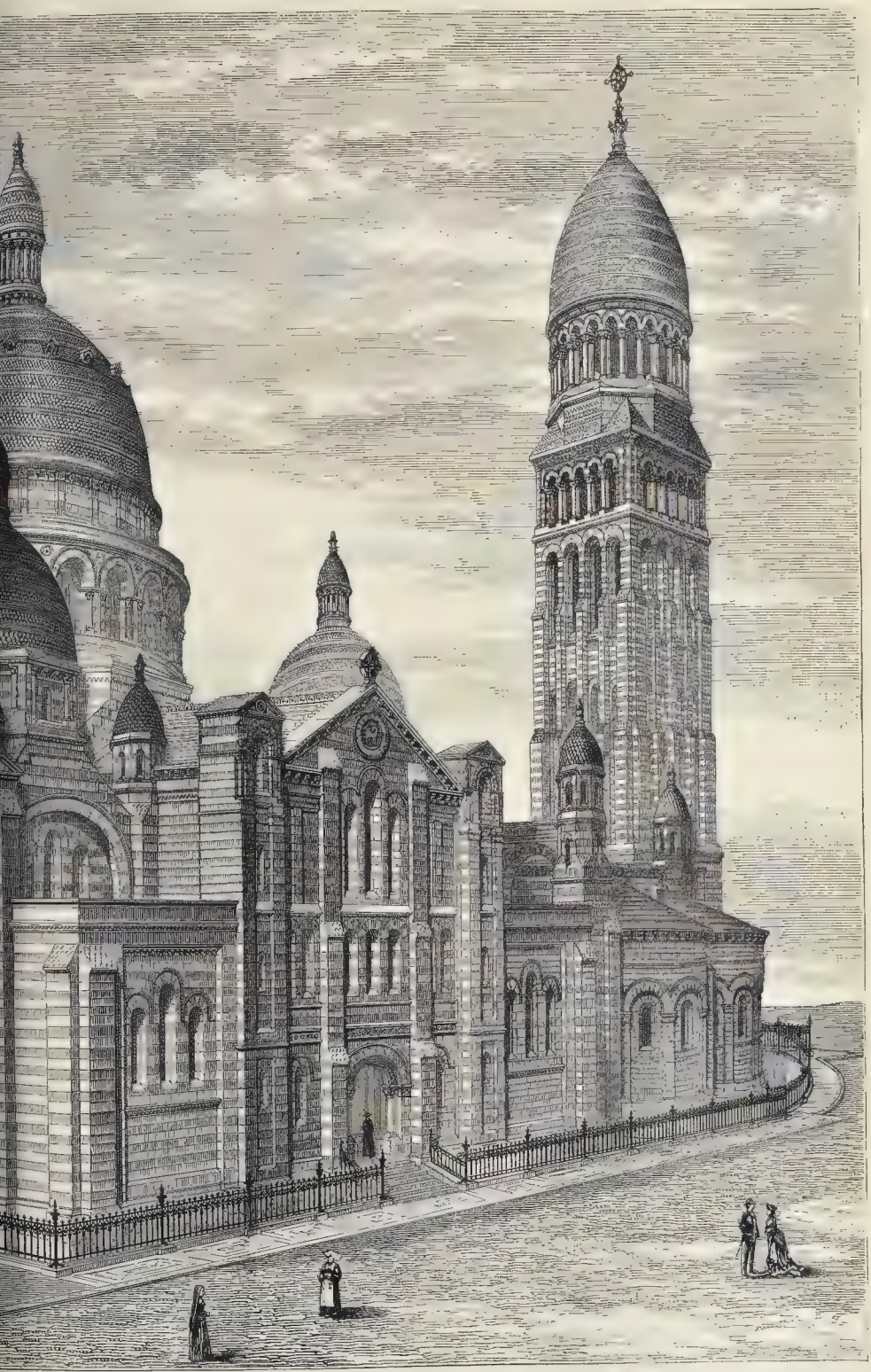
"The old-fashioned practice of storing rain water for washing purposes has dropped out c fashion. Would it not be possible to revive i in a form less disagreeable than that associate with the tall "water-butt"? Some, if no many, of the difficulties which beset the di posal of sewage are due to the delivery of wha is technically known as "storm-water" into th drains. The value of rain-water for domesti use is well understood, and the water-companie if not the housekeepers, should have a direc interest in its supply. We question whether taking the annual cost of water-supply, it woul not be worth while to devise and provide system of thoroughly sanitary apparatus for th collection and use of rain-water, of course care fully avoiding the evils of stagnant water an the risk of use for improper purposes. Tank on the roofs of houses would not only be out c reach of pollution, but useful in case of fire and by collecting a large series of these recep tacles, which our streets would render prac ticable, a considerable and distributed suppl might be secured."

The above extract from the *Lancet* refers t a subject which was brought forward in th *Builder* on February 16th last, as well as before The recent action of rain as an enemy is enoug to awaken very serious reflections as to ou present mode of doing nothing with the mai source of universal water-supply, when it de scends on an urban district, but to turn int the sewers as much as they will carry off at the risk of blowing up, if not the work at all events the sewage, into our streets an houses.

The Soane Museum.—Mr. James Wild ha been elected Curator of Sir John Soane Museum.



THE CHURCH OF THE SACRED HEA



RTRE, PARIS.—M. Abadie, Architect.

THE CHURCH OF THE SACRED HEART, MONTMARTRE, PARIS.

In July, 1874, at the Exhibition building in the Champs Elysées, seventy-three architects competed for a premium of 12,000 francs, offered for the best design for a church (dedicated to the "Sacred Heart") to be erected on the heights of Montmartre. We gave particulars at the time, and on another occasion small views of several of the designs. The successful competitor was M. Abadie, who was further charged with the erection of the building. The material being stone, and the nature of the soil being very unstable, great difficulties presented themselves in making the foundations, which, however, are now nearly completed, thanks to the indefatigable energy of the architect, the builder, and the superintendent of the works, M. Delarocque. The building, of which we give a view in our present number, will present an imposing and peculiar aspect. The portico over the principal entrance is supported upon massive stone and marble columns, the corners being surmounted by equestrian statues of St. George and St. Martin.

The crypt, for which 1,500 stones are now ready, will be commenced early in June. The fact that the church will afford accommodation for several thousand people will give some idea of the magnitude of the edifice. The total cost of it is estimated at 20,000,000 francs (800,000*l.*)

INSTITUTION OF MECHANICAL ENGINEERS.

The discussion, on the 10th of April, at the annual meeting of the Institution of Mechanical Engineers, of Mr. Conder's paper on the cost of working different descriptions of railway traffic, excited much interest, although from the fact that the paper was read at an earlier period than was at first fixed, fewer members were prepared to take part in the discussion than would otherwise have been the case. Mr. Price Williams, who spoke first after the paper had been read, laboured under the disadvantage of not having been present during the reading, and the statistical tables, which formed the marrow of the paper, were not referred to by any speaker. Several gentlemen engaged in locomotive superintendence deprecated the attempt to throw any light on the interior arrangements of railway business, and diametrically opposite opinions were expressed, by different speakers, as to the relative cost of fast and of slow, or of light and heavy, transport. There was, however, a general concurrence as to the fact that the proportionate cost of the three great branches of railway traffic is altogether unknown. To that extent the main position of the paper was adopted or confirmed by every one who addressed the meeting.

The chairman, Mr. John Robinson, in his impartial remarks, called attention to the prosperity of one or two almost exclusively mineral lines, as an argument against the conclusion that mineral traffic was conducted at a loss. Mr. Conder, in reply, observed that it had been his object to bring before the meeting only a few main facts, ascertained from *data* which were undeniable, and as to which it was of extreme importance that mechanical engineers should allow no doubt to linger. The plea of the companies for secrecy might come with more weight if the 10 per cent. dividend, long promised, and to some extent attained thirty years ago, had been kept up. But when, as at present, the earning power of railway capital, as a whole, was diminishing year by year, and when it was found, as shown by the facts brought forward, that the non-mineral trunk lines were annually increasing, and that the mineral trunk lines were annually decreasing, in earning power, in proportion to capital, he thought the public would not long be content to let the matter remain without inquiry. His paper had not dealt with exclusively mineral lines, but with the trunk lines of which the through traffic was complicated and rendered costly by the interference of fast and slow trains. The latter were stated to be timed at fifteen miles an hour. But recent investigation on one of the principal passenger lines had shown that the actual time consumed by the engines hauling mineral trucks was such as to make the real speed as low as five miles per hour.

The paper stated, as the result of the details which were brought forward, that on seven principal French railways, in 1872, the average cost of carrying a passenger for a mile was 0·306d., that of carrying a ton of goods for a mile was 0·66d. On seven principal Indian railways, 1875, the average cost of carrying a passenger for a mile was 0·15d.; that of a ton of goods was 0·813d. On seven American railways, in 1873, the conveyance of a passenger for a mile cost 0·493d.; that of a ton of goods 1·57d. And on 460 miles of railway in New South Wales, on which the details of running had been tabulated by the Government Commissioner in accordance with Mr. Conder's recommendations, the average cost of conveying a passenger for a mile was 0·534d., and a ton of goods 1·598d. Thus over the railways of the world, as far as data were accessible, the cost of the conveyance of a ton of goods was equal to that of conveying from two to three passengers for an equal distance.

The paper then proceeded to show the rapid increase in the cost of the three engineering items of locomotives, maintenance, and repairs, which, on the main English railways, was shown by the Government returns to accompany an increase in the proportion of mineral to other traffic. The annexed table shows some of the most remarkable examples of this increase.

ENGLISH RAILWAYS.

Comparative view of proportion of mineral traffic to revenue, and of proportion of engineering cost to gross revenue:—

Railway.	Percentage of Mineral Revenue.	Working Expenses. Percentage of Revenue.
Metropolitan	2·3	15
South Eastern	3·8	21·1
London and South Western	6·2	24·9
London and Brighton	7·1	24.5
Great Eastern	10·1	28·8
Lancashire and Yorkshire.	17·8	21·9
Great Northern	18·6	28·2
London and North Western	21·3	28·7
Manchester and Sheffield	21·5	22·5
Great Western	25·2	28·0
Midland	27·5	29·2
North Eastern	37·1	35·5

TRUTH IN DECORATION.

Mr. Stephen Adam read a paper on "Truth in Decoration" to the members of the Architectural Section of the Glasgow Philosophical Institution, at their last meeting, Mr. Cowan presiding. In his opening remarks the lecturer said art was not exclusive nor local, but universal. Art knowledge to the masses was wealth to the nation. It was wise to cultivate the "poetic passion," the desire for beauty in our surroundings, because of the ennobling influence it exercised on the mind. It would be wise in the local "powers that be" to help the growth among us of such feelings. The Art Institute had done much towards creating a demand for, as well as in promoting the sale of, works of art. The Corporation creditably placed within reach of public view many valuable paintings; and it was the fault of the public if this privilege was not more generally availed of. The Glasgow School of Design had been a most powerful local influence at work in promoting a love of art among students; but after the student had passed into manhood there was little provision made to keep alive or further stimulate this impulse. There was, therefore, still wanting in Glasgow an annual industrial exhibition for displaying and judging of the proficiency in art manufactures in the district. The lecturer referred to the historic styles of ornamentation, emphasising the features of utility and fitness as expressive exponents of the faith or national sentiments of a people. Under this head he passed in review the salient features of the Egyptian, the Grecian, the Roman, and other less universal styles. The Egyptian style, he said, through the medium of art, individualised and asserted the sentiments of that people. The Greeks also speak as a united people in art; for here "Truth's eternal measures mark the bound by circle, cube, or sphere." The Roman and the various ancient Oriental styles were equally expressive of the characteristics of those respective races. The Renaissance, he said, has been defined as manifesting itself in a great love for things of the imagination for their own sake. Imitate marbles, make gas-brackets like oil-lamps or flowers, pottery like wicker-baskets, try to increase the natural beauties of marble by application of colour, make stained glass like painted canvas, and we tell lies,—material lies,—that stand out year after year even in that abode of purity, the Church. Our degradations were increased if we continued to tolerate such erections as that railway bridge over the Clyde, which was so frightful in its ugliness as to be itself sufficient to divert the traffic. When devising form, or with colour enriching it, they must be truthful. Let them conceive and carry out their designs on Nature's principles, not slavishly; but as the plants grow in obedience to Nature's law, so let their designs grow. Mr. Adam then proceeded to the consideration of colour, "the glorious adjunct of form," laying down a few of its fixed rules, which, like the rules of form, could not with impunity be violated. He would like to see in every decorative workshop a scale of colour, every harmony being struck out, as in the case of music, in notes, as he could not see why men who employ colour in decoration should not, by a more rigid adherence to colour, scale, and notes, after examination of the space to work on and geometric parts arranged, become efficient, or at all events safe, decorators. The three primary colours were red, blue, and yellow, and by admixture the secondary and tertiary colours were obtained. A correct mechanical balancing of these colours gave rest to the eye and peace to the mind, and those particular hues that improved each other when in contact to the fullest extent were those which gave most perfect harmony, and in order to perfect harmonies the presence of the three primary colours was necessary, — either pure or combined. Eastern productions could not be too carefully studied. In the bloomy warmth of Indian work, the repose and coolness of Chinese, and the simplicity of Japanese, there was beautiful harmony, beside which our best work was crude and raw. Mr. Adam then alluded to the manufactured articles in present use employed in house embellishment,—chairs, cabinets, wardrobes, window drapery, and domestic stained glass. He held that in these they must be truthful, and our country would give its expression. After dealing shortly with wall-painting and roof decoration, he referred to carpets, remarking that nothing could be finer than some of the carpets now made in Glasgow, the designs seeming to have caught the bloomy, soft feeling of Eastern work. What was intended to instruct our art-workmen had almost had an opposite tendency,—the tempting facility which stencils, printed wall-papers, &c., offer having retarded original design, and men were inclined to be kept back from nature and truth. The mere repeating of dead expressions and forms symbolic only of what was long past would not avail. Let the designer immortalise the nobler material surroundings. Let him cultivate the mind by reading and observation, and the powers of the eye and hand by labour, and with sketch-book in hand wander lovingly among Nature's flowers, learning to rear his design, mature his style, in faithful obedience to natural laws,—truth and beauty. The paper, which was frequently applauded, was at its close favourably criticised, and a vote of thanks accorded to the author.

SERIOUS EFFECTS OF THE FLOODS AT MAIDSTONE.

Maidstone suffered very much last week by the rapid rising of the river Medway. The approaches to the bridges were flooded, and the pedestrian traffic from the High-street to the South-Eastern Railway was stopped. The wharfs, storehouses, and dwellings near the river were flooded, and great damage done. Upon the banks of the river there are large timber yards, and a considerable quantity of the timber was washed away. The contractors for the new bridge in course of erection over the Medway have also been great sufferers, about 80 tons of cement, besides a quantity of building materials, having been destroyed. The flood at its highest point reached nearly 12 ft. above high-water mark.

Gustave Dore as a Sculptor. — Among the artistic curiosities of the coming Exhibition, says *Galignani*, may be mentioned M. Gustave Doré as a sculptor. He is going to exhibit an enormous vase, 4 mètres high, with a diameter of 2 mètres. He is finishing another sculptural group of quite a different kind, "The Prize of Glory,"—a young hero dying.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, on Monday evening last, Mr. Charles Barry, president, in the chair, the following new members were balloted for and duly elected, viz.:—As Associates,—Mr. Alexander Bleakley, of Liverpool; Mr. Auguster E. Hughes, of Mortimer-street, Cavendish-square; and Mr. Alfred Reading, of Birmingham. As Honorary Associate,—Mr. George Troyte Bullock, of Sedgehill House, Shaftesbury.

The President said he had to announce, with great regret, the death of one of the members of the Institute, under particularly painful circumstances. He alluded to Mr. Charles Chaloner Ogle, Associate, who, while in the performance of his duties as correspondent of the *Times* in that Eastern land which had swallowed up the lives of so many good men, had been foully murdered.

Several donations to the library were announced, and the thanks of the Institute were accorded to the donors.

The President read the following letter, which he had received from Mr. Oldrid Scott:—

"31, Spring-gardens, S.W., April 13, 1878.

My dear Sir, I beg on behalf of myself and the members of our family to offer to you and to the Institute our very heartfelt thanks for the honour done to my father's name by your presence at the Abbey last Saturday. The great gathering of architects on that occasion was indeed a noble tribute of respect for him whose remains they followed to that appropriate resting-place. I cannot omit to thank you personally for all your kindness and trouble in connexion with this sad event.—Believe me, my dear sir, yours very faithfully, John Oldrid Scott.

Charles Barry, Esq."

The President said the Council had been that day considering, with very great care, some plans which had been laid before them for the improvement and partial reconstruction of the Institute rooms, and in connexion with that subject he wished to call the attention of those who were present,—and, through the Press, of those who were absent,—to the fact that of the total sum promised towards the cost of effecting the proposed improvements, some 150*l.* had not yet been received by the treasurer. He begged that those subscriptions might be sent in forthwith, and he strongly appealed to those members who had not yet subscribed,—particularly the metropolitan members,—to do so without further delay, inasmuch as, in order to make the members thoroughly comfortable, the Council would want considerably more than the sum which had been subscribed (872*l.*). The Council hoped, with the increased aid of the members, that at the opening of the next session they would be able to meet in rooms far more fitted to the increased growth and importance of the Institute than was at present the case.

Mr. Arthur Cates asked whether the plans in question would be "submitted to the admiration of the members generally?" If so, and if they were as admirable as the President had implied,—and of which he had not a doubt,—their exhibition would doubtless cause subscriptions to flow in for their immediate realisation. He believed that some members had been withholding subscriptions until they saw what was proposed to be done. The exhibition of the drawings, too, might cause gentlemen who had already promised or given subscriptions, to double them in amount.

Professor Donaldson asked what was the total amount proposed to be expended in carrying out the plans referred to.

The President replied that the drawings, which had been prepared by Mr. Phipps, had been carefully examined by the Council, who were all professional architects. If Mr. Phipps's plans had successfully passed through the fire of criticism to which they had been subjected by the Council, he thought that was some guarantee of their excellence. Whether they would be improved by passing through the larger fire of criticism by the members generally was a point as to which he was a little uncertain. It would be a question for the Council to decide whether the drawings should be exhibited to the members. He quite felt the reasonableness of Mr. Cates's suggestion. As to Professor Donaldson's question, the sum which had already been promised was 872*l.*, of which some 150*l.*, as before mentioned, had yet to come into the treasurer's hands. The lessors of the premises, the Architectural Union Company, who originally did all they could to meet the wishes of the Institute, were still animated by the same spirit, and were prepared to give 200*l.* or 300*l.* towards the cost of the proposed alterations, so that it might be assumed that there were already 1,000*l.* or 1,100*l.* available, but to carry out the plans which had been prepared, more than double that sum would be needed.

Mr. Cates suggested that the drawings and plans should be exhibited on the occasion of the annual general meeting of members only on the 6th prox., but

The President said he was afraid that if the drawings were to be hung up on that date they would have to be exhibited as *un fait accompli*, if the rooms were to be ready for use at the commencement of next session.

Professor Donaldson said he perceived in the *Builder* report of the proceedings of the meeting on the 1st of April, that Mr. Edmeston had sought to correct a supposed misstatement of his (the Professor's) that the late Sir G. G. Scott was a pupil of the late H. Roberts, architect of the Fishmongers' Hall; on the contrary, that both the then Mr. G. G. Scott and Mr. Moffatt were pupils of Mr. Edmeston's father. He (the Professor) now begged to state that Mr. Roberts, whose conscientious accuracy in every circumstance of life was well known, had himself mentioned the fact to him (Professor Donaldson) as one of personal gratification to himself. He happened to call last Saturday on their suffering friend, Mr. C. C. Nelson, whose clear memory and judgment they would all recognise. Casually alluding to the circumstance, Mr. Nelson said that Sir G. G. Scott acknowledged to him having been Mr. Roberts's pupil, and to having been impressed with the importance which Mr. Roberts attached to his own studied contours of the mouldings and other details of outline in his buildings.

Mr. Ewan Christian said that from what he remembered of Sir Gilbert Scott's statement to him, he (Sir Gilbert) was not a pupil of Roberts, but was with him for some time, as an "improver," probably. He believed that Mr. Edmeston's statement that Sir Gilbert was articled to his (Mr. Edmeston's) father was correct, and he thought that Mr. Edmeston possessed the "articles."

Mr. Wyatt Papworth said he believed the statement that Mr. Edmeston had the "articles" was correct.

The President said it was not surprising that so much interest was felt as to the pupilage of so distinguished an architect. If Mr. Edmeston had the "articles," of course that settled the matter, but Mr. Edmeston not being present the subject would have to drop for the present.

The discussion then took place on Professor Donaldson's paper on "Obelisks," of which we gave the substance in our last.* A report of the discussion will be found following this.

Mr. Thomas Blashill then read a paper on "The Vexed Question of Oak or Chestnut in Old Timber Roofs." This will be found on another page.

A vote of thanks having been accorded to the author, the meeting terminated with the announcement that the annual general meeting of members only will be held on Monday, May 6.

We may add that the rooms of the Institute will be closed on Saturday, the 20th inst., and on Monday, the 22nd inst. The Library will only be open to readers during the morning hours of Easter week.

* See p. 376, *ante*.

OBELISKS AND THEIR PEDESTALS.—"CLEOPATRA'S NEEDLE."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the meeting of the Institute of Architects on Monday evening last, Mr. Charles Barry, president, in the chair,

Professor Donaldson supplemented his paper on this subject (see last week's *Builder*, p. 376), with some remarks, in the course of which he said he had purposely refrained from describing the manner in which the Romans and more modern nations had treated the bases of obelisks which they had brought from Egypt. Referring to the obelisks at Karnak and Heliopolis (of which models had been presented to the Institute by the late Mr. Bonomi, and which models, the Professor observed, were worthy of being better displayed than they usually were in a dingy corner of the staircase), he said that the pedestal of the former was vertical on two sides and tapered on the others, but whether there were any steps below the die-block Mr. Bonomi was unable to say, as the ground was so encumbered with broken blocks of granite. The obelisk of Luxor, now in Paris, was remarkable as having on its original base the sculptured monkeys mentioned in the paper. It might not be generally known that the original pedestal of the obelisk of Luxor was in the museum of the Louvre, just as it was when brought over by Le Bas, the engineer; but Dr. Birch said it was inaccessible. The learned Professor concluded some very interesting remarks by referring to the Roman obelisks, and to their pedestals as designed by Bernini and others. He did not think that any of the ornate bases which had been provided were exactly fitted to their purpose.

Mr. John Dixon, C.E., said it was his special desire some months ago to have this subject discussed by the members of the Institute. The form of the pedestal for "Cleopatra's Needle" had been all but finally decided upon; still, if any obvious improvement could be suggested it might not be too late, even now, to give effect to it. What Mr. Erasmus Wilson and himself had to consider, and what he begged the members of the Institute to consider, was that in bringing the obelisk to England they were simply preserving from decay and destruction an interesting old monument, and having got it here, they were desirous of setting it on a plain and suitable pedestal, adapted to its purpose, without any ornate pretensions. It was not desired to make a national monument of it, but simply to set it in an appropriate place, so that it might be seen to the best advantage. They wished to proceed, in fact, much as a man who possessed a valuable picture would do: he would put it in a suitable frame and in as suitable a part of his house as possible, but would not go to the expense of building a new house for its reception. A great many suggestions had been made for very ornate pedestals, and designs had been foreshadowed in which the obelisk itself performed but a very subordinate part. All the obelisks of Egypt with which we were acquainted stood on bases of some kind, and, while those who had seen Egyptian obelisks and antiquities *in situ* knew that the ideas of the Egyptians as to the best form of pedestal were somewhat mixed, the question as to what was the best form of pedestal for an imported obelisk must be determined, in great measure, by the surroundings of its intended future site, and the selection of site was limited by difficulty of access. His opinion was that the top of Ludgate-hill was the finest possible site which could have been selected in London, but he knew that it would be impossible to get the obelisk there without temporarily obstructing a great thoroughfare, and that was a thing not likely to be endured by those whose sole thought was of commerce. A great deal of sense as well as a great deal of nonsense had been written on the subject of skyline and outline. Now, if an obelisk were erected in the middle of Salisbury Plain, it would be seen, without doubt, but there would be nothing by which to gauge its size, and without that it would appear a very insignificant thing. It might be large as a monolith, but it was insignificant as a building. In Egypt obelisks stood in front of temples, and generally in pairs. It seemed to him that in setting up an obelisk in this country we should have something in juxtaposition to it, by which to estimate its proportions. Having determined upon the present site, they had sought to obtain the best form of pedestal for the purpose of supporting the obelisk, and one which would accord with the architectural design of the Embankment, and present no incongruous characteristics nor harsh lines such as would jar on the eye of the beholder. The first step which had been taken after the site on the Embankment had been decided upon, was to induce the Metropolitan Board of Works to consent to lower the oblong blocks of granite which flanked the site. The base which had been determined upon had met with the approval of all architects and Egyptologists who had seen it, the late Sir Gilbert Scott having given it his most unqualified approval. The tapering form of the die-block, suggested by Professor Donaldson, had met with general approval, as had also the intention to dispense with any kind of capital at the junction of the obelisk with its pedestal. In conclusion, Mr. Dixon explained the mode which he intended to use in raising the obelisk into position. The method to be adopted, while essentially the same in principle as hitherto proposed by him,*

* See *Builder*, vol. xxxv., p. 326.

will be somewhat modified, so as to dispense with the two large stacks of timber, one at either end. Incidentally, Mr. Dixon expressed a hope that the Metropolitan Board of Works might be prevailed upon to remove altogether the square blocks of granite facing the river on the site of the obelisk.

Mr. H. H. Statham asked whether the base of the monolith was in such a condition as to render the whole structure stable when in an erect position.

Mr. Dixon replied that he had calculated that when the obelisk was standing on its base it would be sufficiently stable to resist a wind pressure of 95 lb. per square foot on its surface, and as we seldom in England got more than one-fourth of that wind-pressure it would be perfectly safe to stand the obelisk on its present base. To cut off the damaged piece would be to justly provoke the protests of Dr. Birch, Professor Donaldson, and others whose opinion was worth deferring to. After the obelisk was up it would be a matter of further consideration whether, by the use of bronze plates, or otherwise, the line of the obelisk should be continued down unbroken to its base.

Mr. Edward Hall asked whether due precautions had been taken as to foundations. If he remembered rightly, there were some rather elaborate underground works connected with sewerage arrangements. Would the obelisk rest on a solid foundation, or on iron girders, as proposed in the Parliament-square site?

Professor Donaldson protested that these questions were beyond the scope of the present discussion. It must be assumed that Mr. Dixon had sufficient engineering skill and science to enable him to secure a good foundation. As a matter of fact, he believed that the bed of the river at the point where the obelisk would stand was solid gravel, as was discovered by Brunel in sinking the foundations for the piers of the Hungerford suspension-bridge. In conclusion, the Professor suggested that the Institute should express its opinion as to the desirability of removing the blocks of granite referred to by Mr. Dixon.

Mr. Ewan Christian said that Sir Joseph Bazalgette had expressed his entire approval of what was being done to ensure the safety of the obelisk.

Mr. Arthur Cates said, with regard to the sphinxes which were to flank the obelisk, he hoped that they would not face towards the river, for such a posture would hardly be courteous to the majority of those who saw the obelisk, who would view it from the Embankment, and not from the river. In the course of his remarks, Mr. Cates referred to some suggestions and drawings [exhibited] which had been communicated to him by Mr. James Thomson, of Devonshire-street, who, in contemplation of the possibility that some future patriotic individual would emulate Mr. Erasmus Wilson by presenting to the nation some similar Eastern monolith, had prepared plans for its erection on a metropolitan site where it could be well seen from a considerable distance, and yet where it could be approximately approached, and also where it would be no interruption to traffic. Such a site was the Park-square, in Regent's Park.

Mr. Kidner suggested that the sphinxes should be made to face the obelisk. He was aware that such an arrangement would involve the alteration of all the bases as at present determined upon, but he thought it would be an improvement.

The Chairman, in closing the discussion, moved a cordial vote of thanks to Mr. Dixon for his kindness in coming amongst them and affording them so much information. He was to be congratulated on having overcome the difficulties of transporting the obelisk, and also on having survived the heaps of correspondence and suggestions which had poured in from all quarters from those who, rightly or wrongly, thought themselves competent to volunteer opinions on matters of taste. Probably he would have been prepared to pay a considerable sum in the shape of "salvage" if he could only have been saved from such a mass of conflicting opinion. He agreed in the suggestion which had been made that the blocks of granite referred to by Mr. Dixon might advantageously be removed, and hoped that the Metropolitan Board of Works would consent to remove them, as the site of the base was, at present, he thought, too crowded and confined. The parapet flanking the steps might also be advantageously altered so as to follow the rake of the steps; at present it only served to collect the mud and slime of the river. As to the sphinxes, he hoped it would be seriously considered whether they ought to be placed at the base of the obelisk at all, whether courteous to the road or courteous to the river. It was open to question whether modern copies of sphinxes could be introduced in conjunction with the obelisk without a certain amount of incongruity. If ancient sphinxes could be procured, the case might be different. Simplicity and grandeur would, in the present case, be best served, he thought, by omitting the sphinxes. He was sorry to hear that the pecuniary loss which Mr. Dixon would suffer by his enterprise was somewhat serious, and he could only hope that he would be in some measure recouped by having his name indelibly associated with that of Mr. Erasmus Wilson in connexion with the acquisition by this country of so interesting a monument of antiquity.

Mr. Dixon having briefly replied, the meeting terminated.

THE ARTISTS' BENEVOLENT FUND.

The sixty-ninth aniversary dinner in connexion with the Artists' Benevolent Fund was held at the Freemasons' Tavern on Saturday last, Mr. George Godwin in the chair (in the unavoidable absence of Lord Ronald Gower, who had promised to preside, but had been suddenly called away to America on matters of urgency). In accordance with a commendable usage, the tables were graced by the presence of ladies.

The Chairman, in proposing the customary loyal and patriotic toasts, announced that her Majesty the Queen, the munificent patroness of the Fund, had for the thirty-ninth time sent her usual donation of one hundred guineas, thereby showing her sympathy with artists. Reference was made to the exertions of H.R.H. the Prince of Wales for the due representation of British art at the approaching Exhibition in Paris.

Captain Hight, of the Royal Naval Reserve, responded in appropriate terms on behalf of "The Army, Navy, and Reserve Forces."

Mr. Godwin, in proposing the toast of the evening, "Prosperity to the Artists' Benevolent Fund," said it would be very easy, with such a theme as art, to string together a certain number of sonorous platitudes which might pass muster for a speech, but he should better discharge his duty if he endeavoured in a few quiet sentences to make evident the claims which the Artists' Benevolent Fund had upon the public; and in the name of the Council he asked the aid of the Press, without which such an appeal would be utterly useless. As some of his hearers would know, there was another society very similar in name and purpose, viz., the Artists' General Benevolent Institution, and it was of no use blinking the fact that that society, although younger than the Artists' Benevolent Fund, had to a certain extent overshadowed it. He ventured to say that such ought not to have been the case, and a glance at the constitution of the two societies would show that he had reason for making that assertion. The Artists' Benevolent Society consisted of two parts. The Artists' Annuity Fund was founded in 1810 by Sir Thomas Lawrence, W. Mulready, and Sir John Swinburne, especially for the purpose of enabling artists to make some provision for such accidents as might befal them, or for old age. Very soon after the establishment of the Annuity Fund it was found necessary to supplement it by a benevolent fund, which was called "The Artists' Benevolent Fund." Now, in the Annuity Fund, the members, by paying a certain premium, small in amount, secured to themselves, in the event of illness or accident, certain payments, and at the age of sixty, if they had not sufficient means of subsistence, an annuity of some 40*l*. But it was soon found that the payment of these premiums would do nothing more than that, and when the artists who were members of the Fund died, their widows and children were often left destitute. Hence the establishment of the Artists' Benevolent Fund, which was supported by the voluntary subscriptions of the members of the Annuity Fund, as well as by other artists and the public at large. There were at the present time fifty-eight widows on the Benevolent Fund, receiving what must be regarded as the very insufficient sum,—welcome as it might be to the recipients,—of 20*l*. per annum, and a large number of children receiving 6*l*. per annum each. This would show that the support of the public was much needed. The Artists' General Benevolent Institution, established a few years later, relieved any artist who went to them, but it had no Annuity Fund in connexion with it. Any artist,—be he painter, sculptor, architect, or engraver,—who could make out a good case would be relieved by the Institution, and a very good work it was doing. But, nevertheless, he was prepared to maintain *à l'outrance* that the principle upon which the Artists' Benevolent Fund was based was to be preferred. They were taught very early in life that if they put their own shoulders to the wheel, Jove would help them to give it a push; that Providence would protect those who protected themselves. Providence did help those who helped themselves, but the British public did not, preferring to help those who did not help themselves, judging from the way in which it showered money on the Artists' General Benevolent Institution, which had the powerful support and aid of Mr. Millais, Mr. Hardwick, and others, while it neglected the Artists' Benevolent Fund. He rejoiced at the prosperity of the Artists' General Benevolent Institution, for it was doing excellent work; but he also claimed that the Artists' Benevolent Fund was also doing good work. He contended that the Artists' General Benevolent Institution might help the Artists' Benevolent Fund to their mutual advantage. When a young artist in temporary distress or difficulties went to the Artists' General Benevolent Institution and obtained relief, the officials of that institution might urge him to join the Artists' Annuity Fund, so that by paying a small premium he would put himself in a position to be above the necessity of receiving charity; for the members of the Artists' Annuity Fund did not receive charity: they only received what they had laid by or assured for a rainy day. He invited the General Benevolent Institution to urge the claims of the Artists' Annuity Fund in that way, for the existence of that fund had doubtless prevented a great many applications being made to the Artists' General Benevolent Institution for relief. The same observation applied to the Artists' Benevolent Fund, whose fifty-eight widows and numerous children must have gone to the Artists' General Benevolent Institution but for the existence of the Artists' Benevolent Fund. In going over the cases relieved, in conjunction with the excellent honorary secretary of the fund, Mr. C. J. Dimond (to whom the gratitude of artists was due, as he had for years given his time and talents to the affairs of the fund without having a single personal object to serve, merely following in the footsteps of his excellent father), and the secretary, Mr. Lambton Young (who also worked hard in the cause), he had met with some notable examples of the value of the work the Artists' Benevolent Fund was doing. In one instance there were two rising artists, who joined the Annuity Fund about the same time. When they had paid but one yearly premium they were both cut off by typhoid fever, and their widows and children had ever since been in receipt of the relief afforded by the Benevolent Fund. Then, again, there was another distressing case of a sculptor who, finding that a work by him had been rejected at the Royal Academy, returned to his studio and killed himself with a modelling tool. His wife, together with a large number of children, came upon the Fund, and had since been in the receipt of 20*l*. per annum and 6*l*. per annum for each child. Last year, a painter, from the very same cause, lost his reason and died. His widow was now in receipt of the benefits of the Fund. Now he (the Chairman) was not impeaching the Royal Academy by the mention of these two instances. It was utterly impossible for the Academy to accept every work sent in, and it was quite possible that neither of the works in question deserved the honour of acceptance; but, at any rate, the selecting body, knowing the sad results that might follow rejection, should give the most careful consideration to every work coming before them. They had an enormous monopoly, and they should use it wisely. The fight for life at the present time amongst artists was very real and terrible. Our great men, and even our fashionable men, received very large prices for their works, and were making large fortunes; but it was impossible to shut one's eyes to the fact that there were, not merely scores, but hundreds of artists, men and women, whose whole life was a struggle. They loved their art too much to leave it for some calling which might bring them more financial reward. Let all who were able come

in due time and join the Artists' Annuity Fund, and let artists and the public generally come to the aid of the Artists' Benevolent Fund, so that the widows and children bereft of their husbands and fathers might be something like adequately provided for. The 20*l.* a year now paid to widows from the Fund, much as it was to them, was disgracefully inadequate, and the Council were most desirous, if the public would aid them, to increase it to at least 30*l.* or 40*l.* He appealed to those who had the means to aid them while living, instead of leaving their money to be given away in heaps by executors. The affairs of the society were administered in the most economical manner.

The toast having been drunk with enthusiasm,

Mr. C. J. Dimond, the hon. sec., made a brief statement of the working of the society, and appealed for increased subscriptions. The Council did not ask so much for large individual subscriptions (though, of course, they were very acceptable) as for an increase in the numbers of those who would subscribe a small sum annually. There had lately come upon the Benevolent Fund three widows, one of them having fourteen children.

Mr. Hawksley, C.E., proposed "The Royal Academy." He said he believed it was usual, in proposing that toast, for the speaker to commence with a description of the wall-paintings of the Egyptians, then to pass to the sculpture of Phidias, and then, after descending to Titian and Michelangelo, to dash his brains out against the rocks ahead of the present day. He should, however, on the present occasion, take a different course by alluding to good old King George III., who, he believed, gave the Academy their charter. The old king was not generally credited with much wisdom, but nevertheless he did a great many wise things, which we in the present day did not sufficiently appreciate. He (the speaker) had travelled a good deal, had been in all the capitals of Europe, and had seen their academies and galleries of arts, but he had never seen anything anywhere which, in his judgment, could compare with the annual exhibition of the Royal Academy. He attributed the growth of art excellence in England very much to the example set by the Academy, and had it not been for those abominable trade unions, which had hindered the development of much in this country, he believed that there would be nothing within the domain of the four departments of art which we could not do in this country. In his opinion, art was never better represented by the Royal Academy than it was at the present time. With the toast he coupled the name of Mr. Forbes Robertson.

Mr. Forbes Robertson said that as a lover of art he felt honoured at having his name associated with the Royal Academy, which by common consent represented the best art of the country; for whatever a country said was its best, was its best, in spite of Parliamentary commissions or anything else.

Mr. Lambton Young, the secretary, then announced a list of subscriptions and donations, among which were included 105*l.* from the Queen, 58*l.* from the members of the Artists' Annuity Fund, and 50*l.* from Miss Landseer, the total amount being nearly 600*l.*

Mr. Carter proposed "The President and Members of the Artists' Annuity Fund," coupled with the name of Mr. J. H. Mole, who, in responding, expressed regret that the president of the Annuity Fund, Mr. Lumb Stocks, R.A., was unavoidably absent.

Mr. W. Cave Thomas, in proposing the health of the Chairman, expressed regret at the absence of Lord Ronald Gower, whom he looked upon as having a message of art to the nobility. He referred eloquently to the services of the Chairman in terms too laudatory for these columns.

Mr. Godwin, in responding, maintained that the Art-Union of London, to which Mr. Cave Thomas had referred, had been of the very greatest service to art and artists, and had spent more than 400,000*l.* in purchasing and producing works of art. Not one penny of that sum would ever have been spent in art and for the benefit of artists but for the Art-Union of London. Many an artist of celebrity dated his first step towards fame to the purchase of his works by the Art-Union of London. Moreover, the Art-Union had, by the dissemination of good art at home and in the colonies, done much to promote the love of art among the public, and, therefore, to create a demand for it.

Dr. Howell, of New York, in proposing "The Honorary Physicians and Medical Officers," spoke of the natural sympathies subsisting between artists and medical men, and said that in the course of his experience he had never known a medical man to accept any sort of fee from any kind of artist.

Mr. Dimond proposed "The Artists' General Benevolent Institution, and the other Societies connected with the Fine Arts," coupled with the name of Mr. J. Absolon.

Mr. Absolon, in reply, made acknowledgment of the good work done by the Art-Union of London.

Due honour having been done to the last toast on the list, "The Ladies," the proceedings terminated.

During the evening a selection of music was given under the direction of Mr. Lawler, who was assisted by Miss Annie Sinclair, Miss Adelaide Newton, Miss Bernard (at the pianoforte), and Mr. Henry Guy.

"SYDNEY."

SIR,—The article in your number of March 23rd headed "Sydney," and signed "Gargoyle," has so many inaccurate or unfounded statements and inferences, upon the subject it purports to expound, that, for the sake of truth, I ask from you an equal privilege of contradiction or explanation. I propose, however, to deal only with a few salient points, which will sufficiently exemplify what remains.

1. Your correspondent's statement, that "we can proceed four or five miles up either George-street, Pitt-street, Castlereagh-street, or Elizabeth-street, from this point," is an exaggeration of the size both of streets and city. George-street is not much more than about two miles long, nor, even if Paramatta-street be added, would it reach more than another mile. Pitt-street, Castlereagh-street, and Elizabeth-street are each much shorter than George-street.

2. Your correspondent says, "For some miles the pathways are flagged with the same disintegrating stone as that with which the better buildings are erected." This, and other statements, having reference to the streets, seem to imply that no other stone is used, whereas the fact is that most of the main streets are tolerably well macadamised, while the others are frequently neglected, and only paved in a few places.

3. By the statements about water, it is left to be inferred that the only water consumed in Sydney for drinking, and most other purposes, is mainly, if not entirely, derived from the roofs of houses, and that no underground drainage exists. Now, it surely argues ignorance of his subject, that the writer should not be aware that Sydney is abundantly, even if not quite sufficiently, supplied with water, used as well for watering the streets as for house purposes, by a system of pipes connected with water-works at Botany, some eight miles distant, for which rates are imposed and levied, through the Municipal Corporation; and moreover, that an extensive system of underground drainage has been in operation for many years. It is true that, from faults of management or construction, the one system occasionally interferes with the other, and that deterioration of the water intended for household purposes has been the consequence. But the mischief has not been general, and endeavours have been made, both by the central and local authorities, to apply remedies, which I have no reason to believe have failed of their intended effect.

4. It will surprise many entomologists, colonial no less than European, to learn that among other insects enumerated, "dragonflies are terrible pests, and send many bimana back to the northern part of the empire." Dragonflies are certainly not common in the streets of Sydney. And I have never heard of the hostility of these insects to man or beast being of such a character as to drive any one even from the neighbourhood of the pools, where in summer they sometimes congregate and hover in considerable numbers.

5. In the following paragraph:—"The Government is giving free passages to cabinetmakers, carpenters, bricklayers, blacksmiths, masons, plasterers, brickmakers, navvies, bricklayers' labourers, and farm labourers. It was giving them also to engine fitters and drivers, foundrymen, weavers, and a host of other useless men in a colony, and there is no doubt that hundreds in this last category would be glad if there were any workhouses in the colonies. Many of them were sent out to country towns when there was nothing but the cultivation of the soil for them to be employed at,"—there is much untruth, both direct and inferential. The Government of New South Wales is not giving,—has never given,—free passages to emigrants or labourers of any class whatsoever. A passage to the colony at present costs to every emigrant, pronounced eligible by myself or the emigration officer, 2*l.*, from which a deduction may be made for bedding and utensils furnished at the expense of the Government, and which become the property of the emigrant. The emigration, upon the conditions above specified, of miners and certain classes of mechanics, has been lately discouraged, because the demand had begun to fall short of the supply in these cases. But it is not true that "many,"—or any,—of such emigrants, "were sent out to country towns, where there was nothing but the cultivation of the soil for them to be employed upon." There are many other occupations in the country and throughout the colony for labourers "to be employed upon" other than "the cultivation of the soil," which is by no means an exclusive or even common occupation in any part of the colony, or one which affords employment to the largest number of labourers, as compared with others. But the demand for labour is in general so great, and the disposition of employers, in consequence, to accept general capacity and willingness to work in place of superior skill or experience so universal, that labouring men often find it to their advantage in the long run to change from one occupation to another in which even they may have had no previous training.

6. The statement, with reference to any working man or woman, that "he has nothing to fall back upon, and he will put up with any brutal treatment from his master," is absurdly untrue. As a rule, so much has the servant his own way that masters are compelled to treat their servants with a civility, and even a deference, which would be considered astonishing in England. No master, in fact, dare treat his servant otherwise, under penalty of not being able to obtain labour at all, or having to pay for it exorbitant prices. Dismissal is no punishment. Every servant knows well that even without a character or recommendation from any late or previous employer, he can find employment with much less difficulty than his master would have in supplying his place.

WILLIAM FORSTER,
Agent-General for New South Wales.

EMBANKMENTS OF THE THAMES.

THE INSTITUTION OF CIVIL ENGINEERS.

AT the meeting on the 9th of April, Mr. Bateman, president, in the chair, the paper was "On the Embankments of the River Thames," by Mr. Edward Bazalgette, C.E.

The river Thames was the arterial drain for 5,264 square miles. Its source in Gloucestershire was 330 ft. above the mean level of the sea. It traversed 210 miles, and was tidal to Teddington-lock. In dry weather the discharge was about 470 million gallons daily. Its waters had been prevented from overflowing large tracts of land by embankments formed under various Acts of Parliament. The removal of Old London, Westminster, and Blackfriars bridges had enabled the tide to ebb and flow more freely, by which the navigable channel had been deepened. The width of the river was, however, still very variable. Above Southwark Bridge it was 670 ft. wide, and the waterway between the piers of that bridge was only 600 ft. At Hungerford Bridge, before the formation of the Victoria Embankment, the width was 1,340 ft., whilst opposite Millbank it was only 610 ft., increased to nearly double that width at Battersea. Mud banks had formed along the foreshore, and between Westminster and Blackfriars about 27 acres of mud were exposed at low water on the north side.

The first commissioners for embanking the Thames were appointed in 1367. Acts for constructing embankments and improving the navigation were passed in the reigns of Henry VIII. and of Elizabeth. Sir Christopher Wren proposed an embankment from the Temple to the Tower, after the Fire of London in 1666. Sir Frederick Trench and Mr. Martin suggested similar embankments. In 1840 Mr. James Walker laid down a line for a northern embankment for the corporation of London, to be raised 4 ft. above Trinity high water. His line and

levels had since been adopted. Various Parliamentary commissions and committees had considered the subject. In 1862, an Act was obtained by the Metropolitan Board of Works for the formation of the Victoria Embankment from Westminster to Blackfriars Bridge. In 1863, another Act was passed for the construction of the Albert Embankment from Westminster to Vauxhall Bridge. And, lastly, in 1868, the Act for the Chelsea Embankment, from Chelsea Hospital to Battersea Bridge, was sanctioned. These embankments comprised about three miles and a half of river wall, and had reclaimed 52 acres of land.

The length of the Victoria Embankment was about three-quarters of a mile, and the area reclaimed was 37½ acres. The roadway was 100 ft. wide from Westminster to Blackfriars Bridge, and was continued nearly all the way from thence to the Mansion House of a width of 70 ft. The cost of the embankment had been 1,200,000*l.*, besides 450,000*l.* paid for the purchase of property. The tides now rose higher than in former years. On the 15th of November, 1875, the tide was 17 ft. 1 in., and in January, 1877, it was 16 ft. 6 in. above datum. This had been attributed to the formation of the embankments; but it was ascertained that the cause was chiefly due to the removal of the old bridges and of other obstructions. This embankment was formed with a sewer and a subway for gas and water pipes in the retaining wall. The subway was 7 ft. 6 in. in height and 9 ft. in width, and the sewer varied from 7 ft. 9 in. to 8 ft. 3 in. in diameter. The batter of the wall was slightly curved, and the wall was faced with granite, fine-axed, up to high-water line, and moulded above that level. There were steamboat piers and landing-places at various points. The Metropolitan District Railway had been constructed along the whole of this embankment, the level of the rails being 17½ ft. below the surface of the roadway, which was supported by iron girders. The foundations of the embankment varied in depth with the nature of the ground; but were 32½ ft. below Trinity high water. They were formed partly behind whole-tide timber-dams driven into the clay, as previously described by Mr. Ridley (Min. of Proc. Inst. C.E., vol. xxxi., p. 3), and partly behind wrought-iron caissons, the caissons being used in bad ground, and near to the bridges and around the landing-piers. The clay was reached at about 28 ft. below Ordnance datum; but near Westminster Bridge it was 32 ft. deep. The level of the foreshore sloped from 6 ft. above to 7 ft. below datum. The foundations were carried down to 20 ft. below datum; they rested mostly on the clay, and were formed of Portland cement concrete up to 12 ft. 6 in. below datum, at which level the brickwork commenced. The bottom portions of the iron caisson cofferdams were filled with concrete, and left in the ground permanently, and the piles of the wooden cofferdams were cut off under water at various levels, in both cases to protect the toe of the wall. The upper portions of the caissons were in half rings, and were capable of being used several times. When bolted together, these rings formed an oval 12 ft. 6 in. in length by 7 ft. wide in the centre. The rings were 7 ft. 6 in. deep, and were made of ⅜-in. and ½-in. wrought-iron plates. The lowest ring of each caisson was of cast iron, weighing about 32 cwt., and it had a cutting edge at the bottom. The caissons were bolted together longitudinally, and strips of felt rendered the joint watertight. These dams, like the timber dams, were supported by timber shoring from the land side, and the upper portions of the dams consisted of half caissons only, by which a considerable saving was effected. In each caisson there was a sluice, worked from the top, for admitting or discharging the tidal waters. The caissons were sunk by weighting them, and excavating within them by three methods: 1st, by men working inside, the water being kept down by pumping; 2ndly, by men working within, the water being excluded by pneumatic pressure; and 3rdly, by a telescopic dredger, the water being allowed to rise and fall within the cylinders. By the first plan 6 cubic yards, by the second 5·31 cubic yards, and by the third 10 cubic yards of material were excavated per diem. Again, according to the first system, a cylinder was sunk on an average in eight days and a third, and the labour cost 14s. 6d. per cubic yard. By the second, a cylinder was sunk 20 ft. in eleven days and a half, and the labour cost 12s. per cubic yard. By the third, a cylinder was sunk in less time at a cost of 8s. per cubic yard for labour.

The Albert Embankment was about 4,300 ft. long, and was similar in elevation to the Victoria Embankment. It had, however, neither sewer nor subway behind it. The foundations were carried to a depth of 30 ft. below Trinity high water, and the wall was formed behind a whole-tide timber dam, partly of single piles closely driven and caulked. Opposite Millbank the river had been widened for a length of 800 ft. from 600 ft. to 720 ft. Good foundations for this embankment were more easily reached than on the other side. Part of the embankment wall was formed of concrete instead of brickwork, and the whole was faced with granite. The works cost 309,000*l.*

The Chelsea Embankment was commenced in July, 1871, and completed in May, 1874. It extended from Battersea Bridge to Chelsea Hospital, and was upwards of three-quarters of a mile in length. The wall was composed of Portland cement concrete, faced with hammer-dressed granite. It had a sewer from 5 ft. 9 in. to 6 ft. 9 in. in diameter behind it, conveying the sewage from Hammersmith to the Western Pumping-station. It had reduced the width of the river from 850 ft. to 700 ft., and had reclaimed 9½ acres of foreshore. The roadway was 70 ft. wide, and 5 ft. above Trinity high water. The foundations were carried to 10 ft. below Ordnance datum, or 4 ft. under low-water spring tides, and they were put in behind a half-tide dam. A trench was dredged, and concrete blocks were bedded upon the ground at low water up to 3 ft. 3 in. below datum. Above this level the concrete was filled in and bonded with the granite facing. The cost of this work, including the low-level sewer and roadway, was 134,000*l.* The introduction of concrete in lieu of brickwork had effected a saving of about 21,000*l.* A short length of this embankment, opposite Cadogan Pier, settled in consequence of the removal of some piles, which formed part of the old pier, in front of it. The wall had since been underpinned from the land side, and its toe protected by sheet piling.

NEW GLASGOW ACADEMY.

The edifice now in course of erection under the auspices of "The New Glasgow Academy Company (Limited)," is being pushed forward with unusual rapidity. The old academy in Elmbank-street was last year sold to the Glasgow School Board, and several of the shareholders, together with a number of former pupils, met, and afterwards decided to form themselves into a company for the erection of a new institution on the old basis. A site was procured on the Great Western-road, near Kelvin Bridge, and Messrs. H. & D. Barclay, West Regent-street, were selected as the architects for the new undertaking. The capital, which was registered on the 18th of October last, is 30,000*l.*, in 3,000 shares of 10*l.* each. While the foundations were in course of preparation, estimates for the buildings were procured, and ultimately a contract for the whole work was entered into with Mr. Robert Whyte, joiner and builder, who is bound under heavy penalties to have it all completed by the 15th of August next. On the other hand, the contractor will be entitled to a premium should the work be finished at an earlier date. The extent of the ground acquired by the company, at a cost of 20,000*l.*, is 24,285 square yards, or about five acres, and nearly in the centre stands the extensive structure, which, judging from appearances, the contractor will have no difficulty in completing within the stipulated time. As affording some indication of the rapidity with which the building is being pushed forward, it may be mentioned that the masons' work was only commenced in the middle of December last, and the structure was ready for roofing on the 18th of February. A special feature in connexion with the edifice is the fact that owing to the site consisting of what is known as "made-up" ground, the foundations have not been excavated, but built upon the surface, scarcely a turf having been removed. The result, so far as can be ascertained, is successful, the structure apparently standing with as firm a stability as though the site consisted of natural ground. The materials used in the foundation were hard-burned brick set in Portland cement, the whole being firmly bound together girder-fashion by means of timber and iron beams. The breadth of base to the outer walls is 11 ft. The structure of the foundation rises 9 ft. above the surface, while the design of the foundation is well carried out. In imparting dignity of proportion to the exterior, advantage has been taken of the interior to construct a spacious drill-hall, open in the centre to the roof of the building, a height of 60 ft. Outside the foundation walls, on three sides, the structure will be provided with a verandah to serve as a playshed for the pupils. The exterior arrangement of the building is square, its somewhat plain appearance being relieved by Grecian façades, while its dimensions will be 100 ft. on each side. The main entrance is on the west side, approached by a new street, a broad flight of steps communicating with the level of the main floor. The pupils will enter by two doors situated north and south on the playground level. The two main floors, with 18 ft. height of ceiling, will afford accommodation exceeding that of the old Academy, while an additional floor, with 16 ft. height of ceiling, is provided in view of extension. The interior will be divided into twenty-four apartments, the dimensions varying from 25 ft. by 20 ft. to 90 ft. by 30 ft., besides drill-hall and gymnasium. Entrance to the two main floors is obtained from broad galleries, to be fitted with glass-cases for museum purposes, and the whole of which is commanded from a window in the head-master's room. Fresh and warm air is to be supplied to all the rooms by mechanical contrivance. It is intended to plant the banks of the Kelvin, which surround the playground, with shrubs, while palisading with wire-netting will afford protection next the river. As the whole of the site will not be required for the purposes of the Academy, the directors expect in due time to sell or let portions of it, with a due regard to securing the amenities of the place. As above indicated, Mr. Whyte is the contractor for the whole work, and Mr. Wilson under him for the masons' work. The other tradesmen are Messrs. Brown & Gray, plumbers; A. & D. Mackay, slaters; Stewart & Co., Edinburgh, plasterers; and W. Meikle & Son, glaziers.

THE LATE MR. ROCHEAD, ARCHITECT.

We mentioned in our last the death of this architect, much esteemed in Scotland. A few more particulars will doubtless interest some of our readers. Mr. Rochead was born in Edinburgh in 1814. Having a taste for drawing, he decided on architecture as his profession, and, at the age of sixteen, entered the office of the late David Bryce, R.S.A. On the termination of a seven years' apprenticeship there, he was appointed principal draughtsman in Messrs. Harst & Moffat's office, Doncaster, where he remained about two years. In 1840 he gained the first premium, amongst 150 competitors, for a design for a proposed Roman Catholic cathedral at Belfast. Commencing business in Glasgow in the following year, he resided there till 1870. During these thirty years, commissions of important character were entrusted to him, and, animated by great zeal in his profession, he took part in numerous public competitions. For the design of St. John's Free Church, Glasgow, there was a keen competition between George Kemp, architect of the Scott Monument, and Mr. Rochead, whose design was preferred. During the building of Free Churches consequent on the Disruption, his reputation as an ecclesiastical architect spread throughout Scotland, and considering the comparatively backward state of Gothic church architecture at that time, he may be said to have exhibited advanced study of Mediæval art in such works as in the West End Church, Glasgow, the Parish Church, Renfrew, and St. Mary's Free Church, Albany-street, Edinburgh. His treatment of Roman architecture, perhaps finer in its way, was exemplified in the Bank of Scotland, George-square, Glasgow, and his beautiful design for the Glasgow University, exhibited in the Royal Scottish Academy a few years ago. Numerous large and picturesque mansion-houses in the Scottish baronial style, including Knock Castle, West Shandon, Blair Vaddoch, and Sillerbut Hall, Hawick, were erected from his plans. The Wallace Monument on Abbey Craig, Stirling, was also built from a design by Mr. Rochead, after two extensive competitions, in both of which he was successful, latterly against seventy rivals. In 1870 the effects of nearly thirty years' too arduous work had so far impaired Mr. Rochead's health that he was prevailed upon to retire. He chose his native city for

quiet relaxation, and there he spent his last years among friends who admired and loved him, and by whom his generous nature and his ready felicitous manner of conversation will be long remembered.

We may also mention that he won the 300*l.* prize in the War Office competition, London,—the late Sir Gilbert Scott occupying precisely the same position with regard to the Foreign Office. In all things Scottish he was an enthusiast. Several years ago, Mr. Rochead became nervous and ill, and for a time practically retired from business. He then removed to Edinburgh, where he enjoyed the frequent society of one of his oldest and stanchest friends, the late Mr. Ballantine, author of the "Gaberlunzie's Wallet." That warm-hearted man, and vigorous Scotch poet he has not been destined long to survive. Mr. Rochead has left behind him a widow and grown-up family, together with a host of attached friends.

CANAL BOATS.

Every canal boat which is used as a dwelling will, after the 30th day of June next, be obliged to be registered, after inspection by a competent person, and the following are among the conditions which must be complied with, says the *Lancet*, before such registration will be granted.

The boat shall contain a clean and weather-proof cabin, which shall be, if an after-cabin, of a capacity of not less than 180, and if a fore-cabin not less than 80 cubic feet, and shall possess means of ventilation other than by the door. One cabin at least shall possess a stove and a chimney. If the boat is meant for the conveyance of offensive cargo, then between the cargo and the cabin there shall be placed two bulkheads separated by a space of not less than 4 in., which space shall be open to the air, and shall be furnished with a pump to insure its ready and effectual cleansing. The number of persons who may dwell in a boat is so regulated that every person over twelve shall have at least 60, and every person under twelve at least 40 cubic feet of space. A cabin occupied as a sleeping-place by a husband and wife shall not be occupied by any other female person above the age of twelve, or by any other male person above the age of fourteen. A cabin occupied as a sleeping-place by a person of the male sex above the age of fourteen years shall not at any time be occupied as a sleeping-place by a person of the female sex above the age of twelve years, unless she be the wife of the male occupant. Every canal boat is to be properly pumped out every twenty-four hours, and painted every three years. In case of serious illness occurring on board a boat, the master of the boat is required to notify the same to the sanitary authority of the district through which the boat happens to be, at the time, passing, and "in every case where a sanitary authority may have detained a canal boat for the cleansing and inspection thereof, the authority, before allowing the boat to proceed on its journey, shall obtain from the medical officer of health, or from some other legally qualified practitioner, a certificate to the effect that the boat has been duly cleansed and disinfected, and shall cause such certificate to be delivered to the master of the boat."

CONVERSION OF THE OLD BURIAL-GROUND, RED LION MARKET.

MESSRS. SUTTON'S NEW GOODS DEPÔT.

The disused old burial-ground in Red Lion Market, Whitecross-street, St. Luke's, which has been closed since the passing of the Metropolis Burial Grounds Act, is at present being turned to a profitable account, after having been for several years past a nuisance to the locality. The ground, which was private property, and never consecrated, has been purchased by Messrs. Sutton, the well-known railway carriers and agents, who have erected large warehouses, offices, and stables on the site. The buildings are to be used as a central depôt for the reception of goods intended for despatch by the several railway companies having their termini in the metropolis. The ground covers an area of about an acre in extent, and the purchase-money is stated to be a little more than 12,000*l.* Before commencing the building it was necessary to make arrangements for the removal and re-interment of the coffins and remains buried in the grounds. It was known that very large numbers of the lower classes had been buried there during the many years the ground was open for interment, and the number of coffins to be removed was set down at little less than 100,000. Mr. Neighbour, the sanitary inspector of the parish, considered that it was undesirable to remove the remains to a distant cemetery, and, at his suggestion, Messrs. Sutton agreed to remove the coffins, and re-inter them in vaults at a considerable depth below the ground floor of the new building; and this has been carried out in what would seem to be a decent and satisfactory manner. On excavating the ground it was found that the graves were exceptionally deep, being carried to a depth of 30 ft., the blue clay being reached, and as many as twenty-five coffins were found in one grave. These have all been re-interred in vaults under the new buildings, which stand on iron piers resting on the blue clay. Between the piers the earth has been dug out to the same level, and in the vaults beneath, the coffins have been laid about six tiers deep. After being so deposited, they have been covered over with 8 ft. of the earth in which they were found, this being covered over with a concrete bed, 2 ft. 6 in. in thickness. Above this concrete bed spring brick arches, covered over with asphalte, which forms the floor of the warehouses. About 80,000 coffins have been removed and re-interred in the manner above described.

The buildings cover a ground area of upwards of 10,000 superficial feet, being 140 ft. in length and 72 ft. in width. They are 36 ft. in height from the basement to the eaves, and are covered in with a roof in five bays, consisting of iron and wood. The buildings are two stories in height, in addition to a basement. The ground-floor forms one immense platform, where the goods will be received. The upper floor consists partly of warehouse room and partly of offices for conducting the business of the firm. The elevations of the building, enclosing the iron piers and columns, are of stock brick, the main frontage being to Golden-lane, out of the Barbican, which will be the principal entrance for the vans. The buildings have already been covered in, and it is expected that the depôt will be completed and opened for business in the course of a few weeks.

Mr. Bentley, of John-street, Adelphi, is the architect, and Messrs. Clarke & Bracey, of Coleman-street, City, are the contractors. The whole of the ironwork has been supplied by Messrs. Moreland & Co., of Old-street.

THE SALE OF CREMORNE GARDENS.

Preparatory to laying out the grounds forming Cremorne Gardens for building upon, a sale of the miscellaneous effects, consisting of everything belonging to the establishment, with the exception of the various buildings themselves, has been going forward during the past week, closing only on Monday in the present week with the sale of the statuary and other property in the grounds, including a very large number of iron seats and other like effects. The property disposed of since the opening of the sale on Monday week was of the most varied character, and included, amongst other articles, the fittings, machinery, and scenery of all the four theatres on the grounds, together with the theatrical wardrobe, consisting of upwards of 6,000 dresses, which formed an interesting feature of the sale. The materials of the buildings will be sold separately. They include the erections of the four theatres, the grand ball-room, hotel, firework gallery, several bars, a large number of grottos, together with the various outbuildings, in addition to a large quantity of growing timber, consisting of several hundreds of trees, many of which are of great size and girth. Some of them are said to be upwards of 100 years of age, and to have been on the grounds many years before Lord Cremorne, the Irish peer, whose suburban residence it was, disposed of it for the purposes to which it has now been applied for upwards of thirty years. The gardens were first opened in 1847, and in 1860 were enlarged by the addition of grounds belonging to the Ashburnham family. A few weeks will now suffice for dismantling the whole, and Cremorne will be an institution of the past, to be succeeded by a new uprising of bricks and mortar. A large notice-board at the entrance announces that the Cremorne and Ashburnham estates are to be let on building leases. We understand that they will be laid out under the superintendence of Mr. Scrivenor, of Norfolk-street, Strand.

THE TEMPLE AT PHILŒ.

Sir,—In Professor Erasmus Wilson's book on "Cleopatra's Needle," referring to the so-called hypæthral temple at Philœ, he states, p. 125, "Here also may be seen an elegant and picturesque hypæthral or roofless temple, open, as were many of the temples of Egypt, to the blue vault of the firmament." Is not this an error? I know of no Egyptian temples open to the sky. The courts in them were, of course, uncovered, and that they were intended to be so is shown by the existence of the usual *cavetto* cornice as a crowning member to the walls or colonnades. This, however, is not the case with the temple above referred to by Professor Wilson. The depth of its cornice above the dies of the columns is about 6 ft. The inside face of the same, to a depth of 3 ft., is set back 9 in. (as if to receive the usual stone slabs which roof-in Egyptian temples), below which and over the centres of each of the three columns on either side are mortise-holes, sunk to the same depth, formed for the reception of *some supporting members*. These latter are usually in stone. In this particular temple however, there are no internal columns, and the bearing (about 25 ft.) would be too great to admit of the use of stone; besides which, the mortise-holes are only from 14 in. to 16 in. square, so that the only alternative would be to use wooden beams. Their entire disappearance after a lapse of some 2,000 years is not surprising; but the traces of their probable existence are too palpable to allow of the term hypæthral being still attached to this temple. There is also a great improbability that such a building (erected probably for the assembling and formation of processions to the main temple) would in the hot climate of Nubia be constructed without a roof.

R. Phené Spiers.

HANDSWORTH WOODHOUSE, NEAR SHEFFIELD.

The new church of St. James is now complete; and awaiting a formal dedication and opening by the Archbishop of York. It is in the Geometrical style, and has been built from the designs and under the immediate superintendence of Messrs. Innocent & Brown, architects, Sheffield. It consists of a nave, south aisle, south-west porch, chancel, and south-east organ-chamber and vestry. The walling generally is of Dunsford Bridge stone, and the dressings are from the quarries at Treeton, near Rotherham. The south-west porch is a good feature; and a unique one is the triple bell-turret over the chancel-arch, and which has a spirelet pleasantly contrived in the central part of it. The roofs are of steep pitch, and covered with blue Welsh slates, surmounted by a red crease. The copings of the gables are crowned upon their apices by worked foliated crosses in stone. The grouping of the building, especially from the south-east point of view, is very happy. The doors, which are oak upon pitch-pine frames, have good wrought-iron hinge-work, and the effect of this is heightened by its being gilded. The aisle is divided from the nave by a bold arcade of four bays, the columns together with their bases and capitals being circular. There are clearstory windows over the arcade, but the wall on the north side is not pierced to correspond, having only windows under. The aisles and approaches to the body of the church are laid with red and black Staffordshire tiles; the chancel-floor, however, is of encaustic tiles, by Messrs. Maw, of Broseley, and encaustic tiles line the east wall up to the string under the window. There is a well-moulded chancel arch, and the chancel itself is approached by a couple of steps in Greenmoor stone; there is a further rise of three more steps in the same material upon nearing the sanctuary. The roofs are of timber, — that of the chancel panelled and boarded; in the nave, plastered within the purlins; and the aisle roof is a lean-to of somewhat uncommon construction. There are good east and west windows of three lights, and the church is heated by hot air. The font partakes of a quatrefoil form, and is made in its entirety from a block of Treeton stone. It stands close by the south-east entrance. The seating in the nave and aisle, and the organ-case and screen, are of pitch-pine. The chancel fittings are entirely of Riga oak. The stalls have carved ends and terminations, and open fronts; the altar-table and its re-table are carved with symbolical forms

and foliage. The pulpit stands upon a moulded base of Bath stone, and, like the other fittings, is of oak. These fittings have been carried out by Mr. Harry Hems. The contractors for the works were Messrs. Greenwood & Son, of Handsworth Woodhouse, and Mr. Spink, of Sheffield, has done the ordinary joiner's work.

THE BASE OF THE OBELISK.

Sir,—We were told that we were to have a very interesting discussion at the Institute on obelisks last Monday evening, and that it would turn mainly on the question, what sort of base was to be put under the obelisk about to be placed on the Thames Embankment.

Those who attended under that supposition have certainly some little right to complain, considering what really did happen. In the first place, we learned, at the outset, that so far from coming to consult the opinions of the architects, the "promoters" of the obelisk were only going to tell us what they had decided to do, and the time for criticism was past. We had, therefore, only to sit as learners and approvers,—a position which those who took part in the proceedings certainly seemed to accept very meekly, for the most part. We learned, then, with the assistance of a model, that the obelisk is to stand on a base copied from the existing base of the companion obelisk at Alexandria, which is still in existence, and consists of a square block mounted on three steps; with the difference that the sides of the surbase are to be sloped parallel with the lines of the obelisk; but in the main we were to understand that this was the correct thing. Now, as I believe it to be entirely incorrect both architecturally and archæologically, I shall be glad if you will give me space for a remark or two which it was impossible to make at the meeting, as the discussion was brought to a sudden and unexpected close before, in fact, there had been any real discussion "at all at all."

Archæologically, it has been an actual commonplace for fifty years past that the Alexandrian obelisk stands on a Roman base. This conclusion, with the reasons for it, is given in the great work on Egypt by the French *savans* who accompanied the Egyptian expedition of Napoleon. The testimony of M. Saint-Genis ("ingénieur de ponts et chaussées") is in this wise: that the obelisk rests on a block of granite about 6 ft. high by 9 ft. wide, which was supported in turn by three steps running round it. The base of the obelisk is broken,* and is kept in its place on the block by some masonry which fills up its inequalities, and renders it stable. The steps are of granite and are ancient, but neither they nor the surbase have any hieroglyphics. The masonry (supporting the angles of the obelisk) appears more modern. All these characteristics seem to me, says M. Saint-Genis, to prove that the whole substructure of the obelisk was made by the Ptolemies; or the obelisk may have been overturned in ancient times, and set up again by the Arabs or Greeks of the lower empire, who made a basement for it in their own style. He adds that it "certainly was not built by the ancient Egyptians as we see it." This was in print more than half a century since, and is, as I know from conversation with Egyptian archæologists, accepted as a matter of course by them; but neither Mr. Dixon nor his critics seemed aware of it. Zoéga, whose work is the central one on the subject even now, entirely confirms this view.† But there is really a very strong confirmation of it in the way in which the obelisk is introduced in the ancient Egyptian hieroglyphics, where it is always an upright stele upon a low square base, without a hint of steps; and in one of the pictorial papyri which are hung in frames on the stairs near the print-room in the British Museum, is a representation of two obelisks close side by side, with the same simple square base, a good deal lower than its width; while there is certainly not a shadow of evidence for steps around the base in any real Egyptian work. I understand that Mr. Dixon relies also on the precedent of the Heliopolis obelisk, which, he says, is still standing on its original base, and has two steps beneath the plinth. A reference to even so accessible an authority as Murray's "Handbook to Egypt" (which, as is well known, was written by Sir Gardner Wilkinson) might have warned him against trusting to this. He (Wilkinson) there says, "the base of the obelisk rests upon two slabs, *which apparently formed part of the paved dromos*, and were not to be regarded as pedestals or plinths." This view is confirmed in a curious manner by the testimony of an Arab traveller, Abd-el-Latyf, who visited Heliopolis in 1190, and whose account is quoted by Mariette Bey ("Monuments of Upper Egypt," page 65). He says, "In this city are found the two famous obelisks called Pharaoh's two Needles. These obelisks consist of a square base, 6 cubits long and 6 cubits wide, and of the same height, resting firmly on its foundation. Above this base rises a square column of pyramidal form," &c. Not a word of steps.

Now, if the steps were any improvement, this would not matter so much; but they are quite the reverse, being manifestly out of keeping with Egyptian architectural feeling in a work of this kind, and also positively injurious in another way, by suggesting (in a distant view) steps of ordinary size, and thereby dwarfing the scale of the whole thing.

The sloping of the lines of the surbase, following those of the obelisk, has very little precedent, and that little somewhat doubtful. Champollion in his drawings restored the Luxor obelisk in that way, but on mere conjecture. It would have, however, a happy effect if the set-off of the pedestal from the line of the obelisk were much less than it is in the model; as it is, the break is far too great, and the sloping line is so effectually cut by it, that it seems not worth while, so to speak, to carry it on again. A hint might be taken in regard to this from the base of the obelisk at Beneventum (set up in the eighteenth century), of which a very rough engraving is given by Zoéga, and which consists simply of a block "out of the square," but with lines carrying on the slope of the obelisk, with a very slight set-off at the foot of the obelisk, and another similar set-off half-way in the height of the block. It seems about the only modern base to an obelisk which has any real character about it. As to the Roman bases, with their cornices and scrolls, they are all impertinences.

Those who are undertaking for the obelisk will do well to get some competent hand to arrange the details for them, for a more clumsy concern than the model as decided on, to bring before an assembly of architects, could hardly be desired. The big blocks of granite at each side are to be removed nearly down to the plinth line,* but, as shown in the model, they bore not the slightest relation to the pedestal of the obelisk—none of the heights ranged, and the two things might have come from different places, and had no necessary connexion with each other. The whole thing is really very simple. The centre block, which is to lift the obelisk clear of the balustrade line, should range with and correspond with the other two, and thus a connected appearance would be given to the whole, and the arrangement would appear as if designed from the first, instead of a piece of accident and jumbling. The real base of the obelisk would then come on the centre block, and a low plinth and a square surbase would suffice to raise it sufficiently, and would be in keeping with Egyptian traditions, which the proposed steps or "gradines" are not. As to the proposed modern sphinxes, with their posteriors turned to the public road, they are too ridiculous to be worth a word of serious comment.

H. Heathcote Statham.

Strike of Painters.—The men belonging to the Liverpool and Birkenhead Operative Painters' Association, numbering about 1,600, struck work on Saturday. They had demanded an advance of 1d. per hour, which the masters had refused. They have been receiving 7½d. per hour, and now ask 8½d. The Birkenhead men subsequently reduced their demand to 8d. per hour, but without avail, except with a few small employers.

* This breakage, from which our own and other obelisks have suffered, was obviously owing to the mistake of putting into the base near the angles in order to insert metal cramps.

† His words are, "Quantum enim colligere est e monumentis atque e novissimorum peregrinatorum relationibus, beliscI in Ægypto modo infixi fuere stylobatæ humili quadrato, sive plinthum appellare mavis, modo toro alicui sub-rotundo, cui nonnumquam subdita fuit plinthus parum elevata."

* This appears to be made a great point of now; but when the present site was first proposed in a letter to the *Times*, there was a great flourish of trumpets about its being "flanked by the granite masses," &c.; and it was only after the absurdity of burying the obelisk between two screens of granite was pointed out in your columns, that their removal was made such a merit, and those who are carrying it out seem to think they invented the idea.—H. H. S.

WORKMEN AND THE PARIS EXHIBITION.

The following letter has been received by the Council of the Society of Arts from his Royal Highness the Prince of Wales in reference to the forthcoming Paris Exhibition:—

"Marlborough House, Pall-mall, S.W.,
13th April, 1878.

Sir,—As President of the Royal Commission for the Paris Exhibition, I am desirous of ascertaining what assistance can be given towards the visit of artisans, who might be delegated to examine and report upon the special technicalities of the various industries which will be displayed at this Exhibition.

Similar reports were made during the Paris Exhibition of 1867, and the Society of Arts, always foremost in promoting such undertakings, took an important part in bringing together the very valuable documents which were published at that time.

At the Vienna Exhibition, also, reports of a like nature were drawn up, and a small volume containing much interesting information was the result.

In the present instance, having undertaken the responsibility of the executive arrangements connected with the Paris Exhibition, I should be glad to hear that the Council of the Society of Arts find that it is in their power to co-operate with the Royal Commission in providing for the funds and organisation which will be necessary in order to carry out the object in view.

The Royal Commission will contribute a sum of one hundred guineas out of the vote which has been placed at their disposal for the British section; and as a further proof of the interest which, in common with my colleagues, I take in the promotion of these visits, I propose to request certain members of the Royal Commission to form themselves into a Committee for the purpose of co-operating with the Council of the Society of Arts.

I am, Sir, your obedient servant,
Albert Edward P.

To P. Le Neve Foster, Esq.,
Secretary of the Society of Arts."

The Council, at their meeting on Monday, expressed their willingness to undertake the duties proposed by his Royal Highness, and to render such assistance as lay in their power to further the object in view. For this purpose they nominated a Committee to co-operate with the Committee appointed by his Royal Highness, and voted 100 guineas towards the expenses of the undertaking.

BRITISH EXHIBITS AT THE PARIS EXHIBITION.

Messrs. Gardner, of Charing Cross, are sending several good specimens of their art-manufacture in metals and pottery. Considering that this firm has hitherto refrained from seeking distinction as architectural metal-workers, we were scarcely prepared for some of their productions, which are decidedly architectural. A bronze lantern, filled with stained glass, and a pair of altar candlesticks, also in bronze, are conspicuous among their works. The lantern—in character somewhat German—is octagonal on plan, surmounted by a foliated open canopy of tabernacle work. The panelling is formed with stained glass, the subjects being *fac-similes* on a reduced scale, selected from unique drawings, by Carter, of tapestry formerly in the House of Lords, which drawings are now in the possession of a member of the firm.

Among lamps of many varieties, Messrs. Gardner have produced some good examples for suspension from ceilings. One of these is in what is known as the "Adam" style, the coronæ, the chains, and the sconces being modelled and finished with some delicacy, and in good taste, while the effect of the whole work, which is in oxidised silver and parcel-gilt, is graceful. In other lamps of the same style, suitable for dining-rooms, libraries, halls, conservatories, and staircases, Messrs. Gardner have combined with their own metal-work, vases, buds, flowers, and other coloured enrichments in Doulton ware, German, or Japanese pottery, and Minton's faïence. A selection of table-lamps, of similar character to those for suspending, forms another group of Messrs. Gardner's contributions to the Exhibition. Among these are a pair of old Japanese enamel vases, mounted on tripods formed with peacocks of rose and green and gold coloured bronze; a pair of moulded plum-coloured vases by Minton; a Persian blue *coupe* by Wedgwood, with oxidised silver mountings; and a pair of Chinese enamel-on-porcelain vases, mounted with pierced brass fittings, to form moderator lamps.

We have not space for particulars of other works, but we anticipate that these examples of art manufacture will be speedily followed by others, wherein our home public will have the opportunity now given to Paris of seeing the spirit which pervades Messrs. Gardner's combinations. As we have before intimated, Messrs. Gardner have not made themselves known as artists and manufacturers hitherto, but their reputation in those capacities will be advanced by their present works.

ARCHITECTS' RESPONSIBILITIES.

A CLAIM of a rather novel character, involving the powers of an architect over his client, was heard a few days ago at the Edmonton County Court.

Mr. Patman, a builder, sued Mr. Evans, the owner of some property at Edmonton, for 13*l.* 9*s.* 7*d.*, for building and plumbing work executed under contract. During the progress of the work, which comprised the erection of a bath-room and water supply to a house, a difficulty arose with the Local Board, who refused to lay on the water unless the supply was also conducted to some outhouses. Mr. Hill, the architect for the defendant, gave instructions for the work to be done, but when the defendant came to know of it he refused to pay for it, as he contended the water supply to the outhouses was useless, and that it was a violation of the contract.

Mr. Low, solicitor, who appeared for the plaintiff, urged that Mr. Hill, the architect, who was the defendant's agent, had full powers to order the work to be done, and that it was in every way a necessary work if the Local Board were to put in force the powers they possessed under the Act of Parliament.

Mr. Hill, the architect, on behalf of the plaintiff, gave evidence as to the necessity for the work being done in order to comply with the requirements of the Local Board; but, in answer to this, the agreement between the plaintiff and the defendant was put in, in which it was stipulated that no alteration or addition was to be made without the consent of the defendant, and on the strength of the agreement the plaintiff was non-suited; the Judge, however, giving him permission to apply for a new trial.

A LAKE OF LAVA.

READING Mr. Thos. Brassey's concluding paper, "Round the World in the *Sunbeam*," in the current number of the *Nineteenth Century*, we have been so much struck by his account of the crater of Kilauea in Hawaii (Sandwich Islands), that we are led to hand it on to our readers. It must, indeed, be a wonderful sight. An ascent of 4,000 ft. above the sea level brings the visitor to the crater house, erected on the edge of the outer crater, on the brink of a rocky precipice, 650 ft. high, which forms the contour of a mass of hardened lava, looking as if the waves of a tumultuous sea had been instantaneously congealed into a mass of dark volcanic rock. Mr. Brassey proceeds:—

"In the latter part of the afternoon we made an expedition to the inner crater. We descended into the outer crater by a steep path, formed on the face of the precipice already described. For the first hour the walk over the old lava bed was tolerably easy. Our difficulties began when we reached a stream of lava, which had poured out but two days ago, and was only now beginning to cool down. At the extreme edge of this most recent overflow the lava, only 2 in. below our feet, was red-hot. At a short distance above us, on the left, we could see the stream, still uncongealed, and accumulating in such a mass as to threaten another overflow to a lower level at no long interval. Our guide, having made a circuit of at least a mile round this obstacle, led the way up a rapid ascent to the edge of the cliffs overhanging the inner crater, which contains the famous lake of molten lava. The precipice surrounding this inner crater was estimated by Mr. Dana to have an elevation of 340 ft. From the survey of the Americans it was ascertained that the inner crater was of an oblong ovate form, 16,000 ft. in length in a N.E. and S.W. direction. The average breadth is 7,500 ft. The pit includes, therefore, an area of four square miles, thus exceeding in extent, as Mr. Dana points out, many a city of 150,000 inhabitants. The level of the volcanic lake is subject to perpetual oscillation. It sometimes sinks 800 feet below the edge of the lower crater.

Looking down from a precipice formed by an accumulation of cinders and heated lava, we saw a terrible and marvellous scene. Let the imagination conceive a lake, two-thirds of a mile in length, one-third of a mile in width, hemmed in by a semicircle of precipitous cliffs of lava, 250 ft. high. On the side from which we approached, the cliffs were broken away, so that we looked down on masses of lava riven asunder, here forming sloping ravines, there rising up into splintered pinnacles or bold and threatening crags. On our left a dark valley descended, by a gradual slope, from the upper level on which we stood to the boiling lava below. On the opposite shores of the lake the cliffs formed a precipice, not less than 100 ft. in height, rising up from the rugged and confused accumulations of lava at the edge of the lake. Such were the more prominent features in the vicinity of the crater. But if its borders presented a scene of fearful devastation, the aspect of the lake itself was far more terrible. In the centre the lava was covered with a thin grey film; but numerous tortuous streaks or cracks upon its surface served to show the lurid glow beneath. An awful calm generally prevailed in the middle of the lake, though its surface was sometimes disturbed by the sudden spouting forth of a jet of lava, or by the bubbling upwards of the volcanic gases. The margin, on the other hand, was in constant and violent agitation. On the further side, over against our place of observation, three whirlpools of lava were in a state of perpetual agitation from the explosion of gases from below. At each explosion the lava was tossed, with all the vehemence of the stormy ocean, against the overhanging cliffs, on which it broke in countless jets of fire, and then fell back into the gulf beneath, causing the whole surface of the lake to undulate in heavy pulsations.

I have endeavoured to describe the scene presented to the eye. It was magnificent, majestic, and sublime. The strange sounds that fell on the ear were even more impressive. If hushed for a moment, it was only that they might gather up new force for a more profound and heavier roar. Listening with closed eyes, they recalled the raging of the stormy ocean: and yet they came with a more measured and a deadlier sound. There is probably no other spot upon the face of the earth where man becomes more profoundly conscious of his impotence, before the mighty forces of nature, than on the brink of the crater of Kilauea."

VENTILATING SHAFTS AND COWLS.

SIR, — Having gathered much valuable information upon sanitary matters from the various articles which have from time to time appeared in the *Builder*, I shall be glad if you will allow this letter to appear in your columns, when, perhaps, some of your readers will give us the benefit of their experience upon what appears to me a very important point, namely, the best place to put the outlet of ventilating shafts. I know the idea is very prevalent that sewage-gas is rendered harmless directly it escapes into the open air, and this, no doubt, accounts for the close proximity to windows in which so many pipes are placed. I have seen many so placed that a child could reach the mouth of them from the window. The question is,—How many feet from all breathing-places is it necessary to place the outlet of a ventilating shaft, in order that the gases arising therefrom may escape without danger to health? A case recently came under my notice where a zinc ventilating-shaft open at top is taken to a point only 6 in. above the slates; and I find that, under certain conditions of the atmosphere, the gases arising from this shaft are driven under the slates, and cause a stench in the roof which, in my opinion, is very injurious to health.

Then as to cowls. From what I read of Banner's cowls, and from experiments I saw at Billiter-square, I had hoped that all down-draught could in future be prevented, but I find this is not the case. I have fixed some of Banner's cowls, and have tried a great many experiments with them, one of which was as follows:—Having inserted a quantity of burning brown paper at the foot air-inlet, I sat down upon the roof and watched the cowl while the smoke was escaping from it; there was at the time a gentle shifty wind blowing, the effect of which on the cowl was to cause it to swing round sluggishly, and to repeatedly stop mouth to wind, and while in this position large volumes of smoke escaped at the foul-vent, thus proving a down-draught. I was very careful to see that the cowl was properly fixed. I have also tried Scott Dunn & Co.'s cowl with a similar effect. I am now trying Howorth's Archimedean Screw Ventilator, which appears to me the best of the three, as, no matter which way the wind blows, if the cowl moves at all it is always in one direction, while the two first-named move backwards and forwards. D. E.

LOCAL GOVERNMENT OF LONDON.

SIR,—That there will be a change shortly, in that the vestries will cease to be the "wire-pullers," is tolerably certain; but those parties opposed to the anomalous influence of vestries have failed to produce any tangible workable scheme, whereby this mode of election, objectionable in every particular, is to be obviated. One fact is clear, that Government should decide that no person engaged in "trade or business," or "deriving profits from trade," or any other business, should be eligible for a seat on the new Board.

At the Metropolitan Board, business has been conducted with some amount of economy and efficiency; but the Board is overtasked, and its working strength to proceed with due despatch should be increased. A RATEPAYER.

METROPOLIS LOCAL MANAGEMENT AND BUILDINGS BILL.

SIR,—This measure has passed the third reading, and will shortly be before the House of Lords.

The Bill will be, no doubt, sifted thoroughly, and the objectionable features of legislating by "bye-law" eliminated.

Bye-laws subject the whole case necessarily to a state of chronic uncertainty as to what is law, and what is not law.

In conclusion, bye-laws never had, and never will have, the force of law, and place in the hands of those making them an irresponsible power.

That building in the suburbs is not satisfactory is clear, but we must be careful not to increase house-rents and the price of building too much. A HOUSEHOLDER.

BRICKYARD CHIMNEYS.

SIR,—If "M. & S." would use the hard, compact sandstone from the lower beds of the millstone grit series for their chimney-caps, and would place it on its natural or quarry bed, fastening with slate dowels or copper cramps, they would find it would resist any acid which might accumulate in the chimney.

SAMUEL TRICKETT.

SIR,—In answer to "M. & S." in your issue of Saturday last, the Buckley Brick and Tile Company make fire-clay caps of any shape or size, and have made some for chemical works to replace stone ones, which had become disintegrated by the action of the gases.

JOHN M. GIBSON.

HANDRAILING.

SIR,—The statements in my letter on "Handrailing,"* to the effect that it is impossible to cover a quadrant and part of the flyers adjacent to both ends of it, and still keep the centres of plank and rail coincident, require to be modified by the clause "except in one particular case,"—a case which I overlooked when writing, but which probably never occurs in practice, viz., where one and the same plane contains the central line of straight rail on both sides of the quadrant. When this condition is present, the job is easy enough; but what I had in view was any ordinary case in which the radius might be from 6 in. to 12 in., and the quadrant contain from four to seven winders.

Melbourne. P. SINCLAIR.

FULHAM CASUAL WARD COMPETITION.

SIR,—I think the vast majority of those who have had anything to do with competitions will agree with me that there is room for immense improvement in the method usually adopted by those entrusted with the power of making awards. Scarcely a week passes but we have letters in the *Builder* from unfortunate individuals like myself (in this case), who have speculated in this game of chance, complaining of the unfair and often suspicious nature of the selection. It is only natural that an unsuccessful competitor should have an inclination to grumble, but for this very reason every care should be taken that the whole series of arrangements from beginning to end be conducted openly, without prejudice or the slightest appearance of favouritism or taint of suspicion; and any deviation by a competitor from the specified conditions of the competition should be deemed fatal, *i.e.*, such as preparing the drawings to a scale of ¼-in. a foot instead of a ⅛-in. scale, as stipulated, but not complied with, in this case,—the first premiated design being drawn to the former scale. It is certainly hard and unfair that after a competitor has been toiling away incessantly early and late for a month or more, and possibly finishing up

* *Builder*, vol. xxxv., p. 1081.

with day and night straight away, his design, though not accepted, should be quietly put on one side, utilised as a reference, or otherwise made use of. I do not wish to infer that such has been the exact mode of procedure in the present instance; but, at the same time, I do affirm that the selection and the whole string of incidents connected with this case have a very suspicious cast, as will appear from the following facts.

In the *Builder* of February 9th, 1878, architects were invited to submit designs in competition for casual wards, to be sent in not later than March 6th, thus leaving twenty days for preparation. However, no block plan, nor even sketch, of the site, nor instructions were forwarded until after I had made a second application, and then a tracing of the site, made by a local architect or surveyor from an Ordnance map, was forwarded to me, reducing the already short time for preparation to about fourteen days. This would be sufficient to convey the idea that it was not so much a utilisation of the site required as a variety of internal arrangements. At the date stipulated I sent in my design (with estimates) the same being very similar to several wards already erect in the metropolis, and approved and recommended by the Local Government Board. From that day to this I have heard nothing officially as to the decision, neither have my drawings been returned. I ask, then, is there not just cause for complaint, especially after the hole-and-corner manner adopted in the selection, and that, too, without any professional advice, but merely made by gentlemen nine-tenths of whom doubtless are mere novices as to the practicability, utility, or costliness of a proposed building as shown on paper. I might here mention that the author of the first premiated design is Mr. A. C. Bean, who holds the position of surveyor to the Fulham District Board of Works, to whom I had to refer for the depths and position of sewer in connexion with the proposed casual wards; also that at one of the meetings of the Fulham Board of Works a member placed the following motion on the agenda paper:—"That Mr. Bean, the surveyor, be requested to relinquish all private practice, and give his undivided attention to the Board; otherwise send in his resignation."

I trust the matter may be taken up by the ratepayers for their own interest, and that the whole internal arrangements of this public body as regards this competition may see the light, and be settled on its legal merits, as before suggested in the *Builder* of March 30th. This would have a salutary influence on future decisions, giving architects some slight guarantee that they are not being trifled with, and in this special case that the ratepayers should have a building of the best description, suitable for the purpose intended, and at a proportionate and reasonable outlay, the requirements being a plain, substantial, and commodious building, at a cost of about 900*l.* below Mr. Bean's estimate. Competitor.

SUB-CONTRACTORS.

Sir,—Permit me on behalf of my firm to give a flat denial to the misrepresentations contained in the letter inserted in your last week's issue under the above heading. The facts are as follow:—The man Leech came to us, and undertook to fix some staircases by piece-work. After some demur, we let him the *work at his own price*. He went on all right for a fortnight, taking his money and paying his men; but the third week he succeeded in obtaining a larger sum from us than he was entitled to under the terms of his contract. Within an hour after, he deliberately told the few men in his employ that he had not obtained from us an advance at all, and that they must wait until the following week for their wages. His men then came down to the yard, when we showed them his stamped receipt for the money he had obtained. At this their indignation knew no bounds. They have since summoned him at the Guildhall Police-court, and have got judgment and costs. The facts speak for themselves. We trust this is not a fair average specimen of the British workman. J. H. Tilney.

*** With this the correspondence must end.

HIGH-LEVEL BRIDGE OVER THE THAMES.

Sir,—Would it not be better to have a stationary engine, with an endless chain and some hooks to attach, rather than a circle, to help the loaded wagons up the incline? Also another chain with two pulleys, that laden carts going down could be regulated by attaching it to some carts wanting to ascend? As the ascending and descending momentum would be both the same incline, the horses up and down would be much relieved, and it would help our C.E. over a greater difficulty. M. Tossele.

Miscellanea.

Death of a Builder.—Mr. Henry Hughes, the senior partner of the firm of Messrs. H. & C. Hughes, contractors, builders, and brickmakers, of St. Leonard's, Sussex, died last week, at the early age of forty-four. The borough of Hastings was placed in mourning, for Mr. Hughes was a prominent town councillor, and well-beloved by all classes. Much of the building-work carried out in Sussex, of late years, was effected by Messrs. Hughes, and, with the exception of nine houses, all that palatial section of St. Leonard's, Marina, was under the superintendence of Mr. Hughes. Many of the mansions in Church-road, Maze-hill, and the Magdalen Estate, were erected by the firm. Amongst the most recent contracts carried out by his firm was the tower of St. Mary-Magdalen's Church, extensive additions to the Mayfield Priory Convent, Ore Parish Church, St. Paul's Schools, St. Andrew's Schools, National Schools, Wesleyan chapels, and minor structures.

Fall of Building.—Mr. Humphreys opened an inquiry at the Town-hall, Shoreditch, as to the death of Frances Drysdale, 66, who was killed on Tuesday by the falling in of a house in Britannia-street. Mr. Napier appeared to watch the proceedings on behalf of the Metropolitan Board of Works; Mr. B. J. Abbott appeared for the occupier; and Mr. M'Coll, barrister, for Mr. Atkinson, the builder engaged on premises adjacent to those where the accident occurred. Thomas Sweeting, the tenant of the house, 21, Britannia-street, Hoxton, said that the house adjoining had recently been pulled down. A warehouse had been built, between which and the witness's house there was a vacant space. There were struts running from the warehouse to support the witness's house. Late on Monday night, while in bed, he felt a vibration. A quarter of an hour afterwards the witness found that the brick wall between his house and the warehouse had fallen. He made his escape, but Drysdale was buried in the ruins. Thomas Atkinson, builder, 64, Paul-street, Finsbury, said that he erected the warehouse in question, and pulled down the house between it and the house which had fallen. The space between No. 21 and the warehouse was about 16 ft., and there were four tiers of struts connecting the two buildings, which had been fixed in a proper manner. They were erecting a new building on the vacant space. The witness could form no opinion as to the cause of the house falling. Thomas Smith gave evidence to the effect that he never saw a building better shored up than the one that had fallen. He was at a loss to account for it falling, as every precaution had been taken. Mr. Charles Fowler, district surveyor, Old-street, Shoreditch, gave evidence as to the means taken to support the house by struts both before and behind and across. He was unable to give any opinion as to the cause of the accident. The inquiry was adjourned to allow the district surveyor to make an inspection.

The Reredos in St. Martin's Church, Birmingham.—The reredos of St. Martin's Church, unveiled with Masonic ceremonies in November, 1876, had two vacant arcade spaces requiring to be filled in with figure-carvings from Scriptural subjects to harmonise with the general design. Those carvings have now been added, completing the reredos. It occupies the space extending along the full width of the central chancel window, and is an enriched canopied and crocketed design in the Gothic style of architecture. A number of artistically carved figures of the Apostles, and also of Moses and Aaron, are arranged in niches along the top and sides of the reredos, and in the arcaded spaces are various subjects illustrative of memorable events in the life of Christ. On the north side is a representation of the "Entry into Jerusalem," with the rejoicing multitudes strewing laurel-branches in the path of the Messiah. Adjoining it, on the same side, is an illustration of Christ expelling the buyers and sellers from the Temple. The central group represents the institution of the Lord's Supper. On the south side the groups are emblematical of the "Agony in the Garden," with Peter, James, and John asleep beside the Saviour. The remaining group is allegorical of the betrayal of Christ by Judas. Altogether the design contains forty-five figures. The main design of the reredos is executed in Scotch red sandstone, and the subjects in alabaster. The cost has been about 900*l.*, the whole of which has been raised by subscriptions. Towards this outlay the Provincial Grand Lodge of Warwickshire Freemasons has contributed a considerable proportion. Messrs. Farmer & Brindley, of London, have executed the work, from the designs of Mr. J. S. Chatwin.

The Treaty Map.—Mr. Jas. Wyld, always prompt, has published a map of the boundaries in Turkey in Europe as proposed by the Treaty of San Stefano between Russia and Turkey, showing the proposed limits of the new principality of Bulgaria, the additions to Servia and Montenegro, and the proposed line of the new Roumanian boundary; also the limits of the nationalities and races. At the present moment it is valuable.

A Deep Cavity has opened in Blackheath, at the north-eastern part of the heath, near Greenwich Park wall. It is about 10 ft. in diameter at the surface, and increases in size downwards, the banks being undermined in a dangerous manner by the fall of earth. The damage is attributed to the recent heavy rains. The Board of Works have railed in the opening.

Mortuaries in Churchyards.—Judgment has been given in the Consistory Court by Dr. Tristram, Chancellor of the Diocese of London, on an application made by the Vicar and Churchwardens of St. Matthew's, Bethnal-green, on behalf of the parish, for a licence or faculty from the Bishop of London to erect a mortuary and other buildings in the churchyard for holding a coroner's court and for making *post-mortem* examinations. Several objections were urged, and a good deal of evidence adduced, both by affidavits and *viva voce* examination on both sides. One of the objections urged was that as the ground was consecrated, it could not be used for secular purposes; and on the other side the medical officers showed that for sanitary arrangements, the application, if granted, would be of public benefit. The Chancellor, having reviewed the facts and the law applicable thereto, now said he considered that the persons opposing as owners of houses had a *locus standi* in the matter. He was also of opinion that consecrated ground might be used for a mortuary, but not for a coroner's court or living-rooms for the keeper of the mortuary; as in such instances it would be for secular and profane purposes. He (the Chancellor) had inspected the place, and, though objectionable, thought it was the best place that could be selected for a mortuary in such a crowded parish. He would grant a faculty for a mortuary and post-mortem room only, but it must be placed further back from the road. The matter was important, and he would give the parties opposing costs on the points on which they were successful. An order was made accordingly.

Lamp Lighting by Electricity.—Mr. Lane Fox's plan of lighting street-lamps by electricity was tried on Saturday evening in Pall-mall and Waterloo-place. The system was recently described by the inventor at the Society of Arts (see *Builder*, p. 331, *ante*), after he had tried it at the Fulham station of the Gaslight and Coke Company with success. Passengers in the neighbourhood of the clubs have remarked for some few weeks a length of electric wire carried from lamp to lamp by supports; but, should this method of lighting be adopted as a permanency, the wire will be taken underground, as, indeed, it now is from one lamp-post to another between the east corner of the Travellers' Club and the Reform. The trial on Saturday was not immediately perfect in its effects. Some of the carbon points had been set too close to one another and to the orifice of the burner, and, as a consequence, the lamps in which this was the case showed no light. But in the great majority of instances, where the points had been properly adjusted, the experiment succeeded. It is somewhat surprising that the inventor did not see that all things were in order before the public experiment.

The Loop-line to Bewdley.—Colonel Rich, Inspector to the Board of Trade, has made the official examination of the new line. The inspection train contained a number of the officials of the Great Western Railway, including Mr. H. Y. Adye, traffic superintendent; Mr. Armstrong, engineer, Hereford; Mr. Rowbotham, engineer Wolverhampton; Mr. G. Armstrong, locomotive superintendent, Wolverhampton; and Mr. Charles Dickenson, the contractor for the line, with his manager (Mr. Swaker). Every part of the line was examined by Colonel Rich, who pronounced the bridges and the viaduct very satisfactory structures.

Royal Architectural Museum.—The "Scott Memorial" Committee have received permission for the use of the Chapter-house, Westminster, in which to hold the intended public meeting to consider the proposed memorial to Sir Gilbert Scott. The meeting expected to be held on Wednesday, May 15th.

TENDERS

For pulling down and rebuilding the Bird in Hand public-house and 40, High-street, Hampstead, with stabling in rear of same, for Mr. Henry Maltby. Mr. Jos. Lavender, architect. Quantities supplied:—

Andrews	£7,720	0	0
Hoare & Son	5,978	0	0
Pickersgill	5,808	0	0
Scrivener & Co.	5,800	0	0
Langmead & Way	5,798	0	0
Axford	5,740	0	0
Patman & Fotheringham	5,575	0	0
Hatfield & Sons	5,370	0	0

For cottages and shop, Enfield. Quantities by Mr. J. H. Weston:—

Pratt & Wiseman (accepted)	£2,579	0	0

For the erection of new public baths, Leicester (except plumbing and glazing). Mr. J. B. Everard, C.E., architect. Quantities supplied:—

Bromage	£11,777	0	0
T. & H. Herbert	10,709	0	0
Robinson	10,500	0	0
Allen	10,250	0	0
Bland	10,101	0	0
Chamberlain	10,031	0	0
Wright Bros.	9,349	0	0
Langton & Son	9,125	0	0
Bass (accepted)	9,100	0	0
Plumbing and Glazing.			
Hudston & Smith	£429	10	0
Briggs	427	11	0
Fearn	415	15	0
T. & H. Maydew	400	0	0
Hill	399	10	0
Adams	380	0	0
Whitmore (accepted)	359	10	0
Chamberlain	352	10	0
Allen	300	0	0
Matts & Biggs (withdrawn)	295	0	0

For the erection of buildings for the London Fire Salvage Corps, in Southwark Bridge-road. Mr. W. Wimble, architect:—

Hook & Oldrey	£7,844	0	0
Morter	7,728	0	0
Braid & Co.	7,678	0	0
Abbott & Son	7,627	0	0
Grover	7,569	0	0
Scrivener & Co.	7,567	0	0
Lawrance (accepted)	7,507	0	0

For block of dwellings, Burnett-street, Vauxhall. Mr. S. Burbridge, architect:—

Dove Bros.	£8,395	0	0
Wall Bros.	7,900	0	0
Pocock	7,850	0	0
Browne & Robinson	7,450	0	0
Pritchard	7,435	0	0
Scrivener & Co.	7,393	0	0
Nightingale	7,281	0	0
Clarke & Bracey	6,850	0	0
Merritt & Ashby	6,829	0	0
Lawrance (accepted)	6,747	0	0
Downs & Co. (too late)	6,629	0	0

For the erection of additions to Spring Bank House, Chesterfield, Derbyshire, for Mr. C. H. Chater. Messrs. Rollinson & Son, architects:—

Chadwick & Co.	£1,820	0	0
Gilling	1,744	0	0
Stevenson	1,733	0	0
Hoole & Handly	1,685	0	0
Marsden	1,669	0	0
Brailsford & Brown	1,625	10	0
Wright (accepted)	1,619	0	0
Forrest	1,578	0	0

For the erection of temporary printing premises in Bedford-street, Mile-end, for Mr. F. H. Hurd. Messrs. H. S. & C. A. Legg, architects:—

Cohen	£950	0	0
Johnson	937	0	0
Steed Bros.	760	0	0

For premises, Nos. 47, 48, and 49, Charlotte-street, Finsbury, for Mr. J. K. Farlow, of 118, Cannon-street. Mr. B. P. Notley, architect:—

Hart (accepted)	£4,380	0	0

For the erection of ten cottages at Hither-green, Lewisham:—

Seward	£4,700	0	0
Taylor & Son	3,500	0	0
Keen	3,200	0	0
Hammond	3,000	0	0
Hughes	2,950	0	0
Hudson	2,750	0	0
Storey	2,594	10	0
Lyons	2,400	0	0
Cox	2,250	0	0
Saunders	2,050	0	0

For the erection of a detached hospital for contagious diseases at the City of London Lunatic Asylum, Stone, Kent, for the Corporation of the City of London. Mr. Horace Jones, architect. Quantities by Mr. Reddall:—

Morter	£3,306	0	0
Conder	3,287	0	0
Carter & Son	3,147	0	0
Sharp & Son	2,944	0	0
Taylor & Son	2,859	11	9
Blake	2,847	0	0
Clements & Wallis	2,747	0	0
Punnett	2,690	0	0
Naylar	2,643	0	0

For new sewers, for Board of Works for St. Giles's District. Mr. G. Wallace, surveyor:—

Hoare & Son	£2,198	0	0
Carey, Sons, & Co.	2,125	0	0
Neave & Son	2,050	0	0
Culverhouse	1,700	0	0
Keeble	1,600	0	0
Mowlem & Co.	1,550	0	0
Crockett	1,530	0	0
Killingback (accepted)	1,390	0	0

For new malting at Bury St. Edmund's, Suffolk, for Messrs. Gough & Co., export maltsters. Mr. A. Grimwood, architect:—

Robinson & Son	£5,460	0	0
Grimwood & Sons	4,930	0	0
Andrews	4,777	7	7
Tooley	4,477	0	0

For the erection of a monument in the Wesleyan Church, Drayton Park, Highbury, for Mr. William H. Hodge. Mr. David G. Reddall, architect:—
Mitchell (accepted).

For schools and caretaker's house in Portrack-lane, for the Stockton School Board, to accommodate 650 children. Mr. Eugene E. Clephan, architect. Quantities supplied:

	Schools.			House.		
Winsby	£6,368	10	0	£236	16	4
Bell	5,863	6	5	346	13	7
Pounder	5,256	19	0	262	0	0
Davison	5,235	0	0	275	0	0
Renshaw & Walker	5,222	0	0	261	0	0
Garbut	5,200	17	0	277	1	8
Craggs & Benson	5,159	10	0	285	10	0
Hearsisides	5,205	0	0	235	0	0
Yeo	5,000	0	0	300	0	0
Smirke	5,050	0	0	244	14	9
Raper & Co.	4,950	0	0	250	0	0
Wilkinson	4,800	0	0	358	19	0
Trevor	4,823	0	0	254	10	0
Barry	4,779	0	0	281	0	0
Estill	4,760	0	0	270	0	0
Bridges & Robson	4,759	0	0	262	0	0
Boyes	4,725	0	0	265	0	0
Hodgson	4,698	10	0	272	0	0
Lazanby (accepted)	4,500	0	0	247	18	4
Middleton	4,500	0	0	189	0	0

For the erection and completion of south aisle, transept, organ-chamber, chancel, and portion of tower to the Church of Emmanuel, Saltburn-by-the-Sea, Yorkshire. Mr. E. E. Clephan, architect. Quantities supplied:—

Smirke	£3,957	1	3
Raper & Co.	3,400	0	0
Barry	3,142	0	0
Adamson	3,003	16	0
Cooper & Dickenson	2,872	16	0
Grange	2,779	15	0
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The Builder.

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The Labour Question in Lancashire.

CONSIDERATION hitherto undiscussed, arising out of the history of disputes, such as that now assuming so painful and even dangerous a form in the great home of the cotton manufacture in Lancashire, may prove worthy of attention. It is this. The disputes between the owners and the employers of labour, of which unhappily so much of late has been heard, generally occur around the cradle of the steam engine. We do not forget that at times critical difficulties have arisen in very different parts of the social edifice. We have had trouble and question on the part of bakers, of policemen, of bodies of workmen, such as masons. But, as a rule, it has chiefly been when a large population has sprung up around the centres created by or for the application of the motive power of steam, that labour strife has arisen. And in most other cases, even if there be no direct question of steam power, it has yet mostly been due to the concentration of population, or the other great changes in human condition which have been wrought out in consequence of the mighty invention of Watt, that the origin of disputes can be traced. The nature of these steam conflicts, we have before pointed out, is too often suicidal. When, owing to misapprehension of fact, or to any other source of human error, the paymaster and the producer of labour begin to pull in opposite directions, it is certain that the trade in which such dispute occurs is passing through a period of crises.

But the point that we have now most distinctly in view is, that it is in the production, rather than in the distribution, of commodities that labour disputes now for the most part occur. And this is the new feature of the case, as compared with times before production was facilitated by artificial means. It was in distribution that the great differences of cost formerly arose, and that they might naturally be regarded as most likely to arise. It is not so long since that the truck system was dragged to light as a method of wringing unjust pence out of every shilling earned by the labourer. Our readers can hardly have forgotten the iniquities that were the fruit of that most plausible social arrangement. The best dreams of a certain school as to the organisation of credit were invested with living reality by the truck system; and the result was the robbing of the working classes in a more thorough manner than has perhaps been in any other way accomplished.

In many a country village and remote agricultural district the tyranny of "the shop" is still flourishing. At how much an ounce does the shopkeeper sell the tea or the cheese that he buys by the hundredweight? What is his idea of a fair profit? The rule *beati possidentes* is still very thoroughly worked out in many a rural locality.

Why is not this the case in large towns? How is it that, as a rule, prices are alike in all shops of equal respectability?—meaning by respectability not the income of the shop-owner, but the reliable excellence of the wares that he sells? Looking at the large number of persons who derive their living from the exercise of retail trade, and at the enormous competition for custom which, openly or tacitly, almost everywhere exists, how is it that the most inexperienced buyer may count upon having his pennyworth for his penny in any respectable shop?

The reason is, that with certain notable exceptions, a general appreciation of community of interest has led to a general adoption of common rules by the great mass of the distributors of commodities. Tacit self-defence has instituted an unwritten code of laws. The young tradesman who sets up for the first time soon understands that it will pay him better in the long run to sell at the price common in his business, and to strive for his share of custom by civility, promptitude, intelligence, and excellence of goods, than to attempt to take the market by storm by reduction of price. It may be hoped that this feeling is rather on the increase than otherwise. The various co-operative associations have an influence in that direction. Persons who seek only to lay out as little money as possible, relying on their own judgment for the selection of purchases, and having ample time to devote to the purpose, can usually, by one means or another, obtain what they require at the stores. Persons to whom time is of the first importance, who do not feel themselves to be experienced buyers, who hold that the best articles are, in point of fact, the most economical, whatever be their money price, so that it be proportioned to the real value of the goods, will go to the best tradesman, where they can obtain what they require, at a fair price, on the responsibility of a well-known name. Between the two, the shifty advertising, scamping shopkeeper is, it may be hoped, rather going to the wall.

This state of things has arisen, there can be no doubt, from a general diffusion of knowledge and intelligence on the subject of the articles of retail trade. Competition here assumes, under the light of publicity, a beneficial instead of a ruinous aspect. Competition for excellence is a national benefit. Competition for nominal cheapness may almost be regarded as a main source of national disaster. It is all very well to buy in the cheapest market, if the goods be worth the cost; it is all very well to sell in the dearest if the demand be equal to the price. By omitting these two requisite conditions, writers on political economy have converted a harmless platitude into a mischievous fallacy.

In the case of manufacture, competition has not arrived at the stage to which long experience has conducted the distribution of commodities. Manufacture, using the term to designate those enormous outputs of wrought material that are produced by steam-mills of all kinds, is yet in its infancy. It is, indeed, a colossal babe. But we know when Arkwright first began to supplant human skill by the spinning-jenny. We know when Boulton and Watt first began to banish human toil and horse labour by the consumption of coal. In point of time, even tracing our national history not further back than the Norman Conquest, steam manufacture is so recent that we cannot doubt that it is only in its infancy. It is in accordance with this view to find that the conduct of manufacturers, in respect to competition, was also that of an early and ill-educated condition of affairs in regard to retail trade. So keen is the race for sales, that the sellers make too much demand on their own resources. They act like men who begin to row at a number of strokes per minute which no human muscles can keep up. They take it out of their own vigour. Reducing the pay of labour below its proper proportion is an act of folly of the same nature as over-tasking the physical energies of the racer.

Remembering that the causes of action, in any complex society, are themselves complex—avoiding any too hasty, and therefore too exclusive generalisation, it may yet be urged that the main source of the disputes which have arisen between the owners of capital and the owners of labour may be found in the unbridled and unmeasured competition of the former, as between themselves. From the desire to undersell comes the need to screw the workman. From the slopseller who advertises cheap shirts, of which the warp is thickened with devil's dust, and the woof is damp with women's tears—those of the women engaged at 2d. per shirt,—to the millowner who turns out hundreds of miles of steam-rolled goods, at a price one element of which is the hunger of his factory-folk—the evil is of the same nature. There is a general ignorance on the part of the consumer of the tests of excellence, among which ranks the test of adequate price. There is a general ignorance, on the part of at least the subordinate producers, of the proper proportionate cost of each item of the general manufacturing cost.

If this be so—and we see no means of impugning the statement—it is, at all events, clear in which direction to look for a remedy. It is in the distribution of knowledge; in the introduction into the system of manufacturing industry of that same kind of minute acquaint-

ance with the cost of each detail of business that is instinctively acquired in distributive industry. As the humblest retail trader must know something of the business of the merchant, so must, sooner or later, the humblest manufacturing operative know something of the theory and cost of manufacture.

The actual state of things, then, is one that imperatively demands that the fullest light shall be thrown on the cost of manufacture, as well as on the tests of excellence in the articles manufactured. We shall not be accused by any of those familiar with our pages of any undue prejudice in favour of the labourer, as against his employer. We have been too often compelled rather to dwell on the points in favour of the dispensers of wages, as against those urged by the claimants for increase of pay, or diminution of working time. But there are special circumstances in the present case. The scene of the contest is one that is memorable as a locality that was illustrated by the noblest self-control on the part of the operative thousands, at a time when a policy, which many foreseeing thinkers condemned, allowed the looms of Lancashire to be famished for want of cotton. It is a circumstance of which the significance can hardly be exaggerated; that at a time when 30,000 hands have already ceased work, the largest firm in the town or district of Preston, that of Messrs. Horrocks, Miller, & Co., who employ 150,000 spindles and 3,500 looms, are going on at full swing, without any reduction of wages. It is hardly possible to give any explanation but one to that statement, supposing it to be exact. The general position of the mill-owners is that a reduction of ten per cent. in the prices paid for labour is essential to allow them to make such a reduction of price as will enable them to sell their products. It is not said that the prices of commodities will be reduced ten per cent. To that part of the question we shall return. We now wish to show that, in the opinion of the manufacturers as a body, the state of the market is such as to require a reduction of prices in order to stimulate sales. Of Manchester goods as a whole there is a glut in the markets of the world. How is it, then, that Messrs. Horrocks can go on as merrily as if nothing of the sort had happened? There can be only one reply. If things are as above stated, the goods produced by that firm must have such a well-known standard of excellence that they command an undiminished sale. It is difficult to imagine any fact that would be more instructive as to the real cause of the glut than this, if it be true.

Again, there is a feature in the present conflict which shows a great sense of justice on the part of the operatives. That sales have declined seems to be admitted on all hands, though we have just seen that there appear to be exceptions. Whether this fact be, as the workpeople urge, due to the systematic adulteration of cotton goods by the admixture of size and clay or not, it seems to be generally admitted that a reduction in price is the only mode of increasing demand. It may well be questioned, if the statements which come from India be reliable, whether any such reduction can be made as will restore the former activity of sales. But that by the bye. In case of the glut of a market with goods that are in themselves not only suitable to the market, in design, but of a quality that will stand investigation, two modes of stimulating purchase exist. One is by diminishing supply, the other is by reducing cost. A concurrence of the two modes is what might naturally be regarded as both the fairest and the most effectual plan to adopt.

Now it is quite clear that if the only means adopted for stimulating sale be to effect such a reduction in price as can be made by deducting 10 per cent. from the wages of the workpeople, manufacturers will be doing little in order to re-open the market, and they will be doing that little exclusively at the cost of their hands. If such be their policy, there can be no doubt that, as soon as it is thoroughly understood, and proved to be in operation, public opinion will be loudly pronounced on behalf of the operatives. And it is a sign as hopeful as it is significant, that the working people themselves have not only understood this part of the case, but have offered to aid in improving the market at a personal sacrifice of no slight magnitude. A reduction of wages by 10 per cent. means a loss to every labourer of one shilling out of ten. But a stoppage of a factory for two days out of six means a reduction of one-third of the earnings of every workman. True, he has his time on his hands, but what will he do with it? It is, as things are at present ordered, a useless commodity: it has not even the merit of being a holiday. Two days' idleness in the week to an operative means two days' *ennui*; and the cost of these days, in food and other necessaries, is likely to be more, rather than less, than that of two days spent at work.

What, then, is the meaning of the offer on the part of the working people to submit to a loss of 2s. in the pound in the rate of wages, if their employers at the same time inflict on them a further loss of 6s. in the pound by running short time?

In our view of the case, not even the conduct of the Lancashire operatives during the American cotton famine has been more noble and more deserving of national admiration and support than such a proposal as the above,—a proposal, be it observed, that the mayor of Blackburn has either accepted, or himself originated, in dealing with his own hands. "I object to take 18s. instead of 20s. for six days' work," says the spinner, "as it will be a useless sacrifice, but I will work four days in the week for 12s., if you will close your mills on the other two days." Whether the view taken by the operative be right or wrong, as regards the future course of the market, it is signally fair and unselfish. We should have said, signally disinterested; but it would be more correct to say, prompted by a regard to the permanent welfare of the trade, at the cost of immediate personal suffering. And supposing it to be true, as reported in the daily papers, that this is the present attitude of the workpeople, we do not hesitate to pronounce it one that is worthy of the very highest admiration, in a moral point of view. How far it is equally admirable in an intellectual point of view is another question; and it is one of which the national welfare demands the prompt and certain solution.

We hope that we express our opinions with sufficient clearness. The great thing that is now needed is knowledge of the whole state of the case. Is there a glut of cotton goods in the markets of the world? The producers say that there is; and the probability is that they are right. Is there a glut of good cotton manufacturers in the market, or is it only the case that the quality, as a rule, has so deteriorated that trade turns aside, not because it has no need, but because it has no trust? That is a point to ascertain. The operatives say that it is so. Reports from all parts of the world say that it is so. The full time worked by Messrs. Horrocks intimates that it is so. We wait for the evidence in contradiction. The first point, then, accurately to ascertain is the real relation of demand and supply. Is the world full of cotton goods? or is it only refusing to take goods which it suspects to be part cotton and part size and clay?

If the former be the case, if there be only a temporary glut of goods, the true remedy is the contraction of production. Diminution of cost will do but little by way of remedy. The diminution of price to be effected on a piece of goods is said to be disproportionately small as compared with the reduction of wages. But let this be as it will. Let us suppose that by reducing wages 10 per cent., sale prices are diminished 20 per cent. What will be the result. If the case be one of real glut, the stimulus thus given would be comparatively small, and its effect would be limited. If it induced the purchaser to take 120 yards of cotton goods where he would otherwise have taken 100, he will be so much the longer before he comes for another 100. If the glut be a *bonâ fide* glut, reduction of price is not the true expedient. Reduction of quantity is what is required, or, in other words, not reduction of wages, but reduction of time.

If, on the other hand, the slackening of purchase be due, not to over-production, but to a long-advancing inferiority of material which has at last been so generally detected as to tell on the market, neither reduction of cost nor reduction of supply will avail much. The only remedy will lie in the change of system. It will be by only the recovery of the too-lightly risked character of excellence that once belonged to the English market that the looms of Lancashire can hereafter be kept at work.

We are not now offering any opinion as to the fairness or the reverse of the actual rate of wages. Thirty thousand operatives are spoken of as now idle. The cotton operatives, as a whole, number between 450,000 and 500,000 hands. From 1871 to 1876 there was a general, though not a universal rise in the rate of wages among them. In some branches of employment the advance was as much as one-sixth during these five years. In other branches (generally those requiring little or no skill) there was no advance. We refer to this as one of the elements with regard to which it is requisite to have some information. The relation between the wages paid to various branches, and the general cost of production, is one element in the case. The relation between these wages and the present cost of living is another. The relation between the cost of production, distributed under its different heads, and the market price, is yet a third subject for inquiry. The welfare of the country demands that these matters should be no longer shrouded in obscurity. Manufacturers may think it highly desirable to keep the question of profit and loss to themselves. That is but natural. But when a stress such as that which may now be only beginning to be felt comes upon any system, that mode of action is no longer possible. When there is a profit to divide, men may be reticent as to the mode in which it is made. But when insolvency stares one in the face reserve is at an end. For better or for worse, every item of profit and of loss must then be shown in the balance-sheet.

We think, then, that proposals of arbitration are not, at the present moment, what is required. It is said that the millowners decline to admit any such expedient. For an arbitrator or umpire to act, he must first be called in. But any man who would be competent to act as an umpire, and who could afford to devote enough time, unpaid, to the service of the nation, can now render a far more signal service to Lancashire than would be done by the effecting of a compromise between any particular employer and his hands. Any man who, possessed of competent knowledge, and armed with impartiality, shall set himself the task of throwing the full light of day on the actual state of the cotton manufactures of England, will deserve well of his country.

The task, indeed, will take the labour of more than one or two. It is one which can be much lightened by co-operation. Yet it must not be denied that much difficulty opposes so desirable an achievement. The first duty, that of ascertaining the true condition of the foreign market, is one of great delicacy. It need not, however, be unduly complicated. The first question is not that of the amount of unsold goods in warehouse. It is that of the tone of public feeling on the great marts. Is it a question of buying more or less,—sooner or later? Or is it one of buying from a French or German, rather than from a Lancashire producer? It is essential that this question should be solved. It has long been brought irregularly before the public. The prosperity of Lancashire, and the credit of England, demand that it should be now authoritatively set at rest.

That done, the second point is to throw some light on the demands of each market; and as to how much might be fairly exported, year by year, to a given port, making allowance for increase of demand. As to this, the local merchants would, no doubt, be the best judges. And to a certain extent such demand would be self-indicating, in the absence of any attempt to force rubbish on the customer.

With some clear idea of the consumption of the world for goods of undeniable quality, the question of fair price might be attacked with success. In the great public works of Italy the plan is adopted of totalling the number of days' work performed in the year, and of pricing the average day's work according to the gross annual expenditure, including materials as well as wages. We require something of the kind to be applied to the cotton manufacture. How much is the cost of cotton? How much that of preparing, of spinning, and of weaving it? In each of these main departments, how much is required for interest on capital and maintenance of buildings and machinery, and how much for wages? As to the distribution of the wages in each department, the hands themselves have something to say. The proportionate wages differ greatly, rising from 3s. to 40s. or more per week. There, however, we do not suppose that the difficulty will arise. When we throw the division of the cost of production into the three main branches, and add to them the cost of warehouse and of sale (an item corresponding in some respects to the "traffic charges" of the railway accounts), we shall have made a

great advance towards rendering labour disputes such as the present impracticable in the cotton trade.

No doubt we shall hear much of the sanctity of private interests, and of the impropriety of letting outsiders know the secrets of trade. Those opinions have a certain weight. There are times and seasons when they are entitled to great respect. Unfortunately those times are not the present. We are menaced with a stoppage in a great branch of our national trade. We must do what great merchants do when they find insolvency stare them in the face. They place their books in the hands of an accountant. We see no issue for the present conflict,—no hope for the full activity of Lancashire,—but by one of two courses. Either steps must be taken to convince all concerned of the good quality of our manufactures; or, failing by the *prestige* of excellent quality to command the markets of the world, we must make such an examination of our accounts as to see where the loss occurs, and how it may fairly be distributed. At present the offer to combine reduction of wage with reduction of time has an aspect of equity that demands, to say the least of it, full consideration.

THE WELL-SPRING OF ART.

It seems to be getting more and more generally recognised that in regard to ornamental art—all that art which is not in the strict sense pictorial—we are between a kind of Scylla and Charybdis; an utter negation, on the one hand, of any attempt at imparting beauty to objects of utility; and an endeavour, on the contrary, to impart the quality of beauty by a conscious effort, in a manner not arising necessarily or naturally out of the purposes for which the object is intended, or even out of the unsophisticated predilections of the artists' own feeling, but out of a conviction that we ought to like beauty, that things generally ought to be beautiful, and that we should at once proceed to make them so.

That is the plain statement of the motive which lies at the root of all the æsthetic receipts for making life more beautiful which have been so prevalent of late. The result has been what we have so often commented upon, the practice of seizing on a certain phase of work belonging to a past age and calling it artistic, and affixing it to all our habitations and articles of furniture as the necessary condition of their being accepted with satisfaction by artistic people. Things are made in a form which would not be dictated by mere reference to their uses and to the habits of workmanship of the present day, but which arose from the habits of workmanship of a former time; and the prefix "art" is then placed before them; as "art-furniture," "art-pottery," &c.; and so far has the self-conscious selection of certain elements of decoration been carried, that we hear even of "art-colours," that is, colours which harmonise with a certain style of decorative treatment now popular; the phrase just at present standing really for some favourite sets of tertiary tones which are in vogue. This last application of the system to colours, as if there were certain colours that were in their nature more artistic than others, is in itself a *reductio ad absurdum*, and perhaps is a rather instructive comment on the character of the whole movement.

In opposition to this, or rather entirely ignoring it, lies the mass of hard practical work in which the practical object to be attained is alone thought of: work which is represented on the largest scale by the proceedings of modern engineering, but also in a very multifarious manner by the workmanship of most ordinary manufacturing or artificers' trades, such as hatters, shoemakers, &c. To a certain extent the engineers have occasionally bowed to the demand for art in a tentative and desultory manner, adding architectural ornamentation to their structures, but in a way arguing that they were either ashamed of or entirely indifferent to it, and generally in such a style as to prove that they had better have been so. But for the most part the real pride of the engineer is not at all in the appearance of his work, but in the sense of its practical success and suitability for its purpose. And this is much the same with the maker of articles of dress and of furniture who has not been caught by the shibboleth of any æsthetic clique. He is desirous, probably, to turn out a "neat job," and takes a pride in finish of mere workmanship; but beyond that he has no special interest in the appearance of his work. It is sufficient to him that it is in the accepted fashion, that it answers its purpose, and is of good quality and make*: whether it is beautiful or not would be a point that would never enter his mind. And as a rule this is much the same with the engineer, though his, of course, is a much more highly-educated mind. It is of no use to tell him that the bridge he has made is ugly. He cannot see that it is; and he hardly understands why you should care about that at all, if it takes you safely over the chasm.

A pendant to the engineer in this respect is the average builder, the speculating builder, in his higher and lower varieties. He may at times build what is called a "good" house; i.e., fairly planned and provided, and of tolerably honest materials. The upper class of builder, in his lucid intervals, is equal to this; but he, also, does not care the least how his house looks, except so far as this, that experience has taught him that certain customary architectural (?) costumes and dressings, of pilasters and architraves, are necessary in order to make a house go off well with the better class of tenants. He even sometimes gets a step further than this, and imitates, with more or less success, the scenery of the "art-architect," the better to catch the more æsthetically-minded of his customers.

His model in this case, the art-architect, is, of course, the centre and fountain-head of the whole "art-movement," and is now an old institution, who has already gone through several phases of taste, and upon whom criticism, appreciative and the reverse, have been all but exhausted. He is the opposite pole of the engineer, and they are a mutual wonder and bewilderment to each other.

Thus it seems that we can have, whenever we want it and can pay for it, one of two things: we can have something made precisely suiting its purpose, but from which all aim at, and too often all realisation of, the beautiful, is excluded; or we can have something which is consciously intended to be made beautiful by the application of a certain kind of treatment engrafted upon it,—a treatment in regard to form and colour which is arbitrarily selected as having been thought beautiful by former generations of workers, and, *ergo*, must, it is supposed, be beautiful now; but which does not arise out of the conditions of the material from which the article thus decorated is made, or the objects for which it is intended.

That neither of these alternatives is a satisfactory one to ourselves, or to those generally who still wish for art, it is needless to observe. We neither want suitability without beauty, nor beauty without suitability. The attitude of society at large towards these two opposite schools of workmanship, the practical and the "æsthetic," it is not, however, so easy to define in a word. The fact seems to be this. A considerable section of society, among the upper classes especially, has adopted the imitative æsthetic art-workmanship as a fashion to be followed and believed in, with at least an appearance of enthusiasm. A much larger proportion of the English public, including many different classes of society, and including also most of the strongest and keenest intellects of the day, looks with indifference and a certain degree of contempt on the æsthetic party, and pins its faith to practical workmanship and the best and most economical way of making things to serve their purpose, as the aim most worthy of sensible people. So far has this become the spirit of the present day, that there seems really some reason for what we have heard remarked, that it was not impossible that mankind would eventually look upon the attempt to produce beauty of any kind as too frivolous a matter to engage the attention of a reasonable being. With many persons, and those by no means persons of weak intellect or even of essentially narrow mind, it seems really to have come pretty nearly to that now. The æsthetic set are regarded as "foolish persons" (to adopt Carlyle's euphuism), whose aims and tastes are quite beside the real and serious ends of life.

And one cannot but feel that this contempt is in a great degree justified. We have ourselves recently endeavoured to show the inherent folly and futility of a set of publications in which the ideas of the æsthetic party for the time being are summed up and crystallised. And it is of some consequence to consider what it is which mainly renders this movement obnoxious in the eyes of strong-minded people. There is, from a certain point of view, something to be said for it. With some people, even now, and with a still larger number a quarter of a century back, the love of the art of the past has really been due to a disgust with the ugliness of modern life, a feeling that beauty must be had somehow,—beauty in architecture, beauty in furniture and decoration; that if we could not get it from modern forms of work, it was better to go back to old ones, and try to revive them, rather than to have no beauty at all. In other words, the revival spirit has sprung up in some people from a real love of beauty, and hatred of ugliness; and in this form it is unquestionably respectable, even if mistaken: it is an effort at what is right, even though in a wrong way. The taste for tertiary tones, however we may ridicule the term "art-colours" as applied to such tones, has a certain value also, as a protest against the detestable character which colours and colour-combinations (one cannot say harmonies) constantly assume in the wares offered for sale in English shops, and worn contentedly and happily by English people.* What we believe makes the movement contemptible in the view of thoughtful people, is that the majority of those who follow it do so not from critical judgment, nor from love of art, but purely from fashion. You go to house after house and find the same reproduction of the same type of things, obviously from no personal taste on the part of the owner, but from the mere habit of moving in a groove along with others, and accepting as beautiful that which it is the fashion to say is beautiful. The choice is made, in short, from no inherent love of the forms of art that are chosen; and this brings us to the point of our remarks.

For we take it that at the root of the whole unreality of modern art and taste lies the fact that for the most part it is not indulged through love of anything, unless we may say that it is through love of novelty on the one side, and of money on the other. We ornament a building in some accepted style, not because we desire that special decoration as an expression of our own delight in beauty or of our desire to realise it, but because some one else expects us to put it there; because it has become the fashion to do it in that way. Each new phase of art-revival has apparently something real in it at starting, because in most cases those who first begin it do so through a natural and sincere admiration for the particular style revived: they throw themselves, for instance, as Pugin did, into the life and thought of a former time, and to a great extent adopt it as their own. But even the first enthusiasts can only do this partially, because no man of the nineteenth century can really put himself in the position of a man of another age, however he may wish to do so; and as soon as the movement passes beyond the first founders of it, inevitably it becomes a fashion arbitrarily selected. For we cannot have artistic feeling at second-hand: we may admire and endeavour to imitate the work of the thirteenth-century or of the eighteenth-century workman, but we do not produce it with the same feeling with which he did it: we cannot even realise what that feeling was. If it were possible to have one building erected in which no ornament and no colour were introduced except what the maker of it really desired for his own pleasure and as an addition to the beauty and expression of his work, we might have a practical example of the secret of true interest in decorative work. We have certainly, it may be said, a good many things done in accordance with the unsophisticated wishes of those who do them; but they unfortunately only serve to prove that there are many people who do not wish for beauty at all. If the engineer had a strong and decided pleasure in the picturesque of masonry and ironwork on a great scale, his structures would show it: they would be stamped with a force and character derived from the personal predilections of the designer, and his enjoyment in the appearance of his work. But the engineer does not care about its appearance, he only cares for its practical sufficiency, and the result is accordingly. What we do not care for we cannot put into our work; we can only make a

* We speak, of course, of an ideally-honest artificer; a *rara avis*, certainly, at present.

* We once "assisted" at a discussion by a man of science and an art-critic on the subject of taste, when the scientific interlocutor severely ridiculed the "æsthetic" school of the day, unconscious that he was offering one practical argument on their side, by himself wearing a neck-tie the colours of which were an absolute insult to the eye.

show of regard for it by making it like what some one else once cared for; what some one did because he enjoyed doing it, and we do because we think we ought to enjoy it.

"If," says Mill, "we meet with even a piece of mechanical work which is done as if the workman loved it, and tried to make it as good as possible, though something less good would have answered the purpose for which it was ostensibly made, we say that he has worked like an artist." There is the condemnation of the whole body of engineers and hatters in one word. It is not desired by any "practical man" now to make a thing as good as it possibly can be, if anything less good will serve the immediate purpose: it would be rather thought absurd to do so.

But till we have that desire to make a thing as good as possible, in accordance with our own feeling as to what is good, and not in accordance with some arbitrarily-accepted standard, we cannot have real art. We can draw out of the art of the past as out of a reservoir, no doubt: and perhaps the draught is not altogether to be despised; in a dry and thirsty land it is better than nothing, and it is possible that it may be all that is left to us now; but it is better to recognise that it is only a reservoir, only standing water. Art, as a living fountain of enjoyment, can spring only out of our genuine love for what is beautiful in nature, and desire to emulate and reproduce it direct from nature; which love, therefore, let us cultivate and cherish, as the most precious possession we can have, the only real source of beauty and joy in our feverish and crowded modern life. Let us carve or paint on our walls and elsewhere about us that which we feel gives us pleasure, not that which A says is the right thing, or which B desires to sell to us. The real joy of art is like that mentioned in the good book, "with which a stranger intermeddleth not."

MARBLE, IRON, AND ZINC PALACES IN NEW YORK.

REPUBLICAN Americans regarding themselves as merchant princes, are quite right, we suppose, to erect and make use for ordinary purposes, of marble palaces after the fashion of the De' Medici, or the Ricasoli, who for what we now know still sell their pleasantly thin wine in the lower apartments of Michelozzi's magnificent palazzo at Florence.

Stewart's marble palace, that famous building, the envy most likely of the dry-goods men of the world, was the first palace erected in this city, and it still asserts by its simple exterior a claim to our esteem, while the magnificence of the wares that load its well-planned floors are said even in this year of commercial depression to be attracting at this season as many admirers as on former years.

Stewart's up-town palace is of somewhat larger dimensions; but is in reality the work of the ironmongers' skill, having however, the appearance to the novice in these matters of the purest marble; of Mrs. Stewart's real, dazzling, marble palace still higher up-town, "on Fifth Avenue," we are not speaking hastily when we affirm that it is a larger and more expensive building than any single London or Parisian princely structure that has been built for many a day; it is certainly superior in importance, as a work of the stone-masons, to Bridgewater House. What will ultimately become of Mrs. Stewart's marble palace here, it is difficult to say; in this country, where the property of a man is divided at his death, it is rarely that the eldest son or any member of the family is affluent enough to keep up the great house, and such an experiment as this has never yet been tried on so large a scale.

New York is not yet a city of palaces, and even the Fifth Avenue, with its unquestioned beauty, will never rival the Strada Nuovo of Genoa, or even the Boulevard Centrale of Brussels, and when the exceedingly fine Roman Catholic marble cathedral is finished, and other projected artistic works completed, we shall find that Stewart's Women's Hotel, cast-iron as it is, will have a claim to artistic merit, such as real utility is entitled to, equal to the best of the more plastic productions of the builder, erected for less benevolent purposes. Well-contrived iron and skilfully-cast zinc are surely good enough materials to house and protect from the rain the ill-manufactured products that serve to swell the enormous incomes, and to aid the loving work of the trade speculator in politics and commerce.

What is so peculiarly offensive about the building here, is not so much the want of art, but the look as if art, as it is generally understood, had been considered over-much; the decorator appears invariably to have been called in too early to make unsightly a construction sufficiently simple to be able to rely on its own beauty; for defects may be admired in the way that parents are said to have the strongest affection for their weakest offspring; the fact is, that the builders and their employers have long known, and therefore now know very well, how their own interests are best served, and the temporary improvements that they have been making have succeeded sufficiently well to warrant them in continuing to build on principles that they have long followed.

There are just now being completed in Wall-street, two houses, however, the designs and finish of which are equal, we believe, to any City work in London or elsewhere, and they have the appearance of a stability that will long outlast the many rotten transactions that will assuredly be conducted within their walls.

There can be no absolute or unquestioned reasons for our admiration or poetical respect of marble as a material for our shops and homes; bricks and mortar are surely good enough, and wood, iron, or zinc, and especially terra-cotta or porcelain, are excellent materials for the civilised world to make use of; but here, if we could canvas the opinion of the many who are about to build, the majority would decide on costly Carrara, or dazzling Delaware, marble for their houses, their places of worship, for their mantelpieces, or their mangers.

It is, after all, the abuse of iron, in place of marble, that gets at last found out, and the humbug of the thing offends even the offender, while a general tone of suspicion exists in the minds of every one, to the utter destruction of the imaginative powers, and the imitation heavy columns of iron, or the bold zinc cornice and mouldings, no longer represent to their minds, or to the eye, a costly marble or stone piece of "whittling," but a cheap, flimsy, and, correctly does it appear to them, a useless projection.

We can recall at least one cast-iron front not a hundred miles from the Bank of England that suffers nothing by comparison with what it appears to imitate, but the same noble artist who designed it has since done better work on the banks of the Thames at Chelsea, and at Kensington, which shows an appreciation of old work in other parts of the world; and if we allow the same skilful artist to adorn London still more, the dear old smoky city will become more beautiful than ever; but here, however, much as iron and zinc may have aided, as they have done, the builders' purposes, neither iron nor zinc has added to the beauty of the city.

In Belgium, especially in Brussels, decorative architects make great use, and have long done so, of wooden cornices and attic windows, so skilfully incorporated with the composition surfaces of the house that the expert in building matters may be led into admiration that loses no claim to his esteem, even after he is undeceived; and the woodwork here, when the best is done, needs no addition of paint to enhance its beauty, although undoubtedly some of the most thoroughly estimable buildings in this country are the old wooden residences, surrounded by picturesque and comfortable verandahs, the whole house being painted with honest white lead, the only thorough protection against an inclement summer and searching winter weather. When these eighteenth-century houses are additionally adorned with finished mouldings within and prettily-designed fanlights over the front doors, and iron railing of admirable design leading up the stone steps, and winding to the upper floors, admitting one to "carved" apartments, where good old-fashioned fireplaces are to be found, one feels at home and disposed to remain where so much resembles the residences of Old England.

Everything can be said against, very little in favour of, the building that is now going on in New York, regarded from any other point of view than the most mercenary. One must have a profound knowledge of municipal real estate property to know how all this rubbish "pays," before one can speak authoritatively on such a question; but, regarded from an artistic position, everything we see about us calls for the severest condemnation, with the exception of a certain amount of domestic convenience, far deficient, however, on the whole, to what is being done just now in Paris and other cities. We, who are at this moment surrounded with all these modern comforts, occupying, as we do, a flat in a perfectly new house, envy immensely our neighbour 100 yards off, who is living in an old wooden mansion built a century ago,—such a house as G. P. R. James, when he first visited America, in 1850, occupied at Hell-gate, within sight of the pleasant spot from which we are now writing.

The real palaces of America, as everybody knows, have long been their famous hotels; here are built and furnished, as many travellers are stupidly in the habit of saying, "palaces for the people," containing all the comforts and luxuries of the palaces of Europe; and here, it is not uncommonly supposed, may be secured at a comparatively low rate all the delicacies of a Parisian restaurant; but this is a popular error with European travellers; the natives themselves know better; they in such respects are real old travellers, and no one better than an American knows how to appreciate our simple good old-fashioned English inns, or the exact merit of the last established hotel near the Trocadero.

Here are certainly to be found, at an easy rate and of no small choice, well-carpeted, perfectly clean and comfortable bed-rooms, with a gorgeous table, good enough, it must be admitted, for the most affluent backwoodsman, and sufficiently abundant for the stupidest giant; wines and other stuff, not much more adulterated than at European hotels, with one comfort certainly in advance of the world, a variety of seats and lounges all but perfect; but to compare any hôtel with those of Paris, the Hôtel in the Rue Castiglione, the Hôtel Chatham, and several others, becomes as odious as the comparison between many other of the social institutions of this country and our own.

The iron palaces in New York and the zinc ornamentations are confined to the warehouses, the large shops, and to some of the up-town hotels; the zinc cornices to about fifty or sixty miles of red-brick and brown-stone-front houses between 14th and 120th streets. Zinc is now beginning to be properly used for Mansarde windows in some of the most pronounced of these justly-admired uppermost stories, and one is reminded by these reproductions of the charming windows of modern Paris. Notwithstanding the great admiration that New Yorkers have always entertained for "the wickedest city in the world," it is a little surprising that New York in no degree, not even in its wickedness, reminds one of the French capital.

In the neighbourhood of Mr. Lenox's own charming residence, and near to his hideous museum, some agreeable sky-lines are to be met with contrasted with an overwhelming mass of tiresome sameness, and if New York is ever to obtain any character of an architectural description it will surely be for the slightness and easily-detected falsehood of its street cornices, and for the largest amount of vulgarity and coarseness of artistic detail of any city in the wide world.

New York houses, whether in marble, brown stone, red brick, or iron, rarely give one the idea of happiness within, and probably the pleasantest hours passed by their inmates are in anticipating the time when they can leave their over-heated apartments for "the bed-room and parlour" of the Hôtel du Louvre, or the "Splendide"; the more easily pleased are those who have learned to be content with their own homes (like our Londoner who sighs for the country) for an early departure to Newport or Longbranch, or some pleasant height of the Hudson and the Catskills, where again the chief employment of home is in the accumulation of objects and surroundings of foreign travel.

The ability to live decently in a palace, marble or not, in New York, can, after all, if truth be said, scarcely ever exist; for by the time the art required for such a life can be acquired, the luxury of leaving the place must have also been felt, and the constant succession of new inhabitants in search of palatial homes and corresponding manners must ultimately dishearten the domestic element so completely as to render our very servants discontented, notwithstanding their enormous wages, with the simplicity of our ways, and our invincible ignorance as regards vales and percentage, and even the most obedient servant can scarcely contrive to remain patient with our vulgar habit in America of suspecting that every one wants to "take a rise" out of every other person.

In London we are just beginning to see our way how to enjoy the pleasure of living every one in his own palace, and what with Mr. Hankey's new house, and many others that

appear to be literally springing up, we may all of us some day find that living on a flat is the right way; that is, those who are obliged to live in London; but Heaven spare us from such a mode of life, even in the neighbourhood of the metropolis; our country life appears nearer on the road which leads to perfection than any onward movement that we know of. In whatever other art England may be deficient, how to live in the country is an art there that the world may safely endeavour to emulate, and at the same time we may ourselves repose complacently in the comfortable assurance that those who so assiduously avail themselves of the good things and points that exist in all other parts of the world are not likely to be surpassed by those who are contented with simply their own ways and means.

New York.

FIRES IN THEATRES.*

"Now and then the public are startled by reports of terrific fires in theatres, accompanied too often by great loss of life. A vague feeling takes possession of us that a place meant for recreation ought not to be so lightly exposed to the risk of fire, and that perhaps we ourselves have often escaped death in the flames by a mere chance. But this feeling does not last. The dreadful occurrence recedes into the background, is looked upon by and by as an unfortunate accident, and until the next conflagration in a theatre everything remains as before."

It is thus that the writer of the book before us introduces a subject which has been unfortunately only too often before the public, without, however, any practical result having followed the discussion to which it invariably gives rise. The author has laboured long with a view of inducing those concerned in the management of theatres to adopt efficient measures for the prevention of fires in the buildings under their charge. About seven years ago he delivered a lecture before the Society of Engineers and Architects of Vienna on "Fires in Theatres," and on the protective measures necessary for preventing their occurrence. This lecture was at the time issued in the form of a pamphlet which is now out of print. Meanwhile more than a hundred theatres have been destroyed by fire; many of the conflagrations, especially those of Rouen, Barmen, and Brooklyn, have exacted heavy sacrifices of life. Notwithstanding the loss of life involved, very little has been done up to the present time for preventing similar calamities. On the one hand, the ever impending danger seems but little understood; on the other, the conviction does not yet appear to have gained ground that there are ample mechanical appliances and means at our disposal for forestalling effectually that peril.

This state of the matter happily induced the author to collect and put together during the last few years such material as he was able to obtain, and to give it wider publicity in a book which, besides being a mine of information, supplies practical suggestions for preventing fires in theatres. After reading it, we do not feel at all surprised that its appearance should have excited the greatest interest in Germany.

The list of fires in theatres that have been recorded includes 523 cases in which the buildings were completely destroyed. The record extends from the year 1569, when the Teatro della Carita in Venice was consumed by the flames, up to the end of 1877 (December 11, Cardiff theatre); mention is also made of the destruction by fire of eleven Roman theatres, chronicled by classical authors. As a simple register of fires in theatres would be of little use, the author has endeavoured to gather as many details as he has been able of each calamity, and to discover, by means of past experience, the right way for remedying the present evils. It would lead us too far, and encroach too much on the space at our disposal, were we to attempt to reproduce even a tithe of the information thus given. We may, however, remind Londoners especially that Astley's Amphitheatre has been burnt down four times (1794, 1803, 1830, 1841); that Drury Lane, Covent Garden, and Her Majesty's have each been consumed by the flames three times; and that of existing theatres, seven have before been destroyed by fire. No less than thirty-one fires in London theatres are chronicled, the next largest number (twenty-nine) being recorded in the case of Paris, New York following with twenty-six, and the modern San Francisco with the astounding number of twenty-one. In Paris and London nearly all the theatres, one after another, have been burnt down. A remarkable case is that of Edinburgh, where four theatres were destroyed within twelve years. Of foreign theatres, the Teatro Atarazanos in Seville deserves mention. An old chronicle records that it was burnt down in 1615 for the sixth time, that it was re-erected in 1631, and that it was consumed by the flames for the seventh time in 1675.

Among the most disastrous fires recorded comes that of the theatre of Capo d'Istria in 1794; about 1,000 persons lost their lives. Nearly 800 persons were killed in the fire which broke out in Lehmann's Theatre and Circus at St. Petersburg, on February 14, 1836. On May 25, 1845, at Canton, a Chinese theatre caught fire. As usual there, the structure consisted only of bamboo, mats, boards, and light stuffs, the whole being surrounded by four walls, and only *one* exit being provided. Of the many spectators, only a few were able to save their lives. The Mandarin, in his official report, stated that 1,370 corpses had been found, and that there were no less than 2,000 persons injured, of whom 300 expired shortly after. "This is perhaps," the author remarks, "the most apt caricature of the arrangements in our own modern theatres. We, also, heap up a mass of the most combustible materials, play carelessly with fire and naked lights, and squeeze together in an enclosed space thousands of people, without providing for cases of emergency a sufficient number of exits." Another disastrous fire in China was that of Tientsin, in May, 1872, when 600 people lost their lives.

The horrors of the destruction by fire of the Brooklyn theatre on December 5, 1876, are yet too fresh in men's minds to require recapitulating here, nor is there any need to refer at length to the exasperation of the American public when the utter recklessness with which the safety of the public had been disregarded became known. That just indignation found vent in the verdict of the jury; but that verdict was most effectually emphasised by the public when for weeks and months after that dire evening they stayed away from all theatres, although their proprietors, as far as they had not already been brought to bankruptcy, provided exits in abundance, bought fire-engines and hose wholesale, and, to use the language of the American press, "laid on whole aquariums behind the scenes."

Amongst all the scenes of suffering caused by carelessness, it is refreshing to look at the other side of the picture presented by the author. Very often great catastrophes are arrested by mere accident; fortunately more often disasters are prevented by the presence of mind of a few. Thus, on January 31, 1865, when the Surrey Theatre was burnt down, not a single life was lost, thanks to the display of coolness by several actors, but thanks also to the excellent arrangements made for the exit of the spectators, as was testified by Captain Shaw in his evidence before the Parliamentary Committee on January 28, 1866. We do not know whether the provisions made in the new Surrey Theatre for such emergencies are as good as they were in the old building. Another remarkable case of presence of mind, which probably saved hundreds of lives, was that in Crosby's Opera, Chicago, when one evening in February, 1870, the stage-manager suddenly noticed a fire smouldering at the rear of the stage. Instead of announcing the fact to the spectators, he ordered the curtain to be dropped, and, stepping before it, intimated to them that something had happened which made it imperative for the performance to cease at once. The public were startled, but retired quietly. Only when outside did they learn the real state of the matter.

By far the most valuable portion of the work is formed by the suggestions which the writer makes for preventing fires in theatres; but before turning to this part of his subject, let us inquire, as far as we are able with the aid of his book, what has actually been done in this and other countries for guarding the safety of the public in that direction. In Austria and Germany the arrangements are, on the whole, satisfactory. Some of the Vienna theatres are recommended as the very patterns of what a theatre should be. In France, the destruction of the Grand Théâtre at Nantes, on August 24th, 1796, and of the Odéon at Paris, on March 18th, 1799, supplied the initiative to a series of thorough-going measures respecting the prevention of similar calamities, and subsequent fires led to the issue of a number of ordinances by the Prefect of Police in Paris. They were consolidated in the ordinance of July 1st, 1864, issued by that functionary, and they contain many excellent regulations, proved by long experience, but somewhat out of date. The principal provisions of that ordinance are given in full by the author.

It is interesting to hear what the latter has to say respecting theatres in this country. He describes the manner in which we look after our theatres as "peculiar." "In England," he remarks, "everything which in France is regulated by a series of ordinances issued by the paternal care of the Prefect of Police is left to the goodwill and responsibility of individual persons. The arrangements of some English theatres are, no doubt, excellent; but in most of them the provisions made for protection against fire are simply *miserable*. . . Some sort of supervision has been exercised by the Lord Chamberlain for the last 250 years. Theoretically, he has large powers, an appeal against his regulations being permitted only to the House of Commons 'for unwarrantable interference.' But, as a matter of fact, the Lord Chamberlain can inflict no penalty whatever." The author, after a criticism of the functions exercised by the Lord Chamberlain in the capacity of official censor, then describes the successive steps taken in England in 1866 and 1867; and again in 1875, but without practical results. In speaking of Captain Shaw's "Fires in Theatres" (published in 1876), he says that the contents of that pamphlet may be fitly summarised in one of its sentences, viz., that in which the writer characterises as a reproach to our time that by the clumsiness or overzeal of a scene-shifter or other "super" the lives of thousands may still be jeopardised. All the steps taken have been useless. Matters cannot be so easily managed with us, the author thinks, as, for instance, in France, where the Prefect of Police has simply to issue his ordinance, while in England everything must be done by Act of Parliament. Only the dreadful calamity of Brooklyn caused some fresh stir, and led to the conviction that matters as they are at present are extremely dangerous, and should no longer be permitted to exist. Notwithstanding the growing excitement of public opinion, the Lord Chamberlain confined himself to order a general inspection of the theatres, and on December 21, 1876, to address to all managers of theatres a written admonition to keep all doors of exit open, adding, at the same time, that he left it "confidently" to the managers that they would do their utmost to avoid calamities of all descriptions, and especially to prevent the consequences of a panic, which may arise at all times "without cause and without any blame attaching to managers of theatres." The managers of theatres, however, who felt hard hit by the ever-recurring articles of the papers, headed "Fires in Theatres," thought of exorcising the spirit raised by pointing out the fact that, in all recent fires in theatres in England, no lives have been sacrificed. They further emphasised that, if there really existed any dangerous arrangements in theatres, the good sense and the humanity of managers of theatres would be powerful enough to take the necessary steps for removing them without public discussion. This mutual expression of confidence was but ill-suited to calm excited public opinion; theatre-goers felt only too truly how imperatively necessary it was to eradicate, once and for all, the danger always lurking in theatres. Soon after the opening of Parliament in 1877, the question of theatres was again brought to the fore, and the recent committee on fires was instructed to examine closely into the means for the better protection of life and property in theatres and other public places of amusement. The result was a report which, it is true, proposes, as formulated in the Buildings Bill now before Parliament, for all new theatres complete protection against fire, but which with regard to existing theatres suggests that only such evils should be remedied as might be effected without a disproportionate expense! The further recommendations for frequent inspection of theatres, imposition of fines in case of non-observance of the rules laid down, &c., seem to the point; but the proposal to permit present arrangements, acknowledged to be dangerous as far as the public is concerned, to continue simply because their remedy would cause considerable expense, is erroneous, and has met with such a powerful resistance on all sides that

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* Theaterbrände und die zur Verhütung derselben erforderlichen Schutzmassregeln. Von Aug. Fölsch. Hamburg: Otto Meissner. 1878.

surely our legislators cannot let the matter rest where it is, nor be satisfied with half-measures. The catastrophe of Brooklyn has, however, led to some decisive steps being taken in the English provincial towns by authorities not under the control of the Lord Chamberlain. In Dublin, the Chief Commissioner, at the beginning of 1877, ordered a thorough examination of all the theatres with respect to their means of exit and the provisions made for cases of fire. In Liverpool the permanent inspection of theatres, with a view of ensuring safety in similar cases, &c., was also ordered.

It is time now to direct attention to the most important portion of the work before us—that treating of the means to be adopted to protect theatres against fire; further, how so to construct them as to prevent such calamities as have been from time to time recorded. The principal requirement for a theatre, according to the author, is that it should stand isolated. In too many cases town-halls, valuable archives, libraries, churches, picture-galleries, bazaars, &c., have fallen victims to the flames in consequence of their proximity to theatres. The latter, further, should not be in the neighbourhood of buildings containing highly inflammable or explosive substances. Where, however, this highly desirable condition cannot be complied with, theatres ought to be separated from neighbouring buildings by efficient party-walls. The report on the fire at the Theatre Royal in Sheffield, on March 25th, 1865, states distinctly that some of the neighbouring houses were preserved "because the party-walls were of unusual thickness." The same experience was obtained also in the case of the destruction of the Queen's Theatre in Edinburgh, on April 4th, 1877. Those party-walls should be carried at least 6 ft. beyond the roof. In places where theatres are separated from other buildings only by narrow courts or lanes, the doors and windows of such buildings facing the theatre should be protected by iron shutters or blinds. As regards the theatres themselves, solidity is the first and principal condition, not only of safety against fire, but also of sustaining the enormous strain put upon the structure by a large concourse of people. The instances are numerous in which dreadful accidents have occurred from the latter cause. A most objectionable way of testing the capacity of theatres to bear weights was resorted to in Paris before the First Revolution. When, after the third destruction by fire of the Grand Opera-house, on April 18th, 1788, the provisional building in the Boulevard Saint-Martin was erected within seventy-five days, the solidity of the interim opera-house was tried by giving a gratis performance for the people on the birthday of the Dauphin! Later, soldiers were detached for the same purpose, an infamous proceeding which fortunately is now no longer thought of. Theatrical buildings should be constructed in such a manner as to provide ample space in every part of the house. In theatres where this condition is not complied with—and this is the case with many of our structures — the want of space increases the danger in case of fire, for it brings all the combustible materials accumulated in a theatre more closely together, hinders the efforts made to extinguish fires, and impedes the rapid exit of a panic-stricken audience.

It seems only reasonable that theatres which day after day are exposed to such great risks of fire should be constructed as much as possible of fireproof materials. Their use ensures the advantage of preventing the spread of fire by materials which are themselves incombustible. Wooden erections, even of a temporary nature, for theatrical purposes ought not to be suffered to exist. Wood, in this age of iron, should be most sparingly used in permanent buildings. The modern high mansard roofs are not applicable at all for theatres, because their construction involves the employment on a large scale of that material. It would be idle to attempt to construct theatres perfectly fireproof, for the material has yet to be found which would resist the effects of fire under all conditions. We ought to be perfectly satisfied if we are able to restrict fires from spreading by using materials which will not aid in doing so. Much may be done for the protection of theatres by dividing the different parts of the building by solid walls reaching beyond the roof, the introduction of as few openings as possible in those walls, and the closing of all such openings by solid iron doors. This isolation we have always strongly advocated. But it ought to be carried out not only in a vertical direction, sub-division ought also to take place horizontally by fireproof floors and ceilings. Models in this respect are the new Imperial Opera-house, Vienna, and the Grand Opéra-house of Paris.

One of the principal protections against loss of life in theatres in case of fire is the complete separation of the stage from the auditorium. This is best effected by an iron curtain, for even a wall carried from the very foundations to above the roof would serve to but little purpose if the great opening formed by the proscenium were left unprotected. Such curtains are not a modern invention; the Drury Lane Theatre burnt down on February 24, 1809, was provided with one as early as 1794, but shortly before that fire it had been taken down, because it had become useless and rusted through long neglect. At the re-erection of the same theatre, the stage and auditorium were perfectly separated from each other by an iron curtain. Reference to this provision is made in the prologue spoken at the opening of the theatre on October 10, 1812, and written by Lord Byron, wherein he humorously said:—

> "Fire, we assure our generous benefactors,
> Will only burn the scenery and the actors."

Since that time the iron curtain has been introduced in all good theatres. In Vienna every theatre is provided with it. In Paris its introduction has been made compulsory. The iron curtain is found in the best theatres of St. Petersburg, Berlin, Munich, and other large cities on the Continent. It is made generally of closely-meshed iron wire; but those formed of sheet iron, corrugated in some instances, and others constructed of steel plates on the same principle as revolving shutters, are considered the best. In order to ensure perfect safety, the parting wall should be carried up to the level of the proscenium, so as to meet the descending iron curtain. It should also be made a practice to let that curtain down every evening after the close of the performance, when at least the auditorium would be safe during the night. Naturally, those curtains ought to be hung on chains or wire-rope.

The question what and how many exits ought to be provided for a theatre is one of the utmost importance. We mentioned above the case of the Chinese theatre at Canton, and yet a great many theatres are no better off for means of exit. In most of them they are utterly inadequate, as, unfortunately, only too many catastrophes have again and again demonstrated, and it is only when they happen that the evil is remedied in the particular locality where they have occurred. We might point to hundreds of such instances mentioned by the author, but regard for space prevents us. Suffice it to say that thousands of valuable lives have been sacrificed in the *sauve qui peut* through few and narrow exits in case of alarm of fire in theatres, very often false alarm, which might have been saved if ample doors had been provided. Such panics, however, are not confined to theatres; they have occurred in churches, in concert-rooms, and elsewhere. The rules recommended by the author for providing exits are as follows. Doors should be made on all sides of theatres; they should be so arranged that the different streams of the departing spectators should nowhere meet. To attain this object, doors must be provided in abundance, and they should be as broad as possible. The latter condition is also a *sine quâ non* in all staircases, corridors, and passages. All doors should open towards the outside; otherwise in a crush it would be impossible to open them. As stairs, under the most favourable conditions, form a source of danger, they should be constructed of incombustible materials. Winding stairs are highly objectionable, and at all times dangerous to life and limb. Besides the usual means of exit, auxiliary doors, to be plainly described as safety doors, should be provided, and they should all lead direct into the open air without interfering with the usual exits. In Paris theatres it is the practice to open at the close of the performance all the doors, so as to make the public acquainted with them. Finally, all corridors, passages, stairs, doors, &c., intended for the departure of the public must be kept completely free from all obstruction. If it is highly necessary to adopt all these and numerous other precautions for the safety of the public, it becomes imperative to do the same for the stage portion of a theatre. Actors and all others engaged in that part are exposed to much greater risk, for nearly all fires in theatres originate there. In many cases the provisions made in that direction are of such an inadequate nature that only one way is left for escape to persons engaged on the stage, viz., through the window. Captain Shaw, in his evidence, recommended iron safety ladders outside theatres. Of his valuable book on this subject of fires, we have before now spoken.

The means adopted for lighting and heating theatres are another source of danger. Gas is now almost universally used for lighting; but petroleum is also burnt, notwithstanding the enormous risk attending its use. In many theatres oil-lamps are combined with gas, or are supplementary to them. All gas-flames should be protected by wire gauze; naked lights should, under no circumstances, be permitted. All the arrangements for lighting by gas should be systematic, and placed in charge of a gas-engineer. An idea may be formed of the extent and importance of the gas arrangements in large theatres, when it is stated that the total length of gas-pipes in the new Opéra at Paris is over 15¼ English miles, that of the Vienna Opera House 7½ English miles, and that often from 2,000 to 3,000 gas-flames are required for lighting the stage alone. The gas for the two portions of the house ought to be derived from different and entirely independent supply-pipes, so as to be able to shut off either at pleasure. In the Brooklyn Theatre the same main supplied both parts, and the horror of the situation was increased a hundred-fold when those in the auditorium suddenly found themselves in the dark by the gas being turned off. The mode generally adopted of lighting the gas is also highly dangerous, and the introduction of electricity for lighting gas is a great improvement. Electricity serves for this purpose in the larger theatres of Vienna, Prague, Berlin, St. Petersburg, and Moscow.

The measures of precaution in heating theatres may be shortly summarised thus. Under all circumstances the heating of the whole theatre by a single apparatus, located in the basement of the house, is much safer than the heating of its different parts separately, as each warming apparatus forms a source of danger by itself, and the employment of a number of them consequently only multiplies the risk. Whatever mode of heating may be adopted, whether steam, hot water, or hot air, the greatest care must, under all circumstances, be exercised.

As regards the means of extinguishing fires, each theatre ought to be abundantly provided with them. An ample store of water must always be kept in reserve. Where the pressure of the outside supply is not sufficient, extra reservoirs should be constructed, which should be always full, and should not be exposed to the effects of changes of temperature. Cases of fires have occurred where, although ample provision was made for the supply of water, both the pipes and the tanks were *frozen*. Hydrants in different parts of the house become a necessity, especially in larger theatres. In theatres, more than in any other building, conflagrations spread so rapidly that only the promptest extinction of the fire will save them from destruction. The mode of extinguishing fires introduced in the Court Theatre at Munich, by flooding the stage or any other part of the house, by means of perforated pipes, is not a novelty, but it had fallen somewhat into disuse. This system was patented in 1862, by Messrs. Lawes & McLennan, and proposed by Mr. Boucicault for the new Her Majesty's Theatre, but was not introduced. After the Brooklyn fire, Professor Pepper illustrated this mode of extinguishing fires by a lecture, with practical illustrations, at Sadler's Wells. His object was to calm the public mind after the dreadful catastrophe in America, by this experiment, being justly of opinion that the public would prefer to be wetted to the skin rather than burnt alive.

Another safeguard against the destruction of theatres by fire is that they should be continually guarded. In most theatres men of the public fire brigades are detached for this purpose, and with good effect; but the guarding of such buildings is not always effectual, as has been shown by the destruction of the theatres at Plymouth and Glasgow, both in 1863; of the Theatre Royal, Sheffield, 1865; Her Majesty's, 1867; the Prince of Wales Theatre, Glasgow, 1869; the Theatre Royal, Hull, the same year; the Rotunda Theatre, 1877; and numerous other instances. In all those cases proper supervision might have prevented their destruction.

This sort of supervision, however, will only prove effective if it is supplemented by periodical inspections by some constituted authority.

They take place regularly in several cities of the Continent, and they have been recommended for London; but there the matter has rested. Those inspections should happen without previous notice being given, and best of all during performances, when any hitch in the arrangements for safety might be easily discovered. It would serve greatly to reassure the public if the results of those inspections were published in the daily papers, as is done, for instance, in Vienna. It need hardly be added that *bonâ fide* accounts of the state in which theatres are found would better tend in that direction than if the papers were to use the stereotyped phrase that everything has been found in perfect order, which, in ninety-nine cases out of a hundred, is not true.

Yet, after all the measures of safety have been adopted that are possible, there still remains the ugly fact, that, on the whole, theatres are nothing better than vast storehouses of inflammable materials which the omission of due precaution might set at any moment ablaze. This is just the vulnerable point in buildings used for theatrical purposes, and it can only be guarded against by the employment of incombustible materials, or by rendering those that are easily inflammable less so, or fireproof. The substances proper for attaining that end have been known, and in many cases employed, but unfortunately not universally. Those materials include soluble glass to which whitening has been added; such a coating applied to woodwork will last for twenty years. The progress made in chemistry has added other substances equally effective, such as sulphate of ammonia, which, mixed with gypsum, supplies a fireproof coat for wood; the same may be said of borate of magnesia. As regards the decorations, much more difficulty has had to be encountered. All protective substances hitherto recommended have failed to find approval, mainly because they destroy the effect of the colouring. A preparation, the composition of which is at present still a secret, was made in 1874 by Messrs. Kreittmayr, of Munich, which, when tested, gave the greatest satisfaction. Gauze, as well as the coarsest linen, impregnated with this preparation, did not transmit the flame; they were simply slowly charred. Professor Pepper showed by experiment how decorations treated with fireproof preparations, such as alum, borate of magnesia, tungstate of soda, phosphate of ammonia, &c., on being exposed to a powerful spirit-flame, were slowly carbonised; they were not consumed, nor did they transmit the flame. The practical application of such protective preparations has made some progress in London. All the new decorations, for some time past, in the Criterion Theatre and in the Folly Theatre have been impregnated with tungstate of soda; and a number of theatrical managers, in their evidence before the Parliamentary Committee in April, 1877, spoke very favourably of this proceeding. How great the progress made in this direction has been in America since the great Brooklyn fire, the following notice, published in the play-bills of the Eagle Theatre, New York, may show:—

"Mr. Hart begs to call the attention of the patrons of the Eagle to the fact, that all the scenery, drops, transformations, used in the holiday pantomime have in them a preparation of tungstate of soda, which was carefully tested as proof against fire at Wallack's Theatre, on December 20th, 1876, and recommended to all theatres by Mr. Dion Boucicault."

It is to be hoped that the aversion to innovations rooted in the British mind may be overcome, and the dangerous state of our stages be removed by introducing some sort of protection against fire to all objects of decoration. It is likewise to be desired that all dresses made of light inflammable materials should be protected in a similar manner by impregnation with a fireproof solution. It becomes the duty of the authorities to insist upon this, because those most interested in it, the persons engaged on the stage, are, strangely enough, most averse to it. On the whole, it is highly advisable that the public authorities should be furnished with larger powers for enforcing all measures of precaution, as to some extent is the case on the Continent. Great assistance in this respect may also be expected from the fire insurance companies, who are very frequently heavy sufferers, and whose interest it would seem to be to insist upon due precautions being adopted. At present, London theatres pay an average premium of three per cent. The companies might effect much good by raising the premiums for badly-arranged theatres, or even by refusing to entertain applications for insurance in such cases. But, after all, the public themselves are the most powerful agent for effecting any good.

Before concluding our remarks, which we have endeavoured to keep as concise as possible in dealing with a subject of such various aspects, we would urge managers of theatres, and all those interested in the matter, to well study the book, and ponder over the information it contains. In comparing the two systems, they will come to the same conclusion as ourselves, that the public on the Continent are much better protected, and that with all our vaunted liberty of the subject we are in such matters much worse off than those of our neighbours whom we look down upon in this respect. A little paternal government would effect much good also in this country. As regards the British public, the matter rests entirely in their own hands, as we have already ventured to point out. They should encourage legislation for such a laudable object, and not rest satisfied until all that human foresight can accomplish is done, and without further loss of time. The duty of fostering this tendency belongs to the Press of this country.

SION COLLEGE, LONDON.

The City of London is truly the city of charity, and all over the world it has long been celebrated for the remarkable number of its benevolent institutions. It matters little what class of charity is desired, for sure enough, if looked for, so will it be found. More especially striking are the nooks and corners wherein many of our forefathers loved to build those low-roofed ill-ventilated huts which served for centuries as the almshouses for the decayed City townsfolk. Happily, "the march of improvement" has taught modern trustees to seek a healthier atmosphere for their brethren, while, as for the houses that are now erected, they are palaces, indeed, compared with those which were thought sufficient in those good old times when no true citizen lived out of the sound of Bow bells. For instance, compare the Mercers' almshouses of old with their new ones at Highgate; the Drapers' in Crutched-friars and Barbican with those at Tottenham; the Fishmongers', at Newington,—a better class of the old stock,—with those at Wandsworth; and the Clothworkers', at Cripplegate, with those at Essex-road. Truly may it be said comparisons are odious!

And now another block of houses has vanished. On April 4 were sold the materials of the Sion College Almshouses in Philip-lane, London-wall, and upon the site of these and adjoining buildings in Aldermanbury (11,015 super. feet) will soon be formed a new street of warehouses, which, running between Philip-lane and Aldermanbury, is to be called Sion College-street.

There are few sites in the City more historically interesting than this one. We can go back 500 years, and there are deeds extant telling us its descent to the present time. But it was not Sion College until the first Charles's reign. Before then, although a foundation of charity, its name was properly Elsing Spittle. The old London chronicler of the reign of Elizabeth, John Stow, tells us that "at the north end of Gayspurr-lane, in Cripplegate Ward Within, was of old time a house of Nuns, which house being in great decay, William Elsing, mercer, in the year of Christ 1329 (the third of Edward III.), began, in place thereof, the foundation of an hospital for sustentation of one hundred blind men, towards the erection whereof he gave his two houses in the parish of St. Alphage and our blessed Lady, in Aldermanbury, and also his houses and rents in St. Lawrence, Jewry, and St. Martin Pomeroy. This house was afterwards called a priory or hospital of St. Mary the Virgin, founded in the year 1332, by William Elsing, for canons regular, the which William became the first prior thereof himself. Robert Elsing, son of the said William, gave to the said hospital xii. li. per annum for the finding of three priests." Such is Stow's account of the origin of the charity. Dugdale furnishes copies of the original foundation deeds, which fortunately are still preserved among the Cottonian charters in the British Museum. The first is dated 1st June, 1331. It has two seals appended, one being Elsing's own seal with motto, "*Jesus Nazarenus Rex Judeorum.*" The second is dated Hadham, 2nd November, 1340, being the consent of the Biship of London that the four secular priests should be made canons regular of the order of St. Augustine. The seal upon this deed,—a bishop conferring the benediction,—is very beautiful. In addition to these, it is interesting to note that both Sion College and the Museum possess other valuable documents relating to the early foundation, which, after an existence of exactly two centuries, was surrendered to Henry VIII. on the 11th of May, in the 22nd year of his reign, 1531. Its value was set down as 193*l.* 15*s.* 5d. by Dugdale, and 239*l.* 13*s.* 11d. by Speed.

For a time the character of the institution underwent a radical change. The lodgings of the prior and nine canons were turned into ordinary dwellings; the chapel-yard into a garden, and the almshouses into stabling. Sir John Williams, the Master of the King's Jewels, then became resident here, when in 1541, the gallery caught fire, burnt down the house and with it the jewels. Subsequently, Sir Rowland Hayward, twice Lord Mayor, and who died father of the City in 1593, not only "kept his house" on the site of the old Spittle, but ordered his body to be buried in the priory chapel which had been granted to the inhabitants in June, 1547, and dedicated to St. Alphage, their ancient church, nearer the wall, having become ruinous. They paid the king 100*l.* for "the clere purchase of the said church, chauncel, and steple, with the bells in the same." On the remaining portion of the priory site, was subsequently erected Sion College. Of its founder, a few details may prove interesting.

Thomas White was the son of John White, and was born in Temple parish, in the city of Bristol, Somerset, about 1551. He was descended from the Whites of Bedfordshire, was brought up at Oxford, and settled in London as a minister at St. Gregory's, by St. Paul's, and afterwards as vicar of St. Dunstan's-in-the-West, Fleet-street. Quaint Fuller says of him:—"He was accused for being a great pluralist, though I cannot learn that at once he had more than one *cure of soules*, the rest being *dignities*. As false is the aspersion of his being a great usurer, but one bond being found by his executors amongst his writings of 1,000*l.*, which he lent *gratis* for many years to the company of Marchant Taylors, whereof he was free, the rest of his estate being in land and ready money." In 1584 he was created D.D.; in 1588 a Prebendary of St. Paul's; in 1590 Treasurer of the Church of Salisbury; in 1591 Canon of Christ Church, Oxon; and in 1593 Canon of Windsor. We are told by Mr. T. C. Noble, in his history of St. Dunstan's, that Dr. White was instituted to the vicarage on the 23rd November, 1575, and was twice married in his own church, viz., on the 21st August, 1576, to Fortune Knight, and on the 30th November, 1580, to Elizabeth Boughe. Both wives were also buried here in his life time, the second one on the 17th of January, 1612-13. His own funeral also took place in the church, March 11th, 1623-4, and although he ordered a gravestone to cost three pounds to be erected over his remains, no record is met with of the order being obeyed. He had endowed almshouses at Bristol in 1613, and a moral philosophy lecture at Oxford in 1621, so it is not to be wondered at that by will he should extend his benevolence.

This will, dated in two places February 20th, 1622-3, and Windsor, October 1, 1623, and proved March 19th, 1624, is a very remarkable document. He gave gowns, and twelve pence each "for diet," to twenty poor men and ten poor women, of whom twelve were to be chosen out of St. Dunstan's parish (the grave-digger to be one) and eight out of St. Gregory's; also 16*l.* 13*s.* 4*d.* to the same parishes for a dinner on the day of his funeral, desiring those of St. Gregory's to dine at the Green Dragon! And another 8*l.* "for diett" on the same day for his friends and servants. To St. Dunstan's and St. Warborow's, Bristol, he gave Communion cups. He left 40*l.* per annum for a preacher to the prisoners at Newgate, and his special directions thereon are very curious, particularly desiring the Lord Mayor, when any criminal is condemned, and has a Sunday between that and his execution, to send to *all* the parishes in London "to pray for the poor souls." He also left another 40*l.* per annum for term lectures at St. Paul's; 100*l.* per annum to Bristol for the repairing of highways and loans; 40*l.* per annum to his brother George, for life and afterwards to the almspeople at Bristol; all his books in Windsor to the library of the deanery there, and as for his house in Fleet-street, rented at 23*l.* per annum, he left it for the benefit of twenty poor persons of St. Dunstan's parish, and for the preaching of an annual sermon, "to instruct the inhabitants and their children and servants in the truth of religion against all

straggling opinions, either from Rome or from any amongst us!"

But the principal portion of his will relates to the foundation of Sion College. "I doe geve ffor the buying of a faire howse and backside fitt to make a colledge for a corporacion of all the ministers, persons, vicars, lecturers, and curates within London and suburbs thereof, as allsoe for a convenient howse or place fast buy, to make a convenient almeshowse for twentye persones, viz., tenne men and tenne women, and one of the discreetest to be chosen every three years by the masters, as also a widow woman toe be matrone to governe, I say I geve three thousand poundes." The almshouse to be under the same kinds of rules as those at Bristol; the governors to be a president, two deans, and four ancients; the Bishop of London visitor; a dinner and Latin sermon once a quarter; and "all the clarcks of parishes in London and suburbs" to belong to the college. He endowed it with 160*l.* per annum. If the corporation cannot be procured, then the almshouse to be purchased alone, at a cost of 1,500*l.*, for twenty poor persons, viz., six out of St. Dunstan's, two out of St. Gregory's, four "oute of Bristowe," and eight out of the Merchant Taylors' Company; the said company "to rule the said poore" similar to those at Bristol. If any of his or his two wives' kindred be in need, then they to the number of four to be part of the twenty.

His executors were John Simpson, his kinsman, rector of St. Olave, Hart-street, City, and afterwards founder of the library, and John Kelynge, the celebrated Temple lawyer. A royal grant was obtained March 7, 1626, for the incorporation of Sion College, with power to purchase lands in mortmain of 240*l.* per annum over and above the 160*l.* named in the will, and the incorporation completed the 30th of June (by docquet) and 3rd of July (by patent), 1630. The site of the Priory (except the church) had been purchased of Alderman Parkhurst, in April, 1627, for 2,450*l.*, and on May 3, 1631, the first entry was made in the register,—the election of the first officers and the adoption of a seal; the Samaritan curing a wounded man, with the motto, "Vade fac similiter"; and inserted border, "Sigillum collegii de Sion Londini." By deed dated the 5th of July, 1631, the whole property was formally conveyed by the executors to the President and Fellows. In 1633, the first Latin sermon was preached, and although Dr. White specially mentioned four, there is no record of that number ever having been delivered! In the same year died Mr. Simpson, the executor, who, according to William Reading's history (1724) had founded the library from the simple circumstance of a remark made by the Rev. Thomas Wood, rector of St. Michael, Crooked-lane, that the almshouses would form a good basis for such a room. Our good friend took the hint, and built the apartment, 121 ft. long by 25 ft. wide, at a cost of 2,000*l.*

Between this date and the year of the second or exemplification charter of incorporation (dated 20th of June, 1664) there were many events disturbing the quietude of Sion College. The Civil War period was a troublesome time for the City clergy. One of the curiosities appears among the State Papers, dated June, 1637. It purports to be a statement of conversation and certain words used at Sion College by a silenced minister. One of the expressions relates to the celebrated Dr. Wren, uncle of our London architect: "Here was Wren: the last Lord's day he goes down to Greenwich, forsooth, and as he took water the people all there bad the devil take him!" Ten years later we find a further illustration of the times in a broadside issued in September, 1647, entitled "A Justification of the Synod of Sion Colledge against those who say they have sate long and done Nothing." One quotation will give a pretty good idea of its composition:—

> "The Synod who dare to controule,
> That sit in Sion House;
> The people lookt for mountains, but
> They have brought forth a mouse.
> Each man four shillings hath a day,
> And do you think they'll lack, ho!
> When every man has so much pay
> To drink wine and tobacco?
> The Synod have full four years sate
> To find out a new religion;
> Yet to conclude they know not what:
> They want a new edition."

The next year quite a little army of pamphlets came out, and among them numbers relating to our college and its governors. In one entitled "A Thunder Clap to Sion Colledge," the writer says,—"If it be demanded why I direct my speech to Sion College, it's because I conceive that it be the conservatory or fountain original from whence flows all that rubbish, trash, and trumpery that is publiquely divulged in most pulpits throughout the Citty"! Between 1648 and 1653, the buildings were at various times occupied by the soldiers; in fact history gives very sad details of the military occupation of churches and religious houses at this date. Here is a copy of one of the orders:—"Wednesday, the 16th of April, 1651, at the Councell of State sitting at Whitehall. Ordered: That the place called Sion College be appointed to quarter such soldiers in as Colonel Barkstead shall send thither for the safety of the City and parts adjacent, and that special care be had that the library be kept safe, and no injury done to it." But there is no doubt the place did suffer, for several remonstrances were made by the governors, although the soldiers were not cleared out until March, 1653.

The next terrible calamity was the Great Fire of London, September, 1666. The College and all the surrounding buildings (except the church) were burnt to the ground, and a loss entailed of property worth 4,000*l.* and rents of 106*l.* per annum. The poor almsfolk took refuge in St. Alphage's Church, and here they stopped, refusing to quit until the governors were compelled to threaten them with loss of pension, and then only in the following November. History does not say where they went to. But, says Reading, "Praised be the divine goodness, our Sion was not like that of old, neglected in its ashes, and disregarded by all those that passed by it. The hands of the liberal were speedily extended to it, and raised it again." New buildings were promptly erected at a cost of 1,300*l.*, and in 1692 further subscriptions enabled the completion of the wainscoting of the hall and of the rooms at a cost of 2,000*l.* more. And yet at this date the income was 95*l.* 6*s.* 8*d.*, while the yearly outlay was 122*l.* 17*s.* 2*d.* One of the annual charges was 8*l.*, viz., 4*l.* to the parson of St. Alphage in lieu of tithes, and 4*l.* to the poor of the parish under the old gift of Sir Rowland Hayward, the former owner of the site.

About the same time the College possessed plate weighing 138 ozs. The governors had the mortification of finding themselves in increasing debt, so that in 1714 the sum of 900*l.* appeared on the wrong side of their balance-sheet. Clergy and laity made many gifts, but it was not until the leases of their estates fell in that the society were enabled to clear themselves. To give an idea of their troubles, we may note that Samuel Brewer in 1684, left by will his property in Berkhampstead and Hatfield, called Tyler's Causeway Farm, to the College almsfolk "under Sion Library," for their maintenance for ever, and also all his books to the said library. His executors, however, did not carry out their trust; legal expenses cost the governors 70*l.*; but, says Reading, "while it gained the estate to the hospital, as for the books, they shuffled us out of them." Brewer, in his will, directs himself to be buried "handsomely and decently" in St. Alphage's Church. His portrait hangs in the College library. All the charges the governors had been put to compelled them to reduce the pensions of the almsfolk, and in 1724, in view of the falling in of leases, it was suggested that the pensioners be removed from under the library; that a printing-office be opened there under the care of six learned professors, who as authors and editors should carry out the ideas of the founders of the College and library, and augment the income of the house.

Speaking of this library reminds us that it will be interesting to say a word or two about it. We have already stated that the founder was the Rev. John Simpson, Dr. White's executor, who died on the 24th of August, 1633. The building was first opened to students in 1631. For many years the library of St. Paul's Cathedral was kept here. In the Great Fire, out of 3,253 volumes which the library then possessed, 692 volumes were burnt or destroyed; the remainder were placed at the Charter House until October, 1670. The new library was opened the following December, and from that time the purchases (under trusts) and gifts have increased its extent to something like 40,000 volumes. The clergy have from time to time made valuable additions. We are told, however, that "from the beginning of the library to the year 1720 the books were generally chained," but in that year the desks were raised, and "we had found by experience that chains were not a security against thievish hands." Our readers of history will recollect that it was the custom in our old churches to chain the Bible to the reading-desk! Let us hope that these ideas of honesty have long since departed; at the same time it must be borne in mind books were of more value,—cost more in production,—than now. One of the additions to the library was a Jesuit's study, seized by the Crown in 1679, in Yorkshire, and, upon petition, presented to our college. George, Earl Berkeley, in 1682 gave "a noble study of books," and his portrait, as did also Thomas James, the printer, in 1711, to the extent of 3,000 vols. By Act 8th of Queen Anne, c. 21, 1709, which came into force April 10, 1710, a copy of each book entered at Stationers' Hall was ordered to be sent to Sion College. It was quite a chance that they got this favour, for in the draft bill the library of St. Paul's had been inserted by error! The privilege, however, was taken away by the Act 6 & 7 Will. IV., c. 110, and a compensation of 363*l.* 15*s.* 2*d.* per annum given instead. Oldys early in the last century speaks of the library as "a most convenient place for situation out of the noise of coaches." The first catalogue was compiled in 1650, but William Reading, the library keeper, printed one in folio in 1724, together with an account of the College. It cost over 400*l.*, and was published by subscription. At that date every person studying (except the clergy), paid a fee of 5*s.*, and one of the rules was that every rector or vicar after induction gave the library a book worth 20*s.* Among the early benefactors was the celebrated Abraham Colfe, rector of Lewisham, who, by will proved 1657, left 20*s.* per annum for books, and 1*s.* for the keeper. The Leathersellers' Company have paid the annuity since 1662. At the College is a vellum record of all benefactors since its foundation. At the present time the library is open from ten to four daily under certain rules, incumbents paying 1*l.* 1*s.*, and curates or lecturers 10*s.* 6*d.* a year.

During the past century there have been but few events of historical interest attached to the College. In 1759, Dr. John Free made a speech here relative to a persecution he had suffered for preaching a sermon on April 29th at St. Mary's, Bermondsey, in which he beseeched all "to love one another," which caused him to be "in most imminent danger of being murthered by the Methodists"! In 1789, upon the recovery of George III., the College illuminated their building with the device, "Sion heard of it and was glad." In 1800 the London-wall front was taken down and rebuilt in red brick, with two towers, which give the building an antique appearance. Between 1836 and 1846 a series of lawsuits took place about the College estates, and an Act of Parliament was passed (9th Victoria) for a settlement of the same. The present estates are situated at London-wall, Bradwell and Hockley, Essex, and Tyler's Causeway, Herts. Also certain money bequests. The property mortgaged (under the Act) until 1889 produces about 800*l.* per annum; other property about 700*l.*; while the annual amount for purchasing books is about 370*l.* In 1858 it was resolved that the assignment of an ecclesiastical district is not necessary to acquire the fellowship of the College.

There are twenty portraits of benefactors, commencing with one of Sir Thomas White, given by the Corporation of Bristol to replace the one destroyed in the Great Fire. The great east window of the hall contains an emblazonment of recent presidents' arms, while there is a picture on panel of the head of our Saviour; as the reverse is the decollation of St. John the Baptist. There is a tradition that it is a relic of the old priory church.

As to the founder of the College, one note from Mr. Clode's valuable memorials of the Merchant Taylors' Guild may be of interest. On December 6th, 1622, "our master is requested to provide for Mr. Doctor White, of Paules, to be sent him as a company's gift, so much sack and claretl wyne as by former presidents hath been provided."

In 1845, some 2,000*l.* were spent in repairs at the College, and under a decree of the Court of Chancery, two houses of ten rooms each were erected south of the library at the cost of 2,500*l.* These have just been removed by virtue of the Sion Hospital scheme, dated July 23rd, 1877. The original almshouses scheme, under the will of Dr. White, was established in 1647, under a decree of the court, so that the almshouses have been established in London Wall for exactly 231 years. In future the pensioners will reside "abroad," as it was quaintly called in the olden time, but which at the present day means among their friends or where they please.

A LIVERPOOL RESTAURANT.

There has just been opened in Liverpool an immense building, called "The Pavilion Restaurant." It affords an illustration of modern luxury in connexion with the art of dining.

This restaurant has been erected, at a cost (including the site) of 45,000*l.*, by a limited liability company, with a capital of 100,000*l.*, of which 85,000*l.* have been taken up chiefly by London financiers. It is situated in William-street, one of the streets leading off Dale-street, and has the advantage of an almost direct by-communication with the Exchange flags *viâ* Quaker's-alley and Mason's-buildings, there being access also from Tempest Hey and Tithebarn-street. It is thus close to the heart of Liverpool's commercial life. Being, however, in a narrow thoroughfare, its architectural proportions cannot be observed to advantage. The plans were prepared by Mr. Edwin Kirby, of Liverpool, architect. It has a frontage to William-street of 141 ft., chiefly of white Stourton dressed stone, with red stone bands, to give a certain character to the exterior. The style of architecture is that known as the Domestic Gothic, with mullioned windows to suit. The height of the front elevation from the street level to the eaves is about 32 ft. Descending a staircase to the right of the main entrance, there is a novel feature in English restaurants in the shape of what is called a "Laube," a sort of arched grotto, ornamented with vine and other growing plants, the walls being clothed with virgin cork. There is a dimmed glass roof, depending from it being baskets containing flowers, ferns, &c. It is intended for a smoking and wine corridor. Immediately adjoining are the grill-room and the wholesale wine and spirit department. The latter has a tasting buffet, behind which is a cellar 90 ft. square, fitted up with the most improved metal bins. To the right is the secretary's office, from which there is telephonic communication with every part of the building. The grill-room and luncheon-bar is also on the basement, its dimensions being 60 ft. in length, 25 ft. in width, and 14 ft. high. In the corner is a French patent air-pump for drawing beer from the casks without the ordinary pumping. It forces the air into the barrels, and drives the contents into the pipes without further trouble. Behind the grill-room are the larder and the servants' hall. The kitchen is fitted up in the most approved modern style. The chief portions of the cooking will be done by an arrangement of steam pipes in communication with a 6-horse-power boiler, which also serves to furnish the laundry at the top of the building with hot water and hot air for cleansing and drying purposes. There is a large stove, which is capable of cooking victuals for 400 persons at short notice. A suspended hot-table and two hot-closets are provided for keeping the dishes at a proper temperature. Among the other appliances are the two *bains-maries* for keeping sauces hot, a hot hearth, atmospheric gas table for two stock-pots, &c. Ventilation is obtained by an air-shaft extending from the top to the bottom of the building.

The entrance-hall to the more public part of the building contains a buffet elaborately decorated. The marble-topped counters are of polished pitch-pine, the panels in front bearing painted representations of fruit and flowers. There is a smoke-room close by, 45 ft. long by 20 ft. in breadth, furnished with suites of American ash upholstered in morone-covered morocco.

The great feature of the building is the large dining-hall. It is 77 ft. in length, 42 ft. in breadth, and has a height of 26 ft. The walls and roof are lavishly decorated with the symbols of Liverpool trade, commerce, &c., the ceiling being on the same principle as that adopted in the House of Lords refreshment-room, while the lighting is on the plan of that adopted in the Upper House. The bosses which catch the main roof are decorated with the arms of England, Ireland, Scotland, and Wales, as well as those of many of the great northern towns. The outlines of the roof are stencilled with stars on a white ground, the border and the cove having received attention. The floor is of stained pitch-pine, and there are two open fireplaces. The two large oak sideboards have plate-glass backs, and contain bronzes and antique plate. There are thirty large dining-tables; the chairs, numbering about 120, are copied from those in the House of Lords refreshment-room. Each of them has a hat-rail below the seat. Communicating with this hall is the general serving-room.

On the next floor is the billiard-room, 43 ft. long by 24 ft. broad, with three tables; two private dining-rooms, one 29 ft. by 17 ft., and the other 15 ft. by 17 ft., a commodious assembly-room, 40 ft. long by 27 ft. broad, intended for meetings, sales, &c.; ladies' private room, lavatory, &c. On the top floor are the laundry, ironing and mangling room, and housekeeper's room.

The brickwork and masonry were executed by Messrs. Rumsey and Rowse; the carpentering and joinery by Messrs. Brown & Backhouse, and the plastering was by Messrs. Hall & Johnson, all of Liverpool.

The restaurant occupies the whole of one side of William-street, with the exception of a large building now being erected for the Liverpool Reform Club. On the opposite side is an unusually extensive range of offices, also in course of erection.

NEW INFIRMARY IN LIVERPOOL.

There is about to be erected in Liverpool a new eye and ear infirmary, the old building in Mount Pleasant having long been found inadequate to the delicate and important work required to be performed in such an institution, while the overcrowding that daily exists has seriously incommoded both patients and doctors. In the new building it is believed that Liverpool will possess an infirmary worthy of the town and of the present state of ophthalmic and surgical science.

Some time since a site was secured in Myrtle-street, near the Philharmonic Hall, and the committee of the charity invited local architects to send in plans. Messrs. Audsley, Grayson, Kirby, Hornblower, Hamilton, Walker, and C. O. Ellison became competitors. A special committee was formed, which had the assistance of Messrs. Paley & Austin, to adjudicate upon the plans. In the result, Mr. C. O. Ellison, of Liverpool, was appointed architect, and the new building will shortly be commenced under his supervision.

The style of the exterior will be English Domestic Gothic. The design is extremely simple, and has no merely ornamental feature whatever. A dignified effect is obtained by the proportions and balance of line. The fenestration is well considered, and there is a somewhat novel and quaint arrangement of the dormer windows.

The building consists of a main block facing Myrtle-street, and two wings,—one containing the out-patient department, facing Stowell-street, the other running parallel with one side of the Liverpool Gymnasium. By this arrangement a cross-ventilation can be secured at any time by the old-fashioned plan of opening the windows. Special wards are provided for cases of a contagious nature, and a few private rooms have been set apart for patients who can afford to pay. The minimum allowance of air per patient is 927 cubic feet, but in some wards as much as 1,787 cubic feet is provided. Each ward is in direct communication with a nurse's room. The lavatories and offices are arranged with a cross-ventilating passage between them and the wards, so that they are completely separated from the interior of the building, and obviate even an accidental defect in drainage. There are four sitting-rooms for the use of those patients who are not required to remain in bed.

In the centre of the main block, equi-distant from the male and female wards, is the operating-theatre. A large bay-window, facing the north, affords the clear steady light needful for the performance of the most delicate operations. Space has been provided for the accommodation of students, and two waiting-rooms for patients communicate directly with the theatre.

In the administrative department, rooms are provided for the house surgeon, a resident pupil, matron, nurses, and a staff of servants. The board-room, and smaller ante-rooms for visitors, open out of the central hall. Easy communication between all parts of the building is furnished by corridors and double staircases. The general wards and corridors are warmed by hot-water pipes; other apartments by open fireplaces. In regard to ventilation, fresh air will be admitted by tubes in the floors, and by an arrangement of double sashes in the upper part of the windows; foul-air chambers or tubes being placed in the roofs of the wards and corridors, communicating with a large extracting shaft. In this an upward current of air will be maintained by the heat generated by the kitchen and boiler flues. The shaft terminates externally in a lofty *flèche*, ornamentally treated.

The out-patient work will be carried on in the west wing. Patients entering will be admitted into a lofty waiting-room capable of seating about 200 persons. At the north end is a room for the clerk; beyond is the consulting-room, lighted by a large window facing the north, and communicating on one side with a small operating theatre, and on the other with a dark room for the use of the ophthalmoscope. After consultation patients proceed to the dispensary; by means of barriers and turnstiles arrangements have been made for attending to the crowd of out-patients in a quiet, systematic, and expeditious manner. The out-patient department is entirely separate from the interior of the hospital, but communicates with it by means of a glass-covered passage. In 1877 the total number of separate applications was 10,000, these patients being attended to and prescribed for 39,000 times, and nearly 500 operations were performed. The estimated cost of the new building is about 15,000*l.*

NORMANDY.

The fact of Normandy being so close to and accessible from England causes it to be a good deal overlooked as a holiday-ground by tourists; for, to slightly change a certain proverb, distance nowadays is considered one of the chief elements in the value of a place. At the same time, Normandy is not a fit field for a great many tourists. We all know how crowds of ignorant persons will gaze for a certain number of minutes at the most magnificent of ruins, but we all know full well that they are much better pleased when they have to depart from them than when they have to commence the visitation. Of course, a fine building must strike any educated person with admiration, but there is nothing so common, first of all, as to suppose that every person must necessarily delight in viewing buildings; and next, as the supposition that persons without any artistic education, and without any knowledge,—not necessarily technical knowledge, but knowledge acquired by observation and thought,—ought necessarily to appreciate the grace or the magnificence of some great Gothic monument. It is really laughable to see many worthy persons, who pass Westminster Abbey some dozen times in the course of a month without raising their eyes to notice the grandeur of this splendid pile, being guided over a place like Rouen and endeavouring to think that they appreciate the fact pointed out by guide-book or artistic friend that St. Maclou is built in the Flamboyant style; that the porch of Marmouzets in St. Ouen is a real gem of Gothic work. Therefore it is that we say that Normandy is not a very good ground for the ordinary, and, as Mr. Matthew Arnold would say, "Philistine" tourist. For if observation and knowledge have not caused the visitor to have already a cultivated taste, he must at any rate possess a desire to appreciate beautiful buildings, or have a certain amount of inborn taste. Moreover, the country is not such as to attract any one who is in search of what is uncommon or strange. Most of Normandy, except that portion in the direction of Brittany, is singularly akin to a good deal of southern England in its appearance,—it is a land of peace and plenty. The hedgerows in spring time, rich with masses of primroses and cowslips, with violets intermingled with the soft white of the wool anemone, and with the stately purple orchids arising in the shelter of the drooping ferns, and the miles upon miles of white-blossomed orchards on the green sides of the valleys, recall a richer and sunnier England.

But for any one whose professional work causes architecture to be a study, or who appreciates, or desires to appreciate, the works of the Mediæval builders, or who likes the pleasant tranquillity of rich and homely scenery, Normandy is the perfection of a holiday ground. And we venture also to think that it possesses another recommendation for some of our younger readers—the cost of getting there is most slight, and the cost of living there is but little. For two pounds the tourist can obtain a first-class return-ticket to Rouen or Havre, and when he considers what distance a return-ticket of the same class and the same price will carry him on his way to Scotland or Ireland, he will probably consider his money best laid out by a trip across the Channel. And in all the hotels of Normandy

living is most moderate, except the traveller, in a place like Rouen, betakes himself to the hotel where the English most do congregate, and even then the prices are moderate compared with those of the first-class English hotels. If Normandy were a new province, or Rouen a new fashionable sea-side resort like Trouville, we should be said to be puffing it; but words said of the duchy of Danish Rollo and his capital are mere passing voices in the far-stretching history of province and town. We have written this because we think those who should do it scarcely appreciate the capabilities of this holiday ground. In spring time Normandy should be visited; take a week at Easter, and from the time you leave Dieppe or Havre you will scarcely meet a fellow-countryman. At least, such is the present writer's experience; and he does not speak after one expedition only, or after staying at one place only. And that seems to be additional evidence of the fact that there exists some want of appreciation of Normandy. Nor has any part of France within the last ten or fifteen years made greater advances in the creation of railways, and this progress still continues; so that if not disposed to walk, there is hardly a considerable village which cannot now or will not soon be within reach of some line of railway. Nor, unfortunately, does Normandy stand still in other ways. In the towns, the ancient houses, quaint specimens of Mediæval architecture, are fast giving way to the modern buildings.

"The old order changeth, giving place to new,"

is most keenly applicable to the towns of Normandy. Take Lisieux, for example. Side by side with an ancient-timbered and gabled house will be seen a brand new, square, red brick erection, with spick and span stone facings. The modern Frenchman has, in fact, no veneration for the past. Republican and Bonapartist may detest each other cordially enough, but they neither of them have any respect for the things of the *ancien régime*. Indeed, so far as buildings were concerned, the second empire was the most radical of governments. We have no desire that Frenchmen should suffer all sorts of sanitary evils and inconveniences to gratify the taste of the artistic visitor; but there does seem to be a mean between preserving old things in the same state and erecting new ones in a totally different style. As we have before this pointed out in the *Builder*, the people of Chester are contriving to keep the characteristics of their ancient city comparatively intact, and yet to move on with the necessities of modern times; but the people of Lisieux and Rouen seem rather to take a pride in putting something most modern in character in the place of that which is most ancient, an indulgence which seems to us to be a feature of municipal management of a strongly objectionable character. However, the moral to be drawn from it is, that men of taste should make haste to visit Normandy.

We have no intention of describing the various notable buildings or the chief characteristics of the architecture of the country. It has been done already in our pages as well as elsewhere. But there can be no doubt that it is still necessary to point out that, rich though England is in specimens of Gothic architecture, yet valuable suggestions may be obtained from a careful study of some of the very early buildings and the rich structures in the Flamboyant style. To become "soaked" with an idea of the buildings of Normandy will enable any careful observer to obtain a greater appreciation of the virtues or the vices of our great English buildings. Moreover, in these days, when so much is said for and against restoration, it is possible to observe partial restoration carried on in Normandy, and to judge of its value. At this very moment, for example, a portion of the north side of the fine Church of St. Pierre, at Caen, is being restored, and you may see here a buttress touched, and there a pinnacle.

But no one who carefully visits Normandy can fail to note the vast distance which exists between English clergymen and French ecclesiastics in the value they set upon ecclesiastical edifices solely as buildings, and likewise the large interest which every class of Englishmen take in their great historical buildings compared with Frenchmen. There are numbers of really magnificent and beautiful churches used for religious purposes in Normandy, which are in a state of which the most unæsthetic of English divines would be ashamed. It is not needful to enumerate them, they will be present to the minds of any recent visitor in the departments of Calvados or Eure. Nor again would the neglect of churches as great historical monuments be tolerated for a moment in England as it is in France. To take one example only, there is the beautiful and graceful Gothic church of St. Etienne le Vieux, at Caen, used as the workshop for the carpenter of the municipality. Its rose-window is stuffed with bricks, its doorways are blocked up, and it is, if we may be permitted to use somewhat uncourteous and metaphorical language, a pearl absolutely cast before swine, and treated as of no more value than the peelings of a Normandy pippin. We do not mean to say that the Municipality of Caen is worse than various other municipalities, and it is a question of degree which is worst treated, this church of St. Etienne le Vieux, or the Norman church of St. Nicholas, turned into a hay-loft for the cavalry, with its round-headed doorways overgrown with ivy, and surrounded by an ugly stone wall, or the great Abbaye aux Hommes, the real monument of William the Conqueror, crowded round and built against by modern buildings quite hideous in their appearance. These things must comfort Englishmen when they are told that they do not appreciate art, for the appreciation of art is no way more truly shown than by the reverential care and affection bestowed on those great buildings which our forefathers have left to our protection. "Caen démoli" * is the title of a work recently published in that town, showing how the historical buildings of this fine city have been neglected or maltreated. We doubt if any town in England would, if it could furnish the buildings, also furnish the subject for a similar work. We have touched upon this point of the restoration and care of the ancient historical monuments of Normandy, because apart altogether from the intrinsic interest and beauty of these great works of art, similar suggestions, often valuable, must occur to the careful observer, and they carry with them conclusions which have to do in reality with much larger questions than the beauty of any one particular building. It is said that it is impossible to understand a people and their history without an intimate acquaintance with every class of the nation, but we doubt whether a study of the great ecclesiastical buildings of Normandy will not suggest some sound reflections upon the character and modern history of the French people.

THE WOMEN'S HOTEL, NEW YORK.

We were present the other night, in company with twenty thousand other invited guests, at the opening of Mrs. A. T. Stewart's (and Judge Hilton's) Women's Hotel, an enormous establishment, constructed and furnished entirely at Mrs. Stewart's cost, with the charitable intention of supplying five hundred New York workwomen with comfortable board and lodging at a cost which is supposed to be an easy rate for such persons here, namely, 25s. a week for the supply of everything with the exception of wine, washing, baths, and carriages.

The architectural difficulties of the hotel have been famously overcome by artful blacksmiths, although the work has been done in no tinkering spirit; nevertheless, the utmost that iron is capable of in lending its lusty aid to our domestic comforts has not here been exhausted.

The mechanical and domestic arrangements of the house appear all but perfection, and the thousand and more lighted windows gave the hotel the appearance, from a little distance, of a vulgar prosaic fairy palace, not much superior in style to the best hotels in the Fifth Avenue or Broadway.

The library is furnished with several thousand readable books; the bed-rooms have each a black walnut bedstead, with four chairs, a well-planned wardrobe, and other conveniences, and the central court-yard is supplied with a real fountain, faultless in design, simply because the decorator has not been called in to assist the plumber, who has, as plumbers mostly do in this country, done his work skilfully; the flowers around the fountain were, for this night at least, in perfection, the palms but little injured, and their radiating leaves suggesting their native groves.

The seats of the "parlours" are all of the most roomy and substantial make; the busts and statues are of the worst; the pictures no better; the vases and ornamentations of a reckless description; the ice-reservoirs most conveniently placed; and the whole look of the hotel is of that peculiar order that at first appears to the stranger as an enormous advance on all things of the kind that have yet been done, but suggesting at the same time a strong hope that such an hotel as this, not only in its design, but in its entire contemplated management, may be regarded like everything else in this country, as only a very imperfect although promising experiment.

New York.

* "Caen Démoli," par Gaston Lavilley. Caen, 1878.

GASWORKS: THEIR ARRANGEMENT AND CONSTRUCTION.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At a meeting of this Society, on the 11th inst., Mr. H. V. F. Valpy, president, in the chair, a paper on the arrangement and construction of gasworks was read by Mr. H. Ellis Hill, C.E. The following is the substance of the paper:—

The first consideration in connexion with the designing of gasworks is, of course, the obtaining a suitable area and site, and this is of the utmost importance, not only as bearing on the first cost of the work, but also on the working expenses for manufacture, so long as the works may be in existence. Having estimated the requirements of the town, and the capacity of the works, not only to supply present needs, but also the probable quantity required within, say, the next ten years, an area should be obtained large enough to contain the new works, and also to allow for the probable extension, so that new buildings and apparatus may be added as required. This area should be easy of access by rail, and also, if possible, by water. A railway siding should run into the works, so that coal could be delivered directly into the coal-store, and empty trucks returned to the line with the minimum amount of labour. The works should also,—and this would generally follow if near a river,—be at a low level compared with the district to be supplied. Sometimes great difficulty is experienced, if part of the town be higher and part lower than the works, in keeping a uniform and constant supply to both parts. Gas having a natural tendency to rise, will readily supply the higher levels, but the lower parts, unless supplied from a different holder, and under pressure, would often be without gas. But while it is of advantage to obtain a low level for the works, care must be taken that the district is not likely to be inundated by floods, as was the case at large works I recently visited, where the utmost difficulty was experienced in keeping the flood waters from the retort furnaces.

The site having been decided upon, the all-important question of arrangement would then require that all the knowledge and ingenuity of the engineer should be brought to its proper consideration. All the apparatus should be constructed and arranged so that the coal may be easily received in the stores, and then passed on from stage to stage, until the purified gas is safely stored in the holder ready for distribution into the town mains.

Instead of laying down abstract principles and general formulæ, I will bring to your notice some model works I have designed for a town of given size, and work out and describe the apparatus in the order of its procedure when gas-making.

First in order and importance, as regulating the size of the whole works, are the retort-house and fittings. I have taken in this instance a town of 5,000 inhabitants, and have designed the works to be fully equal to their present demands, with space for easy extension to twice that capacity. For small works of this size the retorts would be what are called "single settings,"—that is, open at one end only, the benches being about 10 ft. in length from front to back, and the retorts 16 in. in diameter. The house should be about 30 ft. clear span, and about 20 ft. high to the wall-plate, covered with a slated roof on wrought-iron trussed principals, and well furnished with louvre openings for ventilation, the length of the house being regulated by the number and size of the retort-benches. A space in front of the retorts, about 8 ft. in width, and the whole length of the benches, should be paved with firebricks on edge, laid with a gentle slope towards the furnace, so that water used in slaking coke may run into the ashpit, the remainder of the house being paved with 4-in. flagging. The retorts may be either round, oval, or D-shaped; the two latter give the best carbonising result,

but are not so strong as the round, so that in small works, where there would not be many spare benches, the round ones would generally be preferred. The number of retorts required would be found by the following rule:—For a small town, a fair allowance would be 1,800 cubic feet of gas per head of population per annum, so that for 5,000 people 9,000,000 cubic feet of gas per year would be required. This, divided by 180 days,—a number found by experience to give a good practical result, shows 50,000 cubic feet as the average daily consumption. But as the heaviest day's make must be allowed for, this would probably be half as much again, or 75,000 cubic feet. Each retort would produce about 4,600 cubic feet of gas per day of twenty-four hours, thus seventeen retorts would be required for the heaviest day's make. Add to this number 25 per cent. for repairs, and the retort-house needs to be constructed for twenty-one or twenty-two retorts. Supposing a bench to be set with seven retorts,—a very good number,—three benches would be required; or perhaps a preferable arrangement would be two benches of seven retorts each, one of five, and a smaller one of three retorts, thus giving increased facilities for regulating the make between the small consumption at midsummer and that of the heaviest winter's day, as a combination of either 3, 5, 7, 8, 10, 12, 14, 15, 17, 19, or 22 retorts may be used. The retorts are charged by means of long scoops with about 2 cwt. of coal, which is allowed to carbonise for between four and five hours, a good method being to give five charges per twenty-four hours, the gas as made being taken from the retorts by an ascension-pipe above the projecting mouthpiece, generally 5 in. internal diameter at the lower end, and tapering to 4 in. internal diameter at the top. The gas then passes, at a considerable distance above the retorts, through a cross or H-pipe and hydraulic dip into the hydraulic main, a simple and beautiful contrivance for carrying off the gas. The main should be made, for lightness and strength, of wrought-iron plates, bent to the required shape,—generally U-section,—having a flat cover with opening to admit the dip-pipes. The main is generally carried by brickwork or brackets from the top of the benches. The lower portion of the hydraulic main is charged with tar and liquor at a sufficient height to immerse the lower end of the dip-pipe and form a seal, so that the gas which forces its way or is drawn from the retorts cannot return. In some cases the hydraulic main is constructed in short lengths or sections, the gas and tar being taken off by a false main running parallel to it.

The retort-benches are constructed principally of fire-brick, having a furnace below with openings or flues passing round the retorts for the heated gases from the furnace to carbonise the coal in the retorts, a single flue passing from the end to the main chimney-stack. Through-bolts are built into or over the stack to prevent its splitting with the varying temperatures. Before re-charging the retorts the residual coke is drawn out and slaked, part being used as fuel in the furnace, and the remainder stacked in a convenient place for sale. In connexion with this part of the works should be built the coal-store. The preferable way is to put this building parallel with the retort-house and opposite the front of the retorts. The size will of course vary with the facilities for obtaining coal-supply; but in ordinary cases a storage capacity equal to six weeks' heavy consumption should be allowed for. The building should be so arranged that the full coal-trucks from the railway could run in and drop their contents on to the floor of the stores until the coal reached the level of the rails; it could then be thrown over the sides of the trucks on each side, and walled up to the level of the wall-plates. The lower part of the wall between the coal-store and retort-house should have openings through which coal could be drawn for use in charging the retorts. In the works I am describing the coal-store is 22 ft. clear in span, and the same height and length as the retort-house. The rails for the coal-trucks would be carried on columns and girders for the length of the building, the top of the rails being 12 ft. from the ground level, to allow of loaded trucks passing under the tie-rods of the roof. The calculations for size of coal-stores are very simple. Taking 75,000 cubic feet as the heaviest day's make of gas, and a ton of coal as yielding 9,500 cubic feet, a day's consumption would be 7·9 tons, which, multiplied by 42 days, would amount to 332 tons, which, at 43 cubic feet per ton, equals 14,276 cubic feet of space required for the storage of coal. By having a large coal-store the works would not only be independent of fluctuations in the supply, but the coal would get thoroughly dry before being required for use.

The coal having been brought from the railway to the store, and thence to the retorts, the products of carbonisation, viz., the illuminating gas and its impurities and the condensed tar and liquor, pass from the retorts through the hydraulic main to the condenser, to be gradually cooled down to as nearly as possible the atmospheric temperature. Condensers are of various kinds. Those known as surface-condensers are the most general and simplest in their action. They are of three well-known types: firstly, a series of horizontal, or nearly horizontal, tubes, the lower ones immersed in water, in which the gas passes backwards and forwards from the top to the bottom, being gradually cooled in its passage by radiation through the metal of the tubes; secondly, a series of vertical pipes fixed on a rectangular iron box, in which the gas traverses alternately up and down through the series until the temperature is sufficiently lowered; and thirdly,—perhaps the simplest and best form,—the vertical annular condenser, consisting of a series of double tubes side by side, with annular spaces between them. These tubes are fixed at the lower ends on to a rectangular box by short horizontal branch-pipes to the top, or by diagonal pipes from top to bottom. The gas from the hydraulic main, passing into the annular space at one end of the condenser, is brought in contact with two cool surfaces, that is, the outer and inner tube, both exposed to the atmosphere. As the gas cools the tar and liquor carried with it are deposited on and trickle down the tubes into the chamber beneath, and thence into the tar-well, the series of tubes being sufficiently large to give the required amount of cooling-surface. The advantage of this condenser is that a continuous current of air is kept up through the inner tube, caused by the cold exterior air forcing upwards the warmer air from inside the tube. In warm weather, if the condenser is exposed to the direct action of the sun, water may be allowed to play on the outside tube to keep it cool; and in cold weather the inner tube may be closed or partially closed to regulate the supply of cold air. In calculating the size of condensers, it is usual to allow 150 superficial feet of cooling surface for each thousand cubic feet of gas passed through per hour; therefore in works designed to produce 75,000 cubic feet as the heaviest day's make, or 3,125 cubic feet per hour, a condenser with 470 superficial feet of cooling surface would be required, or, say, two condensers, each 2 ft. 6 in. outside diameter by 18 ft. high.

The next apparatus in order is the exhauster, for drawing the gas from the condenser, and passing it on to the scrubber for lessening the pressure and preventing the deposition of carbon in the retorts. There are two distinct types of exhauster in general use, the rotatory and the reciprocating, each having advocates,—the former, I believe, generally giving the best results. The rotatory exhauster consists of two cylinders, the outer one fixed to a bedplate, and having within it a smaller one revolving on a shaft set out of centre. Projecting from the small cylinder is a slide actuated by a pin working in a groove in the outer casing. As the inner cylinder revolves, the slide, filling the space between it and the casing, causes a vacuum behind, into which rushes the gas from the condenser, and at the same time the gas in front of the slide is forced on to the scrubber. The theoretical objection to this form of exhauster is, that it does not exhaust steadily, as the work done in similar times varies with the varying length of the diaphragm-slide between the two cylinders. The reciprocating exhauster is similar in principle to a horizontal blowing-engine, the piston of the exhausting cylinder being worked either direct from the end of the steam piston-rod, or by a connecting-rod from the crank-shaft, the action being, of course, the reverse of that in the steam-cylinder; that is, the piston causes in its travel a vacuum behind it, the gas from the condenser rushes in, and at the return stroke is forced through what would be called the exhaust-port of a steam-cylinder on to a scrubber. In single exhausters of this type, the same objection would apply as to the rotatory type; but they are generally made with two exhausting cylinders, the pistons being driven by cranks set at right angles, so as to equalise the work done as nearly as possible to the traverse of the steam-piston.

From the exhauster the gas is passed to the scrubber to remove the ammonia. The scrubber, as generally constructed, consists of a large upright cylinder, with an inlet pipe at the bottom, and an outlet at the top. Shelves are arranged inside, covered with coke, tiles, brushwood, or other porous substance, or, as is probably the best plan, filled with thin boards set on edge and crossed in layers, the boards being about ⅜ in. thick, with about the same amount of space between. At the top of the scrubber is an apparatus for distributing water or ammoniacal liquor over the surface. This water, or liquor, trickling down through the pores or spaces of the materials, absorbs the ammonia from the ascending gas. When coke is used, it must be periodically renewed, as the pores get choked with impurities; but, as far as I know, this does not seem necessary with the boards, some scrubbers having been at work some years without requiring any change or filling. This stage of gas purification has become more important during the last few years, because not only is an impurity taken from the gas, but a valuable article of commerce is obtained. A scrubber requires a capacity of 150 cubic feet for each thousand cubic feet of gas passed per hour, and fifteen gallons of water per ton of coal carbonised; so, for works of the size mentioned, the scrubber should be 6 ft. diameter and 18 ft. high.

In connexion with the scrubber and condenser is a tar and liquor tank, into which the tar and liquor distilled from the gas in the condenser and scrubber pass for storage until sold. The tank or well may be of brickwork, concrete, or iron, sunk in the ground, the top being level with the surface. The size should be equal to eight weeks' storage. Taking twenty-five gallons as the quantity yielded by each ton of coal carbonised, the size of the tank for the works described would be 20 ft. by 15 ft. by 12 ft. deep.

Following the scrubber are the purifiers, where the gas is completely purified before entering the holder. They are generally arranged in sets of four, three being in use and one at liberty for recharging, a centre valve being placed between them, to direct the passage of gas in any required order through the purifiers. The usual pattern of purifier is like a large box, constructed with cast-iron ribbed plates, bolted together, and caulked at the flanges. Ledges are cast inside, on which rest sieves, covered with lime or oxide of iron. In the metropolitan district, where the Act of Parliament is very strict as to the presence of carbonic acid, lime is necessarily used in purifiers either alone or in conjunction with oxide; but in the provinces oxide is very often the only material used. The cover of the purifier, which is removable, is made to pass over the sides, dipping into a recess nearly filled with water, acting as a seal, to prevent the escape of gas. The gas from the scrubber is introduced at the bottom of the purifier, and in passing through the purifying agent parts with its carbonic acid and sulphuretted hydrogen, the process of its purification being similar whether the agent employed be lime, oxide, or a combination of the two. Taking, for example, a set of lime purifiers, in each casing would be an arrangement of sieves,—generally four or five, placed one above another,—each spread with a layer of slaked lime, 3 in. or 4 in. thick. The gas, entering through an inlet-pipe at the bottom, passes through each layer and down an outlet pipe at the top, leaving a portion of its carbonic acid and sulphuretted hydrogen in combination with the lime. The gas then passes through the centre valve to the second purifier, and then to the third, by which time it should have obtained the required state of purity. When the first purifier has become too foul for further use the valve-cover is lifted and turned a quarter-turn; the second purifier then becomes the first in order, and the spare one, which had in the meantime been refilled, is brought into use as the third one. The one that has now been thrown out of action is emptied of its foul contents ready for recharging when required. When oxide is used the sieves would be fewer in number, and would have thicker layers; but the great difference between the two systems is not so much in the action as in the residue, which, in the case of lime, becomes an intolerable nuisance while it remains on the works; and although it is possible in country districts to sell it as manure, in large towns it is often difficult to get rid of it even by payment, while in the case of oxide the spent material may be laid

on the ground, and after being turned over for two or three days is again fit for use. Before emptying a purifier the cover has to be lifted and taken away. A very usual plan of doing this is to have rails supported on brackets running along the length of the house over the purifiers. On these rails is a traveller frame, with a traversing hand-crab or with a vertical screw, to which are slung four chains hooked into shackles at the corner of the cover, by which the cover may be lifted and carried over the next purifier. This method is only applicable where the weight of the cover is not great; but in large works, where manual labour both in lifting the covers and filling the purifiers must be dispensed with as much as possible, different systems must be adopted. The latest and most complete arrangement for this purpose, and which, by the kindness of Mr. Morley, of the Salford Corporation Gasworks,—who has also supplied me with much other valuable information on the subject of this paper,—I am able to give particulars of, is now being applied to some new purifiers 30 ft. square at those works. In this case a line shaft runs along two sides and one end of the purifier-house driven by a belt, from an engine below. The lifting-machinery for each purifier consists of four square thread-screws, one at each corner, working in worm-wheel nuts attached to the beams carrying the purifiers. These wheels are actuated by worms on shafts alongside the purifier, the four shafts being connected at the corners by mitre-gearing, so that when set in motion the four screws are simultaneously turned and the cover raised to the required height. When high enough, four carrier-wheels are inserted into brackets on the cover, the screws are withdrawn, and the cover, running on wheels, is hauled along on the edge of the purifier on to the next one, a short rail being placed between them to make a continuous line. In connexion with this apparatus is an arrangement for lifting the oxide and re-charging the purifiers. Between each pair of purifiers is an elevator, consisting of a series of iron buckets or links forming a continuous chain carried round a drum at the top of the house, the lower end dipping into an elevator-trough on the ground-floor, into which oxide is tipped from barrows. When a purifier requires charging, the elevator is put into motion by worm-wheel gearing, and takes up from the oxide-trough a continuous supply, delivering it into a hopper attached to a swinging-shoot so arranged that it may be brought over the centre of the purifier being charged, the attendant merely having to spread it evenly over the surface. The whole of the machinery for lifting the covers and filling the purifiers is to be driven by an engine with a cylinder, 10½ in. diameter and 24 in. stroke, the boiler being 5 ft. 6 in. diameter, 15 ft. long, with 2 ft. 9 in. tube. To calculate the size of purifiers, the simplest rule is,—supposing there to be four to the set, three always in work,—multiply the heaviest day's make in thousands by ·6 for the superficial area of each purifier.

From the purifiers the gas passes through an instrument which, although having nothing to do with either the manufacture, purification, or storage, is an essential part of all well-regulated gasworks, that is, the station meter, for measuring and registering the quantity of gas made. Its construction is similar to that of an ordinary service meter, but of course large enough to pass the total make of the works.

The gas has now to be stored previously to distribution to the town. For this purpose a gasholder and tank are required. The tank is generally a large circular pit sunk in the ground and lined with brickwork backed with clay-puddle, finishing at the ground level with a stone coping. Until recently, except where iron tanks were used, brickwork was the only material used for tanks, but a few years since Mr. George Livesey, of the South Metropolitan Gasworks, who has had the honour of introducing many improvements into gasworks, constructed a concrete tank with a brick lining, and afterwards one entirely of concrete,—and without any puddle backing,—and with so much success that I believe concrete is destined, from its adaptability and cheapness to supersede brick for this work. At one side of the tank is a recess to receive the inlet pipe from the station meter and the outlet pipes to the street mains. Bed-stones are placed on the bottom of the tank to receive the runner-guides for the holder, and at the coping for the columns or stanchions. The construction of a gasholder is a matter of great importance. It is a costly article, and requires more skill to construct than any other portion of gasworks plant. There are two kinds of holder, the single and the telescopic. The former is cheaper as to first cost, but the latter, by taking up less ground, would in many cases be found the cheapest in the end. The holder for the works described is 54 ft. diameter, and double-lift, each lift 17 ft. 6 in. high, the plates varying in thickness according to position,—the crown-plate being ⅜-in. thick; the inner and outer circles No. 13 Birmingham wire-gauge; the remainder of the roof-sheets No. 14 B.W.G.; the top and bottom tiers of the sides No. 14 B.W.G.; the others, No. 15 B.W.G. The rivets for the thin plates are ¼ in. diameter, and 1 in. pitch. At the bottom of the inner lift is a cup to receive the dip of the outer lift. The cup and dip are similar in construction, but inverted in position, and may be made by riveting to the shell of the holder a piece of channel-iron or double angle-iron, or a plate may be bent to the required form. When in action, the cup would be partially filled with water to act as a seal to prevent the escape of gas between the lifts. The sides of the holder are generally stiffened by vertical truss-bars to prevent the sides buckling when resting on the bottom of the tank. The cover is also in most cases trussed, for the alleged purpose of keeping the crown in its proper shape when not distended by gas. This point, however, is now being warmly discussed, and the result will be, I think, that trussed covers will soon belong only to the past, for it seems contrary to all ideas of correct designing that a heavy trussing should be attached to and carried up and down with the cover in all its journeying, and continually straining it, merely because it may be wanted to keep the cover in shape when the holder is empty, which could be more simply and effectually done by erecting a fixed light framework in the tank to receive the cover. The holder is kept in vertical position by guide-pulleys running on guide-bars in the tank, and continued up the face of the columns. For economical working, and for the peace of mind of the manager, the holder should be large enough to contain twenty-four hours' maximum make, and furnished with, say, one column to every 10 ft. diameter of holder. There is nothing very special about the ordinary column, except that it is specially unadapted for the work it has to do, and will possibly, in the future, give place to the light but stiff wrought-iron lattice columns now largely used in America.

From the holder the gas is taken by an outlet main through the governor,—an apparatus for regulating the pressure,—into the town mains and service-pipes for use as required.

Within the boundary of the works there should of course be a manager's house and the necessary offices, stores, fitting-shop, &c.

The paper was illustrated with numerous diagrams, and with a model plan of works specially designed to meet the requirements of a town of 5,000 inhabitants.

A discussion followed, in which the president (Mr. Valpy) and Messrs. Walmisley, Coates, Thorneloe, Bancroft, and Feeny, took part.

The next meeting of the society will be held on the 2nd prox., when a paper will be read by Mr. W. C. Street, on "Landing-pier and Concrete Warehouses at Thames Haven."

MM. GOUPIL'S GALLERY.

A small collection of pictures at present on view at MM. Goupil's Gallery in Bedford-street, Covent-garden, is worth notice, if only on account of the presence there of one of the finest and most successful of figure-studies by modern painters, the "Chloe" of M. Lefebvre, which made a sensation two or three years ago at the Paris *salon*. It is the figure of a young girl of the finest type of youthful beauty, with head turned to one side as if listening to some distant sound; her weight thrown mostly on one limb, the supporting action of which is wonderfully given. Although in one sense a completely realistic study of the figure, there is a great deal of ideal charm in the work, which represents almost the typical idea of fresh girlish life and beauty without any self-consciousness. The picture is life-size: there was a very small replica of it in M. Deschamp's Gallery about a year ago, which we noticed at the time with admiration. Another picture, of small size, by Gerôme, is equally remarkable as a figure-painting, though in every other respect the reverse of Lefebvre's work; it is a harem woman crouched at the edge of a bath, in which her figure is reflected, with her back to the spectator. As a piece of drawing of a very difficult position it is masterly; in every other respect it is as repulsive in feeling and expression as the "Chloe" is charming in both senses. There could hardly be two more typical instances of the high and the low ideal in nude painting.

Besides these works, which stand out from the others on account of the great difficulty of the artistic problems embodied in them, are some exquisite and truly poetic landscapes of the late N. Diaz; a fine Israels; the last picture painted by Daubigny; and other works of great merit. The collection is well worth a visit.

SEPULCHRAL MONUMENTS, GERMANY.

In continuation of the series of illustrations which we have from time to time given of sepulchral monuments, we publish in our present number two very uncommon forms of Mediæval memorials of the dead.

The first represents a mural tablet dating from the end of the fifteenth century, in the cloisters of the Cathedral of Maestricht. Although Maestricht is geographically in Holland, yet we have classed this monument amongst German examples, because the architecture of this neighbourhood seems to partake rather more of the peculiarities of German than of Flemish Gothic.

Although mural tablets are not very commonly met with of a date previously to the end of the sixteenth century, yet a few examples of an earlier date are to be seen in Germany, Belgium, and Holland. In addition to the one we illustrate, we recollect to have seen some good examples in the cloisters of Freising Cathedral, in the Spital-kirche at Passau, the cathedral at Bois-le-Duc, &c.

This monument is of a kind of red marble, and is in a good state of preservation. It is singular the horror with which the early Gothic revivers regarded mural tablets, to which they gave the name of "blisters," and in many restorations which we could name great injury has been done by a wholesale and most injudicious removal of all the tablets in the church. We know of one case in which some of those destroyed were the works of Bacon!

Our second illustration represents a most singular monument in the Cathedral of Eichstadt, in Bavaria. It is in the form of a shrine, and stands about 4 ft. high. The shrine itself is about 2 ft. 8 in. long, and is composed of stone. It has been richly decorated. The ridge of the roof is broken away. Probably it had a small flèche rising from it. We were unable to find out anything about the history of this singular little monument. Possibly it may have been erected to the memory of one of the choir-boys or children who served at the Mass in the cathedral. Whatever may be its history, it strikes us as being a pretty form of monument.

NEW CHURCH, OUNDLE.

This little church will stand at the west end of Oundle, on a triangular piece of ground, insulated in a picturesque manner by the convergence of the roads from Benefield, Stoke Doyle, and Barnwell.

A small chapel and some other buildings of a more domestic character formerly stood on the same spot. Some remains of these still exist, but so mutilated, altered, and partially destroyed by modern additions, principally workshops, that nothing certain can be made out.

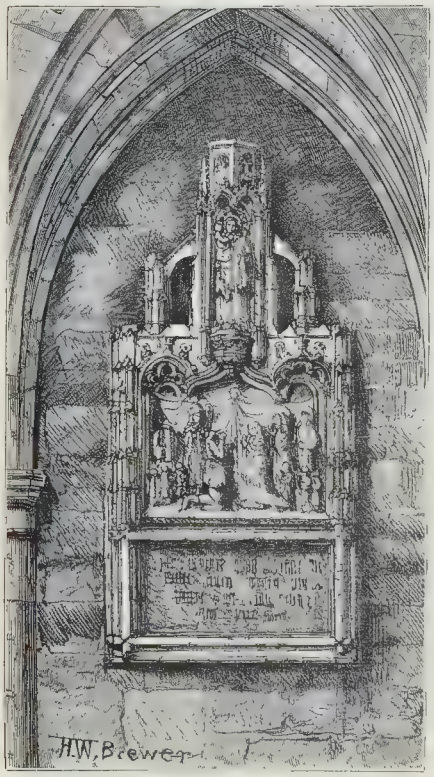
The new church, as the view indicates, is very small, and of extremely simple character, though somewhat peculiar in plan. It will be seated for 175 adults. It will be constructed of local stone in random range work, with Casterton stone for windows, plinths, and weatherings. The roofs will be covered with Colley Weston slates.

Internally the piers which carry the octagon will be of Ketton stone, and the remainder of the stonework Casterton or Bath. Stone, however, will be used as sparingly as possible, and in the main arches, and wherever practicable, brickwork and plaster will be substituted.

A curate's house, in connexion with the church, is in contemplation at the west end of the site, for which designs have been prepared.

Mr. Blomfield is the architect, and Mr. Clipsham, of Norwell, the builder.

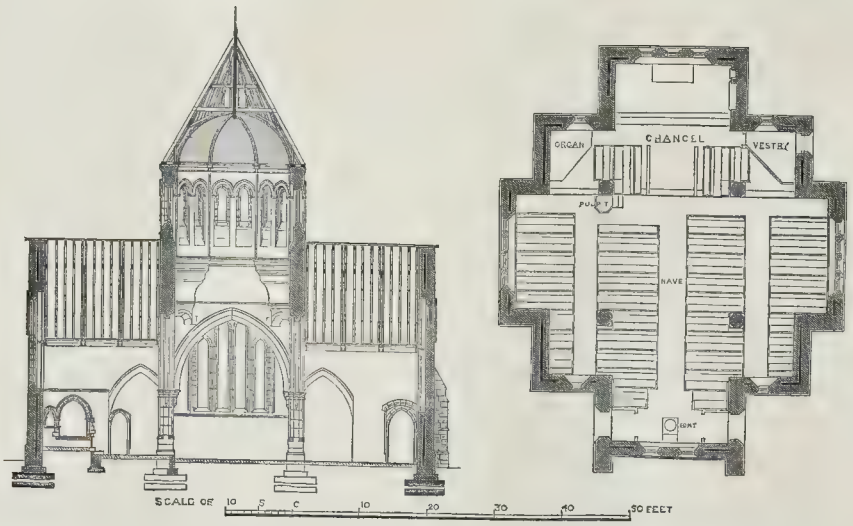
ANCIENT SEPULCHRAL MONUMENTS.



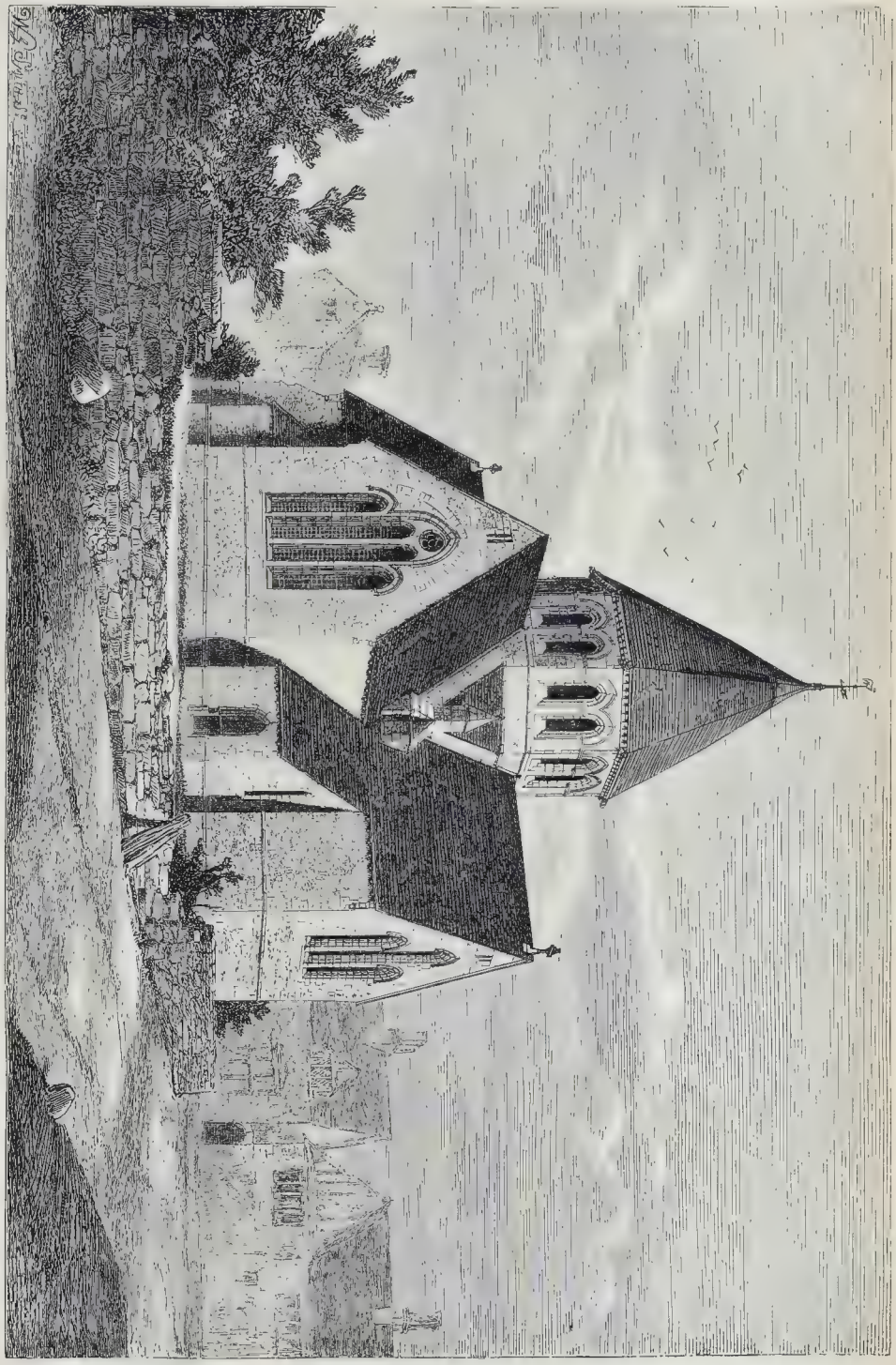
MAESTRICHT CATHEDRAL.



EICHSTADT CATHEDRAL.



NEW CHURCH, OUNDLE.—*Plan, Section, &c.*



NEW CHURCH, OUNDLE.—Mr. Arthur Blomfield, Architect

OPEN DRAINS, SEWERS, AND SOIL-PIPES.

Sir,—I had much pleasure in reading Mr. Shaw's recent article on soil-pipes in the *Builder*, and have followed with considerable interest the correspondence which has since taken place.

I was glad to see that he had hit upon the common-sense plan of preventing the bad effects of sewer gas by abundant ventilation. As I have been using a somewhat similar plan for some years past, and as there are points in the system I have adopted which have not been touched upon in the recent discussion, the following notes on the subject of drainage may perhaps interest your readers, and produce some further correspondence of an instructive kind.

It is a matter on which we may congratulate ourselves that this subject is being so well taken up within the bounds of the profession, and so earnestly discussed by so many distinguished architects, and we have all to thank Mr. Shaw for having sounded the keynote of so useful and instructive a correspondence as has taken place in the professional papers.

It is not many years since the deleterious effects of bad drainage became generally known. The old-fashioned idea was that drains were objectionable things which should be ignored, and kept as much hidden out of sight as possible,—and out of sight in the case of drains and cesspools generally meant out of mind also. All that had to be done to get rid of any unpleasant object was to send it down the drain. The result was that the drains became an insufferable nuisance, and all kinds of ingenious contrivances had to be adopted to "trap" them, and keep back the unpleasant odours arising from them. The most perfectly air-tight pipes were substituted for the old built drains, and every appliance was put into requisition to prevent anything unsavoury from escaping. Now people begin to see that in carrying out these devices they have been altogether on the wrong tack, and that ventilation, not corking up tight, is what is wanted.

Medical men now declare that one of the chief causes of the injurious effects of our modern drains is the very perfection of the materials used in their construction, and it must be confessed that the imperfect jointing and levelling of the drain-pipes which so often happens (causing a disastrous outflow of sewage under our basements) has given the doctors and the public too much reason to complain. In the old built drains there was always a little outlet through the joints of the masonry for the escape of the foul gases generated in the drains; but in the hermetically sealed glazed pipes now in use there is no chance of escape except into our houses. The gases generated in such pipes are carefully bottled up until they have time to acquire those virulent qualities which render them so dangerous. The cure for all this is admitted on all hands to be ventilation. The practical question which we, as architects, have to solve, is how best to apply this remedy.

While studying this subject some years ago I was greatly struck with the results of the carefully prepared statistics of the medical officers of Glasgow, as quoted in an interesting pamphlet on the sewage question by Dr. Fergus.

The river Clyde is now nearly as foul as the Thames was before it was purified by the construction of the Embankment with its great sewers. The water, especially when churned by the paddles of the steamers, is most offensive to sight and smell. Here, one would have thought, side by side with so much corruption, would have been the hot-bed of fever and disease. But, strange to say, the case was entirely otherwise. The houses on the banks of the river and the ships in the harbour were free from typhoid and diphtheria, and these were to be found chiefly in the principal modern streets and squares of the west end. Wherever, in fact, the drains were carefully and hermetically sealed, there diphtheria and typhoid prevailed; but on the banks of the river, polluted though it was, these diseases were practically unknown.

At first sight this result appears paradoxical, but becomes easily intelligible when it is considered that, however foul the water may be, it is open to the fresh air, into which the gases generated immediately disperse, while the gases in the glazed drains are kept sealed up till they become poisonous. In short, the river is thoroughly ventilated, and the glazed drains are the very opposite. Further inquiry convinced me that the same result is found elsewhere.

Here in Edinburgh, for instance, in parts of the old town, the primitive system of surface drainage still exists. The ordure from the house is poured out into open gutters in the narrow closes which slope steeply down from each side of the High-street and Grass-market, and is swept and washed out by the scavenger. It is needless to say that the system is most unsightly, and would never have been endured so long but that these closes are seldom visited by eyes polite. This, too, is the most crowded part of the town: the houses are huddled together, and rise to the height of eight or ten stories, and every room is full. But amidst all this filth and crowding, the absence of diphtheria and typhoid is very marked.

I make this statement on the authority of Dr. Littlejohn, the distinguished medical officer of health in Edinburgh, who further assures me that in the houses which have been connected with the sewers by soil-pipes from w.c.s and sinks, the number of deaths from typhoid and scarlet fever was doubled in one year.

Dr. Fergus also quotes as follows from Dr. Murchison's work on Fevers:—"It is not a little remarkable that the increase of enteric fever in the metropolis has been contemporaneous with the completion of the main drainage scheme."

Every one is familiar with another instance of natural ventilation in the case of farm onsteads, stables, &c. There the fresh smell is actually said to be wholesome, and however much manure may be accumulated in the vicinity, the result seems to be innocuous. This arises from the perfect ventilation of the dung-hill: from its being in the open air, gases escape at once as soon as formed.

With these facts before me, I came to the conclusion that what is wanted to prevent drains from being dangerous is to make them, in respect of ventilation, as like an open river or an open gutter as possible.

It is evident that, throughout a large town especially, this idea could not be carried out literally, but still I saw no reason why it should not be at least imitated in principle. That principle is: let ventilation prevail,—let every drain be as thoroughly ventilated as the river or the open gutter. Instead of corking up our drains with the most skilful traps at one end, and with the sea and tide at the other, do away with traps entirely, and make as many openings as possible from the drains directly to the open air, so that every wind may blow through them and carry off and purify any noxious vapours that may be forming,—nipping them, as it were, in the bud, and preventing them from getting to the dangerous stage. So strongly did I feel convinced that this thorough and complete ventilation was the proper cure for the evils of our drainage system, that I resolved to carry out a plan in a house I was then erecting which should give it a fair trial. That plan has been quite successful, and I have since then introduced it into every house I have erected in the country, and also into some in town, with the most satisfactory results.

The plan is as follows, viz.:—In the first place, all baths, w.c.s, sinks, &c., are placed next the outside walls of the house. The branch soil-pipes from them are immediately led through the wall to the outside, and are there joined to a cast-iron vertical soil-pipe 4 in. in diameter. This is in lengths of 6 ft. to 9 ft., with spigot joints, which are not cemented, but left open for ventilation. The vertical pipe is also open at bottom and top. I generally continue it up to the eaves of roof to carry off rain-water, which, of course, helps to flush and clean it; at the bottom it discharges with a bend into a funnel of glazed fire-clay 15 in. in diameter. This funnel is covered with an open iron grating.

Up to this point this system seems to be almost identical in principle with Mr. Shaw's, but I carry the same principle further, and would like to carry it still a great deal further than I have yet had an opportunity of doing. I wish to ventilate not only the soil-pipes, but the drains themselves. I, therefore, have as many openings as possible directly from the open air down to the drains; all traps are done away with, and the wind is allowed to blow through the drains from end to end. Every inlet is formed by a vertical pipe let into a proper junction formed on the fire-clay drain, and on top is placed one of the fire-clay funnels with open grating already referred to. The top of this funnel stands about 6 in. above the ground, and it is perforated with 1-in. holes all round, within 1 in. or 2 in. of the top, for additional ventilation. One of these funnels is placed at the foot of every down-pipe, whether for soil or rain water; also at every sharp curve in the course of the drain, at every point where two or more drains join, and at as many other convenient places as possible. One great advantage of these openings is the ready access thus obtained to the drains for inspection, cleaning, &c.

By lifting the grating and looking in, the state of the drain is at once observed; and, so far as my experience goes, it has always been to find the drain-pipe in the cleanest possible condition.

We are all aware how liable the architect is to blame when any accident occurs to the drains, such as choking of a drain-pipe by dish-clouts or other rubbish sent down them. Such things are sure to stop up the traps of the old drains, and it is one advantage of the above system that it is entirely free from traps, and so much the less likely to get stopped up. But should a choke by any accident occur, its position can at once be ascertained and a remedy easily applied without breaking up pavement, drains, &c., and renewing the traditional woes of Mr. Briggs.

The usual objection urged at first sight to this system is, "Oh! but the smell will get out and be very unpleasant in the grounds, and perhaps dangerous." The answer is, of course, intelligible to any one who has considered the subject, viz., that as there will be no bottling up of gases there will be no smell; but if there were any offensive gases, they would be much less dangerous when allowed to escape than when confined.

The above description is applicable to a country-house where the drainage system is complete in itself, and unconnected with any other drainage. In the case of villas it is equally applicable, except that a small cesspool or trap (of course ventilated) must be used to cut off the connexion of the villa drains from the main sewer in the street. I have also applied it in town houses, but at the end of the drain, before it joins the main drain, I have found it desirable, besides the usual single or double trap, to introduce a ventilation-pipe from behind the trap, and carry the same to the highest point of the roof, in the way referred to by several of your correspondents. Potts & Co.'s patent air-chambered sewer-trap is the best I have met with for this purpose.

In the very populous parts of towns, where the whole surface of the ground is covered with buildings, I admit that I have not yet been able to introduce the above system, but have had to content myself with the usual ventilation-pipes carried to the roof.

But this arises from what I consider the defective state of the public sewers in every town I am acquainted with. The sewers are simply a repetition, on a large scale, of the old system of house-drains, being, for the most part, large pipes or built conduits, all carefully trapped in the houses and streets, and without any means of ventilation whatever. Those which empty into rivers have the pressure of the river water or the air at the lower end, and those which fall into the sea have still further the great pressure of the rising tide to contend with twice daily.

If abundant means of ventilation were provided in every street, these pressures would not matter, they would, in fact, be beneficial by producing a current of air through the drains, but in the present state of matters they can only tend to drive back the sewer-gas into the houses. Various modes of ventilating public sewers have been proposed, such as the erection of tall chimneys with fires to cause up-draughts, or to lead pipes from the drains to the chimneys of factories, &c., which I dare say would be very useful if sufficiently numerous. But what I would like to see would be the thorough ventilation of every sewer in every street, in much the same way as above described for the drains of villas.

I have recently heard that this has been done in some parts of London, but have not seen it. I should be much interested in knowing the result.

In Paris, I believe that the sewers are like open underground rivers, running in large tunnels, which are ventilated to the streets above, and from accounts I have read of excursions along these tunnels (in which carriages of some kind also run), the result appears to be highly satisfactory. If some one well acquainted with that system would give a full description of it, it might perhaps help us to arrive at a good method of ventilating our main sewers.

The various minor points dilated upon by your correspondents,—such as the nature of the

materials of which the soil-pipes are made, the prevention of the offensive coating which is apt to form in these pipes, the use of the water-trap or the valves in closets, &c., are all very important, and well worthy of further consideration; but I believe they are all subordinate points, and that the main thing we have first to contend for is the *thorough ventilation of all our sewers, drains, and soil-pipes.*

This must be admitted when the following observations by Dr. Fergus, which so clearly state the principles which should guide us in our efforts after improvements on drainage, are considered, viz.,—"Decomposition of excreta is very much facilitated by their being shut up in limited spaces, with a moderate supply of air and water; therefore, our modern house and service sewers and cesspools are ingeniously contrived chemical laboratories for the production of sewer-gas. When sewage matter in a state of decomposition is exposed freely to the air, it ceases to be injurious to health."

As already stated, all our modern appliances for trapping and shutting up sewers are, in the light of these observations, a gigantic blunder. To carry out the true and natural principles of drainage, we must start afresh from a new point of departure. Instead of shutting up the drains, we must open them up; instead of concealing, we must disclose them to view; and instead of trapping back gases, we must tempt them at once to escape.

The practical conclusion of the whole matter is, "Do away with all traps, and open up and ventilate all sewers and drains."

DAVID MACGIBBON.

A LUCKY ARCHITECT.

YET who shall say? "No man can be called lucky till he is dead," runs the old saying, and there is much truth in it, for who can tell to what a supposed piece of luck may lead? However, here is the story as it reaches us from the papers:—

A few days ago Mr. D. P. M'Carthy, a native of Cork, architect of Barrington-street, received a letter, signed G. A. Stanley, New-square, Lincoln's Inn, informing him as follows:—"I am directed to apprise you that the first instalment of the O'Keefe legacy has come to hand in your favour for 500,000*l.* The whole of the greater portion of the five millions left by the deceased will come to you, except the portion allotted to your brothers, about which the Crown will decide." Mr. M'Carthy received the intimation with great equanimity and thankfulness that his first cousin, Charles Robert O'Keefe, late of Allahabad, who died a bachelor, had left him such a splendid fortune. It seems that the parents of the deceased Mr. O'Keefe resided in Cork, and carried on a respectable business there as general merchants. Both Mr. O'Keefe's parents died before he reached his majority. He had one brother and one sister, but both are dead. The chief heir in Limerick was often invited by the millionaire to go out to India, but he had to decline the offer in consequence of a delicate constitution. He had also to decline a similar offer from the deceased brother to go out to Australia, to both of whom he stood in relationship of first cousin. After a time spent in Cork with his father, and while yet only about eighteen years of age, O'Keefe made his way to India, where he enlisted as a private soldier. Service in the East during the year 1842 suggested to his mind that he could make money by engaging in the opium traffic and other branches of trade, and so he went into the opium trade, some said as an agent of the East India Company, others on his own account. Be this as it may, by close attention to business and "good luck" he soon acquired a colossal fortune—five millions of money in ready cash, and an income of 150,000*l.* from landed and other property! Mr. O'Keefe died unmarried in February, 1876, when Messrs. Carrington & Whigley, solicitors at Calcutta, advertised for heirs, of which apparently there was no lack, no fewer than 175 applicants putting in claims as the next of kin; but they were all put aside on investigation in favour of Mr. M'Carthy, of Limerick, who has four brothers, each of whom will come in for a twenty-fifth part of the five millions and estate, but Mr. M'Carthy will be the recipient of the great bulk of the fortune. The heir is a very industrious and energetic man, and had just completed the building of a terrace of houses on his own account, which he named Barrington-terrace, when the letter "On her Majesty's Service" proclaimed to him his unprecedented good fortune. The heir served his time in Cork with the building firm of Messrs. Dickson & Taylor. At an early age he started business for himself in Newcastle West, and after several years of close application was selected as architect to the Ecclesiastical Commissioners up to the period of the disestablishment of the Irish Church. Since then he has carried on his business in Limerick.

BUCKINGHAM WATER-GATE, YORK STAIRS.

SIR,—Sauntering the other day along the Thames Embankment, and musing over the prodigious advance, architectural and other, which I have witnessed in the neighbourhood during periodical visits within the last forty years, the mournfully neglected condition of this fine old relic attracted my attention. Dirty, squalid, half buried in the earth, it seems pathetically to appeal for some recognition of its once stately associations, when it was the avenue for all that was bright and beautiful in a luxurious court.

I cannot help feeling some surprise that the subject has not been taken up by the Institute of Architects, a recommendation from whom to the Metropolitan Board of Works would doubtless meet with attention.

The remedy is extremely simple, and would be accomplished at a very moderate expenditure. A flight of steps at the foot of Buckingham-street occupying the width of the carriage-way, with retaining walls upholding the footways so as to give access to the last houses on each side, would afford a direct avenue from the Strand to the garden and embankment, through the gateway, with a short flight of steps on the garden side. An area would have to be formed round the structure similar to that round the arch of Septimius Severus in the Forum Romanum.

Between the end of Buckingham-street and the garden there is a narrow passage, which is private property, but the manifest advantage to all concerned ought to remove any difficulty arising from this source.

The destruction of Temple Bar gives an additional reason for preserving whatever remains to us of seventeenth-century architecture, particularly from such a master hand as that of Inigo Jones.

I trust if anything is done in this direction no attempt will be made at *restoration* in the modern sense of the word. Let the *ipsissima saxa* remain in all their rugged grandeur until time and the elements have done their work. One would as soon think of restoring the Arch of Titus.

I shall be glad if the powerful influence of the *Builder* can be enlisted in so good a cause.

Wavertree. J. A. PICTON.

INTENDED CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE Council of the British Archæological Association have accepted the invitation of the Mayor and Corporation of Wisbech, to hold the thirty-fifth annual congress of the Society in their ancient port and borough, some time in the month of August next. The Hon. Congress Secretary, Mr. Wright, F.S.A., who has lately visited Wisbech, says there is reason to believe that the town and neighbouring districts will afford a very wide and interesting field for archæological study and research. "The Fenland," as it is called, presents a large amount of antiquarian interest, not only from its especial and early history (the Iceni having dwelt partly in Cambridgeshire, and it is supposed originally formed the dykes which covered the open lands between the forests of Essex and the Marsh districts), but from the after-works of their Roman conquerors, who constructed roads (notably a branch of the Akeman-street, from Cambridge to Cirencester, and the Via Devana from Cambridge to Colchester, or "Wool-street" as generally called by the country people) and banks, in various parts of Cambridgeshire, and left other evidences of their occupation in the camps and stations of which Cambridge itself, as Camboricum, and Granchester not far from the Via Devana (running from Cambridge to Chester, the Deva of the Romans, meaning a town on the Dee), are, perhaps, now the best known of this important class of ancient remains.

As illustrating Mediæval and later history, the Cathedral of Ely and the famous churches of the Marshland, stand out, and in themselves will present a feature of interest. Although Ely Cathedral was visited by the Association during the Norwich Congress in 1857, it is intended to pay to that now fully-restored work a day's visit; whilst to the churches of the Fenland, such as Walsoken with its Norman nave, Whittlesea with its richly-ornamented Perpendicular steeple, Leverington with its Early English tower and parvise chamber over porch, West Walton with its noble detached bell-tower and porch of Trans-Norman date, Walpole, Emneth, Elm, &c., and the fine specimen of Norman, Decorated, and Perpendicular architecture in the Church of St. Peter and St. Paul, Wisbech, as much attention will be devoted as time and circumstances will allow, as well as to the interesting remains of the Abbeys of Thorney and Crowland, once the chief glories of the old Fen country.

Wisbech being the centre, as it were, of parts of four different counties, excursions will be made to places of interest within them, and thus King's Lynn, Castle Rising, and Castle Acre, in Norfolk, will form one day's work, Peterborough Cathedral and Castor (the remains of a Roman encampment) in Northamptonshire, probably occupying another, these places being all accessible by railway communication. In Lincolnshire it is proposed to visit Burleigh House, the Elizabethan mansion of the Cecils, and, if time will permit, the neighbouring town of Stamford. In that county there are many places of antiquarian interest to be inspected, amongst them especially, the remains of Ramsey Abbey and the site of what once was Whittlesea Mere. The drainage of the whole of the Fen district, now known as the Bedford Level, about sixty miles in length, from Milton in Cambridge to Toynton in Lincoln, and in breadth about forty miles, from Peterborough in Northampton to Brandon in Suffolk, was commenced in 1634, and was finished, after many vicissitudes, soon after the commencement of the present century, and, as a history of successful and early engineering, deserves to be especially noticed by all archæologists. To conclude the week, a visit to Cambridge will be arranged, and there, with the assistance, it is hoped, of the Cambridge Archæological Society and the authorities of the University, a most interesting time will be spent, not only in the examination of the architectural features of the colleges, but in visits to such places as the "so-called" school of Pythagoras, the Round Church, old houses near Magdalen Bridge, the Falcon Inn and Yard, Petty Cury, and ancient buildings in Barnwell. Inquiries may be addressed to Mr. George R. Wright, Junior Athenæum, Piccadilly; or to the Hon. Local Secretaries, Dr. R. A. Douglas Lithgow, and Mr. John Leach, Wisbech.

THE LATE MR. C. C. OGLE, ARCHITECT.

THE late Mr. Charles Chaloner Ogle, barbarously murdered while acting as *Times* correspondent in Thessaly, and watching the conflict between the Greek insurgents and the Turks, made his first serious efforts in journalism as correspondent of the *Builder* in Italy and Greece. His death has excited just feelings of indignation and regret for the untimely fate of one deservedly esteemed and beloved amongst his personal acquaintance. Mr. Ogle, who would have completed the twenty-seventh year of his age on the 16th inst., was educated with other pupils under the tuition of his father at St. Clere, near Sevenoaks; after which he studied architecture, and in 1873 became an Associate of the Royal Institute of British Architects. With a view to enlarge his knowledge of that art, he visited Rome, having first called on us, and arranged for the transmission of information. In August, 1875, he went to Athens, where he associated himself with Herr Ziller, the Royal Architect, and worked some months in his office. While thus engaged, Mr. Ogle sent us several very interesting communications, to three of which we give references:—"Athens To-day," in our volume for 1875, p. 875; "Modern Athens," in the same volume, p. 899; and "Modern Athens," at p. 1 of the volume for 1876. He had about the same date addressed a letter to the *Times*, and was encouraged by its favourable reception to write again, and ultimately he became the recognised correspondent of that journal. The study of architecture then gave place to other things, and we heard nothing more of him until the news reached us of his sad fate.

THE ST. GOTTHARD TUNNEL.

Berlin papers recently made the startling announcement "that in boring for the St. Gotthard Tunnel a large lake would be met with, which would put a sudden end to all the works." This apprehension rested on the report made by the Swiss Federal Council on the progress of the boring operations during December, in which it was alleged to have been stated that "the sloping of the strata, which became more and more apparent as the boring advanced, had given rise to the assumption that there existed a 'natural basin' in the heart of St. Gotthard." A Bern correspondent, who, in consequence of this statement, made inquiries in the proper quarter respecting its correctness, says that this fear is entirely without foundation. It arose from an erroneous translation of the words "*bassin naturel*," used in the official French report. This term ought not to be translated "natural basin," but "natural cavity," which in geological language means a stratum or bed returning back upon itself.

PROPOSED NEW PUBLIC BUILDINGS FOR READING.

At a special meeting of the Reading Town Council, on the 16th inst., the plans prepared by Mr. Thomas Lainson, architect, Brighton, for the contemplated new Town Hall, Free Library, Museum, and Schools of Science and Art for Reading, were approved. The *Reading Mercury* says that the architect has so drawn his plans that the work may be done in three blocks, each section being complete and presentable in itself, so that should funds not be forthcoming the whole of the undertaking need not be completed for years. The first block contains the Town Hall, with its appurtenances; the next, the Free Library and Reading-room and Museum; and the third the Science and Art Schools, &c. The first-named section will immediately abut upon the present municipal buildings, a portion of the northern end, containing the old Council Chamber, and a little of the hall, being demolished to square the site, and to give a better effect. The hall, which will face Blagrave-street, where the principal entrance will be, is to be reached from the street first by an outer vestibule, with a flight of stairs, 20 ft. in width, and then a vestibule running the whole width of the hall, and measuring 15 ft. across. An important feature in the plans is that five doorways will be constructed, not necessarily for ingress, but to afford ample means of exit in case of fire or panic. The interior of the hall is in the French Renaissance style. On the ground-floor of the hall seats may be arranged for 950 persons, leaving for each individual the space of 1 ft. 6 in. by 2 ft. 8 in., and allowing for ample gangways. Arranged with similar liberality of space, the orchestra will accommodate 300 persons, and the balcony, which will be quite free from columns, about 500 more. The building will have a flat ceiling, coved, light being admitted through the cove. The internal dimensions will be 98 ft. by 60 ft., and a clear height of 50 ft. between the floor and the ceiling. The balcony will be approached by spacious stone staircases. The organ (the present instrument) will not be put in a recess as at present. Under the hall will be a large supper-room, with dressing-rooms for ladies and gentlemen, each having double approaches and exits; these rooms may, of course, be used for any purpose.

The block containing the Free Library, Reading-room, and Museum will also face Blagrave-street, the entrance being on the south side of Messrs. Collins's premises, facing west. The library is intended to have an area of 3,700 superficial feet, with a wall-space for bookshelves of about the same area. The room will be artificially divided into a reference library, inquiry office, reading-room, and ladies' room. The museum will extend above the library, and also over the vestibule and entrance to the hall, thus securing a floor area of more than 4,000 superficial feet.

The site to the east of Messrs. Collins's offices, and fronting north to the new road, will be appropriated for the Science and Art Schools. The block of buildings will comprse a commodious lecture-theatre, several drawing-rooms and class-rooms, a room for painting and drawing from the round, a modelling-room, a casting-room, a science-room, a laboratory for science teaching, a balance and instrument room, and a suite of rooms for the teaching of cookery.

With the exception of the Town-hall, the whole of the buildings will be (internally) in the Early French Gothic style. The external features of the whole will harmonise in colour and accord architecturally with the present block. An interesting feature of the new buildings will be that terra-cotta panels, illustrative of the principal incidents in the history of Reading, from the earliest records, will be used to embellish the Blagrave-street front of the Town-hall. The Schools of Science and Art will be adorned in a similar manner, with illustrations intended to represent the various arts and sciences instruction in which may be obtained within the buildings.

The total cost of the proposed buildings is stated at about 40,000*l.*

WATERLOO RAILWAY TERMINUS.

More than a year ago (*Builder*, vol. xxxv., p. 66), we gave particulars of some extensive works then and since in progress on the South-Western Railway. To the particulars then given as to the enlargement of Waterloo Terminus we may add that for the purpose of providing additional and separate space for the local traffic on the main line to Wimbledon, Epsom, Leatherhead, Surbiton, and Hampton Court, so as to set free the room on the old station for the main line through traffic, an extensive widening of the terminus is being effected on the south-east side. The whole of the extension is constructed on a viaduct, and the foundations have been peculiarly treacherous and difficult to deal with, it having been necessary in some cases to carry them to a depth of upwards of 20 ft. Upon blue lias lime concrete the piers have been built, and the arches turned in Portland cement. The additional viaduct thus formed will provide a very large space, having a double frontage approached by two lines of rails. The length of the platform will be 800 ft., varying in width from 32 ft. to 18 ft. At the Waterloo-road end, adjoining the offices, there will be a large area of platform space to accommodate the large crowds which frequently assemble during race weeks and other occasions. The whole of this area of platform and lines of rails is now being covered with a roof, carried on wrought-iron girders, and covered with zinc and glass. Facing the main street there will be a range of offices extending 160 ft. in length, and consisting of booking-offices, general waiting-rooms, besides waiting-room, refreshment-room, and telegraph office. These will be reached from the present station by means of a covered gangway or bridge over the approach-road leading from the Waterloo-road to the old offices, and which will be utilised to give access for carriages in waiting for trains arriving at the new station. Hydraulic machinery will be provided for working the luggage-hoists from the street level to the platform, also to convey the meat and milk traffic to one of the arches under the viaduct. This hydraulic machinery will be used in case of fire, affording a pressure of 600 lb. or 700 lb. per square inch, and being capable of throwing water to the highest point of the station with considerable force. An extensive range of offices is also being constructed next the old station, forming an arcade over the footpath leading from the Waterloo-road to the main-line departure side. The works are being carried out to meet the requirements of Mr. Archibald Scott, the general manager, from plans and designs prepared by Mr. W. Jacomb, the chief resident engineer, and are being executed by Messrs. Perry & Co., builders, of Bow. The hydraulic machinery will be provided and fixed by Sir William Armstrong & Co. It is expected that the new station will be opened about the 1st of July.

Mortlake. — On the 13th instant Messrs. Hawkes & Co., of the Brewery, Bishops Stortford, gave a dinner to the workmen who have been employed in erecting the new Queen's Head Hotel, Mortlake. The present building, which has a "stand" on the top capable of accommodating upwards of 150 people, was not commenced till the beginning of December last, and was pushed on rapidly in order to be ready for the Oxford and Cambridge boat-race. The architect is Mr. Thos. W. Willis, and the builders are Messrs. T. H. Adamson & Sons, of Putney.

THE ARTISTS' BENEVOLENT FUND.

Mr. George Augustus Sala, in his usually instructive and always entertaining "Echoes" (in the *Illustrated London News*), following up what was urged by the chairman at the recent dinner in aid of the Artists' Benevolent Fund, says:—

"The *élite* of the artistic world reserve their support, it would seem, for the Artists' *General* Benevolent Fund, of which the annual dinner takes place early in May. Mr. Frederick Leighton, R.A., is to be the president this year. It is, nevertheless, distressing to hear that both these beneficent institutions are not equally prosperous; for (let me whisper it in your ear) there is, notwithstanding the prodigious prices paid to the Princes of the Pencil, a terrible amount of poverty and suffering among the widows and children of artists, especially of those who die young, and whose feet have scarcely crossed the threshold of the House of Fame, ere they find—a grave: which may be the best kind of fame after all, for no one envies us when we are laid there. Fifty-eight widows and a large number of children are now in receipt of annuities from that Artists' Fund which is not 'general'; but the benevolent public, I take it, would be willing to support both charities if they knew more about them. The story of the foundation of the Artists' Annuity Fund is a very touching one. In the year 1809 Mr. Tagg, a once eminent engraver, became reduced by epilepsy and paralysis to a state of utter destitution. He was frequently visited by a brother engraver, Mr. Edward Scriven, of whom it has been said that when he had done his work 'his pleasure was to travel across the busy city, unknown and unheeded, to discover misery and solace affliction.' On the occasion of one of the visits of this just man to his paralytic friend, he found the brokers in the house. They were going to seize Tagg's bed; but Scriven and another engraver named Pollard paid out the execution, and shortly afterwards got up a meeting at the Gray's Inn Coffee-house to organise a permanent fund (founded on the important principle of provident care) for the relief of distress amongst artists, and the granting of annuities to their widows and orphans. This fund was incorporated by Royal Charter in 1827. In the list of the original founders I find such historically artistic names as those of Cromek, Luke Schiavonetti (who engraved Blake's outlines to Blair's 'Grave'), Uwins, Girtin, Landseer, Woolnoth, Bromley, Colnaghi, Heath, Linnell, and Earlom. That was sixty-nine years since. I like to trace hereditary talent in the artistic race. At the annual dinner of the benevolent branch of the Fund in 1827 the Earl of Aberdeen presided, and the subscriptions amounted to 1,099*l.* 13*s.* 2*d.*"

DECORATION OF THE PARIS EXHIBITION BUILDING.

A correspondent of the *Society of Arts* says:—"Approaching the building by the front, I note the façade decorated with illuminated shields of the exhibiting nations, which are to be surmounted each by its own colours; above the a ch of the great door will be a device indicative of the French Republic, peace and prosperity; the great wrought-iron pillars are being filled in with slabs of brilliantly coloured faïence, and on pedestals below, a series of fine colossal figures are being set up, and are very effective. Entering the grand vestibule, the first thing, perhaps, that will strike most people is the novel kind of decoration that has been adopted. All attempt, or nearly all, at treating the building as an iron one, has been abandoned; the ceiling is filled in with composition casts, those in the centre being circular, and of immense size, probably 30 ft. in diameter, in strong wooden frames, and when on the floor no one would have guessed that they were intended to be fixed overhead; their weight must be enormous. On each side of the preceding are three ranges of panels, and outside these again are decorative covings; the ornament is principally in dusky gold, with reddish brown reflections, and in the covings a little vermilion is introduced; the other colours are generally of a neutral character. The clearstory windows are peculiar, each being divided into nine equal parts, and the frames so planned that there is a square in the middle of each division, while all the rest of the bars are set obliquely, producing a number of triangular panes around the

central squares, and beyond the former a number of squares set lozenge-fashion. A few of the panes are decorated with white scroll-work on a blue ground stencilled on, and the remainder are rendered opaque. The effect does not strike one as very satisfactory, but the plan is a good one, and might be made to produce admirable results without much expense. The huge wrought-iron pillars which support the roof, sufficiently large to contain fixed ladders, by means of which the top of the building is reached, are treated as metal, painted and heightened with bronze powder on the rivet heads and other prominent parts, but they are fitted with panels formed of plaster casts, painted and gilt, and over these with gilt medallions bearing the letters 'R. F.'—*République Française.*

Remembering that this noble vestibule was intended to be the grand promenade of the Exhibition, graced only with some of the most exquisite productions of Europe and Asia, it was startling at first to find it more like an enormous carpenter's shop than anything else, with an army of men busy at work. From end to end, with the exception of the central part reserved for M. Lindin's grand trophy of Belgian horticulture, the middle portion is being covered with large structures. Of these by far the most remarkable is the Indian temple, in which are to be exhibited your president's treasures, with some of those of H.R.H. the Princess of Wales, and a selection of the most beautiful objects of Indian manufacture attainable. The pavilion was designed and is being erected under the eye of Mr. C. Purdon Clarke, the official agent for the Indian section; it is a compound structure, consisting of two pavilions, each having an upper floor, and connected by a long narrow arcade-like structure. The whole is formed of extremely slender and elegant colonettes set wide apart, the spaces to be filled in with plate-glass on all sides; along the central part is a frieze formed of open-work panels, and over each pavilion is a complication roof with several small domes surmounted with spikes. The structure is 130 ft. long and abont 30 ft. in width and height. It is much admired. It is being painted a bright chocolate colour, relieved with a little gold; other colours were tried experimentally, but this was considered the most successful. Just beyond this temple is a third pavilion, precisely like the other two; this is being constructed for the Colonial Commissions conjointly, to contain a selection of the most remarkable productions of our other possessions abroad. Canada, in addition, is erecting a large trophy of her own in the angle beyond, facing the machinery court."

THE NOTTINGHAM TOWN IMPROVEMENTS.

Town improvements and other works in connexion therewith, upon a scale of very considerable magnitude, have been going forward at Nottingham during the last two years, and are still in progress. One of the most costly of these is that in connexion with Nottingham Castle and grounds, which, as our readers know, are undergoing very extensive alterations with the view of adapting them to the purposes of a museum. At a meeting of the Town Council lately, the Midland Counties Art Museum Committee reported that a further expenditure of 5,282*l.* would be necessary upon the castle and grounds, and the Council voted the sum. This brings the total cost of the museum to the ratepayers up to 15,718*l.*, in addition to 10,580*l.*, which has been defrayed by public subscription. At the same meeting of the Council propositions were submitted for the establishment of three new recreation-grounds, which would amount to a total cost of between 25,000*l.* and 30,000*l.* Two of these schemes, for grounds at Sneinton and Fenton, were favourably received, and referred to the improvement committee for the arrangement of details, but the third,—that for a recreation-ground at Basford,—was rejected, on account of the vicinity of the racecourse. Apart from the new recreation-grounds which have thus been sanctioned, Nottingham already possesses five of these areas of health.

Ripon Cathedral.—On Wednesday morning there was a very large congregation in Ripon Cathedral on the occasion of the opening of the new organ built by Messrs. Lewis & Co. The service was held in the nave of the cathedral.

THE THIRLMERE WATER SCHEME.

The report of the Select Committee on the Manchester Corporation Water Bill has just been issued. The Committee point out that there are only three lakes, Ullswater, Haweswater, and Thirlmere, at sufficient elevation to supply Manchester by gravitation, and the cost of making tunnels from the first two, both from their length and depth below the surface, render them less suitable for the purpose. The Committee add:—

"The hills which supply Thirlmere with water are practically free from mines and other sources of contamination, while the quality of the water is excellent. The lake is formed by a natural dam of rock at its south end, and this causes the valley to be filled by the drainage from the hills. In former times the lake was much larger than it is at present, but parts of the rocky barrier being worn away, the lake became reduced to its present dimensions. The proposal of the corporation is to fill up the parts thus abraded by an artificial embankment, and thus to restore the lake to its ancient condition. This is an engineering work of great simplicity, for the highest portion of the embankment will only be 50 ft., and, in proportion to the lofty hills around, it is not of a character to attract attention. The water thus impounded will rise 50 ft., and cover a greater area of ground. It will remove the narrow portion of the lake, which is now crossed by bridges in the middle, and will thus certainly obliterate a characteristic feature in it. On the other hand, though one small island will be submerged, two new islands will be formed, so that these may partly compensate for the widening of the narrow part of the lake by breaking up the continuity of the surface. Undoubtedly, if the roads are constructed as projected in the Bill, the lake will be seen in future by a much larger number of people than at present, for the proprietors hitherto have kept it very much like a preserve, and have offered few facilities for the enjoyment of the scenery by the general public."

The water is to be carried to Manchester by a composite aqueduct 102 miles in length, partly consisting of 14 miles of tunnel, partly of 39 miles of a "cut and cover" channel in the ground, and partly, in the case of valleys and rivers, by 33 miles of cast-iron syphon-pipes, or in a few cases by bridges. The Committee are of opinion that beyond the temporary inconvenience and unsightliness caused by the construction of the works there will be little or no permanent injury to the scenery.

THE CAMEL AND THE NEEDLE'S EYE.

Sir Charles A. Murray, whose adventures, forty years ago, among the wild Pawnee Indians, took the world by storm, but who now inhabits (what was) Mr. Woodfield's charming villa at Cannes, mentions in a recent number of *Notes and Queries* his having somewhere read that in Persia the small door, or wicket, through which foot-passengers enter a town after the larger gate is closed, goes by the name of "needle's eye." He asks if there be any evidence to show that the same metaphorical sense was current in Palestine at the time of our Saviour's preaching. He also notices the use by Dante (in his "Purgatorio") of the term *cruna* (*Anglicè* "a needle's eye"), when describing how the poet and his conductor crept through a narrow passage. As might have been expected, the query has elicited a host of replies. The *Rock* condenses them thus:—Mr. Tew (Patching Rectory) cites a long passage from Pole's "Synopsis," which he deems exhaustive of the subject, but which, while containing much curious information, is by no means "exhaustive" of the difficulty. Mr. Tew discards, and most properly, the idea that by the word Κάμηλος our Lord intended, not "camel," but "cable." Cuthbert Bede refers to (1) Kitto's Pictorial Bible, where mention is made of the Indian proverb of "an elephant passing through the eye of a needle," and (2) to Mr. John Macgregor's sketch of the "Town Gate of Siout," where there is one wide opening:—

"But this is closed at sunset, and after that you can get in only by the small gate, which is very narrow and lower than the other. Many camels go into the town every day, with their loads hanging in large broad packages on each side of the camel's hump. When the high, broad gate is closed the camel cannot get in through the narrow gate, unless he stoops down on his knees, and has his load taken from his sides."

Canon Farrar, as usual, does not see his way, and remarks (in his "Life of Christ") that "this explanation needs confirmation." But other correspondents fully establish the fact about which the rev. doctor is in doubt. Thus a writer, signing himself "St. Swithun," quotes from the Rev. J. G. Wood's "Bible Animals":—

"In Oriental cities there are in the large gates small and very low apertures, called, metaphorically, 'needles' eyes,' just as we talk of certain windows as 'bulls' eyes.' These entrances are too narrow for a camel to pass through them in the ordinary manner, if loaded. When a loaded camel has to pass through one of these entrances, it kneels down, its load is removed, and then it shuffles through it on its knees. 'Yesterday,' writes Lady Duff Gordon, from Cairo, 'I saw a camel go through the eye of a needle, *i. e.*, the low-arched door of an enclosure. He must kneel and bow his head, to creep through, and thus the rich man must humble himself.'"

A further corroboration is furnished by Mr. Shirley (of Eatington), who quotes the following passage from "The Life and Memoirs" of his uncle, Bishop Shirley: "By the way, I met, the other day, with an interesting illustration of Matthew xix. 24, about the camel and the needle's eye. Lord Nugent, when at Hebron, was directed to 'go out by the needle's eye,' that is, by the small side-gate of the city." After all, the metaphor itself is not stronger than that employed by our Lord when rebuking the Pharisees: "Ye blind guides, which strain at [or out] a gnat and swallow a camel" (Matthew xxiii. 24). And as to the application, we cannot do better than borrow a note in St. Anselm's "Catena Aurea," referring to Matthew xix. 24:—

"At Jerusalem there is, or was, a certain gate, called the 'Needle's eye,' through which a camel could not pass but upon its bended knees, and after its burden had been taken off; and so the rich man should not be able to pass along the narrow way that leads to life till he had put off the burden of sin and of riches, that is, by ceasing to love them."

PILE DWELLINGS IN BRANDENBURG.

From Cottbus, in the province of Brandenburg, Prussia, it is announced that, on the occasion of laying the foundations of a house there, the remains of one of the primeval pile dwellings were discovered by a local antiquary, Dr. Veckenstedt. According to that gentleman, among other articles found at the spot were two grinding-stones upon which were carved two designs. The chief features of these were two swans opposite to each other on each of three different grounds. In the locality in question the same gentleman has made altogether five discoveries of primeval remains, comprising arrow-heads, scrapers, cerns, flint knives, &c., mingled with pieces of German and Slavonic urns.

SURVEYORSHIP ITEMS.

Ellon.—A meeting of the Ellon district of Aberdeenshire Road Trustees was held on the 10th inst. for the purpose of appointing a road surveyor for the district. Mr. A. F. Douglass, Haddo House, presided. There were in all fifty-one applications for the situation, which has a salary attached to it of 150*l.* a year. The applications had been remitted to a committee, and the candidates were reduced to a leet of three:—Mr. Jas. Calder, Perth; Mr. Jas. Dawson, Fetternear, Inverurie; and Mr. Alex. W. Chrystal. From the latter gentleman, however, a telegram had been received withdrawing his name from the leet. The committee's report having been approved, Mr. James Dawson was unanimously elected.

Droitwich.—At the meeting of the Droitwich Town Council on the 15th inst., Mr. George Hands, the borough surveyor, whom it was recommended by the Streets and Sanitary Committee, at a recent meeting, should be appointed as clerk of the works on the sewerage and water works schemes, at a salary of 25*l.* in addition to his salary for his surveyorship, applied that he should be paid a guinea per week in his proposed new capacity. It was resolved by a majority of one that Mr. Hands should be paid at the rate of 35*l.* per annum. It was also decided that an assistant whom Mr. Hands might recommend to take instructions from him as to the work, should be appointed, and paid by the Council.

NEWS FROM INDIA.

The *Bombay Gazette* says it is reported that, at the suggestion of Sir A. Clarke, Colonel Thompson, R.E., is going out from England thoroughly to examine the Indian coast, with a view of selecting spots where new ports may be opened out.

An archæological find is reported near Rupar. Greek copper coins, silver coins of Akbar, 200 swords, and double-edged swords. The informant was of opinion that the Sutlej, now some three miles distant, once ran close to the locality of the find.

The municipal corporation of Bombay have resolved to proceed with the most urgently required portion of the new drainage scheme at once, for which purpose they have sanctioned an outlay of 16,17,000 rupees (161,000*l.*) during the next twelve months, and have appointed a committee to inquire into ways and means for

carrying out the entire scheme. Some of the European members are in favour of the whole work being completed in three years; but the native members have taken fright at the prospect of a slight increase of taxation for a few years, and prefer to spread the work over a longer period, with a view to avoid increasing the burden of the ratepayers.

CASES UNDER THE METROPOLITAN BUILDING ACT.

Mr. Francis Light, of 21, Thornhill-crescent, Barnsbury, was summoned at Clerkenwell by Mr. J. Goldicutt Turner, Deputy District Surveyor for East Islington, for erecting the party-wall between the first and second houses east from Turle-road, on the south side of Thorpdale-road, improperly bonded, and not of bricks at least 8½ in. in length. The Surveyor produced specimens of the materials ("bats," &c.) with which the bulk of the wall was being constructed; he also showed the magistrate bricks laid in proper bond, and a specimen, as far as size was concerned, of the bricks required by the Act. Notwithstanding the statutory notices to amend and the summons taken out, besides several letters, defendant was still proceeding with the wall in question.

Mr. Frederick Wallen, architect, confirmed Mr. Turner's evidence, and said it was the worst wall he had ever seen.

Defendant called his bricklayer and carpenter, who both said the wall was a good one, and properly built.

The magistrate (Mr. Barstow) ordered defendant to pull down and amend the wall within seven days, and pay the costs of the proceedings.

Mr. John Gurney, of 131, Seven Sisters-road, was summoned at Clerkenwell Police Court by J. Goldicutt Turner, deputy district surveyor of East Islington, to answer a complaint that he did erect an addition to a building situate in the garden on the east side of 131, Seven Sisters-road, partially covered with boarding instead of with slates, tiles, metal, or other incombustible materials, and extending beyond the general line of front on the north side of the Seven Sisters-road, without first having obtained permission of the Metropolitan Board of Works.

It was stated that the defendant had applied for permission to erect the building in question, but it had been refused.

The defendant contended that the building did not come within the provisions of the Building Act, as it was built on wheels. The magistrate made an order on the defendant to pull down the objectionable building, and also ordered the defendant to pay 1*l.* 3s. costs.

Mr. Charles Webber, of Riga Wharf, Kingsland-road, was also summoned by Mr. Turner to answer a complaint of doing certain work at the Gipsy Queen, Blackstock-road; did divide the building, in one occupation, into two tenements, each having a separate entrance from without and separate staircase, without having constructed a proper party-wall between them; and did omit to separate the two tenements by a party-wall constructed of brick, stone, or other hard and incombustible materials, having three courses of footings,—two stories of work 13½ in. in thickness, and two stories 8½ inches; and though he had received notice to do the work, had omitted to do so.

The magistrate, after hearing arguments on both sides, adjourned the case for twenty-eight days.

AN ARCHITECT'S CLAIM SUSTAINED.

CHALON *v.* ROCHE.

In this action (in Bloomsbury County Court, before Mr. Judge Russell) the plaintiff, an architect and surveyor, residing in Gloucester-road, Regent's Park, sued the defendant, a private gentleman residing in Adelaide-road, Haverstock-hill, to recover the sum of 10*l.* for professional services rendered to the defendant on his alleged order.

Mr. M. Lewis appeared as solicitor for the plaintiff, while the defendant conducted his own case in person.

The plaintiff being called said the defendant personally ordered the plans in dispute to be prepared, and he fully expected from the subsequent correspondence upon the subject that the defendant would act upon the plans which had been submitted to him: finding this not the case, and feeling himself, a little annoyed, as he considered he had been in a measure trifled with, he considered that in the interests of the profession he was entitled to instruct his solicitor to bring the present action to test whether he was justified or not in doing so, as the transaction appeared to him to be very like sucking one man's brains in order that another might reap the benefit, inasmuch as although the work in question materially deviated in its construction from the plan he had supplied, many of his original views had been carried out.

Mr. Lewis here put in several letters in support of the plaintiff's case, which terminated it.

The defendant, being sworn, said he considered the plaintiff's claim an extortionate one as, even admitting his liability, there was a witness present in court who would abundantly prove that the charge made by the plaintiff was an excessive one.

The Judge here asked the plaintiff if the charge made was a fair and reasonable one, and being answered in the affirmative, the defendant concluded by stating he had asked one or two other persons to submit plans to him, and he intended to select whichever suited his purpose, and never expected to be charged for those he did not adopt, as no other person had applied to him for payment. He considered the transaction equivalent to builders sending him an estimate, and that he was entitled to select which best suited his purpose, and he therefore felt bound to resist the present claim upon principle. In cross-examination the defendant said he had plans from two other architects, and the one whose plan he had adopted was present in court, for the purpose of giving evidence in the matter.

Edward Ward said the plan he had submitted to the defendant had been adopted by him, and that he had considered the charge which the plaintiff had made to be an excessive one, and that 5*l.* would amply compensate him for so small a plan as the one produced in court.

In cross-examination witness said he was not a member of the Institute of British Architects, nor was he an architect at all, but only a builder; upon which Mr. Lewis told him to sit down, and declined to ask him any further questions.

This being the defendant's case,

The Judge considered the case to be one of oath against oath, inasmuch as the testimony of the last witness could hardly be admitted, as he acknowledged himself he was only a builder, and, consequently, not being an architect, would not be expected to form any adequate opinion as to professional charges; and again, looking at the plans before him, together with all the surroundings of the case, he should certainly rule in favour of the plaintiff, with solicitor's costs.

Judgment was accordingly entered for the plaintiff for the full amount claimed, with costs.

AN ARCHITECT'S CLAIM FOR "QUANTITIES."

SHAW *v.* MATTOCK.

In this case, heard in the Keighley County Court on the 17th inst., the plaintiff was Mr. John Shaw, architect, Ilkley, who sought to recover from the defendant, Mr. Jonathan Mattock, contractor, the value of professional services rendered.

Some months ago tenders were invited for the erection of a villa residence at Ilkley. Defendant was desirous of tendering, and secured the job. The defence was to the effect that the defendant did not obtain the contract for the house by means of the quantities of the plaintiff.

Jonathan Mattock, the defendant, said the plaintiff offered him the quantities. He expected that they would be correct in all particulars. He asked the plaintiff to guarantee their accuracy, and this was refused. He was appointed contractor directly from the person advertising for the tenders, and not through the quantities of the plaintiff. Plaintiff's quantities valued the erection at 2,860*l.*; when he had quantities prepared by another man he found the work would extend to 160*l.* more, which he would lose, having tendered on the plaintiff's quantities.

Verdict for the defendant, with costs.

HOUSE PROPERTY DAMAGED BY RAILWAY WORKS.

EDWARDS *v.* THE GREAT EASTERN RAILWAY COMPANY.

This case was heard on the 12th inst., in the Court of Appeal, before Lords Justices James, Cotton, and Thesiger.

The plaintiff was a lessee, under the Carpenters' Company, of certain land near Stratford, in Essex, upon which he had built twelve houses. Adjoining these houses there was a garden surrounded by a ditch. The defendants, while enlarging their railway, had filled up an old water-course, and had constructed a new one nearer the plaintiff's houses, and had connected it with the above-mentioned ditch by means of a pipe, the effect of which was to cause the ditch to overflow and injure the foundations of plaintiff's houses. The plaintiff claimed an injunction to restrain the defendants from discharging any water into the ditch in question so as to overflow his premises, and damages for the injury which had been caused. The Court below had granted a perpetual injunction, with costs of the action, and given the plaintiff 100*l.*, on the ground that some damage had been done to his property, and by way of compensation for the extra costs he would have to pay beyond the costs between party and party. The defendants appealed.

Their lordships held that the defendants had constructed their works in accordance with the powers contained in their Act of Parliament, and therefore the decision of the Vice-Chancellor could not stand. If any injury had been done by the railway company, the remedy was not by an action, but by compensation under the 68th section of the Act.

Berlin, which has now a population of one million souls, possesses no fewer than 7,200 public-houses and *cafés*, being rather more than one such an establishment to every 139 of the inhabitants. Many of the new beer-houses, like the *Reichshalle*, are gigantic establishments, capable of seating 500 to 1,000 guests, and have considerable architectural pretensions.

THE DRAINAGE OF THE SURREY GARDENS ESTATE.

The works in connexion with the laying-out of the Surrey Gardens estate for building upon are about to be commenced by Messrs. Sutton & Dudley, who have come into possession of the property, and the matter was before the Newington Vestry last week on a recommendation of the sewers committee that a new brick sewer be constructed down Manor-place (the approach to the estate from Walworth-road), at an estimated cost of 1,100*l.*, and that the owners of the Surrey Gardens estate be charged 130*l.*, one-half cost of a 15-inch sewer, which would be sufficient for the drainage of that estate. Objection was taken by a number of members to the expenditure of 1,100*l.* by the parish, on the ground that the outlay was not necessary for the ordinary drainage of the district; but that it was required for the houses which were about to be erected on the estate. A long and somewhat personal discussion took place, in the course of which Mr. Malthouse observed that it looked very like an attempt to tax the ratepayers in order to oblige speculators; upon which Mr. C. S. Barker said that such was not the fact, as the brick sewer was required for the whole drainage of the district, which was very heavy. Ultimately a compromise was agreed to, to the effect that the owners of the Surrey Gardens estate should be called upon to pay 300*l.* towards the new brick sewer.

DRAINAGE ITEMS.

Slough.—A specification has been prepared by Mr. Grantham, C.E., for providing the town of Slough with a new system of sewers and outfall sewer. The separate system will be adopted, the existing sewers being used for surface water, &c., and a new set of sewers laid down for the sewage.

Harwich.—The Harwich Town Council have agreed to a scheme for draining the town, the outlet to be at the end of the breakwater. The estimate is 8,000*l.* The approval of the Harbour Conservancy Board has to be obtained.

Chapel-en-le-Frith.—On the 18th inst. Mr. Robert Morgan, one of the inspectors of the Local Government Board, held an inquiry at Chapel-en-le-Frith into an application made by the Sanitary Authority of the Chapel-en-le-Frith Union to borrow 3,000*l.* for the purpose of sewering the town of Chapel-en-le-Frith. Mr. John Nall, the surveyor to the Authority, explained the intended works, and said it was proposed to turn the overflow from the filtration-tanks into the River Goyt, a tributary of the Mersey. The inspector asked what means were to be adopted to clarify the sewage? Mr. Nall said on a small scale land filtration was to be resorted to. The inspector pointed out that it was against the Rivers Pollution Prevention Act to turn the sewage into the stream before it had been clarified, and that the Local Government Board would not lend money unless means were taken to clarify the sewage before passing it into the river.

Wallingford.—Messrs. Ripley & Simmonds, the engineers employed by the Wallingford Town Council to advise them on the subject of the drainage of the town, have made their report. It is stated that they recommend a system for utilisation of the sewage upon land by irrigation, as the best for Wallingford, upon engineering, sanitary, and economical grounds. They recommend a site in the allotment gardens for the outfall works, and a field adjoining the Corporation land, to the north-west of the town, for sewage irrigation. The estimated cost, exclusive of the purchase of the land for irrigation, is 4,900*l.*,—the items mentioned being, providing straining-tanks in duplicate, engines and machinery in duplicate, an engine-house, underground tank or equalising reservoir to contain 10,000 gallons, purchase of land at pumping-station, compensation to owners and occupiers of land through which the rising main and main-drain will pass, drains in the town, with the necessary flushing arrangements; ventilating-pipes and inspection-wells, preparing fifteen acres of land for irrigation, law expenses, and engineers' charges.

A Technical College has just been opened at Bielefeld, devoted to textile industry. Another has been founded at Iserlohn in connexion with metallic manufactures.

THE BIENNIAL CONFERENCE, 1878.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—In view of the approaching Conference, to be held during the week commencing the 3rd of June next, and which has already been announced in your advertisement columns, the council have nominated a committee who, in accordance with bye-law 74, have appointed two of their number to act as hon. secretaries. We ask leave, therefore, to say, through the medium of your journal, that any suggestions regarding the programme of the Conference should be addressed to Mr. Arthur Cates or to Mr R. Phené Spiers, hon. secs., Conference Committee, 1878. These gentlemen, we may add, have kindly consented to give information about the probable proceedings to any one who may be pleased to apply to them.

(Signed) FRED. P. COCKERELL, Hon. Sec.
WILLIAM H. WHITE, Officiating Sec.

THE NEW BUILDING REGULATIONS FOR GLASGOW.

THE following letter referring to the proposed alteration of the Police Act has been addressed to the Town Council, and also to Lord Redesdale and the Lord Advocate, who have promised to give it due consideration. We understand that the aim of the architects is to induce the Town Council to take up the subject of a General Building Act, consolidating existing regulations so far as these are satisfactory, and embracing all proper provisions as to structure and arrangement for securing the public health and safety :—

"157, St. Vincent-street, Glasgow,
April 8, 1878.

Dear Sir—We duly received Mr. Lang's letter of the 3rd inst., sending us print of the minute of the Town Council as to new building regulations, with amendments thereon, for which we beg to thank you. The Council of the Glasgow Institute of Architects think it right to express their strong and unanimous disapproval of the course which the Town Council has adopted in asking the Government to give statutory force to new building regulations which neither the owners of property in Glasgow nor their professional advisers have had any opportunity whatever of considering. The members of the Glasgow Institute of Architects are fully alive to the necessity of all building operations (especially in towns) being regulated by statute, and conducted under competent supervision, in such a manner as shall most conduce to the public health and safety, with due regard to the rights of private property. The subject has been frequently before them, and they are prepared, in any way which may be considered desirable, to co-operate most heartily with the authorities in devising and obtaining a comprehensive measure dealing with this important and complex subject, so directly affecting their interests, and so beset with difficulties, which only those practically acquainted with it can fully appreciate; but they must decidedly condemn a hasty attempt to patch up a measure which, as a whole, is acknowledged to be unsatisfactory, by the addition of clauses which are also, in many respects, objectionable.—We are, dear sir, yours truly,

(Signed) JOHN BURNET, Prest.
WILLIAM M'LEAN, Secy.

James D. Marwick, Esq., Town Clerk."

FULHAM CASUAL WARDS COMPETITION.

SIR,—Pressure of business prevented me replying to the letter signed "Fair Play," in your issue of the 29th ult., on the subject of this competition; and as I did not do so at the time, I should have let it pass but for the communication signed "Competitor," in your paper of the 20th inst. I now feel it necessary to do so in justice to myself, and also to remove, if possible, the imputation of any unfairness on my part, or favour from the Board of Guardians, because I happen to be a local man.

I quite agree with your correspondent that there is great room for improvement in the matter of competitions; and also that competitive drawings should always be drawn to a uniform scale. I would go further and say that the colouring (or rather the want of colouring) should be uniform; for I would have all drawings in sepia or ink, and eschew altogether highly-coloured drawings, with showy skies and landscape and perspectives from impossible points of view. These auxiliaries, sir, as you well know, often influence the selection in favour of an ill-considered and unworthy design. Now, as to this particular case, allow me to state the facts so far as I am concerned. I went to the Union House to inquire if there was any plan of the site, or written or printed instructions. I saw a youth at the office, who knew nothing about it; I then left my name as an intending competitor, thinking that if there was anything of the kind it would be sent to me; but I received nothing, and therefore prepared my design from the information contained in the advertisement, and that alone; and in that advertisement there was nothing about scale; and the site was mentioned as "the Stone Yard." Why I did not in common with your correspondent and other competitors receive the copy of the Ordnance maps referred to, and the particulars of the scale to which the plans were to be drawn, I cannot tell, and I consider that I was placed at a disadvantage thereby, because the plan of the site (which I saw for the first time when summoned by letter dated March 20th, to attend the Board of Guardians on the 22nd) showed a much larger area of ground than "the Stone Yard": and had I seen it before, my design would have been different, and possibly better; and further, I consider that it is much to the advantage of a competitor to make his drawings to a ¼ in. than to ⅛ in. scale, as he can show what he intends in a more clear and detailed manner.

With reference to the remark,—I had almost said imputation, that the other designs "were put on one side, utilised as a reference, or otherwise made use of,"—all I can say is that I had a hasty glance at them, altogether not exceeding half an hour, on the day I attended the guardians, viz., 22nd of March. I was in the room in which the designs were hung, and there met two of the other competitors, viz, Mr Messenger and Mr. Saunders Mr. Messinger at once discovered that the selected plan was not to the same scale as the others, and said he should enter his protest against it; he further said to me,—What would you do under the circumstances? I replied, protest, certainly. He then went into the office, wrote a letter and sent it in to the Board, which was sitting at the time, and was called in. Upon inquiry, it was found that Mr. Marsh, the clerk, had not sent the plan and particulars to me. Mr. Messenger being informed that such was the case, I believe stated that the explanation was sufficient, and he further did me the honour to say to the guardians that they had selected a good plan.

Now, as to the personal question of my being Surveyor to "The Fulham District Board of Works," and that a member of that body had placed upon the agenda a notice of motion, "That Mr. Bean, the surveyor, be requested to relinquish all private practice, &c.," I cannot help saying that I think this is quite beside the question, and savours somewhat of the animus to which I have been subjected for some time past; but what my arrangement with a Board of Works (entered into more than twenty-two years ago, with a clear and distinct understanding that I should be permitted to carry on my private practice) can have to do with a public competition I am at a loss to understand.

I trust this statement of facts will set at rest the question at issue, and for my own part I shall not again trespass on your valuable space on this subject.

ALFRED C. BEAN.

THE PUPILAGE OF SIR G. G. SCOTT.

I REGRET to see by the *Builder* of the 20th inst. that Professor Donaldson has repeated his erroneous statement as to the pupilage of the late Sir Gilbert Scott. Your excellent sketch of the life of the late most eminent architect mentioned quite correctly that he was articled to my father, and entered his office on April 10, 1827. It would have been more to the purpose if my respected friend, instead of calling on Mr. Nelson, had called on me. No doubt I could have satisfied him; a mere comparison of dates would have done it. I think he would have been saved the trouble of those further remarks at the Institute meeting on Monday week. I should hardly have ventured so strange a statement unless I had been perfectly sure; and it is quite true that among my late father's papers I found the very Articles themselves.

And now, sir, let me add that the remarkable way in which Sir Gilbert Scott appreciated the Gothic movement at its initiation, and placed himself at the head of it, entering upon and carrying out with great success one of the most extraordinary careers ever seen in the history of art, is without doubt all due to his own genius and talent, perseverance, and great power of work. Those with whom he passed his days of pupilage were educated in another school, and could have done very little to lay the foundation for that special knowledge and learning which he afterwards exhibited. JAMES EDMESTON.

CHESTNUT TIMBER.

SIR,—I am quite sure that the above-named timber was greatly used in Cornwall (in the olden times) for building and other purposes. My ancestors have been general carpenters and builders for 250 years, and I have heard some of them say that the local-grown timber was much used before deal came into knowledge and use. I have had a great practical experience in building matters, and have come across many old buildings where chestnut, walnut, elm, &c., have been used in construction, and which were, no doubt, grown on the estates.

Some twenty-five years since I was restoring a gentleman's residence, in which there were some rooms of great antiquity. These rooms were panelled from floor to ceiling with walnut and chestnut, and were wanted to be kept intact. The ceilings were attached to the main roof timbers, and it was therefore desirable to disturb the roof as little as possible. On examining the roof I found the principals to be elm, the heart of which was in a very good state of preservation; but the sap at the least touch would crumble into dust. The scantlings of the principals being large, the heart-timber was quite strong enough to support the roof. I may say that the heart of the wood was so good and so tough (as locally termed) that there was hardly any cutting it with saw or hatchet. It was more like leather than wood. I allowed the elm principals to remain and put on new deal purlins and rafters only.

In another residence I found chestnut beams, elm principals to roofs, deal purlins and rafters, door and window frames chestnut. The heart of the chestnut was in a good state of preservation, the sap entirely decayed. The heart of the elm in a very good state, the sap decayed. The original deal purlins and rafters, or what was left, were decayed and eaten out with worms, and the roofs appeared to be kept together by the new purlins and rafters which had from time to time been fixed. I have also found chestnut used in the roofs of churches, and have often used it for wheel timber, as spokes and felloes.

In the aforenamed instances I at first thought the wood to be oak; but, on examining, I found it to be chestnut, the difference of which to a practical man is easily known.

From the construction of the roofs, I have no doubt but that those buildings were originally covered with straw thatch. W. L. DALE.

BRICKYARD CHIMNEYS.*

SIR,—Mr. R. M. Bancroft, in a paper on chimney construction, recently read before the Civil and Mechanical Engineers' Society, describes, among many others, the chimney at Messrs. Edward Brook & Sons' fire-clay works, Huddersfield. In this chimney the interior of the shaft is built entirely of fire-clay. The cap is 12 ft. outside diameter, and no stone is used in it, all overlapping being gradually formed by hard-burnt radiated firebricks, 14 in. by 5 in. by 3 in.

DELTA.

In answer to "M. & S.," a correspondent recommends the West Bromwich vitrified blue bricks for this purpose, as they are not affected by atmospheric or chemical action. "The stacks at these works, which are built of blue bricks, have been in constant use for many years, and, practically speaking, the bricks are as good as when they were first used." At the Branch Works (Radnall Field, Oldbury) a very large stack has been completed, the ornamental top of which is built of bricks, some of which weigh nearly one ton each, made at these works.

PUBLIC INCONVENIENCE.

How much longer is the public who use the "underground railway" to be subjected to the annoyance, inconvenience, and, at times, considerable loss, at those stations where gates are used, by having these gates slammed in their faces by the men in charge, whilst the train is stationary at the platform for minutes after, and to be subjected to the impertinence of these men on remonstrating with them on the state of things, and to be told,—as occurred to me at the Charing-cross Station, to instance the last case only,—with a most insolent grin,—"You will have to wait half an hour for the next train." I can understand, in the case of a crowd accumulating on the steps, the value of such a precaution; but when there are one or two persons only, surely it is quite unnecessary, and it cannot be the intention or desire of the directors. I should also like to inquire if it is the duty of the men who walk the platforms, with gold lace on their caps, to stand by and hear passengers placed in this position insulted and sneered at by the underlings.

A DAILY PASSENGER.

READING TOWN-HALL COMPETITION.

SIR,—Your columns from time to time have given accounts of queer competitions, but I think that the above furnishes a novel feature.

It appears that the Town Council appointed Mr. Thos. Lainson, of Brighton, to report upon the competitive designs, and, after the announcement that none of the plans were in accordance with the requirements, three were placed first, second, and third in order of merit, and the premiums paid to the respective authors.

Plans by Mr. Lainson, the referee, were brought forward, and have been approved by the Corporation.

As Mr. Lainson indulges in the letters F.R.I.B.A., it appears to be a matter for the Institute to take up. It is better "to bear the ills we have" in having designs selected by non-professional judges, than to have referees appointed who eventually get the work.

FAIR PLAY.

Rent at Brighton.—A little house with shop has been built in the King's-road, Brighton, under the direction of Mr. Arthur Loader, which is somewhat novel in design, if not particularly beautiful. It is said to be the smallest building, as a house, anywhere, as a table 6 ft. square cannot be put inside it. Yet it is let at 150*l.* a year.

* See pp. 391, 416, *ante*.

MASTERS AND MEN.

Bolton.—A strike is, it is feared, likely to take place amongst the carpenters and joiners of Bolton. The master builders on the 1st of February gave notice that after the 1st of May wages would be reduced 1d. per hour, and working hours both indoor and outdoor increased from 48½ to 52 per week for ten months, and from 43½ to 47 per week during December and January. At present the hours for indoor work in winter are 48½, and for out-door work 43½. By the proposed alteration the operatives will earn 36s. 10d. per week for ten months, and 33s. 3½d. per week in December and January. This represents a net increase of 10d. per week for ten months, for which the operatives will have to work 3½ hours longer; but in December and January they will work 1½ hour less. Other alterations are proposed in respect to piece-work, starting-places, and overtime, with the view of adapting the Bolton system to that of Manchester. The operatives have just held a meeting at which the various proposals were considered and rejected. The masters, however, adhere to their determination to enforce the alterations, and it is expected that on the 1st of May there will be a strike of between 500 and 600 operatives.

Liverpool.—In October last the operative painters of Liverpool gave notice to their employers of their intention to ask for an increase of 1d. per hour (*i. e.*, from 7½d. to 8½d.) in their wages, which the masters refused, on account of the depressed state of trade. In March the operatives asked for an interview; and the employers replied that they did not see what benefit an interview would be when they could not give an advance in the rate of wages. The men then requested that the matter should be referred to arbitration, and the employers consented to this course on condition that the arbitrator should take into consideration the question of reduction as well as increase of wages. The operatives, however, refused to go to arbitration on these terms, and urged that only the question of increase should be laid before the arbitrator. The employers declined to give way on this point; and the men went out on strike on the 13th inst. Such is the position of affairs as stated by the Master Builders' Association. The Strike Committee, on the other hand, state that the men have hitherto been working under certain printed rules of long standing, and one of these rules provides that six months' notice of an advance or reduction of wages must be given on either side in the month of October. The masters now say they would consent to arbitration if the men would allow the question of reduction as well as increase of wages to be considered; but the operatives contend that this proposal is unfair, because the masters have not given them six months' notice. On this ground, therefore, they refuse to refer the dispute to arbitration.

Sheffield.—A strike of a somewhat novel character has taken place at the Burngreave Relief Works, Sheffield. Some time ago, when the distress amongst working classes was at its worst phase, the Duke of Norfolk consented to give employment to a number of men on land near All Saints' Church, and in Burngreave. The work consisted in removing earth, rock, &c., and taking it to a "tip" some distance off. Upwards of 250 men accepted employment, and this number has been maintained up to the 13th inst., the remuneration given being according to the nature of the work which had to be performed. The men were formed into six gangs, and one of these, consisting of 95 men, was engaged at the Burngreave-road land. At first the work was not too heavy, and the men were able to eke out a scanty living; but the labour has become greater every week, on account of the rock which was encountered and the distance it had to be wheeled to the tip; and latterly the men have been somewhat dissatisfied at the amount of their wages. Last week they earned 1s. 7d. per day. A meeting of the "gang" was held, and it was decided to "strike," until terms of a more favourable character were offered to them.

CHURCH-BUILDING NEWS.

Feniton.—The restoration of St. Andrew's Church is proceeding. The east wall and the north chancel-walls have been rebuilt, and a new vestry erected on the north side of the chancel. The panelled woodwork of the chancel and roof is new. The chancel windows, and those on the north side of the church generally, are also new. The dressings are of Ham Hill stone. The western gallery has entirely disappeared. The walls are coloured a warm tint, and the old oak timbers of the aisle and nave are painted. The old rood and parclose screens are now undergoing restoration. The floors have been lowered and brought down to their original level. The church is heated by Porritt's hot-air apparatus. The organ-chamber floor is lowered to about the level of the church. A double squint and a credence have been put in on the south side of the sanctuary. The church, which on plan consists of western tower, nave, south aisle, and chancel, is Perpendicular in its type of architecture; but much of the new stonework, especially the tracery of the windows, is somewhat earlier. The whole of the works are being carried out by Mr. Harry Hems. Mr. R. Medley Fulford is the architect.

Chastleton.—It is stated that the restoration of the ancient church at Chastleton, More-on-in-Marsh, will shortly be commenced. The architect selected is Mr. C. E. Powell, a pupil of the late Sir Gilbert Scott. The estimated cost is 900*l.*

Killamarsh.—The parish church of St. Giles's, Killamarsh, which has been restored under the direction of Mr. H. R. Gough, of London, was re-opened on the 14th inst. The unsightly pews and gallery have been entirely removed, new floor and paving laid, and pitch pine open benches supplied. The tower arch, which was before the restoration blocked up by the gallery, has been opened out, and the west window filled in with stained glass by Messrs. Clayton & Bell. The flat roof of the nave was found to be in a rotten condition, and it was found necessary to entirely remove it, and a new open timber roof has been substituted, the pitch being raised to its original height. It has also been found necessary to rebuild the porch, but the interesting Norman arch to the door from the porch to the nave has not been disturbed. A massive font has taken the place of the wooden pedestal and mean basin which was formerly used for baptisms. The new font, which is the gift of the rector, partakes somewhat of the Norman character. The church is warmed by means of one of Messrs. Musgrave & Co.'s slow combustion air-warmers, placed in a chamber below the nave gangway, and covered with an ornamental iron grating. The works have been carried out, under the architect's supervision, by the contractor, Mr. John Lister, of Aston, at a cost of, including stained glass and value of old materials reused, about 1,000*l.*

Woodford Halse.—On the 30th ult., the foundation-stone of the new tower of the church of Woodford Halse, now in course of re-building, was laid by Lady Knightley. In digging the foundations for the new wall, two coins of Edward II., one of Edward VI., and one of William III., were found. A very fine recumbent effigy of a lady was also discovered, a short distance from the surface, against the outside of the north wall of the chancel. Mr. Hartshorne, the architect, considers it to be of the date of Edward II. About that time, according to Baker's history, Maud, widow of Robert Holland, was Lady of the Manor of Woodford Halse, and rather later Alice Perers was Lady of the Manor of West Farndon. The effigy may possibly be that of one of these ladies.

Newchapel.—A meeting of the committee formed with the object of replacing the present church at Newchapel with a new erection, to serve as a memorial to James Brindley, the famous engineer, was held in Tunstall Town-hall on the 10th inst. The plans for a building in the Early Gothic style, to accommodate 450 persons, have been prepared by Messrs. Lewis, of Newcastle, and the building, of stone, is calculated to cost 7,000*l.* If the church were built of brick it was estimated that the cost of erection would be reduced 25 per cent., and Mr. Lewis was asked to obtain a tender for a church of brick with stone dressings, and submit it to an adjourned meeting.

Bordesley.—For some time past the Church of St. Andrew, at Bordesley, has been undergoing considerable improvement and restoration in portions of the interior, under the direction of Mr. Yeoville Thomason, architect. The building and carpentering work has been executed by Mr. Wilkes, of Kingston-road. The mullions and tracery work of the windows have been removed and constructed afresh. New stalls have been provided in the chancel. An old gallery, at the western extremity of the edifice, has disappeared, and stalls are so arranged on the floor as to afford increased accommodation there. The re-decoration has been carried out by Mr. Robert Mann. The building is to be warmed by the use of Gurney's stoves on Woodward's patent. The organ is also in course of restoration, under the direction of Mr. Halmshaw, of Camp-hill. The total cost of the works will be about 1,000*l.*

Churcham.—Churcham Church, five miles from Gloucester, was destroyed by fire in October, 1876. It has now been rebuilt, and was re-opened on the 8th inst. The original structure was built by the Normans, and much of their substantial work remains in the thick masonry and circular arches still preserved. Previously to the fire, the church had undergone several restorations in modern times. A sufficient amount having been collected to justify the commencement of the re-building, Messrs. Waller & Son, architects, Gloucester, were engaged to furnish plans and estimates. The walls, doors, and windows have been repaired, and the floors, both tile and wood, have been renewed, the walls re-plastered on the inside, and new open seats, with new pulpit and other fittings, provided. The nave has been covered with a substantial open-timber roof and Broseley tiles, and the interior will be warmed by a Gurney stove. The new covering of the spire is wholly different to its predecessor; indeed, no other like it is to be seen in this part of the country. Its form was taken by Mr. Waller, at the suggestion of Mr. Gambier Parry, from the old church of Sompting, in Sussex, a church well known to all archæologists. The height and various dimensions were obtained at Sompting by Mr. Waller as a guide for the Churcham tower. It may be described as a square tower tapering into a short eight-angled spire. The angles forming the base lines of the spire spring alternately from each corner of the tower, and from the top of a gable which rises on the four faces of the tower. A new peal of bells, in place of the six destroyed, has been supplied by Messrs. Warner & Son, of Cripplegate, at a cost of nearly 340*l.* The wall beneath the chancel-window has been covered with rich drapery, the gift of Mr. Gambier Parry. The total cost of restoration is stated to have been about 1,800*l.*

Books Received.

The Geometry and Optics of Ancient Architecture. Illustrated by Examples from Thebes, Athens, and Rome. By John Pennethorne, Esq. Assisted in drawing and colouring of the plates, and in the arrangement of the text, by John Robinson, architect. London and Edinburgh: Williams & Norgate. 1878.

The large, costly, and elaborate work, just now completed by Mr. John Pennethorne, was commenced as long ago as 1835. Involving the labour and thought of years, it is not to be hastily treated, and we will give it in due time the consideration to which it is obviously entitled. Meanwhile we mention the fact of its publication, and present a summary of the results which the author considers have been arrived at from the study of the geometry and optics of ancient architecture. It appears possible, he thinks, to recover from the marble the ancient theory of proportion, viz.,—the original given proportions of the porticos, and the trigonometrical calculations that were made in each case for determining the true executed heights of the corrected masses of the Temples, when they were fixed in position, and all the visual angles were made to appear commensurable one with another, when viewed perspectively from a given point of sight. Also to recover the calculations that were made for determining the curvature of the horizontal lines of the steps and of the entablatures. Further, to recover from the marble the original given proportions of the columns, and to trace, by the aid of the descriptive geometry, the forms of the Doric and Ionic capitals, including the describing of the Ionic spiral line, and other details of the columns. These curved lines, he shows, are invariably traced as the combined arcs of the different conic sections. He maintains the possibility of recovering from the marble the ancient methods of tracing geometrically the mouldings and ornaments as the combined arcs of the several conic sections, and also to recover the ancient method of designing perspectively the Egyptian, the Greek, and the Roman

entablatures. And he reasons that if we can again follow the Greek artists in the designing of the masses, and the details of their works of architecture, we are then able to recover from the marble the intellectual labour that was bestowed upon such designs as the Parthenon and the Propylæa, when the working drawings from which these designs were executed in the marble were being prepared by the Greek architects. Further that if the works that were written upon architecture by the Greeks had been preserved, viz.—Anaxagoras on Perspective, Ictinus on the Parthenon, Philo on the symmetry of Temples, and other authors whose names are known, we should have found that they treated of the proportions, the curves, the perspective designs, the colouring of the temples, as well as of the paintings and the sculpture, belonging to them, so that in recovering the original calculations and drawings we recover at the same time, in a degree, some of the contents of those lost works. The utility of attempting the recovery of what has so long been dormant might be questioned; but as, after 2,000 years, the Greek geometry remains as the basis of modern mathematics, he believes equally that the principles of Greek art, when recovered, will be found to be a sure foundation for all modern art to rest upon, for certainly during this long period of time no works of art have been executed to equal intellectually such designs as the Parthenon, the Propylæa, and other works in the Acropolis of Athens as combined works of painting, sculpture, architecture, and geometry.

Aid Book to Engineering Enterprise Abroad. By EWING MATHESON, M. Inst. C.E. London: E. & F. N. Spon. 1878.

MR. MATHESON says his book has been written from an Englishman's point of view as an aid to those who may be interested in the projection of engineering enterprises in foreign countries. We quite agree with him that the intimate relations which arise between the promoters of new undertakings abroad and the English engineers, capitalists, and contractors upon whom they depend, render it important that all those concerned should be in full accord. Too often, foreign or international transactions are hindered by the insufficient knowledge, on one side or the other, of the necessary facts; and in his clearly-written pages it is attempted to classify and link together those technical and economical conditions which determine the success or failure of public works and engineering ventures; and especially to enumerate those preliminary particulars on which alone designs and estimates of cost can be framed. The subject of concessions for engineering enterprises in foreign countries is of course, therefore, treated at some length, and if studied by persons likely to embark in such undertakings, may save much time, much money, and consequent heart-ache.

Warning the promoters of new schemes against various rocks ahead, Mr. Matheson justly says:—

"An engineering enterprise, to be successful, must satisfy certain technical and economical conditions; and these demand entirely different kinds of investigation. An engineer to whom a scheme is submitted may find that it is feasible, and that as no experimental methods or extraordinary works are required, the risk will be but small, the calculations of outlay and profit may also appear to him reasonable, and he gives to the scheme the sanction of his name. Yet there may be economical reasons, which to a financier or economist, as eminent in his way as the engineer, will show the unsoundness of the undertaking. The fault is sometimes on the other side. A scheme is submitted to a financier, who, uninformed on technical matters, may accept as correct the plausible but incomplete engineering details, and on such a basis may decide that the scheme will be safe and profitable; while in reality there may be some flaw,—perhaps even of a rudimentary kind,—which bars the way to success. Were it not that failures frequently occur for these reasons, the need for fuller investigation would appear too obvious to be mentioned. But even where the feasibility of a scheme, both in its technical and economical aspects, appears certain, it often fails for some secondary reason to obtain support."

Railways, Telegraphs, Harbours, Bridges, Irrigation, Waterworks, Town Drainage, Tramways, Markets, and Gasworks are all treated of; the latter makes an especially valuable chapter, and we strongly recommend the book to the consideration of a much larger circle of readers than those only interested in the projection of engineering enterprises in foreign countries.

VARIORUM.

A SECOND edition of "Common Sense for Gas Users," by Robt. Wilson, C.E. (Crosby Lockwood & Co.) has been published. It contains a large amount of information on the subject, and plentifully blames gasfitters. The author says,—"The importance of the subject may be gathered from the statement that the loss of light consequent upon the use of bad burners and high pressures of gas in London alone, when calculated upon the gas rental and expressed in money value, cannot be less than 600,000*l.* per annum. The loss in such towns as Liverpool, Manchester, and Glasgow, cannot be less than 120,000*l.* per annum." Whether or not the particular burner recommended will justify his praise we do not know.——"The History of Bell's Telephone." Edited by Kate Field (London: Bradbury, Agnew, & Co.). This little book gives a pleasant chatty account of the steps which led up to the completion of Mr. Alexander Graham Bell's Telephone, and of incidents connected with its introduction since. What the owners of Mr. Bell's patent are doing with it financially we do not know; but there seems to be a pretty general endeavour to supersede it, and prevent them, as far as practicable, from reaping any advantage from it. We cannot help thinking that this was brought about, to some extent, by the endeavour which was made, in the first instance, to put too high a price upon its use.——Last week's *Nature* (Macmillan) commences with a paper on "The Coming Total Solar Eclipse," which will sweep over the United States in July next, by Mr. Norman Lockyer. There are other interesting communications, and the number is altogether a good specimen of this valuable periodical.——"Picturesque Europe" is now taking us abroad with very pleasant discourse and many charming views. Numbers 25 and 26 before us illustrate Normandy and Brittany and the Italian Lakes, a steel engraving in No. 25 showing us Orta, from a charming drawing by Mr. Birket Foster; and one in No. 26, a view of the well-known tomb of Louis de Brèze, in Rouen Cathedral. Charming, indeed, are the associations recalled by the sketches about the Lago di Garda, the Lago di Como, and the Lago Maggiore, to those who know this delightful part of the world; few who have visited it fail to cherish delightful recollections of the time spent there,—recollections which will be recalled with intensity by the pages of the work before us. "Picturesque Europe" promises to be, when completed, a very fine book indeed.

Miscellanea.

The City Guilds and Technical Education.—A correspondent writes:—The Drapers' Company having voted 25 guineas for the establishment of technical carpentry and joinery classes, on the plans pursued at the Artisans' Institute, 29, Castle-street, Upper St. Martin's-lane, W.C., the Rev. H. Solly has recently addressed public meetings on the subject at Croydon, Clapham Junction, and Nottingham. At the latter place there appears to be always a considerable number of intelligent workmen ready to take up the subject of educational work, and the response on the occasion in question, particularly at a small representative conference held the following night, was most hearty. In London and the surrounding districts, however, the indifference of the "British workman" to his true interests and advancement is too often most discouraging, though the great distances and the difficulty of making any matter generally known present formidable obstacles not felt in most provincial towns. It is, however, at once interesting and important to watch how eagerly a few men in every trade welcome any attempt to promote their ranks, and there is little doubt that when the City guilds are prepared to come forward with their long-promised scheme of a technical university, with affiliated institutions, they will meet with a large amount of grateful recognition, and the present humble pioneer efforts will be found to have been the insertion of the thin edge of the wedge into the dense mass of industrial ignorance and apathy. We learn that the technical carpentry class founded at Croydon has made a tolerably good commencement, and that the one started this week at Clapham Junction is likely to have a fair measure of success.

The Wellington Monument.—The Wellington Monument in St. Paul's Cathedral being now complete, the First Commissioner of her Majesty's Works, &c., has handed over the custody thereof to the Dean and Chapter of St. Paul's. A large view of the monument appeared in the *Builder* for 1875, pp. 688, 689.

Royal Italian Opera, Covent Garden.—The manner in which Madame Scalchi has steadily increased her hold on the London public is very noticeable. Her recent performances in "La Favorita" and "Il Trovatore" have been quite remarkable. The distribution of the *dramatis personæ* this season in the former is much the same as it was a twelvemonth ago, with Madame Scalchi as *Leonora*, Mdlle. Cottino as *Inez*, Signor Graziani as *Alfonso*, Signor Bagagiolo as *Baldassare*, Signor Gayarré as *Fernando*. Madame Scalchi, it may not be forgotten, had the honour of playing *Leonora* on the memorable occasion (July 19, 1871) when Mario as *Fernando* took his last "farewell" of the English public. She had essayed the character before, but never before created so strong an impression. Since then she has evidently studied it *con amore*; and the fruits of her perseverance are apparent. The *Fernando* of Signor Gayarré, up to this time, is the part which has won for him most honour. The general performance of "La Favorita" was excellent.

The Late Sir Gilbert Scott.—A resolution in the following terms has been passed at a meeting of the Council of the Royal Architectural Museum, Mr. Beresford Hope, M.P., president, in the chair:—"In the death of Sir Gilbert Scott the Royal Architectural Museum recognises publicly an irreparable loss to that art for the promotion of which the Museum exists, and of which he was so great a master, and, within its own sphere, an ever-loving indefatigable foster-father and mainstay, its founder, and its ever vigilant and untiring treasurer, councillor, and, by his own choice, laborious working officer. Personally, all its members have lost in him a friend who cannot easily be replaced. On all these accounts, the Royal Architectural Museum desires (while bowing to the will of Providence) to record its great sorrow and its deep sympathy with the family of their late treasurer, whose loss it can partially measure by the sense of what it has been deprived of, and it requests the honorary secretaries to convey this expression of its feeling to the family of Sir Gilbert Scott."

The Passage Way through St. Alban's Abbey.—The Abbey Restoration Committee have purchased land at the east end of the building, at an expense of 1,080*l.*, in order to make a pathway to take the place of the public passage which has for so long a time cut the ante-chapel in two, severing the lady-chapel from the rest of the church. The new pathway will leave the Abbey cloisters (the footway leading southward from the High-street) at 66 ft. from the church wall, and bend to the south-east, being 16 ft. wide at the east end, and lead into the sumpter-yard. Forty-four poles of land will be devoted to the improvement. The Town Council have agreed to the proposal to stop up the old footway, and the formation of the new footways, shrubberies, &c., is now well in hand.

The Institution of Civil Engineers.—In accordance with custom, it was resolved at the last meeting to adjourn over Easter, till Tuesday, the 30th instant, when the papers on the Ravi, Chenab, and Jhelum Bridges on the Punjâb Northern State Railway, will be read and discussed. The President's Annual *Conversazione* has been fixed to take place on Monday, the 3rd of June, being the fiftieth anniversary of the incorporation of the Society. Mr. Bateman has decided to return to the original practice, and to invite gentlemen only to this gathering, which, by permission of the Council for India, will be held in the Galleries of the India Museum, at South Kensington.

Bolton Infirmary Plans.—The building committee for the proposed new infirmary resolved that the plans be open to the subscribers and their friends on Monday and Tuesday last, and to the public on Wednesday, Thursday, and Friday. The committee have resolved to call in Mr. Charles Barry, president of the Royal Institute of British Architects, to report upon the plans, and generally advise the committee.

Voltaire Statue Competition, Paris.—The jury on the Voltaire statue have found the designs of M. Caille and M. Maillet to be of equal merit, and have invited both sculptors to produce a statue one-third of the intended size, in order that definitive choice may then be made, the unsuccessful sculptor to receive 2,000 francs. The third premium goes to M. Dumaige.

Telegraphy at Home and Abroad.—The International Telegraph Office at Bern has just completed the publication of the statistics which it has been able to collect. These statistics apply to the year 1876. The statistics given as to the length of the lines constructed and worked by the various administrations show that among the State Telegraph Departments Russia is pre-eminent, having a total of 56,000 miles of line, of which 9,000 miles are in Asia. France ranks next with 34,000 miles of line, while Germany (including Bavaria and Wurtemberg) has 30,000 miles, Austria-Hungary 29,000 miles, England 25,000 miles, India 17,670 miles, and Italy 14,000 miles. The proportion of miles of wire to miles of line varies very greatly in different countries. While the Russian telegraph lines carry, on the average, only two wires, the lines in this country carry, on the average, four wires and a half. The result of this difference is shown in the statistics of miles of wire, where England heads all other States with a total of 113,000 miles. Russia and Germany rank next with 112,000 miles each, France has 90,000 miles, Austria-Hungary 84,000 miles, Italy 49,000 miles, and India 39,000 miles. The Government Telegraph Departments, however, are all eclipsed in length, both of line and of wire, by the Western Union Telegraph Company, which has 77,000 miles of line and 190,000 miles of wire.

The Monuments (Metropolis) Bill.—The objects of this Bill, by which the Metropolitan Board seeks Parliamentary powers in connexion with Cleopatra's Needle and other monuments, are sufficiently indicated by the preamble: "Whereas the Thames Embankments, called the Victoria, Albert, and Chelsea Embankments, and other lands, are vested in the Metropolitan Board of Works, and subject to their control and management for the benefit of the public: and whereas it would be to the advantage of the metropolis that facilities should be afforded for the maintenance of the obelisk known by the name of Cleopatra's Needle upon the Victoria Embankment, and that other powers should be conferred as in this Act provided with respect to the erection, preservation, and maintenance of monuments, statues, and other works of art, from time to time upon any of the said Embankments and lands: Be it enacted," &c.

Proposed New Town Hall for Hove.—At the meeting of the Hove Commissioners, on the 18th inst., the Town Hall Committee reported that they had conferred generally on the subject of a new Town Hall, and had agreed upon a list of requirements, which they recommended for approval. They had also considered the sum of money the Commissioners should expend on the buildings in question, and recommended that the sum do not exceed 25,000*l.*, exclusive of architect's commission, furniture, heating-apparatus, &c. The General Purposes Committee recommended that these recommendations should be affirmed and sent up to the Board for adoption, and that the Board be recommended to instruct the Town Hall Committee to consult Mr. Waterhouse, and obtain plans, and submit the same to this Committee for approval. The Board adopted these recommendations by a large majority.

The Value of "Waste."—The Bradford Corporation have accepted the tender of Mr. Steuart, of Manchester, offering 10,359*l.* per annum for seven years for the ammoniacal liquor produced at the Bradford Gasworks during that period from July 1st. There were several tenders, the highest being 10,600*l.* The price paid under the expiring contract has been 800*l.* per annum during the past ten years. The holder of this contract was among the competitors for the new contract, and his tender was not 800*l.* a year, but 8,000*l.* a year! The discovery in the liquor of a certain chemical substance used in the manufacture of aniline dyes has greatly enhanced its value.

Crampton's Patent Joiners' Cramp.—Another cramp, which claims to be distinguished by strength, lightness, simplicity, and durability. It seems to be self-fastening by the action of a steel roller and wedge placed in the adjustable jaw, which merely requires sliding up to the work, and the greater the pressure applied by the screw, the firmer the grip; it can be used in any position, there being no pin to drop out, nor any projecting parts to prevent its lying flat, and the sliding-jaw cannot cant. Without pledging ourselves for what we have not tried, we should certainly advise those to whom a good cramp is of value to look to Crampton's.

Stoves.—Every now and then apparently sensible persons, non-readers of the *Builder*, take the trouble to write us a letter to inquire where they can obtain Captain Galton's stoves, when, if they turned over our advertising pages, they would see that the manufacturers are Messrs. Yates, Haywood, & Co., of Upper Thames-street. There are so many positions in which this stove may be most usefully introduced, that we willingly emphasise their advertisement. The same firm are making some very nice and inexpensive little stoves, which they term "Queen Anne Stoves." Without adopting that title, we can go so far as to say that they are quite fit for use in houses of that character. They have back and sides of brick, and admit of tiles being fixed outside.

National Association for the Promotion of Social Science.—The executive of this association having intimated to the Mayor of Cheltenham that they were prepared to hold their annual congress this autumn in Cheltenham if invited, the Mayor convened a meeting of ladies and gentlemen likely to be interested in the matter at the Queen's Hotel, and it was unanimously resolved to invite the Association to Cheltenham in October, provided a sum of at least 750*l.* be raised to cover the expenses attendant on the proper reception and meetings for so influential a body. Upwards of 250*l.* were subscribed in the room.

The Archæological Congress of France will hold its forty-fifth session at Mans and Laval, commencing on Monday, May 20th, and ending on Tuesday, the 28th. The programme suggests a number of important questions for discussion, and medals will be awarded to the writers of the most valuable papers.

Stone and Marble Chimney-pieces. — John W. Bird & Co.'s Price List just now published, in the Euston-road, contains a considerable number of designs as well as prices, and is therefore useful for reference. It also includes chromo-lithographs of four new French marbles which can be furnished at very moderate prices.

The Cabmen's Shelter Movement, York. In regard to the cabmen's shelter in Blossom-street, in this city, referred to in the *Builder*, we have to add that this erection is now in use, but that notice of its opening came too late for insertion in the "General View" given to our readers a fortnight ago.

TENDERS

For Agricultural Hall, Canterbury. Mr. John Green Hall, architect:—

Handyside & Co.	£2,840	0	0
Tildesley	2,608	0	0
Vernon & Ewens	2,585	17	8
Tice	2,473	0	0
Dixon & Co.	2,396	12	0
Hemming	2,350	0	0
Morewood	2,350	0	0
Fetherstone & Lucas	2,300	0	0
Brettell & Co.	2,296	0	0
Coulson & Co.	2,282	0	0
Wiltshier	2,278	14	0
Knight	2,197	12	5
Cozens	2,185	0	0
Drury & Bigglestone (accepted)	2,060	0	0
Whitford & Co. (withdrawn)	1,948	0	0
Woodall (ironwork only)	1,204	10	0

For rebuilding the George Tavern, Great Portland-street. Messrs. Bird & Walters, architects. Quantities supplied:—

Grimwood & Sons	£5,143	0	0
Perkins	4,933	0	0
Mark	4,857	0	0
Hockly	4,830	0	0
Temple & Foster	4,812	0	0
Lawrance	4,790	0	0
Brown	4,750	0	0
Williams & Son	4,668	0	0
McLachlan & Sons	4,570	0	0
Anley (accepted)	4,467	0	0

For the erection of a house at Midhurst, for Mr. Edwin Albery. Mr. W. H. Hunt, architect. Quantities supplied by Mr. H. P. Foster:—

Puzey	£4,223	10	0
Marshall & Son	3,725	0	0
Rapley & Son	3,693	17	9
Johnson & Son	3,668	10	0
Burbidge	3,477	0	0
W. R. & C. Light (accepted)	3,450	0	0

For new houses at The Dean, Alresford, for Mr. Vickers. Mr. W. H. Hunt, architect. Quantities supplied by Mr. H. P. Foster:—

Corbett & Fowler	£2,500	0	0
Puzey	2,329	10	0

For alterations to St. Catherine's House, Ventnor, Isle of Wight, for Dr. Coghill. Mr. T. Hellyer, architect. Quantities supplied by Mr. H. P. Foster:—

Ingram & Sons (accepted)	£1,680	0	0

For restoration of the Old House, Blandford, Dorset, exclusive of stabling. Mr. J. H. Weston, architect:—

Pratt & Wiseman (accepted)	£800	0	0

For the erection of an infant [school at Wardley, for the Heworth School Board. Mr. George Ord, architect:—

R. J. & J. W. Carr	£2,352	0	0
Towns, Bros.	1,932	8	11½
Henderson & Parkinson	1,719	15	0
Smith	1,689	3	10
Allison	1,585	9	9
R. & J. T. Harrison (accepted)	1,521	16	3
Fishburn	1,425	0	0

For the erection of the new east and west wings of the new recreation-hall, the enlargement of the chapel, dining-hall, farm buildings, laundry, engine-house, offices, the boundary-walls, and sundry additions and alterations to the existing buildings, and other works connected therewith, at the Moulsford Lunatic Asylum, for the county of Berks and the boroughs of Reading and Newbury. Mr. C. H. Howell, architect. Quantities by Mr. Scott and Messrs. Widnell & Trollope:—

Browne & Robinson	£50,150	0	0
Trollope	49,368	0	0
Rider & Son	48,180	0	0
Brass	48,134	0	0
Lucas, Bros.	47,900	0	0
Holland & Hannen	47,840	0	0
Peto, Bros	47,640	0	0
Higgs & Hill	46,890	0	0
Macey	45,925	0	0
Wheeler	45,780	0	0

For rebuilding warehouse, No. 47, Gun-street, Spitalfields, for Mr. Alfred J. Isaacs. Mr. W. C. Banks, architect. Quantities supplied by Mr. C. Stanger:—

Hart	£1,137	0	0
Marriage	1,080	0	0
Cohen	905	0	0
Merritt & Ashby	869	0	0
Ward	864	0	0
Croaker	850	0	0
Nightingale	817	0	0

For rebuilding warehouse at rear of Nos. 19 and 20, White-street, Borough, for Messrs. G. Harding & Sons. Mr. W. C. Banks, architect. Quantities supplied by Mr. C. Stanger:—

Falkner	£995	0	0
Hart	953	0	0
Tarrant & Sons	927	0	0
Marriage	900	0	0
Croaker	879	0	0
Nightingale	847	0	0
Rider & Son	798	0	0

Revised, for new schools, Fleet-road, Marylebone, for the School Board for London. Mr. E. R. Robson, architect; Messrs. Northcroft, Son, & Neighbour, surveyors:—

Sheffield & Prebble	£10,825	0	0
Scrivener & White	10,740	0	0
Perry & Co	10,631	0	0
Cox	10,567	0	0
Higgs & Hill	10,528	0	0
Aitchison & Walker	10,444	0	0
Brass	10,418	0	0
Thompson	10,370	0	0
Grover	10,298	0	0
Williams	10,272	0	0
Wall, Bros.	10,114	0	0

For additions to schools, Henry-street, Hampstead-road, for the London School Board. Mr. E. R. Robson, architect; Messrs. Northcroft, Son, & Neighbour, surveyors:—

Perry & Co.	£2,496	0	0
Cox	2,480	0	0
Thompson	2,442	0	0
Scrivener & White	2,441	0	0
Brass	2,424	0	0
Williams	2,393	0	0
Sheffield & Prebble	2,383	0	0
Wall, Bros.	2,368	0	0
Higgs & Hill	2,364	0	0
Grover	2,288	0	0
Aitchison & Walker	2,199	0	0

For new wing, with cloister and sacristies, at the Convent of Our Lady, Central-hill, Norwood, Surrey. Messrs. Goldie & Child, architects; Mr. J. Schofield, surveyor:—

Patman & Fotheringham	£12,302	0	0
Dove, Bros.	11,660	0	0
Nash	10,900	0	0
Conder	10,416	0	0
Higgs & Hill	10,344	0	0
Rider	10,288	0	0
Lucas, Bros.	10,043	0	0
Nightingale	9,881	0	0
Shepherd	9,776	0	0

For additions to St. John's Factory, High-street, Battersea, for Messrs. Allen, Bros. Messrs. Drury & Lovejoy, architects; Messrs. Strudwick & Mennie, surveyors:—

Gregory	£1,919	0	0
Merritt & Ashby	1,897	0	0
Colls & Sons	1,878	0	0
Downs	1,796	0	0
Perry & Co.	1,698	0	0
Macey	1,685	0	0
Higgs & Hill	1,584	0	0

For new schools, Berger-road, Hackney, for the London School Board. Mr. E. R. Robson, architect; Mr. T. Thornton Green, surveyor:—

Thompson	£13,597	0	0
Hobson	13,674	0	0
Tyerman	13,534	0	0
Brass	13,322	0	0
Hook & Oldrey	13,291	0	0
Williams & Son	13,230	0	0
Higgs & Hill	13,190	0	0
Perry & Co.	13,178	0	0
Sheffield & Prebble	12,973	0	0
Sargeant	12,673	0	0
Boyce	12,583	0	0
Roberts	12,577	0	0
Grover	12,366	0	0

For new Wesleyan chapel, Greenwich. Mr. T. Lewis Banks, architect; Mr. J. Sergeant, surveyor:—

Morter	£6,930	0	0
Dove, Bros.	6,765	0	0
Smith	6,625	0	0
Downs	6,539	0	0
Higgs & Hill	6,364	0	0
Joslin	6,100	0	0
Kirk & Randall	5,555	0	0

For new sewer in Harrow-road, Kensal New Town, for the Vestry of Chelsea. Mr. G. H. Stayton, engineer :—

Nowell & Robson	£1,295	0	0
Meare	1,247	0	0
Neave & Son	1,157	0	0
Blackmore	1,110	0	0
Crockett	1,070	0	0
Hook & Oldrey (accepted)	931	0	0

For the erection of two residences at Prittlewell, Essex, for the Southend School Board. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove :—

Dover	£1,706	0	0 !
Garrod	1,415	0	0
Prout	1,144	0	0
Scott (accepted)	1,124	0	0
Steward	1,100	0	0
Groome	850	0	0 !

For the erection of Board schools, for 750 children, in Broom-street, Hanley, Staffordshire. Mr. W. A. Keats, architect. Quantities supplied :—

Clarke	£5,330	18	0
Gallimore	5,150	0	0
Lea	4,995	0	0
Barlow	4,950	0	0
Redferns	4,450	0	0
Matthews	4,390	0	0
Ellis (accepted)	4,360	0	0

For the restoration and partial rebuilding of the Parish Church at West Knoyle, Wilts, with new churchyard-gates, &c. Mr. J. Mountford Allen, architect :—

Hooper	£1,607	0	0
Gaisford	1,464	0	0
Avery	1,430	10	0
Parsons	1,390	0	0
Trask	1,351	0	0
Osborne & Davis (accepted)	1,288	10	0

For the erection of new grammar-school at Ilminster, Somerset, for the governors of the Ilminster Endowed Schools. Mr. J. M. Allen, architect :—

Taylor	£1,670	0	0
Legg	1,645	0	0
Trask	1,560	0	0
Langdon & Poole (accepted)	1,380	0	0

For the erection of Board schools for 500 children, offices, drainage, and fencing the whole of the site, at Prittlewell, Essex, for the Southend School Board. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove :—

Groome	£4,996	0	0
Garrod	4,835	0	0
Dover & Co.	4,796	0	0
Prout	4,690	0	0
Steward	4,500	0	0
Scott (accepted)	4,469	0	0

For schools for 170 children at Frosterly, for the Stanhope School Board, Durham. Messrs. John Smith & Son, architects. Quantities not supplied :—

Yoe	£1,500	0	0
Hutchinson	1,283	0	0
Temperley	1,235	5	3
Westgarth	1,183	0	0
Robinson	1,175	0	0
Maddison	1,131	0	0
Dalton (accepted)	1,084	18	6

For rebuilding and restoring the parish church of Llanbadarn Fawr, Radnorshire. Mr. Stephen W. Williams, architect. Quantities supplied :—

Speake	£2,090	0	0
Bowers	1,922	12	3
Stephens & Bastow	1,854	0	0
Hamer	1,820	0	0
Williams (accepted)	1,748	14	0
Berry	1,625	0	0

For the erection of new concert-rooms, St. Leonard's-on-Sea, for the Warrior-square Concert-rooms Company. Messrs. Richard A. Hill & W. L. Vernon, architects :—

Kirk & Randall	£6,180	0	0
Dover, Bros.	5,900	0	0
Austen	5,668	0	0
Parks	5,393	0	0
Geary	5,376	0	0
Vidler	5,297	0	0
Cruttenden	5,270	0	0

For Teynham Vicarage. Mr. W. Barber, architect. Quantities by Mr. G. Naitress :—

Staines & Son	£2,296	0	0
R. & H. Whiting	2,170	0	0
George	2,093	0	0
Seager (accepted)	2,090	0	0
Naylor (withdrawn)	1,973	0	0

For rebuilding Ballykilty House, near Quin, co. Clare. Mr. W. Fogerty, architect. Quantities supplied :—

Carroll	£2,278	2	6
Ryan & Son	2,084	0	0
Cavanagh (accepted)	1,856	0	0

For constructing sewers and roads from Finchley-road to Canfield-road, with junction to North-end-road. Messrs. Farebrother, Ellis, Clark, & Co. surveyors :—

A. & D. Anderson	£7,885	0	0
Keeble	7,620	0	0
Nowell & Robson	7,260	0	0
A. & F. Culverhouse	7,155	0	0
Killingback (accepted)	6,990	0	0

TO CORRESPONDENTS.

Oak and Chestnut.—Several letters on this subject shall have consideration next week.

The Bewdley Loop Line.—Mr. R. Strong says he was manager throughout the work.

Cremorne and Ashburnham Estates.—Mr. F. N. Kemp wishes it mentioned that he has been appointed joint surveyor with Mr. Thos. Simpson for these estates.

G. R. W.—C. B.—Mr. H.—W. L. D.—R. N. S.—T. L. P.—R. A. H —T. B.—F. H. & C.—P. & B.—A. & F. C.—D. G. R.—W. G.—S. W. W. —D. Bros.—P. (no).—T. A. B. (next week).—T. A. (next week).—H. J. jun. (too late for this week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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VOL. XXXVI. No. 1839. SATURDAY, MAY 4, 1878.

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Neale's St. Alban's Abbey.

ANY words may by chance be wasted by the advocates of philosophies of names, or by others, if there should seem a resolution to change the well-known name of St. Alban's Abbey into St. Alban's Cathedral. The Shandean theory, —if wildly used,—leads such a controversy, as a matter of course, over perfectly unlimited areas. The odd awkwardnesses of a time of change would tend to keep up the movement. Precedents, such as Bath (Abbey), York and Ripon (Minsters), for instance, — cases not on all fours, but evidently precedents for all that,—would be cited; and other steps would be taken, useless and a little difficult to detail: but it would probably happen in the result that the old name would only succeed in dying very hard. Mr. Neale, who has at last issued his long-expected volume on the Abbey Church * to the subscribers, probably has not the advantage of a prophetic spirit. The title of his book was, presumably, no longer under his control when the Act of Parliament showed its fruit, and St. Alban's obtained its own bishop in June last year. Accident, if accident it be, has, however, provided a better title than the best foresight could have managed. We go out of our course to say that it would be well for the natural preference for apt alliteration and labials to be humoured; and that a strong declaration in favour of the old name, by any dignitary whose official sympathies might otherwise be supposed to be in favour of the change of name, would find welcome and support.

St. Alban's gains surely upon all who have patience. It might be difficult for any one standing outside the west of the church, and called upon suddenly for reasons, to put briefly and in general phrases its special fascinations. It stands on a hill side, and is old and large. The central tower, especially since the high-pitched roofs have been parted with, draws into a sort of unity the buildings below it, by means of its elevation and sheer mass. But the parts to the westward of the tower—the largest and most seen of all—are in the main merely a large rectangular solid in the centre, with a smaller one on each side. There are no visible roofs to the nave, nor pinnacles, nor turrets, nor strong buttresses to either nave or aisles, no broad shadows in fact,—no shade, except it may be from a cloud resting over some part of the pair of little precipices, which stretch side by side for near upon 300 ft. No roofs are seen to slope between the walls of nave and aisles. The walls, thus practically unvaried in themselves, are not parts of a complete design. Almost the only connexion is supplied by a good degree of unity of scale, one of the merits of the Mediæval architects, usually overlooked because the unity is obtained so successfully and naturally, without dulness and without parade. When all this has been hinted in the interests of candour and precision, in view of the tendency to give praise as by rote for qualities that are absent,—the recognition of those that are present may properly follow, in the words of the latest chronicler, who thus concludes (p. 6) the slight sketch of the history of the Abbey Church prefixed to his book:—"Every Englishman must regard St. Alban's with interest, and more especially every English architect. Its antiquity, its vast size, the exquisite proportions of many parts, the wealth of original detail, attracted me first to its study, and my reverence and interest have grown deeper continually, as I have laboriously sought after the principles of its designers. An architectural student may well be thankful that good fortune has given him a training by which he may be able to follow through the work of his life in the footsteps of the men of olden time. An expression of hearty gratitude to many such old masters in our art is also due from me; especially now to those who at St. Alban's have left for our learning such monuments of their skill and their devotion."

Some of the results of this search, which seems to have extended over a good part of the five years last past, are given in the sixty illustrations, each 22 in. by 15 in., photo-lithographed with skill from the author's drawings by Mr. C. F. Kell. By the aid of Plate 3 (the general plan), and Plates 6 to 11, the nature of a problem may be apprehended, which is now being vigorously pressed on the attention of the public. Plates 9, 10, and 11 illustrate the north porch. Plates 6, 7, and 8, the central porch at the west end. The south is in size nearly similar to the north porch. These were the first works carried out in the true Early English style in this building. For peculiarly original character of general design, perfect proportions, and rich, refined, and varied details, they are works of art among the most precious in England. The mouldings are given with great beauty of drawing in Plates 8 and 10 (one-third real size), the jointing being carefully marked, and all the projections shown in relation to each other. The arches filling the east side of the central porch (plate 8), have different mouldings from any which occur in the north porch or elsewhere in the central; and the way in which this filling-in finds its way home at the sides, points also to one of those changes in the course of construction so frequent in this building. Another hand and a slight change in style are evidenced; as also in the carving, the alterations in the vault ribs, the awkwardness of the design of the upper tiers in the sides of the central porch (plate 7), and by many other minor differences of handling. There was a touch of humorous knowledge of the world, as well as of naïve self-assertion, at the bottom of many of these changes,—mere freaks as some of them seem from our nineteenth-century point of observation. The story of the man who, among much similar conduct, —altered so oddly the stones which he found prepared to his hand,—in order to make them suit better what he was prepared to place by their side, might serve to point a number of morals,—from becoming respect for predecessors to the identity of some aspects of human nature for at least thirty generations. All the three porches are incomplete. The northern and southern are only about half their original size, the solid walls at their west ends being apparently formed of materials that had fallen or were ready to fall. The floors are below the ground level; they are damp and dark,—so dark that an illumination by oil lamps was necessary to obtain the details, and to draw real size on the spot the carving of the north porch (plate 11). The central porch having manifested a tendency to lean to the westward, a massive coarsely-moulded archway, with huge splayed jambs, and awkward angular buttresses beyond them, was built in the fifteenth century in order to oppose sheer mass to any further movement; and has of course been successful. Parapet walls of rough red brick, and ugly brick crenellations, complete the central porch. A huge nine-light window occupies the space from the porch roof upwards, and the parallel lines of copings to another piece of brick crenellation,—once cemented, but now showing ragged brickwork for the most part,—cut against the sky.

Sundry recent investigations have furnished a few new facts. The western filling-in, between the great buttresses and the sides of the central porch, having been cut into and the roof removed, two little chambers, each about 4 ft. square, have been opened out, which had not hitherto been looked for. The east wall of these chambers is the west wall of the church, and contains arches, similar in character to the lower portions of the porch adjoining. These arches are immediately under the circular pateras formerly visible, and they are of the same width as the arches above the pateras, which have the strange wavy-moulded filling-in, and which rise nearly to the cill of the great west window. It will be understood that the chambers are really the open spaces between the walls of the central and side porches, blocked in with western walls and roofed over. This discovery has put an end to an opinion, heretofore held, and to some extent justified by the form of the building. It was held that the three porches might have been connected internally, or that they were intended to be connected at some stage in their erection. The joints of the courses of the masonry on the sides of the central porch do not range with the joints in the eastern and western walls,

* The Abbey Church of St. Alban, Hertfordshire. Illustrated by James Neale, F.S.A., Architect, 8, Adelphi-terrace, W.C.

which also differ from each other as to their joint levels. It was therefore suggested by competent observers, that the insertion of the north and south walls might have been the result of change of purpose. The opinion, which of course now seems to have been always perfectly untenable, was really flattering to the designers of the porches; for the arrangement would have been a singularly fine one, both as respects the western walls of the porches, and the view across their interiors. The upper water-tables of buttresses, which formed part of the now exposed north and south faces of the porch walls, and the shapes of the main buttresses of the great west wall, show that every possible artifice was used (as one would have expected), to widen the spaces between the porches at the western ends, so as to detach the porches well from each other. A face of external ashlar, a little over 3 ft. west of the face of the jambs of the great west window, with raking stones against its western face,—also recently discovered,—may supply the angle of pitch of the porch roof. Perhaps the walls, at the west of the northern and southern porches, contain some decided evidence with respect to the roofs of those porches. Thus a proposal to complete the porches involves, at present, interesting conjecture as to the true forms of their western archways, their western gables, and their roofs. Mr. Neale has theorised as to the west front above the porches on p. 11:

"The three porches had high-pitched roofs. The west wall of the nave above these porches consisted mainly of three tiers of arcading; part of the lowest tier of these arcades still remains. [Namely, the arches with the shaped filling-in mentioned above.] Above this were six lancet windows arranged in pairs, and enclosed by outer moulded arches supported by shafts, similar to the interior arcade on the north side of the nave (plate 4). The arcading at the level of the clearstory probably had windows alternating with recessed arches. The whole was surmounted by a gable, probably containing small windows and arches. No triple lancets at the clearstory level could have extended high into the gable. The high-pitched gable of the nave was, no doubt, removed in the fifteenth century, when the low roof superseded the earlier high-pitched roof, and the existing west window of nine lights was inserted. The staircases in the north west and south-west angles stop, at present, at the level of the clearstory passage, but it is probable that in the thirteenth century they were surmounted by turrets."

There is little to quarrel with in these conjectures. It may be hinted, however, that there was a sort of gallery to the westward of the main west wall, and that it would be difficult to adduce any conclusive evidence as to the existence of a flat ceiling in the nave, abutting against Trumpington's west front. An open high-pitched roof might very well have existed there. The western angles of the staircases on the north and south sides are about 5 ft. back from the west wall. These staircases may (or quite equally may not) have been covered with visible roofs. The reasons for keeping them back from the face of the gable were:—(1) apparently, to put them in a convenient position with reference to the interior passages; (2) to obtain solid unpierced masses of walling at the angle,—interior buttresses which might justify the omission of buttresses projecting northwards from the north, and southwards from the south wall. The very prominent and massive buttresses, projecting from the west wall (6 ft. at their upper portions), unite themselves to the walling, and a considerable solidity at the angle was thus obtained. From the foregoing we see that,—for reproducing the original design of the parts above the porches, the proper treatment of the west wall and its gable, of the roof behind it, and the turrets flanking it, must be supplied,—if possible, by further investigation, by consideration of probabilities, by analogy of other buildings, and, where these fail, by harmonious original design.

The removal from its present position of the west window, which is necessarily implied, if it becomes possible to press forward the scheme for the creation of a grand west front,—will require some courage. This is the window, of which the mullions and tracery are in a hard stone (said to be a Yorkshire sandstone). The records state that a window was made in the north country during the first abbacy of John de Whethamsted (1420-40), for placing at the west end of the nave. The other two great Perpendicular windows in the building,—at the ends of the transepts, each 24 ft. wide by 28 ft. high (plate 4), were no doubt carried out in Totternhoe stone, which had been up to that time mainly used throughout the building for tracery, &c. The south window is now in Bath stone, having been replaced some years ago. The original north window still exists, but the stonework is much decayed externally, and patched with cement, &c. It was possibly thought, when the west window was in contemplation, that it would be well to fill in an opening of such considerable size with materials of assured strength and durability. The stone has stood well, and is apparently, for the most part, as good as when it was put into the building.

It has been stated on good authority that Sir G. G. Scott was bringing his great powers to bear on the design at the time of his lamented decease; and there is little reason to doubt that, when completed under his direction, the west front of St. Alban's would have been one of the finest of modern ecclesiastical works.

Mr. Neale has not devoted any of his thirty-six pages of text to better use than the "general review of the carved ornamentation presented in this volume" (on page 35),—a rapid sketch of floriation from the Transition work of 1160 (plates 30 and 31), and the formal foliage of the earlier parts of the western porches (about 1205) to the carving which had early in the thirteenth century parted with stiff formality, and thence to the use of distinctly natural forms (plates 21, 37, 46, 52, and 58) towards the end of the century. The drawings of these carvings have rightness, firmness, and lightness of touch. The work shown on plate 21, naturalistic foliage of the early part of the fourteenth century,—considered "as near perfection as can be hoped for from human powers" has especially been treated with admirable feeling. Plates 47, 48, 49, 50, and 60 are devoted to carvings of fifteenth-century date from the watching-loft and the chantry on the south of the sanctuary. "My collections from the church would render possible a complete history of the development of ornament without a break from the middle of the twelfth to the sixteenth century," points to one of the uses to which fragments have been put. Some one, whom no triteness can appal, may be disposed thereanent to remark on the usefulness of excavations and the opening out of blocked-up openings.

We had almost been beguiled,—by example and the temptation of easy reference,—into sketching a short history of tracery, showing the stages of which St. Alban's does and does not furnish examples. Fillet, roll, and edge tracery,—to make use of Professor Willis's attempt to discriminate by means of the finish of the edge of the tracery bar,—are all to be found. The first, as usual, is the most common. The second is rarer, though Mr. Neale has evidently slipped in stating (p. 33) that plate 56,—an excellent drawing of the easternmost window in the south wall of the ante-chapel,—supplies the only example in the church. The inside of the westernmost window in the north aisle, and the window in the south aisle of the sanctuary, are other examples of roll tracery. Edge tracery is only found in the four windows of Decorated date in the south aisle of the nave, shown to a favourite scale of ½ in. to a foot with mouldings one-third the real size, on plate 22. The proud custodians of the great six-light windows at Hull, that have this sort of tracery bar, might deem Mr. Neale rather unfair in calling the edge (detailed on plate 22), *a feather edge*. It sounds like an injustice to the robust form of a right angle. The earliest windows with full tracery are in the aisles of the sanctuary (plates 45 and 46). The very noble windows (plate 41) in the clearstories on the north and south sides of the sanctuary, though belonging to a date when tracery was in common use, seem to have been deprived of that ornament by some influence not very easy to point out. The windows in the east wall of the Saint's Chapel are of somewhat later date (plates 38 and 40), and they have tracery of much beauty. The sanctuary aisles, and the parts adjoining them, supply a succession of good examples (plates 42, 43, 53, 54, 55, and 56) of windows with pure circular forms, the so-called Geometrical tracery. Over the design of the clearstory, of the early fourteenth-century bays on the south of the nave (plate 17), the influence of the Early English bays to the westward seems to have been very strong. The Decorated windows are quite without tracery, although the triforium below them has tracery, where curves of contrary flexure seem on the point of showing themselves. The lady-chapel windows, with true Curvilinear tracery, are shown on plates 57, 58, and 59, by compass and line drawings, in which improvement would be unnecessary. The wall-arcade in the cloister,—work of about the same date,—makes a very good subject for plate 23. The tracery-bar (plate 57), at the springing line of the tracery, is 7½ in. wide, the same size as the mullion, but becomes 6½ in. where the reverse curve joins on. This is an instance of the delicate refinements in Curvilinear work, which could be used with effect when some of the difficulties of the earlier tracery had been eluded,—difficulties felt so keenly by the architects of some fifty years before. Some of the difficulties, successes, and failures in tracery design may thus be followed pretty closely at St. Alban's, which might by chance pass without the notice of architectural critics, who "do not feel much interest in the question whether a given piece of architecture is fifty years older or younger than some other people suppose." The volume does not give details of any Perpendicular windows; indeed, the building does not contain specimens of rare merit.

At least a dozen different treatments of the cusp, in section and in the form and in the termination of its horn, may be found, if the screens are looked over, and the Ramryge Chantry allowed to contribute its strange cusps. Similar cusps do not appear to occur elsewhere in the Abbey Church, and their curved ram's-horn shape might lead some people to believe that, at the beginning of the sixteenth century, for a successful pun on a name, a profusion of effigies of leaping animals (rams) did not suffice, but that every cinquefoil in a monument of considerable size must bear witness to the graceful humour of the ruling abbot. The custom of inserting the cusps, in early tracery, was a weakness by no means local. One of the oddest instances of inserted cusps in this volume is in the arcade, on plate 44. No doubt the system was very convenient in such situations; but Mr. Neale is quite justified in stating that "the system of letting in the cusping is more like that employed in woodwork than in stonework."

We must not, however, be led into any new excursion, by the mere desire to shift out of the atmosphere of detail in which fate seems to have enveloped us hitherto. The influence of the Norman structure on the later designs, the relation of solid and void at different dates, and its effect on the general expression, the nature of the vaults, the extent of lighting area, the development of the mouldings for different purposes, and their fitness for their positions, are, however, only a few of the items of a list of subjects deserving general review. Mr. Neale would probably have looked upon the dealing with them as part of his task, if the text of his volume had not already attained such a considerable dimension.

For some or for no reason,—perhaps owing to unwillingness to contest the vested rights usually following long possession,—architectural students, who used to be welcomed in goodly numbers at St. Alban's some years since, are now the theme of regretful tradition. Mr. Neale's book does not, however, profess to be final or exhaustive; there are consequently, at least, another sixty good drawings to be obtained from the building. The west front, the south-west porch, transverse sections at the west and east portions of the nave and aisles, the north elevation, the western walls of the transepts, the sections across the transepts, the ante-chapel and lady-chapel, are only incidentally noticed; some details of windows, &c., being only given. The two shrines, the beautiful doorway leading from the east walk of the cloister into the south aisle of the choir, the stone screen in the nave, the gigantic reredos and its wings, and the two chantries in the sanctuary, the Duke of Gloucester's tomb, the remains of chapels on the south of the aisle of the sanctuary and saint's chapel, numerous inserted windows, the brasses, the tiles, the painted decorations,—all works placed in or applied to the previously completed fabric,—are some other items of a fair sounding catalogue of possible spoils. Also the great gateway of the monastery has in it work of a special merit and character.

The statement (on p. 16), that "the south elevation [a remarkable delineation of the whole length of the building, plate 4], exhibits examples of the various periods of architecture from the earliest Norman to the latest Perpendicular," must, one would say, be intended as a specimen of genial rhetorical exaggeration. The original church was brought to practical completion before the last decade of the eleventh century. The earliest addition to the original church, which shows externally on the south, is to be found in the five bays at the west end of the nave, due to Trumpington (Abbot 1214-1235). A very long century is therefore unre-

presented here; and elsewhere, except by the little slype and the fragments of the destroyed cloister, in date about 1160 (capitally shown on plates 30 and 31). This century was occupied elsewhere in England in continuous change, first, to fully developed Norman; and thereafter, in about half a century, the semicircular arch, the square abacus, and formal carving were for ordinary use slowly parted with, proportions generally were lightened, and much modelling introduced into the mouldings. When these changes had been made, the 1190 work of Bishop Hugh of Lincoln became possible. Another unrepresented interval on this side of the Abbey church is the third of a century, at least, from the completion of Trumpington's work in the nave to the Geometrical window—the only one remaining—in the south aisle of the sanctuary. From the completion of the great cloister, just after the middle of the fourteenth century, to the building of the chapel of St. Saviour, and the Transfiguration, on the south of the Lady Chapel, at the very end of the fifteenth century, no structural additions or alterations of importance were undertaken, though some half dozen altered windows on this side attest the wish of the abbots to make changes in the manner of their time. This recital may serve to point out clearly the truth, of which Mr. Neale's exaggeration is only an unduly forcible statement. The south elevation, of course, furnishes more nearly than any of the other façades the materials for a chart of English Mediæval art. But the building was not the scene of unintermitted building, and, therefore, cannot be expected to supply specimens of all the stages of that development which appears,—"when viewed in the order of time, and with the real duration of that time well in mind,—a purely natural piece of evolution." Here, as elsewhere, the tone of the time had to be caught afresh, whenever new enterprises were undertaken. The Norman church, the unique work of the west porches, and the perfected architecture of the Early Decorated period, are the three most impressive sections, of work of rare quality at St. Alban's. Still, it is true (and Mr. Neale is quite justified in pointing to the fact with pardonable pride) that,—the whole of these reservations notwithstanding,—the whole structure, the screens, the woodwork, the altered doorways and windows, taken together,—constitute a somewhat disorderly book of reference which, well conned, will convince anybody that the "process [of architectural development] has a quasi-scientific charm in itself,—of course, not lessened by the beauty of the individual objects of the series" (p. 35).

We will take a further opportunity of appraising the volume in some other respects; but it is necessary to mention, in this connexion, that one of its greatest merits is the judicious proportioning of the illustrations,—so that some of the best work of each well-marked period is well represented, and so that the impression of this fixed plan is conveyed strongly, though not obtrusively. "Discrimination," as initiated by Rickman, and followed up by Sharpe and others, with constantly increasing appreciation of delicate shades of difference, takes strong possession of the imagination of all who once thoroughly understand, and use it in practical contact with buildings. Mr. Neale has apparently been possessed by the desire to out-do all his teachers in the thoroughness of his expositions. It may be that he would hardly have done this so well, if he had not been sustained through his long labours by an almost fanatical faith in the work at St. Alban's, the subject of his studies. Such a faith would naturally be encouraged as he perceived that power to comprehend his masters, and skill to reproduce his impressions of their works, came to him as he lived in the presence and the constant memory of the best work of the builders at St. Alban's.

The Plaint of a Poor Mechanic.—"A Poor Mechanic" says,—

"Model lodging-houses have just been completed in Willow-walk, Paul-street, Finsbury, which are supposed to be built to accommodate, and to improve, the workingman's home. But how on earth is a poor mechanic to pay such a rent as 8s. or 9s. a week for two rooms and a scullery, or even 6s. per week for one room and a scullery, and be compelled to sell half his furniture to be comfortable at all as regards room to move? But, if he does not care to do this, he is compelled to move further out, and put up with the inconvenience of living from home, which costs him almost double, for railway fares and living. . . . If Lady Burdett Coutts can afford to let the working classes have two rooms and a scullery for 5s. per week, why can't the Industrial Dwellings Company?"

THE GROSVENOR GALLERY.

IF the Grosvenor Gallery does not produce so much effect on its visitors as it did last year, this will only be because the novelty of the room, of the style of hanging, and of the class of subjects most prominent, is worn off; for the exhibition itself is certainly, on the whole, superior to that of last year. There is less of sensation art, more of sober and real work of a high class; and the affectations of a certain clique of artists, though sufficiently represented, are not placed so decidedly in the place of honour; they are, in fact, relegated mostly to the east gallery, which, by common consent, being the smaller, is regarded as the secondary room. One piece of very remarkable artistic eccentricity, however, faces the visitor immediately on coming up the staircase. This is a picture, the first of a series representing the history of Perseus, by Mr. Burne-Jones. We call it a picture, for it is in a frame in the usual manner; but it is not a painting, at all events. It is a great panel of wood, the upper half taken up with a Latin inscription in metal letters in relief, stating "what it is all about," the lower part is occupied by four figures, Perseus and the Fates (?), whereof the heads and hands are drawn on the wood very delicately; the remaining portions of the figures, which are concealed by armour and other dress, are formed of metal let into the wood and modelled in slight relief on the surface. By this means the figure of Perseus is represented as clad in a complete and embossed suit of steel armour, and the other figures in a fibrous golden drapery; the metal, which looks like soft brass, being scored and indented all over to give this effect. The design thus becomes a kind of combination of drawing and bas-relief; not that it is in relief, the main surface of the metal not being raised above the plane of the picture, but the effect is nevertheless produced by cutting into the surface and not by painting. With the exception of the bunched-up look of the figure on the right with back to the spectator, the design is a very fine one; the heads are beautifully designed, that of Perseus in particular; and the outline of his figure, which is seen in profile, is very fine, and in every sense "Classic"; there is nothing stiff about the work, in spite of the apparently intractable method employed. What whim drove the artist to so peculiar a means of representation we are not informed; no doubt a collection or series executed in this way would give a very marked decorative character to the apartment in which it was placed, and if some one wanted that sort of effect he was lucky in finding an artist of so much genius willing to carry it out for him. At the same time we regret the tendency to "whim" which such a proceeding shows; it will repel many who would otherwise admire a really fine design. We may point out, too, as a practical matter, that the metal will be sure to tarnish, and that there will be great difficulty in keeping its ridge-and-furrow surface free from visible lodgment of dust.

Having passed this strange outpost, we enter the principal gallery, somewhat relieved to find by no means the same standard of eccentricity maintained within. The number of works is about the same as last year, and the system of hanging those of each artist in groups is maintained as far as possible,—a system we entirely approve. Going round the gallery in order of numbering, we are first struck with the works of that able and rising painter, Mr. Herkomer, whose advance since the comparatively recent time when his work began to be much talked of is really remarkable. His portrait of Richard Wagner (2) is one of the most striking and successful of recent portraits; it was painted, we believe, under considerable difficulties, the musician being impatient of regular "sittings"; it is, perhaps, partly owing to this very fact that the artist has succeeded in producing a likeness which seems to give so much of the inner genius of the man, rather than a mere reproduction of his features: as a head it may be called a flattering likeness, but as a representation of the mind of Wagner it is a very fine effort of high-class portraiture. The same artist's "Souvenir de Rembrandt" (4) is a very powerful study of an old woman's head. Sir Coutts Lindsay contributes three works,—"An Idyll," "Golden Fetters," and the "Shepherd's Farewell"; the last-named pleases us most; it is a composition of two figures, very beautiful in feeling, and graceful, and a little unusual, in design. Next we are arrested by Mr. Gregory's forcible portrait of "W. T. Eley, Esq." (20), a picture in which there is almost, one may say, an affectation of roughness and unconventionality both in the get-up of the sitter and the style of the picture; but the power and originality of the work cannot be questioned. It is balanced (if we can say "balanced" of two paintings so unlike each other) by Mr. Millais's very interesting and successful portrait-group of two young ladies, "Twins" (22).

Between these, the centre position of the end wall is occupied by a large landscape by a painter not yet much known to fame, but who bids fair to be further heard of, Mr. Cecil Lawson, whose picture, "In the Minister's Garden" (21), is described as "a tribute to the memory of Oliver Goldsmith," we presume with some reference to "The Deserted Village": no other connexion occurs to us, at least. This is a very large and elaborate work, painted with great feeling for colour, but wanting rather in aërial effect,—a result, we think, arising from a deficiency of force in the foreground, and of delicacy of gradation in the distance: the whole seems to be too much under the same conditions of aërial tone. This is not nearly so much the case with Mr. Lawson's other large work, "In the Valley,—a Pastoral" (58), which is hung near the other end of the room, and is a very fine and poetic work. There are, at any rate, no landscapes in the gallery of equal pretensions with these, the exhibition being this year, as before, peculiarly weak in landscape.

Mr. Alma Tadema's five pictures contain much superb painting; not very much beauty. "Hide and Seek" (26) is a game played by two Roman girls, one of whom hides behind the base of a stele with a terminal head of Jupiter on it; there are beautiful qualities in this little painting. "Architecture," "Sculpture," and "Painting," are the respective titles of 27, 28, 29: "Sculpture" being represented by a colossal head filling the picture, at which two men are chipping; "Painting" by a studio where a nude model is seated before the painter: in "Architecture" the principal figure is one whom we have before seen as "the architect of the Colosseum" in another small work. On the whole, Mr. Tadema's Grosvenor work is hardly equal to that of last year. M. Tissot, who comes next, is much better than last year; he has not inflicted any more allegory upon us, and his paintings of London girls are in his best way, especially "Evening," where a set of people are at an evening reception, a girl in a yellowish dress with a train turning round her like a corkscrew forming the prominent object in the foreground; "July" (34), where a young lady is seated on a sofa with her face to the spectator and her back to the light and to an open window, is also exceedingly clever and unusual. This and No. 31, "Spring," are each labelled "specimen of a portrait"; a rather curious rider to put to the title. Are we to understand that M. Tissot wishes to be an accepted portrait-painter, and that this is his "bid"?

Mr. W. B. Richmond is to oil-painting what Mr. Moore is to water-colour; he is the painter of decorative portraits. Of the four here, that of the little girl, "Elspeth Angela Campbell" (41) is certainly the most charming; and with all its finished execution (the feet to be especially noted) it is quite natural and unaffected. But the most remarkable of the four is perhaps that of "Mrs. Frederick Faner" (39), a half-length relieved against white marble; the sitter wears a dress producing a rich though quiet harmony; a butterfly gives the strongest point of colour in the picture. The face is very carefully painted, and it is certainly delightful to see a good likeness in so charming a setting, although one may be disposed to say that this style of portrait painting is a trifle too artificial for the highest ends of portraiture. Of M. Legros's pictures we can hardly say there is one equal to "Le Chaudronnier" of last year; his study in monochrome for a "Saint Sebastian" does not affect us; "Le Repas des Pauvres" (44), where some persons of the order indicated sit at a table in a shabby place of entertainment, has a real pathos in it, and a pathos of a kind which has not been much "worked," since it is not that of rustic life, but of a life that would fain be above it; that of the lower section of "shabby genteel," usually regarded as one of the most contemptible sections of humanity, a fact which is just what makes part of the peculiar pathos of the picture. The study of a head (42), painted before the Slade school students, is excellent; its companion (47) is not equal to it. This artist and M. Heilbuth keep us in the

domain of the art of real life; the arch, coquettish, pretty young lady "in the fields," by the latter artist, is charming; we saw the lady last year in a slightly different attitude, and hardly know which vision is the prettiest: we recognise also some former friends in the scene where "Roman Orphans" (49) are receiving the attentions of a benevolent Cardinal. But we must come back again to the unreal with Mr. Whistler, whose "harmony in blue and yellow" and "Variation in flesh-colour and green" (52-4), we should call simply "bosh"; but the "Nocturne in blue and silver" (53) is a very pretty realisation of a perfectly possible night effect under certain conditions of atmosphere and artificial lights. But what of the full-size figure over these, the long thin girl who is called "an arrangement in white and black"? Well, it is one of the cleverest things exhibited anywhere this year; however, people may call it "smeary" painting, the whole form and *mécanique* of the body, the sway of its contours, behind this veil of ghostly white muslin, is completely felt, and it may be doubted if higher finish would not have interfered with the painter's object. If Mr. Whistler would only do more of this kind of thing, and less of impossible effects with fantastic titles, he would do better for himself and us. Not that we are deliberately approving even this style of his painting; but if an artist feels moved to it, he is certainly to be excused for following his bent, when he can put such real and original talent into production of the kind.

Mr. G. F. Watts occupies the end of the room with two large works, "Mischief," and "Time and Death." Concerning the former, we can only say that we fail to evoke any distinct meaning out of it, and do not derive any satisfaction from it. The latter is, in its way, a grand work, but it just touches on the very limits of the boundary which separates true ideal art from conventional allegorical representation. It is easy to see the allegorical meaning of the wide-eyed forward gaze of "Time," but the result is decidedly odd and staring in a picture. Death, a heavily-draped wan figure, droops on his arm, and they appear to be walking through water together. We should need to look at and think of the work more before coming to a decided impression as to its intellectual value; but our feeling is that it is not equal to the "Love and Death" of last year, chiefly because it is less shadowy, and has more of detail and circumstance; whereas subjects of this kind should always be kept in the regions of vagueness and shadow,—the moment allegory is brought to the light of full day, and illustrated in detail, it is lost, even in poetry, much more in painting. On the whole, we like Mr. Watts's little "Sir Galahad" (68), as well as any of his works that are here.

Coming into the East room, we can only say of Mr. Spencer Stanhope's pictures what Mr. Burchell said of the Honourable Miss Skeggs' and her friends' conversation. Mr. Leighton's portrait of a little lady, called "Miss Stewart Hodgson" (94), is very characteristic, and highly finished as to the figure, but surely unfinished as to the rest; else wherefore does the child cast no shadow, and stand almost upon nothing? Miss Evelyn Pickering's "Venus and Cupid" (95) is very graceful and sweet; this is a fully-draped Venus, a gracious and beneficent nymph, not a deity of passion and folly. So graceful is the long-limbed figure, that we might almost wish rather to see it in the more usual costume of a Venus, but think we have already had that pleasure when the lady appeared in the Dudley Gallery as "Harmonia." Passing over certain *bêtises*, we come on a large collection of Mr. Burne-Jones's works, filling the upper end of the room. Of these it is more easy to speak than of some of his last year's works. Certainly the first one, "Day" (100), a lean, melancholy, naked figure entering a portal with a torch, is unhappy-looking enough; but in some of the others there is not that strange mingling of beautiful execution with puerile conception which puzzled one in the pictures exhibited last year. Hardly any of these, by the way, seem to be new works. The series of the seasons was painted in 1867-8, and is very fine, spring and summer especially so; fine in colour, and in attitude and design; and, of course, in allegorical figures one can pardon a certain conventionality of style. Of the large picture, called "Laus Veneris," painted 1873-5, we can only say that we do not, so to speak, see the use of such a conscious reproduction of the art and the feeling of another age quite foreign to our own; the beautiful work in the picture may be granted at once. More emphatically may we grant this in regard to the "Chant d'Amour," a picture magnificently painted, of which one might say that it might, if it were a little "aged," be passed off for a Giorgione with every chance of success; but it is therein that the very weakness of the thing lies; Giorgione did that sort of thing because he himself and his contemporaries loved it; Mr. Burne-Jones repeats it because they loved it, which is quite another affair. Of all the set, we like best the small one of "Psyche helped out of the River by Shepherd Pan," after she had tried to drown herself, because here there is really piquant originality and invention; the figure of Psyche is very pretty, and Pan is a real invention, a figure half-serious, half-grotesque, and altogether old-world and fabulous, and with yet a sort of (artistic) probability about him too.

To such a mere imitator of early art as Mr. Strudwick it is useless to say anything. Mr. Morris's large picture called "Michaelmas," is of doubtful interest: a capital and most truthful study of geese in the foreground, but the painting of the landscape is raw and violent in its lights; the same artist's "Village Coquette" we like better; it is a trifle mannered, too, and the man is too distinctly a reminiscence of Walker. Mr. Boughton's "Rivals" is a picture with a point in it. The rivals are two sturdy quarry-workers, with picks in full swing, and apparently competing for the good graces of the young woman in the foreground. Mr. Armstrong's "Three Female Figures on a Marble Seat, with Orange Blossoms and Marigold" (116: Mr. Armstrong seems to disdain fancy titles) is very graceful as a composition, but we cannot make out what he is about with his colour of late; it never seems clear or pure. Mr. Walter Crane's "Persephone" would, no doubt, make a very good illustration for chromolithography for a children's book of classic stories; but how any one could deliberately paint in this way on such a scale is inconceivable to us. Mrs. Joplin's "Pity is akin to Love," and Mr. Lehmann's "Burning Love-letters," are both very pleasing works, both showing more genuine feeling than their authors usually attain. We passed for the moment, purposely, Mr. Albert Moore's "Birds," to finish with it, as something perfectly pleasant to look at and remember. The title is, of course, merely a distinguishing name for a figure picture: a beautiful girl stands facing us and looking up at some birds, probably (one canary is introduced, at her feet), so that her face appears turned upward, and half in profile; she has on a saffron gown, and a headdress of very subdued and delicate reddish tint; she is backed by a delicately diapered hanging, and a plant with white blossoms springs from a vase by her side. In beauty of form, and subtle delicate harmony of colour, this seems to us almost to surpass anything of the kind that Mr. A. Moore has produced; it is simply perfect, and leaves a delightful impression on the memory.

THE SOCIETY OF PAINTERS IN WATER-COLOURS.

The Exhibition this year (the nineteenth) is a good one; its strength is in landscape, however, more than in figures. Mr. Tadema sends only one slight little work, possessing less interest than even slight drawings from his hand usually have. Mrs. Allingham, sending several works marked more or less by her peculiar refinement of colour and feeling, is, nevertheless, not at her best in any of them. Mr. Marks's drawing of the lover "with a woful ballad made to his mistress's eyebrow," which he is reciting to a half-sympathising, half-satirical, listener, has fine qualities, and is a good specimen of his peculiar humour. Mr. Carl Haag's very large drawing, one of the largest of modern water-colours, at the top of the room, is vexatious; it is an example of splendid manipulation wasted upon an uninteresting and even repelling subject. It represents "An Ancestor" (72), a very brutal and beefy-looking ancient British (?) chieftain, clad in splendid barbaric trappings, with a helmet with two horns fixed to it by way of decoration. It is simply a study of costume and manipulation; as for its representing "an ancestor," the face is really of a type that may be too often seen among the well-fed Britons of this comparatively civilised era. Mr. Radford's drawings continue to show little more than fine painting of texture and colour of the furniture and properties of the rooms in which his mechanical-looking personages are discovered; the least mechanical of them is the "Dernier Regard" (98), cast towards the looking-glass by a damsel just moving away from it, and who is probably regretting that her arm is so thick. Mr. Fred. Tayler's brightly-coloured but not crude studies of hunting scenes of a few generations back show his usual solid talent in drawing of men, dogs, and horses. "They are all coming" (30), a hunting morning incident, is the best; by no means equal, in point of character, though, to one or two of his works we saw in the Dudley Gallery lately. There are some things on the walls which it makes one sad to see; and among those which did not make us happy was Mr. Wallis's "In a Sacristy," especially considering the name attached to it; but it is to the same artist that we owe what is one of the most powerful things that has been in this room lately,—"The Sentinel" (187),—a Moorish figure clad in a gorgeous dress, and set in a framework and background of rich architectural detail; he and an antelope mutually contemplate each other, the innocent-looking animal and its sober colour serving to enhance greatly the force both of character and colour in the figure. This is a drawing to be returned to; a powerful and thoroughly successful thing. More interesting intellectually, but less entirely successful, is Mr. Walter Duncan's large work, the largest he has exhibited here, "Le Jardin d'Amour" (181). This is a kind of Boccacio scene, as one may call it, resembling in feeling some other drawings in previous exhibitions; one or two of the figures, the central female figure in pink, for instance, are also repeated from previous works, more completely than is desirable. There is, however, splendid colour in this work, and a great deal of fine drawing, and real, though rather vague, imaginative feeling; in point and meaning it hardly seems equal to other drawings the artist has contributed. We look with great interest to Mr. Walter Duncan as one of the few contributors to the Gallery who seem able to paint ideal figure-subjects, in which something like the poetry of art is represented; we hope he will not fall into mannerism or repetition of himself. Among other smaller figure-subjects Mr. Arthur Hopkins's "Boys' Paradise" (208) contains very clever drawing; and Mr. Norman Tayler's "Rainy Weather" (144) is an admirable transcription of rustic character, notable also for the success with which he has represented the general appearance of the landscape under a heavy rain.

The combination of figures and landscape, where the latter predominates, is represented in some beautiful works by Mr. Tom Lloyd, who, as a new member of the society, claims precedence of mention in his own line of production, and who will do something to atone for the obvious mistakes which have been made in some elections of late years, by the results of which the society's exhibitions are now suffering. Mr. Lloyd is one of the best of the artists whose peculiar tone and feeling in idyllic subjects was most brilliantly represented by Frederick Walker, if that artist, indeed, did not invent it. Of his contributions the best is that entitled "So Tired," where a man and woman on the way home have turned to call after and encourage a tired child, who follows them crying. There is a melancholy tendency about it, to which the landscape as well as the figures contribute. It is, in fact, part of the essence of this peculiarly modern form of art that the meaning of the landscape and of the figures is blended so that neither is complete without the other. This is equally well done in "Shade," a work of lighter vein and interest, though more difficult of execution. Another name we must also notice as for the first time prominent in this exhibition, as far as we remember, is that of Mr. Cuthbert Rigby, whose works are of remarkable excellence. "Yewdale Beck,—a Bright Day in Winter" (35), is a beautiful drawing, full of fresh and aërial effect, and remarkably and minutely true to nature. There are others that are very good, and we shall look with interest to the future work by the artist. Among the usual leading contributors to the exhibition, Mr. Powell sends a fine work,—"The Evening Breeze" (21), in which, however, his cunning in dealing with sea-water is not so remarkably shown as in some others we have seen here. His style seems to have been, to a certain extent, purposely modified, not altogether for the better. There are bits of water, both in this and in "The Squall" (61), which look solid rather

than liquid, which certainly used never to be the case with his work. On the other hand, "The Evening Breeze" is more distinctly a poetic work, perhaps, than most which he has exhibited. Mr. Alfred Fripp is at his very best in "Blackberrying by the Sea" (6), in spite of the mannered execution and artificial colour of the bushes in the foreground, illustrating qualities which have always been drawbacks in his work; on the other hand, there is an almost magical gleam over part of the scene: the artist has almost succeeded in painting sunlight. His other work, "Gipsy Common" (111) is interesting from its marked individuality, and a tone and character different from what we are used to from him. Mr. Thorne Waite is well represented, his best work being, perhaps, "The Fen Country in Harvest-time" (1). Mr. J. W. North's works have the same characteristics we have previously noticed, and begin to look too like receipts; always a white house in the middle distance to give value to the peculiar warm tone of colour which the artist seeks for, and which is very beautiful in itself; always a spotty foreground which gives opportunity for much study of detail of flowers, &c., but confuses the eye in regard to the whole: "An English Home in Algiers" (66) shows the beauties and mannerism of the artist equally; it is very clever, but he should look for another point of view of nature before long, at all events. Mr. Albert Goodwin sends a good many small works, all marked by his strong poetic feeling and determination to realise nature from his own point of view; even some of the names to his scenes convey a great deal, and suggest a whole train of associations; the solemn sunset effect (51) is called "Requiem"; another is a "Pastoral Symphony" (63); but there is no cooking nature; it is all genuine open-air art. We doubt if this can be said of Mr. Clarence Whaite, whose "Salmon Fishing—Sunset" (182) seems to us a most decidedly invented effect: there is fine painting in the foreground; there is a great deal of power of a kind, too, in his "Thirlmere, the proposed Source of Water Supply to Manchester" (185); but it is a forced effect which might just be possible under some very exceptional circumstances, perhaps. We fear from the form of the title that the picture is hung (if not painted) on other than merely artistic grounds; it became, at all events, the centre of much foolish discussion, by visitors, of a topic they did not seem to understand. Why force these social and political squabbles into an exhibition? Mr. Alfred Hunt makes the same mistake in entitling the repetition of his grand work, "An Ironbound Coast" (which was in last year's Academy), "Low Tide on the Scaur, Whitby—a Case for Plimsoll" (130); thereby at once vulgarising the whole association of the work, which in itself is a noble one, though hardly equal to its original in oil. He sends two other fine drawings from the Whitby neighbourhood.

What do the hanging committee mean by placing the work of such an artist as Mr. A. P. Newton so badly? Considering the vulgarities which are to be seen on the line, it is really wrong to have a drawing like his "Beauties of the Moon" (190) hung so high. There is, of course, reason for high position in the case of his larger work, "Mystery and Immensity" (180), on which we looked with rather mingled feelings. It is a view of the Colosseum by moonlight, the great building obscurely seen in the partial illumination of the moon, and the effect of light further assisted or intensified by the torchlights accompanying some public ceremony that is going on. The drawing is a grand and striking one; but it is a little theatrical, which certainly cannot be said of Mr. Newton's work generally. There are some powerful and broad drawings by Sir John Gilbert, in which landscape predominates; but he seems to us to have somewhat lost the fresh and open-air effect which distinguished some previous landscape work of his, by a preference for certain grey and unreal tones in the grass and foliage, which give a heavy and dead look to the whole, though there is great freedom and a true watercolour style in the treatment of the landscape. Mr. Boyce (to jump to the opposite extreme of style) is highly successful in his remarkable manner. His "Ancient Tithebarne near Bradford-on-Avon" (42), is a beautiful drawing; and in the "Saxon Church" in the same town (118), there is a triumph of realism without hardness in the representation of old buildings. Other well-known contributors are represented by drawings presenting their usual and now almost *too* well-known excellences. Mr. Hale sends something strong and powerful in his large drawing of "A lonely Moor" (151); Mr. A. H. Marsh's "After the Storm" is fine (133), and Mr. Collingwood, who has long been in the habit of contributing small studies of Alpine effect, sends this year a larger one than usual, "The Jungfrau at Sunset" (173), giving the idea of a very careful study of tone and effect from nature. Altogether, this seems to us one of the best exhibitions of the Society that we have seen of late years (which is no scant praise); only we wish more attention were given to high-class figure-subjects.

MILLAIS'S "BRIDE OF LAMMERMOOR."

A YEAR ago we noticed Mr. Millais's painting from "The Heart of Mid-Lothian," then exhibited in the Gallery at No. 9, King-street. The same Gallery now contains what may be called in some degree a companion picture; the first meeting of Ravenswood and Lucy of Lammermoor. The moment chosen is that when, after the rescue, Ravenswood has led the fainting girl to the brook to get some water, and she leans heavily on his shoulder still only half recovered; the expression of faintness and recent terror on her features is given with great reality, and at the same time with great reticence and delicacy of treatment and execution; there is nothing painful or overstrained in it, unmistakable as the "faint" is; and when we consider upon what delicate minutiæ of study and execution this kind of realism depends, one must regard this face as a remarkable achievement in painting. Ravenswood is for the moment lost in thought; he gazes forward blankly, without appearing to attend to his fair companion, but as if some forecast of their future fate were before him. His face seems to us a little deficient in refinement, and in that aristocratic character which he is represented as preserving so tenaciously amid his material necessities, to be a realisation of the character; nor is Lucy by any means *our* Lucy of Lammermoor; she is a pretty Scotch girl who has fainted. In this respect the work is not such a success as "Effie Deans," in which the girl and her lover seemed the very people of the tale. In regard to execution the Bride of Lammermoor is more than up to the artist's reputation, as regards the figures and their costume especially. Of the face of the girl we have already spoken; but in other respects the group is as remarkable; such a piece of painting as the hand of Ravenswood is rarely seen. The picture will hardly satisfy the ideal sense of those who are most interested in the romance and tragedy of the story; but every one who cares about painting should see it.

FRENCH WORKMEN ON WOOD CARVING.

THOUGH the French working-classes successfully contrived to send some representatives all the way to Philadelphia during the Centennial Exhibition, an extraordinary delay has been allowed to occur before the public have enjoyed an opportunity of appreciating the advantages resulting from this expensive expedition. It was only last month, for instance, that the report of the sculptors in wood, written by M. Lépine, a working man delegate, was finally published. Apart, however, from this, in our mind, unnecessary and prejudicial delay, it would be difficult to find any other fault. The report before us redounds to the credit of the simple artisan who is its author. He is evidently one of those artistic workmen who would raise his craft to the dignity of a profession, and considers that the cultivation of manual skill must be accompanied with the development of intellectual attainments before we can approach perfection in art applied to industry. But few such workmen exist in any country, though a small number suffice to win renown for the market they supply, and to them is due the reputation which French furniture enjoys.

The wood-carvers' report is divided into three sections. The first is a brief summary of the history of sculpture; the second is a review of the wood-carving seen at the Philadelphia Exhibition; and the third part is devoted to the consideration of the social and material condition of the workmen in the United States who belong to this craft. In dealing with the history of wood-carving, the author shows that he has some knowledge of the Roman and Etruscan specimens which have survived the downfall of the Byzantine Empire. The monuments and tombs of Arles prove that sculpture was attempted in France during the earliest ages, though the first French sculptor mentioned in history lived in the sixth century. He was named Abbon, and acted as manager of the Mint at Limoges. During the Dark Ages sculpture was practised principally in the monasteries, where Greek art was roughly imitated by workers who had the merit of not being specialists. They carved both wood and stone, notably the celebrated Fulcon, who lived in the eleventh century; while others were architects, engravers, &c. The *chefs d'œuvre* that were occasionally achieved gave rise to sumptuary laws, which the clergy themselves at first imposed. Saint Bruno, in the eleventh century, issued, for instance, the following rule:—"We blame, and in future forbid, as opposed to the spirit of humility and rusticity, all paintings, all pictures artistically executed, whether on stone or wood, &c. As for those which already exist, they should be pulled down and taken away if this can be done easily, and without creating any scandal."

The clergy also sought to suppress all independent and secular workers. If a layman acquired any skill as a sculptor or wood-carver, the bishops immediately sought to confer on him some ecclesiastical title and office, so that his talents should be devoted exclusively to the service of the church. It was not until the enfranchisement of the cities of France, and the formation of trade corporations or guilds that the lay-workers were able to hold their own and finally to introduce sculpture within the homes of the civil population. The honour of this change is due to the thirteenth century, and then on all sides triumphs of art were achieved in wood, in stone, in ivory, mosaics, marquetry, and such like.

We can, however, only follow M. Lépine very briefly through the different periods of history. The fifteenth century, with its plethora of Italian artists overriding what little national genius might still be mouldering in the country, is well described. The formation of an independent French school in the sixteenth century is dwelt upon with evident pride, and the Château de Gaillon is mentioned as one of its best expressions. This marvellous building, though for many years attributed to foreign artists, and quoted as an admirable example of the Renaissance art, has been proved, by the recent discovery of authentic historical documents, to have been conceived by French artists and architects, and executed by French workmen. After seeking thus to restore to his countrymen the credit due to some of the chief works of the Renaissance, M. Lépine attempts to demonstrate that the school called "de Fontainebleau" was the French modification of the Renaissance style, and that it was only adopted in Tuscany after it had been practised in France. But, on the other hand, he admits that this brilliant reign of art was soon over. Already in the seventeenth century the artists were obliged to sacrifice the purity of their style to the caprice and eccentricity of their patrons. This was the beginning of the decadence, though it did not affect public monuments so soon, wood-carving was the first to suffer. In the eighteenth century æsthetic rules were more and more despised. Industrial artists were guilty of the most fantastic and extravagant designs. Losing their taste, neglecting their studies, they soon became little better than mere shopmen and tradesmen. This downfall reached its culminating point during the first Empire, when the taste for form seemed almost extinct. An attempt was then made both at Vienna and Venice to revive the art of carving in wood. A new field of study was then opened to the imagination of art-workers, and the first school of modern sculpture was opened at Florence in 1830 by the celebrated Angelo Barbetti, whose pupils are now the pride of Italy. Since this date wood-carving has gradually improved, and has now reached a degree of perfection which meets the entire approval of the reporter and promises greater things for the future.

The Institution of Civil Engineers.—From a recently printed list of the members of this incorporated society we find that there has been, during the last three months, an increase of fifty-four members, fifty-eight associates, and twenty-seven students; the numbers of these several classes now on the books being 1,033, 1,759, and 520, making, with sixteen honorary members, 3,328 of all classes.

FERGUSSON'S "TEMPLE OF THE JEWS." *

MR. JAMES FERGUSSON'S latest contribution to architectural literature is one to make "the critic" stand aghast. We do not, however, mean to infer that this attitude of mind is induced by any feeling as to inherent improbability or extravagance in any of the views set forth by the author. There will be literary and ecclesiological critics quite ready to object to them *ab initio* on that score, no doubt; literary critics who will object because the views propounded are to them new or unusual; ecclesiological and clerical critics, who will take up the cudgels against Mr. Fergusson with all the vigour of *odium theologicum*, because he interferes with their holy places and things, and has very little respect for some of their superstitions. Any objection which we may have to register against his conclusions will, at all events, not be based on such grounds. To us it is obvious that Mr. Fergusson's architectural reasoning, if his premises be granted, is almost invariably as logical as a proposition of Euclid; and we are in the mind that his premises are never unreasonable, and are morally probable. What renders the task of pronouncing a deliberate opinion, such as our columns are almost bound to put on record, on the topics of which he treats, or at least, on his method and conclusions in regard to them, a somewhat formidable one, is the consideration of the mass of evidence, *pro* and *con.*, which ought to be sifted and weighed before one can even be in a position to pronounce a decided opinion on the principal points of his argument. And we may say at once that we do not intend to attempt pronouncing such an opinion in the present short notice. A student of architectural history who has worked at his subject with the untiring perseverance and remarkable insight which the author of this book has long exhibited, has a right to expect that his views should not be in any way definitely adjudicated upon without full consideration; and this we defer for a week or two, at all events till we can have time to go through the subject more at leisure. But we do not wish to leave Mr. Fergusson's book a week longer than we can help, without at least recognition; and a brief notice of the nature and scope of its contents may serve to introduce it to our readers.

The volume on the Temples of the Jews is divided into three main sections,—on the early temples, on the temple of Herod, and on the Christian and Saracenic buildings in the Haram area. In the first section the authorities on the subject are summed up, and their respective merits as to liability discussed; the subject of Jewish measures is considered in a separate chapter; and the author then enters systematically upon his task of tracing out the peculiarities and varieties of the temple plan, from the first tabernacle to the last temple preceding that of Herod. Much of this part of the subject deals with matter which by most persons will be set down as purely conjectural, and which to a greater or less extent must be so; but the author, at all events, claims to have worked it out with a completeness of method which has not hitherto been attempted. "No one," as he says in his introductory chapter, "has gone through all the temples from the Tabernacle to the destruction of the last by Titus, protracting each peculiarity as it arose, and superimposing each addition and alteration upon the same plan. No one, while doing this, has attempted, in modern times, to co-ordinate the Bible, the historians, and the Talmud, so as to get a consistent answer out of their frequently discordant testimonies." This system of investigation, carried out with great elaboration, lays the foundation for the restoration of the Temple of Herod, built 19 B.C., and within which many of the events recorded in the New Testament actually took place. Towards the solution of the problems here dealt with a mass of evidence, ancient and modern, is brought together, the cumulative force of which is, of course, far greater than any portion of it can be when taken separately. The attempt to restore the architectural design of the Temple must, of course, necessarily be much more conjectural than the plan, so far as general appearance, height, and many of the details are concerned; but the attempt is, at any rate, of the greatest interest, and, moreover, leads to some very curious and suggestive comparisons with existing remains in Palestine and Syria, which exhibit characteristics such as would no doubt have also belonged to the temple architecture, from which some of them even probably arose. The question of the size and site of the temple has a direct bearing on the problem treated of in the third section, he buildings in the Haram area and the question of the identity of the Mosque of Omar with the original Church of the Restoration (Anastasis); since it is only upon a theory which limits the extent of the Temple enclosure to a portion of the hill that the localisation of the sacred sites in this position can be possible.

The latter portion of the book, which deals with the buildings in the Haram inclosure, is in some respects the most interesting of all, as it leads to the consideration of one of the most curious problems in architectural history, and illustrates remarkably the ability and perseverance of the author in estimating the archæological significance of minute differences and peculiarities in architectural style, and combining isolated deductions from a logical whole. Even if his theory of the meaning and origin of the "Mosque of Omar" should never come to be received without question, the whole history of the controversy, which originated entirely with Mr. Fergusson, is so interesting and remarkable an example of reasoning deduced from architectural style alone, independent of, and even in contradiction to, general belief and tradition, that we will conclude these few remarks by briefly recapitulating the matter, preparatory to considering it a little more critically just now.

Some of those who have only been interested in the latter phases of what may be called the Holy Sepulchre controversy, perhaps even forget how it really originated. It had been, from what may be called time immemorial, a generally accepted belief that the Church of the Holy Sepulchre, whatever might be thought of some of the wonders and superstitions connected with it, did mark the real site of the sepulchre of Christ, over which Constantine was known to have built a church. The fact of the erection of such a church in such a position by Constantine is matter of history, and has never been doubted; and though the present church contains not a trace of architecture of his period, this was considered to be sufficiently accounted for by the burning of the church, from motives of fanaticism, on two different occasions which are recorded; by the Persians in the seventh and by the Mahommedans in the twelfth century; it being in each case rebuilt, so it was supposed, on the same site; and as it was believed that Constantine would have had undoubted information as to the true sepulchre, it was always considered that this was the traditionally-correct site which might be accepted by Christians as such. Mr. Fergusson's "first misgivings of the faith" arose from no consideration of ecclesiology or church history, but from a purely architectural source of difficulty, stated in the introduction to his earlier work on Jerusalem. In his first Indian studies he had been struck by the fact of finding Mahommedan buildings "imported full-grown into India," and turned for the links in the chain of development, towards Egypt and Syria, when his attention was arrested by the remarkable fact that an octagonal building should be called and accepted as the Mosque of Omar, and attributed to a Mahommedan builder. As every one knows, the traditional Mosque plan is a short wide building with the wall opposite the entrance as much extended as possible, and as nearly as possible at right angles to the direction of Mecca, so that the faithful may have room to pray towards the holy place. What then could be the explanation of this building called a mosque, but differing so entirely in plan from the true mosque? Had it been called the *Tomb* of Omar, he observes, or of any one else, he would probably have inquired no further; with the superficial knowledge he had of its details, its form would have corresponded very tolerably with its destination; but the more intimate he became with the style, the more he was puzzled to find out what could have induced Omar or Abd-el-Malek to build a mosque in this form. There was obviously something to be explained; and the explanation that flashed on Mr. Fergusson's mind was that *here* was the site and part of the remains of Constantine's church, cased externally with a Mahommedan covering, and finished with a Mahommedan dome. The capitals of the internal colonnade are more classical in form than any that could have possibly been produced by a post-Mahommedan architect; the general plan of the building, and the peculiarity of the continuous moulded architrave carried from column to column, find their counterpart in undoubted Constantinian buildings at Rome. But in that case, how were we to account for the long-supposed site of the tomb, under the walls of the church of the Holy Sepulchre, on the other side of the valley and within the city? Mr. Fergusson's explanation is that when the Christians were driven into a corner, as it were, under Saracenic domination, and had no access to the Temple mount which was entirely in the hands of the Infidel, they found it necessary to have their Holy Sepulchre,—their centre of adoration,—where they could reach it; to please their own minds by a kind of pious fraud on themselves, or perhaps a fraud of the hierarchical leaders of the body upon the less-informed among the Christians. Dire was the wrath of the modern churchmen who had long believed implicitly in the site of the Holy Sepulchre, and written semi-devotional books on the topography of Jerusalem, to find their faith thus set at naught. No doubt the assumption of a change in the site in the Middle Ages would be a very gratuitous one, if there were not the architectural problem pressing so hard on the other side. But while, on the other hand, such a piece of pious jugglery or credulity is as intelligible as possible, the existence of the Dome of the Rock is quite unintelligible, so far, except on Mr. Fergusson's theory. He has, however, lain under the disadvantage, as he himself complains, of arguing with opponents who could not understand the force of the evidence of architectural style and history; who imagined that a Mahommedan architect might have built a Classic structure just as a modern architect builds a thirteenth-century church; not realising the fact that such imitations are a modern fashion only.

But if the style of the arcade of the Dome of the Rock by itself is so strongly suggestive of classical Christian architecture, it becomes ten times more so when in its vicinity is a portal, the "Golden Gateway," the very first glance at which at once recals Spalatro, which is Christian by the symbols carved on its capitals, neo-Greek in its ornamental details, Roman in the reminiscences suggested by its general treatment (so far as the original portions of it are left). And when it is historically admitted that Constantine built a church over the site of the sepulchre, and on the lines of a Pagan temple previously erected on the site (which temple would probably be a circular one); when it is also known that he built a basilica near it, with a gateway which was much admired; and when we find, in close contiguity, a circular building and a gateway, containing remains precisely in accordance with what we know certainly of the architectural style of Constantine's other buildings, and when there is absolutely no explanation offered as to how these semi-classic architectural remains came to be here amid Mahommedan buildings, or what they were, one is inclined to think that it is hardly necessary to go further. We do not here touch upon more recent discoveries in regard to these buildings which seem greatly to strengthen Mr. Fergusson's position; nor upon topographical difficulties which seem to tend in the other direction: these points we may be able to go into later. But with Mr. Fergusson the unquestionable fact remains, that he has accounted for these two structures, and that no one else has done so; and whatever be the ultimate judgment of the minority who alone are capable of forming a judgment on such a point, his publications on the subject ought, at least, to do lasting service, apart from the mass of information contained in them, in bringing before the mind of English topographers the fact, which still seems to be new and bewildering to them, that in such questions ancient styles of architecture, the dates and history of which are known, are fixed points in the argument; the architectural style cannot be made to fit the traditions; the traditions must give way to the architecture; and it is only when this is understood and admitted that any profitable discussion can take place.

* The Temples of the Jews, and the other Buildings in the Haram Area, at Jerusalem. By James Fergusson, esq., D.C.L., F.R.S., &c. London: John Murray. 1878.

The Royal Academy.—The 110th Exhibition of the Royal Academy of Arts, now about to be opened, comprises 1,547 works, including about 140 architectural designs and drawings. To meet the views of the council we withhold our review for a week, when we shall treat of the exhibition at some length.

MR. HENRY BAKER.

We regret to announce the death, at the age of 75, of Mr. Henry Baker, of 108, Gower-street, an esteemed Fellow of the Institute of British Architects, and, in point of official age, the father of the district surveyors. Mr. Baker, up to the date of his decease, on the 26th ult., was District Surveyor of the important and extensive parish of St. Pancras, an appointment which he had held for the long period of fifty-three years. In our volume for 1874, under the heading "Official Longevity," we gave some notes of the appointment of Mr. Baker, and pointed out that 100 years had then just elapsed since the passing of the first Metropolitan Building Act, under which district surveyors were originally appointed; and that singular as it might appear during the whole of that long period, there had been no death vacancy in the district surveyorship of that parish. Mr. Baker's predecessor, Mr. John Crunden, held the office fifty years, and then retired. His district included Paddington and Chelsea besides St. Pancras, then villages supposed to be to the district surveyor of the value of 20*l.* a year each. Circumstances have altered since those days, and when we consider that the parish of St. Pancras at the present time extends north and south from Highgate to Oxford-street, and east and west from Gray's-inn-road to Tottenham-court-road, we have some idea of the immense amount of supervision such a parish required from Mr. Baker, and which we believe it ever had from him. We understand that it is now contemplated by the Metropolitan Board of Works, in whom the appointment rests, to subdivide the parish into three districts, for the purposes of the Building Acts.

Mr. Baker was educated under Mr. Samuel Ware, who was then surveyor to his Grace the Duke of Portland's Marylebone estates,—an appointment which Mr. Baker, from his long experience and sound judgment of metropolitan property, himself was chosen to fill in 1864, and has held to the present time. Mr. Baker, perhaps, was not so much known as an architect as a surveyor; still, in former days, he exhibited drawings in the Royal Academy with approbation, and amongst his works we may mention the building called "The Corner," formerly belonging to Messrs. Overend, Gurney, & Co.; the English, Scottish, and Australian Chartered Bank, in Cornhill; the London and Westminster Bank, High Holborn (gained in competition); St. Pancras Almshouses, at Maitland Park, Haverstock-hill; Messrs Spalding & Hodge's paper warehouse, in Drury-lane; the chancel of Wargrave Church, &c.

Besides the appointments to which we have already alluded, Mr. Baker was surveyor to St. John's College, Cambridge, estate, at Kentish-town; surveyor to the Paxton estate, in Tottenham-court-road, comprising the plots on which the premises of Messrs. Maple and of Messrs. Shoolbred, and the University Hospital, are built; and surveyor to the Glossop estate, in Oxford-street. He was for many years on the Council of the Art-Union of London, and a member of the District Surveyors' Association, taking a kindly interest in everything connected with the profession, and was much respected for his amiable and genial qualities by every one who knew him.

Mr. Baker was on Thursday interred at Highgate Cemetery, where, besides his own sorrowing family, many of his professional brethren gathered around the grave to pay this token of respect to his memory.

Buildings for Torpedo Work. — The torpedo arrangements in connexion with the Thames Defences are now complete. The station is at Shornemead Fort. The buildings comprise magazine stores, connecting-shed, cable, and tanks, and a jetty has been constructed on piles and carried out far enough into the river to enable the torpedo launches to embark and disembark at any hour. The buildings and the jetty have been carried out under the direction of the Commanding Royal Engineer, Col. Grain, R.E., by Mr. Geo. R. Cobham, contractor to H.M. War Department. The torpedoes will be moored when required in various parts of the river, sinkers being attached by chains. Each torpedo will be connected by an electric cable with one of a series of bells, so that upon a ship touching a torpedo it will be instantly known in the operating-room. The torpedoes are exploded from the shore.

THE ART-UNION OF LONDON.

ANNUAL MEETING AND PRIZE DISTRIBUTION.

The forty-second annual meeting of the Art-Union of London was held on Tuesday last, in the Lyceum Theatre (by the kindness of Mrs. Bateman). The Right Hon. Lord Houghton, president, had been announced to preside, but was unavoidably precluded from attending by other pressing engagements. In this emergency, the chair was taken by Mr. George Godwin, one of the vice-presidents.

Mr. Francis Bennoch, F.S.A., read the Report of the Council, of which we print the more salient portions:—

The great depression of trade in most parts of the world, and the partial or total cessation of work in many places in England, led to the anticipation of a very considerable decline in the amount of subscriptions for the year just closed. Still the Council are able to report a total of 13,643*l.* 14*s.* To the local honorary secretaries and agents the thanks of the Society are especially due this year, since the difficulty of obtaining subscriptions has been unusually great.

The Council have recently had an opportunity of purchasing a fine plate, engraved by Mr. J. H. Robinson, one of the first of English line-engravers. The original of the plate is a portrait of Anne, wife of the Earl of Bedford, raised to the title of Duke in the reign of Charles II., and mother of the celebrated Lord William Russell, who died on the scaffold. Vandyke painted the picture from which the plate was engraved, and a more lovely subject never occupied his brush. The original was in the gallery of Lord Egremont, at Petworth, and there a room was fitted up for Mr. Robinson, who, towards the latter part of his life, devoted many months to this plate. It was, indeed, a labour of love, and one of his most brilliant and successful works. A certain number of proofs will be distributed as prizes to-day.

In reference to engravings, it may be mentioned that, in an exhibition held last year, in Birmingham, of plates by engravers of that locality, by far the most conspicuous, and those to which the highest prices were attached, were subjects engraved for the Art-Union, by Messrs. Brandard, Radclyffe, Sharpe, Willmore, and others. Many of the proofs were quoted at prices three, four, and five times the amount at which they had been issued from this Society.

The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the report:—

Amount of Subscriptions			£13,643 14 0
Allotted for prizes	£6,312 0 0		
Set apart towards providing works of art for accumulated payments	727 10 0		
For print of the year, almanack, exhibition, report, &c., and reserve	3,735 19 3		
		10,775 9 3	
Agents' commission and charges, advertisements, printing, postage, &c.		2,868 4 9	
			£13,643 14 0

The amount to be expended on prizes will be thus allotted:

Mr. Duncan's drawing, "The Return of the Life Boat,"	210*l.*	
1 work at	£200	
2 works at	150	each.
3 ,,	100	,,
6 ,,	75	,,
6 ,,	60	,,
6 ,,	50	,,
12 ,,	45	,,
12 ,,	40	,,
12 ,,	35	,,
14 ,,	30	,,
14 ,,	25	,,
18 ,,	20	,,
20 ,,	15	,,
30 ,,	10	,,

1 Bronze Group, "America."
2 Bronze Statuettes, "The Warriors."
10 China Tazzas.
20 Bronze "Diver" Tazzas.
100 Framed Proofs, "Countess of Bedford."
30 Silver Medals of Maclise.

These, with prizes given to unsuccessful members of ten years' standing, will make the total number of prizes 620.

In reference to the presentation work for the coming year, the Council, finding that there is a steady demand amongst the subscribers for books of illustrations, such as "The Ancient Mariner" and "The Norman Conquest," think that the time has come round for giving a work of that kind, and they have arranged for the production of a volume of illustrations of Lord Byron's poem of "Lara," by Mr. C. B. Birch. This poem was chosen for illustration on account of its presenting a large amount of dramatic incident within the limits best suited for a work of this character. Thus facilitating the aim of making a series of designs which should, as far as possible, tell their own tale. In addition to this, great advantages are offered by the costume and architecture of the probable period suggested.

Since our last meeting a very remarkable addition has been made to the large number of picture-galleries in London, by the establishment of the Grosvenor Gallery, in New Bond-street, built by Sir Coutts Lindsay, at a large outlay. In the first gathering of works here in May last there was evinced a leaning towards a special type of art, of which the most remarkable exponents were Mr. Burne Jones, Mr. Holman Hunt, Mr. Spencer Stanhope, and Mr. Whistler; though, in other modes, too, were works by Messrs. Watts, Poynter, Tadema, Tissot, and others, the founder himself, Sir Coutts Lindsay, occupying no unworthy place.

The Exhibition of Water-colour Drawings, lately closed, was a vigorous step towards carrying out the leading notion of the institution. It would be difficult to collect works more interesting than the groups of drawings by early English artists in water-colours; and the specimens, strongly contrasting in style, and more interesting as evidences of power and simplicity of execution, of the original sketches and studies of the great old masters.

On Thursday, September 6th, Liverpool was *en fête* on the occasion of opening the Walker Art-Gallery. This noble structure, containing ample accommodation for works of painting and sculpture, was built, and presented to the city, by Mr. Alderman A. B. Walker, who, in delivering over the edifice for the benefit of the community, expressed a hope that the establishment of a permanent gallery would enable the town to secure a large number of valuable works and collections that otherwise would find a home elsewhere. It is to be hoped that those who possess the means may be induced to emulate this generous example in other of our provincial towns.

Another step in the same direction has been taken by the Town Council of Nottingham. By the liberality of the Duke of Newcastle they have been enabled to acquire, on very moderate terms, a lease of 500 years of the site of Nottingham Castle. And here a noble building, standing in its own grounds, but close to the town, will be erected at an estimated cost of more than 26,000*l.*, and the town will be in possession of one of the finest art-galleries, considered in relation to situation, size, lighting, and general suitability, to be found in the United Kingdom, outside the metropolis.

Yet again, another instance. An influential committee has been formed in Manchester to obtain suitable premises, in a central part of the town, for an art-museum, to hold a carefully-made collection of paintings, drawings, engravings, and other works, and (which is a very important feature) to provide for the delivery of short and familiar addresses on the objects exhibited in the museum; the central principle being, that knowledge shall be used by those who have it, for the good of those who have less. The originator of this movement was Mr. Horsfall, of Altrincham, who, in a powerfully-written pamphlet, points out what the influence of art on the life of a people might be. He remarks, "If art is to influence the life of people at all, it must take as its subject-matter things which interest the people,—things about which they think and feel, or can be made to think and feel. It must tell them something which they care to know. It must do this, whether it tries simply to amuse them, or has the higher aim of teaching them. It must show them their best thoughts and hopes in their most beautiful form, so that they may be helped to think, and feel, and hope on a higher level. In Italy, during the fifteenth, sixteenth, and seventeenth centuries, the church was as much a part of the homes of the people as the public-house is now. Art, then, had not to be sought in a comfortless gallery; it was there where men spent their best hours, the hours that gave them the assurance that, in the manifold troubles of their lives, they were not left friendless, and gave them, too, the promise that a glad life free from all troubles should surely come." Cannot something be done to supply, in modern and Protestant times, somewhat of that which the churches were at the period above named?

In connexion with the Manchester Art-Museum, it has been announced that it is intended, for the information of visitors, to tell in words, as briefly as possible, that which each work tells in form and colour, and to explain the process of art of which it is the product. The mention of this proposal leads to a thought in connexion with the priceless treasures contained in our National Gallery and British Museum. Great as their value is, as the chief art-training schools of the metropolis, one cannot but reflect how much of their influence for good is lost, through the want of a regularly organised staff of able professors to guide and assist the progress of the art-students who frequent them.

In the report of 1877, the Council announced that they had arranged with Mr John Bell, the sculptor, to make for the Art-Union a reduced copy of his fine group "America," which stands at the north-west corner of the Albert Memorial in Hyde Park. A most satisfactory reduction was supplied by Mr. Bell, and has been very successfully produced in bronze by Mr. Hatfield, and some of the casts will be amongst the prizes to be allotted to-day. One of these groups has been sent to the Paris Universal Exhibition. The Society also sends, at the special request of the Prince of Wales, the bronze statuette of "Caractacus," from the original by Mr. Foley. A few hours hence will witness the opening of this Great Exhibition. Ten years ago the Champ-de-Mars was occupied by an industrial temple of iron and glass. Paris entertained the sovereigns and princes of the Continent. It was the crowning triumph of the Empire—and the Empire was Peace. War came, and revolution followed, and France emerged from the bitter trial under the crushing weight of an enormous war-indemnity. In Paris many of her finest and most cherished edifices were in ruins, and it was prophesied that many years must elapse before she could recover in any degree from her depth of misery. But what do we now behold? The greater part of her public buildings have been restored, or are now in course of restoration; and, on the same Champ-de-Mars, Paris again invites the world to visit a vast Exhibition, unsurpassed in the annals of similar undertakings. The Palace of the Trocadero, built on a large space of ground, rising in a steep ascent from the river, opposite the Champ-de-Mars, one of the finest sites conceivable, is not intended, like the Exhibition proper, to be only a temporary structure, but it is to be essentially the palace of the people, and a temple of the arts, and, to the Parisians, very much what the Crystal Palace was intended to be to Londoners; but with this exception, that the Trocadero is reached in a few minutes by tram-car from the centre of Paris. The zeal, energy, and perseverance which have, in so short a time, called these enormous erections into existence, is truly marvellous. It is believed that the products of very few of the leading British manufacturers will be absent from this great gathering. In every branch of art we promise to be well represented, and, it is to be hoped, show that the various facilities which have, of late years, been placed at our command, have not been placed in vain.

In comparing the position of this country with that of Continental nations, it must never be lost sight of that, while they show a steady development of art-training for centuries, the regular existence of anything like a school of art in England only dates from little more than a hundred years ago. The appearance amongst us of Holbein, Vandyke, Rubens, and Sir Peter Lely must be regarded merely as momentary meteors appearing in our art-sky. With Hogarth only began to burn anything like a steady lamp of art in England; and very recent indeed has been the effort to feed and sustain the flame by any systematic aid.

At this moment a large number of art-schools is at work in all parts of the kingdom, and there is no manufactory of any importance where the artist is not as regularly employed as the artisan.

Are we to suppose that no good result has arisen from this remarkable change? This would argue that the present derives no benefit from the past; that the old teaching of experience has died out; that labour leads to nothing; that men are so wilfully blind to their own interests, that they will do nothing to cultivate the ground to which they must look for the harvest.

Even in a merely commercial spirit it must be evident that, if we are to hold our own in the markets of the world, we must not neglect that training, without which we cannot hope to compete with the earnest and devoted spirit in which some of the nations of Europe show an enthusiastic determination to excel in the production of all that is beautifully conceived and well wrought out.

In spite of the opinion of some, who are not unworthy of consideration, we will not allow that England is likely to be passed by in the race for pre-eminence in taste, and in the power of embodying beauty and grace in manufacture. We cling to the belief that she will go on conquering, and to conquer, in that battle-field where the enemies to be overcome are ignorance, and apathy, and sloth; and praying that Heaven may avert from our beloved country any other kind of war, we conclude in the last words of the Report of 1861,—May peace be preserved, and the Fine Arts flourish.

Mr. Godwin, in moving the adoption of the report, said:—It is now my province to move the adoption of the report. I shall not detain you at any great length, but there are one or two matters referred to in the report to which some further reference may be desirable. I think you will all consider it matter of congratulation that the amount subscribed,—recollecting the condition in which the world has been for some time past, through the ambition of rulers and the intrigues of statesmen,—should have reached the sum of nearly 14,000*l*. The report refers,—and the Council of the Art-Union have reason to be proud of the fact,—to the gradual establishment and opening of art-galleries in the provinces. Year after year, in our reports and at these meetings, reference has been made to the discredit attaching to this country from the fact of the absence of such galleries, while they are present in all the important towns of the Continent. You have heard from the report,—you probably knew before,—that Manchester, Liverpool, and Nottingham have made or are making at this moment remarkable efforts to establish galleries which will be of the greatest advantage to those towns and their inhabitants. At Nottingham there will be, I have reason to believe, a loan collection opened within a very short time which will prove a source of the greatest delight and instruction to thousands of people who up to this time have had little opportunity of seeing the finest works of art. Another point referred to in the report is the utilisation to a greater extent than is now the case of our national collections; and I am sure all of you will endorse the desire of the Council that the British Museum, South Kensington Museum, and other national establishments of the kind, should be made of more use by the presence there of gentlemen able to point out all that is admirable in and capable of being learned from the collections. Above all, I think we should anxiously impress upon those who have the power of providing a remedy that the numerous students who attend at the British Museum and at South Kensington deserve some looking after. There should, I venture to observe, be appointed, and properly paid, artists to aid the students in their studies, which they now carry on under the greatest difficulties, without any assistance or suggestions from those capable of aiding them. This is not the moment to urge upon the Government, embroiled as they are, the adoption of this course; but should we escape war,—as we all heartily hope and pray may be the case, so we escape it with honour,—I do hope the Government will take more important steps for the promotion of art than they have yet done, for, to tell the truth, to my mind they do very little now, and they certainly ought to do a great deal more. Artists want opportunities; opportunities sometimes make artists. Our public buildings should, as we have again and again said in our reports, and as I personally have often urged, be artistically decorated, if only to find occupation or to give commissions to the rising artists of the country. If it were my wish to detain you, and you were willing to listen, I might dwell on what has been done by the Art-Union in years past, for it seems to me to be very important that the history of the association should at times be referred to, so that those who now support it and are in it should be reminded of how it was established and how it has grown. I will not do this now, important as I consider it to be, but I would remind those who find it necessary at times, not to defend, but to advocate the claims of the Art-Union of London, that, apart from the pleasure which it has given to thousands of persons in every part of the world, it has raised half a million of money which has been spent upon art; it has kept alive the art of line-engraving; it has revived the art of producing bronzes; and it has alone maintained the art of medal die-engraving. These of themselves are no slight achievements, and should be recollected by those who at times have to reply to those who are apt to speak somewhat slightingly of the Art-Union. This used to be the case with some of the leading artists, but I do not think it is so now, because many of those who are now leading artists, if they look back to their early days, will be compelled to remember the help they received through the Art-Union of London, either by the purchase of some one of their pictures, or the gaining of some premium or prize offered by the society, and which incidents were among the first in aiding them to attain their present position. There are many members of the Royal Academy who are never unready to acknowledge this. Of those artists, however, who have been positively saved from ruin the world never hears. A few weeks ago, the death of the chief master of one of the principal art-schools in Ireland reminded me of a striking incident of that kind. He came to me a great many years ago, when artists were not so well paid as they are now, and said, "Your association has saved me from a great sin. None of my pictures were sold; I felt utterly ruined and depressed, and if it had not been that a member of your Council had recommended to one of your prizeholders the purchase of a picture of mine I should certainly have destroyed myself." He obtained his appointment very shortly after. Many such stories might be told. We have spoken of the past, but I will now betray a confidence, and tell you one or two facts as to the future. When you go to the Royal Academy exhibition next week you will see a remarkable series of paintings by Mr. Frith, R.A., which may probably be called "The Road to Ruin." There are some five of them, and I have little doubt that they will form a most attractive feature of the exhibition. The Council of the Art-Union of London have purchased the right to engrave those pictures, so that the whole five will one of these days be presented to each subscriber of a guinea. If this is achieved,—it will of course take some years,—if these five remarkable works are given to every subscriber, and a due amount left for prizes out of the annual guinea, I maintain that it will be one of the most wonderful results of co-operation that has ever been seen. We have also some works in preparation on national subjects by Mr. E. M. Ward, R.A., Mr. Cope, R.A., and many others; so I think you will say that the future is as promising as the past has been satisfactory. I move that the report be received and adopted, and ask Mr. Grote, member of the Council, to second it.

Mr. Arthur Grote.—I second the adoption of the report.

The motion having been put, was carried *nem. con.*

Mr. Francis Bennoch said:—Our success, as the report has mentioned, depends to a large extent upon the loyalty and exertions of our various agents, but it as largely depends upon the untiring efforts of the honorary secretaries, and therefore I have very great pleasure in moving "That the warmest thanks of this meeting be given to Mr. Lewis Pocock and Mr. Edmund E. Antrobus, honorary secretaries, for their continued efforts for the prosperity of this society." Some of us know that from the beginning Mr. Pocock has been one of our most valuable officers. He is one of the only two now remaining who originally founded this society. The efforts and achievements of the Art-Union of London have been so well explained by Mr. Godwin, that I need not say anything on the same subject; but I have one little incident to relate which will be interesting to you, as it shows how far and wide the influence of our Art-Union is known and appreciated—penetrating, I may almost say, even into the very centre of savagery itself. A friend of mine, now making surveys in New Zealand, entered the hut or cabin of a Maori chief, and great was his surprise and delight to find adorning the walls of the humble abode our two great engravings of Nelson and Wellington. To find our pictures appreciated by a man of that sort gave my friend a thrill of satisfaction no less than that experienced by myself when I received his letter. This and like results we may largely attribute to the civilising and Christianising influence of the labours of the late Bishop Selwyn, who carried with him not only the doctrines he was bound to teach, but that kindly sympathy which won for him the affection, confidence, and deep regard of even the savage tribes themselves.

Sir Walter Stirling.—It gives me great pleasure to second that resolution, not only on account of the esteem in which I personally hold the gentlemen named in it, but because of their efforts on behalf of this society, which it is quite clear must entail upon them an enormous amount of labour.

The resolution having being carried unanimously,

Mr. Pocock said,—I thank you very heartily, both on behalf of myself and for Mr. Antrobus, who is, I am sorry to say, unable to be here to-day. There is one omission in the resolution, however, to which I should like to refer. The name of our friend Mr. Watson, the secretary, ought to have been included in it. Perhaps you will allow me further to propose,—"That this meeting offers its best thanks to Mrs. Bateman for kindly granting the use of her theatre for this meeting; and to Mr. Loveday and Mr. Mather for the arrangements they have made."

Mr. E. M. Ward, R.A.—I have much pleasure in seconding that.

The Chairman.—I am sure you will all cordially join in this expression of thanks to Mrs. Bateman for her handsome donation to the Art-Union of London in granting us for this meeting the free use of her theatre,—a theatre which is really hallowed now in the minds of earnest playgoers.

The resolution was carried by acclamation.

On the motion of the Chairman, it was unanimously resolved,—"That the thanks of the meeting and a copy of the print be given to Miss Vacher and Miss Peregrine for their kind assistance in drawing the prizes, and to the scrutineers and auditors."

The drawing for prizes was then proceeded with, Mr. E. M. Ward, R.A., succeeding Mr. Godwin in the chair after a time. We append a list of the principal prize-holders, amongst whom, as will be seen, there are many colonial and foreign subscribers:—

A Painting, by Edward Duncan, "The Return of the Life Boat," value 200 guineas.—White, Sam, Norwich.

200*l*.—Moore, Dr. M., Coventry.

150*l*.—Hopkins, Mrs., Belmont-street; Evans, E., Neath.

100*l*.—Dale, H., Peckham-grove; Eady, Dr., Crawley; M'Kenzie, A., Wairnka.

75*l*.—Forbes, J., Dundee; Harding, Jno., Stone; Snyder, H. F., Williamport; Laurento, C., Robe; Moody, C., South Australia; Moore, W., Pershore.

60*l*.—Chewings, J., Koringa; Christie, W., Walsall; Gaunt, Mrs. W. H., Old Thornville; Hudson, J., Leeds; Pidgeon, Miss, Reading; Sewell, J., Buenos Ayres.

50*l*.—C. W. Q., Barcelona; Freeman, W. P., Shaw; Green, Jos., Maidstone; Hammond, A. O., Greenwich; Kino, J. C., Fenchurch-street; Lillywhite, A., Onslow-road.

45*l*.—De Keyser, P., Blackfriars; Furze, H., Forest-hill; Gamboa, F., Jersey; Gibbs, W. C., Oatland; Houghton, Mrs., Kensington; Jenkins, H. M., Hanover-square; Johnston, T., Kelso; Mecars, Capt., Elgin-crescent; M'Millan, J., Adelaide-road; Murray, W., Warwick-lane; Pilcher, J. D., Gordon-square; Wood, T., Leeds.

40*l*.—Allen & Son, Nottingham; Bennett, Dr., Cavendish-square; Brown, Dr. H., Godalming; C. U. X., Barcelona; Crossman, Mrs., Camden-square; Earl, J., Ashford; Habershon, W., Bloomsbury-square; Jones, T. B., Brixton; Kelsey, J., Hackney; Larnach, J. D., Belfast, Victoria; Reid, W., Edinburgh; Taylor, F., Walsall.

35*l*.—Botterill, Mrs., Upper Thames-street; Cover, J. L., South Milford; Fisher, Mrs., Streatham; Hick, M. B., Wakefield; Montgomerie, J. R., Strenky-bay; Orris, Mrs., Norwich; Parker, T. T. Lytham; Russell, W., Perth, South Australia; Rutter, J. S., Richmond; Saxon, W. Stockwell; Thomson, —, Bromley-common; Vyvyan, R. H. S., St. Columb.

30*l*.—Cleaver, J., Clapham; Gelder, N., Knaresborough; Hammond, Mrs., Colchester; Hanam, Dr., Invercargill; Hawkes, W. C., Cloudesley-square; Johnson, F., Westsquare, Keenan, J., Bradford; M'Donald, T. M. Invercargill; Mountain, T., Grimsby; Pick, T. A., Redhill; Pooler, R. F., Brixton; Smith, J., Swaffham, Weaver, W. G., Hobart-town; Wolfe, J. W., Upper Montagu-mews.

25*l*.—Barratt, E., Bishop Stortford; Brewer, H. E., Portland; Dennis, F., Nottingham; Griffin, J., Walsall; Hall, E., Narracoorte; Harrison, G. O., Ashton-under-Line; Henderson, J., Stansbury; Hills, B., Deptford; Hodgson, J. B., Stockton; Houghton, J., Railway Clearing-house; Howells, P. A., Adelaide; Nash, S., Oxford-street; Saunders, P., Dundee; Porter, T. D., Adelaide.

20*l*.—Bird, Dr. E., Shrewsbury; Bourne, S., Nottingham; Butler, E. B., Hobart Town; Cooper, F. W., Halifax; Craig, D., Christchurch; Easton, S. W., Islington; Hope, J., Clare, S.A.; Humphreys, E., Bickley; Isherwood, J., Darwen; Lewis, Miss, Port Rewitt; Leavitt, C., Providence; Malcozzi, J., Smyrna; Noyes, G., Sutton; Read, Jos., Leicester; Sangster, G. E., Montrose; Sargent, A., Denman; Walker, J., Railway Clearing-house; Wright, C., Toronto.

15*l*.—Baber, W. H., Brixton; Berryman, S., Kadina; Bostock, T., Burslem; Bryce, C., Merino; Clarke, H. B., Highbury New Park; Cock, F. G., Wandsworth; Dodwell, J., Eccles; Eaton, Jas. S., St. Ninian's, Ashton; Horne, W. J., Old Broad-street; Humphrys, R. H., Sevenoaks; Ison, W., Bexley; Learmonth, W., Ettrick; Lenden, W., Railway Clearing-house; Palmer, W. D., Thistle-grove; Rowe, E., Plymouth; Saunders, R., Adelaide; Snelgrove, A. G., London Hospital; Stockdale, R., Robe, S.A.; Tidy, H. T., Sittingbourne; Worham, —, Bow.

10*l*.—Anderson, J., Melton; Archer, W., Reading; Blow, J., Greenwich; Cameron, R. B., Hobart Town; Clark, A., Charlotte-street; Clewett, F. J., Duncannon-street; Coates, Miss, Greymouth; Collyns, G. N., Moretonhampton; Cook, W. B., Stirling; Couldery, H. H., Lower Sydenham; Cox, S. G., Leicester; C. W. L., Bar-

celona; East, J., Silchester-road, W.; Ellis, W. J., Melbourne; Evans, W., Kennington Park-road; Hall, F., Plymouth; Harland, S., Leeds; Holdsworth, J., Sandhurst; Howard, M. R., Holloway; Langaard, F., Bilbao; Marriccini, C., Smyrna; Mills, J. C., New-street, S.W.; Moss, Geo. W., Greymouth; Palmer, W. T., Clifton; Parkinson, J., Junior Naval and Military Club; Post, S. P., Cincinnati; Prescott, Sir George, Clarges-street; Shannon, W., Angaston; Turner, C., 77, Park-street, W.; Welburn, —, Veryan.

A Bronze Group, "America," from the original by Mr. Bell.—Noon, A., Adelaide.

A Bronze Statuette, "The Warrior," after the original by H. Thornycroft.—Francis, J., Portmadoc; Terry, Major W., St. Cross, Winchester.

A China Tazza.—Breakey, W., Quebec; Burrell, H., 18, Edith-road, Peckham; Coles, J. F., 2, Bedford-street, Strand; Crofton, Mrs., Westbourne-terrace; Gale, W. F., Caterham; Elusby, B. B, 18, Gloucester-road, Kew; Harvey, W. F., Chartham; Heydemann, P., 3, Steele's-road, Haverstock-hill; Richards, G., Worthing; Russell, A., Quebec.

A Bronze "Discr" Tazza.—Burne, W. L., Bank of England, Leeds; Dines, J. C., 15, Clipstone-street, S.W.; Derby, Right Hon. the Earl of, St. James's-square; Fothergill, R., Bedale; Gelder, W., Knaresborough; Grey, R., Water-lane; Hale, B., Holly-hill, Hartfield; Hopps, J. Ripon; Jimenez, R., Puerto; Maling, Dr., Sunderland; Mallinson, T., Welshpool; Moules, George, Sutton; Purvis, T. T., Railway Clearing-house; Ridley, J., Union Bank; Stack, J., Adelaide; Stiles, W., Wells-street, W.; Stribling, C., Bury-street, W.C.; Wildman, R., Settle; Wilkinson, Mrs. R. G., Mitcham, S.A.; Yolland, J. G., Barnet.

DECORATIVE ART IN SCOTLAND.*

ABOUT the end of the sixteenth century there was born in the city of Aberdeen one who was destined to occupy a high niche in the temple of art fame, and was known in after years as the Scottish Van Dyke. Jameson's early training in art was effected on the Continent, and he rapidly acquired great skill and reputation in his native country. When Charles I. visited Scotland, the Edinburgh Council requested Jameson's presence in the capital, for the purpose of painting his Majesty's portrait. The King and Queen both acquiesced in the proposal, and the result was a great success, and was highly approved of by the royal pair. This eminent artist was chiefly engaged in portrait-painting, although there is evidence in a few of his works that, had there been encouragement in the more decorative spirit, he would have gladly employed his pencil in its exposition. One of the known works wherein he exhibited this tendency is preserved in Taymouth Castle, being a beautiful example of illuminated scroll-work and colour, depicting the genealogical tree of the Glenorchy family; and another is a composition exhibiting a perspective view of our own city, where he introduces an allegorical figure of Neptune in the foreground. Indeed, Jameson's artistic success has not been surpassed in the history of art in Scotland. This is a circumstance which causes a little surprise; not that his works did not merit all the commendation that they received. But when we take into account the state of society, and the absence of everything pertaining to art, we are struck at the appreciation of his abilities and the ample reward accorded him, as is proved by the extent of the fortune he left. From this excellent painter there arose many followers, but it would appear that none of them attained anything like the reputation secured by their master, and, with very few exceptions, failed even to preserve their names from oblivion. Nevertheless, however much we may regret the absence of any biographical sketch of those painters, it would not fit our present purpose, nor be of much advantage to us, as there is no evidence of decorative art having been practised at the period, nor for many years after. And although many names appeared from time to time whose works seem to have met the requirements of the age, it was not until about fifty years after the Scottish Van Dyke had passed away, that one who bore a name which is specially memorable appeared—Allan Ramsay, nameson of the celebrated author of the "Gentle Shepherd." He was a man of singular talent, and is justly and honourably spoken of as the restorer of the limner's art from the affectation of manner which had been introduced by Sir Peter Lely, whose fantastic treatment of ladies' portraits had been imitated by his followers, and had grown to a great excess, more particularly in the treatment of the drapery, which, although the figure itself expressed repose, was represented as restless and flowing.

We have now reached an epoch in the art history of our country, in which our native artists are no longer to have a merely local standing, but their fame is to be known and esteemed throughout the world of art. Among the first to achieve this high honour was Alexander Runciman, in whose works we especially discern the true spirit of decorative art. He was born in Edinburgh in the year 1736. Through the enlightened liberality of the baronet of Penicuik, Sir James Clerk, he was enabled to prosecute his studies in Rome. During Runciman's sojourn in the Eternal City he became deeply imbued with the spirit of art, which breathed upon him from the roofs and walls of the churches and palaces there and in Venice, and he inhaled those inspirations that enabled him on his return to recompense his noble patron by designing and executing in oil, on the ceiling of the drawing-room at Penicuik House, one of the most remarkable productions of decorative art in Great Britain, and to this day it continues unrivalled for splendid pictorial conception and vigorous and expressive treatment. The subjects are taken from Ossian's poems, and from this circumstance the room is named Ossian's Hall. There are several other proofs of Runciman's decorative skill in the same house. The dome of the staircase, for instance, is an excellent specimen of purely ornamental art, while in the outside porch the ceiling is painted in exquisite bas-reliefs. St. Patrick's Roman Catholic Chapel, in this city, also possesses an important work, placed over the altar. He also introduced an artistic, and at the same time constructive, system of decorative art that so appropriately wrought in with the style of the interior arrangements of the public rooms of that period, the walls of which were invariably panelled. With the assistance of many talented decorators whose names have been lost to us, he was largely employed in adorning these apartments with painted panels placed over the doors and mantelpieces, representing landscape views of our country which, I may here suggest, in all probability, formed the basis of that special phase of art, that in our time has arrived at such excellence, and by which our artists have justly gained such high repute. Runciman and his scholars likewise executed fanciful architectural groups in light and shade on panels. Many specimens of these have been brought to light through the action of the City Improvement Trust, the course of whose operations had rendered it necessary to demolish numbers of houses in the old parts of the town. There can be no doubt of the fact that we must look on Runciman as the truly foremost representative of the decorative element in what had been a very prosaic craft, and the reviver of that desire for the employment of decoration in our homes which has happily now been accepted and received with public approbation. Runciman had also the distinction conferred on him of being the *first* native artist officially appointed by the Board of Trustees for the Encouragement of Manufactures, &c., in Scotland, to the position of Master of the Academy for Drawing in 1772. He died in 1785, and was succeeded in this office by the celebrated David Allan, who achieved so many brilliant triumphs in the field of art.

David Allan was born in this city, but received the rudiments of his art-education in Glasgow, in an academy founded by Robert and Andrew Foulis. He subsequently studied in Rome, where, in open competition, he carried away the gold medal of the Academy of Saint Luke for the best historical composition, the subject being the origin of painting. This picture may be seen at the present time in our National Gallery.

The influence of the school, so successfully presided over by Allan and his predecessor Runciman, ultimately became, in the hands of Sir William Allan, the nucleus from which arose the Royal Scottish Academy. The latter, like his predecessors, raised himself by sheer force of genius, to the exalted position of president of that Academy which he had so ably assisted to establish.

The style introduced by Runciman continued to be greatly patronised throughout the country, and employed the youthful efforts of such men as David Allan, Sir William Allan, Stansfield, Ewbank, Fenwick, Roberts, J. Wilson, Kidd, Cooper, Gibb, Balmar, Nichol, and Bonnar, nearly all of whom began their career in the painting establishments of this city. And not a few of the heads of these painting-shops have become noted for their artistic skill,—such names as Coulson, the brothers Norrie, Sommerville, and Clelland, all of whom were good artists, and were well versed in the technical knowledge of decorative art. It is assuredly gratifying to be able to associate such names with our craft,—names that are renowned throughout the length and breadth of the land, and which have gained a position in the very highest rank of the art profession.

However pleasant it may be to contemplate these results, we may, without the risk of being accused of grumbling, ponder for an instant over the questions which they suggest,—or, more correctly speaking, the one question into which they resolve themselves,—namely, what would have been the issue had there been a general demand for the works of the mural decorator. To my mind the answer is clear, and carries no uncertain sound in its ring, and may be conveyed in these words:—"Had there been a steady and apparently extending desire for the higher and more artistic forms of decorative art, nearly all these illustrious names would have remained in our ranks, and would have shed the lustre of their presence over our craft, and by their invaluable direction and aid the mural art of the country might have obtained an eminence equal in dignity and position to that of any country in Europe."

The consequences of this lack of encouragement on the part of the public showed themselves in many ways, but there was one in particular which had the greatest effect in retarding the advance of our special art, and, unfortunately, it still, to some extent, prevails,—that is, as soon as an individual connected with our trade imagines that he discerns in himself a capacity for the exposition of what is called *the higher sphere of art*, he immediately puts aside those things which he affects to look upon as beneath him. I presume we are all of us familiar with instances of that kind. The aspiration may doubtless exhibit commendable ambition, but the capabilities are not always equal to the occasion, and the end is disaster, in place of the anticipated triumph; for, it is not an external acquirement which may be learned by rote. True art is an innate faculty, and it is not often that nature bestows on the world men with the genius of John Philip, of Aberdeen, or David Scott, of this town, whose names will always be associated from the circumstance of their being the greatest colourists which this century has produced in Britain. And again we have Horatio Macculloch, of Glasgow, who inaugurated his artistic career by employing his pencil on the embellishments of those floating palaces for which the Clyde is celebrated. And although it is a natural and laudable thing for every man to strive for what is high and honourable, I think there is so much that is meritorious to be gained in the field which we cultivate, that it is quite unnecessary to seek for fresh pastures. No doubt there are difficulties to encounter and obstacles to be thrown down, and prejudices to be overcome, but the reward of success would sufficiently repay the effort. And that success would consist in raising decorative art to its proper place, and defining its functions as a pure and legitimate form of "art thought" which would inspire its exponents with an earnest desire to acquire the necessary knowledge of its technicalities, and the skill to employ that knowledge so as to ensure approbation, and the courage to face undauntedly that mercenary spirit so powerful in these days, which attempts to change it,—no matter however genuine the nature of the art may be,—into a medium of merely fashionable traffic, enslaved by certain hard and fast precepts promulgated by a few who have arrogated to themselves that imaginary privilege.

The results of such coercion are invariably fatal, and they pass the way of all things that are dominated by the tyrant fashion. It is very much to be regretted that the tendency of the present day seems to lie in that direction. I can think of nothing better fitted to withstand the wave which threatens to break down, or at least retard the rising art spirit of the country, than the united action of this and similar associations in denouncing and discouraging all that is of a clap-trap and upholstery propensity.

It is a subject for congratulation to find at the present time that the decorative profession, although holding a position which has not hitherto been fully understood, and notwithstanding the arduous studies essential for the attainment of even a humble standing in its ranks,—it is, I repeat, gratifying to find so many earnest workers in our ranks; and all who will take the trouble to observe closely, can easily perceive that the day is not far distant when the study of decorative art will be considered a qualification in its possessor which shall com-

* By Mr. Thomas Bonnar. From an address entitled "The Past of Art in Scotland," delivered at the inaugural meeting of the Association of Master Painters in Scotland.

mand the respect of the community. It already includes amongst its patrons many of the upper classes, a number of whom are enthusiastic in its praise, and are by their activity in its favour popularising our beautiful art, and inciting that numerous class, who in all matters,—taste included,—join their voice in the cry that has gone forth, obedient to the injunctions of those who, according to their judgment, are qualified to define what is to be regarded as acceptable.

It is with great satisfaction that we mark the advancement of our art, and I have every confidence that with the liberal encouragement of the public (when contrasted with the struggles of our brethren forty years ago) which we enjoy, combined with the enlightened system of technical education in vogue, the spread of the principles of art by the machinery of our schools of design, and with the rich and varied examples open to our study in the galleries of South Kensington, and within the walls of our own Industrial Museum, we ought to have every reliance in the future of our art to excel, or at all events to compare favouraby in design and beauty of form, with the productions of other lands, although they have enjoyed for centuries the advantages which are only now being brought within our reach. For it cannot be doubted but that the extension of mural art, in addition to the want of patronage, was greatly retarded by our domestic proclivities making us slow to comprehend or accept decorative art in its higher development. This might have been otherwise had our manners and customs been similar to those of France and Germany, where for a long period art has been generously patronised, even in the smallest towns, which possess in abundance theatres, concert-halls, cafés, &c., the most important of the former being generally supported by the Government. As a rule, these places are decorated with considerable artistic effect; the question of expense is evidently a matter of secondary import, the main object being a desire to make them attractive and agreeable places of entertainment. It is beyond question that they serve, although it may be unconsciously, to educate public taste, by making it familiar with objects of beauty and refinement. And not only is this end realised, but this class of work has also the merit of furnishing employment to a large number of decorators; and for this cause alone the encouragement extended by Government may be looked upon from an art point of view as of great public and national advantage.

That the employment of mural decoration as a medium for the embellishment of our churches and public buildings, as well as our private mansions, should only be, and is best inculcated by, a gradual but appreciative process, is too apparent a fact to admit of enlarging upon. It should have that facile power of beauty which will enable it to create an atmosphere of art that will imperceptibly blend itself with the national æsthetic tastes, and that so firmly that it will ultimately become an essential mode of the art and expression of the every-day life of the community.

But let us not assume, as some people would have us to believe, that this happy accomplishment of our wishes is ready to spring into existence all at once, although it is undoubted that the germs of art have been widely sown, and have now become deeply rooted in our midst. They require but the warmth of patronage for their growth and enduring development. And on us, an association of decorators, lies the onus, nay, the imperative duty, to guide, cherish, and protect, in every manner possible, this object of our solicitude, to beware that it sinks not into a mere soulless mass of reproductions devoid of life or meaning. Let steady, earnest study be our motto; and let us always endeavour to engraft on our works the stamp of individuality, which is the prominent feature of true art; for on our success or failure in this depends the decision whether we shall be accepted or rejected for the position we so ardently aspire to occupy as the exponents of the expressiveness of the decorative art of Scotland. We must not be discouraged if immediate success does not reward our efforts, but should rather be animated by an increasing desire to master that subtle quality of beauty which so materially assists us in promoting, as far as in us lies, —individually and collectively,— the refinement and elevation of that high idealistic state of society, by and for which we live and work.

WATER-GATE, YORK-STAIRS.

SIR,—A correspondent, in your last number, has called attention again to the discreditable condition in which for so long a time this beautiful work of Inigo Jones has been allowed to remain. I conclude that it is likely to remain as it is until it is thoroughly agreed that the right position for it has been found; and I am afraid that the suggestion of your correspondent will not advance the matter. But I venture to think that the favourable moment has at last come for raising it from its half-buried condition, and placing it—not far from its original site—in a position most suitable with regard to its history, where it will be well placed for the display of its own beauty, and where it must contribute to the effect of the objects with which it will be associated. There is but one spot that fully meets all these requirements. It is immediately opposite the steps on the Embankment upon which Cleopatra's Needle is about to be raised. Thus York-gate (as I think it should be called) would again be at the head of York Stairs; but instead of being an outlet in an embattled wall, as in the time of Charles II., when the Duke of Buckingham used to pass through it to his barge, it will serve to break the monotony of a long line of iron railing, and form a picturesque entrance to the garden. The object, however, it would most serve in placing it here, is the balance and contrast it would afford to the obelisk. This would again throw its shadow upon a gateway; and one of the many associations from which it has been torn would be restored to it. Perhaps the two objects would combine with the best effect from the river; but to those passing along the Embankment, where there are at present not too many objects of interest to attract attention, the graceful old gateway, embedded in foliage on the one hand, and the mysterious Needle, with its attendant sphinxes looking calmly into the water, on the other, will together give an impression which few even of Cook's tourists may have retained from anything they have seen abroad. A. P.

THE COLD STORAGE WHARF.

THE extensive premises under the Cannon-street Station of the South-Eastern Railway, reaching from Thames-street down to the river, and which were formerly occupied by Messrs. Macfarlane, founders, have been recently taken on lease by the Cold Storage Wharf (Limited), and converted, at considerable outlay, into a market-hall, refrigerating storage, and general and bonded vaults.

The situation is very central, being in the heart of the City, and it possesses four landing stages at the riverside, with ample cartage way. The storage capacity is nearly 500,000 cubic feet, and the area 27,000 square feet. The refrigerating chambers are capable of holding more than a week's supply of meat for the whole metropolis; and, besides meat, it is purposed to store poultry, fish, fruit, and other perishable foods, one-third of the building being fitted up for this branch of business.

The perfect development of the foreign meat trade has been greatly retarded, and the profits considerably reduced below a remunerative point, from want of proper storage, where consignments could be kept in good condition for the markets; but it is hoped that the principle adopted and just now put into operation by this company will meet that requirement. Although the system of cold storage is by no means an experiment, having been in use in America for some time, it has involved long and careful deliberation as to the best means of applying and establishing a system suitable to the building of a capacity sufficient to meet the requirements of the metropolis.

On considering the matter of food supply in the light of the fact that during 1877, 104,371,394 lb. of fresh meat, valued 2,046,670*l.*, were imported into this country from America, and 200,420 cases from Australia, the importance of any undertaking for securing the delivery of the meat fresh and good to the consumer will become more than ever manifest, and should such a result be successfully and permanently obtained, the prices will of necessity fall much below what are now necessarily charged.

The following is a description of the scheme, which has been designed by Mr. Archibald D. Dawnay, C.E., and Mr. E. A. Grüning, architect, and carried out under their direction by Mr. Garrud, builder, and Messrs. Russell & Co., engineers, Hatcham.

Four of the arches,—5, 6, 7, and 8 on plan,—are entirely isolated and made airtight; the entrance to them is from a passage also shut off at each end, so as to limit the quantity of air admitted at the opening of any chamber. The doors are of double thickness, in double-rebated and grooved frames, lined with rubber stops, and fastened with heavy iron self-tightening latches. A double glazed opening shows a thermometer and hygrometer hung inside. A vacuum gauge is also inserted with an inside funnel, as a precaution should accident arise to any of the valves, and stop the passage of air. The interior of the ground floor of each chamber is fitted up with hooks and bars, upon which to hang quarters of meat; the upper floor is also prepared for storing baskets and crates of perishable foods.

An arch contiguous to No. 8, termed the "coil-chamber," is fitted up with four coils of 6 in. by $\frac{3}{8}$ in. cast-iron pipes connected with bonnet bends, and strapped to a gridiron of rolled joists at varying heights from the floor. These pipes are laid to a transverse fall of 1 foot, and to an alternate rise and fall longitudinally of 1 in., and graduated so that any condensation of moisture in the air in its passage through the pipes may run to the lowest end, and thence into a cast-iron syphon pot which is attached to each coil; these pots are luted with water to prevent air being drawn. The lower end of each coil is fitted with a funnel, and passed through the chamber wall, and bolted to an iron receiver of sufficient size for four inlets. The receiver is prepared for holding charcoal trays and chemically saturated wool so as to purify the air when necessary before passing into the coils.

Under the coils a grid is fixed for supporting the ice, which is laid in sufficient quantities to cool the entire pipe surface; arrangements are also made by means of tanks, so that the coils can be wholly immersed in a freezing mixture other than ice. The upper end of each coil is conveyed to the corresponding cooling chambers, into which it projects with a funnel.

Outside of the chambers, and running parallel with them, is laid a 9-in. exhaust main, to which is connected a draw-off pipe from each chamber, having at its extreme end a funnel projecting above the floor.

At one end of the main a Waller and Beale's exhauster is fixed, capable of drawing 15,000 cubic feet of air per hour, and which is driven by a horizontal 10-horse high-pressure engine. The boiler is an ordinary short "Cornish," fitted with a steam injector and other usual appliances. A series of valves are placed in various situations along the pipes and coils, so that one or more chambers may be worked together or singly; or two coils may be worked into any one chamber if greater cold is requisite.

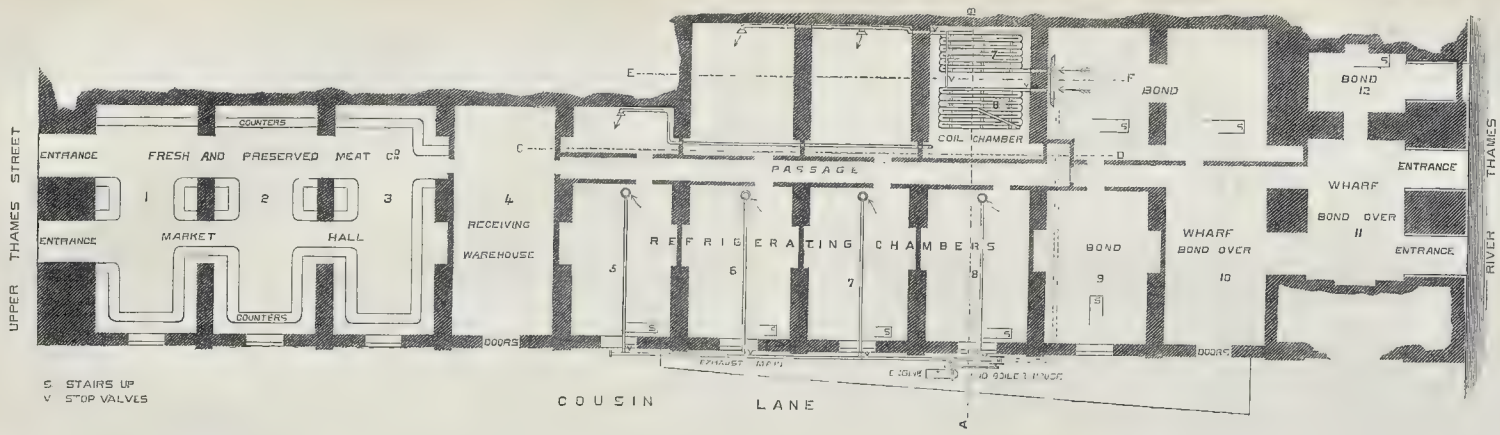
The coil-chamber being filled with ice, or the tanks with mixture, it is closed up, and the valves for the chamber to be worked being opened, and the exhauster set in motion, a partial vacuum is first produced, and then the air is admitted into the receiver, and passes through the coil and ascending pipe into the upper and thence into the lower floors of the cooling-chamber, and is drawn out by the pipe attached to the exhaust main.

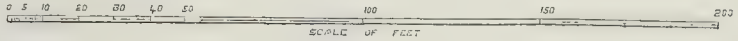
A pipe velocity of 3 ft. per second, and equal to a discharge of 3,000 cubic feet per hour, will reduce the temperature of a chamber to 38° in a few hours, or, otherwise, in proportion to its cubical capacity and the temperature of the chamber at the time of closing, and also to the temperature of the food stored.

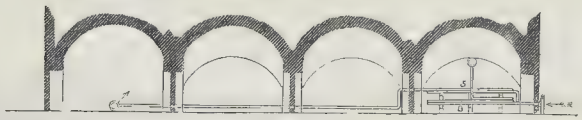
The machinery is kept at work day and night. Each coil contains about 300 ft. of pipe. A number of trials have been made under varying circumstances, all of which have substantiated the hypothesis of the engineer.

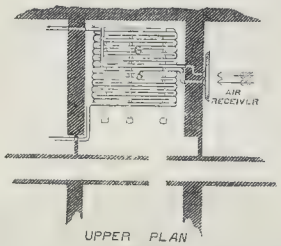
In addition to the storage this company is inaugurating its own service of home and foreign refrigerating rail cars and vessels: the cars are now being designed by Mr. Dawnay, and they will in all probability be built by an English wagon company.

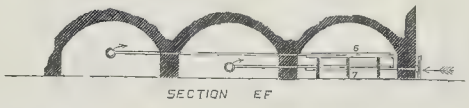
Duston.—One of the windows in the chancel of Duston Church has just been filled with stained glass to the memory of the late Mr. Henry Billington Whitworth, of Dallington Hall. The window represents the Ascension of our Blessed Lord and Saviour, and was executed by Messrs. Heaton, Butler, & Bayne.

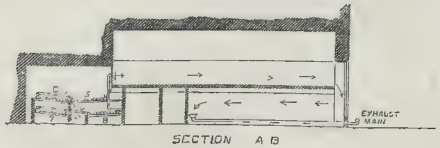












THE COLD STORAGE WHARF, CANNON STREET, LONDON.—Mr. Archibald D. Dawnay, C.E., and Mr. E. A. Gruning, Architect.

THE WELLINGTON MONUMENT.

IT is with feelings of deep regret—we may say with a sort of despair—that we turn away from the contemplation of the Wellington memorial now that it is at last opened to public view. Every one who knew anything about the work and its author knew that in it, so far as the sculptured figures at least are concerned, we had at last *one* great work in modern English memorial sculpture. This is literally thrown away. One, of course, knew very well that the recess called the Consistory Court in St. Paul's Cathedral could not possibly be a good position for a work of such dimensions as this; but only the inspection of it now that the whole (except the terminal figure) is erected and the scaffolds and screens removed, could give any idea of the enormity of the mistake that has been made. There is absolutely *no* place from which to see the figures which are artistically the chief glory of the design. From the ends and from the south side, whence the light is thrown on them, it is only possible to see them absurdly foreshortened, and the south view of the figures in any case is not the principal one; they front the other way. From the north side, no doubt, we can get a more distant view of them, but how? As silhouettes against the light of the aisle window! It is inconceivable that anything so stupid could have been done as deliberately to build up a great and costly monument in such a place, without (apparently) once reflecting that sculpture cannot possibly be seen when *between* the eye and the light. It is the last and most deplorable instance of the inevitable fate which seems to await all effort at anything great in sculptural and monumental art in this country. Here is a work to which a gifted man gave the best years of his life, into which he put all that was best in him, and it is placed where all his genius and all his labour are thrown away. But for having seen "Valour and Cowardice" in the octagon hall of the Royal Academy, we should not have had an idea what grand qualities there are in it; as it is we see the sole of the foot of "Cowardice," and the cheek and chin of "Valour," and *voila tout!* What there may be to admire in the other group we can hardly say, for it is impossible to see it.

The architectural pedestal presents more room for criticism than we had anticipated. The general idea is admirable; but the details are of doubtful excellence (sculptors' architectural detail, we must say, very rarely is good). The twisted bits of rope (apparently) which separate the panels in the bronze dado, have a bad appearance, and seem quite unmeaning; the cherub's heads in the frieze have a rather unhappy look, as if squeezed between architrave and cornice; and the ornament of foliage, &c., on the upper moulding of the sur-base of the podium, though very beautiful and delicate work in itself, seems out of place, giving a broken and ragged line where continuity and strength are specially required. The capitals of the columns are beautiful, however, in design and workmanship; and there are novelty and good effect in the diaper over the surface of the columns.

No defects of detail of this kind, however, would affect the power and force of the principal sculptural groups, which are thus condemned to be lost to all real appreciation. The position is simply deplorable, and the fact ought at once to be faced that a hopeless mistake has been made, that a great work has been hidden "under a bushel," and that the only course is to take the whole down with due care and erect it where justice can be done to it.

In regard to the terminal figure, at present forbidden, we may add that we entirely coincide with those who think that the monument is truncated and incomplete in *tout ensemble* without it. The idea of placing the living figure of the Duke over the recumbent effigy was not quite happy, perhaps; an allegorical figure of Fame, or War, or something of that nature, would have been better; but Stevens's model of the figure is complete, and it will be better to take it as it is than invent another of a different idea; indeed, any other course would be wrong. But, in the first place, the monument *must* be moved from its present position; until that is done, it is nonsense to discuss the question of adding the equestrian statue, as that would only be to throw away another fine piece of sculpture.

REPORT OF THE COUNCIL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE report which will be read at the annual general meeting on the 6th of May will include the following paragraphs:—"An increase of business has been happily supplemented by an increase in the number of members. The Council have, however, to announce with regret the resignation of nine Fellows and four Associates. Death has also carried off eleven professional members. At the same time the increase in the number of Fellows does not afford an equal augmentation in the number of members, for eleven of the new Fellows have come from the class of Associates. Nevertheless, the annual number of professional members is 638, made up of 327 Fellows and 311 Associates. Of these 638 there are about 215 who are non-metropolitan members;* and it may be useful to compare that number with the figures of former years. In 1876 there were about 606 members of both classes, and of them more than 200 were non-metropolitan; in 1874 there were about 576 members of both classes, and of them more than 180 were non-metropolitan. Since the reorganisation of the Institute, fifty-four gentlemen have been elected Fellows or Associates, and, of these, eighteen are non-metropolitan, making exactly one-third,—which is about the same proportion as that existing before the equalisation of the annual subscriptions. Since the issue of the last report, twenty-five Fellows, twenty-four Associates, and seventy-two Honorary Associates have been elected, making a total (exclusive of Hon. Fellows, Hon. Members, and Foreign Correspondents) of 710 subscribing members, against 628 in October, 1877, and about 606 in 1876."

"The Council turn with confidence to their financial statement. On previous occasions it has been often agreeable for them to observe that the amount received in subscriptions for the twelve months under examination has exceeded the estimate published at the beginning of that year; it has been sometimes necessary to report an excess of actual disbursements over the sum provided in that estimate. Thus, in 1876, while the actual expenses exceeded by 180*l.* the sum estimated, the amount received in subscriptions exceeded by 60*l.* the sum named in the estimate for that year. Though the total disbursements of 1877, estimated at 1,934*l.*, have been exceeded to the amount of 60*l.* 18*s.* 8*d.*, the excess is more than explained by the honorarium for special services in 1876-77 voted to the last secretary, and the special outlay for fittings and furniture incurred for the Architectural Examination. The Council are glad also to state that the actual revenue from subscriptions at the close of 1877 has exceeded by 187*l.* 15*s.* the estimate made twelve months before."

"It will be in the recollection of members that a clause in the Charing Cross and Victoria Embankment Approach Act involved the Council in official and friendly intercourse with the Metropolitan Board of Works, thus:—'That the architectural elevations of all buildings to be erected under this Act, fronting the new approach to the Thames Embankment or fronting any street to be made under this Act, shall be submitted by the Board to the consideration of the Council of the Royal Institute of British Architects previously to the commencement of any such buildings." The Council, therefore, in compliance with the clause, examined the several designs which have been submitted to them; have expressed an opinion thereon; and have suggested alterations. Furthermore, a deputation from them has attended a committee of the Metropolitan Board for the purpose of discussing questions with reference to the new avenue. The deputation was received with the utmost courtesy, and the Council have been impressed with the conviction that their opinion upon the elevations of buildings to be erected in Northumberland-avenue has already received and will receive due attention from the Metropolitan Board.

Another matter connected with that Board has lately interested the Council. On receipt of the Bill which had been introduced into Parliament for the amendment of the Metropolis Management and Building Acts, the Council, having carefully considered the provisions of the Bill, felt it their duty to represent to the Metropolitan Board their objections to much that was proposed. These representations, adopted after a few verbal amendments by the Council, were submitted to the Metropolitan Board, and an examination of the Bill, as amended by the Select Committee of the House of Commons, leaves no doubt but that practically some of the most prominent modifications desired by that Council have been conceded. The valid objection to that clause in the original Bill by which the Board could from time to time make, alter, vary, and amend such bye-laws as they might deem expedient, has been limited by the insertion of a proviso that (see the amended Bill, clause 15) 'A bye-law made under this section* shall not, nor shall any alteration therein or repeal thereof, be confirmed by the principal Secretaries of State until the expiration of two months after a copy of the bye-law, together with notice of the intention to apply for confirmation of the same, has been published by the Board once at least in each of two consecutive weeks in two or more newspapers circulating in the metropolis, and copies of such bye-law and notice have been delivered at the office of the Royal Institute of British Architects,' &c.

The conditions originally proposed with reference to the deposit of plans have been considerably modified, and now affect only public buildings and other structures to which the rules of the Building Act do not apply.

The somewhat arbitrary powers which by the original Bill it was proposed to confer on the Board, enabling them to pull down any building begun to be erected contrary to the provisions of the Act or the bye-laws made thereunder, have been lessened by the introduction of a paragraph giving power of appeal before a Justice of the Peace, by whom alone an order in writing authorising the Board so to act can be made.

Another clause of the original Bill which gave power to the Board to sell the land as well as the materials, in cases where the materials of a dangerous structure were not of sufficient value to pay expenses, has been modified, in the Amended Bill, to the effect that, 'no part of the land whereon such structure stands or stood shall be built upon until the balance due to the Board is paid.' These results encourage the Council to hope that, in future, intended legislation with reference to buildings in the metropolis will not be initiated without matters of technical import being early brought under their consideration.

The suggested Bill to prevent the acceptance of illicit commissions has also engaged the attention of the Council. While anxious that right be done, they have not swerved from the position maintained by the President in the correspondence which took place in 1876-77 in the public journals. The rules of the Institute and the obligations accepted by every member, not to mention the recognised code of honour among gentlemen, afford a guarantee against the malpractices of men who call themselves architects without valid title to an honourable name. Nevertheless, in spite of that conviction, the Council are prepared to co-operate with the Legislature in order to prevent and exterminate what critics have justly termed 'fraud by fiduciary agents.'"

* "It is difficult to draw the line rigidly between the town members and those residing at a distance. For instance, a member at Croydon or Reigate is called a town member. Members having offices both in London and the provinces are counted as town members."

BUILDING AT TOTTENHAM.

AT the last meeting of the Tottenham Local Board, Sir Charles Reed called the attention of the Board to the new houses now in course of erection in Seven Sisters-road, which were being run up with great rapidity during the late wet weather, and the floors of which were a very few inches above the level of the ground. Mr. De Page, in reply, said that the houses were built on a bed of concrete, and that there were 12 in. between this bed of concrete and the flooring, but that it would certainly have been desirable to have had the floors raised a few inches higher. Mr. Stacey, a member of the Board, fully endorsed the remarks of Sir Charles Reed as to the new houses now being built, adding that those members of the Board who walked about the parish were perfectly horrified to see the manner in which the foundations were laid down and the materials made use of, not only in the neighbourhood of Seven Sisters-road, but of Page-green, the Crescent, and other parts of the parish.

* Affecting sites and foundations.



KRAMER'S HOTEL, MALMÖ, SWEDEN.—Mr. Rasmussen, Architect.

KRAMER'S HOTEL, MALMÖ, SWEDEN.

This building is an important factor in the imposing aspect presented by the Stortorget, at Malmö, which vies in the estimation of travellers with the most fashionable resorts of great cities. This hotel, the work of the architect Rasmussen, with its façade embellished with turrets, forming by itself a whole quarter on the northern side of Stortorget, is so organised as to satisfy all the requirements of the present age. It contains 100 bedrooms, besides dining-rooms, with all their appurtenances. A festival-hall will be erected in the northern wing of the hotel, with an entrance from Adelgatan. The building includes a number of good shops.

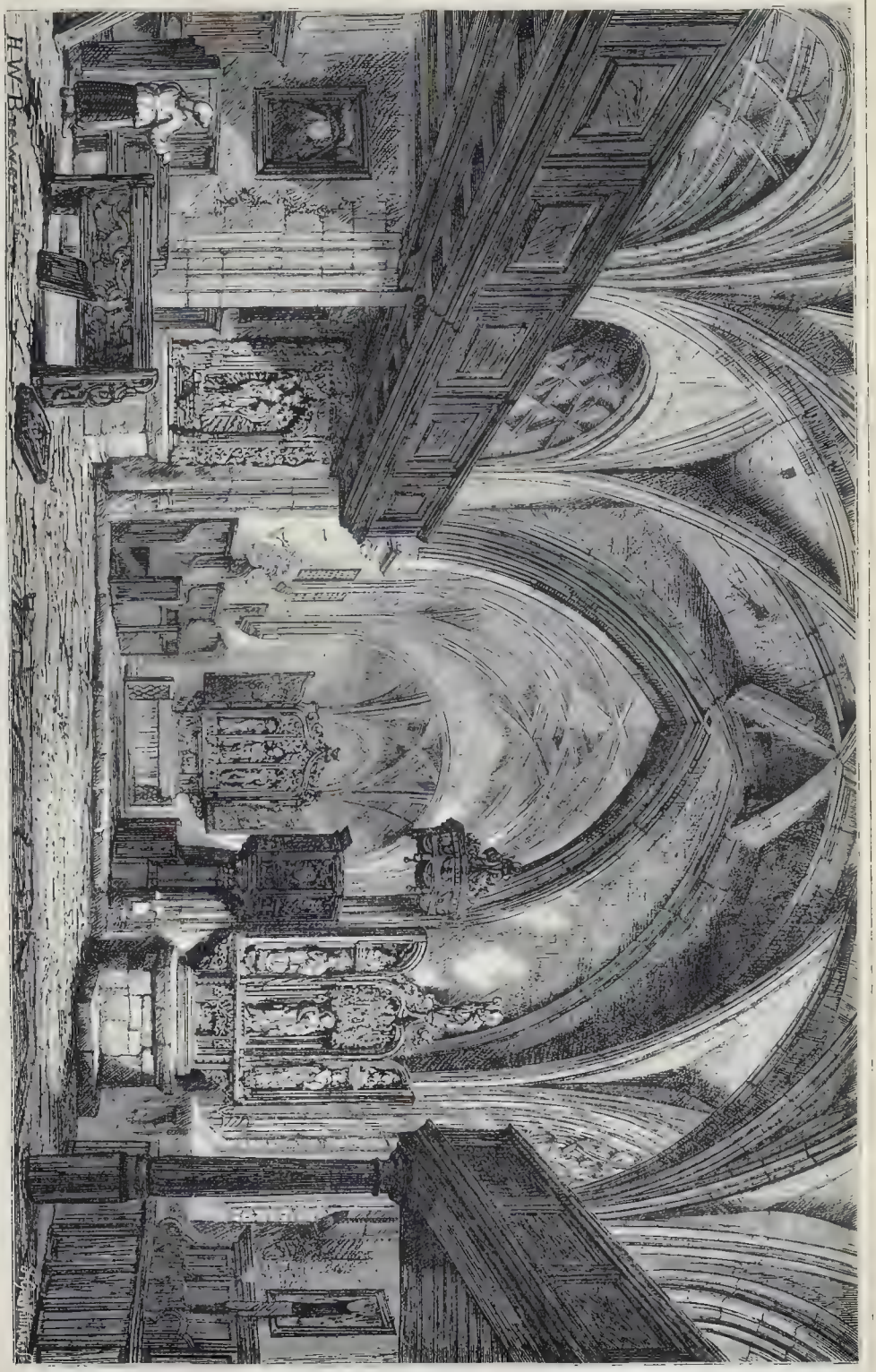
ST. WOLFGANG'S CHURCH, ROTHENBURG, BAVARIA.

The church of St. Wolfgang, in Rothenburg, the subject of our illustration, is a very interesting example of the clever way in which Mediæval architects overcame the difficulties offered by the site or situation of their buildings. Few modern architects would have ventured upon the erection of a church in such a position as that occupied by the one we are about to describe.

The Church of St. Wolfgang consists of a nave, which is in plan nearly a perfect square, and a long narrow chancel terminating in a shallow apse. There is a small flèche on the roof near the west end, and three vaulted recesses opening into the nave on the south side. The peculiarities of the site necessitated this treatment of plan. The nave had to be crowded in between the city wall on the north side and a street on the south, whereas its termination westward was determined by the city-gate. The spaces formed by the embrasures between the internal buttresses of the city-walls gave the space for the vaulted recesses to which we have previously referred. Thus a serviceable and very practicable nave was erected, but then came the difficulty how to fit a chancel on to this nave; for as the street, which bounded the church on the south, turned off rapidly in a northern direction at the east end of the nave, it was evident that the chancel could not extend so far south as the nave, and must thus be narrower than the nave. If, however, the chancel-arch were placed in the centre of the east end of the nave the chancel, would be painfully narrow and quite unsuited to the dignity and importance required for such a building by the ceremonial of the Roman Catholic Church. If, on the other hand, the north wall of the chancel were to continue in a line with that of the nave and the south wall of the chancel kept within that of the nave, it is obvious that the chancel would be "all on one side." As, however, the Mediæval architects were eminently practical men, it was decided to sacrifice symmetry to convenience, and a glance at our illustration will show how cleverly the difficulty of arranging this lop-sided plan has been overcome. By placing the chancel in its present position, another advantage was also to be derived, for its eastern termination was able to be continued as far as a semicircular bastion which was built into, and thus form the apse. A considerable difficulty presented itself to the builders in the lighting of this church. No light could be gained at the west end because it abutted against the city gate. The whole of the north side was against the city wall, and the eastern apse was formed in the bastion of the wall; so the only quarter from which light could be obtained was the south. The beautiful effect of the light in this church suggests to us that, where practicable, it might be well to have windows only on one side of a church. The treatment of the vaulting is very remarkable, as not only the cross-ribs, but also the diagonals, are treated as arches, which do not follow the same curve as the soffit of the vaulting. Like many other churches in this part of Germany, St. Wolfgang's retains its ancient altars and reredoses. The latter are beautiful examples of German carved woodwork of the fifteenth century, richly painted and gilt, but now in a sad state of mutilation.

There is a small sacristy arranged in one of the embrasures on the north side of the chancel. Over the little door which leads into it from the church is some decarative painting, consisting of inscribed scrolls interwoven with the leaves and branches of the thistle.

As this interesting church has been closed for many years, it is in a sad state of neglect and decay, but we would rather see it in this condition than subjected to such an unfeeling and inartistic restoration as that which has been recently carried out at the noble church St. James, in the same town.



ST. WOLFGANG'S CHURCH, ROTHENBURG, BAVARIA.

ENGLISH HOUSES AT THE PARIS EXHIBITION.

THE following is an official account of what has been done in this direction :—

"The total length of the English space fronting the central avenue being upwards of 540 ft., it was deemed advisable to sub-divide the façade into five portions, and to separate each of these from one another by gardens. By this means it has been possible to give to each of the five houses a distinctive character, and to relieve the monotony of a long, unbroken frontage. The first house, on entering the central avenue from the grand vestibule, has been erected by Mr. W. H. Lascelles, of 121, Bunhill-row, from the design of Mr. R. Norman Shaw, R.A. It is in the Queen Anne style of architecture, and is constructed of a patented imitation of red brickwork, the invention of the exhibitor, Mr. Lascelles, faced with thin slabs of Portland cement concrete, with smaller slabs of red concrete, the size of bricks; these slabs are screwed on to a timber framework. The furniture and decorations of this house have been supplied by Messrs. Jackson & Graham, of 37, Oxford-street; the wall-papers by Messrs. Jeffrey & Co., Essex-road, Islington; and the whole has been offered by these firms to his Royal Highness the President for the use of the Commission. The second house, the pavilion of his Royal Highness the Prince of Wales, has been erected by the Royal Commissioners from the designs of their architect, Mr. Gilbert R. Redgrave, for the President of the Royal Commission. This house is in the Elizabethan style, and has been constructed of rubble stonework, faced with coloured plaster in imitation of red brickwork, with Bath stone dressings. The entrance-gates of this pavilion and the garden-gates, as also the railings on either side of it, have been supplied by Messrs. Barnard, Bishop, & Barnard, of Norwich. The interior fittings and decorations, together with the furniture, have been supplied by Messrs. Gillow & Co., with whom are associated some English exhibitors, whose offers to contribute a part of their exhibition have been accepted. The whole of the designs for the interior of the house have been prepared by Messrs. Gillow & Co., 176, Oxford-street, from drawings by their artists, Messrs. Henry and Hay. The third house, being a façade of red brick and terra-cotta, manufactured by Messrs. Doulton & Co., of Lambeth, and exhibited by them, is the design of Messrs. Tarring & Wilkinson; the furniture and decorations have been executed by Messrs. Shoolbred & Co., of Tottenham-court-road, and placed by them at the disposal of his Royal Highness the president. The fourth house of the series, erected by Messrs. William Cubitt & Co., of 258, Gray's-inn-road, from the designs of Mr. Gilbert Redgrave, the architect of the Royal Commission, and offered by them to the Prince of Wales for the use of the Commission, has been placed at the disposal of the Dominion of Canada. The house is built of pitch-pine framework, enriched with carving, and filled in with plaster-panels—a style of construction known as half-timbered work, and very much employed in England from the fifteenth to the seventeenth century. The entrance-gates, in wrought iron-work, which enclose the garden between this house and the end one, have been made by Messrs. William Cubitt & Co. for Lord Crewe's park from the design of Mr. E. Barry, R.A. The furniture of this house has been provided by Canadian manufacturers; the carpets are supplied as part of their exhibition by Messrs. John Brinton, of Kidderminster; and wall-papers by Messrs. Jeffrey & Co., Essex-road, Islington. The fifth house, erected by Messrs. Collinson & Lock, of Fleet-street, was designed by Mr. T. E. Colcutt. It is in the style of an English country-house of the reign of King William III. The framework is of timber. The furniture and internal decorations of this house are manufactured and exhibited by Messrs. Collinson & Lock."

Interesting as most of these buildings are from their designers' point of view, it is to be regretted that they do not include any attempt at the highest sort of work.

New Bridge in Paris.—A new iron footbridge over the Seine, erected with the object of connecting the quarter of Passy with that of Javal, was opened on the 14th ult. M. Barré was the engineer who had charge of the works.

FACTORY CHIMNEY CONSTRUCTION.*

REFERENCE to the various authorities who have written upon chimney construction will show that there is a wide difference of opinion as to the proper dimensions for chimneys. Mr. Robert Armstrong, in the appendix to his "Chimneys, Furnaces, and Fireplaces," says,—

"It may be set down as an axiom that a steam-engine chimney cannot be too large, if only provided with a damper, although ninety-nine in one hundred at the present time [1866] are decidedly too small. They are unable to create a sufficient draught of air through the furnace, consequently, a smoky flame is produced, instead of a flame with little or no smoke."

On the other hand, Mr. Peter Carmichael, in a paper on "Factory Chimneys," read before the Institution of Engineers in Scotland in 1865, says his experience is that—

"Most factory chimneys are too large for the work they have to do,—not too high (they can hardly be that), but too wide, especially at the top. In our [Messrs. Baxter Brothers, flax-mills, Dundee] practice, invariably as more boilers and furnaces have been added to a chimney, the draught has been improved; and it is obvious that if the opening in the chimney be too large compared with the whole of the openings in the dampers passing into it, the draught will be reduced. Hence it is very noticeable in many chimneys, which are large in proportion to the number of furnaces they serve or the coals consumed, or where a new chimney is put up to serve for prospective additional furnaces, the smoke issuing from such has a very lazy ascent, and they are generally blackened a long way down from the top by the smoke, for when a breeze is blowing, the smoke, instead of ascending, falls down the leeward side of the chimney, and clings to it like a ragged black flag."

Mr. Robert Wilson, in his "Boiler and Factory Chimneys," published in 1877, also cautions us against too large a flue. He says,—

"It is usually considered that the larger the area of the chimney the better the draught; but this is not always the case with lofty chimneys, where the gases can cool down too rapidly in a chimney of large section, and it has been found in several instances that when chimneys are very large for the number of boilers they serve, or for the quantity of coals burnt, as when a chimney is built to serve for future additions to the boiler-power, the draught is improved by the better maintenance of temperature as additional boilers are set to work. When the area of the chimney is much larger than the aggregate area of the flues debouching upon it, the diminution of friction and the expansion of the hot gases into a large area are favourable for the improvement of the draught. But the velocity of the ascent of the heated gases may be very much diminished, and in extreme cases where the ascending current does not fill the chimney, so to speak, downward currents of air will be produced, especially with the wind in certain directions, to the impairment of the draught."

Temperature of Escaping Gases.—Mr. Peter Carmichael recorded observations made from time to time for several years on the temperature of the escaping products of combustion in the flues and at the bottom of the chimneys, and also took notes of the force of the draught, both of which are important elements in considering the value of a chimney for doing its work properly, and he gives the results as follow :—

"The temperature is obtained by using small strips of the following metals,—zinc, which melts at 700°; lead, 600°; bismuth, 500°; and tin, 440°. Small bits of each of these, about 1 in. long and ¼ in. broad, are pierced with a hole, for passing a wire through, and suspended in the flues behind the damper, or at the bottom of the chimney, and the time noted when they are melted. From these observations, frequently repeated, and tried under various circumstances, it has been found that the temperature is nearly uniform at 600° behind the dampers: 400° melts at once, 500° generally in less than a minute, 600° melts when the fires are in good condition, and 700° does not melt. So unvarying are these results under different circumstances, that I assume 600° at the bottom of our chimneys as a standard of temperature of escaping products."

Foundations.—The Edinburgh Gasworks chimney exerts a pressure on the foundations of 8 tons 2 cwt. per square foot. If a good natural bottom is not to be obtained, an artificial foundation must be made, either by concreting or driving piles. The former is generally sufficient. At the spot upon which the structure is to be raised the different strata immediately beneath the surface must be examined by boring until some definite stratum be reached. By a reference to the depth of this bed some idea of the extent of excavation is arrived at. In all cases the foundation must be equally resistant, that is, all parts of it must be capable of bearing the same amount of pressure. If this be not attended to, unequal settlement is sure to result. In all cases the "made earth" must be removed. If the stratum immediately beneath be of clay, gravel, chalk, or other firm bed, and is found to be sufficiently thick for a solid bearing, the excavation may be finished and the foundation laid in. In the neighbourhood of London the substratum is generally "made earth," beneath which, at variable depths, not often exceeding 12 ft., a good bottom is usually met with, when, to save brickwork, concrete may be thrown in until only enough depth is left from the surface to cover the footings of the chimney. A good example of the value of concrete is afforded by a chimney that was built by Mr. Clegg at Fulham, in 1829. The foundation was a quicksand. After the excavation was got out to a depth of 15 ft., an iron rod sank, with little more than its own weight, 15 ft. more; it was, in fact, as bad a foundation as could possibly occur.

The Townsend Chimney, Port Dundas, Glasgow.—The total height of this chimney from foundation to top of coping is 468 ft., and from ground level to summit 454 ft. The history of its construction, and of its threatened failure when nearly completed, is fraught with much interest. The chimney was designed and built by Mr. Robert Corbett, for Mr. Joseph Townsend, Crawford-street Chemical Works, Port Dundas. No piles were used in the foundation, which is on "blue till" or clay, which is as solid and compact as rock. The foundation consists of thirty courses of brick on edge, the lowest course being 50 ft., and the topmost course 32 ft. diameter. The foundation was commenced on July 30, 1857, and finished on August 20 of the same year. The erection of the shaft was continued until November 11, 1857 (excepting from September 3 to October 5, during which period operations were suspended). This closed the first season. The second season commenced on June 10, 1858, and closed on October 16 in the same year, the stalk at the latter date being 228 ft. in height. The third and last season commenced on June 3, 1859, and the coping was laid on October 6 of the same year; but the work was suspended from September 15 to October 5, in consequence of the chimney swaying. During this interval it was restored by twelve cuttings with saws on the opposite side of the inclination, as detailed hereafter. The inside lining or cone is of 9-in. fire-brick, and about 60 ft. in height, built distinct from the chimney proper, with air-space between, and covered on top to prevent dust from falling in, but built with open work in the four upper courses, so as to allow of air passing into the chimney. The size of the bricks used in the construction of the chimney was 10 in. by 4 in. by 3½ in.; and the number consumed was as follows :—

Common bricks in chimney	1,142,532
Composition and firebricks in cone.	157,468
Total	1,300,000

The bricklayers' time was:—In 1857, 316 days of ten hours each; in 1858, 431½ days of ten hours each; and in 1859, 423½ days of ten hours each, giving a total of 1,171 days' time occupied in building the chimney, which gives on an average 1,110 bricks built per day of ten hours by each bricklayer. Besides the above number of bricks used in the chimney, there were also 100,000 used in constructing flues, &c. The total number of bricks laid in chimney and flues was 1,400,000, the weight of which, at five tons per thousand, is 7,000 tons. The cope is of vitrified till, purpose-made, about 9 in. wide by 3 in. thick, flanged over the wall of the chimney, and jointed with Portland cement. The top of the chimney was struck by lightning some time since, which displaced and threw to the ground some pieces of coping, and upon inspection only one of the flanges was found to be broken. Iron hoops were built in at a distance from the surface of 9 in. at the bottom, and 4½ in. at the top, and at intervals of 25 ft. in height. The thickness of the wall of the chimney varies as follows, commencing, of course, at the ground level :—

1st section,	30	ft. in height,	5	ft. 7	in. thick.
2nd	,, 30	,,	5	2	,,
3rd	,, 30	,,	4	10	,,
4th	,, 40	,,	4	5	,,
5th	,, 40	,,	4	0	,,
6th	,, 40	,,	3	7	,,
7th	,, 40	,,	3	2	,,
8th	,, 40	,,	2	9	,,
9th	,, 40	,,	2	4	,,
10th	,, 52	,,	1	11	,,
11th	,, 52	,,	1	7	,,
12th	,, 20	,,	1	2	,,

Total 454 ft. from ground line.

The height originally contemplated for the chimney was 450 ft.; but when about 350 ft. up it was proposed to add about 35 ft. to the original height, making the total height 485 ft.: hence the increased height of the tenth and eleventh sections. But on the completion of the eleventh section this idea was abandoned, and therefore only 20 ft. of the last thickness were added. The chimney was not built by contract, but by day wages, as Mr. Townsend was not quite certain to what height he would

* From a paper by Mr. R. M. Bancroft, C.E., recently read before the Civil and Mechanical Engineers' Society.

carry it, or what deviation might be made in course of construction from the proposed plan. Three different dimensions were calculated by the builder; those carried out were the greatest of the three. The builder calculates the cost of the chimney and cone (exclusive of iron hoops in the chimney and flues) at from 5,500*l.* to 6,000*l.* Mr. Townsend estimates the cost of the whole, including flues, iron hoops, machinery, and scaffolding, at 8,000*l.* On September 9, 1859, the chimney was struck by a gale from the north-east, which caused it to sway; but the builder does not attribute the action to the gale alone, but to the pressure of the whole pile on the scaffolding, which was so constructed as not to yield to any pressure caused by a slight settling-down. The additional pressure thrown by the wind to the lee-side of the stalk (the mortar of which was not solidified) was consequently too great for the scaffolding to bear, and caused the splice of one of the uprights to give way by abrasion, making the fibres of the wood to work into each other. The ends of the planks forming the scaffolding were placed about 5 ft. or 6 ft. apart vertically, and were tightly built into the masonry; but had a little space been left over each, the stalk would have subsided uniformly, and would possibly have withstood the gale. The builder observed the error, but too late. He thinks the deflection commenced at from 100 ft. to 150 ft. from the ground, so that the foundation and heaviest portion remained firm. Had not the process of sawing been commenced promptly and continued vigorously, in all likelihood the chimney would have fallen. Even during the earlier part of the process of sawing, Mr. Townsend observed the deflection increasing, but as the sawing progressed he observed that the deflection got a check, and the chimney came-to gradually. The chimney was 7 ft. 9 in. out of the perpendicular, and several feet less in height than before it swayed; but when brought back it regained its original height, at which time it was not completed by 5 ft. Mr. Townsend made his observations during the sawing-back by taking up his position in a room of the works near by the chimney, where he had a full view of it, and fixing the ends of two pieces of twine to a beam above, he formed them into two plummet-lines in a line with the stalk, and by these alone he directed the adjustment of the colossal mass. The sawing-back was performed by Mr. Townsend's own men, ten men working in relays, four at a time sawing, and two pouring water on the saws. This work was done from the inside on the original scaffolding, which, of course, had not been removed. Holes were first punched through the sides to admit the saws, which were wrought alternately in each direction at the same joint on the opposite inclination, so that the chimney was brought back in a slightly oscillating manner. This was done at twelve different heights from the ground line, viz., 41 ft., 81 ft., 121 ft., 151 ft., 171 ft., 189 ft., 209 ft., 228 ft., 240 ft., 255 ft., 277 ft., and 326 ft. The men discovered when they were gaining by the saws getting tightened with the superincumbent weight. It took six men to do this work, at a cost of 400*l.* Prior to the sawing operations, they had taken out and altered the bolts of the scaffolding, so as to relieve the pressure on it. This was done to meet the want of a little spare space over the ends of the planks built into the chimney, as before stated. The stack is protected from lightning by two copper wire conductors, ½ in. thick, opposite each other all the way up, joined to one pike fixed to the chimney, but standing above it, at the top. It was erected by a "Steeple Jack" of Manchester, after the chimney had been put straight. The chimney has been several times struck by lightning, and slightly damaged. It is intended to put three more pikes at the top, and take the conductor round the chimney from pike to pike, to give a better opportunity for absorption of the electric fluid.

St. Rollox Chemical Works Chimney, Glasgow. This (Messrs. Charles Tennant & Co.'s) chimney, projected by the late Dr. W. J. Macquorn Rankine, designed by Mr. L. D. B. Gordon, and built by the late Mr. McIntyre, ranks second in height. The following are its dimensions:—

Height from foundation to top	455 ft. 6 in.
,, ground line to top	436 ft. 6 in.
Outside diameter at foundation	50 ft. 0 in.
,, ,, at ground-line	40 ft. 0 in.
,, ,, at top	13 ft. 6 in.

It has an inner cone of the following dimensions:

Height of cone from foundation to top	263 ft. 0 in.
Height of inner cone from ground-line to top	243 ft. 0 in.
Inner cone inside diameter at foundation	12 ft. 0 in.
Inner cone inside diameter at top	13 ft. 6 in.

The use of the inner cone is to protect the principal stalk from various kinds of gases. No piles were driven in the foundation, it being founded on a bed of concrete 15 ft. thick on top of the rock, the upper surface of the concrete, the better to resist any downward pressure, being finished at right angles to the line of principal shaft, which inclines inwards for a considerable height. The outline of the chimney is taken from the Eddystone light-house, and is of the natural form which a chain would assume in being stretched from a height to a point on the ground beyond that of its upper end.

The Highest Chimney-Stack in England is the large chimney at Messrs. Dobson & Barlow's, Kay-street Machine Works, Bolton. It is connected with seven boilers, besides ventilating fines, furnaces, &c. It was completed in November, 1842, and was then intended to serve chemical works. Shortly afterwards, the ground occupied by the chemical works was absorbed by Messrs. Dobson & Barlow's works, and consequently the chimney came into their possession. The following are some of its principal dimensions:—Total height from ground level, 367 ft. 6 in. The shaft is octagonal on plan, and measures 14 ft. on either side, or 112 ft. in girth, at the bottom. The thickness of brickwork at the bottom is 8 ft., and the thickness at top is 1 ft. 6 in. The shaft measures 5 ft. 6 in. on every side, or a total of 44 ft. in girth, at the top. 800,000 bricks, and 120 tons of stone, were consumed in its erection. The cap, with cornices and mouldings, absorbed 30 tons of stone and cement.

The Edinburgh Gasworks Chimney is 341 ft. 6 in. high from foundation to top, or 329 ft. high from the ground line. The stone foundation is 40 ft. 6 in. square, and 6 ft. 6in. deep. The stone pedestal is 71 ft. high, 30 ft. square at the ground line, and 27 ft. 9 in. square at the top. The brick shaft is 264 ft. high, 26 ft. 3 in. diameter at the bottom, and 15 ft. diameter at the top. The main brick shaft is diminished in five steps, of the following successive heights:—

	Height.	Thickness.
1st bottom portion	35 ft.	35 in.
2nd portion	40 ft ...	30 in.
3rd ,,	48 ft.	25 in.
4th ,,	68 ft.	20 in.
5th ,,	83 ft.	15 in.

Chimney at Barmen, Prussia. — Messrs. Wesenfeld & Co.'s chimney, at the chemical factory, Barmen, is 345 ft. high from the foundation to the top, and 331 ft. high from the ground level. The foundation was made of large flat quarry stones, with terras mortar, consisting of one part lime, one part river sand, one part terras, which latter is a kind of puzzolana. The pedestal is 20 ft. square by 40 ft. high by seven bricks thick. The octagonal shaft is 291 ft. high, with an exterior diameter of 17 ft. at the base, by five bricks thick; this diameter is reduced 2½ in. every 10 ft., so that at the top of the shaft it is two bricks thick. According to the original design, it was only intended to build it 260 ft. high, but as the building was proceeding in a very satisfactory manner, it was considered safe to increase the height without altering the dimensions of the base, and it has been calculated that in the lowest part of the shaft the brickwork sustains a pressure of 21,335 lb. per square foot, or 148 lb. per square inch. A few months after completion the chimney got out of the straight, and had to be put right in a similar manner to that adopted in connexion with the Port Dundas chimney. The chimney was built with great care, the mortar being prepared every morning, the proportions used for the pedestal being one of lime to two of river-sand. Cement mortar was used on rainy days, mixed in the proportions of one of cement to two of river-sand, cement exclusively being used for the crown. The joints of the brickwork were flushed up with cement. The three masons who did the whole work daily changed their positions on the chimney, so as to equalise any unevenness in the masonry that might be caused by imperceptible differences in the manipulations of the different individuals. At distances of 50 ft. single layers of brickwork were painted black outside, to afterwards facilitate an estimate of the height of any point of the chimney above-ground. The chimney was built from the inside, without a scaffold, the materials being hoisted by a steam-engine put up temporarily near the place of construction. The motion was transmitted by three rollers or drums. The frame which supported the upper drum was moved higher up after the completion of every three or four layers of brickwork, and was, at the same time, turned horizontally from one side of the octagon to the next one, to equalise the effect of the pressure of the frame on the masonry. The holes made in the masonry to support the frame were filled up with brick and mortar immediately after the removal of the frame to a higher level. The construction of the chimney was thus successfully completed in October, 1867. The structure was then perfectly vertical, but in the spring of 1868, remarkable for vehement and long-continued gales and storms, it suddenly assumed an inclined position towards the north-east. The injurious action of the south-west wind was probably favoured by the bold projections of the structure, by the yet subsisting softness of the mortar, and by the large size and the shape of the ornamental crown or cap. This crown caught the wind, and thereby caused it to act as on a long lever. The chimney was thus bent, and the mortar not being perfectly dry, the brickwork did not yet possess the necessary elasticity to return to its original shape. The deflection seemed to increase, and threatened an overthrow. As before mentioned, some layers of bricks in the chimney, at distances of 50 ft. from each other, were painted black outside. The height of these black lines above the pedestal being known, these lines were, by means of a theodolite, projected on a plank situated on the pedestal of the chimney, to find the deviation from the vertical line at those different heights. It was thus ascertained that the chimney, at a height of 251 ft., was 45 in. out of the perpendicular; at the height of 210 ft., 30 in.; at the height of 160 ft., 16 in.; and at the height of 110 ft., 5 in. The pedestal stood perpendicular. As the deviation was still increasing, and as it would have done too serious an injury to the business of the establishment to set the chimney temporarily out of use, it was necessary that immediate action should be taken in the matter. The ordinary method of straightening chimneys was at first resorted to. A hole was made through the whole thickness of the masonry on that side of the chimney which required lowering, at a distance of 4 ft. above the top of the pedestal. Into this hole a saw was introduced, with which a horizontal cut through one half of the chimney was attempted. But as the thickness of the wall was considerable, and the bricks hard, and as the saw could be manipulated from one of its extremities only, the effect of sawing after two hours' work was scarcely perceptible. The hole through the chimney having been made without trouble, the difficulty experienced in sawing led to the idea of gradually removing a whole layer of bricks, replacing it by a thinner layer, thus to produce the desired slit. Before, however, this operation was performed, the experiment was made with an old inclined chimney 120 ft. high. When the method had there proved practicable and successful, it was concluded to treat the new chimney in the same way. A layer of bricks was broken out by means of pointed cast-steel bars from 1 ft. 6 in. to 5 ft. in length. Purpose-made flat shovels, with long handles, were used to lay those bricks which had to be placed near the inside of the chimney. A space of 5 in. was left each time between the newly-laid bricks and the old ones of the next division, to break out the latter with greater facility. The width of each single division was 2 ft. to 2 ft. 6 in. The masonry was sufficiently dry above not to give way when a layer of that width was removed below it. The act of settling by oscillations lasted from eighteen to thirty-six hours, corresponding to the width of the slit, which was different in the different cuts performed, in a similar way at different heights of the same chimney. The oscillations were the greater and the livelier the higher up the cut was which produced them. At the highest cut, 100 ft. from the top, the oscillations were such that the mason became frightened, and left the place; the slit became alternately wider and narrower by ¾ of an inch. The facts before mentioned seem to prove the elasticity of the whole structure. Four cuts were made into this chimney, the first one 4 ft. above the pedestal, greatest width ⅜ in.; the second, 100 ft. above the pedestal, greatest width, 1¼ in.; the third, 140 ft. above the pedestal, greatest width, 1½ in.; the fourth, 140 ft. above the pedestal, greatest width, 1 in. After the completion of these operations, the chimney continued during several weeks to settle slightly in the direction opposite to its former inclination, the brickwork on the side being now subjected to a higher pressure than before. This circumstance had to be carefully considered beforehand, or else the slits would be made too wide, and produce an in-

clination of the chimney in the opposite direction. A severe storm, which occurred on the 6th and 7th of December, 1868, and which threw over several chimneys in the neighbourhood, did not affect the above. The result of the straightening operation before described is perfectly satisfactory, and the structure is now stronger and steadier than ever. I have yet to speak of the means by which the upper parts of the chimney were made accessible to perform the upper cuts. This was done on a new and interesting plan. Standing on the lowest platform, the masons made a number of holes all on the same level, 4 ft. above the platform, into the exterior wall of the chimney. They stuck iron bars into these holes, and fixed boards to them, so as to form another platform. Standing, then, on the latter, they made another one 4 ft. higher up in the same way, and so forth. Every second platform was again removed, so that the remaining platforms were 8 ft. apart. They were then connected by ladders to make the ascent possible and easy. This method is, however, only practicable when the chimney has a considerable diameter, and when the mortar is sufficiently dry not to give way under the one-side pressure of the bars and platforms, which would make the arrangement loose and unsafe. In December, 1868, another chimney (at Duisburg) was straightened by the method last described; but as the diameter of the chimney was not so large as that of the Barmen chimney, and as the mortar was yet soft, a wooden scaffold was erected around the chimney, to get at the upper points which required cutting. The breaking out and replacing of the bricks could not be done there in divisions wider than from 5 in. to 10 in., otherwise the upper masonry, not being dry, would have settled down. When the chimney was straight, a further settling towards the side of the cut was prevented by driving iron wedges covered with mortar into the slit. It is needless to add that great care must be used in the method of straighteuing chimneys here described; for, without precaution, it may end in a fatal manner, as in a case at Oldham, where, owing to the reckless manner in which the work was done, one man lost his life.*

PROGRESS OF SANITATION.

NORTHAMPTON.

At a meeting of the Association of Sanitary Inspectors, held in Northampton, on the 15th ult., Mr. Edwin Chadwick, C.B., read a paper, in which he said that in the present state of sanitation there was much important experience and observation, both of what would not do, as well as what would, to be collected outside their own immediate district from other parts of the kingdom. He admitted that he was not in a position to be able to systematise the results of such experience and observation, and that he could only offer a few incomplete remarks as one deeply interested in the subject. It was now thirty-seven years since he directed an inquiry into the sanitary condition of the town and county of Northampton, together with other towns and counties, on data obtained from the Registrar-General's department. The death-rate for the whole of the department was then 22 per 1,000 of the population, and of the town 25 per 1,000. He decided upon the condition of the town and county by those which appeared to be the most unhealthy districts. In Hardingstone, Wellingborough, and Brixworth, it was 20 in 1,000, while in the less unhealthy urban and rural districts it was 17, and even 15, per 1,000, and he might cite others in which it was not much more than half of what it was for the whole of the county. The best general test of sanitary conditions was the death-rate of children under one year, as their conditions were, to a less degree, affected by occupation and migration, and denoted an intelligent care of infant life. Of children born, one in seven died within the year of birth. In Westmoreland the death-rate was one in eleven, and in Cornwall and Devon it was one in ten; while the deaths from epidemic diseases amidst the whole of the population of this county were nearly double those in counties just named. From these and other indications it was perfectly certain to those conversant with sanitary science that had a knowledge of it permeated the local administrative organisations, they would have been, as now, among the first to direct force with which to protect the population against destructive epidemics. What were the indications, then, to guide the direction of the defensive force? Whilst in the district of Hardingstone 39 in 10,000 died of foul-air diseases, 44 died of them in Northampton; and similarly the numbers were 55 and 76 respectively of those who died of diseases of the respiratory organs. What, at the lowest estimate, was the cost of life, force, and money of those insanitary conditions? In Northampton, in life it was upwards of 130 persons yearly; in the cost of excessive sickness it was nearly 4,000 cases per annum; while in the loss of labour, from premature working disability, it must have been upwards of 22,000 persons per annum, or 26,000*l.* in the town of Northampton alone. In the county labour was less productive; but, putting down 7*s.* 6*d.* per week as the average of the earnings of each male and female, there was a loss of 35,000*l.*; and from all preventible diseases in the entire county, it was more than 74,000*l.* That was the money loss; but what was the loss of domestic happiness, from the insanitary condition under which more than 47 per cent., nearly half the children born in the town, were in their graves by their fifth year? Since then it appeared that there had been scattered and unsystematised efforts in sanitation, and possibly much misdirected energy expended, if they might judge of that from the small amount of progress which had been made in the reduction of the death-rate in the county to 19 in 1,000. He had said that the best test of sanitary progress was the infantile death-rate. In the town that would appear to have been increased, for while in 1847 it was 24 per cent. of the children under one year, in 1876, it was 29 per cent. That (probably was an exceptional year. For the same years, however, 47 and 45 per cent. respectively of children under five years died. The progress they were making, therefore, must be a most melancholy one, when of all children born one-half would be in their graves before their sixth year. Whilst in the district of Uppingham, according to a table made out by Mr. Haviland, one in 11, in Northampton one in five, of the children born died within their fifth year; and whilst in the former place the death-rate from zymotic diseases was 1·54 of the population, in Northampton it was 4·53. Even measured by the standard taken from the district of Sulgrave, their progress was slow. In that the death-rate was 13·1 in 1,000, which included deaths from preventible diseases; but, taking it at that, there were 1,422 preventible deaths every year, involving, according to his estimate, if they also considered preventible sickness and premature working disability, a money loss on the part of the wage-earning classes of 140,000*l.* He asked them to picture to themselves such a loss of human life if it were occasioned by an invading enemy, and proceeded to remark that at first there was no curative service in connexion with local administration worthy of the name, while the area of the parish was too small to bear the expense of a preventive service, and that even when, with the extended area of the union, a curative service was obtained, it was of a very rudimentary character. What they had to do now was to face round, and put the provisional service on a comparatively preventive footing, to give it, instead of a comparatively useless curative action, an aggressive preventive action. In what direction must that preventive force be first applied? In the first place, to the cottage and to the homestead, in removing the source of disease, in examining sewage-sodden soils and polluted well-water, and enforcing such regulations as had been attended with marked success in common lodging-houses. Other objective points were, first, as to children having a continued and vigilant inspection of common schools, where, very often, filthy-skinned and dirty-clothed children were mixed together in a confined space; and next, as to adults, placing all workshops and factories under similar inspection, the object of which should be the conservation of force against overwork, as well as from deterioration by disease. Under proper arrangements the visits of the sanitary inspector would be commonly welcomed by the employer as well as by the employed in workshops. But, beyond these special objective points, there were, and must be, with insanitary conditions, cases of sickness and death from foul-air diseases which should be immediately looked to and the causes removed. In Glasgow there had been a reduction in the death-rate of 9 in 1,000, and the chief factor in the reduction was, on learning of any case of typhus or other foul-air cases, to send to the premises, and have them examined by a competent officer, to see that the waters in or about were pure, to look to the drains and take action to have the lethal cause eradicated. Provision was required for a closer examination into the causes of every death, and the elimination of those deaths which were preventible. He then referred to the last general visitation of cholera, to show that the remedy might be worse than the disease, if ignorantly applied, as for instance in cleaning out foul ditches and allowing the foul matter to lie on the banks and emit noxious exhalations, thus occasioning fresh outbreaks of the disease. He went on to say that sanitary science had found no place in architectural works, and gave a remarkable illustration to show how the most elementary principles had been neglected in the construction of our great buildings. We expended 2,000,000*l.* on the offices of the Local Government Board, the Home Office, and the Colonial Department at Westminster, yet when the offices were first occupied the walls were so damp as to spoil the paper put upon them, and two deaths were ascribed to the sewer gas which pervaded the rooms. Having given other instances to show that they must not look to the metropolis for the highest development of sanitary science, he proceeded to advocate an arterial system of drainage, such as had been adopted at Croydon, Bedford, Leamington, and other places, by means of which the sewage should, in a few hours, be carried away and deposited on the land in the best condition, *i.e.*, unaccompanied by surface water, which reduced the value of the manure, and was not wanted on the sewage farm. He then alluded to the ignorance which was rife among local bodies. They commonly asserted, and it was usually believed, that the town was not in so bad a condition as some would make out. Now, in directing inquiries into the state of towns, he had instructed sanitary officers to get out carefully those localities in which fever generally prevailed; and then to get the Mayor and Town Clerk and other officials to accompany him, and the usual result was a common exclamation of surprise that they could not have believed that such conditions existed if they had not seen them. Having remarked as to the possibility of local bodies falling victims to expensive quackeries in sanitary appliances, he next spoke of the curative and preventive service in Northampton. The former included twenty-six medical practitioners, while the medical officer of health, with a salary of 100*l.*, for which he could give only a quarter of his professional time, was considered sufficient to deal with preventible diseases among a population of 50,000 persons. He regarded this as an instance of the lamentable ignorance which prevailed on the whole subject, and, at the same time, as showing a lack of administrative economy. What was needed was a reorganisation of union administration areas, on the principle propounded in the Poor Law Commission of Inquiry, and possibly the new County Boards Bill might contribute to the reform of the local administration and efficiency in this great science for the relief of the population. He deprecated the multiplication of inferior local officers with inferior qualifications, which was a growing evil, and a source of inefficiency and wastefulness. The extension of the administrative area from the parish to the union was one great step in advance; but in thinly-populated districts that area was insufficient for the one medical officer. An extension was needed, not only for purposes of economy, but for those of gradation in the employment of officers. They had an illustration here of erroneous administrative arrangement, in the separation of the town from the surrounding districts, and then excluding it from the supervisory service of one who, by his position, was superior to that gentleman who was paid an inferior salary in the town for a portion of the time taken from his private practice. The effect of this was that the town might become the centre of an epidemic, and though much might be done in the way of isolation, the contagion might be carried by workpeople into their village homes, and for that neither the town nor their officers would be responsible, and, therefore, it would be better if preventive measures in such cases were taken for the town and county as a whole. Mr. Chadwick then went on to advocate the adoption of the competitive system in the appointment of officials, so as to prevent jobbery. He next added a few words with regard to shoemakers. On examining statistics he found

* To be continued.

that deplorably little had been done for the relief of the shoemaker from premature working disability arising from preventible sickness and premature mortality, by the local self-government under which he lived. His doom was certain, after a life beset with painful diseases, to die at the end of his 55th year; that is, to die some eight years before others of the wage classes who live under less insanitary conditions, or rather the best sanitary conditions. He found, moreover, as respects the young shoemaker who lives to settle and marry in Northampton, that of the children born to him one-half were put into their graves soon after their fifth year. Now, what might sanitary science do for his relief? It might secure for him the same advantages which was conferred by Lord Shaftesbury's Act upon common lodging-houses. Sanitary science might give him comparative immunity from ravaging epidemics, and which it gave to the thief in a well-regulated county gaol. It might extend the shoemaker's working ability by some ten years,—enable him to live till he had obtained a deferred annuity, so that he could then spend his last days with that ease, comfort, and respectability which a well-spent industrial life deserved. In crowded urban districts it might give to his children the protection of the *crêche*, which on the Continent had been remarkable for reducing infant mortality, and it might, in an advanced stage, give them the protection of a well-appointed infant-school, under good sanitary conditions; further, a well-organised half-time school would minister to the prosperity and happiness of the household. And here he would tender a passing warning against that false political economy which regards production as a fixed quantity, and children as new cares, and reducers, instead of being, as they would be, under proper sanitary educational rule, augmenters of it. The falsity of the population doctrine was demonstrated in the shoemaker's own trade. Within less than a quarter of a century labour-saving machinery had so far advanced that for the greater part manual labour had been superseded, and yet within that time the population of the trade had been largely augmented. In 1861 there were in Northampton 3,758 males and 750 females engaged in the shoe trade; in 1871 there were 4,641 males and 852 females. Now, according to the population doctrine, as labour-saving machines increased, wages should have decreased. But had they done so? No; they they had largely increased. He was assured by one manufacturer that the amount of advance had been at least 50 per cent.; but had the mean duration of life increased as it might have done? The money which might have gone to improve the dwelling and increase the comfort of the family had, he feared, in many cases gone to the beer and the gin shop. "Show me the class whose wages have most advanced," said one who knew them, "and I will show you the class whose habits of intemperance have most advanced." Insanitary local conditions had much to do with that. Working in foul air and in dirty, crowded, and ill-ventilated factories, was depressing to the nervous system, and provocative of the use of alcoholic stimuli. He had known instances in which the classes working under different and healthy influences drank less, and some nothing but pure water. Mr. Chadwick then concluded his paper by quoting a pertinent extract from the writings of Dr. Wilson as to the changed condition of things when the Government should come to see that the preservation of the nation's life was as important as trade and commerce.

The Will of the late Sir G. G. Scott.—The will (dated November 28, 1876) of Sir George Gilbert Scott, late of Courtfield House, South Kensington, and of No. 31, Spring-gardens who died ont he 27th of March, was proved on the 11th ult., by the Rev. Melville Horne Scott, the brother, and the Rev. Thomas Scott and John Henry Scott, the nephews, the executors, the personal estate being sworn under 120,000*l.* The testator bequeaths to his executors 200*l.* each; to his son, Dukinfield Henry, 3,000*l.*; to his servant, John Pavings, 200*l.*; and there are various provisions as to the carrying on of his business by his sons George Gilbert and John Oldrid. The residue of his property he leaves between his four sons. It will be noticed as a coincidence that the will mentioned in the *Illustrated News* list immediately before Sir G. G. Scott's is that of a gentleman named Moffatt.

THE PARIS EXHIBITION.

April 30th.

TO-DAY is the last day, and with to-morrow's sun comes the opening of the great Exhibition of 1878. The English machinery, carriage, and industrial sections are fairly finished; so, too, are the Canadian, Queensland, and other colonial courts. The Chinese and their neighbours from Japan are also well on, and may be termed complete. And that is all we can say, for nearly all the other departments are exceedingly backward. Probably it will be a month or six weeks before the Exhibition will be finished. The gardens are beginning to give a good idea of what they will ultimately be; but, like the Trocadéro itself, they are still, in a great measure, in a state of chaos. The rain that fell to-day, and several times recently, has helped on the trees and plants famously; indeed, nothing can be more beautiful than the delicate fringes of sage green that have appeared within the last week or so along every boulevard. These avenues are very often of chestnut, and, much as Mr. Blashill may have to say against the wood in work, the tree in flower is a glorious specimen of nature's handiwork. Everybody at home is proud of the avenue of chestnut trees in Bushey Park; in Paris there are a hundred rows of the same tree, and now that they have burst into flower the effect is simply superb.

The English administrative department is fairly well managed, and under Mr. Cunliffe Owen the arrangements are, taking all things into consideration, excellent. Captain Harris has the general management, but no words can speak too highly of his acting man, Sergeant Wright, as many of us who have received timely assistance at Vienna and at Philadelphia from this ever-active, ever-civil non-com. of the Royal Engineers, know. At Paris he is, as at former Exhibitions, the helping friend of every Englishman. Sergeant Wright is, without doubt, the right man in the right place.

Everybody, English and French, Italians, and Austrians, Chinese and Japanese, and, indeed, all sorts of persons from all sorts of places, are hard at work here, day and night. Wages are high, and one cannot get the help of an ordinary mechanic under one and eight-pence, or two shillings an hour. The place was in full swing all Sunday, and on that day the men demanded, and were paid, double money. It is, I believe, the usual custom here to be paid extra money for Sunday work. It would be far better for them not to toil at all on that day. The fact is, they make so many hours that a great lack of energy is often displayed. There is a deal of truth in the remark a young English lad I have brought over as my assistant made just now, "These French blokes look all tired out."

Many of the boxes are still missing, but the confusion is not nearly so great as one might have anticipated. A man who was hanging carpets fell, yesterday, in the English section, and was killed, and another had his leg broken, about half-past six this morning. I have seen two show cases smashed within the last forty-eight hours; and the other day a large show case, by Sage, of London, containing varnishes, &c., fell bodily, pots and all—everything being irretrievably broken to pieces. I saw half-a-dozen Frenchmen carrying in a box containing a beautiful work of art. One of them stumbled, the others let go, and down it came. The whole was broken to pieces, and when I re-passed, they were sweeping away the pieces with brooms! The value of this exhibit was estimated at 500*l.*

The Exhibition is probably a mile and a half long, and half a mile wide. The Seine divides the Trocadéro, or Fine Art part, from the main building. The former, of which you have given a view, is somewhat like the Albert Hall, with a crescent-like annex on entry side thereof. The main building has a fine, Crystal Palace-like front facing the grounds, but the structure itself is exceptionally low, and cannot be termed imposing. I do not say this grumblingly, for, of course—

> "The more fair and crystal is the sky,
> The uglier seem the clouds that in it fly."

But, candidly speaking, looking at the building generally, with all former exhibitions in my mind's eye, this one, architecturally speaking, and the Trocadéro excluded, is the reverse of being a noble pile. The places of "convenience" provided for the workmen are very horrible, and are enough to drive Mr. Jennings, or any other person interested in sanitary matters, out of his mind.

It may be as well to remark that in the French and Belgian refreshment-rooms in the grounds, Allsopp's bear may be procured for five-pence a-glass, and the *same* liquor in the four angle pavilions, in Duval's, and in several other refreshment rooms within the grounds, for three-pence the glass. Things are rather dear in Paris, but not particularly so in the *cafés* and restaurants which the workmen frequent. Food is about the same price as in London. A beef-steak or chop, potatoes, watercresses, bread, and bottle of wine may be had in a hundred places, within three minutes of the Exhibition, for ten-pence.

The Prince of Wales evinces the greatest interest in the progress of the works. He spent the greater part of Saturday and yesterday in careful examination of the various British productions, and as I write I can see him, accompanied by the Duke of Sutherland, Mr. Mundella, and others, inspecting the machinery. He spent fully three hours in the court in which my exhibits are, yesterday afternoon, and everybody was delighted with the interest he evinced. I can personally testify that the queries he put to me, and the remarks he made upon my works, prove that his Royal Highness has more than a passing knowledge of architecture and its attributes.

Amongst the principal things to be noticed of architectural interest amongst our English exhibits are Messrs. Collinson & Lock's and Mr. Lascelles's model houses; tiles and ceramic ware by Messrs. Mintons, Maw & Co., the Worcester Porcelain Works, Simpson & Co., Wedgwood & Sons, Minton, Hollins, & Co., J. Howell & Co., and others. There is a charming Jacobean mantelpiece and wings in oak, measuring some 35 ft. by 13 ft., by Messrs. Howard & Sons, of Berners-street, London; a chimney-piece by Simpson & Co., and a huge one designed by Mr. Somers Clarke, and shown by Messrs. Longdon & Co., of Sheffield.

In the way of cabinets, Mr. C. Green, of Sheffield, shows a unique one in ebony and bronze, the central panel of which is a lovely bit of modelling. Mr. Lascelles, Messrs. H. & J. Cooper, of London, Mr. J. Lamb, and Mr. H. Ogden, of Manchester, and Mr. Hall, of Edinburgh, also send good cabinets. Stained-glass is represented by Messrs. Fouracre & Watson, of Plymouth; Mr. Camm, of Birmingham; and Messrs. Simpson. Messrs. Hardman, of Birmingham, show some nice brass and wrought-iron work; so, too, do Messrs. Jones & Willis, who also show a most ornate reredos in oak. This is a very imperfect summary, but it embraces some items of interest to those who care to see what England has done to hold her own in this peaceful exhibition of the world's skill and power.

HARRY HEMS.

THE "RESTORATION" AND OPENING OF CHRIST CHURCH CATHEDRAL, DUBLIN.

THE formal re-opening of Christ Church Cathedral took place on the 1st inst. It was first proposed to build the south aisle and south side of the nave; to restore the north aisle and north side of the nave; to restore the west front and finish the groining of the nave; and, finally, to complete the work by repairing the transepts and the entire church west of the choir. The cost of these works was estimated at nearly 16,000*l.*

A second report, drawn up at the request of the Duke of Leinster, included the erection of a Synod Hall for the deliberations of the church body, rendered necessary by the Act that led to the disestablishment of the Church in Ireland. The work of restoration would probably have never been carried out had it not been for the munificence of Mr. Henry Roe, a wealthy merchant and distiller in Dublin, who nobly came forward to supply the necessary funds. Mr. Street was the architect.

The Synod Hall, as many of our readers are aware, has been provided by utilising a portion of the old church of St. Michael's, and connecting the cathedral with it by an arched passage over Wine Tavern-street. Including the Synod Hall and other alterations and additions that have been found necessary during the progress of the restoration, the original sum has swelled into 200,000*l.* We have already, from time to time, furnished our readers with sundry details of the works that have been carried out. It is a great pity that the two cathedrals of Dublin—St. Patrick's and Christ Church—which owe their

restoration respectively to the munificence of a Dublin brewer and a Dublin distiller, who have generously and lavishly expended a large portion of the wealth they made in the country, are not situated in better localities, and approached by finer thoroughfares. St. Patrick's is situated in a low neighbourhood, in the midst of squalor and poverty, and tumble-down house property, and to some extent the same may be said of Christ Church, though occupying an elevated position. Until the new street is opened in continuation of Dame-street to Christ Church-place, the appearance of the cathedral must suffer. The two cathedrals are situated in localities which were once the industrial and opulent centres of Dublin, but since the commencement of the present century they have rapidly gone to decay and dilapidation. Rank and fashion have migrated to the southern suburbs and the marine townships, and the ancient and restored cathedrals are now standing almost in solitary grandeur, presenting painful contrasts with their ruined architectural and unsanitary surroundings.

IMPROVEMENT OF MANCHESTER INFIRMARY.

At the last meeting of the Board, the plans of Messrs. Pennington & Bridgen for remedying the structural and sanitary defects of the Infirmary were laid before the Board, accompanied by a report, referring especially to the drainage of the entire building, the position of the water-closets internally, and the ventilation of the wards into the corridors and *vice versâ*. As to the last, the report says,—"With regard to the ventilation of the wards, they now communicate freely with the corridors, and the corridors, by means of well-holes and stairs, with each other; so that the internal atmosphere is very foul and bad. It is intended to admit fresh air, by Tobin's system of ventilation, into every ward, and to provide effective extractors at the ceiling level. This will enable us to stop up the apertures for ventilation from corridors into wards now existing, and so remedy one of the most obvious and prominent defects in the existing building."

Mr. Alderman King moved that the report should be adopted, and that Messrs. Southern's estimate for carrying out the work at a cost of 4,090*l.* be acceded to. He said that, including the interior work, it was not expected that the entire cost would amount to more than 5,000*l.*, and it was hoped that the suggested improvements would place the Infirmary in a thoroughly satisfactory condition.

Mr. A. Simpson seconded the motion, which was passed.

ARCHITECTS' ESTIMATES AND BUILDERS' TENDERS.

THE Hackney Board of Guardians are about to erect a new infirmary building in connexion with the Brentwood School, the land for which has cost them 3,700*l.*, and the architect's estimate of the cost of the building is 17,500*l.*, for which it appears tenders have just been sent in. At the last meeting of the Board it transpired that there is a considerable discrepancy between the tenders of the builders and the estimate of the architect, the lowest tender sent in being 24,000*l.*, or about one-third more than the amount named by the architect as the probable cost of the building. The difference being so great none of the tenders have been accepted, but their consideration adjourned to a future meeting.

SURVEYORSHIP ITEMS.

Southampton.—At a meeting of the Borough Council on the 1st inst., Mr. W. B. G. Bennett, assistant surveyor, was appointed borough surveyor, Mr. James Lemon, who resigned, being appointed consulting engineer to the corporation.

Preston.—On the 25th ult. the Preston Town Council accepted the resignation of Mr. R. H. Hunter, the borough surveyor. The salary is 300*l.*

Leamington.—At a special meeting of the Leamington Town Council, on the 18th ult., the resignation of Mr. Robert Davidson, borough surveyor, who has been unanimously elected to a similar post at Sheffield, at 600*l.* per annum, was accepted. It was decided to advertise for a successor, at a salary of 300*l.* a year.

SCREWING UP ST. ALBAN'S ABBEY.

THE very interesting and almost unique operation (on such a scale, at least) of forcibly putting straight the south wall of the nave of St. Alban's Abbey, will, by the time these words appear in print, have either succeeded or failed; though we have little fear that the latter catastrophe will have to be recorded. Formidable as the job seems, of forcibly putting straight a lofty wall, 7 ft. thick, containing a great proportion of "solids," and resting on piers rather deficient in body for the weight they have to carry, the measures for carrying it out seemed to have been so well taken that there could not be much fear of the result. The actual operation was fixed for Thursday in the present week, a date which precludes our giving any detailed account of the result of the process in this number of the *Builder*; but we may afford our readers a little information as to the state of things at the building, and the means employed for carrying out the straightening of the wall.

Both the main walls of the nave,—that is to say, the walls carried by the nave arcade,—lean outwards; but the north wall is only a few inches out of the perpendicular, and is considered to be practically safe. The south wall, —that part of it at least which is known as Abbot Trumpington's work,—leans outwards 27 in. at the point of greatest settlement, and has besides a horizontal buckle of considerable extent: it is all one great bulge, in fact. At the junction eastward of Trumpington's work with the later work, the discrepancy from the perpendicular is only an inch or two; at the western extremity, where the north wall joins the west wall, it is about 11 in. out; and the greatest bulge occurs, naturally, about half way between these points. What has caused the wall to give way in this manner it is not very easy to decide; it seems probable that defective foundations, and the fact of a higher level inside than outside the building, had a good deal to do with it; but the fact that the north wall also leans outward, though not so seriously, seems to have some connexion with the immense weight of solid masonry which is thrown upon the outer edge of the piers, the weight over the inner edge being very much less, owing to the lightness of the triforium story towards the interior. The appearance of the wall, when one considered what had to be done with it, was not very prepossessing; so much of it looked "rotten" and disintegrated, and there was such an evident deficiency of bond.

The means employed to bring over the mass to the perpendicular were these. At the interior base of the aisle wall a firm concrete foundation has been formed, presenting an oblique face, sloped towards the nave wall; upon this a continuous template of heavy timber is laid, and from this timber springs a series of heavy framed struts, each with its foot resting on the template, and each spreading vertically into a fan-shape, and terminating in a vertical wall-piece pressing against the nave wall, above the arcade. The balks which rest on the template, however, are each footed on a small hydraulic press interposed between the timber and the template, and placed so as to act directly in the line of the strut, raising it obliquely, and thus pressing the wall inwards. A different plan had at first been adopted. It was proposed to have hydraulic presses in the same position as now, at the interior base of the aisle wall, but working *vertically* against the under side of a lever projecting from the nave wall, about the height of the aisle, and which lever again was to raise the foot of an oblique strut bearing inwards and upwards upon the exterior of the clearstory wall. Whose idea this was we do not know; but it should certainly have been obvious that such a construction would be likely to draw *away* from the wall rather than towards it, and might have resulted only in pulling it further out. Fortunately it has been abandoned for the system we are describing.* What we have already mentioned deals with the lower portion of the wall; but the upper portion also receives its oblique strutting system footed in the same manner upon hydraulic presses fixed on the top of the aisle wall, and operating obliquely against the clearstory wall, in a parallel line with those below. It is hardly necessary to add that these receive support from oblique struts, carrying the *appui* down to the ground, and to a concrete bedding or foundation.

Small as these hydraulic presses were, they were capable of bringing an enormous force to bear upon the wall, sufficient in itself, perhaps, to do all that was wanted. But this is not all. Entering the nave, the place seemed a mere forest of timber, the main features of which consisted of a number of great framed struts like those outside, only larger, springing from concrete footings near the inside of the south arcade, and bearing against the interior surface of the north wall. This would at first seem strange, as the north wall is already leaning outward to some extent; but the object was to render the north wall a fulcrum to pull against, and thus to assist the action of the external oblique struts by internal horizontal tie-bars from wall to wall, which were to be screwed up by winches operated by men on scaffolding in the centre of the length of each tie-bar. A third series of timber-work consists of a set of horizontal trusses supported on scaffolding at the height of the clearstory, impinging on the one side against the interior of the north wall, while their other margin marked the point to which the south wall had to be brought up, so that when the latter was so far screwed up that the horizontal truss was firmly clipped between the two walls, the job would be done.

In regard to the resistance to be encountered in turning the wall on its centre, two points for "give" had been provided, beneath the bases of the nave piers and of the triforium arcade, by cutting away under them with a cross-cut saw to nearly the centre of the wall, allowing in each case something less than 1 in. for the settlement of the inner plane of the wall when it is pushed into the perpendicular. These cuts, of course, were hardly noticeable until attention was called to them; but it was rather curious to reflect that all this enormous mass of wall was thus in reality standing on tiptoe, as one might say, on its outer edges. The other point where something had to be overcome was at the junction of the nave wall with the western wall, where the deviation from the perpendicular, as before stated, was nearly 1 ft. Here, in contemplating the work, it almost seemed that only one of two things could happen, either the bending of the timber struts under the strain, or the moving of a great part of the west wall, forming the pier to southward of the great west window, in upon the window, and the consequent crumpling up of the latter. Mr. Wood, however, under whose personal superintendence the work was carried out, was of opinion that the bond between the two walls at the south-western angle of the nave was so little solid that it would simply give way, the southern wall be torn from its bond and forced inwards, when the whole could be made good afterwards. A formidable external crack in the part of the southern wall where the bulge was greatest, was left to heal itself on the straightening of the wall, which, it was expected, would necessarily close it up.

If the wall has been got straight, the next thing will certainly be to cover the nave with a new roof. Few of those who admire the building from below can have an idea of the wreck and dilapidation up at the top. In many cases the principals are completely rotted away at the bearing, which has been roughly made good by flitches of iron screwed on upon either side of the principal, while the wood between is a kind of cavern full of spongy matter, rather than wood. The roof has king-posts, but no struts; much of it is nailed together in any fashion, and many of the timbers show evidence of having been used before in some other position. The painted ceiling, which is so much admired from below, consists of thin wood almost like pieces of bandbox nailed to the under side of the principals, and as rotten as tinder; and its surface undulates in every direction from the diverse sagging and settling of the principals. The roof at present, as our readers are aware, stands up a few inches clear of the walls, having been elevated with screw-jacks until the wall could be got into position under it. Altogether, looking at the work from this point of view, up among the roof timbers, it seems wonderful how the building has stuck together as it has.

At the west end, contiguous to the rubbishy "late" porch which has been tacked on here, an opening in the wall shows where the last of Sir G. Scott's investigations was made; the opening showing the old Early English wall and a shaft behind the Perpendicular facing. The last time Sir G. Scott was at the Abbey, not

* We may take an opportunity of warning our readers that some illustrations of the method of working published in an engineering paper, a little while ago, are quite incorrect. In regard to struts and application of the hydraulic power, the drawings represent a mixture of the two systems, the first and the second.

many days before his death, he spent a whole day investigating this, and declared himself satisfied that he had got every detail necessary for the complete restoration of the west front. "It is one of the finest things ever done," he said, "and we will do it again." It seems difficult even for the most conscientious anti-restorationist to resist a certain sympathy with the kind of enthusiam thus expressed; and certainly the existing late work is so bad that one might very well prefer to see good modern work substituted.

In our next we shall probably be able to give some account of the incidents of the actual operation on the building. Before concluding our present remarks it is only just to say a word in regard to the excellent and thorough spirit in which Messrs. Longmire & Burge, the contractors for this part of the work, have carried out their part of the undertaking. It would be difficult to see a finer piece of practical shoring and scaffolding work, framed in the most solid manner and with the best timber. No pains seem to have been spared to get a completely solid fulcrum for the operation in every direction, and to preserve the various parts of the building from any injury.

It may be added that, once the south wall is got in its place again, its subsidence in future will be provided against by the heavy and solid buttresses built against the aisle wall, to which the thrust of the nave wall will be brought down by flying buttresses well wedged up to the nave wall.

Since the above was written, we are able to report the partial completion, and entire success so far as it was carried, of the important operation referred to. Work was commenced early on Thursday morning, and before breakfast-time the wall had been got back about 10 in., and the piers were not far from plumb. The action upon the wall was at first carried on simultaneously by the two sets of hydraulic presses, acting externally upon the upper and lower portions of the wall, and by screwing up the horizontal ties inside. The plan adopted was to aim at getting the piers perpendicular at as early a period of the proceeding as possible, so as to have them firm, and then turn the rest of the wall upon them. This was, no doubt, the best method; in fact, it would hardly have been possible to keep an eye over the whole mass at once if it had been attempted to move it all to the required extent simultaneously. We were able to witness the completion of the works on the piers, and to observe their condition immediately afterwards. It seemed at first rather singular to find nearly all the splitting that had taken place was on the south side, against which the force was applied, as it would naturally be expected that the crushing would be on the other side; but if it be considered that at this point of the proceedings the piers were really being forced to such a position as to get all the weight of the superstructure on their outer edges, while "play" had been purposely given to their inner edges by under-cutting the bases, as mentioned above, their behaviour is readily comprehensible. Some of the joints on the outer faces were opened, but the effect of the pressure showed itself more in splits through the stone, which were in nearly all cases in a vertical rather than a horizontal direction; the pier nearest the west respond had a sinuous vertical crack through several courses, in a manner which showed that it had been twisted on its axis, no doubt from the fact that the portion of the wall next the western angle moved much less than the more free portion resting wholly on the arcade. The wall had, however, broken away from its bond at the western angle, as was expected, so that there seemed no serious obstacle to getting the upper portion of it as much over as was required at this point.

The further pressure on the clearstory and triforium walls was then proceeded with, the pressure being applied, however, more partially, first to one portion and then to another, so as to keep it more completely under control, the hydraulic pressure being arranged so that one or other could be shut off from the pump as required, in order to concentrate the pressure where desired. The wall was moved several inches while we stayed; but this part of the work was more difficult and delicate, owing to the care required to prevent injury to the arcades, &c., of the triforium, and also from the fact that the rubble walling, all of small stones, was somewhat lively under pressure, and did not by any means subside in its movement entirely when the pressure was checked. It had moved, we were told, during the time the men were at breakfast, an inch farther in than they left it.

It was expected that the operation would be completed on Thursday, but we are unable to give further particulars till next week. We should have mentioned that immediately the piers were plumb, the gaps cut under the bases to give them settling space were wedged and filled in with cement. The wall will be left with all its timber bandages on for a week at least after the straightening is completed, to give it time to settle properly, and then the necessary proceedings will be taken to render it permanently stable.

Mr. Gilbert Scott overlooked the proceedings, as architect for the completion of the work, and the whole was immediately superintended by Mr. Wood, the late architect's principal assistant, who has had charge of it from the first.

COMPETITION DESIGNS FOR THE NEW INFIRMARY, BOLTON.

The competition designs which have been prepared in response to the advertisement of the Building Committee of the proposed new Infirmary, Bolton, and which have been exhibited for some days in the Albert Hall in that town, show a very respectable amount of talent, especially as to knowledge of the peculiar plan and arrangements called for to constitute an efficient hospital in accordance with the principles propounded by modern science. In number they are very considerable—being thirty-seven, or thirty-eight, including an incomplete set, sent in with only three drawings to illustrate it.

It may be necessary, in order to explain the circumstances under which the competitors worked, to state shortly the general terms imposed by the published conditions of the committee. The cost of the building, including fixtures and fittings, was stipulated not to exceed 16,000*l.*; and accommodation was required for fifty adult patients, with a separate ward for eighteen children. Each adult patient was to have an average allowance of 2,000 cubic feet of space, and each child 1,500 ft. In addition to this accommodation, a Children's Hospital, one story high, and containing eighteen beds, was also to be provided, situated if possible on the west side of the principal building; but the cost of this set of wards, we believe, is defrayed by a separate sum of 5,000*l.* left by the will of a local medical man.

The terms as to drawings and sections to accompany each set of designs were much as usual in similar cases; but explanations of the proposed system of draining, ventilation, &c., were required to be given in detail. These particulars, however, were not appended to the sets of drawings as hung up for exhibition.

The site of the building, which is in the outskirts, about a mile from the centre of the town, is a piece of land at the south-west side of Chorley-street, and extending to the eastern boundary of recently laid-out grounds called Bolton Park. The area of the land is sufficient both for the erection of the infirmary and also for some little ornamental ground, but it seems to us a difficult and expensive site to build upon, as it has a steep gradient to the south, and is in other respects irregular in its surface. Local architects under such circumstances must have a manifest advantage over their more distant brethren, for both plans and elevations must be greatly influenced by such special requirements; and on inspecting the plans the differences between those which have been carefully adapted to the land from personal observation, and the cases in which the architect has apparently depended simply upon the plan supplied to each competitor, are very obvious; in many of the designs, indeed, little attention as to the levels seems to have been paid even to the plan provided.

Bolton is one of the cleanest and most agreeable of our Lancashire manufacturing towns, and situated as it is on the edge of the moors, it enjoys a healthy and bracing atmosphere, and as the proposed infirmary will occupy an elevated position, although it may be encroached upon by surrounding buildings on two sides in future years, it will always have the benefit of the open park to the west, and secure on the whole a tolerably free circulation of air. It will be within the recollection of our readers that a Town Hall of considerable importance was built here some years ago, from the joint designs of Messrs. Broderick & Woodhouse, the latter being one of the leading architects of the town. This building at present forms the chief architectural embellishment Bolton can boast of, the other chief buildings consisting of large cotton mills, many of them of very imposing dimensions, and some of good design also. The present infirmary is a very ordinary square stone building in Nelson-square, but the new building under discussion, in addition to supplying a local want in accommodation for both infirmary and hospital cases, will prove, it is to be hoped, a feature of interest to the neighbourhood, and present an appearance worthy of its era, and one that may farther adorn a certainly important and rising town.

The Boltonians, following the example of most building committees in these days, in offering three premiums of 50*l.*, 30*l.*, and 20*l.*, for the three best sets of designs, stipulate that if the first premiated design is adopted, and its erection superintended by its author, the premium shall merge in the ordinary commission of 5 per cent.,—very much like giving an architect a premium with the right hand and taking it from him again with the left.

It would be difficult minutely to classify the designs before us, the leading features and arrangements of each being so far governed by the conformation of the site, and the necessity imposed by it on all to place their principal façade facing south, and the almost universal adoption, in consequence, of an east and west aspect for the principal wards, that their arrangements are, on the whole, very similar to one another. Suffice it to say, with reference to the bulk of the designs, that as a general rule their plans are fairly good, and better than their elevations; the latter being often very commonplace, and presenting few features that call for special notice. The styles chosen range as usual from plain Elizabethan, Jacobean, and Queen Anne, to plain Italian, and, in two or three instances, of more or less florid Gothic; and nondescript fusions of all these. There is, however, a great preponderance of the fashionable "Queen Anne"; the latter, as indeed may be said in too many cases of every style adopted, often being so treated as to lose artistic effect.

The first set of plans we shall select for special notice is one under the motto of "Health." This design exhibits a well-managed plan, with the principal front to the south, and the male and female wards (which are each at the extreme ends of a corridor running the whole length of the front), projecting at right angles to it, and the children's ward running parallel with the front. The administrative department is kept to the front. The wards are well isolated, and the communication between the parts by means of corridors complete—there is an exit at the ends of the corridors by bay windows to the gardens. The style adopted is a sort of Jacobean, and the general effect would be by no means agreeable. This design possesses many of the whims of the style; amongst others, strange arched stone transoms across the middle of the windows, a mode of embellishment "more honoured in its breach than in its observance." "Sanitas" adopts an arrangement somewhat different from the majority of his competitors; this being a building in the Queen Anne style, forming three sides of a quadrangle, the principal front to south as usual, and the men's and women's wards contained in the wings at right angles to it. The administrative department, containing living rooms, &c., is kept to the back, behind the centre of the main front. Special mention in this case ought to be made of the etched perspective accompanying the plans, which is very clever. In a design under the title of "En Avant," there is a building in the Queen Anne style, placing the wards due north and south, with an alternative plan, which shows them south-east and south-west. The administrative, or house, department is set back; the women's ward being to the right, and the men's and children's to the left. There are also windows at the ends of the wards, with lavatories, &c., in the angles, also verandahs with steps down to the ornamental grounds. The principal wards are well isolated, being reached by corridors of one story. The staircases are good, and the out-patients and accidents departments well arranged; the whole, however, is much compromised by an elevation plain almost to meanness, possessing many of the least pleasing features of the Queen Anne style. A set of plans, "Health before Wealth," is a very favourable specimen of Queen Anne style; the drawings, especially the main or south elevation, are very well got

up. "Healtha."—This design in plan exhibits great talent for symmetrical arrangement; the wards are situated at the back, well isolated, and admirably arranged; the administrative department is to the front, and is separated by a corridor and kitchen department, with an operating theatre behind. The style of the building is Gothic, well treated. The set of plans under the motto "Efficient Plan" is also worthy of attention. The plan is good and well arranged, strictly on the pavilion principle. The wards run north and south, and project forward at right angles; the parts well detached, without being too straggling. The elevations are Gothic, freely treated, and would make a telling and characteristic building. In the designs under the motto of "Thorough" we find a very good plan, with a very perfect isolation of the wards, gained, however, at the expense of having very long corridors to traverse. There are alternative plans showing the wards running north and south, and one with an eastern flank for men's ward. This is a very good Gothic design, and would make a good infirmary, but it would be an expensive building. "Thorough" in triangle: here we have a plain Italian design, with round-headed windows and clock-tower in centre, well adapted for an infirmary, and explaining its purpose. In plan the wards run at right angles to the front, but by means of end windows some southern sun is obtained. There are airing terraces to the south as well, and lavatories, closets, &c. are well isolated. "Comme il Faut" shows a good, plain, Gothic elevation, with small central tower. In plan the wards are all at the back, and at right angles to the principal front. They seem easy of access to each other, and to the administrative department. The arrangement is a very good one. The last design we shall mention is "Health" in interlaced triangle, which in plan is very well arranged, with the principal wards at right angles to the front, but the children's parallel with it. There is a corridor passing across the administrative department, which is well arranged. The elevations are good, with semi-arched windows of pleasing character. There are also covered balconies opening out of the wards. The elevations in this case have been carefully studied with reference to the levels of the site.

Of the whole designs exhibited, those we have specially selected for notice appear to us superior to the rest. The designs are an interesting collection, displaying much thought and study, though in some instances not a little eccentricity, especially as to choice and treatment of style.

We understand that Mr. Charles Barry, who has been chosen by the committee as their referee to adjudicate upon the merits of these designs, is proceeding with his task, and has ordered the necessary measurements of about a dozen of them to be calculated and tested; but it is not, we believe, expected that his final award of the premiums will be made immediately; and, under present circumstances, it seems probable that the final decision of the committee will be given about the end of the present month.

THE LANGHAM SKATING-RINK SITE IN THE AUCTION MART.

THERE are few places of recreation and entertainment which have been more overdone within the last year or two than skating-rink undertakings. Large numbers of them, both in the metropolis and elsewhere, have turned out failures and come to grief. And amongst others which have collapsed is the Langham, which, in addition to the construction of a skating-rink covering a large area, included a project for the erection of a spacious and high-class hotel. Last week the site of the rink and intended hotel was submitted for sale at the Auction Mart, under an order of the Master of the Rolls, and by direction of the official liquidator. The property, which is leasehold under the Crown, was described as containing an area of 17,000 superficial feet, with frontages to Regent-street and Langham-place. The property offered included the building lately occupied as the Portland Bazaar. The ground-rent of the property was stated to be 514*l.* per annum. Before submitting the site, Mr. Beale, the auctioneer, said that a body of capitalists were desirous of purchasing it for the purpose of erecting a theatre upon it, and negotiations, with this object, had been in progress with the liquidators, but that in consequence of the Crown having refused to allow a building of this character to be erected on the site, the negotiations had been brought to a close. The auctioneer having intimated that the value of the property could not be estimated at less than about 16,000*l.*, the first offer made was 5,000*l.*, the property by advances on the several bids being run up to 8,500*l.*, when, there being no further offers, it was withdrawn, the sum offered being much below the reserve price which had been fixed by the Master of the Rolls.

SEWAGE DEPOSITS IN THE THAMES.

AT a late meeting of the Metropolitan Board of Works a report was presented by the Works and General Purposes Committee, submitting lengthy reports made to them by Sir J. W. Bazalgette, C.B., and Messrs. Law and Chatterton, civil engineers, and by Mr. T. W. Keates, the Board's chemist, and Mr. Dupré, on a report made by Captain Calver to the Conservators of the Thames, on the discharge of metropolitan sewage into the River Thames at Barking Creek and Crossness. In the report of Captain Calver it was stated:—

"As matters now stand, the metropolitan sewage discharge has reproduced in mid-Thames, in an aggravated form, a nuisance which was felt to be unbearable in the upper portion of the river.

The only difference now is, that the nuisance, which was formerly brought down to London by the ebb, is now carried up to London by the flood.

That the present channel in mid-Thames is through banks of fœtid matter, that the water in the channel is loaded with material in a state of putrescence, and that it daily oscillates within the metropolitan area, with its teeming population, and contaminates the atmosphere.

That a vast mass of polluted water, eight miles long, 750 yards wide, and 4½ feet deep, charged with offensive matter, both fluid and solid, moves up and down the channel four times daily between Gravesend and near to Blackwall, dropping its solid burden wherever a reduction in the rate of the current or still water may favour deposit."

The report submitted by the committee entered at great length into the subject, and after a consideration of a careful analysis of the Thames water taken at different places between London and the two outfalls at Barking and Crossness by Mr. T. W. Keates and Dr. Dupré, F.R.S., the conclusions arrived at by the engineers are as follow:—

"1. That we have shown that there is no documentary evidence to prove that foul and offensive accretions have recently formed within the channel of the Thames, but, on the contrary, that the condition of the river is gradually improving, more especially as regards the depths of its channel.

2. That a true interpretation of the analyses quoted by Captain Calver proves, as is the fact, that both the water and mud of the Thames have improved greatly in purity since its sewage has been diverted from the metropolis to a point lower down the river.

3. That these same analyses show that there is no resemblance whatever between sewage mud and Thames mud, and, therefore, that Thames mud cannot be derived from sewage.

4. That there is no evidence whatever which supports the statement that the sewage works its way up the river, and that such statement is contrary to the fact.

5. That the present muddy condition of the river is caused principally by the unprotected state of its banks, which in many places are being rapidly washed away, and which are the result of a neglect of the duty which legislation has cast upon the Thames Conservators."

On the motion of Mr. Richardson, it was resolved that these several reports be referred back to the committee for consideration and report.

THE FREE LIBRARIES MOVEMENT IN THE METROPOLIS.

MR. EDWARD B. NICHOLSON, librarian at the London Institution, Finsbury-circus, writes as to the progress of the free libraries movement in London, and in the course of his letter says:—And now a few words as to the Metropolitan Free Libraries Committee, and its work. It consists of between twenty and thirty gentlemen (many of them members of one or other House of Parliament, and nearly all men of public note) who are resolved that London shall not for ever lag behind the scores of provincial towns which supply literature free to that great mass of the population which has not the means either of buying or of hiring it. They do not believe that the metropolis is at heart more niggardly and more hostile to progress than the provinces, and they mean to pursue their work in a spirit not of interference and reproach, but of kindly appeal, until they have procured something like a general adoption of the Public Libraries Act. Their mode of procedure is this:—When they have decided on appealing to any one of the great parishes, they address a letter to the Vestry. The letter shows the crying need of local libraries in the metropolis, and the objections to founding such libraries on any system except that provided for by the Act. It explains the provisions of the Act, and how, if the rate yield enough, a museum and art-gallery can be added to the library; and it points to the lengthy and successful operation of the Act throughout the kingdom—an appendix, compiled from last year's Parliamentary return, giving full details as to size, use, and cost of public libraries in all places of more than 40,000 inhabitants. They print this letter, and send a copy to each member of the Vestry, even when, as in many vestries, there are over 100 members. It is not, indeed, the Vestry who can adopt the Act,—that must be done by the ratepayers at large; but if the Vestry be already well inclined, the letter will probably draw from them a favourable acknowledgment, which will be of the greatest value in that particular parish; and, if the Vestry be not so well inclined, they are assuredly the persons whose active opposition the committee should first endeavour to disarm by facts and figures. If the Vestry pass a friendly vote, the committee at once organise a local committee for informing the ratepayers on the question before taking a poll. If the vestry be neutral or unfavourable, the committee act according to their estimate of public spirit in the locality. The committee met for the first time in December, and have as yet appealed to no more than six vestries. St. Pancras has given an unfavourable reply, on the ground that in 1874 the parish (by a majority of about thirty) declined to adopt the Act. St. Martin's-in-the-Fields has not formally answered, but is known to be against us. Islington and Marylebone have simply acknowledged the letter. In Kensington, however, the subject has been referred to the Special Purposes Committee, and since Mr. James Heywood is understood to be willing to hand over to the parish the free library which he maintains, with such beneficial results, at his own cost, there are strong hopes that the reply will be an encouraging one; but the Hackney Vestry, though much had been expected of it, has more than answered our expectations, having, after two hours' debate, taken on itself (by a majority of three to one) the initiative in polling the parish. A very strong local committee has begun work; the local press supports the movement; and before long the committee hope to be able to record Hackney's adoption of the Act. I ask those who believe that their vestry or their parish would lend us a willing ear, or who, being ratepayers, are ready to serve on local committees, or who know of influential sympathisers, to communicate with me. All that is needed for our eventual success is that we should know where we can count on active allies.

THE SOUTHPORT MAIN SEWERAGE WORKS.

FOR some time past main sewerage works have been in progress at Southport, the entire length of the works being between six and seven miles. The contract was divided into three sections, each about two miles in length, and the third section, which completes the whole, has just been finished, and was last week formally inspected by the sewerage committee of the town council, accompanied by the engineer, and several professional gentlemen interested. The party traversed the entire length of the two miles of which the sewer consists, and expressed themselves perfectly satisfied with the manner in which the work had been carried out by Messrs. Pearson & Sons, the contractors. The dimensions of the sewer are 4 ft. 6 in. in height, by 2 ft. 8 in. in width, laid at a depth of from 17 ft. to 21 ft. below the general street levels. The sewer is fitted with ventilators, flushing-gates, and penstocks, and is carried out into the river for a considerable distance, and below low water-mark.

BRICKYARD CHIMNEYS.

IN reply to "M. & S.'s" inquiry in the *Builder* of April 13th, the remedy I would suggest as a blocking course or coping to the top of chimney for the purpose of a finishing course would be to have it formed of burnt fire-clay, 9 in. or 10 in. thick, of an outline to suit width of walling and shape of chimney, having the joints protected by forming dovetailed sinkings two-thirds the depth of coping, in abutting end, and purpose-made pieces let into same to fit in full depth of sinking, so as to form a continuous girth around the whole top.

The above is a method I have adopted with success in work carried out by me, in preference to using cramps. PAGETT.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

The eleventh meeting of the District Committee for the Midlands for the above association was held on Saturday morning in the Council Chamber at the Town-hall, Wolverhampton. Mr. F. Ashmead, borough engineer, Bristol (president of the association), occupied the chair, and there were also present Messrs. Deacon (vice-president), borough and water engineer, Liverpool; E. Pritchard (vice-president and secretary of the Midland district), Warwick and Westminster; C. Jones (honorary general secretary), Ealing, W.; G. E. Thoms, borough engineer and surveyor, Wolverhampton; Cole, Hereford; Lobley, Hanley; Eyre, Newcastle-under-Lyme; Bayliss, Redditch; Allen, Stratford-on-Avon; Denis, Oldbury; Comber, Kidderminster; White, Oxford; Cartwright, Bury (Lancashire); Fereday, Wednesbury; Richards, Bursiem; Newman, Ryde (Isle of Wight); May, Town Malling; Newton, Altrincham; Kenworthy, Handsworth; Cross, Dewsbury; M'Callum, Stafford. The visitors included Alderman Hawksford, Messrs. Willcock (Messrs. Horsman & Willcock), E. L. Wright, T. J. Barnett, Bryan, Broom, Adams (manager of the Barnhurst Farm), Wolverhampton; C. Law Green, resident engineer, Yardley Sewerage Works; Marshall, Smethwick; Pewtress, Rowley Regis, &c. Mr. R. Rawlinson, C.B., chief engineering inspector of the Local Government Board, wrote apologising for his inability to attend, and forwarded a number of valuable suggestions to the members; after which a paper, by Mr. Thoms, on the Wolverhampton sewerage scheme was read. The members subsequently inspected the waterworks and the sewage-tanks and irrigation farm, and in the evening dined together.

LIVERPOOL ENGINEERING SOCIETY.

This society held its usual fortnightly meeting on Wednesday evening (April 24) at the Royal Institution, Colquitt-street, the president, Mr. Robinson Souttar, occupying the chair. After the ordinary business of the meeting had been disposed of, Mr. Lawrence M. Kortright read a paper on "The appliances and operations for raising the steamship *Edith* at Holyhead." The *Edith* was one of the London and North-Western Railway Company's passenger steamers, and was sunk in Holyhead Harbour by collision with a sister ship, September, 1875. The plan adopted for raising her was by means of wrought-iron caissons of sufficient buoyancy, which were sunk on either side of the vessel, and attached to her by hooks and chains passing through holes cut in the ship's sides. Each pair of caissons was kept apart by wrought-iron girders on the top of which was a timber platform carrying the engines for pumping out the caissons. On the caissons being pumped out they rose and lifted the ship with them.

NEW PUBLIC BUILDINGS AND OTHER WORKS AT HOVE.

The commissioners of Hove, near Brighton, are engaged in the erection of a new town-hall and other public works of an important character, and at a meeting of the commissioners, which has just been held, the Works Committee recommended, as already stated, that the entire outlay for constructing and completing the new town-hall in Church-road should not exceed 25,000*l*. Waterworks, on a scale of some magnitude, are likewise resolved upon, and the surveyor to the commissioners estimates that to erect a pumping-station, reservoir, and lay a complete system of water-mains through every thoroughfare in Cliftonville and Hove would cost 20,000*l*., and that the annual expense of maintenance would be 1,500*l*. per annum. He adds that the average cost of the existing watering of the streets is 430*l*. a year.

The Newington Butts Improvement.—At its last meeting the Metropolitan Board of Works adopted a report of the works committee, recommending that the Board do contribute one-half of the cost,—namely, 1,384*l*.,—of the works proposed by the Vestry of St. Mary, Newington, for laying out ornamentally the churchyard of the parish, such contribution not to exceed the sum of 692*l*.

MEMBERS' SOIRÉE, ARCHITECTURAL ASSOCIATION.

The queer shape of the bottom of the obelisk very naturally supplied Mr. Stannus, the honorary secretary for entertainments, with material for a timely skit,—perhaps even a trifle quainter than some of the odd proposals for honouring that ancient specimen of lithoglyphy. Misrepresentation of Mr. Dixon's calculations was, however, under the circumstances, hardly justifiable. The safe pressure on the square foot was given at 95½ lb., not 95 lb. 11⅝ oz. Camels' backs are said to have been broken by even smaller additions to their burdens. But too great fervour, anent the conditions of statical equilibrium, severe reprobation of Mark Twain, and moralising on the ungracefulness of laughter, are not the only possible merits of an observer at such times. The world at large is not supposed to be looking, as usual, at the Association on the long and pleasant evening set apart by custom once a year for secret conclave. The members, assembling in the character of human beings, have only to act their parts accordingly, to merit and receive good-humoured applause.

AN ARTISTIC MEMORIAL OF SIR G. GILBERT SCOTT.

Sir,—Most architects, at least, are familiar with the splendid engraving of the group of Sir Christopher Wren's works, arranged in most effective style by the late Mr. Cockerell, and admirably executed. There is no more appropriate ornament to an architect's room than this picture, which, as it were, focuses the genius of the great English master of Classic architecture. Would it not be a fitting memorial of the great English master of Gothic architecture to have such an artistic group of his works arranged by some able and sympathetic architect? Apart from the gratification it would give to thousands to possess in such a form the masterpieces of our deceased leader, it could not fail to repay the cost of its production in the best style of art. I would further suggest that this memorial of Sir Gilbert Scott's work should be of the same size, and as nearly as possible engraved in the same style, as the group of Sir Christopher Wren's works, so that they might appear as companion pictures. One, the fullest outcome of Classic art on English soil, the other the highest modern development of Gothic art. The work of grouping and representing the various buildings should be entrusted to the very best architect who would be willing and able to undertake such a responsible duty, one as worthy to interpret Scott as Cockerell was to interpret Wren. Such a memorial need in no way conflict with others that have been suggested. On the contrary, it might be made a means of increasing the funds required for others more expensive and permanent. I would earnestly commend this suggestion to the favourable notice of those gentlemen belonging to the Institute of Architects, and others who at present as representatives of our profession are considering how best to do honour to one who has conferred so much honour on us.

T. Arnold.

MEMORIAL OF THE LATE SIR GILBERT SCOTT.

Sir,—I am sorry to see by a letter in the *Guardian* of the 17th ult., that it has been proposed at a meeting, held at the Architectural Museum, on the 10th inst., to combine "a suitable monument with an endowment for art tuition, at the Museum, similar to the Pugin Studentship at the Royal Institute of British Architects." A circular which I have since received from the secretaries of the Museum mentions only instituting a fund to raise a memorial to Sir Gilbert's honour, but the suggested endowment is not alluded to. The erection of a monument would, I venture to say, be a very appropriate tribute to the memory of their distinguished *confrère* by the members of the profession, if exclusively subscribed for by them. An opportunity would then be afforded of producing a real work of art, such as it is doubtful whether any restoration scheme would present.

It is well known that Sir Gilbert was an enthusiast in his art, particularly where the restoration of a cathedral or a church was concerned, and many buildings could probably be brought before the public in which his intense personal interest could be cited. Sir Gilbert's interest in the Architectural Museum was very great, and any memorial intrusted there should have some definite connexion with it. How the "endowment for art tuition similar to the Pugin studentship" will assist the Museum I am at a loss to understand. Is there not some confusion here? The Pugin studentship can hardly be called "art tuition" in the ordinary meaning of the words, which would rather imply the endowment of an art-teacher.

Would it not be as well to inquire into the results of the Pugin Studentship before establishing a similar one? The tendency of such a studentship appears to be to foster archæologists rather than architects. The successful competitors for the Pugin travelling fund are those who distinguish themselves by the production of the largest and best collection of measured drawings. A candidate's nascent powers of design are in no way considered; the one whose means and leisure have afforded most opportunities for sketching has generally proved successful, whilst the student whose means and time have been limited has stood no chance of a prize. The Pugin fund was surely not established for the aid of students of independent means; but to enable those to travel who could not afford it. I fear still greater abuses would arise in the administration of a travelling fund by a not strictly professional body, such as the Council of the Architectural Museum.

If the memorial is to take the form of some work in connexion with the Museum, surely the enlargement and proper arangement of the collection would be the most fitting work. The number of casts requires multiplying at least fourfold to be any practical use. There are very few specimens of Classic or Renaissance ornament. Small and delicately-modelled casts are hung too high or covered with too much dust to be properly studied. The walls of the Museum require painting some light colour, to impart a cheerful aspect to the interior, which it certainly now lacks. A work of restoration at some cathedral would doubtless be a more acceptable form of memorial with the general public than the purchase of casts. Indeed, it is a question as to whether more harm is not done to the original in making a cast than good is obtained by having the cast in a museum where the subject cannot be studied in the position for which it was made. All reproductions have been forbidden at Southwell Minster, since the damage was done to the beautiful carving at the entrance to the Chapter House in making the casts for the Crystal Palace, and objections might properly be made elsewhere. It is hardly to be expected that the contributions of the members of the profession would be sufficient to put the Museum in proper condition, while a handsome monument would be obtainable, and it would possess a greater personal and sentimental interest than the purchase of casts.

F.R.I.B.A.

THE LABOUR QUESTION.

Sir, After reading your judicious article on this subject in last Saturday's *Builder*, it struck me that if the following questions could be succinctly answered, the answers would throw important light upon the labour question:—

1. May we not regard the demand for a staple commodity by the world as an approximately fixed quantity?

2. Had we not a few years since almost the monopoly of the cotton trade?

3. Have there been any changes, any distribution of manufacturing industry among the nations, calculated to break up this monopoly?

4. If there have been, can underselling be anything else than a temporary expedient to avert the ultimate and inevitable contraction of our own industries?

5. What are the remedial expedients to meet these changes? Can they be other than those of turning surplus labour into other industries, and wholesale emigration?

W. Cave Thomas.

DR. WHITE AND SION COLLEGE.

Will you allow me to supplement the interesting article on Sion College, published in the *Builder* last week, by the following note or two?

At the beginning of Dr. White's will he dates it February 20th, 1622, and towards the end, June 4th, 1623, while a memorandum in the shape of a codicil is dated "at Windsor," October 1st, 1623. The clause relating to the 1,000*l*. which he lent to the City Company is as follows:—"I doe call in the one thousand pounds I lent to the M^r^ and Wardens of the Marchantaylors, and have their comon seal for it, I say I desire it may be called in and paid within one half yeare after my decease for ye better performance of this my last will and testament."

The following are extracts out of the register of St. Dunstan's in the West, of the marriages of the vicar:—

"1576. August. Maried, Mr. Thomas Whight, M^r^ of Arte of Oxforde, and Vycar of S. Dustones in the West of London and Fortune Knight, the xxj^tie^ daie, in the pish church of S. Dustones aforesaid, and that by the lycence of Mr Doctor Hawode, the Bychoppe of Londo^n^ Chancellor."

"1580. November 30th. Thomas White, minister, and Elizabeth Bouge."

Although Dr. White specially said,—"I would have a grave-stone about three pounds' price with a short inscription made and laid," I cannot find that the order was obeyed. Old St. Dunstan's Church escaped the Great Fire of London in 1666, and there was *no* inscribed stone existing when my much esteemed and lamented friend, the Rev. J. F. Denham (who was curate there), compiled his Pictorial Account of the Church and its Monuments in 1829. But more than 250 years after Dr. White's death, thinking it was time to pay a little respect to the last wishes of so good a benefactor, we of the nine-

teenth century,—that is to say, those who have not forgotten him,—erected in September, 1877, on the north wall of St. Dunstan's, a handsome mural monument of alabaster, enriched with coloured marble columns and marble inlays, with a medallion portrait in statuary marble, and a suitable inscription, although more lengthy than Dr. White desired. The monument was designed by Mr. A. W. Blomfield, and executed by Mr. J. Forsyth.

The following is the title of one of the seventeenth-century tracts, which was printed in 1648 :—"Sion College, what it is, and doeth; with a Vindication of that Society from the Slanderous Defamations of Two Fell and Fiery Satyres, as also a little Taste, by the way of Another Young Thing of Mr. J. Godwin's running about with the Shell on the Head before it be all hatch'd!" In those times they liked *striking* titles, and it was no uncommon thing to find more in the title than in the text of the book itself.

T. C. NOBLE.

MISTAKEN IDENTITY: OAK *v.* CHESTNUT.

SIR,—Mr. Blashill's paper "On the Question of Oak or Chestnut in old Timber Roofs," in the *Builder* of April 20, will be extremely interesting to most of your readers. I regret that details were not given respecting the roofs he has examined and the names of the authorities in favour of chestnut.

Without devoting much time to looking up the subject, I will quote two cases of chestnut roofs in London and its vicinity, and mention my authority in each case.

No. 1. *Eltham Palace, Kent.*—If Mr. Blashill will refer to Pugin's "Examples of Gothic Architecture," he will find a plate showing the roof to the great hall, and on an enlarged sectional drawing of the ribs Pugin has placed these words, "Chestnut rib." This is not the only instance to be found in Pugin's works of the use of chestnut for carpentry purposes. He was often at considerable pains to make out this wood when he found it in roofs.

No. 2. *Westminster Hall.*—Mr. Blashill alludes to Wren's statement that chestnut had been used in Westminster Hall. To Wren's name I will add Tredgold's. In the first edition of his "Carpentry," Tredgold referred to Westminster Hall roof as being a chestnut one; but having made a *personal examination* of it before the publication of the second edition of his well-known book, he came to the conclusion, as stated in the second edition, that the *rafters* were of oak.

I cannot quote the name of any living or dead author who, having made a personal examination of the famous *principals* of this roof, came to the conclusion that they were of oak. I cannot quote the name of any living architect who has made a careful examination of the roof with the view of determining the question of oak or chestnut *principals*.

Mr. Blashill states that after many years' search he has never been able to find a chestnut roof, "while such as it was possible to investigate have been proved to be untrue." As he has, no doubt, examined the Westminster Hall roof, it would be interesting to your readers to peruse his notes, if he will favour you with them. My contention is, that the old statement that the roof of this celebrated hall is formed of chestnut has never yet been satisfactorily disproved by any well-known authority from personal examination; except, so far as regards some specimens of the rafters examined by Tredgold, and which he found to be of oak with a fine kind of septa. It is now the custom to say that the whole roof is of oak, with a fine kind of septa.

I lay particular stress on the words *personal examination*, for the following reason. It is an easy matter to examine some specimens of oak and chestnut which have been placed on the table in the meeting-room of the Royal Institute of British Architects; but it is not so easy a matter, while standing near the top of a tall ladder, to hold in one hand a guttering tallow candle, and with the other hand to wipe away the dust and cobwebs from a church roof, in order to determine the question of chestnut, or oak with a fine kind of septa. When I was only twenty-one years of age, and knew very little about chestnut wood, the ladder business would have been a joke; now it would be no joke, and I should request a competent clerk of the works or carpenter to go in my place,—with this result, that I could only quote his opinion, and not my own.

I venture to think that Mr. Blashill, when giving his strong opinions, viz., "Although I cannot admit its (chestnut) occurrence in ancient roofs, &c.," "After many years' search, &c.," should quote,—say twelve,—cases of roofs which he has examined, and found to be of oak, and give the chestnut authorities in each case. There would then be some opportunity of testing his judgment. The opinion of any clerk of the works, of whose ability your readers are practically ignorant, can scarcely be considered decisive in any case.

I believe the following method is adopted by carpenters for settling the question of oak or chestnut; it is some years since I tried it, and, therefore, cannot write positively about the matter. Suppose two blocks of wood, one oak, the other chestnut, and it is required to determine their identity. With a wet saw (which should be kept wet whilst being used) cut off a piece of wood from each block. The oak, where the saw has been, will have a slight blue stain on it; the chestnut will have pink slight stains mixed with blue.

Reference was made in the paper by Mr. Blashill to the thinness of the plates in the *Sessiliflora* oak. Mr. Laslett, timber inspector to the Admiralty, has recently stated that after an experience of many years in the practical working of the *Pedunculata* and *Sessiliflora* oaks, he finds it almost impossible to detect any difference between them, and that very few timber surveyors are able to distinguish them, except when growing.

THOMAS A. BRITTON.

SIR,—I observe in the last number of the *Builder* a letter on the use of chestnut timber. I have some panelling carved in very high relief in very fine Renaissance style, which I bought at Avignon, and which, judging from its style, cannot be of later date than about 1550. I was told that it came from the Chartreuse at Villeneuve les Avignon, where the sacristy was lined with carved work of great celebrity: it is mentioned by the President des Brosses in his travels.

In the panels in my possession the heart-wood is in the most perfect state of preservation, very hard, and quite untouched by worms, but some portions of sap-wood were much decayed and full of worm-holes.

I do not think that the value of chestnut for decorative carving is duly recognised at the present day; it is much finer in grain than oak, and age gives it a finer colour,—a rich red-brown.

If I were about to have carvings for the decoration of rooms or churches executed, I should be much disposed to cause chestnut to be used in preference to oak.

N.

BAD WORK.

SIR,—Thousands of working men and women, besides those now idle at Lancashire, will thank you for your remarks upon the strike of cotton operatives against the reduction of their wages.

Thousands of people in the poorer parts of London and other large towns know for years past by experience the truth of your remarks as to the inferior quality of great quantities of cheap goods now sold.

Tons and tons of worthless rubbish, in the way of articles of clothing of the lighter sort, are being sold in all the poorer parts of our large towns at cheap and tempting prices, a disgrace to the firms that make them, knowing, as they must do, full well that they are but robbing the poor people who buy them of their hard-earned money. Living, as I do, in the east end of London, and having a little family to clothe, I know from experience that it is a serious matter this vile rubbish now being heaped upon us. Mothers and others who cannot deal at the cheap and flashy shops around them, have to travel daily to West-end and other well-known respectable houses for their family clothing, and are only too glad and willing to pay much higher prices for good articles, knowing by experience that they are by far the cheapest.

This cannot be denied; and if, as we have no doubt, this rubbish has been sent to the foreign markets, can we wonder at our trade, both home and foreign, falling off, and will *any amount of "reduction"* in the prices compel people to buy worthless articles largely composed of "clay," "size," "devil's dust," &c.? No one complains of having to pay a fair price for a good article; and it undoubtedly costs as much to *make* bad articles as good ones, the difference being in the *quality* of the materials; and if I do not mistake the opinion of the buying portion of the community upon the subject, it is this:—Sell us a good article, charge us a fair price, and we will cheerfully pay it; but do not manufacture this vile rubbish, forcing shopkeepers to sell goods they are thoroughly ashamed of, robbing the poor of their money, disgracing our country in the markets of the world, and, at the same time, paying a starving price to those who make them.

A WORKING MAN.

VENTILATION.

SIR,—In your issue of the 6th inst., Mr. Hood questions the statement lately made by the *Times* that the foulest air in a room is the lowest in position. Until this question is settled no confidence can be felt in any system of ventilation, for we do not know even whether the aperture for the withdrawal of vitiated air from a room should be placed near the ceiling or the floor.

It is agreed that the deleteriousness of the atmosphere in a crowded hall is owing to the presence of the carbonic acid evolved in respiration, and which, the *Times* asserts, descends as soon as it loses the heat acquired from the human body. Now, the presence of carbonic acid anywhere, and the proportion in which it exists, can be ascertained by the carbonometer, and by means of this simple inexpensive instrument the relative purity of the air in the higher and lower parts of a room may be determined.

Possibly observations of this kind have been made. Can any of your readers enlighten me?

G.

BUILDERS' CONTRACTS.

SIR,—I see in your impression of the 12th of January a case stated. (Builders' Contracts, page 45, Lewis *v.* Brass.) I should be glad to know if the Tender then sent in and accepted by the plaintiff's architect was stamped previously to the case going into Court.

J. J.

ARCHÆOLOGICAL SOCIETIES.

Cumberland and Westmoreland Antiquarian Society.—At a meeting of the council of this society, held at Cockermouth, on the 23rd ult., the following arrangements were made:—A two-days' meeting at Windermere in the first week of June, of which the details will be arranged shortly; a two-days' meeting with Cockermouth as head-quarters, and a winter meeting at Penrith. It is contemplated to hold a winter meeting at Carlisle in 1879, when particular attention will be given to Carlisle and its civic history and records.

Shropshire Archæological Society.—At a recent meeting of the council of this Society, at the Museum, Shrewsbury, it was decided that the summer excursion this year should be to Boscobel, Whiteladies, Tong, &c., and that the annual meeting of the members should be held on the same evening at Shifnal. Monday, July 8, is fixed on as the day for the excursion and meeting.

SCHOOL-BOARD SCHOOLS.

Halifax.—On the 25th ult. the new Board schools which have been erected in Portland-road, Halifax, in consequence of Rangebank Schools not affording sufficient accommodation for the children in the neighbourhood, were opened by Mr. Swallow, chairman of the School Board. The departments consist of a large room, 54 ft. by 25 ft., and four class-rooms, one of which is 20 ft. by 19 ft.; another, 17 ft. 6 in. by 18 ft. 6 in.; and the remaining two, 17 ft. by 19 ft. each. The rooms are lighted from at least two sides, and light is provided for the desks from the left-hand side. The whole of the desk accommodation is upon the dual system, and the infants' galleries are upon the London Government model. The building cost 5,713*l.* 14*s.* 9*d.*, and will accommodate about 1,000 children, divided proportionately between the three departments. It is Early Gothic in style. The principal front consists of a central block, two stories high, with square-headed windows, transomed and mullioned. There are two-light lancet-headed windows ranged along the ground-floor level and on the first-floor are others. There are covered playgrounds for the girls' and infants' departments. Arcading ranges along

the front elevation, with pointed arches, supported upon piers, and having chamfered caps and bases. In the centre of the building is a tower of three stages, which forms the principal entrance to the girls' department, and which consists of a pointed-headed doorway, having a two-light tracery window over. The upper stage of the tower is formed by a range of lancet lights, filled in with ventilating louvres, the whole being crowned by a pyramidal roof, having weather-vanes. Mr. Richard Horsfall is the architect, and the following were the contractors:—Mason, Mr. J. W. Wilson, Halifax; carpenters and joiners, Messrs. A. Halstead & Son, Halifax; plasterers and slaters, Messrs. J. Bancroft & Son, Halifax; plumber and glazier, Mr. J. Barker, Halifax; heating apparatus, &c., Mr. Henry Edmunds, Halifax; painter, Mr. Robert Moores, Ripponden.

THE METROPOLITAN BOARD OF WORKS AND THE LONDON WATER SUPPLY.

AT the last meeting of the Metropolitan Board of Works before the Easter recess, the following report of the Parliamentary Committee was read:—

"Your committee have had under consideration the question of the course to be adopted with the two Bills of the Board relating to the water-supply of the metropolis, and it appears to them, looking at the position of the two Bills, that it would be well for the Board to refer the question to the Works and General Purposes Committee for consideration and report, and to instruct the solicitor to report to that committee upon it. Your committee recommend accordingly."

Mr. Freeman proposed the adoption of the report. He said the session had now considerably advanced, and the feeling of the committee was that the Works Committee should consider whether these Bills should still be pushed forward.

Mr. Runtz said he was sorry he could not agree with the recommendation of the committee. There was now no doubt that both of their Water Bills were in a hopeless condition. It had been stated by Mr. Sclater-Booth in the House of Commons, in answer to a question put by Professor Fawcett, that the Government was not prepared to consent to the appointment of a Select Committee "to inquire whether the water supply of London should continue to be in the hands of private companies, and, if not, to what public body it should be entrusted, and on what terms the rights of the existing private companies should be acquired." The Home Secretary had also stated, in answer to a deputation from the water companies, that there was not the slightest chance of the Purchase Bill being read a second time or coming on for discussion. Seeing, therefore, that there was not the least chance of the Bills becoming law this year, he thought their wisest course would be to withdraw them at once. He moved as an amendment,—"That the two Water Bills be withdrawn at the first meeting of Parliament after the Easter recess."

Mr. Fowler seconded the amendment.

Mr. Munro agreed that for all practical purposes these Bills were dead, but approved of the proposed reference to the Works Committee; but Mr. Walker pointed out that the object of the Board was to give the inhabitants of the metropolis an ample supply of pure water at the lowest possible cost, and if the Government would not assist them in endeavouring to obtain so very desirable an object it was the duty of the Board in the interests of the public to go to the Government in a body, and to bring every possible pressure to bear upon the Government in the matter.

Mr. Watkins thought these Bills had had a most miserable existence in the House of Commons, and for the credit of the Board he said their wisest course would be to withdraw them at once, instead of badgering them about from pillar to post in this kind of way. The only result of a reference to the Works Committee could be that the Bills would be withdrawn, and the Board could just as well decide that question at once.

Mr. Selway greatly regretted that the amendment had been brought forward, and remarked that the Purchase Bill was adopted by the Board almost unanimously. He hoped, however, and believed that these Bills were only to be withdrawn temporarily. The day would most assuredly come when the water-supply of London would be in the hands of one public body, and if the Board was not the proper body, then another body would have to be created for the purpose. But that the water-supply of the metropolis should remain in the hands of private parties he believed was a state of things that would not be allowed to continue.

Mr. Freeman briefly replied. He said, no doubt both the motion and the amendment meant just the same thing. He contended that the Board had been perfectly justified in the action they had taken from the pressure put upon them from without. Strange to say, when they yielded to this pressure, the vestries and district Boards gave them the strongest opposition. No doubt, in the end the water-supply would pass under the control of the Board, and that at no very distant time. They might depend upon it a most favourable opportunity would be lost of settling this question if they retrogressed (!) now, and the ratepayors would find to their cost that the expense would be increased, by possibly one or two millions a year, the longer the matter was delayed. He denied, however, that the Water Supply Bill had given rise to all the opposition to the action of the Board. The Supply Bill had been read a second time; it was the Purchase Bill that had blocked the way.

On a division, the amendment was rejected by ten for and seventeen against. The report of the committee was then adopted.

STAINED GLASS.

Stratford-upon-Avon. The east window of the Guild Chapel has been filled with stained glass, containing in the three centre openings a representation of the Resurrection of our Lord, the text running along the bottom:—"I am the resurrection and the life." In the outer left-hand light is the subject of our Lord's Charge to St. Peter: text,—"Lovest thou me?" and in the other light, right hand, our Lord meeting Mary in the garden after his resurrection: text, "I ascend unto my Father and your Father." The work has been designed and executed by Mr. Frank Holt, of Warwick.

Worcester. Two stained-glass windows have just been placed in the Cathedral at Worcester. One is at the west end of the south aisle of the nave, and was erected by Miss Cook, of Shelsley. It is a four-light window, of Geometrical character. The tracery in the head of the window is rich, consisting of a cinquefoil at the apex; next, two elongated quatrefoils; thirdly, four trefoils, with a triangle in the centre. At the base is the following inscription:—"James Pychard, of Worcester, d. 1591; Mary, his eldest daughter, d. 1621; Thomas Cook, her husband, d. 1629; Edmund Cooke, their son, d. 1635." The other window is in the centre of the same aisle, and contains three lights, representing Elijah fed by ravens, his meeting with the poor widow of Zarephath, and his ascent in a fiery chariot. The head tracery depicts angels playing musical instruments, and the Lamb of God at the head. Messrs. Clayton & Bell executed the first window, and Messrs. Hardman the other.

Hoole.—Messrs. Camm Brothers, of Birmingham, have recently filled the east window of Hoole Church, near Chester, with stained glass, in memory of the late Mrs. Bridgman. The window contains the following subjects:—"The Nativity," "The Baptism," "Crucifixion," "Resurrection," "Ascension"; and in the tracery, "Our Lord blessing little Children," "The good Shepherd," and our Lord's charge to Peter, "Feed my Lambs." In the bases of the canopies enclosed are the evangelistic and sacred symbols.

Bradshaw.—Two stained-glass windows by Mayer & Co., of Munich, have just been fixed in the south side of this church; one in memory of the late Mr. and Mrs. Dean, of Scausby Hall, erected by their daughters; the other in memory of the late Mr. James Wilcock, of Bradshaw, erected by his sons. In each window there are four groups. In the former, the representation of Matthew xxv. 35, 36:—"I was a stranger, and ye took me in; naked, and ye clothed me; sick, and ye visited me; in prison, and ye came unto me." In the latter window are represented four parables: the Talents, the Hidden Treasure, the Good Samaritan, and the Prodigal Son.

Hertford Water Supply.—Mr. J. F. Bateman, C.E., has made a report on the relative merits of two schemes for extending the water supply of Hertford, prepared by Messrs. Smith & Austin and Mr. Easton respectively. Mr. Bateman's report is to the effect that Messrs. Smith & Austin's scheme is preferable to that of Mr. Easton, both in respect of economy and efficiency.

VARIORUM.

AN article in the current *Quarterly*, "The Church in the West Riding," gives some particulars of the expenditure there on church-building and restoration:—"To sum up the record of church progress, as seen in the erection of new churches, we may state that since the year 1836 no less than 244 new churches have been consecrated in the diocese of Ripon, of which forty-four were built to replace older structures which had become unsuitable, or had fallen into decay; leaving a clear gain of 200 new churches, besides the additional accommodation almost invariably obtained when old churches were rebuilt. To this number must be added fifty-nine more, built since 1840, in that part of the West Riding which lies within the diocese of York, so that the full tale reaches 259 in number." The restoration of Ripon Cathedral occupied ten years, and cost 40,000*l.* "It is impossible to dwell in detail on all the other important restorations effected in the West Riding during the last half-century. These witnesses, 'with silent but impressive eloquence,' as Bishop Bickersteth happily expresses it, 'to the piety, munificence, and hearty attachment of churchmen to the national church," abound in every direction. Wakefield parish church, with its beautiful spire, which dates from 1329, has been rendered, under Sir G. Scott's skilful handling, worthy of its original design, at an outlay of 23,000*l.*; the last 600*l.* required being raised in a fortnight in 5*l.* subscriptions. The Abbey Church at Selby, the parish churches of Bradford, Sheffield, Huddersfield, Keighley, and indeed of almost every large manufacturing town and village, stand out in fresh beauty, and the country districts have not lagged behind the towns. Lord Hampton's return gives 171,071*l.* as the amount expended upon church restoration in that part of the West Riding which lies within the diocese of York, and 299,050*l.* more in the diocese of Ripon, making a total of 470,121*l.* Large as these figures are, they fall far short of the sum actually contributed. How universal the movement has been may be judged from the fact that in 472 parishes in the diocese of Ripon only eleven churches are now in urgent need of restoration. To the foregoing outlay we may now add the amount given in Lord Hampton's return, in order to complete this branch of our subject. We find that the estimated cost of the new churches in the West Riding within the diocese of York was 283,463*l.*, and within the diocese of Ripon, 703,241*l.*, making a grand total of nearly a million sterling. And if we take into consideration the facts that actual expenditure almost invariably exceeds the actual estimate, that additional churches have been built and restored since the date of Lord Hampton's return, and that there are others which are not included in it, because less than 500*l.* has been expended on them, we shall be quite within the mark when we assert that a million and a half has been contributed during the last forty years to this one single element of church extension."

Miscellanea.

The Crystal Palace Picture Gallery.—The prizes offered by the directors of the Crystal Palace Company for the most meritorious among the pictures exhibited in the picture-gallery have been awarded, under the joint adjudication of Messrs. G. D. Leslie, G. A. Storey, and P. R. Morris, and the principal awards are as follow:—

To English artists for history or figure-subjects in oil,—"Our Soldiers Past and Future," by A. Stock, gold medal; "Happy Children," by C. Baucrie; "Sympathy and Sorrow," by J. Haylar; "Daylight at the Land's End," by A. E. Stanners; "Exiles from the Cloister—Monks quitting a suppressed Italian Monastery," by F. Smallfield, each a silver medal. For landscapes, sea-pieces, animals, and other subjects,—"Autumn Twilight," by E. W. Meyer, gold medal; "An Old Thief," by H. H. Couldery; "Mist and Sunshine," by H. Moore; "Autumn," by A. De Branski; and "Ardchonnel Castle, Loch Awe," by J. J. Bannatyne, each a silver medal. For water-colour drawings, irrespective of subject, "Death of Warwick, the King-maker," by J. A. Houston, gold medal; "Highland Poachers," by E. Hargitt; "West Indiaman's Repairs," by R. H. Nibbs; "Ben Dhag, from the River Oarley," by J. Macculloch, each a silver medal. For the best picture exhibited, without regard to school, style, or subject, by a living artist,—"The Orphans," by Professor C. Lasch, a special gold medal. To foreign artists, for history or figure subjects in oil,—"In the Sculpture Gallery," by C. Winneberg, gold medal; "At a German Pawnbroker's," by L. Brockelman; "Mamma's Boudoir," by F. Hammel; "A Reverie," by G. Kuhl, each a silver medal. For landscapes, &c. "On the Maes," by V. Wieshampt; "A Norwegian Lake," by A. Rasmussen; "On the Thames," by A. Meyerheim; and the "Disturbed Cat," by Miss H. K. Arendt, each a silver medal.

A Town on the Move.—The *Virginia City Enterprise* says:—"Our town is very quietly and very slowly moving to the eastward down the face of the mountain. This is owing to the settling of the ground over the Bonanza mines. As all the town is going together it is not much noticed on the surface, where no cracks are seen. The water and gas companies are better acquainted with the movements taking place in the ground forming the site of the town than most others, as the instability of the earth tells upon their pipes. On B and C streets the ground is moving both north and east. A water-main running north and south, uncovered yesterday, was found to be telescoped to the distance of over a foot, and besides had in it a great kink, which made it necessary to take out a piece nearly 2 ft. in length. About the Consolidated Virginia Pan Mill the pipes are crowding in from both east and west; at least, owing to the settling of the ground in that neighbourhood, there is a large one to the westward. Towards the north this crevice is about 8 in. in width, and the ground on the east side of it is about 3 ft. lower than on the west side. Captain Overton, of the water company, whose opportunities for observing these movements are unsurpassed, says that as the ground settles over the Bonanzas that on the slope of the mountain, where it is not much undermined, gradually moves down. He says the International Hotel has moved east about 5 in. since it was built. If such is the case, all the buildings in that part of the town, with the ground on which they stand, must have moved the same distance, as no cracks are to be seen in the earth."

Old China.—The Civil Tribunal of Nancy (Meurthe) has just tried a case interesting to collectors of old china. Count d'Hoffelize, who resides in that place, seeing an advertisement from M. Duchêne, of Paris, for objects of art of various kinds, offered him for sale two vases alleged to be of Sèvres manufacture, and which he stated were valued by experts of the neighbourhood at 10,000 francs. After some correspondence and a visit to Nancy by the advertiser, the vases were purchased for 5,000 francs and a painting valued at 800 francs. But shortly after the fact was discovered that the vases were not real Sèvres, and that the seller had committed an error in describing them as such. A claim was in consequence made to have the bargain cancelled, and the purchase-money returned; but Count d'Hoffelize maintained that they were "Old Sèvres," adding "that they were given to his grandmother by Madame Elizabeth," and he refused, therefore, to entertain the question. M. Duchêne then asked the opinion of M. Robert, director of the Sèvres manufactory, and that gentleman's reply was that they were made at the manufactory of the Faubourg Saint-Lazare, founded in 1769 by Hannong, of Strasbourg, which in 1782 was placed under the patronage of the Count d'Artois, and soon obtained the authorisation to mark its products with the initials of its protector and the crown of a Prince of the Blood; he added that the ceramic museum did not contain any specimen of the manufacture. This reply, of course, was conclusive; but as the Count still refused to refund the money paid, the suit was commenced, and the tribunal unhesitatingly gave judgment for the plaintiff.

The Roman Remains of Italica.—At a recent meeting of the British Archæological Association, Mr. Thomas Morgan described the important Roman remains of Italica, and particularly those of the amphitheatre, a building of large dimensions, capable of containing 25,000 persons. It bears indications of an extended period for its construction, probably from the time of Augustus to Hadrian. There are ten principal approaches, and the extreme length of the elliptic plan is 514 ft. by 414 ft. The massive walls are of concrete, with some arches of tile, but the stone facing is almost destroyed, the building having been greatly demolished in 1711 and recently excavated. In the discussion which ensued, Mr. Grover, C.E., F.S.A., compared the enormous area with the size of the Albert Hall, which could be readily placed within the open area of the amphitheatre only. He compared its size with the humble structures of Roman date in Britain, and he noted the use of organs worked by water-power by the Romans during the performances.

Bethnal-green Museum.—A special loan exhibition of furniture, cabinet work, and ornamental woodwork, will be opened here on Thursday, the 9th of May.

Fatal Fall of a House.—The inquiry has been concluded at the Town Hall, Shoreditch, before Mr. Humphreys, coroner, respecting the death of Mrs. Frances Dryland, aged sixty-six, which was caused by the fall of the house in which she lived, at 21, Britannia-street, Hoxton. The adjoining house had been pulled down, and excavations made for the erection of another. No. 21 was supported by struts from an adjacent warehouse. Mr. Thomas Atkinson, builder, said he gave instructions for the shoring up of No. 21; the space between that house and the warehouse was 16 ft. The struts commenced on the ground-floor. The depth of the excavation was 7 ft. 3 in., and the drain was 2 ft. at one end, 18 in. at the other, below that excavation. He was confident there was no imperfection in the shoring. The party-wall was 14 in. thick up to the ground-floor, and 9 in. above that. They were not allowed by Act of Parliament to build walls of those dimensions now. In his opinion the cause of the fall was attributable to the fact of the cellar being deeper on the inside. Mr. Charles Fowler, district surveyor, said the works had been under his supervision for some time past. The party-wall had been condemned, and it was shored up temporarily until a new one was built. The wall fell where the trench had been dug. The bricks were fairly good, but the mortar was bad, as it did not adhere to the fallen bricks. He did not see the trench the day it was made, but he thought the shoring was well and efficiently done for a temporary purpose. The jury returned a verdict to the effect that the deceased met with her death from suffocation and divers injuries received by the fall of a wall, due to accident; but they were of opinion that more caution ought to have been taken in digging the trench round the wall.

Telephone Experiments. — From some observations by Mr. A. Damoget, of Nantes, we select the following, says *Les Mondes*. It is desirable that the plates should vibrate in unison with the sounds which are transmitted. The voices of women and children are best heard with plates of 3 to 5 centimètres' diameter; those of men, with plates of 6 to 8 centimètres. If a gamut is sung in a telephone with a large disc, the first low notes will be easily heard, while the highest notes will be less distinct; if the disc is small, the highest notes will be most clearly heard. At one end of a line two telephones may be placed in double circuit, and if two persons sing simultaneously in the two instruments, the two voices will be heard in a single telephone at the other end of the line. M. Demoget proposes to experiment with two or three telephones of different pitch, in a sort of acoustic horn, in the hope of getting more intense and more distinct sounds.

Saws.—The *Lumberman's Gazette* says "Nine thousand feet per minute—that is, nearly two miles per minute—for the rim of a circular-saw to travel may be laid down as a rule. For example,—a saw, 12 in. in diameter, 3 ft. around the rim, 3,000 revolutions; 24 in. in diameter, or 6 ft. around the rim, 1,500 revolutions; 3 ft. in diameter, or 9 ft. around the rim, 1,000 revolutions; 4 ft. in diameter, or 12 ft. around the rim, 750 revolutions; 5 ft. in diameter, or 15 ft. around the rim, 600 revolutions. The rim of the saw will run a little faster than this, as these figures assume that the circumference is equal to the diameter multiplied by 3 instead of 3·1416. Shingle and some other saws, either riveted to a cast-iron collar or very thick at the centre and thin at the rim, may be run with safety at a greater speed."

Fall of Portion of a Wall at Hexham Abbey Church.—It is reported that, on Sunday the 21st ult., the entire stone facing of the south wall of the south transept of Hexham Abbey, about 1 ft. in thickness, fell down. The wall, which is about 3 ft. thick, is probably some 600 or 700 years old; it faces Beaumont-street, and forms part of the chapter-house. The portion which has given way is from a height of about 40 ft., and a breadth of about 20 ft. or 25 ft.

Costly Pictures.—Extraordinary prizes were obtained at the sale of the collection of pictures which belonged to the late Mr. Munro, of Novar. Nine of Turner's paintings fetched forty thousand guineas; six thousand guineas were paid for two pictures by Bonington; and a portrait by Sir Joshua Reynolds was bought for three thousand guineas. On the other hand, some works of Hogarth, Wilson, and Etty went for comparatively small sums.

The National Gallery.—The report of the Director of the National Gallery for the year 1877 states that there has been one donation, which is described as follows:—

"George Morland (1763 1804) British School 'The Inside of a Stable,' said to be that of the White Lion, at Paddington. Two horses and a pony are being led into a stable; to the left a man is stooping and collecting together some straw. Painted in oil, on canvas, 4 ft. 9 in. high, by 6 ft. 7½ in. wide. Exhibited at the Royal Academy in 1791. It was purchased from the Exhibition by the Rev. Sir Henry Bate Dudley, bart., and was presented by his nephew, Mr. Thomas Birch Wolfe, in 1877. Engraved in mezzotint. Hung in the Gallery, No. 1,039."

Under the head of loans, the report says:—

"The three special loan selections of Turner Sketches are at present,—one set in the National Gallery of Ireland, at Dublin; and two other sets: one returned from Southampton and one from Edinburgh, which remain deposited in the Gallery at Trafalgar-square, available for future distribution. The Colonna Raphael still remains deposited in the Gallery, but is not exhibited, the trustees being absolved from all responsibility for its custody while it remains there."

The Galleries in Trafalgar-square have been visited by 1,332,794 persons on the public days during the year 1877, showing a daily average attendance on such days (190 in number) of 7,014, being an increase of 1,000 per day since the issue of the last report. On students' days, the collections received 20,313 visits from students. Independently of partial studies, 773 oil-colour copies of pictures have been made,—namely, 345 from the works of seventy-three old masters, and 428 from the works of thirty-four modern masters.

Libel.—At Bow-street four summonses were fixed for hearing against one George Edward Pearson, 5, Brentford-street, Bury St. Edmund's, who is charged with having threatened to publish a libel concerning Sir Henry Arthur Hunt, with intent to induce Sir Henry Hunt, Mr. Algernon Bertram Mitford, and the First Commissioner of Works to confer upon him an appointment and office of trust. Another summons charged him with having published the alleged libel. Mr. Poland appeared to prosecute on behalf of the Treasury. On the case being called the defendant failed to appear, and formal proof having been given that the libels complained of were in his handwriting, Mr. Vaughan granted a warrant for his apprehension.

The Painting of the Paris Exhibition Building is a gigantic work. Near the École Militaire is the depôt for the colour, which literally arrives by tons, and is stored in what more resemble mash-tubs than paint-pots. The painting of the chief façade of the Exhibition building was contracted for at the cost of 3,200*l*. The immense ranges of clearstory windows of the two vestibules are being coloured by the stencil process. The glass is arranged in geometrical figures, diamonds within squares.

TENDERS

For shop and dwelling-house, No. 7, Gutter-lane, City, E.C. Messrs. Ford & Hesketh, architects:—

Braid	£2,661	0	0
Ashby, Bros.	2,631	0	0
Hunt	2,614	0	0
Morter	2,595	0	0
Mark	2,579	0	0
Brass	2,567	0	0
Boyce	2,463	0	0
Browne & Robinson	2,442	0	0
Crabb	2,408	7	0
Conder	2,291	0	0

For new schools, Trott-street, Battersea. Mr. H. J. Hansom, architect. Quantities by Mr. Henry Smith.—

Turtle & Appleton	£870	0	0
Newtown & Trigg	815	0	0
Smith	747	0	0
Head	705	10	0

For rebuilding Nos. 291 and 292, High Holborn, with show-rooms in the rear. Mr. Charles Reilly, architect. Quantities by Messrs. Gardner, Son, & Theobald:—

Lathey, Bros.	£15,550	0	0
Sewell & Son	14,921	0	0
Killby	14,738	0	0
Longmire & Burge	14,600	0	0
Trollope & Son	14,234	0	0
Holland & Hannen	13,787	0	0
Ashby & Horner	13,390	0	0
Ashby, Bros.	13,315	0	0
Smith & Co.	12,978	0	0
Browne & Robinson	12,690	0	0
Conder	12,539	0	0

For a house at Walthamstow, for Mr. David McLean. Mr. William Kidner, architect. Quantities by Mr. H. Blackwell:—

Larter	£3,944	0	0
Shurmur	3,895	0	0
Ashby & Horner	3,870	0	0
Staines & Son	3,846	0	0
Browne & Robinson	3,809	0	0
Lawrance	3,775	0	0
Conder	3,674	0	0
Morter	3,643	0	0
Garrud (accepted)	3,519	0	0

For Board schools at Lyminster, Sussex. Mr. George Truefitt, architect :—

Smith	£2,703	0	0
Fielder	2,681	0	0
Bushby	2,687	0	0
Snewin (accepted)	2,300	0	0

For the erection of chapels, with towers and spires, covered carriageway, entrance lodge, mortuary, and front wall and gates, Teddington Cemetery. Mr. Thos. Goodchild, architect. Quantities by Mr. H. P. Foster :—

Collinson	£5,987	0	0
Hiscock	5,474	0	0
Gibson	5,419	0	0
Hurst	5,405	0	0
Prout	5,320	0	0
R. & E. Smith	5,289	0	0
Piller	5,118	0	0
Harris & Bonsell (accepted)	4,820	0	0
Wilcox	4,402	0	0

For preparation of Northern Sewage Farm, Ripley, Derby, including levelling and draining about 30 acres of land, construction of settling-tanks, sewage carriers, &c., for the Ripley Local Board. Mr. R. Argile, jun., engineer. Quantities supplied :—

Drewitt	£12,617	1	1
Limb	7,445	0	0
Coupe *	5,983	2	1
Wain	5,758	4	3

* Accepted for a portion of the work.

For the enlargement of Catholic Schools, Winterton-place, Chelsea. Messrs. J. A. Hansom & Son, architects :—

Stimpson & Co.	£690	0	0
Linfield	678	0	0
Hook & Oldrey	658	0	0
Reading	620	0	0
Newton & Triggs	522	10	0

For the nave, aisles, and transept of a new church at Hugglescote, Leicestershire. Mr. J. B. Everard, architect. Quantities supplied :—

Lilley & Sons	£5,551	18	0
Wright, Bros.	5,200	0	0
Roberts	4,495	0	0
Allen	4,465	0	0
Neal	4,448	0	0
Hextall	4,277	0	0
Vann (accepted)	4,198	17	0

For additions to dwelling-house at Basford, Nottingham. Messrs. S. D. Walker and H. Walker, joint architects :—

Middleton	£1,120	0	0
Mosley	1,078	0	0
Clarke	1,018	0	0
Messom	999	0	0
Bell & Son	974	0	0
Tutin	966	0	0
Bailey	950	0	0
Hopewell	906	0	0
Hodson & Facon	893	10	0
Baines & Turton	867	0	0
Doughty	860	0	0
Scott (accepted)	849	14	0

For alterations to dormitories at Basford Union Workhouse. Mr. Herbert Walker, architect :—

Peel	£860	0	0
Tyers	709	0	0
Tyers, sen.	678	15	0
Clarke	610	0	0
Bell & Son	608	0	0
Woolf	605	0	0
Middleton	600	0	0
Dudson & Parrish	599	10	0
Hodson & Facon	597	10	0
Stamforth	594	13	0
Messom	553	0	0
Baines & Turton	549	10	0
Tutin	542	0	0
Jelley	537	0	0
Hopewell (accepted)	518	0	0
McCulloch	510	0	0

For pulling down and rebuilding the Van Tromp Tavern (and two shops adjoining) in Bethnal-green-road and Tyssen-street. Messrs. Bird & Walters, architects. Quantities supplied :—

Hockley	£5,350	0	0
McLachlan & Sons	5,490	0	0
Anley	5,380	0	0
Perkins	5,320	0	0
Grimwood & Sons	5,270	0	0
Mark	5,232	0	0
Forrest	5,163	0	0
Lawrance	5,160	0	0
Williams & Son	5,057	0	0
Temple & Foster	4,968	0	0
Braid & Co. (accepted)	4,950	0	0

For four houses and shops at Crouch End, for Mr. Candler. Mr. Trehearne, architect :—

Langmead & Way	£4,380	0	0
Macey	4,350	0	0
Patman & Fetheringham	4,333	0	0
Anley	4,055	0	0
Dove, Bros.	3,815	0	0

For housekeeper's residence and other works at Odessa-road Board Schools, West Ham. Mr. J. T. Newman, architect :—

Page	£718	0	0
Read	699	0	0
Abrahams	697	0	0
Norton	693	0	0
Martin	687	0	0
King	683	0	0
Maddison	530	0	0

For new schools at Maryland Point, Stratford, for the West Ham School Board. Mr. J. T. Newman, architect. Quantities by Messrs. Curtis & Sons :—

Wall	£8,395	0	0
Sheffield	7,984	0	0
Scrivener	7,943	0	0
Killby	7,911	0	0
Abrahams	7,860	0	0
Norton	7,775	0	0
Higgs & Hill	7,769	0	0
Grimwood	7,640	0	0
Woods	7,597	0	0
Knight	7,520	0	0
Morter (accepted)	7,447	0	0

For new tower and spire to Church of St. Michael and All Angels, Hackney. Mr. Moye, architect :—

Roberts	£2,093	0	0
Boyce	1,886	0	0
Langmead & Way	1,746	0	0
Adamson	1,695	0	0

For various alterations at the Moreton Arms, Kentish Town-road, for Mr. C. W. Avis. James Robert Furniss, architect :—

Marr	£777	0	0
Gould & Brand	772	0	0
Drew	759	0	0
Anley	737	0	0
Schlater	716	0	0
Bishop (accepted)	672	0	0

Gasfitting.

Clarke	£55	10	0

Pewtering.

Grimes	£185	0	0
Helling	162	0	0
Watts	159	15	0
Caisberg	140	0	0
Deacon (accepted)	125	0	0

For conversion of mission-hall, St. Matthias Poplar, into Public Elementary Schools for the Rev. Chas. Neil. Mr. J. T. Newman, architect :—

Page	£258	0	0
Abrahams	249	0	0
Riddell (accepted)	243	0	0

For repairs to three houses in Hosier-lane, Smithfield, for Mr. Thos. Gray. Mr. J. T. Newman, architect :—

Page	£354	0	0
Hosking, Bros.	257	0	0
Reed (accepted)	240	0	0

In the list of tenders for new wing and cloister and sacristies at the Convent of Our Lady, Central-hill, Norwood, "Lucas Bros." should be *Lucas & Son.*

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VOL. XXXVI. No. 1840. SATURDAY, MAY 11, 1878

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The Royal Academy Exhibition.

IT seems to be the talk that the Academy Exhibition this year is a bad one, but we confess we hardly understand why. Public opinion is very capricious in these matters. It is true that there is no great picture this year,—none that forms the unquestionable central point of the exhibition. It is true, also, that more terrible things than ever have been placed on the line by R.A.s who would do more wisely to repose upon their laurels; and one worse than unfortunate effort has formed such a centre of ridicule that it would have been a kindness on the part of any friend of the artist to have surreptitiously removed it before the exhibition opened: it is, at all events, to be hoped that this *reductio ad absurdum* of the results of leaving unlimited licence to the privileged to hang their works will lead to some reform. But in spite of these negative and positive deficiencies, there are a great many good and interesting pictures, some of them by painters who are new to fame, and are making rapid progress in their art; and this is a good sign for the future of the Academy. There are also a good many works that are out of the hackneyed line in regard to choice of subject, and present something like new ideas.

We will notice some of the principal works, taking the artists as their names come in the order of hanging. Mr. Millais and Mr. Leslie have the places of honour in Gallery I. The "Princes in the Tower" (21) of the former artist illustrates an incident in English history which has an undying attraction, from its peculiarly tragic pathos. As usual, Mr. Millais is realistic, it may be said prosaic, in his rendering; but then, on the other hand, he is not (and we may say could never be) theatrical, which is matter for deep thankfulness. There is a painful interest in the very simplicity of the picture: the two poor children, with a look of bewilderment and not knowing what to do with themselves, are discovered aimlessly pacing a landing of the Tower Stairs, hand in hand; one of them looking merely blank, the other fearful and suspicious at sight of a figure whose shadow only is seen in the picture. There is nothing to remark upon in the execution different from the artist's usual well-known style: indeed, the painting is so unobtrusive in every way that one does not at first recognise how much it assists in bringing the reality of the story home to us. Mr. Leslie's painting, "Home, Sweet Home" (64), does not quite explain whether the interesting group of girls who compose it are already "home," or are only singing of it in anticipation; one sits at an old-fashioned piano, the others stand round; their dresses form, as usual with the artist, a beautiful "colour-symphony"; their characters are well discriminated, but all are a little dreamy and unreal, except the lassie leaning on a chair on the left; she has the most life in her. The picture is not so bright and taking as some of Mr. Leslie's previous works, but it is sure to be much liked. We complain that the young lady's hands are not playing on the keyboard; rarely do we see hands drawn under these circumstances as they really appear; they are nearly always limp in action and too close down on the keyboard. Mr. John Reid's "County Cricket Match, Sussex" (77), is a clever and humorous treatment of a thoroughly English subject. The door is flanked by two Eastern subjects; Mr. V. Prinsep's "Study of a Kashmiree Nautch Girl" and Mr. Poynter's "Zenobia captive" (43): the latter is a copper-coloured, richly caparisoned, handsome woman, whose arm is very finely drawn and modelled, and whose costume combines with the marble background to produce a sumptuous decorative effect. Mr. Prinsep's more important effort must be looked for on the other side of the wall in Gallery II., the portrait of "Martaba" (167), another Nautch girl, in which the artist seems to have somewhat adopted not only an Eastern subject, but an Eastern style of art, for his picture is certainly not like the work of a European artist, and is more curious than beautiful. Mr. Poynter's portrait of "Mrs. Langtry" (155) is a central piece in Gallery II., a half-length again in a rather hard decorative style, with much attention bestowed on the dress. Odious as comparisons are said to be, it is impossible to avoid them, when two leading artists paint the same lady; and besides, the comparison with Mr. Millais's, "A Jersey Lily," in Gallery III., points a moral. We have often suggested that "decorative" portraiture, however brilliant, was beside the highest objects of portrait-painting; we regretted last year that Mr. Poynter, in one of his portraits (Mrs. Milman), had allowed the accessories to get so much the upper hand of the personality of the sitter: is not the criticism justified by the present example? His "Mrs. Langtry" is a picture producing a brilliant effect; Mr. Millais's portrait hardly affects us as a picture: it is a real, breathing, flesh-and-blood woman, whom we are disposed to fall in love with; and certainly that is a greater success in portraiture than one which sets us looking at the combinations and accessories; even as a woman who is beautiful, independently of adornment, is better than one who only strikes us as artistically dressed.

Gallery II. contains what is perhaps the most powerful painting in the exhibition, Mr. Brett's "Cornish Lions" (105), certain rocks so named from their outlines, and which are seen across the angle of a bay from the shore. The painting of the effect of light and shadow on the cliffs in very strong sunlight is what we have had before from the artist, but the foreground, showing the beach and the incoming sea, is almost startling in its reality; we are almost persuaded we hear the sound of the waves. As we look more at the details of the painting, we realise what labour must have gone to the attainment of this remarkable reproduction of nature, more especially in the minutely-studied drawing of the breaking waves, and their reflected and transmitted lights. There is something absurd in the fact that the painter of this work is not even an Associate, considering the style of landscape painting which has not long since found favour in the eyes of the electing body. The other large work in this room is Mr. Long's "Interior of an Egyptian God-manufactory" (129), as we may call it, where a group of young women are engaged in modelling and painting cat-headed figures and other characteristic objects of Egyptian cult. A black attendant holds a frightened-looking white cat for one of the artists to model from. Considering the known veneration of the Egyptians for cats, as well as the very unrealistic character of their figures, we should think this a most improbable incident. The subject gives occasion for a great deal of painting of Egyptain "properties"; but the best thing in the picture is the drawing of the back of the seated figure in the centre. We look with more interest and sympathy at Mr. Hodgson's admirably humorous "Eastern Question" (97), an attempted conversation between Orientals and English sailors, in some place of entertainment; at least, one sailor is attempting to make himself understood; the other, a regular jack-tar, obviously considers it absurd to think of getting anything out of fellows of such outlandish dress and "lingo." Mr. Armitage's "Beati Possidentes," which balances this, the "possessor" being the fortunate purchaser of a rare beetle at an entomological sale, has excellent qualities and a vein of original humour.

Mr. Leighton's "Nausicaa" (145) hangs a little on one side in this gallery. It is a charming work,—a damsel, with white dress and green mantle over her shoulders, whose fine, full figure is quite evident in its development beneath her drapery, which also is painted with singular beauty and care. There seems, however, no reason for calling the figure Nausicaa more than by any other name, and she is not dignified and aristocratic enough for the character. But Mr. Leighton's best picture of the year is in Gallery III., "Winding the Skein" (302), an operation which is carried on by two classic girls of a far-away period. The elder, seated, has a somewhat mannered and expressionless face, and exquisite arms, hands, and feet, of that peculiarly waxen look which this painter affects, and which is certainly not nature, though it is very charming in its way. The real interest and originality of the painting

lie in the smaller figure of the young girl standing up. Her bright, characteristic face has a thoroughly human interest, and her figure is beautifully drawn and studied, and has a kind of naïve, piquant grace quite unusual.

After Mr. Leighton's work, the most important painting in Gallery IV. is Mr. Alma Tadema's "Sculptor's Model" (255). This is a realistic studio scene, though the canvas is nearly filled by the figure of the model, who stands on a table, facing the spectator, grasping with one hand an upright branch of some kind of tree, with which she steadies herself, while a turn of the fillet that is round her head, hitched also round the branch, helps to keep the whole figure in position. The Sculptor stands on the floor behind, directing the "posing." As a matter of flesh-painting, the picture is very fine,—*cela va sans dire*; but the figure is not overwell drawn, and is not beautiful, being starved and angular at the hips, and something thick in the leg below the knee;—neither, certainly, admirable points. Hence the picture seems a failure, since we hardly want mere nudity, except as the means of unveiling to us beauty. Compare this with Lefebvre's "Chloe," which we mentioned the other day, and the difference in artistic value is obvious at once. Mr. Tadema's smaller work, "A Love Missile" (256), is nearly in his best way,—not quite; but, to say "nearly," is saying a great deal in its favour.

At the top of the room is Mr. Calderon's scene (190) of the carting away of some favoured nuns, by the kind forewarning of "your friend, Oliver Cromwell," to escape the scene of the demolition of the convent by the Parliamentary troops. Nuns in pictures are always pretty, and these are no exception, but the work does not impress us with a feeling of reality. Mr. Calderon's most taking work is the half-length of a fine handsome girl carrying a flower-basket filled with "La Gloire de Dijon" (629), "herself a fairer flower"; and his portrait of a little girl preparing an *al fresco* tea out of doors (458) is very pretty and successful. Mr. Britton Rivière has made a thoroughly good hit in his picture of lions walking by moonlight up the stairs of the ruined Palace of Persepolis; and in a quite different way his study of geese, "An anxious Moment" (392), in the next room, is admirable; [illegible] better could be done of its kind.

In fact, nothing [illegible]

Mr. Peter Graham shows signs of being himself again in his fine landscape called "Wandering Shadows" (267), the glint of the sunlight on the hill to the left is very finely given: it is balanced, but not equally, by a large landscape of Mr. Vicat Cole's, "The Alps at Rosenlani" (268), of which the distance is the finest part; the foreground is hard and somewhat conventional. Mr. Graham's smaller work, "Gusty Weather" (997), in the Lecture Room, should be looked at.

Mr. Frith, R.A., exhibits in this room a remarkable series of pictures entitled "The Road to Ruin" (291-5), illustrating the fatal effects of a passion for gambling. The pictures have been so fully described in the daily papers that we need not go over the ground again. Suffice it to say that they contain much able and carefully-studied work, display a large amount of character (especially in the group of bettingmen in the second subject, "Ascot,") and tell the story clearly and well. Mr. Orchardson has here a very clever thing in his peculiar and very original style, "A Social Eddy,—Left by the Tide" (308), the title referring to a young lady at a dance of the Jane Austen period, who has been left without a partner, while the rest of the party are defiling through a door into the ball-room. The incident is very slight, no doubt, but the whole thing is completely in keeping; it is a bit of the humour of art, and the execution is very good indeed, better than in "Queen of the Swords," last year, though there is not so much spirit and "go" in it as in that very effective performance. Mr. Orchardson is an artist who has made his own style, and made a success in it. Mr. Marks's picture in this room must not be forgotten, "Convocation" (286); it is one of those humourous bird-studies which have been favourites with the painter ever since the great success of "St. Francis Preaching to the Birds." The *dramatis personæ* in this case are some solemn-looking marabout cranes; as usual, there is a lurking satire on things human in the expressions of the birds.

The central place in Gallery IV. is occupied by Mr. Yeames's large work, the examination of the family of a Royalist household by a Parliamentary party of soldiers: the question, "And when did you last see your father?" (329) being put to a small boy who stands on a footstool, to bring his face better above the line of the table that is between him and his questioners. The painting tells its story forcibly; the simplicity of the child, the anxious faces of his elder relatives, and the varied but all alike rough and sombre expressions of the Parliamentary party, form an effective and pathetic contrast. A tall steeple-hatted figure, seated among the Parliament men, recalls Scott's "Corporal Humgudgeon," and was perhaps suggested by the description of that worthy in Woodstock. The same room contains Mr. Watts's principal contribution "Britomart and her Nurse" (379) from Spenser's "Faerie Queene"; not, however, treated in accordance with the poem, for Britomart's vision in the magic glass was seen when she was alone, and only told to her nurse afterwards, when she wanted consolation: here the two occasions are combined; but in so visionary a subject correctness is of little consequence. The painting is rich in colour, and very fine in design; the two figures are seated on the ground, the "warlike maid" facing the spectator, and with her back to the magic imagery; an emblematical lily springs before her in the front of the picture, serving the additional purpose of heightening the richness of colour in the draperies of the two figures. The face of Britomart does not quite satisfy one's ideal; but it is a remarkable work. The same painter has in this room a good portrait of Mr. Blumenthal, the composer. We also find here Mr. Hook's principal contribution, "The Coral Fisher, Amalfi" (351); the artist has gone to southern shores for his figures and scenery (both very effective), but the sea,—the old Hook sea,—follows him there, and is welcome for old association sake, though one may think that there should be some more marked distinction between the tone of northern and southern seas. Mr. Boughton's painting, "Green Leaves among the Sere" (374), gives more prominence to the figures than has been the case in much of his work lately; they are a group of melancholy-looking women, whose expression of past sorrow is contrasted with the youth and life of the children; there is considerable pathos in the work, but perhaps a little far-fetched. Mrs. Ward has a good subject in the "Incident of Burns and Jessy Sewars" (380), and there is considerable [illegible] in the figure of the poet reflecting [illegible] on his verses with his pen in his mouth; the action, by the way, he mentions in one of his letters to have been a usual one with him when composing; putting it in his own characteristic way, "I'm a devil of a crib-biter."

Mr. Frank Holl is one of those who has made what is called a "hit" (there are a good many hits this year) in his "Newgate: committed for Trial" (423), where an interesting-looking prisoner, whom we may reasonably hope is proved to be innocent at last, is interviewed by his wife and children. The point of the picture lies in the contrast between the tearful reality of sorrow in this group and the low cunning and merely selfish interest of the fellow who also addresses his better half (worse she could hardly be), the cold impassivity of the official forming a foil to both groups. The thing is carefully worked out, and contains less of the mere "agony" element than is usual in this artist's rather sensational scenes. Mr. Long has been most successful in his portrait of Mr. Irving, as the "Duke of Gloucester" (472); the likeness is exceptionally good. Near this hangs Mr. Millais's landscape, "St. Martin's: Summer" (465); hardly a success, considering what has preceded it. Whatever may be popularly said, this artist is so very much greater as a figure painter than as a landscape painter, that it is almost to be regretted that he should step out of his real path. Certainly we have had some remarkable achievements in landscape from him, remarkable in certain qualities, which, however, the present one can hardly be said to possess to any marked extent. Mr. Gow, a painter who is coming to the front, shows admirable humour, and some very good painting, in "A War Despatch at the Hôtel de Ville" (444), the purport of the despatch being shouted through the window to the crowd by a gentleman who stands on a chair, and is bawling at the full pitch of his voice, steadying himself against the window-sash; the contrast between his obviously rather theatrical energy and the easy half-critical manner of the group within the room is very well given.

Mr. Poole generally contributes something powerful,—something that compels us to pause in going even hastily round the room; but he is hardly at his best this year. We cannot care for his "Smithfield" (487), where some women are looking for relics in the early morning after one of those horrible "executions" which made the name of the locality infamous. The scene is lighted half by the early dawn light, half by the lanterns of the seekers; the effect of light having apparently been the main object, and appearing too decidedly to be so: and the long quotation in the catalogue has no point as regards the picture, since it refers to the scene of Anne Askew's trial, not to her execution,—still less to the morning after. Mr. Poole's best work, though a much quieter one, is "Harvest Time," in Gallery III.; but altogether this fine and usually imaginative painter is hardly *en première force* this year. The central place in Gallery VI. is occupied by Mr. F. R. Morris, who has attempted a difficult task in making a picture of figures nearly all clad in white,—a number of young girls going in procession to "Première Communion" (506) at Dieppe. Candidates for confirmation, like nuns, are always pretty in pictures, but these countenances do not affect us otherwise than as pretty; they could not, indeed, have much expression, for they are all singing as they walk; and on the whole one feels there is a good deal of canvas expended on mere white dresses and veils, without enough to show for it. The most interesting group is that of the old peasant people on the right. It is curious to recollect that the last prominent picture of women singing in procession at the Academy was Mr. Leighton's "Daphnephoria"; but what a gulf separates the two subjects!

Mr. Rivière has made another hit in "Sympathy" (496), which perhaps after all is his best work this year, and it may be said that he has never shown such a variety of power in one exhibition before. The picture represents a somewhat sulky little child who has sat down on the stairs to indulge his feelings, while his favourite dog comes and puts his head against the child's cheek: a certain similarity of expression between child and animal is realised in a half-ludicrous manner, but without in the least imparting a human expression to the latter, which is the mistake sometimes made by animal painters in subjects of this kind. Sir John Gilbert's "May-dew" (550) is an effort in a new line again for him, but not by any means so successful as his Venetian Council Scene last year; it illustrates [illegible] is illustrated by some verses of Mackay's, we [illegible] them, one cannot say which; a party of ladies have gone out, in very high spirits, obviously, to revel in the morning dew; but they are to us impossible or undefinable figures, not like real life, and belonging to one knows not what period or state of society. Mr. Erskine Nicol, generally humorous, is here tragic, in his picture called "The Missing Boat" (534), showing a party of rough hard Scotch fisher-folk, men, women, and boys, looking anxiously out from over a wet pier-wall, with a strong gale blowing in their faces; there is a great deal of powerful expression in this work. Mr. Eyre Crowe sends a large painting of a subject much better suited to his powers than the serious or quasi-classical ones which he tried last year; it is a "School Treat" (567), the children in several wagons, just preparing to start; it is a large canvas full of small figures to which a great amount of study has been given; the various characters of the children, the mistresses or young lady teachers, and the drivers, are admirably discriminated; the horses are each a study, not less so the dog panting in the heat in the middle of the picture, impatient to be off. This is an exceedingly able work, and one to which no little study must have been given. Mr. Sant's portrait group of three young ladies (513) is a very graceful and successful work; in regard to colour, the portraits of this artist seem somewhat deficient in flesh tints as compared with some more recent schools of portrait-painting, but the grace and refinement of design have alway the same charm.

No one at first sight would guess that "The Tomb" (590), was by the same hand as the "Première Communion." Mr. Morris, who is an obviously rising painter, will not at any rate fail from lack of enterprise and ambition. "The Tomb" is a ruined monument on the site of an old abbey, but the picture is really a large animal painting, deer and a peacock: it is very carefully studied and very able in every way, and grouped so as to produce a fine pyramidal effect, the peacock perched on the tomb forming the climax. The picture occu-

pies the post of honour in Gallery VII. This room presents us with two battle pictures, both of which, strictly speaking, are retreats; the "Halt of Charles Edward on the Nairne, after Culloden" (584), by Mr. Beavis; and the "Retreat of Wellington from Quatre Bras to Waterloo," by Mr. Crofts (609). The first is chiefly noticeable for the manner in which the painter has felt the reality of the incidents after a battle, in the pathetic appearance of the wounded lads (mere lads) who are painfully carried over the stream by their comrades. Mr. Croft's picture marks the continued success of a painter who has only been heard of for about three years past, who has chosen his task and worked at it systematically with constantly-increasing power. In this work "The Duke" rides up the centre of the picture at the head of the column, which winds away into the distance behind him, and the leading members of which present a curiously contrasted group of sound and wounded men and prisoners; the soldier in Highland dress, who marches by the side of the chief, and probably is one of his personal attendants, is a complete summing up of the soldier character in one figure. On the left a squadron of the Greys lower their swords and shout as the duke passes; in the distance we see the guns in the open, galloping back in the contrary direction of the column, to give another check to the enemy. The whole thing, as far as an unmilitary spectator can judge, is remarkably real, and full of brilliant talent. Mr. H. Moore has "A Moonlight Sea" (638) with all his usual fine qualities of feeling and execution in such subjects; indeed, we should call the work, though not large, an exceptionally fine specimen of his genius. One of the most beautiful pictures in the Exhibition is cornered in this room,—Mr. Arthur Hughes's "Uncertainty" (602): a figure of a beautiful and refined-looking girl, who, standing in the embrasure of a window, awaits apparently the result of a conference between her father and her lover, who is seen in the background just entering the father's room. The story is made more complete by the manner in which the greyhound, evidently the canine friend of the lover, looks up at the girl, regarding her as a familiar acquaintance. The fine painting of every part of the picture, the warm rich glow of light over the whole, and the beautiful feeling conveyed in the principal figure, combine to produce a work of very touching interest, and in sentiment and association quite above the average of exhibition pictures.

The Lecture-room contains some noteworthy works; in especial that of Mr. Herkomer,—"Eventide: a Scene in the Westminster Union" (1,002), a study of old women, marked by much truth and pathos, not without its admixture, also, of the humorous element. One or two of the other names that have in recent years attracted us, as full of promise, are represented in this room: Mr. Seymour Lucas, by his clever pictures, "A Doubtful Date" (957) and "An Ambuscade, Edge Hill" (931); the latter a most real and spirited work, in which a party of Puritan troopers, marching along a lane, have suddenly come into the range of certain cavalier marksmen *perdus* in a cornfield; the leader, a very characteristic figure, pauses cautiously, a man behind him falls. Mr. Waller, who will be remembered by his "Home?" last year, has another picture combining a study of deer with a human interest, in "The King's Banner" (927), the unfortunate bearer of which is left dead with his horse in the avenue of some old estate, and is the centre of curiosity to the deer: the picture is a singular one, very suggestive, however, and very clever. Mr. Armitage has made a curious and interesting experiment in a very elaborate painting of "Pygmalion's Statue coming to Life" (the second treatment of the subject which we have noticed this year): a faint flush of life has come over the upper portion of the figure, but not reached the feet, which are still cold white marble: the marble drapery which falls behind the figure serves to throw out the very delicate flesh-tint of the upper portion: the sculptor has fallen with face buried in his hands on the pedestal, but whether with alarm at the prodigy, or in prayer for its accomplishment, is not obvious. The picture is exceedingly clever, but there is the same complaint against it as against Mr. Tadema's painting, the figure is not beautiful *per se*.

We have other notes to make on some of the less prominent, but not always less meritorious works.

THE SCREWING UP AT ST. ALBAN'S ABBEY.

THE work of pushing the nave wall into perpendicular was completed on the 2nd instant, the day on which it was commenced, so far, at least, as the operation of the presses and screws was concerned. It would, perhaps, have been better, however, if the upper portion of the work had been more deliberately proceeded with, and its immediate completion not been made a point of, as it seemed to have been, for though the operation on the lower part had been very successful, the wall has got rather rough handling in the upper portion. The splits which we mentioned in the piers, in our last article, were very thin, scarcely involving any movement of the stone; or any material injury to the cohesion and stability of the piers, so far as appears at present; or anything which cannot be easily made good in regard to appearance. But the upper portion of the wall has much less bond; it is, in fact, a sort of pudding of masonry rather than a wall, and advantage seems to have been taken of its consequent flexibility to push one portion after another, applying the force at certain points successively, not simultaneously. It is obvious, as we mentioned last week, that it was easier to keep the presses under control when working them separately, and that to have done the whole length simultaneously, would have required much more consideration and more elaborate arrangement of the presses so as to regulate the pressure to the right proportion at each point; and the preparations necessary for doing this would very likely have occupied too much time to allow of the completion of the work the same day, and would have necessitated a slower movement than seems to have been used. But it is probable that an exceedingly slow movement, carried on simultaneously along the whole length of the wall, might have got it into position with less evidence of hard usage than it now shows internally. As it is, the result has been that too much has been done at one point, too little at another; in some places the wall has been forced over beyond the perpendicular to the extent of a couple of inches; in other places it still wants to come more over; and the internal line of the wall under the feet of the principals, when the eye is run along it, is still very meandering. Part of the difficulty may have arisen from the want of correspondence betweeen the inner and outer surfaces of the wall itself; for, during the earlier part of the work, word was passed that at one point the wall was plumb inside, while it was still hanging over externally. The necessary conclusion is either that the wall is thicker at the top than at the bottom, or that it has split down the centre. There is no doubt that the nature of the wall at this point rendered the treatment of it very difficult; how very little longitudinal cohesion there was in it became evident in walking along the internal scaffold on the clearstory level; for at the points against which the heaviest action of the presses had been used, the wall was bulged as if the timber struts intended to come through; in fact, the wall sagged horizontally between the struts, just as a weak roof sags vertically between the principals. In two instances the two jambs and arches of the windows had felt the pressure so unequally that at the vertical joint at the apex of the arch the outer edge of the hood-mould on one side of the joint nearly coincided with the wall plane on the other side: the appearance may be imagined. No mischief has been done that is irreparable, but the taking down and resetting of some portions of the inner face of masonry in the clearstory will probably be necessary to bring things to their proper condition.

The horizontal pushing-in of the wall at certain points, however, was not the only mark left upon it; and the other incident we note is rather important, as it suggests a possible source of difficulty which has perhaps not been taken into account. This is, that in several places the piers, both in the triforium and clearstory, have parted vertically on the joints in the inner face, the course over a joint having lifted, apparently, so as to leave the joint gaping to the extent of a quarter of an inch or more. Now, it seems impossible that a mere pushing action on the external face of the wall, tending to force it over towards the interior, could have the effect of opening the joints in the interior face. The explanation we suggest is, that the raking shores have exercised a lifting as well as a pushing force, the effect of which has been overlooked. The shores acted upon crossheads placed against the wall, which again were confined from upward movement by baulks placed in the walls at right angles to the surface; otherwise at the angle at which the shores operated, they would merely have pushed the crossheads and templates up the surface of the wall. But, the end of the shore being thus confined, and its angle with the wall not very great (a good deal less than 45°, we should say from recollection), it appears to us that it would exercise a considerable *upward* thrust upon the wall, and that the effect of this would be all the more apparent in the upper part of the wall where the proportion of the vertical pressure to the angle of thrust of the shore was less than in the lower portion; and this explains why the joints should have opened above, on the inside, though they did not do so below. The opening of the joints is a patent fact requiring explanation, at all events; and if this is, as we suspect, the explanation, and part of the wall has in reality been vertically lifted as well as pushed over, it is a point to be considered in regard to the effect upon the whole when the hydraulic presses are relaxed and the shores struck. We strongly suspect that unless this is very carefully and cautiously done, some difficulties will occur with the wall before it gets fully settled to its bearing in every part.

The thrusting back of the wall has effected one thing,—it has brought the wall back to a point at which the yet solid portion of the tie-beams can find a bearing on it. The present roof timbers were cut to fit the space in the bulged state of the wall; [illegible] the bearing portions are, as we mentioned last week, entirely rotted away, and the real bearing of most of them was on flitches of iron screwed to each side of the beams. The ends of these flitches served to mark very prominently during the operations the extent to which the wall had been sent back; the irons which were within the face of the wall in the morning being seen long before noon jutting out in a row, like so many spout-heads. As to the restoration of the roof, it seems from what we hear that there are divided counsels, most of the committee being in favour of making the present one "do," while one very energetic member, who alone of the committee is equal to going up ladders and seeing for himself (and whose name some of our readers will readily guess), is strongly in favour of having it down, and is right in his opinion; it would be absurd to tinker up such rotten stuff, so badly put together at the best.

DUTCH DRAWINGS AT THE BURLINGTON FINE ARTS CLUB.

THIS collection of sketches and studies by Dutch masters at present to be seen, by the courtesy of members, at the Gallery of the Burlington Club, is of great interest as showing some of the earliest efforts in water-colour art, and also as exhibiting to us the work of some of the earlier and now not much remembered artists who were the precursors of some greater or more successful men. Thus, the work of Zeeman, whose Indian-ink sketches of calm seas and lazy shipping are beautiful in themselves, has an additional interest, as being obviously the forerunner of Vandevelde. Even if the latter were not directly indebted to Zeeman for his style and choice of subjects, Zeeman's drawings go to show that there was a previous bias towards this class of scene and treatment in Dutch painting, of which Vandevelde was the culmination. We find also, in looking through the collection, that the love of brick buildings, and the power of representing with faithful minuteness and truth, are not so peculiarly an attainment of Van der Heyde as the study of the Peel collection in the National Gallery might lead us to think; there are drawings here bearing names much less familiar, which rival Van der Heyde in his peculiar qualities and taste. Among the water-colours, those by Ostade, and the flower and fruit studies of Van Huysum and Van Os, are the most remarkable, and are alone well worth a visit to the club, though not numerous. The Ostade water-colours are mostly highly finished, and include some of the finest designs he ever made; one numbered 29 in the catalogue is a remarkable and celebrated drawing, an exterior of a cottage with figures, in which what strikes one especially is the variety and close approach to truth of the local colour, in spite of the obviously limited scale of pigments at the artist's disposal. A small interior, No. 32, is one of the most perfect in composition we have ever seen

by Ostade, who was such a master in this way; *ars est celare artem* could hardly be better illustrated, for every object in the scene is disposed with regard to a harmonious combination of lines, as is evident if we come to think of and study it, though nothing could appear more natural and unstudied when looked at as a result. It is worth while to compare with these Dusart's interior (115), in a somewhat Ostade style, and painted with much the same resources in pigments, to realise how much delicacy of gradation Ostade obtained with his water-colours. Dusart's drawing is more highly finished in some ways, but comparatively raw and crude in colour. Two very interesting little landscape sketches by De Koningh (47, 48) show the way in which this fine landscape-painter put his first ideas for his pictures into shape.

There are some capital separate figure-studies: a remarkable one by Van Mieris, executed on vellum with black chalk, with great delicacy of finish, the effect of which is heightened by the peculiarity of the material on which it is drawn. A "Pastorale" (113), by the same artist,—a small work with two figures,—is very noble and dignified in style. A crayon study of a peasant playing the violin, by Zorg (59), and a study of the same kind by Jan Steen (73), are both remarkable for their intensity of expression and individuality of manner. In the Jan Steen drawing a man examines a bottle of some liquid, holding it against the light, with open mouth and screwed-up eyes. There are some fine drawings by Paul Potter [illegible] and there is a rival of Paul Potter in Balthasar Paul Ommeganck, whose drawing of a bull tied to a tree (133) is splendidly forcible and true in action. As to the before-named fruit and flower pieces, they are absolutely marvellous: one by Van Os (132), perhaps, surpasses all; the hues and reflected tints of the leaves and flowers are given with a subtlety and delicacy which rival Nature herself.

At one end of the room there are a number of small sketches by Rembrandt, mostly rather rough pen outlines, but many of them of great force and interest. To describe the sketch No. 22, however, as "highly-finished drawing in sepia" is certainly a stretch of enthusiasm on the part of the compilers of the catalogue. But the whole collection is a very remarkable and interesting one.

ART AND MIND.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE retiring president, Mr. J. M. Hay, delivered an address at the last meeting of this society. He said,—Let me speak for a moment of our national style which I endeavoured in my opening address to defend from some prejudices and misrepresentations. Let me (addressing myself more especially, but not exclusively, to the student members), insist upon the exercise of free thought, and what inventive power we possess upon this style, which I take to be not our style only, but, with local modifications, the style of Western Europe. To free thought all styles and all arts owe their origin, and the truly national style is what sincere thought and invention are to evolve from the ancient architecture of the Greeks and Romans, laying the Italian, the Gothic, and all other styles under contribution in the process. Therefore, developing it and applying it to new purposes, by the continued exercise of the same faculties that originally produced it, is the best way to follow the Greeks, and make the style what they themselves would have made it under the same circumstances. The loftiest and most refined elements of the style are to experience the transforming power of the imagination, and to be re-cast in the mould of local and modern surroundings.

Let me press on the student the truth that a true work of art cannot be made from the grandest of styles without the pervading element of mind—without receiving its finer influences from the life within,—and that with this fusing power he can do anything. No matter how broad his eclecticism—no matter where or at what time his materials originated,—the result of their re-combination will be satisfactory.

It is with the architect as with the painter: it is immaterial where the latter collects the materials he introduces into his picture if he combine them so as to produce breadth of light and shade, and brilliancy and harmony of colour, and give life and beauty to the whole.

There are modern buildings that prove this; the better works of the Italian of the Cinque Cento were cast in a correct modification of the Greek mould. The Venetian architects, Palladio, Sansovino, and others, made new application of the style, and advanced, I think, in some respects on their predecessors and contemporaries of Rome and Florence. True examples of this style may be found in our own country, in St. Paul's Cathedral, and in other churches of Wren, and in those of Gibbs and Chambers, as well as in the works of the German and French architects—the latter, especially in Paris, are showing admirably the ductility and elasticity of the style.

There is no need of employing the chief characteristic features of the style, columns, and pilasters, merely as decoration. So much of columnar grandeur can be given to essential features,—doors and windows,—that the lack of columns and pilasters elsewhere would not be felt, and the restriction of these elements to the useful features, so far from crippling the style, would only lead to fresh fields and pastures new.

The next important thing, perhaps, in reference to future architecture, is to let scientific and constructive skill proceed in their onward course untrammelled by considerations of decorative style or artistic beauty. Beauty is utility in blossom,—for the union of science and art is indissoluble. The architect must throw the reins on the neck of circumstances, architecture being, like ourselves, very much the creature of circumstances. He who has learned to do so will not consider any necessary utilitarian feature an obstacle to beauty; but, on the contrary, an opportunity for some new phase of beauty and the display of greater originality and truth. Then beauty of the right and expressive kind will grow up. Art dwells not in any particular class of buildings, or in any particular style; but in the soul of the true artist; and its office is neither to exhibit an old style nor invent a new one, but to imbue the necessary construction of the day with life and sentiment. No age has been richer than our own in means and appliances, or presented scope for greater originality, and everything points to progress in our architecture,—progress in many respects beyond anything that has gone before. We cannot again build Egyptian pyramids, Roman amphitheatres, or Greek temples; and we need not grieve for this, for, connecting architecture with a higher condition of humanity,—bringing it into loftier associations,—we may build works of which the Roman masters of the world would have been proud.

But we must be careful not to narrow our sympathies. Adoption of any particular phase or historic period of the style,—as the manner of Queen Anne's reign,—shows a narrowness of mind and misconception of the true nature of fine art. We want a style broader than anything that the architecture of Queen Anne's reign suggests, and such is the one in question, which may reflect all styles and all periods of art, and be not a little influenced by the ecclesiastical style of the Gothic, which we prize so much; which will, I think, have the effect of lessening the distance between, and bringing their respective works into greater harmony with each other than they have yet shown. Styles have always been influenced by others in their neighbourhood, and many styles have arisen by the amalgamation of the elements of two styles. Besides, we should be in a condition to look down on the architecture of Queen Anne's reign; we have greatly advanced in others of the fine arts, poetry and painting, as well as in the science of Government, since the days of Pope and Bolingbroke.

The question of water-supply is one destined to occupy public attention to a greater extent than it has hitherto done. We in Liverpool have not as yet decided upon anything. In the neighbouring city of Manchester the corporation have a Bill before Parliament for obtaining their water from Thirlmere Lake, in Cumberland. This scheme has encountered considerable opposition from artists, persons of taste, and lovers of natural scenery, who maintain that by erecting an embankment at the lower end of this shallow lake, in order to raise the level of the water some 50 ft., the beautiful contour of its margin will be destroyed, and the natural beauty of one of the loveliest spots in Great Britain seriously impaired; that the people of this country have a vested interest in the preservation of such places, and that it is not in the right of any lord of the soil, who may for the time being be in actual possession, to allow them to be disfigured, whether from motives of avarice or sheer indifference.

The House of Commons is not a place where sentiment of this kind is much regarded. Above all things the Commons pique themselves on being an assembly of practical men. They will, I fear, give little heed to æsthetic considerations, and will no doubt say if Manchester wants the water and there is no other place to get it, let them get it from Thirlmere, even though it should utterly and for ever destroy its unique charm and loveliness.

But supposing the Bill passed, and the scheme carried out in its entirety, does it follow that this shallow lake transformed into a large sheet of water, and called the "Thirlmere Reservoir," must of necessity be ugly? or that the aqueduct conveying the water should disfigure the landscape?

Let the artist and architect be co-partners of the engineer entrusted with the execution of the work, and the graces of art may be made to compensate in some measure for any necessary interference with natural beauty. A railway or aqueduct carried on numerous arches across a valley, whether in a straight or curvilinear direction, contains so many elements of beauty in itself that it would not be a formidable object to deal with, and even the pumping station and high chimney might be so placed with respect to selection of site and architectural treatment as to enhance the beauty of the landscape.

I never could heartily sympathise with the great poet Wordsworth in his terror at the very idea of the locomotive invading the peaceful serenity of his mountain home—which, probably, was considerably allayed before he left the scene which his genius has hallowed. The rush and hush of life cannot be realised or better represented anywhere than by the sudden appearance and withdrawal in high land districts of a railway-train, puffing, hissing, rattling along, and then nothing left but the wreath of white vapour gently dissolving into nought. The Swiss châlet on the mountain side, the mere morsel of a human habitation, does not, nor does a number of them, detract from, but rather aids and intensifies, that sublime solitude which is the grand characteristic of mountain scenery.

The great subject of water supply, however, is not one limited as in this particular instance to a question of preservation or destruction of the natural scenery of any particular spot, but as to how the wants of the nation at large are to be met in the face of an increasing population and the various eligible sources of supply becoming appropriated.

It is evidently in view of such an exigency that the Prince of Wales, in an excellent letter addressed to the Society of Arts, has directed the attention of the Council to this very question, and to the propriety of offering prizes for the best scheme of water supply, which should be national in character, collecting water from all available points of supply, and making provision for the wants not only of large towns, but every village and hamlet in the kingdom.

This is a grand and comprehensive idea, and opens up a new field for the display of engineering enterprise and skill. May those who engage in it be impressed with the obligation under which they lie to deal gently with the fair bosom of nature, and ever to remember that true glory consists in creating, not in destroying.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following is a list of the Council and officers, and also of the Board of Examiners under the Metropolitan Building Act, elected for the ensuing twelve months at the annual meeting, held on Monday last:—

President.—Charles Barry, F.S.A.

Vice-Presidents.—John Whichcord, F.S.A.; G. E. Street, R.A.; Professor Lewis, F.S.A.

Ordinary Members of Council.—Henry Currey, John Gibson, Alfred Waterhouse, A.R.A.; E. I'Anson, F.G.S.; E. M. Barry, R.A.; E. Christian, Horace Jones, G. Vulliamy, T. Worthington (Manchester), J. L. Pearson, A.R.A.; A. W. Blomfield, M.A.; D. Brandon, F.S.A.; J. Clarke, F.S.A.; O. Hansard, J. Honeyman (Glasgow).

Honorary Secretary.—Fred. P. Cockerell.

Secretary.—William H. White.

The above form the Council.

Auditors.—W. A. Boulnois, Francis T. Dollman.

Board of Examiners, Metropolitan Building Act.—W. A. Boulnois, H. Dawson, C. Fowler, C. F. Hayward, F.S.A.; E. I'Anson, F.G.S.; J. Jennings, Professor Kerr, J. T. Knowles, Professor T. H. Lewis, Edwin Nash, Rowland Plumbe, John Whichcord, F.S.A.; Sancton Wood.

NEW YORK HOUSEHOLD TASTE.

NOTWITHSTANDING the gloriously independent right we all have in America to our own opinion, and the proverbial but still questionable dictum that tastes differ, the tolerably thoughtful mind is strongly disposed to admit that taste may be something more than a capricious instinct leading many uncultured people to have a leaning towards pernicious things; but most of these people admit that taste, after all, has been well understood for ages to mean something that the peculiarly gifted are alone initiated in.

There can be no question that the same standards of taste regulate the households of New York, and, indeed, the whole of the United States of America, as those of many English people. For centuries there have existed in the country many families surrounded with household gods of precisely the same character, neither better nor worse, than are to be met with in thousands of middle-class houses at home.

In America, of course, one meets with a diversity, arising from the number of nationalities that are here represented, but England and English ways, like its distorted tongue, prevail and appear most to be esteemed. Some fine old specimens of the true Anglo-American lady still advocate dressing like English gentlewomen in preference to the more successful adaptation of the Parisian; the large German population invariably giving up their own ideas as regards the adornment of their fair persons, and copying, as far as their prudent ways allow them, the *modes* of the Rue de la Paix and the Faubourg St. Honoré.

The great change that has taken place in what may be strictly considered household taste in America since Mr. Charles Eastlake's book has been so widely spread in this country, has led to the multiplication and the rapid manufacture of means for making the houses here beautiful, the beauty being of a kind that would cause the author of that book to regret that he had been the innocent means of encouraging so thorough a misunderstanding of correct principles.

The American art-lover — and he abounds here — is a much more severe critic of the surrounding errors of taste than his English cousins, who, in many high quarters, are utterly indifferent, at least, to any new ideas on the subject; and those gentlemen who in this country give expression to their opinions, show a contempt for their brethren which must be perfectly refreshing to the true and good hater of America and its institutions.

We do not think that any really well-instructed American has any desire to claim more than an equality of taste with the rest of the world in household matters, or on any other subjects relating to our intellectual progress; and we should think that a very little reflection must assuredly lead the thinker to the conclusion that it can be but in very rare instances that American artists arrive at their positions of honour through other than the long-recognised channels.

The professional household decorator here and the mercantile speculators in this line are sufficiently ready to avail themselves of foreign aid, and the mere purveyor of household beauty manifests a faith in the merits of Viennese and Parisian art,—and in fact in all objects that he has to dispose of,—that is worthy a higher cause. Like his brethren in other profitable markets, he regards the object he has to furnish as merely an ephemeral thing to be put aside next season for another style. The Gothic, one day being the rage, the Queen Anne style another day, to be put aside for the Washington or the Victoria; the former, by the bye, a suggestion that we here give the trade the gratuitous advantage of, the latter positively admitting of a range so wide that the man who condemns all will condemn much that is not likely to be excelled; for in no period of future civilisation can we expect to have within our reach, on terms so easy, so large an amount of beautiful household surroundings; all that appears to be wanted is a wholesome condemnation of the bad and basely-constructed, so as to allow the good and simple a little more room to be seen.

For many ages past each century has had a special taste to consider, and the distinction which all of us can so easily detect between tenth and seventeenth century household matters is scarcely less marked between this century and the last, or between this moment and fifty years ago; although few living authorities on such subjects are sufficiently broad-minded to acknowledge much merit to our immediate fathers as household comforters; and the few who remember sixty years back are just as unwilling to admit the ability of the present generation to teach the world how to surround themselves, or how to add to charms of an old-fashioned fireside, or where to place an additional cushion in a substantial deep, square-shaped bedroom easy-chair.

It is, after all, a melancholy reflection that in spite of the lecturing and preaching on the subject, there is no more household taste in America, or little more in England, than in the years past that so many are in the habit of alternately extolling or reviling; the new needs of the present generation have compelled the producers of pretty things to change their methods in order to accommodate a new demand, and in a few, very few, noticeable instances the artists have kept always before them the necessity of aiming to promote a love of what has long been acknowledged to be right.

In America the expression "awful" may be fairly made use of in connexion with household taste; but not even the most reckless *debauché* in modern slang could say of the household taste of New York, that it is, under any circumstances, "awfully jolly."

How long have you been gay? may be asked of the New Yorker at home, precisely in the same spirit, and with equal significance, as applied by the interlocutor in Mr. Leech's inimitable picture; and how long it will be before they will return to the comfortable household surroundings of their ancestors is an equally difficult question to answer.

How is it that the New Yorkers, so many of whom pride themselves on their Dutch origin, have not contrived to build and keep up houses after the fashion of the famous old towns of the days of the Dutch Republic? In England our great Dutch millionaire built his modern house in London in exact imitation of his Amsterdam palace; and why so many others here, who are not ashamed of their English descent, do not adopt instead of the Queen Anne style, or the Gothic, or what not, a good Washingtonian manner of conducting their homes and their morals, is a mystery to us.

It may, without injustice, be said of the New Yorkers that there are at least here a smaller proportion of home-loving inhabitants than in any other city of the world; and whenever the household taste appears of a tolerable standard, it is not owing to any respect to the surroundings, beyond the advantage such surroundings give fine people to appear well up in such matters; the reward looked for is an ignoble one, and with the discord of vice that reigns here, it is not strange that there should appear a want of harmony between down-town speculation and up-town social emulation.

The rules of life in New York are simple enough, but in any question of doubt New Yorkers are not easily instructed by reference to any of those canons of taste or morality that nations longer cultured have consulted.

There are here a proportion of the population, not a very large section, who, after a fashion, devote some study to household taste, and with this view read assiduously a great deal that is now written for our edification. On the whole, we have not found the household taste of people in America quite so bigoted to any particular style as the faddish people in England have long been, who talk and decorate up to a period.

The popular European decorator, whether he resides in Paris, London, or Vienna, is good enough for a thorough New Yorker; and here there are very few small people who have sufficient leisure to carry out decoration on a limited scale: every one in New York who has any pretensions,—and here we are literally all pretenders,—is willing to wait, if not patiently, still willing to "hold on" until the arrival of that happy time when their ships come in again, and they have at their command the best of everything.

In an age when manufacturers believe they have touched the utmost limits of improvement, and still more, at a time when capitalists think that nothing is denied to well-directed combination, it is difficult to induce a young people to wait for the results of patient ill-rewarded labour; for the disposition of the period is to scoff, we hear, at the hope of rewards that pass all understanding, and the possibility of enjoyment in this world at a cheap rate is associated with the idea of something nasty; the notion of simplicity and inexpensiveness possesses no charm whatever to the modern everyday mind; small things seem to have gone out with small beer and all other domestic economies. As for a small and well-conducted household in New York, such an establishment is altogether comparative, and probably the idea of a house like that the late Comte d'Orsay was unable to keep up in Curzon-street, Mayfair, or of a house like old Samuel Rogers's in St. James's-place, has not entered the mind of that extraordinary personage, a thorough New Yorker.

A newly-arrived Britisher, taking his first walk down Fifth Avenue, or paying his first visit at a great house, would be apt to form hastily the opinion that there exists here a rather higher standard of household taste than is ordinarily to be found at home; so many of our friends at a distance are still happily surrounded with the belongings of their grandfathers, that in nine cases out of ten the houses of our friends in England have what is irreverently called an "old fogey" appearance; and it must be owned that a general dinginess pervades a middle-class London house that gives the stranger,—he, at least, who thinks much of such things,—the impression that the furniture, picture-frames, carpets, and especially the curtains, want renewing.

We, when in London, do not all of us live in Belgrave-square or Park-lane, and even when we visit in those favoured quarters, we who are devotees of the present style of furniture, find many objects to quarrel with, although for ourselves we have long learnt to be content to live in the discomfort that surrounds the inhabitants of Mayfair and Belgravia; nor have we found in the houses decorated and made beautiful by the modern artists, more luxurious seats on which to rest our wearied limbs, or on which our fatigued mind can repose with confidence that the chair is perfectly comfortable.

Here in New York the dingy is to be met with alone in houses such as presentable strangers rarely visit, although in these "hard times,"—times that are beginning rapidly to petrify,—some very nice American people live in anything but nice apartments, and the household taste that surrounds the vast majority of dwellers in this city is in reality of a kind calculated to make the methodical domestic grumble fearfully.

But here in New York beware of examination, that is, if you happen to know anything about household matters; be content with the impression that you have probably received that you are surrounded with evidences of wealth and a certain show of stability; you are assuredly witnessing the result of an expenditure during an earlier good time, and never mind about taste, it is a sickening subject to many of us. It is not many people who know what is meant by style or in what it consists, so take your friends here for what they appear to be worth, and for whatever they please to call themselves, and admire them, not for their big houses and costly furniture, but for that superiority in all things which you will soon learn from them they possess in a high degree.

No doubt there are houses in New York in which we may find,—discover is exactly the right word,—remote evidences of sound taste, but these will be found to lean in a material direction, carrying one back to those pleasant old homely days when certain families were proud of their domestic achievements, when corn-cakes and "chicken-fixings" were household triumphs; and in such houses evidences of taste of a consistent nature will be found in the well-kept surroundings of an earlier period, the portrait of grandpapa, by Gilbert Stuart; a lovely miniature of grandmamma, by Malbone; a view of the Colosseum by moonlight; an early drawing by Glenny, before Macpherson and Anderson's photographic days; a cameo-portrait by Solini; and in one instance that we can recall of good taste, we were shown the portrait of our host's first wife, painted by Angelica Kauffmann, in Rome, in 1792.

Here and there in New York may be found traces of household taste, such as the visit to Rome fifty years ago encouraged in some minds; but where this order of taste still lingers it is invariably in America muddled up with horsehair and Utrecht velvet seats, and highly-coloured Berlin wool-work of thirty or forty years ago,—in those good times when the Mesdames Inglis and MacLeods, in their pleasant Staten Island quarters, taught the fair New Yorkers how to become fine ladies.

What taste one meets with here now is imitative stuff, acquired from sources in themselves very questionable, and little remains to attest

the fact that we are living in a progressive country. America must be yet more flooded with "shoddy" of every kind, poor copies of all good things, a perfect deluge must overwhelm the city homes of this people, before a love can be created for simple household surroundings.

They make much, not too much, of their few distinguished writers, but we suspect that Irving and Prescott, Ticknor and Bancroft, owe quite as much to their affluent connexions as to their literary ability; and, as for the scientists and artists, the former are well able to take care of themselves, but the painters and sculptors must look for their laurels, as they are now doing, to Europe.

Whenever the American commercial and legislative troubles return to ordinary ways and means of success, we English may find ourselves defeated in many large branches on which we have for too long a period confidently relied; then will be the time for America to think seriously of studying out and defeating us in the matter of household taste, when they have secured what they appear desirous of becoming, in the first place, the directors and owners of the world's great shop for all useful, but for no portion of the beautiful, objects that we all seem to require. In the meantime they will become enriched by our needs and their own industry. France will always supply them with their taste for finery; the English will be able to furnish them with any quantity of the bad that they are still unrivalled in their ability to produce,—objects, as bad almost as Germany or any other country can turn out, if not at quite so low a price.

Let years and years of a wretched government such as now exists in America work its worst throughout the terrible experience and fearful lessons that have yet to be learnt here, and then let a few brilliant years of well-won commercial success overtake America, and New York household taste with other blessings may reach a perfection that older countries may sigh in vain to emulate, unless,—but, perhaps, by that time the very climate may have changed, when Eastern magnificence and Western ingenuity may be successfully combined in New York and its surrounding country.

New York.

HOW THE PUBLIC MONEY GOES.

There has recently been issued by the Queen's printers a report which is not unworthy of some notice. It is the first report from the Committee of Public Accounts, together with the minutes of evidence taken during the present year. The actual subjects hitherto investigated by this Parliamentary Committee have been the appropriation accounts of the sums granted by Parliament for Civil Services, Class I. to VII., for the year ending March 13th, 1877. Much that is contained in this volume does not come within our province to notice; such, for example, as convict establishments in England and the Colonies. But, on the other hand, there are some parts of it which are well worth notice, and which show the remarkable way in which too frequently the public funds are spent. These portions should not be allowed to lie in serene peacefulness in the pages of a Blue Book; it is highly desirable that they should afford a few minutes' thought for the public, who are the persons chiefly interested in knowing how the public money goes.

We turn, then, to Class IV., vote 2, Science and Art Department. It will be remembered that in the course of last year there was a loan exhibition of "science apparatus" at South Kensington,—a thing commendable in its way, but of no great public utility, interesting but to a very few persons, and, we will venture to add, of small advantage to the cause of true science. What would any one suppose was the amount which this little bill actually attained in times when the public have need for every penny of their money? This is how it is described by the committee:—"In addition to the sum of 13,677*l.* 10s. 7d. shown (in the accounts), it is stated that there was a previous payment of about 500*l.* in 1875-76, on account of the exhibition, and that there are still outstanding claims which will amount to about 1,000*l.* The total cost of the exhibition will thus probably exceed 15,000*l.*, an expenditure which was incurred *without the knowledge of Parliament or Treasury sanction.* Explanations were made to your committee, showing the gradual manner in which the proportions, and consequently the expenses, of this exhibition had grown; but they trust that the minutes issued by the Committee of Council on Education, dated December 18th, 1876, will prevent the recurrence of these grave irregularities." "Grave irregularities," albeit it is a term of strong Parliamentary censure, is none too strong for the waste of money which took place in regard to the recent exhibition at South Kensington.

In the first place, the estimates were in no way equal to the amount which was spent; in the second, even these estimates were far too high; and in the third the actual expenditure was absolutely wasteful. Thus, for the preparation of catalogues the estimate was 1,700*l.* odd, whereas the actual amount paid amounted to 3,600*l.* It is true that included catalogues for other things connected with the South Kensington Museum; but just let these questions and answers be considered for a moment, and we venture to think that any ordinary man of business will consider the way in which the finances of South Kensington are managed as being seriously bad. Q. 277. "How much did you under-estimate your own expense in the matter of catalogues?"—"We under-estimated it by the difference between 1,700*l.* plus 841*l.* 15s. and 3,666*l.* 5s. 3d." Q. 277. "Then you under-estimated it by about 1,100*l.*?"—"Yes." Imagine the amount of forethought and care expended upon the finances of an establishment when the cost of catalogues alone is under-estimated by 1,100*l.* But attend to what follows. Q. 281. "Can you give any explanation of the reason why your estimate was 1,100*l.* wrong for the ordinary catalogues?"—"No." Absolutely no reason given; no unexpected event occurred; simply the officials were incapable of being in their calculations within 1,000*l.* of the amount required or spent.

Then, to take another example furnished by the questions of Mr. Goldney, one of the committee. The bare question and answer are significant of the want of management and forethought which this Blue Book has exposed. Q. 302. "I will take another item. You added 1,000*l.* to D. 4, 'furniture, fittings, and materials'?"—"We did." Q. 303. "But instead of spending 6,800*l.* you spent 9,600*l.*: you must have made some calculation about that, I should think?"—"As I said before, this special exhibition grew in size." We might, from this examination of Mr. Norman MacLeod, take any number of similar instances of want of forethought and of squandering of the public money. It is enough, however, to show by the above examples how the public money goes,—at the South Kensington Museum at least. In the first place, it must be considered an extraordinary act to contemplate spending many thousands of public money without consulting Parliament beforehand on the matter. We are the first to welcome exhibitions, or other things which increase public knowledge and taste, and add to the progress in knowledge of professional men and artisans; but, on the other hand, we should also be the first to consider as reprehensible the spending of public money first of all without the sanction of the representatives of the public, and finally, in the careless and extravagant manner which is shown in the present report.

But to turn to other matters. In the winter of 1876 were spent 3,375*l.* upon the repairs of Rotten-row; and that sum, for all the good it did, might have equally well been buried in the rubbish at the bottom of the ride. Here we have another instance of the way in which the public money goes. No doubt the winter of 1876 was a trying one, but it was by no means a very uncommon one, and the public authorities might have been equal to the weight of properly preparing and repairing a park ride. Of course the work has all had to be done again. On the other hand, no special vote has been asked either for this sum or for the extra amount required by the additional works since 1876, but this question and answer show how the expenditure is defrayed. Q. 6. "You thought you could squeeze out the cost of it by savings on other sub-heads?"—"Yes; by putting off things, very much as a man would do on his own estate." But commendable as this economy of the Commissioner of Works may be, it is open to this criticism, that so large a sum could not be saved without curtailing improperly the expenditure on other parts of the park; or else that, if this 3,000*l.* odd could be fairly taken away from other things, then that when the Office of Works frame their estimates they ask for that amount too much, and have hitherto wasted so much public money. Hyde Park and Kensington Gardens may thus only be a sample of what takes place in regard to various public buildings for which too much is asked, or on which certain sums are quite wrongly saved, because a Public Department is unable to get a simple work executed with the efficiency which we will be bound to say nine out of every ten private individuals would succeed in securing.

Let us now turn to a third and concluding head of a different kind, namely, that connected with lighthouses abroad. In 1866 a vote of 10,000*l.* was taken for building a lighthouse on the Bird Rock in the Bahamas. Its history is one of procrastination and increasing expenditure. In 1867 Mr. Harvey, the Colonial Architect and Inspector of Lighthouses in the Bahamas, resigned, and his successor did not reach the colony till the following year. Next year he had to come home on sick leave, and the lighthouse on the Bird Rock still remained unbuilt. In 1871 the Board of Trade requested the War Office to supply them with an officer of the Royal Engineers who would undertake the work; and a Captain Whatley was appointed. Whether this was a wise choice may be doubted, for apparently this,—no doubt able officer,—knew nothing of the work which he had to undertake; for, says the official from the Board of Trade, who was examined by the Committee, "We placed him (Captain Whatley) under instruction at the Trinity House, under Mr. Douglas, in order that he might get some knowledge of lighthouse work." Certainly the mariners and people of the Bahamas must thank the Government for allowing them to have the privilege of furnishing the *corpus vile* on which an officer of the Royal Engineers might experimentalise by trying his hand at the not very easy and not unimportant task of building a lighthouse. However, the long and short of the matter was, that, instead of 10,000*l.* being required for the structure, 18,000*l.* were ultimately spent upon it. From time to time the new inspector furnished estimates to the Board of Trade at home which always turned out to be under the mark, but though the committee may be just in considering that they were furnished in this and in the first instance "without due care and forethought," it is hardly possible, we imagine, for a mere tyro in marine architecture to be able to give a really reliable estimate, and without doubt there is always a desire, and a very natural one on the part of servants of a Government Department, to make estimates as low as possible. The wish in such cases may possibly be too strong for the thought. But the Board of Trade appear yet to consider colonial lighthouses a *bête noir*, partly from the difficulty of exercising a proper control and supervison over the work, for, says Mr. Hamilton,—"We have tried building by contract, which has been a failure; so badly, indeed, was the work done, that in one case, a tower, which was of native stone, was reported to be something like 2½ ft. out of the perpendicular. We have tried building by hired labour, which has been very expensive. I think, in future, when a tower is to be built of stone or iron, the Board of Trade will have the whole of that work executed in this country, and then the only work left to be done in the colony would be the mere setting of it up." But we fail to see how this will do away with some of the causes of the increased expenditure which occurred in the present case,—as, for instance, that the Admiralty charts showed that there was a good anchorage close to the rock, whereas it turned out otherwise. Imagine the arrival of the stones of a lighthouse from England, and in place of a good anchorage it was found that it was a most dangerous spot, and a gale springing up it became necessary to throw some of the cargo overboard. This would hardly be a cheaper or more expeditious mode of proceeding; nor, indeed, in the most favourable circumstances, does Mr. Hamilton's plan look very promising on the score of economy.

A much simpler and better method would be, we should think, to hand over the colonial lighthouses to the Colonial Governments, who would be able to obtain a proper architect, and give prompt attention to the matter. But that is a point outside this present article, which has been to present to our readers the remarkable manner in which too often the public money goes. It shows how carefully every penny of public expenditure should be watched.

Royal School of Art-Needlework.—An exhibition of ancient needlework has been opened at the school, South Kensington, and will be found interesting. It will be closed on the 22nd.

SANITARY AND SOCIAL NOTES IN AND ABOUT DUBLIN.

THE SOUTH CITY AND ENVIRONS.

Dublin has undergone several social and other changes during the last twenty-five or thirty years; but improvements within the city, except in a few leading thoroughfares, have been small. The Liffey once divided the old city into nearly two equal portions, but that on the south side of the river looking up the stream, and embracing the area between it and the South Circular-road, is, for the most part, a sadly-changed and woe-begone district. Except on the suburban edges, this district has not witnessed much building or sanitary progress, but gives evidence of decay, dirt, and corporate neglect. From the very border of St. Stephen's Green, the finest open space in the city, you may at once plunge into the feculent labyrinth of the South City, winding your way left and right, but still pushing ahead, until you reach the vicinity of Dolphin's Barn on one side, and old Kilmainham on the other. In your circuitous route, if you wish to see the most of the ills this portion of the city is heir to, you will have to do as we have done; make frequent detours and stoppages on your way. Right and left of the Coombe, extending in the line of Francis-street and New-street to Cork-street, exists a neighbourhood which but seldom receives a visit from the stranger in Dublin, and as seldom from the fashionable residents of the southern suburban and marine townships. Indeed, the quarters we are speaking of, and known as the Earl of Meath's Liberties, have for long years gone into decay, and bitter, grinding poverty, squalor, and wretchedness are its present-day characteristics. Yet in this and neighbouring localities Dublin's industrial wealth and manufacturing power were once concentrated. Here the descendants of the Huguenot settlers laboured long and prosperously, as well as native artisans; but the silk trade and kindred trades that once flourished here, and gave employment to thousands of looms, have long since died out. A remnant of the Dublin weaving trade exists in the production of poplins and tabinets by two or three Dublin houses. In the localities we have mentioned, and under the shadow of St. Patrick's Cathedral,—a noble pile, sunk as it were in a valley of squalor,—sad pictures of domestic desolation and dirt, of impending and actual ruin, are observable. The house property is almost all of a crumbling or tumble-down character; the streets and courts are in ruts and full of dirt, and the municipal scavenger appears (when he does appear) to be a *rara avis*. We visited scores of the streets, lanes, and alleys in and about this quarter, and dirt and rags, illness and want, were everywhere. No wonder need be expressed at a smallpox epidemic or fevers, while smoking dunghills and festering pest-heaps remain for days in the back-places, around the habitations of the poor. With a mortality of 34 in 1,000, the corporation ought to open its eyes, if its members are not dead to shame, human feeling, and personal and public safety. The drainage of Dublin, we can have no doubt of it, is very bad, particularly the house-drainage; in fact, in many localities, no proper house-drainage exists, and in numerous other places the drains are choke-full of filth, and of course do not act. In a street close to Dublin Castle, the head-quarters of the Irish Executive, we stood by at the opening of a street drain whose condition was abominable. In Werburgh and Bride streets, close by, we witnessed other choked drains, full to repletion, and off the same streets courts with heaps of unspeakable filth. We conversed with the purchaser of some tumble-down property in Derby-square, off Bride-street, who had some hands employed in patching-up houses for tenement-lodgers,—houses that should be condemned. We were informed by this tenement-house owner, that he had applied to the Corporation to have the heap of filth removed from the small square, and that they promised to attend to his request; but the heap remained, we believe, for some days before it was removed. Taking the line of the quays on the south side, from Sir John Rogerson's Quay to the end of Ncher's Quay at Watling-street, a continuous number of streets, lanes, and courts at their rear, are in a most filthy, offensively sickening, and neglected condition. Poolbeg and Townshend streets, and the side streets and lanes branching off, we found in a very filthy state; and indeed the same may be written of most of the back streets in the vicinity of the south quays, and extending their entire length.

For the hundredth time, perhaps, the pollution of the Liffey is affording a politically and religiously talkative Corporation food for debate, motion, and counter-motion; but the chronic elongated cesspool still remains, while the Registrar-General's returns are supplying weekly to Dublin's local rulers and the citizens grim and serious facts and figures. We fear that the constitution of the municipal body is such that at present little can be expected from them in the way of thorough sanitary reform. The majority of the representatives belong to a class who by instincts are rather opposed to than in favour of sweeping social or sanitary changes. They are moved solely by party or personal interests, and many of them are the catspaws of others. With very few exceptions, the municipal representatives of the city are not educated men, nor has their training been such as to qualify them for the position they occupy, which in too many instances has been secured by a low compound system of combined politico-religious electioneering. If the municipal body of Dublin were a fair representation of the educated, business, and practical knowledge of the city, sanitary and public interests would be attended to, and political and religious disputes relegated to other councils outside the civic body. There is a marked depression in the value of house property in many parts of Dublin compared with it fifteen or twenty years since. Of course, we do not include the leading thoroughfares, the houses around the squares, or those in their immediate vicinity or approaches, although even in a few of these the value of house property has gone down. Apart from the above, on the south side there are numerous private streets east of Grafton-street extending to the line of the Royal Canal, the houses in which are now occupied by tenement lodgers, though a few years since the residence of professional men, and of single private families in affluent circumstances. For several years past in Dublin there was an exodus of the resident, opulent, and fashionable inhabitants, or all that remained of them, to the outlying suburbs, sea-ward and mountain-ward. The City of London has become during the last half century a city of shops, offices, and warehouses, and the City of Dublin in its older centres is becoming, in fact, a city of shops and tenement lodgers.

The great and present staple industries of Dublin would appear to be that of brewing and distilling. The working classes,—ay, and other classes above them,—still drink; and, despite the great temperance movement begun by Father Mathew nigh forty years ago, immense quantities of malt and spirituous liquors are consumed in Dublin. The publicans, consequently, in Dublin are prospering, and many of them in a few years, from being merely potboys or assistants, have amassed large sums, become owners of considerable house property, and some of it of the worst kind, and not a few of these men in the beer and whiskey interest are the representatives of the people in the corporation. The old public buildings of Dublin, built towards the end of the last century, and in the earlier years of the present century remain still the best specimens of Classic architecture that the capital possesses. Street architecture in a few of the thoroughfares north and south of the Liffey has improved; branch banks, insurance offices, and ecclesiastical structures have cropped up; business chambers in the city's centre increased; and large warehouses and agencies have been established in several places by English and Scotch firms for the sale of imported goods. Some few native dealers and manufacturers of sundry goods in Dublin are large importers of English, Scotch, or Continental wares. In the matter of building wants and materials there is a considerable trade done, and the imports into Dublin have been large of late years. Large quantities of English and Scotch stone, bricks, slates, lime, cements, &c., are imported, as well as various other building and sanitary appliances. We must add, at the same time, considerable quantities of Irish limestone, sandstone, granite, and marble, are raised in the sister kingdom, and are exported and used in its capital and chief cities and towns. Although native bricks are largely used in many domestic buildings, the desideratum in the capital is a well-made and durable brick, of any colour that may be required. There are suitable clays in abundance north and south of Dublin for the making of good bricks, if intelligent and practical brick-makers would commence operations. In the district of Fingal we examined excellent clay during our visit to that locality, and all that is needed is enterprise. Other building materials in the neighbourhood of Dublin are in the greatest plenty.

Of outside industries in and about Dublin at present, those connected with the building trade may be said to be the most brisk. Large building jobs in the immediate city are few, that connected with the "restoration" of Christ Church Cathedral being all but completed. During the last seven years, at least, the works at the cathedral afforded employment for a large number of masons, stone carvers, and other building workmen. The rebuilding of Carlisle Bridge, which was agitated for several years, and the construction of a new bridge further down the river, near the Custom-house, have for some months past been proceeded with by the contractor, Mr. W. J. Doherty. Both of these bridges are under the superintendence of Mr. Bindon B. Stoney, the engineer of the Dublin Port and Docks Board. The foundation works of these structures are heavy, and require a large amount of labour and plant. The operations are below water as yet, and little is to be seen save piles, raised platforms, pile-driving, caisson-sinking, travelling-derricks, and the usual belongings of modern building in water, expedited by steam, in pumping water and lifting and lowering stone. What would not George Semple have given upwards of 120 years ago, when he was constructing Essex Bridge over the Liffey, for such appliances as are now within the reach of architects, engineers, and builders! And yet, though he had to invent and construct most of his bridge-building appliances, and never once dreamed of the utilisation of steam power, he built expeditiously and well. Another port and docks improvement, the extension of the North Wall Quay, is proceeding satisfactorily. This work, besides the dredging operations which are being continuously carried out in the river and harbour, has of late years vastly added to the accommodation required for vessels and steamboats, affording at the same time a sufficient depth of water, and rendering vessels independent of the service of the tides, ingoing and outgoing. The operations of the Dublin Port and Dock Board have certainly been of great benefit to the trade of Dublin, for they have placed the leading English and Scotch lines almost in direct contact with the Irish lines, the connecting links being additional express services by steamboats between Holyhead and the North Wall, Dublin, and Liverpool and the same place.

For specimens of domestic architecture, and of signs of building industry and progress south of the Liffey, the outlying townships and localities extending from Rathmines to Roundtown, and from Rathgar around by Milton, and thence across by Ranelagh and Collenswood to Donnybrook and Bull's Bridge, must be visited. In these localities, a quarter of a century since, there was little to be seen but private demesnes, green fields, and market gardens. They are broken up in several places by new roads, lined with detached and semi-detached villas, and again by rows of houses and squares. Although much of the house property erected in these localities is of a speculative character, there are numerous well-built domestic buildings of an ornate kind to be met with. The localities are very healthy and pleasant; the Dublin and Wicklow mountains may be seen in the distance, and there is plenty of foliage and pleasing sights. To the localities just named, and those extending along the Bay of Dublin to Bray, fashionable Dublin of late years has run out, leaving the city's turmoil and dirt, the city's ruin and squalor, to the Corporation and the unfortunate citizens, who must perforce carry on business as best they may, taxed to overbearance, and year after year running the gauntlet of moral plagues and more dangerous epidemics.

In another paper we shall have something further to say of Dublin, sanitary and social, and in relation to the north city and its suburbs.

SHORT "QUANTITIES."

Sir,—Having paid for quantities taken out by the architect, I now find the work greatly in excess of the same. I did not have them guaranteed. Can I recover the difference? If I can, from whom? Rudo.

*** Our correspondent would have his remedy against the person whom he paid for doing the work.

ARCHITECTURE AT THE ROYAL ACADEMY.

The architectural room at the Royal Academy does not offer much suggestion this year in regard to any special tendency one way or another in architectural style and progress. We confine ourselves to remarks on the drawings taken singly.

1034. "Norman Tower, Bury St. Edmunds," John W. Simpson. A monument of early architecture well worth illustration, but calling for a more powerful style than is shown in this neat pen-drawing. We may be mistaken, but our recollection certainly is that there is some arcade work in the lower portion of the tower which is not shown in this drawing.

1035. "Houses at Guildford," Maurice H. Pocock. We mention this because it provokes the inquiry, is this kind of thing "architecture"? The drawing is a good one, but as to calling it a *design* it is really out of the question. Now there surely is some halting-point between self-conscious repetition of styles and mere putting bricks together and leaving holes irregularly for windows.

1037. "The Temple of Jerusalem, as rebuilt by Herod," restored by James Fergusson. A large drawing of the design which forms the frontispiece to Mr. Fergusson's recent book. Any critical remarks we may have to make about the design we must reserve till further notice of the publication with which it is connected.

1038. "Design for Examination Schools for University of Oxford: elevation in High-street," Basil Champneys. A geometrical drawing of a quiet and tasteful building in late Gothic style, suitable in character and expression to its purpose, and to the architectural associations of Oxford.

1039. "The New Lodge, Beddington Park," Jos. Clarke. A building in the Old English style, with coved plaster cornices decorated with impressed ornament, which has become so dear to certain picturesquely-minded architects of late. The drawing is rather unusual and pretty in effect, in pen-and-ink, but marred by a mistake not unfrequently made in these pen-and-ink drawings, a want of gradation of force between the foreground and the background treatment: everything seems on the same plane.

1043. Wakefield Municipal Buildings," T. E. Collcutt. A beautiful pen-drawing of the exterior perspective of a building which in detail is entirely a Queen Anne reproduction, but in general treatment shows considerable originality and feeling for the picturesque. The windows in the side next the spectator are concentrated in three bays rising the whole height of the building, with nearly solid wall between; the effect is at once light, and yet with ample appearance of stability and mass.

1042. "Theatre and Opera-house at Leeds," G. Corson. A front containing original treatment of Classic features in a novel and somewhat forcible manner; but much of the detail we cannot admire.

1044. "Courtyard of a River-side Hotel at Great Marlow," W. H. Powell. A pleasing example of quietly picturesque building; the nature of the materials is hardly to be gathered from the drawing. The heavy corbels rising from the ground to carry the porch-roof are effective in themselves, but seem out of keeping with the style and feeling of the rest of the building.

1048. "Interior of the proposed new Cathedral at Manchester," R. H. Carpenter and B. Ingelow. A very finely-drawn tinted perspective of a design which has already been made public.

1050. "Design for new Church, Potternewton, Leeds," Henry Walker. Hung too high to be well seen; but it looks like a good design with some real Gothic feeling in it.

1051 and 1077. "Queen's College, Oxford: Designs for Decoration and Furniture," John P. Seddon. Two of the most important drawings in the collection, showing alternative designs for re-decorating the chancel of the College Chapel in the most sumptuous manner. The building is a Renaissance one, with stained-glass windows of the period, and No. 1051 is a scheme based on the retention and restoration of these windows, which are of strong and pronounced colour. The pilasters between them are kept dark against a light wall, the upper and lower part of the pilasters in two tones of green marble, which tones are repeated in the panelling in the dado, from which the pilasters are separated by a band of warmer tint. The cove of the ceiling is decorated with a network of hexagonal panelling, and the *plafonds* with classic ornament of the approved conventional type. No. 1077 assumes the re-designing of the stained windows, which are much lighter and with plenty of white glass, and give the lighter key to the whole: the pilasters in this case are light against a red ground, and the surbase panels filled with bas-relief figure subjects on a gold ground. The ceiling is treated in a very original manner: angelic figures rise from the cornice between each rib, holding up with their hands the circular compartments in the centre, which are treated partially in relief and decorated with symbols of the days of creation; an idea obviously borrowed from Mr. Burne-Jones. This is much the more effective and original design of the two, but at the same time less homogeneous in character and less in keeping with the style of the building than the other; it is more or less pervaded by Gothic feeling; but it would unquestionably find many admirers if well carried out. The actual execution of the drawings is by Mr. Gaye, whose name ought to be mentioned, for they are masterpieces of architectural colouring. The same architect exhibits a drawing (1061) of the chancel screen of Llangwm Church, Monmouthshire; a beautiful piece of old wood-work, hung too high to be well seen.

1053. "New Hall for Music and Theatricals," Ticehurst, Sussex," E. F. C. Clarke. A pen-drawing of an apparently richly-decorated interior, having (perhaps intentionally) more of the appearance of a large drawing-room than of a room for entertainments. It looks well in the drawing, but one has, of course, to guess at the effect. We have repeatedly urged that the prevalent style of pen-drawing is utterly useless for the presentation of decorative effect: texture it can give, no doubt; colour is left entirely to the guesswork of the spectator.

1054. "Iwerne Minster, Dorset," A. Waterhouse, A. Not an ecclesiastical building, but a quietly-designed Gothic mansion, shown in a small water-colour drawing, not pleasing in tone. We have before now wondered why this architect has his buildings illustrated in so heavy and uninviting a style of water-colour drawing.

1055. "Royal Tapestry Manufactory, Old Windsor," Walter F. Lyon. We looked with some interest to see what the building for this now unusual purpose had suggested; but it presents no speciality: it is a low Queen Anne building, with large square windows, and rather a clock-case kind of pediments.

1056. "Interior of the Library of the Muir College, Allahabad University," Wm. Emerson. This is hung far too high to be properly seen; it is a powerful water-colour of an interior, suggesting a kind of blending of Romanesque character with Indian details. It certainly deserved a better place.

1062, 1067. "Competitive Designs for the New Rathhaus, Hamburg," the late Sir G. G. Scott, R.A. Two large and fine pen perspectives, of which the first numbered shows a Classic, if we may use the word for distinction sake, and the other a Gothic treatment of a building essentially the same in its main points. The Gothic one was, of course, its author's favourite, the other being labelled "alternative design." Both are absolutely symmetrical, a central tower in a long front with angle turrets, and the window design continued in unbroken repetition along the whole of each story. The general type is Early Gothic, and suggests nothing deviating from the usual type of the style, except in the gables which break the line of the front on either side of the tower, and which show original and picturesque treatment, but suggestive, to our thinking, more of the feeling of the Gothic of a century later than of that which the main design recalls. Sculpture is largely introduced, against the mullions dividing the lower windows, and elsewhere, with an effect sufficiently rich, but not crowded. The tower is very simply treated, and terminates in a timber spire square on plan, in which the only unsatisfactory point is the kind of cage forming the upper portion, and which seems out of keeping with the dignity of so large and stately a structure. The effect of the whole mainly depends on its simplicity and breadth of treatment; and the alternative design affords an instance how Classic in feeling a great deal of Scott's Gothic design really was; for, except with regard to the tower, there seems nothing required but the substitution of Classic details where Gothic were in the other design, to make it a completely orthodox Classic building; the main architectural scheme is identical in both. The Gothic design is the finest generally, simply because the Gothic treatment of a window with an arch over it is more true and architectural than the Classic habit of framing the windows in pediments and architraves; but the Classic tower is the finer of the two, and shows considerable power and originality in the manner in which the really Gothic type of octagonal angle turret is assimilated with Classic architecture. The tower terminates in an octagon, rising in stages from between the angle turrets, and covered with a cupola. It is a very fine and effective feature, with a great deal that is unusual in appearance.

1063. "Clun Church, Salop," G. E. Street, R.A. An interior of a church, with Norman arcade, and a fine timber roof of rather late style, springing from angel corbels. The roof and substructure being so distinct in style we presume the work is a restoration, or that the roof is a new one; but no information is given. The drawing, in pen and ink, is an admirable specimen of effect in this kind of drawing.

1064–5–6. "Competitive Design, new Vestry Hall, Kensington," John O. Scott. The drawings consist of elevation and two sections. The architect is to be praised for sending geometrical drawings, which, as we have often said, are not nearly enough represented in the Academy Architectural room. The design is a pleasing one, of Jacobean type, in very good taste, and showing considerable elegance and originality in the slight ornamental details.

1072. "The Château de Chenonceaux," Bernard E. Smith. A sketch in pen-and-ink, made during the author's travels as Pugin student in 1875, and a very good one; showing the well-known old château, wildly abnormal as a building of one's dreams, founded in the middle of a river, and reflected in the water.

1073. "Tettenhall Church, Staffordshire," G. E. Street, R.A. An exterior view of a small country church, Lancet style, with short square tower and thick heavy buttresses; a complete realisation of the spirit of Mediæval architecture in buildings of this kind. A very pretty drawing except the trees, except the trees, except the trees (to adapt Hamlet's repetition formula).

1074. "Interior of St. Margaret's Church, Lee, Kent," James Brooks. A beautifully "clean" perspective drawing of arches and vaulting ribs, and other details of a church of Early English type of architecture, conscientiously reproduced. The only weak point is the organ-case, which is common-place, and redolent of Southampton-street and "church furniture."

1075. "New Boarding-house at Harrow School," T. G. Jackson. Not a happy effort nor pleasing as a drawing, though hung on the line. The architect seems to have taken three stories from houses of different type and description, and placed them one upon another.

1076. "Vestry Hall, Hampstead," Fred. Mew. A square building with a pediment and three windows under it in centre of each face, flanked by blank wall, with a garland and shield for decoration, on each side of the centre. There is a certain effectiveness in this treatment: but the circles above the lower tier of windows are unmeaning, and there is a sadly "gin-palace" air about the detail generally, and certainly nothing in the excellence of the drawing to atone for the character of the detail. Why this and other drawings of even less pretension to artistic merit are placed on the line, and things so much better put up where they cannot be seen, is a question to be asked.

1078. "Proposed Church of St. Peter, Mottingham, Kent," E. F. Clarke. An original and picturesque design for a country church, shown in a very nice drawing.

1083. "Bellhaven Church, Glasgow," Douglas & Sellars. A fine drawing of a fine design. The drawing, in pen-and-ink, represents what appears to be the east end of the church with a tall triplet of lancet windows flanked by massive buttresses, almost unbroken by set-offs, and terminated by equally solid pinnacles; a wall arcade crosses the head of the main window, and there is a range of small windows below. Some accessory buildings are connected with the main one so as to form a very effective grouping. What strikes us in the whole thing is its massive and monumental character, an entire freedom from tinsel. There is a certain amount of French feeling in the detail, which is quite in keeping for Scottish work.

1084. "The 'Three Nuns' Hotel, Aldgate," Tarring & Wilkinson. The drawing hardly

does justice to the building, which is a very pleasing one, and gives an agreeable foretaste of improvement in East-end architecture.

1085. "No. 96, New Bond-street," E. W. Edis. A charming water-colour drawing of a brick front, mainly Elizabethan in character, but with touches of Queen Anne detail; characteristic, though a little patchworky; an improvement, however, to Bond-street architecture.

1086. "The Grand Hotel, Trafalgar-square," F. H. Francis and J. E. Saunders. The "very moral" of the regulation grand hotel. Need we say more?

1087. "Third Group of Houses erecting on the Cadogan Estate," Geo. T. Robinson. "Queen Anne" of the most erubescent type. The way in which the balconies are continued from porch to porch by arches carried on brackets is effective.

1088. "Two Houses at Lowther Gardens, Queen's-gate," J. J. Stevenson. Same style as the last, but with more force of treatment: the side porch is very effective, in spite of its mongrel details. The surface of the walls is besprinkled with bows and love-knots, executed in terra-cotta or cut brick. The drawing (a water colour) is an admirable one, and does full justice, perhaps more than justice, to the design.

1080. "Cavendish College, Cambridge," J. Giles & Gough. A bird's-eye view of the buildings and grounds, showing the general disposition of what appears an extensive scheme, but affording no real idea of its architectural style or merits. As a general rule, bird's-eye views are useless things.

1089. "Interior of the Private Chapel, Tyntesfield, near Bristol," Arthur W. Blomfield. A good reproduction of Geometric Gothic, shown in a very careful and finely-executed pen-drawing.

1091. "North-west View of the Cathedral, Queenstown," E. W. Pugin and G. C. Ashlin. Hung in a most stupid manner, the perspective being taken with a high horizon, while the drawing is hung far above the eye, so as to appear perfectly distorted. The want of ordinary common sense shown in placing a drawing thus is inexcusable, and suggests the inquiry, who is really responsible for the hanging in this department of the exhibition? The building is a large and richly-decorated church of the most ornate period of Gothic, apparently treated with considerable effect. The great arch the whole height of the west gable, including the other features of the design of this front beneath it, has a fine effect. The building appears to stand on an elevated platform, which would give great effect to the lofty tower and spire at the south-west angle.

We shall continue our notes.

LAMBETH PALACE.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last a large number of the members of the Architectural Association visited Lambeth Palace, by the permission of the Archbishop of Canterbury, and two hours were very pleasantly and instructively passed, under the guidance of Mr. J. P. Seddon. The chapel, now in course of decoration by Messrs. Clayton & Bell, was first inspected. Here Mr. Seddon gave a brief historical sketch* of Lambeth and its archiepiscopal palace, and then proceeded to describe the chapel and his proposals for its restoration. These were contained in a report which he had prepared on the subject, and the substance of which we give, together with some incidental remarks made by its author. The chapel of Lambeth Palace, said Mr. Seddon, is a beautiful structure of the thirteenth century, probably commenced by Archbishop Boniface in the year 1216. In plan it is a simple parallelogram, 72 ft. long by 25 ft. broad internally. It is divided into four bays, each of which has on both sides a noble triplet window, resembling those of the choir of the Temple Church, and the east and west walls have five-light windows of the same character. Under the west window is a fine doorway, divided into two openings by a central pillar. The shafts of the columns of these several openings, with their bases and capitals, are of Purbeck marble. The chapel was originally vaulted with stone, but the vaulting having disappeared, a flat ceiling, panelled and ornamented, was put over it by Archbishop Laud. This has since given place to sham vaulting in lath and plaster, with which the chapel is now covered. The windows are said to have been filled with painted glass by Archbishop Morton, representing the whole Biblical history, from the Creation to the Day of Judgment. The subjects were arranged in the side windows, with the types from the Old Testament in the side-lights, and in the middle lights the antitypes from the New Testament. These were much dilapidated in the time of Archbishop Laud, to whom it was imputed as a crime that he caused them to be repaired. The chapel was subsequently despoiled and desecrated when the Palace was held by Colonel Scott for the Commonwealth. It was repaired and refitted by Archbishop Juxon, and again, more recently, in the time of Archbishop Sumner, under the superintendence of Mr. Blore. The present condition of the chapel is as follows:—It is partly surrounded by and attached to the later and modern buildings of the Palace, from which it is, externally, barely distinguishable. The only portions of its exterior now visible are the three bays of the north side, recessed from the principal façade of the Palace, and the eastern end, seen from an inner court. Of the former some 12 ft. of the base is hidden by accumulated soil. Of both, the stone facing of the walls, the buttresses, and windows is dilapidated and decayed. Unduly high modern parapets of common brickwork conceal the flat leaden roof which now covers the building, instead of one of lofty pitch, as the original one must have been. The fine crypt has become filled up nearly to the level of the capitals of its vaulting shafts, and has been converted into the wine-cellar of the palace. Internally, the destroyed vaulting of the chapel itself has been imitated in timber and lath-and-plaster. This accords, as to its lines and form, with the old, some few stones left in the wall having served as a guide in this respect, but the details are coarse and bad. The lower parts of the side windows of the three westernmost bays have been partially filled up with brickwork, and the upper parts of these and the western five-light window are filled with modern glass of poor character. The side windows of the easternmost bay open into adjoining parts of the palace, which are used as pews. Objectionable balconies jut beyond the openings of that on the north side, and in both cases the treatment is very injurious to the effect of the chapel. A high, solid screen, erected by Archbishop Laud, divides off the westernmost bay from the rest, so as to injure the internal proportions, and to reduce its accommodation, while the ante-chapel so severed is unnecessarily large and of little use. The flooring eastward of the screen is raised a step above the proper original level, and the paving, of squares of black and white marble, is ugly and inappropriate. The furniture, partly of the time, probably, of Archbishop Juxon, and partly modern, is unsuitable, and either *bizarre* or mean in design. Altogether, neither the condition of the structure nor of its contents is what it should be, considering that the chapel is that of the palace of the see of Canterbury, although it is not to be denied that an historical, and in some sense an antiquarian, interest is attached to some of the work, indifferent as it is; and no doubt differences of opinion will arise in consequence as to the treatment which should be adopted with regard to it. The following is the treatment which I should recommend to be adopted, under the circumstances, in the proposed restoration and decoration of this chapel. In the first place, I should propose to substitute for the present sham vaulting and flat roof proper and durable vaulting, and an appropriately high-pitched roof over it, in character with the original design. The walls in general are sound and substantial, and can be made capable of bearing the weight and thrust with perfect safety. It would, I think, be wasteful to apply any decoration of a high class to the present surface, as it could only be of the nature of painting, which in this locality would be sure to need renovation within a comparatively short period. The material which I should like to adopt for the vaulting would be Portuguese cream-coloured marble, with mosaic in the spandrels. These would be thoroughly durable, and admit of occasional cleansing without injury. The cost, in comparison with stone, would not, I find, be excessive, considering the advantages, and that there would be no further decoration needed to be applied to them. With regard to the north wall, I should propose to excavate outside it, so as to expose the whole of it from the base upwards, the ground around being kept up by a retaining-wall and parapet at some distance from the building. The walling itself, with the buttresses and windows, should be re-faced, and a new and appropriate parapet added to the top in place of the brick one to be removed. The east wall should be repaired and re-cased, and a new gable-end built. The new high-pitched roof I would propose to be covered with Westmoreland slates, like the other high-pitched roofs of the buildings of the Palace. As to the crypt, it would, of course, be desirable, but not essential, to have the floor lowered to the original level, and the walls, columns, and vaulting examined and made good, as might be found needed. The whole of the windows on the south side, and the three westernmost ones on the north side, can be lowered to their original sills, and these, with the east window, should be filled with good painted glass. I should propose two tiers of figure-subjects carried round on grisaille grounds, which would ensure ample light to the interior. In the side windows I should represent the types and antitypes of our Lord, according to the recorded arrangement of the ancient glass that was destroyed; but the east window I have reserved for the representation of the Crucifixion and the Ascension as their climax. I should put rich metal grilles in the openings of the easternmost window on the north side, with casements to open, so that the room behind could be occasionally used in connexion with the services; and I should arrange the organ at the west end, with the pipes clustered in front of the several openings. As to the decoration of the rest of the chapel, for which the glass would have given the key-note in the principal figure-subjects, I should, in the mosaic of the vaulting spandrels, represent the heavenly hierarchy of angels, the colouring being kept light and aërial. The small wall-space left around the windows I should inlay with mosaic, with ornament on a deep but subdued coloured ground, in which purple would predominate. On the piers dividing the bays below the corbels I should put the figures of the Prophets and Evangelists, and on the wall-space around the sacrarium I should concentrate rich designs and colouring in deep and subdued tones to throw up the reredos and altar-cloth, which would doubtless be of still costlier character, such as the mosaic picture already kindly offered for the purpose. In the paving I should combine mosaic and encaustic tiling, studied to form a suitable base for the rest. As regards the screen, I should not hesitate to remove it, the great question to my mind being whither. It appears to me that its sole interest is historical, and if it be considered needful to retain it, it might be placed against the western wall, or within the ante-room adjoining the chapel, or elsewhere in the palace. I should certainly not desire to retain it in the chapel. I should put a lighter and more open screen nearer the west end of the chapel, and extend the stalls westward to it, to increase the accommodation, as is occasionally much needed. I am of opinion that the back range of the present stalls might be raised, and that the remainder should be new. It is needless to say that such a work of restoration would require, and should receive, the most careful and anxious consideration in every detail, and that, were it entrusted to me, I should devote myself to it as a labour of love, and be willing to submit the drawings of every part for the criticism and advice of the committee, so as to ensure the best result possible.

Incidentally, Mr. Seddon said he had good ground for asserting that the present wood and plaster vaulting followed the lines of the original stone vaulting. Mr. Burges, when a pupil of Mr. Blore's, discovered and sketched, during the progress of the works carried out by the last-named architect, some of the stone springers *in situ*. Referring to the works of painted decoration now in progress by Messrs. Clayton & Bell, on the existing lath-and-plaster vaulting, Mr. Seddon said he felt bound to make allusion to a

* Much interesting information of this kind relating to Lambeth, its palace, and church, has appeared in past volumes of the *Builder*. In 1852 (p. 145) some historical notes were given, on the occasion of the rebuilding of the parish church (with the exception of the tower, restored a few years previously) under the direction of Mr. P. C. Hardwick. The church contains several monumental brasses, including that of Elias Ashmole, the well-known antiquary and founder of the Ashmolean Museum at Oxford, who died in 1692; and in the churchyard is a monument to the Tradescants, the noted collectors. In 1856 the Surrey Archæological Society visited the Palace, as recorded in the *Builder* for that year, pp. 590, 604-5. At p. 591 of the same volume will be found the following illustrations, viz.: (1) view in the crypt beneath the chapel; (2) view of the Lollards' Tower and part of the chapel, from the gardens; and (3) doorway of the chapel and entrance to the Lollards' Tower.

matter which, though in some degree personal, was of great interest not only to the architectural profession, but to the public generally. What had happened at St. Paul's Cathedral had occurred at Lambeth Palace. In each case an architect had been called in and consulted as to a scheme of decoration, and in each case the architect so called in had been practically dismissed on the *dictum* of Mr. Gambier Parry and others that "decoration was not within the architect's province." Whose province was it, then? Was it that of painters, who, as a rule, knew little of architectural details? Or was such work to be given over to professional decorators,—men who took up such work, not as a labour of love, but merely as a matter of profit? Were glass-painters hereafter to step in and take out of the charge of the architect all that pertained to the decoration of buildings? The specious pretence on which such proposals were made was that it was not recognised by the public that architects had studied this province of art, and that therefore it was better that such work should be in the hands of men who were engaged in nothing else,—in decorators' hands, in fact. The decorative works now in progress Mr. Seddon said he believed were merely tentative, with the view (firstly) of ascertaining the effect, and (secondly) of preparing the chapel for use on the occasion of the Pan-Anglican Synod to be held this summer at the palace. Really fine painted decoration in such an atmosphere as that contiguous to the Lambeth potteries, and on so perishable a groundwork as a lath-and-plaster vault, would be thrown away, as it must in a few years be utterly destroyed. Such a scheme of decoration as he had proposed, in imperishable materials, was alone worthy of the building, which ought not to be treated with less interest and care than the Sainte Chapelle at Paris.*

Leaving the chapel, the visitors ascended the Lollards' Tower, and inspected the prison-room, with the quaint inscriptions cut by some of the poor prisoners and martyrs for conscience-sake on the wood-bound walls of the small apartment. A few steps higher, and the visitors found themselves on the roof, whence a fine panoramic view of London was obtained, as well as of the palace grounds, those who were strangers to the place expressing surprise at the extent of the palace garden grounds and adjoining meadows, which, notwithstanding the hydrochloric acid fumes said to be given off in large quantities from the adjacent potteries, were bright and verdant. With reference to these fumes, Mr. Seddon pointed out the extensive and complete nature of the decay of the stonework, especially of the archiepiscopal palace erected from the designs of Blore. The stone used here is of the Bath or oolitic variety, and so dangerous had some of it become that Mr. Seddon had been obliged to cut off all gurgoyles and some other projections. The decay was almost as complete and rapid with the harder stone used by Mr. Ewan Christian some four years ago in restoring the entrance gateway. The various silicates which had been used seemed of little avail, except one, which was applied about a quarter of a century ago to some of the brickwork of the Lollards' Tower, with good preservative effects. Unfortunately, no record is known to exist as to the kind of silicate used at that time. Having descended the Lollards' Tower, the visitors inspected some of the apartments of the palace, that of chief interest being what is called the "Guard Room," now used as the state dining-room. Here are ranged round the walls portraits of many of Archbishop Tait's predecessors. Apart from the historic interest of this collection, its artistic merits are very great, the painters' names including those of Vandyck, Holbein, Sir Peter Lely, Sir Martin Archer Shee, and others of repute. The visitors were unable to obtain access to the library, as a meeting was being held there in aid of Miss Leigh's mission homes in Paris. Had the library been disengaged, however, the visitors would, by the kindness of the librarian, Mr. S. W. Kershaw, M.A., have had an opportunity of seeing some of the rare books. However, the library is open three days a week to the public. Having returned to the chapel to inspect Salviati's mosaic picture at the east end, the visitors left the palace, and, proceeding a short distance up the Albert Embankment, paid a brief visit to Mr. Jesse Rust's new manufactory of glass mosaic. Mr. Rust kindly explained the details of his manufacture, which is a striking illustration of the convertibility of apparently waste materials (such as broken glass, &c.) into wall-decorations and pavements which will be "things of beauty" in proportion to the art-power of their designers, and which, provided their design be good, are calculated, from the durability of the material, to be "joys for ever,"—or, at any rate, for a very long time.

* In the *Builder* for 1856 (p. 604), we said,—"It [the chapel of Lambeth Palace] affords an admirable object for appropriate decoration, and might be made into a minor Sainte Chapelle."

ROMAN REMAINS AT ITCHEN ABBAS.

An antiquarian discovery of no small interest was announced by the Rev. C. Collier, F.S.A., of the Winchester Training College, at the last meeting of the British Archæological Association. It has recently been made at Itchen Abbas, near Winchester. Late in the autumn the proposal for excavating the site of a Roman villa, which was known to exist there, was discussed among a few archæologists of Winchester and its locality, and some tentative explorations were made. These were of a very encouraging nature; for two trial-holes, sunk a very small depth into the earth, revealed the existence of two tesselated pavements. Funds were soon collected; but the work of research was unavoidably postponed until the spring. They were commenced in good earnest a few weeks ago, and very shortly afterwards one of the tesselated pavements, and then the other, was cleared of the earth which had covered them for the last seventeen centuries or so. It had done more. It had preserved them; and the excavators were rewarded by finding these art-treasures almost perfect,—one, in fact, is perfect; the other is damaged only slightly,—and with their colours fresh as when laid down, under such altered circumstances, so many centuries ago. This is the more remarkable, since they were only about 18 in. below the present level of the earth. The walls of the rooms of the villa are fully 1 ft. high, thus coming to within but 6 in. of the surface. They retain much of their plaster coverings. The ornamental portions of the pavement are enclosed with a broad border of ordinary red tesseræ, and the central portion is, in one case, about 16 ft. by 8 ft. in extent; in the other, 6 ft. by 6 ft. They are formed of small dies, as usual, red, white, and black in colour, the larger pavement having a circular centre, filled with an eight-leaved flower, with bold fret border around it, in black and red. The spaces of the parallelogram right and left of the circle are formed of panels, enclosing in each case a two-handled vase, from which, on either side, extends a bold scroll pattern in white. The borders are formed by guilloche and interlaced patterns. The second pavement has a pattern of elaborate design, the broad border being a complicated fret at the four corners, with panels between. The centre is wholly filled with an interlaced fret pattern, in red and white, on a black ground.

The excavations revealed many traces of the former inhabitants; many examples of pottery of Samian and other wares have been found; a large quantity of bones, as is usual on such sites; many of the roofing tiles of the building, with the nails still remaining; but only two coins. The flues from the hypocaust are all but perfect, as is apparently the hypocaust itself, but this has not yet been cleared out. The arch of entrance has been uncovered, and is found to be formed of tiles now in a very decayed condition. The site stands high and exposed, overlooking the valley of the Itchen, with a magnificent prospect, and not on low ground, as is often the case. The villa has had a south-west frontage. The remainder of the villa has yet to be excavated, and more important results may be hoped for.

At a recent meeting of the British Archæological Association, the Rev. C. Collier exhibited drawings of the pavements, which will be engraved in the next part of the Journal. The Chairman, Mr. Syer Cuming, F.S.A. (Scotland), called attention to the occurrence of the vases, which are of very similar form to those of the India House pavement, discovered early in the present century, where they were accompanied by the form of Bacchus, and suggested that the apartment had been devoted to dining and festive purposes.

Mr. Loftus Brock, F.S.A., identified some of the peculiar pottery found as being the production of the Roman kilns in the New Forest. The coins found were of the time of the Emperor Constantine, but the patterns of the pavements, and the style of the workmanship pointed to an earlier date than even this respectable antiquity.

Much praise is due to the archæologists who have inaugurated these important researches, and thus proved that there are yet Roman pavements to be found in England, although of late years only a very few have been heard of. Also to Mr. E. Shelley, of Avington Park, the owner of the land; and not least, to Mr. Way, the tenant, who has in every manner assisted the explorers, and who has with much considerate forethought covered the pavements over to protect them from injury during the temporary cessation of the works. It is very much to be desired that these remains should be covered over with a building, and thus permanently protected. This has been done to the neighbouring pavements at Bramdean.

THE REFORMS IN HOUSE-CONSTRUCTION DEMANDED BY SANITARY SCIENCE.

Under this title Dr. Balbirnie read a paper at the Society of Arts on the 1st inst., in which he referred to various evils and advised various improvements in house-planning, which have all at various times been discussed in these pages. The real question is how they are to be brought about, and we have not had an opportunity to examine the lecturer's plans and models. These, we understand, are to be sent to South Kensington Museum, so that if we find it desirable we may speak of them hereafter. In the meanwhile we print a portion of the paper:—

A sanitary revolution in the architecture of the dwellings of the industrial and other classes is now imperatively called for, as one of the essential domestic necessities of this age. The houses of even the wealthy are far too often in flagrant antagonism to the first teachings of physiology,—the basis of all sanitary science. As regards the working classes, how dear, in every way, to the general community, is the cost of the pestilent dens in which crowds of them are cooped up in great towns, is a theme that needs not to be here enlarged upon. Suffice it that Governments have awakened up to the magnitude of the evil, and have resolved to lay the axe to the root of the tree.

In what way best to replace effete tenements, and what are the most suitable buildings to fill up the new sites outside our great manufacturing centres, daily opening to receive an ever-expanding population,—is an inquiry that constitutes the most pregnant social problem of the day,—a problem in which, it is conceded, the sanitarian must go before and direct the architect.

In discussing this great topic it behoves, first, to unfold and insist on the radical alterations sanitary science dictates, as the regulating principles of construction in the future abodes of man, especially in closely packed populations; secondly, to reduce theory to practice on a small scale, until largely tested; in other words, to illustrate the innovations called for by a series of plans and models.

Under the first leading head of discourse I shall take up, *seriatim*:—

1st. The plan proper of a dwelling-house and its appurtenances; or the imperative domestic conveniences in a healthful and comfortable domicile, for any class of tenants.

2nd. The thorough ventilation of houses without cool draughts.

3rd. The heating of houses without expensive or easily deranged mechanism.

4th, and lastly. The cooling of houses, without risk or trouble, in hot seasons and climates. This last will be found an entirely new and hitherto unattempted branch of the architecture of the interior of houses, not to say of ironclads and other ships. This, in any case, will be a subject of interest to the rich denizens of the tropics.

The first subject of our programme is the proper arrangement of suites of apartments, larger or smaller, with their annexes.

The four essential compartments of a dwelling-house, in which there are at present radical defects, are—1st. The porch, lobby, vestibule, or entrance-hall. 2nd. The staircase. 3rd. The water-closet. 4th. The sub-divisions of the kitchen, or other rooms. Of course, all my observations refer to the close-pent houses of towns. These are of two classes: (*a*) massive "blocks" of many stories, for large numbers of tenants on one floor, under one roof, the "horizontal" or "flat" system, as it is called; and (*b*) houses less lofty, and less massive, in various degrees,—the "perpendicular" system, where

each tenant has his apartments one story above another.

The porch, lobby, vestibule, or entrance-hall of a domicile, the common medium of access to its suite of rooms, should be the most carefully, —I need not say the most tastefully,—laid-out portion of our domestic arrangements. Yet nothing has been more neglected. The majority of the houses of the working community, even of a steady high-wage class, are without it entirely. This primary appendage and introduction to a healthy set of apartments should, in all cases, be well lighted, and should open directly to the winds of heaven. As a rule, however, in the houses of well-to-do, or even wealthy, people, it is confined and paltry in its dimensions, usually dark and gloomy, and unventilated, save in the short and spasmodic intervals of opening and shutting the main door. From this proceeds, often at two paces distance only, a steep staircase, like a ladder, direct, without rest or turn, to the floor above. In the artisans' houses, generally, this upper landing is a short *cul de sac*, without direct light or air. And be assured, wherever there is darkness, there is dirt and bad air! In the houses on the "flat" system,—and they are by thousands in Glasgow and Edinburgh,—the lobby has seldom anything but borrowed light, and not much of that. My plans and models will show how completely this may be remedied.

To recommend this portion of an architect's work to his most careful planning, it needs only to say that it is to the household economy what the lungs are to the body,—a direct ventilating medium, the indispensable aërating and purifying apparatus that prevents putrescence of the living fabric. This primary inlet and outlet of the domicile being so placed as freely to let in the light of day, and the air of day or night, is a guarantee for freshness of atmosphere.

From this showing, two things are clear,—two great canons of construction are established. 1st. That the omission of architects and builders to do justice to the vestibule of a house is reprehensible, as failing to turn to account the first sanitary "coign of vantage" to be secured in a fitting residence, of whatever dimensions, for any class of people. And 2nd, that a well-placed, well-lighted, well-ventilated entrance-hall should be the prominent feature, the distinctive peculiarity, the *sine quâ non*, of a thoroughly sanitary residence. We have accordingly given this, however, humble the scale of dwelling, due and conspicuous place, in all the plans and models submitted for criticism. But how many, or rather how few, of even first-class town houses, have anything like adequate entrance-halls, well-lighted and well-ventilated,—not to say well-planned and well-adorned? As the class of building and of tenant rises, the greater the necessity for a fitting entrance, and the greater the scope for its size and ornamentation.

The staircases of our day and of past times come now to be reviewed. Here a fundamental and baneful error of construction has been perpetuated, I am sorry to say, in our recent "improved industrial" dwellings,—even the dwellings of Mr. Peabody's trust, of Sir Sydney Waterlow, and others. It is to be hoped, however, that no future buildings of the sort will be disgraced by this error; nor the health of the occupants, as is too often the case now, compromised by preventible evils.

The staircases that concern us are divisible into two leading classes—1st. Those of large blocks for a multitude of tenants. 2nd. Those of single or "self-contained" houses. The great blocks have, for the most part, inner staircases; this in London almost without exception. In Scotland, circular staircases to the back are very common; also square staircases to the front, but within the line of the front walls. In Paris, this square staircase is frequent, towards the back of the block, but not projecting beyond the walls.

Dr. Richardson has objected to these inner staircases on the best grounds. He declares them, as a rule, incompatible with the health of the inmates of the houses so reached; that such a construction is antagonistic to the first laws of physiology; and this all the more the greater the number of single families that have apartments right and left off the landings of such stairs. These share among them a common lobby of access on each side of the stairs, and the lobbies are always dark and unventilated. The evils of this system may be readily conceived. Every time infectious disease prevails in any of these close-packed families,—rather a frequent event,—all the neighbours have a species of blockade to run every time they have to reach or leave their own dwellings. I have shown, by plans and models, how clumsy, dark, inconvenient, expensive, and unsanitary such staircases are, even when bettered by the best expedients, compared with the system I advocate of outside corridors or open galleries of access to the rows of apartments on each floor. These massive verandahs, or hanging balconies, strongly propped and tied, when of iron, from story to story, or solidly built, colonnade wise, in a more expensive style of house, I propose to be reached from a spacious staircase, quite through and through the block, made fire-proof, or by staircases attached to the back. As a rule, these common centres and ways of approach to this community of tenants under one roof should have their windows always open, or nearly so. In this way, there is no close or confined air about the back apartments, nothing approaching to the "stuffy" atmosphere of the central corridors of great hotels.

The second division of domestic staircases are those belonging to smaller blocks, containing individual or self-contained residences,— the "Perpendicular" system, so-called, where every tenant has two or more stories for himself. This second category consists of four classes of stairs, and they all require entire reform. The first of these sub-classes occurs only in poor artisans' houses and in "jerry" buildings. Such houses are usually built back to back, or, where a central wall longitudinally through the block divides the tenants into two distinct series, front row and back row. In all these cases there is a narrow, steep, dark, unventilated staircase leading to the story or stories above. This objectionable central staircase also obtains in a much better class of houses, where a front room and a back kitchen have corresponding rooms above them, with garrets and cellars.

The second and sub-class is that I have already alluded to, where the staircase proceeds straight up from the front door, at a distance of two paces, to a dark, small, airless landing above. Such houses have often a room on each side on entering, and two corresponding rooms upstairs. These two classes of stairs are often closed up by doors, rendering them doubly dark and airless. The first should be abolished entirely, and the staircase made as I have shown in plan, leading up from the front door by a "well" 6 ft. wide, and extending the whole depth of the dwelling. The front of this "well" upstairs is open to the day. In a better class of this sort there is a porch; over this, on the first floor, there is a bath-room and W.C., and a small passage with a window on each side, virtually detaching this necessary appendage entirely from the house.

The third sub-class of these objectionable staircases obtains in the mansions of the wealthy in our best streets. (Of course we are only here treating of houses built in rows.) I illustrate them by plans and sections cut out of a standard work in its day—the *Builders' Magazine*, 1788. The staircase is placed in the centre of the house, on one side of the entrance-hall, between the front and back apartments, and always lighted by a close skylight. Here, as a rule, there is no pure air, and the odours from the kitchen and servants' rooms and offices in the basement are continually percolating into all the upper regions. A Howorth or Banner ventilator at the top, with air-inlets under the stairs on each floor, from front and back, is the only palliator of this faulty arrangement. But no houses henceforth should be built of this type.

The fourth sub-class of staircase is the best of this unhappy series, as admitting of direct light and air. It abuts upon the back wall of the house, is directly in front of the main-door, and at the end of the entrance-hall. It only requires to be moved 7 ft. or 8 ft. farther back from the wall, to be in its right situation. Then t will give space for a water-closet and bath-room and an intervening passage of 2 ft., or 3 ft., or 4 ft., with its window on either hand, effectually isolating these conveniences from the main body of the building. This is the staircase that will henceforth obtain in the best class of houses. I recommend every second landing to be kept entirely open, for the purpose of forming a small conservatory or picture-gallery; in either case, to flood with light the landings and central-halls of each story. This should be still further effected by a dome-light at the top of the stair "well," with Howorth or Banner ventilator; and if without a skylight here, there should, at all events, be a ventilator through an aperture in the ceiling. In this way, there would be a regular exhausting medium of all the foul air of the house, an attractor of currents upwards from every lobby and apartment. This would tell in cold seasons, when all the windows were closed. In such houses, properly constructed *ab initio*, no one would ever breathe the same air twice, a sanitary consummation devoutly to be wished. And fresh air need not be frosty air. But of all this anon.

The position of the water-closet (including the bath-room) has now to be discussed. This necessary appanage of all dwellings, from the humblest up, should always have a window to the open air, also an intervening or intersecting lobby, with a window on each side wherever practicable, to give a through current. This will throw out a projection of at least six or eight square feet from the house, which projection may be utilised in many ways; below, for a porch or scullery, above, for a conservatory or dressing-room, or a repetition of the bath-room and watercloset. These essential points of domestic convenience, comfort, privacy, delicacy, and self respect have been too much neglected in times past by architects and builders. In very fine mansions in town and country we find the water-closet set in holes and corners, or off inner stairs and passages, mostly in central places where direct light and air were impossible. In hotels, hospitals, boarding-houses, hydropathic establishments, &c., these evils are rampant. In all places, the crowded resort of human beings, the water-closet system should be quite detached from the main building. This has seldom been attended to. I have made it an essential feature of the large blocks planned and reduced to model, and proposed as the sort of buildings that may with credit and increased usefulness adorn the clear "slums," and replace the departing "rookeries." The water-closets are near and easy of access to all tenants, yet sufficiently remote not to be a nuisance, nor are they so much in the way as to arrest attention. This is the only permissible arrangement for large working-men's blocks in the City, where land is dear. But in suburban districts and in newly-laid-out sites in the country every steady man of the working class should be in his own little castle—his house of two stories, if only of four rooms. In this he should have *multum in parvo* of accommodation, but especially his bath-room and water-closet—the bath-room always, in any case from the time he can occupy the two-room dwelling of the large City block. But elsewhere, in the smaller blocks, the bath-room and the water-closet must always go together. Nothing will so enhance a man or woman's self-respect as this quiet, unobtrusive arrangement. The community of these essential necessities of civilised humanity is only tolerated in large establishments holding large bodies of people.

To sum up and emphasise my proposition on this head, I contend that it should be a grand architectural canon henceforth, that staircases, as a rule, should, in the houses in question, be at the further end of halls or lobbies leading directly from the front-door, and that they should project at least 7 ft. or 8 ft. from the main wall, and should be to all intents and purposes, insulated by an intervening passage continuous with the stair-landing. At each side of this small passage should be a window, to ensure a through draught at command. This arrangement can be carried out without very much expense of time or material, or loss of ground, even in buildings of the humblest pretensions.

Before I conclude my strictures, it behoves me to describe a variety of innovations, introduced with the double view at once of economising space and saving the working man expense in cupboards, store-presses, or closets, wardrobes and drawers. I refer to the simple utilisation of the corners of apartments for the most part. Without much infringement on the actual usable space of a room, we may carve out three or four snug closets, two of them always with a window each to the daylight. Here we have virtual or real larders, sculleries, pantries, bath-rooms, wardrobes, store-presses, and closets galore, available in the humblest dwellings, of one or two "pieces," for the poorest working man—all indispensable conveniences of a household, now found only in tenements for a higher class, and here put up at a very little expense, and therefore at only a small increase of rent. Even in houses of quality and pretence, for the same class of men when become rich masters, I have used freely these resources, especially in the arrangements of the kitchen.

All kitchens, I contend, no matter how spacious,

in closely packed town-houses, should have their corners so utilised. In one of these with a window should be the scullery with its sink and hot-water tap from the close adjoining kitchen range. On the other side of the central window lighting the kitchen, should be the corresponding closet with its window, a convenient site for a supplementary kitchen, larder, or pantry, or both in one. In those cases the space in front of the kitchen window would give room for an ample table with drawers on one side, and a coal-bunker on the other. All my plans are replete with these expedients for profitably using up vacant or superfluous space, where the necessities of the tenant require a series of conveniences to be placed at hand or within the smallest available limits.

The next great topic for discussion is the very pregnant one of ventilation. A safe and valid mode of introducing fresh air into our houses is the question of questions in domestic economy. Here an entire revolution is called for, and is at hand. The theory is all cut and dry, finished and perfect, to the satisfaction of an inquirer. All that remains now is to put the well-matured plans into practice. Advanced as the present highly civilised era is in the arts of construction, and with the means of wealthy and polished communities at command, we are still far behind in the appliances for perfect ventilation. It is an easy thing in theory and in fact to ventilate a house by letting in floods of fresh air from an open window or wall-openings, Sherringham or otherwise. And, in fine weather, there cannot be too much of this,—provided one keeps out of draughts. But when cold weather comes cold air is eschewed as fraught with danger. And the prejudice is partly justified, because of the clumsiness of the fresh-air expedients. Even our hardy soldiers, in cold nights, in model barracks (as I happen to know), prefer to stifle themselves,—to close up all means of access of pure air, because it is cold, and they think riskful. Now the point to gain, and it is an easy point, is the construction of house (whether on a large or small scale) on such a simple, inexpensive, universally applicable principle, that pure heated air in cold climates, and pure cooled air in hot climates, will be circulated throughout all parts of human habitations and places of assembly, by one identical machinery yielding at command a hot or cold fountain of supply, and this of all intermediate degrees of temperature, just as the necessities of the season dictate. This machinery, I say, in building a house, is inexpensive to construct, is liable to no derangements, and requires little supervision. My plans, models, dissected models, and diagrams show all this. By these improved methods there will be no excuse henceforth either for bad ventilation or the alternate evil of cold draughts in our houses; nor will the atmosphere of a picture gallery, like the Grosvenor, as occurred one day there last summer, resemble that of the hot room of a Turkish bath. To avoid breathing tainted air, people need not, after this, be exposed to the chances of chills and colds, of coughs and quinsies, of rheumatism and inflammation. I greatly mistake if an immense number of our finest buildings, our palaces, law courts, club-houses, colleges, picture-galleries, museums, theatres, concert-rooms, hotels, hospitals, churches, &c., will not demand to be fitted, at any expense, with the mechanism to these ends. But with new buildings, projected or started, and with our embryo ironclads on the stocks, the incorporation with the architect's designs of a valid ventilating, heating, and cooling apparatus, pervading every department, chamber, and floor, will cost comparatively little time, trouble, or material to carry the new system into effect.

This question, then, of ventilating, heating, and cooling human habitations, I shall now discuss under one head,—for they are but parts of one perfect system,—the action of one identical mechanism, modified to meet the demands of varying seasons and circumstances. Nor, in all this, do I make any pretensions to novelty or discovery. I simply turn to account a great principle of circulation every day adopted in coal-mines, and which, moreover, has been well tested and attested for forty years in the Pentonville Prison. The really wonderful thing is, that a simple, safe, sure, and inexpensive scientific expedient has not been largely supplied by architects to the great public buildings above enumerated. If this hot or cold current never escaped from its flues, but merely circulated through hollow walls and hollow floors, from its entrance in the basement to its exit 30 ft. or 40 ft. above the roof, the atmosphere of the whole house, in every chamber, hall, lobby, and staircase, would be uniformly warm and genial in the coldest weather, and as uniformly cool and bracing in the heat of summer or the tropics.

Of this comprehensive circulatory agency, a grand central, all-commanding chimney, with a never extinguished fire near its summit, is the motive power—the medium of exhaustion or elimination of all the vitiated and residual air in every chamber, hall, passage, and staircase of the largest possible building. The walls are proposed to be hollow—to have a continuous interspace throughout of from 4 in. to 1 ft. at an average, along which vacancy in the walls, and the same in the floors, a continuous stream of air, cooled or heated, or *au naturel*, is conducted from a chamber of supply in the basement, till it finds its exit by the great chimney,—just as a river disembogues itself into the vast ocean,—there losing all the foulness and all the *débris* it had swept down in its current. No one who understands mechanics will here presume to say that a hollow wall, or floor, or pillar, or girder may not be as valid support for the weight it has to bear as if made solid. This sort of thing applied to steamships will be much simpler work than in house construction, because there there is so much hollow wall, and hollow floor, and hollow mast, hollow funnel, and hollow foundation (the kelson), that the whole art necessary is the fitting of holes here and there, to make the communications continuous, and this without infringing the integrity of its separate compartments. For the rest, there is the non-utilised draught up the funnel,—the *primum mobile*, henceforth, of a perfect system of ventilation, and of the circulation of cold or warm air in all steam-going ships, fighting or commercial.

As regards this power to pervade large or small blocks, or isolated houses, with pure air, cold or warm, I may remark that the central chimney force is imperative for the large blocks; but that in single self-contained houses on the "perpendicular" principle, the ordinary chimney-breast, with its flues improved and added to, will be perfectly competent to this grand domestic acquisition,—the service of cold or warm air *ad libitum* throughout a household. This is no small recommendation of the system, as applied on a small scale, to rows of houses, or self-contained villas and mansions of all sizes. In the case of the poor, we hope the day is at hand that ventilation will be made compulsory, as education is for the same class.

Anyhow, I have a firm conviction,—and I want this recorded in all architectural books as coming from a physician,—that the want of this grand desideratum of social life,—a perfect system of ventilating, heating, and cooling houses,—has produced more prostration, mental and moral, more suffering, more disease, and more deaths than all other causes of human deterioration and extermination put together.

WROUGHT-IRON GATES, PARIS EXHIBITION.

In the notice of English Houses at the Paris Exhibition given in our last (p. 461, *ante*), it was stated, after describing a house erected by Messrs. William Cubitt & Co., of Gray's-inn-road, that some wrought-iron gates which have been prepared for the Right Hon. Lord Crewe are used to enclose the garden between this house and the end one. Of these gates we now give a view. They are of wrought and hammered iron, and are intended for one of the approaches at Crewe Hall, Cheshire. They were designed by Mr. Edward M. Barry, R.A., and manufactured by Messrs. Cubitt & Co.

HEALTHY HOUSES.

SIR,—In common with doubtless many of your readers, I have followed with interest the discussion on open pipes, traps, ventilation, &c., to which you have opened your columns. There is another subject of equal importance to "healthy houses,"—the proper mode of drying their basements, where the subsoil is clay or heavy land, and the basement is overlaid with flags or tiles periodically wet with washing, &c., considering that drains through or under houses are now condemned. Will some of your contributors, who are so competent to deal with the subject, take it up? Q.

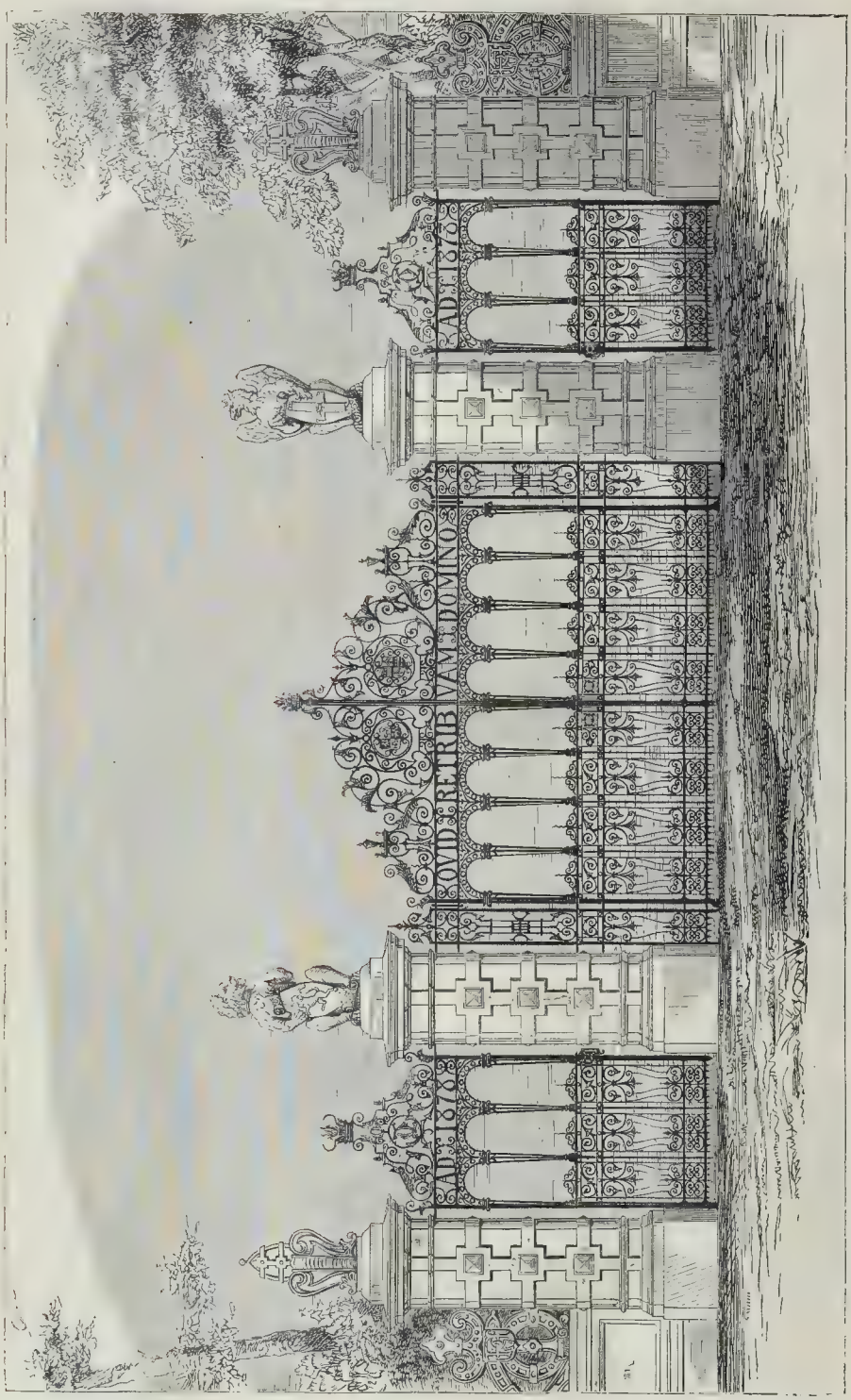
OXFORD UNIVERSITY OBSERVATORY.

In May, 1873, the Oxford University authorities, having determined to make the study of astronomy one of the advantages, and indeed, necessities, of university education for those who might intend in after-life to devote their time to that fascinating branch of research, agreed to purchase as perfect a refracting telescope as present science could produce, and to erect a building to contain it. Convocation resolved to request Mr. Charles Barry to furnish the design and plans for such a building, which might be capable of extension if need arose. Accordingly, in June following, Mr. Barry made a design which, from the limited means placed at that time at his disposal, about 2,000*l.*, could only consist of a square building to carry the requisite revolving dome for the telescope, and in its lower stories a computing-room and workshop. This was hardly commenced, when in November, 1873, Mr. De la Rue, whose name must always be associated with astronomical, and particularly lunar, research, made the generous offer to present to the new University Observatory his very valuable reflecting telescope, and several other valuable astronomical instruments (described below), conditionally that the building should be so far enlarged as to contain them efficiently in regard to their use by the professor and by students. The University at once responded to this wish, and the further portion of the design was undertaken, comprising the dome to contain the De la Rue telescope, and the annexe connecting it with the original central dome, which annexe should contain the other instruments. These two portions of the design were completed fit for use in March 1875, the contractors being Messrs. Symm, of Oxford, and the total cost 3,280*l.* The mechanical arrangements necessary for the revolving domes and the shifting roofs, for the transit and other instrument in the annexe, were skilfully designed by and carried out under the supervision of the late Mr. Price Prichard Baly, C.E.

Very soon after the building was finished, the zealous efforts and practical lectures of the Savilian Professor of Astronomy in Oxford, the Rev. Charles Pritchard, in whose charge the new observatory was placed, caused the formation of a very numerous class of students, and in 1876 the Professor reported to the Committee of Visitors that it became almost an essential to provide a fitting lecture-room and a reference library, and intimated that if these could not be provided in connexion with the observatory, the lectures must be given in some other building, though, of course, at great inconvenience. Nothing was, however, done that year; but upon a report from the Professor in June, 1877, further urging the growing needs of the observatory, the visitors obtained permission from Convocation to expend a further 2,000*l.* in providing a good lecture-room, library, and other conveniences, and for warming the centre building with a system of hot-water pipes, with a further 400*l.* for laying out grounds, fencing in, and incidental expenses. Mr. Barry then, at the request of the visitors, proposed to continue his design by the erection of those rooms communicating with the original centre block, and a tender for the same by Messrs. Symm was accepted, and the work at once commenced, and has now been brought to completion, so that lectures in the new room will at once be commenced.

It will be seen on reference to the plan and view how far the portion of the building erected realises Mr. Barry's complete design. The parts tinted solid are those erected. There is as yet no person resident in the building as caretaker,—an obvious necessity when the great value of its contents is remembered; this residence is proposed to be contained in some buildings around small open courts on the east side, kept low so as not to interfere with observations from the domes or flat roof over the lecture-room. Finally, to complete the building there would be a third telescope dome, an additional annexe connecting it with the central dome to contain additional instruments, and around a similar small courtyard some further rooms for students engaged in special studies, and for the gradual but essential extension of the library. It is to be hoped these will be added by the authorities at no distant date, when, in the words of the Professor's report of 1876, "The University observatory would become admirably efficient, both as a place for instruction and as an institution for original research."

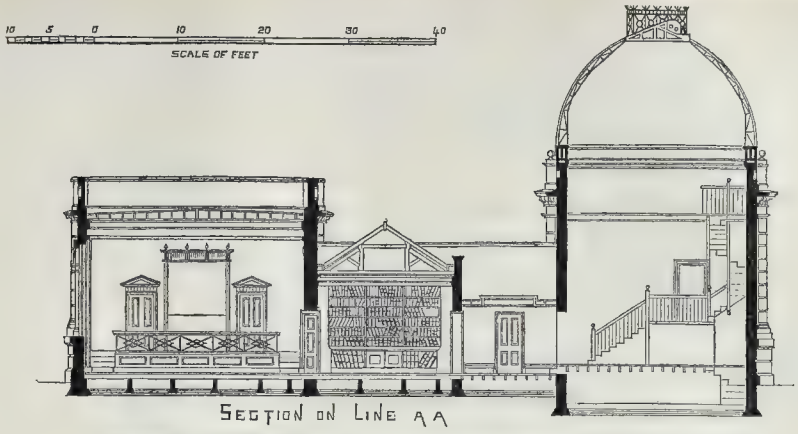
It should be mentioned that the new building is placed on a most admirable and beautiful site



WROUGHT IRON GATES, AT THE PARIS EXHIBITION.—Designed by Mr. Edward M. Barry, R.A., Architect.



OXFORD UNIVERSITY OBSERVATORY.—Mr. Charles Barry, F.S.A., Architect.



SECTION ON LINE A A



GENERAL PLAN

OXFORD OBSERVATORY.—*Plan and Section.*

in the middle of the great park, which is year by year becoming a more and more beautiful feature of the western end of the city of Oxford.

The mode of occupation of the building and its valuable contents are as follows:—In the larger dome of the building described there is erected a large refracting telescope, having an aperture of 12¼ in. and a focal length of about 15 ft. It is mounted and provided with all the accessories of the most advanced science and modern skill, and is probably not surpassed by any instrument of its kind and dimensions. It has now been in use for two years and a half, and well sustains the reputation of Mr. Howard Grubb, of Dublin.

In the smaller dome is placed Mr. De la Rue's well-known reflecting telescope of 13 in. aperture. This instrument, together with many others, was the munificent gift of that gentleman. At present it is devoted to lunar photography; about 1,200 measurable photographs of the moon have already been secured, and they will soon be subjected to the scrutiny of Mr. De la Rue's large micrometrical engine for the purpose of measuring the mutation of the moon's axis, if such exists to an appreciable amount.

In the two divisions of the corridor are placed a transit instrument, and a second reflecting telescope from Mr. De la Rue mounted as an altazimuth. It is now being fitted by that gentleman with apparatus for photographing the sun's photosphere on a large scale, with a view of ascertaining the details and change of details thereon.

In the basement is placed Mr. De la Rue's engine for polishing specula: the remainder serves for photography, for a darkened optical room, and for a workshop for the skilled mechanic who acts as attendant on the observatory.

The flat top of the lecture-room is provided with a deep parapet, and with several small but very firm platforms, not in direct communication with the roof. It serves as an out-of-door observatory, or open-air lecture-room for the university students. On these platforms are to be placed a reflecting telescope of 10¼ in. aperture, a refracting telescope of 4½ in. aperture, a sextant, a small portable transit circle, and a transparent star-drum movable round an axis parallel to that of the earth: on this cylinder are projected all the principal stars and the celestial circles. An arrangement of this sort promises to secure several advantages for the instruction of the students, which are not afforded by a closed observatory.

It should be added that the entire building is warmed with hot water.

There are gratings in the floor of the two domes through which in continued damp weather warm air can be introduced, and thereby prevent the mischievous deposition of moisture which is so injurious to instruments when unprotected.

If it be asked, as it naturally may be, what results have been so far obtained, from the costly apparatus thus detailed, it may be stated that, independently of the large amount of lunar photography which has been already referred to, the delegates of the Clarendon Press are now printing (with a view to circulation) the observations made from the autumn of 1875, so soon, that is, as the instruments were erected, to January 1st of the present year. They comprise three extensive series of the co-ordinates of Saturn's satellites. Observations of the fine orbs of the six comets of 1877, together with the elements of their orbits, as computed from Oxford observations. Four hundred double star observations, together with the elements of the elliptical orbits of three of them. Finally, the newly-discovered small satellites of Mars have been observed. The above work is independent of a continued series of lectures to the University students during term time, and a certain amount of practical work completed by themselves.

Such are the provisions which the University of Oxford has made for the instruction of her higher order of students in the science of astronomy, and for furnishing the Professor with the means of advancing the science itself. Nor are arrangements forgotten for that more numerous class, who may be inclined to pursue the more interesting and alluring branches of it which require no very deep acquaintance with mathematics. It is, however, only right to add that the amount of pecuniary encouragement held out in Oxford to the students in other branches of learning is considerable, while but little has yet been done for the most ancient, the most practically useful, the most elevating of the sciences. The facts of the case have been brought under the notice of the Board of Visitors, and the Observatory, and of the University Commission; and as the University of Oxford has invariably acted in a fair and liberal spirit when properly and accurately informed of the issues before it, there can be but little doubt that in due time the want of encouragement which has been the fate of astronomy will be effectually removed.

FACTORY CHIMNEY CONSTRUCTION.*

The shaft of Messrs. E. Brooks & Sons' chimney, fireclay works, Huddersfield, is built entirely of fireclay. It is 330 ft. high from foundation to top, and 315 ft. high from ground line. It rests on a concrete foundation, with ragstone footings 36 ft. square at the base, and 31 ft. square at the ground-line. The brick shaft is 27 ft. external diameter at ground level, and 15 ft. internal diameter at the same level, the diameter at top being 12 ft. externally and 9 ft. internally. The chimney contains the following materials: — 144 cubic yards concrete, 2,452 cubic feet ragstone footings, 3,341 cubic feet of ashlar, and 2,227 cubic yards brickwork. The cap being so large, and overhanging so much, has cost the firm at least 700*l*. The firm, from their experience, have arrived at the conviction that chimneys should be built with one regular batter from bottom to top, and that no stone should be used at top, any overlapping to be gradually formed with hard-burnt radiated firebricks, 14 in. by 5 in. by 3 in.

Chimney at Messrs. Mitchell, Brothers', Manchester-road, Bradford.—This chimney is of stone, and octagonal on plan. The height, from foundation to top, is 330 ft., the height from the ground being 300 ft. The flue is perpendicular, and 7 ft. in diameter. The foundation consists of one course of concrete, 22 ft. by 22 ft. by 1 ft., and one course 21 ft. by 21 ft. by 1 ft. The stack itself measures 20 ft. across at the foundation, and 9 ft. across at the summit. The chimney was designed by Mr. Mark Brayshaw, and built by Messrs. John Moulson & Son.

Chimney at Adams's Soap Works, Smethwick. This is a circular chimney. The height from the bottom of the foundation to the top of the chimney was originally 326 ft. 10 in., the height from the ground-level being 312 ft. The external diameter at the ground-line is 27 ft. 2 in., the internal diameter at the same level being 15 ft. 2 in. At the top the external and internal diameters are respectively 5 ft. 6 in. and 4 ft. Two thousand tons of bricks were used in its construction, together with 150 tons of concrete, sand, and lime. The chimney was built in 1835, and at the time of its erection it was the highest in the kingdom. The builder who began the stack felt alarmed when about half-way through his work, and the firm had to finish it themselves. It has been five times struck by lightning,—once during the building, and four times since. No very serious damage was done to it by the electric fluid; but once, when perhaps from the same cause, and the abstraction of the lime by hydrochloric acid from the mortar, the owner was compelled to take down a portion of the top. A few years ago, about 30 ft. more were removed by Mr. Frith, builder, of Coventry, by means of a kite, without stopping the works. The total height is now about 250 ft.

Chimney at Camperdown Linen Works, Lochee. This chimney is square up to the height of 230 ft., where there is a balcony or cornice, and from this to the top the form is octagonal, and finished with a heavy moulded coping. It is built in different panels, and ornamented with various designs in parti-coloured bricks. The base externally is of ashlar, and surmounted by a massive moulding in stone. Above this is the first panel, the stiles or pilasters of which are chequered red and white; above this is a base moulding, out of which spring the stiles of the next or main panel, forming the shaft of the tower, and is 137 ft. high. It is relieved by loopholes in the centre, and sham clock-holes at the top, the stiles being striped red and white. The top of the panel is rounded or arched, and above it are two smaller panels, surmounted by a frieze and other ornaments in white and black bricks; over this is a cornice or balcony, with square turret at each corner, between which is an ornamental railing. There is access to the balcony by means of an iron ladder, built into one of the corners, the outside walls being square, while the smoke-shaft, or flue, is round, thus leaving an empty space in each corner, one of which has been used for this purpose. The smoke is admitted into the chimney by elliptical openings 9 ft. 6 in. by 5 ft. 6 in. in each of the four sides, but only two are yet in use. At present there are fifty-eight furnaces connected to the chimney, and also the smoke from thirteen forges in the smith's shop, and the draught is also utilised for some other purposes. The strength of the draught at present is equal to 1½ in., which goes to prove that the chimney would be capable of doing double the amount of work it is doing now. The following are some of the principal dimensions:—Foundations, 35 ft. square,—walls, 12 ft. thick. At surface of the ground, 30 ft. square,—walls, 6 ft. thick. At top of first panel, 24 ft. square, —walls, 3 ft. 5 in. thick. At top of main panel, 21 ft. 3 in. square,—walls, 2 ft. 5 in. thick. At the top of balcony, 20 ft. 3 in. square,—walls, 2 ft. 0½ in. thick. At the top of chimney, 19 ft. square,—walls, 1 ft. 6 in. thick. Diameter of smoke-shaft at bottom, 14 ft. 6 in.,—walls, 1 ft. 6 in. thick. Diameter of smoke-shaft at top, 13 ft. 8 in.,—walls, 9 in. thick. Height from foundations, 296 ft. Height from surface of ground, 282 ft. The chimney was designed by Mr. James Maclaren, for Messrs. Cox Brothers, of the Camperdown Linen Works.

Wrought-iron Chimney, Messrs. Schneider's Works, Creusot.—This chimney has a height above the ground level of 279 ft., with a diameter at the top of 7 ft. 6½ in., and at the base of 22 ft. 11½ in. The weight is 80 tons. Its dimensions obviously precluded its being raised in a single piece without the employment of appliances which were considered inadmissible. Under these circumstances it was decided to erect the chimney in parts, without the use of any fixed scaffolding whatever. The chimney is founded on a mass of masonry rising about 3 ft. 3 in. above the level of the ground, and weighing about 300 tons, the base of the structure,—which is spread,—being fixed to this masonry by a very strong angle-iron ring riveted to the chimney-plates, and secured to the foundation by holding-down bolts. The chimney, properly so-called, is composed of rings 4 ft. 1 in. in height, the plates varying from 0·552 in. thick at the base to 0·275 in. thick at the summit. At the ninth ring the circumference is made up of eight plates, while at the upper part the rings are each composed of four plates only. To protect the plates from the heat arising from the combustion of the gas, and to prevent the lower rings from being injured, an inner shaft of fire-brick is carried up within the iron casing to the height of eight rings.

Chimney at the West Cumberland Hæmatite Ironworks.—The principal dimensions of this chimney, which was designed by the late Professor Macquorn Rankine, are as follow:—Height above the ground-line, 250 ft.; depth of foundation below the ground-line (including a layer of concrete 3 ft. deep), 17 ft.; total height from foundation to top, 267 ft. Inside diameter at top of cone, 13 ft.; inside diameter at 2 ft. above bottom of cone, 21 ft. 10 in. Inside diameter in basement, 18 ft. 10 in.; inside diameter of archways for flues, 7 ft. 6 in. Outside diameter at top of cone, 15 ft. 3 in.; outside diameter at 2 ft. above bottom of cone, 25 ft. 7 in. Outside dimensions of foundation course, 31 ft. 6 in. by 31 ft. 6 in.; outside dimensions of concrete foundations, 34 ft. 6 in. by 34 ft. 6 in. This chimney has to carry off the gaseous products of combustion from four blast-furnaces, and from various stoves and boilers. Above ground the chimney is a frustum of a cone, with a straight batter. Underground there is a plinth or basement octagonal outside at the ground-line and square at the bottom; cylindrical inside and pierced with four circular openings for flues. The reason for adopting a straight batter, notwithstanding that a curved batter enables certain theoretical conditions to be more perfectly fulfilled, is that the accuracy of building with a straight batter can be tested at any moment by a glance of the eye, without the aid of instruments. The change from the square to the octagonal shape in the basement is made gradually by stepping the brickwork at the corners. It had previously been ascertained by observation of the success and failure of actual chimneys, and especially of those which respectively stood and fell during the violent storms of 1856, that in order that a round

* From a paper by Mr. R. M. Bancroft, C.E., recently read before the Civil and Mechanical Engineers' Society. Concluded from p. 463, *ante*.

chimney in this country may be sufficiently stable, its weight should be such that a pressure of wind of about 55 lb. per square foot of a plane surface directly facing the wind, or 27½ lb. per square foot of the plane projection of a cylindrical surface,—that is to say, a pressure equivalent to the weight of a layer of brickwork 3 in. deep, and of an area equal to the vertical section of a round chimney,—shall not cause the resultant pressure at any bed joint to deviate from the axis of the chimney by more than one quarter of the outside diameter at that joint.* By calculating according to that principle, the thickness of brickwork in the cone was determined to be as follows:—Uppermost 80 ft. of height, 1½ brick; next 80 ft. of height, 2 bricks; next 88 ft. of height, 2 bricks; lowest 2 ft. of height, increasing by steps from 2½ bricks to 4 bricks, in order to spread the pressure on the basement. The bed joint of least stability is 2 ft. above the ground-line, and the deviation of the resultant pressure from the axis of the chimney at that joint, which would be produced by such a wind as has been mentioned, is 6 ft. 4 in., being a fraction of an inch less than one quarter of the outside diameter. The thickness of the arching in the openings for flues is three bricks. The following are the intensities of the mean pressures due to the load on different bed-joints:—At 2 ft. above the ground-line 8 tons on the square foot; in the basement at the springing of the arches, 3 tons on the square foot; on the upper surface of the concrete, 2 tons on the square foot; on the ground below, 1·6 tons on the square foot. The thicknesses of brickwork already stated include the fire-brick linings, whose thicknesses are as follow:—In the uppermost 160 ft. of the cone, ½ brick; in the lower part of the cone, the basement, and the flue archways, 1 brick. The firebrick lining is bonded with the common brickwork in the ordinary way, the only difference being that the firebricks are laid in fireclay and the common bricks in mortar. The reasons for adopting this mode of construction in preference to an internal firebrick chimney are as follow:—First, when the firebricks are bonded with the common bricks they contribute along with the common bricks to the stability of the chimney, whereas, if an internal firebrick chimney had been used, an additional thickness of common brickwork would have been required in order to give stability to the outer cone; secondly, unless the internal chimney is carried up to the top of the outer cone, there is a risk of damage through the explosion of inflammable gaseous mixtures in the space between; and thirdly, under the same circumstances, there is also a risk of the cracking of the outer cone, at and near the upper end of the inner cone, through unequal heating at that place. Vertical cracks in a chimney are the more dangerous the higher the level at which they occur, because the safety of the higher part of a chimney depends more on cohesion and less on weight than that of the lower parts. When such cracks take place near the ground, they are of little or no consequence. The basement is paved inside with 6 in. of firebrick resting on 6 in. of common brick, which rests on the concrete. The ordinary brickwork is of white bricks of very good quality, supplied by the Iron Company. It is built in English bond. In the basement there is one course of headers to every two courses of stretchers; in the cone one course of headers to every three courses of stretchers. Strips of No. 15 hoop-iron, tarred and sanded, are laid in the bed-joints of the cone, at intervals of 4 ft. in height, with their ends turned down into the side-joints. Care was taken to bed the hoop-iron on the common brickwork, and not on the firebrick lining. The length of hoop-iron in each bed-joint in which it is laid was twice the circumference of the chimney. In the concrete foundation, the basement, and a small part of the cone, the mortar was made of hydraulic lime. Owing to an unexpected difficulty in obtaining such lime on the spot, it had to be brought from a distance at considerable expense, and, therefore, the mortar for the rest of the structure was made of a very pure lime from the immediate neighbourhood, rendered artificially hydraulic by a mixture of iron scale from the rolling-mills at the works, it having been in the first place ascertained that the supply of iron scale could be furnished to the contractor with sufficient rapidity. The following are approximately the proportions of the ingredients of the mortar by measure:—Lime, 2 measures; scale, 1 measure; sand, 5 measures,—total, 8 measures. It is scarcely necessary to state that the use of iron scale for hardening mortar and making it artificially hydraulic is familiar to engineers, architects, and builders in Glasgow and its neighbourhood; but in many other parts of the country that process appears to be less known than it deserves. The principal constituents of the iron scale are probably silica and protoxide of iron; but its action upon lime, and the nature of the artificial cement which it forms, have not hitherto, so far as I know, been investigated by chemists. Considering the benefits that have arisen from the chemical analysis of other cementing materials, it is much to be wished that some chemist would undertake the examination of this material also. On the top of the chimney is a pitch-coated cast-iron curb, 1 in. thick, coming down 3 in. on the outside and inside. The lightning-conductor is a copper-wire rope about ¾ in. diameter. It terminates in a covered drain in which there is always a sufficient run of water. In the construction of the internal scaffolding, care was taken that the needles or horizontal beams should be supported wholly by the brickwork, and not by the upright posts, for great danger has been known to arise from the brickwork coming to bear upon the ends of the needles, and, through them, on to the posts, owing to the settlement of the lower part of the chimney. In order that the concrete foundation might have time to harden before being subjected to a heavy load, it was made by the Iron Company themselves before the contract for the chimney was let; for it was known that intense pressure tends to retard the hardening of concrete. The progress of the building was restricted by the specification to a rate not exceeding 6 ft. of vertical height per day. Tenders were taken from a limited number of builders in the North of England and in Scotland, and the lowest offer was accepted, being that of Messrs. William Wilson & Son, of Glasgow. The work was executed by that firm in a manner that left nothing to be desired. The following were the amounts of the estimated and actual cost respectively:—Engineers' approximate estimate, 1,672*l.*; actual cost, including designing and superintendence, 1,560*l.*; being at the rate of almost exactly 4d. per cubic foot of the whole space occupied by the building, which is 94,000 cubic feet nearly. According to the last account, the temperature inside the chimney, when doing about three-fourths of its full duty, is 490 deg. Fah., and the pressure of the draught is 1¼ in. of water, which agrees to a very small fraction with the pressure as deduced theoretically from the temperature and the height of the chimney. The dimensions and stability of this chimney are nearly the same as those of the second highest chimney at St. Rollox Chemical Works, built about ten years previously, except that in the older chimney the joint of least stability is 100 ft. above the ground. In the great St. Rollox chimney, 455 ft. 6 in. high from foundation to top, the greatest pressure of wind which can safely be borne is almost exactly the same, viz., 55 lb. per square foot of a plane surface, or about 27½ lb. per square foot of the plane projection of a cylindrical surface. The bed-joint of least stability is 210 ft. above ground. In the great Port Dundas chimney, 468 ft. high from foundation to top, the bed-joint of least stability is 200 ft. above the ground, and the greatest safe pressure of wind is 67 lb. per square foot of plane surface, or 33½ lb. per square foot of the plane projection of a cylindrical surface; so that here it may be considered that there is an excess of stability.

Messrs. Gostling's (Cement-works) Chimney, Northfleet.—This chimney has a height, from the foundation to the top, of 227 ft. (220 ft. from the ground-level). The outside diameter is, at the base, 30 ft., and at the ground-line 22 ft. The inside diameter is, at the ground-line, 14 ft. 6 in.; and the outside diameter at the top is 11 ft. The inside diameter at the top is 9 ft. 6 in., reduced, at 4 ft. 7½ in. from the top to 8 ft. 9 in. The rate of progress in building was under 15 ft. per week, or 2 ft. 6 in. per working-day. The bricks chiefly used were Rutter's "paviors," or best picked stocks. The mortar was made of the best Dorking grey-stone lime and the best Thames sand, and every few courses of work were grouted in with Portland cement. Part of this shaft fell in October, 1873, and was rebuilt and finished by August, 1874. Special precaution was taken, in rebuilding, that all the bricks should be wetted before being laid. The architect was Mr. James Cubitt, the builder being Mr. Blagburn.

Chimneys at the Georgs-Marien Ironworks, near Osnabruck.—The first chimney, erected in 1857, has a height of 180 ft., with a clear width at the bottom of 10 ft. 9 in., and at the top of 7 ft. The height of the square basement, built in sandstone, is 30 ft. The shaft is octagonal, and of brick, the walls being made of six different thicknesses, consisting of a brick and a half at the top, and of four bricks at the bottom (the length of the bricks used at Georgs-Marienhutte is 10 in.). Two other chimneys, 102 ft. high, have also a square basement of sandstone and an octagonal shaft of bricks, with a clear width of 4 ft. at the top, and of 6 ft. 3 in. at the bottom. The walls of these shafts are each 1 ft. 8 in. thick at the top, and 2 ft. 6 in. thick at the bottom. A fourth chimney, erected in 1868, has a height of 102 ft., a clear width of 7 ft. at the top, and 9 ft. at the bottom. The shaft is built in four thicknesses, of a brick, a brick and a half, two bricks, and two bricks and a half; whilst the base, 18 ft. in height, and made of sandstone, is 3 ft. 6 in. thick. The shaft of this chimney is built from the base to the top in such a manner that it forms in the circumference four separate parts, which are simply brought in contact with each other, without being jointed by mortar. This construction has been found to answer exceedingly well, and is recommended for chimneys exposed to various temperatures; as, for example, in the case of chimneys connected with coke-ovens, the gases of which are either applied to the firing of boilers or are allowed to escape directly into the chimney in the event of the boilers being laid off for cleaning or repairs. The latter arrangements have, however, been altered so far that, with the hot gases, cold air is simultaneously admitted into the chimney. The most recently-erected chimney, built in 1870, is sufficient for twenty of the Cornish boilers, and has a height of 120 ft., and a circular shaft of a clear diameter of 10 *ft.* at the top, and 10 ft. 10 in. at the bottom. This chimney has no base, and the thickness of the walls decreases in seven steps, from four bricks to one brick (10 in. each). The circular form has been chosen, in order to save the expensive base and the many-shaped bricks necessary for octagonal chimneys. All the chimneys have been erected without scaffolding, and by conveying the materials through the inner space of the chimney.

The Chimney at the Grosvenor-road Pumping Station of the western district of the metropolitan main drainage works is constructed of gault bricks, with Portland stone dressings. It is 200 ft. high, and has a campanile-like appearance. It is a model shaft in its style. The foundations of the shaft rest upon a mass of concrete 35 ft. square, carried down to the clay. The shaft is constructed double. The circular central shaft, 7 ft. in diameter, serves for the smoke, while the outer square casing encloses a staircase consisting of 220 stone steps, reaching to the top, which is terminated by a heavy iron capping and stone cornice. This square tower measures 21 ft. at the base, and 15 ft. at the summit. Sir J. Bazalgette, C.B., was the engineer-in-chief, Mr. Lovick being the resident engineer. The bricks were purpose-made, and gradually tapered from 1 ft. 6 in. to 1 ft. 2 in. The lightning conductor is of copper tube.

Messrs. Abraham Stott & Sons' Cavity Chimney, Oldham.—The height of this chimney from foundation to top is 180 ft., the height from ground-level being 168 ft. The external diameter is 16 ft. at base and 7 ft. 6 in. at top, the internal diameter at base being 6 ft. The height of the cavity was 30 ft. After completion, this chimney leaned over considerably on one side, and the owners entered into a contract with two brothers, who were chimney-builders, to "saw" the chimney; but instead of sawing, they took out a whole course of bricks, and, while one of the men was on a scaffold about a third of the distance from the ground engaged at the work, the stack fell over, except about 30 ft. from the base, and killed one of the men.

Concrete Chimney, South Docks, Sunderland.—In compliance with the requirements of the Board of Trade, the River Wear Commissioners have erected, from the designs of their engineer, Mr. H. H. Wake, large chain-cable and anchor-testing works at their South Docks at Sunderland. The whole of the buildings are constructed of concrete, built with Tall's patent apparatus, by Mr. George Grainger. The design included two boiler-house chimneys, one of which has

* See Proceedings of the Philosophical Society of Glasgow for 1856, p. 14.

just been completed, and as it is believed to be the first chimney of the kind built of concrete and without scaffolding in this country, some brief description of the manner of its erection may be of interest. The chimney is carried up square until it is well clear of the level of roof of testing-house, the dimensions being 22 ft. 3 in. by 7 ft. 6 in. by 7 ft. 6 in., the construction of this portion presenting no feature of novelty. At this level the corners are gradually taken off the square base, until, at the height of 24 ft. 9 in. above the surface of the ground, it is brought into the octagonal form of the tapering portion of the chimney, that the profile of base mould might be shown to greater advantage. This octagonal and tapering portion of chimney, in which the interest and difficulty of the work chiefly centred, was moulded in the following manner:—Panels 3 ft. in height were formed of ¾-in. boards, hinged together in pairs at their outer edges, being so proportioned that the lines of their inner edges, when produced, came into one point at the centre, at half the height of this section of the chimney, the intermediate space being made up by a wedge-piece, which, after the concrete poured between the panels on the inside and outside of the chimney-walls had set, was easily reduced to meet the decrease in size on the next left due to the batter, this reduction being just sufficient to take off the holes in one side of the wedge for the stud-bolts, which connected it to the upright members of the frame. When the stalk of the chimney had been carried up to the half of its full height, these panels were sufficiently reduced to admit a second set of intermediate wedges, of exactly the same dimensions as those introduced at the level of the base mould, bringing the inner edges of the reduced panels into one point at the centre of the top of the chimney, in a manner similar to that in which, at their original dimensions, they had been brought together at half of its height, affording a tolerably severe test of the accuracy of the work, which it was found to bear admirably, for the uprights being 6 ft. in length, and always being moved with the panels, which were only half that height, they had a continual hold of 3 ft. on the completed portion of the work, which sufficiently insured regularity in line. The chimney when completed was stuccoed with cement, and drawn in courses to imitate stone; it is considered to present an excellent example of concrete building, both as regards strength and appearance; the chimney being exactly perpendicular, and the mouldings, which were formed in their respective positions, clear and sharp in outline. The concrete for the work was specified to be mixed at the rate of one part of Portland cement to eight of gravel, but in the case of the chimney the proportion was increased to one in five by the contractor, by whom also the simple and efficacious arrangement used in building was devised.

Cavity Chimneys.—This form of chimney is frequently built in the North of England. The inner ring is carried up vertically of 4½ in. fire-brick for, say, 20 ft. to 30 ft. high, until it nearly closes with the main shaft. The outer or main shaft is started with 1 ft. 2 in. work at base, and diminishes or batters regularly towards the top.

Taking Down Chimneys.—There is an ingenious arrangement for facilitating the taking down an old chimney-shaft which was employed, some little time ago, at Messrs. Gilkes, Wilson, Pease, & Co.'s Tees Ironworks, Middlesbrough, and which was designed by the engineer of the works, Mr. Chas. Wood. In consequence of the chimney-shaft, on which this arrangement was employed, standing in a crowded position, the plan of letting it fall was inadmissible, and it had to be taken down from the top. The question was,—How to get the bricks down with as little damage as possible, so that they might be used again for building purposes? Owing to the position of the chimney, the bricks could not be thrown down outside; and, if thrown down inside, they would have been smashed, or if lowered by mechanical means, the process would have been very tedious. Under these circumstances, the question was considered whether the bricks could not be allowed to fall by their own gravity; but, at the same time, be cushioned sufficiently to break their fall and prevent damage. In order to do this, an air-tight iron box was placed at the bottom of the chimney; this box was fitted with an air-tight door, mounted on hinges, and closing on an india-rubber face, against which it was tightened by a wedge. A wooden spout was then fixed on the top of the box, and carried up to the top of the chimney; this spout was 3½ in. by 5 in. inside, and was made of planks 1½ in. thick, well nailed together, with a little white lead on the edges, thus making the spout perfectly air-tight. The spout was made in about 12-ft. lengths, and they were joined together by cast-iron sockets or shoes, and caulked round with tarred yarn, the whole apparatus costing about 6*l*. A few stays were put inside the chimney to keep the spout steady, and steps were nailed upon it by which the men could ascend. It will be seen that the whole of the spouting being perfectly air-tight, if a brick filled the spout perfectly, it would not descend; but, as the section of a brick is 3 in. by 4½ in., and the spout was 3½ in. by 5 in., there was a half-inch space each way, through which the air could pass the brick freely; this space further allowing for any irregularity in the size of the bricks. The result was, that the bricks, being partially cushioned in their fall, arrived at the bottom without any damage whatever. As soon as the box was full, the man at the bottom rapped on the spout as a signal to stop, and then opened the air-tight door and removed the bricks which had come down. This being done, he again shut the door, and signalled to the man on the top to go on again. The man on the top lowered his own scaffold, and as the spout got too high he cut a piece of with a saw. If there was much mortar adhering to the bricks, it was knocked off before putting the latter into the spout, and it was allowed, with any little pieces, to fall inside the chimney, and was wheeled out. The plan described is, I believe, quite new, and it is certainly most simple and ingenious. There are, no doubt, many circumstances under which it might be advantageously employed.

Straightening a Chimney by Pressure.—The foundation of a furnace-shaft in course of erection by M. Dubose, at Havre, had settled very irregularly, in consequence of the very unequal resistance of the soil, and so quickly that it was found impossible to complete it. The upper part had consequently to be taken down again, and the completion of the remaining 15 ft. had to be postponed until the chimney had been straightened. This latter operation was effected in the following manner:—The soil on the side opposite the sinking was removed to a breadth of about 4 ft. 6 in., and to the depth of the last stage of the foundation. Upon the lowest stage a number of piers leaning against the chimney-shaft were erected to the height of the ground-level, and the semicircular ditch thus formed was covered with radiating double T-beams, which were protected against sinking in the soil by a layer of sleepers, and rested on the piers. Planks were then laid on the beams, and about 30,000 bricks were put on them. This one-sided weighting of the foundation had the desired effect of bringing the shaft back to its perpendicular position, the movement within six weeks at the top being nearly 1 ft., so that a deviation from the perpendicular was then hardly noticeable.

Moving a Chimney.—In 1872, at the Cabot Mill, Brunswick, Me., a chimney, 78 ft. high, 7 ft. 9 in. square at the base, and 5 ft. 9 in. square at the top, containing upwards of 40,000 bricks, and weighing more than 100 tons, was moved 20 ft. to make room for the enlargement of the mill, on the plan of Benjamin Greene's. The work was done by a process similar to that by which ships are launched, the chimney being slidden along planed and greased planks. It was moved, the flues connected, and the fires started, in 8½ hours. The power used was two screw-jacks.

Mr. Bancroft's paper also included more or less fully-detailed descriptions of the following chimneys, viz.:—Woolwich Arsenal (239 ft. 9 in. high from foundations); wrought-iron chimney at Messrs. Schneider's Creusot Works (197 ft. high, riveted together horizontally and afterwards raised with a crane); wrought-iron chimney at Pittsburgh (1 ft. less in height, and raised in the same manner); Abbey Mills Pumping Station, Metropolitan Main Drainage (Sir Joseph Bazalgette, engineer); Royal Porcelain Works, Worcester (three); retort-house, South Metropolitan Gasworks, Old Kent-road (Mr. C. G. Livesey, engineer); a chimney at Boston, Lincolnshire (Mr. W. H. Wheeler, engineer); and the chimneys at Den's Works, Dundee. In describing the latter structures, Mr. Bancroft referred at some length to Mr. Carmichael's experiments on draught. We cannot, however, spare more space to the subject, contenting ourselves with giving the most salient items in the paper.

THREE INDIAN RAILWAY BRIDGES.

THE INSTITUTION OF CIVIL ENGINEERS.

At the meeting on the 30th of April, Mr. Bateman, president, in the chair, the papers read were descriptive of three bridges on the Punjab Northern State Railway, viz.: "The Ravi Bridge," by Mr. R. T. Mallet; "The Alexandra Bridge, over the Chenab," by Mr. H. Lambert; and "The Jhelum Bridge," by Mr. F. M. Avern.

The bridge over the Ravi at Lahore consisted of thirty-three spans of 90 ft. in the clear, and 97 ft. 6 in. from centre to centre of the piers. The piers were of brickwork, each founded on three brick cylinders, sunk 70 ft. below the lowest water-level. Eight vertical tie-bars were built into the brickwork. The piers were protected from scour by concrete blocks thrown round them. The girders were of the parallel flange type. The lattice-bars formed two series of triangles, inclined at 45 degrees. The superstructure was designed to carry a footpath on the lower flange, and an asphalte cart roadway, flush with the railway, on the top. The cross-girders carrying the railway were suspended in stirrups from the upper flange. The first operation was the erection of a temporary wooden trestle-bridge, which was occasionally much damaged by floods, but was easily repaired. It served for material trains for four years. The bricks for the foundation cylinders were of three special forms. The lime was slightly hydraulic, and was made of the kunkur of the district. The mortar was composed of equal volumes of lime, brick-dust and fine river sand. The concrete was made of broken waste brick and 42 per cent. of unground mortar. The excavation of the cylinders was effected principally by Bull's dredgers. Cylinders of brick, 12 ft. 6in. in diameter, and of the same height, were sunk from 10 ft. to 12 ft.; then a similar length was added and sunk; next a length of 25 ft. was added, and sunk usually without weighting Finally, a length of 20 ft. was built, completing the 70 ft., which was sunk sometimes to 60 ft., when a load of 150 tons of rails commonly sufficed to complete the sinking. Among the tools used for excavating the material from the interior of the cylinders Fouracres' "spider" proved efficient. Whenever a cylinder showed a tendency to leave the perpendicular, it was corrected by shoring from the ground, and by passing a chain round, the two ends of which were anchored taut at a distance. Rails laid across the chain produced an efficient horizontal pull. The average progress with the large cylinders was 2 ft. a day of actual sinking. Half the girders were put together on the south bank, and half on the north, and they were carried into place by two travelling gantry cranes. The floating of the girders for the spans over the main channel of the river was accomplished by four native barges, on which timber staging was erected.

The Alexandra Bridge was 9,300 ft. long and 100 ft. deep. The first brick was laid on the 1st of November, 1871. The first train crossed the bridge on the 23rd of December, 1875; and it was opened on the 27th of January, 1876. In floods, the Chenab rose 11 ft. above low-water mark, and its width at Wuzerabad was 3½ miles. The mass of the water did not flow rapidly; but the main stream, corresponding to the fluctuating deep channel, rushed through with great velocity, in a serpentine direction. This was often nearly at right angles to the general course of the river when obstacles occurred. Under these circumstances the bed was driven before it. The depth of the main current was more than 50 ft., moving at a rate exceeding 10 miles an hour. The ground for about half the space of 3½ miles between the banks was composed of river deposit. On this a massive embankment had been raised, for several years, to carry the Grand Trunk Road as far as possible across the river-bed, the rest of the way being over temporary bridges of boats at the varying channels. During four months a ferry was established. A back channel, called the Pulkoo Nullah, flowed for several miles parallel to the main river, and in high flood their united waters submerged the intervening country. The effect of the embankment was to dam up the body of comparatively still water, forming the bulk of the river, and to divert the swift moving diagonal current against the crumbling shores. Hence the Pulkoo

developed into a deep navigable channel, 800 ft. wide. At Kuthola, on the northern shore of the Chenab, the river became wider by half a mile. The main current set against the proposed site of the northern abutment of the bridge, and the deepest water was close under the nearly vertical bank. The Trunk-road was gradually falling into the river, and a ferry had to be established at the Pulkoo. Thus, in the Wuzerabad Reach, the Chenab had become wide to an abnormal extent. The fine sand of the bed was ascertained to be about 65 ft. in depth, overlying clay of moderate consistency. The rapid current, moving from shore to shore, was likely not merely to attack the bridge piers in flank, but also to scour the ground from under them. Various works were undertaken to improve the site of the bridge. The first was to close the Wuzerabad navigable channel by an embankment three quarters of a mile long. A second embankment extended from the southern abutment of the bridge to the Pulkoo Nullah, to prevent the water of the river pouring into the Wuzerabad channel during floods. A third work deflected the stream at right angles to the general alignment of the railway in a direct line through the bridge. A fourth main work, being a star-shaped spur of trees and stones, was to prevent the river cutting behind the abutments in the event of disaster to the up-stream works. Several subsidiary works were executed of rough tree-spurs to catch floating sand, and to assist in turning the stream towards the centre of the river. The Chenab training works were carried out by September, 1872, at a cost of 4½ lakhs of rupees, and had since been maintained at a yearly cost of half a lakh of rupees. The first design for the bridge was, that it should consist of single well-piers 12 ft. 6 in. in external diameter, sunk 40 ft., and carrying lattice-girders under the rails, 97 ft. 6 in. in length from centre to centre of the piers. But the high floods of the rainy season of 1871 led to the adoption of Power's three-well system, and to the wells being sunk 70 ft. The piers were 35 ft. long, 8 ft. 8 in. thick, with semicircular ends, standing on similar basements 38 ft. long, supported on diminishing arches between the wells. Three were to be sunk 6 in. apart. The abutments were on fifteen wells, sunk to the same depth as the piers, and in two rows parallel to the central line. This change increased the quantity of brickwork originally proposed five or six times. At the close of the rainy season of 1871 the curbs of several of the piers were pitched. It was then determined to adopt Warren girders, and to have the rail-level at the bottom; also to have sixty-four spans, 142 ft. from centre to centre, and the bridge was thus commenced. The bridge over the Pulkoo back channel consisted of nine spans, 43 ft. 6 in. from centre to centre, with piers of single well cylinders sunk into the clay substratum underlying the river bed. The girders were of plate iron, carrying the rails on the top. On account of the great length of the Chenab Bridge two passing places were provided by widening the structure for two spans, and making it stronger. A concatenation of causes led to the current of the river running parallel with the bridge. Ultimately a deep trench was scoured out along the face of the bridge for more than a mile in length, resulting in the up-stream and centre wells of three of the piers toppling over from insufficiency of base. As the sites of three piers were blocked, so that fresh wells could not be sunk in the same place, two of the spans of the bridge were modified to suit the altered circumstances. The total cost of the bridge, including the training works, was 65 lakhs of rupees.

The Jhelum Bridge was situated on the line of the Grand Trunk road, the river being about 5,000 ft. wide. The bed was of sand, 15 ft. to 20 ft. deep, overlying a thick stratum of boulders and shingle. The fall of the bed was 1 ft. per mile, and the approximate discharge of the river at high flood was 200,000 cubic feet per second; the maximum recorded surface-velocity being 8·66 ft. per second. The length of the bridge was 4,875 ft. between the abutments, with training works on the left banks. There were fifty spans of 90 ft. each, giving forty-nine piers and two abutments. The right abutment and the three contiguous piers were founded in the boulder stratum. The foundations were brick cylinders, three in a line transverse to the bridge, a centre one, 12 ft. 6 in. in external diameter, and two flanking ones, each 10 ft. in diameter. The brickwork was built on a substantial wrought-iron curb, to which it was bonded by circular flat iron rings and vertical round-iron tie-rods. Three rings were introduced in the 32-ft. length of brickwork, at intervals of 10 ft., and the tie-rods, starting from the curb, went through the whole length of brickwork in the well. In the smaller wells there were eight rods, and nine in the larger wells. The rings were of flat iron, 3 ft. broad by $\frac{5}{16}$ in. thick. The brickwork of the smaller wells was 2 ft. thick; that of the larger wells was 3 ft. 3 in. thick. It was composed of specially-made radiating bricks, set in mortar consisting of one part of stone lime, two parts of kunkur, and six parts of fine brick-dust, the whole well ground together. The wells were successfully sunk through artificial islands. They were filled with concrete, and connected by small arches. The superstructure of the piers was 27 ft. 6 in. long, 7 ft. 6 in. wide, with semicircular cut-waters. They were carried up 21 ft. above low water. The abutments were founded on three wells, each 12 ft. 6 in. in diameter, and were similar to the piers, but flanked with longitudinal wing walls. Nearly nine wells were sunk per month. A spur of earth and boulders, 4,800 ft. in length, was made from the left abutment of the bridge to the high ground forming the left bank of the river, as a protection against the river getting in the rear of the bridge abutment. Moreover, an average amount of 13,467 cubic feet of boulders had been thrown round each of the piers. The boulders formed a local supply of material ready to be dropped into any holes scoured out around the piers, and gave support to the piers to resist the overturning action of the stream. The superstructure was composed of a pair of lattice-girders, connected on the top by an upper roadway of cross girders and rail-bearers, covered by buckle and flat plates, braced on their under sides. This upper roadway carried the railway and two footways. There was a lower roadway for foot-passengers and mules and ponies only. A detailed account was given of the girders and roadways, and of the erection of the girders. The total cost of the bridge, including the protective works, had been 139,502*l.*, or 28*l.* 11*s.* per lineal foot.

KEBLE COLLEGE, OXFORD.

THE new Dining-Hall and Library of Keble College, Oxford, were formally opened on the 25th ult.,—the anniversary of Keble's birth, the foundation-stone of the College having been laid just ten years previously by the late Archbishop of Canterbury. The chapel also was opened, and the foundation-stone of the Hall and Library laid, on the same day two years ago, by the Marquis of Salisbury, Chancellor of the University. The new buildings, which have been erected from the designs of Mr. Butterfield, architect, by Messrs. Parnell, of Rugby, comprise, besides the hall and library, common rooms, senior and junior, and a lecture-room. The style of the new buildings is in accordance with that of the rest of the college. The hall measures 127 ft. in length, by 35 ft. in breadth. The library is somewhat smaller. The common rooms and lecture-room are under the library. The kitchen with its offices and the buttery are of unusual size, since the system of common meals demands far greater accommodation than with the college arrangements which obtain elsewhere. The interior does not depend for its decoration upon the architect alone. Mr. Holman Hunt's picture, the "Light of the World," presented to the college by Mrs. Combe, is placed at the east end of the library. A portrait of Mr. Keble, by Mr. George Richmond, R.A., has also been presented by him to the college, and is placed over the "high table" in the hall. Portraits of Archbishop Longley, who laid the foundation-stone of the college on St. Mark's Day ten years since, and of the late Mr. W. Gibbs, the munificent donor of the chapel, by Mr. Ouless, after Boxall, as well as of the late Dr. Shirley, who took an active part in promoting the Keble Memorial Fund, are also placed in a group at the west end of the hall, imbedded in the wainscot panelling. The entire hall is surrounded with a low wainscoting. The windows contain medallion portraits of the founders of the several colleges, the arms of the See of Canterbury, the Diocese of Oxford, of the University, and of Mr. Gibbs; at the foot of the windows run mottoes selected from the Vulgate version of the Psalms. The only group of figures in the windows is that of the "Supper at Emmaus," in the upper tracery of the east window. The roof, of wagon-head form, is elaborately painted, and on one side of the hall is a minstrels' gallery. On issuing from the hall the visitor finds himself in an extremely lofty vestibule, on the other side of which lies the library, fitted up with reading recesses, lined with bookshelves, after the fashion of the Bodleian. Here is already a large collection of books,—Mr. Keble's,—Dr. Newman's presents, inscribed "*Amico suo dilectissimo Joannis Keble*," and those of other munificent benefactors, Lord Beauchamp, for instance, presenting the whole Bollandist collection of the Lives of the Saints. Facing the entrance are two lofty windows, containing appropriate mottoes from the Vulgate, and pictures respectively of the Tree of Knowledge and the Tree of Life. Under the window is Mr. Holman Hunt's picture before mentioned. The senior common room,—a very fine apartment,—is interesting as containing writing and other tables, the present of Canon Liddon, which were in constant use by the author of the "Christian Year." In the junior common room, which is for undergraduate use, the principal object is at present the portrait of the Warden, by Mr. Richmond. The whole of this costly pile of buildings has been presented to the college by benefactors who were, until the opening day, anonymous. At the luncheon, however, Mr. H. H. Gibbs announced that the donors were his cousins, Mr. Antony Gibbs and Mr. Martin Gibbs, sons of the late Mr. Antony Gibbs, of Tyntesfield, who gave the chapel.

Since the opening of the chapel in 1876 numerous other buildings have been completed in the same style as the earlier portions of the college. Additional sets of rooms have been built, giving in all accommodation for 140 students within the college walls, the principle of the place being intramural residence; and the Warden's lodgings, a large and handsome pile, has been erected at the south-east corner of the college, constituting one angle of a second quadrangle.

ALLEGED INSANITARY FLATS.

AT the meeting of the Metropolitan Board of Works on the 3rd inst., the Superintending Architect reported upon an application made by Messrs. Sutton & Dudley, builders, for permission to erect houses, in he new streets to be formed on the Surrey Gardens Estate, of a greater height than the width of the roads, recommending that the application be referred to the Building Act Committee for consideration and report. Mr. Selway said it was desired to erect the buildings in question 14 ft. higher than the width of the street. He felt it his duty to move, as an amendment, that the application be not granted. If the Board acceded to the application, they would be doing one of the very things which they were now promoting a Bill in Parliament to prevent. Mr. Fowler supported the motion for the adoption of the architect's recommendation. The applicants were the builders of Palatinate-buildings, in New Kent-road and Albany-road. Those buildings were arranged in flats, were exceedingly well constructed, of good materials, and the sanitary conditions were unimpeachable. It was proposed to erect buildings of the same character on the Surrey Gardens Estate. Mr. R. P. Taylor also supported the architect's recommendation, and said that the applicants ought to be encouraged rather than hindered in their enterprise. Mr. Selway, in reply, said he was quite aware of the kind of buildings proposed to be erected on the site in question. He had seen those already referred to, and more wretched buildings were not to be found in London,—he meant among new buildings. The area at the back of the buildings in New Kent-road was a mere well, into which no sunshine, and very little air, could ever enter. It was exceedingly undesirable that these enormous buildings should be carried up to such great heights. It was true that the buildings erected by the Peabody Trust and others were carried up to a great height, but where this was the case the streets were old thoroughfares, and the Board had no control over the height of the buildings there. In newly-laid-out streets, however, the Board would not be doing its duty did it sanction the violation of sanitary laws. The Board had to enforce an Act which said that all new streets should be 40 ft. wide, and that the houses should not exceed the width of the streets. The matter was referred to the Committee.

PARIS AND ITS EXHIBITION.

It is said that the French are good at a rush, but that when steady and dogged resolution is requisite, the English beat them hollow. A rush, a wonderful rush too, was made in the Exhibition buildings the night prior to the opening. We left it, at half-past seven on Tuesday evening, April 30th, very much in a state of chaos. We entered again after breakfast the following morning, and, lo and behold, the twenty long miles of corridors and avenues had all been swept and garnished. An army of 20,000 men had done this, and much else; for thousands of glass cases that had stood empty the night before were now stocked, all ready for presentation to the world at large. Lighted in part by the singularly beautiful electric light, and in part by ordinary lamps, the amount of work got through in the Exhibition during that one eventful night was simply astounding.

The greatest difficulty existed in gaining an entrance upon the morning of opening. Englishmen, however, were readily admitted at the Porte Decazes, opposite the British Commission Offices, in the Avenue de Suffren. The French police are a queer race, and, like the fair sex, do not reason; if, therefore, any Briton has in future any misunderstanding in getting into the building, with or without a ticket, let him resort to the Porte Decazes, where he will find the union-jack, flying at our Commission office close by, a singular incentive to the officials. The photographic season-tickets have, most of them, been dealt out to the various exhibitors. A French version of one's name is inscribed upon the back of each. This time they dub me "Hams Hems." In 1867 our friends rendered my patronymic "Darry Dems." I have the two tickets before me. They are precisely the same size, and are neither larger nor smaller than were the tickets at Vienna. At this latter Exhibition, however, no photographs were attached. At Philadelphia photographs were required, and the ticket took the form of a little book. Every day the Show was to be open was marked upon squares around this, and upon the entrance of the bearer the square corresponding with the date was punched through. Hence only one visit a day could be made with the season-ticket.

The opening ceremony at Paris was fairly imposing, but if there were *really* 80,000 soldiers present they made a very poor show. I should have guessed 20,000 at the most, and, being an old volunteer, I do not think I am much mistaken. Of the assembled princes, &c., our own Prince of Wales,—in scarlet coat and plumed cocked hat,—looked by far the best; and next to him the most imposing men were two Russian generals in white tunics, and golden helmets,—the latter crowned by double-headed eagles having outspread wings in the same metal. These birds were 7 in. or 8 in. high, and beautifully modelled. The *cortége* did not pass *through* the British Section, as nearly all the "dailies" have reported, but *by* it, and straight up the street of representative houses.

On the day of opening the French Restaurant raised its prices, and charged a franc (10d.) for each glass of beer. A great row ensued,—crockery and glasses were broken, tables overturned, and much clamour made. The waiters looked frightened, and the manager very pale. I think they were taught a lesson. At present there is only, so far as I am aware, one set of w.c.'s, and the charge for their use is 2½d. This, to those constantly at the Exhibition, is no inconsiderable item. The enclosed space being 2,000 yards or more long, and a third, perhaps, of that distance wide, locomotion becomes a serious thing. Hence ten pillar-boxes have been established at given points within the buildings; and collections are made every two hours by a staff of just a score of postmen.

It is in the Italian Court that some of the most beautiful work—artistically speaking—is to be found. Much of their marble sculpture is singularly full of grace and power, whilst samples of their wood-carving in walnut are unrivalled throughout the Exhibition. It is possible that some of it may be too delicate to come under the term of useful ornament, but it is, nevertheless, wondrously beautiful.

The Americans have brought some useful things over, and have capital little chariot-planes, which they can sell for about 6d. a-piece. These planes I know, from experience, to be superior to anything else of their class.

In the British section there is a large piece of carving in box-wood. It is called the "Helicon Fountain," and is an elaborate piece of workmanship of, perhaps, some 4 ft. high. It is not unlike a Chinese temple, and a card informs the visitor that it was made by a Scotch peasant. The villager in question is also present, and from him we learn that he took seven years over the work, and made it entirely with two old chisels and a pocket-knife. Had he, in the first place, spent a sovereign in procuring a dozen or two of proper carving tools, he would probably have completed his work in half the time, and saved three years and a-half of a valuable life. Had the man had any sort of art-training he might have become a second Stevens or a Godfrey Sykes. As it is, he prides himself upon originality, and that his work belongs to *no known style!*

The asphalte used by the French seems to have excellent setting powers, it is scarcely laid down ere it becomes perfectly hard, setting almost as quickly as plaster of Paris. The tram-rails, by which goods have been brought into the Exhibition, and the turn-tables, still remain in their respective positions. They are merely buried in a coating of cement, and, at the last day,—upon the close of the building,—will rise again for future use.

The Hôtel Dieu is now nearly complete, and in the finished portion there are now 500 beds occupied. We were glad to find, in a careful perambulation of the building, that none of our country-folk lay sick there. The wards have capital corridors for promenading in, these communicating with the court-yards by open arcading. The salles or wards themselves have oak parquet floors, and arched ceilings, the latter, with the walls, are whitewashed. The beds are four-posted, furnished with white curtains, and rather too close together. They average twenty-four in a ward. The fittings are all good. The patients' lockers are of polished oak, with marble tops. The kitchens are superb, and the cooking apparatus,—heated by hot-air or steam,—of very high character.

The decorations of the Sainte-Chapelle, close by, are, of course, finished; but the chapel does not seem to be used save as a show-place. There is neither altar, chairs, nor priest there.

Very good is much of the stonework in the city. Paris has rebuilt itself, and much of its masonry is excellent. The new Avenue de l'Opéra is nearly complete, and the scaffoldings have been mostly removed. There, as everywhere else, we find capital masonry and carving. If our London masons will only take a few days' trip to Paris this summer, they will laugh to scorn such of their leaders as in future may tell them foreign stonemasons cannot work. The four or five-ironed "talking" planes the French masons use are a characteristic feature. The irons project beyond the wood fully an inch, and their use is something between that of a saw and a drag, quite as much as it is that of a plane. It gets up fillets, &c., with great nicety and despatch. Bedding the stones merely, fixing, and then working them *in situ*, takes an immense deal of head labour from the foreman's shoulders, and, as no templets are required, must save a little fortune, in zinc alone, in the course of a year. The French joinery, as a rule, seems inferior to our own.

It really behoves every thoughtful workman to try his best to spend a week during the coming season in Paris. This need not cost him much, little more than being at home, and he will have a good opportunity thereby for judging fairly how we stand as a nation of workmen with the rest of the world. Of course,—

> "Our very eyes
> Are sometimes like our judgments, blind;"

but, after all, "seeing is believing," and although we may have little or no connexion with the house opposite, it may be as well to see what they can do in the shop "over the way."

Harry Hems.

Insanitary Property at Liverpool.—A Liverpool paper says,—"We understand that the Local Government Board have refused to grant a provisional order to the Corporation of Liverpool for the amendment of the Sanitary Act of 1864, to enable them to deal with and demolish insanitary property more expeditiously than at present. We believe, however, the objection of the Local Government Board is more to the particular form in which the Council seek to obtain the powers than to the principle embodied in the request, and that application in another direction, if made, would be duly considered."

OBITUARY.

Mr. W. Menzies, the Deputy Surveyor of Windsor Park, died at his residence, near Virginia Water, on the 3rd of May. The Queen, who visited Mr. Menzies during his long and painful illness, has lost in him a valuable servant, whose constant endeavour was to do his duty and to serve her Majesty faithfully. Mr. Menzies was the architect of some model farms on the Royal Property (illustrated in a previous volume of the *Builder*), and published a book to which we drew attention at the time of its appearance.

THE WORK AT ST. ALBAN'S ABBEY.

Sir,—As I had an opportunity last week of seeing the work which has been done in moving the south wall of the nave of St. Alban's Abbey, and as there seems to have been some misapprehension as to the strains which would result from the force as applied to replace the wall in a perpendicular position, perhaps you will allow me to say a few words on the subject, from an engineer's point of view, and to make a remark or two on the manner in which, I think, the force might have been more advantageously applied.

In order to replace the south wall of the nave, which had receded, in its proper position, whole-balk struts have been used one against the top of each pier, and another row, parallel to them, at a higher level; there are intermediate timbers, but they only act as preventers. The lower row of struts, three in number, rest, as described in your report last week, on timber sills laid on concrete and against the foundations of the wall of the south aisle, and under the heel of each is placed a hydraulic jack. The head of each strut abuts against a whole-balk timber which is built into the wall to be moved, and through which all the force is applied. The upper row of struts is similar in position, the thrust being taken down to the ground outside the building, and the force applied by means of a hydraulic jack under the heel of each, placed at the level of the top of the wall of the south aisle. The distance between the two walls being small in comparison with the length of the struts, the thrust is more nearly vertical than horizontal, and the tendency is to raise the whole of the masonry above each timber, and the force being applied at the end of a beam built into the wall, tends to upset it inwards, *i.e.*, towards the north. This effect will be more marked in the case of the upper row of struts, as the weight of the superincumbent mass of masonry is there less. This action will account for the opening of the joints in the south side of the wall after the pressure had been applied; and when the struts are withdrawn great strain on the part of the wall at present borne by the timbers; and if the openings are only superficially made good with cement, which will not crush so easily as the stone, I should expect many courses to crack.

Besides the timber mentioned above as having been used for the purpose of forcing the wall back into its proper position, a perfect grove of struts has been applied to the south face of the north wall of the nave, to prevent its being drawn out of the perpendicular southwards, by the pull of the bolts which have been placed between the two walls, and screwed up as the hydraulic presses did their work. As the distance between the walls of the nave is much greater than that in the aisles, the slope of the struts is also greater, and their thrust more nearly horizontal; and I think the north wall thus strutted might with advantage have been made a *point d'appui* from which to pull, and the south wall could then have been brought into position without any of the injurious lifting action of which I have spoken; and the tendency to raise the north wall would have been slight in comparison, on account of the greater ratio of the struts, and whether this tendency would have been likely to be injurious would be a simple matter for calculation. The means by which I should have proposed to apply the necessary force, with hydraulic jacks placed at the heads of the struts in the nave, iron ties, vertical timbers outside the walls, and through bolts, as at present applied, would, I am afraid, take too long to describe, and be scarcely intelligible without drawings; but perhaps I have said enough to explain my meaning, and I trust that you may think my remarks on this successful work, although they take the form of criticism after the event, worthy of a place in your paper.

Reginald E. Middleton, C.E.

DISTRICT SURVEYORSHIPS.

METROPOLITAN BOARD OF WORKS.

At the meeting of the Metropolitan Board of Works on the 3rd inst., Mr. Vulliamy, the Superintending Architect, presented a report announcing the decease of Mr. Henry Baker, District Surveyor of St. Pancras. Mr. Furniss moved that the report be referred to the Building Act Committee, to consider and report as to the advisability of dividing the district. Mr. Watkins, in supporting the motion, said that the fees received last year by the District Surveyor amounted to 1,114*l.*, the average for the last three years being 947*l.* The district was therefore one which might advantageously be divided into at least two districts. The motion was agreed to, and a discussion then arose as to the appointment of a surveyor *ad interim*. By some members it was suggested that Mr. Frederick Wallen should be appointed, on the ground that he had been acting as "deputy" for Mr. Baker for some time past. Mr. Selway, however, moved that the usual course be adopted of placing the district *pro tem.* in the hands of the surveyor of the adjoining district, viz., Mr. Sedley. This having been seconded, Mr. Runtz said that Mr. Wallen had been performing the duties for some time past very satisfactorily, and he had been for some years before the Board as a candidate for a surveyorship. He therefore hoped that Mr. Wallen would be placed in charge of the district, at any rate for the present. Mr. Cuffiin concurred, as it would look invidious, he thought, to oust Mr. Wallen from the performance of the duties which he had been ably fulfilling as the deputy of the late district surveyor. It was pointed out, however, by Mr. Selway and other members, that Mr. Wallen had not been acting as a deputy district surveyor recognised by the Board; that, in fact, he had simply been Mr. Baker's managing clerk in the district office, no doubt doing most of the responsible work, but owing responsibility to Mr. Baker, and not to the Board. In the end, Mr. Selway's motion was carried.

Mr. Vulliamy also presented a report on a letter from Mr. John Turner, district surveyor of East Islington, requesting the Board to extend the appointment of his son, Mr. J. Goldicutt Turner, as his deputy for a further period. Mr. Vulliamy recommended that permission be granted for a further period of six months. This recommendation gave rise to further discussion, in the course of which Mr. R. P. Taylor asked how long Mr. Turner's duties had been performed by deputy in this way? Mr. Vulliamy replied that it was since January, 1876. Mr. Taylor said it was high time some principle should be laid down as to how often, if at all, the appointment of a deputy *pro tem.* should be renewed. He moved that the subject be referred to the Building Act Committee, but subsequently, on the suggestion of Mr. Fowler, consented that the question should go to the Works Committee. Mr. Fowler said it was an important question whether, in the public interests, district surveyors, when unable to fulfil their duties in person, through physical or other disabilities, should not be compelled to resign, if unfit to continue their duties after an interval of six months. He was quite aware of the long and faithful service which Mr. Turner had rendered, but the Board, as a public body, must do its duty. Mr. Richardson thought that the adoption of any hard-and-fast rule would be productive of great hardship in certain cases. The motion to refer the question to the Works Committee was unanimously agreed to.

Mr. Vulliamy also submitted a letter which had been received from Mr. J. H. Good, district surveyor of Poplar, in which the writer said that failing health and increasing infirmities made it necessary for him to resign his appointment, which he had held for forty years. The average annual amount of fees received during the last three years Mr. Vulliamy reported to be 628*l.* 5s. 1d. As the district consists of two parishes, Bow and Poplar, and is a very large one, it was desirable, in Mr. Vulliamy's opinion, that the matter should be referred to the Building Act Committee, to consider the advisability of dividing the district. The chairman (Mr. Lowman Taylor) said, he thought it would be advisable for the Board not to accept the resignation for the present, as a serious accident had happened by the fall of a building in Mr. Good's district on the very day that he had sent in his resignation, and it was desirable to know, before entertaining the question of accepting the resignation, whether Mr. Good had been in any way remiss in the performance of his duties as district surveyor. It was agreed to refer the matter to the committee, and to defer acceptance of Mr. Good's resignation for the present.

THE SCHOOL BOARD AND SANITARY MATTERS.

THE "Laws of Health" are not in the syllabus of the School Board.

At the town of Hartland, in the county of Devon, there has for some time past been a very high death-rate from zymotic and preventible diseases. At the instigation of the Sanitary Authority, Dr. A. W. Blyth has inspected this spot in the warm county of Devon, and his report at once condemns the public school. He states that the closets open and ventilate into the rooms, and the drains empty into a cesspit about 24 ft. from the school-wall, and 22 ft. from the centre of the well, supplying the school with drinking and washing water.

The cesspit is ventilated into the school by means of an untrapped drain, running from the lavatory to the cesspit.

The whole class-room at the time of the inspector's visit was infected with a distinct sewage odour, and a stream of offensive gas was pouring into the lavatories, and the water behind was found to be polluted. In the schoolyard the cesspit was covered with a loose stone slab, which any child might lift or kick away.

The inspecting doctor urges the Sanitary Authority to take immediate steps against the School Board authority to compel it to set its school in decent and healthy order.

RIVER PURIFICATION.

THE Corporation of Hertford have placed their works for the purification of the sewage of that town in the hands of the Rivers' Purification Association, who for an annual subsidy of 350*l.*, undertake the whole management of the place similarly to what they have done at Coventry, which place has been worked for some time by the Rivers Purification Association under a subsidy from the Corporation of Coventry.

Hertford is situated on the river Lea, whence the New River Company derives part of its supply. The average daily flow of sewage amounts to about 1,640,000 gallons, the population being 7,169. Waterclosets are in general use, and the sewage, which is very dilute, in consequence of leakage of subsoil waters into the sewers, also contains refuse from breweries. By an Act passed in 1854 the New River Company obtained powers to lay down intercepting main sewers through the town, to construct works for treating the sewage by the lime process, and to convey the effluent water past the New River head into the Lea, above the town of Ware. These sewage and outlet works cost the New River Company 28,000*l.*, and they pay the Corporation of Hertford 600*l.* a year to purify the sewage. For sixteen years, from 1858 until 1875, the lime process was used to purify the sewage, at a working cost of 410*l.* a year, and was then given up, as the Phosphate Sewage Company took a lease of the sewage works.

NEW ROMAN CATHOLIC LADIES' COLLEGE AT CAMBERWELL.

A LARGE new building designated the Ladies' College, is just on the point of completion, on a piece of land situated in Knatchbull-road, Camberwell, and immediately adjacent to the Roman Catholic Church of the Sacred Heart, Camberwell New-road. The building stands about the centre of a site nearly two acres in extent, and is inclosed by boundary walls 9 ft. high. It has four distinct elevations, but the principal frontages are those facing the west and the east, the first-named elevation containing the chief architectural features of the structure. It is 74 ft. in width, and 42 ft. in height to the cornice, with a gable at the south-west angle, carried to a height of 55 ft. It has three lofty stories, besides a deep basement. The materials are stock brick, with white Suffolk brick and Portland stone dressings. Internally the building is very spacious, and has accommodation for a large number of female pupils and students. The basement contains the refectory department, and all the domestic offices of the college. On the ground floor are two schoolrooms, each 17 ft. by 20 ft. These, with the chapel, are situated on the east side of this floor, the private apartments being on the west side, and divided from the schools and chapel by a corridor 5 ft. in width. The main area of the chapel is 16 ft. by 22 ft., apart from the chancel and altar space and an adjoining vestry.

Mr. C. A. Buckler, of Hereford-place, is the architect, and Mr. Kelly, of Windsor, the contractor.

MODEL PIPE LAYING.

THE *Consett Guardian* of the 3rd inst. states that at the last meeting of the Consett Local Board a report from the surveyor (Mr. Dixon) was read. According to the instructions received at the previous meeting, he had extended the drain at Rose Mount, and was surprised to find, on opening it out, that about twenty yards of it were entirely choked up. Before removing the deposit, he had levelled the drain, and found that it fell 6 in. *the wrong way* in twenty yards. He had relaid the drain at a proper level.

In the discussion which followed, it transpired that the drain had been laid by a former surveyor to the Board. If this can occur in the case of sewers laid down by a public body, supposed to possess properly-qualified officials, it is small wonder that complaints of defective private drainage are so rife in many towns, seeing that large numbers of the latter works are laid down without any pretence to competent design or supervision.

THE QUESTION OF OAK OR CHESTNUT IN BUILDING OPERATIONS.

THIRTY years ago my attention (practically) was brought to bear on this subject. I, with another, was sent from Cubitt's, Gray's-inn-road, in the spring of 1847, to Tenterden, in Kent; there, at the corner of the Rolvenden-road, stood the remains of what was part of a palace where Queen Elizabeth had resided, so tradition informed us, though at the time only about an eighth of what once was originally remained. We were sent to repair the carved oak panelling covering the walls from floor to ceiling. Necessarily this panelling, which had not been removed for ages apparently, was taken down. Behind it were, to all appearance, very solid and massive timbers, forming an interior partition next the hall; the main stanchions about 10 in. by 10 in., with double filling in studs, 4 in. by 5 in., all of chestnut (for so it turned out to be), but to all appearance like sound old English oak, unwrought. I individually, but accidentally, put the point of a screw-driver against one of the large upright timbers, and to my surprise it penetrated with ease the full depth, and when taken out the dust or decay came out most prodigiously, and on joint examination we found nothing but a thin crust from the plate above to the sill below,—all was completely perished inside. The sill below was of oak, and sound; the smaller timbers were not acted on to the same extent, except where the heart of the tree was forming part of the smaller scantlings, showing conclusively to my mind that the chestnut began to rot or decay at the heart, and if so, *query* from a worm or grub, but rather from some chemical action peculiar to the wood.

We had ample opportunity of comparing the two woods,—oak and chestnut,—and most probably they were of the same age. The difference was quite apparent; its texture and durability were for building purposes very inferior. The restoration had finally to be given up, the chestnut used in construction of framing timbers being in excess of oak; therefore the whole was pulled down, and a new mansion built on the site. I had as relics several of the best pieces I could collect, though small, but, unfortunately, I lost them by fire a few years ago; but having worked some of these relics myself, by carving and otherwise, I can testify to chestnut working easily any way of the grain, breaking off short, and being of a dead nature. Its appearance is much like oak when worked up, though in working and appearance an expert can easily tell the difference. To imitate it in graining the combing would be dispensed with; where the silver grain would be cut through on the bias it would show a long coarse streak, the other parts of a lighter colour, and works up very smooth and close-grained, polishing easily. I do not recollect any figure in any I come across like oak or wainscot.

In conclusion, I should think our ancient

brethren would know its properties, and would never use it in the construction of church roofs, or, indeed, for any purpose where durability would be a feature.

In America, the wood is of little worth. It grows large and quick, is very porous, and of a light colour. A great deal is used for fence-posts with its bark on; in short, any common purpose it is put to. The nut is very small indeed, and hardly worth the trouble to pick. For anything in building purposes I never saw it used, and I had over fifteen years' experience in that country. In short, there is no wood in the world for durability and strength to equal the English oak. T. H.

THE ARTISANS', LABOURERS', AND GENERAL DWELLINGS COMPANY, LIMITED.

SIR,—Some few months ago you commented upon my action as an auditor of the above company, and I shall esteem it a favour if you will kindly permit me to say that the official report of the recent annual meeting just issued to the shareholders is not a *verbatim* or fair record of what transpired on the occasion.

Several of the speeches have been "manipulated," and the numerous omissions, interpolations, and emendations are all made to my prejudice. But I will not trouble you with examples beyond the following.

Shareholders will at once recognise the importance of the omission from the speech of Mr. R. E. Farrant, one of the directors, of the following sentences:—

"I may add that it was a clearly understood thing yesterday at the Board—the Board having been riven, split in two on another matter—that we were to take our own course and our own position. That is some justification for Mr. Pearce in the course he has taken."

As the report does me an injustice, I trust you will find room for this brief communication.

JOHN PEARCE.

P.S.—I should be content to leave my case—even as presented in the report—in the hands of those having a knowledge of building, and shareholders could not do better than submit the points in dispute to some building friend.

*** Judging from the report of the proceedings at the meeting, Mr. Pearce appears to have had good grounds for animadversion; but in making an attack, at a public meeting of the shareholders, on his brother directors, without giving them proper and sufficient notice, he exposed himself to reproof.

BUCKINGHAM WATER-GATE.

SIR,—It may interest some of your readers to know that the landing-stairs between Charing Cross and Westminster Bridge were originally constructed as a site for this water-gate, but the price asked for it seemed so excessive that the purchase, I think fortunately, was not concluded.

The gate will be much more interesting and suggestive to future generations if allowed to remain where it is. Although to-day we can remember that the river ran up to its steps, in a few years—Somerset House alone excepted—every object indicative of the old condition of things will have disappeared, and it will be a matter of wonder. The gate will then become an eloquent landmark of the old foreshore; and as such, in addition to its being on its present site, the only memento of the old ducal gardens, should be one of the protected monuments of London.

In the contract for the embankment a sum of 90,000*l.* was included for providing statuary, &c., in terms of the original designs. This sum must evidently be still in hand, and should provide enough of imposing ornament without making it necessary to borrow old works, such as this water-gate. Its surroundings may be improved; but, beyond repair, the gate itself should remain untouched. M. M.

End of a Strike.—The journeymen slaters in Dundee, who had been locked out for two months, in consequence of their refusal to accept a reduction of wages from 8½d. to 8d. per hour, have intimated their willingness to resume their employment at the reduced rate of pay.

"THE PLAINT OF A POOR MECHANIC."

SIR,—With reference to the letter of your correspondent, will you allow me to say that I believe his statement is quite correct as to the rents charged at some buildings recently erected in Willow-street, Finsbury, but the buildings were not erected by "The Improved Industrial Dwellings Company (Limited)." This company, in 1868, built 168 improved dwellings in the same street, and the rents are from 5s. to 6s. 6d. per week for three rooms, and 7s. to 8s. for four rooms. J. MOORE, Secretary.

READING TOWN HALL COMPETITION.

SIR,—The letter of "Fair Play," in your impression of the 27th ult., has reminded me that I am one of the unfortunate competitors whose design was not in "accordance with the requirements."

I have before objected to competitions upon principle, so that I must admit that what I have lost in time and money was well deserved. Several eminent architects competed, and what their feelings are at being thus played with will be better imagined than expressed.

About sixty designs were sent in, and after being considered by a "Building Committee," a limited number of these designs, instead of the whole, were submitted to Mr. Lainson, of Brighton. In what manner the latter gentleman fulfilled the trust imposed upon him, "Fair Play's" letter clearly demonstrates.

This matter should be investigated by the Institute, as suggested by "Fair Play." GRATIS.

CONTRACT TO SELL.

HUSSEY *v.* HORNE PAYNE.

THIS was an action (Court of Appeal) to enforce the specific performance of an alleged contract by the defendant to sell to the plaintiff an estate called the Mornington Estate, at Fulham, for 37,500*l.* In the letter which the plaintiff's agent wrote accepting the defendant's offer to sell were these words, "subject to the title being approved by our solicitors." The defendant demurred to the statement of claim, and Vice-Chancellor Malins overruled the demurrer. The defendant appealed.

Their Lordships allowed the demurrer upon a ground which was not taken before the Vice-Chancellor,—viz., that the words above quoted from the acceptance of the defendant's offer meant that the opinion of the plaintiff's solicitor as to the goodness of the defendant's title to the property was to be conclusive. This introduced a new term into the contract, and as the defendant had never assented to it there never was a binding contract.

It seems perfectly extraordinary to outsiders that Vice-Chancellor Malins should have overruled the demurrer when the letter relied on to establish a contract contained the words quoted above. The way in which decisions nowadays are given one week to be set aside the next is not creditable to our present system. Money enough has been wasted in the present case, but Mr. Hussey will probably go on to the House of Lords on the mere chance of, after all, finding a majority on his side.

ARCHITECTS' CERTIFICATES.

SPARROW *v.* HILL.

THIS was an action, in the Queen's Bench Division, to recover a balance on a builder's bill (tried at Nottingham at the last Assizes, before Lord Justice Bramwell), and it afforded a curious illustration of the present working of our judicial system. The question, as usual, was as to "extras." The tender accepted was for 589*l.*, and it was sworn on one side, though denied on the other, that the builder promised that he would leave it in the hands of the architect to say what should be due, which was agreed to. The architect considered the claim for extras, and allowed 600*l.*, which was paid into court. The builder claimed, however, nearly 500*l.* more, which was disputed on the ground that the architect had not certified for it. The Lord Justice, however, held that there really was not a particle of evidence to support the defence set up, and although, he said, some "ingenious person" might possibly think there was a scintilla of evidence of it, he did not think there was, and so, without leaving the question to the jury, he directed a verdict for the plaintiff for the amount claimed.

Mr. Metcalfe, Q.C. (with Mr. Graham), moved to set aside this verdict and for a new trial, on the ground that there was evidence to sustain the defence set up; and after some discussion,

The Court, being assured that the Lord Justice had withdrawn the case from the jury, and held that there was no evidence to support the defence, granted a *rule nisi* for a new trial. But if the rule is made absolute, and there is an appeal, it will go before the Court of Appeal, constituted of Lord Justice Bramwell and two other Judges.

Banquet at the Royal Academy.—On Saturday evening, the 4th inst., the president and council of the Royal Academy gave their anniversary banquet at Burlington House. Sir John Gilbert presided.

Books Received.

The Crace Collection. A Catalogue of Maps, Plans, and Views of London, Westminster, and Southwark. Collected and arranged by FREDERICK CRACE. Edited by his son, JOHN GREGORY CRACE. London: 38, Wigmore-street. 1878.

THE remarkable collection of views and maps illustrating the metropolis, made by the late Mr. Frederick Crace, is largely known amongst those who take special interest in such matters, but it was left to his son, Mr. J. G. Crace, to give the reading public some idea of its extent and value. The collection is the work of many years. The maps, plans, and views described in the catalogue are arranged in a series of fifty-seven portfolios of uniform size; besides these, there are eighteen large rollers with mounted maps and plans, three volumes of maps, and one volume of illustrations of frost fairs on the Thames.

The maps of London, commencing in 1560, form one continuous series, representing the gradual growth of this mighty city up to the year of the collector's death in 1859. Some of the maps are unique, and many of them are of great rarity. The earlier maps are bird's-eye views, giving representations of many of the principal buildings; some convey also much interesting information. Thus in Braun's map of 1572 (No. 13), republished in Belleforest's "Cosmography," London is described as "Ennoblie pour le commerce de plusieurs nations, bien peuplée de maisons, ornée de temples, magnifique en palais, illustrée pour les bons esprits y nouris." In the "Plan de la Ville de Londres" (No. 77), published 1700, it is stated, "État présent de Londres, 115,884 familles, 1,200,000 âmes;" and it adds that the yearly consumption of beer is 1,500,000 barrels, of oxen 67,000, of sheep 675,000. In the map No. 84, published 1724, the Customs duties of London are estimated at 300,000*l.* per annum; and it states that 800 hackney coaches are allowed to ply, giving the rates for hire of them. Various plans also represent important properties, such as the Greye Friars, St. Bartholomew's Priory and Hospital, Gresham College, the Bank, the Goring Estate where Buckingham Palace stands, Tart Hall, the Manor of Eburie, the Grosvenor Estates, the Bailiwick of St. James's, and the Pest-house Craven Hill Estate: the production of this last plan by the late Mr. Crace in the Court of Chancery, in 1858, is believed to have decided the question of the ownership of the property. The editor says the views of London are so numerous that, though many of them are of great interest, it is difficult to particularise them. He mentions, however, the *fac simile* copy of the view of London by Ant. Van Wyngaerde, now in the Bodleian Library, which is as valuable for its artistic merit as for its undoubtedly faithful representation of London about 1550. It is 10 ft. long and 17 in. high, and gives a most picturesque view of Southwark and London Bridge, with its towers and houses in the foreground, and a bird's-eye view of the whole City from Westminster to the Palace of Placentia, by Greenwich; St. Paul's is beautifully shown, with its tall spire. There are fine views of the City also by Vischer, 1620, by W. Hollar, 1647, by Kip, 1748, and by Buck, 1749, each of these being about 7 ft. long and 18 in. high, and all of them having the merit of truthful representation, for they corroborate each other.

Many of the drawn views are admirable for their artistic merit as well as for their antiquarian interest, such as those by W. Capon, P. Sandby, T. Sandby, R. B. Schnebbelie, Major Yates, J. Findlay, J. Buckler, G. Shepherd, and by T. H. Shepherd, whose water-colour drawings will be found by hundreds in this collection. In addition to the buildings, the views illustrate in many ways the habits of the people and occurrences of the time. The Great Fire of London, in 1666, is represented in many views by Hollar and others; the Water-works by London Bridge, fireworks on the river and in the parks, executions on Tower-hill and at Tyburn, and frost fairs on the Thames, will be found fully illustrated.

There are many views of Ranelagh and its masquerades of the last century, as well as of Vauxhall from its beginning to its close in our own time. In the grand view of St. James's Park, by Kip, 1710, are shown men playing at Pale Maille, so called by King James I., resembling our modern game of croquet; and in views

of entrance into London by Hyde Park Corner and Blackfriars Bridge, as well as of the Bank, dated 1800 to 1802, omnibuses will be seen on four, six, and eight wheels. The promenades on the Mall in St. James's Park illustrate the costumes of various periods from 1735 to 1800.

In forming the catalogue the editor has adopted the actual titles of the engraved maps and views, and has attached the dates where they can be found. He has also given the sizes of every drawing and print, the first dimension being the width, and the second the height of the plate, this last in some few cases including the title.

The late Mr. Crace, of whom we have a very agreeable remembrance, was born June 3, 1779. Following the profession of his father, he was extensively employed in the decoration of the royal palaces and of other important works. He married, in 1804, Augusta, daughter of Mr. John Gregory, J.P., of Chelsea, who was the Treasurer of the Whig Club and a friend of Charles James Fox. The editor may well be excused for saying,—"My father's kind and genial disposition gained him a large circle of friends, to whom his enthusiasm in the work, and the unceasing industry which he brought to bear in forming this collection, were well known. As it was the labour, so it was the solace of his latter days. As his collection increased, his love for it became all the stronger; and he worked at it without intermission, even through failing health, until, to use the words of Strype on old Stow, "prevented by sicknesse-bringing death," he "imparted not only his good intentions but best collections also unto me," and I have endeavoured thus "to perfect so well-deserving a work."

It was the desire of the elder Mr. Crace that the collection should remain unbroken, and be placed in some public institution, and this is also the desire of the present owner. It is to be hoped that the interesting and careful catalogue which he has prepared will speedily bring this about.

Miscellanea.

New Cemetery, Market Harborough.—The consecration of the chapel and the ground set apart for the burial of members of the Church of England, in the new cemetery at Market Harborough, took place on the 13th ult. The new cemetery, which is situated on the Northampton-road, about half a mile from the town, occupies two acres of ground, which originally cost 720*l*. Since coming into the hands of the Burial Board, the ground has been levelled and laid out at considerable expense, that portion facing the road being enclosed with a low brick wall, on the top of which is a strong iron palisading. The caretaker's lodge at the entrance and the two chapels are Gothic in style. Both the chapels are alike in the exterior and interior, each having a vestry. They are constructed of brick, with bands carried through to the interior, of brown stone from the Duston Quarries, Northampton. The windows are traceried, and of Bath stone. The roofs and seats are of best deal, varnished tables being placed at the east end of each chapel. The floors are of black and red quarries, and the tiles at the east end are from Willington, Shropshire. The architect was Mr. H. M. Townsend, of Peterborough, the contractor being Mr. Walter Lindley, of Leicester. The amount of the contract was 2,158*l*.

Libel.—George Edward Pearson, of Bury St. Edmunds, was again charged at Bow-street with libelling Sir Henry Arthur Hunt. The charge arose out of certain transactions between the firm of Kelk and Sir H. Hunt. The alleged libels were contained in letters written by the defendant, stating that Sir Henry Hunt had been bribed by Messrs. Kelk to obtain a contract for them. Sir John Kelk denied emphatically that there had been anything except perfectly regular dealings between Sir Henry Hunt and the firm. The defendant reserved his defence, and was committed for trial. A plea of insanity was raised.

Sewer Flushers.—At the meeting of the Metropolitan Board of Works, on the 3rd inst., it was resolved, on the motion of Mr. Fowler, "That a return be prepared of the number of men in the employ of the Board as flushers, and others in connexion with sewer works, who have been temporarily invalided during the past two years, and the amount paid in respect thereof."

Architects' Benevolent Society. — The Hon. Sec., Mr. J. Goldicutt Turner, writes:—"Sir,—In memoriam of the late Sir George Gilbert Scott I am cognisant of a donor to the funds of this Society of a sum of 26*l*. 5*s*., provided that not less than two others come forward with similar donations, the aggregate to be added to the stock invested in the names of the Society's trustees."

New Font, Gloucester Cathedral.—Mr. William Gibbs, of Tyntesfield, the well-known benefactor of Keble College, Oxford, died in April, 1875, at the age of eighty-five years. Among his many other good deeds, he had intended to offer a font for Gloucester Cathedral, and his son, knowing of this unfulfilled purpose, in October of that year offered to give the font as a memorial of his father. The late Sir Gilbert Scott accordingly prepared the design, the execution of which was entrusted to Messrs. Farmer & Brindley. The font has now been completed. It is to be placed at the west end of the south aisle, just inside the porch, and under the Elliott and Jenner memorial windows. The style of the structure is Norman. It will stand about 5½ ft. high. The base is about 7 ft. square, and rises in three steps, diminishing in size. The first two steps are fine-axed, and the third step, upon which the base of the font rests, as well as the font, is a redder variety of the same stone, polished, and is of a mottled red colour of a beautiful shade. From the top step at the corners spring four columns, with carved capitals, supporting the bowl above, which is about 3 ft. 6 in. square on the outside, with a circular interior. It has a carved ornamental base, and its four sides are enriched with carved panels, representing fish, Noah's Ark, a cross, &c

New Reredos, Long Sutton—A reredos has just been placed in the chancel of Long Sutton Church, from designs by Mr. W. Smith, architect, London. The centre consists of a representation of Our Saviour's administration of the Last Supper to his disciples, sculptured by J. Forsyth, London, on a slab of alabaster, 7 ft. wide and 3 ft. 6 in. high, having a gold background. On each side are richly-decorated pillars of Ancaster stone, surmounted by a canopy 12 ft. high, with pinnacles, crockets, and sculptured heads, the whole being supported by solid stone masonry 11 ft. wide. The stonework and the stone carving were undertaken by Messrs. Law & King, builders, &c., Lutterworth. Beyond, extending on either side about 4 ft. to the side walls of the chancel, a stone cornice surmounts a series of architectural designs, painted on Parian cement by Messrs. Heaton, Butler, & Bayne. The most striking objects are four full-length figures on gold grounds, illustrating the Mosaic and Christian dispensations. The Old Testament is represented by Kings David and Solomon; the New by St. Peter and St. Paul. Under each pair of figures is a geometrical dado, embellished with vine foliage and divers coloured borders.

New Barracks, Montrose.—The *Montrose Review* understands that Messrs. Ford & Son, builders, have completed a contract with the War Department for the whole work in connexion with the transformation of the Old Asylum Buildings into barracks for the militia. The alterations on the present buildings will be very extensive. The greater part of the interior will be gutted, and a new range of offices will be erected between the present building and Panmure Barracks. The grounds within the inclosed walls are in the meantime divided by stone dykes, the whole of which are to be removed, and by this means the barracks will be surrounded by a large open space. When the alterations are completed there will be accommodation for at least 550 men. Messrs. Ford have just completed the erection of the new hospital, Cameron and Murray wings, of the barracks at Perth, at a cost of 17,000*l*.

Monument to an Editor. —The sum of 2,078*l*. has been received for a memorial to the late Mr. Alexander Russell, long editor of the *Scotsman*. At a meeting of the committee in charge of the matter on the 10th ult., it was unanimously resolved to erect in the Dean Cemetery, Edinburgh, where the remains of Mr. Russell are interred, a monumental obelisk of polished red granite 35 ft. 8 in. in height, from a design furnished by Alexander Macdonald, Field, & Co., Aberdeen.

Proposed Large Church for the Oratorians, South Kensington.—Designs have been submitted by Mr. Hansom, Messrs. Goldie & Child, Mr. Fowler, Mr. Walford, and others.

Fall of a House.—An accident occurred on the 2nd instant in Vesey-street, Poplar. It appears that for some time past a row of houses at one end of Vesey-street has been undergoing the process of partial rebuilding, in addition to which an addition has been erected at the back of the houses, intended to give three extra rooms to each house. About five o'clock the new erection at the back of one of the houses came down with a crash, pulling a portion of the old structure with it, and so greatly shaking the adjoining tenements on either side, that they appear likely to fall also.

Kidderminster School of Art.—A meeting has been held in the Mayor's parlour, Kidderminster, for the purpose of considering the revised plans and taking into consideration the necessary steps for the erection of a School of Art at as early a date as possible. Mr. Brinton said that the sum of 3,000*l*. would be required to carry out the whole of the works. He concluded by moving the adoption of the plans prepared by Mr. Gethin. The motion was unanimously agreed to.

Mr. P. Le Neve Foster.—A committee is in course of formation for the purpose of raising a sum of money to be presented to Mr. P. Le Neve Foster as a testimonial in recognition of his twenty years' efficient services at the Society of Arts. We wish it every success.

The Rebuilding of the Tuileries. — The Tuileries Commission has resolved to recommend the restoration of the ruined palace, at a cost of about 4,000,000 francs, and the appropriation of it as a museum of modern art. The Chamber will be asked to sanction the scheme.

The Bridgewater School Board, on Saturday last, adopted plans for new schools to be built in Albert-street for the accommodation of 720 children, prepared by Mr. Parker, the borough surveyor.

TENDERS

For works at the School for Imbecile Children, Darenth, Kent, for the Managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, architects:—

Road-making and Ground Work.

Wipe	£7,355	0	0
Blake	6,990	0	0
Bell	6,880	0	0
Perry	6,582	0	0
Young & Williams	5,566	0	0
Webster	4,637	0	0
Goddard	4,180	0	0
Paice	3,397	0	0
Brady	3,393	0	0
Nicholson (accepted)	2,670	0	0

Farm Buildings.

Webster	£7,500	0	0
Blake	7,490	0	0
Wall	6,662	0	0
Prout	6,135	0	0
Cowland	5,984	0	0
Kirk (accepted)	5,960	0	0

Turret Clock.

Moore Bros. (accepted)	£300	0	0

Oak Fencing.

White & Co.	£1,369	13	0
Taylor & Brooker	1,350	0	0
Stenning & Co.	1,335	0	0
Key (accepted)	1,225	0	0

For engine and boiler house, shaft, &c., at East Farleigh, East Kent, for the Maidstone Water Works Company. Mr. Henry Teague, engineer:—

Bowes	£3,990	0	0
Cox	3,680	0	0
Wilkins	3,672	0	0
Bridge	3,556	0	0
Wallace & Clements (accepted)	3,554	0	0
Avard	3,505	0	0
Ames	3,316	6	9
Miklejohn (withdrawn)	3,120	0	0

For county bridge, Southend-lane, Beckenham, for the Justices of the County of Kent. Mr. Martin Bulmer, architect:—

Payne & Balding	£449	0	0
Ames	434	10	6
Jerrard	385	0	0
Landsbury (accepted)	362	0	0

For two shops to be erected over the forecourts of 96 and 98, Newington-butts, also various alterations. Mr. E. Taylor, architect:—

Smith (accepted)	£315	0	0

For house and factory, Salway-road, Stratford, for Mr. S. Flaxman. Mr. Geo. More, surveyor:

Reed	£975	0	0
Hoskings Bros.	823	0	0
Gregor	815	0	0
Charlton & Mansell	700	0	0

For master's house, in Church-street, Lower Edmonton, for the Trustees of Latymer's Charity. Mr. E. Ellis, architect:—

Linzell	£789	0	0
Field & Sons	776	0	0
Humphreys	738	0	0
Ward	682	0	0

For new dining-hall, restaurant, &c., to the Cliftonville Hotel, Margate. Mr. Alfred Drewe, architect. Quantities by Messrs. Bull:—

Naylar	£5,270 0 0
Bushell & Sons	5,216 0 0
Paramor & Son	5,100 0 0
Wilson	4,990 0 0
Brown & Son	4,716 0 0
Mark	4,698 0 0
Denne	4,260 0 0

For Primitive Methodist Chapel, Battersea-fields. Mr. A. J. Rouse, architect:—

Stubbs	£3,179 0 0
Storr	3,120 0 0
Ford	3,032 4 0
Williams	2,965 19 9
Parker & Evans	2,673 0 0
Coles	2,615 0 0
Blow	2,540 0 0
Steed Bros.	2,532 0 0
Garrud	2,483 0 0
Newton & Triggs	2,465 0 0
Sawyer	2,371 10 0
Lathey Bros.	2,330 0 0
Sampson & Parrish	2,250 0 0
Hocking	2,248 0 0
Holloway	2,217 0 0

For the extension of Slater's-street Primitive Methodist Chapel and school, High Wycombe. Mr. A. J. Rouse, architect:—

Pierce	£448 12 7
Harris	443 9 0
Hunt	429 15 0
Salt	295 0 0

For the erection of six houses and shops, at Coseley, in the parish of Sedgley, for Mr. S. E. Smith. Mr. Charles Round, architect:—

Exors. of Millward	£1,855 6 0
Nicklin	1,621 0 0
Rawlins	1,515 10 0
Burton	1,353 0 0
Adams	1,320 10 0
Jones & Sons	1,250 0 0
Tranter (accepted)	1,134 8 0

For the erection of three chapels, three lodges, and mortuary-house, in Everton Cemetery, Liverpool. Messrs. T. D. Barry & Son, architects. Quantities supplied:—

Urmson	£21,812 0 0
Roberts	21,800 0 0
Wells & Sons	21,500 0 0
Morrison & Sons	20,612 0 0
Jones	20,360 0 0
Black & Toul	20,333 0 0
Brown & Backhouse	20,090 0 0
Thornton & Son	19,812 0 0
Nicholson & Ayre	19,663 0 0
Miller	19,620 0 0
Yates	19,583 0 0
Anwell*	19,555 18 7

* Accepted, subject to arrangement.

For the erection of schools and master's residence, at Tipton-green, for the Tipton School Board. Mr. Charles Round, architect. Quantities supplied:—

Rowley & Lynex	£7,146 8 11
Exors. of Millward	6,917 11 0
Everal	6,643 0 0
Exors. of Cresswell	6,513 0 0
Harley	6,229 2 6
Dawson & Bradney	6,142 0 0
Webb & Round	5,940 0 0
Nelson	5,803 0 0
Holland & Sons	5,642 0 0
Jones & Sons	5,622 0 0
Tranter	5,446 0 0
Stockton & Son	5,098 0 0
Horton	5,079 0 0
Adams (accepted)	4,928 10 0

For the erection of schools and master's residence, at Burnt Tree, for the Tipton School Board. Mr. Charles Round, architect. Quantities supplied:—

Love & Flint	£5,812 17 3
Rowley & Lynex	4,945 15 7
Everal	4,633 0 0
Exors. of Cresswell	4,530 0 0
Harley	4,409 18 10
Dawson & Bradney	4,339 0 0
Jones & Sons	4,190 0 0
Nelson	4,155 0 0
Webb & Round	4,132 10 0
Holland & Sons	4,103 0 0
Exors. of Millward	3,917 1 4
Stockton & Sons	3,780 0 0
Tranter	3,668 0 0
Horton	3,648 0 0
Adams (accepted)	3,371 0 0

For construction of outfall sewage works, &c., Northwich. Mr. Henry Bancroft, engineer:—

Hocson	£3,445 4 6
Bennison	3,439 0 0
Keegan	3,397 7 0
Whittle	3,333 14 0½
McGuire	3,200 0 0
Dale	3,199 0 0
Winnard	3,163 2 1
Stafford & Co.	3,125 18 4
Leicester Bros.	2,986 0 0
Mackey	2,960 13 10
G. & J. Foote	2,710 13 1
Hirst	2,685 15 6
Cowdery & Sons	2,681 12 6
Kirk (accepted)	2,607 0 0
Rayner	2,524 7 0

For master's residence, St. Mark's School, Windsor. Mr. Stephen Wyborn, architect:—

Norris	£4,447 0 0
Potbury	4,010 0 0
Woodbridge	3,977 0 0
Hollis	3,791 0 0
Reavell (accepted)	3,771 0 0

For new Wesleyan Chapel, Broad-street, Ludlow, Salop. Mr. Ranger, architect:—

Grosvenor	£2,000 0 0
Jones & Co.	1,969 0 0
Hine	1,900 0 0
Gethin Bros.	1,796 0 0
Nevitt Bros.*	1,550 0 0

* Accepted, exclusive of old materials, valued at 500*l*.

For construction of river wall, shedding, and boundary-walls, &c., at the Vestry-wharf, No. 2, Lot's-road, Chelsea, for the Vestry of the said Parish. Mr. G. H. Stayton, engineer:—

Braid & Co.	£1,475 0 0
Thorn	1,450 0 0
Newell & Robson	1,450 0 0
Cook & Co.	1,350 0 0
Brass	1,328 0 0
Young & Co.	1,299 0 0
Neave & Son	1,295 0 0
Crockett	1,200 0 0
Cardus	1,190 0 0
Dickenson (accepted)	1,146 0 0

For formation of new streets, Burslem. Mr. Ralph Dain, architect:—

Trubshaw	£1,730 0 0
Mackay	1,591 0 0
Worthington & Hill	1,530 0 0
Smith	1,454 0 0
Brindley	1,403 0 0
Noden & Wilding	1,359 0 0
Dovener & Queseneé	1,324 0 0
Drewitt & Pickering (accepted)	1,305 0 0
Boughey	1,182 0 0

For the restoration of Castle-frome Church, near Bromyard, Herefordshire. Mr. M. B. Buckle, architect:—

Smith	£1,332 0 0
Barrett	1,096 0 0
Porter (accepted)	894 0 0

For additions to Storridge Schools, near Malvern, Herefordshire. Mr. M. B. Buckle, architect:—

Porter	£131 0 0

For the erection of residence and farm buildings, at Manor-court Farm, Brasted, Kent, for the Earl Stanhope. Mr. Martin Bulmer, architect:—

Ashby & Horner	£4,440 0 0
Durtnell	4,244 0 0
Calland (accepted)	4,200 0 0

For five houses and shops, at Stamford-hill. Messrs. Wm. Waymouth & Son, architects:—

Dover Bros.	£6,117 19 0
Wyeth	5,030 0 0
Sawyer	4,989 0 0
Sheffield & Prebble	4,987 0 0
Shurmur	4,977 0 0

For rebuilding house, at Walthamstow, for Mr. David McLean. Mr. William Kidner, architect. Quantities by Mr. H. Blackwell:—

Larter & Son	£3,844 0 0
Shurmur	3,825 0 0
Ashby & Horner	3,770 0 0
Browne & Robinson	3,769 0 0
Lawrence	3,755 0 0
Staines & Son	3,746 0 0
Morter	3,643 0 0
Conder	3,620 0 0
Garrud	3,473 0 0

For proposed residence and chapel, for the Brotherhood, Randolph-gardens, Kilburn. Mr. F. W. Hunt, architect:—

	Residence.	Chapel.
Harris	£4,303 0 0	£1,332 0 0
Simpson	4,096 0 0	1,325 0 0
Towns	3,950 0 0	1,200 0 0
Laley Bros.	3,796 0 0	1,174 0 0
Phillips & Briscoe	3,691 0 0	1,145 0 0
Bailey	3,542 0 0	1,085 0 0
Tileman	3,441 0 0	1,108 0 0
Haylock	3,455 0 0	1,073 0 0

TO CORRESPONDENTS.

J. P.—W. H. J.—M. B.—J. P.—J. S. H.—H. S.—R. U. B.—A. D.—H. D.—C. R.—G. & V.—E. T.—J. P.—Dr. A.—B.—W. E.—E. P. L. B.—A. & C. H.—J. G. B.—L. P. & B.—J. K.—J. R.—M. B. B.—R. L.—S. W.—T. C.—R. K.—H. G. T.—T. P. W.—W. R. D.—J. B. & Son—C. H.—J. H. W. (diagram referred to appeared first in the *Builder*. We do not observe anything new in the diagrams sent)—J. K. (we should be glad to receive the particulars offered as to the Embankment).—J. S. (send plans and particulars).—G. & M. (should send list of tenders and announte)—P. B. (next week)—H. S. B. (next week).—O. E. (next week).—O. E. C. (too late for this week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

The Builder.

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The Electric Light.



ELECTRIC light has been used in the British Isles principally for light-houses; but we are not aware that, beyond a few experiments, even a beginning has yet been made in its use for lighting up large open spaces or workshops, factories, and such like. The recent trials with the light made at the Mansion House,—which experiments are considered to have been on the whole successful, as might have been expected,—may therefore be said to fairly open up in this country the question of lighting public thoroughfares by those means. It may confidently be said that its introduction into factories and workshops will not long be delayed if once the electric light is accepted as a medium for lighting our thoroughfares. On the Continent they are very much ahead of us in this respect, especially as regards the employment of the new illuminator (which, by the way, cannot be everywhere utilised) in factories and workshops. In a recently published work, "L'Éclairage à l'Électricité," numerous instances of its use are given; we propose to cite some of them. The author, M. H. Fontaine, discusses its use in the various branches of industry, the requisite machines and lamps, the preparation of the charcoal points, the power required, and the cost. Those of our readers interested in the matter will do well to follow us.

Nothing known at present can take the place of the electric light wherever it is a question of being able to see or be seen at long distances; as in lighthouses, in fortresses, on board ships, on sea-coasts, or in the field during campaigns. The same is the case at works in the open air. Gas, petroleum, oil, are still to be preferred for lighting up dwelling-houses and low workrooms with their many small divisions, which have to be illuminated separately. In some cases, where now no nightwork can be done, it might be introduced if an illuminating power four to five times as strong could replace that at present in use.

There exist at the present time more than 300 applications of the Gramme machine for lighting, while about a year or two ago there were only twelve. The electric light was first used in engineering shops; next in dye-works, where a very white light is required; in sugar manufactories, where the steam, after its exit from the cylinders, is still further used for evaporation; also in railway stations; for building operations during night-time; finally, for spinning-mills, forges, foundries, &c. The electric lamp of Jablochkoff, although it will cause no revolution in the present mode of lighting, may be profitably employed in certain cases.

In the use of the electric light, in order to prevent dark shades, two lamps have to be set up. Each lamp burns from three and a half to four hours; fresh charcoal points must then be put in. This takes up only a few seconds, so that the extinction of the light does not give rise to much delay, especially if more than one lamp is employed. Whenever a continuous light is desired, two lamps are used, of which one ignites itself as soon as the other goes out. The light does not try the eye. Transparent balls were employed at first in workshops, but were found unnecessary, and removed at the desire of the workmen themselves. One great advantage in the use of the electric light is that the colours appear of the same hues as by daylight, a fact of great importance to dyers, spinners, painters, and others.

One lamp suffices for illuminating about 5,400 square mètres in an engineering workshop, half that space in dye-works or print-works, and four times that space on a wharf or quay, where no delicate work has to be performed. The cost of the lamp, the magneto-electric machine, the wires, &c., amounted in France altogether to 96*l.*

The electric light was introduced in the workshops of the Gramme Company in 1873. Only one lamp is used, and it replaces twenty-five gas-burners. It has worked well for four years, and the expense has been, including everything, not quite 6d. per hour. The room illuminated is 16 ft. 6 in. high, and about 40 ft. square.

In the works of M. Ducommun at Mülhausen, four lamps, each with a Gramme machine, have been in use for the last three years. The expenses of fitting up (400*l.*) are equal to that for 250 gas-burners; the light exceeds that of 400 burners. The lamps are 16 ft. 6 in. over the floor, and are distant from each other, as regards length, 69 ft., as regards width, 46 ft. Messrs. Heilmann & Steinlen have designed an especial communication of the steam-engine with the Gramme machine on the same foundation plate, which is very suitable for workshops and ships. The foundation plate, 7 ft. 4 in. long and 3 ft. 3 in. broad, is very heavy, so that all vibration is avoided. The fly-wheel of the steam-engine, of which one strap runs to the Gramme machine, makes 150 revolutions per minute, the Gramme machine, 850. The whole apparatus is sold in France for 160*l.*

The establishment of Lautter, Lemonnier, & Co., of Paris, in which lighting apparatus for lighthouses are made, consists of two rooms, each 98 ft. 6 in. long and 62 ft. broad; down the whole length of the workshops runs a gallery 33 ft. wide. On the ground floor the machinery and machine tools are placed; on the gallery the modellers and formers work. The three electric machines employed are in the machine-room, and make 850 to 900 revolutions per minute; each requires two elements, and supplies a light equal to 100 (Carcel) gas-burners. The charcoal points are consumed at the rate of about 70 millimètres per hour, their cost being 1s. 7d. per mètre, so that 100 Carcel burners cost about 1½d. per hour, besides the expense for the motors.

M. Menier's several factories comprise works at Grenelle (Paris) for manufacturing caoutchouc, sugar-boiling works at Roye, and a chocolate manufactory at Noisiel. In each of the two former, three machines, each of 150 burners, are placed, in the latter eight of them. M. H. Menier has made the lamp easily accessible, for the purpose of changing the charcoal, without ladders, by hanging them by a cable running over two rollers at the ceiling. The cable encloses a copper wire, surrounded by a coating of caoutchouc; over this, again, a wick-like layer of copper wire; then again a coating of caoutchouc; and, finally, a covering of hemp. At one end of the cable is a plate, supporting, on curved rods, the lamp; on the other end the cable runs round a drum of hard india-rubber, at both cast-iron cheeks of which the conducting wires are fixed. The lamp, when drawn up, is kept in its position by a catch on the drum. The eight machines of the chocolate factory at Noisiel are united in two batteries of four each, and are driven by water-wheels, the place of which, in case of necessity, may be taken by a special steam-engine. The wires lead to a commutator on the ground-floor, which permits the stream of each individual machine to be sent in fifteen different directions. Thus, each machine may be used for any lamp placed in a separate room; and in case a machine or a lamp should fail, others will take its place. This establishment of M. Menier is said to possess the most perfect method of lighting by electricity. Each lamp, hung in a square lantern at a height of 23 ft., lights up a court space of 21,529 square feet; two other lamps illuminate each an inner court of 5,382 square feet. The kiln-house, in which thirty-two workmen are engaged, of a length of 145 ft., a breadth of 36 ft., and a height of 25 ft., is lighted up by a single lamp, hung up at one end; the light is thrown by a parabolic reflector to the ceiling, whence it is equally distributed. In the forming and weighing-room ninety workpeople are employed; this room is 171 ft. long, and as broad and as high as the room last described. Two lamps are hung up 20 ft. high, and distant from each other 50 ft. The engineer's repairing-shop, of a surface of 4,306 square feet, is lighted up by a lamp placed 20 ft. high.

The Electric Light used in Spinning Mills.—In the spinning-mill of Dieu-Orby Veuve, at Daours (Somme), the work-room is 12 ft. high, 141 ft. long, and 36 ft. broad. It contains nine lapping-machines, with thirty spindles each, and seventeen twisting-frames with fifty-two spindles each; fifty men and women are engaged. Two

Gramme machines are driven by an hydraulic motor. The lamps hang about 7 ft. high, and are (as at Noisiel) provided with a reversed skylight, which throws the rays of light towards the ceiling, whence they are distributed in all directions, so that the glowing centres of light are not seen. Everywhere where there is a very white ceiling under 13 ft. high, it is better to employ the reflected light in preference to the direct. In the spinning-mills of Ricard Fils, at Mauresa (Barcelona), where the electric light is also used, the first floor is 108 ft. long, 70 ft. wide, and 13 ft. high. Two lamps are used for two self-actors. The two Gramme machines are placed at one end of the building, and are driven by the steam-engine of the works. The lamps are hung at a height of 11 ft.; they are placed 49 ft. from each other. In the second floor, the spinning-machines occupy a space 70 ft. long, 52 ft. broad, and 13 ft. high; one lamp suffices. The five self-actors work, like those of the first story, since May, 1876, every night. The owners of the mill are perfectly satisfied with the electric light. In the wool-spinning and weaving mills of Buxeda Frères in Sabadell (Spain), the room is 177 ft. long, 72 ft. broad, contains thirteen spinning-frames, twelve carding-machines, one butting-machine, and several other auxiliary machines; eighty workmen are employed. Formerly, when lighted with gas, some work could not be done at night, on account of the change in colour. At present three lamps, hung at a height of 13 ft., and 42 ft. apart, are used; and the mills work night and day, notwithstanding the dark colours of the yarn. The lighting is now cheaper than with either gas or petroleum.

The goods station of the Chemin de Fer du Nord, at La Chapelle at Paris, is now also lighted by electric light. The hall illuminated has a length of 230 ft., a breadth of 82 ft., and a height to the top of 26 ft.; a court 65 ft. broad separates the hall from a carriage-shed, which is 230 ft. long, 49 ft. broad, and 26 ft. high. The hall is lighted by two lamps, fixed in lanterns placed 15 ft. high; the glass of the lower parts of which is painted white, to protect the eye. It is stated that a saving of 25 per cent. is effected in the number of workmen employed at night. One lamp suffices for the court and the carriage-shed. The machine is placed about 283 ft. from the lamps. The expenses per hour for each lamp amount to about 7d. The cost of fitting up, including the steam-engine, is stated at 920*l.*

The harbour works at Havre for enlarging the outer harbour could be carried on only during low water. Two electric lamps, each of a lighting power of 500 Carcel burners, enabled 150 workmen, distributed over a space of a little over three-quarters of an acre, to work as during day.

In the iron pipe foundry of Mignon, Rouart, & Delinière, of Montluçon, two Gramme machines light a room 207 ft. long, and 112 ft. broad, by means of two lamps hanging at a height of 20 ft., and at a distance of 103 ft. from each other. The shadows thrown by the workmen on the machines are so little noticed that it is possible to read even in places where they are darkest. A second room, next to the first one, and separated from it by a wall with broad niches, receives light enough to enable persons to read in it everywhere, although some spots are distant 279 ft. from the lamps.

In a port belonging to a sugar refinery on the Rhine-Marne Canal at Sermaize, the electric light has been used since the end of 1875 for lighting up a wharf used for unloading beet-roots. A Gramme machine of 200-candle power is placed near the steam-engines, 230 ft. from the lamp. Two ships are very often unloading at the same time. The saving effected per hour is at least 8s. In sugar refineries the expense of lighting by electricity is almost confined to the cost of the charcoal points, for the steam required for driving the machine may be further utilised.

In a skating-rink at Vienna, near the Park-ring, with a skating surface of nearly an acre and a half, two Gramme machines, driven by a No. 8 engine, and placed 443 ft. from the rink, illuminate easily a space of a length of 436 ft. (including the promenade) and a breadth of 187 ft. The Serrin lamps are placed in the upper parts of two turrets of pine, 25 ft. high, and 187 ft. distant from each other. To prevent the light being thrown upwards, two reflectors are so placed as to reflect all the light on to the skating-ground. The eight sectors of the reflector are curved in an ellipse, one focus of which is the lamp, while the other lies 3 ft. lower.

To the above information may be added a few details from a report addressed by M. Ch. Rousseau to the Société Industrielle d'Amiens.

The oldest and best known electrical lighting apparatus, founded on Clark's principle, employed by the Alliance Company, is used in various French lighthouses. The more powerful and smaller machine of Wilde has been selected for the Scottish lighthouses.

The Gramme machine is used in Daour's foundry, Amiens. The room in which it is employed, of a surface of 5,167 square feet, is nearly four times as long as it is broad (144 ft. by 36 ft.) and 13 ft. high. It is lighted by two Gramme machines by means of two Serrin lamps, which are placed 40 ft. from the ends of the room and 7 ft. 6 in. above the floor. At first the lamps were protected by dull glass; the intensity of the light, however, was still too much for the eyes of the workmen, and the room near the lamps much lighter than at its ends. The work had to be suspended when one of those glass globes broke. M. Ernest Dieu then had the happy idea of replacing the dull glass by metal reflectors fixed underneath the lamps, which threw the light on to the ceiling. The sources of the light are thus nowhere seen in the room. The motive power is supplied by a very powerful water-wheel. The expenses for fitting up the electric light were:—

Two Gramme machines	£152	0	0
Conducting wires	6	14	0
Mounting of the cylinders, &c.	19	2	0
Straps	7	0	0
Erecting the lamps	2	0	0
Total	£186	16	0
Consequently interest and amortisation	£24	0	0

With steam-power by means of a small machine 8*l.* would have been used for 10 tons of coal. The charcoal points cost for 500 hours 7*l.* 12s. Reckoning 8s. for extras, 40*l.* would be the yearly expense, or 1s. 7½d. per hour. Fifty-five gas-burners would in Amiens each consume 2s. 2½d. worth of gas, to which would have to be added 4d. for each for interest and amortisation of capital sunk (60*l.*), besides the cost of maintenance.

In the Gare du Chemin de Fer du Nord, at Paris, the extinction of the light has been prevented by setting up a reserve lamp. The lamps are placed on tables, which are long enough to permit of a fresh lamp being put on them, while the one to be changed need not be taken away until the new one is in operation.

In the recent trials at the Mansion House the light was obtained from a Bunsen 48-cell battery, and its effect was so powerful on the populous thoroughfare as to make the numerous vehicles and foot-passengers as conspicuous as in broad daylight. The lamps were protected by opal glasses, to tone down the dazzling effect of the light. It is proposed at present to illuminate only the Thames bridges and the open spaces of the City with the new light. The statement that its cost, after the erection of the necessary machinery, will be about the same as that for gas, seems to us erroneous, unless the City of London is going to pay at a much higher rate for the new light than that at which it is produced on the Continent, as appears from what has been stated above. The instances we have cited show that the expenses for the electric light are very considerably below the price of gas; unless the statements be explained by the fact that gas is charged much higher on the Continent than it is in this country.

The Property Market.—The total sales for the year reported up to the 30th of April, inclusive of sales by private contract, amount to 2,149,795*l.* This is no less than a million below the sales during the same period of last year, and about the same amount as 1876. Business is dull, and will continue to be so till after the question of peace or war is settled. Messrs. Farebrother, Ellis, & Co. sold, on the 4th, a nice little estate of 53 acres, with residence, in the Isle of Wight. It fetched 7,000*l.*,—about 150*l.* per acre,—cheap, we should think, at the price. Messrs. Newbon & Harding sold freehold ground-rents, amounting to 621*l.* per annum, at Holloway, for 16,010*l.*,—over twenty-five years' purchase. Messrs. Hards, Vaughan, & Co. sold, on the 5th, ground-rents at East Dulwich, amounting to 144*l.*, for 3,065*l.*, about twenty-two years' purchase.—*Metropolitan.*

NOTES ON ARCHITECTURE AT THE ROYAL ACADEMY.

Continuing our notes in the architectural room,* the next work of importance is that numbered 1092, "New Banking Premises for Messrs. Child & Co., Temple Bar," John Gibson. The style in which the building is designed, Roman with "engaged" columns, has been so all but universally accepted as the bank style in this country, that only an exceptionally bold architect would venture to depart from it. The drawing is a large and rather mechanical draughtsman's production: it is needless to say that Mr. Gibson has carried out the style with knowledge and good taste. It may be time, however, for some new architectural expression of banking to be evolved.

1093. "South-west View of Mansion at Lytchett Heath, Dorset," David Brandon. This and No. 1081 illustrate two mansions by this architect, both in Elizabethan style and preserving the recognised features of the style intact; they will probably look more noticeable in execution than they do in these drawings.

1095. "Design for the Completion of the Belfry, Christ Church, Oxford," G. F. Bodley & T. Garner. A very fine powerful water-colour drawing showing a corner of the "quad," with the massive square tower, and on it an open-work lantern of very elaborate late Gothic design, terminating in a cupola roof. It is not made sufficiently obvious what is the material of the proposed lantern: it looks most like iron from the way it is coloured, but is certainly too heavy in parts for that, while it is too light for stone, which the tinting also contradicts: wood seems the only alternative: this should have been made clearer, but the drawing as it stands is very effective.

1094. "Yattendon, near Newbury," A. Waterhouse, A. This is a much more effective and original building than "Iwerne Minster"; the treatment of the upper portion of the large heavy tower has considerable novelty, and is very pleasing in result.

1100. "Design for Town Hall, Barrow-in-Furness: Second Premium," T. E. Collcutt. The Barrow folk were fortunate in their competition if the selected design is superior to this; it is rather a medley of Classic, Gothic, and Queen Anne detail, certainly, but that is what we seem to be coming to, and the architect has contrived to give considerable unity of effect, after all. The objections are that the dormers are somewhat heavy to come over the arcaded story below them, and that the junction of the octagon lantern with the square tower is not well managed, and the broach angles are filled up with objects that seem actually intended to imitate "pepper-boxes." There is a separate drawing of the tower exhibited (1130), which, however, does not reconcile us to this defect. The design owes something to the fine drawing; but there is much force and originality in it in spite of the defects named.

1104. "Reredos, St. Martin's Church, Brighton," H. Ellis Wooldridge. A large coloured elevation, occupying the centre position on the wall, a position which it seems to merit rather for its size and elaboration as a drawing than from any remarkable qualities as a design, so far as the architectural portion is concerned, at least. It is a large built-up composition in florid late Gothic style, entirely gilt, which would have a somewhat tawdry, rather than a rich effect; the spaces between the architectural constructive portions are filled with fresco paintings, which in the drawing are too small, and too far from the eye to be judged minutely; the general result is certainly rather too *prononcé*.

1103. "Houses now building in Cadogan-square," R. N. Shaw, R.A. elect. A fine drawing, like all Mr. Shaw's drawings, and a singular medley in regard to design. The square projecting bay in the centre of the front requires three ponderous stone brackets to carry it; the equally projecting octagon bay at the angle stands upon a glass window. There is eccentric—one may say piquant—effect in this, but all principle or logic of design seems ignored.

1106. "Selected Design for proposed Municipal and School Board Offices, Leeds," Geo. Corson. We mention the presence of the drawing here; the design we commented upon fully at the time of the competition, and gave an engraving of it subsequently.

1109. "Central Hall of new Natural History Museum," A. Waterhouse. An elaborate

* See p. 480, *ante*.

coloured drawing of an interior in which terra-cotta work and constructive polychromy are largely used, and in which the style may be said to be founded on Romanesque, with a modern treatment suitable to the material employed. The hall is roofed with iron principals, which spring from vaulting-shafts carried up from the floors; between the piers the lower story has an arcade of rather low-proportioned round arches, with no imposts, and the archivolts decorated with terra-cotta ornament; above, the bay is filled with triplets of arches on shafts, the centre arch carried up with a very high stilt, after the Byzantine manner. This latter feature strikes us as an awkward feature which it is a pity needlessly to revive; in many respects the interest and originality of the design cannot be disputed. The effect of the junction of the iron roof with the masonry would have been more satisfactory, perhaps, if more mass could have been given to the iron principal at its springing; as it is, there is too marked a contrast between the massive character of the masonry design and the thin web of the iron rib.

1108. "Westwood House, Sydenham: a Remodelling of the Exterior without any material Alteration of its present Plan," J. L. Pearson. A very rich and effective design of Late Elizabethan type. An original feature is the manner in which the reversed convex and concave gables characteristic of the style are filled with ornament in relief, apparently modelled in plaster, but as the drawing is not coloured, the material here can only be guessed at.

1115. 'Design submitted in Competition for the Kensington Vestry Hall," J. M. Brydon. An elevation of a Queen Anne design with a great deal of merit, which we noticed with commendation when the competition drawings were exhibited.

1116. "Great Central Schools, Public Offices, and Firth College, Sheffield," E. R. Robson and T. J. Flocton. A group of educational buildings on an irregularly-shaped piece of ground, as appears by the small plan which the authors append (we wish all contributors to the architectural room would do the same); but the perspective is rather unscrupulously "cooked," so as to have the effect of a right angle instead of an acute angle, with the object of showing both fronts, which would be impossible from this point of view if the true shape of the plan were adhered to. The parroting of the manner of building of a century back could hardly be carried further, or done more completely, than in this building, with its curved buttresses and scrolls, and its heavy blank niches in the end wall of the schoolhouse. The only interest of the design appears to us to lie in its success as a revival; it is certainly not beautiful. The drawing is a very refined and artistic one, drawn and shaded delicately with a pen, in brown ink.

1107. "House at Woburn Park, Surrey," F. Allen. A design showing a good deal of originality in a quiet way; an old English type is suggested, but not implicitly copied.

1114. The interior view of the Catholic Cathedral at Queenstown, by Pugin and Ashlin, the exterior of which was noticed in our last. The capitals of the round piers of the main arcade are a little too florid and "cabbagy" in appearance; but otherwise it is a fine Gothic interior. The panelled roof is carried by heavy solid principals, which are very well connected in design with the substructure. A section of the wall is given on the plane of the picture. We note with approval every attempt thus to combine (at least) geometrical drawing with picture-making, as that is what we want to see more of.

1117. "School Buildings, Woburn Park," A Dunn and E. J. Hansom. A large expanse of red brick Tudor buildings pleasingly and correctly treated. The large wooden bargeboards to two gables in one corner look rather like intruders, unless they are meant to specialise that particular portion in some way.

1120. "New Church for the Welsh Calvinistic Methodists, Cardiff," H. C. Harris. At this rate of progress in ecclesiastical architecture the Welsh Calvinists will surely hardly know themselves soon. The building is in an early style of more or less Frenchified Gothic, and is apparently inspired by the style of a well-known architect of French Gothic tendencies who has done a good deal of work at Cardiff. It deserves all praise for the solidity and true feeling for Gothic displayed in the treatment of the style.

1122. "Falcon Tower, Surrey," E. A. Heffer. A large house of domestic Gothic type, showing a good deal of character and originality in the treatment of the heavy half-timbered gables.

1123. "Offices and Residence for the Chartered Mercantile Bank of India, London, and China, Shanghai," Wm. Kidner. A very suggestive title. What an opportunity for connecting the architectural expression of the building with all the three countries it represents, by blending or mingling details or ornament of those nationalities! The architect has not yielded to the temptation; he has made a Classic building with very narrow and tall engaged pilasters running in strips up the face. However, the necessities of the climate, in demanding a shadow recess in front of the windows, necessarily give the cue for some original treatment, and the author has availed himself of this very well, especially in the upper story, where the small square coupled columns thrown out by the deep shadow of the balcony or verandah behind (only "verandah" is always applied to a ground-floor, we believe), have a very pretty effect: also the treatment of the frieze and cornice with large double brackets rising over the columns before mentioned, and a kind of grid-iron between them in the frieze, whether for ornament or for some utilitarian purpose of providing ventilation, is not quite apparent.

1121. "Design for St. Michael's Church, Northampton," A. W. N. Burder. Noticeable for its solidity of character and a certain originality in the treatment of the centre octagon.

1124. "Offices to be erected in the Grey Friars, Leicester," Isaac Barradale. Very pretty indeed: Domestic Gothic, with long mullioned windows built out as bays, thus getting a side light at the end of the desks, if we suppose the desks to be in the windows. At all events, this would be a useful point in the arrangement of the windows for some kinds of work; and the building is not so merely imitation old style as many of its class.

1126. "House in the Grounds of the Paris Exhibition," T. E. Collcutt. We have had to praise Mr. Collcutt more than once in the course of our notes, but verily in this we praise him not. We hope the Parisian public will not take this as a sample of what we are able to do in Domestic architecture.

1125. "New Buildings, Salisbury-court, Fleet-street," A. Peebles. A resuscitation of old London building, with solid brick piers and bay windows between, set back from the line of frontage. An imitation of previous efforts in the City which have led the way to this kind of thing; and, on the whole, not behind its models.

1131. "Manchester Town Hall, Albert-square Entrance (A. Waterhouse, A.R.A., architect)," T. Raffles Davison. A small pen drawing, remarkable for the beauty and finish of the draughtsmanship. Is the arch of the entrance really horse-shoe form, drawing inwards at the springing? It is made to seem so here, slightly, but unmistakeably.

1132. "Proposed Morning Chapel, Church of the Annunciation, Chislehurst, Kent," Jas. Brooks. Looks like a careful drawing of a good piece of thirteenth-century English Gothic; which, we suppose, is the object aimed at.

1113. "St. John the Evangelist, Red Lion-square," J. L. Pearson, A. Here is some original treatment of Gothic, at all events, and in a very fine way. The mass of the church is red brick, but the spire is of stone, and so also are the heavy spirelets crowning the turrets which flank the chancel. The upper stage of these turrets wants scale and force to carry the weight of the solid-looking stone roofs over them; otherwise everything in the building is in keeping. The outline is varied and picturesque, but the author appreciates thoroughly the value of a solid base of nearly unbroken wall as a foundation for the picturesque of "skyline."

1140. "Dining-room, No. 52, Prince's Gate," Geo. Aitchison. The only drawing of Mr. Aitchison's exhibited this year, and one which would not in itself give a full idea of his abilities as a decorative architect, though it is in irreproachable taste as far as it goes. The fireplace is surmounted by a quasi-architectural design in dark wood, of completely Classic type, and with paintings in the panels; low bookcases carried along the wall in the same style. The design of the wall-paper seems a little over-large, and too straggling in its principal lines.

1142. "Designs for a Series of Painted Glass Windows on the Staircase of the Conservative Club, Manchester," E. Frampton. Very good specimens of stained-glass design. Three single-light windows are shown, each with an allegorical figure, much better drawn than figures in stained glass generally are, and with good colour.

1147. "Galleries, No. 39B, Old Bond-street," E. Salomons and R. S. Wornum. The galleries built for Messrs. Agnew, which have attracted the notice of passers-by in Old Bond-street recently. A red brick Queen Anne front, very completely carried out.

1154. "Study for Ceiling Decoration," G. E. Fox. A clever coloured drawing, but a design unsuitable for ceiling decoration, as it includes quasi-architectural niches and figures standing in them, their heads pointing in different directions over the ceiling, a kind of design totally unsuitable for painting on a ceiling, where there is no "right way up," to enable us to decide whether to regard the figures as standing on their heads or their feet.

1162. "The Domestic Chapel, Mooresfort," G. C. Ashlin. A very good drawing of an interior, apparently modern, but in that case an exact and literal reproduction of the most characteristic details of early Transitional work,—double zigzags, &c. The treatment of the wooden wagon-vault with heavy ribs is good, and is the only portion with any claim to originality.

1164. "New Buildings, Paternoster-square, City," A. M. Ridge. The effect of the open arches, with galleries in the gables, is very good. This is in danger, however, of becoming a commonplace. It has been found such a good means of producing effect in a street-front that a great many architects seem to be adopting it as a feature in their city designs.

1163. "Design for a Convalescent Hospital," P. J. Marvin. Why did not the author give a plan? It is utterly impossible to speak of a hospital design on the basis of a perspective view only; it may be fit, or it may not. We only notice it here as a pretty drawing.

1167. "Decoration, Great Library Ceiling, Eastnor Castle," G. E. Fox. Not very pleasing in colour, but much more suitable for a ceiling design than the other drawing, by the same hand, mentioned above.

1168. "Decoration to Dining-room," Cole A. Adams. Rather strong tones, green and red, well combined in the dado, with a light and delicate wall diaper over; the frieze is carried out in the same key as the diaper, with some originality of detail.

1171. "View of Entrance, New House, Eastbourne," R. W. Edis. Looks much more like a good sketch of an old house; and whether that be regarded as a complimentary criticism or the reverse, depends upon a good many considerations.

1173. "New Bank erecting at Salisbury," H. Hall. An agreeable addition to the not very interesting street architecture of Salisbury.

1174. "Proposed Addition to Queen Elizabeth's Grammar School, Cranbrook," W. West Neve. It is not obvious which is addition and which is original. The whole is a pretty drawing of a remarkably picturesque old English building of rural type.

One cannot but feel the exceedingly unpractical nature of such an architectural exhibition as this. There is a great deal of good, very good, drawing, mostly expended on what is pure "scenery,"—the getting up of architectural masks of a more or less antiquated character. Hardly a drawing in the room shows plan or section; the outside of the buildings we can see, but their suitability for their purpose, and the relation between their plan and construction and the external design, we learn nothing of for the most part. Almost the only drawings which really can be judged of on their own merits are the coloured drawings of decorative design, which are very few, and of which only three or four can be said to be very good. The fashionable drawings of decorative schemes in pen-shading are little more than waste paper. The getting up of such things is merely a matter of the sleight-of-hand of a draughtsman; with a due amount of work put on the shading and touching up they can always be made to look effective, and the trick once learned is easily repeated to any extent. It is, therefore, the department of coloured decorative work which it seems really most worth while to develop in the architectural room of the Academy, as the only class of design which really can be adequately represented in this room, and which, moreover, painters, and perhaps the outside public also, are the most likely to feel interested in. It is possible that the Academy would not encourage the mul.i li.a-

tion of plans, sections, and constructive drawings in the architectural room, as tending too much in the direction of science rather than art. Yet any full consideration of the subject ought to show that it is only on this basis that architectural design can be a reality or can be properly judged of. The tendency to fill the room with pretty drawings has had its effect more or less on the public, and the architectural room is not quite such a desert as it used to be; but though no doubt it may be good for the architects that their pretty drawings of Queen Anne houses, &c., should be seen by visitors who may thereby be incited to be clients, the educational effect on the lay mind can only be injurious, as tending to confirm them in that merely dilettante skin-deep view of architecture, as the art of copying old buildings, which is as widespread as ever. As to architects *learning* anything from the architectural room, no one, we suppose, ever thinks much of that. But if the objects of the Royal Academy Exhibition would be at variance with the more practical and constructive architectural display which would be of real value, it is much to be regretted that we cannot have an architectural exhibition which would show the practical basis as well as the outward results of architecture. The difficulty, of course, is (as it was found to be before) that the public do not care for such an exhibition, and therefore it cannot be made self-supporting. It might meet with better success than before, however, if the element of decorative design were more emphasised and made a leading feature, in combination with the constructive design.

As matters stand at the Royal Academy, we can only hope that in future architects who send works for exhibition will make more a point of at least including, in a kind of marginal way, some of the practical details of the buildings illustrated, and not be so generally content with merely making pictures of buildings mostly in imitation of something else. And we strongly recommend a more extended development of decorative design, as the portion of architecture most purely artistic, most nearly allied to painting, most capable of being illustrated in drawing, and certainly most likely to render the architectural room attractive. Perspective views of buildings are but bald things, except in cases where there is an opportunity for realising something like the highest capabilities of architectural grandeur; but decorative design is a most attractive branch of art to most people who care for art at all, and its adequate representation in the architectural room might go far to make "Gallery IX." compete fairly with the other rooms in securing public interest, which it certainly does not at present.

OUR IRON INDUSTRIES.

Our iron industries are becoming more and more the controlling trades of very great districts of Great Britain,—not only extending the trading bounds of those districts very greatly, but also forcing on an immense development of other and allied industries. It is not too much to assert that the application of discoveries of ironstone frequently changes not only the character, but even the physical appearance of whole districts; and there is full exemplification of the truth of this statement in the marvellous changes that have taken place in the course of less than two score years in the iron-producing districts of the north-east and the north-west,—the Cleveland and Furness tracts of country respectively. It is by the application of such discoveries, and by the improved methods of smelting and working the produce of the mines, that in the course of a century we have not only ceased to depend upon other countries for our supplies of iron, but we have built up a very large export trade in iron in all the branches of that wonderful industry. From the many mines in the kingdom we now yearly draw close upon seventeen million tons of iron ore, worth a sum approaching 7,000,000*l.*; we have over 930 blast furnaces erected,—a costly smelting-plant which represents a capital of probably over 15,000,000*l.*; and of finishing ironworks, we have 312 enumerated in the mineral statistics, which in times of normal value would represent a capital of 7,000,000*l.* addition; so that whether we measure the trade by its extent, by its influence upon tracts of country, or on allied trades, or by the capital which may be assumed to be invested in it, it is in every way worth more general knowledge than obtains in regard to it. We have three sources of our iron supply,—that is to say, that the many kinds of ironstone may be roughly divided into three. First, those found in the coal measures; then, those found in the lias of Cleveland, and the oolitic ores of Lincoln, Northampton, and other counties; and lastly, the hematite ores, such as those of the Furness and West Cumbrian districts. Of late, the old materials for the supply of the blast-furnaces,—those deposited in the coal measures,—have grown scarcer, and there has been an increased resort to the second class, whilst the third have also grown largely. Out of our 16,841,000 tons of iron ore, considerably more than a third are derived from the comparatively new iron-producing district of Cleveland, and this vast iron-making centre, which has been styled a new Golconda, may be taken as a type of the whole of the iron-making districts of the kingdom.

Down to thirty years ago, it was merely a sparsely-cultivated and thinly-peopled district, untraversed by railways, and out of the track of commerce. A few small towns carried on older industries, and a few villages and hamlets found subsistence for their inhabitants by fishing, if on the coast, and by agricultural pursuits if in the interior. The opening of a railway from Pickering to the small port of Whitby disclosed the existence of workable beds of ironstone, which were brought into requisition to supply the needs of Northern furnaces; and as the latter grew, increased, and at length successful search was made for the seams of ironstone in the northern part of Cleveland. Since that success, there has grown up a trade which, for extent, has no compeer in the records of metallurgy. The whole district has been given up to the trade in its many forms. The Northern spur of hills, the valleys, and near the coast have been almost honeycombed in the gratified search for iron ore; and now, from nearly forty mines, from 6,250,000 tons to 6,500,000 tons of iron ore are annually extracted in quantities varying from a thousand to over half-a-million tons respectively. In the last year for which official statistics are procurable, the value of this ironstone was estimated at 1,162,020*l.*, the basis of the calculation being an estimation of its value at the mines at from 36s. 4d. to 36s. 9d. per ton. This use of the argillaceous carbonate treasures of the North Riding of Yorkshire has changed the appearance of its north-eastern portion, scattering prosperous little mining hamlets and villages on the once bleak moors in the pleasant little dales, and drawing to it a population from near and far to supply the ever-increasing needs of the blast furnaces. And from the commencement of the smelting of this iron ore down to the present there have been erected in and on the borders of Cleveland 126 blast-furnaces, which now produce over 2,000,000 tons of crude iron annually. Nor is this production of pig-iron (worth, at the lowest computation, 4,000,000*l.* sterling annually) the only token of the growth of that great primal industry of Cleveland; for it has allowed of the building up of an export trade of very large dimensions; and it and the finishing iron trade have caused the upgrowth of towns of very large population, which are far from having attained their maximum growth. As to the finishing iron trade, it may be said that in the district of Cleveland proper there are twenty-six rolling-mills, and in the adjoining district eighty more, the productive capacity of which is indicated by the fact that there are over 2,100 puddling-furnaces in connexion with them, with auxiliary appliances in full corresponding number. There has been, moreover, a full development of allied trades,—foundries, iron shipbuilding-yards, and similar establishments, which almost invariably follow the upgrowth of the manufactured iron trade. The face of the country has been changed by this great industrial uprisal. All the mining district is now a well-peopled region; and if by hundreds miners and their families have been brought thereto, there have been thousands of ironworkers and others brought to the towns. Not only have old towns, such as Darlington and Stockton, been greatly added to by the development of branches of the iron trade in their midst, but, in addition, newer towns have become centres of the manufacture, and have risen surprisingly with it. Middlesbrough, from one of the smallest of the coal-shipping towns on the north-east coast, has grown until its population is computed at over 50,000, and there are half a dozen towns in embryo near it. The whole of Cleveland has, in fact, been built on iron, and the foundations of its greatness are on the same base. Its presence is all-pervading. It is observable in the mining district in the shape of the gridironing of the land with railways to and from the mines, and the "cradles," ventilators, and other machinery near the mine mouth; it shows itself on and near Teeside, in the miles of slag from the furnaces, and in those dark indices to prosperity, often flame-crested and frequently sending out streams of white-hot iron; and it is most powerfully portrayed in the rolling-mills, in which now and again the yawning mouth of the puddling-furnace displays a vast space white-hot, and sending forth fierce rays; whilst more frequently, through an aperture, an even intenser heat pains the eye, and throws out hot emanations. The ear attests the presence of the sons of Vulcan in the rattle of the barrows, with their supplies of ore and fuel, and the creak of the "slide" at the blast-furnaces, with the hissing of steam and the shunting of many trucks; in the rolling-mills by the scraping of the "paddle" in the furnaces, the strong thud of the steam-hammer, and the beat of the rolls, as the hot bar passes through them; and in the clinking of the riveters' hammers in the shipyards.

The great industry thus typified is subject specially to ebbs and flows, and this is proved to the full by the recent history of the Cleveland district. In the times of prosperity which set in some seven or eight years ago, there was known an intense demand for iron goods, which taxed the producing capacities of most iron-yielding districts. New mines were opened out, new furnaces built, and new rolling-mills erected; but before these were all fully productive, the intensity of the demand had passed away, and the markets became glutted with iron goods, whilst the prices began to fall rapidly, and demand followed its usual course in retreating from a falling market. A change became observable also in the nature of the diminished demand which very materially affected the condition of Cleveland; the durability and longer "life" of steel rails had been proved to demonstration on railways, and the increased facilities of supply by the extension of Bessemer steel works enabled the price to be brought so near to them for iron rails that the demand for the latter fell off from one of great extent to one of mere nominal dimensions. In the Cleveland district, the production of iron rails had formed one of the largest branches of the manufactured iron trade, and as steel rails were not produced on any scale of magnitude in the district, the result of the change was at the time practically, if gradually, to close the iron-rail mills, and to depress all other branches of the iron industries as well as the allied trades. Thus, one by one rail-mills were laid idle, and the blast furnaces which had supplied them with nearly half a million tons of crude iron, felt the loss of the demand, and after storing their production for a time, were compelled to cease work, for the same depression had in some degree affected other districts consuming the cheap pig iron of Cleveland. And now, probably, the lowest range in production and prices has been reached in consequence of this cause; for only 95 out of the 164 blast furnaces in the North are at work, and only about one-half of the 2,000 puddling furnaces are now productive, whilst the price of pig-iron is only a third of what it was four or five years ago, and that of manufactured iron is only about one-half. The manufacture of steel rails has been introduced into the district, and the use of imported ores is now on a large scale; for the presence of phosphorus and other vitiating elements in the Cleveland ironstone has hitherto prevented the manufacture of steel from it. At the same time, attempts are being made to render it fit for this, and as the ores of iron in Britain capable of being smelted and used for the steel manufacture are small comparatively, the solution of this metallurgical problem is one of the needs of Britain. The great change which has been known in the rail manufacture is being carried out in other branches of the iron industries, and it is impending in still more, so that the growing demand for ironstone is one needing an extension of the fields from which it is at present supplied. But whilst that problem remains unsolved, our iron industries are checked in their growth, more especially those situated as are those in Cleveland, and the check is rendered sharper by its occurrence at a period before they had begun to recover from the depth of depression into which they were plunged by the reaction after

the period of abnormal trading prosperity and intense demand. The lowest depths in the descent have now been reached, and as the period of the lowest ebb of the tide precedes its rise, so in the iron industries it is to be expected that the flow cannot now be far off commencement. As the incidence of the depression has been unequally felt in the various districts, owing to their unequal dependence upon the branches chiefly affected, so the effect of the probable increase in the trade will be unequally known and distributed. But looking to the long reign of dulness, and to the previous history of our iron industries, it may be expected that the commencement of an improvement cannot now be much longer deferred, and the first to benefit by it will be those districts which, in the years of dulness, have prepared themselves to meet an increased demand in the changed form in which it will declare itself.

THE FURNITURE EXHIBITION.

A SIGNAL interest, no doubt, attaches to the Furniture Exhibition at Bethnal-green, and the lights thrown upon it by the introduction to the catalogue, and the catalogue itself, are useful to the general visitor. As an illustrative collection the display is sufficiently large and varied. It begins earlier than the commencement of the sixteenth century, and stops short of modern upholstery. There are casts, or copies, of those unique magisterial chairs, in bronze, which were discovered at Pompeii, and are preserved in the National Museum at Naples, each being a work of art indicating a high state of luxury. The throne of Dagobert is also in model, from the original, in the Louvre; but it is nothing better than a barbarous restoration, after all; for no one pretends that this is, in its integrity, the royal seat of the Frankish king. The other groups of chairs, principally in oak and chestnut, and belonging to different—and much later—periods, are chiefly remarkable on account of the lines of advance they show in the craft of carving, the Italian and Venetian being especially remarkable on this account, though many of the English, French, and German examples are well worth studying by the modern designer and artisan. Judged from a comparative point of view, it cannot be said that the English cabinet-work excels. With reference to the Indian and Japanese specimens, they are, of course, only curiosities, as, indeed, are those from Portugal and Holland, at a time when the art of furniture was scarcely understood in Europe. The Chippendale specimens are more important, as marking at once a change in fashion and a progress of industry; and to Thomas Chippendale, indeed, we owe a multitude of modern comforts; for it is difficult to imagine how our forefathers could have sat at those olden tables, on those olden chairs or stools, or knelt upon those high-backed prayer-chairs. It may be worth while, however, to ask what lessons those old makers left to their posterity. It is curious to find, among the earliest developments, that of Switzerland, whose cabinets, in sculptured wood, vied with the best of English fabrication,—imitated from Venice,—in the latest years of the fifteenth century. No doubt the taste of that age, in both countries, as in others, was a near approach to the grotesque. There were side-boards, as they would now be termed, composed of vase-shaped forms, piled one on the top of another, with Roman friezes between; and there were tables, the legs of which were masses of statuary in wood, of enormous solidity and weight; but the idea that they could never have been moved from spot to spot, in a baronial hall, is disposed of by the fact that they were obviously, from signs still existing, supplied with castors to roll upon. But it would be a mistake to infer that this heaviness of composition was all-prevailing, or that Dr. Johnson was right when he declared that all the old furniture-makers used oak as their material. The famous little "Hill" table, with its medallions of beautiful faces, is of cedar, and with its graceful lines of foliage, appears to grow out of the ground. There is no example of this class, so far as we have examined the collection at Bethnal-green, but it is one extremely characteristic, and worth attention.

The bedstead is an article of furniture upon which have been lavished the utmost ingenuity, and even genius, of artists belonging to this order, in all times, and among all humanised nations. It is, upon the whole, only fragmentarily represented at Bethnal-green; but a collection, even of copies, would be exceedingly interesting. The bedsteads of the ancients took the form rather of couches,—still affected by the French,—rather than of that which we understand by the term,—a fashion that reached its height in the sixteenth century, when "architects" were employed to design these "commodities of comfort" for royal palaces. The first Francis of France would be content with nothing less than a drapery of curtains upheld by Corinthian columns, deeply grooved, of sandal-wood, and the ladies of his court reposed beneath cloister-like vaults of chestnut, surmounted by crowns. Still, a bedstead is not a very appropriate subject of art, — far less so, at any rate, than a cabinet. Now, of cabinets, or *armoires*, in the modern sense of the expression, the ancients knew nothing,—they used, instead, as did the Mediæval Venetians and Germans, huge coffers, upon the sides and lids, and sometimes even in the interiors of which, the fancy of the wood-carver at once exercised and exhausted itself. The *armoire*, or cabinet, was a production of the Renaissance, when its adoption became a rage with both the nobility and the wealthier middle-classes, all over Europe. One of the earliest and noblest specimens is preserved in the Hôtel de Cluny in Paris, illustrating the story of Ganymede. All this work, indeed, attributable to that period, is characterised by almost an excess of richness, governed, however, by a noble taste and great picturesque powers of imagination. The variety of creation, in shape and ornament, in that great furniture age,—preceding the barbarisms of the younger French style,—was little less than miraculous, and the same genius which designed the façades of Blois, of Anet, and of Fontainebleau, was devoted to the elaboration of a table or the carving of a side-board. The same artist, indeed, often helped to build a palace, and to furnish it. Jean Goujon sculptured the doors of Saint Maclou de Rouen; Germain Pilon wrought the cedar arabesques for the altar of the Celestines at Paris; and Benvenuto Cellini did not disdain to carve a wooden salt-cellar.

With the increase of wealth came an increase, naturally, in the luxury of furniture. We see this fact of history illustrated, though in a vague and desultory manner, at the Bethnal-green Museum. Under Catherine de Medicis, the comparatively rude sideboards, for example, which had satisfied the subjects of the First Francis, were condemned as too simple and barbaric, and for them were substituted immense *armoires*, profusely carved, of oak, walnut, and ebony, then first called "cabinets," containing multitudes of compartments and drawers, and furnished, as a rule, with double doors, the interiors of which, as they were more frequently open than shut, were enriched with incrustations of tortoise-shell, copper, polished tin, marble, precious stones, and Florentine mosaics. Those were golden days for the cabinet-making craft. But the spirit of change never slept. The innovations of that fantastic artist, Wendel Dietterlin, towards the close of the sixteenth century, brought about an unhappy decadence of taste in England as well as in France, and, for awhile, the furniture of the period bore the impress of his hand. André Charles Boule, born half a century later, effected, as it were, a kind of artistic restoration in these matters; but it was long before the pernicious influence of Wendel Dietterlin ceased to be felt. There is not, so far as we are aware, a single genuine specimen of either artist's work at Bethnal-green. It was Boule who furnished the Palace of Versailles, in such perfect consonance with its architect as to draw from Mansart the remark, "Posterity will hardly know whether I built a palace for his furniture, or he made furniture for my palace." The principle upon which Boule worked was that of preserving as many straight lines as possible. His influence did not last long. The Berninis and the Borrominis came into fashion with their sinuous, irregular, and arbitrary lines; natural gave way to hybrid decorations; feathers, fruits, flowers, and shells were festooned together wherever room could be found for them; and Aurèle Meissonier came in to give the last touch of degradation by inventing that which is ignobly known, though not yet utterly repudiated, according to its deserts, as "Louis Quinze." "Pompadourism" flourished for a time, and then the equally obnoxious, if less flimsy, "modern Classic," stimulated by the discovery of Pompeii, took its place, preserved from utter pedantry by the genius of such men as Piranesi and his son, to whose aid came Louis David, who, without knowing anything of antiquity, possessed an antique genius, which he was not above displaying in the frame of a mirror or the canopy of a bedstead. The history of taste in furniture, indeed, is very suggestive, in its way, of other history. Napoleon's conquest of Egypt, for instance, produced a perfect eruption of sphynxes and obelisks in the drawing-rooms of Paris. There was a Walter Scott fashion, and a Byron fashion, in these matters, but a propensity has always been manifest, to return upon the traces of the Middle Ages. No traces of these latter are to be found at Bethnal-green; but the loan collection might have been made infinitely more instructive and valuable had it contained the means of a comparison between the old and the new arts in furniture,—the days of "solid," so to speak, and the days of "veneer," of which latter the French, in their Exhibition, appear so ambitious to get rid, — as witness the cabinet-work of MM. Mazaroz-Ribaillier.

MORE ABOUT THE ACADEMY PICTURES.

AMONG the works in which, whether including landscape or not, figures form the predominant interest, Mr. Marcus Stone's "The Post-Bag" (71) might perhaps have justly claimed earlier notice, for it is one of the pleasantest works to be found in Gallery I. It is an out-door breakfast-scene of the last century, in a sunlit garden of some Classic mansion: two elderly men in cocked hats sit over their coffee and letters on the right, and their fair companion stands apart from them to read her correspondence more privately. There is a touch of the theatrical in the garden landscape, perhaps not out of keeping with the socially artificial period suggested. The artist is not so fortunate in his figure-study called "The Time of Roses" (262), where he seems to have tried some not very comprehensible experiment in colour, for the same tone pervades the roses, and the face and dress of the figure. Mr. Edgar Barclay has a new subject treated with very artistic feeling in "Women moulding Water-jars, Algeria" (53); he exhibits a companion picture of the use of the same water-jars when made (183), also very clever and interesting. Among the half-decorative paintings of single figures which have become a kind of fashion, Mr. C. E. Perugini sends one, "Girl Reading" (96), which is highly successful in its way; a life-size figure of a girl in white seated, with head relieved against a background of foliage; an orange by her side forms the one bit of high colour in the work. We are getting to know this orange very well; a taste for oranges has set in among painters lately; but there is fine painting in the face and arms of the fair reader too, though the inspiration of the work is certainly borrowed. In the same room with this we meet with the first specimen of a young painter who is going to take a good place, Mr. Fred. Morgan, whose able works last year we noticed as showing a new talent, which is more than confirmed in his works this year, of which "Charity" (121) is the most prominent and perhaps the best. Mr. Morgan is closely related to the school of which F. Walker was the central type; a painter of rustic life in combination with landscape, and in this particular work reminding us very much of Walker in general feeling; but the pathos of his figures is far less tragic, and his landscape painted more in "the light of common day," with great force and freedom of execution. In his other large picture, "After the Reaper's Work is done" (357), more is attempted in the landscape, a deeper chord struck, but not quite with equal success. But this painter has earned a place and a right to be looked for in future. The second room contains the first exhibited work of Mr. R. Browning (son of the poet), a large figure of "A Worker in Brass" (130), which is interesting rather for the execution of details than as a whole; the head is deficient in power and expression, the hands of the figure and the metal work which he has completed, are very well painted; the picture is life-size. Mr. Boughton's "Waning of the Honeymoon" (172) is a bit of excellent and very refined humour; and an excellent though hardly refined work just above it is the "Member of the Long Parliament" (171), by Mr. Pettie, who contributes several others, all with more or less power, but nearly all more or less ugly; "The Hour" (64) is the most remarkable for both qualities

a very plain woman in a crimson dress coming down a staircase: it is rather annoying to see so much force and cleverness expended on a painting which is yet so absolutely uninteresting in expression and subject.

Mr. Erskine Nicol is in his best vein of humour in his portraiture of the old dame who wonders if it is "A Colorado Beetle?" (177) that appears over the edge of the table at which she is seated; and Sir John Gilbert's "Ready!" (216) is a piece of brilliant *fanfaronnade* in his well-known manner. The best of the secondary works in the third room, however (if it can indeed be called secondary), is M. Grützner's "Vespers in the Monastery" (299), a very humorous portrayal of the scene in a modern monastery where travellers of various nationalities are receiving hospitality, when the bell for vespers sounds, and the "brother" in the middle of the room chants his devotions where he stands, while the strangers look on with varied expressions, some of conventional reverence, some of sarcasm, one, who obviously represents the English evangelical, with a kind of stolid and settled disapproval: the picture is a little heavy in colour, but very clever in drawing and expression. Mr. Brewtnall's "Beggar's Daughter of Bethnal-green" (90) has claims to notice, but is hopelessly marred by the affectation in the pose and manner of the figures.

In the fourth room we come on a very interesting work of Mr. Heywood Hardy, "Tipping" (314), a bit of contractor's operations on a new line of railway; a big horse has just been unhooked from the wagon full of ballast which he has been drawing, and is pulled sharply out of the way by his driver to let the wagon run on to the "tip"; another wagon has just been upset at the end of the embankment. This is a very clever thing, and the painter must have studied the manner and behaviour of horses on this kind of work very minutely to realise it so well. "Reviewing the Programme" (Rossi), "News from the Front" (A. C. Gow), and "Cats (F. Smallfield) are all good little bits from the same corner. Mr. F. S. Walker has a very original and telling work, "The Convent Garden" (345), a garden scene on a bright sunny day, where the serious and rather sad and faded appearance of a group of nuns in black in the foreground is emphasised by contrast with the gay manner of some young lady visitors from the outer world who are seen at the further side of the lawn; the execution is rather heavy and "loaded," but there is much feeling in it. Mrs. Luke Fildes's little bit called "Peeling Potatoes" (372) should be looked at, for refined yet broad style; and there is an interest attaching to Mr. E. W. Cooke's painting of the *Cleopatra* on her way here through a heavy sea and in the wake of a steamer. Mr. F. Goodall's "Palm Sunday" (397), a life-size painting of a young lady and a child seated in a window, has its qualities, no doubt, but does not interest us. Near this, one may note, as a clever curiosity, Mr. Blewitt's accurate painting in one of the Egyptian mummy-rooms in the British Museum, called "From out the Corridors of Time" (399).

Mr. Walter C. Horsley has hardly come up to his promise of last year in "Shopping in Constantinople" (408), at least as far as general artistic force and effect are concerned; in detail there is a good deal of character in the picture, but it is hard in execution. Another subject still further East, Mr. Chevalier's "Llama Priests at Home" (416), is very clever, and a real novelty in subject; it represents a group of these worthy, fat, and shaven Oriental clergy engaged over some game resembling draughts, while another reads to them; they are all clad in yellow silk gowns, producing a curious effect of colour, and their round heads and placid and somewhat stupid countenances are obviously studied from life. Where shall we go next for subjects for Academy pictures? "Ultima Thule" has nearly been reached now. It is hard work to find novelty of subject, and excursions into other times and other places than our own are necessary almost as a matter of course. Thus Mr. Laslett J. Pott places his card-playing scene, "Fallen among Thieves" (435), in a period of swords and silk stockings, and perhaps such complete rascality among people of such good surroundings would not be easily found at present; the contrast between the appealing young man who has been fleeced and the imperturbable face of the old sinner opposite to him is very well given, though the "situation" is not very new in painting. Mr. Erskine Nicol, in "Under a Cloud" (467), repeats the puffy-faced gentleman who was "his legal adviser" last year; and Mr. J. Watson Nicol more than keeps up his promise in his very clever picture, "To Our Next Merrie Meeting" (474), where one reveller sits on the table in a jaunty way to exchange healths with his companion. The large picture by Israels, "Returning Home from the Field" (461), is full of the most tragic pathos of every-day life, in the worn hopeless look of the wearied group trudging over the field; the gloom is almost too deep, and the cast of colour too leaden, for artistic success; yet there are great qualities in it, as in almost everything from the hand of this thoughtful and powerful painter.

There is a certain power in Mr. Colin Hunter's scene on the jetty of a fishing village, called "Store for the Cabin" (417), with a feeling a little akin to that of Israels; but the work is marred by the heavy and rather dirty-looking tone of colouring which pervades it, and which certainly does not suggest open-air effect. Mr. Blackbourne's "Roman Widow celebrating an Anniversary" (499), is really an architectural painting of the interior of a Roman burial-place restored, and is sufficiently clever in this way to have merited a better place. Mr. Rooke's "Death of Ahab" (533) does not keep up the promise which his "Ruth" last year certainly gave, though we were of opinion at the time that the merits of that work were a little exaggerated by the hanging committee and the critics. Gallery VI. contains, however, quite a group of clever works by painters who have not yet attained the pinnacle of fame. Mr. J. W. Waterhouse, indeed, may be said by this time to have made his reputation, at all events, by his last and best work, "The Remorse of Nero after the Murder of his Mother" (547): there is no very strong remorse expressed, but that may be intentional; as a composition there is undoubted originality, and considerable force in the painting. Mr. Helmick's "Wayward Daughter" (537), a saucy-looking lass who has offended her very sour-looking parents, is a small work of remarkable point and ability both of humour and of execution; Miss Havers's "June" (538), where a country girl stands by a stream under the shade of trees, is unusually successful in realising atmosphere, and the freshness of the country in early summer; "Her Last Sacrament" (543), by Mr. A. Stocks, though with a little touch of the "goody" element, has real pathos and feeling, and the same may be said of Mr. Dixon's railway-station scene, "It may be for Years" (546), in which there is also good study of varieties of character and expression. Mr. Cameron's "Haymakers at Noonday" (554), and Mr. J. Knight's "Pollie" (556), are worth attention; and Mr. W. V. Herbert's "Unwelcomed Visitors" (557) cannot be passed over, certainly, but one must name it with regret that a young painter of undoubted ability should have taken to such an affected unreal style, and almost tawdry colouring.

In Gallery VII. Mr. Edwin Hughes's "Distinguished Visitors" (572) is as clever and complete a thing of the kind as one can often see; it is the interior of a large mansion where the old housekeeper is showing the tapestries to a very richly-dressed young couple, the gentleman in a magnificent flowered waistcoat and green coat, such as was once considered the appropriate dress of a gentleman of means: the character shown in this figure and that of the housekeeper, and the almost faultless execution of every part of the work, render this a noteworthy little painting; one only feels that the ability displayed is almost more than so slight a subject is worth. Mr. Lamont's large picture, "The Prince's Choice" (610) is ambitious enough, but we really cannot see the point or interest of it, nor admire the very heated colour. "After the Confession," by Mr. Wünnenberg (616), should be looked at, and Mr. Bridgeman's little work "Having a good Time" (627), a couple of urchins, who have been bathing, rolling each other over in the sand; there is some capital drawing in this. Mr. Hodgson's large work, "Lost" (635) *must* be looked at, for one cannot help seeing it, but what it means we have endeavoured in vain to make out, except that it is a forcible painting of two Arab cut-throats and their gear. Mr. Blair Leighton's "A Flaw in the Title" (650) is very clever; Mr. Frère's "Le Chemin de l'École" (649), where a boy stoops his head awkwardly to squeeze under an umbrella, and yet keep it low enough to shelter his little sister, is in the artist's best manner. Mr. Elmslie has painted a scene which we should very much like to come upon in "An Autumn Walk" (647), and Mr. F. Slocombe interests us in the efforts of a young lady to learn "A New Song" (646) by strumming it over with one finger on the piano (s very bad way of doing it, musicians would tel her, but so far true that it is the usual way in England). This reminds us that we passed ove a clever painting by Mr. Ormsby of a somewha similar subject, "The Sonata" (481), and whic should be mentioned the rather as the painte is a comparatively new man who is steadil improving, and always manages to give a original turn to the subjects he treats.

The Lecture-room contains a good many very clever things besides those already mentione in our last notice. We first come upon "Th Apple-loft" (904), by Mr. Arthur Hopkins, a admirable painting of two girls bringing apple up to the store, and excellent painting of apple also, which the artist seems to have studie "lovingly," as the phrase goes. Of less marke merit, but worth attention, are Mr. Chevalier' "Weary: an Episode at St. Leonard's" (917) Mr. Waite's "Mending the Well-rope" (922) Mr. Burr's "The Truant" (921), an unfortunat lad, who is certainly going to "catch it" fro the irate old man who thumps his green um brella on the floor. There is a good deal o feeling in "The Soldier's Wife" (942), by M Geo. Smith, though the subject is a little hack neyed. The subject of Mr. F. G. Cotman' "Au revoir" (948), is a well-worn one also, bu treated with such originality as to seem quit new. We look down a country lane, with delightful old lichened wall at one side of it, an at the turn of the road a horseman looks bac just before disappearing, the object of his regar being a pretty girl who stands at a gate in th foreground looking after him. The descriptio sounds like a thing that has been done scores times, but the present work reminds us of n other, and is charming in its own way. M Fantin's "La Lecture" (955), a life-size pain ing of two girls, one reading to the other, is powerful as his portrait of Mr. and Mrs. Edwi Edwards in a previous Academy, and mor pleasing as a picture. Miss Thorneycroft "Dives and Lazarus" is a painting we canno like much, but recognise the talent and stud displayed in portions of it. A little thing, b Mr. Claude Calthrop, "A Caller" (1004), ha real humour and satire; the figure seated befo us has just the regulation simper and affecte interest of a commonplace woman paying a co ventional call. We fear Mr. Macbeth's larg work, "Sedge-cutting in Wicken Fen" (1016 will hardly do; there is power in it, but it unreal and theatrical, and the man on the righ is absurdly tall, measured by the size of his hea In the Tenth and last Gallery there are onl two or three figure subjects that seem wort special attention: Mr. Pettie's "The Laird (1325), an old long waistcoated gentleman the style of the Baron of Bradwardine, wh walks out to look over his acres in the pride property, is perhaps the best thing in the roon and certainly the best of Mr. Pettie's painting this year. Mr. F. W. W. Topham's large an crowded work, "Drawing for Military Servic Modern Italy" (1385), has a good deal humour and interest in its portrayal of varietie in modern Italian character. "Après le D jeûner" (1401), by Miss Kate Thompson, clever, so is M. Gussow's head called "Th Fruit-seller" (1394); and Mr. Weguelin' "Labour of the Danaïds" (1405) has some ver fine painting and drawing in it, but it is of n use to treat a wild poetic legend in this matte of-fact mechanical manner,—it becomes absurd one is only inclined to say, "Why don't the stop up the hole in the barrel at once?"

We have something yet to say on portrait landscapes, and sculpture.

Quick Work.—An American paper says tha an interesting experiment has recently bee made at the Michigan Central Railway Work in order to ascertain the very shortest time i which a locomotive engine could be mounte ready for use from the finished component part Two sets of fourteen workmen were employe under Mr. Stewart, of Jackson, and M Edington, each set to mount an engine, havin all the parts of which the engine consists read at hand. They accomplished the task in th remarkably short period of two hours fifty-fiv minutes, a bet on the result being won by M Edington, who finished one minute sooner tha his antagonist. Up to the present this work ha been generally done by about five or six work men in the space of from nine to fourteen day

"IMITATED ARCHITECTURE" IN NEW YORK.

PROBABLY no city in the world may be said to make so large a show of imitated architecture as that at the very extremity of which, twelve miles from its Town Hall, we are now writing.

Even here, on ground much of which is still unbroken since the Weekquæsek Indians, the allies of the Dutch, came down to the Spuyten Duyvil Creek to fish for the nutritious shad and succulent soft-crab, or track the deer and wild turkey,—and it seems but the other day that they did so, for in the same years Charles II. was feeding his ducks in the waters of St. James's Park, and Mdme. de Maintenon brought her tit-bits for the famous Fontainebleau carp (the death of a survivor of which shoal most of us remember), —even here, at Spuyten Duyvil, with the gray rocks still asserting their real estate rights, are springing up in all directions many well-built, but too evidently imitated architectural villa residences, most of which have precisely that appearance which in England has for some years seemed to please a certain class of prosperous people, but which have generally drawn from the true lover of domestic architecture supercilious expressions of dislike. These are the sort of houses that give one the idea that the master is "in the city," the older children at finishing schools, the younger ones and the mamma, and perhaps her unmarried sister, in undisturbed possession of the house that is all but empty nine months out of the twelve. We all know the sort of house; they surround most large towns throughout England.

Unless the stranger who visits New York for the first time be an architectural expert, no matter how many large cities he may have visited elsewhere, he will scarcely escape arriving at the conclusion that never before has he seen so many magnificent warehouses, shops, hotels, and dwelling-houses, or more substantial churches, with a greater variety of steeples and ritualistic projections; larger plate-glass windows, or broader streets, and smoother pavements; and long after he has been forced to relinquish the idea that the pavements or the ways generally are all smooth, he will remain under the impression that architecturally New York surpasses any city of modern construction. Under this delusion many strangers on their way through the capital may leave the city, may carry home a want of knowledge of what they have seen, and will bear in their minds a doubtful remembrance regarding Stewart's great shops, the Women's Hotel, and other pseudo-marble palaces, and in after-years would be shocked to hear that the gorgeous recollections which have abided with him were, after all, inspired by shams and imitations of bad copies.

As yet a description of New York cannot lay claim to any resemblance to that delightful account quoted by Mr. Aitchison the other day from an English topographical dictionary describing a well-known city whose variety of architectural styles somewhat exceeded the conventional number that Pinnock and other great professional authorities early instructed us in. Here in New York there certainly is a Gothic cathedral resembling most Continental cathedrals of historic fame in one particular, that of not being yet finished; of this great work it is not for us to speak lightly. It already presents an appearance, especially from the Central Park, that commands one's warmest admiration, and if on approaching it the details are faulty and mechanical, what modern work has not that character?

Unlike the town described by Mr. Aitchison, we know no examples here from the temple of Ilissus, nor has the Queen Anne style been yet adopted; one famous house here, a house within a stone's throw of the entrance to the Central Park, is in a style which of late in England has been much lauded, an old English style; but it appears out of character, and in spite of its solidity, it has not the look of endurance.

Notwithstanding the very large amount of imitated architecture that exists in New York, there is so much that is truly original, that one might almost argue that the New Yorkers are on their way to a genuine architectural taste; they certainly build to suit their peculiar imagined requirements; everything here is large, almost in proportion to the size of their continent. In this respect there is no sham, and therefore their art must be better than people would at first suppose.

One New York building, at least, ought to escape wholesale or lightly considered condemnation, if only on the score of its perfect adaptability to the purpose for which it has been built, and in this respect the recently-opened New York Natural History Museum might be held up for imitation to the whole world; architecturally, this building, even in its unfinished state, is worth our admiration, and when viewed from many spots at a distance it forms a skyline that adds a beauty to the noble Central Park, on the margin of which it is built. As for its contents, and its perfectly arranged collections, Professor Owen himself might repose complacently with the feeling that a perfect commencement at least has been made.

In New York and elsewhere in America may be found a limited class of highly-informed Americans whose manner of life, and whose ways of thinking and acting, whose culture and refinement are quite in keeping with the idea that exists with other nations,—people, in fact, who are precisely in accord with similarly-gifted persons to be found in Europe.

But these happily-constituted and well-instructed individuals naturally holding themselves intellectually superior to the mass about them, show too great a disposition for a retired life, in which they dispense for their own advantage that fund of goodness that they are merely waiting for the growth of the society about them to participate in.

That ever-living question, the real estate interest in New York, seems to have resolved itself into certainty on the situation of their Faubourg St. Germain, which, for an American age, is likely to remain between the Fifth and Sixth Avennes as high up as 56th and 57th streets, where the owners of names hallowed in the New York world have already built and beautified a number of brown-stone-front houses sufficiently original to escape the stigma of being imitated from anything but genuine American prototypes.

That New Yorkers have not attempted to imitate some one of the many delightful Parisian residences known to them is a matter of wonder to us; and considering the attractions that the New York people have so long found in the French capital, and the manner in which they show their affection for the many aids to enjoyment and foolish vanity that Paris especially showers upon us, it is a little singular that New Yorkers specially have not imitated Parisian methods of housing themselves. We know in New York of no single house with a *porte-cochère*; and whatever objections may be brought to this feature for a climate like this, or that of London, those who have seen the magnificent effect of the *porte-cochère* enclosed behind thickly-glazed iron gates, such as exist in the Boulevard Haussmann, will remember the beauty and charm of the effect. Nor have they, oddly enough, imitated in New York the institution of the *concierge*, unless we may consider as an equivalent the "Janitor,"—a term, perhaps, of easier correct derivation, but carrying with it too classical an association to make it quite so domestic as we would like. The term *concierge* to the English ear has a peculiar fascination far beyond that which the individual generally possesses, the *concierge* with a very large class of Parisians being fair sport for that feeble idea of practical joking that Alphonse possesses. For our part, the habit of paying the *concierge* the attention that is due to our ordinary friends was never pleasant; but here in America the street-door intimacy that we have been called upon to indulge in with the "Janitor" is even more disagreeable.

It is to be sincerely regretted that the Americans have not more relied upon their own resources and their own early mode of living in almost every particular, and the reckless way in which they fall into the vice of imitation, and especially of imitated architecture, is to be deplored. In the days of their early history they, as all other thoughtful people have done, built and adorned their houses according to the exigencies of the moment, and naturally they availed themselves, so far as they were informed, of those methods and fashions that prevailed in older civilised countries; they had simply to make allowance for a difference of climate, which soon led them to protect themselves well from the cold of severe winter, and the scorching sun of a torrid summer. For more than two centuries houses have been built in many parts of America that other countries might imitate, or rather emulate, as regards the perfect fitness and complete propriety of all that makes a house a home.

Up to a certain period of their architectural history the Americans appear to have built nothing but what was honestly, and therefore beautifully done; there exist at this moment hundreds of homesteads throughout this country that have withstood the searching climate for much more than a hundred years; there still remain a sufficient number of examples of well-to-do houses to form a school of architectural domestic art, houses that Americans could refer to with a just pride.

English colonists, even those most honoured and favoured by the parent Government, appear not to have carried with them any thought of what we are in the habit of calling Elizabethan architecture, and what houses they built with the ample material at their command must have been designed essentially on Gothic principles, as regards simplicity and directness of construction. They doubtless thought little of those decorative arts that are now beginning to give so much trouble here. Moated granges, oriel casements, and tapestried chambers have added a romantic charm to American life and story merely in the pages of the romancists and historians, and it is only now that we have lost the significance of so many old ways that they are beginning here to imitate what takes but an imperfect place in their minds.

Notwithstanding the many intended-to-be picturesque mansions that have sprung up within the last few years (at present the lull is ominous), the old pleasant houses on Fourth Avenue, near Madison-square, still retain to our mind a look of abiding respectability that no single new house possesses.

We wonder New York does not imitate on a gigantic scale some of the *culs-de-sac* of Europe, or that it does not build for itself a *Palais Républicain*, with its covered ways; that it has not thought of having its own arcades and other ways dear to the New York Parisians. Such places would be exactly suitable to many of their bright, but cold, windy, dusty, spring days. But where all the imitation that exists here will end no one knows nor cares to trouble himself about, and imitated architecture, and this style or that of decoration, will flourish here yet for years; the good and the correct,—the truthful, in fact,—asserting itself now and then, until we have all arrived at that stage of perfection prophesied by Victor Hugo, when the whole civilised world will unite, like the seven primitive colours of the prism, to establish one beautiful tone of perfect brightness, when all the world will be draped in white,—the natural and scientific symbol of divine wisdom.

Spuyten Duyvil, New York.

SANITARY AND SOCIAL NOTES IN AND ABOUT DUBLIN.

THE NORTH CITY AND SUBURBS.*

FOR the first half of the present century the greater portion of the north city, that at least extending from the line of Capel-street to the North Circular-road, was a fashionable and wealthy district. Numerous private streets inhabited by families of the highest respectability were in this quarter; but the northern city proper, with the exception of a few streets and those in the vicinity of Rutland and Mountjoy squares, has, during the last quarter of a century, being rapidly going down. Its professional and fashionable populations have to a large extent departed, mostly to the southern and the seaside townships. It is a sad picture to witness in the north, as we have in the south, long lines of high and well-built houses, once inhabited by wealthy private families, now occupied from kitchen to garret by tenement lodgers, artisans and workmen, struggling seamstresses and lodging-house keepers. Labourers and quay porters now reside in parlours, drawing-rooms, and bedrooms once occupied by a resident nobility and affluent gentry. Many of the fashionable city houses and mansions are converted in their ground-stories into shops; and pawnbrokers and publicans, the sure signs of phases of social life that need not be particularly described, are to be seen everywhere.

We do not remember anything so rapid as the decline of house property in a large portion of the north city. If its two fashionable squares were invaded by lodging-house keepers, as some of their approaches are at present, or if any of the houses in them were cut up into tenements, we fear that the very worst would have befallen

* See p. 479, *ante*.

the north city. Ruin and dilapidation have already set in, and numerous fine streets of houses are given over to neglect. The houses are left unpainted and unrepaired from year to year by their present owners, and since their wealthy residents have left them the Corporation or its scavenging staff give little attention to cleansing the streets. The state of the thoroughfares almost everywhere, north as well as south, is bad. The finest, broadest, and most leading thoroughfare, Sackville-street, is in anything but a good condition, and the trees planted there are leafless and rotten. We find ruts plentiful, and mud, after the least shower of rain, in abundance. The road metalling put upon the streets is of the worst description of stone, and its laying seems to be done in the most perfunctory manner. We do not like to say a hard word against working men, but the scavenging staff of the Dublin Corporation is the worst that we have seen anywhere over the kingdom. Many of the poor fellows are long past their labour, or otherwise unfitted for the work. Although a deputy surveyor of the streets was lately appointed for their better management, little improvement is visible. The Municipal body are adepts at making appointments, permanent and temporary, the latter form being the thin end of the wedge for arriving at the first. It is not for the want of officers that the city, north and south, remains in dirt, neither is it for the lack of sufficient taxation. There have been for years past ample funds, if economically used, for sanitary purposes, but they have been shamefully wasted in legal and Parliamentary costs, in promoting and opposing Bills, in useless deputations, and in sundry other mad and mischievous ways. The citizens are paying the penalty to-day,—indeed, they have been paying the penalty of corporate neglect for many years past,—in periodic epidemics and a high rate of mortality. Several years have been wasted over a main drainage scheme, too costly and elaborate (even if it were thoroughly satisfactory) for the financial circumstances of Dublin. The aiders and abettors of this scheme, not having succeeded in their desires, have elected to do nothing, in the meantime, in ridding the city of its dirt or mitigating the pollution of the river, which every summer is an intolerable and dangerous nuisance. A main drainage arrangement is certainly indispensable for the city, but it needs to be well thought out, in respect to construction, outfall, and cost, matters in which the collapsed scheme gave rise to serious and well-founded objections.

A walk through that part of the north city lying between the Royal Barracks and Oxmantown and the line of Capel-street, brought under our view many deplorable pictures of ruin, wretched habitations, rookeries that ought to be demolished forthwith if possible, and heaps of dirt lying in the streets and in the backyards of the dwellings. In Mary's-lane in its entire length, and in the cross streets and lanes branching off, we found many sad evidences of dirt, decay, and human wretchedness. Off Church-street, out and about Pill-lane and Ormond Market, there was plenty of dirt and decay, tumble-down dwellings, unremoved nuisances, and foul-smelling drains. Indeed, whenever we stopped to converse with the poor dwellers in these places, and visit the inside of their dwellings, which we did pretty often, they informed us plainly enough that "the corporation men" seldom visited their quarter, and only swept the "leading streets." The olden meat or butcher markets of the North City have gone into ruin, for the butcher fraternity have migrated, and are to be found everywhere now scattered over the town.

Dublin has within late years, under the auspices of the corporation, obtained a new cattle-market, situated in the North Circular-road. The old market of Smithfield in the city is still used partly for the sale of milch-cows, pigs, and hay and straw. There is scarcely any city or town of importance in the three kingdoms which stands so much in need of good general markets as Dublin. A company was formed several months,—we might nearly write some years ago,—for the establishment of meat markets, &c., in the south city, but difficulties as to compensation and other matters having arisen, no active steps have yet been taken to carry out the project. The corporation, also, some years since, obtained powers to erect a public *abattoir*, but have not proceeded with the desirable work. The licensed slaughter-houses which are at present scattered over the city north and south, are situated in the worst neighbourhoods, and the greater number of them are kept in a disgusting state, ill-drained, if drained at all, and generally filthy within and without.

The Artisans' and Labourers' Dwellings movement in Dublin is very small in its dimensions. The Company has erected a limited number of blocks, north and south of the Liffey, in Echlin-street, Denmark-street, and Buckingham-street. These are but drops of water in the ocean of ruin and wretchedness which surges through the city from north to south. We visited and examined some of these artisan-dwellings. They are fairly constructed, and sanitary wants to some extent have been attended to. The rooms in these houses are too small, the spaces as yards at their rear too limited, and we hear of complaints as to their dearness. It is objected also that the company is letting the rooms of these dwellings to a class of persons who do not strictly belong to the artisan or labouring element. So long as there are hundreds of large rooms obtainable in the deserted town mansions and private houses, once occupied by the gentry, we fear that the artisan and labouring classes will prefer them to the new dwellings. The big houses once occupied by the "quality" are thought to be respectable, and month after month in the north city these private houses are losing their original tenants, and are invaded by tenement-lodgers. Their owners often keep them empty for months in expectation of a new tenant to occupy the whole of a house, but are obliged at last to surrender to the inevitable, and in rush the many to take possession where the one lived for years in quiet. A dozen of poor families living in those five-story brick houses, built originally for the accommodation of one private family, is not a pleasant social change or picture to contemplate. Many of these houses were undoubtedly well built, and are roomy, but as a whole they are entirely unsuited for the accommodation of a number of distinct families. Two or three years of occupation under their new condition are sufficient to wreck them considerably, and each advancing year adds to their ruin. It is a great pity that several of these houses in quarters where artisans' dwellings are needed are not taken possession of, and by some structural alterations and sanitary arrangements, converted into suitable dwellings for the working classes. At a little outlay many of them could be made excellent dwellings for the housing healthfully of a number of people.

In the northern suburbs strange contrasts are to be witnessed. In portions of the Phibsborough, Glasnevin, and Drumcondra districts recently a building movement has taken place, and a large number of private dwellings have been erected. We certainly must, from an examination of several of them, pronounce them to be purely speculative dwellings, and not a few of them badly built, and with bad materials. More eastward of the above districts, in the localities of Richmond and Fairview, once pleasant localities and healthy, and containing several avenues of good old, substantial, and well-built houses, house property for some years back has been going to ruin, and many houses are empty. The bad state of the river Tolka, which flows through a portion of the latter localities, and the recent erection of distillery buildings, as also the presence of some unsightly, smoky, and offensively-smelling works, no doubt have tended to drive away several of the old, respectable, and once resident gentry. Farther east, again, in the Clontarf district, along the margin of the strand looking on to the bay, with the distant prospect of the Dublin and Wicklow mountains standing out against the sun and sky,—a grand view,—a building movement, too, has set in. There could not be a more healthy locality than the Clontarf district from the sea-beach, stretching for miles inward to the very heart of Fingal. A large area of the latter district is surrounded by the sea, crested by the magnificent Hill of Howth; while out upon the waters, and within sight and easy access, are small pleasant islands. In the last century, and in the earlier years of the present, the northern suburbs, east and west, were a more favourite locality than the southern suburbs. A reaction, however, set in upwards of a quarter of a century since, as the tide of fashion flowed to the south side. Another cause of the desertion of the northern suburbs was the long-continued existence of turnpikes and tolls in that district, an impost which was considered obnoxious by sightseers, visitors, and strangers driving out, as well as by the residents in the localities named. The northern suburbs of Dublin, east and west, are certain to rise again into favour in the course of a few years. There is plenty of building land procurable and pleasant and healthy sites available. The localities, however, abutting on the city boundary are without a system of drainage, and this must continue to be a drawback. The Tolka river on the north side, as well as the Dodder river, and its tributaries on the south, must be kept clear of further pollution. It is difficult to see how the northern, and projected northern, townships are to dispose of their sewage before the main drainage of the city proper is completed. If the city systems were completed, the township ones could be made subsidiary to them; but in the absence of a thorough main drainage scheme, the northern townships have only the alternative of making the outfall on Clontarf Strand, or adopting a sewage utilisation scheme, and this ought to be first considered. A large portion of the sewage, if thrown upon the Strand by the former method, more particularly as the Strand is uncovered at low water, would be washed back again to the sea margin at high tides, and left there by the returning waters. The sea-beach would thus in a few years be transformed into offensively-smelling slob lands, and solid slime would take the place of golden sands. On the other hand, the present circumstances of the northern townships unfit them for adopting an expensive sewage utilisation scheme single-handed. The northern and other townships in the county of Dublin, if they adopt a sewage utilisation scheme, must be prepared to carry it out for some years at a loss, and be content to look at the matter from a public health point of view. The safety of the people is of more consequence than the profitable disposal of sewage manure. It will take many years yet before the Fingal farmers, or other County Dublin farmers, are got to believe in the fertilising value of town sewage, and to give up the use of stable manure. By the seaside the farmers use sea-wrack extensively still, and the cartage of stable manure from the city costs County Dublin farmers and gentlemen farmers considerable sums of money in the year. Manure is carted from the city for several miles inland, north and south.

A few words more and we end for the present. Dublin has certainly improved, and greatly improved, in her outlying townships during the last twenty years, and is still continuing to improve outside the municipal boundary; but with the exception of her port and dock improvements, and of public offices and warehouses in a few of her leading thoroughfares north and south, there is no marked improvement in her old northern and southern centres of trade. True two great cathedral "restorations" have taken place, and some city and several surburban churches for different communities have been erected; but there is a boulder of unmelting ice upon the city's heart. Here are disease and death, ruin and squalor, rags and wretchedness, ignorance and consequent crime, drunkenness and dirt, and sundry other social evils to be observed. To cap the climax, and patent to all, there is stark-staring wanton and long-continued municipal neglect on all sides. Dublin is more than half-sepulchred,—pressed to earth with taxation, poisoned with foul exhalations, choked with filth, and cheated into the somnolent belief that her Corporation is the model of propriety.

LANDING PIER AND CONCRETE WAREHOUSES AT THAMES HAVEN.*

THE STORAGE OF PETROLEUM FOR LONDON.

In describing the works carried out for the Petroleum Storage Company, it will be well if in the first instance I explain the purpose for which they have been executed. It is usual to refer to the practices of the ancients when speaking of any specific work, but as petroleum has no history that I am aware of, except the discreditable history connected with the latest French revolution, I am spared any trouble in that respect. The inflammable character of the material, and the terrible explosion in the Regent's Canal a few years ago, have engaged the attention of the Metropolitan Board of Works, with a view of diminishing the danger to the crowded population of the metropolis from the storage of large quantities of petroleum

* Paper by Mr. William C. Street, Assoc. Inst. C.E., read before the Civil and Mechanical Engineers' Society, on the 9th inst.

within its area, the quantity in stock being generally about 50,000 barrels. The Thames Conservancy have already, with a view to the protection of the shipping in the Port of London, prohibited the discharge of any oil giving off vapour at a temperature under 100 deg. Fah. nearer London than Thames Haven. Having these considerations in view, a company was formed about two years ago for the erection of suitable storage accommodation, with landing conveniences and railway communication at Thames Haven.

At the present time, petroleum is brought to this country in vessels of about 600 tons register, with a carrying capacity for from four to five thousand barrels of oil, each barrel containing about thirty-six gallons. Those vessels bound to the Port of London containing spirits of petroleum are now discharged at Thames Haven into lighters, by which the barrels are brought up to the various wharfs and stores belonging to the London petroleum merchants. By availing themselves of the works now completed, the vessels can lie alongside a large and convenient pier at any state of the tide, and discharge their cargoes direct on to the pier and into the warehouses, whence they can be sent to London or elsewhere in small quantities, according to the requirements of dealers. There are now thirteen warehouses finished, each capable of storing about 1,400 barrels, and it is intended to finish forty-two or any larger number of warehouses, as the trade and funds may warrant.

The river at the part selected for the pier is in some respects admirably suited for the purposes of the undertaking, giving a deep water-channel very near to the Essex shore.

The first portion of the pier, that between the river-wall and the pier-head, is constructed of timber, and is about 220 ft. long and 16 ft. wide. The T-shaped head is constructed principally of iron, and is 90 ft. long by 32 ft. wide.

The ordinary tidal range at springs is about 17 ft., and at low-water springs there is a depth of from 24 ft. to 26 ft. close against the front piles, and as the bed of the river in front of the pier shelves considerably, there would be from 27 ft. to 30 ft. under the centre of a vessel of average width of beam, or a sufficient depth for the largest vessels at the lowest water.

The first portion of the pier has been constructed of timber, as, in the event of any extension of the pierwork being necessary, the iron end would probably be lengthened-out in the direction of a curve until it met the shore, thus giving a great extent of deep water quayage, with direct communication for a large number of railway wagons or trucks at the same time.

The construction of the timber portion is very simple, and does not require much comment. The piles are 14 in. by 14 in., driven into the ground by an ordinary pile-engine, the monkey weighing about one ton, and the fall being about 10 ft. The depth driven by the last blow was generally about ¼ in., the silty substratum being very hard and difficult to drive into. The piles are as a rule driven from 10 ft. to 12 ft. into the solid. Each pier is composed of four vertical piles, with two additional raking piles for the last six piers. The spans are 20 ft. from centre to centre of piers, and the longitudinal beams are 14 in. by 14 in., with straining-pieces and struts also 14 in. by 14 in. The longitudinal and cross-walings are in two halves, each 14 in. by 7 in. The floor or deck is of 3 in. planks, and the handrail is formed out of 4 in. by 4 in., 6 in. by 6 in., and 8 in. by 4 in. stuff. The whole of the timber in the piles, walings, and floor has been tarred, and the handrail has been painted.

The construction of the pier-head was the subject of much consideration, as, though strong cast-iron columns have been used for the principal part, that metal is too brittle, and could not be relied upon for the front row of piles, which may have to take the impact of large vessels. The front row has, therefore, been constructed of wrought-iron, and they resemble long box-girders placed on end. The front and back plates of the piles, or what would be the top and bottom plates if they were considered as girders, are each 16 in. by ½ in.; the sides are 11 in. by ½ in.; and the angle irons at each corner are 3 in. by 3 in. by ½ in., all riveted together with ⅞ in. rivets, 4-in. pitch. Lugs 6 in. by 6 in., 4 in. wide and ⅞ in. thick, are riveted on at the proper places to receive the ends of the horizontal and diagonal bracing. These piles are each 54 ft. 5 in. long, and a timber dolly being placed on the top they were driven into their positions by a pile-engine similar to that used for the timber piles.

The three back rows of piles in the pier-head are of cast-iron, and are 12 in. external diameter, with 1 in. thickness of metal. They are fitted with screw-discs at their feet, the blade of the screw being 3 ft. 6 in. diameter, with a 6-in. pitch, and were screwed into their places from staging in the usual manner, by means of capstans into which eight bars, each 10 ft. long, were fitted. A rope was passed round the ends of the bars, and the capstans worked round by means of men hauling the rope on opposite sides with "double-purchase" crabs. Even with the force thus exerted, there was much difficulty in getting the piles screwed through the hard silt to the requisite depth, and two lengths of piles were broken under the torsional strain to which they were subjected.

The bracing is composed of T-irons 4 in. by 3½ in. by ½ in., and angle-irons 3 in. by 3 in. by ¼ in., fastened to the flanges and lugs of the columns by two ¾ in. bolts.

The timber walings below low-water level were put together above water, and slidden down the sides of the columns to the required depths, where they were fixed in position by divers.

The insides of both cast and wrought iron columns have been filled in with cement concrete as a preservative against internal oxidation, and also as a preservative against the piles being cracked by water getting in between tides and freezing in the winter, as is sometimes the case in piers or viaducts exposed to the effects of a large tidal range. The whole of the ironwork is painted externally with Palford's magnetic paint.

The deck of the pier-head is of 3-in. planks, laid upon joists 12 in. by 3 in., carried by longitudinal beams 14 in. by 14 in., resting upon the heads of the columns.

The front of the pier is protected by timber fender-piles, each 60 ft. long, and 14 in. by 14 in., with vertical rubbing pieces, 14 in. by 7 in., bolted on to them.

The pier-head has a cluster of timber piles, called a "dolphin" at each end. These are each composed of ten piles, each 14 in. by 14 in., with horizontal and diagonal bracing, 14 in. by 14 in. and 14 in. by 7 in. respectively. The centre pile of each dolphin is higher than the rest, and is fitted with irons at the angles, so that it may be used by vessels for the purpose of making-fast to the pier. The hand-railing on the pier-head is composed of iron standards, 3 ft. high, 6 ft. 6 in. apart, with chains of ¾-in. iron between. Two strong mooring-posts are fixed at the front of each end of the pier, and vessels coming alongside will also be attached to mooring-buoys fastened to the bed of the river in the usual manner by screw moorings.

In addition to the landing accommodation provided by the deck on the surface of the pier-head, there are stairs running beneath the deck to landings constructed to suit low-water and mid-tide levels.

Since the completion of the pier, the river has scoured somewhat along its front, the run of the ebb-tide coming down Lower Hope Reach setting straight towards it, and the feet of the piles have had to be protected by the deposition of stone around them. The flood-tide runs up more on the Kentish side of the river. The average pace of the tide is about three knots an hour, but it varies considerably.

The pier is connected with the warehouses by lines of 4 ft. 8½ in. and 2 ft. gauges, the larger gauge communicating with other sidings, and with the London, Tilbury, and Southend Railway, and the smaller gauge being intended for the easy passage of small trollies of convenient dimensions for the carriage of petroleum barrels between the pier and the warehouses.

The warehouses at present constructed are thirteen in number, and are more properly large vaults, each 90 ft. long by 20 ft. wide, and 14 ft. high. The arch is a segment of a circle, with 3 ft. rise or versed sine, and is 15 in. thick. The arches are built of concrete composed of Portland cement and Thames ballast in the proportions of 1 to 5. The eastern and western end walls are 4 ft. thick, the southern or river-side wall is 2 ft. thick, and the northern wall and the cross walls are all 1 ft. 6 in. thick. The walls and the floor, which latter is over 12 in. thick, are also composed of Portland cement and Thames ballast, but in the proportions of 1 to 7. The concrete is some of the finest I have ever seen executed, but owing to the character of the foundation, much difficulty has been experienced in completing the job satisfactorily. On the surface of the marsh there is about 4 ft. of clay marl; beneath this the material is of a soft muddy bluish-clay character; this extends to a depth of about 24 ft., at which depth we reach the hard silt similar to that met with in the bed of the river. Acting upon the advice of professional men of considerable experience in works in that locality, the warehouses have been constructed on the surface of the marsh, trusting to the distribution of the downward pressure over a large surface of concrete footings and floors. This would probably have been efficacious, but some old ditches which ran across the site have rendered the supporting power of the marsh very variable, occasioning some settlements and several transverse cracks, which have from time to time given much trouble. In the end warehouse, and the one next it, at each of the extremities iron ribs and ties have been inserted, and the movement of the foundation has practically ceased. The piercing of the necessary holes for the insertion of the iron ties through the walls was a work of great labour, thus testifying to the character of the concrete.

The doors to the warehouses are of wrought-iron, fitted to cast-iron cills, but with Portland stone heads. The receiving-doors are flaps 5 ft. by 4 ft. 5 in., and the delivery-doors are a pair of sliding-doors, each 6 ft. 5 in. by 2 ft. 7½ in., running on roller-paths fitted on the inside of the heads.

The works are, as before stated, connected with the London, Tilbury, and Southend Railway, and the machinery for working the points and the signalling apparatus has been inspected and passed by the Government inspector, General Hutchinson, R.E. By means of this connexion the stores are placed in communication with the principal lines of railway in the kingdom, so as to enable petroleum merchants to supply from them the shopkeepers not of London alone, but of a considerable portion of the kingdom.

The works have occupied about eighteen months in execution, and their total cost has been about 22,000*l.* The contractor was Mr. William Eckersley, M. Inst. C.E., by whom the numerous difficulties presented were cheerfully encountered and the works pushed forward vigorously to their completion. The works have been executed under the superintendence of Mr. Brunlees, vice-president of the Institution of Civil Engineers, as consulting engineer; of Mr. Henry William Spratt as architect; and of the author (Mr. William C. Street) as acting engineer.

THE RULE AS TO DAMAGE FOR THE OBSTRUCTION OF ANCIENT LIGHTS.

THE question of the obstruction of light has frequently formed the subject of papers in the *Builder*. But there is a point connected with this matter which is of sufficient importance to demand some consideration, especially as it has quite lately been somewhat elaborately discussed in the courts of law. The point is as to the amount of damages to be awarded when an obstruction to the light of some building has been proved. It will, therefore, be noticed that we have now nothing to do with any questions as to the right of persons to legal remedies on account of some obstruction; but as to the rule by which the amount of compensation which they should receive ought to be assessed. And this particular branch of the subject is of great importance, also, because even in the courts of equity, when a person whose lights have been darkened seeks not any actual pecuniary indemnity, but merely that the man whom we may term the obstructor should be prevented from continuing his work, or should destroy the offending part, there must have been substantial injury done to the building in question in order that a court of equity may interfere. What falls within the term "substantial damages" may vary according to the mind of the person who considers the subject. Vice-Chancellor Wood (the present Lord Hatherley) spoke of substantial damages "as distinguished from some small sum of 5*l.*, 10*l.*, or 20*l.*"; whilst the present Master of the Rolls talked of substantial damages as considerable damages, and added, "some people may say that 20*l.* is substantial damages," thus apparently differing from Lord Hatherley, who thought that 20*l.* hardly fell within the term. But whilst men's minds may differ on this subject, it is yet obvious that the word "substantial" must be considered a relative term, that is, in relation to the building to which the injury is done. For example, it might be

that 20*l.* damage done to a large mansion worth 800*l.* or 900*l.* per annum would hardly be considered a sufficient amount to enable a Court to interfere to prevent the objectionable works from proceeding; but, on the other hand, the same amount of damage done to a house of the annual value of 50*l.* might most justly be considered ground for the interference of a Court of Equity. Thus it is clear that we must not lay down a hard-and-fast rule as to what sum constitutes substantial damages, otherwise it is more than probable that if carried into practice it may cause both loss and disappointment. All the circumstances of the individual case must be considered, and though we may regret that the imperfection of human law and human undertakings prevents any distinct rule from being laid down, it is obvious that to consider the term substantial in a relative sense will in the end be most just and most likely to meet the practical requirements of the time. What is, or is not, substantial damage,—in some respects, perhaps,—becomes thus of more importance to lawyers than to builders or architects, though it is advisable that this somewhat subsidiary point in regard to the rule which regulates damages should not be overlooked by any one who is in any way concerned with buildings or building operations.

We now come to the second and more important point of this matter, one which we are glad to think has at length been satisfactorily and properly settled by the Courts of Law after a long period of uncertainty. The rule, then, as it now stands, is that a person is entitled to receive pecuniary compensation by way of damages for any deprivation of light to the detriment of the dominant tenement, without regard to the purposes for which this tenement is used. In the year 1808 the case of Martin *v.* Goble (1 Campbell, p. 320) was decided, and it was then held by the Court of Exchequer that regard must be had to the purpose for which the building had been used, where the right to the light was accruing. In that case the person invoking the aid of the Court was the owner of a dwelling-house which had previously been used as a malt-house. It was held that the house was entitled to the degree of light necessary for a malt-house, and not for a dwelling-house. "The house had for twenty years enjoyed light sufficient for a malt-house, and up to this extent and no farther the plaintiff could still require that light should be admitted to it." Therefore it was clear that a rule was laid down which might sometimes render the amount obtainable for damages exceedingly small, and sometimes might even deprive a plaintiff of his remedy altogether. It is unnecessary to go through all the subsequent cases, but we may take our readers at once to the year 1874, in which the case of Aynsley *v.* Glover (43 *Law Journal* Reports, Chancery, p. 776) was decided by the Master of the Rolls. The point in that case arose because it was urged that the room deprived of the light was a smoking-room, and that this deprivation of light, great though it might be, would not interfere with the comfort of those who used the room or deprive it of its value as a smoking-room. This was practically Martin *v.* Goble over again in a different form, but the Master of the Rolls would not abide by that or kindred decisions, and came to the very proper conclusion that "the change of use of a room will not deprive the party complaining of his right to the access of light, and conversely, in considering the injury to the light, the Court is bound to consider that the room may be used for some other purpose than that for which it is used at the moment when the injunction is applied for." So that here there is a clear and definite rule laid down in relation to the use of rooms which it will be observed are on a precisely analogous footing with houses, and therefore the reasoning applicable to rooms is equally applicable to whole dwellings, and conversely the reasoning applicable to dwellings applies with equal force to rooms.

Let us turn now to a still more recent case, decided during the present year (Moore *v.* Hall, 47 *Law Journal* Reports, Queen's Bench Division, p. 335), in another division of the High Court. The point here arose because, though the house as to which the action was brought was generally darkened, yet the bedrooms, which suffered in particular, were still as useful for all practical sleeping-purposes as they were before the warehouse which took away the light was built. Here, again, the Court held that the particular use to which rooms or houses might at a particular moment be applied was not to form the basis of the rule by which damages were to be regulated. On the contrary, to apply Lord Chief Justice Cockburn's proposition almost literally, in estimating damages for the admitted interference with the access of light to a person's house, it may fairly be taken into consideration whether the tenement will always be applied to the same use as now, or whether there is a reasonable probability of its being applied to some other purpose for which the full light will be wanted. This, as it appears to us, is the proper and reasonable rule; of course, the light required by a warehouse in the City would not be the same with that needed by a dwelling-house in Kensington, and the rule must be applied and read in a reasonable manner. For, after all, the true measure of damages is the diminished value of the premises, and this cannot be ascertained simply by reference to the present use of the premises, for in the course of a very short time they may be used for a purpose for which the full access of light is wanted. Take, for instance, a small tenement in which an upper room has been used as a bedroom, and the height of the window was ample for that use. Then suppose, to continue the illustration, that the owner lets it to an artist, and puts a skylight in the roof, letting in a great quantity of additional light. It would be obviously absurd if a man might come and say, "Now you have a vertical light I shall interfere with impunity with your horizontal light, because it will be quite enough if I leave you sufficient to use the room as a sleeping-apartment as before.

The rule, therefore, is plainly a very proper one; for if the amount of light for a particular purpose were a test, it would introduce the still further complication, that nobody would ever be able to agree how much light was really required for the particular purpose to which the room was put, which would be an endless source of disputes; and it follows from this rule that there is a secondary one of some importance, that if a man possesses a right to light through ancient windows of small size, and increases them, and if a person obstructing the new light at the same time obstructs the ancient light, that the courts of law will interfere. Of course, in twenty years, the person who complains will in that case gain an equally valid title to the right to what we have called the new light. This, as we have said, is a somewhat subordinate point, but it is still one of some importance, because it might appear at first sight as if a person complaining were gaining an undue advantage, which, in fact, he does. But, on the other hand, it must be borne in mind that in the majority of cases the effect of the new lights in preventing the erection of new buildings will be infinitesimal if there were at the same spot ancient but smaller lights entitled to this easement. And even if hardships may sometimes occur through this rule, it is questionable whether this is not the least of two evils. But, at any rate, such is the law as it now exists. Taken, however, as a whole, the legal principles as to this question of the rule in regard to the damage to lights are fair and equitable, and well fitted to do justice to all parties. To recapitulate them briefly, they are, — Firstly, in order to obtain the aid of a court of equity, there must be a "substantial" interference with the light,—that is, substantial damage, in a relative sense, must be done; secondly, the injury to the property generally, and not in regard to the use to which at the moment it is put, is the main ground upon which damages may be recovered, or, indeed, for the interference of the powers of the law; and thirdly, after a material alteration of ancient lights, a person cannot obstruct the additional or new lights, if by so doing he, to any appreciable extent, interferes with the acquired right to the ancient lights.

Mission-hall, Birkenhead.—A new mission-hall, in Brassey-street, Birkenhead, has just been completed by Messrs. Ritchie & Davidson, builders, of Westbourne-road, Birkenhead, under the superintendence of Mr. James N. Crofts, architect, Liverpool. It contains, on the first floor, a hall 50 ft. by 24 ft., and 15 ft. 6 in. high, capable of seating about 230 persons, with a committee-room attached; and under the same, on the ground floor, are six class-rooms and an infants' room, with all necessary conveniences. The contract for the building, including boundaries and extras, was a little under 1,400*l.*

WITHDRAWAL OF THE WATER BILLS OF THE METROPOLITAN BOARD OF WORKS.

THE Metropolitan Board of Works have stayed proceedings on both of their Water Bills, viz., that for the double supply of water, which was to render unnecessary the purchase of the existing undertakings, and that to authorise the purchase of the existing undertakings. We ventured to predict, some time ago, that this would be the case. But what we are not able even now to predict is, that the Board will take warning by the general opposition that the proceeding has awakened, and by the keen and destructive criticism which has been applied to these projects; and promise not to undertake any colossal measures in future without some kind of preliminary assurance that they will meet general support or public approval.

We are, as our readers are aware, among the last to express satisfaction with the state of the existing water-supply of London. But the more anxious any one feels for improvement in this respect, the more strongly must he condemn hasty and inappropriate action. There can be no doubt that any future measures of reform or of control have been already rendered more difficult by the proceedings of the Metropolitan Board of Works. As it is, the companies, in anticipation of the proposed purchase, have increased the water-rates in various districts, and thus added a further tax on the ratepayers. If the existing water companies wished to remain without check or supervision, they could not take a more effectual means than to encourage the presentation to Parliament of wild and ill-digested schemes, which excite general condemnation, and the only result of the introduction of which is the infliction of a heavy bill for Parliamentary and engineering expenses upon the ratepayers. We need not express our own opinions alone in this matter. At the meeting of the Board of Works on the 10th current, one of the members spoke out pretty plainly. Mr. Leslie said that the Bills, even if dropped at the present stage, "would cost the ratepayers some 12,000*l.*, which went into the pockets of professional men,—engineers, lawyers, and Parliamentary agents." He was glad that the Bills had failed, and said that "before long the wire-pullers should be unkennelled." Nor is the cost to the ratepayers all that has been caused by the abortive and ill-considered schemes as to which Mr. Runtz promises that "the Board would not let the question drop." Mr. Roche's memorable boast, "that the Board were not afraid of expense," seems fairly to express the sentiments of that body. We question how far the ratepayers and vestrymen will be pleased with the annual addition of even so small a sum as 12,000*l.* to the salaries and expenditure of the professional officers of the Board, paid them for taking into Parliament Bills so drawn that their movers have not even ventured to ask for a second reading. But this sum represents only a portion of the money-cost inflicted on London, to say nothing of harass and loss of time. Every one interested in the matter appears to have done something to oppose the Bills. The water companies petitioned Parliament to reject them. The Lord Mayor, aldermen, and citizens of London, in Common Council, petitioned Parliament to reject them. The Vestry of St. Pancras petitioned Parliament to reject them. The representative meeting of the Vestries and district Boards of the metropolis, held at St. Pancras Vestry-hall on February 15th, 1878, was loud in its denunciation of the measures in themselves and of the conduct of the Board in regard to them. The Bills themselves were propounded in the teeth of the reports of the two committees of the House of Commons,—that of 1867, and that of 1869. No single good word, as far as we are aware, has been uttered in their behalf by any individual whatever who was neither a member nor an official of the Board of Works. The two Bills were based on arguments that were mutually destructive. The hydraulic character of the works proposed was such as to provide an enormous pressure, of upwards of 200 pounds on the square inch, over a portion of the closed system of pipes, while the jet-power over another important part of the area of the metropolis would have been *nil*. No doubt the Board acted wisely in not throwing the light of a Parliamentary inquiry on schemes so jejune.

But our protest is on behalf of the ratepayers. It is bad enough to ask them for 12,000*l.* to pay

for the blunders of this year. But the Board, as far as their opinions are represented by Mr. Runtz and Mr. Roche, will not be contented with this. They "will not let the matter drop." It is, unfortunately, but too likely that as long as large parliamentary bills are annually paid, out of the pockets of the ratepayers, by a Board that "does not fear expense," the question will be kept alive. Surely it is a ratepayers' question; and we should be glad to hear what the ratepayers have to say about it. If they are content to pay nearly double water-rates for the privilege of putting the control of the water-works in the hands of the Metropolitan Board of Works, it is not worth while to say anything more as to such a bagatelle as an annual expenditure of 12,000*l.* for the luxury of depositing Bills for that purpose.

ST. MARGARET'S CHURCH, WESTMINSTER.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

At the evening meeting of this Society on Monday last, Mr. Alfred White, F.S.A., in the chair, the papers read were (1) "Notes on the Kilburn Brass," by Mr. J. G. Waller; (2) a communication read by Mr. J. E. Price, F.S.A., from Mr. C. Roach Smith, F.S.A., with reference to Roman coffins; and (3) "Notes on St. Margaret's, Westminster, and the Ancient Remains uncovered there during the Restoration under the late Sir George Gilbert Scott," by the Hon. Sec., Mr. George H. Birch, A.R.I.B.A. We limit our report to some notes of the last-named paper, and may return to the others next week.

Mr. Birch observed that St. Margaret of Antioch, to whom this church, in common with two others in the city of London, was dedicated, was greatly in favour with our forefathers in the Middle Ages, and in sacred and legendary art she occupied a very prominent place, in common with SS. Catherine, Barbara, and Ursula. St. Margaret's, Westminster, occupied so prominent a position, nestling, as it were, under the very wing of the great Abbey adjacent, that it could not fail to be a matter of speculation, in the minds of all who remarked its comparatively small and flag-surmounted tower, as to how it came there at all, and why it was wanted. Regret had frequently been openly expressed that the church had not been swept away, in order to throw open to view that side of the Abbey which it was supposed not only to conceal, but to absolutely disfigure. It was not worth while to combat that opinion, or even to suggest the many reasons for keeping the church, æsthetically, historically, and archæologically; they would be apparent to all who took the trouble to think. Some writers had laid it down authoritatively that when Edward the Confessor rebuilt the ancient abbey founded by Sebert, he thought it would be a dishonour to his new and stately edifice, and an annoyance to his beloved monks, if the neighbouring people assembled for worship in the Abbey as they had been wont to do, and that about the year 1064 (so circumstantial are they) he caused to be erected, on the north side of the Abbey Church of St. Peter, a church dedicated to the virgin martyr St. Margaret of Antioch, for their use. No authority, however, could be found for these statements. The earliest notice of the boundaries of the parish is contained in the charter of King Edgar, A.D. 962. At the prayer of St. Dunstan he granted or sold a confirmation to the abbey of a certain portion of land, only containing then five houses. The money equivalent was a golden armilla. This grant was preserved in the British Museum, and attached to it was a description in Saxon of the boundaries of it, which Sir Henry Ellis thus translated: — "First up from the Thames along Merfleet (the marshy site of Whitehall) to Pollen Stock, so to Bulinga Fen (Tothill-fields), afterwards along the Fen by the ditch to Cowford (Buckingham Palace), from Cowford up along Tybourne (by Vauxhall Bridge), to the broad military road (Oxford-street), following the road to the old stock of St. Andrew's Church, then within London Fen, proceeding south on Thames to mid-stream, and along the stream by land and strand to Merfleet." This ancient parish was subsequently sub-divided into many others,—St. Clement's, St. James's, St. Martin's, St. Mary-le-Strand, St. George's, Hanover-square; St. Anne's, Soho; St. Paul's, Covent-garden; St. John's, Westminster; &c. The church said to have been erected at the instance of the Confessor, very likely a small and inconvenient structure, remained until the time of Edward I., according to Stow, when it was pulled down and entirely rebuilt, the nave and aisles at the expense of the parish and the merchants of the staple, and the chancel and aisles by the Abbey of St. Peter, to whom the advowson belonged. The Rev. Mackenzie Walcott, in his history, implies that this rebuilding was not until Edward II.'s time, *circa* 1350, but in another passage he confirms the statement of Stow, and mentions a rebuilding or considerable alterations in Edward IV.'s time. There was, however, little doubt that the present church was rebuilt entirely at one period, most probably in the reign last mentioned. Walcott, while quoting Stow, on whose sole authority rests the statement about the parishioners being turned out of the Abbey, considers that the change of site was necessary in consequence of the number of bad characters attracted by the privilege of sanctuary, and who lived in defiance of justice. The chapels and chantries within the church included those of the Holy Trinity (south aisle), Our Lady (north aisle), St. Margaret, St. George, St. Catherine, St. Erasmus, SS. John and Cornelius, St. Nicholas, and St. Christopher. Of the few remains of ancient stained glass in London, the most perfect and complete is certainly the superb east window. According to well-known tradition, it was originally intended by the magistrates of Dort, in Holland, as a present to Henry VII., but the king dying before it was presented, it fell into the hands of the Abbot of Waltham, who kept it in his church until the Dissolution. Robert Fuller, the last abbot, to preserve it sent it to New Hall, where it remained until the time of General Monk, who had bought that property from the Villiers family, and by whom the window was supposed to have been buried to preserve it from the Puritans, and afterwards replaced in the window of the chapel. The chapel was afterwards demolished by the then possessor, John Olmins, but he preserved the window for the purpose of selling it to some church. In the British Museum is preserved a letter from him to Dr. Swinton, Wadham College, Oxford, to this effect:—

"July 30, 1738

Dear Doctor, -Having some time ago made the purchase of an old house where there is a fine chapel, and not being yet old enough to stand in need of the assistance of a chaplain for the use of my maids and female neighbours, I have resolved to pull it down; and knowing right well that you are a great dealer in *virtu*, I thought proper to acquaint your Holyness that there is one of the finest large windows of painted glass in England, which I desire you will make known to the good people of your College that they may depute you to take a view of it. If they like it they shall have it, in honour to you, for less than any else. If your College should not buy it, I shall be obliged to you to mention it to some of the others, for it is a thing of value, and I am certain they will be glad of it."

Not being successful in this respect, the possessor cased the window up, and so it remained for some years, until it was finally sold to a Mr. Conyers, of Copt Hall, Epping, for 50 guineas. Here it remained until his son, in 1758, sold it for 400 guineas to the committee for repairing and beautifying St. Margaret's, and so at last it rested within a very few feet of the place for which, according to popular tradition, it had been designed nearly 300 years previously. There was, however, no authority for the statement that the window was originally intended for Henry VII.'s Chapel. Rickman states that the window was ordered by Ferdinand and Isabella, as a bridal gift, when Catherine, their daughter, was affianced to Arthur, Prince of Wales. The subject of the window is "The Crucifixion." The church contains some interesting monuments, including a tablet to Sir Walter Raleigh, who was buried in the chancel. In Weever's "Funeral Monuments" there is a description of a curious tomb, formerly existing in the north aisle, of Lady Billing, 1499. It represented the Almighty shedding rays from above on the Blessed Virgin, who, by label, was saying, "Behold thine handmaid!" On the right was an angel, with the label, "Hail, Mary!" During the restoration now in progress, behind the pewing has been found a monumental recess in the north aisle, with remains of this painting of the "Annunciation," as usually depicted. The traces of colour were more distinct when first uncovered, but a solution of shellac has been applied, to preserve what remains. At the back of the recess there seems to have been a small brass inscription, and the top of the tomb seems also to have been inlaid with brass figures. The arch and spandrel have been knocked away, leaving only the square opening and outer moulding. In Smith's "Antiquities of Westminster" is a curious plate representing the interior of the church, from a rare print by Brook prefixed to Warner's edition of the Book of Common Prayer, printed for Crockett & Hodges. The view is taken looking east. In this view a gallery is seen in the north aisle, stopping short at the chancel, the last two bays being clear. The altar-piece seems to be of the usual Wrennian character, and consists of a broken curved pediment with central urn, the usual Tables of the Law, and cherubs' heads. Within the rails,—which are spiked at the top, presumably to prevent people sitting on them,—is a monumental effigy in a kneeling position against the north wall, and a recumbent effigy below it. So accurately is the interior represented, that even a small corbel supporting one of the stone shafts for the roof principals is shown correctly as it still exists,—an angel bearing a shield on which is a Catherine wheel. The roof is flat and divided into panels, with rosettes in the centre of each and curved pieces coming down on to the clearstory walls. The windows are flat-headed, of two-lights, with cinquefoiled heads. Standing within the present fabric, though yet encumbered with scaffolding, the transformation which has been effected is seen to be so marvellous that the beholder can scarcely realise that it is the same church. The building has gained immensely both in seeming height and length. It is no longer the "little" Church of St. Margaret. From the west door the eye takes in the whole unbroken length of 130 ft. The exquisitely-beautiful nave, arcaded in eight bays and a half, with its coupled clearstory windows and panelled oak roof, is before the spectator in one unbroken view. The aisles, seen through the nave arches, increase the long perspective, and give that appearance of space and lightness so characteristic of Perpendicular churches. There are a monotony and tameness in the arcades of our London churches of this period,—as St. Andrew Undershaft's; St. Olave's, Hart-street; St. Ethelburga's, and St. Helen's, Bishopsgate,—which are wholly wanting in St. Margaret's, where the detail of the work is so vastly superior. It would be difficult to find a better-proportioned arcade than this of St. Margaret's anywhere. The rather stilted proportion of the bases, the tracery in the spandrels, and the richness of the mouldings, are very superior to the same items in the churches before mentioned, where the mouldings of the arches and piers are continuous, and the arches themselves four-centred. Few churches had undergone greater degradations, both internally and externally. It had been shorn of its length by one bay of the nave being divided off as a vestibule at the west end, and again at the east end by the intrusion of a semicircular sacrarium, with a domed roof in plaster; the north and south aisles curtailed of their length by the intrusion of vestibules with staircases; encumbered with huge galleries on three sides; pewed bewilderingly above and below; and the stonework and walls hidden under plaster and paint which had darkened to a treacly hue by age and dirt. The tracery of the windows had been barbarously altered; wretched monumental slabs blistered the walls, and were even stuck on to the plaster divisions forming the ceilings beneath the galleries. The mouldings and strings and piers had been cut and hacked about to fit pews. There was a perfect charnel-house below the pavement, and externally every architectural feature had been pared and toned down to one tame and insipid flatness by "neat" courses of Portland ashlar, and a porch most fearfully and wonderfully made added at the western end of the nave, in the "Druidical" style, as it was somewhat proudly called by the parishioners. Entrances had also been made in the east walls of the north and south aisles. The gallery was continued across the west end, thus depriving the church of another bay, and the roof was plastered internally in panels, after the "Gothic" manner of Strawberry Hill, and a wheel-window inserted in the east gable after the same fashion. The tracery of the windows had been removed, and a meagre and thin imitation of Gothic work inserted in its place. The same process was applied to St. Margaret's which had been applied to the huge abbey church. Every bit of interesting detail had been pared off as if it had been skinned, and the building, to quote the graphic descriptions in guide-books, had "a plain and neat exterior." Whatever faults may have been committed under the name of "restoration," such faults or errors

could not be quoted in the case of the restoration now in progress. Of late a good deal had been heard of the misdeeds of restorers, and the piety and devotion which would seek to cleanse God's house from the awful desecration of neglect and private greed had been stigmatised almost as a crime. The author said he had too much confidence in the sound practical common sense of the age to believe, when the question was before people as to whether a sacred building should be devoted to and rendered fit for the uses for which it was originally designed, or whether a mandlin sentimentality for whatever had been done in times past should be an excuse for continued encumberment and disfigurement of the church, that the latter sentiment would for one moment prevail. Unless the wretched plaster apse had been removed, the "history" of the old east window and the remains of the reredos beneath would never have been confirmed. The removal of the galleries corroborated the churchwardens' accounts as to the rood-loft. Again, the remains of the tomb on the north wall confirmed Weever's description, and in many other respects the restoration had proved of the greatest value and assistance to antiquaries, and when, as at St. Margaret's, the things discovered were carefully preserved to tell their history to future generations, surely restoration was a blessing instead of the curse which some people said it was. The church had a narrow escape in the time of the Protector Somerset. He was about pulling it down as a quarry for his new house in the Strand, and the scaffolds were already erected, when the parishioners rose to a man and pulled the scaffolds down. In conclusion, Mr. Birch described some of the discoveries which had been made during the restoration. These included a stone figure of St. Margaret, about life size, with the colours still bright upon it (portions of this figure, including the bust and one of the feet in the act of treading upon a dragon, were exhibited); a portion of the rood-beam; a head of a small figure, supposed to have been a Christ; the lower portion of another small figure very delicately coloured and gilded, &c. The following are some of the entries in the churchwardens' accounts:—

"1478. The day of burying W. Caxton, 2 torches & 4 tapirs at a low Mass, 1s. 8d.

1498. For the knell of Eliz. de Word, widow of Wynkyn, 6d.

1508. For bringing the organs of the abbey into the church, and bering them home again, 2d.

1510. The said wardens now accomptants of Mrs. Eliz. Morley widow towards the making of a new rood Mary & John in the Roode loft, at the time that the parish be of power and substance to make and build the said roode left the sum of 10l.

1517. Water Gardinr to the making of the roode loft, 33s.

1531. Paid to Renacever, Payntour, for painting and gylding the 60 stories of S. Margaret's tabernacle, 3l. 6s. 8d. Gilding 12 small images for do., 2l. 8s.

1541. Pd to Roger Weston for the taking down of our Lady's tabernacle at Rouncyval* and for setting up thereof in the Trinity isle, 13s. 4d.

1550. Pd to him that did paint and write the 6th chapter of S. John's gospel in the Quire, 2l.

1554. Pd to a painter for washing out the Scripture of the High Altar table, 1s.

1556. Pd to Nicholas Clarke, for making the image of St. Margaret, 11s.

1559. Pd 2s. 8d. for 3 days work takin down the roode Mary & John, the table on the High Altar, and the holy water stock, and for clearing and sawing of the rood.

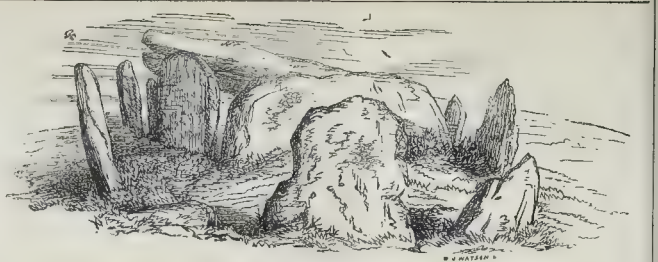
1610. To Goodwyfe Wells for salt to destroy the fleas in the churchwardens' seat, 8d.

1644. 1. 13. 4. received for 29 lbs of fine brass and 96 lbs of coarse brass taken from sundrie tombs; 2l. 10s. of Arthur Condall for the screen and organ loft; and of Edward Staathwaite, for having company in his house on a fast-day, and for swearing, 11s."

A short discussion ensued, in which Messrs. C. R. B. King, J. T. Micklethwaite, and the chairman took part, and votes of thanks having been accorded to the readers of papers, the meeting terminated.

Competition. — At the annual meeting of the Liverpool Architectural Society, the subject of the competitive plans for the additions to the Children's Infirmary having been introduced, it was resolved that having been made acquainted with the fact of the committee of that charity having invited architects to compete for a proposed alteration of their premises on the terms that all plans sent in should become the sole property of the committee, 10l. being paid to each unsuccessful competitor, the society expressed its regret not only that such a derogatory offer should have been made, but have been persisted in after its peculiarity was pointed out, and more particularly regretted that any architect should have acquiesced in any such terms.

* St. Mary Rouncival, occupying part of the site of Northumberland House.



Dolmen, with Peristalith, Brittany.

ANTIQUITIES IN BRITTANY.

A LECTURE entitled "Pen and Pencil Sketches in Brittany," was delivered before the Fine Arts Society, Conduit-street, on the 16th inst., by Dr. John S. Phené. The lecturer, after detailing many of the sylvan beauties, and subjects for the pencil, of the *châteaux*, moorlands, and forests, gave an outline of the rise and progress of landscape art, which he contended was purely the offspring of freedom of religious thought in combination with literary refinement, and described many of the strange and still existing rites and ceremonies of the Bretons. Some of these have clearly been engrafted on anterior ceremonies of the preceding Pagan faith. In a district described as "the district sacred to the sun," a large number of horses join in the sacred processions on the religious festivals; horses, in the ancient faiths, having been sacred to the great luminary. In another part, horned cattle take the post of honour. In almost all these quaint ceremonies, a sort of Saturnalia is permitted, which, when at its height, in the frantic gesticulations of *la danse ronde*, cider-drinking, singing, and a Babel of sounds, accompanied by discordant instruments, is suddenly hushed by the chanting of churchmen, and a long procession of penitents bearing lighted tapers. Some of the strange legends of the country were recounted, and the still existing superstitions, which hang about the standing stones, even yet venerated by the peasants. The lecturer concluded his subject by some instances of the risks attending exploration in Brittany. On ascending the mountain, Méné Hom, the party had their course tracked by a wolf, which, as they found, on their return to Chataulin, had attacked and lacerated a number of persons on the road between that town and the mountain. Eight persons were already reported, in a letter from Chataulin to the lecturer, to have died from hydrophobia from this attack, and not less than thirty head of horned cattle and one horse. The wolf was killed by a peasant, taken to the Prefecture, and dissected. On another occasion, after taking observations along the coast, in search for the Isle of Avalon, of Arthurian romance, the lecturer was arrested at his hotel at ten p.m., on a cold winter's night, and compelled to accompany a file of *gendarmes* to the Prefecture, where he underwent an hour's examination, from which his passport, containing a *visé* for each of the principal countries of Europe, alone extricated him. The result of this search was the culminating point of the lecture. Several writers were referred to who gave the matter up as hopeless, but the lecturer determined to visit successively every island along the coast of the Arthurian district, and closely inspect for himself. All the hand-books and local authorities were silent or unable to give information. At last an island was found on which was a remarkable dolmen, having round it a circle of stones, or, as the lecturer preferred to call it, a court, enclosed by an external peristalith, similar to that at Mycenæ, excavated by Dr. Schliemann. Local inquiry led to the discovery that an adjoining island was the traditionary Avalon (Isle of Apples), and on visiting it the inhabitants maintained that it was so. An investigation of the encroachments by the sea showed that the two islands were formerly one, and that consequently the dolmen once stood on the Isle of Avalon. The description agrees with that given of the position of the island by a writer of many years past; but the difficulty was, there were no trees, and, consequently, no apples.

In a close inspection of the island some very ancient stones, admitted, traditionally, to have been the apparatus for ancient cider-making, were found, and with them some stone celts, rubbing-stones, and other neolithic implements, —evidence, in short, that before the encroachments of the sea the island had its primitive cider-making, and consequently the apples for its production. An old and rude *bénitier*, dug up several feet under the surface near the dolmen, indicates that a primitive chapel must once have existed near the tomb of the Royal combatant for the Christian faith,—King Arthur? An enormous menhir, now sculptured with a great many Christian emblems, commands the two islands from the mainland, and two other large dolmens, not having the "peristalith," are on land to the east and west of Avalon. The name of the town in the district, Tregastel, i.e., three castles, seems indicative of these three monuments, and near the town is a menhir, sculptured into the form of a serpent, supporting on its head a rude stone cross. The lecturer said he had purchased the estate on the island, and brought the lithic evidences of the cider-making, &c., with him to London for their security.

We give a view of the tomb. Without desiring to throw doubt on Dr. Phené's supposition, it is right to say that the occurrence of a dolmen (or cromlech) with a circle of stones around it is by no means unusual.

RECENTLY-DISCOVERED SYNAGOGUE AT SÛFSÂF.

THIS is one of the two newly-discovered synagogues found during the course of last year by the Palestine Exploration party while executing the survey of the northern portion of Palestine. These synagogues are peculiar to Galilee, none having been found in the south; they date from about 120 A.D, when Rabbi Simeon Bar Jochaï built a great number of synagogues, notably those at Kefr-Birim, el Jish, and Meirûn.

The remains of the synagogue shown in the illustration, taken from a photograph by Lieut. Kitchener, R.E., consist of a sculptured lintel built in over the door of the modern Mosque of the village, and surmounted by a curved niche surrounded by ornamental voussoirs. The lintel measures 5 ft. long by 1 ft. 8 in. high, the voussoirs are 1 ft. 4 in. on the inner arc, and 1 ft. 9 in. on the outer, by 1 ft. 1 in. high.

It appears probable that this lintel formerly belonged to one of the smaller of the three doors common to these synagogues. The niche is placed over it, as it probably was in the original building, but the ornamented voussoirs evidently come from the larger doorway, as there are one or two lying about, and they do not fit round the niche. The probable voussoirs of this smaller doorway are shown in the illustration built into the wall on the left.

A curious feature in these synagogues is the prevalence of figured animals, contrary to the Jewish law, which forbade the representation of any animal forms. In the present instance two rams' heads are sculptured, one on either side of the central wreath of the lintel. At Kefr-Birim, on the two principal lintels of the synagogues rams are figured. At El-Jish, in the other newly-discovered synagogue, a stone bears the design of a Roman eagle. It is curious in this case to find the very emblem employed against the admission of which into the Temple at Jerusalem the Jews at an earlier period had so strenuously resisted. In the synagogue at Nebartein, on the base of one of the columns a hare is sculptured, although an unclean animal according to the law of Moses. In the synagogue at Umm-el-Amud, and probably at Irbid, lions occur on the lintels. All this seems to point to a change in Jewish customs, showing



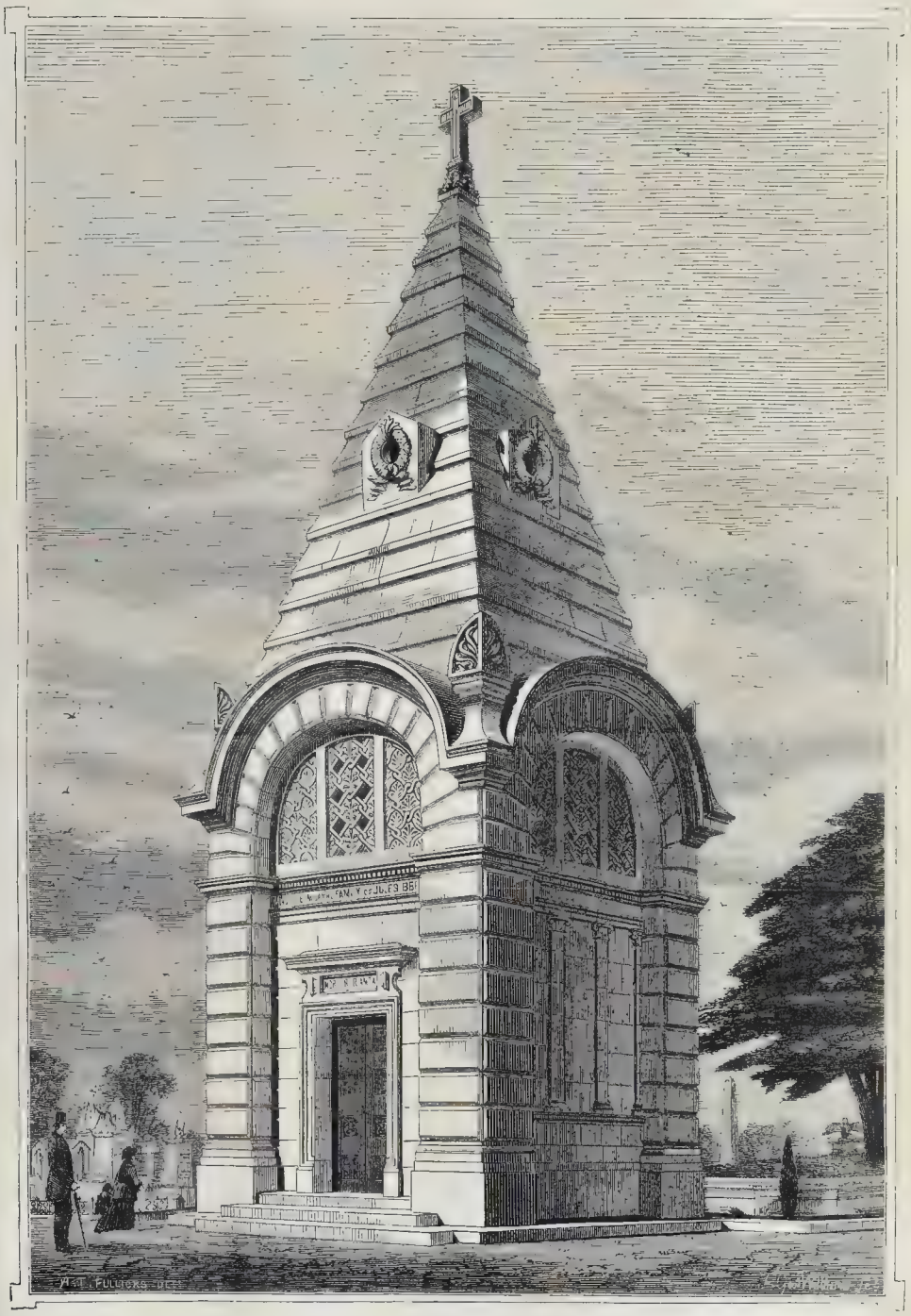
RECENTLY DISCOVERED SYNAGOGUE AT SÛFSÂF, IN PALESTINE.

Hellenistic influence, which agrees with and accounts for the architectural character of these remains.

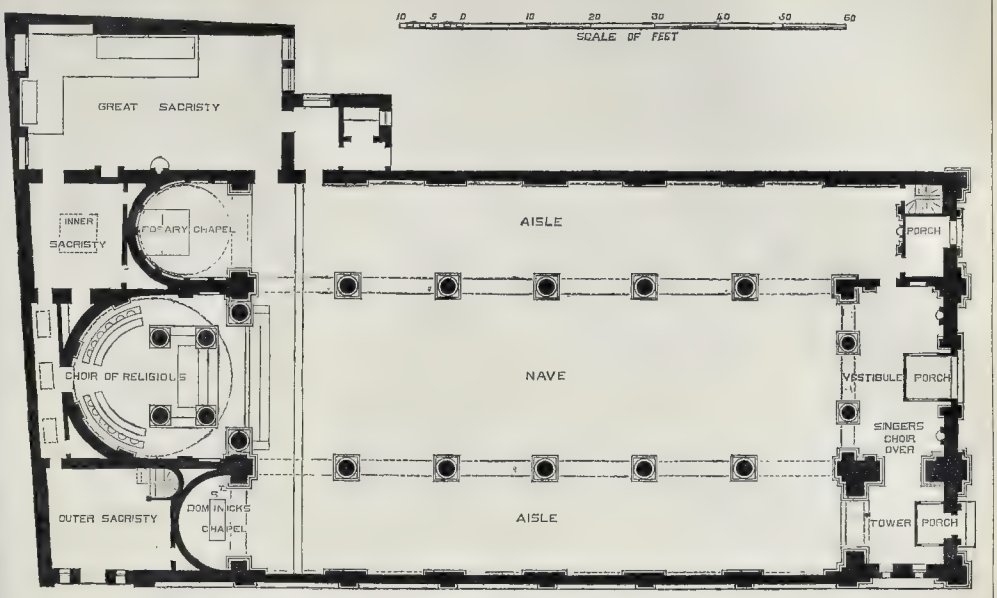
The general plan of these synagogues is well known, and has been already fully described by Major Wilson, R.E. The special features are the three or five aisles running north and south, with three doors to the south, one large and two small; the small inter-columniation of the pillars, and the peculiar double-corner columns.

THE BEER MAUSOLEUM, HIGHGATE CEMETERY.

This mausoleum has been erected for Mr. Julius Beer, from designs by Mr. John Oldrid Scott, architect, and is built of brown Portland stone, from Messrs. Giles's quarries. The crypt is entered from the lower catacombs. It is domed internally, the dome being covered by a pyramidal roof. The interior is intended to be inlaid with mosaics. The sculptures are from the studio of Mr. H. Hugh Armstead, A.R.A. Mr. Terry is employed to execute the marble sarcophagus. Messrs. Farmer & Brindley are the carvers and modellers of the bronze doors. The contractors are Messrs. C. Millward & Co., of Kentish Wharf. Mr. Thomas Leigh has acted as clerk of the works; and the cost is stated as about 5,000*l*.



THE BEER MAUSOLEUM, HIGHGATE CEMETERY.—Mr. John O. Scott, Architect.



ST. SAVIOUR'S CHURCH, WATERFORD, IRELAND.—*Plan.*

ST. SAVIOUR'S CHURCH, WATERFORD, IRELAND.

To the illustration of this church already published, with some descriptive particulars,* we now add a plan.

ARCHITECTURAL ORNAMENTATION.

ARCHITECTURAL ASSOCIATION.

At the ordinary general meeting of this Association on Friday, the 10th inst., Mr. Bowes A. Paice, president, in the chair, a letter was read from Mr. George Gilbert Scott in acknowledgment of the vote of condolence sent by the Association to the family of the late Sir Gilbert Scott, and also thanking the Association for the part it took in connexion with the funeral.

Mr. Frederick Lees and Mr. Leonard B. Willoughby were elected members.

Votes of thanks were passed to his Grace the Archbishop of Canterbury for allowing the members to visit Lambeth Palace, and to Mr. J. P. Seddon for his kindness in conducting them over the building, as reported in last week's *Builder*, p. 481.

The President said he regretted to announce the death of Mr. H. Avern, one of the most energetic and promising members of the Association. He was articled to Mr. John Ladds, of Chapel-street, with whom he stayed seven or eight years, and by whom his services were much valued. He left there to go to Mr. Chancellor's, Finsbury-circus, where he had been for the last five years, latterly acting as managing assistant. He was a very hard worker, and long hours and too little exercise had told but too surely on his by-no-means vigorous constitution. He was enthusiastically fond of his profession, and worked energetically at anything he took up. He had won numerous prizes offered by or through the Association, and his loss would be much deplored by all who knew him.

It was announced that to-day (Saturday, the 18th) a visit would be paid to the New Law Courts.

Votes of thanks having been accorded to Mr. H. H. Stannus and the Entertainments Sub-committee, and to the "Whip Quartette," for services rendered in connexion with the members' *soirée* on the 26th ult.,

The President announced that, as the members of the Association were doubtless aware, the Biennial Conference of Architects was to take place from the 3rd to the 7th of June next, and as the Association had arranged to hold its closing ordinary meeting on the last-named date (when Mr. T. Roger Smith had consented to read a paper on "Prehistoric Art and Rude Stone Monuments"), he had been requested to ask permission of the members to allow that meeting to form part of the Conference programme.

No objection was offered to the adoption of this course.

It was announced that the next meeting of the Association would be held on the 24th inst., when the officers and committee for Session 1878-79 will be nominated, and Mr. Alexander Payne will read a paper descriptive of a trip "To Burgos and Back."

Mr. Hugh H. Stannus then proceeded to give a lecture "On Architectural Ornamentation." He remarked that some time ago he wrote an essay on "The Decorative Treatment of Constructive Ironwork," for the Institute Medal. In the course of that task he found that many of the laws or rules which governed the application of ornament to ironwork were equally good for the governance of all kinds of architectural ornament. The remarks he intended to make would have reference entirely to Classic art, and to its Roman and Italian presentments. He adopted that course, not from any want of appreciation of the beauties of Gothic art, which were many and various, but because Classic art was, if he might say so, his own vernacular. Old John Evelyn, in that delightfully quaint book of his, says:—

"Ornaments, however gay and fine they appear to the eye [and are in many cases very laudable and necessary], there is yet no small judgment required how and when to place them appositely, so that they do not detract, rather than add, to the beauty of the work. Now by ornament we understand whatsoever of sculpture and carving is not of constant use, or is not absolutely necessary, such as frutages, festoons, chaplets, wreaths, &c.; frets, guilloches, dentils; metops, triglyphs, cartouches; niches; statues, busts, relievos; pine-cones; urns."

Mr. Stannus said he intended to speak of architectural ornament properly so called, as distinguished from decorative work such as designs for wall-papers, curtain-stuffs, and other textile fabrics. He also limited his remarks to external architecture, because internally the question of mere decoration was apt to get mixed up with what was purely architectural. By architectural ornamentation, he meant any enrichment superadded to the constructive parts of a building. Such ornament was of two kinds, the symbolic and the æsthetic. By means of the former, the whole of a building could be covered with symbols which, if not exactly beautiful, spoke to the beholder of the purpose for which the building was erected. On the other hand, such symbolic ornament could be made to answer its purpose without palling on the sense of beauty, and would then be entitled to be considered æsthetic. The laws governing the application of architectural ornament were not all necessarily universal in their application. He divided those laws into two classes, the practical or technic, and the æsthetic. Amongst practical considerations, the position of the building, and the distance from the eye of the spectator of different parts of it, would determine the size and character of the ornament, the more honourable or important parts of the building being, where possible, emphasised by the character of the ornament. Then, again, the material in which the work was executed would demand consideration. For instance, marble, from its closeness of grain, would admit of a higher degree of finish than a coarser material, and its translucency was a quality which, when taken advantage of, was capable of conducing to incomparable effects. Weather or climate was another of the practical considerations which had to be borne in mind by the designer of architectural ornamentation. The construction or form of the ornament itself should be such as would not render any portions specially liable to breakage or damage, and economy of material should, of course, be studied. Among the æsthetic laws were these: That the ornament must be fit for the purposes of the building. It was self-evident that a building which was to be used for grave and solemn purposes should have ornament in keeping with its character, while a gay or festive building, such as an assembly-room, should be gaily and lightly ornamented. While the ornament should thus be fitted to the purpose of the building, it should also be fitted to its particular position in the building. Another important æsthetic law governing the use of architectural ornament was contrast in distribu-

* See pp. 378 and 381, *ante*.

tion. Ornament should not be frittered away all over a building, as in Indian architecture. The Indians spread a sort of delicate lace ornamentation all over their buildings, very beautiful, no doubt, in itself, but, notwithstanding the vast time and labour spent upon it, comparatively poor and miserable in effect. Another æsthetic law of ornament was what Mr. Ruskin called "principality," which consisted in making certain features more important than others. Other æsthetic laws governing ornament were symmetry, radiation, and parallelism,—these three being very important elements in architectural ornamentation; in fact, they constituted what was called "obedience" in ornamentation. When an ornament had to fulfil a certain duty in a particular place, it ought to acknowledge or recognise the shape of the position by which it was surrounded. Another important æsthetic principle which ought to be recognised in architectural ornament was growth upwards, —vigour, life. The last of the æsthetic principles governing architectural ornamentation was proportion, which could not be taught; everybody must acquire it for himself. Evelyn says further, on fitness:—

"The ancients, who spared nothing which might accomplish their public buildings, were not at all lavish in over-frequent and unnecessary gaieties. Their temples, amphitheatres, courts of justice, and other buildings of state, were grave and solid structures, void of those little membrets, trifling mouldings, and other superfluous carvings which take away from that majestic and grand manner that most becomes them; reserving those richer accessories and costly finishings for theatres, triumphal arches, historical columns, and other ostentatious pomps. Nor even in these did they use them promiscuously, but with great judgment, symbolical to the subjects and occasion. And therefore those ancient ornaments would not suit so properly with the ages since, and may, I conceive, lawfully be changed, without presumption: as if (for instance) instead of *sphinges* and *gryphons* placed before the Pagan temples (guardians of the treasure which was kept in those sacred buildings), *angels* should be set before our churches; and again:—in the friezes, instead of ox-sculls, dishes, and other sacrificing utensils, we chuse to set them into cherubs, flaming hearts, books laid open, &c. The fronts of Parliaments had antique helmets, shields, battle-axes, thunderbolts, &c., which we may answer with our modern artillery of cannon, bombs, trumpets, drums, &c."

Then Evelyn went on to make a valuable remark as to the size of these "properties," which, he said, should not be too far removed from natural size. Incidentally, Mr. Stannus remarked that young architects would find it a useful thing to keep a portfolio for such "properties and trophies," which were constantly being wanted. Proceeding with his lecture, Mr. Stannus observed that of the ornamented parts of a building there were the following five functional parts, viz., the dado, the base, the shaft, the capital, and the bracket. All these were features in ornament which had some work to do. There were four other ornamented parts not functional, and therefore receiving the highest kind of ornament, viz., the frieze, the panel, the border, and the moulding. The highest kind of ornament was never put upon functional members, but only upon such members as had nothing to do in the construction. Proceeding to illustrate the foregoing laws of ornamentation as applied to these several functional and non-functional features, Mr. Stannus omitted the dado and base for want of time, and proceeded to speak of the shaft or column. In his remarks on this head he deprecated the ordinary method of treating built-up columns, notwithstanding the example of the Greeks. He thought that a stone column, built up of a number of courses ought not to possess the unbroken lines of a monolithic column. However great the technical skill of our masons, we should not let such excellence of workmanship carry us away from true principles of design. The inconsistency of treating built-up columns in the usual way seemed to have been felt by Inigo Jones, for in designing the York Water Gate he had, instead of piling "cheese" upon "cheese," placed square and circular blocks of stone alternately in his columns, the result being, however, very clumsy and unsuccessful. Instead of building up columns in the usual way, with the usual fine joints, why not recognise the fact that a column was built up by acknowledging the joints by means of small rings or annulets? In that interesting period of architecture, the French Renaissance, when men were just breaking away from Gothic and were using up Italian features and details, gradually evolving the French château style, there were some interesting specimens of that mode of treating columns. Mr. Stannus said he believed that if we attempted to treat our columns in that manner we should be going along the path of progress. Passing on to speak of capitals, the lecturer confined his remarks to Corinthian caps, which, he said, were generally very unsatisfactory in the way in which they were treated by the moderns. Even Sir Christopher Wren's Corinthian caps were not satisfactory, and Wren failed in this respect from the same reason that other and lesser architects had failed,—because he took his Corinthian caps directly out of a book, and did not think out the subject for himself. Whenever Wren did think out a detail for himself it was good, but when, on the contrary, he took his details from a book, without modification, they were good, bad, or indifferent, as chance decreed. He (the lecturer) thought it was obvious that, when they immediately adjoined a plain shaft, the lower row of leaves in the Corinthian cap, they should be carved flatly, like "water-leaves," as the carvers called them, so as to break the violence of the contrast between the perfectly plain surface of the shaft and the highly-enriched carving of the upper part of the capital. A very objectionable feature in the Corinthian capital was its bell, which architects ought to make a vigorous effort to get rid of, as it was suggestive of nothing so much as the "compo" manufacturer, who, given the bell of the capital turned in wood, would apply the leaf-ornament, and soon turn out complete his compo imitation of the Corinthian cap. The retention of the bell gave to the ornament of carved Corinthian capitals a "stuck-on" appearance, and seeing that a Corinthian cap was very expensive to carve, it was not desirable that it should look like compo-work. In ornamenting a cap or any other functional member in architecture, the "ground" should not be visible beneath the ornament, which would otherwise inevitably look as if "stuck on." The "ground" might be shown in a frieze or panel, or other non-functional member, but in a functional member the carver should "lose the ground." Another objection to the bell of the Corinthian cap was, that it, being circular on plan, did not combine well with the abacus, which was rectangular on plan; in fact, the abacus, as seen in the Nelson column and elsewhere, seemed to be a thing by itself, instead of being an integral part of the cap. The projecting abacus was particularly unsightly, and in a cast for the caps of the Wellington Monument in St. Paul's the late Alfred Stevens had been very successful in getting over the difficulty, thereby proving, were any additional proof necessary, that architects were not obliged to copy the details of Classic architecture *verbatim et literatim*. What they ought to do was to take those details and reason them out before applying them to modern requirements, discarding altogether every bit for the employment of which a reason could not be given. Without venturing upon prophecy, the lecturer said he thought that Classic was coming up again to take its innings, and if so, it would be found that people would abandon all its useless features one after another, and thus prevent architecture from sinking so low as in the past. Having shown how the Romans debased the Corinthian cap, the lecturer treated of the modillion or bracket, which also suffered in Roman hands. In referring to the ornamentation of friezes and panels, the lecturer said it was highly important that such ornamentation should take cognisance of the axial lines of the building. The Arc de l'Étoile, Paris, was a very fine example of axiality in the lines of the repeating forms. As to parallelism, it was necessary, in such features as friezes, to have horizontal as well as vertical lines, and wherever possible the joints should be so arranged as not to clash with or mar the effect of the design. The podium of the Albert Memorial exhibited a glaring disregard of this rule. Among the figures was that of Phidias, holding up a statuette of Minerva, the joint in the marble coming right through the statuette, and in another figure the joint came through the elbow. Surely in a work of that kind, where there was no lack of expense, more care should have been taken to prevent such unsightliness. He did not say it was a proper thing to hide joints altogether, but they might be honestly shown and arranged without obtruding upon the beholder in so rough a manner as in the instance mentioned. Having dwelt at some length on mouldings and their enrichments, Mr. Stannus proceeded to speak of the importance of *reticence* in ornament, citing, as examples of the contrary method of fulness, the overdone or, as he called them, the "covered-all-over" works of the Romans. He recalled Ruskin's saying to the effect that were paints a guinea an ounce, people would be better colourists, and in the same connexion quoted Fergusson's remark, that if some Chancellor of the Exchequer would put a tax upon Classic columns and Gothic traceried windows and panels, people, being forced to abandon these, would be compelled to think out something else, and there would be progress in architecture. So, in like manner, the lecturer believed that if ornament were more expensive, — if a man were allowed to use only a limited number of architectural members in his façade, we should have more buildings which, like Baldassare Peruzzi's Farnesina Palace at Rome,—a gem amongst a lot of rubbish,—owed their success to *reticence* in the use of ornament. Having dismissed the question of "grammar and style," for want of time to deal with them, Mr. Stannus concluded a very interesting *vivâ-voce* lecture, our report of which is necessarily lacking in completeness, owing to the absence of the numerous sketches (on the blackboard) with which the lecturer aptly illustrated many of the points touched upon.

A brief discussion ensued, in which Messrs. H. L. Florence, Aston Webb, and W. Hilton Nash took part. To this we may return.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE annual meeting of this Association was held on the 7th inst., in the Old Castle, Newcastle, the president (Mr. T. Oliver) occupying the chair. Mr. J. W. Herring was elected an associate. The secretary (Mr. W. H. Dunn) read the annual report, which was the twentieth of the Association. The election of officers was then proceeded with, when Mr. T. Oliver was elected president; Mr. S. Oswald was elected vice-president; Mr. G. W. Hodge was re-elected hon. solicitor; Mr. M. Thompson, hon. treasurer; and Mr. W. H. Dunn, hon. secretary. A committee of ten members was also elected.

The President then delivered his address. He congratulated the Association in that during the hard times it not only held its own, but had made its way in the profession. In the death of Sir George Gilbert Scott they had to deplore the loss of the last honorary member of the Association. That class of membership had only numbered three members,—Grainger, Bonomi, and Scott. Each of these members was selected as special circumstances transpired, circumstances that rendered the event honourable to the Association and complimentary to the individual. The circumstance of Sir Gilbert Scott's election was that in connexion with his appointment as architect for the restoration of St. Nicholas's Church. In order to testify their appreciation of his great skill in church restoration, and to welcome him amongst them as a fellow-worker, and perhaps to some extent as a challenge to those critics who apprehended jealousy, they unanimously placed him in the category of honorary members, which was the highest compliment they as architects could pay him. He had the assurance from Mr. Scott's own lips, that their appreciation of his worth was as deeply felt on his part as on theirs. The history of a great man wrote itself upon those who observed him, whether through his works as works of art and skill, or through his writings. He was in that sense familiar with their late honorary member. He had addressed him (the speaker) by his architecture, by his literature, and by his presence. His architecture, speaking of his great works, was one,—one in feeling and style. It was not original, nor was it strictly eclectic, but it was always chaste, refined, and elevated. The Greek and the Roman form had no charm for him. He was the mental antithesis of Sir Christopher Wren. Pagan art was, in a sense, barbarous to Scott, as Gothic art was considered barbarous by Wren. Nevertheless, both were compelled by the force of circumstances to exercise their art in the department which they contemned. Barry, who designed the grandest Gothic building in the world,—the Palace of Westminster,—designed also the Reform Club and the Government Offices. Barry was eclectic. Scott, as by inspiration, seized hold of one idea, and held it to the day of his death. It was a beautiful idea,—so full of sentiment, and grace, and truth. It bordered on the holy; it was so sedate, severe, and reverential. It was the embodiment of mystic piety,—true poetry. Thirteenth-century Gothic architecture contained that idea. Like many other beautiful things, it had not been observed by others. He seized it with a

iant's grip, and it grew up under his care to erfection. Nearly the whole of the best of ilbert Scott's works were Gothic. While other en were studying Vitruvius and Chambers, he as sketching the remains of our parish churches nd bits of old cathedrals. Like a true artist, e had got hold of an idea, and he would work out. His idea had to dislodge another idea, r then began the "battle of the styles." othic won the day, and the crown had been laced on Sir Gilbert's head. He had been equested to draw the attention of the members o another question. It was whether the muni ipality of Newcastle was justified in authorising s engineering officials to study and practise rchitecture. The town had no official archi ect. Indeed, he did not know of any provincial ity or town that had one. They had engineers, owever,—regular, thorough, properly-educated, nd qualified engineers. He wished to ask hem and the authorities whether it was possible o make an educated engineer an educated rchitect. If their engineers professed to be rchitects, whence did they get their education? f they were not thus educated, they could call uch interference by the name that other pro essions did. The architecture of engineers was emarkable for one thing,—the absence of rtistic feeling and effect. It was usually only rick and stone, and nothing more. There was o speech nor voice in it; nor could there be, or the simple reason that it was impossible to e a skilful engineer and an accomplished archi ect. The thoughts and ways and feelings, the outhful training, the after-thinking, and the ractical carrying out of the works in those espective professions were inimical, and could ot be blended in the ordinary man. Under hese circumstances, he would advise that a special meeting be held for the purpose of con sidering the question in all its details. They could then decide upon taking such action as might seem to be necessary for the public benefit, and for the more public recogni tion of their acknowledged position as a pro fession. He then referred to the Architectural Conference to be held in London on the 3rd of next month, to which their Association usually sent two delegates. Mr. Oliver and Mr. S. Oswald were appointed delegates to attend the Conference.

TESTIMONIAL TO SIR HENRY COLE, K.C.B.

A MEETING of the subscribers was held on the 16th inst., at Grosvenor House, with the kind permission of his Grace the Duke of West minster, who presided, for the purpose of making the presentation to Sir Henry Cole.

In opening the proceedings, the chairman said that five years ago a meeting was held at Willis's Rooms to take into consideration a proposal then made to offer to Sir Henry Cole some tangible recognition of his public services. Two years afterwards it was decided by the committee that the memorial should take the form of a mosaic portrait of Sir Henry, set in a tablet of Della Robbia ware, and of a bust to be executed by Mr. Boehm.

Mr. J. G. Crace, hon. secretary, laid before the meeting the results of the subscription, and the course which had been pursued. He said that the total amount of the subscriptions received was 2,924*l.* 13s. 4d. Every subscription promised, with one exception, had been received. The expenditure had been as follows: —For the manufacture of the mural monument, designed by Mr. Moody, 326*l.* 5s. 6d.; to Mr. Boehm, for the bust, 160*l.*; for advertisements, stationery, postages, &c., 200*l.*; to assistant secretaries, 31*l.* 10s.; 2,000*l.* had been paid over to Sir Henry; and there remained a balance in hand of about 200*l.*

The Duke of Westminster, in formally presenting the testimonial to Mr. Cole, expressed regret at the absence of Lord Granville, who of all others would most fittingly have discharged the duty. Those who knew anything of Sir Henry Cole's career knew how successfully he had worked for the promotion of science and art in this country, and what enormous results had accrued from his labours. The success, and indeed the very existence, of the South Kensington Museum was a striking testimony to the zeal and ability which he had displayed for so many years for the public good. The Chairman then asked Sir Henry Cole to accept the testimonial.

Sir Henry Cole acknowledged the presentation somewhat in the following words:—

I feel as though I am here to-day to receive judgment from a special jury, far too lenient to the faults and shortcomings of my life. But the forces of my nature have impelled me to do what has received this unusual and welcome mark of approval. My words can but feebly express my hearty thanks to the princes, peers, commoners, men of science, art, and literature, and handworkers, who have joined in this testimonial, and especially to the Duke of Westminster and the executive committee for their exertions. The testimonial connects my name with science and art and the South Kensington Museum, but let me say that the work done has been far less my own than the outcome of other sympathetic agencies. The origin and much of the progress of the Science and Art Department and erection of the Kensington Museum came from the Prince Consort, and after him they have been chiefly fostered by Earl Granville, who is the god-father of the name of South Kensington. More than twenty-five years ago, Mr. Henley, agreeing with Adam Smith's advice given 100 years before, enabled the carpenters and masons, and workers by rule in this county, for the first time, to learn the science and art of geometrical drawing. Twenty years ago the second Marquis of Salisbury started the present science system, and commenced the first permanent buildings of the Museum. Lord Granville largely advanced the buildings in 1859, being aided by Mr. Lowe, a most valiant defender of the South Kensington Museum at the time of his connexion with the Science and Art Department,—a time I look back to as that of *dies ambrosianæ* passed in the Board-room of the Institution. The Duke of Buckingham sanctioned the erection of the science schools and the great courts in 1866, and at this point the works have stood still since my retirement. It was by means of a co-operative system which used the various scientific and artistic powers available in the department,—the great constructive genius of Capt. Fowke; the decorative talent of Godfrey Sykes and his pupils, John Gamble and Reuben Townroe, students of unusual ability, trained in the Sheffield Art School; with the sagacious and learned criticism of the Art Director, Mr. Redgrave,—that successive Lord Presidents were induced to cause the buildings at South Kensington to be carried on, and many novelties in decorative art to be first introduced into England, but this system has been altered, and the works have stopped too. I have faith that the day may come when the system may be revived with further advantage to the public taste of the country, and enable the Government to promote the fine arts as Lord Beaconsfield desires to see. The State work of Art and then of Science has had to pass through many battles since it was started in 1852, but Parliament has never refused the necessary funds, which have increased nearly twenty-fold, whilst the number of students of different kinds and the visitors to the Kensington Museum and the allied institutions may be numbered by millions annually. The testimonial has in part taken the embodiment of a mosaic portrait, designed and directed by Mr. Moody, with a marble bust, sculptured by Mr. Boehm; and your executive committee have kindly asked me to suggest where they may be placed. In the Kensington Museum, a sort of chronological history is marked of the progress of the building during my time, by means of the mosaic portraits of the authorities, upon whose Parliamentary responsibility the work has proceeded. Upon the walls will be found portraits in mosaic (an art first introduced into this country) of Lord Sydenham, Lord Taunton, Mr. Henley, Viscount Cardwell, Lord Stanley of Alderney, Earl Granville, the Marquis of Salisbury, the Duke of Buckingham, the Duke of Marlborough, and the Marquis of Ripon. The portraits of Lord Aberdare and the Duke of Richmond have yet to be added. I hope I may properly ask that when the right time comes (perhaps when I return to mother earth) this testimonial portrait may be permitted to rest on the walls of the Museum as one who assisted in its creation. As respects the bust, by Mr. Boehm, after first ascertaining the views of the Prince of Wales, the president of the Royal Albert Hall, it was intended to be offered to that institution, together with a bust of Gen. Grey, copied by permission of the Queen. Without the personal exertions of Gen. Grey, I consider the Hall could not have been built. After fifty years of public life, with my health declining from the constant strain of official work, I felt it right to resign my duties. I am not idle in my leisure. My health has improved, and if Heaven be pleased to grant me life and strength a little longer, and with the cheering remembrance of your very great kindness, I hope to do still some useful public work on my own responsibility. I am trying to obtain a national recognition for music, the first and most popular of all fine arts; to help elementary education to become rather the work of the people than of the State; and to promote improved health throughout the country.

Lord Elcho moved the following resolution:—

"That the Mural Tablet in Della Robbia ware, containing the portrait in mosaic of Sir Henry Cole, shall be offered to the authorities of the South Kensington Museum as a record of the public services and the untiring energy of Sir H. Cole, and as a valuable product of British art-manufacture, with the earnest hope that it may be placed in some suitable situation in the Museum."

He said he had had the honour to be associated with Sir Henry Cole in many ways, and he could not speak too strongly of the great debt which the nation owed to that gentleman for his efforts in the promotion of art and science. Without detracting from the merit due to the late Prince Consort and to Lord Granville in connexion with the establishment of the South Kensington Museum, it could truly be said that the accomplishment of the work was mainly due to the administrative ability, tact, and good judgment of Sir Henry Cole. The energy and "go" that he possessed were well illustrated by the way in which, in a very short time, he succeeded in obtaining 120,000*l.* for the erection of the Albert Hall, as part of a scheme for the promotion of the study of the art of music

Mr. Minton Campbell, in seconding the motion, spoke of Sir Henry's services in connexion with the promotion of industrial art, and of his aptitude for comprehending the technical conditions limiting the application of art to pottery, glass, iron, and other manufactures. His services in connexion with the Exhibition of 1851 were also alluded to as having benefited, not England alone, but the whole world.

The resolution having been adopted, Lord Clarence Paget moved,—

"That his Grace the Duke of Westminster be invited to present the marble Bust of Sir Henry Cole to H.R.H. the Prince of Wales, as President of the Royal Albert Hall, with the request that his Royal Highness will be graciously pleased to arrange for the same to be suitably placed in the Albert Hall."

His lordship more particularly alluded to the great services which Sir Henry had rendered in connexion with the Royal Albert Hall.

Mr. Godwin, in seconding the motion, adverted to the former resolution, and expressed the hope that immediate application would be made for consent to place the mural tablet in a prominent position in South Kensington Museum. It was at Sir Henry Cole's own request that a portion of the sum of money raised had been spent in works of art produced in this country. He might have received the whole of the money subscribed had he been so disposed. Even the cost of the bust of General Grey, which it was hoped would accompany that of Sir Henry Cole, had been defrayed out of the funds subscribed, because Sir Henry felt that if his own bust were to be placed in the Albert Hall, it should be accompanied by that of General Grey, and all who knew the history of the Albert Hall would agree as to the appropriateness of such an arrangement. The Della Robbia tablet was one of the largest and most successful specimens of the kind which had been produced in England, and would probably be the "fruitful parent of a hundred more." It was hardly possible that any official connected with the Government or with South Kensington could refuse a suitable position for it. As to Sir Henry's services in connexion with the Albert Hall, they had resulted in the provision, wholly by voluntary subscriptions, of a building suited not only for music, but for a variety of large and important gatherings; but no undertaking had been subjected to so much misrepresentation.

The motion was agreed to *nem. con.*

The meeting was also addressed by Macleod of Macleod, Sir S. Morton Peto, and Mr. Warren Delarue, the last-named gentleman remarking that the sum subscribed was not at all commensurate with the services which Sir Henry Cole had rendered.

Mr. Godwin, in moving a vote of thanks to the Chairman for the interest he had taken in the movement, took occasion to speak in appreciative terms of the untiring efforts of the hon. sec., Mr. J. G. Crace, to promote the success of the testimonial.

The Chairman, in responding, also expressed his sense of the obligations the subscribers were under to Mr. Crace.

INCRUSTATIONS ON BRICK WALLS.*

The disfiguration of brick house-fronts by white incrustations is now so general that it is to the interest of the public, and of brick-makers and builders particularly, that its causes shall be determined and a remedy applied, so that, if possible, houses built hereafter may be free from it. Many recent attempts at ornamental brickwork have resulted only in unsightly walls. The incrustation has been variously discussed in the newspapers, but owing to conflicting views of its causes, builders, brick-makers, and bricklayers appear still to doubt the efficacy of any remedy hitherto proposed. It is desirable that all observed facts and statistics of attempted improvements should be collated and reviewed by some competent authority.

This defacement is most noticeable in dry weather on parts of walls subject to dampness, and on entire walls after rain-storms have soaked them. North and east walls are coated on drying after north-east storms. Chimney-walls and chimney-tops, lines of leaky or obstructed water-spouts, spaces beneath window-sills, walls near the pavement, and pavement-bricks, are specially marked. The white coating is derived primarily from both bricks and mortar, and in some cases it is difficult to decide, without dissecting the walls, whether the bricks, the mortar, or both, are or are not concerned. The Bankers and Brokers' building, opposite the Stock Exchange, is not yet completed, but its walls are already unsightly with white patches. The black mortar or cement with which they are pointed has disintegrated and crumbled out here and there, leading to the conclusion that this is chargeable with the defacement. The bricks, however, are coated where the pointing is not at all affected, and one particular brick, which was left out of the wall, and was faultless in form, colour, and consistency, showed white patches when it dried after having been wet.

It will be found most convenient to consider, first, the incrustration as derived originally from the bricks. It is most conspicuous on comparatively new walls. It may be observed in the outskirts of the city, on very new walls of unfinished houses in which no fires have burned, and where the mortar is unchanged. In these cases the white substance is dissolved by moisture from the bricks, which contain it before they are built into the houses. The writer has visited several brickyards in the suburbs, where piles of new bricks, which had never been in contact with mortar, but remained in a comparatively pure atmosphere since leaving the kilns, showed the common white incrustration. Some of the bricks which remained in the kiln were also coated. In several yards the incrustation had, here and there, a yellow tinge, possibly from traces of oxide of iron or hyposulphite of lime. One of these bricks, taken haphazard, was examined somewhat in detail. The white coating had a peculiar taste, in which that of sulphate of magnesia (Epsom salts), though disguised, was recognisable. As this white substance had come out from within the brick, the latter was crushed and the *débris* digested in water. At the end of a week the water had dissolved out a mixture, consisting mainly of the sulphates of magnesia, lime, and iron. This brick contained no traces of sulphites, soluble carbonites, or soluble chlorides. The white incrustration disfiguring several fine pressed bricks in a new wall was also examined. It had so saline a taste that most persons would have pronounced it common salt. Nevertheless it contained none. It was almost wholly sulphate of lime and magnesia, with traces of iron and alumina. No carbonates were present. Several other specimens of incrustation were examined, with the same results. Two specimens of incrustration were examined specially for soda and potassa, but neither contained noticeable quantities.

The fact being established that bricks burned with coal fires are impregnated with the soluble sulphates mentioned above, specimens of brick-clay from the pits of different brickyards were next examined, in order to determine whether, and to what extent, these salts originally exist in brick-clay, or are produced when bricks are burned with coal fires. None of the specimens contained free sulphuric acid or appreciable quantities of soluble sulphates (such as the sulphates of magnesia, lime, or alumina). They contained no soluble carbonate or chloride. Only minute quantities of insoluble carbonates (such as the carbonates of lime and magnesia) were present. Further examination proved that all the specimens consisted chiefly of clay proper, *i. e.*, silicate of alumina, with much oxide of iron, and small proportions of lime and magnesia, which, presumably, were also contained as silicates. The proportion of lime and magnesia contained in the clay,—separated by long digestion with an excess of hot sulphuric acid,—about equalled those existing as sulphates in the aqueous brick solution; suggesting the inference that brick-burning may, in some instances, convert all, or nearly all, the supposed silicates of magnesia and lime into sulphates.

The process of burning bricks with coal sufficiently accounts for this conversion. Nearly all coal contains diffused particles of sulphide of iron, or iron pyrites. These are decomposed when coal burns, and sulphurous acid gas is one of the products of the combustion. When sulphurous acid gas, air, moisture, and substances which have an affinity for sulphuric acid, are brought together at high temperatures, long sustained, sulphates of the susceptible substances are formed. The silicates of lime and magnesia are probably decomposed under these circumstances, sulphates of lime and magnesia being formed, while silica is liberated. It is, therefore, reasonable to suppose that when the dense, sulphurous vapours of a coal-burned brick-kiln, which are suffocating outside of it, are diffused, with moisture and air around and through the clay of intensely heated bricks for the greater part of a week, the fires being maintained usually three days, and the kilns opened at the end of a week, a reaction takes place; and that when the bricks are turned out from the kiln, they are impregnated with the above-named sulphates. When the bricks become wet, these compounds dissolve, and in dry weather, succeeding storms, the solution evaporating from the surface of the bricks leaves them coated with these white compounds.

Sulphate of magnesia possesses the peculiar property of efflorescing, or blossoming, in dry air. In this way a very small amount becomes conspicuous. Brick clays contain varying proportions of lime and magnesia, and the percentage of iron pyrites varies in different specimens of coal. Bricks may be noticed apparently overstocked with the sulphates of magnesia and lime. These are much whiter in dry weather than others surrounding them. Coal is now generally, if not universally, used here for brick burning in place of wood. Coal-dust is commonly mixed with brick-clay in clay-pits, and may add to the production of sulphates within the bricks. The white incrustation, however, occurs on bricks in yards where coal-dust is not mixed with the clay. It is not used in pressed bricks, and these are as frequently defaced as others. Common bricks, in back buildings, are coated with the white incrustation, but generally escape attention. Bricks least subjected to sulphurous vapours while burning, may be less impregnated with the sulphates of magnesia, &c., than others.

The simplest way to get rid of the sulphates, so far as the bricks supply them, is to avoid producing them while manufacturing the bricks. Pressed bricks, and others intended for ornamental purposes, might be burned with wood or with coke, if free from sulphur, in separate kilns, far away from places where coal is burned in considerable quantities. Unless afterwards exposed to an unusual amount of sulphurous vapour, they would probably undergo no change.*

It has been asserted that the white coating was formerly noticed on bricks burned with wood, but the evidence appears to be mostly the other way. It is quite possible, though, that a white efflorescence, derived from the mortar, may have been observed on old wood-burned bricks; or that such bricks, in rare instances, have been specially subjected to sulphurous vapours, and thus altered.

It has been suggested that the white incrustation results from chemical change effected in bricks by sulphuric acid vapours in the air,—derived from coal burned as fuel, and from the combustion of illuminating gas. If the gas is properly purified at the gasworks, little sulphuric acid can be traced to it. Much more is generated by burning coal in houses and factories, but it is at least doubtful if much change is effected by it in bricks, particularly after its diffusion, though there is no doubt of its effect, in time, upon mortar, as explained hereafter. We have seen that bricks now generally contain enough of the unwelcome sulphates before they are placed in walls, and that, in some instances, all the susceptible magnesia and lime in them are then already converted into sulphates. The small amount of sulphuric acid diffused in the air is insufficient to produce any effect until after long exposure, yet new bricks are more disfigured than old ones. Silicates of lime and magnesia in the semi-vitrified bricks are somewhat protected from the action of the air. It is questionable, on the principle of elective chemical affinity, whether these silicates, even if more exposed, would undergo decomposition in the presence of the more vulnerable mortar. Some bricks, however, may contain free lime and magnesia.* If the atmospheric acid vapours affected silicate of magnesia in bricks, serpentine stone fronts,—almost wholly silicate of magnesia,—would be much more affected. Many of these have been carefully examined, but in no case were the stones altered. Sometimes the thick lines of mortar between them being decomposed, solution of sulphates from these had washed over the stonework and defaced it.

Sulphate of magnesia is largely produced by the decomposition of mortar. Most of the lime used here is burnt from magnesian limestone, obtained in this vicinity, and the result is a mixture of lime and magnesia in varying proportions. The limestone belt of Chester Valley, which runs diagonally across the State, and which furnishes most of our lime, is largely magnesian limestone; the lower sub-division of the same formation in New Jersey being specially named the magnesian limestone in New Jersey geological reports. The mixture of lime and magnesia thus obtained, when slaked and made into mortar, is very susceptible to the influence of sulphurous fumes. These react, forming the sulphates of lime and magnesia. The great solubility of sulphate of magnesia facilitates its diffusion, and makes it the chief cause of defacement; sulphate of lime being comparatively insoluble. As the sulphate of magnesia dissolves and effloresces, the mortar is disintegrated. Sulphurous acid from coal burned in houses, produces its chief effects before it is diffused in the outer air. As it passes up through a chimney, it finds its way through crevices and pores in the wall, and thus directly attacks the mortar; sometimes causing the fall of chimneys, by eating out the mortar cementing them. The bricks, when damp, absorb sulphate of magnesia, or sulphate of magnesia and lime, from the altered mortar surrounding them. Sulphate of magnesia from altered mortar is most noticeable within doors, on chimney walls, and in cellars, where the damp mortar is directly subjected to sulphurous vapours. Efflorescent crystalline masses of sulphate of magnesia often accumulate and protrude from between the loosening bricks.

Dampness produces a solution, which is sometimes diffused through a brick and makes its appearance outside, while the outer lines of mortar bordering the brick remain intact.† Several soft bricks in the outer wall of a chimney-flue were examined recently. They were completely impregnated, as well as coated, with a white substance, which had disintegrated some of them, and which, on analysis, proved to be sulphate of magnesia, with traces of lime, alumina, and oxide of iron. Sometimes, after long exposure, the outer lines of mortar appear to be directly affected by sulphuric acid vapours diffused in the surrounding atmosphere. Delicate crystals and protuberances of sulphate of magnesia and washings from these were observed on mortar limes in brick and granite garden walls as well as on house fronts. Thick mortar lines in walls of brown stone buildings are much affected. Churches at Thirty-sixth and Chestnut streets, Eighteenth and Columbia avenue, and Franklin-street, near Brown, will serve as illustrations. The syenite retaining walls inclosing the Friends' Meeting House, at Seventeenth-street, and Girard-avenue, and those of the House of Refuge on Poplar-street, show the defacement. In all these cases,—particularly in the instances of the syenite walls,—sulphuric

* By Mr. William Trautwine, in the Journal of the Franklin Institute.

* Clay sometimes contains iron pyrites, and its decomposition results in the formation of sulphates. Such clay is, of course, unsuitable for bricks intended for house fronts.

* The writer does not assert that the magnesia and lime found by him in the clay specimens existed as silicates. This point was not determined, and is assumed only because no carbonates or sulphates of magnesia or lime were found in the clay.

† Bricks readily absorb solutions, such as those of common salt, soap, &c., and these substances appear on the surface when the solutions evaporate.

acid vapours clearly do not affect anything within the stones. In some cases mortar contains the sulphates of lime and magnesia before it is used. Most of our lime is burned with coal, and a half-dozen specimens of quick-lime from different lime-kilns yielded slight traces of the sulphates of lime and magnesia. If we accept the development of these traces of sulphates in the lime by coal-burning, mortar is probably made and used now about as it has been for many years past, excepting also that mud is sometimes used in place of mortar. Much more sulphuric acid, however, is now generated within the city limits, particularly in winter, by the greatly increased use of coal.*

To avoid this white defacement developed from mortar, builders should use lime free from magnesia in erecting exposed brickwork. A demand for such lime will bring ample supplies from other localities, and at low prices.

Continuous exposure to sulphurous vapours may effect some change even in mortar made from lime containing no magnesia. But, as before stated, the great solubility of sulphate of magnesia, and its tendency to effloresce, make it the chief evil, and it is worth while to try the result of using purer lime.

When argillaceous limestone is burned, hydraulic cement is formed. The resulting mixture of lime and burned clay (usually with some sand), when wet, "sets" compactly, and the admixture of clay may, to some extent, protect the lime from such influences as might otherwise affect it injuriously. Portland (hydraulic) cement is made by burning an artificial mixture of limestone (chalk) and clay. Portland cement is believed to contain but a small proportion of magnesia, and this circumstance, in connexion with that of the possible protective influence of the clay, justifies the supposition that walls built with this cement may show less white defacement than those in which our ordinary mortar is used. Several brown stone base-walls, laid in good cement, and particularly exposed to dampness, were examined, but showed no defacement. The painted walls of a room in the building of one of the trust companies in this city, lately became much disfigured by the formation of efflorescent crusts of sulphate of magnesia and lime, from the decomposition of mortar within the walls. At the writer's suggestion, hydraulic cement was substituted for the mortar, and the walls repainted. This has since remained unaffected. Cements vary in price and quality, from good to worthless.† Chimneys might be laid in cement, and if white markings between the bricks are desired these can be painted or pointed with marble-dust. This is nearly pure carbonate of lime, and is used in mortar for pointing. It appears to remain a long while unaffected, indicating that sulphuric acid vapours in the air exert little influence upon it. Plaster (sulphate of lime) is not generally used for pointing. Unless largely mixed with mortar it would crack off or be dissolved, and washed by rain over the bricks. Paint serves to some extent as a protection from dampness. The disfigurement may, however, be observed occasionally on painted brick walls after damp weather, the paint being discoloured, and in some cases thrown off by the incrustation forming beneath it.

The unsightliness caused by the white incrustations is intensified by contrast with what may be termed the black streaks. On almost every brick house these hang repulsively at either end of each window-sill. They represent the repeated washings of dust and dirt from window-spaces and window-frames. Scrubbing-brushes, vigorously applied, might remove them. Any simple device would serve to divert the dirty drippings which soak the bricks beneath the windows, developing characteristic white patches here between the black streaks. As it is, the model Philadelphia brick house, with its white incrustations and black streaks, is a reproach and shame. Builders and brick manufacturers who prevent these evils in new houses, may reasonably expect to reap public gratitude, and, perhaps, something more satisfying. Entire blocks of houses have so changed countenance,—have "so gone down,"—within a single year, as to repel desirable tenants, when, indeed, they remained in all other respects unchanged. The subject under consideration has for a long time interested the writer from a utilitarian standpoint, rather than a scientific one.

* Rain absorbs acid vapours contained in the air through which it falls, and driving rains from the north-east may thus acidify, as well as moisten, north and east walls

† White efflorescences, chiefly of the carbonates of soda and potassa, sometimes disfigure walls built with cement mortar. Rosendale cements frequently contain a large per-centage of magnesia, together with soda and potassa. (*Vide* Gillmore on "Limes, Hydraulic Cements, and Mortars," N. Y., 1863.)

VENTILATION OF PUBLIC BUILDINGS.

SIR,—Your correspondent "G." may rest assured that Mr. Hood is quite right in questioning the statement in the *Times* that carbonic acid, the main vitiating substance of ordinary air, is always to be found at the bottom rather than at the top of an inhabited room, and that the inlets for fresh air should in consequence be at the top, and the outlets at the lower part of all well-ventilated apartments.

The result of experiments on the subject, both in this country and abroad, prove, on the contrary, that no such rule exists, and a similar conclusion must result from a consideration of the condition under which all gases are contained in the atmosphere.

The following are the results of determinations made by Professor Pettenkofer in the wards of a Lying-in Hospital at Munich, and they show the amount of carbonic acid in 100 parts of air collected at a short distance from the floors and ceilings of various wards:—

Ward containing twenty-six patients and without ventilation:—

	Carbonic acid.
From air 12 in. below ceiling	·269
Do. do.	·263
Do. 12 in. above floor	·220
Do. do.	·224
Do. near an inner wall	·227

Ward containing five women and children, with ventilation:—

	Carbonic acid.
From air 2 in. below ceiling	·068
Do. do.	·074
Do. 6 in. above floor	·038
Do. do.	·039

Another ventilated ward:—

From air 12 in. below ceiling	·071
Do. 12 in. above floor	·039

Another unventilated ward:—

From air 12 in. below ceiling	·266
Do. 12 in. above floor	·224

Similar experiments were made by Professor Roscoe in England with the following results. In a small room having a capacity of 950 cubic feet, inhabited by a costermonger's family of nine persons, the chimney draught from a small fire and other accidental sources being the only means of ventilation:—

	Carbonic acid.
From air 6 in. below ceiling	·1213
Do. 2 ft. 6 in. above floor...	·1276

In a crowded schoolroom, having a capacity of 4,640 cubic feet, and containing seventy boys:—

	Carbonic acid.
From air 6 in. below ceiling.....	·3305
Do. 3 ft. above floor.....	·3253
Do. 6 in. below ceiling.....	·2390
Do. 2 ft. 6 in. above floor...	·2459

In a large schoolroom, having a capacity of 22,140 cubic feet, and after having been occupied for two hours, being imperfectly ventilated from a stove flue and other accidental sources:—

	Carbonic acid.
Air from 6 in. below ceiling.....	·2696
Do. 3 ft. above floor	·2948

At Wellington Barracks, in a room containing twenty men, and having a capacity of 7,920 cubic feet, supplied with an Arnott's stove and ventilator, both flue and ventilator being fully open, and the fire nearly out:—

	Carbonic acid.
Air from 3 in. below ceiling.....	·1382
Do. 2 ft. 6 in. above floor...	·1684

In a "fashionable theatre," when quite full:—

	Carbonic acid.
Air from 34 ft. above the level of stage, and over the stalls	·2637
Do. 4 ft. above do.	·3212

It will be found, by averaging these results (the only ones I know to have been published), that the quantity of carbonic acid at the lower part of the chambers experimented upon was slightly smaller than that at the top, the exact proportion being as 1 to 1·042. The average difference was no more, in fact, than is often found to exist where two or more determinations are taken at the same moment from any one spot, and when such difference would simply arise from unavoidable imperfection in the apparatus used for experimenting.

We may therefore assume that, though under certain conditions the quantity of carbonic acid in any two distinct volumes of air may differ, yet that in ordinary inhabited rooms no one portion can be certainly stated to contain more or less of this deleterious gas than any other portion.

The above result would necessarily follow a consideration of the laws under which gases and all other fluids have their existence. These laws, though in themselves simple, are, in their combination, and when considered in reference to the question of ventilation, somewhat complex; and from this arises, I presume, the difficulty which scientific writers seem to experience in their endeavours to clearly indicate what are the conditions under which a mass of air in an inhabited space can be dealt with so as to best maintain the nearest approach to purity.

Most people who have inquired into the science of ventilation are satisfied to have discovered the two very important facts that the principal deleterious gases of the atmosphere are heavier than the vital gases, and also that all gases when heated will ascend, and when cooled will descend. Their attention is not called to the equally important facts to be derived from studying the laws which govern the diffusion and transpiration of fluids, all of which laws are actively at work in causing what appear to them anomalous results.

It is, however, much to be regretted that the gentleman who of late years has had the editing of the articles appearing in the *Times* on the subject of ventilation should not make himself more fully acquainted with the chemical and physical properties of our atmosphere; for although, as Mr. Hood has pointed out, some of the statements bear their own refutation, yet the casual reader is too apt to imbibe false notions as to this all-important subject, and the more so that such errors are not suspected to exist in a journal of so high a class.

H. SAXON SNELL.

SIR,—A correspondent in your impression of the 4th inst. appears to be puzzled on the question as to whether carbonic acid, in ill-ventilated rooms, is to be sought for at the floor or at the ceiling. This question was definitely set at rest more than twenty years ago by some experiments undertaken by the Commission appointed to report on the ventilation of barrack-rooms and other buildings, and published by order of the House of Commons in a Blue Book dated August, 1857. These experiments showed that more carbonic acid gas always existed at the ceiling than at any lower part of the room, by a very appreciable amount. It was further found to be impossible to retain carbonic acid gas beyond a certain limited amount in any room, however accurately every aperture was closed. Those who understand the laws of the diffusion of gases will readily comprehend this. Experiments were made by mixing or diffusing a certain percentage of carbonic acid gas with the air of a large room. At the end of thirty minutes (every aperture being closed), it was found that the quantity of carbonic acid was reduced four-sevenths of its whole quantity, and this experiment was repeated in various forms, with the same result.

In addition to these experiments made by order of the Parliamentary Commission, independent experiments were made at the same time by Professor Pettenkofer, of Munich, nearly in the same form, and with precisely the same results. The question, therefore, has long been considered beyond dispute; and it is a mere waste of time to inquire whether ventilation should be by upward or by downward extraction.

C. H.

Memorial of the Late Lord Boston.—The tenants of the late Lord Boston have recently placed a stained-glass window in the east end of the parish church of Llanidan, Isle of Anglesea, as a memorial of his lordship. The window, consisting of three lights of lancet-form, is filled with mosaic glass, with medallions containing subjects. The three principal panels contain figures emblematic of the three Christian virtues,—Faith, Hope, and Charity; each figure having a smaller group in its light, exemplifying the practice of each respective virtue. Along the base runs an English and Welsh memorial inscription. The window was executed by Messrs. Heaton, Butler, & Bayne.

LIVERPOOL ENGINEERING SOCIETY.

THIS Society held its usual fortnightly meeting on Wednesday, the 8th inst., at the Royal Institution, Colquitt-street. Mr. M. E. Yeatman M.A., vice-president, reported to the Society on M. Balpaire's method of calculating the resistance of arched structures. The Honorary Secretary stated that the council had considered the proposal to visit works of interest in the neighbourhood of Liverpool during the summer, and that the first visit would be to the North Extension Railway Works.

Mr. L. M. Kortright, through the secretary, replied to the discussion on his paper on "Raising the wreck *Edith* in Holyhead Harbour," after which Mr. Alfred Holt, M. Inst. C.E., read a paper on "The Progress of Steam Shipping during the last quarter of a Century," previously read before the Institution of Civil Engineers.

BUCKINGHAM WATER GATE.

SIR,—With reference to this relic of Old London, I have myself taken some pains in endeavouring to rescue it from its present degraded state, but up to the present without success. It is private property, the owners setting an exaggerated pecuniary value upon it, though I think this may be modified, from communications I have had with a representative of the owners. Every one will, however, agree that it ought not to be left any longer as it is, now that public notice has been called to it.

Two ways suggest themselves—one, to excavate the land around the gate, and to leave it open to its base, showing the old steps and foreshore, and utilising it as an adjunct to the adjoining gardens; another, more utilitarian, would be to raise it bodily to the level of the gardens, forming an entrance through it from Buckingham-street, but so as not to interfere with the present terrace, which is a private promenade.

With the contemplated prolongation of Villiers-street to the Embankment, and the consequent pushing westward of the District Railway Station, the suggested thoroughfare would be a boon to the neighbourhood, and open up a direct access from the Strand to the gardens.

The Metropolitan and District Boards of Works are, no doubt, the proper authorities to deal with the matter, and with the cordial sympathy and co-operation of the committee of the Royal Institute of British Architects for the conservation of ancient monuments, Sir John Lubbock, and others, it ought to be speedily accomplished.

ROBERT J. WITHERS.

MISTAKEN IDENTITY: OAK OR CHESTNUT.

SIR,—As it fortunately happens that the discussion on my paper will not be taken till the 20th inst., the letters of your correspondents may lead to some useful additional matter against that day. I venture to think, however, that the writers do not show that amount of information on the history of this question which might have been expected. Premising that the subject was originally intended to occupy only one-half of an evening, and that the paper was therefore short, I may say that I should never undertake to give a full account of the whole controversy, much of which is embodied in Mr. Papworth's paper, and is, besides, notorious amongst those who have given any attention to the matter.

Mr. Britton, who offers no evidence of his own, speaks of the Westminster Hall roof in a way that makes me ask whether a question can ever be settled by any amount of evidence. His own authority, Tredgold, was actually one of the committee appointed by the Horticultural Society to determine the question of what wood was the roof of Westminster Hall really built; and with Atkinson, the well-known architect, Donald Beaton the gardener, Dr. Lindley, and other qualified persons, reported that it was of *sessiliflora* oak. Having seen several well-authenticated specimens of the wood, one or more of which are at the Institute, I shall certainly leave further examination of this roof to those who think they can find evidence in it to favour the chestnut theory.

As to Eltham Palace, the only evidence I know of its being chestnut is that alluded to by Mr. Britton. But the letterpress accompanying the engraving contains a footnote to the effect that during the late repairs some had said the roof was of oak, and others thought it to be chestnut, a matter which was difficult of determination. I know nothing of A. Pugin's qualification to judge between oak and chestnut, but if he felt sure that the ribs were chestnut why did he allow that note to appear? At all events, here is an opportunity for any one who will try to establish a case of a chestnut roof to examine this one.

Mr. Britton implies that there is little use in looking at specimens of oak and chestnut on the table of the Institute, but I maintain that such an examination of authenticated specimens is an essential preliminary to a judgment on any roof that may be in question. It is a remarkable fact that none of your correspondents notice the test which I have given, by which any piece of oak,—even if no larger than a cubic inch,—can with certainty be identified, and which can be easily applied to the old timbers of a roof. If this test is worthless, nothing can be easier than to prove it to be so; but if it is a true test, it is useless to talk of the difficulty of judging, and to apply such tests as that of a wet saw, which is probably of as little value as the driving of iron nails, which, in the discussion on Mr. Papworth's paper, was said to be inconclusive.

I gave no opinion of a clerk of works,—I produced his specimens, and I produced my own. If any person will exhibit authentic examples of either wood, and show that he has studied the subject, I am sure they will be welcomed by the members of the Institute, any of whom, like myself, will facilitate their exhibition.

I should be particularly glad to see exhibited one or two of the chestnut panels alluded to by "N.," though they do not affect the question. They would, however, serve to show the utility of the wood for internal decorations, or for furniture, as to which I have no doubt.

THOS. BLASHILL.

P.S. There are persons who seem to think that it is incumbent on any one who disputes the use of chestnut in old roofs to disprove every case in which its occurrence has been asserted. Surely, it is the business of those who make such assertions to establish their truth. At any rate, there must be a period in such a discussion when the erroneous statements of old writers have been sufficiently notorious, and their ignorance of the matter so patent, that one is bound to doubt their evidence till it is confirmed by fresh examination made with the full knowledge which we now possess.

PARIS DRAINAGE.

SIR,—In your issue of the 27th ult., p. 435, Mr. David MacGibbon, in writing upon the ventilation of sewers, alludes to the drainage of Paris, of which he appears to desire some more particular account. The twenty-fourth volume of the Minutes of the Proceedings of the Institution of Civil Engineers contains "An Account of the Drainage of Paris," by H. B. Hederstedt, Assoc.Inst.C.E., in which is very much information of a practical character, but little or nothing upon the particular point of ventilation, directly; indirectly it may be seen that the sewer gases can find vent.

But the Paris sewers do not generate gases of the character Mr. MacGibbon writes of, for what we call "night soil" is not admitted to them, but only rainfall and household water, and the contents of a comparatively small number of public urinals.

The Paris sewers came to mind as I was reading the leading article in your previous number of the *Builder* upon "The Structural Provision for the Discharge of the Rainfall of London."

The volume to which I have referred contains also a paper "On the Main Drainage of London and the Interception of the Sewage from the river Thames," by Joseph William Bazalgette, M. Inst. C.E. The first paper was read on the 7th, and the second on the 14th of March, 1865, and the two were discussed together.

I will not attempt to improve upon so much that has been ably written lately upon the question of deposit of solid matters at or near the outfalls of our London sewers; but it would appear that great expense is incurred in dredging and removing the deposits near the outfalls of the Paris sewers which discharge into the Seine,—which is not, be it remembered, a tidal river at Paris. At the date of the paper I refer to it is said,—"The maintenance of the system is most expensive, having amounted during a recent year to about 30,000*l.*, including the pay of one inspector, two office assistants, twenty general superintending conductors, and the labour of four hundred workmen employed in dredging the Seine, and in removing the deposit by carts and barges, as well as for tools and stores."

I think Mr. MacGibbon will find that much more has been done than he supposes in systematic ventilation of sewers in towns. In vol. 22 of the Proceedings of the Institution of Civil Engineers he will find interesting discussion and description in and resulting from papers read in February, 1863, upon the drainage of Dundee by J. Fulton, and of Newport by A. Williams.

JOHN HENDERSON PORTER.

ST. PAUL'S CATHEDRAL.

A WONDROUS improvement has been effected in the western frontage to Ludgate-hill by the opening out of the old inclosure in a semicircular plateau to Queen Anne's statue, and by the sale to the public of more than half the area formerly enclosed by a massive iron fence, 6 ft. high, surmounted upon a wall 4 ft. high, which impeded the pedestrians' view of the building at its base.

The new plateau is bounded most tastefully by short polished granite pillars, which sufficiently protect the enclosure, and at the same time open out an enlarged route for both mercantile traffic and foot-passengers.

To complete the work, and to give dignity to the noble structure, the clearance of the north and south sides from the western end to the central portals still remains to be carried out. On these sides there are but narrow strips of ground never used for interments, but still enclosed by those obscene iron barriers. If these were removed, and the plateau, with polished granite pillars, continued from the western angles, the surplus ground being thrown out for public user, then the integrity of the whole would be assured, whilst a sense of enlargement, both from within and without, would add grace to the structure of which all Britons are proud.

Placed in the great commercial centre of the metropolis, the principal arterial thoroughfare, by Fleet-street, Ludgate-hill, and the Poultry, to the Bank, instead of taking the direct route on the north side, has to make a detour around the south and east sides, involving an increased distance of 160 yards, besides the awkward return at a right angle by St. Paul's School to Cheapside!

At present there is a main driftway along the north side, 40 ft. wide from the entrance at Ludgate-hill to near the Chapter-house, where it is narrowed to 12 ft., and here there is a fixed bar, whence to the Poultry the driftway is but 18 ft., the paved footway having throughout a main width of 12 ft.

Now, the narrowest part of the enclosed churchyard is at the circular steps of the north portico, where there are still 28 ft. clear to the iron railings; and, as the churchyard extends from the portico towards the Poultry and St. Paul's School, there need be only about 30 ft. to 36 ft. of the old cemetery cut off, and thrown into a public causeway, to make the most utilitarian and important improvement of the day.

The roadway should be timber-paved, so as to assure quietude to both cathedral and shops, and a sufficiently wide paved footway reserved also on the church side.

Such a change as this would impart dignity with an aspect of unity to our illustrious cathedral, which, as viewed from the new causeway, would impress all beholders with the merits of the work, and a due appreciation of its great architect.

As to the old railing round the churchyard, it might still remain *in situ*, and the portion between the north portal and the Poultry (say about 80 yards) might be reconstructed, as a continuous and appropriate boundary.

QUONDAM.

Value of Land in the Northern Suburbs. As illustrating the rise in the value of land in the northern suburbs of London, it may be mentioned that a plot of land opposite the Finsbury Park Railway Station, containing about 27,000 square feet, was recently sold by auction by Messrs. Prickett, Venables, & Co. for 9,000*l.*

THE WIDENING OF CHEAPSIDE, AND MERCERS' CHAPEL.

THE widening and improving of Cheapside and the Poultry, between Old Jewry and Ironmonger-lane, will involve the demolition of the ornamental entrance to Mercers' Chapel from Cheapside, including the carving and sculpture on the face of the elevation, along with the several houses and shops on the east and west side of the chapel entrance. The materials of these buildings, consisting of eight houses and shops, in addition to the chapel frontage, were sold lately, and during the last few days workmen have been busily engaged in demolishing the premises, preparatory to the erection of new buildings on the site, the frontages of which will be set back northwards varying in distance from 8 ft. to about 12 ft. We understand, however, that for the present the elevation to the chapel will not be disturbed, but that when taken down it will be re-erected at a depth of about 9 ft. backwards.

THE POPULATION OF THE WORLD.

VERY loose and erroneous notions as to the number of the human race are by no means rare in general society, and even experienced writers, who commence leading articles with the well-worn phrase attributing to "every schoolboy" a knowledge possessed as a matter of fact by few men, are themselves often woefully at fault on the question as to the total population of the world. It is very common to find the number put down approximately at a thousand millions, but this cannot be justly called even a rough approximation to the actual figures. The ignorance prevailing on the subject is the less excusable, as estimates made by the highest statistical authorities on various occasions of late years have conclusively shown that the common impression about the matter is altogether mistaken, or, to say the least, is centuries out of date and obsolete. A few years ago, at the instigation of the International Congress of Statisticians at St. Petersburg, Dr. E. Berg found the population of Europe, according to the latest enumerations and estimates, to be upwards of 300 millions; and as there are 700 millions in China and India, it follows that there are 1,000 millions in Europe, China, and India alone, independently of all the rest of the world. The latest estimate of the world's population is that made by Messrs. Behm and Wagner, and published in Dr. Petermann's *Geographical Magazine*. According to these authorities the total number of the human race at the present time is between *fourteen* and *fifteen* hundred millions. As regards the population of the different quarters of the globe, these gentlemen show that Europe is now inhabited by rather more than 309 millions of people. Asia has more inhabitants than all the rest of the world put together, the estimated number of its population being set down at 824½ millions. As to Africa the observations of modern explorers show that its population was till recently very greatly under-estimated, and, according to the best authorities, its inhabitants cannot be now put down at less than 200 millions. The population of America, which, next to Europe, is the best ascertained by official enumerations or censuses, is at present not less than 85½ millions, and is more rapidly increasing than any other quarter of the globe. Finally, Australia and the Islands of the Pacific, or Polynesia, as they are sometimes collectively called, are estimated to contain rather less than five millions of people. Adding these several totals together, we arrive at the result that the present population of the globe amounts to nearly fourteen hundred and twenty-four (1,424) millions, or nearly half as many again as is commonly taken for granted.

Turning for a moment to the principal States of the world, we find that, next to China, with its 400 and odd millions, by far the most populous empire on the face of the earth is the British. Its total population is upwards of 236 millions. This is without reckoning the native states or protected principalities of India. The British empire contains nearly three times the population of the Russian, which has the next largest population, 86½ millions. The Turkish empire, as constituted previously to the late war, contained 48½ millions. Next come Germany and France, with 42 millions each, the Germans being Europeans, while of the French population, 5 millions belong to the colonies. The United States has a population nearly equal to that of Germany or France; while Austria numbers not quite 38 millions, and Italy about 27½ millions. It is interesting to notice that, according to the estimate of M. Vladimir Jackschitj, chief of the Servian statistical department, the inhabitants of Turkey in Europe number altogether a little more than 15 millions. Of these he estimates that 5 millions are in Roumania, 1,100,000 in Servia, 190,000 in Montenegro, and 8,500,000 in the other European provinces of Turkey. Of this 8,500,000 he calculates that 4,750,000 are Christians, rather over 3,500,000 Mahometans, and 75,000 Jews.

A FINE ART AND INDUSTRIAL EXHIBITION FOR YORKSHIRE.

THE foundation stone of a permanent building, to be called the Yorkshire Fine Art and Industrial Exhibition, was laid at York on the 22nd ult. The site secured belonged to her Majesty's Commissioners of Woods and Forests, and has been obtained from the Crown on a lease of 999 years for 4,000*l.*, and the entire cost of the building, &c., will be about 20,000*l.* The structure will have a frontage of 104 ft., and will be set back on the site, so as to provide an open space in front of 200 ft. by 120 ft. In front the building will be two stories high, and one story at the back. The main front will have an open arcaded portico of five arches, with an arcade at each angle, covering a surface of 54 ft. by 13 ft. The entrance will be by three central doorways, 7 ft. wide each, and also by a doorway upon each side of the portico. These will open into an entrance-hall, 39 ft. by 27 ft., with secretaries' and committees' rooms, lavatories, &c. This hall will lead directly by three arches into a central lecture or concert hall, 87 ft. by 39 ft. and 50 ft. in height, having a curved and open timber roof, which will be decorated. On each side of this hall will be apartments for pictures, lighted from the top, and forming two continuous galleries,—that nearest to the Palace of James I., now used as a school for the blind, measuring 102 ft. by 29 ft.; and the other, on the Bootham side, 85 ft. by 29 ft., both having a height of 26 ft. On the front portion of the structure there will be a permanent picture-saloon, 100 ft. by 29 ft. and 26 ft. high, furnished with fireproof floor, and lighted by double sky-lights. This will be approached by a wide staircase. The material used for the building will be, in the front portion entirely of stone, whilst the sides will be erected with white brick and stone dressings. The main front will have ornamentations of statuary and mosaic work. It is expected that the Exhibition will be opened in the autumn of next year. Mr. E. Taylor is the architect.

ARCHITECTS' CERTIFICATES.

LUDBROOK *v.* BARRETT.

THE plaintiff in this action, tried in the Common Pleas Division, before Mr. Justice Manisty and a special jury, was a painter and decorator, of Norris-street, Haymarket, and the defendant an architect and surveyor, carrying on business at Dowgate-hill, in the City.

Mr. Woodard, instructed by Mr. G. E. Carpenter, appeared for the plaintiff; Mr. Edward Clarke and Mr. Gill, instructed by Messrs. Wontner & Son, for the defendant.

This case is important to architects and builders, as it decides that an architect may, under certain circumstances, be liable to a builder for the amount due to him from a building owner. In the year 1875 the plaintiff agreed to do certain repairs at No. 30, St. Martin's-lane, for a Colonel Ridgway, the lessee of the premises, according to a specification prepared by Mr. Joseph Waghorn, of Craven-street, Strand, who was the architect and surveyor to the ground landlords. It was part of the contract that the work should be done to the satisfaction of both Mr. Waghorn and the defendant Barrett, Col. Ridgway's architect. The plaintiff, as the works progressed, received from Col. Ridgway moneys on account. After the work was done, the plaintiff was unable to obtain payment of the balance due under the contract from Col. Ridgway, and therefore attempted to recover it in an action. The action was referred to a Master, and, though the plaintiff succeeded in obtaining an award from the Master for so much of his claim as related to extra work, and which was not included under the contract, he was unsuccessful for so much of his claim as consisted of the balance of the contract, owing to Mr. Barrett refusing to signify his satisfaction.

This action was now brought to recover damages from the defendant as Col. Ridgway's architect; and it was alleged on the part of the plaintiff that he had executed the work in accordance with the specification above mentioned in a good, sound, and workmanlike manner, and that all things necessary had been done by the plaintiff to entitle him to have from the defendant an intimation of his satisfaction.

Mr. Waghorn gave evidence as to his being satisfied; and the plaintiff and his solicitor also spoke to the defendant's having admitted to them that he was satisfied with the work, but that when he was asked to declare his satisfaction, he refused to do so.

The Judge left it to the jury to say whether they thought the defendant really was satisfied with the work, but pretended that he was not so satisfied. If he was, the plaintiff was entitled to a verdict; if, on the other hand, they thought that the defendant never was satisfied with the work, and was acting in good faith, then their finding must be for the defendant.

The jury found a verdict for the plaintiff for damages equal to the balance of the contract.

A SURVEYOR'S ACTION SUSTAINED.

KEELING *v.* LAKE.

THIS was an action tried in the Bloomsbury County Court, before Mr. Judge Russell, in which the plaintiff, an architect and surveyor, carrying on business at 22, Basinghall-street, sued the defendant, described as a promoter of public companies, residing in Great Russell-street, Bloomsbury, to recover the sum of seven guineas for professional services rendered to the defendant in surveying, plotting, and making plans of some proposed bank buildings in Great Russell-street.

It appeared from the plaintiff's statement that he took out the summons in the joint names of himself and his former partner, a Mr. Blackburn, who was in connexion with him at the time of the transaction, but since then the partnership had been dissolved. The plaintiff said the instructions for the work done had been given to his former partner, but he had personally seen the defendant, who was satisfied with the work, the account for which not having been paid, the present action was brought. After the plaintiff had stated his case at some length,

The Judge asked how he proposed to render the defendant liable.

The plaintiff replied, by the letters he should produce in Court, which, being put in, concluded the plaintiff's case.

The defendant being called, said that the arrangement come to with the defendant's partner was that the firm should accept the surveyorship of the Proposed Banking Company, and that the order given was only preliminary to that arrangement being carried out. Moreover, the arrangement was entered into entirely with Mr. Blackburn, and not with the present plaintiff.

His Honour. But he has sued in their joint names, and therefore that objection cannot stand.

The plaintiff re-called, said, in reply to the Judge, that such a proposition had been mooted; and had they been able to ascertain who the directors of the proposed company were, they would have entertained the proposition; but not being able to ascertain this, they did not wish to give their names to an undertaking about which they knew nothing.

At this stage of the case, the Judge said he was clearly of opinion that the plaintiff was entitled to recover, as even the letters produced by the plaintiff, written by the defendant, had clearly put the latter out of court.

Judgment was accordingly entered for the plaintiff for the full amount claimed, with costs.

KILLED IN AN EXCAVATION.

ON Saturday last, Dr. Diplock, coroner for West Middlesex, held two inquests at Brentford, on the bodies of George Pizzey and Thomas Edmunds, two labourers, who had been employed under Mr. W. J. Ball on some houses being erected at Brentford Butts, for Mr. James Bignell, of Stile Hall, Kew Bridge-road.

John Powell, another labourer employed on the works, deposed that Edmunds, who was "his mate," took the job, and witness was going with him to sign an agreement after being paid on the Saturday. An excavation had been made for a drain, 200 ft. in length, and 10 ft. deep, being about 7 ft. wide at the top, and there was about 20 ft. more to do. They had begun to put struts in, and while at dinner about two barrowloads of loose earth fell. Immediately after dinner, about two tons of earth "like a slice of the side" fell in upon the deceased men. The other men were working with their backs to them, and they did not at first know of the accident, but as soon as they did the two men were dug out, when one was found to be already dead and the other expired while the doctor was examining him.

In reply to the jury, witness said one cross strut had been put in at the bottom, and they had begun to put in another at the top, when the accident happened. He did not employ Pizzey, Edmunds did.

Mr. W. J. Ball, builder, of the Upper Butts, New Brentford, was examined, and said he was foreman over the building works at the Butts, and they started opening

a drain on Monday. He superintended the laying in of the pipes. He saw the work on Thursday morning, and there did not appear to be any alteration. He told Edmunds, to whom he gave the job, to let him know if there was any alteration in the earth, and to use struts; and he said he would take care not to risk his life.

In reply to a juror, witness said the greater part of the earth was gravel, and he considered it did not require strutting, but the loose earth did. He let the job to Edmunds, who was a sober, steady man. Neither he nor witness had had any experience in ground works, but in building operations generally, and Edmunds had carried out several jobs satisfactorily in the New-road, Brentford. Edmunds was to have signed the paper witness drew up on the Saturday. Powell was brought in by Edmunds. Since the accident, Powell being the contractor, witness had got him to strut the excavation throughout, to prevent any further accident.

The jury remarked that, for men working at such a depth from the surface as 10ft., there ought to have been better protection in the way of timber supports to the sides of the excavation.

The jury returned a verdict of "Accidental death."

VACANT DISTRICT SURVEYORSHIPS.

At the meeting of the Metropolitan Board of Works, on the 10th inst., the Building Act Committee submitted a report, recommending that the district of St. Pancras, vacant by the death of Mr. H. Baker, late district surveyor, be divided into three districts of approximately equal value, and that the Board do fix a day for the election of three district surveyors for the respective districts.

Mr. Furniss proposed the adoption of the report, and said it was thought that each of these three districts, if properly managed, would yield an income of between 400*l.* and 500*l.* a year.

Mr. Freeman considered that in this matter the Board was pursuing altogether a wrong course. He held that it was detrimental to the public service that district surveyors should be allowed to have private practice. They ought to have good districts, yielding not less than 800*l.* or 900*l.* a year each, and gentleman should only be appointed on the express condition that they devoted the whole of their time to the performance of their duties as district surveyors.

Mr. Selway said he entirely shared the view urged by Mr. Freeman, and in the committee he moved a resolution to that effect, but was defeated. He was of opinion that the time had come when district surveyors should be in more direct communication with the Board, and should give the whole of their time to the performance of their duties as public servants. He thought the committee made a mistake in dividing this district into three parts, and that a division into two would be preferable.

Mr. Le Breton did not consider that the time had come when they should revolutionise the whole system, and believed that in the past the duties of district surveyor had been very well performed.

After some remarks from Mr. Dresser-Rogers, who believed that in calling upon district surveyors to relinquish their private practice, a practical difficulty would arise in regard to the varying amounts yielded in the shape of fees by the different districts,

Mr. Fowler advocated a system of promotion in regard to the district surveyors, so that a man who had proved himself a careful, able, and trustworthy servant, should be promoted to a district which produced a larger income. If the suggestion of Mr Freeman were adopted, he was afraid that they would get a very different class of men to offer themselves for appointment.

Mr. J. E. Saunders strongly supported the motion for the adoption of the recommendation of the committee, and expressed his conviction that, on the whole, the work of the district surveyor was not badly done.

The motion was then put and carried *nem. con.*, and on the suggestion of Mr. Furniss, that day month was fixed for the election.

Another report of the Building Act Committee was read, recommending, with reference to the letter from Mr. J. H. Good, tendering his resignation as district surveyor for the district of St. Mary, Stratford-le-Bow, and All Saints, Poplar, that the resignation be accepted; and that Mr. Chester Foulsham, district surveyor of St. Leonard, Bromley, be appointed interim surveyor of the vacant district.

Mr. Furniss, in moving the adoption of the report, stated that the committee had under consideration the question of the expediency of dividing such district, and would report to the Board thereon after the next meeting of the committee.

BRICK KILNS.

Sir,—In your number for April 6th, you gave an account of Fosters' new brick-kiln at work at Normanton. I wish to inform you that my continuous drying and burning brick-kiln was invented and patented a year and a half before that of Messrs. Foster; and as they use a system similar in many details to my own patent, I wish to call attention to the fact, lest persons adopting the kiln in question should inadvertently become liable for infringement of my patent right. My system, however, in addition dries the bricks by induced currents of fresh air, before submitting them to any heat. Many inventors have tried the same system as Messrs. Foster, but have always failed, because the principle of my invention has invariably been lost sight of. Thomas Whitwell.

Surveyorship, Christ's Hospital.—Out of the thirty-one candidates who offered themselves, the Committee of Almoners, on the 7th inst., selected four, viz., Messrs. F. Chambers, H. S. Legg, T. Roger Smith, and W. Tasker. These names were submitted to the court of Governors on the 15th inst., H.R.H. the Duke of Cambridge in the chair, when Mr. Legg was elected. The votes recorded were: Legg, 53; Chambers, 41; T. Roger Smith, 16; and W. Tasker, 16.

TAKING CASTS.

Sir,—In the *Builder* of May 4th I see a letter, signed "F.R.I.B.A.," on the proposed memorial to the late Sir G. G. Scott, and therein he says:—"All reproductions have been forbidden at Southwell Minster since the damage was done to the beautiful carvings at the entrance to the chapter-house in making the casts for the Crystal Palace." That is an error. No damage was done, or complaint made at that time, for my father had the contract to supply the casts from both Southwell Minster and Lincoln Cathedral to the Crystal Palace. On a subsequent occasion a workman, an Italian, by the way, whom he sent there, left the parts he operated on in such a disgracefully-dirty state that permission to take casts there was stopped. In 1860, after his death, through Sir G. Scott, the greater part of his stock of casts were purchased for the Museum, and amongst them were some fine specimens from Southwell Minster.

J. C.

CHURCH-BUILDING NEWS.

Chelmsford. — The chancel of Chelmsford Parish Church was reopened for use on the 14th ult., after being closed for nearly a year during restoration, the cost of which has been borne by the rector, the Ven. Archdeacon Mildmay. The chancel, before restoration, was low, and, owing to the absence of any clear-story, not well lighted. A range of clearstory windows has been built over the old arches, which have been carefully preserved intact, and an open timber roof of simple character has replaced the old plaster ceiling. The east window has been enlarged from three to five lights, still retaining its original character, and the stained glass has been re-arranged by Messrs. Clayton & Bell. An enriched string-course runs along the east wall under the window, but there is no reredos, as a movable triptych is to be placed on the retable. This is now in preparation, the panels being painted by Miss Mildmay, and the carving being executed by Miss Evelyn Mildmay, by whom the side-screens for the sanctuary will also be carved. The whole of the chancel roof is decorated with colour and gilding, by Messrs. Heaton, Butler, & Bayne, under the direction of the architect. New gas-fittings, by Messrs. Hart, Son, & Peard, have replaced the old standards, and a pavement in tile mosaic has been laid in the sanctuary by Messrs. Simpson. Mr. Parmenter, of Braintree, was the builder, and Mr. A. W. Blomfield was the architect employed.

Havering.—The new church of St. John the Evangelist, Havering, near Romford, was consecrated by the Bishop of St. Albans on the 13th ult. The old church, which was demolished to make room for the new one, is stated to have possessed little archæological interest. It was a one-span church, in the style of the latest period of Gothic, but executed for the most part at a much later period, probably in the seventeenth century. The walls were of brick, and the mullions and tracery of cement. The new church has been built as far as possible on the lines of the old, but is considerably larger in plan. It consists of a nave and one side aisle, a chancel, and a chancel aisle, which forms the organ-chamber and vestry. The material of which it is built is internally brick, used merely in the place of rubble, and nowhere exposed to view. It is plastered internally, and externally is faced with split flint. The dressed work is throughout of Box Ground Bath stone. The tower is placed towards the south-west angle of the church, and the lowest stage forms the porch. The doorways are richly moulded. The tower itself is square, and has a circular staircase forming an angle turret. The nave is divided into three bays of wide-spanned arches. It is lighted by a large traceried window in the west end, and by two traceried windows in the south wall. There is a range of small windows to light the north aisle. The chancel has an east and three south traceried windows. The roof of the nave is a tie-beam roof of simple construction, boarded and divided into panels. The roof of the chancel is a plain arched roof similarly divided into panels, but is ornamented by carved bosses at the intersections of the ribs. Beneath the easternmost window of the chancel are three sedilia with carved canopied heads. The church is warmed by a hot-water apparatus by Mr. D. O. Boyd, of Maddox-street, Regent-street. The style of architecture adopted is that of the latter part of the fourteenth century. Mr. Basil Champneys is the architect, and Mr. J. S. Hammond has carried out the work, the cost of which has been nearly 5,000*l.*

Speenhamland.—The work of erecting a new chancel to St. Mary's Church, Speenhamland, near Newbury, is about to be commenced. The estimated cost of the works is about 3,000*l.* It is not at present contemplated to remove the old-fashioned galleries, although this matter will receive further consideration as the work proceeds, but another organ is to take the place of the one now in use. The work will be carried out from plans by Mr. Street, R.A.

VARIORUM.

"L'Art," which week by week fulfils the promises of its earlier life, has commenced an account of the buildings for the Paris Exhibition, by M. Eug. Viollet-le-Duc. An etched view of the Palace of Trocadéro is given. The same number contains an interesting illustrated account of the Mont Saint-Michel. In the current number views of the building on the Champ de Mars appear.—— No. 1 of Cassell's cheap *Magazine of Art* gives good promise. The editor says, "In the *Magazine of Art* the theme of art will be enlarged upon by presenting conceptions of a higher order, carried out by more subtle skill: art, which provides, not merely what is agreeable to eat, soft for wear, or convenient for daily uses, but recreation and enjoyment, as well as culture for the mind. These conceptions, clothed by art, are properly called fine arts; and it is with a view to providing the largest number of persons possible with the means of participating in the incomparable advantages and pleasures which art can confer, that the *Magazine of Art* has been projected."——Cook's "Guide to Paris and its Exhibition, 1878," is so mere a skeleton that we fail to recognise its use. Messrs. Cook should have made it fuller while they were about it. ——"A Handbook for Public Meetings, and as to the Duties of Chairmen, &c.," by G. F. Chambers, Barrister-at-Law (Stevens & Sons), is exactly what its title indicates, and, moreover, includes a valuable digest of reported cases relating to meetings.——Messrs. Cassell, Petter, & Galpin have commenced, in monthly parts, a popular serial work on science, under the title of "Science for All," edited by Robert Brown, M.A., and illustrated with engravings and diagrams. What is proposed in "Science for All" is to take the every-day incidents of life and the commonest objects which surround us, and show, in simple and clear language, the scientific principles which underlie them, and whose operation they illustrate. "The flame of a candle will serve as a text on which to treat of combustion,—from a dead leaf picked up in the woods can be taught the principles of vegetable construction, and life, and growth; by the markings in the marble which ornaments our chimney-piece can be elucidated the geological formation from which it has been dug, and the varied processes by which it and kindred formations have been produced."

Sacrarium Pavement, Norwich Cathedral.—There has just been brought to a close a portion of the internal restoration at Norwich Cathedral, to which the Dean, Dr. Goulburn, has given very special attention. This work is the sacrarium pavement. A broad band of steel-coloured Belgian marble follows the line of the apse, and extends one bay westward of the semi-circle within this, and about 4 ft. distant is another marble band following the same line. The space between the two bands is filled with mosaic paving of a guilloche or interlaced pattern of black and gray, with a border of a dancette pattern, claret and gray; between these and the marble runs a pattern of iridescent green. The space immediately in front of the altar is covered with a large and intricate geometrical pattern, enriched by a variety of coloured marble, and this is continued at the back or east of the altar, the border in this case being the vine forming a rich scroll pattern. At the chord of the apse a larger daïs or footpace is raised, formed by solid marble steps, and on this, between two borders of black and blue, runs a most beautiful pattern of the vine-branch in natural colours. The altar-table, which is of large dimensions, stands on the centre of this platform. The work was designed by Mr. A. W. Blomfield, architect.

Miscellanea.

Rood Screens in Christ Church, Dublin. At the General Synod of the Church of Ireland there was a protracted discussion as to the erection of a rood-screen, surmounted by a cross, in Christ Church Cathedral. Mr. J. C. Bloomfield moved the adoption of a canon making the erection of screens, shrines, &c., illegal in the church, as leading to idolatry or superstitious uses. He said they were all thankful to Mr. Rowe for his magnificent liberality in restoring the old cathedral, but really if things remained as they were—if rood-screens were permitted—there would inevitably be a schism in the Church. What with these erections and the painted windows—two representing the Saviour on the cross, and the third the Queen of Heaven with the Church in one hand and a lily in the other—they might easily conceive a Roman Catholic onlooker saying of the cathedral, "Dear me; is it ours already?" Archdeacon Reichel moved the previous question. Mr. James Spaight, in seconding the proposition to shelve the question, regretted that there had been censorious criticism instead of universal gratitude for the gift, he might say, of one of the noblest ecclesiastical edifices in the United Kingdom. If they were about to build a cathedral or a church, the objection to screens would be another thing. The Bishop of Cashel supported the original resolution, submitting that it would be an insulting delicacy to suppose that Mr. Rowe would feel offended by the removal of what was a stumbling-block to many. The previous question was put, and the voting was:—Clergy—ayes, 46; noes, 127. Laity—ayes, 108; noes, 64. There not being a majority of each order in favour of putting Mr. Bloomfield's resolution, it was lost.

Stanford's Patent Joint.—This joint is made by casting on the spigot and in the socket of the pipe, by means of accurately turned iron moulds, a durable material, which, immediately setting on the pipe, clings to it, and forms accurate rings mechanically fitting one another, like the spigot and socket of turned and bored cast-iron pipes. The rigidity of the iron pipe joint is avoided by giving the moulds a spherical form, the result being practically a turned and bored, spherical, or ball-and-socket joint, allowing considerable movement without rupture. To the practical man, aware of the difficulty and frequent impossibility of obtaining water-tight joints in deep cuttings, running sand, or other water-bearing strata, the advantages of a mechanically-fitting joint must be obvious. By its use the ordinary labourer will succeed in making sound work in ground where the most skilful workman might fail upon the old principle. The pipe-layer requires no tools, and no clay, cement, or other jointing material. He has merely to place the spigot of the pipe truly and fairly in the socket of the pipe previously laid and to drive it home. The joint is then perfect, and, owing to its spherical form, will remain so, there seems reason to believe, even after considerable settlement of the ground. During the last four years upwards of fifty miles of pipes with these joints have been laid, mostly in very bad ground, with satisfactory results. Messrs. H. Doulton & Co., of Lambeth, St. Helen's, and Rowley Regis, are the agents of the patentee for this country.

Level Crossings.—A meeting of the Court of Common Council has been held at the Guildhall, the Lord Mayor in the chair. Deputy Jones presented a petition from the inhabitants of the Ward of Bishopsgate praying the Court to take immediate steps to obtain the rejection of the clauses of the London and North-Western Railway (Additional Powers) Bill, now before Parliament, which refer to the permission sought to be obtained to lay down level crossings in Primrose-street and Skinner-street. These level crossings, he urged, would be a source of the utmost danger and inconvenience to the inhabitants, and he proposed the reference of the petition to the Local Government and Taxation Committee to oppose the clauses. Alderman William Lawrence seconded the motion. Mr. Rooke said that although these streets led to nowhere yet, the Metropolitan Board of Works had decided to construct a street in the vicinity, at a cost of 70,000*l.* or 80,000*l.*, which, if the level crossings were permitted, would be practically useless. The Court unanimously referred the petition with instructions to act as proposed. It is almost past belief that an attempt should be made to introduce a source of such danger in the City. Parliament would be guilty of neglect of duty if it gave the power asked for.

Exhibition of Art Treasures, Manchester.—Under the direction of Mr. Alfred Darbyshire, architect, Messrs. R. Neill & Sons have added very considerably to the floor-space at the Royal Institution, Manchester, available for use at the Art Exhibition, opened on the 16th inst, in aid of the building fund of the School of Art. The entrance-hall has been floored, and a space of about 40 ft. by 30 ft. is gained for glazed cases of art objects, and the walls will be covered with oil-paintings, tapestries, &c. The extensive loan collection of ancient and modern pictures comprise, specimens of Millais, Turner, Leighton, W. Müller, William Etty, F. Goodall, E. J. Poynter, Gainsborough, Legros, David Cox, the two Leslies, Andrea del Sarto, Henrietta Brown, A. Yvon, R. Ansdell, Elmore, Constable, Frost, J. Philip, T. Faed, and other artists of eminence. One of the rooms contains a selection of art objects from South Kensington Museum. The art workmanship includes enamelling, Japanese, Chinese, French, &c.; inlaid metal work, damascene niello, chased repoussé, &c., in gold and silver; Persian ware of singular beauty and rarity; ivory carvings in great variety; Chinese, French, and English porcelain and pottery, embroidery and other needlework, &c.

The Company of Fanmakers' Competitive Exhibition.—This Exhibition will be held in June, in a hall of one of the City livery companies, and will comprise the following classes:—1. Ancient European Fans. 2. Modern European Fans. 3. Exotic Fans. 4. Modern Fans of British manufacture. 5. Fans not comprised in the above classes. These classes will be subdivided into sections according to the leaves and sticks of the fans (if deemed necessary). Manufacturers, amateurs, collectors, and dealers are invited to contribute to the exhibition, designs or specimens of fan-leaves, painted or embroidered on silk, satin, cloth, or any other material, and of fan-leaves made of lace of various sorts, and fan-leaves to be exhibited either mounted or unmounted. The fourth class will form the object of special attention, the chief aim of this company being to revive the manufacture of fans in England. The prizes will consist of gold, silver, and bronze medals, struck with a special die bearing the arms of the Fanmakers' Company, and a suitable inscription; the freedom of the company, and an engraved diploma, signed by the master and wardens of the company. Mr. James Curtis, Old Jewry Chambers, is the honorary secretary to the Exhibition Committee.

New Church at East Acton.—Mr. F. J. Bramwell, F.R.S., the prime warden of the Goldsmiths' Company, on the 11th inst. laid the foundation of a new church at East Acton, which is about to be erected and endowed by the Company on its estate there. The church is to cost 14,000*l.*, and will be dedicated to St. Dunstan. At a luncheon which followed, the Bishop of London stated that this was the eighth church provided by City Companies since his occupation of the Metropolitan See.

End of the Manchester Joiners' Strike—The strike of joiners in Manchester, which began on the 1st of May last year, has ended in the submission of the workmen. They have agreed to return to work at 8½d. per hour, the wages they had previously to the strike.

TENDERS

For the erection of an infectious hospital for the Guardians of Brentford Union, Isleworth. Mr. Edward Monson, jun., architect:—

Prout	£1,591	0	0
Beauchamp	1,450	0	0
Lambert	1,325	0	0
Baker	1,298	0	0
Linfield (accepted)	1,258	0	0

For first portion of alterations to the Earl of Zetland public house, Prince's-road, Notting-hill. Mr. Edward Monson, jun., architect:—

Colley	£315	0	0
Chapman	308	18	0
Linfield	292	0	0
Riches	291	10	0
Mitchell & Co.	279	0	0
Beach Bros.	268	0	0
Jackson & Todd	255	0	0
Banbury & Stevens	247	0	0
Vincent	235	0	0
Cox (accepted)	213	8	0

For the erection of four shops in Starch-green-road, for Mr. O. Davies. Mr. Edward Monson, jun., architect:—

Beach Bros. (accepted)	£2,155	0	0

For the erection of a villa residence in Goldsmith's-avenue, Acton, for Mr. J. Reeves. Mr. Edward Monson, jun., architect:—

Hunt (accepted)	£1,100	0	0

For alterations to the City of Salisbury tavern, Rodney-road, Walworth, for Mr. Carnell. Messrs. Ashby & Green architects:—

T. Brown	£930	0	0
Stamp & Bowtle	910	0	0
G. & S. Fisher	895	0	0
Jackson & Todd	764	15	0
Bolam*	498	14	0
Pewtering.			
Warne	153	0	0
Grimes	129	10	0
Browning (accepted)	123	0	0
Gas-fitting.			
Dunn & Sons	158	10	0
Dodson (accepted)	105	0	0
Plate Glass, Writing, and Embossing.			
Hollyer	168	0	0

* Accepted contrary to the architects' advice.

For cleansing, whitening, and colouring the whole of the interior of the Highgate Asylum, offices, and chapel, for the Managers of the Central London Sick Asylum District:—

Crouch	£477	0	0
Nicholls	447	0	0
Ball	440	0	0
Bangs	420	0	0
Britten	356	10	0
Robertson	295	0	0
Holmes (accepted)	288	0	0

For external repairs, painting, &c., the Licensed Victuallers' Asylum, Old Kent-road, consisting of 176 houses, chapel, chaplain's residence, court-room, board-room, library, lodges, &c. Mr. W. F. Potter, architect:—

Butler	£961	0	0
Herbee	850	0	0
Andrews	613	0	0
Pritchard	410	0	0
Hayworth (accepted)	395	0	0

For alterations, additions, and repairs, to the Eagle Tavern, Camden-road. Messrs. Bird & Walters, architects. Quantities supplied:—

McLachlan & Sons	£1,928	0	0
Anley	1,797	0	0
Nightingale	1,750	0	0
Hockly	1,730	0	0
Lawrance	1,720	0	0
Temple & Foster	1,703	0	0
Williams & Son	1,683	0	0
Mark (accepted)	1,657	0	0

For stabling, cart-shed, &c., at New Barnet, for Mr. Wood. Quantities supplied. Mr. Joseph White, surveyor:—

Steel Bros.	£515	0	0
Prout	449	0	0
Grover	447	0	0
Butcher	437	0	0

For a new cottage and proposed alterations to a laundry, Strafford-road, Acton, for Mrs. Elizabeth Yates. Mr. E. Monson, architect:—

Waters	£840	0	0
Niblet	832	0	0
Nye	796	0	0
Bing	737	0	0
Penoney	700	0	0
Johnson	698	0	0
Linfield	685	0	0
Baker	679	0	0

For a villa residence, Guildown, for Mr. Paine. Messrs. Sparkes & Neville, architects. Quantities by Mr. Henry Moon:—

Putney & Sons	£1,265	0	0
Colls & Sons	1,195	0	0
Pink	1,163	0	0
Beale (too late)	1,123	10	0
Goddard & Sons	1,119	0	0

For new schools and residence, Tetsworth, Oxon. Mr. Arthur Vernon, architect. Quantities supplied:—

Fincher	£1,700	0	0
Honnor	1,697	0	0
Holland & Wells	1,690	0	0
Cooper	1,662	0	0
Hunt	1,615	0	0
Loosley	1,600	0	0
Silver & Sons	1,580	0	0
Woodbridge	1,547	0	0
Coles	1,544	0	0
Taylor & Grist	1,489	10	0
Holland & Son (accepted)	1,440	0	0
Groom	1,369	0	0

For Primitive Methodist school chapel, Colney Hatch. Mr. A. J. Rouse, architect:—

Heather & Davies	£1,244	19	0
Uff	1,075	0	0
Williams	1,050	0	0
Chapman	950	0	0
Crabb	925	0	0
Twelvetrees	897	0	0
Webber	885	0	0
Shurmur	873	0	0
Linfield	855	0	0
Freeman	845	0	0
Hobern	825	0	0
Matlock Bros.	797	0	0
Gibson & Guthrie	780	0	0
Vincent	775	0	0
Parker & Evans	764	0	0

For the erection of house and stabling, &c., at Sutton, for Mr. C. Bland. Mr. H. Jones, architect. Quantities by Mr. W. G. Ivett:—

Simpkins	£3,580	0	0
Turner	3,510	0	0
Drake & Co.	3,486	0	0
Bird & Son	3,395	0	0
Anwell	3,350	0	0
Holland	3,310	0	0

For the erection of a villa residence at Child's-hill, Hampstead, for Mr. Peter W. May. Mr. R. Adolphus Came, architect. Quantities supplied:—

Harper	£3,870	0	0
Morter	3,700	0	0
Browne & Robinson	3,633	0	0
Langmead & Way	3,573	0	0
Phillipson & Sons	3,349	0	0
Nightingale	3,292	0	0
Dando	3,097	0	0

For the erection of board-room, offices, public mortuary, &c., on land situate at the corner of Liquorpond-street and Gray's-inn-road, for the Board of Works for the Holborn District. Messrs. Isaacs & Florence, architects. Quantities supplied by Mr. L. C. Riddett :—

Webster	£31,999	0	0
Patman & Fotheringham	29,500	0	0
Lucas Bros.	29,200	0	0
Brass	27,997	0	0
Kirk & Randall	27,940	0	0
Conder	27,868	0	0
Macey & Sons	26,572	0	0
Killby	26,326	0	0
Scrivener & Co.	26,210	0	0
Browne & Robinson (accepted)	25,987	0	0

For the restoration of St. Mary's Church, Ilchester. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. Deane :—

Bladwell	£4,896	0	0

For the restoration of the parish church, Radstock. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. A. Deane :—

Long	£3,137	0	0
Mann	2,933	0	0
Bird	2,932	0	0
Bladwell	2,899	0	0
Hatherly	2,689	0	0
Brown	2,657	0	0
Jones	2,640	0	0
Davis	2,570	0	0
Wall & Hook (accepted)	2,519	0	0

For Manor Farm, Thickwood, for Mr. R. Walmesly. Messrs. Wilson, Willcox, & Wilson, architects :—

Bladwell (accepted)	£1,600	0	0

For Colerne schools, Wilts. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. Deane :—

Bladwell (accepted)	£2,290	0	0

For music hall, Wellclose-square. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. A. Deane :—

Clements	£4,049	0	0
Bladwell	3,960	0	0
Cullum	3,798	0	0
Jones (accepted*)	3,282	0	0

* Also for the internal fittings, extra £1,017.

For St. John's Vicarage, Clapham, Surrey. Mr. A. C. Morton, architect. Quantities by Mr. Henry Smith :—

Niblett	£2,790	0	0
Tuxell	2,692	0	0
Harris	2,580	0	0
Cox	2,469	0	0
Sawyer	2,449	0	0
Newton & Triggs	2,285	0	0
Julian & Co.	2,176	0	0
Mills	2,119	0	0
Beale	1,974	0	0
Howlett	1,768	0	0

For the erection of Board schools at Mount-pleasant, Coseley, for the Sedgley School Board. Mr. Archibald Paull Brevitt, architect. Quantities by the architect :—

Dawson & Bradney	£3,987	0	0
G. & F. Higham	3,926	0	0
Lovatt	3,913	0	0
Horsman & Co.	3,848	0	0
Gough	3,736	18	6
Nelson	3,705	0	0
Millward	3,590	0	0
Horton	3,489	0	0
Peacock	3,477	17	6
Stockton & Son	3,474	0	0
Jones & Sons	3,389	0	0
Guest	3,350	0	0

For the erection of Board schools at Lanesfield, for the Sedgley School Board. Mr. Archibald Paull Brevitt, architect. Quantities by the architect :—

Rowley & Lynex	£1,375	0	0
Nelson	1,310	0	0
G. & F. Higham	1,200	0	0
Exors. of Cresswell	1,200	0	0
Horsman & Co.	1,196	0	0
Peacock	1,165	14	0
Dawson & Bradney	1,150	0	0
Adams	1,150	0	0
Stockton & Son	1,099	0	0
Horton	1,087	0	0
Gough	1,084	0	0
Moore	1,065	0	0
Guest	1,032	0	0
Jones & Sons	995	0	0

For repairs to highways, Isle of Wight. Mr. E. Humphreys, surveyor :—

Jones	£4,125	0	0
Cotter	3,800	0	0
Cooper	3,500	0	0
Coker & Co. (accepted)	3,260	0	0
Hailock	2,998	0	0
Davis	2,300	0	0

For the erection of a Sunday school, in rear of the Wesleyan Chapel, Mildmay Park. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove :—

Chessum	£4,430	0	0
Tarrant	2,336	0	0
Woodward	2,258	0	0
Ball & Wickes	2,197	0	0
Hobson	2,190	0	0
Nightingale	2,181	0	0
Scrivener	2,157	0	0
Browne & Robinson	2,148	0	0

For proposed hotel, Kingston-on-Thames, for Mr. George Jackson. Mr. Silvester C. Capes, architect. Quantities by Mr. Alfred Boxall :—

Elder	£5,880	10	0
Alderton	5,840	0	0
Harmer	5,800	0	0
Jarvis	5,760	0	0
Scrivener & Co.	5,597	0	0
Messom	5,497	0	0
Mason	5,390	0	0
Nightingale	5,287	0	0
Wells	5,029	19	0

For the erection of three pairs of villas in the Underhill-road, East Dulwich, for Mr. Joseph Sarl. Messrs Hooper & Co., architects :—

Dover Bros. & Co. (accepted)	£3,480	0	0

For sundry artificers' works required to be done in the erection and completion of a factory with offices, engine and boiler houses, boundary walls, &c., in Trinity-street, Loughborough, for the Nottingham Manufacturing Company, Limited. Messrs. Evans & Jolley, architects :—

Needham	£11,687	0	0
Pattinson	11,479	0	0
Dennett & Co.	10,277	0	0
Richardson	10,438	0	0
Smith	9,695	10	0
Main	9,448	0	0
Moss	9,209	0	0
Hind	9,167	0	0
Vickers	9,157	0	0
Bradley & Barker	8,998	0	0
Wheatley & Co.	8,894	0	0
Till	8,874	0	0
Stevenson (accepted)	8,700	0	0

For the erection of a Branch Bank, for the London and South-Western Banking Company, at the corner of Small-street and Corn-street, Bristol. Mr. James Weir, architect. Quantities by Mr. C. G. Maylard :—

	Portland Stone.	Doulting Stone.	Bath Stone.
Eastabrook & Son	£25,600	£23,000	£22,300
Wilkins & Sons	25,400	22,800	22,000
Church	24,400	21,972	20,700
Veals	21,850	21,000	20,000
Kingstone	20,022	—	19,622
Hatherley	22,000	19,975	19,143
Davis	21,385	19,950	18,900
Baker	19,640	19,990	18,440
Crocker	18,919	18,450	18,119
Brock & Bruce	19,810	19,310	17,850
Stephens & Bastow	19,895	18,147	17,295
Howell*	19,500	17,400	17,150

* Accepted in Bath stone.

For pulling down and rebuilding No. 322, Bethnal-green-road, for Messrs. Winsbury. Mr. J. A. Needham, architect :—

Stamp & Bowtle	£1,172	0	0
Howard	1,124	0	0
Wire	1,085	0	0

TO CORRESPONDENTS.

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Erratum.—In Mr. Middleton's letter on "the work at St. Alban's" last week (p. 494, *ante*), the phrase, "greater *ratio* of struts," towards the end, should have been "greater *rake* of struts."

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St. Alban's. Illustrators of Architecture. Some well-known Monographs.

WHEN,—by the ordinary early course for an architect in Britain,—mind, eye, and hand had been fairly well trained, an eminent member of the profession urged Mr. Neale to thoroughly measure and draw St. Alban's, treating it as a *pièce de résistance*, and not allowing his other studies to prevent his doing it ample justice. This seed fell on good ground. Mr. Neale had the good sense to be ready, and the good fortune to be able, to intercalate such a period in his life, before commencing actively the work of directing others. The good old custom of so many masters of our craft was so well and so thoroughly followed, that capable judges recommended publication of the results. We gave, with pleasure, announcements and encouragements from time to time, with respect to the honours won in the course, and the progress towards completion, of the work; and, as soon as the long-promised volume was completed, we made use of it as a text,* commenting by the aid of illustrations and letterpress on problems at present receiving public attention in connexion with the building,—indicating, also, its true status as a monument of architecture, and as a record of parts of its history in England. We will now give a little attention to the volume itself, noting the manner in which a thorough and reliable book of reference has been produced, and slightly comparing it with specimens of the labours of other illustrators of architecture.

A short recital, of the manner in which the measurement of the great Church of St. Alban's was actually managed, should interest a fair number of people who warm towards any bit of actual experience,—all the while that they feel little disposed to accept with patience airy suggestions purveyed by others. The story is simple enough, and even a little suggestive of tedium, when it is all told. Perhaps every attempt,—to describe a well-purposed, well-executed scheme of the same sort,—would be liable to similar accusations. Comparison of experiences would, however, be of value, and might lead to an interesting compilation. As "observation maketh a full man, sketching a ready man, and measured drawings an exact man,"—a compiler "On Studies" might by chance do worse than teach precision by examples.

The church does not appear to have any extraordinary twists in the main lines,—such as are sometimes found in Mediæval buildings, as Whitby Abbey, St. Michael's Coventry, &c. A straight line can be imagined which should run inside the church, from east to west, and deviate by a few inches only from the centre line of any section of the length. The lines at right angles to such an axis,—for instance, the various east walls, the transepts, the main west wall,—seem also to have been set out with a fair attention to accuracy,—minor deviations, from what might have been looked for, occur, however, in every direction, some of them explicable more or less satisfactorily. The widths of the easternmost pair of Early English bays on the south side of the nave are near upon 2 ft. less than those of the nearly similar bays further westward, and than those of the north bays. Less pronounced differences,—the greatest being 9 in.,—occur in the Decorated bays. The north transept is 7 in. wider at the north than at the south; the slype was not properly squared with the south transept. The eccentricities in the present form of the Sanctuary have passed into a proverb; and been explained with much earnestness for thirty years, by conjecturing the original plan of that part of the Norman building. The walls of the lady-chapel incline slightly to the southward. Apparently to improve the effect from the ante-chapel, the east window of the lady-chapel is not in the centre between the north and south walls.

When such a list is being made, and seems likely to increase, as the distortion of the north wall of the nave aisle, and other comparatively modern changes come to mind, a good system of lines within and without the building appears to be indispensable, so that stations may be fixed as starting-points for detailed surveys, and the main dimensions properly obtained. A right line for laying down the axis could only be carried without a break through the doorways in the great screens. Such a line was carried from the east end to the west wall through the northernmost of those doorways. As the total internal length of the church is over 500 ft., a telescope was used in ranging from end to end. Large lumps of kneaded clay were placed at intervals upon the paving of the floors, in which wood laths were stuck. Positions and dimensions being fixed,—two other lines, exactly parallel to the original one, were run from end to end of the aisles,—just clearing the piers projecting from the faces of the north and south walls. The positions of the lines were marked, so that any part could be replaced when required. Strong whipcord could be strained for such distances as that from the rood-screen to the west door (205 ft.); and the base lines were thus replaced section by section. A square, about 16 ft. long in the arm, was used in setting up parallel lines,—running from north to south at right angles to the main base lines. These were obtained at the public passage through the ante-chapel, now happily likely to become a thing of the past; through the doorways leading from the aisles into the saint's chapel; immediately to the east of the great reredos; through the openings of the westernmost bays of the sanctuary next to the tower; through the transepts and tower; on the west side of the rood-screen; and at the west end of the church, (seven positions in all). A line was put down from east to west on the exterior, as a test of the correctness of the lines in the interior. Certain of the lines from north to south were run, through windows, &c., on to this external base line. The external line was used in obtaining the lines and dimensions of the great cloister and of the slype; also for the diagonals by which the external wall faces of aisles, transepts, &c., were tested on plan. For long dimensions, Chesterman's ribbon steel tape, 100 ft. long was used. Such dimensions, as a rule, were taken twice; the extreme dimension from east to west, which had piqued curiosity a good deal, was taken three times, with less than ⅛ in. of extreme variation. The tendency of a Mr. Mantalini towards diluted flippancy, at the sound of 550 ft. 1¼ in., might haply be restrained by such an explanation. The main lines and dimensions were laid down as soon as possible. Thereafter parts, such as the transepts, chapels, porches, &c., were plotted separately, and these smaller plans attached in their proper positions. Special lines for wall faces and piers were set up near to the walls, so that lengths and offsets could be taken by eye. When this could not be managed with safety, as in the piers of the nave, the large square was used, in order to mark dimensions upon the lines. Diagonal dimensions were taken pretty freely at every stage to assist in the detection of errors. The centre line of each pier was marked; and when it was determined to record on plate 4 all the differences in the various professedly similar bays, the parts between each pair of centre lines were dealt with in succession.

At about a dozen points in different parts of the building, a fixed level,—some 4 ft. above the level of the east end of the Sanctuary,—was marked by the aid of level and staff; and by a long mason's level this datum was carried wherever required. Special scaffolds were erected for measuring the detailed bays, illustrated on plates 12, 17, 33, and 38, and for the full details of those bays, which fill more than a dozen other plates. In the interior, the scaffold landings were fixed,—the first at the caps of the ground-story arcades, and the second and third at the triforium and clearstory levels. The centre lines of piers and bay being fixed, they were at once plumbed up and marked, and then all vertical dimensions could be taken on the

* See p. 445, *ante*.

nearest of these vertical lines. Many intermediate measurements were, of course, taken from ladders; but small scaffolds were necessary for capitals, arches, and mouldings. All the mouldings were taken full size by means of straight-edge and square; the cymagraph was discarded. For filling in profiles, in the general drawings and details, the mouldings were drawn to scale from the full sizes; for the plates, they were reduced by photography to a scale of one-third the full size. Plotting being carried on simultaneously with measuring, the jointing of the masonry was only measured, when a drawing otherwise completed was ready to receive it.

Many cold, windy days,—spent in the upper stages of the tower working on plates 26 and 27, varied by excursions on a plank let down by ropes from the parapet,—were necessary in order to warrant the note on plate 26, "most of these tiles were set to scale, and drawn out on the spot, together with a great part of the tower." Accidents, and missing them by hairbreadths, are not unlooked for in such operations. Mr. Neale gives one suggestive sample a place in his carefully laboured descriptive text (page 17).

"During the heavy gales in the spring of 1873, whilst standing on a ladder sketching one of the grotesque heads of animals, above the Decorated clearstory arcade on the south of the nave [given on plate 60], at a height of over 70 ft. from the ground, a sudden gust displaced the ladder. Its fall was fortunately impeded for a few moments by a projecting wooden spout, before it slipped down on the aisle roof, and I was enabled to reach that roof with but little injury." The vivid memory of such struggles with cooling breezes, might take the place of "thinking on the frosty Caucasus," whilst crawling in "fantastic summer's heat," through the lead-covered roof of the Sanctuary aisle,—in search of facts for plates 38 and 42. "All the roofs were measured by lantern-light, and this aisle-roof with much difficulty, owing to its low pitch" (p. 29). A Fahrenheit thermometer bore witness to the successful action of the sun's rays by going up to 130°; and the recognised measuring costume,—a plasterer's blouse, with continuations to match,—to the strait and dusty nature of those rarely-visited shades.

The main forms in the stained glass (plates 24 and 25) were traced on Whatman's drawing-paper, rendered in line on the spot, and thereafter reduced to about five-eighths of the real size by photography. The heraldic methods have been followed to some extent in the plates, and the stronger tones of colour suggested by the usual variations in hatchings and dottings. The painted decorations on the wooden vault of the Sanctuary, some 63 ft. from the ground, were traced (for plates 35, 36, and 46) on very transparent French tracing paper, secured to the boarding. These fifteenth-century decorations are of considerable size,—about 9 ft. by 6 ft.,—for each division of the vault; and there is powerful character of design and drawing in foliage and formal decoration, thoroughly decorative treatment of the whole, and admirable colour. Still well-built birds and beasts, on well turned and jointed limbs, appeal with advantage to the severest sticklers for the universal talents of other days.

In dealing with another point, curiosity led to a comparison of plate 44, with another drawing of the same arcade, in a volume which has been a standard text-book now just upon thirty years; and to the noting of ten discrepancies between the two,—in forms of mouldings, stoppings, and minutiæ of construction. The actual arcade was examined, and plate 44 won on every point,—which is testimony, pretty conclusive in its way, of the presence of a spirit of minute observation,—constantly endeavouring to get behind the mind of the architect, and the mason, and to discover all their reasons, and their methods. The wording, — "the jointing of the masonry to be *particularly marked*," — of the instructions for the silver medal of the R.I.B.A. may be responsible for some of the prevalent love for very heavy joint lines,—perhaps for some of the tendency to give very careful representations of slovenly workmanship, or constructive failures in old buildings, which would have been passed over very lightly a generation ago. Mr. Neale cannot be accused of forcing anatomy on the eye to the injury of the art;—nor of winking at all little weaknesses, as of the thirteenth-century builders, shown in the ashlar spandrels of the triforium on plate 12. Carving, shattered out of recognition, is "carving broken away" (plate 23, &c.); and missing shafts, &c., appear in dotted outlines only, as on plates 9, 12, and 14; but mere irregularities, and crippled lines due to bulges, are not noticed. The resolution has evidently been to show with much fidelity the building as the author found it, making only such judicious compromises as must be made in carrying through such a resolution. As restoration has been going on, difficult problems have cropped up where he has found parts of the building changing under his eyes, as noted on pages 32 and 33, and plates 42, 53, &c.; and these problems have been dealt with as they arose,—it is to be feared according to no cast-iron rule, but with a leaning towards the omission of all marks of modern work.

"The Monks' Watching-Loft at St. Alban's Abbey," the very admirable original drawing for plate 47, now hung as No. 1156 in the Royal Academy Exhibition, shows the resolution carried out with completeness. All the irregularities in the levels of the springing lines of the tracery, and in the widths of the panels are shown. In the central cornice some carvings are shapeless, the places of others are indicated by dotted outlines marked "gone." The record on page 31 shows why the upper cornice assumes so special a form:—"Some few years since, in the upper cornice, there were a number of shields bearing devices, but in 1874 these had been reduced to three. At the present time (1877) only one shield remains. The cresting —now destroyed— is partly illustrated from a fragment which, in 1873, when I sketched it, was in good preservation." Times of restoration, and times of neglect, have common and special perils.

The original drawings for plan, elevations, and sections (plates 3, 4, and 5) were prepared to a scale of 8 ft. to an inch. The scale for elevations of bays of the nave, transept, sanctuary, &c. (plates 12, 17, 23, 28, 33, 38), was 2 ft. to an inch, as also that for the tower; that for the porches (plates 6, 7, and 9), and the slype (plate 30), 1 in. to a foot;—the same scale as for details of windows generally (plates 20, 22, 40, 41, 45, 53, 54, &c.), and for the arcade (plate 44).

At the present time, reproductions of such drawings for publication seem, as a matter of course, to be work cut out for one or another of the processes where reduction can be made by photography. Mr. Neale sums up the case for photolithography in prefatory remarks, no doubt written after experience had tested his convictions:—"Its advantages are (1) that the original drawings being made to a large scale, more detail and accuracy can be shown than if the drawings had been made to the reduced scale and (2) that the copies are facsimiles of *my* original drawings,—thus any chance of additional drawing or touching up by the lithographer has been avoided." The process hardly needs to be described at length. By the aid of the sun an accurate reduction of a drawing is obtained. As throughout this negative, the lines of the drawing reproduced are transparent, the solution, on the sensitised paper placed against the negative, is hardened by the action of light where the lines occur; and then the other parts are washed away by floating the paper in warm water. The transfer leaves lines in greasy ink on the stone, and wetting, inking, and printing take place as in all lithography.

In the reductions from the original drawings, an attempt has apparently been made to secure uniformity of scale for similar subjects,—the uniform size of the plates of course determining what the precise extent of the reduction should be. The 8 ft. to an inch of the general drawings has become almost exactly 20 ft. to an inch; the 2 ft. to an inch for the bays almost exactly 4 ft. to an inch. Some adjustments have been made by treating the margins of the plates as slightly elastic. Still, in reducing the porches (plates 6, 7, 9) to a scale of about 2 ft. to an inch, the quasi-procrustean process has resulted in three different scales,—the extreme variation being about 1-40th of an inch to the foot. The scales put on the drawings have been reduced with the drawings themselves, and tell at once, that the original drawing and camera have not been put exactly in the relative position, in which the size marked on the glass would have been exactly occupied by the image of the drawing. The scale of the carving,—where the smallest reduction has been made is three-fourths (·75) of the real size; the scale of the general drawings where the greatest reduction has been made is two-fifths (·4) of the original; and there are several intermediate varieties; details one-half (·5); mouldings one-third (·33); stained glass five-eighths (·625). In order to obtain proper proportion in the photographs, each ordinary plate was divided into two pieces, some plates into three, and the double plates into five or six. Junctions would be made in the interspaces between the subjects where possible, and then there would evidently be less demand for delicate management, than when a drawing was cut across again and again (plates 3, 4, &c.).

Photolithography,—as becomes a young giant now very powerful, albeit not mixing much in architectural matters till about ten years ago,—visits with penalties all who fail to follow good counsel. Plate 33, a very good drawing, but without sufficient firmness and evenness of line to stand reduction, has suffered in the process. Plate 26, a reproduction of one of the drawings for which the Silver Medal of the R.I.B.A. was awarded, was more striking in its original form. The surfaces between the lines were broader, and consequently the lines, expressing colour in the tile-work, did not overpower the outlines of the architectural forms; some of the colour and texture lines have coalesced, and disturbed the proper relation of form, shadow, and colour in the drawing,—still of much excellence, and as an architectural record of extreme interest. The same class of risk has affected plate 4. The buildings in the fore-front, being forced forward by increased elaboration of the surface, the very considerable reduction has drawn together lines originally widely separated. In part of plate 14—a greater degree of reduction has apparently been contemplated, and the lines come out unduly vigorous. Photography is itself responsible for some falling short at times,—as in the right half of plate 2, where a dull grey day probably prevented the lines being cut out as sharply as might be wished. Clean, firm handling,—force of line carefully regulated to suit the extent of the reduction proposed,—gives an air of mastery to such plates as 6, 7, 9, 12, 38, and to such detail drawings as plates 22, 57, &c.,—which could not be improved.

As a lithograph is printed on soft porous paper, the ink hardens in the paper, and does not set off. Tissue guards do not therefore make life burdensome in using plates 2, 3, &c., as may happen to a tender conscience using doubled plates of forcible steel engravings. Indiarubber backing secures a flat page for such plates of a total size of 22 in. by 30 in. These are not by any means mere odd and trivial details, interesting only to bibliophilists. The question of size has not a little to do with a work of this kind, as it controls the scale of the drawings, and consequently the thoroughness of the illustrations. The excellent qualities in Mr. Kell's lithography have already been generally mentioned; but one of the chief merits must not pass without special remark. The plates, in Mr. Neale's handsome folio, have about 90 superficial inches more area than those of the largest book of photolithographs hitherto published.

OTHER ILLUSTRATORS.

It now behoves us,—after telling this story of the volume from its inception to its binding,—to make, as promised, some slight comparisons with the labours of other illustrators of architecture. (1). Among books of the same kind one's memory naturally turns first to that on the same subject, the set of nineteen plates, each 26 in. by 19 in., engraved by James Basire in 1810, from the drawings of John Carter, and published by the Society of Antiquaries with a text by Sir Henry Englefield (mainly from Gough's notes) in 1813. No considerable finding fault with Carter's measurements is necessary; he was not responsible for the 600 ft. which (see page 626 of vol. xxxv. of the *Builder*) crept into the text, and troubled many souls for long. The main dimensions in his general drawings stand the test of comparison with Mr. Neale's very well. There are, indeed, errors about which a good deal might be said. Carter believed that the two westernmost bays of the ground story of the Sanctuary were open once, and only filled with modern blocking up. Mr. Neale's plate 33, and the remark (p. 27) thereon, must effectually dispose of this belief,—which might otherwise be stoutly defended by any one who had never thought of the forms of the aisles adjoining:—"The stones of the piers are bonded into the tile-work of the filling in; they were measured in 1873, when the old plaster was removed." Showing the cloister arcading wholly clear of the wall-face of the south aisle was another error,—and a very natural one if the drawings to scale were not carefully compared with the actual work. The strange relation of the wall-face of the cloister, to the general face

f the aisle wall is shown with much care on Mr. Neale's general plan, and by the south elevation, nd plates 22 and 23. The notes on page 17 seem o be dictated by a desire to answer a puzzling uestion put in the *Builder*, p. 625, vol. xxxv.: ut they might lead to further questioning and iscussion, and the reasoning, which would go o explain the positions of the wall faces in the loister and above it, is not hinted at. The duty f noting Carter's other misapprehensions may, or the present, be left thus imperfectly performed. The greatest defect is, that some of he details have been badly seen, and that, consequently, the expression of the architecture is hanged. Mr. Neale's admirable drawings assist o a greater distinctness the memory, which holds well the effect of the actual work. Carter's would not have the same effect. Tracery and amb-shafts are too clumsy; the true forms of usps and of all carving are generally missed; nd the absence of jointing gives an unconstructive and unreal character to the wall surfaces, rches, and piers. Mr. Neale has cleverly rightened his drawings by touches of sharp shadow, and has cut out the open arches by suggestion of shade, with which it would be yper-fastidiousness to grumble; but broad and strong cast shadows, such as Basire used, we now think best avoided in such geometrical drawings. The greatest difficulty with which Carter contended has been eluded by showing only the work that is on one plane, or nearly so to have shown aisle and transept windows on the longitudinal section, and to have kept them well back from the main arcades without cast shadows would have been no easy task,—for the nearer surfaces are not entitled to much suggestion of colour.

(2.) L. N. Cottingham's first volume (1822) on Henry VII.'s Chapel contained forty-five plates, 23½ in. by 18 in., illustrating the exterior; and his second volume (1829) twenty-seven plates illustrating the interior. The original proposal was to have 110 plates in all,—"making an illustration more extensive, and more complete, than has ever yet been bestowed on a single edifice, in this or any other country" (Cottingham's Preface, 1822). The spirit of the architecture being well caught, the book is not likely to become obsolete: it may even be better appreciated, fifty years and more after its publication, than ever before. The restoration of the external stonework under James Wyatt was carried on from 1809 to 1822, and Cottingham no doubt took advantage of the facilities for measuring, as—let us hope—some one will now get the run of the scaffolds, in the Early English bays on the south side of the nave of St. Alban's. Plates 12 to 16 (Mr. Neale) show with much completeness of detail the bays on the north side. We have noted already the extent to which the easternmost of the south bays differ in size from the others. Narrower bays and sharpened arches were thereafter preferred, and similar spacing was used in the Decorated bays still further eastward. There are many obvious differences between the north bays and the two latest south bays: observable at a glance—in mouldings and other details. A parallel set of five plates would illustrate the changes which had taken place, and the other three bays on the south might, on more critical questioning, yield also contributions to architectural history. Henry VII.'s Chapel, having extreme external dimensions of 128 ft. east to west, including the vestibule, and of 78 ft. north to south, is not so large as many a parish church; the general design, and the talent of the detail, deserve, however, all the pains that Cottingham took, and all the plates he promised. One of the defects is the want of an easily-recognisable plan in the arrangement of the whole work,—the regular movement from west to east in Mr. Neale's plates is a particularly happy idea. Cottingham's illustrations, obviously resulting from genuine measurement, are all well laboured, and well figured, and on the whole well drawn, though cross-hatched to death in parts; and though rotten lines in the early plates evince weakness in the lithography. The author was fully conscious of the defects, mentioning with satisfaction his "improved knowledge of the process" when contemplating the second volume.

(3.) Salzenburg was sent to Constantinople, by the King of Prussia, when the repairs of St. Sophia were in hand in 1847-48, and in 1854 the great monograph with plates (2 ft. 2 in. by 1 ft. 7½ in.) was published at Berlin,—twenty-six plates being devoted to St. Sophia. About a dozen of the plates are engraved,—the others being shaded lithographs, and lithographs in colours, gold, and silver. The extreme dimensions of the mass of buildings being about 310 ft. by 390 ft. (reduced to 2 ft. 1½ in. by 1 ft. 7½ in. for the plan) call for a double plate, with a scale of $\frac{1}{16}$ in. to the foot. The same scale is used for all the general drawings,—which, as well as the engraved details, are very elegant, and touched with firmness and feeling.* The effect of the architecture is well given, though to some English eyes,—accustomed to well lettered and figured drawings, and much minute analysis of construction,—there may be some suggestion of vague generality. The mosaics occupy twelve lavish plates. Though in chromo-lithography 1854 is not 1878, the execution of plate 27,—the decoration of the narthex over the great door, the best of all,—compares well with the clever frontispiece of Mr. Neale's volume, printed from fourteen stones,—a reduced *facsimile* of a panel of the choir ceiling, brought into view in 1875,—the perfect finish of which has well repaid all the painstaking.

(4.) The Norwegian Government work on Throndhjem Cathedral consists of twenty-eight plates, 1 ft. 10 in. by 1 ft. 2 in., by H. Schirmer and F. W. Schiertz,—all engraved by our John H. Le Keux. The church, 350 ft. long, 84 ft. wide across nave and aisles, and full of characteristic design, would evidently supply material for a larger work. Some of the drawings are very beautiful, especially the rendering of the twelfth-century ornamental detail,—but detailed plans, elevations of bays, and complete details of parts, are almost wholly wanting.

(5.) The great monograph of Chartres,—*publié par ordre de l'Empereur*,—issued from the Imprimerie Impériale in parts from 1856, is a sample of the sumptuous works which French Governments encourage. The numerous plates,—produced by engraving, lithography in chalks and colours, and by heliogravure,—are 28 in. by 22 in.; for the architecture, carved ornamentation, and stained glass, under the direction of J. B. A. Lassus; and for the sculpture proper, and the wall paintings of A. Duval. The number of collaborators,—editors, draughtsmen, engravers, and lithographers, whose names appear,—is very considerable. The general drawings,—to a scale of ·005m. pour mètre (·06 of an inch to a foot English),—are of a splendour befitting the majestic cathedral. Its total length is only 440 ft., but the height to the ridge of the roof is 174 ft. By the side of a main mass of so considerable a height, the 378 ft. total height of the north-west spire has not all the force that might be looked for. The extreme height of St. Alban's tower Mr. Neale gives as 143 ft. 7 in., from the floor-line under the tower to the top of its parapet. As the top of the nave parapet is about 68 ft. from the same floor-line (the Sanctuary parapet about 78 ft.), the restoration of high-pitched roofs, rising 20 ft. higher as now proposed, must lead to some additions to the tower itself, if it is to retain its present power over the immense structures beneath it. Such subjects as the two towers,—the old and the new,—at Chartres, are honestly and thoroughly delineated. The rampant fidelity which marks nearly every plate of the St. Alban's volume, is, indeed, absent throughout. A curious inquirer has ascertained that the legend "measured and drawn to scale on the spot," or its equivalents, is repeated thirty-six times on the plates. Evidently no disrespect was intended to the other plates, but "protesting too much" has its dangers, even with such as Hamlet's mother. It must be confessed, however, that in such views as plates 19, 20, 21, and 22 of the south porch (Chartres),—all drawn by Gaucherel, and the two last engraved by him,—the leanings of a good deal of the work are evidenced. Air, light, and shade, and masterful drawing, are especially demanded by such subjects, where large-sized figures of a high order of art are not adornments only of the architecture, but indispensable portions of it. St. Alban's does not afford even an average number of specimens of figure sculpture. There are judicious and novel remarks by Mr. Neale on p. 34, with reference to the figures in the Lady Chapel (plate 58). These figures—probably unique in their position and treatment—are the only full-length figures that are parts of the fabric. The hand which shaped the grotesques (well sketched on plate 60) and some of the heads on the south of the nave, and one at least in the south transept might, one would think, have done some rare work. Lassus put much strength into illustrations of the stained glass. Tracings were made from the glass, and these were reduced,—frequently to one-sixth of the original size. The Tree of Jesse, the Life of Christ, and His Passion, filling the three great western windows of the nave, are given in full colour in chromo-lithography by Emile Beau. The central window—"The Life"—works out to the reduced scale, 6 ft. high by 25 in. wide, being given in five sections; the actual window is about 36 ft. by 12 ft. 6 in. St. Alban's is out-distanced here again; plates 21 and 25 have the merit of introducing a pleasant variety of subject, and of recording some pretty patterns of fifteenth-century glass quarries, and the building would not allow any one to do more;—once it may have rivalled Chartres itself.

(6.) The church at Monreale furnished ninety lithographed plates, 28 in. by 20 in., published at Palermo, in 1859, under Gravina's direction. Although this work could not be passed over in taking stock of notable illustrations of notable buildings, it would be difficult to put it into the first rank of our illustrations. The architecture of nave and cloister is not without a certain amount of expressiveness; but the architectural features did not take the first place in the mind of the designer, and the mosaic decorations, subordinating form to colour, have the same prominence in the volume that they have in the actual work. The general drawings, to a scale of 1-200th (about $\frac{1}{17}$ in. to a foot), are really diagrams,—to illustrate the positions in which the mosaics may be found; purely architectural and constructional details are not hunted down with fervour. Gravina at plate 22 gets clear of the architecture, and deals with the mosaics. As the scale is small, and they are too evidently ground out with patient labour, the illustrations fail to convey to the full the impression of magnificence, which might have been looked for from their number and unstinted completeness of finish.

(7.) A description of Sharpe's "Architectural Parallels" would be a lengthy paper; let us be contented with six notes:—(1.) The work was published in 1848, and contains 121 plates 22 in. by 15 in., with a supplement of sixty plates of full-sized mouldings. (2.) There was no intention to make a complete monograph of any building. The nave, choir, and south transept of Tintern have fifteen plates devoted to them, and out of these,—the largest number devoted to any building,—eight are perspective views. Parts of buildings,—such as the naves of Fountains, Kirkstall, Byland, Bridlington, and St. Mary's, York,—such as the choirs of Whitby, Rievaulx, Netley, Guisborough, Selby, and Howden,—have been selected, in order that a series of parallel examples, of different dates but of somewhat similar scale, should receive about the same extent of illustration. (3.) Fountains,—the largest of the churches,—is 358 ft. long inside, and 129 ft. across the transepts. Tintern,—the most completely illustrated,—is 228 ft. long, 151 ft. across the transepts, and 75 ft. across nave and aisles. (4.) The buildings are mostly ruined abbey churches. Out of the thirteen buildings most fully illustrated, the naves of Bridlington and Howden, and Selby,—the most perfect monastic church remaining in Yorkshire,—form the only exceptions. (5.) The views show, with considerable skill, and, no doubt, with complete literalness, the actual state of the buildings thirty years ago; but the geometrical illustrations are all restorations. Fountains,—roofless, with shattered aisle vaults, missing gable courses, and ragged fringes of tracery in the arch of the great west window,—reappears with completed vaults, restored parapets and gable courses, and all traces of the later window swept away, in order that a complete example of the twelfth-century architecture may be presented. This rule,—of drawing each building as it probably was when complete and new,—is followed steadily throughout. (6.) The drawings are almost all lithographs, drawn on stone under the direction of the author, and many bear such well-known names as R. J. Withers, T. Austin. . . . The admirable author and man, who thus expounded "parallelism" at the beginning and end of thirty years, always felt satisfaction when he saw that his lesson had been well taught, and that the example which he set of accuracy and fulness of illustration was well followed. This satisfaction can now find no expression for our ears. It is, however, still possible to link the present

* Some few of us may remember the reading, on February 5th, 1855, of an excellent Sessional Paper at the R.I.B.A., bringing Salzenburg's work under the notice of English architects immediately after the publication,—by that good servant of the profession and the Institute, Mr. C. C. Nelson.

with an earlier day by mentioning a well known work, kindred in spirit to Mr. Sharpe's, of which the author is still living among us.

(8.) The 123 plates of "The Churches of the Middle Ages," by H. Bowman and J. S. Crowther, were published over four lustres since, and illustrate fourteen churches,—eight in Lincolnshire, two in Warwickshire, and four in other counties. They are almost all parish churches,—some of no great size: so that the class of subject prevents the work joining the highest rank of monographs,—however much its execution entitles it to honour. The grand church at Heckington,—the largest except Nantwich,—is only 171 ft. by 90 ft.; and not one of the buildings has that "guinea stamp,"—the possession of a triforium stage. Heckington comes in for thirty-eight plates, 21½ in. by 13½ in., and seven other buildings for between fifteen and seven. Grouping, by means of an index, makes the whole into an illustrated glossary,—showing the treatment of parts of buildings at different dates; and, not the less, the variations from solidity to lightness, the methods of grouping, &c., in such buildings, through a century and a half. The early forms of true Pointed art at Frampton pass into the Transition towards Geometrical in Etton; Threckingham affords a rare tower and spire in Geometrical; and there is very fine fully-developed Geometrical at Temple Balsall. Ewerby and Heckington, with parts of others (Frampton, for instance), deal fully with the perfect work of Curvilinear date, which had the best affection of the authors. Cley-next-the-Sea is followed by Nantwich, which brings some characteristic Perpendicular on the scene. The chalk lithographic views by G. Hawkins do not interest so much as the well-measured and well-drawn line drawings,—plans, elevations, and sections, details of windows and doorways, arcades and buttresses, and a general collection of mouldings,—leaving in the instances of full illustration little to wish for. The buildings are a little restored into comeliness, as then seemed proper in all eyes in such drawings. The "get up" shows some influence of "The Parallels" in minor matters, such as the broad, black shadows in the figure-drawings, with very slight suggestions of shade. The signatures of the bright, clean drawings on the stone are not without hints in their way. The name of James Fowler (now of Louth, and well famed) is appended to careful draughtsmanship on the plates of Heckington, Nantwich, and others.

These reminiscences might be enlarged to almost any extent by casting a wide enough net,—not that such examples of the completest sort of English illustrations are not all too rare; but enough has been done to show things in proportion, and to stimulate memories. It will be seen that Mr. Neale belongs to the English type, acting under his own direction, and obtaining no direct aid from Government or monarch; also that he has shown what may be looked upon as English leanings and preferences in other things. The new book on St. Alban's is neither in superficial dimension, nor in number of plates, the largest, nor in style of production the most magnificent of the modern architectural monographs, but it must be regarded as belonging to those of the first rank, and fairly entitled to a place among such as those brought forward for comparison. In some respects, indeed, it can claim to be considered unique among English books of its class. It supplies the most thorough set of such illustrations yet produced among us,—illustrations of the entire fabric of one of the greatest of our Mediæval structures, of immense extent, with parts of many dates, and singularly full of varied detail. The analysis of architectural details is exhaustive;—such perfect completeness as is shown in the illustration of the porches, for instance, makes plates 6 to 11 models, that care and skill will not really surpass. The drawings, as we see them, are, moreover, in every sense the real and unaided work of the author. We ought not to omit to join thanks to commendation for a considerable task well performed, and to wish Mr. Neale, in his career as an architect, the good fortune that should properly follow studies so earnestly pursued, and already so fruitful.

Parbold.—The foundation-stone of a new church at Parbold, near Wigan, dedicated to All Saints, was laid on the 7th inst. The church will seat about 300 people. It consists of nave, aisles, western tower, and spire, and is being erected by Mr. Hugh Ainscough, of Lancaster House, from the designs of Mr. Edmund Kirby, architect, Liverpool.

KILLING AND WOUNDING ON THE PLATFORM.

In what respect does preventible fatal accident differ from manslaughter? Not at all, we have always maintained, in its moral aspect. The crime is the same. But the difficulty that arises regards the identification of the criminals, and, very often, the criminality has to be divided over so large a number of persons, that not only is punishment out of the question, but the sense of responsibility itself is frittered away. There are many cases of manslaughter in which society is the criminal. An appreciation of this truth, in fact, underlies all recent efforts to protect human life and welfare by new legislation. Such is the case with regard to public health, to the seaworthiness of vessels, to the safety of miners, to the guarding of machinery in motion, to the fabrication, store, and carriage of explosive substances, to the construction and working of railways. Our statute-books are laden with numerous measures passed within the last few years on these topics; the preamble to each of which might have been expressed in the language,—"Whereas it is the duty of the State to take heed that none of its citizens suffer death from the neglect of proper precautions for public safety."

It may be difficult to form an accurate opinion how far this view of the case has come to form an integral element of public conscience. The spread of the doctrine has been slow. And, as is so generally the case in England, it has rather been as question of detail than as question of principle that it has made such way as is really the case. It is desirable that the matter should be looked at in block. The old idea was, that no one had a right to meddle with the internal arrangements of a house, a factory, a mine, or an establishment of any kind. A man had a right to his own opinion as to draining his house, or calling in a doctor to his child, or allowing his workpeople to run more or less risk. One by one all these items of the personal liberty of the individual to do all the passive harm in his power have been broken down. But we are yet far from the state of things when it shall be inscribed in large letters on every church, market-place, factory, public hall, or other place where men congregate,—"England expects that every man shall do his duty in preventing all preventible calamity that threatens himself or his fellows."

If this ever were fully brought home to the public conscience—that is to say, to the private conscience of every individual, we should put a stop to a class of terrible sources of personal injury which strike down more than two daily victims. Of what are called "platform accidents on railways," the number that has occurred during the years 1872—1875 has been steadily on the increase. From "falling between the carriages and platform," and from "falling on to the platform, &c.," 264 passengers have been killed, and 1,026 injured, in those four years. During the same period seventy-seven railway servants have been killed, and 165 have been injured, by "falling or being caught between vehicles and platforms." The numbers seem at first sight to tell heavily against the passengers as compared to the railway servants. But on reflection, the balance turns rather in the other direction. The number of the railway servants in 1875 was estimated at 280,000. The number of passenger journeys in that year was 1,363,000 per diem. By this latter figure, therefore, we have to divide the number 1,290, while the number 242 has to be divided by 280,000. Thus, while the fraction $\frac{1,290}{1,363,000}$, or ·00093, represents the risk of the passenger from this class of accident, the fraction $\frac{242}{280,000}$, or ·00086, represents the risk of the railway servant from the same cause. And as the latter are exposed to the risk for the whole period of the day, while the latter are only on the average travelling for about twelve miles, the actual individual risk appears to be pretty evenly distributed. The familiarity with danger that breeds an unwholesome contempt, in the case of the railway servant, may be set off against the nervous alarm of the inexperienced passenger. But the above features deal with only a portion of the case. During the four years in question, 138 passengers were killed, and 98 injured, while crossing the line at stations; 618 servants of the companies were killed, and 602 were injured, "whilst crossing or standing on the line." These figures, treated as before, give the decimals ·00017 and ·00043 as the respective co-efficients of casualty from crossing the line in the case of the railway passenger and the railway servant.

With regard to the latter cause of death or wounds, we have thus almost exactly a daily casualty arising from a source of danger that is almost wholly preventible. This class of collisions arises almost entirely from the habitual disregard of regulations. At almost every railway-station we see placards prohibiting the crossing of the rails. At every station we see the servants of the company disregarding the injunction. At many we see them aiding the passengers to do the same. Either the placards should be removed, and the passengers openly told to look out for their own safety, or the regulations should be enforced on passengers and servants alike, even at the expense of some increase of the staff of the latter.

The platform accidents, including the catching between carriages, are nearly the same in total amount, though differing in distribution, as those above considered. During the four years under notice they amounted in all to 383 per annum, against 364 of the crossing accidents. It is to these platform casualties that public attention has recently been so sharply called by the killing of a venerable and benevolent gentleman, whose loss many persons have deep reason to deplore. And hardly is Sir Francis Goldsmid laid in his tomb, before the Board of Trade are presented with the report of Colonel Yolland on the death of William Searle at the Turnham-green Station of the London and South-Western Railway while attempting to enter a passenger train belonging to the Metropolitan District Company. These two deaths are directly attributable to sources of danger which have been distinctly pointed out. They were both within the category of preventible deaths, if proper precautions had been taken. Were the railway companies independent of any control, and were the application of penalty in case of injury as sharp and sudden in this country as is the case in France, a verdict of manslaughter would have been returned against the directors, engineer, and manager of the line on which the deaths occurred in each case, and against those of the company owning the carriages composing the train in the case of Searle. As it is, the control of the Board of Trade, as sanctioned by Parliament, is just sufficiently effective to remove a very grave legal responsibility from the parties concerned, while it has proved to be utterly inefficient as to removing an ascertained cause of danger.

It is here, then, that it is desirable for the public to be more fully acquainted with the facts of the case than it actually is.

The floors of our railway carriages are on an average from 3 ft. 6 in. to 4 ft., or even 4 ft. 1½ in., above the level of the rails. To climb up this height is not, indeed, quite so hard a task as to climb to the top of a coach. But it is far more serious an undertaking than it is to enter the inside of a coach or carriage, with which operation the conveyance of the first and second class passenger may be most properly compared. To assist the climbers two steps are usually attached to the carriage, one at the height of about 2 ft. above the rails, and the other a foot higher. In many carriages one or both of these steps are replaced by a board running the whole length of the carriage. For the convenience of passengers, however, the great appliance is the platform. From the earliest commencement of the carriage of passengers on railways it became clear that a roofed space, containing a platform affording an easy entrance to the carriages, must replace the old footway, or gateway of the inn yard. As railways sprang up under the care of different engineers, each jealous of his own opinion, and perhaps too regardless of that of his brother, different ideas were adopted as to the platform. On the Continent generally,—certainly on all the Italian railways,—the level of the platform is only some 10 in. above that of the rails, and the dwarf side wall which supports it is 2 ft. 7½ in. from the rail. There is thus left a height of a yard or more for the passenger to climb. At the same time it is almost impossible for any one to be entrapped between the steps of the carriage and the platform. And every one being accustomed to the same method of entering a carriage, accident from expecting one thing, and meeting another, does not arise. And on the railways of Italy the wise provision is made compulsory that the passenger platforms shall be 18 ft. wide at the least.

On the English lines the arrangement of the platform varies to a great extent. This variation

is the direct cause of many casualties. It would be better for the public that the worst form of platform existing among us should be made normal, than that this variety should exist. But the travelling public have the right to demand that the best form of platform should be made normal and compulsory.

On the South-Western line, on which the two fatal casualties referred to took place, the usual height of the platform is 1 ft. 9 in. above the rails, and the platform-wall is at a distance of 28 in. from the rail. This allows of a clearance of some 3 in. between the step or longitudinal board and the platform, a clearance which is enough to make the ascent of the carriage more difficult than if less room were left; far too much for the mere requirements of running clear; and entirely inadequate to afford any possibility of escape to any one falling between the platform and the train. A more general and more convenient height for the surface of the passenger-platform is 2 ft. 10 in. above the rails. This only requires an ascent of about a foot to the floor of the carriage, which is a great convenience for entering, and still more for quitting, a vehicle. But there is no doubt that the comfort and safety of the passenger have been more fully provided for by the original platforms and carriages of the Great Western Railway than on any other English line. Mr. Brunel not only raised his platform to the level, or even a little above the level, of the floor of the carriage, but he made the planking or flagging to project over the side wall, so as to come close to the side of the carriage. All that was needful by way of clearance was, that the carriage-door should swing clear above the surface of the platform. The maximum of comfort was here combined with perhaps the maximum of safety. At the same time the platform-wall could be kept so far from the rails that a child, or even a man, might lie between the two uninjured by the passage of a carriage.

Neither the general reports to the Board of Trade of the accidents which have occurred, year by year, in the United Kingdom, nor the report of the Royal Commission on Railway Accidents, is so framed as to enable any one to institute a comparison between the relative safety of different lines. It would almost seem as if the tables had been expressly drawn up so as to obviate the possibility of any such comparisons. If the accidents of each class were distributed not only per class but per line on which they occurred, a very simple calculation would show the relative safety of different arrangements. When extended over a series of years, such a comparison would prove in the highest degree instructive. Thus, in the case of platform accidents, if they were distributed according to the lines on which they occurred (which it would have been easy for the reporters to do), and then reduced to a ratio proportionate to the traffic, we should at once obtain a valuable indication as to the relative amount of protection to the passengers afforded by each of the systems above indicated, or by any modification of the same. We should incline to the opinion that the Great Western system is the safest employed in this country, although fewer grave, but possibly more light, accidents would occur on the low Continental platforms. But this can be little more than a guess, in the absence of that digestion of their own returns which the Board of Trade have not taken the trouble to make. Again, we should hold that while the mode of involving the travellers in the most danger is to allow different heights of platform to be adopted at the caprice of each manager, the 21-in. platform is the one which combines the greatest amount of danger and discomfort with the least advantage of any kind. Here again, however, it is desirable to have the verdict of statistics.

The question of continuous foot-board is not altogether independent of that of construction of platform. The Royal Commission on Railway Accidents assert "there are only two ways by which accidents of the first class (falling between carriages and platform) can be wholly prevented; namely, either by abolishing platforms altogether, or else by putting it out of the power of passengers to open the doors of railway carriages, and excluding intending passengers from the platform, save when the train is at rest. One or other of these systems is adopted on some Continental railways, but public feeling in this country would be so opposed to the introduction of them here that the attempt, even if practicable, would be undesirable." Of course, if there be no platform there can be no fall between a platform and a carriage, but it is almost trifling with a serious question to make such a remark as this. It is incorrect, as far as our knowledge of Continental railways goes, to speak of them as having no platforms; although we have said that these constructions are generally very low. "But a third alternative," the Report goes on to say, "already resorted to by several railway companies, would, if generally adopted, do a great deal to lessen the evil; and that is the provision of continuous footboards of sufficient width. Objections of different kinds are urged against the use of such footboards, but we confidently believe that the companies will come to acknowledge universally that they are desirable. We therefore recommend that the Board of Trade be empowered to enforce their adoption whenever the circumstances of the traffic are such as to render them necessary for the safety of passengers." With all respect for the Royal Commission, the above is but a hasty and superficial statement. Who is to judge of circumstances such as to render footboards necessary? If this is to be remitted to the Board of Trade to decide, it should be so stated in plain terms. The recommendation as it stands is too vague to have any utility. Few persons who have had to climb from the ground, or from a very low platform, on to a railway carriage, will gainsay the fact that a continuous footboard is a great convenience and advantage. But it may be fairly doubted whether this is the case with two footboards, one above the other. And if it be only the lower step, say at 2 ft. from the ground, that is replaced by the continuous footboard, as in many of the London and South-Western carriages, the expedient becomes comparatively useless, if not a source of danger, in the stations. In order to mount from a 21-in. platform into a carriage, the comfort of the passenger requires that there should be a continuous footboard between the level of the platform and that of the carriage floor; that is to say, in the place of the upper step. But in case of having to enter or to leave a carriage in a spot where there is no platform,—a case which occasionally occurs, and which has proved a fertile source of accidents,—an upper footboard, whether accompanied by a lower one, or by lower steps, would be a serious obstacle. Again, the lower footboard is within 1 in. or 2 in. of the level of the platform, and some 3 in. from it, so that it is more likely to perplex than to aid the descending passenger; or even to catch his foot against the platform edge.

The original purpose of the continuous footboard was to allow the guard to pass along outside the train while in motion,—a proceeding which should be altogether discouraged. As far as the passengers are concerned, the footboard is a doubtful convenience, for the reasons before given. But if the stations be so built that the floor of the carriage shall be approximately on the level of the platform, allowing only fair clearance for the carriage-door to open, the question of steps or footboard is deprived of any importance. Neither will be used by the passenger except in case of a train stopping out of a station. And another advantage is possible, which would carry out a requisite for safety, at which the Royal Commission hint, although they gave no hope that it is practically attainable.

It would be perfectly easy, in the case of a platform approximately on the level of the floor of the carriage, to provide a wooden or metal rail at or close to the edge of the platform, which might be readily raised for 3 in. or 4 in. from its level. The increasing application of hydraulic power would make the management of this moving rail perfectly easy at great terminal stations. On line stations it might be moved by hand. The normal position of this rail would be the elevated position. The result would be, that whenever a train came up to a platform it would be impossible to open the door of the carriages until the rail was lowered, which should not be done by the station servants until the train was at a stand. In the same way the raising of the rail on the departure platform should be made a *sine qua non* before the engineer was allowed to start. Thus every attempt either to enter or to leave a carriage in motion (except by jumping through the window) would be rendered physically impossible. By this simple expedient one considerable source of distressing injury, and often of fatal disaster, would be entirely abolished.

One objection only could be urged: "You are putting the companies to great expense." It is to be questioned whether the application of a guard of this kind to every station platform would cost more than the fitting of footboards, on one agreed model, to the 10,500 carriages now running on our lines for the conveyance of passengers. But we demur to the weighing of human life and limb in a balance so fine as this against pounds, shillings, and pence. The reasonable protection of human life is a duty to be enforced on every commercial company. Just as we are interfering with the owners of steam machinery to compel them to place proper guards, in order to prevent the accidents that occur, however rarely, to their operatives, must we compel the carrying companies to place proper guards to prevent a class of accident which injures at least one individual per diem. Let it be done, by all means, as cheaply as possible. But done it must be, or we fail to prevent preventible homicide.

Countries far younger than England in the introduction and use of railways are far in advance of England in the appreciation of the eventual importance of unity of system. The railways of Italy communicate with those of France and of Germany, or at least of Austria. There is a difference of ·55 in. between the French and the German gauge. A commission was appointed in 1871, by the Italian Minister of Public Works, to draw up a series of regulations for the normal dimensions of the Italian railways. Not only the gauge of the way, but that of the wheels, the widths and thicknesses of tires, the depth and width of flanges, the height and distance apart of buffer rods, the diameter of buffer heads, the height and minimum width of both passenger and goods platform, and their distance from the nearest rail, are all fixed within narrow limits by this Commission. The details were revised in 1877. A template was also drawn up, showing the fullest dimension allowable for any part of a vehicle allowed to run on an Italian line, from the height of the chimney to the width of the most prominent step or footboard. A width of 10 ft., and a height of 14 ft. 3 in. are allowed for this profile of the train, and a clearance of 6 in. must be left between any structure connected with a railway, and the most prominent part of the template in question. Once for all, a series of minute regulations is thus laid down by Government authority. Every railway engine, and every builder of carriages or engines, is provided with these regulations. Any vehicle that departed from the rule would be refused entrance on an Italian line. Thus, at the expense of a certain amount of trouble, taken once for all, that degree of uniformity which is essential to the public safety is secured for the railways of Italy.

The traffic in the railways of the United Kingdom is the heaviest in the world. With nearly a million and a half of daily passenger journeys a loss of two persons killed or wounded per diem by platform and local crossing accidents may not seem much. But it is an unnecessary loss, and therefore is of the nature of manslaughter. Whatever may be said of train accidents, these two classes of casualties may be, and therefore ought to be, effectually prevented. We make no special claim on behalf of the safeguard which we have now suggested. If a better and a cheaper one can be proposed, we shall be the first to prefer it to our own. But we are anxious to do what lies in our power to awaken a healthy action of public opinion on this subject. We wish to call to mind the fact that the risk of human life, wilfully and unnecessary incurred, involves a great responsibility. Primarily, no doubt, that responsibility weighs on the managers of railway traffic. But in a country where public opinion is so freely outspoken, a great share of the responsibility lies on the public. A railway manager may be excused, if he is not justified, by the plea, "The public have made no demand for this or that measure of protection." Therefore we wish to tell the public plainly that unless certain changes are made, two preventible cases of slaughter or maiming are likely to occur daily. We venture to suggest a method of making at least a portion of those casualties impossible. The neglect of that proposal can be only justified by the substitute of one that is better. Meantime there is a daily victim to the want of the Platform Guard-rail of the *Builder*. The suggestion comes from the engineer who first put bars to the windows of railway carriages; and thus, at the expense of some disfigurement to the vehicle, prevented what on certain lines would have been a certain cause of fatal disasters.

ARCHITECTS AND THE PUBLIC.

As will be seen by our report elsewhere of the meeting of the Institute last Monday evening, Mr. Chatfeild Clarke's short paper on the wrongs which the architectural profession have received at the hands of the English public failed to elicit any exhaustive discussion of the subject on the part of the members of what we suppose may be called, on Mr. Clarke's showing, "the suppressed profession" (as Mill called women "the suppressed sex"). On the whole, we must say that, while there was everything to approve in the moderation and tact of the few remarks with which the President closed what would have been the discussion if there had been any, we are of the same mind with the member who succeeded in shutting the lips of his brethren by a decided expression of opinion that it was unwise and in bad taste to discuss the subject on such an occasion. Such a discussion could not have done any good in convincing the public of their injustice (supposing it to be injustice), and as far as the architects themselves are concerned, it could scarcely have resulted but in one of two things: either a great blowing of their own trumpet on the part of the representatives of the profession, and declaring that they did not care a straw what any body said about them,—not they; or else in an admission that the public censure spoken of is justifiable, and that they would do better in future; and though that would be (under the supposed circumstances) a very proper and Christian attitude of mind in itself, it may be doubted whether any body of professional men are called upon to admit themselves wrong, and humble themselves before that many-headed and not very reasoning monster, the public. If the architects are convinced that they are in need of improvement, the best plan is to begin to improve at once; but there is no need to put weapons into the hands of those who are so ready to accuse them.

As, however, we are in some sort the unprejudiced (we hope) mediators between the profession and the public, ready to represent the interests of either when circumstances call on us to do so, there is not the same objection to our offering a word on the subject. We may be allowed to say, in the first place, that though brevity is a merit in a paper, we are a little disappointed with Mr. Clarke's rather slight treatment of the subject: the paper certainly left, as the President observed, plenty to talk about, but did not say very much as to the reasons and motives of the complaints made against the profession, or the degree in which they were reasonable, nor as to the manner in which they should be met. Now, we take it as a fact that there is a good deal of disparagement of the architectural profession going about at present. It is perfectly true, as was observed, that other professions are spoken uncharitably of; the doctors and the lawyers, for instance; but it is not quite in the same way. There are plenty of current witticisms and cynicisms constantly to be heard at the expense of those professions, but these are mostly in private talk and in a spirit which is obviously only half-serious. There is not the seriously-intended depreciation and sneering in the columns of public prints to which the architectural profession is not unfrequently exposed, and which is hardly to be found directed, with equally heavy guns, against any other eminent profession. In regard to private feeling, we are inclined to think that the architects are as good favourites with the best educated class of people as any other body of men,—among those, at least, who have no interest in depreciating them. The majority of private persons speak of the architectural profession, as far as our knowledge goes, with a great deal of respect, and regard it as an honourable and fascinating one. Those who say otherwise are mostly either those who are closely connected with engineers (and who invariably run down architects), or those who merely believe and repeat what they see in the *Times* or the *Pall Mall Gazette*, or elsewhere, and who would be equally ready to be complimentary if the papers from which they take their opinions led the way. The detractors are the papers and the Government officials, whose opinions to a great extent the papers represent. And this public detraction certainly does exist to an extent which seems peculiar to this country. The fact is there; then comes the question, whose fault is it? Does the wrong lie in the shortcomings of the architects, or in the ill-nature or stupidity of their critics?

We should say that a considerable part of the blame lies with the public. The modern English public is a peculiar public. It piques itself on being "practical"; and its governing body, being to a great extent, in fact as well as in name, representative, piques itself still more on this same quality. And by this class of the public the architect is regarded as pre-eminently a man of taste; that is to say, a man who puts what he calls artistic considerations before practical convenience and suitability; and there is no character which is more antipathetic to the true Briton than this. Once let him be persuaded that any man or body of men are set upon inculcating taste upon him, and from that moment he views that man or that body with an unappeasable suspicion. He does not want all that; he wants something solid and tangible, and whether it is beautiful or not is a matter he can hardly think it worth while to consider; and unfortunately, but not unnaturally, the average Englishman's great mouth-piece, which lives by expressing his own opinions for him, the Press, is in this country (at least so far as the daily or newspaper press is concerned) the very incarnation of this feeling. The want of knowledge shown, as a rule, by the daily papers, upon subjects connected with art, and upon architecture more than any, is but a too palpable fact; and consequent upon this comes the readiness of editors to believe any literary person who chooses to libel architects and their doings—to admit into their columns any statements, however erroneous, which are sent over the signature of any scribe whom they choose to confide in—and their absolute indifference towards even allowing fair-play, often, to those who are attacked. In some leading papers it is notorious that anything said against architects is welcome, and that anything in their defence is grudgingly admitted, if at all. And this is in the main the result of this so-called "practical" tendency of the English mind, concentrated in the representative organs of the press.

On the other hand, there is no doubt that in a certain way the architectural profession does lay itself open to the charge of dilettantism, though this is justly incurred rather by a small but representative body than by the profession at large. The numerical majority of architects are really people doing steady practical work in a steady practical way. But there are those, who generally are put rather forward in the public mind as representing the tendencies of the profession, who certainly seem deliberately to lay themselves out to be sentimentalists in building, caring more to make a building realise a certain type which their minds approve than to think of its suitability for the purposes required of it. To engraft beauty on suitability is the bounden duty of the architect; to consider beauty first, and that only a borrowed, imitated, factitious beauty, is really, if we come to think of it, enough to give a reasonable excuse for putting him out of court. We cannot help thinking that here is really the rub between the modern architect and the public. They (the latter) want convenience and comfort, solid, healthful, and permanent building, in the first place, and if they find that they get these they may be led to care for beauty as well as for fitness afterwards. But the æsthetic architect wants beauty, or what he thinks beauty, first and fitness afterwards: he is first desirous of Gothic or Queen Anne, and then the other things may be added to it,—if he has time to think of them. As we have said, it is but to a few, numerically, that this criticism applies; but they are a few who contrive to be rather prominent, and whose aims are identified by the public, who can hardly be expected to discriminate such matters with much nicety, with those of the profession generally.

We should say that, in a sense, this position of things is rather encouraged and stimulated than otherwise by the action of the Institute of Architects itself, so far as it is educational. It gives medals and scholarships to young members of the profession to go and sketch and study old buildings, acquiring thus the habit of draughtsmanship and archæological knowledge, no doubt, but also inciting or confirming the mistaken view of the architectural profession as the art of reproducing old styles. If, instead of, or, at any rate, in addition to, scholarships and medals for the illustration and study of ancient buildings, there were the same rewards offered for the study of modern buildings and decoration, and sanitary and practical requirements all over Europe, with suggestions for their improvement, we should probably have a useful step in the direction of removing one accusation which is directed against the architects of this country. With which hint we leave the subject for the present, though there is unquestionably much more to be said about it.

GERMAN ART AT THE PARIS EXHIBITION.

The German section of the Paris Exhibition—quite out of proportion to the space now taken up by the German Empire in the map of Europe and the position the German race has reached in the scale of civilisation among nations—was opened on May 11th. Almost at the eleventh hour the German Government decided to provide for the representation of German art, thus in some way relenting from and making amends for its unwise resolution to keep away from the Exhibition altogether. We should know the German people very badly if they did not resent this attitude of their Government, which prevented German industry from competing in Paris, and if they did not rejoice in its subsequent action to find a domicile in the great building on the Trocadéro and the Champ de Mars, at least for the art of Germany. It is a well-known characteristic feature of the Germans that they are never too proud to learn from other nations, demonstrating this by the great numbers in which they always have flocked to exhibitions; and they prove this again by the large influx of the Teutonic element already now reported from Paris, notwithstanding that German skill and handicraft are almost entirely unrepresented at the Exhibition.

The space occupied by the German Art Section is a hall about 120 ft. by 80 ft., lighted from above. The postponement of the opening of the section was due to the desire of the German officials to have everything ready and in its place before the public were permitted to view it—a mode of procedure much to be recommended. The impression created by an exhibition—whatever its size—when completed is much more effective than when thrown open to the public gaze in a half-finished state—a condition in which the 1st of May found a great many sections of the Paris Exhibition.

The German Art Section is located in the part of the Exhibition fronting the Ecole Militaire. A portal of noble proportions in imitation black marble, surmounted by a medallion containing the Black Eagle and the inscription, "Deutsches Reich," and closed by cloth curtains, opens on a very large hall, one of the largest of the whole building. Its walls are covered by oil-paintings, the large space of the hall being filled by statuary of marble and bronze, between which are interspersed exotic plants. The blending of the white of the marble with the green foliage is very effective. The whole hall is covered with soft carpet, and chairs and seats are provided in abundance.

The centre of the hall is occupied by several tables, upon which are spread, round a few bronze statuettes, a large number of handsome editions of poetry and prose, enriched by photographs, water-colours, lithographs, &c., open to the inspection of the public. The number of oil-paintings is 155, and that of works of sculpture 23, without reckoning water-colours and other smaller works of art.

The selection of pictures made is generally considered to have been judicious, with a few exceptions; and although their value has been differently criticised, there is nothing absolutely flat or unblushingly vulgar. In picking out a few of the best works exhibited, one of the most striking is Karl Becker's "Dichterkrönung Ulrichs von Hutten" ("The Crowning of Ulrich of Hutten"), with a charming fair figure in the foreground, such as has been noticed in several of the painter's works before. Close to it is a sea-piece by Achenbach,—a bit of sea-coast near Flushing in stormy weather. Next we come upon an old woman busily applying soap and soda to a marble statuette of a Venus of Milo, probably in the studio of her master, whether painter or sculptor: a composition in which the contrast between the highly idealistic features of the small goddess, and the expression of the face of the servant, bent upon the prosaic task before her, is very striking. Fagerlin, of Düsseldorf, has a pretty painting, "Ohne Trost" ("Disconsolate"); Meyerheim, a dance of Indians on an American stage; Menzel, a scene from an iron foundry; Gusson, a work-room, treated in Makart's style, with his neglect of details. Of other pictures which cause people involuntarily to stop

y their attractiveness may be mentioned, on ccount of the grotesqueness of fancy per- ading it,—although it is admirably painted,— sea-monster, half-woman, half-fish, bending ith glaring eyes upon the corpse of a hand- me woman floating in the water. Close by is cardinal, with harsh, strongly-set features, laying the piano, while a Madonna hung above looks down upon him with a sad yet friendly nile. Near it is a painting by R. Nenneberg— The Pursuit of Fortune,"—an idea as attractive or the brush of the painter as it is here power- lly rendered. Of sculptures, a small marble itch, by Cauer, of Kreuznach; a beautiful ronze group of Begas, the Rape of the Sabine omen; and a number of portrait busts of erman artists and men of letters, are the most emarkable. Crossing the German section ngitudinally from the entrance, the Dutch Art xhibition, which occupies several rooms, is eached through an open door.

The German Art Exhibition promises to ecome a favourite portion of the Exhibition. t has been greatly crowded since its opening, nd there appear to be many buyers, some of hem Englishmen.

LANDSCAPES, PORTRAITS, AND CULPTURE AT THE ROYAL ACADEMY.

We have only hitherto named the leading land- capes, and it cannot be said that the Academy strong in landscape this year. Yet there re a good many things not to be passed over. The rst room contains two couples of pictures that ake very good pendants to each other, and are hung with some effect: Mr. V. Cole's "Showery ay" (20), and Mr. F. Goodall's "Oxhey Place, lerts" (26), form a very good contrast between he fresh daylight effect of the first and the niet twilight of the second picture, in which the ainting of a group of red cows in the fore- round, their colour toned down in the fading ght, forms an element of interest: and at the rther extremities of the same wall hang two orks, which almost seem as if painted as com- anions, "Forest Scene, Evening" (9), by Herr arl Rodeck, and "A Grove" (32), by Mr. Mac- rtny; both consist of a canvas filled with trees ith straggling snatches of sunlight between hem, and have considerable feeling and effect, hough we suspect the German artist owes his osition on the line to the fact of his picture orming a good balance to that of the English ainter, whose work, if looked into, is much nore refined and studious in the drawing of the rees. Hung rather high over this set is Mr. umonier's characteristic and melancholy paint- ng of "Waste Land" (28), a wild place over- ooking the sea, and overgrown with weeds; as sual, there is much intensity and originality of eeling in this. How long are the Academy oing to persist in hanging this really poetic andscape-painter where his works cannot be een? A little work in the corner of the same oom, with the title "Old and Young" (76), by Mr. J. White, should be looked at; the meaning f the title it is impossible to make out, but it is very original and clever painting of a desolate- ooking corner near some old cottages. These nd other paintings we come across suggest the dea that, under the supposition that the beauties nd pleasant aspects of Nature are worked out, here is now a kind of inclination among painters o turn to the desolate and comfortless corners f the earth, and see what can be made of them n the way of landscape effect.

A small painting, also hung high in the irst room, "Derelict, the Morning after the Storm" (22), by Mr. Laurits Holst, is very suc- essful in the general tone of the scene and the eeling intended to be conveyed, though the bandoned ship looks a little too steady and nmoved on the swell. To convey the idea of he motion and swing of a ship on the water is feat in which few painters succeed: Mr. Hook did it wonderfully in one or two of his orks, one especially, the title of which we orget, where the spectator was in the craft, nd we really felt the swing of the boat under s as we looked at it; this is what Mr. Naish as attempted in "Devonshire Trawlers" (459), ut it will not do: the boat is not moving. A lever and more successful attempt of the same ind is hung high up in Gallery VII., Mr. Bird's "Watching a Chance" (621), where a boat is waiting at the back of a heavy ground swell for good chance of beaching; we see the receding wave that has passed under the boat and is oing shorewards, and the cottages on the beach over the crest of it, in a very real manner. Hanging committees, we take it, do not know very much about this kind of thing, from the way they have several times treated works of this sort in which there were real ability and observation of nature. Mr. R. C. Leslie, who we remember ware a sufferer in this respect before, has, however, got deservedly placed on the line for his very able work, "A Last Shot at the Spanish Armada" (507), equally truthful in the painting of the great semi-transparent heap of water on the left, and the palpable "send" of the ship down into the hollow of the sea, so that we almost hear the roar of the foam under her bows. Another marine work, by Mr. Naish, "A Summer Sea: Scilly Islands" (110), is remarkable not for the sea, but for the rocks, which, in fact, form the main portion of the picture. Mr. Henderson's "Under the Sand Hills,—Full Tide" (98), has truth and reality, though the water is a trifle hard and mannered.

Of the various landscapes combined with cattle studies by Mr. H. W. B. Davies, it is difficult to know quite what to say; in the combined ability for landscape and cattle-painting they are exceptional, relatively speaking, and positively so in regard to the cattle, if we consider them as the works of an animal-painter; but the landscape is too important an element for them to be so considered, and yet it never seems to get beyond a certain point of smooth and realistic character; the work, for instance, to which the line "The lowing herd winds slowly o'er the lea," is appended in the catalogue (615), is absolutely destitute of any such sentiment as the reference to Gray's poem would lead us to look for. As a brilliant painter of foreground detail, as in "Mid-day Shelter" (134), Mr. Davies is more at home. A picture of a style of landscape very similar to that which Mr. Davies prefers (but without the attendant cattle), namely,, "Conway Marsh" (324) by Mr. Jos. Knight, affords an instance of the distinction between landscape in which the poetic element, so indefinable, yet so surely felt, is present, and that from which, as in the works we have just been mentioning, it is absent. For the absence of this quality of feeling, only extreme power and intensity of realism can at all compensate, —that kind of power which makes a poetry of its own in the sense of ability on the part of the painter; but such a power is rare. In Mr. Goodwin's beautiful little work, "The Pastures of the Higher Alps" (142), full of such delicate colour and aërial tint, we have an example of the kind of landscape which the Academy authorities try to keep out of sight, as in those of Mr. Oakes (all on the line) we see what they delight to honour: the conclusion is not favourable to the immediate future of landscape painting. Among that class of landscapes in which a peculiarity of local character is illustrated, Mr. Enfield's "Saltwater Marsh, near Tankerville" (342), where a long dyke stretches in perspective right away from the spectator, with pools of water on either side of it, is very successful, and makes a very good picture out of slight materials. Mr. Macullum is highly successful this year in his coast scenes, chiefly remarkable for the treatment of the water,— "Shrimping" (384), and "Waiting for the Ebb" (606); in the first, figures are wading about in a large expanse of shallow water; in both the effect of reflected sunlight on the water, perhaps partaking of mannerism, is nevertheless singularly brilliant and real. Mr. Colin Hunter's "Ebbing Tide" (409; far superior to his larger picture near it) is a good little work of the same type of subject. Miss Montalba's large Venetian picture, "The Last Journey" (424), would be named as a brilliant thing if it were our first experience of the artist; but, alas! manner, manner, manner; we know it off by heart already in these few seasons. Mr. Cecil Lawson's "Wet Moon, Old Battersea" (433), hung very high, looks good; and Mr. Meyerheim's "Changing Pasture" (471), where some cattle are coming through the middle of a field of high grass, has very fine qualities and is thoroughly individual in style. This kind of individuality, though with less unexceptionable execution, belongs also to Mr. Hugh Cameron's "Haymakers at Noonday" (554), painted in a very broad style; and not far from this we notice an apparently original and striking effect in Mr. Holloway's "Night on the River" (545); it is hung very high, and may perhaps not bear closer examination so well, but it certainly seems to have power of effect and handling. Mr. H. Moore is hardly himself in "Highland Pastures" (571), a hard painting to come from his easel, and which we should scarcely have credited to him. Among other works we may mention those of Mr. Wyllie, especially his clever and original, though rather eccentric, painting, "The Silent Highway" (951),—to wit, the river with a steamer coming along it, treated a little after the manner of the artist who paints "Nocturnes"; Mr. Meyer's "Picturesque View in North Wales" (592), Mr. Hennessey's "Summer Evening on the Thames" (1384); Mr. Clarence Whaite's "Thirlmere" (604), painted, like his picture in the water-colour exhibition, in direct reference to a recent Manchester controversy, and very hard though brilliant; Mr. H. Goodwin's "Old Venetian Palace" (349); Miss Kate Goodwin's "Old Rookery, Winchelsea" (355), and Mr. Ivystan Hetherington's "Summer-time" (1003), a very fresh and real little study.

Portraits are very much stronger this year than landscapes, and there is a smaller proportion than usual of that hopeless class of works which can only be regarded as filling so much wall-space. Mr. Ouless keeps his place completely, but does not altogether strike us as having made any marked step in advance, partly perhaps because he has not been so fortunate as some of his compeers in having subjects whose character is strongly marked, or who are of special interest to the public in themselves. His best work is, perhaps, the half-length of a gentleman (232), which hangs in the large room; but a fine one, also, is "Lieut.-Col. Loyd Lindsay" (65) in the first room; a straightforward, soldierly portrait, in which the simple grey coat and red ribbon are made the opportunity for some very refined colouring. The pendant to this is Mr. G. Richmond's "Marquis of Bath" (59), which is admired as a capital likeness, but in which there is too much of the satin waistcoat to be in entirely good taste, and the painter has not escaped from the old conventionality of a pedestal for the hand of the figure to lean on. Mr. Millais, besides the beautiful "Jersey Lily" mentioned already, contributes a really remarkable portrait of "The Earl of Shaftesbury" (242), one of the most concentrated pieces of character ever put upon canvas; it is painted for the Bible Society, and the whole history and *raison d'être* of that society, and the movement which it represents, seem to be summed up in the expression of this remarkable portrait. It is singular that the same artist who produced this work could in the same year send so comparatively common-place a portrait as the "Countess of Carysfort" (1021); but the fact is that Mr. Millais is always (and we may say only) aroused to his finest efforts in portraiture when there is something of interest, some large and important association, connected with his subject. The Jersey Lily had been the talk of London for her beauty; Lord Shaftesbury is the centre of a very large section of the religious world; in each case Mr. Millais rises to the occasion. Mr. Watts is different in this; he has produced remarkable portraits of great men, but he will put as much of his genius, almost, into the portrait of a sitter unknown to fame, if the head itself is suggestive. Thus in this exhibition there is more of artistic power and beauty in the painting of the girl's head called "Florence" (195) than in the portrait of "Mr. Lecky" (128), though the latter is characteristic enough in its way. His "Lady Constance Lawley" (189) is an attempt at a *spirituel* effect in the painting of a *spirituelle* sitter, who is clad entirely in white, treated in a kind of vague half-suggestive manner; the effect is a little too ghostly, on the whole. Mr. Wirgman, a young painter whose works we have previously mentioned with approbation, has produced a very original and refined work in his portrait of "Mr. Thornycroft" (28), treated in a peculiar key of colour, with very delicate greys and neutral tones, the only approach to positive colour being in a pair of orange-coloured gloves lying on the table; but even in these the colour is rather relatively suggested than positively shown. Mr. Wirgman's other portraits, in a much stronger system of colour, show that he is by no means bound to this method of colouring in a low key, but that this portrait has been a deliberate experiment, and a very interesting and successful one. Mr. Wells's "Mrs. Percy Chapman" (116), in a classic dress, and carrying a casket, is pretty, though hard and mannered. The fact of this being on the line, and Mr. Wirgman's first-named work put high up, is another of those contrasts between the privileges of Academicians and non-Academicians, new men and old, in which this year's exhibition is so instructively rife. Mr. Henry

Gibbs's head of a girl, called "A Portrait" (127), has force and character, and Mr. Storey's "Sweet Margery" (133) is a painting of a face of singular beauty, beneath a red-feathered hat, but it is too smoothed out and deficient in character as regards execution. A better portrait is the three-quarter length of "Lady Clayton" (526), finely drawn, and natural and easy in attitude,—also, however, a trifle hard. Mr. P. R. Morris, whose versatility this year we have before commented on, shows yet another style in the large full-length portrait of "Mrs. Frederick Leyland" (227), a blond figure, in tight-fitting white satin dress, relieved against a crimson curtain. There is a successful kind of *bravura* about it, but it has too decidedly the look of a show portrait. Mr. Otto Scholderer's "Young Girl in a Fancy Costume" (219), obviously a portrait, has much character, and should have been far better hung; and Miss Rosa Koberwein's head, "In Maiden Meditation" (362), representing a lady with white (or powdered) hair in a yellow dress, shows very skilful and agreeable treatment of colour. Mr. Archer has made a very happy hit in his "Miss Sylvia Schlesinger" (511), in a highly characteristic treatment of colour, exactly suited to the marked individuality of his sitter. The portraits of "Miss Meyrick" and "Miss Clara Meyrick" (385, 395), by Mr. Desanges, are very interesting, and form a finely-contrasted pair of pictures,—the one an indoor picture, with a dark costume; the other, an outdoor portrait, full of light and brightness, with which, indeed, the artist might well be inspired by so engaging a subject. Beneath these, in the same room, is Mr. Story's best effort of the year, a "Portrait of a Lady *à la* Rubens" (593), a painting of great force and brilliancy, and which grows upon one. Among children's portraits, which are so interesting when successfully treated, the best is Mr. Sant's charming little girl with a red belt (211), whose face has more colour than the artist now allows to his grown-up ladies; Mr. Orchardson's "Conditional Neutrality" (41), is a portrait of a boy also in a red sash, and backed by a yellow curtain; a somewhat eccentric but clever work. Another we noted as pleasant and characteristic is the little fellow painted by Mr. Weigall, under the title, "Going for mine Walk" (605).

Our review of the portraits leads to the conclusion that they are the strongest part of this year's exhibition, as the sculpture is undoubtedly the weakest part: indeed, the dearth of successful works of a high class is more decided than we remember for some time. The bronze bas-reliefs from George Herbert's poems, by Mr. Thrupp (1413), have some specialty of interest, but the execution is by no means equal to the conception. In the octagon, colossal figures of uninteresting people stand around, of which the best statue is Mr. Woolner's "Sir Thomas White" (1475), the founder of Merchant Taylors' School. "Whispering Vows to Pan," by Mr. Calder Marshall, is a prettily-modelled figure with some sentiment in it; and Mr. Lawson's "The Ramblers" is a very pretty sketch in marble. In the inner gallery the only one of the larger works that has any force or power in it is Mr. Lawson's group of a man struggling with a panther, called "In the Arena"; it is force of action, however, not of expression; and Miss Dubray's seated figure, called "Jephthah's Daughter," is fine in conception, but very roughly modelled. Among the busts round this room are terra-cottas of Mr. Calderon and Mr. Marks, by Mr. Adams-Acton, in which there is a good deal of spirit. M. Daragon's terra-cotta bust of "L'Abbé Testory" is very French and very finely finished, and in the same material Mr. Mullins has made an interesting study of the sad and worn countenance of James Martineau. Scattered about the rooms we find miserable nursery subjects: mothers urging refractory little boys to bathe, and all that kind of goodiness and bread-and-butter which is even worse in sculpture than in real life. And even in subjects of more imaginative character a prosaic veil seems to hang over everything. An eminent sculptor sends a half-size figure of "Godiva," appending in the catalogue the pretty verse of Herrick, ending,—

> "But Beauty's self she is
> When all her robes are gone"

(they are not all gone in this case); but there is absolutely no beauty in it: a commonplace plump woman, that is all. The very object of art is to raise such a story and such a figure to the level of poetry, not to reduce it to prose: but the spirit of commonplace seems to have presided over this year's sculpture even more uncompromisingly than usual.

MUSEUMS OF ARCHITECTURE, AND THEIR DIFFICULTIES.

THERE is certainly a something or other attractive about plaster. Plaster would seem to possess in itself a sort of power of doing what other and more valued substances do not possess. Some, indeed, of the most notable things in the way of art in the world have been executed in plaster, as the Moors in Spain have proved; and not a few of the more durable art objects have been cast first in plaster before their final rendering in more durable and valuable material. But there is yet more in it than this, for it would seem to possess a species of fascinating power over some minds out of all proportion to its apparent strength as a material. The Prime Minister but the other day was asked some questions as to a "National Museum of Plaster Casts," and they would seem to have puzzled him a little, for though he could not but allow the desirability of such a collection, and the utility of it, and the furtherance it might prove to things artistic,—said broadly,—that the "state of the world" and of things generally, all about us, did not really admit of the serious consideration of so vast an idea,—he sympathised with it, but the outer world had other and more immediately interesting objects before it! And that this is so none can doubt. And much might be said about it, but still in spite of all difficulties and all obscuring interests, a collection of the "art thoughts" of the past, even if but in plaster, would be a right good thing to see, and is worth a word or two now and then.

It might be somewhat difficult, putting aside this indifference, to find a way to a really hopeful commencement of this great work, for not only have the *casts* to be got, all untampered with, but there is, perhaps, the more difficult thing still to be found,—a suitable and large enough place for them. All the comparatively few things that are now available are scattered about here, there, and everywhere, as accident and fortune have willed it, so that to get at anything like a comprehensive view of what there is, say in London alone, very many places and collections, more or less widely apart, have to be visited, from the magnificent collection of antiquities in the British Museum, to the Soane Museum, the scattered collection at South Kensington, and the Architectural Museum collection of Gothic art,—the only one, indeed, to be found in this country, for in the great national collection at the British Museum there is not a solitary specimen of it. Other small collections there are scattered about; but all but inaccessible to the public, and indeed to the student. It might be impossible to bring these together, though duplicates of them might be obtained without any very great difficulties or hindrances. But even with all this, such collection would be not a little imperfect and faulty, requiring to be filled up at all points, needing beginnings and endings, and very much to make it at all complete and thoroughly fit for its purpose of presenting to the eye and mind of the student of art a general and comprehensive view of it. A large space would be needed for this; but England ought certainly to have a complete Museum of Sculpture and Architecture.

In any future general art arrangement, and it may, perhaps, be a distant future, we cannot but think that architecture, as a fine art, should take the lead, and guide to the arrangement, both chronologically and in order of place and position; and that sculpture,—to use that general term,—should follow and illustrate it, and so form part of it. Art is in reality one and indivisible, and architecture, sculpture, and painting should be linked together. In the great eras of art they were so, as all history and art precedent proves, from the earliest and rudest times to those of the Renaissance; so that sculpture at least,—using that word in its widest sense, and as comprehending "ornament" as well as statuary, should not only be present, but should be so placed as to indicate the purpose for which it was wrought. We would urge this as a general and comprehensive principle, and the more so as it has nowhere been acted upon, or even hardly thought about, sculpture being always dominant; and admitting architectural and constructive forms only as quite subordinate, and as parts to be put out of view indeed as much as possible, to admit them at all! We need but point to the British Museum in proof of this, and note how very scanty the architectural forms are, and how few, at least until very lately, had any place. And as it is, so little are they considered, or perhaps understood, that many of the details of architecture there may fairly be said to stand on their heads!

It may, perhaps, be useful and convincing to point to one or two examples of the "ruling power,"—if we may use the term,—of architectural forms, and even minor details, as mouldings, and as making more expressive a work of sculpture. We allude first, by way of proof, to the world-famous *metopes* from the frieze of the Parthenon, and of which there are sixteen in the British Museum, *fixed*,—somewhat unfortunately, as we think,—into the north wall of the "Elgin Room," as it is called, and thus forming all but a component part of the room itself. These metopes represent a series of single combats, or encounters between the Lapithæ, or Athenians, and the Centaurs, and nothing can surpass the magnificent way in which the work is executed. So individualised is the handwriting, or art-writing, on the marble, that you may all but see the great sculptor at his work, or rather sculptors, for there were more than one. And in looking at them, and at each individual panel, one cannot but regret the total absence of all their architectural surroundings, as the *triglyphs* between them, the mouldings under them, and more than all at the want of the great crowning *cornice* above them, and which in the temple itself forms so striking and characteristic a feature in it. The purely architectural details of this Greek temple are as finely wrought as the great sculptures themselves, and if *artist-workmen* ever did exist, and work, why here is the evidence of it. If not so, it is nowhere.

Let it be observed here, that this consideration will help to make our argument the clearer, especially to those who have not thought much about it. The strictly-architectural parts of the great temples of the old Greeks are to the full as fine in their own way as the mighty sculptured forms themselves. Nothing would seem to have been missed or lost sight of, and the workmanship cannot possibly be surpassed,—nay, might we not almost go the length of saying that without the "architecture" of the temples, the sculpture, great and individualised as it is, and descriptive of the Greek mind, and hand, and thought, cannot fully be understood? We would here point not to the Parthenon details only, but to those from the small Ionic temple of the river god, Ilissus, of which there are many scattered fragments; and to the larger temple, also Ionic in order, of Apollo in the same gallery. Note only the working of the scrolls of the volute of the capital.

We might thus go on and point to a number of details purely architectural which would prove, if any proof be indeed needed, that very much is lost to the sculptures here by the absence of the architectural forms, and by the neglect of those who, like Lord Elgin, took the great sculptures from their panels in the temple, but who did not think it worth while to pick up and bring away a section of the cornice which covered them, and which lies all about the platform on which the so-ruined temple stands!

It is to be always borne in mind, too, that in all the great styles of architecture, there is not alone the most expressive and emblematical of it to be studied, and, if nought better can be done in these days, *imitated* and copied, but there are always the *beginnings* of such style, and the *endings* or decline of it. And to a thorough comprehension of it these are as necessary as the study of the fully and more perfectly developed phase of the style in its maturity and perfection. There is really no exception to this rule; it is universal all the world over, and through all time. In the Gothic we may read its history from birth to death in our great cathedrals,—nay, for that matter, in almost any one of them; and in the museum as it is, and imperfect as it is, no slight idea is given of the beginnings, perfection, and endings of the *Greek*. A subject this all but new, and certainly waiting to be thoroughly analysed and studied; and it is for this purpose that a large and as complete a collection as possible is needed.

Who will begin it?

OUR EXPORTS AND IMPORTS.

THE variation in value between the goods we import and those we export is continuing to provoke a good deal of discussion; and there is no doubt that some of the features of that variation need attentive consideration, the more especially as its extent has been for some time growing. A few figures will show in a novel mode the variation. In 1861, the imports of goods into the kingdom amounted for that year to 7*l.* 10s. 2d. per head on the population of the United Kingdom, and the value rose gradually and rather irregularly to 11*l.* 11s. 2d. per head in 1873, and in 1876,—the latest year for which the proportion is officially given, — it was 11*l.* 6s. 8d., or some 4s. 6d. per head below the maximum value. But the value of the exports of British produce rose from 4*l.* 6s. 5d. per head on the population of the United Kingdom in 1861 to 8*l.* 1s. per head in 1872; but since then it fell to 6*l.* 1s. 3d.,—a much more serious declension; and thus what is known as the balance of trade is apparently very greatly against us. We have, however, after thus roughly indicating the extent of the variation, to ascertain the totals before we can grasp the real bearing of the change, and before we can come at the special feature which has not in the discussion been as yet sufficiently touched.

First, as to our imports. In 1862, the total value of goods we imported was 225,716,976*l.*; and the value rose with comparative regularity until it reached, in 1877, the sum of 393,941,256*l.*, —a very rapid rate of increase. But it is especially noticeable that certain kinds of imports have increased in far more than the general rates: thus, the butter imports are doubled, cheese is trebled, eggs are fourfold in value, wrought or manufactured iron and steel goods are sevenfold, and refined sugar is eight times what it was seventeen years ago. Whilst there has been this large increase in the general imports, let us see how it has fared with the exports. First, as to exports of British and Irish produce:—In 1862, the value of this produce exported was 123,992,264*l.*, and by the end of 1872 it had risen to 256,257,347*l.*; but it has since fallen, until last year the amount was 198,731,073*l.*, so that it is at once evident that the increase in the value of the exports is not so great in the sixteen years as is that of the increase in the value of the imports. In regard to the colonial and foreign merchandise exported, it may be said that, in 1861, it was 42,175,870*l.* in value, and it rose and fell, reaching the highest value in 1871, when the amount was 60,508,538*l.*, and falling off some 3,000,000*l.* since that year. Returning to the British and Irish goods exported, it may be said that the details prove that the beer and ale exports have the average increase, as have also the larger items of cotton manufactures, steam-engines, and iron and steel goods as a whole, silk manufactures, and woollen and worsted manufactures. Our coal exports, machinery (other than steam-engines), cotton-yarn, jute manufactures, and one or two other classes of goods have increased in much more than the general proportion; but the linen manufactures, as a whole, have been stationary, and in some of our lesser manufactures there is a decrease in the exports. Although we imported goods to the value of 393,941,256*l.* last year, and our exports of British and Irish goods were only 256,257,347*l.*, it does not follow that the whole of the balance is against us. Adding to the latter sum the value of the foreign and colonial goods exported, we have still a difference of about 80,000,000*l.* against us; that is to say, we import goods to the value of 80,000,000*l.* more than we export. But it does not follow that we pay the balance in money. There is a difference in the value declarable of exports and imports which reduces the balance in some degree; for, on the one hand, the freight is added to the cost of the goods, on the other it is not, and as the bulk of the trade is in British hands, those freightage charges are chiefly paid to our shipowners, and the amount, and that for services in a similar method rendered abroad, with the interest on occasional loans to foreign States, paid in kind, must very seriously reduce the balance. But the fact remains that that balance has increased during the last few years, and it is this fact which is the most striking, and which has suggested the jeremiads that we are now beginning to live upon our capital.

There is another fact which is most suggestive, and it is that of some of the manufactured goods our imports are increasing whilst our exports are decreasing. In the last three years the value of our writing and printing paper exports has declined, whilst the value of the imports of that class has increased. Similarly our exports of iron and steel have fallen off in value, whilst our much smaller imports have increased in the same period. The same statement holds good in relation to glass, to cotton manufactures, and to one or two other kinds of goods; and though the extent and significance of these facts may be over-estimated, they may also be under-estimated. It is evident that we have now to meet with a growing competition in manufactures, and that this will in some considerable degree alter the conditions of our export and import trades in the future. We are often beaten on our own ground by some neighbouring nations in the cheap production of certain classes of iron goods; in glass some nations deliver their productions here cheaper than our makers can make them; and there is apparently setting in a considerable demand for some kinds of American hardware and ironmongery goods in preference to our home manufactures. It is true that in the present year there has been a step in the right direction to meet this growing competition by a tolerably-general reduction of the cost of production, whilst some attempts are in progress to improve the product. Concurrently with these it is satisfactory to notice that the value of our exports is beginning to show signs of an increase, and that the value of the imports does not increase in like ratio. On the contrary, it is more than possible that the imports will decrease in value, for we have been paying very largely increased sums for wheat and bread stuffs, in consequence of deficient harvests and of the war panic. Whatever may be the ultimate upshot of the political uncertainty, it seems probable that there will be a more abundant harvest, and to the extent to which this is the case we may find a falling off in the value of the imports, and the balance will be lessened against us by the double process alluded to. But it cannot be too often remembered that we need to meet a growing competition, and that the efforts of both employers and employed will be needed to enable us to meet it as successfully now as in the past. The cost of production must be further reduced wherever possible, and the processes must be so amended as to improve the product, if Britain is to continue to be as much of a producing nation as now, instead of one which would be something more like a warehouse.

WATERWORKS FOR SMALL TOWNS.

WINSFORD.

ABOUT three years ago the attention of the Local Board of Winsford was drawn to the then existing water supply of their district, which was both defective in quality and deficient in quantity, and a scheme was proposed to take the water from some springs at the source of Shaw's-lane Brook. This scheme was approved of by the Local Government Board, and the works are now completed.

The springs are about three-quarters of a mile from Oak Mere, in Delamere Forest, and at about 30 ft. lower level. From their steady yield all the year round, and from the fact that the Mere has no outfall, there can be little doubt but that the water percolates through the ground and comes from this source. The land between the Mere and the springs is composed principally of sand, and therefore forms a natural filter. The water is, as Dr. Frankland reported to the Local Government Board, clear, palatable, and wholesome, of most excellent quality for dietetic and domestic use, soft, and therefore well adapted for washing purposes.

The water is conveyed from the uppermost springs, locally known as Stretche's Springs, in a 12 in. earthenware pipe for a distance of 453 yards to the straining frame wells. Near the wells is another spring, known as Austin's Spring, which is at a lower level than Stretche's Springs by 10 ft. An embankment is formed across the valley, forming a small reservoir above; and by a self-acting arrangement this water can be utilised when required. At the present time, however, the uppermost springs are found to yield sufficient for the domestic requirements of the district. The water after passing through the strainers is conveyed into a reservoir, and, by an arrangement of pipes and valves, can be passed round the reservoir into a circular well, and thence to the town. An iron pipe, 10 in. diameter, conveys the water for a distance of three miles and a half to the town.

During the construction of the works great difficulty was experienced with springs, and it was found necessary to puddle the whole of the bottom of the reservoir.

The greater portion of the district is supplied by gravitation; but for the higher section along Over the water has to be lifted 60 ft. by steam power into a wrought-iron tank built on the top of a tower.

The length of the main is 14¼ miles, and the total cost of the works has been about 17,000*l.*

The contractors for the several works were,—Mr. C. E. Firmstone for the iron pipes; Mr. George Oakes for unloading the same; the Glenfield Company, Limited, Kilmarnock, for the valves and hydrants; Messrs. John Pickthall & Sons, of Barrow-in-Furness, for the construction of reservoirs and laying mains; Messrs. Ashworth, Brothers, of Manchester, fer engine, boiler, and tank; Mr. John Price, of Winsford, for building tower, engine-house, chimney, mechanics' shop, and service reservoir; Mr. Alfred Webb, of Belfast, for iron fencing; and Mr. John Lightfoot, jun., of Winsford, for fixing the same.

The works were designed and carried out by Mr. Henry Bancroft, civil engineer, of Manchester.

TECHNICAL EDUCATION AND THE CITY GUILDS.

AT the meeting of the Court of Common Council on the 16th inst., a letter was read from Mr. John Watney, Mr. W. Phillips Sawyer, and Mr. Owen Roberts, the joint honorary secretaries of a committee of livery companies, enclosing copy of a lengthy report on the best mode of applying the funds which the Corporation and the companies might be willing to contribute towards the extension and improvement of technical education, and stating that the committee trust the Court will give its adhesion to the report, and nominate representatives on the Board of Governors. The committee stated that they had consulted a number of men of high standing and varied pursuits as to their views on technical education, and had received reports from Sir W. G. Armstrong, Mr. G. T. C. Bartley, Lieut.-Colonel Donnelly, Capt. Douglas Galton, Professor Huxley, and Mr. H. Trueman Wood. The committee recommended generally that they should not "teach the workman to be more expert in his handicraft, as in their judgment this form of improvement is one which must be derived from greater assiduity in the workshop" . . . . "but they advise that the direction to be pursued in improving technical education should be one which will give to those employed in manufactures the knowledge of the scientific or artistic principles upon which the particular manufacture may depend." In the judgment of the executive committee, the desired ends can best be attained by means of a central institution, and by means of local trade schools. They recommend the establishment, in some convenient locality, of a central institution for more advanced instruction, to supply competent teachers for the local trade schools. It was believed that it would be well to trust to residents in the localities where these schools are most needed to establish them, as the committee thought the object of the companies might best be attained by affording aid to such local effort; but should the assistance thus given not form a sufficient inducement to secure the establishment of suitable trade schools, the executive committee would recommend that the establishment of at least two such schools, to serve as models for others, should be undertaken by the companies. Temporary buildings might be secured for the purposes of the scheme until it was ascertained how it progressed. The committee were advised that the course of studies at the central institution should embrace applied physics, applied chemistry, applied mechanics, and an applied art department. Provision was made for a representative government of the institution by those contributing to its expense. The committee trusted that the livery companies would contribute a sum of not less than 20,000*l.* per annum. Conditionally, several companies had promised sums amounting in the aggregate to 11,580*l.*, and other companies had promised assistance, without yet defining the amount.

It was resolved that the letter and the scheme should be printed, and a copy sent to every member of the Court.

CONGRESS ON NATIONAL WATER SUPPLY.

SOCIETY OF ARTS.

A CONGRESS to discuss the question of a comprehensive scheme of national water supply, "with a view to the consideration of how far the great natural resources of the kingdom might, by a large and comprehensive scheme of a national character, adapted to the varying specialities and wants of districts, be turned to account, for the benefit, not merely of a few centres of population, but for the advantage of the general body of the nation at large," as suggested in the letter * of H.R.H. the Prince of Wales, president of the Society of Arts, was held in the hall of the Society, Adelphi, on Tuesday and Wednesday.

Tuesday's proceedings were devoted to papers and discussions on (1) the great natural water resources of the kingdom; and (2) how they can best be utilised and economised for the supply of large towns, small towns, and country places; while Wednesday's proceedings were principally devoted to the supply of water to London.

Sir Henry Cole, who occupied the chair in the unavoidable absence of the appointed chairman, Sir Ughtred Kay-Shuttleworth, M.P., in opening the proceedings said the suggestion contained in the letter of the Prince of Wales was of great national importance; in fact, it was hardly possible to overrate it. The people of the country were as much entitled to pure water as to pure air, and this, no doubt, could be obtained if the Government were to appoint an authority for obtaining a supply for the whole of the country. He would not go into detail, but no doubt engineers would be able to devise a scheme for dividing the country into districts, whereby the object would be attained, and even if 100 or 200 millions were expended, it could be obtained at a moderate interest with a Government guarantee, and they would not only be repaid commercially, but more than repaid economically in the improved health of the country.

Mr. G. J. Symons submitted a paper which he thus epitomised:—

1. The quantity of rain falling cannot be increased.
2. The population is doubling about every twenty-five years
3. The larger the population the more water will be fouled
4. There will, therefore, be less clean water in future years, and yet there will be two, three, or four times the population even within a century.
5. Entirely new arrangements will, therefore, be necessary.
6. It would have been much better if the entire administration of streams was under a single direction, which should see to all questions of drainage, sewerage, canalisation, motive power, and water supply.
7. Such new works as are required promptly should only be authorised subject to their reverting to Government in fifty or a hundred years.
8. All other hydraulic works should be undertaken, or at all events supervised, by a Government department, so as to insure the greatest possible public benefit, and not merely that of an individual town.
9. These objects will be best obtained, and a very large national saving will be effected, by gradually organising an hydraulic department, resembling as much as possible that of the Ponts et Chaussées, with a training school attached fitted with laboratories, &c., like that at Paris. There is no reason why such a department should not confer upon England advantages equal to those which the similar office has conferred upon France. Are we too proud to learn from our neighbours?

"What the difficulty is, what has been done to meet it, and what remains to be done," were the topics dealt with in a paper by Mr. Joseph Lucas, F.G.S. On the last head of his subject he said:—

"In my humble judgment, a supplementary measure, providing for the formation of a national survey of the sources of water-supply, would act as a motive-power to set existing machinery in motion, and thus facilitate the acquisition of water under the provisions of the Acts of Parliament that already exist.

The sources of water-supply are of two kinds, viz., surface and subterranean, which correspond broadly with impervious and permeable strata. Except in the case of tank-storage, all water-supply is derived directly from one or the other, in view of which consideration I was led some years ago to apply the name of 'hydrogeology' to this now accredited branch of scientific inquiry.

Hydrogeology takes up the history of rain-water from the time that it touches the soil, and follows it through the various rocks which it subsequently percolates.

A hydrogeological survey investigates all the conditions under which it exists in its passage, both above and below ground, from the rainfall to the sea.

In respect of surface basins, or impervious surfaces, the tributary valleys, whose united contributions go to form the large floods in the main valleys, contain natural sites for reservoirs, naturally boggy, sometimes drained, but occasionally converted into large ponds. A series of dams constructed on these sites, on a comprehensive system, and with regard to all the interests involved, would form good retarding mediums for the down-hill flow of flood-waters, and also afford provision for the requirements of upland rural districts during periods of drought.

In view of these considerations, it forms part of a hydrogeological survey to map all these sites, the utilisation of which as store reservoirs for water-supply would prove a great national advantage.

Many years' experience in the field has convinced me that the multiplication of moderate-sized dams, on sites such as those indicated, which are fairly plentifully distributed, would provide an abundant supply of water, mainly or wholly spring water, to large districts now distressed for want of the same. For these reasons I hold that it is part of the scheme of the survey to provide information as to the geological suitability of reservoir sites, viewed broadly.

Again, while the flood-waters are being shed from impervious surfaces, their equivalent is filtered down into the subterranean reservoirs contained in the permeable strata.

Thus is generated a series of water systems, on which probably two-thirds of the area of England are dependent for their water-supply. For this reason, as long ago as the year 1872, it appeared to me a matter of paramount importance that the form and position of these subterranean accumulations of water should be known. I therefore undertook, as opportunity offered, during the years 1873, 1874, and 1875, a series of observations on the chalk water system. Since January, 1876, I have devoted my whole time to the conduct of my survey, and have surveyed about 800 square miles in the Thames basin and the major portion of the county of Hampshire. . . . .

I am of opinion, therefore, that a national survey of the water-bearing strata is the measure that would best serve the present requirements of the country in general. It is an essential forerunner to the execution of any scheme of a constructive or legislative kind, and even, in my opinion, to the successful framing of such. Government would best minister to this popular want by investigating and providing the necessary data, alike to the landowner, the ratepayer, and the engineer, which no interested party can be expected to undertake on a comprehensive scale.

I give it as the result of my experience that the publication of the maps and tables of observations made by the survey would provide fresh food for engineering science, act as a stimulus to engineering enterprise, and promote engineering work. This step would leave the hands of the Government free to adopt in the future any legislative measure that might arise out of the survey, while the engineer would also be left free and untrammelled, as now, save that instead of fragmentary evidence to work upon, he would have a uniform and comprehensive survey, and a map in which the hydrogeology of wide tracts of country are brought well under the eye."

The Rev. J. C. Clutterbuck, in his paper, remarked that,—

"The mere fact of the existence of the difficulties surrounding the question seems to point to the necessity of a more extended and practical knowledge of the whole subject of the water economy of the country. The ordinary officers of the Health Acts have little, if any, scientific knowledge of the question. Most ruinous failures, especially in boring for water without sufficient geological or hydrogeological knowledge even of the most elementary character, show that the present condition of the science,—for science it really is,—will not warrant any attempt at a large and comprehensive scheme, as suggested by the letter of the Prince of Wales. The extent of water-supply, which be it remembered, has its limits, and varies with times and seasons, must be more accurately ascertained. The rainfall by Mr. Symons and some others even yet requires further investigation and practical knowledge. There is a great and growing disposition, especially in and about the neighbourhood of London, to tamper with subterranean water, involving the danger of decreasing the volume of that which, under natural circumstances, flows in a more or less perennial form above ground, and ultimately diminishing the subterranean supply. Moreover, the present laws by which the interests of subterranean water are ruled cannot be deemed satisfactory, or likely to lead to economy, which year by year is of greater importance. It is manifestly difficult to suggest any scheme by which increased and trustworthy knowledge of the great water question can be secured; that there is much to learn is manifest. The neighbourhood of London and its chalk basin have of late found a most industrious investigator in Mr. Joseph Lucas. Encouragement should, at any rate, be given to all such attempts at hydrogeological study, and it may be, as facts and information on this all-important subject are obtained and recorded, the great and good object of the Prince of Wales's letter may find its fulfilment and reward."

Mr. F. R. Conder, C.E., followed with a paper, of which we give the practical conclusion:—

"The problem now before us is that of the collection and distribution, in a pure condition, of less than one per cent. of the rainfall of England.

This is not a problem of great inherent difficulty, if the proper course be taken for its solution. The first indispensable step is the collection of the hydrological data. There is not a single river in our island as to which we are in a position accurately to strike the balance between the rainfall over its basin, and the escape of the amount by evaporation, by sub-aerial, and by subterranean discharge. Any works attempted in ignorance of the hydrography of the district in which they occur, tend to complicate the general problem. It is impossible to separate the question of water-supply from that of drainage, for this reason. Every ton of water brought into a town or house has to be removed when its work is done. Thus water-supply and drainage are as closely related as are concave and convex. Not only are the constructors of works carried on in partial or total ignorance of the general hydrography of a district likely to neglect natural resources, but they may inflict irreparable injury on other districts.

Thus we see, at the moment when the wants of the rural districts are so great as to have attracted the attention of H.R.H. the Prince of Wales, schemes of alarming magnitude proposed in entire ignorance of the main controlling facts. It has been proposed to decant into the valley of the Thames the head waters of the Colne, the Wye, the Severn, the Dove, and the Eden. The natural sources of supply that exist on the right bank of the Thames are, in the mean time, left without investigation. The grave consequences of the wholesale contamination of the Thames by the Metropolitan Board of Works are beginning to excite anxiety (as anticipated by the present writer in 1875). At Carnarvon, Hastings, Margate, Brighton, Glasgow, and other places, the construction of what are called sanitary works are creating intolerable nuisances, perilous to human life. The unregulated action of a host of incompetent local authorities is rapidly tending to render parts of the country uninhabitable, and to convert an engineering question originally simple, into one of invincible difficulty. Such is the natural result of the commencement of numerous hydraulic works without the previous completion of a hydrographic survey.

In what manner existing information can be most readily collected, existing machinery made most available, and the great national need for information most promptly supplied, in accordance with our usual mode of conducting business, I am prepared to indicate if desired. The subject is one as to which we can ill afford to make any more mistakes."

Dr. Gilbert W. Child, of Oxford, contributed a paper, in which he said that:—

"In any scheme whatsoever for the purpose of supplying the population of the country with water—if it is ever to get beyond the region of mere theory—the first principle must be that the supply shall be provided *at the lowest possible money cost* consistent with securing sufficient quantity and adequate purity. This principle at once excludes the idea, which the phrase 'a large and comprehensive scheme' appears to some persons to suggest—of the selection of some one vast source of supply, and its distribution by means of a gigantic system of mechanical arrangements over the whole country. It is simply inconceivable that villages situated, *e.g.*, on the lias or oolite formations, abounding in streams and springs of wholesome water; others on the dead flat of the Oxford clay, whence no water can be extracted fit for use, and where only an occasional stream rising in some more favoured district flows slowly across the surface, and others again high upon the chalk of the Chiltern Hills, where you may go for miles together without seeing a stream, and may bore 400 ft. before you come to water, can all be *economically* supplied by the same means, or from the same source.

I conclude, therefore, that the phrase in question is intended to apply, not so much to the mechanical means by which a water-supply is to be obtained, as to the legislative and administrative machinery whereby we may insure that the population,—more particularly that portion of it which inhabits the small towns and rural districts,—shall all be supplied with wholesome and drinkable water, by whatsoever means may be shown to be most practicable in each separate district. . . . .

The elementary principles upon which any great general improvement in the water supply of this country can be inaugurated are two, viz.:—

(1.) A moderate re-organisation of the machinery of local government; and

(2.) In the carrying out of the actual work required, due regard, before all other considerations, to the physical conformation, and the geological characters of each district which has to be supplied."

Mr. W. Shelford, in his paper, remarked that:—

"Want of good water is widespread. It is greatest in the smaller towns, villages, and country districts, where the cost of works for a systematic supply would be too great a burden, even if the population were disposed to construct them for the utilisation of the nearest local source.

The alternative which naturally suggests itself to the mind of an engineer, viz., the creation of one or more great national sources of supply in mountainous and lake districts, supplemented by pumping from the chalk, sandstone, and suitable strata, and distributed through the country by arterial aqueducts, with ramifications by pipes into every village, may be dismissed for the following reasons:—1st. On account of the cost. 2nd. Because of the difficulty of constructing the works to suit the ever varying specialities and wants of districts. 3rd. Because it has not yet been shown to be either necessary or practicable; and, 4th. By reason of the great difficulty of propelling such a scheme with the negative policy of the British Government, even if the combination of the various towns having existing works, and the apportionment of the taxation, did not prove to be insuperable.

From a constructive point of view, the aim should be simplicity rather than grandeur. The works should vary according to the locality, its physical resources and conditions, its means and wants, and should be regulated by and subordinate to a well-organised administration.

In so far as the water supply of the country is dependent upon streams and rivers (and they are naturally its principal sources), its present want results from the abuse of the streams; but the interests which they serve in the carriage of refuse are too great to admit of the possibility of their complete purification.

Hence the problem for the engineer to solve is, how to supply the poorer and more scattered populations, whilst not diminishing the carrying capacity of the streams; or, in other words, how to provide good water without interference with the foul water.

The key to this problem consists in the separation and collection of sufficient good water at its source, and its conveyance by separate channels or conduits along the valleys, so as to restore to the populations one of their most important amenities."

Mr. C. E. De Rance, of H. M. Geological Survey, submitted a paper accompanied by a table in which were embodied approximate calculations of the area occupied by the different geological formations in each group of river basins, the extent and areas of which he had taken from the Catchment Basin map published by the Ordnance Survey. From this table it appears that,—

"An area of nearly 12,000 square miles in England and Wales is occupied by the more ancient palæozoic rocks, receiving the heaviest rainfall experienced by this country, ranging from 40 in. to more than 75 in., and even up to 130 in. per annum, which is yielded in springs and streams, which the analyses of the Rivers Pollution Commissioners show, have a remarkable freedom from organic impurity, and in a condition of great softness.

The large bodies of water that annually run off the mountains of the lake district and central Wales belong to this class, and, as far as human consumption is concerned, on a large scale, are wholly lost and wasted. From the excessingly impermeable nature of the ground, and its steep declivity, the rainfall flows off at once as floods; the dry weather flow of streams of such districts, according to Mr. Bateman, amounting only to one-fourth to three-fourths of a foot per second from each 1,000 acres drained, against 200 to 500 cubic feet per second in time of flood.

The 10,000 square miles of carboniferous rocks, though supplying large volumes from the *Gorsedale* and *Millstone Grits*, is the reservoirs supplying Manchester, Liverpool, Bolton, Preston, Blackburn, and numerous towns in York-

* Mentioned in the *Builder*, p. 196, *ante*, and commented upon, pp. 203-204.

shire, have still a large residue available for use in gravitation schemes.

Over a large portion of the 8,000 to 9,000 square miles, occupied by the *Permian* and *Trias*, not less than 10 in. of rainfall are annually absorbed, capable of yielding a volume of 400,000 gallons a day. These important water-bearing formations, though penetrated by a large number of wells, some yielding two to three millions of gallons per day, have still immense water-bearing resources, in a district of which a large portion is densely populated.

The *Oolites* absorb a large quantity of water, which they yield up in springs of great importance and value, especially if the large quantity of water they give off after heavy rainfalls were stored, as the water now given off is of great purity, but is almost always polluted in streams before it is made available for consumption.

The *Greensands* and the *Bagshot Sands* are in some districts of local importance, and might be included in any general scheme that divided the country up into districts for the purpose of collecting springs or sinking wells for water-supply.

The vast area of the *Chalk* receives over a part of its exposure probably not less than 5 in. of rainfall annually percolating into its mass; but in some portions of its area, in the eastern counties, it is so overlaid by boulder-clay of an impermeable nature, and in the southern counties by clay, with flints, that probably the percolation is much smaller. The dry-weather flow of its streams being dependent on this percolated water, it would probably not be safe to count on more than 2 in. of rainfall per square mile per year, or 80,000 gallons per day, as capable of being yielded in wells, without interfering with the drainage of the country, but a large number of springs might, with great advantage, be utilised, that are now running to waste, which remark applies generally to the springs that are lost in all parts of the country in various geological formations. Many of them occur in railway cuttings and tunnels, where they might easily be collected, and carried by means of pipes along the line to various country stations that the railways pass through. A suggestion of this nature has already been made, I believe, by Mr. Mott, of the Great Western Railway, to his brother directors.

No one scheme or method of water-supply can be recommended for the country; for even in one water-basin a gravitation scheme may be best for one portion of the area, and a pumping scheme from wells in another.

Each district requiring special and personal study, it is to be hoped that the Local Government Board may become a department of public health, with a staff of officers ready to give each district individual attention, and rescue them from the ills they now experience."

Dr. John Evans, F.R.S., presented a paper, in which he discussed the relation of the water-supply of any given locality with the geological features of the district, and then proceeded to refer to the following questions, viz.:— (1) The right which centres of population, whether large or small, have to acquire the water necessary for their use, when by so doing the interests of others are affected; and (2) the equitable method of meeting the cost of obtaining the supply. He remarked that,—

"With regard to the first question, it would appear that the principle should be maintained that each town should draw its supply within the watershed on which it is situated, and, only under most exceptional circumstances, be allowed to go beyond it. As to interference with existing rights, the law is fairly clear in the case of streams running above ground; but with regard to underground waters, and streams running through districts, the subsoil of which is readily permeable, the law, as at present interpreted, operates in the most inequitable manner. Although, if water be pumped directly from a stream, those at a lower in it are entitled to compensation; yet, if the whole stream were indirectly pumped dry by means of wells placed along its banks, so as to convert the porous bed of the stream into a mere filter, no action would lie for the damage. A legal recognition of rights existing in underground waters, where they follow natural laws as well ascertained as if they flowed above ground, ought certainly to be accorded if law and reason are to go hand in hand, and would turn away some of the opposition now raised to schemes for utilising such waters.

With regard to the incidence of the cost of waterworks, it will usually be found that, in the larger towns, the supply of water will be sufficiently remunerative for it to be undertaken by private enterprise, or by the local authorities, or, at all events, without having recourse to what must be regarded as a charitable rate. But, in the smaller towns, and in country parishes, the conditions are often totally different. The position of nearly all our small towns and villages has been determined by the existence, upon the spot, of a more or less abundant supply of water. In many instances, this is derived from shallow wells, which, owing to the neglect of proper drainage and sanitary precautions, have become dangerously polluted. In such cases, where it is quality rather than quantity which is defective, it is, perhaps, drainage rather than water-supply which ought to be studied. In other cases, where from local causes the population has increased beyond the water-supply, new sources will have to be sought; and here the question as to who should bear the cost requires careful consideration. If those who built houses in situations where no proper water-supply existed were made responsible for obtaining the necessary water, no one could in fairness object; but the system at present pursued of calling upon a district or even a whole parish to be rated for the supply of water to a new colony of houses erected by some building speculator is manifestly unjust. No wonder that those who live, it may be, miles away, though in the same parish, and those against whose will the new houses have been erected, without which the old water-supply would have sufficed, object to such claims upon their purse."

Mr. Walter Pierce, president of the Liverpool Land and House-owners' Association, in his paper dealt with the pollution of well and river water by sewage and other impurities, and said that,—

"The system of town and other districts having the control and direction of the water-supply has been useful in the past. But the circumstances have so altered, by reason of greatly increased populations, fewer districts to select water from, and very much greater scientific knowledge on sanitary science being now abroad, it is almost a foregone conclusion that the water-supply should be undertaken by the Government for the nation."

He quoted from the Report of the Royal Commission on Water Supply in support of this view.

Lieut.-Col. A. H. Brown, M.P., in a long paper, discussed the question of the state of the water supply to rural districts and small towns, and explained the steps he had taken in his Public Health Act Amendment Bill (which has just passed its third reading in the House of Commons), with the view of remedying some of the evils which exist.

"The Bill proposes that the Sanitary Authority shall take action only on the report of the inspector of nuisances or medical officer of health. The object of this provision is that thereby the responsibility is thrown on those officials who are appointed to watch this important matter; and in another part of the Bill power is given to make such inspection as is necessary to carry out the object.

Where a Sanitary Authority are of opinion that a water-supply ought to be provided, they may give the requisite notices calling upon the owner or occupier to provide a supply for the house, provided (and this is a most important provision) that the cost of providing the supply is not more than a capital sum, the interest of which at 5 per cent. would not exceed 2d. per week. The capital sum would be 8*l.* 13*s.* 4*d.* But where a water-supply is difficult to obtain, and where such a sum would be too small, the power is given to the Local Authority to charge more, provided that the Local Government Board consider it reasonable to do so.

It may be said that the sum above mentioned, 8*l.* 13*s.* 4*d.*, is very small for providing a water-supply for a house, but it must be remembered that if two houses are to be supplied, the amount will be double that sum, and if three houses, then three times that sum; and provision is made in the Bill that a common supply can be made for two or more houses, which I hope will take place in many cases. The evidence shows that the limit of cost in most cases would be sufficient.

The means by which water is to be supplied is not set forth in the Bill, but is left to be settled by the circumstances of each particular case."

A paper sent by Mr. R. Jackson, clerk to the Chorley Improvement Commissioners, was next noticed. The Commissioners, at a recent meeting, unanimously passed the following resolution:—

"That the Clerk be requested to write two letters, one to Mr P. Le Neve Foster, and one to the Right Hon. Lyon Playfair, showing how the present and future supply of water for Chorley admirably illustrates the far-seeing sagacity of the Prince of Wales's letter to the Society of Arts. That whilst Chorley is well situated for manufactures, it has no right to a supply of water from the Liverpool Corporation, except for house-supply. That, as a matter of fact, the Liverpool Corporation does supply, to a certain extent, the water required by some of the manufacturers, but it has reached its limit in that respect, and refused to supply 50,000 gallons per day applied for by a manufacturer. That Liverpool draws a large supply from this neighbourhood, and that the Thirlmere water in its passage to Manchester will pass through or near Chorley, and that the Chorley Commissioners consider it would be only just and reasonable that Chorley should be entitled to claim a *pro rata* supply of water by paying their fair share of the expenses of collecting and supplying the water. If some such arrangement cannot be made, towns such as Chorley must stand still while the large towns grow at their expense."

"In connexion with the foregoing [says Mr. Jackson] I may state that Chorley lies in the neighbourhood of coal-fields, within twenty miles of Manchester, having railway communication with that town and Liverpool, yet it has not progressed as might have been expected, as will be shown by the following figures: In 1831, the population was 9,282; in 1841, 13,139; in 1851, 12,684; in 1861, 15,013; and in 1871, 16,864.

In 1846 an Act was obtained for better supplying with water the town of Chorley by a company, which was bound to provide and keep constantly laid on a supply of pure, wholesome water, sufficient for the domestic use of all the inhabitants of Chorley entitled thereto as therein mentioned, and to provide water for extinguishing fires. A domestic supply did not include water for closets, baths, horses, cattle, carriages, or any trade or business, but the company was empowered to supply water for other than domestic purposes by agreement.

In 1856 the undertaking of the Chorley Waterworks Company became vested in the Corporation of Liverpool, which was bound by Parliamentary enactment, at all times thereafter to afford as ample a supply of water within the Chorley district as the company would have been bound to afford, and to supply water for baths and watered spots at certain rates therein mentioned; also to supply the Chorley Commissioners with a water-supply for flushing sewers, watering streets, and other sanitary purposes.

For trading purposes, other than domestic or sanitary, the inhabitants of Chorley, and the neighbourhood have no security for a water-supply from the Chorley Waterworks, although, from the contiguity of hills, nature has provided such supply."

Mr. George Frederic Wills, of Crewkerne, in a short paper, said,—

"The chief obstacle in the way of obtaining proper water supply is, I believe, the constitution of the local authority. This, in rural districts, is largely, sometimes almost entirely, composed of farmers, who are the chief ratepayers, and whose object naturally is to keep the expenditure as a minimum, as their own pockets suffer most from local rates; and although in sanitary measures land is taxed less heavily than houses, yet it is certain that farmers' houses, and their labourers' cottages, scattered as they are in the country, derive (directly) little, if any, benefit from money expended in sewerage or water supply. They are, therefore, extremely averse to such expenditure, especially as most of them hold their lands on lease, or even yearly agreements, and are, therefore, unlikely to reap advantage from the later and indirect benefits which such sewerage or water supply will probably confer on the district. . . .

Then as to villages and small hamlets. In many districts the sanitary acts are a dead letter. The sewage still follows its old course, permeating the soil, contaminating wells, and not being carried away by any drain or sewer. Out of sixty villages within a few miles of this town I do not know one which properly carries away its sewage. What wonder, then, if fever, diarrhœa, consumption, and other preventible diseases still continue to demand the yearly victims? The sanitary authorities do not interfere, from the reasons I have given; the Local Government Board make no inquiry and receive no information; and the public rest contented so long as none of their own families fall victims. If the Local Government Board would only make it compulsory on sanitary authorities to print and circulate the reports of their medical officers, a wonderful change would be effected by the information such reports would give."

Wednesday's sitting of the Conference was, as already stated, chiefly devoted to the discussion of the question as affecting London; but the following general resolution was moved by Dr. Wright, Medical Officer of Health for Cheltenham, seconded by Mr. F. R. Conder, C.E., and unanimously agreed to, viz.:—

"That this Congress desires to urge upon her Majesty's Government the importance of taking steps, with the least possible delay, to appoint a small permanent Commission, to investigate and collect, for the information of the public, the facts connected with water supply in the various districts throughout the United Kingdom, in order to facilitate the utilisation of the national sources of water supply, for the benefit of the country as a whole, as suggested by his Royal Highness the Prince of Wales, the President of the Society of Arts, and recommends that the Council of the Society of Arts be requested to ask the Earl of Beaconsfield to receive a deputation to present the resolution and advocate its adoption."

We shall continue our report next week.

OAK OR CHESTNUT?

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute on Monday evening last, Mr. Charles Barry, F.S.A., president, in the chair,

Mr. W. H. White, secretary, formally announced the decease of Mr. Henry Baker, Fellow. This event was mentioned in the *Builder* for May 4th (p. 451, *ante*).

The recommendations for membership included the names of Mr. W. Calder Marshall, R.A., and Sir Richard Wallace, who seek to become Honorary Associates.

The following gentlemen were balloted for and duly elected, viz.:—As Fellows: Mr. Robert A. Bryden, Glasgow, and Mr. Cornelius Sherlock, Liverpool. As Associates: Mr. Josiah Conder, of the Imperial College of Engineering, Tokio, Japan; Mr. Neil Macara, Darlington; Mr. R. C. Page, of Buckingham-street, Strand; Mr. William Paice, of Henrietta-street, W.C.; and Mr. Sydney Turner, of Mark-lane. As Honorary Associates: Sir Edmund Beckett, Q.C., and Sir James Ramsden, C.E.

The President read a letter which he had received from H.R.H. the Prince of Wales, asking him to act as honorary juror in Class IV., Architectural Drawings and Models, in the Paris Exhibition. As he regarded this as a complimentary recognition of the Institute, he had accepted the position.

Professor Donaldson moved, and Professor T. Hayter Lewis seconded, a vote of thanks to the President for accepting the position.

Several donations to the library were announced, including a new work by Mr. John Pennethorne (brother of the late Sir James Pennethorne) on Greek architecture.

Professor Donaldson spoke of the profoundness of the work, to which the author had devoted a great many years of thought and labour. He moved a special vote of thanks to him for kindly presenting a copy of his valuable work to the Institute.

Mr. Penrose, in seconding the motion, said he had not yet had time to give more than a cursory glance at the work, but he was satisfied that Mr. Pennethorne was the discoverer of the horizontal curves of the Parthenon and other temples of Athens, and therefore anything he had to say was likely to be of great importance and authority. In fact, in the investigations he (Mr. Penrose) had to make, he had to follow Mr. Pennethorne's steps.

The motion having been carried,

The President requested those members who were desirous of being present at the Institute dinner on the 4th prox. to make application for tickets before the 31st of May. It was hoped that on that occasion there would be an unusually large gathering of Fellows, Associates, and Honorary Associates.

Professor Donaldson called attention to the Premises Improvement Fund, and said it was desirable that those who had not yet subscribed should do so at once. As a considerable sum was still required, owing to the necessary works being more extensive than was at first anticipated, he, as a subscriber of ten guineas, would be happy to double his subscription if each subscriber of a like sum would do the same.

Mr. H. H. Statham asked whether the scheme of alterations had been decided upon.

The President replied in the negative, and said that after the close of the Conference, it was intended to call an early special meeting to discuss the subject.

Before the discussion on his paper* commenced, Mr. Blashill said he had brought forward the question on practical and not on archæological grounds. He had mentioned in his paper that a painter's palette of what he said was oak was exhibited in the museum in Kew Gardens as being of Spanish chestnut, from an old beam in Windsor Castle. He had the pleasure of saying that he had induced Mr. Jackson, the curator of the museum, to bring the palette with him to the meeting, and no doubt he would say a few words on the subject.

Mr. Thomas Morris quoted from Tredgold and Loudon with the view of distinguishing between the varieties of English oak. There were two leading varieties, and two only, viz., *Quercus robur*, and *Quercus sessiliflora*. The first had its flowers and fruit at the end of foot-stalks, and had a fine silver grain, well shown in radial section, but lost in tangential cuttings. In the *sessiliflora* the flowers and fruit were, on the contrary, seated close to the wood, without the intervention of foot-stalks. Besides this external variation, the wood of the last named tree was darker, heavier, harder, and more elastic than that afforded by the *Quercus robur*, but it warped very much in seasoning, and was difficult to work. The *sessiliflora* was a denizen of the North of England, although sometimes found in the neighbourhood of London and elsewhere. Loudon, in his Encyclopædia, said that the name of "chestnut-oak" was given to this species because its wood was supposed by some to resemble that of the chestnut. Tredgold, again, said that the qualities of different species of timber must have been well understood by the Gothic builders of this country, for in the roof-beams of most of their buildings we found a very superior kind of oak, which closely resembled, and was often mistaken for, chestnut.

Mr. William White, F.S.A., said he believed there was good authority for saying that there was a third variety of oak, very hard in texture, and now almost extinct in England, which was in reality the oak of the Middle Ages.

Mr. Wyatt Papworth said this was a subject which he brought before the Institute in a paper many years ago,† and he was glad that the views he then advanced had been substantiated by Mr. Blashill. As to the test of weight, Mr. Blashill had stated that he found oak to weigh 43½ lb. per cubic foot, and chestnut, 33 lb., and in these figures he differed from Tredgold, who spoke of dry oak as weighing from 50 lb. to 53 lb. the cubic foot, while he put chestnut down as weighing from 34 lb. to 38 lb. He thought, however, that in spite of these discrepancies, the weight-test was a fairly good one, as the difference between the weight of oak and chestnut was very marked. About thirty years ago, a paper on the restoration of Greensted Church was read before the Institute, by Mr. T. H. Wyatt. The church, one of the oldest in England, has its nave formed of timbers which were stated by Mr. Wyatt to be of oak, but it had lately been stated that they were of chestnut. He had written to Mr. Wyatt and to the rector, but without clearing up the point. Mr. Papworth then quoted from the *Builder* for November 10th last the following lines from a paper read by the Rev. Canon Gee, read before the Watford Natural History Society:—

"Much of the oldest oak timber in this country is not of the same kind as that now in use. What we call oak timber now is the wood of the *Quercus pedunculata*. This has its fruit stalked and its leaves sessile. The other oak, the *Quercus sessiliflora*, has its fruit sessile and its leaves stalked. This latter is the oak which furnishes timber to some of our oldest buildings,—to St. Alban's Abbey and to Westminster Hall. The old wood is so unlike our modern oak timber in the absence or indistinctiveness of the silver grain, that it was long considered to be chestnut. . . . . At the Hospital of St. Cross, near Winchester, is some oak of a very singular dark grain,—commonly attributed to the way in which the wood was cut. The extreme length of each plank was only 5 ft., and it might all have been cut crossways."

Michaux, in his "North American Sylva" (1819) speaks of American chestnut as being strong and elastic and capable of enduring successive changes of dryness and moisture. In France chestnut was, according to Mr. Blashill, very largely used for timbers of buildings, but

* "The Question of Oak or Chestnut in Old Timber Roofs." See *Builder*, p. 490, *ante*.

† See *Builder*, vol. xvi., pp. 496, 528.

M. Viollet-le-Duc said he had not found any chestnut timber at all in Mediæval buildings.

Mr. F. P. Cockerell read the substance of some letters he had received from foreign members on the subject. M. Revoil, of Nismes, said he considered oak to be preferable to chestnut for all kinds of carpentry and joiners' work; and after oak, walnut, and then white poplar. Chestnut, he said, was never used in France for important roofs; oak would always be preferred. Burgundian and Norwegian fir were often used where oak would be too costly.

Mr. G. H. Birch said that in some parts of Brittany, the rafters and smaller timbers generally of roofs were frequently of chestnut.

Mr. Jackson, curator of the museum in Kew Gardens, said that there were three species of oak,—*Quercus robur*, *Quercus sessiliflora*, and *Quercus pedunculata*; but these three forms were now all placed by botanists under one species, and were all considered to be species of *Quercus robur*, there not being sufficient distinction between them to enable them to be regarded as separate species. As to the quality of the woods produced by the three trees, one ran very much into the other. He agreed with Mr. Blashill in thinking that the palette referred to was of oak. The American chestnut referred to was an entirely different species to the *Castanea vesca*, or European chestnut. True chestnut gave no silver grain. He knew nothing about such a wood as "chestnut oak." The chestnut was not indigenous to this country.

Mr. Armitage, R.A., said he had all his life studied entomology, and it was perfectly well known to entomologists that of all woods chestnut was freer from the ravages of insects than any other; in fact, there was only one species of beetle that ever attacked it. On the other hand, oak was attacked by myriads of all kinds of beetles and weevils. These facts might be of interest in considering the subject.

Mr. Blashill, in replying on the discussion, said he believed that the number of insects which fed upon oak was as nearly as possible two hundred.

Mr. T. Chatfeild Clarke then read a paper on "Popular Criticism as applied to the Architectural Profession," the substance of which, and of the discussion thereon, we give elsewhere.

THE NEW COURT THEATRE, DRESDEN.

At the commencement of the present year the opening of the new theatre in Dresden, mentioned by us at the time, was celebrated by a grand performance of Goethe's "Iphigenia in Tauris," at which representatives, not only of every German capital, but of most European countries, were present to testify to the interest which was felt far and near in the event of the day. The assistance of so many well-known friends and professors of native and foreign art was a compliment which this resuscitated temple of the Muses well deserved, as the particulars we are about to give of it will suffice to show.

The old Court Theatre, itself a fine structure, was totally destroyed by fire in the year 1869. As this was a State institution, it fell to the Saxon Government to replace it. Like most German Governments, they went very deliberately to work, and after a considerable interval they resolved not to rebuild the theatre on the old plan, but to construct a new edifice which should embody a number of improvements. The chief architect of the new theatre is Dr. Gottfried Semper, who holds an official position as *Oberbaurath*, or Superior Consulting Architect to the Saxon Government. The practical execution of the plans was, however, superintended by Herr Manfred Semper, an architect, and son of Dr. Semper.

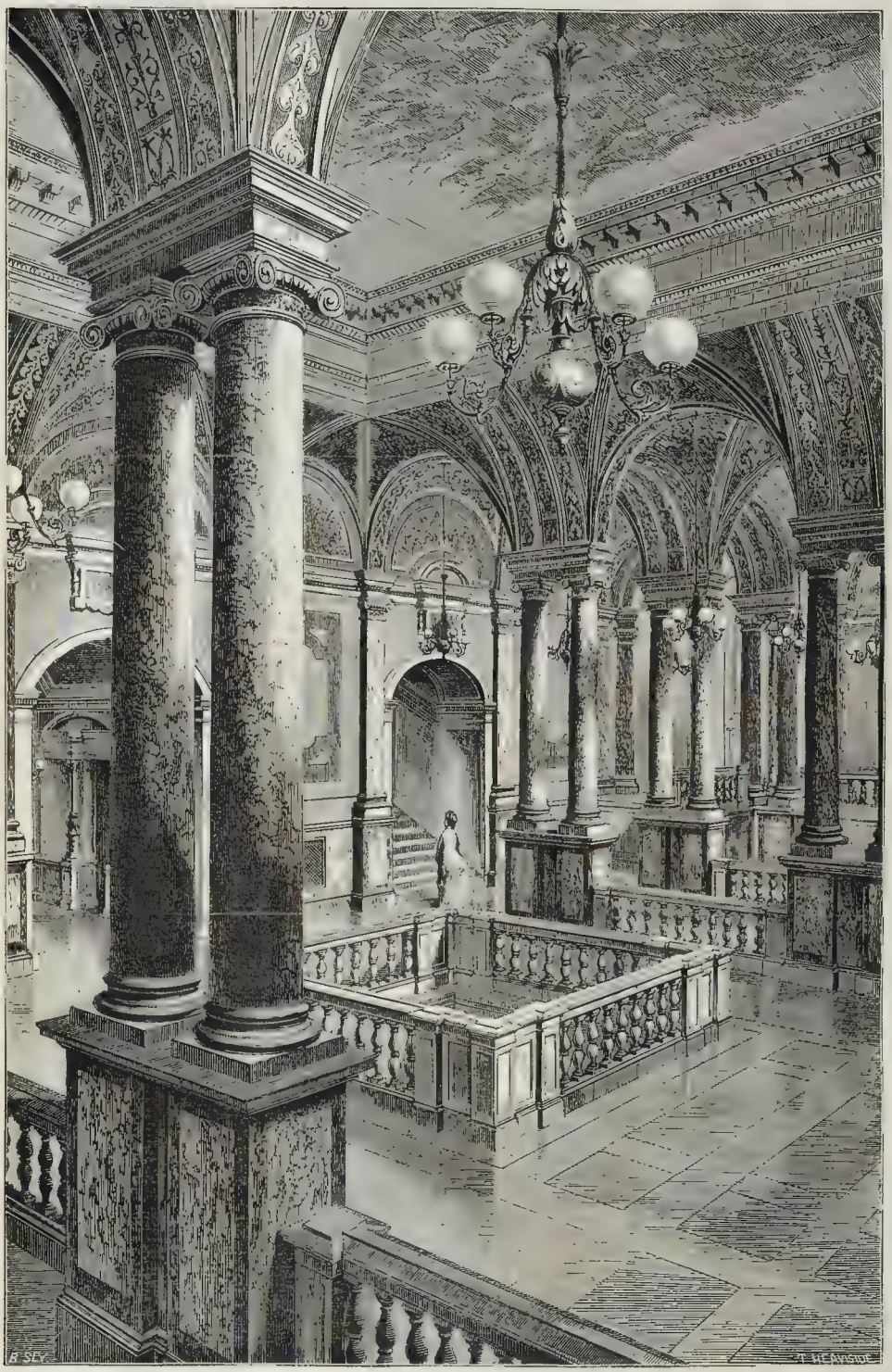
The site of the new building, the same as that of the old theatre, is a very advantageous one, being on the Theatre Square, opposite the Catholic Church of the Court, and near the banks of the river Elbe. The general effect of the exterior of the new structure on the spectator is very impressive,—the form, the material, and the general treatment, all uniting to tell the purpose of the building, and impress the spectator as a monumental edifice.

The fundamental form of the new theatre may be divided into three parts,—the stage, the auditorium, and the vestibule. Externally, each of these three divisions of the building makes itself visible in its outer shape and configuration. Standing out from the body of the edifice, the noble vestibule, with the chief entrance gaily decorated, in harmony with the character of the structure, seems to invite the spectator to enter the temple of art. Above the vestibule, and like it in the form of a segment, rises the auditorium; while the stage, crowned with gabled roof, far exceeds the rest of the building in elevation.

The chief front, which is given in our illustration, is opposite the church of the Court. The characteristic feature of this façade is the tower-shaped structure rising up in the middle of the segment, and in the main axis of the building, the effect of which is at once powerful and picturesque. This *exedra* marks the chief entrance, which is in the lower part; while above is a balcony or large niche, which overlooks the wide area of the Theatre-square below, and which, at public festivals or on grave occasions of State, may be expected to form the central point towards which the eyes of the multitude crowding the square beneath would be naturally directed. From the back of the balcony the spectator obtains a fine view of the interior of the house, through the entrance into the amphitheatre or dress-circle, and right across the auditorium to the stage itself. The walls and the semi-cupola-shaped roof of the balcony are richly decorated, the sides being in variegated marble, while the half-cupola above contains three great medallions of the Graces, Marsyas, and Apollo, executed in the ornamental style of Limoges enamel painting, by Herr Paul Kiessling. On the two sides of the chief entrance are statues of Goethe and Schiller; while above the cornices stand the statues of the four Muses, Thalia, Melpomene, Polyhymnia, and Terpsichore, the work of four of Schilling's pupils. Crowning the whole of this part of the building is a tasteful pedestal, upon which is a colossal group of Dionysos and Ariadne standing on a chariot, drawn by panthers. This effective group, which is by the master-hand of Schilling himself, is in bronze, while all the other pieces of sculpture on the exterior of the theatre are in stone.

Right and left of the *exedra*, making a very flat or shallow segment, run the two *foyers* one above the other, ornamented, as in the old theatre, with the statues of Sophocles, Euripides, Shakspeare, and Molière, which, like the statues above mentioned, were uninjured by the fire. On each side of the building are the vestibules forming the general entrances, and which are approached by covered carriageways, and lead to the principal staircases. On the sides of the stage are saloons for the preparation and practice of the ballet, the chorus, robing-rooms, &c. All these side buildings are of the same height as that of the *foyers*, the only one that is higher being that of the back stage behind the stage proper. The dies above the grouped Corinthian columns, which are on the upper story of the side buildings, are occupied by a series of double statues representing typical characters in dramatic literature. On the one side we have Zeus and Prometheus; Creon and Antigone; Jason and Medea; and a Satyr and Bacchante. On the other side are Macbeth and Witch; Faust and Mephistopheles; Don Juan and Stony Guest; Oberon and Titania. The only objection to these statues is that they are too small for the situation in which they are placed. The hinder portion of the building and the exterior of the parts covering the stage are plainer, having little or no ornament. This is in harmony with the general plan, which, while it lavishes decorations on those parts of the building devoted to the spectator whose object is enjoyment, observes a rigid simplicity in the parts devoted to the actors whose object is serious business. Only four symbolical animal figures, with a lyre, decorate the four corners of the roof of this part of the edifice.

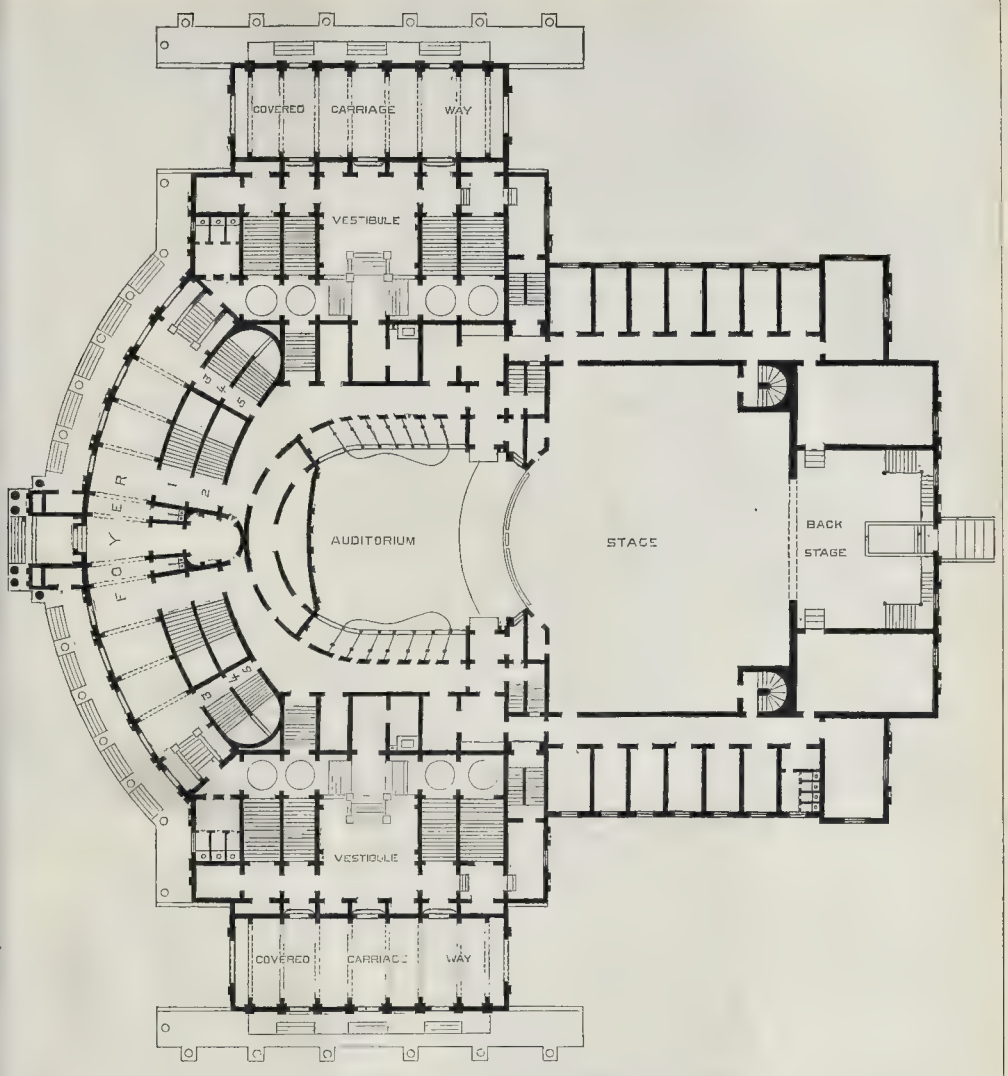
With respect now to the interior arrangements, on passing in by the chief entrance, we find ourselves in the lower *foyer* before the office, on the right and left of which are doors leading to staircases for the circles of the third, fourth, and fifth tiers. This *foyer* likewise connects the two side entrances and the buildings in which are the covered carriage-ways, vestibules, and main staircases leading to the seats of the first and second tier. These staircases lead on each side of the *parterre* vestibule to the vestibule on the level of the first tier, which, like the second tier, is connected by smaller staircases with the large upper *foyer*. The decoration of these ante-rooms is very appropriate and successful. Leaving the lower *foyer*, with its simple oak painting and slight gold ornamentation, we ascend the staircase, whose walls are of polished



THE NEW DRESDEN THEATRE: THE UPPER VESTIBULE.



THE NEW DRESDEN THEATRE.—Dr. Semper and Herr Manfred Semper, Architects.



THE COURT THEATRE, DRESDEN.—*Ground Plan.*

granite, and at every step the colours wax deeper and warmer. In the upper vestibule variegated marble prevails. Bright green columns on dark bases, and with white and gilt Corinthian capitals, support the stuccoed vaulted ceiling, which displays rich and picturesque ornamentation. The decoration culminates, in a joyous, festal tone, in the upper *foyer*, between the architecture of which and that of the vestibules the connecting link is found in its Ionic columns. The style here is that of the arabesques of the *loggie*, especially as developed by Perino del Vago in Genoa. The chief artists who have been engaged in these decorations are Professor Grosse, who, on the ceiling of the upper *foyer*, has painted the life of Dionysos as the original example of a hero of the drama; and Professors Hofmann and Gonne, who have painted in the neighbouring vestibule, the former an apotheosis of heroes of antiquity, and the latter an apotheosis of the heroes of modern romantic times. In the lunettes of this vestibule the scenes of great dramas and operas have been painted by some of the leading German architectural and landscape painters. The combined effect of the architecture of the building and the decorations is thoroughly harmonious.

As regards the auditorium, the shape is a semicircle, with rectilinear lateral prolongations. The area, exclusive of the orchestra, is 440 square mètres, and the number of the audience which can be seated is 2,000. The parapet in front of each tier is embellished with gold decorations, upon a sap green ground, producing a fine effect at night. The parapet of the first tier is further adorned with twelve medallions, representing busts of artists, by Schlüter. Exceedingly rich is the decoration of the ceiling, which, in connexion with the brilliant light of the great chandelier, with its 300 to 400 flames, forms a worthy finish to the interior ornamentation of the house. The space on the stage is considerably larger than in the old theatre, and coupled with its height it will accommodate comfortably any machinery likely to be required. The principal drop-scene is painted by Professor F. Keller, of Carlsruhe. A peculiarity of this new theatre is the iron curtain or shutter which can be let down in front of the stage, and will separate the latter from the auditorium and rest of the theatre entirely. This precaution was it need hardly be said, attributable to the disaster which rendered the rebuilding of the theatre necessary. As regards the acoustical qualities of the new building, they are found to be excellent, and as well adapted for musical and operatic as for dramatic performances. As a whole, the new theatre, both in its architectural details and in its decorations, is a great success. There are theatres which are more luxuriously finished, but there are none in which the general plan has been more harmoniously worked out or more artistically executed.

THE ROYAL ACADEMY.

Sir,—Owing to a careless mistake in the catalogue of the Royal Academy Exhibition, the mansion now building for Mr. Cave is assigned to Lord Eustace Cecil, and *vice versâ*. I have endeavoured by communications with Mr. Eaton to get the error corrected, but could only yesterday obtain information to the effect that nothing could be done until the next issue of the catalogue.

D. Brandon.

POPULAR CRITICISM AS APPLIED TO THE ARCHITECTURAL PROFESSION.*

IT cannot with truth be said that the profession to which we belong has lacked criticism in these latter years, nor can it be denied that the tenour of such criticism has been in the main unfavourable. This depreciation of the architectural profession has taken two forms:—First, an assertion that the art of architecture has retrograded if it is not wholly lost; and next, that we have failed as practical men. Indeed, quoting the words of a writer in a well-known periodical it stands thus:—"The fact is," he says, "we have at present no such thing as a building art, this is entirely lost; we have what is called the profession of architecture, which, as it pretends to the practice of art, is in the nature of an imposture." And again:—"We have in the architectural profession a number of soft-handed gentlemen who may or may not be able to make sketches or plans, ... who prepare what are called designs in any style, and submit them to people ignorant of every style for their approval and acceptance." Again, as late as 1877, in a lecture on art, by a member of the House of Commons,† at the Whitehaven Scientific Association, the lecturer lays down two things for granted:—First, "That good reasons exist for considering the subject of architecture;" and second, "That those reasons are founded not upon the present perfections of art, but upon its imperfections; not upon the success of its professors, but upon their failures, notwithstanding the enormous amount of employment of architects in the present day,—notwithstanding the number of societies and institutions, and schools, that abound all over the country, the periodicals and speakers that deal with the subject invariably,—I may say universally,—declare that art and architecture have not progressed in our age, but that, on the contrary, they have retrograded." It would be easy to make further quotations. But, unfortunately for the profession to which we belong, the charge does not end there. The second form of the indictment is this: that architects are to a great extent untrue to the interests of their clients in the execution of their vocation, that they are far more anxious to execute commissions than faithfully to look after both the completeness and thoroughness of their buildings; it is constantly inferred, if not expressed, that they are far less anxious to keep down the cost of their buildings than they ought to be; that by the system of payment by a percentage on outlay there is a direct inducement to increase the expense of their works with its consequent results, and that the public ought to be warned against the delusion of employing "eminent names" in the works from day to day going on throughout the country. I must confess it requires a good deal of equanimity and dispassionateness of temper to hear these charges repeated so constantly as they have been of late years. It is to me a sign of a want of self-respect and regard for our calling, if we do not inquire into the truth of these reiterated statements, and endeavour to refute them; and I know of no subject so practically useful to the profession at large, as to boldly meet them, and court the fullest inquiry. There is little doubt that the action of some of the public departments in this country, by their treatment or avoidance of skilled architects, is giving a sanction of most injurious character to this tone of popular criticism, and the distrust shown in other quarters is indicative of the same feeling. It cannot be denied that the tone of such an acute writer as Sir Edmund Beckett, in his "Book on Building," is in some senses unfavourable to the architectural profession. It is in a great degree advice to the general public to protect or "hedge" themselves against showing any great confidence in giving a latitude to the architect in the execution of any given work; it is as much as saying,—"Be ever on your guard as to his crotchets; do not give him the fullest scope in his art-judgment; carefully see that the mind of the employer is open to negative, to correct, and alter anything where he may see fit to do so; in other words, consider the architect in relation to his work as in a measure the exponent only of the employer's mind." Upon the subject of the receipt by architects, as it was alleged, of illicit commissions, it cannot be denied that there was shown an "animus" in some of the leading journals of the day to readily insert charges where the proof was withheld from the public, or full details of the transaction; and it must be a source of satisfaction to the conscientious and straightforward practitioner to feel that those most cognisant with the large body of the profession would know at once that such charges were untrue. One fact must be acknowledged in reply to the two heads of charge which I have referred to, that spite the earnest recommendation of certain writers to exalt the "workman" into the sphere of the architect as the only sovereign remedy for the present state of art, it is the architect of to-day who is most interested in arresting the decadence of art-workmanship, and who has endeavoured in many ways to raise the workman to a higher aim and sphere, knowing full well, and feeling thoroughly, that the imagined antagonism is all a myth; that the true idea is for each and all to go hand-in-hand in the execution of the building with the aim of its entire completeness; and I express, I am sure, the unanimous view of the profession, when I say we wish well for every effort to raise the art workman,—nay, more, we will assist in every well-considered effort for this purpose. Dismissing, then, these side issues, we are brought face to face with the fact, paradoxical as it seems, that, notwitstanding all the depreciative criticism of the architectural profession, it flourishes: our towns and cities bear evidence which they never showed before to professional work in many a church, town-hall, market-house, or other building; and that no considerable structure is ever now undertaken without the services of an architect; and that if even a private house is built without the services of one, it is the general and candid acknowledgment afterwards that a great mistake has been made, and how many things could have been improved by the employment of a skilled man. Now to enter into the province of a careful criticism as to whether architecture as an art in the present day has retrograded, more especially as arising from the prevalent adoption of *one* style instead of *another*, would lead me too far, and I will admit this, that to expect the creation of genius or great originality in style or treatment seems, for the present at least, in any style, not possible. Whilst fully admitting this position, I do not think it affords any ground for unfavourable criticism specially as regards the architectural profession. It would apply to the whole field of art-design in painting, sculpture, or the like. The times in which we live, with all the material progress and the scientific resource as applied to art-manufacture, are probably by those very conditions unfavourable to that instinctive love of creative power which the history of the world shows to have been possessed in ruder ages and under very dissimilar states of society. But no good can possibly arise from depreciating the honest and genuine work of men who are consciously alive to the needs of giving to society the most chaste forms they know of, and who give most careful study to such forms of art as are most congenial to them I think a candid and truthful statement of the position is this, that in all styles, whether Classic, Gothic, or what not, there is a large amount of careful and cultivated design produced, combined with sound building and foresight, and an amount of earnest thoroughness to develope any special line of art, that instead of laying the profession open to the charges of being a "soft-handed" and "dainty" body of gentlemen, careless of design, and "only seeking to trade on the ignorance of the public," proves the reverse to be the fact. I feel sure it is impossible to deny that taking a wide survey throughout England, and comparing the buildings of to-day with those of fifty or a hundred years since, there is a greater amount of scientific and artistic skill evident in them, and that architects have reaped a just reward in the increased demand for their services, as well as the confidence shown by the more enlightened portion of the public in their estimation of their works. The truth is, that despite the shortcomings of our practitioners, which none know more than themselves, there is an amount of conscientious and often loving work executed, for which the designer receives but scant acknowledgment, but which reflects lasting credit on himself. A test of some value with reference to the architectural profession, is the experience of those men who have built without the intervention of an architect, and who have trusted wholly to the builder. I am sure the experience of those who have done so (such cases mostly giving rise to litigation between the employer and builder before or after the completion of the work, either as to the mode of execution of the work or the cost) must be a lesson to those who would do likewise, and it is a most satisfactory testimonial to the value of the profession, that the builders as a body, though with some honourable exceptions, very much desire to evade the connexion of any building matter with an architect; their willingness to supply designs without cost to their employers, and estimates, being the delusive bait for future trouble and enhanced profits for themselves. With respect to the practical execution of works, and the allegations made under this head, it may be as well in a few sentences to explain what I conceive to be the relation of the architect and his employer. I hold that an employer or client once having selected the best man for the work he has in contemplation, must unhesitatingly and without reserve, for its success, give the architect his fullest and most complete confidence; under no other circumstances can the architect act with any chances of success, the desire to conceal from the architect any questions about ultimate cost, any wish on the part of the employer to be in a position to check his architect as to the nature and disposition of the design, and any leaning to prepare such a contract as shall place the architect in the contractor's eyes as a mere instrument of the owner, and not in the responsible, though difficult relation of a high-minded, but fair arbiter between the owner and the builder, will result in complications and final dispute. Accepting, then, that these are the terms of the true relation of an architect and his employer, what remains to the relation? Of course, the first step is that the owner should as intelligently, and with as much care as possible, instruct his architect as to all the wants and requirements of the matter in hand, and not leave, as it is too often the case, the architect with imperfect instructions, and at a later stage for the employer to complain that the design does not meet his wants. I hold, then, that a cultivated and careful knowledge of the necessities and general scope of the building required, when more fully understood by the public, would assist the architectural profession materially, though I doubt much whether that rather "fussy," "half knowledge," which goes still further, and which interferes with the detailed execution of works, does operate to the general success of the execution of the design as a whole.

Our accusers begin by believing and by charging, in the face of all evidence, a large and respectable body of men (doubtless with some exceptions) as being lost to their very first duty of moral conscientiousness and duty, in order to secure some paltry additional commission, and to secure some personal benefit to themselves. The charge carries with it its own refutation, and I dismiss it as unworthy of serious consideration. It will be maintained by some that the objections to the practical work of architects lie in quite another direction, viz., that of not meeting the special wants of a building, and often making it unsuitable to its end. Now, I will admit that I think the special training and exclusive study of one subject does very often unfit the mind to deal with modern wants as a whole, and that to some extent architects lie open to this charge. A wider general cultivation and a deeper interest in and mixing more with society in other relations would help rather than hinder architects in their special vocation, and they would be fulfilling far more truly the highest aims of life by taking their part in the general work of the world, and this wider knowledge of men and things is much to be desired; but then it should be remembered that this special interest in and devotion to their calling arises from a love for and an appreciation of its great claims. The real difficulties that beset the architect are the complex questions that arise in the use, especially in public buildings of appliances for heating, ventilation, and the like, and the varying conditions under which they are tested; the limitation of costs also must be borne in mind, the peculiarities of the site, the limiting and cramping nature of the instructions originally given in many cases, and the necessity of meeting the special wants of the head of some department at some sacrifice to the rest of the building. The public, who judge merely after completion, do not take into account these varied difficulties, and visit on the head of the architect the

* From a paper read by Mr. T. Chatfeild Clarke, before the Royal Institute of British Architects, on Monday evening last.

† The Right Hon. G. Cavendish-Bentinck. Reported in the *Builder* for 1877, pp. 187, 208.

special want or failure, as it may be; when, if the truth were known, the defects may have been the special point or difficulty he has been struggling with during the execution of the design. It may, I think, with truth and yet with modesty, be affirmed that there is no vocation connected with the arts requiring so mixed a class of qualities as that necessitated by the architect, which may be briefly summed up as follows:—A knowledge of the laws of design and style; a practical acquaintance with construction and materials; necessity for the considerations of cost and the requirements of modern society; the qualities of a man of business in the preparation and management of contracts; and a knowledge of the associated arts and mechanical and scientific contrivances forming a large part, as they now do, of all large structures. Can it be said, looking at much of the work in the present day, that any of these qualities are wanting, and, if so, where are the true grounds of complaint? The only further head I shall briefly touch on is, whether the attitudes of public departments, in relation to architecture and the non-recognition and want of direction by the State, is to be regretted or the contrary? No doubt the allegations so recently spread with regard to one special building must have had some foundation, and the result is to be regretted; but the question at once occurs, Are you, from any single case of the kind, to resort to a mode of carrying out public buildings which, in the long run, must be detrimental to public taste? Is it not within the cognisance of every one in this room that there are public buildings existing in the metropolis and elsewhere which, whatever their merits may be as regards *internal* convenience, cannot be deemed successful from an *artistic* point of view? It cannot be denied that the true attitude of the Government of any country towards art generally, —and of course, therefore, towards architecture,—is to give that encouragement, by the employment of competent men, as may best conduce not only to develop taste among the people at large, but also to give the most permanent examples of good art to the nation for after-ages to rest upon. Not in any way necessarily confined to one style or another, but by a catholic and liberal judgment, and consideration of all schools of art entrusted to a Minister of State, would be the right way of developing art in this country, as I venture to affirm. It is a trust reposed by the people in the Government of the day for the benefit of the nation, to wisely deal with an expenditure raised by taxation, and in the scant recognition of, and evident desire to avoid, the services of high-class professional men, shown in some recent inquiries, it becomes specially necessary that the public should be alive to the probable result of leaving large works to mere departmental officers, or to their supernumeraries, the training and education of such men being, doubtless, amply sufficient to know and detail the accommodation required, but unfitting them to design buildings which should become national monuments. Of course, the objection raised that the appointment of any such Minister as I have indicated would result in a series of attacks upon him, should be put aside, if we are convinced that the course is a right one, though he must be a man with the force and power to maintain his views with reason and ability. The further objection that any extensive patronage of art would in the end lead to its decay and destroy healthy competition and the growth of art generally, is not applicable to the view I am urging, for I should deprecate any large or active interference beyond the wants of the national work, and specially should deplore the cramping influence of any particular school. To sum up the results of my paper, then, in one word, I would say this, that the charges so freely made against us are "not proven"; that in art work, in conscientious discharge of their duties, and in repudiation of any graver insinuations, the profession can stand the fullest inquiry, and that it is not undesirable by the means of the press, the lecture-room, public speech, and otherwise, for the profession to show that they are prepared to maintain their own position, and to submit frankly their claims to the public at large, who with generosity and fairness always deal with a question they fully understand.

In the discussion which followed,

Mr. Boulnois said he thought any observations on the paper would be best ordered by a *clôture*, for there was not a man in the room but felt humiliated at times by his own mistakes, and the mistakes of his brethren. He thought the less they found fault with people who criticised them the better. They should remember that one great principle of art was "*ars est celare artem.*" If they could not stand upon their own merits as artists and architects, they would not do any good by puffing themselves and each other,—"Ca' me, ca' thee," as the Scotch had it. Any discussion on the topics treated of in Mr. Chatfeild Clarke's paper could only result in bombast and self-laudation. The attacks made upon the profession had been thoroughly answered. In fact, the Institute had that very evening elected a gentleman (Sir Edmund Beckett) who, in spite of the hard things he had said of them, showed his appreciation of the profession by coming amongst them. They did not stand under the necessity of "whitewashing" themselves. In fact, any discussion having that object could only end in bombastic platitude on the one hand, and in "Ca' me, ca' thee," on the other.

Mr. Ewan Christian expressed concurrence in these views.

Mr. Hansard having moved a vote of thanks to Mr. Clarke for his paper,

Mr. Kidner said he could not agree with Mr. Clarke in thinking that criticism by the public was undesirable; on the contrary, he thought it very desirable. As to the vaunted progress of architecture as exemplified in the streets of London and other large towns, he could only say that having been absent from England for nine years, and having read during that period of what was being done in London and elsewhere in the way of opening out new streets and the erection of new public buildings, he had looked forward with considerable pleasure to his return, so that he might inspect the progress that had been made. He must say, however, that he was considerably disappointed at the way in which these great opportunities had been either totally lost or only partially turned to account. The old works that he was taught to admire when a youth were still the best works to be met with. He believed that one cause of mediocrity in architecture was to be found in the constant craving, on the part of the public, for novelty. Architects would never advance their art so long as they pandered to that craving, which was a prolific source of vulgarity.

The President said Mr. Boulnois had succeeded in effectually extinguishing discussion; but while his avowed object had been to deprecate self-assertion, it would be hard to conceive of a more distinct act of self-assertion than to refuse to reply to public criticism on the ground that the public had nothing to criticise. Such procedure was akin to that of the ostrich, which, burying its head in the sand, thought that no one could see it. In point of fact, there generally was, in all cases where architects were attacked or criticised, some slight substratum of justification; in other words, such charges were largely false, but slightly true. At the same time, he thought that architects might fearlessly point to the results of architectural practice during the past twenty-five years, and with confidence compare those results with those obtained during any preceding twenty-five years between the present time and the famed thirteenth century. Reference had been made to the election, as Hon. Associate of the Institute, of one of the most unsparing critics of its members, Sir Edmund Beckett, and the inference had been justly drawn that Sir Edmund did not think them very bad fellows, or he would not desire to come amongst them. Now, although Sir Edmund flattered himself that he knew a great deal about architecture, and was very unsparing in his criticism of architects, he was ever ready to tender his advice to those who, as he said, were foolish enough to take it, always to employ an architect. Reference was also made by Mr. Chatfeild Clarke to the action of the Government in relation to architects, and surely that was a point which should not be allowed to pass without notice. In this connexion it was satisfactory to note that in the new class of Honorary Associates the Institute now included as its members the First Commissioner of Works, and the Secretary to the Office of Works, and it was to be hoped that one result of the interchange of ideas between those gentlemen and the members of the Institute would be to impress upon Government departments the necessity of taking counsel with skilled and responsible architects with reference to the erection of new public buildings, rather than to trust to departmental officers, who, however anxious to do their duty, had usually but limited experience as architects. As to builders, he thought architects had a great deal to be ungrateful for, to use no stronger word, to Messrs. Cubitt (not the present firm of Cubitt, but that of Thomas Cubitt), because they knew how to do their work so uncommonly well, as far as the practical part was concerned, that their houses would compare favourably, as structures, with some houses that had been erected under the supervision of architects. The high character of the work in these houses gained for "builders' houses" generally a reputation by no means universally due to them.

Mr. Chatfeild Clarke, in replying on the discussion, said he could not lay the flattering unction to his soul that Mr. Boulnois was able to do. It was not enough for them, ostrich-like, to hide their heads in the sand.

Mr. Boulnois said that, on the contrary, it was because they could not hide themselves in the sand that it was very much better that the members of the Institute should not discuss these questions amongst themselves.

Mr. Chatfeild Clarke said he, for one, was not prepared to take that advice, and to allow to pass unchallenged the kind of criticism of architects which was now indulged in daily in almost every dining-room in the country. The depreciatory criticism of architects was on the increase, and it ought to be met; and a body of professional architects like the Institute ought to be prepared to make a stand against what was becoming a serious evil. The passive attitude advocated by Mr Boulnois had been tried long enough, and it had utterly failed; and it was now high time to take another and a bolder course.

The meeting closed with the announcement that the Architectural Conference would commence on Monday, June 3.

THE LATE MR. M. THOMPSON, ARCHITECT.

WITH regret we hear of the death, from rheumatic fever, of Mr. Matthew Thompson, F.R.I.B.A., of Newcastle-upon-Tyne, which occurred on Friday night, the 17th of May, at seven o'clock.

Mr. Thompson, of the firm of Thompson & Dunn, of Newcastle, commenced his career in the office of Scott & Moffatt, of London, and was for some time manager for the late Sir Gilbert (after the dissolution of partnership with Mr. Moffatt). About this time he gained both first and second premium (the latter of which he resigned in favour of the owner of the third set of drawings) for the well-known hospital buildings seen by travellers on the North-Eastern Railway near Durham station. This, we believe, was the first thing to draw him again towards his native town, where he soon commenced a bright career, which has been lamentably cut short at the age of fifty-five. Mr. Thompson was an active member of the Town Council of Newcastle, also of the Northern Architectural Association, of which he has been president upon more than one occasion. His death will cause much sorrow, and be a great loss to Tyneside and North-country architects, as well as to the young men who have gone forth from his offices in Eldon-square, mostly to start business for themselves in the North of England.

Mr. Thompson was some fifteen or twenty years ago appointed architect for the Duke of Northumberland's Northumberland estates. Many of the important buildings of Tyneside are his works, including several buildings in Newcastle streets, West Grainger-street, &c.; churches at Morpeth, Gamesley, Birtley, Alnmouth, and in Newcastle in Blacket-street and St. Thomas's-place; also several chapels; mansions at Dipton, Stagshaw (for Mr. J. Straker); Grinkle Park (for Mr. C. M. Palmer, M.P.); Rectory, Bothal; Workhouses at Houghton-le-Spring and Chester-le-street; stabling of note in Newgate-street, Newcastle (for Mr. Stephenson); breweries, Houghton-le-Spring (for Mr. Robinson); besides an innumerable list of private residences in Newcastle, Tynemouth, and the neighbourhood.

Scott Memorial Committee.—We notice that considerable effort is being made to raise a memorial to the late Sir Gilbert Scott, R.A. A public meeting will be held in the Chapter-house, Westminster Abbey, on Saturday, June 1st, at four p.m., when the Duke of Buccleuch is expected to preside.

THE USE OF SEWAGE BY FARMERS; OR FIFTY INSTANCES OF PROFITABLE SEWAGE IRRIGATION.

An important paper under this heading, by Mr. R. W. Peregrine Birch, Associate, was read at the ordinary general meeting of the Institution of Surveyors, on the 13th inst. In this paper, addressed to the Institution of Surveyors (which is understood to represent the management of something like three-fifths of the landed property of England), the subject was treated from an agricultural point of view. Articles, the writer said, have been printed in London newspapers, and tables have been published in books upon sewage disposal, one after another, all showing that the attempts of sewage companies and local boards to use sewage, make it portable, or put it out of the way, have alike resulted in an expenditure of upwards of a shilling a head per annum; and this, although sewage contains materials which, but for their encumbrance, would produce an income of 10s. per head a year to the ratepayer. What has been truly said and written upon the subject has had the effect (as might be expected) of making local authorities cautious and slow to take any action. This is probably as it should be. Let owners or occupiers of agricultural land, however, not be alarmed at the failures of local boards or public companies, but rather see that therein is their opportunity to come forward and help the public with considerable and increasing advantage to themselves.

That the use of sewage has proved advantageous to a large number of agriculturists appeared from the notes collected.

We print Mr. Birch's deductions and the concluding passages of his very valuable contribution towards the settlement of an important question:—

"From the foregoing it appears:—

1st. That there are upwards of 100 owners and occupiers of land in Great Britain who use sewage for the sake alone of what they can get out of it by agricultural means.

2nd. That of this number more than sixty are tenant farmers who continue to use it, although they have, annually at least, the option of ceasing to do so.

3rd. That of the latter number about five-sixths, and of the total number about three-fourths, actually pay money for the use of the sewage, either in the form of out-fall rent, unquestionable increase of land-rent, or the price of occasional dressings.

Nearly 4,000 acres of sewage land have been referred to, and these are in the hands of more than 100 distinct occupiers. These occupiers may be divided into three classes:—

Those who have to cleanse a certain quantity of sewage on a certain area of land;

Those who may take, or leave alone, as much of a town's sewage as they please; and

Those who may take, or leave alone, what sewage can be spared by others having a prior right.

The first class occupies 1,670 acres of sewaged land, and deals with the sewage of twenty distinct sanitary districts, or a population of about 200,000, on as many as twenty-one different farms.

Of these twenty-one farms, twelve are let by local authorities to tenants who undertake to cleanse the sewage as well as use it for their own purposes; and nine are held by persons who take the sewage on their land for no other reason than that they believe their holding will be benefited by it. Now, it is a fact deserving the notice of local authorities, as well as private users of sewage, that while ten out of the twelve authorities having sewage to use manage to become owners or lessees of *arable* farms, six out of the nine agriculturists who take sewage with all its liabilities for the sake only of fertilising their land happen to occupy permanent grass-farms. Now, taking the second class, composed of persons using as much or little sewage as they please. These are sixteen in number, and, with the sewage of about a quarter of a million people at their command, irrigate amongst them nearly 1,500 acres.

This area, with the exception of part of the Edinburgh land, about an acre of osiers at Tyldesley, and part of the Handsworth land, which bears rhubarb, is entirely occupied by permanent grass. The difference between this class of sewage user and the first consists in this: one having the power to pass the dirty water on if it is not wanted, and so neglect to prevent river pollution, and cast the duty on some one else. It is of the highest importance, therefore, to establish what are the periods during which the interests of the unfettered sewage-farmer dictate that he shall let any one else have the sewage for better or worse.

At Crediton, where sewage is only put on grass land, it appears to be passed on during "most of the summer."

At Devizes, it is not used while the hay is tall or being made.

At Edinburgh, three watermen are employed in summer to irrigate the Craigentinny Meadows, and one in winter.

At Handsworth, it runs on grass land all the year round.

At Leek, the outfall, commanding meadows only, discharges on to those meadows during the whole year, except about six weeks or two months, when the growth of the grass prevents access to the channels without damage to the crop.

From Mansfield, the Duke of Portland's bailiff, Mr. Woods, kindly reports that there is no season of the year at which the water cannot with advantage be turned on to the Clipstone Meadows.

At Plympton, the occupiers of Lord Morley's meadows are "crazy after the sewage," excepting during two or three months in the summer.

At Waltham Abbey, the town mead is irrigated from the middle of September till the beginning of May, when the occupier of the adjoining market gardens takes the sewage.

These few notes show that the grass farmer can, without any scheming, do with sewage till May. Then comes the very important note from Leamington, where Lord Warwick has produced sewage-grown roots to win ten silver cups and a number of money prizes, that "Root crops, with the exception of cabbages, never have sewage applied to them before May or June." And another from Arle Court Farm, Cheltenham, where many prize mangolds have been grown, that Mr. Wood had mangold on the same ground five years running.

Now, the third class, into which sewage users have been divided for the purposes of this paper, includes some sixteen or eighteen farmers at Leamington and Cheltenham, who, together irrigate about 500 acres of land when the sewage can be spared to them. For this advantage they have been found ready to pay nearly 200*l.* a year, besides doing such work as the land may require before it can be irrigated. What has been done at these two places goes principally to show that a farmer can, under a great variety of circumstances, if he chooses, try a dressing of sewage on his field (whether arable or pasture) without any such outlay as would only be justified after he had determined to irrigate permanently.

To any one desirous of trying the use of sewage on his land, but unacquainted with the practice, it will be satisfactory to learn that at no place mentioned (with seven exceptions) do the surface carriers, great or small, consist of anything but spade or plough cut channels. At Aberdeen and Guisborough, however, they are made of earthenware channel-pipes; at Penrith channel-pipes are used for the permanent carriers, and portable wooden spouting is used for branch purposes. These both appear troublesome features,—the one to keep in repair in a field occupied by cattle, the other to use; and their merit is by no means apparent. At Altrincham channel-pipes were laid, but have, in a very large measure, been removed in favour of the simple grip. At Swinton the land first laid out had channel-pipes; but in extensions spade-cut furrows have taken their place. At Wrexham solid channels are only used where the necessary proximity of their position to that of a pure watercourse makes them desirable, or where the gradients are so steep that channels simply cut in the ground would not stand. And at Ware the main carrier consists of a wooden spout packed up on legs or laid in the ground at regular gradients, and from this the sewage is carried on to the land, as at Penrith, by means of smaller portable spouting.

The amount of alteration required by the surface before land can be satisfactorily irrigated with sewage must, of course, vary with localities; but what has been done at Leamington and Warwick by some fifteen users of sewage, both on meadow and arable land, as well as at Chorley, and several of the places where grass-land has been irrigated, proves that, under very varying conditions, it is practicable to irrigate land with the same surface that has been given to it by the process of ordinary farming.

Besides the cost of great levelling operations, the tendency they have to rob parts of the surface of its share of soil is a decided disadvantage. Few accurately levelled fields of rye-grass are free from patches of a yellowish colour, which, on investigation, turn out to be due to want of soil.

From what has been said about tanks, it is plain that they are only useful under certain circumstances, and that they require careful handling, to prevent their being a nuisance.

Upon the question of whether or no it is dangerous to graze and irrigate land at the same time, much valuable evidence has been adduced on the negative side, while none to the contrary has come under the author's notice.

That heavy, as well as light, land may be profitably irrigated has been proved at Cheltenham, Crediton, Chorley, Leamington, and Swinton. It must not, however, be wanting in drainage; but if land be sufficiently drained, either naturally or artificially, for advantageous farming without sewage, it is sufficiently drained for the most advantageous use of sewage. Heavy land, however, under sewage, should be laid down in pasture, for sewage adds considerably to the labour and difficulty in working it.

Climate has, no doubt, considerable influence upon all agricultural phenomena, but no variety to be met with in this kingdom south of Edinburgh seems to be inconsistent with the profitable use of liquid sewage. The meteorological character of the country varies very considerably between Edinburgh and Plympton; for, while the average annual rainfall at the latter place must be nearly 50 in., that of Edinburgh is under 30 in., and places situated at intermediate latitudes, where sewage has been profitably used, have annual rainfalls varying from the 25 in. registered at Chelmsford and Guisborough, to double that amount at Penrith, Cockermouth, and Cleator Moor.

The question of whether the separate system of sewerage is desirable or not requires a few words. It concerns principally those who are obliged to cleanse all the sewage that comes to them. There are twenty-one such cases referred to, and the author is in a position to know that, in fourteen of them, those most interested would gladly see storm waters kept out of the sewers. Thirteen of these gentlemen, including Mr. Blackburn, Colonel Jones, Admiral Chaloner, and Captain Fosbery, speak from experience of arable farms, and there can be little doubt that they are right; but with grass land the question is not of such importance. Subsoil water, which makes a less varying addition to the flow of sewage, is probably always an advantage to the sewage farmer, provided only he has enough land for the advantageous utilisation of all the manure contained in the sewage he has to deal with.

The sewage of a town has never probably been spread over enough land for its complete utilisation; and one thing that must always make this difficult, in the majority of cases, is the absence of available water in sufficient quantities to spread the sewage where it is required in summer, and to irrigate the already highly-manured land, which requires moisture rather than manure. It is plain from the table referring to the Leamington farm that, in the field which received nearly 15,000 tons of sewage per acre, between the 8th of February and the end of August last year, a very large proportion of the manure must have been wasted, for, supposing the average manurial value of the refuse of the Leamington population to be 10s. per head per annum, then the value of the dressing per acre would be about 107*l.*, which is, probably, at least four times the value of the crop that it could produce.

"Sewage sickness" is a term that has become common, because it sounds appropriate; but, as a matter of fact, time has no effect in making land "sewage sick," for its pores may be filled, as at Edinburgh, year after year, with infinitely more dissolved manure than can possibly be made use of by vegetation; and the land will continue to be as productive and as capable of receiving sewage as ever. A crop may, however, be ruined if it is covered with sewage, even although it may not have had enough for its manurial requirements; or land may be done more harm to than good temporarily by one single ill-timed dressing. Experience has proved that over-feeding with sewage for years has no ill effect, although land may be choked with it in one meal.

At none of the places mentioned, excepting one, has the use of sewage involved the user in

litigation. The Ware Local Board were, however, a few years ago, summoned before the magistrates by the Lea Conservancy, who alleged that sewage was allowed to run over the surface of the ground into the river, but the case was dismissed.

The object of this paper has been to lead to an increase in the present number of sewage farmers. If this is to come about largely, sewers must be laid out with a view to commanding by their outfalls (or by outfalls that might be made if required) the greatest area of land, and the greatest number of agricultural properties or holdings. And would-be sewage farmers must bear in mind that there is a large variety of circumstances under which it would be possible, and very advantageous to a town, to send part of its sewage to a farm, although that farm may be at level considerably above the general outfall level of its whole system of sewers.

Advocates of sewage precipitation processes should not regard sewage farmers as their rivals; for a chemical process might be very largely used with advantage where farmers are being persuaded or taught to use sewage. But this should be the distinct aim of all authorities; for there is no chemical process that could not be worked to greater advantage during two months of the year than twelve, or applied to a small quantity of sewage at less cost than to a large."

PURCHASE OF WATERWORKS.

THE Middlesbrough Town Council had a special meeting last week in respect of the compulsory purchase of the works of the late Darlington and Stockton Waterworks Company, and some dissatisfaction was expressed as to the award made by Mr. W. H. Higgins, the arbitrator.

The total ascertained cost, leaving out the expenses of the arbitration, is 824,338*l.* divisible between the Middlesbrough and Stockton Corporations.

The amount before the award was made was estimated at 500,000*l.* or 600,000*l.* Some of the council wished to back out of the venture, but eventually it was agreed to pay their share in a lump sum from a special rate.

The Stockton Corporation were alike dissatisfied at having to pay some 200,000*l.* more than they looked for, inasmuch as the Waterworks Company had, in 1875, offered to take 550,000*l.* for the undertaking. A comfortable margin for three years' patience is apparent here.

FINE ON THE CORPORATION OF ST. ALBAN'S FOR RIVER POLLUTION.

THE Corporation of St. Alban's have for some time been the defendants in an action brought against them by Mr. Woollam for polluting the river Ver with sewage matter. The case was again before the St. Alban's County Court judge, Mr. Whigham, on Saturday last, on an application on the part of the plaintiff for the defendants to be fined 50*l.* a day for every day during which they continued to pollute the river Ver with sewage matter.

Mr. Dumville, Deputy Clerk of the Peace for the county of Herts, argued the case very fully on Saturday, and complained of the conduct of the defendants in not proceeding as expeditiously as they might have done with a remedy for the evils complained of.

At the close of the arguments, the Judge made an order for the Corporation, as the Urban Sanitary Authority, to be fined 25*l.* a day, to be paid at such date as the Court might direct. Liberty was, however, to be given to the defendants to apply three months hence for the order to be rescinded, on proof being given that care and despatch had been used in the preparation of a scheme for preventing the continuation of the offence, and that such scheme will be carried out without delay.

ASPHALTE.

SIR,—In your Paris letter, published in your issue of the 11th inst., you say,—"The asphalte used by the French seems to have excellent setting powers; it is scarcely laid down ere it becomes perfectly hard, setting almost as quickly as plaster of Paris."

Will you kindly state in your next issue that the compressed rock asphalte laid in Paris is from our mines in the Val de Travers, and that we supply precisely the same rock to the Val de Travers Asphalte Paving Company, Limited, of London, who have laid it in Cheapside, and a great many other streets.

HENRY R. BRADBURY, Secretary,
Neuchatel Asphalte Company.

THE PARIS EXHIBITION.

THE works are progressing, and there are plenty of fine things for the visitor to look at; but the Exhibition, as a whole, is still far from complete, and will be so for some time to come. A quietness and apathy which are not agreeable are apparent to those who remember some other international Exhibitions, but the interest will probably increase. Some of our readers may be glad to know that the "Catalogue of the British Section," in two parts, is obtainable at Canada-buildings, King-street, Westminster. The first part contains the fine-art sections, and includes much interesting information.

An international sanitary congress is to be held at the Trocadéro from the 1st to the 10th of August. Among the questions discussed will be the pollution of rivers, adulteration of food, artisans' dwellings, unhealthy manufactures, and isolation in hospitals. M. Bardoux will ask the Chambers for a vote of 100,000f. to enable elementary schoolmasters to visit the Exhibition and hold a conference.

PROPOSED NEW FLOATING BATHS, AND A MIDDLE-CLASS SCHOOL FOR GIRLS, FOR THE CITY.

THE Law and City Courts Committee of the Corporation have just recommended that the Corporation should expend the sum of 15,000*l.* in the construction of a floating bath for the City, out of the sum of 60,732*l.*, which is now at the disposal of the Corporation, arising out of the bequest of the late Mr. T. A. Mitchell, M.P. for Bridport. In their report the committee state that they had had strongly urged upon them the desirability of a portion of the fund being applied to constructing a floating-bath upon the Thames for the use of the citizens. It was said that if 15,000*l.* were expended on the erection of the baths, they would prove self-supporting by a small charge only being made for their use. They had ascertained that the working expenses of the new bath would be about 800*l.* a year, and that therefore a very small fee would suffice, as there would be no interest to be charged on capital expended. The bath would provide ninety boxes. Out of the residue they also recommended the establishment of a middle-class school for girls, similar to that for boys in Cowper-street. They had ascertained that the cost of a building capable of receiving 800 girls might be calculated at 30,000*l.*, and of the site 5,000*l.* The estimated annual expense of the teaching staff was 6,000*l.*, to be met to a great extent by the payment of a small annual fee by the pupils. It was also recommended that there should be an endowment for the repair of the fabric and for prizes, and that 20,000*l.* out of the fund should be set aside for that purpose.

THE READING WATERWORKS.

THE new waterworks at Fobney have just been opened. The need of an additional supply has been felt for some time, but with the view of deferring the construction of new works as long as possible, the Waterworks Committee effected a few years ago various reforms and improvements in the management of the works, with very satisfactory results. The general inadequacy, however, remained evident, and the Council subsequently requested Mr. Mansergh to report to them upon the matter of water-supply. Mr. Mansergh proposed a large scheme, embracing storage reservoirs of increased capacity and elevation above the town, but still retaining the principle of filtration at the Bath-road reservoir, the defect of which is that the rate of filtration varies with the rate of consumption, and is, therefore, not uniform. During the night very little filtration would be going on, whilst at some periods during the day the rate would be very excessive. The Council ultimately decided to adopt a scheme recommended by Mr. Donaldson, which had, however, been previously submitted by him to Mr. Mansergh. By this scheme the whole of the filtering will be done at the site of the pumping-station at Fobney before it is pumped, and the rate of filtration will be uniform day and night. The outlay will be considerably less than half the cost of the scheme proposed by Mr. Mansergh. The works may be thus described: By the negotiations connected with the works for lowering the River Kennet, carried out in 1874-5, the Council became possessed of the water-power at old Fobney Lock, the fall being by the same works increased by 3 ft. It is this fall that has been utilised in the new waterworks. On the site of the old lock has been erected a mill-race, in which are fixed two turbines or horizontal water-wheels. Owing to the deep foundations necessary, and the peculiar situation and treacherous nature of the ground, very great engineering difficulties were encountered in this part of the work, but they were all successfully overcome. Over the mill-race is erected a spacious building, in which is enclosed the pumping machinery. The pumps are four in number, and are all of double action, working horizontally, direct from the vertical shafts of the turbines, by a very simple and effective arrangement. Close to and connected with this building is the cottage for the keeper of the works, with all necessary outbuildings. Beyond the buildings, and to the north side of the new head-race, conducting the river to the wheels, are the filtering appliances. These consist of the intake chambers, two large subsiding reservoirs and three filtering-beds, giving a filtering area of nearly three-quarters of an acre. There are also the clear well and the network of pipes, &c., conducting the filtered and unfiltered water to their destinations. The rising main, or line of pipes through which the water is pumped to the old reservoirs, after leaving the pumps, strikes direct for the Bath-road, taking its route through the Fobney meadows, the lands of Mr. J. B. Monck, Coley Park, and Mr. Blackall Simonds, and continuing along the Bath-road to the reservoirs. Here it is also connected with the Whitley reservoir mains, and in an underground chamber is fixed an automatic valve, the invention, we believe, of Mr. Donaldson, which will regulate the pumping to the respective reservoirs. An electric cable is laid along the line of pipes, with call-bells at either end, in order that the waterworks manager at Bath-road may have communication with his assistant at Fobney.

The whole of the works have been designed by and carried out under the superintendence of Mr. Donaldson; Messrs. Cochrane & Co., of Dudley, and London, were the contractors for the supply of the iron pipes; Messrs. James Watt & Co. (late Boulton & Watt), of Birmingham, Limehouse, and London, for the turbines and pumping machinery; and Mr. George Munday, of London and Limehouse, undertook the construction of the rest of the works.

THE GOVERNORS OF DULWICH COLLEGE AND BUILDING IN CROXTED-LANE.

ALLEGED SPOLIATION.

THE governors of Dulwich College contemplate laying out the neighbourhood of Croxted-lane for building upon. Croxted-lane is one of the picturesque parts of West Dulwich, and it is alleged that its being interfered with for building purposes would involve the destruction of a large number of trees, and deprive the public of the use and enjoyment of one of the most delightful lanes in Dulwich. A meeting of the inhabitants of the district has just been held for the purpose of memorialising the governors of the College estate to preserve the lane for public use, as well as the trees at present standing there. The chairman of the meeting (Mr. Cummings) observed that they were all quite agreed as to the beauty of this lane, and that there was no spot near London more admired. Even royalty had enjoyed the prospect, and in old times it was a well-known resort for artists. They must, therefore, feel that in this case the difference between the lane and bricks and mortar was very great indeed. Adverting to the alterations which it was suggested the governors should make in their plans, the chairman observed that one great advantage to their land was the delightful prospect of that place which tempted visitors to purchase land for the purpose of erecting houses near so fine a view. He thought, therefore, that the governors, if they carried out what they meditated, would not only suffer a loss of the prospect, but a loss of revenue as well. By the plan which it was proposed to submit to the governors the prospect would be preserved, whilst they would eventually derive a considerable profit from the alteration. Mr. Mare proposed the following resolution, "That the ancient footway known as Croxted-lane, and used by the public from time immemorial, is one of the most picturesque features of West Dulwich, and that it is therefore desirable, as far as possible, to preserve its rural character." The speaker observed that his resolve to purchase a house on

the estate was induced by the rural aspect of the spot, and that if he had known that it was going to be covered with bricks and mortar he should not have made the purchase. The resolution was unanimously adopted, as was also another resolution to the effect that the erection of buildings on the narrow strips of land between Croxted-lane and the London, Chatham, and Dover Railway would destroy the picturesqueness and rural character of the whole neighbourhood, and also irretrievably destroy the future value of a large portion of the Dulwich College estate.

ST. BEDE'S (R. C.) COLLEGE, MANCHESTER.

The memorial stones of St. Bede's Roman Catholic College, Alexandra-road, Manchester, were laid on the 16th inst. The college, which was recently founded by Dr. Vaughan, the R.C. Bishop of Salford, is designed to provide for the sons of gentlemen such an education as is calculated to fit them for success in professional and commercial life. The new buildings for the college, of which the south wing is now being built, are designed by Messrs. Archibald Dunn and Edward J. Hansom, architects, of Newcastle-upon-Tyne. The building, formerly known as the Manchester Aquarium, having, with the surrounding grounds, been purchased by Dr. Vaughan, the problem to be solved was to incorporate the building with the new parts necessary for carrying on the work of such a college. The plan consists of one long block of building, broken by pavilions at either end, running parallel to the Alexandra-road, and facing the Alexandra Park, slightly in advance of the present front of the Aquarium (which it will mask) and making the old building the central hall. In plan the whole resembles the letter T inverted. The central hall will be kept as the exhibition room and museum, also for meetings, &c. In the centre of the college, and immediately in front of this hall, is the entrance and grand staircase leading to the first floor. On either side extends the new front, which will contain the study-room (65 ft. by 23 ft.); playrooms, 43½ft. by 29 ft.; libraries and class-rooms, 25 ft. by 23 ft., &c. In treating the exterior the architects have adopted the style of the Italian Renaissance. Red brick and terra-cotta are the materials used in the construction, the details of the windows, cornices, &c., being carefully studied and ornamented with modelled enrichments, which, being repeated in terra-cotta, do not entail great expense, and in fact cost much less than a plain building having stone dressings would do. The terra-cotta is being manufactured by Messrs. Doulton & Watts, of Lambeth, and the general contractor is Mr. William Healey, of Salford.

THE BUILDING LAND IN NORTHUMBERLAND AVENUE.

The St. Martin's Vestry do not appear to be satisfied with the manner in which the Metropolitan Board of Works are letting the surplus building land at Northumberland-avenue, and the subject has been discussed at the two last meetings of the Vestry. At the last Mr. Watherston again raised the question, and Mr. Dalton, the representative at the Metropolitan Board, being present, Mr. Watherston said it appeared to him an extraordinary matter that there was so little appearance of building on so eligible and valuable a site, and he wished to know if the reason was that too much money was asked, and too short a lease offered. In reply, Mr. Dalton said the Board thought so much of the site, and the importance of its being a credit to the parish, the metropolis, and themselves, that they would not permit any building that was not to have a stone front. They had had a great number of tenders, but they were, in most cases, below the estimate put upon the land by the architect. The reason why the land was not taken up was the condition of political affairs and the depression of trade. Already one plot was let for an hotel, at a rental of 9,440*l.* a year, and 140,000*l.* were to be laid out upon it; another plot was sold to the Christian Knowledge Society for 45,000*l.*; and a third let to Lord Beaumont at 550*l.* a year. Before the improvement, the rating of the whole property was close upon 8,000*l.* The rating of the hotel alone would be upon double that amount, so that the Vestry would soon have a return for waiting.

THE PROPOSED BUILDINGS ON THE SURREY GARDENS ESTATE, AND THE HEIGHT OF HOUSES.

Messrs. Sutton & Dudley are now laying out the Surrey Gardens Estate for building purposes, in streets of 40 ft. in width, with the intention of erecting houses on the estate, between 60 ft. and 70 ft. in height, and their application to the Metropolitan Board to be allowed to do so has just caused a discussion of some interest at the Newington Vestry, and also at the Metropolitan Board, in which the height of houses as governed by the width of streets was involved.

At the meeting of the Newington Vestry, Mr. Selway, the representative of the Vestry at the Board, stated that he felt it his duty to oppose the application, because he thought it was proper that the inhabitants of those houses should have as much light and air as possible.

In the discussion which followed, Mr. Hart said he thought it was rather hard on Messrs. Sutton & Dudley. If he was rightly informed Messrs. Sutton & Dudley could make a street 50 ft. wide, and then the Board would have no power over them in any way. He believed that that was what those gentlemen would do if the Metropolitan Board insisted in opposing the erection of those houses.

In answer to a member of the Vestry, Mr. Selway said that if the street were 50 ft. in width the builder could go to any height he liked.

Mr. Barker observed that if Messrs. Sutton & Dudley were driven to avail themselves of this, they would not get any more light or air, for if they had to make the roadway wider they would take away the open space in the rear, and put it in the front, so that he did not think it a question of right or wrong at all,—it was simply a question of robbing Peter to pay Paul. Ultimately a resolution was passed to the effect that the Vestry did not approve of high buildings on the Surrey Gardens Estate, and that this expression of opinion be communicated to the Metropolitan Board in the hope that they would not sanction the erection of the proposed buildings.

When subsequently the subject came before the Metropolitan Board of Works, at their last meeting, the Building Act Committee recommended that the application of Messrs. Sutton & Dudley for permission to erect houses on the Surrey Gardens Estate, exceeding in height the width of the street, be granted.

Mr. Selway moved as an amendment that the application be not granted, and presented the letter from the Newington Vestry in opposition to the erection of the houses to the height proposed. He contended that the height of these houses in a roadway of 40 ft. in width was in opposition to the rule laid down by the Act, and contrary to all sanitary principles.

Mr. Fowler supported the committee's recommendation. The houses it was intended to erect were of a class so much needed, and would be constructed internally with so many modern appliances for comfort and health, that the Board should not object to their erection.

It transpired that there would be forecourts on each side, 5 ft. in width, in addition to the width of the roadway. The Board confirmed the committee's recommendation, so that Messrs. Sutton & Dudley are at liberty to carry the houses to the height named.

ARCHITECTURAL ORNAMENTATION.

In the discussion which followed Mr. H. H. Stannus's lecture* on this subject at the Architectural Association,

Mr. H. L. Florence, in moving a vote of thanks to the lecturer, said he quite agreed with him as to the importance of reticence. In the application of ornament, the less educated the architect was, the more generally was he inclined to lay on ornament, and to smother his building with it. It was an undoubted fact that there was a great deal too much mere applied ornament on the buildings of the present day, and even those who were most inclined to be reticent in the use of ornament could often, by taking further thought, profitably dispense with some of the ornament shown in their original designs. By such pruning and denudation of ornament a building was very often vastly improved, and became stronger and more marked as to its purely architectural forms and proportions. What ornament was used, however, should be well placed and judiciously applied. The way in which it was possible to over-do architectural ornamentation was apparent in Roman buildings, with a few notable exceptions, such as the Farnesina Palace. In many of the works of the modern French school, ornament was very judiciously applied. In the judicious application of ornament to architecture there was a vast field for thought and variety of design, and Mr. Stannus had given some valuable hints in the direction of enabling them to think and work out for themselves schemes of architectural ornamentation, not only in words, but by his clever sketches on the blackboard. He (the speaker), therefore, begged to propose a vote of thanks to Mr. Stannus for his interesting lecture.

Mr. Aston Webb, in seconding the motion, said he had been unable from the title of the lecture to gather what turn the subject would take. He had looked in Johnson's Dictionary for a definition of "ornamentation," but it did not give the word. He thought that the word "decoration" would have been preferable, and more worthy of the subject, as "ornamentation" seemed to suggest something of smaller significance than the topic dealt with by the lecturer. As to the smallness in the size of stones in built-up shafts or columns, it was true that at the Madeleine in Paris the stones were so exaggeratedly small as to bring built-up stone columns into ridicule; but in England, where we were able to get stones of fairly large size, he could not see any great harm in building up a column in three or four courses. Why it should be necessary to emphasise the joints in a column any more than in a pier or wall he was unable to see, because no one was in the habit of thinking that all the stone columns he saw were monolithic. As to the amount of ornament allowable in a building, it was impossible to lay down any laws: it was entirely a matter for the architect who designed the building, and was dependent upon a variety of circumstances, such as height from the ground, general composition, and above all, on the taste and feeling of the designer. Mr. Stannus had said that proportion could not be taught; he did not know whether the lecturer quite meant that. Certainly proportion was one of the things which a man could greatly improve himself in. The more they studied both Classic and Gothic examples the more evident would the true principles of proportion become, and they would intuitively learn to use those proportions in designing buildings.

Mr. W. Hilton Nash said Mr. Stannus had quoted a remark by John Evelyn about buildings being gay and fine, but a visit to the Paris Exhibition would serve to show that some limit should be imposed upon gaiety in architecture, for there was to be seen a building, supposed to represent the English school of architecture, in which the casements were gilded! He thought that Mr. Stannus had dwelt rather too much upon the faults (which were no doubt many and grave) of the Roman architects, to the exclusion of their redeeming qualities.

The vote of thanks having been carried by acclamation,

Mr. Stannus, in reply, said Mr. Florence had well expressed his leading idea that most buildings would be better for the omission of much of their supposed "ornament." Notwithstanding Mr. Webb's objection, he preferred the word "ornamentation," as best expressing the particular subject of his paper; and he discarded "decoration" as being somewhat "shoppy," and as embracing a wider field than came within the scope of his paper. He adhered to his statement that proportion could not be taught by one man to another, but he agreed with Mr. Aston Webb in saying that it was possible for a man to acquire it for himself. As to Roman architecture, it was not his fault that its defects were more apparent than its excellencies.

* Reported in last week's *Builder*, p. 515.

The Institute Dinner.—We should be glad if we could further the President's wishes in respect of the approaching dinner. Mr. Barry has worked vigorously and well; his energy and tact have been alike conspicuous in the discharge of the presidential duties; and it is due to him that the members should rally round him on this occasion, and make the dinner a success. We have received some letters objecting to the high price fixed on the tickets. We feel sure, however, that the committee have well considered the matter, and decided in the way that seemed best.

PROGRESS OF SANITATION.

SIR,—Your report of the paper on the above subject read at Northampton, on the 15th ult., by Mr. Edwin Chadwick, has induced me to endeavour to suggest a thought to your mind with reference to it.

I have reason to know that sanitary measures are one of your special studies. You were, I believe, one of the first to call attention to the necessity for them. Writing in 1863, in your preface to "Another Blow for Life," you say,—"Ten years ago I pointed attention to the miserable condition of these [London] districts, and said,—'From dirt comes death.'"

In the paper read by Mr. Chadwick he said, "It was now thirty-seven years since he directed an inquiry into the sanitary condition of the town of Northampton." It may be assumed that the sanitary measures put into practice there since his first inquiry have been beneficial. Must it not then be discouraging to all who have the welfare of the public at heart to notice what he further says:—

"The best test of sanitary progress was the infantine death-rate. In the town this would appear to have increased; for, while in 1847 it was 24·8 per cent. of the children under one year, in 1876 it was 29·3 per cent. That, probably, was an exceptional year. For the same years, however, 47 and 45 per cent. respectively of children under five years died. The progress they were making, therefore, must be a most melancholy one, when, of all children born, one half would be in their graves before their sixth year."

The thought I wish to suggest to your mind is this: if the above is the best result of "thirty-seven years'" sanitary progress, it seems likely that there must be some worse than neutralising agency at work. What can it be? It is advisable that this should be sought out; else why should ratepayers be heavily burdened for expensive sanitary works, apparently fruitless of good results?

To quote again from your "Another Blow for Life," which is well worth re-perusal:—

"The newspapers make a tremendous outcry when some poor 'unfortunate' young woman has been driven, by the force of public indignation, to cast her little one into a pond or river; especially if the outcast excite general indignation still further by failing at the same time to commit self-murder; but how serenely the public contemplate that wholesale infanticide which disposes of forty or fifty children out of every 100 before they are five years old."

Again, in another place you say:

"Slowly, very slowly, do knowledge and experience overcome prejudices and the apparent interests of individuals. It is the duty of all to help on this most desirable object, not merely their duty, but their interest."

Let me entreat you to act up to the spirit of the last paragraph, and consider whether the real source of the mischief,—the real hindrance to the benefits which should be derived from sanitary progress,—the real agent in keeping up the excessively high infant mortality,—be not vaccination. The return issued lately, at the instance of Mr. Hopwood, M.P. for Stockport, shows that with compulsory vaccination there is a very large increase in the death-rate, especially among very young children.

As my object in this letter is not an attempt to prove the evils of vaccination, but only to point out that I believe the practice of it to be the real drawback to the benefits which may reasonably be expected from the study and practice of good sanitary measures, I refrain from quoting statistics, but will quote the words of an article on the vaccination question, which appeared in *Social Notes* of the 20th ult.:—

"Earnestly, then, would we entreat all lovers of their country and of its true welfare to throw aside the prejudices of early habit, or the apathy which has hitherto kept so large a portion of the more highly educated public in bondage to one of the shallowest and most mischievous delusions ever palmed upon mankind, and to look into the matter for themselves; using their own common-sense and God-given reason in the investigation, instead of relying upon the *ipse dixit* of doctors, the very parties interested, by professional pride and *esprit de corps* (setting all motives of pecuniary profit aside), in maintaining the credit of the idol themselves have set up. Such investigations, conducted in a candid and rational spirit, can lead only to one result."

Words fairly quoted for your own good work, on the title-page of "Another Blow for Life," may also, I believe, be fairly used of the writers of the above paragraph, and other leaders of the anti-vaccination movement:

"The world may say I've fail'd; I have not fail'd.
If I set truth 'fore men they will not see,
'Tis they who fail, not I. My faith holds firm.
And time will prove me right."—*Charles Swain.*

I earnestly hope you may be of the number who will see, and also help in this most important matter.

F. B.

Tetbury.

*** We are not likely to do so. The evidence in favour of vaccination is so conclusive and overwhelming that it is, to us, a matter of astonishment that it should be opposed by even so small a section as are arrayed against it. We print the letter because it is fair that readers should know there are some conscientious, if misinformed, people who see evil where others see good; but we cannot admit any discussion on the subject. There are sufficient known causes still in operation, unfortunately, to account for the frightful death-rate amongst infants still prevailing in parts of the kingdom.

THE MATHEMATICAL EXPRESSION OF THE BEAUTIFUL.

SIR,—In a paper which I read at Antwerp, and which was printed in the *Comptes Rendus* of the first Art Congress held in that city, I expressed an opinion that the mean would, some day, be experimentally demonstrated to be the quantitative expression of the beautiful. With this conviction I made some rude experiments by bringing a number of faces in rapid succession upon the same spot in the retina, and perhaps the experimental demonstration of this important fact will some day be successfully accomplished in this way. But whether it be attained by this kind of means or not, is now of very little consequence, for it would appear to have been effected by a curious composite method of photography, in which some half-a-dozen different faces are combined to produce one image. The result of such a procedure is thus described in the *Echo* of the 21st inst.:—"In the experiments already made the compound photographs are found to represent what is common to each of the portraits, while individual peculiarities are suppressed, the result being a handsome and regular face. By this means it is possible to procure photographs representing the general type of features presented by a race of human beings or the average likeness of a family."

W. CAVE THOMAS.

CONCRETE.

GENERAL CONFERENCE OF ARCHITECTS, 1878.

SIR,—Among the subjects to be considered at these meetings is that of "Concrete and Fire-resisting Construction." Having undertaken to arrange the proceedings for this meeting, I should be much obliged if you would permit me to state in your columns that I shall be happy to receive any communications on these subjects, to be considered at the Conference, especially the results of experience and records of failures or special successes. They should be addressed to me at 7, Whitehall-yard, London, S.W. ARTHUR CATES.

THE GIPSY NUISANCE AT DULWICH.

THE large tribe of Gipsies,—upwards of 200 in number,—which has for some time past been encamped on some land adjoining Lordship-lane, Dulwich, appears to be inflicting most serious injuries upon the inhabitants and property in the district, and for the lawless and shocking state of things which at present prevails the British Land Company appear to be primarily responsible.

The Camberwell Vestry have taken the matter in hand, and last week Mr. Marsden, their clerk, together with a number of gentlemen residing in the district, appeared before Mr. Ellison, the stipendiary magistrate, at Lambeth, to take his advice on the matter, when scenes of the most revolting character were described. Mr. Marsden, in addressing the magistrate, said the case was one of a peculiar character, and one which they had found considerable difficulty in dealing with. A number of gipsies had located themselves in the neighbourhood of Lordship-lane, one of the tribe, residing near Nunhead Cemetery, having purchased a plot of ground from the British Land Company, which for the last two years he had let for this encampment, charging one shilling a day or night for each van. The number encamping amounted to about 200, inclusive of women and children. The Inspector of Nuisances had visited the tents, but from the fact that they kept large and fierce-looking dogs, it was dangerous to approach too near. This state of things in itself was a very serious nuisance to the neighbourhood; but, in addition, there was a nuisance of a still worse and most disgusting character, arising from the fact that they possessed none of those accommodations essential to propriety. The consequence was that there arose a sanitary evil, which it was necessary for the health of the inhabitants to attempt to suppress. Mr. Sharp, who was the owner of a house nearly opposite the land in question, was obliged to keep his blinds closed to shut out the scene which this state of things presented.

Several gentlemen gave evidence of the nuisance.

Mr. James Henderson, a resident in the neighbourhood, testified to the great evil and serious injury to building in the neighbourhood which the tribe has caused. The encampment was on building land, and some of the gentlemen who accompanied him in his visit had recently built very large houses there. The continuance of the nuisance had paralysed fresh building, or doing anything with freshly-built houses.

The magistrate advised proceeding by indictment as the best mode, thinking that the evidence produced was not sufficient in itself to grant a summons under the Nuisances Removal Act. There was very strong evidence for action by indictment, and Mr. Marsden said he would consult as to taking that course.

THE CLOSET AIR ESCAPE.

As Prof. Tyndall has invented and brought into general use for firemen a smoke-escape, by the name of "The Smoke Respirator," it is time something of the kind should come into use for the purpose of avoiding an impure and noxious atmosphere sometimes loaded with contagious effluvia. It consists of an India-rubber tube, called also caoutchouc, from ½ in. to ⅝ in. in diameter (the latter size is rather too large, but should perhaps be preferred), having at one end a convenient mouth-piece flattened from the side like that of Sinclair's, "The Smoke Respirator," and at the other a small hook, so as to hook on to anything outside the closet, such as a nail in the wall.

It is found that it may be 7 ft. in length without any inconvenience in breathing through it, but if any stifling sensation is felt the person has only to inspire through the tube and expire into the closet for a very short space of time, in which there is no difficulty. It should be suspended by hooks or loops to the wall of the closet, the mouth-piece end hanging on the side close to the back of the closet so that the person using it can conveniently breathe through it the whole of the time he occupies the closet. The other end passes through a hole in the wall or over the door if there is space, and is hooked on to the wall outside the closet by a nail.

B. CLARKE, F.L.S.

CAUTION TO ENGINEMEN IN BUILDERS' YARDS.

AT the last sitting of the Wakefield County Court, Messrs. Rhodes & Dalby, contractors, sued George Sugden, one of their late enginemen, for 50*l*.

The case on the part of the masters was that some time since the defendant had charge of one of their powerful engines, and blew the water out of the boiler without having first raked out the fire, and the consequence was that damage was done to the property amounting to 400*l*., and life was endangered. The act was not considered to be one of malice, or the criminal law would have been put in force, but it was gross carelessness. The plaintiffs now only sued for 50*l*., an amount paid for repairing the boiler.

The defence was that the engineer did extinguish the fire before he blew out the water; but Sugden, in cross-examination, admitted he negelected to rake out the fire from under the boiler.

The jury gave a verdict for 10*l*., and the Court ordered the defendant to pay the costs, which, with his own, will "slate" up to 30*l*.

Accident.—Mr. Bedford has held an inquest at King's College Hospital on the body of George Harper, aged thirty-six, labourer, who was engaged on the works in connexion with the New Law Courts. On Tuesday afternoon in last week he was at work on a scaffold, and fell to the ground, a distance of 12 ft. He never spoke, and died the same day in the hospital from the effect of injuries to the head. It was not shown how he came to fall from the scaffold. An open verdict was returned.

VENTILATION.

SIR,—Permit me to correct an error in my letter published in your last week's issue.

It is stated as one of the results of Professor Roscoe's experiments that the quantity of carbonic acid in 100 parts of the air of a "fashionable theatre" when quite full, was found to be at

	Carbonic acid.
3½ ft. above the level of the stage, and over the stalls	·2637
Do. 4 ft. above do.	·3212

These figures should have been reversed as follows:—

	Carbonic acid.
3½ ft. above the level of the stage, and over the stalls	·3212
Do. 4 ft. only above do.	·2637

It follows that the proportionate quantity of carbonic acid in the lower and upper strata of all the air experimented upon by the two professors was as 1 to 1·1, and not as 1 to 1·042, thus showing still more strongly how erroneous is the assertion made by the writer of the leading and other articles of the *Times*, that the upper part of a room always contains more carbonic acid than the lower part.

Your correspondent "C. H." is not quite correct in saying that "these experiments showed that more carbonic acid *always* existed at the ceiling than at any lower part of the room by a very appreciable amount," for in four out of the twelve experiments referred to the quantity of carbonic acid was found to be greater at the bottom than at the top, and the difference in all cases was very variable, thus showing, as stated in my last letter, that no rule at present exists by which to determine the preponderance of this gas in any particular portion of ordinary air. Neither do I think "C. H." is right in saying that the question "has long been considered beyond dispute, and that it is a mere waste of time to inquire whether ventilation should be upward or downward." The question, it is true, was settled quite to the satisfaction of the members of the Commission referred to by "C. H.," but it is equally clear that the necessity for these letters arises from the fact that the question is by no means beyond dispute with many, and it, therefore, cannot be waste of time to discuss the point. On the contrary, the greatest harm is done by treating this important and difficult subject as an "extremely simple matter" and worthy only the free and easy dictatorial language used by the writer in the *Times*.

H. SAXON SNELL.

AN AWARD.

SIR,—Perhaps some of your numerous readers will be kind enough to assist me by answering the following:—

Some time since I was employed by a client to make some alterations and renovations to a house, upon which a considerable quantity of new, also some good sound old, materials were used, and my workmen employed in preparing and fixing the new and old materials. The conversion of old materials was something considerable. The whole of the work was done with the immediate direction and approval of the client. A few months after, I sent in my bill, charging materials supplied and labour spent in detail, and a small per-centage for my own trouble and profit. This bill was disputed, and after considerable correspondence it was agreed to have the same surveyed. The client named a surveyor, whom I accepted, through his being a F.S.A., and, as I thought, disinterested. The survey was duly gone through, and, after the lapse of five or six weeks, I received notice that the surveyor had made out "an award," and upon paying his fee the same would be disclosed. I have every reason to believe, from what has leaked out, that this same "survey" or "award" is in the form of a few words only, and simply names a sum, which is about half the actual cost of materials and labour put into the work, and, to all appearance, the work measured in detail has never been valued. The surveyor refuses to show any details of his survey. Can any one kindly say what is the common course taken in such a case? Surely I have not to submit to a considerable loss simply by accepting from the surveyor a few words, naming only the sum to be paid? Is there no professional protection for

ONE IN A FIX?

*** "One in a Fix" having agreed to refer the differences is bound, under ordinary circumstances, to accept the award.

COMPANY-MAKING.

ROBINSON *v.* THE MONOLITHIC FIREPROOF, SANITARY, AND CONSTRUCTION WORKS.

THIS was an action brought (in the Chancery Division, before Vice-Chancellor Sir R. Malins) by Mr. Thomas Maltby Robinson, claiming to have a contract rescinded which had been entered into by him for the purchase from the defendants of certain patents for improvements in the construction of buildings.

The plaintiff stated that the patents in question had been sold under a decree made by the Master of the Rolls in March, 1877, to William George Carpenter, for the sum of 50*l.*, by a company then in existence, and that they had been immediately afterwards resold to Thomas Bouffier, as agent for the defendant company, for 500*l.*; that the plaintiff had contracted, on behalf of a company about to be formed, to purchase the same patents from the defendants for the sum of 11,000*l.*, of which 1,000*l.* was to be paid in cash and 10,000*l.* in shares of the new company. When these facts were discovered, the plaintiff considered that the difference in the price for which the patents had been purchased and that which he was to give for them was so enormous that he refused to carry out the contract.

Mr. Sturges appeared for the plaintiff; the defendants were not represented.

The Vice-Chancellor considered that the facts stated were quite sufficient to warrant a rescinding of the contract, and made the decree claimed.

Barracks, Perth.—It was recently mentioned in these pages that Messrs. Ford & Son, of Montrose, had completed the new wings for the barracks at Perth. We are asked to add that Mr. Jas. Hill supplied all the locks and door furniture throughout the buildings in question.

STAINED GLASS.

Stowmarket.—One of the windows at the east end of the parish church at Stowmarket has just been filled with stained glass. It represents six scenes in our Lord's life, namely, the Garden of Gethsemane, the Scourging, Bearing the Cross, the Last Supper, the Judgment Hall, and "Ecce Homo." The window is in memory of the Rev. Henry Lewis, M.A., for fifteen years vicar of the parish. The work was carried out under the superintendence of Mr. Phipson, architect, Norwich; the designs being executed by Messrs. Clayton & Bell, and Mr. Frederick Brett, contractor, Stowmarket.

Tunbridge Wells.—A stained-glass window has just been introduced into the chancel of Christ Church, Tunbridge Wells. The subjects brought out are intended to illustrate the Divinity of Christ, a Belief in After Life, the Ascension of Christ, and the Preaching of His Gospel. The window has been designed and supplied by Messrs. Morris & Co., of Queen's-square. The expense of the window has been borne by Miss E. L. Carew, of Thornhill, who intends it as a memorial to her deceased sister.

Fulford.—Since the re-opening of Fulford Church, a new stained-glass window has been placed in the north transept by Mrs. Barstow, of Garrow Hill, in memory of her late husband. The window, which has been executed by Messrs. Clayton & Bell, of London, has depicted upon it the two figures of St. Peter and St. Paul.

Workington.—A stained-glass window has been placed in the east end of the south aisle of the parish church, Workington, to the memory of Dr. Anthony Peat. The subject is the "Good Samaritan," who is represented as "pouring in oil and wine," &c., on the wounded man, while in the background are represented two figures, "the Priest and the Levite" passing by "on the other side." The window is by Messrs. Hardman & Co. Birmingham.

Dunfermline.—Another stained-glass window has been inserted in the south-west corner of the old Abbey, thus completing the range of windows on that side of the building. The window has been presented by Mrs. Robert Douglas, of Abbey Parks, and is in memory of her husband, and father and mother. The subject is "Doubting Thomas." The work has been executed by Messrs. James Ballantine & Son, Edinburgh.

Buxted.—The large five-light east window of Buxted Church has just been filled with stained glass as a memorial of Lady Catherine Julia Vernon Harcourt by her husband, Colonel Harcourt. The subjects are the principal events of our Lord's life and death, with the Last Supper below. The subjects are treated in a conventional manner on white backgrounds. The work was executed by Messrs. Heaton, Butler, & Bayne.

Hackney.—Messrs. Pitman & Cuthbertson have completed three stained-glass windows for the chancel of the Catholic Apostolic Church, Mare-street, Hackney, from the designs of Messrs. Perry & Reed.

CHURCH-BUILDING NEWS.

Purley.—Christ Church, Purley, Surrey, was consecrated on the 26th ult. It has been erected from the designs of Mr. James Fowler, architect, Louth, and externally is faced with Kentish rag, with Bath stone dressings. Internally it consists of a nave, chancel, north and south aisles, north transept, organ-chamber, and vestry no the south side of the chancel, and a western porch. In length it is almost 100 ft., with a width of 25 ft. inside. The nave is of three bays, separated from the aisles by pointed arches worked in brick, with occasional bands of stone, above which is arranged, on each side, three clearstory lights. The chancel is a continuation of the nave, without any chancel arch. The chancel is apsidal, and lighted by five lofty lancet windows. The font (the carving of which had been intrusted to Mr. Ruddock), was, with the Communion cloth, presented by Mrs. and Miss Heath, and their friends. The seating throughout is of pitch pine, and arrangements have been made for accommodating 400 worshippers. The style is Early Decorated, and great variety is shown in the treatment of the window tracery and in the carving, which has been executed by Mr. Ruddock, of London; the gasfittings being by Mr. Skidmore, of Coventry. The erection of the building has been completed, under the personal superintendence of the architect, by Messrs. Cornish & Gaymer, of North Walsham, Norfolk, their foreman being Mr. George Wren.

Littlethorpe.—On the 23rd ult. the new church of St. Michael the Archangel at Littlethorpe, near Ripon, was opened. The building consists of nave, chancel, apsidal vestry, organ-chamber, south porch, bell-cot, &c., and is built of common brick, with stone dressings, moulded red and blue Staffordshire bricks being used for window jambs, string-courses, &c. The glazing of the windows is cathedral glass, of different tints, in lead lights The seats are of pitch-pine, and the lectern, prayer-desk, and altar-table are of oak. The floor within the altar-rails and the foot-pace are paved with encaustic tiles. A stained-glass window has been presented for the east end by Canon Worsley. The church will be lighted with pendent ornamental oil-lamps, and is warmed by stoves from Musgrave & Co.'s, of Belfast. The building has been erected from the designs of Mr. R. H. Brodrick, of Ripon, architect. The church will accommodate 120 persons, and will cost over 700*l.*

Tividale.—On the 24th ult. the new church of St. Michael, Tividale, near Dudley, was opened for divine service. The church is built of red brick, with side-aisles, divided from the central aisle by massive stone pillars, with stone caps, but at present these are in a rough state. The chancel is large, and on the left has a commodious vestry, and on the right an organ-chamber. The altar and Communion-table are of variegated marble, and above them are three large windows, which are to be filled with stained glass. At the entrance to the church is a carved marble font, which stands upon a polished granite cross. The church is entirely free, and, instead of pews, the seats are rush-bottomed chairs. The building will accommodate some 800 persons. The cost has been upwards of 8,000*l.*, of which Lord Dudley gave 3,000*l.*, and of the total sum only about 900*l.* remain to be paid. The tower and spire, which are not yet complete, are to be erected at the entire cost of Lord Dudley. The architects are Messrs. Davies & Middleton, of Dudley; and the builder is Mr. John Everal, Malvern.

GREENSTED CHURCH TIMBER.

SIR,—During the discussion on Mr. Blashill's paper on "The Question of Oak or Chestnut in Old Timber Roofs," at the Royal Institute of British Architects, on Monday evening last, one speaker referred to the use of timber in the nave of the famous church of Greensted, in Essex. The peculiarity of this church is that the walls of the nave are, or were (for I do not know whether any portion of them is yet standing), composed of roughly-hewn trunks of trees, set upright and close together, being let into a sill at the base, and fastened with wooden pins at the top. The question, as I understood it, was whether these trunks were oak or chestnut. The museum at Kew contains a portion of one of these trunks, and though I had always considered it as good oak, I did not venture to assert such an opinion at the meeting before I had had another opportunity of examining the wood. I have since done so, and have no hesitation in saying that it is undoubtedly oak. This, I think, is another proof of the soundness of Mr. Blashill's views.

JOHN R. JACKSON, A.L.S.,
Kew. Curator of Museums.

COMPETITIONS.

New Hull Botanic Gardens.—The design by Messrs. W. K. Reeves & F. W. Hagen, of Hull, for manager's residence, has been selected by the committee from the fourteen lots of designs submitted by nine local architects.

Hemel Hempstead Infants' School.—The School Board have had under consideration the designs submitted in a limited competition for rebuilding the infants' school in Queen-street, and have decided in favour of that submitted by Mr. George Low, of London, architect.

Board of Works, Spring-gardens.—A committee has reported it is desirable that an additional story should be erected on the Offices of the Board.

Miscellanea.

Builders' Benevolent Institution.—The forty-ninth election of pensioners in connexion with this Institution was held on Thursday last at Willis's Rooms, St. James's, Mr. Simpson in the chair, in the unavoidable absence of the president, Mr. William Higgs. There were three vacancies to be filled up, and as there were only three candidates (G. T. Spurgin, Thomas Nash, and W. Biscombe) there was no poll, and the candidates were, on the motion of Mr. George Plucknett, seconded by Mr. Thomas Stirling, unanimously elected. A vote of thanks to the chairman (moved by Mr. Plucknett, and seconded by Mr. Bussell) closed the proceedings. We understand that it was at first proposed to elect only two of the candidates, but the committee determined to elect the three candidates, trusting that their action would be justified by an increase in the subscriptions, especially in view of the fact that the pensions have been considerably increased in amount. The annual meeting of the Institution will take place on the 25th of July.

Gray's-inn-road.—In the House of Commons Mr. Hubbard asked the Secretary of State for the Home Department whether his attention had been directed to the dangerous insalubrity of some dwellings in Gray's-inn-road; and whether he could explain why apparently no steps were being taken for the reconstruction of the adjacent district, although a scheme for that purpose was the very earliest among those which were suggested in pursuance of the provisions of the Artisans' Dwellings Act. Mr. Cross said that it was quite true that the part of London referred to had been reported upon by the medical authorities; and he could not conceive any worse place in the whole of London. The scheme that was originally presented by the officers of the Metropolitan Board of Works was a large and comprehensive one; but, unfortunately, the Metropolitan Board of Works cut down that scheme, and presented it in such a mutilated form that it was perfectly unworthy of being passed into a law. He was told that under another Act the Metropolitan Board would pull down one side of Gray's-inn-road, and this would do away with a part of the houses which it was desired to clear away before undertaking a scheme to reconstruct new houses. He hoped this scheme would be speedily carried out; but he must refer his hon. friend to the chairman of the Metropolitan Board of Works for further information on the subject.

St. James's, Piccadilly. — Prebendary Kempe, preaching at St. James's, Piccadilly, stated that in a few days he should have held the living for a quarter of a century, the longest period, with one exception, of its having been held by any rector since its separation from St. Martin's by Archbishop Tenison, and that he desired to signalise this semi-jubilee by effecting certain alterations and improvements in St. James's Church. The works contemplated were—1. Arranging and fitting up the eastern end in such a manner as to give it more of the aspect and character of a chancel. 2. Enriching and brightening the mouldings of the ceiling and of the arcades that vault the galleries. Something had been done towards it twelve years ago. 3. Re-pewing the church. 4. Providing stained-glass for such windows as are not already fitted with it. 5. Moving the font, an interesting and almost unique work of Grinling Gibbons, into the vestibule under the tower, and in fitting up the vestibule as a baptistery, with a marble pavement and a painted window by one of the best artists.

New Roman Catholic Church at Rivelin Glen.—The new church at the Catholic Cemetery, in Rivelin Valley, was opened a few days ago. The church is dedicated to St. Michael. It is in the Early English style of architecture, and built of hammer-dressed Greenmoor wallstone, with Worrall stone dressings. It is 22 ft. wide and 72 ft. long internally, and has an open roof, covered with Staffordshire tiles. At the eastern end a bell-turret, in which hangs a bell by Mears, of London, rises to a height of 60 ft., and in the gable of the south porch is a niche, with a fine figure of St. Michael slaying the dragon. The chancel floor is laid with encaustic tiles, and there is an altar of polished marble and veined alabaster, with a sculptured figure of "The Dead Christ" underneath in white alabaster, by Boulton, of Cheltenham. Messrs. Sadfield & Son were the architects, and Mr. M. J. Dowling was the contractor.

Supposed Explosiveness of Flour-dust. The explosiveness of flour-dust when diffused through the air, says the *American Architect*, of which we made mention at the time of the explosion of the Greenfield Candy Factory, in New York, has apparently received a startling illustration in the destruction of the flouring mills at Minneapolis. The manner in which the accident occurred can never be made clear, for every man perished who was in the great Washburn Mill where the first explosion occurred; but no other cause than the flour-dust has been seriously argued, so far as is known. The material, which could by its detonation, throw down in an instant all four solid stone walls of the great mill, more than 100 ft. square, and lift the roof bodily some hundreds of feet into the air, must have been pretty thoroughly diffused throughout the building.

The Sessions House, Old Bailey.—At a meeting of the Court of Common Council on the 16th inst., the City Lands Committee, reporting on a reference to consider the state and condition of the Sessions House, Old Bailey, stated that in their opinion the only mode of providing suitable accommodation for the transaction and conduct of the business of the Central Criminal Court would be to take down all the existing buildings at the Sessions House, and erect new courts and offices upon the site thereof, and the vacant ground and premises adjoining. The consideration of the subject was postponed.

TENDERS

For alterations to the Assembly House, Kentish-town, for Mr. W. Harwood. Mr. Edward Brown, architect:—

Smeed	£299 10 0
Dickens	290 0 0
Cocks	236 9 0
Marr (accepted)	229 0 0

For alterations to the Manor House, Finsbury Park, for Mr. S. Medcalf. Mr. Edward Brown, architect:—

Stamp & Bowtle	£818 0 0
Salt	796 0 0

For alterations to No. 36, Commercial-street, Spitalfields, for Messrs. Murrey, Patterson, & Roberts. Mr. Edward Brown, architect:—

Salt	£135 0 0
Marr (accepted)	134 5 0

For six model cottages at Roehampton, for Mr. T. D. Galpin. Mr. Samuel Knight, architect. Quantities not supplied:—

		Extra for high-pitched roof, tiled.
Nightingale	£2,325	£35
Shepherd	2,258	95
Pann	2,244	—
Harvey	2,220	50
Sutton (accepted)	2,030	20

Accepted for the erection of a Foresters' Hall and two houses and shops, in West-street, Reading. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Excavator's, Bricklayer's, Carpenter's, Ironmonger's, &c., Work.

Simonds	£3,184 0 0

Plumbing, Painting, &c.

Gocher	354 0 0

Smith and Founder's Work.

Wright	221 2 0

For additions to the Foreign Missionary College of the Sacred Heart, Mill-hill, for Canon Benoit:—

Butler	£416 0 0

For the restoration of Donington Church, Salop. Mr. John Norton, architect:—

Espley & Son	£2,400 0 0 !
Fisher & Co.	1,992 0 0
Stephens & Bastow	1,899 0 0
G. & F. Heigham	1,868 0 0
Nevett Bros.	1,657 0 0
Cornish & Gaymer	1,625 0 0
Patterson & Sons	1,605 0 0
Lovatt	1,593 0 0
Bullock & Son (too late)	1,467 0 0
Cadman (too late)	1,450 0 0
Bateman & Doody	1,298 10 0
Martin (accepted)	1,270 0 0 !

For the erection of new Hide, Skin, and Fat Market, in the Eastcroft, Nottingham. Mr. S. Dutton Walker, architect:—

Vickers	£5,615 0 0
Attenborrow	5,549 0 0
Bell & Son	5,470 0 0
Lowe	5,460 0 0
Stevenson	5,366 0 0
Roberts & Perkins	5,342 0 0
Messom	5,300 0 0
Fish & Son	5,220 0 0
Willimot & Wray	5,209 0 0
Hind	5,111 0 0
Wood	5,100 0 0
Wheatley & Maule	5,063 0 0
Jelley	4,995 0 0
Middleton	4,980 0 0
Clark	4,971 0 0
Hodson & Facon	4,905 0 0
Bailey	4,879 10 0
Fisher & Hutchinson	4,877 0 0
Lees, Brothers (accepted)	4,749 0 0

For the erection of the New Bible Christian Chapel and two houses, Percy-road, Kilburn Park. Mr. W. Ranger, architect:—

	Chapel.	Houses.
Gwyer	£3,109	£1,224
Jones & Co.	2,950	1,362
Taylor	2,991	1,188
Bailey	2,770	1,188
Hook & Oldrey	2,719	1,130
Ennor, Julian, & Co.	2,630	1,120
Richardson, Brothers	2,495	1,053
Allen (accepted)	2,325	996
Collins & Co.	—	990

For new house, at Monk's Wood Farm, near Huntingdon, for the Right Hon. Lord Chesham. Messrs. Sedgwick & Son, architects:—

Frances	£1,315 0 0
Whiteman (accepted)	1,285 10 0

For block of three, and two single cottages, on the Westhorpe Estate, Little Marlow, Bucks, for Mr. J. P. Ellames. Messrs. Sedgwick & Son, architects:—

J. S. Carter	£1,270 0 0
R. G. Carter	1,123 11 2

For three pairs of semi-detached cottages, on the Thurlow Estate, Great Thurlow, Suffolk, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick & Son, architects:—

Mason & Son (accepted)	£1,200 0 0

For alterations and repairs to house and buildings at Bourne Farm, on the Breakspeare Estate, near Uxbridge, for Mrs. W. W. Drake. Messrs. Sedgwick & Son, architects:—

Brown (accepted)	£735 0 0

For converting into three cottages the old malting, at Troy Place, near Rickmansworth, for the provost and scholars of King's College, Cambridge. Messrs. Sedgwick & Son, architects:—

Brown (accepted)	£400 0 0

For new warehouse, in the Old Bailey. Mr. Lewis Solomon, architect. Quantities supplied by Messrs. Williams & Gritten:—

Lidstone	£1,447 0 0
Downs	1,287 0 0
Larter	1,284 0 0
Patman & Fotheringham	1,190 0 0
Elkington	1,100 0 0

For rebuilding and enlarging Radcliffe-on-Trent Church, Notts. Messrs. Goddard & Paget, architects. Quantities not supplied:—

Fisher & Co.	£6,078 0 0
Bradley & Co.	6,010 0 0
Young	5,186 0 0
Allen	4,900 0 0
Barlow, Brothers (accepted)	4,331 0 0

For houses and shops, at Stoke Newington-road. Mr William Reddall, architect:—

Pringle	£14,235 10 0
Forrest	13,528 0 0
Hayworth	13,450 0 0
Palmer	12,084 0 0
Goodall	11,955 0 0
Marr	11,915 0 0
Garrud	11,776 0 0

For pulling down and rebuilding the Swan Hotel, Fenny Stratford, Bucks, for Messrs. Holdorn. Mr. Frederick Gotto, architect:—

Fincher & Smith	£1,399 0 0
Esau	1,308 0 0
Stanniford	1,280 0 0
Adams & Gates	1,160 0 0
Gibbs	1,154 0 0
Gates (accepted)	1,151 0 0

For erecting a new chapel of ease, at Iping Marsh, Sussex, for the Rev. F. R. Stratton. Mr. E. P. Loftus Brock, architect:—

Trigg	£738 16 6
Waller, jun. (accepted)	523 0 0

For Primitive Methodist chapel and school, Hackney-road. Mr. A. J. Rouse, architect:—

	Chapel and School.	Tracery Windows.
Heather & Davies	£4,702	£100
T. J. Williams,	4,350	83
Staines & Son	3,988	18
Steed, Brothers	3,910	117
Shurmur	3,899	111
A. G. Williams,	3,789	132
Stimpson & Co.	3,675	104
Sampson & Parrish	3,697	175
Niblett	3,638	143
Garrud	3,583	175
Chapman	3,571	103
Linfield	3,504	84
Webber	3,475	-

For alterations, &c., White Horse and Cross Keys Tavern, Goswell-road. Mr. C. H. Flack, architect:—

	Old Buildings.	Bar-fittings.
Langmead & Way	£1,028	£150
Crabb	950	340
Somers	850	437
Chapman	812	344
Ward	817	366
Beale	630	280

For new staircase to Middlesex Lunatic Asylum, Hanwell. Mr. Martin, engineer:—

Carless	£2,834 0 0
Nye	2,295 0 0
Lascelles	2,282 0 0
Higgs & Hill	2,280 0 0
Langmead & Way	2,195 0 0

For residence, with stabling, in Netherhall-terrace, Hampstead. Messrs. Spalding & Evans, architects:—

		Extra for Pitch Pine.
Roberts	£4,585	£58
Lascelles	4,440	86
Cook	4,330	—
Downs & Co.	4,310	105
Shepherd	4,259	91
Nightingale	4,181	55

For erecting new warehouse premises, at South Bermondsey, for Mr. J. Phillips. Mr. J. Johnson, architect:—

Castle	£1,055	0	0
Pike	913	0	0
Maxwell, Brothers	879	0	0
Hoare & Son (accepted)	837	0	0

For additions to Fern Bank, Ruckhampton Park. Messrs. Spalding & Evans, architects:—

Eborall	561	0	0
Pain	548	0	0
Stamp & Bowtle	447	0	0

For new house, at Heathfield, Hampstead. Messrs. Spalding & Evans, architects:—

Roberts	£2,710	0	0
Temple & Forster	2,730	0	0
Lascelles	2,683	0	0
King & Brown	2,583	0	0
Cook	2,550	0	0
Downs & Co.	2,520	0	0
Shepherd	2,489	0	0
Nightingale	2,447	0	0

For alterations and additions to No. 35, Granville Park, Blackheath. Messrs. Spalding & Evans, architects.—Philps & Bisiker (accepted)

For the erection of new offices and chambers, 22, Pall-mall, and 33, St. James's-square, for the Imperial Insurance Company. Messrs. Osborn & Russell, architects:—Contract No. 1.

Merritt & Ashby	£4,650	0	0
Colls & Son	4,438	0	0
Brass	4,396	0	0
Grover	4,283	0	0
Chessum	4,163	0	0
Sabey & Son (accepted)	4,040	0	0

For Fire Brigade Station, Bridewell-street, Bristol. Mr. J. Thomas, architect:—

Krauss	£6,176	0	0
Easterbrook & Sons	5,900	0	0
Cowlin & Sons	5,795	0	0
Church	5,695	0	0
Brock & Bruce	5,600	0	0
Howell	5,600	0	0
Hatherly	5,563	0	0
Humphry	5,540	0	0
Davis	5,300	0	0
Williams & Sons	5,300	0	0
Stephens & Bastow	5,199	0	0

For rebuilding house and shop, 23, High-street, Poplar, for Mr. Henry Wickes. Messrs. A. & C. Harston, architects.—

Jacobs	£1,760	0	0
Palmer	1,650	0	0
Riddle	1,600	0	0
Coleman	1,573	0	0
Harle	1,493	0	0
Johnson	1,397	0	0

For the London and South-Western Bank, Small-street, Bristol. Mr. J. Weir, architect. Mr. C. Mayland, surveyor. Quantities supplied:—

	Bath.	Doulting.	Portland.
Easterbrook	£22,310	£23,310	£23,600
Wilkins	22,000	22,800	25,400
Church	20,700	21,972	24,400
Veales	20,000	21,000	21,850
Kingston	19,622	—	20,022
Hatherly	19,143	19,975	22,030
Davis	18,900	19,950	19,640
Baker	18,140	19,940	19,640
Crocker	18,119	18,450	18,919
Brock & Bruce	17,850	19,310	19,810
Stephens & Bastow	17,295	18,147	19,895
Howell	17,150	17,400	19,500

For schools at Mildmay Park, Mr. Chessum's tender was 2,43*l.*, not 2,430*l.*, as printed in the list of tenders last week.

TO CORRESPONDENTS.

G. W.—S. & Son.—Dr. P.—A. C.—G. L.—A. & Co.—S. D. W.—J. W. S.—J. R. J.—C. B.—W. R.—E. L. B.—H. L.—C. S.—O. B.—F. G.—R. W.—M. U.—G. C.—R. Y.—B. C.—A. S.—B. & H.—B. B.—J. & C. J. F.—O. R.—J. G. C.—L. & W.—J. M.—W. & W.—S. & Sons—Mr. B.—W. D. H. (there is no royal road to such knowledge. Go into a builder's office).—A. B. P. (thanks)

Ventilation (some communications on this subject will have consideration next week)

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors

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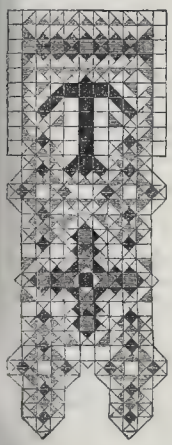
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The Outcome of the Water-Supply Congress.

THE Conference on the National Supply of Water, which, in response to the letter of H.R.H. the Prince of Wales to the Council of the Society of Arts, was held at the Rooms of that Society in John-street on the 21st and 22nd ult., presented an innovation in its proceedings which is worthy of all respect. Our readers may remember that on former occasions we have lamented the loss of available power which has usually occurred on occasions of the kind. Not only at the meetings of the Society of Arts, but at those of the Civil Engineers, the British Association, and many other gatherings of a more or less scientific character, the course hitherto adopted has been for the most part simple and uniform. A certain number of papers of very different orders of merit are sent in to the secretary, in anticipation of the meeting. Where the gathering-ground is large, as in the case of the British Association, a certain degree of relation is possible, and some assurance is thus afforded that the contributions actually read will be worthy of attention. The more novel the association, and the more it is dependent for support, so to speak, on previously untapped sources of supply, the greater is the probability against any high level of excellence being maintained by the contributors. However this may be, the papers admitted are read, in alphabetic or other order. When this is done by the secretary, and when that officer, as in the case of the Institution of Mechanical Engineers, happens to be both a rapid and a good reader, the best method is adopted for bringing the matter to the ears of the meeting. When the authors are allowed to read their own papers, the evils of want of distinctness, want of due speed, and the like, generally render the delivery ineffective; or, otherwise, the time of the meeting is consumed by the prolixity with which the reader will linger over his favourite sentences, and intersperse subsidiary remarks. Then follows the discussion. A will very likely contradict *in toto* the conclusions or the premises of the writer. B will attack A, probably rather on the score of something which he has said or written elsewhere, than directly on the matter of his speech. C will take a third stand-point, and perhaps point his quills all round; and when the discussion is brought to a close, each participant will be more confident than before in the strength of his own position, while the general audience will feel slightly bored, and wholly bothered. The printed record of the paper is all that remains, and any light that was struck from collision of different minds is wholly lost.

To avoid this waste of public time, we suggested, in a recent article, the propriety of proceeding by resolution in cases of this kind. This idea was carried into effect at the recent meeting after several papers of interest, written from entirely different, but not inconsistent, standpoints, had been read. Mr. Conder, instead of following the example of the preceding speakers by merely reading his own printed contribution, inquired of the chairman whether the Council would allow of his proposing a resolution to express the sense of the Conference as to the primary necessity of a hydrographic survey of England, the assertion of which idea was the gist of his own paper, which had been remitted to the Society of Arts by H.R.H. the Prince of Wales. Up to that period of the meeting the attention of the Conference had been called to the subjects of the rain-fall of England, by Mr. G. J. Symons, the honorary secretary of the Meteorological Society; to the water in the chalk system, by Mr. Joseph Lucas; to the information to be obtained from the Geological Society, by Mr. Chadwick; and to the importance of gauging the outflow of rivers, by the Rev. J. C. Clutterbuck. Mr. Conder pointed out that, great as was the importance of each of these questions, it was only by such a solution of the problem as would assign to each of them its proper rank, as well as its proper reply, that the object of the Prince of Wales would be attained. In proceeding to discuss such questions as that of the plan proposed by Mr. Hassard for the conveyance to London of the water of the Cumberland and Westmoreland lakes, controversy might be expected to arise. Up to that moment the meeting was undisturbed by any ground of difference; and it might thus be desirable to secure an expression of unanimity in recommending, as a first step, the preparation of a hydrological survey.

After a little consultation among the members of the council, the chairman, Sir H. Cole, admitted the validity of the argument, and promised that, if the reading of the papers were then allow to continue, the Council would prepare a resolution to the effect suggested by Mr. Conder, and submit it to the meeting on the following day.

Mr. J. Bailey Denton then read a paper, which to a great extent coincided with the statements and with the requirements of that of the preceding speaker. He also referred to the machinery available for the raising of water, such as turbines, hydraulic rams, and pumps; and gave some account of the Bill passed last session under the title of the Limited Owners' Reservoirs and Water Supply Further Facilities Act, 1877; and of the Bill now before Parliament to amend the Public Health Act of 1875. Mr. De Rance read a valuable paper as to the geological distribution of the areas of the chief river outfall districts of England. These districts, which had been grouped by Mr. Conder in ten natural provinces, were presented by Mr. De Rance in fourteen groups, under which the geological systems were referred also to fourteen systems. The sums of the several areas, of course, make up the general area of England. Even as to this, however, there seems to be no absolute accord. The round figures adopted by Mr. Conder, from the returns of the Registrar-General, were 58,400 square miles. Mr. De Rance's formations sum up to a total of 57,655 square miles. In a paper read by Mr. Shelford, an analysis of the river basins, as shown upon the Ordnance Survey of England and Wales, made with a view to ascertain whether these catchment basins are generally limited to one or more counties, gives a total area of 57,919 square miles. The fact that a difference of 254 square miles exists between the measurements made of the Ordnance map by two competent engineers, and that the largest of these is less by 432 miles than the total of the eleven divisions of the English and Welsh counties by the Registrar-General, which comes to 58,357 square miles, is alone sufficient to prove the necessity of a general tabulation of our existing information, similar to that which, in relation to the hydrography of Italy, both continental and insular, has been carried out and published by the Italian Government.

Mr. John Evans, F.R.S., travelled over much the same ground as that covered by the two preceding speakers in their papers, although looking at it from general, rather than a detailed, point of view. Dr. Frankland called attention to the fact that the increasing pollution of rivers and streams renders the supply of wholesome water from them more and more difficult. He also referred to the waste of domestic water, as a crying evil, only to be remedied by the compulsory use of meters. In Glasgow, he stated, 38 gallons per head are used for domestic purposes; in London, 26 gallons, and in Malvern, where the meter system is in use, 7½ gallons per head. Ten gallons per head per diem, in the opinion of Dr. Frankland, is amply sufficient for domestic purposes; and would probably never be reached if the water were sold by meter. How much of the difference between 10, and either 26 or 38 gallons is due to the introduction of the water-closet system, no speaker appears to have calculated. Dr. Frankland admitted, in reply to a question by Mr. Conder, that at spring tides the sewage thrown into the Thames at Barking Creek by the Metropolitan Board of Works ascended the river in some degree above London Bridge.

Mr. Hassard brought forward his scheme for the conveyance of 400,000,000 gallons per diem from the lake districts, by aqueduct, for the supply of London. Instead of the vivid debate

which some persons had anticipated would follow the reading of Mr. Hassard's paper, it attracted far less attention from the meeting than any which had preceded it. It is possible that the estimate of an expenditure of twenty-one millions sterling was rather a barrier to the recognition of the practical nature of the scheme.

In our last number we reproduced what may be called the programme of the Conference, being the series of papers submitted to the meeting, and taken as read. The reports in the daily journals are little more than abstracts of this programme, giving next to no information as to the actual course of the discussions. These were marked by admirable temper, very general accord, the introduction of valuable matter, and now and then by an outburst of general fun, which made a very lively time of it. One gentleman, whose admirably good temper predisposed every one to listen with attention, told the meeting that they were all in the dark. He had had the good fortune to make a physical discovery of the greatest importance. People talked about diseases being caused by bad water or by sewage. Nothing of the kind occurred, because it was impossible. The cause of all this mischief was the sun. Sir H. Cole quietly remarked that the object of the meeting was not to discuss the action of the sun, but that of water, to which the speaker rejoined that he would get into the water directly. Unfortunately for those whose curiosity was excited, Sir Henry kept to the programme, and the physical discovery was for the time lost to the world.

The perusal of the several papers is enough to convince any one acquainted with the subject of the value of the innovation introduced into the proceedings of the day. Such papers as those of Professor Prestwich, Mr. Symons, Mr. Homersham, Mr. Bailey Denton, and some others, were each of permanent value, regarded alone. Each, however, has tenfold value if all of them are brought together as part of a systematic whole. To some extent the paper of Sir H. Cole regarded this necessity. The division of England and Wales into districts, each confided to the care of a competent engineer, is one that will be found advocated in the columns of the *Builder* as far back as 1872. Sir Henry Cole, whether led by antiquarian research, or by any mystic view of the power of numbers, recommended what may be called a water heptarchy. Mr. Conder, whose paper came next in order, not only pointed out the natural arrangement of the country into ten districts, but gave a table of the area, rainfall, population, and proportion of water supply to demand, in each; and further delineated the sources of information already at command, and the nature of the observations that would be requisite to complete the hydrographic survey of the country. He also illustrated the case by the experience of the Italian Ministry of Public Works.

In proposing to apply to Government for the appointment of a commission, the resolution went a little beyond any of the papers; or, indeed, put in plain terms what had only been hinted at before. Some such step is indispensable; and in the absence of a minister of public works, no doubt a small permanent commission is the machinery most suited to work in harmony with our existing legislation. In seconding the motion for the resolution, as prepared by the council, Mr. Conder proposed, and obtained, the omission of the word scientific. This little change, which met with full adhesion all round, was made in order to prevent the public from coming to the conclusion that an abstract and theoretic division was proposed. On the contrary, it is as the best mode of making practical use of positive observation that the commission is suggested. A morning paper, in commenting upon the outcome of the Conference as something unsatisfactory, has entirely missed the practical sense of the proposal to tabulate and publish the facts which it is necessary to know. At present, any one concerned in a scheme has to collect all the data for himself, as the country used to be surveyed and re-surveyed for and against every newly-projected line of railway. The Bill passed, or was rejected, and all this labour was lost. The *Times* cited with approval the proposal of one of the speakers to ascertain the facts of certain water-bearing strata; but this is only a part of the general problem; which is, to ascertain how much water falls on the island, and what becomes of it. When this is done, the water supply of any city or town will be a matter of very simple investigation. Till it is done, no new scheme can be introduced without risk of unnecessary cost, or of interfering with some other district. All this is so patent that the only wonder is, that those who have so long urged it on the Government and on the country have as yet received so little attention.

The value of the upshot of the Conference will become more manifest by comparing Mr. Bateman's paper with those of Sir H. Cole and of Mr. Conder. The President of the Institution of Civil Engineers throws cold water on the Prince's letter. "How, for instance," Mr. Bateman says, "could any scheme be combined for meeting at the same time the wants of a village in Northumberland and one in Cornwall?" The answer is, in the words of His Royal Highness, by preparing a "large and comprehensive scheme of a national character." That is to say, by ascertaining, in the first instance, the hydrographic condition of the country. His Royal Highness has looked at the map of the island, and has seen that a general knowledge of its water conditions was indispensable. It is just the fact, stated by Mr. Bateman, that "the large cities and towns provide for themselves and their neighbours, but many small isolated villages lie beyond the reach of such places, or of the aqueducts which supply them" which forms the state of things which it was the intent of His Royal Highness to remove, and which will be removed owing to the Prince's initiative. As to aqueducts to supply them, that is begging the question. Sir Henry Cole said "the capital required might be a hundred millions or more." The idea of enormous outlay, long aqueducts, and the like, is one which a thorough investigation of existing sources is likely largely to modify. Enough water comes home to us all, and when we have ascertained all the facts of the case we shall be in a position to avail ourselves of the bounty of nature without spending millions on aqueducts. The matter is now placed in a good groove, and we shall have reason to congratulate the country if the measure which we have so long advocated as of primary necessity is now seriously taken in hand.

CHINA AND JAPAN AT THE PARIS EXHIBITION.

IN spite of their variety there is always a sense of monotony stamped upon all exhibitions of purely Asiatic art and industry. At the same time, however, there is a strong impress of character upon every detail, which goes far to redeem this unvarying Orientalism. And it is this which confers so unique an interest upon the Chinese and Japanese cabinets, as they may be termed, which have now been opened to the world at Paris. If regarded only as curious collections, they may, perhaps, be passed over as little more than additions, on a large scale, to the familiar *bric-à-brac* of Eastern connoisseurs, but if, examined minutely, they point to an essential difference between Chinese and Japanese arts, manners, and ideas, they acquire an interest which is historical. The distinction, in order to be recognised, must be very closely traced indeed. There has not been a very large space permitted for their exhibition; but the narrower the limits the better is the opportunity for a close appreciation of the contents. But the first salient point in both these collections is the refusal, on the part of both Japan and China, to put themselves in avowed competition with Europe, — with London, Paris, Berlin, or St. Petersburg. This, while it takes them beyond the range of cosmopolitan rivalry, gives a keener zest to the emulation between themselves. Yet, while asserting their traditional independence of foreign ideas, both nations volunteer for the race, and it may be a matter of doubt whether Chinese and Japanese steam-engines, and Japanese and Chinese photographs, are better represented at Paris than the stock jars, fans, screens, and other frivolous miscellanies of Oriental luxury. In another respect, too, they both egregiously fail. They exhibit great masses of furniture as examples of their progress in the modern arts, in moulding, carving, colouring, and so forth; but nine-tenths of these bear the hall-mark of Europe, — that is, of Hong-Kong, Canton, or Shanghai,—which is to be regretted, because wherever the native capacity, pure and simple, sports itself, the result is interesting, as, for example, in a little wall of white Chinese brick, reputed to be more durable than any manufactured in Europe; and in a group of "piles" prepared for bridge and foundation building by a process unknown, as yet, in the West. It can hardly be the object of an International Exhibition to preserve such secrets, yet, if there be blame in the matter, it has been shared equally between the East and West; and all industries, it must be remembered, were "mysteries" at one time or another. There are to be noticed, too, in this class, the fantastic groups of animal figures in porcelain, intended for the decoration of tombs or dwellings as the occasion may require, and the same material wrought into the shapes of tables, chairs, side-boards, stoves,—a hint to Germany,—and even mingled, in numberless constructions, with ebony and bambû wood. In the art of furnishing, these Orientals possess a kind of magic. Except when copying the West, and employing its artisans, they rely exclusively upon their own light materials, and their own speedy workmen. It is one valuable result of these displays that they enable Europe to distinguish between the rapid and still apparently elaborate work of such countries as China and Japan, with their pretentious minutiæ of detail, and the devotee art, as it may almost be termed, which dedicates the labours of ten men, during ten years, to the weaving and embroidery of a single shawl.

We meet, of course, at the Paris Exhibition, with specimens of Chinese porcelain attributed to every known or traditional age in the chronicles of that famous manufacture. However, with regard to the examples assigned to a period nearly 3,000 years anterior to the Christian epoch, they may be at once set down among the fables of the curiosity-mongers. The reputed, or traditional, inventor of the art, the Emperor Houang-ti,—supposing him to have ever existed, —was not born, according to Chinese chronology, until three centuries later, which rather throws some of the Chinese Court at Paris into the shade. But, unfortunately, allowing all the antiquity credible to this manufacture, it seems impossible to distinguish, even here, between the results of forgery and those of original production. Not a few of the "modern" Chinamen, in fact, challenge a comparison between their avowedly new "painted" and "embroidered" work, and that for which no authenticated date can be claimed. There is no matter for regret in all this, because, if true, it would simply prove that the story of a lost art is a fiction, and that sometimes nations may not be so dead as they seem; and a similar remark applies to the exquisite fans, of painted silk or rice-paper,—the latter scarcely less durable than the former; the delicate sculptures in jade and ivory; and to the designs,—though these are visible in photograph only,—which relieve the sculpture of the East from the charge of being invariably inhuman and grotesque. We have marble, though not of Carrara, shaped by true artistic hands, without, be it remembered, the previous and guiding assistance of clay-modelling; and the fragment of a balustrade in this material, from the Palace of Pekin, is an architectural study in itself, together with pieces of roof, wall, and terraces from the same edifice. The lacquer work is, of course, characteristic, and may be revisited; and the bronzes, from the continent, as well as from the islands, though moulded by a different genius, are, from the point of view of historical ideals, equally magnificent. It was a mistake, however, to classify with these either Chinese or Japanese glass-work. Neither nation can claim glass-making as an industry of its own. It was an art introduced into the far East by those great pioneers of civilisation, the Jesuit missionaries, and has never enjoyed any high development, for even to this day the Chinese employ mica or paper for the glazing, so to speak, of their casements. Their curtains of silk, it must be said, judging from the illustrations at Paris, are incomparably superior to their windows. With the Japanese, we find, so far as their display at Paris is concerned, a somewhat higher ambition to excel in the sight of the Western world. They bring arms, tools, articles of luxury, children's toys, pictures, and useful plants and minerals; but as is invariably the case, no sufficiently distinct line is drawn between their "exhibits,"—to employ an odious neologism,—and those of China. With respect to themselves, however, it is important to observe that they disclaim the idea of being a solitary, isolated, homogeneous people, representing one industry, one art, one stage of civilisation alone, for, on the contrary, they illustrate, on the part of their particular islands, and even of their especial provinces alone, a

peculiar type and epoch of art. Thus a period is marked, before the arrival of European trade, which, as is well known, was inaugurated by the Dutch. We see this also illustrated at the Paris Exhibition, by the varying claims of Yedo, Hakodadi, Nagasaki, Osaki, and so forth, opposed by the hereditary assertions of Satsuma, Nagato, and Fijen,—all three of them representing, however, provincial and family interests rather than local and hereditary talent. We have here, nevertheless, the key to the genius of the Chinese and Japanese cabinets in the Paris Exhibition of 1878. From Japan there is the model of an artisan's or small shop-keeper's house,—an oblong building surmounted by a slowly-sloping conical roof, thick and heavy, partly thatched and partly tiled. There are no steps mounting towards the interior; the windows, as we have said, are composed of materials even more artificial than glass, and sheets of polished steel supply the place of mirrors. To this point has Japanese luxury attained, with thickly-woven fabrics, as defences from the cold; heavy garments of fur; and, above all, furniture, of singular fabric, for a people who use neither tables nor chairs. It is difficult for a European eye to understand, indeed, how Japan can be made so domestically comfortable with so little furniture, an immense *armoire*, sometimes actually let into the wall,—not a table, not a chair, a gigantic set of "tea-things" in porcelain and crystal, and a clock hung up between two masts of gold. But, carrying the sight a little beyond these superficial prettinesses of the Exhibition, we find the perfect model of a Japanese home, rich in enjoyable ornament, yet almost destitute, perhaps, of that which, in Europe, would be called furniture, since the people, with a fortune around them, in the form of vases and lacquers, sleep on bare boards, and have nothing in the way of domestic furniture to exhibit, as a pattern from Asia, to the imitative spirit of Europe. Japan, at the Paris Exhibition, modestly pleads that it has little to show beyond its mechanical ingenuity, and its long-tried experiments in the fine arts. European critics are wrong in saying that in this respect they have nothing to learn from Japan. The Japanese know nothing of perspective; theirs is essentially a surface and a decorative art; but they still possess some secrets, the teaching of which to Europe might be well worth a little even of Western study. The Exhibition contains a large collection of those varieties so characteristic of Chinese manners, and important to them, illustrating the processes and utensils employed in the adaptation of tea as a commodity for human enjoyment. From every point of view, however, we have found these Eastern departments interesting, and, in many respects, instructive.

THE REPORT ON THE HEALTH ACT AMENDMENT BILL.

A SELECT Committee, consisting of fifteen members, was nominated by the House of Commons, on the 19th of February last, to consider a proposed series of amendments to the Public Health Act of 1875. Not only is the report of the Committee deserving of attention, but, as is so often the case, the minutes of evidence contain much valuable information; and papers are printed in the appendix which deserve a wider publicity than is that usually attained by a Blue Book.

The *ratio entis* of the Committee was the usual fountain of dispute, litigation, confusion, and cost,—namely, the inability of a body of 656 men to draw up a form of words that shall hold water, when it comes to the detail of carrying out a general resolution. "From the date of passing the Public Health Act up to last session of Parliament it was believed that provisional orders could be obtained under the Act, by which water rights could be compulsorily taken." Such, no doubt, was the intention of the Act, or at least, of its framers and supporters. Such were the opinions of the Local Government Board, which issued several provisional orders for the compulsory taking of water rights. Suddenly and awkwardly, during last session, a committee of the House of Lords, while considering a provisional order obtained by the Local Board of the West Houghton District for the compulsory purchase of a water right, came to the conclusion that the order was *ultra vires*; "and consequently it was not confirmed." The Law officers of the Crown were then consulted, and came to the satisfactory conclusion that they were of opinion that "the Local Government Board cannot confer upon a local authority power to purchase, otherwise than by agreement, any right to abstract water from any stream."

It follows, in the opinion of the Committee, that, before water from a stream can be taken by any sanitary authority for the water supply of its district, an agreement would have to be made with every owner, lessee, and occupier, below the proposed intake, who may be affected by the abstraction of the water. It is proverbial to speak of the incertitude of the law. The expression, however, is not very appropriate. The law, as far as it is undisturbed by jejune statutes, is certain, stable, and comprehensive. It is the tinkering of amateur legislation that is uncertain. The local authorities, who up to this time have been successful in raising and spending a large amount of money, whatever they have to show for it, are now discovered, by the slow perception of a Committee of the House of Lords, to have been clothed with an imaginary authority as to one essential requisite of any useful action. The Local Government Board has been giving an equally imaginary sanction to the exercise of this imaginary authority. Local and central authorities have been alike in the wrong as to the very A B C of these operations. Can there be a more pregnant comment on the opinions we have ventured to express as to the care, forethought, and wisdom displayed by the framers of the Public Health Act?

A sanitary authority, we are told by way of consolation, can still obtain compulsory powers by a private Bill. So, no doubt, can a canal company, or a waterworks company, or a private individual, if they get their Act. But it has been pointed out, the report adds, with a certain amount of grim humour, that the cost of obtaining a private Bill is much higher than that of obtaining a provisional order. The method contemplated for empowering the local authorities has not only broken down, but so completely broken down, according to the inference of the committee, as to be incapable of being set to rights in any way except by the usual panacea,—new legislation. Even proceeding by agreement is not competent to the unlucky local authorities. For if ninety-nine parties interested in a watercourse be liberally dealt with and fully content, the hundredth,—discovered, may be, after costly works have been carried out,—may upset the whole affair, or demand his own price for his consent.

There can be no doubt that a blunder of this nature is excessively discreditable, wherever the blame may fall. As to that we have no opinion, nor do we care to form one. The actual hitch seems to be that the power was given by the Act of Parliament to the local authorities for the compulsory taking of "lands." "Lands" are defined to include "messuages, buildings, lands, easements, and hereditaments of any tenure." How it is that water rights do not come in under the term "hereditaments" we do not profess to understand. There can be no doubt that a matter of such prime importance to the very commencement of the operations of a sanitary board ought to have been clearly and distinctly stated. The omission to make such a statement was a blot on the Act of Parliament, and a piece of slovenry in all responsible for it. Still, with the utmost respect for the House of Lords' Committee, we cannot understand on what ground they have so sharply limited the word hereditaments in the teeth of the obvious aim and intent of the Act of Parliament.

Another hitch has been discovered, hostile to the peace of the ill-devised and ill-advised local authorities under the Public Health Act. "The Committee have had pointed out to them very forcibly that the prevailing practice with regard to defraying the costs of a water-supply does not appear to meet the equity of the case." It is not urged as yet that everything that has been done by every Sanitary Authority is illegal, owing to the above-declared illegality of the acquisition of water. Perhaps we may look forward to a crop of lawsuits on this ground a little later. But when the water is obtained, it seems that iniquity presides over the charges made for it. At present a Sanitary Authority may recover the cost of the water-supply (that is we suppose, when the other difficulties are cleared up) in either of the following ways:—1. They may charge the whole cost upon the rates; in which case it is paid out of the rate for special expenses; or, 2. They may defray the cost by water-rates or water-rents upon the consumers of the water. These charges may be insufficient, sufficient, or more than sufficient, to meet the costs of water-works. If they are insufficient, the rates have to make up the deficiency. If they are more than sufficient, the rates will be lightened by the surplus revenue derived from the water-works. It appears to the Committee that grave evils result from this state of things. It frequently happens, they remark, notably in rural districts, that the whole charge is borne by the parish, under the rate for special expenses, while the supply of water is limited to the village, or to a particular part of the parish. Those who live out of this favoured locality have thus to pay for the convenience of the residents in the part supplied with water,—a fact that in many cases has raised a formidable, and even an insurmountable, objection to schemes for water-supply.

Again, it occurs in other cases that the Sanitary Authorities charge water-rates and water-rents on too low a scale. In this case the cost of the water to the actual consumer is lightened at the expense of the ratepayers in general. Nor does this exhaust the list of troubles that loom on the vision of the Committee. The price charged for water by some authorities is, it seems, too high. In this case "another grievance arises, viz., that the rates are lightened at the cost of the consumer of water. If a large ratepayer were not a large consumer of water, it would be his interest to have the total amount to be raised by rates lightened by the surplus profit derived from the water-works."

In considering the difficulties thus naturally arising from the intrusting to totally uninstructed bodies of men the decision of questions of a simple business character, the committee seem conscientiously to have regarded themselves as placed in a like position. Painfully and hesitatingly, however, they have made some way through their difficulty, or rather, have been wise enough to catch at the good advice given them by a gentleman who is not an amateur legislator. "After full consideration of these cases," the committee have luminously arrived at the opinion that they "think that the sound principle to lay down is that water supplied by a sanitary authority should be paid for by the consumer." The mountain has thus brought forth a mouse; but it is a very well proportioned mouse. "As it appears that this principle, if carried out to its full length, might, in some cases, cause the charge for water to be very high, it seems desirable that a maximum of charge on the consumer of water should be established. On the other hand, it has been shown to the Committee that it is desirable to establish a minimum."

The upshot of this struggle is the recommendation of a suggestion made by Colonel Cox, R.E., an inspector of the Local Government Board. This is to the effect that both a maximum and minimum charge should be prescribed by Act of Parliament, the former being 2s. in the pound on the rateable value of any house, and the latter 6d. in the pound on the same rateable value. The maximum that can thus be charged on a cottage of 4*l.* per annum rent is 8s. 8d. per annum, or less than 2d. per week, and the minimum is less than ½d. per week. But this plan does not seem to meet the case which the committee proposed, that of "a manufacture being established in which large quantities of water were used." The fact is, that the provision of a certain quantity of water, proportioned to the domestic wants of the population, is all that can be expected under any such maximum and minimum rate; and that the provision of any extraordinary quantities should be made matter of special arrangement, the water being then paid for at something like cost price, and in proportion to quantity actually supplied.

A third hitch has been detected in Section 52 of the Act of 1875. The effect of this section is "to restrict a local authority from providing a water supply when within the limits of supply of a water company." A water company often has a district assigned to it, which includes outlying places to which its mains are not in the first instance laid, but to which it is contemplated that at some future time they may be extended. It is justly observed that such a power should be confined to some reasonable limit of time—or, at all events, that it should not be so conferred as to give to the water company invested with it the means of playing the part of the dog in the manger. As the law now stands, if the inhabitants of a district within

the limit of supply of any water company, or other authority which has been appointed to supply water, will guarantee 10 per cent. for three years on the cost, the company or authority in question is bound to lay down mains and supply them with water. But the usual incertitude here comes in. It is in doubt whether a local sanitary authority can be regarded as "inhabitants," and whether it can legally do—as a constituted body—what any non-constituted body of residents are entitled to do, by giving a guarantee, and charging it on the rates. The words of the Act are, "that a local authority may contract with any one for the supply of water." As it seems, however, that this clause omits the qualification, any one duly authorised to contract with them (as in the case of the owner of partial water rights), the Committee are of opinion that "if there is any doubt about the matter it ought to be removed." It is further suggested that in lieu of a guarantee of 10 per cent. for three years, it would be better to give a guarantee of 7 per cent. until the water rents or rates from the district served amount to a sum sufficient to pay that rate of interest on the outlay. In fact, the doubts that arise are so numerous, and the language of the report is so confused on the subject, that we must pass on to the outcome of the discussion, which is to the satisfactory effect that the Committee recommend the propositions brought before them to the attention of Parliament. It is probable that no opposition will be raised to such a recommendation. Still, looking at the total want of definite aim which it veils, one is tempted to ask of what use was the appointment of a committee that refers the whole subject back again to the body which appointed it?

Hitch No. 4 is "the fact that a rural sanitary authority has not the power to oppose by counsel a Bill in Parliament, by which it is proposed to take water from their district, though they can petition against it." Here is another instance of the slovenly manner in which the new authorities were constituted by the original Act, but we cannot enter into it.

The Select Committee cannot, at all events, be fairly charged with any great rashness of over-statement. That the laying before Parliament of "any information which," in the quaint English of the Report, "it is important for Parliament to know" might help to solve the problem of water supply is, at all events, highly probable. But the really interesting part of the case is that the Committee make a recommendation which involves, however unconsciously, a primary principle for which the *Builder* has contended since the first debate arose as to the form and scope of the Public Health Bill of 1872. The Local Government Board, if required to supply to Parliament a report as to the probable wants of any districts to be affected by legislation, must be enabled to do so, not as a matter of hand-to-mouth inquiry in each individual case, but as part of a general systematic knowledge of the water requirements of the country. Nor will this, taken alone, be of the slightest utility. Not only the requirements, but the means of supply, must be known. The Committee see, and see truly, that the wants of one district are not to be regarded without reference to the wants of their neighbours, if there be any question as to source of supply. But they do not appear to have imagined that there is any established relation between demand and supply. They speak of investigating the first without reference to the second. This has been the radical error of every great scheme of water supply of late brought before the public. A wants so much; and proposes to take it from the ground of X, passing through those of B, C, and D by the way. Before we answer A's demand, say the Committee, let us ascertain how much B, C, D, and X are also likely to require. So far, so good. But this is only half the question. What is the natural source of A's supply? Is X's the nearest available? And so on for B, for C, and for D. Unless this question be solved, it is idle to put the former one. This the Committee do not appear to have comprehended. But it is an inseparable condition of any intelligent inquiry into the case.

But what does this involve? What must the Local Government Board do, in order to put themselves in a position to report to Parliament, or to take any measures of their own authority and initiative, as to any matter affecting the water supply,—or the water discharge,—of the country? They must begin at what we have always insisted on as the beginning. They must provide themselves with a proper hydrological survey of the country. If the Report of the Select Committee on the Amendment of the Public Health Act has any consequent meaning, the necessity of such a survey is the first requisite.

The final clause of the summary of recommendations, with which the report concludes, is such as to leave no room for doubt on this score. We quote the words, "That, when a company or corporation goes to a rural district for water, Parliament, before giving the powers sought for, should be informed of the wants of the district from which water is proposed to be taken, or through which the main passes, in order to make provision for these districts." Lest any reader should think that we have been too severe, or too light, in the criticisms we have let fall on the workmanship of the Report before us, we must call attention to the fact that the above clause of "summary" does not, in point of fact, by any means represent what we were told just before, in clause 17, that "the committee therefore recommend." Nor are the discrepancies unimportant. The earlier clauses dealt with the question of the wants of "sanitary authorities." The summary speaks only of "company or corporation." The earlier clauses propose that a report should be made to Parliament by the Local Government Board. The summary is to the effect that "Parliament should be informed," which it always is. The case of the promoters of every such measure is always based on the information which, in support of such case, they submit to Parliament. The case of the opposition, where there is one, is based on information collected with a different animus. The decision of a Parliamentary Committee, between these two conflicting bodies of information, probably mainly depends on the ability of the engineer or other chief witness to stand examination or cross-examination, and to gain the confidence of the tribunal. It is, at the present moment, far more a matter of personal ability than of fact. To suggest the intervention of the administration may or may not be wise and good. It is, at all events, a total change of procedure. But that with which we are concerned is, what it involves. It is proposed that Parliament should lay on the shoulders of the Local Government Board that very responsibility which the latter has always declined, but in the absence of which no justification can be adduced for the existence of such a department of the administration.

In a word, the Report of the Committee assumes that the Local Government Board ought to be in a position to advise Parliament as to the propriety of passing or rejecting any application for powers affecting the water supply of the country. For such advice to be anything but futile, if not actually mischievous, the Local Government Board must show what the actual conditions regulating the water supply of the county, district by district, are. It is very true that the Committee only speak of the wants of the districts. But that is only a crucial example of what the whole Report breathes,—the practical unacquaintance of the members of the Committee with the matter brought before them for decision. The patient attention to all that was urged seems deserving of all praise. But they evidently were not a body of engineers, nor was the subject brought before them as it would have been done by a great engineer. They are convinced, however, that the central authority must have a voice in the matter. There can be no doubt of this necessity, unless we are to be like the monkeys in the Zoological Gardens, each district stretching out a thievish hand for its neighbour's supply, while neglecting its own. For the opinion of the central authority to have the slightest weight, it must be based on knowledge. That knowledge is only to be rendered permanently useful and available in the form of a proper survey. To this, then, according to any mode of regarding the case, we must come. The sooner this fact is acknowledged and acted on, the better for the ratepayers, for the sanitary bodies, and for the people of England. Mr. Brown's Bill for the Amendment of the Public Health Act is a meritorious attempt to facilitate the supply of water to the rural districts, but in logical order requires to be preceded by the completion of the hydrographical survey of the country.

The New Dublin City Markets.—The Dublin City Markets will be erected from designs by Messrs. Lockwood & Mawson, of Bradford. The estimated cost is 70,000*l*.

THE ARCHITECTURAL CONFERENCE.

THE general conference of architects, which will open at the Institute Rooms on Monday next, will, we hope, be well supported by the members of the profession not resident in London, whose attention we call especially to this opportunity for meeting on common ground, and discussing subjects of common interest to the profession. That the town members will attend in force we have very little doubt, if only because we are sure there are many who will feel with us, that the able, painstaking, and business-like manner in which the president, Mr. C. Barry, has devoted himself to the duties of his office, calls for every recognition and support from his colleagues. But to the country members (and to country architects who are not members, but who ought to be) we especially suggest not to let slip an opportunity of assisting to consolidate the *esprit de corps* of the architectural profession in England, in which more unity of feeling and of action is so much to be desired. And there is the more reason that they should come forward heartily, inasmuch as it is quite certain that nothing has been neglected in the arrangement of the programme to make it, as far as possible, of special interest to visitors, and to provide for their convenience and their welcome in every way. Indeed, it may be said that they have been more thought of than the resident members; there is the greatest desire at head-quarters to secure their co-operation, and to give them every facility for seeing and for saying what they wish to see and to say; and we believe the Conference will be regarded by the Council as a success very much in proportion as it results in drawing together the leading representatives of the profession scattered throughout the kingdom. That, at all events, is our opinion; for we consider one of the most-to-be-desired ends in connexion with the architectural profession is that the central representative society should become more truly and actually representative of the whole British architectural profession, both in view of the internal working of the profession and of its relations to the public. Nearly everything which it can be reasonably said that the Institute of Architects might do and does not do it is prevented from doing simply by the fact of men holding aloof from it, from no intelligible motive: men who complain that it should do this and that, without reflecting that their own help might be a step towards accomplishing more; at all events, that their absence from the ranks creates an appearance of weakness and want of union which has a very bad effect on the status of the profession with the outside public and the press. We should like to give a sample from our own knowledge of how this condition of things acts in regard to public opinion. An architect, who was a member of the Institute, was attacked in conversation by a clever literary man in regard to the supposed sins of architects in taking builders' commissions and in making their own profits out of works independently of their client's interests, about which we heard a good deal of nonsense recently. Of course, our professional friend naturally said, not only that no architect occupying even a respectable professional position would think of soiling his hands in that way, but that the rules of the Institute of Architects compelled every one becoming a member to bind himself against taking remuneration directly or indirectly from any tradesman, and that any member against whom such an allegation could be proved would be liable to be struck off the Institute list. "Very likely," was the answer, "but would that disqualify him in any degree in public estimation?" Of course, the admission had to be made that it would not *necessarily* do so, because it is known that some architects whose abilities and character are beyond question are not members. Now, it is *these* gentlemen who are actually, in such a case, tying the hands of the representative society of architects from doing their work in ensuring purity of practice and public respect for the profession. If every one who has these objects in view would consider it his duty to belong to the Institute of Architects, it would be a comparatively easy matter to quash irregular practices in inferior quarters, and to establish the profession in a position in public opinion which would render the libels which some newspaper correspondents and others have thought fit to circulate against it simply absurd. But where there is so much of disunion and party spirit within the profession, it is no wonder if people

who are not familiarly acquainted with its workings know not what to think when they hear such charges made. We cannot help thinking this consideration very *apropos* to the occasion when another re-union of the architects is invited, and we hope those to whom it applies will give a thought to it; merely adding that in again urging this topic, we are not by any means speaking from an Institute point of view or in the special interests of the present governing body, but in the interests of the profession at large, some of whom we consider are making a great mistake, and neglecting an important means of strengthening their position with the public, by not giving their adherence to the only body which has the position and the official machinery * for acting adequately as a representative influence.

Coming from this general topic to the more immediate object of the Conference, we may say that the programme seems to us to be very well adapted to combine the useful with the agreeable, and that in the main every one who runs an eye through the list of subjects must be struck by its eminently practical character. The first paper, by Mr. Armitage, on "Mural Painting," is in one sense a purely artistic subject, and one which has excited much interest on artistic grounds of late, but that also is a good deal allied with practical questions as to the best materials for standing in this climate, &c. The other three principal subjects, "The Corrosion of Iron," "The Model Bye-laws as the Basis of a Building Act," and "Concrete and Fire-resisting Constructions," are all of the most rigidly practical character, and all deal with subjects of immediate interest in regard to the work to be done in the buildings of the future; and it will be strange if some really valuable information and suggestions are not elicited in the course of the meetings devoted to these subjects. Two other equally practical subjects are to be illustrated in the course of the meetings, one by Mr. T'Anson, who will contribute a paper on the "Iron Ribs to carry the Roofs of the new Corn Exchange," and by Mr. Penrose, who will explain to those who visit St. Paul's Cathedral the means adopted to protect the dome from fire. The visit to Mr. Waterhouse's great building at South Kensington will also have its practical side, for it furnishes the most extensive and we believe the most successful instance in this country of the architectural use of terra-cotta, and there will no doubt be a good deal of information to be gained on the practical side of that subject. Archæology is not forgotten, and the last meeting of the Session is devoted to two archæological papers by Mr. Roger Smith and Dr. Phené. But we specially congratulate the Council and those who will attend the Conference on the very practical nature of the programme which has been made out, not because we by any means think more lightly of the artistic side of architecture than others, but because we consider that it is in regard to practical subjects that discussion and interchange of information are so specially valuable. The art part of architecture is so much a matter of personal taste and predilection, and admits of so many different views and feelings, all with more or less to recommend them to various persons according to their education and temperament, that it is hardly a matter on which fixed conclusions can be arrived at by discussion, though it is interesting to exchange feelings and opinions. But the practical side of architecture hardly admits of difference of opinion except that which arises from difference or insufficiency of knowledge; there is always the best material for a given purpose, the best way of using that material, the best form of construction in a given case, capable almost of mathematical demonstration if we only get facts enough; and the advantage of meeting and discussion is to put together, on such subjects, as many facts and as many experiences as possible, and eliminate the results for future guidance. In regard to this view of the subject we should not have omitted to allude to the proposed visit to Mr. Kirkaldy's testing works, when some of the most efficient and direct methods of arriving at facts in regard to materials will be practically illustrated.

* We cannot help adding that hardly any society of this kind could be better organised in its working than the Institute of Architects now is. With the exception of a recent regulation in regard to the discussions on papers, which we have before said was a mistake (and which will probably be altered), there is really an extent and completeness of organisation for doing everything that is wanted, and considering every subject that requires consideration, which can hardly be improved

Those visitors who want relief from these more serious studies will find a good deal to interest them in London just now, in the way of art at all events; and some of the finest private collections have been kindly thrown open for the inspection of all members of the Conference. We hope all who attend will have both a pleasant and a profitable week.

EDINBURGH.

HERE, as elsewhere, the general depression in trade is felt, and although the price of material has fallen, and wages are down, there is a great falling off in building speculation. The demand of late seems to have set in for commodious flats rather than for self-contained houses or villas, and to meet this demand, sites which would otherwise have been reserved for separate villa residences have been usurped by large tenements. The temptation to erect such is great; for, not only does the builder secure a larger profit by selling each flat separately than by disposing of an entire building, but the proprietor of the ground exacts a separate feu (ground-rent) on each, which in the aggregate is more than what he would obtain from one vassal who requires a self-contained house. This turn of the tide has had a detrimental effect upon some parts of the suburbs, destroying their semi-rural appearance, and interrupting the view, and is particularly unsatisfactory when no attempt has been made to give the blocks of buildings a skyline.

The only new buildings of any magnitude commenced this year are the Medical Class-rooms. Both the infirmary and the cathedral are approaching completion, but the great tower and spire of the latter will necessarily be a work requiring time and caution in its erection. From some points of view, the tower, although the first stage is not complete, dominates over the surrounding buildings, and in coming down the Mound we remark that it takes up a position further to the south than we expected.

The present state of uncertainty as to peace or war has led to a vigorous effort being made to enforce upon Government the necessity of proceeding with the project for fortifying the Firth of Forth, which has been in abeyance for a long period. Colonel Moggridge, commanding Royal Engineers in Scotland, has prepared plans for the erection of batteries, which have received the approval of the War Office, and the erection of them is to be prosecuted forthwith. These are to occupy sites on the island of Inchkeath, and on a point to the west of the village of Kinghorn, on the Fife coast.

The statue to Dr. Chalmers, the execution of which was entrusted to Sir John Steele several years ago, has now assumed shape. It is of bronze, of heroic proportion, and will occupy a site in the centre of George-street, at its intersection with Castle-street, and it will complete the series of public monuments which adorn the centre of the former broad thoroughfare.

The good Dean Ramsay took the leading part in promoting the Chalmers memorial, and now the dean is to have two monuments to his memory, one public, and the other in St. John's Church, in which he officiated. The public monument is to occupy a site on the ground attached to St. John's in the line of Princes-street, and facing South Charlotte-street. It is to consist of a runic cross of red granite, 24 ft. in height, designed by Mr. R. Anderson, A.R.S.A., and, in addition to characteristic ornamentation, is to have a bronze medallion of the dean. The memorial in the church takes the form of a mural tablet in bronze by Skidmore. The tablet is surmounted by a silvered and gilt canopy which is supported by shafts bound with traceried fillets. The canopy is decorated with enamelled plaques representing the rose and thistle, and with clusters of amethysts and crystals. The crest is of silvered foliage and enamelled daisies, and the apex is crowned by a cross enriched by amethysts and crystals. The inscription is on a tablet at the base having a border of forget-me-nots, onyx stones, and pebbles.

The final step toward the realisation of the scheme of the late Mr. David Bryce for the improvement of the Bank of Scotland, has been carried out by the removal of the screen-wall to the north of the building and the substitution of a terrace backed by brick-vaulting. The ground above the vaulting is levelled, and has received a coating of asphalte to prevent the penetration of moisture. The elevation of the terrace is broken up by rusticated piers, above which are pedestals, with balusters between; the terrace wall is returned at either end to meet the sloping ground upon which the bank stands, and at either angle is an open pavilion consisting of four arches with a flat roof surrounded by balusters. The work has been carried out under the direction of Messrs. Peddie & Kinnear.

THE HEALTH AND SEWAGE OF TOWNS.

CONFERENCE AT THE SOCIETY OF ARTS.

THE third annual Conference, under the auspices of the Society of Arts, on the health and sewage of towns, was held on Thursday and Friday in last week, the Right Hon. James Stansfeld, M.P., in the chair. There was a large attendance of professional men and others interested. The programme included papers and discussions on (1) the gradual abolition of cesspools and middens, and substitution of tubs and pails, with speedy removal; (2) the progress, if any, made in treating water-carried sewage since the last Congress; (3) escape of sewage gas into dwellings, and modes of prevention; (4) progress, if any, made in the utilisation of excreta since the last Conference; (5) discharge of sewage into the sea; (6) cost of systems given in the last Report of the Local Government Board; and (7) whether any further legislation, of a compulsory or permissive character, is needed for bringing about a better sanitary condition of towns or dwellings, or any change in imperial administration.

The Chairman, in opening the proceedings, remarked upon the work which the conference had undertaken, and said that they had seen enough of such conferences to be satisfied of their utility. He thought the time had come when they might advisedly enlarge their scope of inquiry. The subject they had undertaken to investigate was at first a somewhat narrow one, and they widened it to the larger question of the health as affected by local government arrangements, which was a part, and possibly not the largest part, of a very much larger question of the national health, viewed in all the causes of national disease, and the influence which the effect of the health had one way and another. Cleanliness was a great source of health, and in the promotion of cleanliness local government could do a great deal with the view of providing clean air to breathe, clean water to drink, clean persons, clean habits, clean houses, and so forth. Upon those matters the previous conferences had arrived at distinct conclusions. They had expressed their view that by legislation as far as necessary, local authorities should have the power and control over the house-drains as well as over the public sewers, so as to be able to fulfil their implied contract with the inhabitants to remove the sewage without allowing the generation and escape of sewer gas. As to the question of pure air, the local bodies could do much, but they could not control that question within the dwelling, and compel internal ventilation. If people preferred their windows shut, and preferred foul air to pure air, it was not for local authorities to place a policeman to every dwelling to see what was desirable should be done. They could not secure that, nor even cleanliness of habit. All those things were matters of education; and he largely viewed the question of health as a matter of education. He looked forward to the day when local government would be further advanced and better understood by the community at large, and when the education of the young would be in the hands of the ordinary local governments of every locality. That he believed to be the future of education and local government, and when that time came he trusted that the science of national health would be taught in the schools of the United Kingdom as much as the "three Rs" were.

Under the first head of the programme, "The gradual Abolition of Cesspools and Middens, and the Substitution of Tubs and Pails, with speedy Removal,"

Alderman Taylor submitted a paper describing what had been done, and was doing, in Rochdale. He stated:—

"The collection of excreta and house-refuse in pails and tubs has been in operation in Rochdale for ten years. The rate of increase in the adoption of the pail and so the

gradual abolition of the cesspools and middens, will be seen by the following figures :—

In March 31st, 1870, there had been adopted			527	pails.
,,	1871,	,, ,,	543	,,
,,	1872,	,, ,,	620	,,
,,	1873,	,, ,,	819	,,
,,	1874,	,, ,,	1,471	,,
,,	1875,	,, ,,	761	,,
,,	1876,	,, ,,	825	,,
,,	1877,	,, ,,	798	,,
,,	1878,	,, ,,	1,140	,,
		Total pails.....	7,504	

The borough was extended by the Act of Parliament in 1872, and now comprises 4,180 acres, being an extension of 3,004 acres. The district added to the borough rapidly adopted the pail system.

The population in 1872 was 45,224, and now, in 1878, is 71,000. On January 25th last it was ascertained that there were still 1,200 old privies and middens, when the Health Committee of the Corporation, being fully convinced of the advantages and economy of the pail system, and the absolute necessity that the practice of 'tipping' should be abolished, decided to recommend that the whole of the remaining old privies should be altered to the pail, and this, notwithstanding the satisfactory increasing voluntary alterations now being carried on.

The town, for the purpose of collection, is divided into six districts, named A, B, C, D, E, and F. Notice has recently been served on eighty owners."

Dr. Wilson, of Rochdale, said that ever since this system had been introduced into the town the death-rate had been continuously lessening. In 1870 it was 27 per 1,000; in 1876, 22; and last year it was 21.

Mr. J. M. Fox, medical officer of health for Mid-Cheshire, submitted a paper, in which he said,—

"It has been the practice of Western teachers of law and religion to concern themselves about things more glorious than the safe arrangement of the excremental process. The word 'typhoid,' in its definition and history, now so well and generally understood, has been the talisman that has awakened statesmen and philanthropists to a knowledge of their error. Preventible diseases are now honoured by being recognised as national adversaries; and it is at last beginning to be considered to be as glorious to save lives at home as it has always been to save them on the field of battle. Yet Moses gave to his people, and through them to the world and to all subsequent time, the leading principles which safely control the discharge of this essential and unavoidable function.* The principles are instantaneous removal, combined with instantaneous disinfection.

I would blend the principles into one still more general and elementary, a violation of which by any one and any where inevitably involves us in peril and in nuisance; a violation of which, therefore, should be defined, and dealt with always as a statutable offence.

The elementary principle I would enunciate is, that excrement once voided should be instantaneously dealt with. To leave it to pollute the common air is a crime against the State and a sin against nature. Such a course indicates a criminal inconsiderateness in the offender, and is an undefinable but not less certain source of injury to others.

In the system of water carriage, excrement is instantaneously dealt with by means of removal. In the tub or pail or pit, it should be as promptly dealt with by the absorbent ashes, or the more disinfectant dry earth. In the latter system—I mean the dry system—automatic contrivances are not essential. Trouble must be incurred in some part of the process; and dirty and inconsiderate people will foul and spoil the best arrangements. Such persons must undergo a course of correction and education. My station, therefore, is this:—that excrement deposited and undealt with is always and everywhere an injurious nuisance, and should be dealt with accordingly."

Dr. Fox went on to speak of the satisfactory working of the ash-closet system in Cockermouth during the last five years.

A report by Dr. S. W. Bushell, physician to the British Legation at Pekin, was next noticed. The writer says :—

"Pekin is fairly well supplied by water. The sewers intersect the city in a rectangular network and open into the canals. The wide parallel streets have a large sewer on either side, into which open the smaller sewers from the lanes. The main sewers are square in section, of diameter sufficient to allow a man to crawl through them, and are constructed of large bricks, and covered with a layer of stone slabs. They are intended, principally, to carry off the flood of rain-water which inundates the city in July and August. This elaborate system, however, is all but useless, having long since fallen into ruin from decay and neglect. Some of the sewers project high above the level of the roadway, gradually worn down by the traffic. All are chronically choked with animal and vegetable *débris*. It is the common practice of the inhabitants to remove one of the flagstones in front of their houses, and to throw in all the refuse, solid and fluid, so that the sewer becomes merely a focus of putrefaction. The putrid contents overflow into the streets after rain, and in dry weather are tapped for the purpose of watering the roads. In short, the sewers in their present condition are not only useless, but absolutely prejudicial to the public health.

The only detail of sanitary work which is at all efficiently performed is the removal of fæcal matters. The fluid excreta are either poured into the roadway or open sewer, or scattered over the street at sunset to lay the dust; but the solid excreta are most carefully collected, as in all other parts of China, for use as manure. They are removed entirely by the dry method. There are no cesspools in the houses, only a shallow hole lined with bricks, which is emptied daily by the scavenger. This is a regular business and means of livelihood in Chinese cities, and the man with a large wooden tub suspended on his back by means of a wide hoop passing over the shoulder, and a long-handled iron scoop in his hand, is a well-known figure in the streets. He does his work as a rule gratuitously, passing from house to house till his tub is full, when he carries it to dispose of the contents at one of the depôts or manufactories. Another man wends his way along the public highway, where he also is able to pick up a fair livelihood, for the common Chinaman never scruples to halt by the wayside, even in broad daylight, and in full view of passers-by. The scavenger often digs holes in the ground of the more retired corners within his circuit for the convenience of the wayfarer and profit of himself.

The matters collected in this way are carried to one of the depôts, whence they are conveyed outside the city in wheelbarrows, with a central wheel of large diameter, and on each side of the wheel a long coarse wicker-basket, of the estimated capacity of two cwt. The wheelbarrow is driven by one man, who supports it with a yoke over his shoulders, and is assisted by one or more other men dragging with a rope in front. These baskets are quite open at the top, and, being conveyed through the streets at all hours of the day, they are an insufferable nuisance. Within the walls of the city itself, moreover, there are not a few manufactories of manure, and, in fact, any large vacant piece of ground is usually utilised for this purpose. The excreta are first emptied into large holes dug in the ground, then spread over the surface in a layer about an inch thick, and constantly turned over with a spade until they become thoroughly dry. This process takes three or four days, the ground being dry and sandy, and the air remarkably free from moisture during ten months of the year. The manure, when dry, is piled into heaps, and sold retail by the small basket. A ton of this *poudrette* is estimated to sell for about 16s. of our currency, which is the equivalent of a month's wages of a labouring man in this part of China. It is a principle in native husbandry to apply manure to the plant rather than to the soil. The *poudrette* is sown with the seed, or supplied to the root of the growing vegetable before irrigation.

Typhoid fever is a rare disease all over China, although typhus, diphtheria, scarlatina, &c., are rampant in the large cities. The rarity of typhoid may be directly due to the system of the removal of human excreta, preventing the contamination of water."

Dr. Chesshire, of Birmingham, submitted a paper, in which he said :—

"The insanitary evils which have occurred to the health of the population by the introduction of underground or subterranean drainage are incalculable, and call for a prompt and effective remedy; those evils, however, would never have arisen even from underground drainage, had the drains been used for their legitimate and proper purposes,—I mean for the conveyance of liquids only. When an architect designs the plan of a house, by means of traps and gratings he takes the greatest care to prevent any solid matter entering the drains; but when he attempts to deal with the water-closet soil, strange as it may appear, he allows all the fæcal matter, viscid and tenacious as that substance is, all the paper, hair, dishcloths, and other solid matters which are put down waterclosets, to pass through the closet soil-pipe into the same system of drains, in the hope that the rainfall will come to his assistance and remove them. As far as he is able, he takes care, by connecting the roof-water with the drains through the spouts, and the surface-water through the gratings, to remove by water-pressure this filthy mass from the house-drains. But, unfortunately for him, as it always has been and ever will be for sewage utilisers of the modern school, the rainfall is very capricious and irregular; it may not put in an appearance for a fortnight, or even for a month, during which time the collection of fæcal matter in the house-drains is enormous. In this great metropolis I estimate during dry weather in one week that about 1,200 tons of fæcal matter are collected in the house drains, or about one ounce and a half per head of the population per day. In those drains this collection of filth undergoes putrefaction and decomposition, generating sulphuretted and phosphoretted hydrogen and other foul gases, known as sewer or sewage gases; and it is those gases which so freely and so continually escape into the interior of houses through the various waterclosets, sinks, lavatories, and waste-pipes . . . .

So long as the solid portion of the excreta from waterclosets is cast into the drains, unless an arrangement can be made with the heavens to give us a continuous, or, at all events, a constantly repeated rainfall, so that the house-drains may always be effectually flushed, so long will those insanitary evils continue; but if the solid portion of the excreta were intercepted and retained in sealed iron boxes —sanitary interceptors—as I have suggested, the drains and sewers, as well as the rivers into which the sewage flows, would be relieved from pollution to a remarkable extent, the foul gases would no longer be generated, and the solid portion of the excreta would be put into a concentrated and portable form for utilisation, while the urine and other liquids would flow freely and continually away, to be dealt with at the sewer's outfall by subsidence and filtration, and ultimately, when clarified, to be applied to the land by intermittent downward filtration and irrigation, as I have so strongly and so frequently recommended. If we could imagine a section horizontally made under London, such section to pass through the house-drains, and if it were possible to lift up the upper portion of the section, we should witness a most revolting sight, and the residents of this great city would at once be made acquainted with the melancholy fact that they were living over, and almost in the midst of, a vast series or network of cesspools of the vilest description, more vile and more insanitary even than the old middens; bad as those middens were, those nasty receptacles were placed outside the houses, whereas the underground, elongated cesspools of the modern kind are almost in direct communication with the interior of dwelling-houses. It is not in the main-sewers where the insanitary evils exist, for when the solid portion of the excreta of the population gets into those channels, provided that they are sufficiently capacious, and are constructed with a sufficient fall, that material, under the influence of the rainfall, escapes quickly into the rivers, either through the storm outlets or the sewer outfalls, where it pollutes and contaminates the rivers."

Dr. Chesshire concluded by describing the arrangement of the receptacle he had devised. By it the urine is separated from the fæces, and the solid parts allowed to remain and accumulate until the box is full.

"It is so constructed that it may be applied either to a common privy in lieu of an ashpit, or to a water-closet at some point intermediate between the seat and the sewer, catching the excreta of the household and retaining the solid or valuable portion in a portable form, while the liquid passes away into the sewer, and the drains remain perfectly clean."

Under the second head of the programme,—"Progress, if any, made in treating water-carried Sewage since the last Congress,"—

Mr. George Hurst, of Bedford, contributed a paper giving some account of the sewage and irrigation farm at Bedford. He said that,—

"In the town of Bedford a system of water, sewage, and irrigation works has been in operation for the last ten years, which has been attended with satisfactory results. Previously some imperfect drains polluted the River Ouse, and the greater part of the houses had offensive middens and cesspools. The town is in many respects unfavourable for drainage, lying low in the Ouse Valley, and being deficient in declivities. The fall in the lower parts is very limited, but the disadvantages have been successfully surmounted. The plan consists of a main-sewer into which, from all parts of the town, lateral drains are discharged, and at the terminus of the main-sewer it empties itself into a tank 16 ft. deep, so that an artificial fall is obtained, from which it is pumped up, and distributed by pipes over the irrigation farm, which consists of about 180 acres. The pumping and irrigation works are distant a mile from the town.

The town has a population of about 19,000, and from the waterworks receives daily 350,000 gallons of water; the greater part of this, of course, passes from the houses and streets into the sewers, which, in addition, take a considerable quantity of subsoil drainage, making together about 700,000 gallons daily to be pumped up and distributed over the farm. So much of the subsoil drainage passing into the sewer is owing to the main-drains not having been made water-tight, which is certainly a defect, for a subsoil drain and a sewer, when properly constructed, are not convertible, and sewers are intended to convey offensive fluids and excremental matter from our habitations, the ultimate disposal of which, and the rendering it perfectly innocuous, has been considered a question of difficult solution. The subsoil drain is intended to convey from the land the surplus water that it may receive, and may properly be discharged into and supply the regular water-courses.

So large a quantity of water passing into the sewers causes the manure to become excessively diluted, and, as a liquid manure, it does not contribute so much richness to the soil as many suppose, and what fertilising matter it does impart to the sand is soon exhausted by the rapid vegetation. The great value of the irrigation is not so much for the solid matter held in solution, as maintaining a constant and sufficient supply of moisture in the arid seasons. So far from land irrigated with sewage becoming surcharged with manure, to keep it in good condition it will bear a considerable quantity of solid in addition.

The land, being near the town, is heavily rented. Excepting in very rare instances can any unpleasant smell be observed on going over the farm, as the sewage, passing immediately into the ground at once, becomes deodorised.

The sum expended in engineering works, buildings, pumping apparatus, and embankment, was 25,000*l.*, which was borrowed, to be repaid with interest by half-yearly instalments running over thirty-five years. It would be unreasonable to expect any portion of this sum to be obtained from the profits of the cultivation, as, although directly paid out of the rates, the public is fully remunerated for the outlay by the important benefits conferred. Previously to the establishment of the sewage works, each householder was at considerable expense in the removal of the offensive refuse matter, which may be considered a fair set-off against the increased assessment, besides the improved healthiness of the town, and having a clear magnificent river flowing through the town, instead of a stream turbid with various pollutions.

The production of the land has been extraordinary, and it is admitted that on no irrigation ground have more luxuriant crops been obtained. The Italian rye-grass, mangel-wurzel, and cabbages have been a great success, and the root-crops generally have been distinguished for obtaining prizes at many agricultural exhibitions. Potatoes, parsnips, and other succulent crops, have been cultivated with equal success. The produce has been sold by auction, and has generally realised good prices. For a public body this method of disposing of the crop is, perhaps, the most satisfactory, although a private individual might possibly turn them to better account.

In the tank, rags, paper, and other solid matters are intercepted by a simple grating; and the sewage is then pumped into a cast-iron tower 7 ft. in diameter and 12 ft. in height, from which, by gravitation, it is distributed over the farm. It is first conveyed through covered piping to the land, and over twenty acres along ridges by a 9-in. half-round drain-tile, which is sunk into the ground. The ridge is 12 in. above the furrow, and the sewage-water running over the tile sinks into the land, very little reaching the bottom. The other fields are less carefully laid out, but are watered in like manner from surface furrows along the higher lines; heavy crops are regularly grown.

The effluent water percolating through the banks on the side of the land is perfectly clear and tasteless, and so purified passes into the river. Two engines, of 12-horse-power each, and two centrifugal pumps, are employed at the pumping works.

The length of the main sewer exceeds a mile and a half, sufficiently capacious to serve as a reservoir during the night, and has a storm-overflow, with a self-acting flap. An excessive rainfall will pass without trouble in the night into the river."

Mr. C. N. Cresswell, barrister-at-law, read a paper, in which he said :—

"The opposition of the Metropolitan Board of Works to the Rivers Pollution Prevention Act was disarmed by the introduction of clauses specially exempting the chiefest offender from its operation. Upon what principle, logical or sanitary, is the noblest river of the kingdom thus doomed to perpetual defilement, and the metropolis of civilisation set above the law of the land, like the old 'benefit of clergy' in the days of the Plantagenets? Is it that the enormity of the dereliction takes the case out of the category of sanitary measures? or that a right to foul its own nest has vested by prescription in the City of London? The right of pollution, and the impunity of wilful waste in this case, is the creation of the Legislature, and a political compromise. In others, it is the result of sheer apathy and ignorance combined. It is otherwise in the North, where Manchester and Halifax, Rochdale and Leeds, are grappling boldly with this pollution, and Professor Ansted has shown us that it is more economical to keep excrementitious matter out of drains than to separate the diluted sewage at the point of outfall. If, however, it be found impracticable in our large towns to dispense with water as a vehicle for removing fæcal refuse, can we not learn a lesson from the analogy of nature and the physiology of the human frame? Solids and fluids are poured into the same gullet, and commingle in the same vessel, yet they are separated again before discharge by the secreting organs of the animal body; which things are an allegory not unworthy of the attention of the metropolitan

* Deut. xxiii. 12, 13, 14.

authorities, who were careful by their Act of 1858, both to acquire the powers of taking lands for deodorising sewage, and to define 'deodorise' as including the separation of 'solid suspended matters in sewage' from 'the liquid before the discharge thereof.' It is strange that nothing has yet been done to give effect to these important clauses; but, says Mr. Norman Bazalgette, the doughty champion of the new philosophy of waste, 'The cost will be enormous, and the process a nuisance.' We admit the cost, but categorically deny the nuisance. As to the first, it is a question of comparative evils; as to the latter, we have abundant evidence in refutation. Take, for instance, Leeds, which, at considerable cost of money and experimentation, has ascertained the best available method of defecating its sewage, and possesses, if only it be willing to employ it, the means of passing without nuisance a comparatively pure effluent into the river. But the stream flows by still foul and fetid as ever from the upper reaches, changing its hue with each particular dye, and polluted with the refuse of tanneries and cloth factories. What is the use, then, of defecation at Leeds, even if the effluent were as Apollinaris water itself, when all salutary effects are lost in a maze of filth pouring down from the towns above it; and what is the resulting advantage of exacting compliance with sanitary laws from one town, while permitting others to pollute the same stream in a geometric progression of filthiness through its whole course, above and below? Surely this is matter for the intervention of the Local Government Board, if it be minded in all loyalty and thoroughness to do that work which the Government alone effectually can do."

Sir Henry Cole, in reply to a challenge thrown out by Mr. Cresswell to point out a single river which had been relieved of its sewage, referred to the case of Burnley, where General Scott's process was now in operation, making cement worth 40s. a ton out of the sewage, at a cost to the town of Burnley of 2½d. in the pound on the rateable value.

Dr. Syson thought that Mr. Cresswell took too gloomy a view. It was to be regretted that he mixed up a crusade against water-closets with the subject before the Conference. Surely all who sought to make progress in solving the sewage question must be eclectics, ready to adopt varying means to meet varying conditions. He thought that, in spite of the wrong-headedness of the Local Government Board, there was much cause for congratulation. What would greatly conduce to a satisfactory settlement of the sewage question in many localities would be to give to corporate bodies and local boards some ready and speedy way of acquiring land at a reasonable cost for irrigation, &c.

Dr. Chesshire strongly condemned the use of waterclosets, and spoke of the pollution of the river Tame since Mr. Chadwick and Mr. Rawlinson had persuaded Birmingham to adopt the watercloset system. It was in the house-drains, not in the sewers, that sewer gas was generated.

Dr. Lawrence Hamilton said that a Japanese author, writing eleven years before the Christian era, said: "The disposal of stinking fish is a very difficult and serious matter." The same thing might be said of sewage, and no progress would be made so long as people put their faith in any one particular method of dealing with it. No system was altogether perfect, and no system could be equally well adopted under all circumstances.

Mr. J. Bailey Denton submitted a paper (accompanied by an appendix by Mr. E. F. Bailey Denton, B.A., describing the works in detail) on intermittent downward filtration as applied at Abingdon. He remarked that:—

"Abingdon is a favourable instance of intermittent filtration combined with surface irrigation, and illustrates what may be done in many instances in the Thames Valley and other valleys where suitable soils exist.

At Abingdon, 34 acres of land have been prepared—6½ for intermittent filtration, and 27½ for surface irrigation, and the total outlay, including delivering conduit (pipes) as well as chambers and distributing earth carriers, cart-roads, barrow-paths and fencing, wages of clerk of works, and charges of engineer, has not exceeded 2,550*l.*, or an average of 75*l.* per acre. The cost of preparing the land for intermittent downward filtration did not reach 85*l.* per acre, while that of preparing it for surface irrigation cost over 70*l.* per acre, including in each case a proper proportion of attendant charges. The soil of Abingdon is not more suitable than that of Merthyr and Kendal, yet it will be seen that the actual cost is only about one-third of that represented in the report referred to as the case at Kendal.

The deduction to be gained from the mode of disposing of sewage at Abingdon is that where intermittent filtration through suitable soil *per se* is adopted, one acre to a thousand people is ample to secure a perfect effluent."

Mr. Spencer asked whether any ferruginous matter was mixed with the filtering medium.

Mr. E. F. Bailey-Denton replied in the negative.

Mr. Cresswell said that Sir Henry Cole had pointed to Burnley as an instance of what could be done in the purification of sewage; but was that at all a fair citation? Burnley, a town of 60,000 inhabitants, had only 1,000 water-closets. The Rivers Pollution Prevention Bill, which came into operation in August last, was almost totally unintelligible, and was therefore impossible to work.

Dr. Ainley read a paper descriptive of Stott's system for the ventilation of sewers and drains, which consists in connecting sewers and drains with the furnaces of steam boilers, or other furnaces with a strong draught. For this purpose the ashes-place is enclosed by a door, so as to connect the pipe from the sewer or drain in any convenient manner. In all cases, however, it was observed that the connexion must be so arranged that the furnace must only receive its supply of air to support combustion from such sewer or drain, so as to be continually exhausting the sewers and drains of foul gases, which must also pass through the fire and be consumed or rendered harmless.

The author then went on to detail some experiments which had been made by Dr. Angus Smith, with the view of testing the efficacy of the system. He said:—

"The first experiment was made at West Vale, near Halifax; the amount of air passing through the fire was measured by the anemometer, and was 980 cubic feet per minute. The question then was, where does this air come from, or how far? The nearest opening was seven yards from the furnace, and the furthest 300 yards away, and between the two points were fifteen other openings or open gullies. Down each of these gullies the anemometer did not register more than about 20 cubic feet, but the fact was abundantly established that, in all of them, remote as well as near, there was a down current. The whole of these gullies were then made up, not absolutely, but in a rough and ready fashion, and the anemometer placed at the extremity of the sewer, when it indicated 490 cubic feet per minute, thus showing that, with well-trapped gullies, the effect must extend over a very considerable area. . . . .

The Corporation of Halifax then took it up, to see whether such connexion with the boilers of mills would remove the complaints of bad smells from certain neighbourhoods. The first complaint came from one of the best parts of the town; it was loud and strong, the stench rising into some of the houses at certain times being unbearable. Upon investigation the cause was clearly discovered, viz., the passage into the sewers from several factories where wool was washed of the residual liquor after the soap had been extracted by the addition of sulphuric acid. This liquor, I need not say, was peculiarly offensive. The question then was,—Shall we stop the business in which this was made, or shall we find a remedy? As our wish was always to interfere as little as possible with business, we decided to connect the sewers with the furnaces of two of the factories; the result has been that we have not had a single complaint since. I ought to add that several of the complaining houses were half a mile from the factories. . . . .

A number of similar cases could be added, but the story is the same, viz., complaints which have found their remedy, thorough, effectual, and simple, in the connexion, on Stott's principle, of the sewers with the furnace of some factory or other furnace having a strong draught."

Mr. Allcock, of Sunderland, said that a good system of sewers was of no use unless the house-drains were properly laid. A great number of dwellings in the suburbs of our large towns were "run up" for sale by speculating builders, most of whom paid not the slightest regard to the proper laying of the drains. For this reason he thought the laying of the house-drains ought to be done by the local authorities themselves. By such an arrangement, the work would not only be properly done, but it would be done at about half its present cost to the property owners. The speaker suggested a resolution on this subject, and undertook to draft one for submission to the Conference.

Dr. Elliott said our ancestors very wisely kept their privies out of their houses; but we in the present age, who assumed to know so much more than our forefathers, brought the water-closet (in some respects equally if not more dangerous to health than the privy) inside our houses. What was needed was that all water-closets should be thoroughly ventilated, and cut off by fresh air from our houses, by means of open lobbies giving convenient access. It was also important that all water-closet apparatus should be automatic, and capable of taking care of itself.

Dr. North, medical officer of health, York, spoke strongly in favour of transferring to local authorities the work of laying the house-drains, at the charge of the property-owners. It was of the utmost importance that drains passing beneath the floor of a dwelling-house should be completely impervious, for subsoil laden with sewage emanations was little better than a cesspool.

After a few remarks from the chairman (who pointed out that in his opening address to the Conference two years ago he had strongly dwelt on the necessity of enacting that the house-drains should, for the reasons mentioned, be laid by the local authorities), the first day's proceedings of the Conference were brought to a close.

The Conference re-assembled on Friday, the 24th inst., when the following resolutions were unanimously agreed to:—

Moved by Mr. Allcock, and seconded by Mr. Ernest Turner:—

"That, in the opinion of this Conference, the benefit to large towns of a well-devised and effective system of sewers is very often entirely neutralised by the careless and improper way in which the house drains in connexion with such sewers are laid and connected with the soil and waste pipes of the house. That all drains intended to be connected with the sewers of a Sanitary Authority ought to be made by such Authority (in the same way that house-services are made by gas and water companies to their mains). That powers as extensive as those contained in the 11 & 12 Vict., cap. 112, with corresponding duties, should be conferred and imposed upon all local Sanitary Authorities, including those in the metropolis. That the Society of Arts be requested to urge these views upon the president of the Local Government Board by deputation or otherwise."

Moved by Mr. Cresswell, and seconded by Captain Douglas Galton:—

"That this Conference desires to record its opinion that further legislation is needed, especially with regard to the constitution of county boards, with a view to strengthening the local government organisation; and authorises the President, in conjunction with the council of this Society, to bring the matter before her Majesty's Government, in such manner as he and the council may deem to be most expedient."

We must break off here for the present.

BOLTON INFIRMARY COMPETITION: AWARD.

FROM the thirty-seven designs submitted, the building committee took out fourteen, bearing the following mottoes:—"Thorough" (enclosed in a circle), "Esculapius," "Simplex Munditiis," "Lancet," "Red Cross," "Alpha," "Light" (in a circle), "Sanitas" *(a)*, "Health" (enclosed in a double triangle), "Light," "Thorough" (enclosed in a triangle), "Westminster," "Health," and "Sanitas" *(b)*; and these were referred to Mr. Charles Barry, F.S.A., to select the designs to which the first, second, and third premiums should be awarded. Mr. Barry places the design bearing the motto "Red Cross" first; "Sanitas" *(a)* second; and "Thorough" third. On the sealed envelopes being opened it was found that the first premium (50*l.*) had been gained by Mr. R. K. Freeman, of Bolton; the second (30*l.*) by Messrs. John Ladds and W. H. Powell, of London (the latter being a nephew of the Vicar of Bolton); and the third (20*l.*) by Mr. J. H. Proctor, also of Bolton.

Mr. Barry, at the end of his report, makes the following general observations:—

"In concluding my report, I hope the Committee will excuse my offering a few remarks upon the instructions to competitors, and which I should have ventured to submit to them had I been consulted at the outset.

First. I have a strong opinion that in such cases the first premium should not merge in the commission of the chosen architect, since the labour of getting up an elaborate set of competition drawings, such as those submitted in this case, will not be overpaid even by the amount of the first premium; and it is, besides, a common experience among architects that beyond settling the main principles of a design, competitive drawings are quite useless in the eventual carrying out of the work. The planning and arrangements have always to be considered anew between a committee and the architect when chosen, and when he is brought for the first time in contact with his employers as their confidential and responsible adviser. Even the architectural design in a large majority of cases is frequently quite changed before the work is actually commenced.

Secondly. I notice in the instructions something of an intimation that whatever the cost of the building, the architect employed is, under no circumstances, to receive for his services, from first to last, more than 800*l.*, or 5 per cent. on the outlay contemplated by the committee, viz., 16,000*l.*, which was, I presume, named by them having regard to the means at command, but of course, could have no reference to a design which was indeed afterwards to be prepared, and which, if approved, might be carried out. I assume that of course the meaning of the committee necessarily must be that 5 per cent. will only be paid on any expenditure (whether less or more than 16,000*l.*) which is made with their previous sanction, and such a stipulation would be most fair and proper.

Thirdly. I trust the committee will not hesitate to employ as their architect the author of the design which shall receive the first premium (unless indeed some moral or equally cogent reason to the contrary shall appear), remembering that in all cases of architectural competition the incentive to competitors is not the premium, which can seldom do more than pay the actual cost of producing the drawings sent in, but the professional credit which may be expected to result from a meritorious design well carried out by its author and identified with his name."

THE WATERWORKS OF VERVIERS.

ABOUT five English miles from the German manufacturing town of Eupen, close to the Belgian frontier, three miles from Dolhain, the busy suburb of Limburg, and nine miles from Verviers, during the last few years an engineering work has been in course of construction of such importance as to be styled by visitors "the eighth wonder of the world." Beholders are not wrong in thus describing the vast undertaking, for modern engineering skill, aided by nature, has here produced a lasting monument of human enterprise. We present our readers with such details as we have been enabled to gather from a paper of Herr Postdirector Rutsch, of Aachen, a gentleman well acquainted with the district, and the author of a book on the neighbourhood of Eupen in its geographical and historical aspects, to which are added extracts from the history of the former duchy of Limburg.

The idea of damming up and collecting large masses of water for special purposes is not of modern origin, and found formerly practical application, especially in hot countries, the soil of which was extremely fertile of itself, but the productiveness of which was rendered difficult by a scarcity of water. In Europe this mode of making large tracts available for agricultural purposes was introduced by the Arabs, first into the south of Spain, and later into France. Saint-Étienne, in the latter country, and Verviers, in Belgium, were the first to construct great hydraulic works for assisting and raising a flourishing branch of industry still further by storing up water or conducting it to a certain locality. Madrid, also, has made use of water for such purposes.

The manufacture of cloth, as well as the preliminary treatment which wool has to undergo before being made into cloth, at Verviers, requires a large quantity of pure water, which, after its use, is returned to the river in a dirty state unfit for further utilisation. This evil naturally increased with the growth of the industry, and led to just complaints on the part of the inhabitants of Verviers and its neighbourhood—complaints only too frequently heard also in this country from the manufacturing centres. This grievance could not be left unattended to if the pursuit of this branch of industry was not to be seriously affected by the emigration of the population from a place where they were unable to obtain one of the principal necessities of life,—water. Experiments to alter this state of things by improving the Vesdre (the principal river of Verviers, and a tributary of the Maas) led to no practical results, or contributed at least very little towards the desired object of removing the nuisance, for the principal reason that at certain times of the year the river does not contain water enough for the purpose.

The Belgian Government, consequently, commissioned, as early as September, 1857, M. Bidaut, Chief Engineer of Mines, to work out a plan by which the various requirements could be effectually met. His scheme was submitted in December, 1859. M. Bidaut had been guided, in drawing up his plan, by several examples, one of which was that of Alicante, in Spain, the value of which has been proved by three centuries, utilising the principal features in drawing up his plan.

The neighbouring town of Eupen, in the interest of its similar but much older industry, which required the same agency to raise it, on being informed of the scheme, willingly gave in its adhesion. But for several reasons the co-operation of that industrious town fell to the ground. On the one hand, the amount of its contribution was considered too high, the Prussian Government, on being applied to, declining to give State aid to the town. On the other hand, the serious apprehension to which the fearful Holmfirth flood, in 1852, caused by the bursting of the Bibury reservoir, near Huddersfield, and then still fresh in men's memories, gave rise, was still further increased when, twelve years later, and when the Verviers scheme was under full discussion, the Bradfield reservoir broke down, and flooded Sheffield and the country twelve or fourteen miles round, entailing a loss of about 250 lives, and doing damage estimated at 327,000*l*. This latter disastrous occurrence had a most deterrent effect on the inhabitants of Eupen; they declined to participate in the work, and their co-operation was therefore relinquished.

Meanwhile, the town of Verviers had had under consideration the fact that a regulation of the Vesdre above the town of Eupen, and the conduct of water the pollution of which by the use made of it by Eupen for manufacturing purposes was inevitable, would interfere most seriously with the object of Verviers. For the latter town it was a question not only of obtaining a sufficient quantity of water all the year round, but also of getting it in a sufficiently pure state. Verviers had come to the resolution to shift for itself. To this it should be added that the original calculations as to its requirements were erroneous. Instead of 3,000,000 cubic mètres (660,290,000 gallons), 14,600,000 cubic mètres (3,214,000,000 gallons) of water were wanted per year, or 40,000 cubic mètres (8,800,000 gallons) daily.

A most essential condition in the manufacture of good cloth is to provide a pure water free from lime, and it is one of the important peculiarities of the place by which the manufacturers of Eupen have obtained world-wide renown that the Vesdre contains only such water. The Vesdre rises in the High Venn, and obtains its supplies exclusively from the layers of peat of that mountain chain. Its three tributaries,—the Hill, the Soor, and the Gileppe,—have the same origin; the first two joining the Vesdre at Eupen, the Gileppe entering that river at Goë. The Gileppe was selected by the town of Verviers in carrying out its scheme, because it not only rises on Belgian soil, but because its course is entirely within the frontiers of Belgium; while the Hill and the Soor touch Prussian soil. The Gileppe, also, was the river nearest to Verviers. Those reasons caused M. Bidaut to take in this valley observations in 1864 and 1865, with a view of ascertaining whether the quantity of water brought by the Gileppe would be sufficient, and whether the formation of the valley and the nature of the rocks were suitable for forming a vast reservoir; whether, in fact, there were sufficient guarantees in both directions. The results were submitted by M. Bidaut to the Minister of Public Works in a report dated May 8, 1868, after, in the month of February, 1867, arrangements had been made for beginning the sinking of a shaft and of galleries. On April 19, 1869, the works for damming up were begun by Messrs. Braive & Caillet, the contractors undertaking to complete them some time in 1874. This term was, later on, prolonged until November 1, 1875. On May 9, 1875, the sluices were closed for the first time, and for the first time the waters of the Gileppe began to collect behind the dams.

After the difficult problem of ascertaining what is the height of large quantities of water of a dammed-up river compared with a fixed annual requirement had been solved by M. Donckier, it was necessary to find out whether it would be more advantageous to collect the water in one or several reservoirs. Investigations have shown that the price of a cubic foot of space is considerably reduced by the height of the dam. In the valley of the Gileppe the reduction of height by one-third leads to the reduction of the quantity accumulated by two-thirds. Consequently, calculated for the several places separately, a single dam of 147 ft. 6 in., or four dams of 95 ft. each, were required for the accumulation of 2,641,160,000 gallons of water.

The sole reason that could have been urged in favour of several reservoirs was the danger involved in constructing dams of too great a height. But it must be taken for granted that the possible bursting of one of several reservoirs would lead to similar disastrous consequences, in so far as it would prove as destructive for the walls behind it. The sudden pressure of the water, not calculated, would be sure to cause the bursting of the other reservoirs. On the other hand, it is much easier to find a single locality offering all the guarantees of solidity than several of them. Besides, dams of 147 ft. 6 in. have been used in other places. That of Alicante exists already for three centuries, and measures 134 ft. 6 in.; others are known of 164 ft. high. The selection of the site depended upon the firmness of the geological formation and the resistance to pressure of the rock, regard being also had to the fact that in a narrow valley the dam to be constructed is shorter and consequently more capable of resistance. The dam closing the valley of the Gileppe has a height of 154 ft. Two outlets, 1 ft. 6 in. below the roads, hinder the water from rising to the top of the embankment, so that its level will be maintained at 147 ft. 6 in. The lake thus formed up the valley by the dam covers an area of nearly 198 acres, and contains 2,693,744,708 gallons of water.

Besides the embankment wall proper, the principal works include the two outlets mentioned, and two subterranean galleries for executing the water conduits. Each gallery contains a shaft which has served originally in making the shore cutting, and through which at present the dispositions for the sluices are carried on. The galleries leading to the water conduits have played an important part during the operations, having served during that time for carrying off the water. The work of excavating the galleries preceded all the other works, partly on account of carrying off the water during the progress of the works, partly also because during the operation of driving the galleries the formation of those rocks which enclose the reservoir could best be observed. Those works showed regular vertical layers of sandstone, slate, and psammite in the proportion of 64, 19, and 17 per cent. In a single locality up the valley, and distant nearly 400 ft. from the left gallery, a poor vein of lead ore and gravel was met with.

The embankment wall contains on both sides a series of steps, each a foot high, which form a sort of stairs of communication between crest and base. The summit of the embankment, of a width of 50 ft., serves as a means of communication for the two shores of the basin, and has a paved roadway 23 ft. wide, and two footpaths, each 13 ft. wide. The sides are of ashlar-stones. On the outer edges are parapets of square blocks of masonry 21 ft. 6 in. long and 2·6 ft. thick, with a coping of ashlar, distant from each other 42 ft. 6 in., the intervals being filled up by wrought-iron railings.

The principal foundation-walls of the embankment are in masonry of coarsely-hewn freestone and rough quarry-stone, the ballasting of hewn quarry-stones. The abutments, which form the base of the embankment at the junction, are in ashlar-stone, as well as the course carrying the dressing. The cubical contents of the masonry of the embankment amount to 8,775,110 cubic feet. The ashlar-stones are so-called "small" granite. The hewn quarry-stones of the dressing are taken from layers varying in thickness between 1 ft. 6 in. and 1 ft., and are laid alternately longthwise and broadways throughout the whole wall, or with 2 ft. and 1 ft. 4 in. towards the outside.

In place of a road formerly in the sole of the valley, one has been constructed on the left side, which crosses a stone bridge, ascends the left hill alongside the outlet, and then follows the shore of the lake.

The works described have been carried on at the expense of the Belgian Government; all the preliminary works at the expense of the town of Verviers. A subsidy of 8,000*l*. was granted to the town as a part of the expense incurred in the preliminary works for the regulation of the Vesdre.

The aqueduct which carries the water of the Gileppe to Verviers commences about 558 ft. from the base of the embankment. Its width is 6 ft. 6 in.; the piers, joined by vaults, have a height of 5 ft. The aqueduct runs through the district of Jalhay, crosses the valley of the Borchêne, passes Goë, Limburg, Stembert, and ends in the neighbourhood of Verviers near Les Roches in a distributing reservoir. Its whole length is 5¼ miles; its fall is 3½ in. per mile. The damming up of the Borchêne, the waters of which are taken up by the aqueduct, consists of an embankment wall joining the two sides of the valley. The wall measures in its longitudinal axis 108 ft., has a breadth of 9 ft. 3 in., and a height of 19 ft. 6 in. below the crest.

The Closet Air Escape.—With reference to your notice of the "Closet Air Escape," allow me to say, it appears to me very valuable, in proof of which I would not sell my tube for 100*l*., unless I could procure another. As an encouragement to invention, it may be added that such an instrument would be invaluable in hospitals for the use of patients confined to their beds; for, by having the tubes carried up to the roof, they could inhale the purest air for hours by day, and even in the night when awake. They would thus escape in a good measure what has been called by Dr. Druitt "the contaminating air of the wards of hospitals," and in exchange receive the powerful tonic effects of fresh air. Patients coming out of a hospital, having been discharged cured, have described their feelings as almost intoxicating, such was the effect of fresh, pure air.—C.

RADLEY.

PUBLIC SCHOOLS OF THE PERIOD.

WHEN the history of the nineteenth century comes to be written, and its social features analysed, not one will stand out more prominently than the growth of the public schools of the Victorian era. By the public schools of the Victorian era, we mean those which have been created during the present reign, as distinguished from the five older foundations, Eton, Harrow, Rugby, Charterhouse, and Westminster. They present features in which they differ conspicuously from the two first of the ancient public schools of England, and they equally are distinct from the grammar schools, which are likewise of very ancient standing. It would be an interesting topic, indeed, to follow out at some length the causes which have produced this growth, and the consequences which these new educational creations have produced, both in an educational and in a social point of view. Their effect in diffusing scholarship and education, *esprit de corps*, and manliness among the middle classes has been great, and they have and do stand as witnesses that gentlemanly feeling and scholarship can be combined in these smaller educational centres, and as protests against the luxury which is becoming so marked a feature of the two great metropolitan schools, Eton and Harrow. None of these Victorian schools is more worthy of note than that which stands at the head of this paper—St. Peter's College, Radley, founded in 1847, which, to all appearances, increases in prosperity and in usefulness as the years pass on.

It would be difficult to find a spot more suited to a school than that on which Radley College is placed. It is situated on the summit of the range of hills which forms the northern boundary of the Valley of the Thames as it winds down from Oxford past Sandford and Nuneham to Abingdon. Thus climatically it is admirably placed in a dry and bracing spot, freshened by the breezes from the Berkshire downs. The level plateau in which it stands serves for all the athletic exercises which are required for a school, and since it is but little over a mile from the Thames there is every facility for boating. The nucleus of the school buildings is formed by what was once Radley House, the family seat of the Bowyers, who succeeded to the manor of Radley in 1792, on the death of the last baronet of the line of Stonehouses, who in their turn had purchased this property in 1575 from the Abbot and Convent of Abingdon. It is a fine structure of red brick with stone facings, and built with admirable solidity. On the west side there is a fine view over the Vale of White Horse, with the graceful steeple of Abingdon Church peeping from among the trees in the middle distance. On this side of the house are a fine suite of rooms opening on to a terrace, a large central apartment, and two smaller ones on each side, which serve as the dining-hall. In addition, in their good proportions they are noticeable as containing a large quantity of old oak panelling, and the centre room contains a mantelpiece and superstructure of really very fine old carving. Indeed, the whole house abounds with old oak,—a very fitting adornment for a school-house. The remaining rooms in the house are occupied by the warden and his family, or by some of the undermasters. Another feature of some interest is the spiral stone staircase which runs from the basement to the attics in the centre of the house, and opens on to the landings of the main staircase by what were, in all probability, at one time trap-doors in the walls. Now, of course, it is used more or less as a back staircase, but it was in all likelihood at one time a secret staircase not intended for general use.

It was of course necessary, when this building was employed as the centre of a number of other school buildings, to devise some means whereby it might be connected with the other buildings. This has been done by means of a covered passage leading from the south side of the house, and connecting it with the chapel, the schoolroom, class-rooms, and dormitories. The main objection to a passage of this kind is its temporary appearance and inferiority, from the picturesque point of view, to a good brick or stone structure. On the other hand, it is a great advantage in a growing school to have ample opportunities for expanding as more accommodation is required.

This passage leads, as we have said, to the chapel, which is a plain brick structure, oblong in shape, with a high-pitched roof, coming to a very acute angle at the summit. The most noticeable features in the chapel are, first of all, the fine organ, and, next, the sculptured reredos of wood, covered with gilding,—a very excellent piece of wood-carving; lastly, there is much good and quite modern carving in the panels, desks, and seat-backs. The effect of the whole is to give an appearance of harmony, and even of richness, to the interior, were it not for the bare flatness of the white walls.

The next building which should be noticed by the visitor to the school is the dormitory, which is divided into a ground and first floor. It is a large and very lofty building, and is divided into cubicles, ranged on each side of a broad central passage, at one end of which is a large window, and at the other a main door. Each cubicle is separated from the other by a wooden partition about 7 ft. in height, and a curtain drawn across the end when the occupant is using his cubicle. Each of these compartments is about 12 ft. by 6 ft., and is capable of holding a small bed, washing-stand and cupboard, and table, and there is room for the morning bath by the side of the bed when it is used, whilst at other times it disappears beneath it. There are, of course, differences of opinion as to the value of this cubicle system; but, taken as a whole, it is, we think, the best system for large schools. For it has the great merit that it enables each boy, however young and however low down in the school, to have a place where he is absolutely and completely private, and the greatest value is attached to this privacy by every boy, whether of a shy disposition or not. The system of rooms in which two, three, or more boys sleep takes away this privacy. A boy may wish to go to his room to read home letters, and what not, and he cannot be alone, whereas even when it is not permitted to go to the dormitory without leave, yet when there the boy feels that his cubicle is his castle. Thus it serves as a protection to weak or shy boys, and it prevents the ruder and rougher spirits from developing that spirit of teasing which so easily degenerates into bullying. From another point of view it is a valuable system, for it enables boys to sleep in a lofty and well-ventilated apartment, it enables a uniform heat in cold weather to be maintained, and economy to be practised by the use of hot-water pipes laid through the building, and it is possible to have a through system of ventilation,—most valuable during the summer time. Added to this it enables much more systematic arrangements of a sanitary domestic kind to be made. There is no carrying of water into one room and then into another. There is one large apartment, with all the apparatus for obtaining water and so forth on the spot. Indeed, when the system of dormitory cubicles and the house system come to be compared, it is obvious that, from every point of view, the house system must go to the wall. The real system for a school is undoubtedly to have a dormitory for sleeping purposes, a separate set of rooms for studies, and a house or houses for married masters.

But to pass on. The next room to be noticed is the large school-room, which, however, may be passed by without further remark than to mention more old oak panelling and the fact that it is a long room, with class-rooms leading out of it.

Another building, however, should not be overlooked, namely, the Gymnasium, a large building, or, rather, structure, of metal, erected in the shape of a Latin cross without its upper end. Thus what in a cathedral corresponds to the nave forms the exercising part, or, more properly, drill-space; while the space which answers to the transepts and part under the central tower is filled with the various gymnastic apparatus, such as ladders, vaulting-horses, and so forth. The whole is painted inside with bright, cheerful colours. This, again, is a building which every school should possess. It serves on some occasions as a concert or banqueting hall; but it is always there for use on wet days, though it is not the kind of building which can ever be used without some supervision, as boys are apt to play dangerous tricks with gymnastic apparatus. But its proper use, as at Radley, is for systematic instruction in gymnastics in regular classes, under the superintendence of Mr. McLaren, of Oxford, and next for use when required by individual boys.

There are, of course, other buildings which might fairly claim to be noticed if our space permitted, such as the hospital and fives courts; but we have sufficiently indicated the main features of the place as they will be found amidst the large elms, the drooping laburnums, and the fragrant lilacs which grow so luxuriantly around.

Certainly, indeed, these modern schools, of which we have taken Radley as a very favourable specimen, have many advantages which even the great names of Eton and Harrow lack, for they unite at present comfort without luxury, abundant means of athletic pastimes without a sacrifice of the intellect, and, in many respects, as in the case of Radley, they are placed in spots where the fairest of English scenery is to be found. Patriotism is composed of a number of complex elements,—love of relations, of friends, of homes, and certainly of schools,—and we can hardly doubt that, not only a love of a school, but a love of the country and a country life, is largely increased if schools are surrounded by that gracious and pleasant aspect which the landscapes of England wear from April to October.

RECONSTRUCTION OF THE GAIETY RESTAURANT.

AN exceptionally-difficult work of building construction has been in progress at the Gaiety Restaurant in the Strand and Catherine-street, during the last six or eight months, and although what may be regarded as the heaviest portion of the work has been accomplished, much yet remains to be done before the undertaking is completed. The works have involved the entire rebuilding of the lower portion of the structure, including the main outer walls, from the basement to the first floor level (a height of 32 ft.), without disturbing the upper parts of the fabric. In order to effect what was intended to be carried out the upper portion of the building had in the first instance to be supported on needles, with strong uprights, 14 in. square, carried up from the basement. Above these, counter-needles, 12 in. square, were then erected, with the view of easing those below, and iron girders were thrown across the entire width of the building at the first-floor level. This preliminary portion of the work having been effected, the outer walls, from the basement to the first-floor level, together with the whole of the interior walls, were cleared away, the whole of this part of the building having been, so to speak, gutted. The work of reconstruction then commenced, the Catherine-street and Strand frontages being carried up on piers from the basement, supported from the street level on blue Pennant bases. The piers are in white Suffolk brick, built in cement, and backed up by cast-iron stanchions, which carry the first-floor girders. These piers are 2 ft. 6 in. wide by 2 ft. thick, the dimensions of the windows between the piers averaging 14 ft. in height by 7 ft. in width. The piers are surmounted at the first-floor level by shafts in Mansfield stone at each angle, with carved Portland stone capitals. All the inner walls having, as already stated, been cleared away, the basement, ground floor, and first floor, have each been converted into spacious apartments of uniform dimensions, their size being 100 ft. in length, by 33 ft. in width. The basement is 11 ft. 8 in. high, the ground floor 22 ft. (to effect which a mezzanine floor has been removed) and the first floor to the ceiling 14 ft. The basement is intended to be fitted up as a grill-room, the ground floor as a buffet, and the first floor as a main dining-room, and each of these several apartments will be handsomely decorated.

Internally the upper portions of the building have, to a certain extent, been likewise reconstructed. In order to extend the first floor to the same dimensions as the ground-floor below, it was necessary to remove some of the inner walls and other structural portions of the building, and in place of these the building at the second floor has been strengthened by girders weighing nine tons each, with strong vertical iron shafts tied to them, which are carried up to the top of the structure. The third and fourth floors have also been entirely reconstructed internally, with great strength, iron having been largely introduced. When completed the building will contain a large number of private dining-rooms, ladies' retiring-rooms, and other apartments. The works have included the removal of the original principal staircase, from the ground to the third floor, and in its place a new staircase has been erected, 24 ft. by 19 ft., which will be approached by a new entrance in the Strand, on the west side of the entrance to the Gaiety Theatre. On each side of this entrance, and also in the centre, there are polished Aberdeen granite columns, resting on blue

Pennant stone bases. In connexion with the works several hydraulic lifts are in course of construction for the purpose of conveying food and stores to and from the upper parts of the building.

Mr. Verity, of Regent-street, is the architect; and Messrs. G. Smith & Co., of Pimlico, are the contractors. Mr. Warburton is clerk of the works, and Mr. Munday the general foreman. The cost of the works when finished is estimated at about 12,000*l.*

THE TELEPHONE HARP.

SOME experiments on this newly-invented instrument, made last week in the Gaiety Theatre, on the occasion of some agreeable performances in aid of the Shakspeare Memorial Theatre at Stratford-on-Avon, have scarcely received from the daily press the amount of attention they well deserve. Before alluding to them, however, let us say briefly that the entertainment, which was originated and carried out by Miss Kate Field, who enlisted in the undertaking a number of well-known actors and actresses, proved eminently successful, and will add, we understand, some 400*l.* to the memorial funds. Passing, then, to the telephone harp, this was played in Stratford, say 120 miles away, and heard in the Strand; we heard it ourselves, and the whole house heard it; identifying the airs and loudly applauding. The use of the wire was afforded, we believe, by the Great Western Railway Company. There were three telephones in the theatre, one on each side of the proscenium at the level of the balcony stalls, and the third in the centre of the balcony-front. It occupied about eight minutes (after the inventor, who addressed a few words to the audience, had left the stage), to exchange signals with the harpist at Stratford, and then the music began, and was heard more or less distinctly by the whole house. It was nothing short of an astounding incident, but we are so used to wonders that we take them too much as a matter of course. What will be the practical outcome of the extraordinary group of acoustical inventions lately made no one will yet venture to say. In their history, when written hereafter, this experiment at the Gaiety Theatre must have a place.

A NEW PAROCHIAL MISSION HALL AT NEWINGTON.

LAST week, the Rev. W. D. Maclagan, Vicar of Kensington and Bishop Designate of Lichfield, laid the foundation stone of a new parochial mission-hall, which is about to be erected in connexion with the parish of Newington, of which the Rev. Dr. Maclagan was rector before his appointment to the vicarage of Kensington. The building is Gothic in character, the south elevation, facing the church, being surmounted by a gable, beneath which are three large windows, with a range of similar windows along the west frontage. The materials are stock brick, relieved with arches and bands of red brick. Internally the building will have an open timber roof, ceiled at the collars. The hall will be 68 ft. long and 40 ft. broad, and will be capable of seating 400 persons. Externally it will be 38 ft. high to the ridge of the roof. Attached to it are a committee and class room, and on the west side is a corridor 6 ft. in width, from which the hall is entered.

The architect is Mr. J. Edward Cutts, of Southampton-street, Strand, and Messrs. Downs & Co. are the contractors.

To Destroy Worms on Lawns. — The *Journal of Forestry* gives the following mode:— Dissolve one ounce of corrosive sublimate in a pint of hot water, adding two large handfuls of salt. When dissolved add nine gallons of cold water, then water the lawn with a common garden watering-can through a rose. Nine gallons will go over 800 square yards, and should be applied immediately after rain, when the worms come up near to the surface of the ground. The application will make the worms appear on the surface, when they can be picked up by hand, or swept up with a broom, taken away, and destroyed, care being taken not to put them in the way of ducks or poultry. The lawn should be well rolled immediately after the operation. Lawns done over three times, from October to March, will have a beneficial effect in keeping the worms quiet during the summer season, when lawn tennis, croquet, and bowling are enjoyable.—C. C.

MR. FERGUSSON ON THE BUILDINGS IN THE HARAM AREA AT JERUSALEM.

WE are enabled to reproduce in our present number some of the illustrations accompanying Mr. Fergusson's remarks, in his recent volume (noticed briefly in the *Builder* of the 4th ult.)* on the Dome of the Rock, and other buildings in the Haram area at Jerusalem, with reference to his theory that the Dome of the Rock is identical with the church erected by Constantine on the site of the sepulchre of Christ, and that, therefore, this, and not the Church of the Holy Sepulchre, is the true burial-place. With the help of these illustrations, we are able to consider a little more fully the facts and arguments upon which this much-contested theory is based.

Almost the one point on which all parties are agreed is that Constantine did build, on the site of what he believed to be the sepulchre, a church in commemoration of the Resurrection, and that in order to uncover the site of the sepulchre he had to remove a heathen temple which had been built over it. The fact of his building the church, since it is in every way probable in itself and attested by historians (Eusebius in particular) in the most positive manner, there seems not the slightest reason to doubt: so far, there is a fixed *point d'appui* for the argument. Most of those concerned in the question (Mr. Fergusson included) seem disposed to agree that Constantine must have known the true site of the sepulchre, and that, therefore, if we find out where he built a church, we fill up the gap of three centuries between his time and the Crucifixion, and have arrived at incontestable evidence as to the place of the entombment. We are hardly disposed ourselves to regard this as a necessary conclusion. Three hundred years looks a short time when we regard it over the long perspective of centuries that separate us from the Christian era, and when we consider it from the point of view of a modern historian, with all his resources in regard to literary evidence and records, we might very well think that it was too short a time for an utter falsification of topographical fact to have been developed. But if we consider what three hundred years was in those days of tradition and credulity, when mankind were so quick to believe whatever they wished specially to believe, and when so many legends, of far more formidable character than the mere question of the site of a tomb, took form and substance in less than a century, so as to be implicitly received and accepted as historical, we should hesitate very much to accept any site as unquestionably fixed merely because it is proved by architectural evidence that Constantine and his contemporaries regarded it as the true site. The very account of the disclosing of the sacred site by the removal of the heathen temple, as given by Eusebius, is so obviously pervaded by enthusiastic exaggeration as at once to raise doubts as to the reliability of his evidence on such a point.

We allude to this side of the question because we think it as well that there should be a check upon the *quasi*-religious feeling which has turned this into a matter almost of theological or ecclesiastical controversy, accompanied by more than the average amount of theological ill-will (not to use a stronger phrase) which is always imported into such arguments. For some centuries past the building called the Church of the Holy Sepulchre has been accepted as traditionally the successor of Constantine's building, although every trace of the latter had, as every one admits, disappeared. But still the site generally has been accepted as the correct one, and consequently has been to a certain extent a centre of devotional interest even to those who, not giving the reins to superstition, or pretending to accept all the holy places and things supposed to be included within the walls of the Holy Sepulchre church, have yet felt a very natural interest in regarding this as at least marking the true burial-place of the founder of Christianity, and therefore the centre of many sacred and endearing associations; and the feeling in regard to Mr. Fergusson, when he first propounded his theory, was not an archæological so much as an ecclesiastical and religious indignation against a critic who had wantonly endeavoured to shake the faith of many generations of men as to the site of the events in which they were most interested. The two most uncompromising opponents of his theory were the late Rev. Geo. Williams, a high-church clergyman, who wrote in the sentimental manner of his caste in regard to the holy places at Jerusalem, and the Comte de Vogüé, whose feelings were likely to be still more influenced in the same kind of direction by the fact of his orthodox Roman Catholic persuasion. He, in fact, denied that the Dome of the Rock theory was worth controverting at all, characterising it as one of those theories which "one does not refute." The spirit in which the proceedings of the Palestine Exploration Society have been carried out, and the results described, has been marked by a good deal of the same theological tendency,—the desire to find facts in accordance with certain accepted traditions. But so far as the question of the place of the entombment is concerned, which is the chief traditional question affected by Mr. Fergusson's theory, it appears to us idle to suppose that any certainty can be arrived at, or that even the unquestionable proof that certain remains were those of the church built by Constantine over the supposed burial-place would prove that Constantine was correct, and that we had arrived at an unquestionable topographical fact. The time is too far removed, the age was one too much under the dominion of credulity and excitability of belief (if one may use the phrase), for there to be any firm basis to go upon. The wisest thing, therefore, is to quit altogether the idea of the reality or unreality of any sacred site being affected by the controversy, or any wound given to any one's religious faith. On that ground there are no certain data to go upon one way or the other. The question between Mr. Fergusson and his opponents is one purely of architecture and archæology; in that sense of no little interest, but one which there is not the slightest occasion to confound with questions of religious faith or of what may be fairly called credulity as to religious topography.

But the fact is that the less credulous or sentimental writers on the topography of Jerusalem have already given up the Church of the Holy Sepulchre as the site of the entombment, simply from the impossibility of reconciling its position with the narrative of the Evangelists. Wherever the scene of these events was, it is at least certain that it was not within the city, and the Holy Sepulchre site is almost unquestionably within the city as it existed at the Christian era. It is next to impossible, therefore, that the Church of the Holy Sepulchre can represent the site of the tomb, or even the site which Constantine supposed to be that of the tomb, since in his time it cannot be doubted that there were data sufficient to avoid making so complete a mistake as to take a site within the city area for an event known to have happened outside of it.

It is obvious, therefore, that there can be no foregone conclusion in the case; that we are quite at liberty to look for the relics of Constantine's church elsewhere, if we find anything which, in its position or style, suggests such an origin. This is what Mr. Fergusson asserts that the building called the Dome of the Rock does suggest.

Of the two principal buildings in the Haram area used as places of Mahommedan worship, the one, the Mosque El Aksa, is an obviously Saracenic building, with the usual plan of a Mahommedan church, — a parallelogram with a flat wall on the side opposite the entrance; the other, the Mosque of Omar, otherwise called the Dome of the Rock, is an octagonal building with an octagonal arcade enclosing an inner circular arcade, from which rises a dome. The dome is obviously Saracenic in form, construction, and ornamentation. But the plan of the building is such as is never known to have been used for any Mahommedan place of worship in any other instance. The usual theory has been that both were erected at the same time, towards the latter part of the seventh century, by the Mahommedan conquerors, who adopted the eminence on which these buildings are situated, and where the Jewish temple had formerly stood, as their peculiarly holy place. But no explanation has been given why there should here be a building professing to be built as a Mahommedan church, but differing entirely in plan from the usual form of such a building.

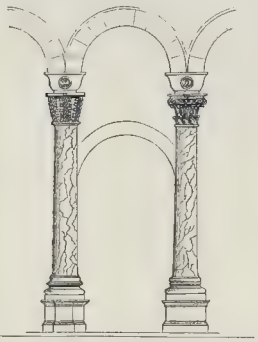
Had not the enclosure of the Haram area been so scrupulously guarded from the intrusion of "the infidel," it is probable that the correctness of this view would have been questioned before now. It is only a comparatively short time since that Messrs. Catherwood and Arundale contrived to overcome the religious intolerance

* The Temples of the Jews, and the other Buildings in the Haram Area, at Jerusalem. By James Fergusson, esq., D.C.L., F.R.S., &c. London: John Murray. 1878.

of the followers of the Prophet, and to obtain permission to see and make drawings of the sacred buildings. Although at that time the state of archæological knowledge in regard to architectural styles, and their bearing on history, was much inferior to what it is now, and though Messrs. Catherwood and Arundale entered on their labours in the full conviction that the "Mosque of Omar" was what it professed to be, even they seem to have been struck by the Classical character of some of the details of the building before them. But in the present state of knowledge among those who give any study to architectural history, it seems impossible that any one possessed of adequate information could look for one moment even at the two small and not very exact views of the two interiors which we reproduce * (see illustrations on page 564, figs. 2 and 3), and not at once repudiate the idea that they were the work of the same time, and the same hands and minds. The distinction is intensified when we examine and compare the enlarged drawings of the two capitals. If we are to suppose that Moslem architects at the close of the seventh century produced that capital (fig. 4), we had better, as Mr. Fergusson suggests, "burn our books, and give up at once all idea of ascertaining the age of buildings, either Gothic or Classical, from their style." The capital is very nearly a Classical one, only modelled in a rather stiff and poor manner. But in the other drawing of the capital and entablature, which we are able to give (fig. 1), we get still nearer the precise date of the work, for we there actually see the first attempt at thickening out the upper part of the bell of the capital to give greater apparent strength for carrying the arch, which resulted eventually in that convex capital which is one of the most prominent characteristics of Byzantine architecture. But the block above the abacus, from which the arch springs, is made a strong point of objection with some of the opponents of this theory, as being a corrupt feature, belonging to a later date than that of Constantine, or anywhere near his time. We will quote in Mr. Fergusson's own words his comment on this part of the question:—

"When in the time of Diocletian, architects first began to tamper with the stereotyped forms of the Roman Corinthian order, they left the cornice and frieze for a long time pretty much as they found them. They pulvinated the frieze, —or, in other words, curved it outwards,—and carved it richly, to supply the place of the figures which were its original and proper ornament, and they omitted some details of the cornice; but the great alteration was made in the architrave. When using arches, as in the Court at Spalatro, they bent the architrave as an archivolt, round the arches, leaving the frieze and cornice as before; but when using a trabeate or horizontal construction, they omitted the architrave altogether, except one block of it over the capital, and afterwards, even in arched construction, used this block in order to give apparent strength to the capital to support the arches, and continued this practice down nearly to the time of Justinian. In his age, however, the convex capitals enabled the architects to dispense with this, their fulness being sufficient to give the requisite appearance of strength. In the intermediate period, however, the architects almost invariably engraved either a cross or a Christian emblem on this *dé*, or cubical block, as in the subjoined example from Thessalonica, dating about the year 500 A.D., and this practice became almost universal in the churches at Ravenna and elsewhere. When the Byzantine style was completed under Justinian, the *dé* was omitted, and the cross or monogram was transferred to the capital, which had then become convex instead of concave, and, in fact, belonged to a totally different style of architecture from that which is found in the buildings of Constantine at Jerusalem."

The small illustration of the Thessalonica arcade we reproduce; but we believe it is not the only instance to be found of a block between the abacus and the arch of this date of the transition from Classic to Byzantine, and that there is more to be learned yet of the details of this singular period of architectural transition. In the mean time, any one who will recall the well-known bulging outline of the capitals of St. Sophia and other specimens of complete Byzantine architecture, must feel at once how impossible, how absurd, it is to imagine that these capitals of the Dome of the Rock were executed *after* the Byzantine form had superseded and obliterated the Classic form, as



Arcade from Church of St. Demetrius at Thessalonica, A.D. 500—520.

according to the popular theory, they must have been. Mr. Fergusson was in great hopes that when the marble slabs which now surmount the capitals of the intermediate range of columns in the Dome of the Rock were removed, and the original *dé* exposed, the Christian symbol would be found in its usual place, and put an end to all question, even among those who cannot read architectural style; but the *dé* turned out to be only a rough block of stone. Mr. Fergusson's explanation, illustrated by the drawing (fig. 1) we have once already referred to, is that the *dé* was originally cased with bronze, as the soffit of the intermediate entablature is still covered with bronze, a supposition which, under these circumstances, seems exceedingly probable.

By those who cannot read architectural "handwriting on the wall" it has been contended that the peculiar employment of the horizontal beam running between the capitals and the arcade, both in the Dome of the Rock and in the El Aksa Mosque, is an indication of their being the work of the same hand following out the same idea. To those who can place any weight on such an argument in the face of the other differences in the two structures it would seem scarcely any use to point out that Aksa merely shows a clumsy imitation by the Mahommedan builder of a feature in the other building which he approved either for constructive or ornamental reasons. The real parallel with this feature in the Dome of the Rock is to be found in the Lateran baptistery at Rome, an unquestionably Constantinian building, where the feature of the continuous beam appears in almost precisely the same form as in the Dome of the Rock. Mr. Fergusson gives, however, another very singular corroboration in a section of a church at Bosrah, extracted from an engraving from the "Syrie Centrale" of his adversary Comte de Vogüé (who is thus made to bear evidence against himself), in which we have the columns with quasi-Corinthian capitals, with a block or *dé* on each abacus, and carrying a horizontal beam or entablature very similar to that in the Dome of the Rock, only that instead of the arcade springing from this entablature, an arch over each inter-column, a large arch is carried over from angle-pier to angle-pier of the octagon, flying over the columns and entablature, the latter being stopped by the jamb of the arch at each end. The Comte de Vogüé himself dates this building, from inscriptions on the walls, at A.D. 512, and Mr. Fergusson regards it as an improved application of the method of design and construction previously carried out in a somewhat less logical form in the Dome of the Rock. We do not think this follows; but there is nothing in the comparative architecture of the two buildings inconsistent with the theory; the architectural scheme at Bosrah is undoubtedly an improvement on that of the Jerusalem building, and undoubtedly it belongs to nearly the same phase in architectural history, and so far is strong evidence on Mr. Fergusson's side: but his argument as to the approximate date of the Jerusalem building appears to us quite inexpugnable even without this assistance from the adversary.

Since the author's theory of the præ-Mahommedan origin of the Dome of the Rock was first promulgated, however, additional light has been thrown upon the matter by the uncovering of the exterior wall of the building. It was known and admitted on all hands that the present external facing and the painted windows were a late Saracenic treatment; but in 1873 the exterior tiling was becoming so dilapidated that a large quantity of it had to be removed, and the original wall disclosed. This proceeding rendered visible, over the principal range of windows, a parapet wall with a range of thirteen small arches on each face, each arch springing from a small shaft with a quasi-Classical base, and a capital bearing a curious resemblance to the simplest form of Norman capital, a block with the lower angles cut away in a curve so as to leave a nearly semicircular plane on each face. This feature is engraved in the proceedings of the Palestine Exploration Fund, and its appearance at once suggests the exterior gallery so often found under the cornice of Romanesque churches in North Italy (especially round the apse). That it is not Saracenic building,—that nothing *like* this is known, at least, in any Saracenic building,—is obvious at once: the strange thing to most readers will be that the capital of the little shafts so much resembles a form that we are accustomed to associate with the eleventh century. Otherwise, the similarity in character between this gallery and that of St. Ambrogio at Milan, with which Mr. Fergusson compares it, is obvious enough. But there are not wanting indications that this supposed peculiarly Norman form of capital had a much earlier and more Eastern origin. The author gives a drawing of one from the "cistern of Philoxenus" at Constantinople, which might pass for an early Norman capital, only that it has not the projecting abacus. But the Christian character, architecturally speaking, of this wall-arcade, as given in the illustration borrowed by the author from the Palestine Exploration Report, is obvious to any one who has even so much as seen drawings of Early Romanesque church architecture.

The whole question of the architectural history of the Dome of the Rock seems likely thus to have a collateral interest for architectural students, in suggesting new ideas as to the date of origin and place of origination of some features of the architecture of the early part of the Christian era; and this is so in regard to one very interesting feature, the pointed arch. For it is one peculiarity of this peculiar building that the arches of the outer arcade, in spite of the pronounced late Classical character of the detail, are very slightly pointed. They can hardly be called, *architecturally*, pointed arches; that is to say, the pointing is so slight that it does not affect one as giving a character to the design, except when seen in very sharp perspective*; and there appears, from the best illustrations we have been able to collate, to be a slight rounding off of the two opposing arcs at the apex, rather than any attempt to make a true point. Still the fact remains that the two sides of the arch are struck from different centres; and this, taken in conjunction with the detail which accompanies them, suggests the question whether further investigation of such remains of this period as are not yet fully exhausted may not reveal other examples of what may be called embryo pointed arches in late Roman buildings, which, like these, will still further emphasise the constructive origin of the pointed arch, exhibiting it in its earliest stage, as an effort to avoid the danger of too flat a crown to the arch without bringing out, more than could be avoided, the appearance of the point as an architectural characteristic.†

Admitting, however, as we believe every one competent to understand the argument from architectural style must eventually admit, that the Dome of the Rock is in its earlier remaining portions a building of pre-Mahommedan date,—and probably of the time of Constantine,—is there equal reason to believe that these portions are the relics of the church built by Constantine? One argument against this is that the sepulchre church is historically recorded to have been

* Good photographs of the interiors,—and they are procurable now,—place the contrast in far more striking light than these small engravings.

* In this respect Mr. Fergusson, in the frontispiece of his former work on "The Ancient Topography of Jerusalem," did an injustice to his own argument in employing an engraving which gave the arches an appearance of very decided point. From comparison with photographs it is obvious that this was a draughtsman's error: the point is so slight that it is hardly perceptible when the arch is seen in elevation.

† While on the subject of the arches, we may call attention to the manner in which the arches of the *inner* arcade are shown in the section of the Dome of the Rock which forms Plate VI. to Mr. Fergusson's work, but which appears to be nearly reproduced from De Vogüé. These arches are shown with a keystone projecting below the soffit of the arch, which is incorrect according to other larger and apparently accurate representations.

twice destroyed, burned to the ground. Mr. Fergusson takes his stand upon the reliability of unconscious architectural evidence as contrasted with the thousand probabilities of error in Mediæval history, with its tendency to exaggeration. As he says, the alternate possessors of the building have involved it in such a mass of contradictory fables that it would be an utterly hopeless task to attempt to unravel its history, "were it not that architecture never lies, and that art, when not purposely falsified, may be depended upon as speaking the truth."* Any one writing of York Minster and its records in the spirit of a Mediæval historian, would, as probably as not, either say or leave the impression that it had been "twice burned to the ground." It would be interesting to ascertain whether any traces of fire are perceptible on the older portions of the Dome of the Rock.

But the probabilities in favour of the Constantine theory are certainly very much enhanced when we take the building in connexion with the smaller structure on the east side of the Haram area, known as the Golden Gateway. It is on record, and is generally believed by all parties, that Constantine erected near the Church of the Resurrection a church (Martyrium) in memory of the site of the Crucifixion, and that he built a sumptuous portal leading to the atrium of this church. Now, the Golden Gateway is such a portal, and its architecture presents the characteristics of the age of Constantine. Some parts of the structure might, indeed, suggest a slightly earlier origin, for it is impossible to look at the curved entablatures in the west front of the structure (the small engraving of which we reproduce from Mr. Fergusson's pages) without at



West Front of Golden Gateway.

once recalling Spalatro. But there is nothing in this feature inconsistent with its being a little later than Spalatro, while on the other hand the style of the capitals of the internal columns, which must have been erected at the same time, is a kind of corrupt Ionic with strong Byzantine tendency,† so peculiar, indeed, that it might be put considerably later if its date were not checked, so to speak, by the external curved entablatures, which retain the principal features of the Classic entablature nearly intact: and again by the entablature and capital over the pilasters in the interior, which also we reproduce. It seems astonishing that Comte de Vogüé and others should have put this building as late as the fifth or sixth century; a theory which the west front alone seems enough to settle. All the indications of its architecture, taken collectively, appear to point to the fourth century. Mr. Fergusson's argument proceeds, that as it is obviously only a gateway to some important building or group of buildings, and that as Constantine did erect such a gateway to such a building, and this is in the style of his day, and we have no other explanation of its origin or meaning, what need to go further? More especially when it is found in proximity to another building of Constantinian date which also answers with great probability to the presumed character of another structure which he is known to have built in the same neighbourhood. It is, of course, obvious that the argument in regard to the two together becomes ten times as strong as it would be in regard to either building taken separately.

If this were Constantine's gateway, then excavation should show some remains of the foundations, at least, of the basilica to which this gateway was one entrance. Mr. Fergusson thinks these have been found in some subterranean walling which was unearthed during the researches of Captain Warren on behalf of the Palestine Exploration Fund, and which he considers to be the foundation of one of the aisle walls of the basilica. The remains are in a parallel line with the axis of the Golden Gateway, but so far north of it as to compel the inference that in that case the gateway was not an entrance right upon the atrium of the basilica, but only to the enclosure which contained it. This removed one difficulty in regard to the statement of Eusebius, that the gateway opened "in front of a broad *agora*," for which the rapid slope of the ground *outside* the Golden Gateway left no possibility, but which Mr. Fergusson now places *inside* the gateway in the space where he would formerly have proposed to place the atrium of the basilica, which he now removes further north to suit the line of Captain Warren's subterranean wall. All this looks perhaps very conjectural, yet there is nothing impossible in it, and certainly the discovery of the wall or foundation was sufficiently *àpropos* to the theory to make it of the greatest interest to get further investigation. This, it seems, has never been done. The discoverer of the wall, who had no interest apparently in Mr. Fergusson's theory, did not follow it up. Mr. Fergusson's note on the subject concludes:—

"When I found he had come away without any further attempt at exploration, I,—fearing that expense might be the cause of nothing further being done,—wrote to the 'Fund' through Major Wilson, offering them, or any one, one hundred guineas if they would only sink a hole where I had marked it on plan, Plate V., and ascertain whether the apse was there or not. I am afraid, however, the opportunity is now lost. In the present state of feeling between Christian and Mahommedan it is scarcely likely any digging there will be allowed, and we must, therefore, be content with the very meagre particulars we now possess."

Unless there is some further explanation forthcoming, we must say that the neglect of such a request from such a quarter was, to say the least, very much to be regretted. We do not see enough evidence yet to prove that this was the site of the Basilica, or that the Golden Gateway was the entrance to it; but there cannot be a question that the theory has sufficient interest and consistency to be well worth a little trouble in testing it further; and if the apse were discovered, in the position indicated by Mr. Fergusson, or ever so small an unquestionable relic of it, the whole chain of evidence would be complete, and the theory irrefutable.

As to the question whether this could have been the real site of the Crucifixion and the entombment, we do not consider, as we have before said, that the actual correctness of the site is, as a matter of course, involved in the question whether these were Constantine's buildings. It is not to be taken for granted that Constantine himself was correct about the site, though on the whole the probabilities are as much in favour of his having correct information or tradition as not. As to the probability of the site *per se*, it is at least more answerable to the Bible narrative than that of the Church of the Holy Sepulchre. The strongest of the objections urged against it is the improbability of the position of such a locality as Golgotha, with the grisly relics and associations implied in the name, being found just outside the walls of the temple. This, no doubt, has much more force with those who believe that the temple enclosure occupied the greater part of the Haram area than it would have on the topographical system of Mr. Fergusson, whose restoration of the temple only covers the south-west portion of the area. Indeed, he uses the proximity of the temple and of the Tower of Antonia to the place of crucifixion, which his theory presupposes, to offer what is unquestionably an exceedingly ingenious interpretation of one or two facts in the narrative as given in St. Matthew's Gospel. The soldiers who "mocked" were, he suggests, not the regular guard who might be detached to see the execution properly carried out, but the idle soldiers of the garrison which was quartered in the neighbouring Tower of Antonia; and the "vinegar" was that which, when mixed with water, was the ordinary drink of the Roman soldiers, which a soldier "ran" and brought from the adjoining quarters. The other suggestion we give in the author's own words:—

"We gather the same impression from the conduct of the priests and people throughout all these transactions. They went together to the Roman governor to clamour for his execution, but there is no hint that any of the priests accompanied him to the place of execution. He was followed there by a great crowd of people (πόλυ πλῆθος τοῦ λαοῦ), but the priests apparently kept apart, and 'mocking him, with the scribes and elders, said, "He saved others, himself he cannot save."' Where, then, were these priests? The answer seems easy: they were looking on, *from the roof of the northern cloister of the Temple*. There, at least, they could easily see all that passed," &c.

This is very real, and shows that the author has some of the qualities that would have made him a good historian of other things besides architecture.

For reasons aforesaid, however, we rather decline to accept at this moment anything decidedly as to the precise site of the events connected with the Crucifixion. Our interest is with the question of architectural history which Mr. Fergusson has raised and illustrated in so brilliant and persevering a manner, and which not only seems to offer a probable solution, of a very interesting kind, of the origin of two remarkable structures which are hitherto entirely unexplained, but also raises collateral questions in regard to the transition from Classic to what may be called Christian architecture, which may suggest a good deal to future architectural students. At some other time we may endeavour to follow out the theory as to the plans of the various Jewish temples, with which the bulk of this very full and valuable book is occupied; but we feel a more immediate interest in the portion we have dealt with above, because it is based on structures which are actually in existence, and has a more direct and practical bearing on the study of architectural history.

THE TYNEMOUTH AQUARIUM, WINTER GARDEN, AND BATHS.

THE Tynemouth Aquarium is about to be opened. Although for many years Tynemouth may have claimed to be considered a watering-place, yet she has been such only in a very limited way. No attention has been given to the need of improvement, little attempt made to take advantage of her natural attractions, and the accommodation hitherto supplied to visitors has been insufficient.

On Tynemouth Links a group of buildings is being completed, consisting of an aquarium and winter garden, baths, club establishment, skating-rink, and pleasure-grounds. The style of architecture adopted is the Italian Renaissance, and the buildings extend from the upper level of the Cullercoats-road to the sea-shore. The length of the main façade is 336 ft. On either side the grounds will be planted with pines, tamarisks, and other hardy trees and shrubs, and meandering paths traversing the slope will communicate between the different levels.

Entered from the road between Tynemouth and Cullercoats will be situated the winter garden or floral hall. This edifice is 225 ft. long by 60 ft. broad, with a mid-transept, increasing the width in that part to 72 ft. The sides consist of a light and lofty arcade of stone, and are filled in with glass. The roof is vault-shaped, of glass, on wrought-iron ribs and principals. The general appearance will be diversified by groups of statuary and fountains. Outside, facing the sea, is the upper of a series of terraces, the balustrades of which will bear vases of flowers.

At each end of the winter garden are the entrance-halls. Above, on the first floor, are the library and reading-rooms, the secretary's and manager's rooms. On the second floor are card, billiard, and smoking rooms. On the third floor, the bedrooms of the domestics.

The aquarium includes both salt and fresh water tanks, occupying both sides of the hall. A row of columns divides the floor into two avenues.

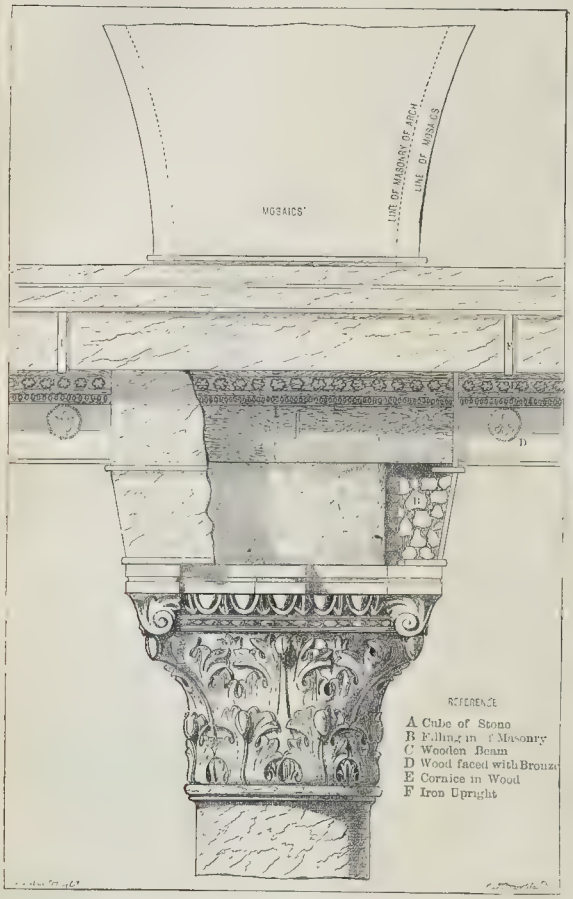
The baths, at the bottom, are not yet commenced. The sum of 50,000*l.* has been already spent, and 30,000*l.* more will be required to complete the design. The architects are Messrs. John Norton and P. E. Masey, of London.

The Artisans' Institute.—A *soirée*, to celebrate the conclusion of the fourth session, is to be held in the Hall on Monday, June 3rd, when Lord Lyttelton will take the chair.

* It is unnecessary to point out to our readers that these remarks refer to the ancient and Pre-Renaissance architectural styles. But so ill-informed are some of the most prominent Jerusalem topographers on this subject, that they have actually imagined it was a sufficient answer to Mr. Fergusson's theory to say that the Saracenic architects of the Dome of the Rock were only imitating Classic architecture, just as modern English architects imitate thirteenth-century architecture: apparently quite unaware that this imitative architecture has only existed in the modern period since the invention of printing and the revival of literature.

† It is remarkable here, again, how we find in a portion of these capitals a channelled or scolloped ornament remarkably similar to a well-known favourite decoration of Norman capitals.

ILLUSTRATIONS OF BUILDINGS IN THE HARAM AREA AT JERUSALEM.



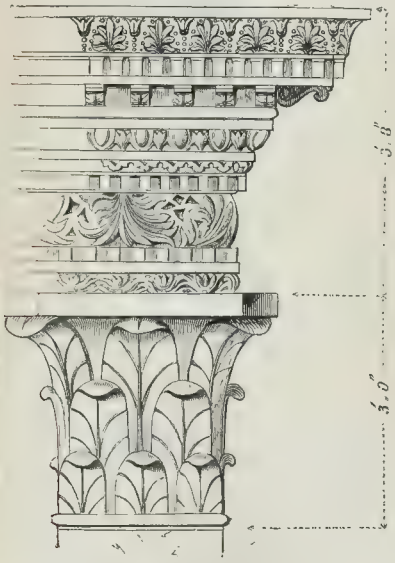
1. *Capital and Entablature of intermediate Range of Pillars in Dome of the Rock.*



2. *View in Mosque El Aksa.*



3. *View in Dome of the Rock.*



6. *Capital and Entablature in Interior of Golden Gateway.*



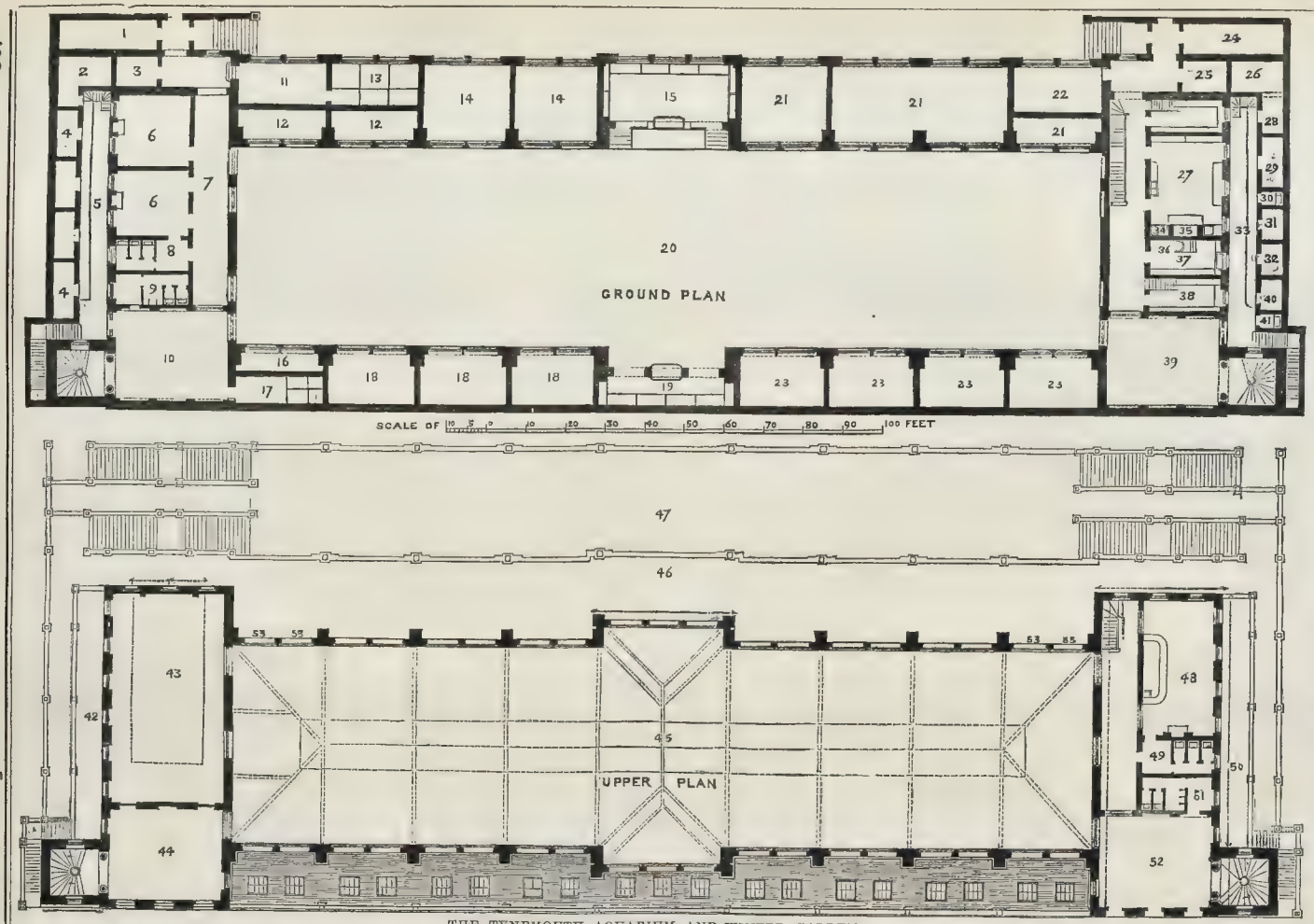
4. *Capital in Dome of the Rock.*



5. *Capital in Mosque El Aksa.*



THE TYNEMOUTH AQUARIUM, WINTER GARDEN, AND BATHS.—Messrs. John Norton and P. E. Masey, Architects.



1. Beer-cellar.
2. Coal-cellar.
3. Wine-cellar.
4. Cellars.
5. Area.
6. Refreshment-room.
7. North Corridor.
8. Ladies.
9. Gentlemen.
10. Lower Hall (North).
11. Naturalist.
12. Fresh-water Tank.
13. Reserve Tank.
14. Fresh-water Tank.
15. Table Tanks—Fresh-water.
16. Zoophites.
17. Attendants and Reserve Tanks.
18. Salt-water Tank.
19. Table Tanks.
20. Aquarium.
21. Salt-water Tank.
22. Engine-room.
23. Salt-water Tank.
24. Beer-cellar.
25. Wine-cellar.
26. Coal-cellar.
27. Kitchen.
28. Coal-cellar.
29. Larder.
30. Men's W.C.
31. Larder.
32. Store.
33. Area.
34. Oven.
35. Close Range.
36. Boiler.
37. Scullery (Room over).
38. Pantry (Room over).
39. Lower Hall, South.
40. Cellar.
41. Maids' W.C.
42. Area.
43. Hall for Music, 53 ft. by 23 ft.
44. North Entrance-hall, 28 ft. by 23 ft.
45. Grand Winter Garden and Promenade, 216 ft. by 50 ft.
46. Upper Terrace.
47. Middle Terrace.
48. Refreshment-room, 34 ft. by 18 ft.
49. Ladies' Lavatory.
50. Area.
51. Gentlemen's Lavatory.
52. South Entrance-hall, 28 ft. by 23 ft.
53. Door.

THE TYNEMOUTH AQUARIUM AND WINTER GARDEN.

DISTRICT SURVEYORS AND DANGEROUS STRUCTURES.

SIR,—I enclose copy of letter I have recently sent to every member of the Metropolitan Board of Works, and shall be pleased if you can kindly insert the same in your next issue.

It is past endurance that educated members of an honourable profession should attend police courts for day labourer's wages.

ROBERT WALKER.

My name having been prominently before the Board, with reference to the late accident in the Haymarket, and it being evident from the remarks that were then made that considerable misconception exists as to the duties and responsibilities, as well as emoluments, of district surveyors, I beg respectfully to solicit your careful perusal of the following statement of facts with reference to my district.

When I was appointed district surveyor to the parishes of St. Martin-in-the-Fields and St. Anne, Soho, in January, 1875, I soon found that though the duties were very onerous, and the responsibility great, yet that the income to be derived from the appointment was practically nothing.

This results from the following causes:—Both parishes are entirely covered with houses (with the exception of the strips of vacant land on the Northumberland-avenue) and a large number of buildings in St. Martin's parish are Government property, and exempt from the Building Act.

The principal matters, therefore, that come under the cognisance of the district surveyor are dangerous structures, and making surveys and reports, and attending Police courts, to give evidence with reference to them. There are a large number of these, especially in the parish of Soho.

It happens, however, that the fees allowed for this class of work are not only totally unremunerative, but practically in many cases do not even pay the expenses out of pocket.

The scale of payment is as follows:—

For surveying and reporting on a dangerous structure not exceeding five squares and two stories	£0	7	6
Exceeding five squares	0	10	0
Every additional story	0	2	6
For attending summons, and giving evidence at police-court	0	5	0
Attending on adjourned summons and giving evidence	0	2	6
During the past year the total receipts from all sources in my district were	207	5	9
Expenditure:—			
Rent of office, clerk's time making up and collecting returns, stationery, postage, cost of books and forms, expenses of ladders and men pinning dangerous structures, &c.	140	0	0
Net income	£67	5	9

The Building Act and Regulations of the Board compel the district surveyor to keep an office open within his district, and a competent clerk always in attendance, between the hours of ten and four, and as the net income of 67*l.* is to a large extent made up of payments of small fees for dangerous structure surveys, and attendances at police-courts, the travelling expenses and loss of time connected with these practically much more than swallowed up the whole income.

As regards dangerous structures, they occur so frequently, and often unexpectedly, that I have been sometimes called up twice in the middle of the night by police telegrams within one week, informing me that walls had fallen, and requesting me to come at once and superintend the shoring of adjacent property. In the day time, this is a common occurrence. As the district surveyor has no power of entry into buildings to ascertain if they are dangerous, it is impossible to foresee when any structure may be found to be in that condition, and it is therefore essential that a competent clerk should be all day at the office to attend to any dangerous structure notices that may be received. The anxiety as well as trouble, and waste of time, caused by these dangerous structures, is such that none but those who have to deal with them can have any correct idea on the subject. I have often been compelled to attend at police-courts on adjourned summonses, and after waiting for some two hours for the case to come on, and then giving important evidence affecting the safety of life and property, have received for my trouble the handsome fee of 2*s.* 6*d.*

A dangerous structure notice usually involves the following:—A survey and report to the Board, and generally two or three inspections, to see whether the property is properly shored, and often the expenses of sending men to plumb the premises before reporting, writing the Board with reference to the shoring, drawing a sketch and instructions what shores are to be fixed, measuring up the contractor's shoring, and checking and certifying his account, and attending the police-court, and giving evidence, sometimes two, three, or even more times, and often waiting until the case comes on, generally writing to the owners two or three times, or seeing them when they call at the office, and very often seeing the surveyors to both leaseholders and freeholders, and writing answers to their letters, the average fee for all the above work being seldom over 1*l.*, often less, and I have frequently in these cases spent more in cab-hire when summoned in the middle of the night, and for cost of plumbing the premises, than the whole fee allowed by the Board.

As the greater part of the works in my district consists of these dangerous structures, this part of my duty is not only totally unremunerative, but practically a serious money loss, apart from the responsibility attached to it. As a specimen, I may mention that some time ago I reported on the safety of Drury Lane Theatre, after about 150 ft. of external stone cornice had fallen suddenly in the middle of the night; and that though I was four hours carefully inspecting the whole fabric, and compelled the owners to spend a large amount of money to render it safe, and met the architects to both the lessees and sub-lessees several times, and attended on five separate occasions at the building, as well as directed the erection of the shoring, and checked the contractor's account, yet the only fee I received for all this was 1*l.* 7*s.* 6*d.* I have lately had a still more serious case at the *Echo* printing office, Strand.

The small fees charged the public for these services are practically a direct encouragement to recklessness, and a premium or them to allow their buildings to fall nto a ruinous condition. The remark is constantly made to me, when I remonstrate with owners on the wickedness and folly of allowing walls, and especially foundations to piers, to fall into a condition dangerous to the inmates of their houses, that they find it cheaper to wait till the district surveyor comes with the order of the Board to survey them, as his services practically cost them nothing, whereas an architect would charge three to five guineas for a report on their buildings

The Building Act, section 69, says that the district surveyor shall report to the Board any information he may receive with regard to dangerous structures; but the general idea in the public mind, I find, is that the district surveyor is a kind of guardian angel of building structures, watching over the whole of his parish, who, in the language of one of the jury at the late inquest, should make every one safe (even when, by their own folly, the owners allow their buildings to fall into decay), and though the district surveyor has no legal power to enter them.

I have recently had under my notice two singular instances of the extent to which this impression pervades all classes.

I condemned part of an old house in Greek-street, Soho, as dangerous. The fee for this would be about 15*s.* I received, shortly afterwards, a notice of commencement of works, from Mr. Whiteley, of Westbourne-grove (who has recently added to his other vocations that of practical builder), and a request that I would instruct his foreman how much of the old building to take down, and what to do to make it safe; in fact, for the above sum, to act as consulting architect to a building where no surveyor was employed.

The same week the proprietor of the *Echo* newspaper sent word to the Metropolitan Board of Works that his own printing-office was dangerous, and upon my inspecting the premises, he informed me he considered it my duty to tell him what to do to make his building safe; of course, I could merely condemn it, and he has since found it necessary, from the extremely dangerous condition into which it had fallen, to call in the services of two eminent architects to advise him.

As regards new buildings, my case is even still more singular; there are very few new buildings erected in the district; last year there were only five, but they are generally very large structures requiring great care and judgment in their erection, and principally supported by scientific iron construction. The Building Act specifies that no fee for a new building shall exceed 10*l.*; there are two buildings now erecting in my district, the cost of each of which is over 80,000*l.*, so that practically I receive for superintending these works the sum of 2*s.* 6*d.* per 1,000*l.* worth of work done. A broker would charge ten times this sum for merely transferring the same amount of Bank Stock The absurdity of the remuneration is, however, better shown by the fact, that if the outlay on these buildings was in the suburbs it would probably represent about 200 houses, the fees on which would be about 600*l.*, yet practically, the responsibility, trouble, and anxiety in overlooking the large buildings I speak of is really much greater than it would be with regard to the 200 ordinary houses. An assistant could render great help in the latter case, but with respect to the former the district surveyor must do all the work himself, so that the fact remains that for the sum of 3*d.* per cent. the district surveyor is assumed to a great extent to be responsible in these cases for any blunders of construction, or in the execution of the work, and also all scamping alike of workmen, foremen, and contractors; while he has always hanging over him the contingency of a verdict of manslaughter from an ignorant coroner's jury, with the chance of spending a night in a common gaol. This fate, I understand, I only escaped at the late inquest because two of the jury, having somewhat clearer views than their fellows, compromised the matter by blaming me for allowing other people to do what I had no legal power to prevent, while they passed no opinion whatever on the actual authors of the failure. . . . . .

As an architect, I can, I believe, confidently refer to the numerous buildings already erected under my superintendence in testimony of my professional character and ability; and I wish to submit most respectfully to the consideration of the Board the following facts, founded on my experience as a district surveyor:—

1st. That no district, so small as mine especially, where the duties consist almost entirely of condemning dangerous structures, can be profitably or properly worked, even though the outlay be more than the receipts. The only really efficient way to work a district is for the district surveyor to make a point of seeing every building or alteration himself, both at its commencement and close; but it is also essential that he should have a competent assistant, who should make it his duty to call at the buildings frequently, and when not expected, in order to detect irregularities and report same to his chief. It is impossible for any district surveyor to do all this himself, nor is it, for many reasons, desirable he should always be his own detective. At a low computation, for even a small district to be managed on this plan, the office expenses cannot be less than 200*l.*

2nd. I also respectfully submit, that the present fees for dangerous structure surveys, and attendance at police-courts, superintending shoring, &c., are most unfair to district surveyors.

3rd. That a fee of 2*s.* 6*d.* per thousand pounds outlay, or 3*d.* per cent., is not enough remuneration for surveying large blocks of buildings, and taking the heavy responsibilities connected with them.

4th. That district surveyors should have the power to compel drawings of new buildings to be submitted to them, and also the right to enter at proper times old houses, to see if they are dangerous.

5th. I would most earnestly join in the wish expressed by one of the members of your Board, that the duties of district surveyors should be more clearly defined; and the public properly informed what those duties are.

I also wish to express to the Board my apprehension, that at any moment a serious catastrophe may happen in my district, accompanied by great loss of life which I am powerless to prevent. A large number of the houses in Soho parish are old mansions of a past ers, which, from age and neglect, are in an exceedingly ruinous state; many of them are owned by freeholders who have not seen them for years, and let to tenants at high rentals, who sublet the separate apartments to a low class of foreign prostitutes. From the neglected condition of the property, its ruinous state, and the dissipated and nocturnal habits of the inmates, several accidents have already occurred, and I fully anticipate being called up some night by a police telegram informing me that one of these houses has fallen and killed its inmates. I wish to state these facts, in order that the Board may be prepared for such an occurrence which I deem highly probable. In order, however, to prevent it as far as possible, I have made arrangements to survey systematically, and as far as I have the power, the whole of the houses in this parish, and to report to the Board every dangerous structure I can detect. This is, really, no part of my duty; it will, I know, cause great hardship and suffering to many innocent persons, and must, as far as I am concerned, be simply a labour of love, as the fees will not pay even the expenses in the matter.

There is also another irksome duty which takes up a large portion of a district surveyor's time in my case, and for which no fees whatever are allowed. Scarcely a week passes but some foreign restaurant-keeper or other in the streets adjacent to Leicester-square, is found to be breaking the law by erecting projections beyond the line of frontage or carrying up some wooden buildings, contrary to the Building Act, and I may state that nearly every street in my district has several of these irregular structures in it, the result of many years of past neglect; a large portion of my assistant's time, and often my own, is occupied in threatening police proceedings against these intelligent foreigners, and losing both time and patience in trying to enforce and make the law understood, whereas should one of them escape notice, the usual formula is directly applied:—Where is the district surveyor? I would again respectfully submit that it is not fair for a district surveyor to be compelled to act the part of a gratuitous public prosecutor.

ROBERT WALKER,
District Surveyor of St. Martin's-in-the-Fields, and St. Anne's, Soho.

CONGRESS ON NATIONAL WATER SUPPLY.

SOCIETY OF ARTS.

IN continuation of our report * of this Congress, we will, before proceeding with our notes of the second day's sitting of the Conference, refer to a few points which, for want of time and space, were omitted from our account of the first day's proceedings.

Dr. Wright, medical officer of health for Cheltenham, spoke of the increasing difficulties experienced by rural districts in obtaining adequate water supplies.

Mr. Williams, of Liverpool, advocated that the Government should take under control the mountain streams of Scotland and Wales, and the lakes of Cumberland, and contended that, by judicious engineering works, the waters of those localities might be impounded and distributed to the large towns of the country at a comparatively trifling cost, the interest on which might, he suggested, be met by an income-tax of a penny in the pound.

Dr. Bond, of Gloucester, criticised some of the provisions of the Public Health Act Amendment Bill (which has just passed its second reading in the House of Lords). Dr. Bond said that the provisions contained in that Bill as to the water supply of cottages would prove, to a large extent, inoperative, as the tenement owners and occupiers were frequently too poor to defray the cost of laying on the water. The only way in which such difficulties could be got over would be by the imposition of "Private Improvement Rates," extending over a period of three or four years, and payable by the owners and occupiers. No legislation would be effective which trusted to the enthusiasm of rural sanitary authorities. For the purpose of effecting the necessary works required for the water supply of rural districts, he urged that rural sanitary authorities should be empowered to borrow money of the Public Works Loan Commissioners.

Dr. Syson said that little progress would be made in providing the rural districts with good water so long as there were divided counsels at the Local Government Board. As to what was and what was not good potable water the chemists and engineers of the Board were constantly at loggerheads. Whatever steps might be necessary to secure better water-supply for the nation at large, care should be taken not to place additional power in the hands of the Local Government Board, the official department of which was, in its organisation and method of working, so utterly and so persistently wrong that it was the laughing-stock of all who knew anything of the requirements of local administration. The whole system upon which its business was conducted was rotten, and it stank in the nostrils of the country. Only when the Augean stable at Whitehall was cleansed would there be much hope of sanitary progress in the country. As to the powers conferred by legislation on sanitary inspectors or inspectors of nuisances with regard to the quality of water, such officials were, as a rule, totally unfitted to exercise discretionary powers, seeing that the powers with which they were invested required some knowledge of science.

Mr. J. F. Bateman, F.R.S., contributed a short paper in which he said:—

"No one is more convinced than I am of the evils arising from a bad or deficient supply of water, nor can any one appreciate more highly than I do the excellent motives

* See p. 534, *ante*.

which dictated the Prince's letter; but I see no way in which a large and comprehensive scheme of a national character could be made subservient to the objects his Royal Highness has in view.

How, for instance, could any scheme be combined for meeting, at the same time, the wants of a village in Northumberland and one in Cornwall, or a village in Essex and another in Merionethshire?

The large cities and towns provide for themselves and their neighbours, but many small isolated villages lie beyond the reach of such places or the aqueducts which supply them. These small places cannot afford to incur any great expense, and as, in this commercial country, few people will be found to lay out their money on unremunerative undertakings, the only way of meeting the wants of such small places will be by the aid or contributions of philanthropic persons, who will give their money without hope of return, for the benefit of those who cannot help themselves.

Much may be done in particular districts by the adoption of such conditions as have been imposed on the Manchester Corporation to supply, within certain limits, all urban and rural authorities who may demand water which lie in the neighbourhood of the aqueduct from Thirlmere to Manchester, but such arrangements would not benefit distant places."

Mr. Martin Underwood said that the Congress seemed to be rather too prone to discuss the question of potable water only; but it should not be forgotten that the husbanding of natural resources in the shape of water supply was needed for the land and for the rivers themselves. In communications to the *Builder*, he had pointed out, years ago, that while we had vastly improved our land for agricultural purposes by underdraining, one effect of such improvement had been to cause the rainfall of the country to pass very rapidly into the watercourses, whence it was carried rapidly away, doing much damage by flooding the low lands, and resulting in drought when the water was most wanted. In order to store the abundance of water which we might make available, he had suggested a complete system of storage reservoirs in each watershed area. The water-closet system was a great enemy to water conservators, not merely on account of the waste of water which it engendered, but because of the pollution caused not only by sewage matter, but by lead from the soil-pipes. The gradual wearing away of soil-pipes was well known. He had calculated that 600,000 lb. of lead were carried into the sewage of London from this cause every year, and as, according to Professor Wanklyn, one-tenth of a grain of lead would poison a gallon of water, 600,000 lb. would poison a lake twenty-one miles and a half square and 10 ft. deep.

Mr. Joseph Whitley said that the provision of storage reservoirs was a simple matter of engineering skill. The abundant natural supplies of water must be reserved at the first point, in order to secure purity, and distributed throughout the length and breadth of the land by conduits. This mode of distribution could be effected to a large extent by gravitation, while the power of the wind and tides could be largely used for pumping purposes, doing perhaps four-fifths of the labour required to be done.

The Chairman (Sir Henry Cole) said that a valuable paper by Mr. W. H. Wheeler, bearing on the points referred to by the last speaker, appeared in the last number of the Royal Agricultural Society's *Journal*.

At the second day's sitting of the Conference, the chief topic discussed was the water-supply of the metropolis. Sir Henry Cole, who again presided, suggested that it would be advisable to discuss this question as far as possible from a scientific point of view, as any reference to cost, and compensations to existing interests, would tend to needlessly complicate the question, which was as to the best way of providing an unlimited supply of pure water for London.

Professor Frankland was the first speaker. He said that there were few river basins which contained such good water as that of the Thames, and London might fairly lay claim to the lion's share of it. In a long drought the Thames was supplied exclusively from springs, and in the greatest drought 350 million gallons passed over Teddington Lock every day, after the abstraction of from 40 to 50 million gallons by the water companies. Then there was a great deal that came into the Thames below Teddington. After being for a long time opposed to the idea, he had at last come to the conclusion that it was desirable to have two systems of water supply in London. To supply such an immense quantity of good water to be used mainly for flushing services was to commit great waste. He did not, however, favour the notion of having two kinds of water in the house, which he thought would be a dangerous thing, for the servants would be sure to go to the nearest tap, whatever the quality might be. Therefore, he would not introduce into the house more than one supply, but he would have an indoor supply and an outdoor supply. The domestic supply for London amounted to 97 millions of gallons a day, and for trade and all other purposes only 20 millions, but he believed there was enormous waste of the water supplied in private houses. He would have the sewers flushed by the outdoor supply, and done under the control of the sanitary authorities, and in order to prevent the waste in houses he would have the water charged for by meter. Instead of a supply of something like thirty gallons per head a day, he thought ten gallons were sufficient. The experiment had been tried in Malvern, and it was found that seven gallons and a half a day for each person sufficed. By this means they would greatly diminish the difficulty of supplying large towns with pure and wholesome water. For instance, the water at London Bridge, if it were allowed a day or two to settle, would be good enough for ordinary purposes other than dietetic.

The Chairman asked whether the Professor would say the same thing of water taken at Crossness.

Professor Frankland replied that he would not say that, and he would not say that a springtide might not bring back some of the sewage to London Bridge, but with ordinary tides the water at London Bridge was little worse than that at Teddington Lock. He had gone carefully through the records of the investigations made by Mr. Bramwell, Mr. Easton, and others, on the necessity of high-pressure for the extinction of fires, and there could be no doubt the result of their investigations was that it was absolutely necessary for London to have a separate and special supply of water for the extinction of fires, or, at all events, there must be a new supply brought into London for that purpose. He differed from the engineers of the Metropolitan Board of Works, inasmuch as he would use the new system of mains for the outdoor or high-pressure supply, and the existing system of mains and pipes for the indoor supply. It was important to bear in mind that it had been ascertained that within certain limits hard water and soft water were equally wholesome.

Admiral Sir Erasmus Ommanney referred to the fact that, at the instance of the Thames Conservancy, many of the towns on the upper Thames had diverted their sewage, and asked whether any great difference was appreciable in the quality of the water.

Professor Frankland was unable to say with precision, as there were no regular analyses made; but, as far as his experience went, there had not been very much improvement in the water of the upper Thames since that part of the river was placed under the jurisdiction of the Thames Conservancy in 1866.

In reply to a question put by Mr. Chadwick,

Professor Frankland said, he did not think that Thames water, as taken from Hampton and filtered, could by any appliances be made sufficiently pure and wholesome for dietetic purposes. What he meant by the pure water of the Thames basin was the water of the springs and deep wells, with which there was no mixture of sewage.

Mr. Williams, of Liverpool, contended that, instead of the supply of water per head to the inhabitants of London being reduced, as proposed by Professor Frankland, what London needed, and what the whole country needed, was an increased supply. It was all very well to say that the water was wasted in driblets, which were ineffectual for flushing closets and drains; but it was important to remember that the constant renewal of water in traps was a prime necessary of wholesome houses, for the water was soon contaminated by the sewer gas, and when so contaminated it readily allowed of the passage of the gas through it. If the Professor's advice were taken, London might expect an increased death-rate.

Mr. Joseph Lucas, F.G.S., speaking of the supply of water likely to be yielded from the chalk, said that if the water were taken from the chalk in the districts proposed by the Metropolitan Board of Works, the effect would be to cause a depression of the water-line in the several localities. At the same time, it was possible that a great deal of the chalk which did not at present hold water could be made to hold it by artificial means.

Mr. Edwin Chadwick, C.B., agreed with Professor Frankland that the water-supply of London would well bear diminishing. It was monstrous to suppose that anything like thirty gallons per head per day (or say fifteen pailfuls) could be needed for domestic supply. The present system was extremely wasteful, and in his opinion the possibility of the beneficial reduction of the London water-supply per head was undoubted.

Mr. Towle, of Oxford, referred to the costly intercepting sewerage works undertaken at Reading and Oxford, and contended that the Thames would be very little, if any, the better for them, seeing that the sewage was passed on to land near the river, and would enter the river without being purified.

Mr. Murphy, of Liverpool, in reference to Professor Frankland's advocacy of the system of charging for water by meter, asked how the adoption of that system would prevent waste in the case of cottage and small tenement property, where the landlord paid the water-rates? Meter or no meter, some of the tenants would not be careful to avoid waste unless they themselves paid for the water.

Mr. S. C. Homersham, C.E., read a paper, in which he said,—

"Earnest men, who pursue science for its own sake, and experts who have made themselves specially acquainted with the qualities which characterise water best fitted for domestic use, would agree,—

1. That such water should be wholesome, free from animalcules or other organisms, animal or vegetable, either living or dead, and at no time or season of the year, or in periods of epidemics, liable to propagate disease or cause the death of those who drink it, or who use it to dilute milk or to mix with other beverages.

2. That it should be soft and pleasant to use with soap both for washing the person and clothes, for baths, and other detergent purposes, and of a quality such as would not dissolve lead, or form a deposit or fur when boiled.

3. That it should be clear and bright, and agreeable to the eye, and refreshing to the taste.

4. That it should be well aërated, of a useful uniform normal temperature, and not, like river or surface water, unduly warm in summer or unduly cold in winter, and so, as in the latter case, liable to be readily frozen in the distributing and service pipes.

It unfortunately happens that many considerable portions of the metropolis and the suburban and country districts around it, are still supplied with water in every respect of a quality at variance with the before-named characteristics; while other portions of the metropolis are supplied with water at variance in essential respects with some of these characteristics, and this notwithstanding that powerful and costly efforts have been made, by disinterested and able scientific men and others, during the last quarter of a century or longer, to prevent the use of the worst of the present sources, and to cause the metropolis to be supplied with uncontaminated, wholesome, and soft water, possessing all the characteristics hereinbefore named.

Probably, there is not to be found another large city in the whole world more admirably situated, as respects both the geological formation and the physical features of the country around it, than this great metropolis for the ready construction of works at a moderate cost capable of affording an abundant and adequate supply of wholesome soft water, well fitted for all domestic purposes, as well as for the construction of covered service reservoirs situated far above the tops of the highest houses built even on the most elevated ground, for keeping the pipes constantly charged, and to convey the water into consumers' dwellings.

But, while the physical difficulties of constructing works to afford an adequate supply of such suitable water, distributed on the most improved system, and the financial difficulties attending the obtaining the requisite amount of money to construct the works, are small indeed, yet, mainly owing to the want of knowledge connected with water-supply, not only among the great mass of the inhabitants, but among men unusually intelligent and well informed on other matters, many portions of the metropolis are still kept wholly supplied with, and the inhabitants have no choice but to use, water from the River Thames, not only of a very inferior quality, but such as in hot weather is likely, and from past experience we may say is sure, sooner or later, in seasons of epidemic, to propagate disease and illness, and to cause premature death among many of those who drink it."

Mr. Homersham went on to say that within a convenient distance northward of London there were more than 1,200 square miles, and southward more than 200 square miles, of chalk hills, the greater portion of the rain, about 28 in. in depth per annum, falling on which could be easily obtained for the supply of the metropolis. Supposing, however, that only 12 in. of rain fell over this area, the yield would be 750,000,000 gallons per day for every day in the year. Why, then, he asked, should not all London be supplied with water derived from chalk strata, softened by Clark's process.* The only reasons that have been urged against this being done were two—first, the pecuniary loss that would accrue to the shareholders of the eight companies that now supply London if competition were allowed; and second, a suspicion that uncontaminated water thus derived direct from the subterranean chalk strata would somehow be abstracted from springs that now issue above the level of the sea, and flow direct into the river Thames, the river Lea, and their tributaries. There was no substantial foundation for such a suspicion.

Mr. Richard Hassard, C.E., read a paper, in which he described a scheme propounded by him for bringing water from the lake districts of Cumberland, and from Bala Lake in

* Fully described in the *Builder* for December 15th, 1877 (vol. xxxv., p. 1246).

Wales, for the supply of Liverpool, Manchester, Birmingham, and other large towns. He said he thought the work could only be undertaken by Government intervention. He proposed to impound the water, and bring it to London, passing to the eastward of Manchester to Birmingham, thence along the middle plateau of England to a large reservoir at Edgware at an altitude of 500 ft. or 600 ft. above London. There was nothing unusual, he said, in the project except its magnitude. The distance from Ulleswater to Edgware was 260 miles, but Manchester was at present seeking powers to construct an aqueduct 100 miles in length; Liverpool proposed to bring water from North Wales, a distance of 70 miles; and Paris had recently constructed two aqueducts 168 miles in length; and why, he asked, could not an aqueduct 260 miles in length be constructed for London?

Mr. Hassard concluded his paper as follows:—

"The cost of the undertaking would be:—

For the works of collection and impounding water in the lake districts, and for the main aqueduct to London, &c.	£18,000,000
For the branch aqueduct to Welsh district, and for works connected therewith	2,500,000
	£20,500,000

Say 21,000,000*l.* = 52,500*l.* per 1,000,000 gallons daily.

The population, of the different towns and localities, including the metropolis, to whom water might be supplied, number about 8,000,000, and the cost would consequently be at the rate of about 2*l.* 12*s.* 6*d.* per individual. In these respects, therefore, as well as in the cost per million gallons daily, the project would compare favourably with any large waterworks hitherto constructed."

Mr. Baldwin Latham, C.E., said that in proposing to supply London with water from the chalk, the existing rights of millowners and others in the neighbourhood of London who now derived their supply of water from wells, ought to be considered. Such, however, was the present state of the law with regard to subterranean waters, that they might be abstracted with impunity, notwithstanding that science was able to ascertain the laws relating to the flow, &c., of subterranean water with the greatest precision.

Mr. Joseph Prestwich, F.R.S., followed with a paper, in which he said:—

"Water-bearing strata, whether consisting of beds of gravel or clying clays, such as the gravel on which London stands, or of the sands of an out-cropping formation, such as the lower tertiary sands under the London clay, or of hills of permeable strata, such as the chalk or oolite ranges, while they absorb and store the rain water to deliver it again in the form of springs, absorb with equal readiness water from any other sources; consequently, to builders in general, what more convenient in constructing a house than to sink a well in one part of the premises for water, and on another part for the house sewage? The works are out of sight; no one thinks of the evil, and few realise it if they see it. But the evil is an accumulative one, and every now and then we are reminded of its existence by disastrous and fatal results. It has grown to such an extent, that almost all the shall wer of these soar ces of water supply are contaminated and injured, and our villages and smaller towns are suffering to an extent which it is difficult to estimate, and which few probably, except geologists, can fully realise. Then, again, the other sources of supply,—our rivers,—have been treated with equal disregard of sanitary principles, and they would, but for tardy Parliamentary interference, have suffered equally in consequence. The able sixth report of the Rivers Pollution Commission illustrates in a remarkable manner the consequence of this neglect, whether in the case of our wells or of our rivers

Fortunately, natural agencies are constantly operating to counteract the evil consequences of our neglect. The power of oxidation and absorption of the soil on underground waters, and of air and light on surface waters, goes far to remedy the evil and restore our springs and rivers to their original purity. The latter having been the subject of successful legislative enactment, it is to be hoped that some similar measure may be applied to our underground springs, for nothing else it seems to me can effect a cure for an evil which is so wide-spread, and at the same time so entirely withdrawn from observation. The arrangements being all below ground, are unknown in most instance to all except the builder, and the well springs, although often seriously contaminated, yield too often water which is so cool, limpid, and sparkling, as to not only give confidence to the resident, but even to inspire him with a belief in its unusual excellence.

In our larger towns, where cess-pits are gradually being done away with, the wells may improve, if no other source of impurity exists; but in villages and detached houses where nothing is done, not only do the local underground waters suffer, but it is to be feared the pollution often injures sources having a wider range. Some contrivance for the protection of, and against the contamination of underground waters, used in common by our populations, is as much needed as party-walls are, as a protection against the spread of neighbouring fires.

After some discussion, the resolution printed in our last (p. 535) was agreed to, and the Congress was brought to a close with a vote of thanks to H.R.H. the Prince of Wales for writing the letter which had led to the conference.

Several other papers were contributed to the congress, but were not read or discussed in detail. We shall give summaries of these papers hereafter.

BARNARD CASTLE.

BETWEEN two great mineral districts in the north of England there is placed, sandwich-wise, a tract of land given up to the farmer, the grazier, and the sportsman, but over which is thrown the glamour of the "great unknown" of a past generation. On the east, from the coast to Darlington, there is the pervading presence of the great industry, and near the latter town, the route westward impinges upon the southernmost end of the great coal basin of the north, but beyond that, there is at Barnard Castle a meeting of trade and spade. In the east, iron presents a familiar sight of mine mouths and their machinery, of lofty blast-furnaces, exhaling flame and smoke, and exuding metal so hot that the air around is scorched, and the sky is aglow with the reflection; rolling-mills, where the puddler steams before his furnace, and the shingler, encased in his coat of metal if not of mail, holds the metal for the sounding thud of the steam-hammer, and the mill-men, with the long strips of red-hot iron writhing in the mill, give a weirdness to the aspect of the vast industry. In the west, there are tokens of the same great manufacture, with only the difference arising from the fact that hematite casts it red over the scene.

Between the great hematite region of the Furness district and the mineral deposits of Cleveland and South Durham, there is the region of bleak moorland, fertile dale, and barren crag, commencing near Barnard Castle and terminating beyond Tebay. It is a district which Scott has immortalised, Dickens made notorious, and which preserves in part the appearance of that past in which it played a more active part than it has latterly done. The key to that district is Barnard Castle, which, in the phrase of old Leland, "standeth stately on Teese." To the son of one of the Conqueror's companions the town owes its origin. Bernard Baliol also built the fine old castle on land which the Conqueror had given to his father. The fortress played its part in the days when King John opposed his barons; three centuries ago it underwent that siege which has given proverbial fame to the town, in the days of the rising of the North. It furnished once a royal residence; but now its cliff-crowding ruins furnish only mementoes of the pomp and circumstance of war, and are perhaps best known as furnishing the site whence Scott in "Rokeby" has portrayed a fair scene. Thence, the great poet saw "Stanemore's shapeless swell," "Lunedale wild," and Arkingarth lying "dark afar," the course of Tees, Staindrop from sylvan bowers saluting "proud Raby's battled towers," with other features in a picture so well known as not to need quotation. In such a scene Barnard Castle grew,—agriculture around, lead to its west, coal to its north-east, and iron to the far east. Fell, and forest, and flood give charms of scenery near it, older associations hallow the district, and the domains of Egglestone, Greta, and Bowes give to it perpetual beauty.

The town has not had, in it the elements of rapid and continuous growth. Of old textile trades were carried on to some extent—woollen plaids were made; with carpets and thread. Wool died away, from the rise of cotton, and the manufacture of carpets became the staple production of Barnard Castle; and in its turn the latter gave place to the manufacture of Scotch tweeds. This, with the manufacture of shoe thread, for which the place is famed, and attempts to revive the carpet manufactory, with the quarrying of various classes of stone around the town, constitute still the bulk of the special industries carried on. Thus, the 3,581 inhabitants of the chapelry in 1821 had grown only to 4,430 in 1831, and at the date of the last census even there had not been much growth, for the town had given up something of its vitality to swell the stream of lusty life that had flown to the east. In forty years, however, the attractions of the town have been increased; its institutions have been extended; it has taken a new lease of life; is widening its bounds, and on the next enumeration of its people its record will be probably of a larger population. Forty years ago its chapel was "not remarkable for anything save its antiquity"; it had a market, a mechanics' institute, a national school, and a book society; there were flax-dressers and curriers, hat-makers and dyers, and these, with weavers and nailmakers, formed the bulk of the special traders of the town. A mail-gig ran east and west, coaches made the town a stopping stage between Manchester and Liverpool thrice a week, and it continued to doze in the midst of its beautiful scenery regardless of the fact that its beauty should have been its dower. That fact has impressed itself upon the town since then; and not neglecting its mills or its quarries, it is adding thereto other aids to its own prosperity, and generous donors are assisting it. Few towns of its size can boast of greater architectural attractions now than Barnard Castle, and thus the change from the stone cottages, thatch-roofed, of a score or two of years ago is most complete. The church is restored and its tower rebuilt; a fine building, the Free Christian Church, has been erected; a grammar-school is meditated; a Masonic Hall has been built; with new offices, villas, and banks. It 1869 the foundation-stone of a magnificent museum was laid by the Countess de Montalbo, the wife of one of the wealthy coal-owners of the neighbourhood, which now approaches completion, and which, for magnitude, extent, completeness, and appearance promises to be one of the finest in the kingdom. With a principal front 300 ft. long; a central dome, half that height; with picture-galleries, 200 ft. long, and sculpture-galleries as extensive, and with stores and treasures gathered from far and near for it, this splendid building, the estimated cost of which is, with its chapel, 100,000*l.*, is at once a proof of the taste and skill of its designer, and of the munificence of those who have founded it for the people amongst whom they have long dwelt. We have before now given illustrations of the building.

Years ago, after a long struggle, the railway system was extended from the east to Barnard Castle, and it acquired communication with the coal country round Auckland. Since then the moors and morasses beyond Bowes have been traversed by the line, and a communication has been thus made between the east and the west, whilst a small local line penetrates into the lead-mining district of Teesdale. The large union of Teesdale comprises 178,346 acres,—the greatest area of any in Durham or the North Riding of Yorkshire; and its population of 20,000 is practically a stationary one; its pauperism is also stationary, at about 110 indoor and 500 outdoor paupers, so that it has the credit of having a larger proportion of pauperism than most of its adjoining unions. It has, however, to counterbalance this, a very low death-rate; and though its birth-rate is equally low, yet the provision of a better water-supply, as well as of other sanitary measures, has considerably improved the health of the town and of the district. There are no tokens of the very great increase of Barnard Castle in the immediate future. It is becoming, it is true, more and more a health resort; and the grand and varying scenery around it,—its combination of wood and water, of fertile dale and bleak moorland,—as well as the mode in which these have been hallowed, give to it very great attractions in this respect; which it moots adding to by erecting a hydropathic establishment. It is utilising the stores of limestone, of whinstone, and of freestone around it; whilst its older trades drag on the even tenour of their way. It is the centre of a good agricultural district, and to it the dalesmen resort from Middleton and other places with their leaden produce. Becoming also, in a small way, a railway junction, it is beginning to derive the advantages which the troops of tourists that follow the footsteps of Scott bring. And to understand either its position or its prospects aright, it should be compared, not with iron-built towns like Middlesbrough, or prosperous coal and timber ports like West Hartlepool but with towns of its own calibre, such as "Royal Staindrop," and it will then be seen that old Barnard Castle has found out that to stand still is to go back in the race, and thus it is preparing again to advance in the rank of northern towns.

Chippenham Fountain.—The tender of Messrs. J. Easton & Son for the above has been accepted. It is to be executed in red and grey granite, with parts polished; the lowermost basin will serve as drinking-trough for horses, and will be 15 ft. in diameter,—it will also have recesses for dogs. The central shaft is to be ornamented with eight polished shafts with carved caps. Three ornamental lamps will form a finish to the structure, which will be 17 ft. high. The architect is Mr. W. Galsworthy Davie, of London.

THE RIGHTS OF VENDORS, PURCHASERS, AND INSURANCE COMPANIES IN REGARD TO BUILDINGS INJURED OR DESTROYED BY FIRE.

THERE has probably been no time when building operations were more actively carried on than the present, in spite of the general dulness of trade, not only in this country, but also on the Continent. Points, therefore, which are of vital importance to the owners of buildings, and especially of dwelling-houses, require to be noted with some care and accuracy. Thus it may not be out of place to dwell for a moment upon some matters regarding the insurance of buildings against fire.

Every prudent owner, we suppose, insures the buildings which are his property, and it is very essential, therefore, that he should fully understand the extent of his rights under policies of insurance. The actual point to which we desire to call our readers' attention is one of quite a simple character, but for that reason it does not lose in importance; this is, indeed, only a greater reason why it should be well comprehended by those who may be affected by it.

Assume, then, that the owner of what we may as well call a dwelling-house insures such house by the usual annually terminable policy, and that during the continuance of such policy he has entered into an agreement to sell the property in question, which would, of course, in equity, give the would-be vendor or purchaser a right to have the contract fulfilled; practically, therefore, that he has sold it, but that he is still without the purchase money, upon payment of which the contract is usually complete, and consequently is an unpaid vendor with a lien on, or, in untechnical language, a right to keep, the property until paid by the purchaser.

These are facts occurring every day, and of the most ordinary occurrence. Next let us assume that during this period, that is, of a continuance of a policy, a sale, and thirdly, the non-payment, and, therefore, the non-completion of the contract,—a fire occurs. The question then arises, has the insurer a right to require a payment of the amount from the person or company with whom he has insured the property? It is obvious that, on the one hand, he has not parted with the possession of his property, and that he is entitled to be considered owner of it, yet, on the other, that the purchaser, if the vendor refused to fulfil his contract, could at any time invoke the aid of the law courts to compel the contract to be fulfilled. It seems equally obvious, therefore, that the holder, as it may be convenient to call him, does not possess all the rights of an ordinary unfettered owner of property, and that, therefore, there is a certain ground for the contention that he cannot require an insurance company to pay the amount for which he is insured. But since he is in possession of the premises he clearly possesses a tangible and very important interest in the property, and one which entitles him to be paid the amount due. For it may be tested in this way,—Suppose that the purchaser did not complete, or could not complete, his contract, that the property is destroyed by fire, and that the vendor cannot recover from the insurance company. It is clear that he then loses the whole benefit of the money which he expects to recover, and equally also that he is just as much an owner of the property as if no negotiations for its sale had ever been entered into. Therefore, we have no doubt at all that the judgment in the recently decided case upon which these remarks are based, of Collingridge *v.* The Royal Exchange Assurance Corporation, 3 Law Reports, Q.B.D., 173, is perfectly correct, namely, that the unpaid owner can recover from the assurers. The result, too, of this decision is quite certain to be just in its operation, and a decision in the opposite direction would have been most unfortunate.

But whilst the unpaid vendor can thus,—it is now decided,—recover the amount for which he is insured, it seems pretty clear that he would not be able to keep the money, and put it into his own pocket, merely handing over to the purchaser the blackened shell of a house. Here we see the effect of the comparative semi-ownership which is all he possesses. He retains the house *until* the purchase-money is paid, but the purchaser has a right to the house, and equally therefore, regarded from the point of view of equity, the vendor must be considered as a trustee for the purchaser of the money received from the insurance company. For, be it observed that the contract is to make good a loss to the buildings and house; and, as the purchaser has a certain right, when he does certain acts, to the possession of these buildings, it seems equally clear that he is entitled to the money to reinstate them in the condition in which they were before the fire destroyed or injured them. Try this again by a very practical test. If the vendor could compel an insurance company to pay up the amount for which the premises are insured, and likewise keep the money so received for his own use, and also compel a purchaser to take the injured property, we should have this practical result, that if a building worth 1,000*l.* were agreed to be sold for that amount, and also insured for the same sum, the vendor would, if it were destroyed, actually be a gainer of 1,000*l.* over and above the value of the property sold,—a result which would be an enormous premium on fraudulent claims, and even on the destruction of buildings themselves, and utterly unjust towards the purchaser. For if the vendor is only the trustee of the money received for the purchaser, it is obvious that the result is one of a perfectly just character: the vendor has his purchase-money and the purchaser has his property, and, if injured, a certain pecuniary equivalent for that part which has been injured or destroyed by the fire. Both these points, upon which we have shortly commented, as they now stand, seem therefore to be correct as regards legal principles, and based upon equity and right.

IRON BRIDGES OF LARGE SPANS.

THE INSTITUTION OF CIVIL ENGINEERS.

AT the meeting on Tuesday, the 28th of May, a paper read at the previous meeting on "The Design generally of Iron Bridges of very large Spans for Railway Traffic," by Mr. T. C. Clarke, C.E., of Philadelphia, was discussed. We give a few notes of the paper.

Two of the latest and best examples of American long-span iron bridge constructions were chosen for illustration. One was the trussed girder bridge across the Ohio River at Cincinnati, for the Southern Railway,—515 ft. between the bearings, and erected on temporary staging of timber, designed and executed by Mr. J. H. Linville. The other was the bridge of three spans of 375 ft. each, carrying the same railway across the Kentucky river, the engineer in this case being Mr. C. Shaler Smith. Both bridges were noteworthy for their economical design, and for their comparatively small amount of dead weight.

The Ohio Bridge consisted entirely of rolled iron, pin-connected. The girders were quadrangular, each 51 ft. 6 in. deep, the panels being 25 ft. 9 in. long, and the girders 20 ft. apart from centre to centre. The weight of iron in the span of 515 ft. was 1,176 tons. With a total load of 431 tons, the centre deflection of the east truss was $2\frac{3}{32}$ in., with a permanent set of $\frac{1}{10}$ in., that of the west truss being 2 in., with no permanent set.

Advantage was taken by the engineer of the Kentucky River Bridge, of two towers and sets of anchorage, formerly constructed for a suspension bridge across the cañon, which had not been completed. The first panel of this bridge on each side was bolted to the towers, and was then corbelled out panel by panel. The towers were calculated to be strong enough to carry 196 ft. of projecting spans. At this point the spans were supported by temporary towers of wood. The corbelling out process was continued until the above spans each reached the main iron piers, which were built up simultaneously, so that the two met in mid-air. Each half of the centre span was then corbelled out as before, until they met in the centre. At this stage of the work, the upper chords being in tension and the lower in compression, the former were nearer to each other than the latter by a few inches. The method of closing the gaps under the changes resulting from alterations of temperature was then described. Up to this time the bridge was a girder 1,125 ft. long, continuous over three spans. But while the abutments on the cliffs were stationary, the iron piers rose and fell under changes of temperature, and so varied the strains on the web system. The shore spans were therefore hinged at points 75 ft. from the piers, leaving a centre girder 525 ft. long, supported by piers 375 ft. apart. Both of the web systems of diagonal rods were consolidated into one member at the point of contrary-flexure, and were separated again after the hinge was passed. When the bridge was tested it was found that the movement of the lower chord tenons under the passing load was $1\frac{1}{4}$ in. Every effort was made to secure the uniformity of the modulus of elasticity of every part of the iron-work. Nevertheless, the variation in length, between the east and west chords, was 1 in. in 1,125 ft. When the end-spans were loaded with 277 tons, and the centre-span unloaded, the central deflection was 1·52 in., and the upward movement of the central span was 2·83 in. With the centre-span loaded with 331 tons, and the end-spans unloaded, the central deflection was 3·5 in., and the upward movement of the cantilever was 1·58 in. With all the spans loaded, 814 tons in 904 ft., the centre-deflection of the centre-span was 1·62 in. The Kentucky River Bridge occupied four months and four days in erection, the average number of workmen employed being fifty-three. The average cost of erection was about 2*l.* 10s. per ton. The weight of iron in the bridge was 3,654,271 lb. The depth of the truss was 37 ft. 6 in. and its width was 18 ft. The iron pier at the base was 28 ft. by 71 ft. 6 in.; at the top it was 1 ft. by 18 ft.; and it was 177 ft. 3 in. high. This was one of the boldest and most original pieces of bridge engineering in America.

Finally, the author stated that the workmanship of long-span bridges in the United States was generally first-class; and that the price of American bridge work had fallen year by year, from 40*l.* 6s. per ton in 1870 to 20*l.* 16s. per ton in 1877.

LIGHTHOUSE BUILDING.

SOME time since, the *Builder* called attention to the dispute between the Trinity House Corporation and the Maritime Corporations of the Bristol Channel seaboard, respecting the building of a lighthouse.

Despite the opposition of the Maritime Corporations, the Tower-hill authorities have commenced building a lighthouse on Bull Point, Morthoe, which will consist of a circular tower 30 ft. high, in two floors of 13 ft. diameter. On the sea-side of the tower will be the engine-room, workshop, and coke store, the former of which will be supplied with caloric engines for driving a fog-horn, similar to the one used at St. Catherine's Lighthouse, Isle of Wight.

On the land-side of the tower will be the dwellings, which are to be occupied by two married keepers and one unmarried assistant. The dwellings and the machine-room will be connected with the tower by passages running at right angles from the centre of the tower. On the top of the tower will be fixed the light, accessible by a granite staircase, and surrounded by an iron balcony. The light is to be a revolving one, and will shine clear of Morte Stone,—the site chosen for a lighthouse by the Maritime Corporations,—and the Capstone Hill at Ilfracombe. The whole of the building, with a garden, will occupy a superficial area of 12,000 ft.

The building is now far advanced, and is expected to be complete by Christmas next. It is to be constructed of local stone and blue lias lime, and will be cemented on the outside with Portland cement.

Delabole stone will be used for the floors, and granite and Forest of Dean stone for the steps, the dressings being brick. The whole of the gravel used for the works is obtained from the beach below, a depth of 150 ft., from which place it is conveyed over an almost perpendicular tramway in a truck hauled up by a 6-horse power steam-engine. The amount of the contract is 7,000*l.*

PROTECTION FROM THE SEA.

THOSE who are interested in seaside property, and are trembling at the falling away of the beach and the coming up of the sea, may be glad to hear of what has taken place at Walton-on-the-Naze. Ever since Mr. Robert Warner, the proprietor of a considerable amount of land in the place, put out a stone pier, it has been observed that there has been a constant influx of clean sand, which has made the small hamlet extend into a considerable seaside resort. Quite lately the sand has increased greatly. It is now some years since the work was completed, and it has proved a wonderful protection to the cliffs, and brought about a great accumulation of sand or foreshore. It is urged that by a few such stone piers dotted about any coast encroachments by the sea would be prevented.

THE PRESERVATION OF IRON.

WHEN the discoverer of a principle or a process allows time to pass away without making practical application of it, the chances are that some one else will find the means of doing so without him. Our readers may remember the process of preserving iron by means of a coating of its own oxide, recently introduced by Professor Barff, mentioned by us as promising great results. Mr. George Bower, of St. Neot's, has now hit upon another and simpler mode of doing the same thing, and his specimens yield nothing in appearance to the samples of Professor Barff, and their protective coating is said to be equal in efficiency, since it is identical in chemical composition. The process by which they are prepared consists in exposing the iron at a suitably elevated temperature to the action of the oxygen of the air. This action forms a coating of the oxide known to chemists as magnetic oxide of iron, which is incapable of change under any ordinary conditions. It has not been generally known that free oxygen, as it exists in the atmosphere, is capable of coating, under suitable conditions, the surface of the iron with the same oxide as that yielded by steam. The method adopted in carrying out this process is to place the articles in a chamber, which is capable of being completely closed, and gradually raise the temperature to the requisite degree, ranging between a dull and a bright red heat, according to the ultimate use to which the articles may be applied. Air is then passed in, and the chamber completely closed for one hour, when the inlet and outlet pipes are again opened, and a fresh supply of air sent into the chamber, which is again closed. This renewal of the air at the end of every hour is continued until the required thickness of magnetic oxide is formed on the iron.

The coating given by the use of air is of an agreeable greyish or neutral tint, so that for many purposes the necessity of further ornamentation by painting is dispensed with. The coating has been tested under the severest conditions, and has always resisted most completely all attempts to set up rusting. Theoretically, the process stands examination, but the actual effect of long-continued exposure has yet to be tried. An accident in the first instance led Mr. Bower to this interesting discovery, but the process in its present shape is the result of a long series of experiments conducted by Mr. Tweedie.

THE GIPSY NUISANCE.

SIR,—I am truly glad to find that the gipsy nuisance is being ventilated, as the loss to builders is such that in some cases it leads to bankruptcy and entire ruin. Some years ago I had four houses empty nearly two years through the proximity of the gipsies. Not only is their encampment filthy, but my front gardens were made the receptacles of their filth. Their thieving, fighting, language, and almost every habit, is enough to arouse every civilised person. Where is the power of the School Board to allow dirty boys and girls, some bordering on man and womanhood, to play and roam all day, to the terror of all decent children? Few people except the builders in new neighbourhoods know the loss occasioned by them. Sometimes whole streets are depopulated by their persistently keeping in the locality.

If instead of sending our money and men abroad to civilise the heathen, we began at home, and by some powerful means try our hands upon the gipsies, we should do much to improve the lovely suburbs of London. Is it too mean a subject for our legislators to give a few hours' attention to? If you will kindly lend your powerful aid, you will render a great boon to many struggling builders who would build good houses in open and healthy localities, but from fear of those nomads they build only cheap and nasty ones.

W. N.

Paris Exhibition: Protection against Fire.—There are several steam fire-engines and fire-engines of a smaller class exhibited at the Paris Exhibition,—notably those from the establishment of Messrs. Merryweather & Sons. This firm has placed at the disposal of the Commissioners some eight or a dozen engines, large and small, for the protection of the building against fire. There is in attendance a fireman from the staff of the above firm.

BURGOS AND ITS BUILDINGS.*

THE town of Burgos is situated on the banks of the river Arlanza, along which are some small gardens used as a public promenade. The houses are mostly built of brick and painted white, with the usual Spanish balconies before most of the windows, which are all enclosed in and glazed like little greenhouses attached to the wall; there is an irregularly-shaped plaza, surrounded by a piazza, in the centre of which a band occasionally plays. The peasant inhabitants are interesting, with their dignified tattered cloaks, dark Spanish faces, and bits of lace for bonnets; but the interest of the place certainly culminates in the magnificent ecclesiastical monuments of the town and neighbourhood.

The cathedral must certainly be reckoned as one of the finest in Europe, both from its size and general appearance, both externally and internally, and from the amazing richness and exuberance of fancy displayed in the details. It is said that the first stone was laid by Bishop Maurice, an Englishman by birth, in 1221. The west front has been sadly mutilated by cutting away the old deeply-recessed Gothic arches, and substituting the present miserable pseudo-Classic ones; but the upper part, with the graceful open-work spires, which rise to a height of 300 ft., centre rose window and coupled window, with its geometrical tracery over, and adorned with a great number of statues,—the whole cut in white marble-like stone from Ontoria,—has a rich and charming effect. The upper parts of this façade are said to be the work of Juan de Colonia (Cologne), date 1442, and the open-work spires were probably inspired by the monster cathedral of the Rhine, though still incomplete. It may, perhaps, be objected that these spires finish somewhat abruptly, but the little crown-like balcony just below the apex appears to me to be a pleasing feature.

The cathedral is surrounded by houses and buildings, so that its general effect can never be seen as a whole, except at a distance, where it towers above the surrounding objects. The site is peculiar. The cathedral is built on the side of a steep hill, so that at the west end you are level with the surrounding ground; at the south transepts you have to ascend some thirty steps to reach the floor level, and the cloisters on this side are on the second story, the lower one being devoted to workshops, or secular use; but on the north side the cathedral is some 15 ft. or 16 ft. below the surrounding ground, and from the door in the north transept you have to descend by a great number of steps into the cathedral. The Puerta del Sarmental, or entrance to south transept, is very fine and impressive; the two walls on either hand of the cloister and archbishop's palace tower up to a great height, and are relieved at the angles by turrets, corbelled out, of pure and graceful design. A noble flight of steps leads up to the façade of the transept, the apparent height of which is, of course, increased by this peculiarity of the ground. There is a fine doorway richly decorated with sculpture, and above a rose window, the whole crowned with a noble triplet decorated with tracery flanked by corner turrets, the whole of the purest and richest design. Another view of the interior is gained from the north-east side of the Chapel of the Constable, which is octagonal, and not unlike the central spire in outline, though somewhat lower, with huge ornamental pinnacles. A passage leads round to the north side to the transept door, called Puerta de la Pellegeria, situated on the same level as the church floor, and which is much more used than the door at the top of the steps above alluded to.

Entering the interior, we observe first the curious arrangement of the choir, which is peculiarly Spanish, and consists of a church within a church. The choir is, west of the transept, enclosed by a lofty screen-wall, and there is no entrance to it except from the lantern. The high chapel containing the high altar occupies the central portion of the church east of the transept, also surrounded by high screen walls. The floor under the lantern is enclosed from the transepts by magnificent brass rail-screens, called "Rejas."

During the time of service the great body of the faithful are in the transepts, and processions backward and forward take place between the high chapel and the choir. It is rather curious that Westminster Abbey is arranged very much on this plan, but in that case there is a western door to the choir, and a very long nave west of it; whereas, in Burgos, on entering the western door of the cathedral, one is brought facing at no great distance the blank outside wall of the choir, which is certainly objectionable, and on this account the transept entrance is far more impressive.

Perhaps the gem of the whole cathedral, both inside and out, is the magnificent lantern, which is, perhaps, without a parallel. Charles V. said "it ought to be placed in a case, and not seen as ordinary works"; and Philip said "it was rather the work of angels than of men." It was designed by Philip Vigarni, a Burgalese, and was also executed by two natives of Burgos, and it was finished in 1687. The main arches are carried on four massive columns with octagonal bases, which are decorated with mezzo-relievo allegorical subjects. The statues in the niches are apostles and fathers of the church,—twenty in number. It may be objected that the details of this, and, indeed, the whole lantern, are of debased style; and they certainly do present so strange a mixture of Gothic and Renaissance work that a rigid purist could not bring himself, perhaps, to admire it. These four columns seem to me to have a massive appearance, which forms an admirable foundation for the lofty lantern above. Above the main arches the superstructure is brought to an octagon by means of pendentives, ornamented in a radiating manner,—an arrangement which seems very judicious. Round the octagon runs the inscription in Latin, "I will praise Thee in Thy temple, and will glorify Thy name, Thou whose works are miracles," in plain raised letters of Roman character. Above this the lantern is divided into three stages, the lower one containing shields of arms supported by figures, and the two upper ones two-light windows, with Gothic tracery. At the angles are figures in niches, all of excellent execution, and below the two rows of windows are balconies running round the octagon.

The vaulting deserves special attention, on account of its peculiarity. The ceiling is flat, and filled in with tracery of an elaborate description, either pierced right through or in front of a black ground; this is supported by vaulting ribs, with vertical open-work tracery over them, and collected on plan in the shape of a double octagon star, and ornamented at the crossings with highly carved bosses.

The choir contains 103 walnut stalls, divided into two tiers, in Renaissance style, and elaborately carved with various Biblical scenes. The date is from 1497 to 1512. In the high chapel the high altar is Italian, and not very interesting. In front of it are two elegant brass pulpits or lecterns, one for reading the gospel, the other the epistle. The cathedral is surrounded by fifteen chapels, built in different periods, which I will describe in detail, beginning from the west end on the north. No. 1. Chapel de Sta. Tecla; this is in the Late Italian, with the most gorgeously vaulted roof and dome, verging towards gaudiness; it was finished in 1734. No. 2. Chapel of St. Anna, containing a sculptured genealogical tree of Christ, and a fine Gothic altar. Passing the transept, we see the fine flight of steps in Renaissance mixed style, something like that of the lantern leading up to the transept; they are richly decorated with sculptured foliage, children, draperies, &c. Passing by the other chapels on the north side, we come to the most noted in the whole cathedral, the Capilla del Constable. The Constable, like the Lord High Constable of England, used to regulate all matters of chivalry, and bore the royal standard in battle. This chapel was founded by the Count of Haro, and, like the west end, was designed by Juan de Colonia. The entrance is under a semicircular arch richly decorated, beneath which is a railing of the most exquisite Renaissance work—date, 1523. The plan of the chapel is octagonal. Internally, it is divided into three compartments in height. The wall-spaces of the lower, where not occupied by altars, are ornamented with coats of arms and somewhat coarse sculptured foliage; the next stage contains a series of arches ornamented with a most elaborate band of sculptured figures and foliage,—a feature which is often reproduced in Burgos, and the upper stage contains a series of traceried windows. Some of the foliage running up between the hollows of the columns and string-courses is extremely delicate and beautiful, as also are the statues and canopies on either side of the pillars. The vault-

* From a paper entitled "To Burgos and Back," read by Mr. Alexander Payne before the Architectural Association, on the 24th ult.

ng of this and the other chapels is peculiar. The ribs form a more ornamented pattern than those of northern vaults on plan, and the central compartments are filled in by minute and elaborate tracery, on a black ground, and having the appearance of being pierced through; the bosses are picked out in gold and colours, and the whole forms a very rich and characteristic roof. In the centre of the Chapel of the Constable are the tombs of the founders, of jasper, with effigies of Carrara marble. They were sculptured in Italy in 1540, and represent the Constable, the Viceroy of Castile, in full armour, and his wife. The elaborateness of the details of the armour, and of the embroidery of the cushions, gloves, and dresses, is wonderful, and almost approaches the minute magnificence of the tombs of Cartuga. The large chapel south of the Constable's Chapel, called the Chapel of Santiago, is now used as a parish church. There is not much interest in the other chapels north of the cloisters except a fine tomb and lectern in that of St. Henrique. The chapel of St. Christo is named after a celebrated crucifix, traditionally said to have been carved by Nicodemus. This image is said to have performed numerous miracles, and, according to local tradition, it perspires on Fridays, and sometimes bleeds.

The cloisters, which date from the fourteenth century, are extremely interesting; there is no interior garden, as they are on the second story, and the lower part is occupied by workshops, which form a square of about 89 ft. in each direction, and the gallery is 22 ft. wide. The door leading from the transept to the cloisters is extremely rich and beautiful, and has Christ's entrance into Jerusalem, and other Biblical and allegorical scenes, carved on it in deep relief; on each side are four statues of David, Isaiah, Gabriel, and the Virgin. The arches of the wall arcade are enriched with an excellently-carved band of foliage, and the cloister contains many interesting and elegant tombs. On the east side is a door leading to the chapel of St. Catherine, a large room about 43 ft. square, and brought to an octagon at the groining by curious tripartite vaulting, which Mr. Street alludes to as being a characteristic Spanish feature.

The cathedral contains 7 staircases, 112 windows, 36 railings, 144 pictures, more than 50 tombs, 7 organs, 9 baptismal fonts, 9 choirs and 9 lecterns, 10 confessionals, 44 altars, and nearly 100 full length statues.

After the cathedral, perhaps the most interesting objects in Burgos are the tombs of the Miraflores, in the Convent of La Cartuza, above two miles and a half from the town, and situated in a low, sandy hill. Though once wealthy, the convent is now very much neglected, and only inhabited by a few slovenly-looking monks. The church was designed by Juan de Colonia, the architect who built much of the cathedral. The style is simple and elegant. The building has a nave without aisles, with an apse at the east end, pointed tracery windows, and some mixed details. The great glory of the place, however, is the tombs, perhaps the finest in Europe. The centre tomb, that of King Juan II. and Queen Isabella of Portugal, forms an octagon star on plan. At the angles are coats of arms, each supported by two lions, between which are seated statues of the various Virtues, the canopies over which, with the buttresses between them, are perfect marvels of delicate workmanship. The moulding which caps the lower part of the tomb is ornamented with graceful foliage; on four corners are seated figures of the Evangelists. On the recumbent effigies of the king and queen, with their robes and crowns and cushions, the sculptor has almost surpassed himself, and the effect of this in glistening white marble can only be compared to point-lace work in stone. At the feet of the queen is a group of a lion, child, and dog. The other tomb is that of the son of Don Juan II., the Infante Don Alonzo. The figure is represented in a kneeling attitude, and the robes and altar are carved with a richness almost equal to that of the recumbent statues. The wall behind the tomb is divided into square compartments, and richly carved. There is a fringe of elegant foliage, representing a vine twined round the arch of the tomb, in the festoons of which children are sculptured plucking the grapes. Unfortunately, part of this beautiful work is broken away. The arch is elliptical below, and finished with a very deep gee hood-mould. In the tympanum is St. George or St. Michael contending with the dragon. The sculpture in the mouldings, and of the canopies and niches on either side, and especially of the magnificent crockets of the hood-moulding, is exceedingly rich and elaborate.

The interior of the church is divided into three parts, according to the rule observed by the Carthusian order. One is allotted to the monks, another to the lay brethren, and a third to the people. The two first are fitted with stalls, elaborately carved. Those of the inner choir are of walnut, by Martin Sauchery, date 1488, and have fine and minute tracery. Those in the choir of the lay brethren are later, and in the Renaissance style. The tombs were designed by the celebrated Gil de Lilce, date 1493.

There is another convent near Burgos, on the opposite side of the town, and about a mile and a half from it, called Las Huelgas, which is interesting, on account of its Early Pointed church, the nave of which is entirely reserved for the nuns, and can only be seen through the screen; the transepts and chapels are open to strangers. In the latter may be seen another instance of the tripartite vaulting mentioned when describing the Chapel of the Constable. The interior cannot be visited on account of the strictness of the discipline. There is, it is said, a very interesting cloister in the interior, of Romanesque character.

The other churches of Burgos are inferior in interest to those described, though they contain several fine tombs and retables. The stone reredos in the church of St. Nicholas, near the west end of the cathedral, is scarcely surpassed in richness by anything in the town.

Among secular buildings and monuments may be mentioned the Arco de Sta. Maria, a gateway leading into the town. It was erected by the Burgalese on the occasion of a visit of Charles V., and is decorated with statues of popular heroes. It is ornamented with turrets and battlements, and circular bastions.

There is not much of interest among the old houses of Burgos. The late Sir Digby Wyatt gives a sketch of one in his "Notes on Spain," the Casa de Miranda, with a fine courtyard and columns. The castle is worth mentioning, on account of the struggle that took place between the French and English in the Peninsular War; but it is now in ruins, and presents little of interest to the architect. It was blown up by the French on their retreat before the victorious Duke of Wellington, and it was at that terrible explosion that several streets and much of the beautiful stained glass of the cathedral were destroyed.

In forming an estimate of the value to the student of the architectural buildings of Burgos and the neighbourhood, it may be conceded at once that those who are wedded to one particular period of art, or who seek for strict purity of architectural style, will probably not find much to please them there. There is about most of the buildings just described an exuberance of fancy and a disregard of precedent beyond what is to be found in the more rigid schools of the north; but those who are ready to appreciate bold effects and graceful detail, wherever they find them, whether according with preconceived notions or not, will find much to admire and much to learn in the old capital of Castile.

HEATING TOWNS FROM A COMMON CENTRE.

WE have heard from several quarters of the heating of houses in Lockport, New York State, by steam laid on from a common centre by the Holly Steam Combination Company, and Mr. George Maw has now sent to the *Times* some additional particulars. Mr. Maw says,—"The experimental works in Lockport were commenced last year, and during the late winter about 200 houses in the city were heated from the central supply, through about three miles of piping, radiating from the boiler-house, containing two boilers 16 ft. by 5 ft., and one boiler 6 ft. by 8 ft. These boilers were during the winter fired to a pressure of 35 lb. to the inch, with a consumption of four tons of anthracite, costing 4½ dollars a ton; during the summer but one boiler is fired, consuming a ton and a half of anthracite in twenty-four hours, and a pressure of 25 lb. per inch maintained.

The boiler pressure of 35 lb. in winter and 25 lb. in summer is maintained through the entire length of the three miles of piping up to the points of consumption, where there is a cut-off under the control of the consumers. The first 600 ft. of mains from the boilers are but 4 in. in diameter. There are 1,400 ft. of 3-in. pipes, 1,500 ft. of 2½-in. pipes, and 2,000 ft. of 2-in. pipes. The supply-pipes from these mains to the houses are 1¼ in. in diameter, and within each house ¾-inch pipes are used. In addition to the cut-off tap from the main under the control of the consumer there is a pressure-valve regulated to a 5 lb. pressure under the control of the company, and beyond this is an ingeniously constructed meter, which not only indicates the total consumption in cubic feet of steam, but also the quantity of steam used in each apartment. At each 100 ft. of main an expansion valve, like an ordinary piston and socket, is inserted, allowing an expansion in each section of 100 ft. of 1¾ in. for the heat at 35 lb. pressure. No condensation whatever occurs in the mains. They are covered with a thin layer of asbestos paper next the iron, then a wrapping of "Russian felt," and finally wrapped round with "Manilla paper" like smooth light-brown paper over all, and the whole encased in timber bored out three-quarters of an inch larger than the felt-covered pipes, and laid along the streets like gas-pipes.

The distribution of heat in the apartments is by means of radiators, consisting of inch pipes 30 in. long placed vertically either in a circle or as a double row, and connected together top and bottom, with an outlet pipe for the condensed water which escapes at a temperature at a little below boiling, and is sufficient for all the domestic purposes of the house, or is used as accessory heating power for horticultural and other purposes.

BROUGHTON CASTLE AND CHURCH.

SIR,—In Brewer's description of Oxfordshire, 1814, it is stated that, "two miles on the south-west of Banbury, is Broughton Castle. The manor of Broughton formerly belonged to the family of De Broughton, who probably took their surname from the place, and who obtained a charter of free warren here about the 29th of Edward I. It was afterwards vested in the family of Wykeham. Margaret, the daughter and heir of Sir William Wykham, carried the property in marriage to Sir William Fiennes, Lord Saye and Sele." This castle is surrounded by a moat, over which is a stone bridge of two arches. The eastern entrance to the court is formed by an ancient tower, yet extant. The eastern side of the castle is believed to have been erected by the Broughton family in the reign of Edward I. The north front was built A.D. 1544. One of the towers on the south-east angle has loopholes for discharging arrows. No portcullis appears in the outer gateway. A gold ring has been found under a beech-tree, near this castle. On this ring a knight, cross-legged, and having a shield with the arms of St. John of Jerusalem, was engraved. These words, in Norman-French, were engraved on a scroll:—"Joie sans ni cesse"; that is, "Joy without cease."

In Gardner's "History of Oxfordshire," 1852, this castle is described (pp. 620-2). It is stated that the hall has a pendent ceiling, being 55 ft. long and nearly 26 ft. wide. In Beesley's "History of Banbury," 1841, pp. 100-10, 294-7, this castle is described, with an engraving. The chapel is stated to be ancient, having an east window of the Decorated style, with geometrical tracery of the fourteenth century. Under the window is the stone altar, consisting of a slab supported on three plain corbels; the slab retains the crosses marked on the surface of an altar in the time of the Roman Catholic religion, before the Reformation. Skelton's "Oxfordshire" contains several views of Broughton Castle, and an engraving of the seal above mentioned. In Sir J. B. Burke's "Visitation of Seats and Arms," vol. i. (1852), pp. 135-8, this ancient castle is described and engraved. It is stated, "In visiting Broughton its church should not be forgotten. This noble relic stands near the bridge and tower leading to the castle, and possesses an interest from its antiquity, belonging to the thirteenth century." Beesley described it as "a valuable specimen of the Decorated style of the fourteenth century. The spire is a broach; it rises from the tower without intervening parapet or pinnacles at the angles. It contains several monuments, including one of the reign of Edward II., engraved in Skelton's "Oxfordshire." This work also contains an interior view of the church, which includes the Wykeham Monument of the time of Henry VI. in the chancel (see "Glossary of Architecture," 1840, plate 98). Mr. Anthony Wood stated that Lord Saye,—of Broughton,—

the opponent of Charles I., "after he had spent eighty years, mostly in an unquiet and discontented condition, &c., did die quietly in his bed on the 14th of April, 1662, whereupon his body was buried in Broughton Church, among the graves of his ancestors, and had over it a rich and costly monument erected more befitting a hero than a rebel." This ancient edifice is only a few miles south of Wroxham Abbey, another interesting specimen of architecture described by me in the *Builder*, vol. xxxiii., p. 284. Compton Wynyate (*Builder*, vol. xxxii., p. 484), although in Warwickshire, is only eight miles north-west of Broughton. C. C.

OAK OR CHESTNUT?

DOES the decorative foliage of the end of the thirteenth century and of the fourteenth century, in which natural types were closely imitated,—supply any specimens of chestnut leaves? If the tree was frequently under the eyes of the carvers of that time, such leaves would not be likely to be entirely absent. It has been suggested that the leaves of the *Castanea vesca* are not so individual in character as to tempt carvers to their reproduction. But the discovery may perhaps be made, and would be worth making, in connexion with this controversy to which Mr. Blashill has given new life and a practical bearing; and perhaps in connexion with decorative foliage generally, as showing why certain natural forms stirred the fancy of the Mediæval workmen, and lent themselves to rendering in wood or stone. A.R.I.B.A.

NEW WELSH CHAPEL.

ON the 15th ult., the memorial stone of a new chapel was laid by Mr. D. Davies, M.P., in Bridgwater-square, Barbican. The original church was founded by the Welsh Calvinistic Methodists in Smithfield, in 1744, and after removal to Wilderness-row for thirty-seven years was located in Jewin-crescent for fifty-four years.

The new chapel when completed will seat about 650 persons on the ground-floor and in the galleries; the basement contains school and class rooms; and there are also vestries and rooms for the chapel-keeper. The walls are of brick, faced with Kentish rag, the dressings being of Portland stone.

The floor of the chapel is of fireproof construction, and (with the iron girders) has been supplied by Mr. A. D. Dawnay, of Queen-street, Cheapside.

The style is Early Gothic, with a tower and slated spire rising some 90 ft. The contractors are Messrs. Browne & Robinson, of Worship-street; and the architect is Mr. Charles Bell.

The site and building will each cost about 5,000*l.*

A JOBBING BRICKLAYER'S VIEW OF THINGS EVIL.

AN aged and practical jobbing bricklayer, in business at Pimlico, declares that the best friends to his craft are rats and storms; and to kill one of the rodent tribe and wish for fair weather, are, in his mind, rank heresies to trade.

The recent storm in the metropolitan district, when nearly 3 in. of rain fell in the course of twenty-four hours, is an event to be marked in red letters on this "brickey's" mind; and a letter sent him by a former working partner from Sydney, Australia, has caused the recipient great satisfaction:—"The parched earth has not been equal to carrying off the downpours of rain, and the finest floods have followed all over the country, sweeping away bridges, walls, slates, gables, drains, and paving. And you should have seen the hailstones walk into the glass! Some as big as hens' eggs. The lightning twisted chimney-stacks and pots in fine style, besides laying low numbers of buildings. Eh! old man, it was grand; and if you could have such a turn up in Pimlico once a year, you could snap your fingers at Cubitt. I am making a little fortune out of this storm." The Pimlico tradesman now regrets not going out with his chum to such an *El Dorado* for jobbing bricklayers as Sydney.

New Pier at Sandown.—A new pier was opened in Sandown Bay on the 29th ult. by Lady Oglander. The pier has been constructed by a local company, and is intended to be about 650 ft. long when completed.

GENERAL CONFERENCE OF ARCHITECTS, 1878.

THE following is the detailed programme of proceedings:—

Monday, June 3rd, 8 *p.m.*—Opening meeting. Presentation of the royal gold medal and of the Institute medals and prizes. Opening address by Mr. Charles Barry, F.S.A., president. Paper by E. Armitage, R.A., Hon. Associate; subject, "Mural Painting." The President and Council will receive gentlemen attending the Conference in the ground-floor galleries, between 7.30 and 8 o'clock.

Tuesday, June 4th, 11 *a.m.*—Visit to the New Law Courts (Strand entrance), where the drawings will be exhibited. Mr. G. E. Street, R.A., vice-president, will (if possible) be present to conduct the members. 2.30 p.m.: Visit to St. Paul's Cathedral (west entrance) to see the Wellington Memorial, and afterwards to examine the precautions taken to protect the dome from fire. Mr. F. C. Penrose, M.A., past vice-president, will conduct the members. 6.30 p.m.: The Institute dinner will take place at the Freemasons' Tavern. The president in the chair.

Wednesday, June 5th.—11 a.m. to 2 p.m.: Visit to Dorchester House, Park-lane, by the kind permission of R. S. Holford, esq. 2 to 5 p.m.: Visit to the Picture Gallery, Bridgewater House, by the kind permission of the Earl of Ellesmere. 8 p.m.: Meeting; paper by Professor Barff: subject, "The Corrosion of Iron." Chair to be taken by Professor Lewis, F.S.A., vice-president.

Thursday, June 6th.—11 a.m.: Visit to the New Natural History Museum (Central Entrance, Cromwell-road), South Kensington. Mr. A. Waterhouse, A.R.A., Member of Council, will meet the members to conduct them through the building. 3 p.m.: Meeting; Discussion on General Building Regulations for the United Kingdom. Paper to be read by Mr. J. Douglass Mathews, Fellow: subject, "The Model Bye-Laws as a Basis of a General Building Act." Chair to be taken by Mr. John Whichcord, F.S.A., vice-president. 8 p.m.: Meeting: discussion on Concrete and Fire-resisting Constructions. To be opened by Mr. Arthur Cates, Fellow. Chair to be taken by Mr. George Godwin, F.R.S., past vice-president.

Friday, June 7th.—11 a.m.: Visit to Mr. Kirkaldy's Testing Works, Southwark-street, when his apparatus for testing the resistance of materials used in construction will be explained and experiments made. 3 p.m.: Meeting; paper by Mr. Edward Dobson, F.G.S., Member of Council; subject, "The Iron Ribs to Carry the Roofs of the Corn Exchange in process of re-erection in Mark-lane." Chair to be taken by Mr. E. M. Barry, R.A., Member of Council. 8 p.m.: Paper to be read before the Architectural Association at the rooms of the Institute, on "Rude Stone Monuments," by Mr. T. Roger Smith, Fellow; to be followed by a short paper on "Troy and Mycenæ," by Dr. J. S. Phené, F.S.A., Fellow.

Any day throughout the week.—11 a.m. to 2 p.m.: Visit to the Galleries of Grosvenor House, by the kind permission of the Duke of Westminster, K.G., Hon. Fellow.

LAMBETH PALACE.

THE Archbishop of Canterbury has given permission (transmitted through his librarian, S. W. Kershaw, M.A.) for all members of the Congress of Architects to visit the chapel and library on presenting their Conference card at the entrance gateway between ten a.m. and four p.m. on Monday, Wednesday, and Friday, the 3rd, 5th, and 7th of June.

The chapel is undergoing restoration, and new glass executed by Messrs. Clayton & Bell has been placed in the east windows. The vaulting has been partly decorated with Scripture subjects, and further work is contemplated.

The great hall (now library), rebuilt by Archbishop Juxon in 1663 is known to all, from its magnificent roof, after the type of Hampton Court and Eltham Palace.

Besides a choice collection of illuminated MSS., the following will have interest for the architect:—Albert Dürer's "Treatise on Perspective"; the "Elements of Architecture," by Wotton (with Evelyn's autograph); "Account of the Rebuilding of St. Paul's" (MS.); Plan of the Observatory at Greenwich (MS.); a rare book of engraved Portraits after Vandyke; with examples of ancient binding.

These will be specially exhibited under glass during the days fixed for the Conference visits.

LIBELLING A SURVEYOR.

GEORGE EDWARD BENSON was indicted at the Central Criminal Court, before the Recorder, for writing and publishing several false and defamatory libels concerning Sir H. Hunt, the consulting surveyor to the Office of Works, and Sir John Kelk.

In other counts the defendant was charged with sending the same libels to the Right Hon. Gerard Noel, First Commissioner of Works, in order to induce him to give him an appointment in the public service.

The prosecutor, Sir H. Hunt, it was stated, was a surveyor of eminence, and in 1856 he was appointed consulting surveyor to the Office of Works, with the understanding, however, that the appointment should not interfere with his private business, which he was permitted to carry on in conjunction with the appointment. Sir Henry was employed in his professional capacity in reference to the erection of the new Foreign Office in 1863, and at this time it appeared that the defendant was in the employ of Sir John Kelk as clerk. It appeared that tenders were originally sent in for the erection of the building upon a Gothic design suggested by Sir Gilbert Scott, but as Lord Palmerston objected to the Gothic style of building on account of its tendency to exclude air and light, the design of Sir Gilbert Scott was not carried out, but the firm of Sir John Kelk obtained the contract for laying in concrete for the foundations and erecting the building upon another design. The defendant seemed to have left his appointment with Sir John Kelk subsequently, and nothing was heard of him until the month of April last year, when he appeared in the first instance to have applied to Sir H. Hunt to obtain him a Government appointment, and threatened that if he did not do so he should "split" with reference to the transactions that had taken place between him and Sir John Kelk at the time the latter obtained the contract for the erection of the Foreign Office. Sir Henry Hunt did not take any notice of this letter, and the defendant then wrote to the First Commissioner of Works, in which he threatened to make certain revelations connected with what he described as the "Foreign Office job." No notice appeared to have been taken of the defendant's letter in the first instance, and the defendant wrote several others to the same purport, and eventually he made a communication to the effect that at the time of the contract being entered into by the Office of Works for the erection of the Foreign Office upon the new design, Sir H. Hunt had accepted a bribe of 500*l.* in the shape of a cheque from Sir John Kelk, for getting his tender accepted. The defendant appears to have persisted in this charge subsequently, and the present prosecution was preferred against him.

Formal evidence having been given in proof,

The Recorder, in summing up, told the jury that even if there had been any truth in the charges made by the defendant, the law would not allow him to make use of his knowledge of such transactions for the purpose either of extorting money or obtaining any lucrative employment, but in the present instance it appeared to him that it had been proved most conclusively that there was not the least foundation for the charges that had been made against Sir H. Hunt and Sir John Kelk, and that, in point of fact, these charges were absolutely false.

The jury, after a very short consideration, found the defendant guilty.

The Recorder, in passing sentence, told the prisoner he had been properly convicted of publishing a libel, and the only thing, as it appeared to him, that could be said in his favour was that the character of Sir H. Hunt and Sir John Kelk stood so high in the estimation of the public, that no one could believe the charges that were made against them, and they were not likely to have suffered any injury. It was, however, a most mischievous offence, and he should order him to be imprisoned and kept to hard labour for twelve months.

BUILDERS' RESPONSIBILITIES.

TAYLOR *v.* RICHARDS.

THIS was an action (in the Exchequer Division, before Baron Pollock) to recover damages for an accident caused by the negligence of the defendant. The plaintiff, who was a labouring man, aged 37, was in the employment of the defendant, Mr. Richards, a builder, of Vincent-square, Westminster.

In the month of March, 1877, Mr. Richards was employed in some building operations in Whitcomb-street, Leicester-square, and the defendant was engaged by him in that work. In the course of these operations it became necessary to pull down some walls, one of which was 40 ft. high, and it was alleged by the plaintiff that on the evening of the 20th of March, Mr. Richards himself gave him directions to pull down the wall the next morning, and pointed out a ladder about 22 ft. long, then leaning against the wall, as the one to use for the purpose. Accordingly, on the 21st the plaintiff commenced his work on the wall. For this he required a rope attached to a scaffold-pole at some height from the ground, and when mounting the ladder, which was placed against the wall, to get the rope, called to a companion beneath to bring him a "pick" to test the strength of the wall. His friend brought the pick and commenced climbing the ladder to hand it to him, when the ladder broke asunder about 7 ft. from the top. Dec, the second man, jumped off without hurting himself; but the plaintiff, who fell from a height of 15 ft., broke his ancle and was at once carried off in a cab to the Charing-cross Hospital, when it was found necessary to amputate his foot. He remained in the hospital for seven weeks, and while there received presents of money from time to time from Mr. Richards, which, however, were suspended on the plaintiff making a legal claim against him. For the defence it was contended that the plaintiff was only engaged to excavate, and had no business on the ladder at all, which the defendant had never directed him to use; that even if he had been employed on the wall, he had placed the ladder at a distance of 10 ft. from the base, and in such a position that it was almost certain to break. It was further stated that the ladder was in all respects a proper one for the purpose. It had been bought some six years before, and had since been painted and repaired when necessary.

After retiring for some minutes, the jury returned a verdict for the plaintiff for 20*l.*, and judgment was entered accordingly.

VENTILATION.

SIR,—Referring to the question discussed in the *Builder* of the 6th of April and 4th and 16th of May, as to whether the greater proportion of carbonic acid is found near the ceiling or near the floor of a room, it is probable that these proportions are very much influenced by the temperature.

Air which has been breathed, containing 5 per cent. of carbonic acid, would, at the temperature of the body, or 98 degrees Fahrenheit, be of the same specific gravity as pure air at about 83 degrees, and in a room containing pure air, at a temperature lower than 83 degrees, the breath, with the carbonic acid it contains, would rise towards the ceiling and collect there. As it cooled it would gradually descend and mix with the air of the room, and, if sufficient time were allowed and no draught existed, the greater proportion of carbonic acid would be found near the floor. Carbonic acid produced by artificial lights, being of a much higher temperature than breath, would rise more rapidly to the ceiling, and remain longer there. If the external atmosphere is of a lower temperature than 83 degrees, and the room is provided with openings at the top and bottom, the air would enter at the floor, and the breath would go out at the ceiling, the body of air in the room ascending.

On the contrary, in a room containing pure air at a temperature higher than 83 degrees, the breath would at once descend towards the floor, and if the room has openings, as before, and the external atmosphere has a temperature exceeding 83 degrees to any considerable extent, the air would enter at the ceiling and flow out at the floor.

Thus, at ordinary temperatures, while a room is occupied, and especially when artificial lights are used, the greater proportion of carbonic acid might be expected near the ceiling; but in very hot weather, or when a room is empty and has cooled down after having been occupied, the greater proportion would probably be near the floor.

If the temperatures were given at which the observations quoted by Mr. S. Snell were made, the differences in the results might be accounted for.

JOHN MACKENZIE, A.I.C.E.

CHURCH-BUILDING NEWS.

Bridlington Priory.—The late Sir G. G. Scott called public attention in September, 1875, to the condition of the old Minster at Bridlington, founded A.D. 1107. The interior of the church had been restored under his direction twenty years before, but the western front and other portions of the exterior remained for future treatment. Sir Gilbert prepared plans in 1875 for the reparation of the decaying parts of the church, and the rebuilding of the western towers. The work of restoration is now going forward. The north-west tower and north porch have been completed by the liberality of the Rev. Y. Lloyd-Graeme; the western front has been restored, and the south-west tower is in course of erection. Sir Gilbert stated in 1875 that the completion of the south-western tower alone would be a work which would richly repay the outlay incurred, and would render this noble structure beautiful as a whole, as it already is in its parts and details. Sir Gilbert took a special personal interest in the restoration of this church, which he often visited, and the beauty of which he greatly admired. He said, "The west window of the nave is a truly noble one,—no less than 55 ft. in height and 27 ft. in width,—while the two western portals with the rich panelling in which they are set, the noble double buttresses and the entire design of the tower, so far as it was erected, are of the highest class of the period, and bid fair to rival the corresponding parts at Beverley."

Henbury.—Henbury Church was recently re-opened after restoration. The church is of the Early English period, and the long range of Norman columns, with Early Pointed arches, in the nave afford evidence of its antiquity; the register dates as far back as the year 1538. The work of restoration was placed in the hands of Mr. Street, R.A., and commenced in the autumn of 1875, and has been carried forward gradually, so as to interfere as little as possible with the conduct of divine service. As the work progressed it was found necessary to rebuild from the foundation the south wall and part of the east wall of the chancel; but this work was faithfully reproduced, and the Early English windows carefully replaced. The east window, which takes the place of a small seventeenth-century window, is entirely new, and it has been filled with stained glass by Mr. Daniel Bell, who is now preparing a window of the same character to replace the old lancet window at the south end of the Communion-table. The east window of the south chapel of the chancel has been filled with Munich glass, and the two south windows are by Messrs. Clayton & Bell. The new pulpit and reredos are the work of Mr. Earp, of Lambeth. The opening up of the tower and west entrance brings into view the long range of Norman columns. The contractors were Messrs. Wall & Hook, of Brimscombe, near Stroud, and the cost of the work, including the new windows, heating apparatus, &c., has amounted to 5,500*l.*

Middleham.—The parish church of St. Alkelda and St. Mary, Middleham, was re-opened on the 30th April, after restoration under the direction of Mr. Edward Low, architect. The restoration comprises a new organ-chamber and vestry, with cellar and heating chamber underneath, and new moulded and wrought oak roofs throughout, covered with cast lead. The walls of the chancel have been raised slightly, so that the principals of the roof should clear the apex of the chancel arch. The church throughout has been heightened by lowering the floors, in order that the bases of the pillars to the nave arcade should be exposed to view. Formerly the church was entered by descending three steps, but by lowering the path in the churchyard two steps only now are required, notwithstanding the excavation of the floor. The nave and aisles have been reseated throughout with open benches of pitch pine, varnished, placed on wooden floors. The chancel is fitted with canopied stalls, with seats for the choir. These stalls are made wholly out of the old oak from the ancient roofs. Mr. H. J. Osborn, of Darlington, was the contractor for all the woodwork. The aisles, choir, and chancel have been laid with tiles, plain and encaustic, by Messrs. Minton & Co. The whole of the stonework throughout has been repaired and cleansed from whitewash, &c., by Mr. Thorpe, mason, Middleham, who was the contractor for this portion of the work. All the windows throughout have been re-glazed with coloured quarry-glass, by Messrs. Croft & Sons, plumbers, Middleham, who also contracted for the gas-fittings, lead, and smith's work, the ornamental gas-fittings being supplied by Messrs. Richardson & Ellson. The font has been executed by Mawer, of Leeds. It is of Caen stone, with octagonal bowl, supported on Italian griotte marble shafts, on moulded bases. The pulpit is of wrought iron, executed by Mr. Winstanley. The oak reredos was executed by Robinson, of London, and has the panels filled in with some of the carved work found in the old seats. A two-light stained-glass window in the north aisle, and a three-light window in the chancel, have been executed by Messrs. Heaton, Butler, & Bayne.

DISSENTING CHURCH-BUILDING NEWS.

Ormskirk.—The new Wesleyan Methodist Chapel of St. Emmanuel, Ormskirk, was opened recently. It consists of a nave and side aisles and a tower, with entrance porch. The style is Early Decorated, the building being faced with Burnley shoddies, relieved with red stone dressings backed with brickwork, and the whole interior lined with plaster. There are three main entrances to the building, two fronting Derby-street, and one (the tower entrance) Railway-road. The chapel will at present accommodate 700 persons. Side galleries have been constructed, but seats will not be introduced therein until they are needed. The organ and choir gallery are immediately above the rostrum, and the former is so arranged as to allow of the choir facing the congregation. In the rear are placed the ministers' vestry and private entrance; two class-rooms, which can at any time be thrown into one; a large lecture-room, and the choir and stewards' entrance. The principals carrying the roof are massive hammer-beams of pitch-pine, filled in with cut work, and varnished. The benches and galleries are also executed in pitch-pine varnished, and the fronts of the galleries are filled in with richly-cut work. Mr. Peter Balmer, of Ormskirk, was the architect, and Mr. Thomas Riding the builder. The cost of the new church has been between 5,500*l.* and 6,000*l.*

Wellingborough.—A new "Independent Wesleyan" Chapel and schools were recently opened at Wellingborough. The building is of red brick, with Bath-stone dressings. The chapel and school are separate, but both under one roof. The former affords accommodation for some 300 persons. The school-room on the top floor provides seats for 200 children; and on the ground-floor about half that number of infants will be accommodated. Mr. E. Sharman was the architect, and Mr. Jabez Underwood, the contractor.

Newcastle-upon-Tyne.—On Good Friday a new chapel for the Methodist New Connexion was opened. The building is in the Venetian Gothic style of architecture, built throughout of stone, faced with thin pitched-faced blockers, and interspersed with bands of Penrith red stone. The interior is divided into nave and two side aisles, and ministers and leaders' vestries are provided. Ample provision is made for the congregation entering and leaving the building, there being six large and distinct exit doors, placed in convenient positions. The lofty nave roof is divided from the aisles by a light and elegant arcading, supported on ornamental cast-iron columns, which carry a clearstory wall. The galleries are placed in the two aisles and across each end of the nave, and are approached by wide staircases, communicating direct with the street. The woodwork throughout is stained and varnished; the seating being by means of open benches, with sloping seats and backs, accommodation being provided for about 900 persons, with a minimum width of 20 in. to each sitting. The acoustic properties were found to be highly satisfactory. The work has been carried out from the designs and under the superintendence of Mr. J. J. Lish, architect, Newcastle. The building has cost about 4,400*l.* The site for the chapel cost 600*l.*, and independently of the above works the congregation contemplate erecting a school to cost about 1,500*l.*, a minister's house to cost about 750*l.*, making a total of contemplated expenditure of 7,340*l.* Messrs. White & Sprout were the contractors for the work.

Books Received.

Kenning's Masonic Cyclopædia and Handbook of Masonic Archæology, History, and Biography. Edited by the Rev. A. F. A. WOODFORD, M.A. 198, Fleet-street. 1878.

THE institution of Freemasonry has never been more popular in this country than it is at the present moment, and the number of neophytes necessarily leads to a demand for books which afford a ready means to attain a general knowledge of its archæology and history. Fully recognising the existence of important works, such as those by Mackey, Schletter and Zille, and Kloss, Mr. Kenning saw that a smaller compendious Masonic cyclopædia of Masonry, as projected by the Rev. Mr. Woodford might yet find a class of readers in those who were unwilling or unable to obtain the larger and more costly books, and the result is the present publication. Mr. Woodford is a well-known and esteemed member of the craft, highly cultured, and with large stores of information, and he has made his book interesting not alone to Freemasons. Our own opinion has long been, with him, "that we have in speculative masonry the sequence of the guild system, which seems to have had a Roman origin in the 'Collegia Fabrorum,' and to have been grafted on to Greek, Egyptian, and Hebrew teaching. We cannot shut out from our consideration the enormous amount of confirmatory or indirect evidences, and the ceaseless witness of the Masons' Marks."

VARIORUM.

"OUR Debt and Duty to the Soil; or, the Poetry and Philosophy of Sewage Utilisation," by E. D. Girdlestone, though a very small book, gives a large amount of truth and knowledge in a pleasant manner.——"May & Co.'s Press Manual" (Gracechurch-street) gives a complete and correct list of all newspapers published in the United Kingdom, corrected to the end of 1877.——The new number of Cassell's "Household Guide" gives some instruction on grinding edge-tools:—"Edge-tools are fitted up by grinding, very much as a plank would be reduced in thickness were a large plane employed, in which were set a hundred or more very small

gouges, each cutting a narrow groove. The sharp grit of the grindstone being harder than the iron or steel, cuts very small channels in the surface of the metal, and the revolving disc carries away all the minute particles that are detached by the grit. If we were to examine the surface of a tool that had just been removed from a grindstone under the lenses of a powerful microscope, it would appear, as it were, like the rough surface of a field which has recently been scarified with some implement which formed alternate ridges and furrows. Hence, as these ridges and furrows run together from both sides, at the cutting edge, the newly-ground edge seems to be formed of a system of minute teeth, rather than to consist of a smooth edge. For this reason, a tool is first ground on a coarse stone, so as to wear the surface of the steel away rapidly; then it is polished on a wheel of much finer grit; and finally, in order to reduce the serrature as much as possible, a whetstone of the finest grit must be employed. This gives a cutting edge having the smallest possible serration. A razor, for example, does not have a perfect cutting edge, as one may perceive by viewing it through a microscope. Beginners are sometimes instructed, when grinding edge-tools, to have the stone revolve towards the cutting edge, and sometimes from it. When the first grinding is being done, it is a matter of indifference whether this is done or not; but when the finishing touches are applied near and at the very edge, a grinder can always complete his task with more accuracy if the periphery of the grindstone revolves towards the cutting edge, as the steel that is worn away will be removed more easily; whereas, when a stone runs in the opposite direction, the grinder cannot always tell exactly when the side of the tool is fully ground up to the edge. This is more especially true when the steel has a rather low or soft temper. The stone, when running from the edge, will not sweep away every particle of the metal that hangs as a 'feather'; but when the stone revolves towards the edge there will be no 'feather edge' to deceive the eye of the grinder."

—The following passage from Cassell's "Illustrated History of England" as to London morality prior to the Commonwealth, will serve to remind us that we have something to be thankful for:—"The riots of the apprentices had generally something of a John-Bullish assertion of right and justice in them; but the streets and alleys of London were infested with an equally boisterous, and much more villainous crew of thieves and cutpurses. Pocket-picking was then, as now, taught as a science, and was carried to a wonderful perfection of dexterity. All kinds of rogueries were practised on country people, the memory of which remains yet in rural districts, and is still believed applicable to the metropolis. These vagabonds had their retreats about the Savoy and the brick-kilns of Islington, but their great headquarters were in Whitefriars, called Alsatia, which possessed the right of sanctuary, and swarmed with debtors, thieves, bullies, and every species of miscreants, who were ready on an alarm, made by the sound of a horn, to turn out in mobs and defend their purlieus from constables and sheriff's officers. Walking the streets in the daytime was dangerous from the affrays often going on betwixt the apprentices and the students of the Temple, or between the butchers and weavers, or from the rude jostling and practical jokes of bullies and swash-bucklers; but at night there was no safety except under a strong guard. Then Alsatia, the Savoy, and the numerous other dens of vice and violence, poured forth their myrmidons, and after nine o'clock there was no safety for quiet passengers. If we add to this description the narrowness of the streets and alleys, the unpaved and filthy state of the streets, and undrained and ill-ventilated houses, London was anything at this period but an attractive place. The plague was a frequent visitant, and we are told that kites and ravens were much kept to devour the offal and filth of the streets instead of scavengers. In the country things were not much better. The roads were terrible, and were infested by sturdy bands of robbers. In the neighbourhood of London, Finchley, Blackheath, Wimbledon, and Shooter's Hill were places of well-known fame for daring highwaymen."—

We printed, with commendations, a portion of Mr. Peregrine Birch's paper read at the Institution of Surveyors. Some of our readers may be glad to know that it is now published by Messrs. Spon, under the title "Sewage Irrigation by Farmers; or, Fifty Instances of Profitable Sewage Irrigation."

Miscellanea.

Waterloo Bridge Arbitration.—The *Land Agents' Record* publishes the proceedings in an arbitration case in which the Waterloo Bridge Company make a claim for 750,000*l.* against the Metropolitan Board of Works on the latter taking over the bridge under the Metropolis Toll Bridges Act, and which is the precursor of more arbitrations which will follow on the Board taking over other metropolitan bridges under the same statute. The arbitrators are Captain Douglas Galton, who acts as umpire, Mr. E. A. Miller, Q.C., and Mr. F. Meadows White, Q.C., and they sit at the Institution of Surveyors, Great George-street, Westminster. Among the witnesses have been Mr. H. Law, C.E., and Sir Joseph Bazalgette, engineer to the Metropolitan Board of Works. Mr. Law considered that the fourth, fifth, and sixth piers from the Middlesex side were in a critical state. Any day, in his opinion, an accident might happen. He did not say there was any danger to the public passing over the bridge, because any accident to the bridge would be accompanied by sufficient warning to protect the public. He considered that at any moment the bridge might fall, and that no prudent owners would allow it to remain in such a state. Sir Joseph Bazalgette advised that iron cylinders should be put round each pier. He would not like to take any responsibility with regard to the bridge unless some repairs of this kind were done to the bridge. The cylinders he would use were of the same kind as he had used in the construction of the embankment. The weakness of parts of the bridge was pointed out by us some time ago.

A Good Example.—Messrs. Cassell, Petter, & Galpin, with the view of benefiting those of their *employés* who have already given, or may hereafter give, long and faithful service to the firm in the various departments of their business, have resolved to set aside, from year to year, a fixed proportion of their profits, to form a Fund out of which certain benefits may, at their discretion, be paid. The scheme will provide for the payment of a sum of money, varying according to length of service, to the family or representative of any person who may die in their employment after seven, fourteen, or twenty-one years' service; or, as the case may be, for the payment of bonus of similar amounts to those who, having served at least seven years, may be incapacitated by old age, after the age of sixty-five, or who may before that age be totally unable to perform any labour, owing to accident or to incapacitating disease, such as blindness, paralysis, insanity, &c. It will further provide for paying, out of the sum so proposed to be set aside, an addition to the amount payable by the Belle Sauvage Sick Fund on the death of a member. But in no case will any *employé* be eligible for any of the benefits before mentioned should he leave the service of the firm, either of his own accord or by reason of dismissal from any cause.

New Baths for St. Pancras.—A view of the new Baths in Whitfield-street, publicly opened on the 8th of May, was given in our last volume (xxxv. pp. 1,222, 1,224). The site was originally purchased by the London School Board for the erection of a school, but in consequence of the outcry that they were about to introduce a school where it was not required, they resold the site to the St. Pancras Vestry for 5,500*l.*, and the building just erected and opened has cost altogether somewhere about 35,000*l.* The building is in the Moorish style. The two large swimming-baths occupy the north and south frontages; the latter is an exceedingly fine plunge-bath, 90 ft. by 28 ft., and graduated from about 4 ft. to 10 ft. or 12 ft. in depth; the second, or smaller swimming-bath, being 55 ft. by 24 ft. The interior of the large bath is decorated in the Moorish style of the building, its principal feature being a pendentive dome. The public wash-houses contain accommodation for seventy-eight women at one and the same time, and the drying-room and other apparatus are of commensurate proportions. Mr. Horace Gundry was the architect, and the work was carried out by Messrs. Kirk & Randall, of Woolwich.

Lighting the Foreign Office.—Messrs. J. Defries & Sons were very successful the other night in lighting the reception and conference rooms at the Foreign Office, on the occasion of Lady Salisbury's reception.

Wood Injection.—The value of creosote as a wood-preserver is generally recognised, but the direct injection requires great quantities of heavy oil, and a desiccation of the injected pores. The high boiling-point of creosote (300°) does not permit its employment in vapour. John Blythe formed the idea of saturating a jet of steam with creosote in minute division, forming, so to speak, a gaseous emulsion. The apparatus comprises a high-pressure steam-boiler; another boiler containing creosote, in which the steam is saturated; a vat, filled with creosote, to be pumped into the boiler; sheet-iron cylinders, for the pieces which are to be injected; and a system of tubing connecting the several parts. In this way Mr. Blythe completely fills the heart of oak, pine, or red beech; he uses 2 to 3 kilos. of creosote for a cross-tie, and 2 kilos. of brown phenic acid per cubic mètre of saturated wood or cross-ties. The cost of preparing a cross-tie, measuring 0·085 m., is from 0·60 f. to 0·70 f. The apparatus can prepare 500 ties per day; the wood comes out softened, so that it can readily be bent or shaped, but it rapidly hardens; at first it shrinks, but after a few weeks it becomes seasoned and resists the influences of moisture; finally, the fibres are greatly strengthened. — *Ann. des Ponts et Chaussées.*

The Shaftesbury Park Estate.—On Saturday evening a meeting of the tenants on this estate was held on the estate, to call public attention to an alleged breach of faith on the part of the company, which was founded for the ostensible purpose of giving to the working classes "healthy homes at low rents." Mr. Pace, a tenant, took the chair. Attention was drawn to the original prospectus of the company, setting forth that the company would give improved dwellings at the lowest cost in rent or purchase—the tenants to have the opportunity of purchasing their dwellings at a fair cost upon the outlay. The dwellings were to be in four classes, the highest 26*l.* a year, the others being 8s., 6s. 9d., and 5s. 9d. a week. The large defalcations which formed the subject of criminal trials and convictions occurred, and the complaints of the tenants on Saturday were that the company had twice raised the rents of the three lower classes of houses, and intended to make them still higher. The 8s. a week houses had already been raised to 10s., the 6s. 9d. to 8s. 6d., and the 5s. 9d. to 7s. 6d. The meeting resolved to appoint a committee to wait upon the directors, and one speaker said that if the tenants could not get satisfaction they would engage to "clear off" the estate.

Crystal Palace.—A large and appreciative audience assembled last Wednesday at the Crystal Palace on the occasion of the second operatic concert there, when Madame Adelina Patti, with other members of Mr. Gye's Company, appeared, it is scarcely necessary to say with the most gratifying results. Madame Patti was twice encored, once in a duet with Mdlle. Scalci. Madlle. Zarè Thalberg was announced to sing, but did not put in an appearance; inasmuch, however, as Mdlle. Smeroschi, who is apparently capable of supplying the place of any absentee whether in opera or concert, was present, the programme was not altered.

The "Stanley" Sash-fastener and Window-opener.—Under this title Mr. Edwardes, an architect, has patented an arrangement for opening and closing large and lofty plate-glass windows with ease, and which at the same time includes a sash-fastener. There is a considerable strain upon the cords employed, but even should one of them yield after a certain amount of wear, it can be replaced with very little trouble. In many houses there are top sashes which are never pulled down, because of the difficulty attending the operation. This can be obviated by the use of the "Stanley," and the cost is very small.

Time and Prime-Cost Books.—Mr. W. S. Oxborrow, of Stowmarket, has prepared and published some new prime-cost books, distinguished for simplicity, and adapted for carpenters, builders, and contractors. For example, Time Book, No. 1 is arranged to prevent workmen overdrawing contracts, and to detect errors on balancing. It has fourteen general headings which are subdivided to meet all requirements. The Labour Cost Book is provided with columns for distinctly showing workmen's number, amounts paid for each class of labour, charges for horses and machinery employed, entire outlay on job, also trading expenses and the charging prices to customers.

The Incrustation of Boilers.—A writer in *Chambers's Journal* says:—Put a lump of zinc into the boiler of a steam-engine, and it will prevent the formation of "scale"; that is, the stony crust, which, as all engineers know to their sorrow, is very injurious, and involves constant expenditure. The experiment having been successfully tried during four years by certain manufacturers in France, the minister of public works appointed a commission to inquire into and report upon it. From their report, which was published last year in the "Annales des Mines," we learn that the zinc is to be placed in the boiler as far as possible from the furnace, the quantity being a quarter-pound for every five square feet of boiler-surface, if the water be soft, and half-pound if the water be hard. The boiler is then worked in the usual way; and when opened for the usual cleaning the appearances, as the Commission describe, will be:—If the water be but slightly calcareous, the deposits, instead of forming solid and adherent scale, are found in a state of fluid mud, which is easily removable by simple washing. The iron being clean and free from rust, no picking or scraping is needed, whereby an important saving of time and labour is effected. On the other hand, if the water be strongly calcareous or hard, the deposits are as coherent and strong as though the zinc had not been employed; but this strong coat does not stick to the iron. It can be pulled off by hand, or at the worst detached without much effort, leaving the iron clean. A simple washing clears it from the boiler; and in this case, as in the foregoing, picking and scraping are avoided.

Fetteresso.—The Established Church at Fetteresso, N.B., has been re-opened, after restoration. The church was built in 1810, and was seated for 1,400 persons. Since then the parish of Fetteresso has found it necessary at different times to erect two *quoad sacra* churches to meet the requirements of the inhabitants, one church being at Cookney and one at Rickarton. The church was extremely plain in appearance, both outside and inside, till about two years ago, when Mr. Baird, of Urie, introduced a large organ, also erecting an addition at the north end, the gallery being occupied by the organ, and the lower part as a vestry. The old pulpit was removed, and a new one erected, and the old seats in front and on the sides were removed, and new ones substituted. These alterations were done by Mr. Baird, at a cost of about 2,000*l.*, entirely by himself. After these alterations had been completed it was seen that the old part presented a most unfavourable appearance, and the congregation at once set to work to have the whole renovated. This has now been done by the contractors, Messrs. Fettes & Stephen, Montrose, under the superintendence of James Garvie & Sons, Aberdeen, at a cost of about 1,000*l.*

King of the Belgians' Prize.—Our readers may remember that the King of the Belgians, writing through the Society of Arts, has given notice that at the next International Congress he will offer a prize "to the municipal authority, or private association, which shall, by the improvement of the dwellings of the wage classes, effect the greatest reduction of their death rates at the lowest cost." The communication has been well considered by the Improvement Committee of the Corporation, of which Mr. J. T. Bedford is chairman, and they are unanimously of opinion that with the view of competing for his Majesty's prize all necessary particulars relative to Corporation buildings and Viaduct buildings should be furnished to the Society of Arts. It appears that the buildings in question accommodate more than 1,000 persons, and that while they "pay" at least four per cent. interest net upon the total outlay, the death-rate which has in this very neighbourhood averaged something like 60 per 1,000 is now reduced to 20,—a change which is of the most highly satisfactory and gratifying character.

The Metropolis Management and Building Acts Amendment Bill, which makes provision for the construction of music-halls and theatres, &c., was, on the motion of Lord Middleton, read a second time in the House of Lords on Tuesday, and referred to a Select Committee.

Social Science Congress.—The Council has accepted an invitation from Cheltenham to hold their next annual Congress in that town. The meeting is fixed to take place from the 23rd to the 30th of October.

Liverpool Engineering Society.—This society held its usual fortnightly meeting on Wednesday, the 22nd ult., Mr. Robinson Souttar, president, in the chair. Mr. Alexander Ross, C.E., read a paper on "The Permanent Way of Railways." The author gave an historical sketch of the different permanent ways in use, and which have been proposed, describing the stone-block system laid on the Stockton and Darlington and Liverpool and Manchester Railways. This road was laid so rigid as to be most uncomfortable to travel over and injurious to rolling stock, and it was consequently superseded by timber sleepers. The permanent way of the present day is in its essential features the same as that used on the earlier railways. The different parts have, however, been constantly increasing in size and weight to keep pace with the growth of traffic and with the necessarily increased weight of engines.

The Church and the Stage.—Thanks to the active zeal of Mr. William Gowing and Miss Evelyn (Mrs. Gowing), an entertainment was organised for Monday afternoon last, at St. George's Hall, in aid of the Vicarage Fund of St. Michael and All Saints, North Kensington, and went off well. Miss Evelyn and Mr. Howe gave two scenes from the "Love Chase" with great spirit, and later in the afternoon a poem of Miss Evelyn's was recited by Miss Emily Faithfull. Mr. Irving read a scene from Hamlet," Mr. G. Grossmith, jun., sang an interesting lyrical scene, Miss Ada Cavendish recited "The Spanish Mother," and Mr. Toole gave his sketch, "Trying a Magistrate." The sum of 175*l.* was added to the fund.

The Corporation of Blackpool has received the sanction of the Local Government Board to borrow money for the following works:—Groynes on the foreshore, 5,000*l.*; paving Parade, 5,784*l.*; land, buildings, and railway siding for a new town's depôt, 3,524*l.*; buildings at existing town's depôt, 900*l.*; extension of gasworks, 10,200*l.*; land for a street improvement, 1,067*l.*; total, 26,475*l.*

TENDERS

For alterations at the Adam and Eve, Nos. 284 and 286, Euston-road, for Mr. T. Potter. Mr. J. R. Furniss, architect. Quantities supplied:—

Toms	£869 0 0
Drew	856 0 0
Handley	827 0 0
White	812 0 0
Marks	810 0 0
Baugh	775 0 0
Bishop	720 0 0

For alterations and repairs at No. 41, Castle-street East, W., for Mr. Boyd. Mr. A. E. Hughes, architect:—

Bywater, Brothers	£440 0 0
Burningham & Co.	425 0 0
Simpson & Son	420 0 0
Perkins	369 0 0
Baugh (accepted)	320 0 0

For twelve cottages, at Waterloo, Radstock, for Mr. F. Parsons. Messrs. Wilson, Willcox, & Wilson, architects:—

Bird (accepted)	£1,050 0 0

For twelve cottages, at Waterloo, Radstock, for Mr. T. H. Worger. Messrs. Wilson, Willcox, & Wilson, architects:

Bird (accepted)	£1,050 0 0

For residence and shop, at Radstock, for Mr. F. Parsons. Messrs. Wilson, Willcox, & Wilson, architects:—

Bird (accepted)	£811 0 0

For the erection of a Baptist chapel, with vestries, school-room, boiler-room, &c. attached, at Curtisden-green, Goudhurst, Kent. Mr. W. Theobalds, architect:—

Tully (accepted).	

For the erection of a house, in Albert-place, Lambeth-road, for Mr. T. Packer. Mr. W. Theobalds, architect:—

Cade & Thompson (accepted)	420 0 0

For Sewage works, Holmesdale-road, Croydon, for the Croydon Local Board of Health:—

Dover, Brothers, & Co. (accepted)	£539 9 0

For the erection of four labourers' cottages, at St. Paul's Cray, Kent. Mr. W. Ranger, architect:—

Ennor, Julian, & Co.	£902 0 0
Taylor & Son	798 0 0
Richardson, Brothers	774 0 0
Laslett	729 0 0
Booker	710 0 0
Haisman	686 11 0

For alterations and additions to stable and coach-house, No. 4, Hall-road, St. John's Wood, for Mr. Bowles. Mr. G. Fleetwood, architect:—

Gould & Brand	£329 0 0
Lovell	280 0 0
Phillips & Son	278 0 0
Scrivener & Co.	267 0 0

For alterations at the Monarch Tavern, Chalk Farm-road:—

Toms	£796 0 0
Jackson & Todd	750 0 0
French	698 0 0
Kingsman	659 0 0
Lamble	595 0 0

For farm-house and buildings, at Heathfield Farm, Hounslow, for Mr. T. C. Cowper. Messrs Walter Graves & Hubert, architects. Quantities supplied:—

Vears & Co.	£1,195 0 0 !
Hooke & Oldrey	850 0 0
Hiscock	799 0 0
Haynes	685 0 0 !

For alterations to premises, at Bermondsey, for Mr. J. Feaver. Mr. J. Gale, architect:—

Hoare & Son (accepted)	£358 0 0

For the erection of an infant school, at Landscore, Crediton. Mr. Charles Pinn, architect. Quantities not supplied:—

Marshall	£850 0 0
Brooks	849 15 0
James	779 15 6
Berry	770 0 0
Pillar	756 13 6
Ditto, amended	736 13 6
Dart	724 0 0

For the erection of a cottage on the Horton Estate, at Epsom, Surrey, for Mr. Charles Tisdall. Mr. J. Hatchard Smith, architect:—

Hopkins (accepted)	£235 0 0

For the erection of a cottage residence, at Epsom Common, for Mr. Edwards. Mr. J. Hatchard Smith, architect:—

Jeal (accepted)	£230 0 0

For the erection of six houses and shops at Holloway, Messrs. H. S. & C. A. Legg, architects:—

J. & H. Cocks	£6,780 0 0
Palmer	5,875 0 0
Prout	5,345 0 0
Eady	5,275 0 0
Steed, Brothers (accepted)	4,460 0 0

For the restoration of Spilsby Church, Lincolnshire. Mr. W. Smith, architect. Quantities not supplied:—

Thompson	£4,518 0 0
White & Wood	4,493 0 0
Hunter & Son	4,410 0 0
Wade	4,066 0 0
Walter & Hensman	3,943 0 0
Lilley	3,790 0 0
Young	3,780 0 0
Storey (accepted)	3,243 0 0

For additions to a detached residence, Pine Ridge, Farnham, Surrey, for Mr. George Goodall. Mr. G. Edwards, architect:—

Kemp	£1,150 0 0
Richardson	1,085 0 0
Hughes	979 0 0
Martin, Wells, & Co. (accepted)	880 10 0

For farmhouse and buildings on Chapel Farm, near Thetford, Norfolk, for Captain Frederick Wentworth Bennett. Messrs. Powell & Swettenham, architects. Quantities supplied:—

	Building in Concrete.	House in Concrete.	House in Brick.
Woodhouse	£2,075	£1,210	£1,193
Bardell, Brothers	2,021	1,068	1,121
Hubbard	2,017	1,169	1,532
Bell & Sons	1,978	1,248	1,168

For alterations and additions to 163, Commercial-road, Newport, Monmouthshire, for Mr. G. J. Kenvyn. Mr. H. A. Goodman, architect:—

Sherran	£231 10 0
Whittaker	175 0 0
Moulton & Brownscombe (accept.)	170 0 0

For Parsonage House at Rowfant, Sussex, for Lady Lampson. Mr. E. P. Loftus Brock, architect:—

Carter & Son	£2,097 0 0
Brass	1,886 5 2
Jarrett	1,850 0 0
Mattock, Brothers	1,649 0 0
Ditto (if stone faced)	1,722 0 0
Shearburn	1,566 0 0
Ditto (if stone faced)	1,766 0 0

For new lodge at Girls' Home, Sudbury Hall, for Mr. W. Williams and the Committee. Mr. E. P. Loftus Brock, architect:—

Brass	£448 0 0
Ennor, Julian, & Co.	440 0 0
Bowman	437 0 0
Kindell	405 0 0
Mattock	397 0 0
Haynes	345 0 0

For five villa residences at Aylesbury, for Mr. Mead. Mr. James Holland, architect:—

Groome	£2,841 0 0
Berry	2,700 0 0
Jones	2,695 0 0
Woodbridge	2,636 0 0
Benson & Pidduck	2,610 9 7
Coles	2,578 0 0
Cooper	2,495 0 0
Taylor & Co.	2,445 0 0

For houses for Mr. Banner, Donnington-road, Reading. Mr. Joseph Greenaway, architect:—

Groome (accepted)	£2,017 14 0

For the East Bury vicarage, Hants, for the Queen Anne's Bounty. Messrs. J. & E. Baddeley, architects:—

Groome (accepted).	

For wainscot, oak, and mahogany fittings in Messrs. S. Smith & Co.'s new bank, Nottingham. Mr. George R. Isborn, architect. Quantities supplied:—

Dennett & Co. (accepted)	£944 4 0

For works at Limehouse. Mr. T. J. Hill, architect:—

M'Cormick	£1,050 0 0
Anley	867 0 0
Hewitt	815 0 0
Lewis	750 0 0

For three houses at Hampstead, for Mr. John Inman. Messrs. Satchell & Edwards, architects:—

Jones	£4,336 6 10
Hockly	4,332 0 0
Smerdon (too late)	4,305 0 0
Sanders (accepted)	4,269 0 0

For lodge for the Sanitary Dwellings Company (Limited), John-street, N. Mr. Banister Fletcher, architect :—

Angood	£760	0	0
Tyerman	760	0	0
Hobern	690	0	0
Bayes, Bros., & Allen (accepted)	670	0	0

For new rooms, Pentonville, for Messrs. Brewis, Brothers. Mr. Banister Fletcher, architect :—

Tyerman	£597	0	0
Bayes, Brothers, & Allen	585	0	0
Hobern (accepted)	545	0	0

For extension of stabling, Pentonville, for Messrs. Brewis, Brothers. Mr. Banister Fletcher, architect :—

Bayes, Brothers, & Allen	£256	0	0
Hobern (accepted)	249	0	0

For proposed warehouse at 45, City-road, for Mr. W. H. Prestwich. Messrs. Ashby & Green, architects :—

Rowe	£2,022	0	0
Stamp & Bowtle	1,971	0	0
Staines & Son	1,688	0	0
Pocock	1,485	0	0
Jackson & Todd (accepted)	1,445	0	0

Accepted for Wesleyan Sunday Schools and Lecture-hall, Queen-street, Scarborough. Mr. William Watson, architect :—

Excavating, Brickwork, Stonework, Slating, and Plastering.

Bastiman	£1,043	0	0

Carpenter's and Joiner's Work.

Fletcher	£595	0	0

Plumbing, Glazing, Ironwork, and Gasfitting.

Whittaker, Brothers	£35	3	0

Painting.

Thompson	£34	5	0

For repairs to the St. John's vicarage, Wakefield. Mr. William Watson, architect :—

Fawcett	£405	6	9
Guest & Craven	405	0	0
Furness	385	8	3
Flower	304	0	0
Fawcett	297	15	9
J. & J. Mountain (accepted)	290	0	0
Bagnall, Brothers	258	7	0

For alterations to No. 45, George-street, Portman-square. Mr. John Robinson, architect. Quantities supplied :—

Curtis & Sons	£1,176	0	0
Longmire & Burge	949	0	0
Lathey, Brothers	937	0	0

For rebuilding the Royal Oak, Tavern, Leatherhead, Surrey, and building two pairs of cottages, for Mr. James Atlee. Mr. Charles Bowes, architect. Quantities by the architect :—

Walker	£1,935	0	0
Parsons	1,928	0	0
Lathey, Brothers	1,750	0	0
Jones	1,730	0	0
Norris	1,678	0	0

For alterations to the Marlborough Head, Pelham-street, Spitalfields, for Mr. F. Garner. Mr. Edward Brown, architect :—

Mann	£462	0	0
Kiddle & Son	375	0	0
Christoffer	352	0	0

For rebuilding No. 252, High-street, Poplar, for Mr Henry Wickes. Messrs. A. & C. Harston, architects :—

Jacobs	£1,760	0	0
Palmer	1,650	0	0
Riddall	1,600	0	0
Sheffield & Prebble	1,597	0	0
Coleman	1,573	0	0
Hearle & Son	1,493	0	0
Johnson (accepted)	1,397	0	0

For altering and fitting up No. 26, Canal-walk, Southampton, for the Refreshment Rooms Company. Mr. W. H. Mitchell, architect :—

Stevens & Son	£124	0	0
Brinton & Bone	120	0	0
Rowland (accepted)	119	0	0

For the erection of a Church of England School, Shirley Warren, near Southampton, for Mr. Andrew Barlow. Mr. W. H. Mitchell, architect :—

Holt	£568	0	0
Crook	539	0	0
Richards	491	0	0
Rowland (accepted)	470	4	0

For taking out old lead water-pipes and substituting block tin and lead encased piping at South Stoneham Union Workhouse. Mr. W. H. Mitchell, architect :—

Brinton & Bone	£325	0	0
Wright & Co.	302	17	6
Penny	297	13	4
Haines	273	3	0
Brazier	258	0	6
Compert (accepted)	241	0	0

For converting old boiler-house into provision store at South Stoneham Union Workhouse. Mr. W. H. Mitchell, architect :—

Haines	£75	2	0
Rowland (accepted)	75	0	0

For sewers at Clapham, Balham, &c., for the Metropolitan Board of Works. Quantities by Mr. Charles W. Whitaker :—

Reddin	£42,079	0	0
Dickinson & Co.	29,900	0	0
Mowlem & Co.	25,000	0	0
Killingbeck	24,400	0	0
Stevens	24,000	0	0
Nowell & Robson	23,897	0	0
Dunmore	23,235	0	0
Hook & Oldrey	23,000	0	0
Young & Co.	22,900	0	0
Crockett	21,400	0	0
Cooke & Co.	21,000	0	0
Webster	20,300	0	0
Ford & Norris	20,050	0	0
Downs & Co.	18,460	0	0
Williams & Co.	17,800	0	0
Pearson	16,800	0	0

For the erection of a warehouse, situated at 40 and 41, Bartholomew-close, for Mr. J. Hull. Mr. Kirkby, architect :—

Ramsey	£2,298	0	0
Greenwood	2,267	0	0
Lawrence	2,209	0	0
Patman & Fotheringham	2,155	0	0
Axford	2,145	0	0
Weeks & Son	2,094	0	0

For printing-house, Broad-street, Bristol. Mr. H. Masters, architect :—

		Deduct.
Boon	£2,824	£123
Shipp	2,499	90
Vgils	2,374	120
Banner & Co.	2,460	115
Wilkins & Hill	2,448	99
Davis	2,440	130
Beavan	2,376	108
Stephens & Bastow	2,375	130
J. & S. R. Garratt	2,363	105
Easterbrook & Sons	2,340	110
Beaven & Sons	2,330	115
Pugsley	2,300	122
Howell & Sons	2,030	105
Hatherly	1,935	95

House, Sutton.—Quantities were supplied by Mr. Tutt, not "Ivett," as printed.

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TO CORRESPONDENTS.

M. U.—S. G.—C.—J. P.—R. D. jun.—T. G.—J. R.—A. & G.—J. H.—W. J. W.—J. B. D.—E. P. L. B.—F. H.—B. W.—F. B.—W. J. D.—R. W. P. B.—Dr. L. M.—T. B.—H. C.—D. J. L.—W. D.—L. Bros.—M. & Sons.—J. F. (glad to receive note).—C. F. (take advice on the spot).—C. F., Marylebone (should have sent list of names and amounts).—W. G. T. (should write name so that it may be read with certainty).—G. H. B. (much information as to concrete buildings has been given in our pages. Information as to cost, &c., may be obtained from those who execute it. See our advertising columns).

Ventilation (some communications on this subject will have consideration next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read a public meetings, rests, of course, with the authors.

Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited), Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Bath Freestone in Blocks of all sizes, warranted sound, and delivered at any Port or Railway Station.—YOCKNEY & COMPANY, Sole Owners of the CORSHAM DOWN QUARRY, Corsham, Wilts, to whom all letters should be addressed. [Advt.]

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office :
No. 90, Cannon-street, E.C. [Advt.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [Advt.]

Whitland Abbey Green Slates.—These slates are of a grey green tint, are stout, and made in all sizes. A large stock available for immediate delivery.—For further particulars, apply to MANAGER, Clynderwen, R.S.O., Carmarthenshire. [Advt.]

J. Sessions & Sons, Docks, Gloucester Manufacturers of ENAMELLED and PLAIN SLATE CHIMNEY-PIECES, URINALS, &c. WELSH ROOFING SLATES direct from Quarries, to any station in the Kingdom. Prices and terms on application. [Advt.]

Patent Stable Fittings.
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The Builder.

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GENERAL CONFERENCE OF ARCHITECTS, 1878.

THE Fifth* General Conference of Architects, held under the auspices of the Royal Institute of British Architects, commence its proceedings on Monday evening last, in the rooms at Conduit-street, which were inconveniently crowded. Mr. Charles Barry, president of the Institute, occupied the chair, and read the following address:—

Gentlemen,—I do not think it would be in good taste, when we have the promise of a paper from one among our distinguished band of Honorary Associates, Mr. Armitage, to detain you long with words of mine; but it seems to be considered my duty in some formal way to open the Conference with an address. I cannot, I think, do so better than by bidding a hearty welcome, in the name of the London resident members, to those of their brethren who have taken the trouble,—at no small sacrifice, as I am well aware, of time and money,—to come among us on this occasion.

It has been well said somewhere that if this Institute is an earnest body, if it indeed represents among its members British architects, these Conferences will become a necessity of its existence, as well, I hope, as means for affording pleasure to all,—and information to all. Since the last Conference in 1876, the Institute has passed through more than one organic change. I fully trust and believe, as I hope you all do, that those changes have added to its vitality and vigour, and have in some measure better enabled it to assert and maintain the best interests of the profession,—interests which I can never believe are diverse from, or opposed to, the interests of the public.

It is impossible, I think, to believe that these meetings cannot do much good amongst us, or that men to whom professional life and labour is a very earnest matter indeed, can meet each other, as they have here an opportunity of doing, without gaining knowledge of much importance to them in their work. And what is, in my opinion, of much more value, they can hardly be brought together in friendly personal conference for a week without a lasting impression being made on their minds how much better it is for themselves, for their art, and for their clients, to be united rather than divided. And surely it is well for our members (now a rapidly increasing number),—and it would be well for those architects of position who still, to my surprise, remain outside our society,—to be able all to feel that there is in England at least one organised body to represent them in the world, to which they can appeal when in difficulty, and which, because it numbers among its members all who are really entitled to be termed architects, can speak with authority, to correct public errors of judgment, and to take a stand, if need be, in asserting the rights, interests, and honour of our profession.

As on former occasions, an anxious committee has worked hard to promote the success of this Conference in obtaining communications of much interest, which will be brought before the meetings in this room, and which I cannot doubt will produce discussion of interest to all.

In the selection of the papers to be read here before you, I think that the committee have exercised a sound judgment in including subjects of practical working interest to architects; and while the paper now to be read deals with the artistic functions of an architect, the concluding papers on Friday next will appeal to him as antiquary and archæologist.

Arrangements have also been made, as will be seen by reference to the Conference programme, to occupy a portion of each day with visits to noble collections of pictorial art, and to modern agricultural works in progress, which are of the greatest interest; and which latter we may, perhaps, dare to hope may not be deemed without merit by succeeding generations.

Let me, then, express a hope, present I am sure to the minds of all here, that this meeting may add its impulse to the promotion of that feeling of brotherhood,—integrity and honour, without which no real progress can be made,—and no personal happiness can long endure.

MURAL PAINTING.

MR. EDWARD ARMITAGE, R.A., Hon. Associate, then read the following paper:—

It appears to me that the election of a considerable number of painters into your body should not be looked upon merely as a graceful compliment paid to a sister art, but also as a means of promoting a better understanding between the members of the two professions. By the words "better understanding," I mean more frequent and more cordial co-operation. It is with a view towards this end that I have written a short paper on the possible revival of the art of mural painting in England. The word "revival" is hardly suitable, as this branch of the art has never flourished in England. It ought rather to be replaced by the word "birth."

Having carefully considered this subject from all points of view, I have come to the conclusion that there are three principal causes which impede the growth of this the noblest branch of our profession:—

First. The enormous cost of modern high-class work.

Secondly. The want of harmony between the work of the architect and that of the painter.

Thirdly. The perishable or unsatisfactory nature of the materials generally used.

I propose to examine these three causes *seriatim*, and to offer suggestions for their removal. First, as to cost. I need hardly apologise, in addressing practical men, for introducing this very important element into the question to be discussed. Æsthetic laymen may rave (as they did at the Antwerp Congress of last year) about art being a "religion," a "subtle essence," a "priceless gem," which it is a profanation to associate with any miserable question of money. All this may be very poetical, but it is not practical, and can lead to nothing. Let us, therefore, take the bull by the horns and frankly examine the question of cost. Mural painting of a very high class need not be enormously expensive, if artists would only bear in mind what is the kind of work required. They too often forget that the qualities of high finish, *chiaro-oscuro*, richness and depth of colouring, so highly prized in an easel picture, are not only unnecessary, but actually detrimental to mural painting. They often labour at details or subtleties of modelling which take up a great deal of time, but are really of no value for decorative purposes. Time is money, and hence a work which takes an artist two years to complete will be very expensive, but if he could make up his mind to finish it in six months, it might be done (and would probably be better done) for one-fourth of the money. The question of cost is also closely connected with the nature of the subjects to be painted. Most of the frescos and wasserglas paintings in the Palace of Westminster are not properly decorative works, but rather a series of gallery pictures executed with water, instead of oil, and an elaborate treatment was almost imposed on the artists by the nature of the subjects. Whenever passages from English history and kindred subjects are required to be illustrated, the work must always partake more or less of easel painting, especially where the panels are close to the eye. On the other hand, ceilings, spandrels of arches, friezes, &c., can be treated in a strictly decorative style. Good composition, firm correct outlines, filled in with flat tints of harmonious colour, is really all that is necessary, and it is possible that this kind of painting might be done rapidly and at small cost. It is obviously impossible to fix a tariff for artistic mural painting, but some step in this direction may be made by an examination of the sums paid abroad to distinguished artists for their work. If we divide the price paid to Paul Delaroche for the Hemicycle by the number of square yards the work contains, we find the cost to have been about 30*l.* per square yard, and if we make the same calculation in respect to Flandrin's frieze of St. Vincent de Paul, we find that the work was done for less than 22*l.* a square yard. Delaroche's work can hardly be called decorative. It is an elaborately finished oil-painting, but Flandrin's may be taken as a fair specimen of decorative painting of the very highest class. Where the panel to be painted is small, and where the figures are required to be less than life-size, the artist would naturally require a higher rate of remuneration, but after taking this into consideration, and after making every allowance for our extravagant age, I think that no mural painting ought to cost more than 50*l.* a square yard, and that a great deal of effective and good work might be done for less than half that price,—certainly where the work is at great distance from the eye. I am speaking of fairly remunerative prices. Of course, it

* The first Conference was held in 1871, the second in 1872, the third in 1874, and the fourth in 1876. Copious notes of the proceedings will be found in the volumes of the *Builder* for the respective years.

l as happened, and will often happen again, that n artist may undertake an important work for the sake of increasing his reputation, or he may be influenced by other motives which may induce him to accept a mere nominal sum; but it is clear that these cases must always be exceptional, and cannot properly enter into our calculation of cost.

I have entered into these ignoble details because I wish to correct the general impression that mural painting of a high class must be always very expensive. It may be so *now*, but that is because so little of it is done in this country. There is no demand, and therefore no supply; but if architects and their employers would open out a fair prospect for the practice of mural figure-painting, I have no doubt but that painters would be found who would (like certain artists of the Continent) devote themselves to this branch of the profession. It is not sufficient that the artist should be well qualified for the work. He ought to have at his command a staff of trustworthy pupils or assistants. These are not improvised at a moment's notice, and without their co-operation mural painting as a rule would be profitless work. No artist can expect to make as large an income by decorating buildings as he would by painting popular pictures. What Dr. Johnson called "the potentiality of becoming rich beyond the dreams of avarice" is out of his power. If the speedy acquisition of a large fortune be denied the mural painter, on the other hand he is saved from many of the minor annoyances to which the painter of easel pictures is exposed. His work is not relegated to the gallery or dining-room of some so-called patron of the art, to re-appear at intervals at Christie's sale-rooms, or very possibly left on his hands without finding a purchaser at all. He is independent of the dealers and the commercial element in art. He is beyond the range of the annual attacks of fine-art critics, whose small stings are really a cause of great annoyance to thin-skinned painters. He has not to flatter or please his sitters, nor to paint "pot-boilers" for the market. Finally, he is educating public taste, and, therefore, benefiting his country in a more direct manner than the successful portrait, *genre*, or landscape painter.

If we now turn to the second cause I have specified, viz., the want of *entente cordiale* between the architect and the painter, I am afraid we shall here find faults on both sides. The architect is often too apt to think of nothing but his own share of the work. He neglects to leave convenient and well-lighted wall-spaces for the painter. No artist of any standing will care about having his work relegated to a dark corner, or overpowered by stained glass and a profusion of late Gothic details. Again, the architect sometimes expects the painter to adopt the quaint composition and uncouth drawing of the thirteenth or fourteenth centuries as being more in keeping with the style of the building. If the painter happens to belong to a certain school, this obligation may be congenial to him, but generally speaking it is not, and hence a fertile source of disagreement between the architect and painter. On the other hand, the painter often forgets that his work is ancillary to the architect's. In an easel picture he chooses his frame to suit the painting, but here he must reverse the process and suit the painting to the frame, the frame being the surrounding building. He must regulate the size of his figures, his light and shade, his perspective, all the elements, in short, of his work, solely with reference to the site it is to occupy. To neglect this is antagonistic to all good work. The architect and the painter should be in complete harmony, like the violin and alto in an orchestra. Where they vie with each other as to who shall attract the most attention the result is fatal.

I will now consider the third impediment to the practice of mural painting, viz., the perishable and unsatisfactory nature of the materials generally used. Real fresco painting has been a complete failure in England as far as durability is concerned. Of this there can be no doubt, but opinions differ as to the cause of this failure. Impure colours, the omnipresent gas, the humidity of the climate, have all been assigned as reasons for the premature decay of our frescoes, but from my own experience I should say that the real cause lay in the bad quality of the lime and sand used in the composition of the mortar. Immense pains were taken at Westminster Palace to get the oldest possible slaked lime procurable, and hogsheads of this curious old lime were imported from Munich. It was kept in tanks in the crypt of the Palace, was watered and skimmed from year's end to year's end, until at last it almost ceased to have any of the adhesive, cohesive, and caustic properties which are indispensable to making good mortar. The sand, again, was a great deal too soft to the touch, and the consequence was that the mortar or *intonaco* was not sufficiently binding, and could neither fix the colours properly nor even consolidate itself. This mania for old worn-out lime has been the bane of fresco-painting in England, and it is probable that no more experiments will be made in this direction. Ordinary oil-painting is notoriously unsuitable for mural work, but if an absorbent ground be used (that is, a ground prepared with size instead of oil) many of the objections to oil-painting are removed at once. I am engaged at present on the cartoons for some panels to be let in to a reredos in a modern church. These panels are of slate (about 5 ft. by 3 ft.), and their surface is being prepared by my colourman in exactly the same way that an absorbent canvas is primed. I shall use oil colours with a little wax dissolved in the medium, and as the light is good, I fully expect thus to obviate all the inconveniences connected with ordinary oil-painting.

There remain wax-painting (*peinture à la cire*) and silica or wasserglas. Until quite recently, I did not think much of either of these methods. The wax-paintings in the Paris churches, however great their artistic merit may be, do not harmonise with the surrounding building as real fresco would. They look like rather dull oil pictures, and have not the charming decorative properties of fresco or mosaic. The same may be said of Kaulbach's wasserglas paintings at Berlin.

About six weeks ago I went to Ypres and Courtrai, in Belgium, to see the modern mural paintings which have been executed there, and I came back quite a convert to both methods employed. The wax-paintings of Pauwels, at Ypres, are immediately opposite, and on the same level with a strong glaring light, but they are as perfectly *seen* as if they were water-colour or fresco. They are totally different in appearance from any wax-painting I ever saw. The same good qualities are very striking in Swertz's wasserglas paintings at Courtrai. His work at Ypres, and that of the Belgian artist Guffens, may be equally satisfactory; but the light is a side light, and does not, therefore, test the fitness of the material for mural work in so severe a manner.

At Courtrai I cross-examined the man who assisted the artist in the mechanical operation of applying the silica. It would be out of place here for me to enter into professional details, particularly as my only authority in the matter was the assistant; but I may say that the artist has a method of his own, the result of which seems to be most admirable.

I do not think there can be a doubt of the durability either of Pauwels's wax-painting or of Swertz's silica method. Some of the work has been done six years, and there is not the faintest trace of bloom or decay of any kind. Besides, the wax method has been known and practised for more than forty years in Paris, and the wasserglas for more than twenty-five in Germany. These modern Belgian works, of which I have been speaking, have not been executed with a new material, and there is nothing whatever in the improvements introduced by the artists which would affect their durability. The processes are no secret; and it appears to me that the problem of replacing fresco by some more permanent but equally suitable method has been solved.

To recapitulate briefly what I have said, I consider that to implant and cultivate in England a taste for mural painting, it would be necessary,—

1st. For the painters to be satisfied with moderate remuneration.

2nd. For the architect and painter to consider themselves as joint artificers in the same piece of work.

3rd. For either of the new methods recently adopted in Belgium to be employed.

The subject is one in which I have always taken a great interest, and I think that the time is rapidly approaching when it will interest others besides myself. The strong Puritanical prejudice against figure-painting in churches is being greatly mollified, and there are symptoms that corporate bodies are beginning to wish for something better than bad portraits of royal dukes in their halls. On the other hand, we have, both at the Academy and South Kensington, a sounder and more thorough system of teaching than formerly; and it would not be impossible to find, amongst the more advanced students, that gratuitous, or nearly gratuitous assistance, without which mural painting on a large scale is almost impracticable. These students would be glad to serve a kind of apprenticeship, and thus to prepare themselves for undertaking similar work.

For this happy state of things to come about, however, it is necessary that architects should take the initiative. They have for many years been successfully engaged on works of restoration. Colour has been introduced pretty freely, and no architect would now be satisfied with the whitewash of the Georgian period. Let them go a step farther, and call in the aid of the best and highest art which the country can produce. Instead of employing men whose position in relation to painting and sculpture is analogous to that of the commonest builder to architecture, let them patronise painters of original talent, but who at the same time are gifted with common sense; men who will neither degrade their art by imitating archaic deformity, nor shock the proprieties by the introduction of sham classicism into a Mediæval building. Mistakes in the choice of a painter would doubtless be made, just as mistakes are sometimes made, I am afraid, in the choice of an architect; but the general system would be sound, and would, I think, lead to noble results. The sharp, hard lines which sever the three professions would become softened; sculptors and painters would know a little more about architecture; and *architects* would learn something of the sister arts.

I hail with satisfaction the introduction of the thin end of the wedge by the admission of painters and sculptors as Honorary Associates of this Institute. It rests with the members of your profession to drive the wedge home.

In the discussion which followed,—

Mr. Waterhouse said he had listened to Mr. Armitage's paper with the greatest interest, because it was proposed to see what could be done in the Manchester Town-hall in the way of providing good mural paintings. He believed, however, that one of the greatest mistakes he had made was to form his panels too long in proportion to their height, and all the painters who had looked at them had said that they would be very expensive panels to fill up, as the figures could not be life-size, and consequently there would be much more for the painter to do. When the Corporation of Manchester contemplated the provision of mural paintings to adorn their Town-hall, they asked him to go and see what he could find in the way of good and successful modern works of the kind, and he went to the Low Countries and saw some of those very excellent works to which Mr. Armitage had referred, and was particularly struck with those by the artists Guffens and Swertz. He had, however, experienced great difficulty in persuading any English artists to adopt the *wasserglas* method. They seemed to feel that the method having been tried on so large a scale at the Houses of Parliament, and having failed completely or given unmitigated trouble, they would do best to avoid it. He must confess to another mistake he had made, but at the instance of an artist who had given a great deal of attention to the matter, he was induced to prepare the panels in one of the rooms with some of the old lime referred to by Mr. Armitage. He did not know that it came from Munich originally, but he was informed that it had been reserved from the Houses of Parliament. It had been mixed with powdered marble, at the instance of the artist before referred to, and he (Mr. Waterhouse) was bound to say that it had made what was, he believed, the hardest plaster he had ever touched, and it seemed to have a very firm grip of the wall. The wall behind it was only 4½ in. thick, with an air-space at the back of it, through which passed the warm air which was to heat the room, so that there would never be cause to fear damp. The artists who were at present at work were Messrs. Madox Brown and Shields, who, between them, were going to paint twelve panels illustrative of the history of Manchester from the earliest times,—from the introduction of Christianity down to Peterloo. The cost of these paintings would be about 30*l.* a square yard, and it would not have been so much but for the circumstance already mentioned.

Mr. Armitage said he ought to have added that the surface on which the Belgian works he had referred to were painted, was the

same as would be used for fresco. The wall was of brick, prepared, in the first instance, with a coat of rough mortar, and then rendered with a fine coat, only, in using the wasserglas method, the mortar was allowed to get thoroughly dry before the colours were applied. They were applied directly on to the surface of the fine coat before mentioned.

Mr. C. J. Phipps said that as to the question of cost, he was at liberty to state that he had paid Mr. Holiday and Mr. Marks each 200*l.* for a frieze 30 ft. long by 6 ft. high, which would come to about 10*l.* per square yard; to Mr. Albert Moore, for the same sized frieze, he had paid 15*l.* a square yard. In each case the figures did not exceed twelve in number.

Mr. Joseph Clarke said that in the chancel of the Church of St. Alban, at Rochdale, erected by him many years ago, there was a painting in fresco by Mr. Albert Moore. It was painted twelve years ago,—some years after the church was built, and the surface was vitrified. This painting was as perfect now as on the day it was completed. It was painted in tempera, on no specially-prepared ground, Parian cement being, if he remembered aright, the surface painted upon. The wall was not hollow, and was built of coarse rubble work. The cost of the painting was 700*l.*,—a very moderate sum, though somewhat in excess per square yard of the figure named by Mr. Armitage.

Mr. Street said he thought Mr. Armitage had rather indicted the architects of the present day, but there was something to be said in defence of architects as against painters. Mr. Armitage had said that the frescoes of the Houses of Parliament were unsatisfactory in treatment and unsatisfactory in their final effect. Now in that building the spaces left for the paintings were very good spaces, and it was the fault of the painters that they had not made the best use of them. The fact was that in that instance they all adopted a mode of decoration which showed that they had not studied architectural decoration at all; they simply transferred to the walls of the building just that kind of work they were in the habit of doing on canvas. The experience of any architect who had tried to employ the more distinguished amongst our painters would be, he thought, the same,—at any rate, such was his own experience. In the first place, the painter generally despised the architect's knowledge of painting, and did just exactly what pleased him best, without deigning to show the architect what he was going to do, and the consequence was that mural paintings frequently did not harmonise with the architecture; nor, as a rule, did the painters, by any systematic study of the architecture of the building, or by the study of those early examples of Italian art in which wall painting was brought to perfection, seek to make their works part of one whole. The consequence was that the architect who tried to introduce mural painting into his building began at times almost to despair. Besides the impediments and difficulties which Mr. Armitage had mentioned as standing in the way of the more general use of mural painting, there was the difficulty that while a great deal of mural painting might be done in churches in comparatively out-of-the-way places, the artists were often unwilling to execute such commissions, from a disinclination to leave the charms of studio life and London society for the purpose of spending a month or two in some comparatively dull town or village. The consequence of this was that where mural painting was a *sine qud non*, the architect often had to go to very inferior men,—though not perhaps quite so inferior as Mr. Armitage had assumed,—to execute it. He (Mr. Street) ventured to traverse what Mr. Armitage had said or implied as to the injurious effect of the conjunction of stained glass and mural decoration. In Italy mural paintings by Orcagna, Taddeo Gaddi, and other masters, were found in juxtaposition and combination with the most brilliant stained glass; and the reason why the stained glass did not do the paintings any harm was that in the latter the artists used simple colours. One point which it might be well worth the while of Mr. Armitage and his brother-painters to consider was as to how far it might be possible to adopt such a style of art for mural decoration,—and such a process of execution,—as would allow of the faithful reproduction of the artists' designs by other hands in out-of-the-way places. Drawings, for instance, chiefly depending on outline, might be repeated in a way that more elaborate works could not possibly be reproduced in. Such a mode of procedure existed in the Middle Ages. In Norwich, for instance, there was known to have been a school of painters whose designs were transmitted to and reproduced in the various village churches of the diocese by local men. It was hardly fair to attempt a comparison between the state of mural painting in the England of to-day and the art as it existed and flourished in the Italy of the Middle Ages. In Mediæval Italy paintings were placed on the walls of every public building and every church, and this was rendered easy of accomplishment, because in Italy, during the Middle Ages, every town was a centre of art; in fact, there was any number of centres of painting in Italy at that period. On the other hand, in the England of the present age, London was the only centre of painting. As to cost, he had been amazed at the exceedingly low prices quoted by Mr. Phipps; but the works referred to were, he imagined, theatre decoration. Ten pounds a square yard for mural painting was less than half the price gladly paid for good stained glass, and if painters generally could be got to work on those terms, mural decoration would be very largely employed. Before, however, architects could do much in the way of encouraging and fostering the art of mural painting, there must arise a school of painters who would devote themselves to that branch of art, and it lay with the painters to prove that they understood how walls ought to be painted, rather than to assume that it was the architect's business to make his style suit any kind of painting which the painter might choose to adopt. As to another remark made by Mr. Armitage, it was difficult to conceive how any quantity of Gothic tracery in one part of a building could be detrimental to the pictorial decoration of another part of it. Marlborough College was a case in point. There Mr. Spencer Stanhope had recently completed a whole series of subjects in wooden Decorated frames. One of the ways in which he (Mr. Street) found it necessary and desirable to decorate buildings was by the introduction of paintings on panels, which could be done in the artist's studio and afterwards fixed in their appointed places. Among examples of this kind of thing were Mr. Burne Jones's painting over the altar at St. Paul's, Brighton; Mr. Leighton's work at Lyndhurst Church, in the New Forest; and Mr. Watts's at the church of St. James the Less, Westminster. He was not altogether prepossessed in favour of Mr. Armitage's suggestion as to the employment of mural decoration of the highest kind on such spaces as were afforded by spandrels and friezes. For mural art of the highest kind, suitable panels or spaces should be expressly provided on the walls. A great deal had been done of late years in the way of introducing permanent decoration in the shape of mosaics, and some of Mr. Clayton's designs for these were extremely good, and the simplicity and superiority of the earlier mosaics at Ravenna led him to make the remark that it was necessary for architects to try always to prevent the painter of mural decoration from revelling too much in the modern power of drawing. The more simple his work was, and the more simple was the process, the better it would be. Mr. Clarke had referred to what appeared to be a very successful work in distemper or *tempera*. Tempera was by no means to be despised. All the more satisfactory examples of mural painting in Italy were in tempera, as were the mural decorations of Mediæval buildings in England. That tempera was not of so evanescent a nature as was often supposed was proved by some remains of colour decoration at Rievaulx Abbey, which were even now in a good state of preservation in spite of three centuries of exposure in an unroofed church. If tempera painting were afterwards "fixed" by water-glass, the method would be much less fugitive than fresco. Fresco paintings generally, not excepting those in Italy, appeared to him to be unsatisfactory in effect. Their colour was generally gloomy to the last degree, and almost all the Italian frescoes had been touched up afterwards in tempera. Even Mr. Dyce's beautiful work in All Saints' Church, Margaret-street, he believed, had been touched up in that way.

Mr. Armitage.—Yes, I touched it up myself; it was all falling to pieces, and I was called in to endeavour to preserve it.

Mr. Street, continuing, said it was hardly ever possible, owing to such "touching up," to look at a fresco without seeing that it contained at least two different kinds of work. Referring to the subject of mural painting for external purposes, Mr. Street said that the last time he was at Augsburg, three or four years ago, he had been very much struck by a painting in oil on the over-hanging cornice of one of the houses, which had a most brilliant effect, and it was worth consideration whether anything of the kind could not be attempted in this country. There was another mode of painted decoration in which the painter might, without leaving his studio, help the architect, and that was by painting figure-subjects to a large scale on tiles. The joints of the tiles were not large enough to be seen, and the decoration so obtained was absolutely permanent as to its material.

Mr. George Aitchison said he was rather inclined to differ from some of the remarks which had fallen from Mr. Street. In his (Mr. Aitchison's) opinion, the painter and his work ought to be considered paramount, the architect and his building taking subordinate positions. He said this because he considered that the painter's art dominated all the visual fine arts, and therefore the place of honour ought to be accorded it. He rather thought that this would always be so, for it had ever been true that, as Pope said,—

"The proper study of mankind is man."

Therefore, wherever human beings were represented, there the central interest would be. We might not have artists in the present day who could vie with the first men of Greece or Italy, but men only second to them were to be found, especially in France. Whenever he had been fortunate enough to secure the services of artists of eminence for his clients, he had willingly accorded to them the place of honour. He could not agree with Mr. Street as to the alleged gloomy and heavy character of the frescoes of Italy; on the contrary, some of them were as brilliant as if only done yesterday. It was, however, very questionable whether frescoes could be made to stand against the smoke, dust, and gaseous vapours with which the air of London and the large towns of the provinces was charged. It was to be hoped, now that the members of the Institute of Architects reckoned amongst their colleagues the Honorary Associates so many distinguished painters, that renewed efforts would be made to extend the use of mural decoration in churches, public buildings, and private mansions.

Mr. Henry Holiday said that subordination of architectural forms and details to the work of the painter was very marked in the Arena Chapel at Padua, but this seemed to him to be an exceptional case, and he could hardly think that architects would be quite willing to take so secondary a position as was assumed by Mr. Aitchison, although where it was contemplated to call in the aid of the painter the architect should be sparing in the use of architectural details likely to detract from the work of the painter. As to the materials and methods to be employed in mural painting, he agreed with all that Mr. Armitage had said. In the use of wax, the effect of dulness might be avoided by roughing the ground with sand before applying the wax. Such a granulated surface would diminish the tendency of the wax to become too smooth. He agreed with Mr. Street that in Italy it was rare to meet with really pure fresco, and he also agreed with him in considering tempera to be an extremely permanent method of decoration where it had a fair chance; it was certainly the most brilliant in colour, and the most rapidly executed of all methods.

Mr. Armitage, in replying on the discussion, said that as to the question of cost, instances had been quoted of mural paintings being executed for 10*l.* or 15*l.* a square yard. Such prices were conceivable only on the hypothesis that the background was large in proportion to the space covered by the figures. As to the wasserglas pictures at Westminster which had decayed and required patching and renewal, their failure was, he believed, entirely owing to the improper way in which they were painted. The method was new to the artists, and they were "not up to it." They committed the radical error of using the silica as a medium or vehicle for colour instead of reserving it for a preservative coating. He saw Mr. Herbert so misapplying the silica, and he believed Mr. Maclise worked in the same way. The Berlin wasserglas paintings, executed twenty-five years ago, were still in tolerably good condition. He was glad to hear such a good account of tempera: he was afraid that it would have been more liable to be affected by damp than it seemed to have been in the cases

mentioned. Of course, if its endurance could be ensured, nothing could be said against it, and its brightness and facility of execution were greatly in its favour. Mr. Street had somewhat misconceived his (Mr. Armitage's) observations as to the relations of the architect and the painter, for he took care to say that mural decoration should be ancillary to the work of the architect. In his opinion, the architect's was the principal work, and the painter ought to suit his work to the building. There should be no difficulty in that being done, for the architects of Gothic or Classic buildings would, if they were wise, employ artists whose predilections as to style were in harmony with their own. A principal point which architects and painters ought ever to bear in mind, when engaged on the same work, was that the work when finished was not to be *two* works, one of the architect, and one of the painter, but *one* work, harmonious throughout, and the joint result of two artists working *con amore* to effect the same end, the painter taking as much interest in the cornice and the other architectural features of the room as the architect took in them, and the architect feeling as much interest in the painting as the painter himself.

The Chairman, in closing the discussion, conveyed the thanks of the Conference to Mr. Armitage for his most interesting and valuable paper, which was one unique in character. The discussion had afforded the pleasing spectacle of painters and architects mutually striving in generosity towards each other as to the relative positions they ought to occupy in respect of works of art in which they were jointly engaged. If that were to be among the first fruits of the institution of the new order of Honorary Associates, as represented in the persons of Royal Academicians and other artists, it would be only one among many proofs of the extreme value of the services which that class of members was capable of rendering to the Institute. As to the cost of mural decoration, while it was necessarily impossible to arrive at any but the vaguest idea of the price of a work of art, it was enough to know that works of art of a kind far from despicable could be executed at the prices mentioned as having been paid to Delaroche and Flandrin; and it was not to be supposed that the painters of Munich were more highly-paid. He agreed with Mr. Armitage in thinking that architect and painter should be on an equality when they were jointly engaged on one and the same building. In the initiation of the general architectural design, the painter should have a voice just as the architect should have a voice, as to the character of the decoration to be carried out. In that way an *entente cordiale* of lasting benefit to both painter and architect would be promoted and effected. As to the questions of style, the "battle of the styles" was one which had been long in progress, and one which would, he supposed, continue to the end of time. But art was many-sided, and the same was true of architecture, as one branch of art. Champions of the different schools could, however, practise in their own styles without flying at each other's throats; and, as had been suggested, painters and architects whose predilections were akin would naturally consort together. He trusted that Mr. Armitage's paper would bear fruit in giving a powerful stimulus to the extended use of mural painting.

VISIT TO THE NEW LAW COURTS.

On Tuesday morning some 200 of the gentlemen attending the Conference visited the works in progress for the erection of the new Law Courts. The visitors were courteously received by the architect, Mr. Street, R.A., and, accompanied by him, they spent about a couple of hours in rambling over the buildings. The works appear to have made considerable progress during the past month, especially in and about the central hall. We must, however, defer for the present any detailed account of what the visitors saw. The architect explained many points as to the construction and planning of this large group of buildings, the progress of which towards completion has been much impeded by the recent strike of masons.

VISIT TO ST. PAUL'S CATHEDRAL.

On Tuesday afternoon a large number of the members of the Conference visited St. Paul's Cathedral, where they were received by Mr. Penrose (the architect to the Dean and Chapter) with his wonted courtesy. Assembling at the west end, the visitors first proceeded to view the still-incomplete Wellington Monument. Mr. Penrose spoke of it as being the work of many years' devotion spent by the artist (the late Alfred Stevens) in surmounting the difficulties of his task. The unfortunate blunder made in boxing-up the monument in such a confined space as the Consistory Court was condemned by many of the visitors in substantially the same terms as those of our recent protest.* On this head, Mr. Penrose said that it was originally intended to place the monument under one of the nave arches; but at the time that it became necessary to absolutely determine its site, the then Dean, who had inaugurated services for large concourses of people in the nave, deemed it undesirable to give up so much space in the nave to so large a monument; and as the Consistory Court was at that time beginning to fall into disuse for the purpose which its name implied, it was decided,—after conferences between the Dean and Chapter, the First Commissioner of Works, and the sculptor,—to appropriate it as the site of the monument. Such a position as that contemplated in the first instance, viz., under one of the nave arches, would have been, in Mr. Penrose's opinion, preferable, though such a position would have possessed the disadvantage that the piers of the nave would have stood in the way of obtaining end-views of the monument. Mr. Penrose gave a few particulars as to the construction of the monument, stating that through each of the marble shafts carrying the superstructure there ran a solid rod of copper 3 in. in diameter, for the purpose of tying the whole well together. The architectural part of the design was entirely Stevens's own. "I know of but one art," was his motto. He was a most beautiful painter, as well as sculptor and architect. Those who did not know of the versatility of his genius rashly predicted that though he might succeed in the general design of the monument, he would be unequal to faithfully portraying the lineaments of the Duke, but the prediction had been completely falsified.

Mr. H. H. Stannus (who had charge of the completion of the monument after the death of Mr. Stevens), at the instance of Mr. Penrose said a few words. He observed that Stevens was led to adopt the motto in question from the circumstance that Michelangelo was once asked which he considered to be the greatest of the arts, architecture, sculpture, or painting. He replied to the effect that there was but one art, of which those three were but different phases. Mr. Stevens had, with the generous instinct characteristic of a true artist, made his design of the upper part of the monument less perfect, perhaps, than he would have made it had he not desired to make it harmonise with that of the cathedral itself, which was vaulted from an attic story. This reticence and self-abnegation afforded a striking proof of the veneration felt by Stevens for Wren's masterpiece. As was well known, the monument had not yet been fully completed in accordance with the original design. It was to have been surmounted by an equestrian statue of the great Duke, but this was for the present omitted.† He (Mr. Stannus) purchased at the sale of Stevens's effects, and now possessed, the model made by Stevens for this statue, which, if ever carried out, would be a masterly work. It was an admirable portrait of the Duke as he was when about forty years of age, or, in other words, at about the time of the battle of Waterloo.

Mr. Penrose called attention to the bas-reliefs on the walls of the Consistory Court,—those on the eastern wall by Mr. Calder Marshall, and those on the western wall by Mr. Worthington. These bas-reliefs embody Scripture subjects which bear on the life and career of the Duke. In answer to questions by Mr. Charles Barry, Mr. E. C. Robins, and other gentlemen, Mr. Penrose said it was *not* intended to remove the screen which divides the Consistory Court from the nave, and which materially interferes with the monument when viewed from the nave. He admitted the desirability of reducing, by means of stained glass, the intensity of light pouring through the window on the south side; but although everybody wished to see this done, nothing was at present contemplated.‡

The visitors having ascended to the dome, inspected the internal timbers of the outer dome, which have within the last year or two been covered with a coating, 1 in. or 1¼ in. thick, of Brannon's patent fibrous concrete. This material is composed of selenitic lime and cocoa-nut fibre, and the timbers are either wholly encased in it or are covered with it on all exposed surfaces. It is not applied directly on to the wood, however, a "key" being obtained by covering the timbers with fine wire-netting. In order to further guard against danger of fire, the space between the outer dome and the cone of brickwork which (it may be news to some of our non-professional readers to learn) is carried up between the inner and outer domes to carry the superincumbent stone lantern, has been divided by two partitions into separate compartments, these partitions being of oak studding 3 in. square, and covered with the same material. Mr. Penrose detailed some experiments which he had witnessed. These experiments were so conclusive that, at his instigation and under his direction, the Dean and Chapter had, in the way indicated, adopted Mr. Brannon's valuable invention.

Descending from the dome, a great surprise was in store for the visitors. In that portion of the churchyard which lies south of the cathedral, three or four shallow pits had been dug, revealing some interesting remains of Old St. Paul's. It appears that, a short time ago, some workmen, sinking a pit for some purpose connected with the gas-supply of the cathedral, came upon some masonry which suggested to Mr. Penrose the idea that if he had the ground opened in one or two places he might light upon some relics of the old cathedral. Choosing the spots by the aid of plans of the old cathedral, he had, in every instance where the ground had yet been opened, hit upon exactly what he thought it possible he might find. These investigations had brought to light considerable remains of the lower part of the south cloister, one portion found being attached to a piece of the wall of the south transept of the cathedral. Another important find is the lower part of one of the buttresses of the chapter-house. The investigations are, we understand, to be pursued. Meanwhile, Mr. Penrose is to be congratulated on his success. Prior to these discoveries, the only remains extant of Old St. Paul's were the four curious recumbent figures now in the crypt.

A visit to the crypt, with its well-known "Artists' Corner,"* brought to a close a very interesting ramble in the Cathedral, rendered especially instructive by the fund of information which Mr. Penrose was so able and willing to afford to all.

VISITS TO DORCHESTER HOUSE AND BRIDGWATER HOUSE.

On Wednesday morning, numerous visitors availed themselves of the permission, kindly given to those attending the Conference by Mr. R. S. Holford, to visit Dorchester House, Park-lane.† The sumptuous marble staircase was of course an attraction in itself, to say nothing of the numerous pictures and other works of art.

In the afternoon, by the permission of the Earl of Ellesmere, a similar visit was paid to Bridgwater House, St. James's.‡

We have no space for an enumeration of the many and varied art treasures which these splendid mansions contain.

THE CORROSION OF IRON.

A Conference meeting was held on Wednesday evening, Professor T. Hayter Lewis in the chair, when Professor Barff read a long and interesting paper on "The Corrosion of Iron." We shall give the substance of this, together with a report of the discussion, next week.

VISIT TO THE NATURAL HISTORY MUSEUM.

On Thursday morning a visit was paid to the new Natural History Museum, South Kensing-

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* *Builder*, p. 456, *ante*.

† A large view of the complete design was published in vol. xxxiii (1875) of the *Builder*, pp. 688, 689.

‡ The glare of light is so strong that, as already pointed out in the *Builder* (in the article before referred to, p. 456, *ante*), the monument, when viewed from the nave has the appearance merely of a black mass, the details being unseen.

* A view of this hallowed corner of the building appeared in vol. x. (1852) of the *Builder*, p. 591. Here lie buried, not only Sir Christopher Wren himself, but Sir Joshua Reynolds, Sir Thomas Lawrence, Opie, Fuseli, J. M. W. Turner, Sir Edwin Landseer, and other artists of fame.

† This mansion, of which Mr. Lewis Vulliamy was the architect, was illustrated in vol. x. of the *Builder*, p. 561.

‡ Sir Charles Barry, architect. Illustrated in the *Builder*, vol. vi. (1848), pp. 461, 474, 475.

ton,* under the guidance of Mr. Alfred Waterhouse, the architect. We shall give some notes of this visit next week.

GENERAL BUILDING REGULATIONS FOR THE UNITED KINGDOM.

A conference meeting was held on Thursday afternoon, Mr. J. Whichcord in the chair.

Mr. J. Douglass Mathews read a paper on "The Model Bye-Laws as the Basis of a General Building Act." He said,—

At the last general Conference of Architects held in 1876, the subject of General Building Regulations was introduced in a paper by Mr. Honeyman, of Glasgow, in which he called attention to the unsatisfactory state of the present system of building requirements, and the desirability of a Building Act to apply generally throughout the United Kingdom. Mr. Clarke, of Liverpool, followed with a paper bearing on the same subject, pointing out some of the defects in the Liverpool Building Act, and suggesting that the general Act should embrace sanitary as well as building requirements. The desirability of promoting a uniform system of building, as far as possible, throughout the kingdom, having been admitted, I will not take up time by further introduction, except to say, that if further proof were necessary, at the time the Conference was taking place the Local Government Board had under its consideration a code of bye-laws, which was proposed to be issued for adoption by local sanitary authorities, constituted under the Public Health Act, 1875, dealing with the subject in much detail. It is only right that I should mention that the Conference meeting concluded with the following resolution :—

"That the Council of the R.I.B.A. be requested to appoint a committee to consider the subject of General Building Regulations for the United Kingdom, which shall communicate with the provincial architectural societies and the Local Government Board and report at the earliest period to the Council."

The Council of the R.I.B.A. acted on this suggestion, and put themselves in communication with the Local Government Board, who at once accepted the services offered, and sent proof copies of the proposed bye-laws, with a request that they should receive the consideration of the council. The several architectural societies having been communicated with, a committee was formed, under the presidency of our chairman, and a great number of meetings considered very fully the proposed bye-laws in detail, making such alterations and amendments as they considered necessary. These were reported to the Local Government Board, and shortly after the bye-laws were issued in their present form, some of the suggestions being embodied therein.

At the outset let me explain that these bye-laws are prepared and issued in accordance with section 157 of the Public Health Act, 1875, which gives to Urban Authorities powers to make bye-laws as to the construction of new streets and the sewerage thereof, the structure of walls, foundations, &c., and chimneys, the sufficiency of space around buildings for securing ventilation, and the drainage of buildings and the closing of buildings unfit for human habitation. To ensure uniformity of requirements and the proper supervision that they may be satisfactorily carried out, the bye-laws have been issued as a model by the Local Government Board, and it is the desire that, in course of time, the various bye-laws in force in different parts of the country may be exchanged for the new and approved ones, and perhaps even before this is accomplished the need of a Building Act to apply generally will be considered so desirable, that the bye-laws will give place to an Act of Parliament to regulate all buildings throughout the country.

I feel myself at some disadvantage in bringing the subject under your notice, having very recently read a paper on the proposed bye-laws before the Architectural Association,† but I propose now to treat them especially as applicable to the purposes of a General Building Act.

It appears desirable that a Building Act should deal with all matters appertaining to building, so that from the laying out of a road to the plastering of the walls of the houses built thereon, the provisions should be clearly understood by all the parties concerned, and the administration should be in the hands of one authority; and although in the larger towns the supervision could be placed in the hands of two or more officers, in smaller towns it could be undertaken by a single officer, as it is of consequence that the official expenses in carrying out an Act of this kind should be as moderate as possible.

The purposes of a Building Act being for the maintenance of public health and safety it should contain provisions for :—

1. Laying out and constructing new streets and sewers.
2. The construction of buildings, including foundations, walls, chimneys, and other things to insure stability of construction and protection from fire.
3. Suitable means for rendering buildings healthful and insuring proper ventilation and fresh air.
4. The arrangement of drains and closets and water-supply thereto.
5. The construction of public buildings.
6. The rights and obligations of neighbours in reference to party-walls.
7. The removal or amendment of dangerous structures.
8. The administration and enforcement of the law.

I propose, in the briefest manner possible, to bring before you the chief provisions of the bye-laws, and to offer a few suggestions as to their adaptability for a general Building Act; and I may remark generally that the bye-laws appear to be conceived in a somewhat arbitrary spirit, for although it is of the greatest importance that in London and large towns where speculating building is carried on to a considerable extent, every means should be taken to enforce good building; yet if the Act is to be general, this class of building in many places is the exception rather than the rule, and therefore care must be taken not to impose needless requirements or to fetter the conscientious builder more than is necessary, otherwise the difficulties will be so great in enforcing it that in time it will practically become a dead letter, as is the case with many of the present local Acts.

One great defect in the bye-laws is that they do not apply to alterations to old buildings, which of necessity must be remedied in a general Act. In the case of new streets, it is provided that they shall be formed at easy gradients and suited to the adjoining streets. That all carriage-roads shall be 36 ft. wide, at least, except where the street is less than 100 ft. long, in which case it may be 24 ft. at the least, and that every street shall be opened at one end at least the full width. That alleys or passages at the back or sides of buildings to prevent ashes, soil, and refuse being carried through the house, may be formed of any width. Details are given as to the curve and width of the roadways, and the inclination and width of footways and heights of kerb; and also that no building shall be less than 24 ft. distant from the boundary of any lands or premises opposite thereto.

The law which allows streets 100 ft. in length to be 24 ft. wide, although of much value when such are only intended as approaches to two or three houses, has been found to work badly in the metropolis, as streets have afterwards been formed of the full width required, the approaches being only 24 ft. wide. The provision requiring one end only of a street to be open seems hardly consistent with other laws for ensuring ventilation and the circulation of air.

The Public Health Act, in addition to the foregoing, includes provisions for the regulation of streets, as to their construction, paving, and sewering; powers to purchase premises for the improvement of streets, and to regulate the line of buildings and projections therefrom. The Towns Improvement Clauses Act also contains provisions for naming streets and numbering houses, improving the lines of streets and removing obstructions, all of which should be collated and embodied in a general Building Act.

For the construction of buildings, including foundations, walls, chimneys, and other things, to ensure stability of construction and protection from fire, the bye-laws require that the footings of every wall shall either rest on the solid ground, or upon a sufficient thickness of good concrete, or upon some solid and sufficient sub-structure as a foundation; that all walls shall be constructed of good bricks, stone, or other hard and incombustible materials, with good mortar composed of good lime and clean sharp sand, or other suitable material, or good cement, and the walls to be of the thicknesses proportionate to their length and height, which are in most cases greater than the requirements of the Metropolitan Building Act, which for many years past has been found sufficient in practice.

Walls may be divided in their length by means of return or cross-walls, which must be carried to the top of the topmost story, and be of the thickness equal to two-thirds that of the external and party-walls, and solid for at least two-thirds the area. This also is in excess of the Building Act, which allows the cross walls to be two-thirds the height of the main walls, and open for one-half the area, which as a rule is quite sufficient to form a good tie to the outside walls.

The sets-off to the walls are taken to the top of each floor instead of to the underside, and the heights of the stories are measured in a similar manner; the reason is not apparent, and the result is, that floors enclosed with walls less than 14 in. thick cannot be more than about 9 ft. 4 in. in height, although 10 ft. are allowed in another clause. Provision is made to obtain higher stories than sixteen times the thickness of the walls in houses and fourteen in warehouses, by means of piers equal to one-fourth part the length of the walls; or as buttresses, if an equal area is obtained by greater projection. Permission is also given for openings more than half the area of the wall in each story by providing sufficient piers of brickwork or incombustible materials. If the walls are built of stone, or of clunches of brick, or other burnt or vitrified material, the beds or courses not being horizontal, the thicknesses shall be one-third greater than bricks.

No provision is especially made for the use of concrete as a building material, except that if a wall is built of other suitable material it may be of the thickness prescribed for brickwork; but this leaves a wide door open for the use of concrete or other material of an inferior description, and unless the suitability of the material can be readily determined, would be productive of considerable difficulty. It is required that, in addition to the bearing on the walls, bressummers shall be further supported, where necessary, on story-posts, iron columns, or other supports.

As a precaution against fire, the bye-laws provide that all woodwork shall be set 4 in. back from the face of the wall, except for loophole doors; that the external walls of all buildings within a distance of 15 ft. from any other buildings shall be carried up to form a parapet; that party-walls of warehouses and public buildings shall be carried above the roofs 3 ft., and in other buildings 15 in.; that no plates or timbers be built in party-walls, and no timbers bear thereon nearer than 4½ in. to the centre line; that the open space inside all partition walls (*i.e.*, between the quarters) and also between the joists in any wall shall be stopped with brickwork, concrete, pugging, or other incombustible material.

The requirements for flues comprise provisions for building and properly bonding and corbelling under certain circumstances. Formation and pargetting of flues, and carrying the same up to a height of 3 ft. above the roof. The thickness of the brickwork to be 9 in. for furnaces, cockles, steam boilers, close fires, cooking ranges and apparatus, to a height of 10 ft. above the floor. The backs of fireplaces of kitchens to be 9 in. thick to a height of 6 ft. above the chimney openings. All arches over chimney openings and arched chimneys to have wrought-iron bars, with some exceptions. All woodwork to be kept a safe and definite distance from chimney openings, flues, and smoke-pipes; and that all roofs, dormers, turrets, and other erections on roofs shall be covered externally with incombustible materials. No provision is made in the bye-laws for the construction of hearths and flues; these, with other requirements, being comprised within the Chimney Sweepers Act, which is incorporated with the Public Health Act, but should be detailed in a general Building Act; and, in fact, if the provisions of the Metropolitan Building Act were adopted generally it would be well, as experience had proved them satisfactory.

In some of the Local Acts, as well as in the bye-laws of some towns, a table of scantlings for joists, beams, roofs, and other buildings is given; and as so much of the stability of a building depends on the construction of floors and roofs, it would appear desirable that some carefully-considered tables or schedules be in-

* Illustrated in *Builder*, vol. xxxi., pp. 10, 28. Described, vol. xxxiv., pp. 120, and present vol., p. 83, *ante*.

† *Builder*, pp. 314, 387 *ante*. The bye-laws have also been fully commented upon in the *Builder*, vol. xxxv. (1877), p. 970, 996, 1118. We ought to state that the exigencies of space have compelled us to curtail Mr. Mathews's paper.

cluded; and as the use of iron in buildings is now so general, some tables or formulæ for determining the size and section of iron joists, girders, columns, story-posts, &c., might well be added. The difficulty in preparing and enforcing such tables would, however, be very great, because so many special cases would arise that they would not always apply; and as the qualities of the materials used would differ, such tables might either be attended by danger, or else, to guard against such a result, the requirements might become arbitrary.

The provisions in the bye-laws to promote health and sufficient light and ventilation, are as follow:—That no building shall be erected on ground impregnated with animal or vegetable or fœcal matter, until such matter has been removed. That a layer of cement concrete 6 in. thick, or a coating of asphalte, be spread over the whole ground surface of a building. That a damp-course of lead, asphalte, slates in cement, or other durable material, be laid in all walls, not less than 6 in. above the surface of the ground adjoining. That all walls shall be properly coped, or otherwise protected, to prevent water from running down the wall or soaking therein. That in the lowest story of a building provided with a boarded floor there shall be a clear space of at least 3 in. under the joists for ventilation, and air-bricks provided for this purpose. Most of these provisions are new in the metropolis, and although very desirable, would in their present form, I fear, be found unworkable. . . . . .

For the purposes of ventilation and free circulation of air, the bye-laws provide that in the rear of all buildings there shall be a clear open space above the level of the ground of at least 150 square feet, which shall run the whole width of the building, and be in no case less than 10 ft. wide between every part of such building and the boundary of lands and premises adjoining. If the height of the building be 15 ft., then a space 15 ft. wide shall be given, and so on up to 25 ft. wide, if the building is 35 ft. or more in height; and no alteration in any building shall at any time be made which will interfere with the foregoing dimensions.

These requirements may be desirable to obtain a sufficiency of pure air, and may be practicable in small towns where land is not very valuable; but I venture to think that if these laws were embodied in a General Building Act in such places as Manchester, Liverpool, and other large towns, it could not, in the great majority of cases, be carried out, as it would require for an ordinary shop and dwelling-house, with rooms built out in the rear, a plot of land of at least 32 ft. 6 in. frontage, and 75 ft. deep. This restriction would also prevent the use of the entire ground floor for trade purposes.

Other provisions for light and ventilation are, that all rooms shall be lighted direct from the external air by windows at least one-tenth the area of the room, with one half to open to give top ventilation. Either a fireplace should be constructed in every habitable room, or an aperture or air-shaft of at least 100 square inches formed.

For the proper ventilation of closets, it is required that all closets should be placed against external walls, and provided with a window not less than 2 ft. by 1 ft., and adequate means of ventilation obtained either by an air-brick, air-shaft, or other approved method. Water-closets lighted by skylights and provided with top ventilation seem to be ignored.

The provisions for drainage and water-closets are prepared with great care, and as they are based upon a principle the very opposite to that formerly employed, there will be difficulty in getting them readily adopted. Instead of hermetically sealing drains and cesspools, it is proposed that as much air as possible is to pass through them; and soil-pipes and all cesspools are to be properly ventilated. All damp subsoils and the lowest stories of all buildings are to be drained into a sewer. The pipes are to be glazed stoneware, and where laid as soil-drains to be bedded in concrete. Main drains to have a trap as near the entrance to the sewer as practicable. No drains inside a house to have any inlet other than from a water-closet or slop-sink, and all overflow-pipes to discharge externally over an open trapped grating.

All closets to be provided with a separate cistern or other means of supplying the closet with water other than directly from the cistern used for the supply of drinking-water.

The position and construction of earth-closets, ash-pits, privies and cesspools are provided for in a very detailed manner; but whatever their value as bye-laws, sanitary science can hardly be said to be so thoroughly understood that laws now made will of necessity be the same in twenty years' time, and therefore it is undesirable to incorporate them in a Building Act, which should be so drawn that constant amendments should be unnecessary. . . . .

It appears to me that the medical profession have had a little too much their own way in framing these clauses, and, therefore, instead of embodying these or other clauses in the Act, powers to make bye-laws should be given to each Local Authority, subject to the approval of the Secretary of State, which would leave each town free to adopt what may be considered the best sanitary improvements.

The construction and inspection of drains can hardly be said to come within the scope of a General Building Act, and in large towns it would no doubt be placed under the care of an officer distinct from the building surveyor; at the same time, as the health and comfort of a house depend as much on the proper construction and working of the drains as in any other part of the building, it is of the utmost importance that special supervision should be bestowed by a proper qualified official, and in small towns, where there is not sufficient work for more than one officer, he would no doubt be required to fulfil both duties.

But I venture to think, whatever be the requirements, and however careful may be the supervision, unless there is a very great improvement in the present laying and connecting of drains, all these precautions will be comparatively useless; and I strongly advocate that the whole of the works connected with house-drainage should be executed by a person who should make this his special work, and be responsible, under a heavy penalty, for the works being properly carried out; and that such persons should receive the special licence from the local authorities, or else that the authorities themselves should execute these works, and charge the cost to the owner. I should prefer the latter course, because the whole system of public and private drainage would be in the hands of the local authorities. A plan of the drains of every building would be registered, and the works be executed under a schedule of prices which would not bear unduly hard on the owner. . . . .

It is manifest that in all towns the construction and supervision of buildings used as churches, chapels, hospitals, workhouses, schools, theatres, concert, ball and lecture rooms, and other places where the public congregate, should receive most careful consideration, and either a General Building Act should contain detailed laws applicable thereto, or else that a competent authority should have power to supervise them, subject, in case of difference, to an appeal. I think the latter course would be the better, because the requirements would differ in almost all cases. . . . .

It has unfortunately happened in many cases where temporary buildings have been erected for public processions, races, &c., that loss of life has occurred in consequence of the careless and ignorant manner in which stages and platforms have been constructed, and to prevent further accident it is desirable that in a Building Act provision should be made for special supervision, so that before any structures are used for public purposes a licence should be obtained, and the responsibility of sound construction thereby rest on some official person.

In the face of so much litigation relative to party walls and structures, and the joint rights of building and adjoining owners out of the metropolis, it is very desirable that a general Building Act should include provisions determining the rights of the respective owners; and although it often happens in towns that each house has its own wall or partition, where the area is limited and the ground proportionately valuable, this practice must be abandoned in favour of party-walls, and the advantages in point of expense and room will nevertheless outweigh the occasional difficulty and litigation attending such structures.

That portion of the Metropolitan Building Act which deals with party structures was drawn with much care, and, considering the many and difficult cases in the metropolis, the provisions may be considered to meet the requirements, and therefore their adoption in the proposed Act is suggested. In this Act certain rights are given to the building owner to deal with the wall or structure in such a manner as to make it suitable for the purposes of his new building, subject to proper notice being given to the adjoining owner, who has the power to object if the works proposed are not absolutely necessary, and in the case of disagreement the matter to be referred to a third surveyor, who shall prepare an award which shall be binding on both parties, subject to an appeal to the county or a higher court. It also deals with the manner the work is to be carried out and the proportion of the expense to be borne by each owner.

In smaller towns, where land is not very valuable, it may be better to build each house with its own walls, whereby independence is insured, which cannot be the case if there is but one wall between two houses, and to prevent loss of ground the bye-laws meet the case by allowing the omission of footings if they adjoin another wall.

The removal or amendment of dangerous structures and ruinous buildings should certainly be dealt with in a general Building Act, and although provisions are contained for this purpose in the Towns Improvement Clauses Act of 1847, they should be embodied in the general Act. The provisions in the Metropolitan Building Act may be taken as a basis. . . . . .

To insure the Act being properly carried out, it is necessary that sufficient information be given to the authorities by the parties building to explain their intentions; that properly-qualified officers be appointed to supervise and direct the works in accordance with the Act, and provision made for their remuneration; and also that simple means may be adopted to enforce the law being properly carried into effect. . . . . .

The administration of the bye-laws is entrusted to the Local Sanitary Authority, which is more or less subject to the Local Government Board, and can hardly be said to be an independent body. However advantageous this may be in the case of small towns and unions, I think that in large towns where an Act of Parliament would generally apply, the corporation or other elected local body should be charged with the sole power to administer the Act; for although in some things centralisation may be good and advisable, yet if the power of conducting its own business is withdrawn from each town, local interest and pride will in a great measure be lost, and I much doubt whether the results obtained in the administration of the Poor Law and other matters where central authority supersedes local, it is sufficient to justify the curtailment of rights and privileges hitherto enjoyed by citizens; and therefore, as the Metropolitan Board of Works is the sole authority to carry out the Building Act in London, so also should the local corporations do the same in their respective boroughs.

An important duty devolving on the authority, whatever it may be, is the appointment of suitable persons to see the Act is fully and properly carried out, and, at the risk of differing from many, I think this can be better and more efficiently performed by an independent person rather than by a salaried officer, and especially if such officer should be empowered to sanction plans for public buildings, dangerous structures, and other things requiring more than ordinary information, or to place him in a superior position to practising architects. In some places it would doubtless be found difficult to procure the services of an architect who could or would properly discharge the duties required, in which case it must rest with the authority to appoint an officer; but this should be the exception rather than the rule. In any case the surveyor should be thoroughly qualified and be duly examined and certified, and the payment of supervision made by fees rather than by salary, and thus place the cost of supervision on the person building rather than on the rates, as at present adopted in local boards.

It will be found in all towns, notwithstanding the utmost utmost care in drawing up an Act of Parliament, that there will be many things where the Act would become too arbitrary if rigidly carried out, or would not meet the purposes intended, and therefore a power should be given to the corporation or other authority to modify the Act in certain particulars, which, if necessary, may be defined. If it is found that even more latitude is required, or an appeal is demanded from the authority, a Board of Appeal might be formed in London, composed of properly-qualified persons whose decision should be final and binding on all parties.

For the enforcement of the general provisions of the Act, summary proceedings taken before a Justice have been found to work fairly well in

the Metropolis, and the provisions of the Metropolitan Building Act should be embodied in a general Act for this purpose, and in case of appeal I would suggest that the Board of Appeal just mentioned might be constituted as the proper authority. . . . . .

Short papers by Mr. Boult (Liverpool) and Mr. Honeyman (Glasgow) were also read.

We shall next week give some notes of these, and of the discussion which ensued.

CONCRETE AND FIRE-RESISTING MATERIALS.

A CONFERENCE meeting was held on Thursday evening, Mr. George Godwin in the chair, when Mr. Arthur Cates, Fellow, read the following "Notes" to open the discussion on this subject:—

In the first volume of the "Transactions of the Royal Institute of British Architects," there appears the Prize Essay upon "The Nature and Properties of Concrete," by George Godwin, jun., Associate. In more recent years, the attempts to use cement concrete as a building material for ordinary constructions, in many cases attended with remarkable success, required consideration; and on June 5, 1871, Mr. Thomas H. Wonnacott, in a paper "On the Use of Portland Cement Concrete as a Building Material," fully described the advance which had been effected. Mr. A. W. Blomfield at the same time contributed "Remarks on Concrete Building." The continually increasing importance of the subject led to its being further considered in 1876, when, on April 10, Mr. Alexander Payne read before the Institute an exhaustive paper on "Concrete as a Building Material": in this paper, and the succeeding discussions, continued on May 15 and May 29, a large amount of valuable information will be found. The advance that has continued to take place in the application of concrete, and the importance that attaches to an interchange of opinions and experiences of its use, have induced the council to select the subject for consideration this evening. In the discussions referred to, numerous instances of remarkable success were given, especially in the construction of floors, such as plate floors, 12 ft. 6 in. by 11 ft. 6 in., of a uniform thickness of 7 in., bearing 4½ in. on walls, without girders, iron or other supports; a plate floor, 20 ft. by 15 ft., 6 in. thick, loaded with 2 cwt. to the foot, without deflection; a balcony, 50 ft. long, 4 ft. projection from the wall, 11 in. thick at the wall, and 3 in. thick at the outer edge, supported merely by the adhesion of the cement to the wall. The success which had attended these bold experiments led to the anticipation that even more striking successes might be obtained; and, should time permit after the discussion of the more important section of the subject—Fire-resisting Constructions—it is to be hoped that full advantage will be taken of this opportunity, and the results of experience since 1876 be freely communicated, not only with regard to such exceptional feats, but especially with relation to—

The formation of walls for ordinary constructions, whether solid or packed with large fragments in the interior.

The use of iron bonds or ties in particular situations.

The homogeneity of concrete structures: their liability or otherwise to vertical fissures, or to splitting up into sections.

The damp-resisting qualities of different descriptions of walls; the conditions under which they are weather-proof without external rendering.

The liability in certain atmospheric conditions to condensation of moisture inside the building.

The sonority of such structures; if any inconvenience is found to arise from the free conduction of sound, more particularly where the walls, floors, and roofs are constructed of concrete; and details of the remedies found to be effectual.

The adoption of any less expensive material than Portland cement, such as selenitic lime.

The external decoration of the wall surfaces.

Ascertained facts as to the comparative advantage of different kinds of apparatus and cost of work.

The other branch of the subject for consideration,—fire-resisting constructions,—has, since 1854, when the French systems and Fox & Barrett's patent were discussed, been frequently considered by the Institute. Professor T. Hayter Lewis, in a paper read April 3rd, 1865, summarised preceding experiences; and from them the following conclusions were drawn:—

1. Iron is unsafe owing to the risk of fracture, and the loss of strength attendant upon great heat.

2. Stone and other substances known to be incombustible are not therefore fireproof, but, on the contrary, their use, as they are commonly applied, is often the source of great danger.

3. Concrete in which silicious material is used is readily destroyed by fire; fire-resisting capability can only be attained by the use of material which has already been calcined, such as clinkers, broken brick, broken pottery, stamped or ground up, and similar material.

The subject was further considered at the Conference Meeting of May 25th, 1871, in the discussion following papers read by Professor Lewis and Mr. Charles Fowler, and in the published reports of these proceedings very valuable details will be found. Since this period very great attention has been devoted to the subject, and it may suffice on this occasion if I briefly refer to those few systems which appear to me to be most worthy of consideration.

Mr. Matthew Allen, in his patent for fireproof buildings, dated January 30, 1862, had described his improved method of making fireproof buildings by the combination of cinders, slags, coke-clinkers, or other calcined substances with Portland or other cement, and he has largely carried out this principle in the lintels and stairs of the numerous buildings in the erection of which he has been concerned. His material was subjected to a severe test in 1871, when a six-story building erected for Messrs. Waterlow & Sons in Hill-street, Finsbury, was partially destroyed by fire. In this building his improved concrete had been used for lintels over double iron doors, in party-walls, and over all door and window openings; by the fire the iron doors, columns, girders, floors and roofs, and all the ordinary stone-work, were destroyed, and even the granite paving of the court-yard was considerably damaged. York landings, 3 ft. by 8 ft. and 6 in. thick, forming the cills under the iron doors, were entirely destroyed, while the concrete lintels above, which had been exposed to a much fiercer heat, were quite unhurt. This remarkable success led to the adoption of this material on a large scale in the new buildings erected by Messrs. Waterlow, where the floors are formed of concrete 7 in. thick, and all the girders and ironwork of the floors are inclosed in this material. Concrete thus prepared has not only great fire-resisting power, but it is otherwise strong. Mr. Allen having used it for templates, bases, &c., and using 5 parts of clinkers to 1 of cement, he has found templates 18 in. square support a load of 170 tons without perceptible effect. For ordinary purposes Mr. Allen uses a proportion of 8 to 1, or, where greater strength is required, 6 to 1. He also recommends that the bottom flanges of all girders should be bound round with wire and covered with the material to protect them from fire; and that pieces should be cast to fit round columns, or iron wire being bound round to form a key, the material should be worked round in the ordinary manner.

The necessity for efficiently protecting the iron beams which constitute the element of strength in ordinary floor constructions, although so clearly demonstrated in 1865, did not, so far as I am aware, receive a practical application till about 1873, when Mr. John Whichcord, at the National Safe Deposit Company's Building, Queen Victoria-street, having for the exterior selected "Minera" stone, as a sandstone promising satisfactory fire-resisting power, next proceeded to devise a really fireproof floor; and as the requirements of the superstructure did not admit of any internal wall, and the points of support by columns were limited to two or three, there was no alternative but to employ iron girders for supporting the arches of the floor; to protect these from the action of fire, Mr. Whichcord devised a fire-brick and clay-casing inclosing the flange, and by actual experiment (detailed in his paper read January 17th, 1876) on a girder 14 ft. 9 in. span, the protection was found to be sufficient, the girder so protected resisted fire for long periods, remained uninjured, and was used in the building. The iron columns were protected in a similar manner, and thus the first practical step to the production of a really fire-resisting structure was made.

Mr. Lewis Hornblower, of Liverpool, patented in 1871 and 1873 a system which appears to be somewhat complex, and which he calls the "Cellular Terra Cotta Fireproof Girder Floor," in which the rolled iron joists, about 2 ft. apart, are cased with hollow skewback springing tiles of fireclay filled in with concrete, the interspaces being filled in with hollow vousoir-shaped tiles, and the whole floated in with liquid cement or concrete. This system has recently been adopted by Messrs. Pennington & Bridgen in the erection of the Manchester Pantechnicon. For a room, 24 ft. by 24 ft., the cost is stated to have been 25s. per square yard. A similar floor at the Liverpool Corn Exchange, 27 ft. 6 in. span, cost 32s. per square yard, fixed complete. I understand, also, that Mr. Honeyman has used this floor in some four instances.

In 1876 Mr. Northcroft obtained a patent for a more elaborate system, by which all girder- and joists would be completely encased in fire clay tiles or blocks, and the interspaces filled in with similar tiles or blocks voussoir-shaped, and joggled together in such a manner as to form a flat soffite and upper surface.

The protection of columns is not less important than that of girders, but beyond the suggestion of Mr. Allen, and the actual work of Mr. Whichcord as before mentioned, they appear to have been in some degree neglected by inventors; in 1877, however, a patent was granted to Mr. Lake, on a communication from Messrs. Drake & White, of Chicago, for the protection of iron columns against the effects of fire and the effect of water on heated iron columns in burning buildings, by surrounding such columns with fireproof cores of terra cotta, concrete blocks, or other non-conducting material forming an annular exterior, filled in and grouted with cement; this appears to be very much what was done by Mr. Whichcord some four years ago.

To illustrate the slowness with which knowledge of the first principles of fire-resisting construction has spread, and the absolute necessity for the subject being considered and discussed at meetings such as this, I may refer to a patent obtained in 1876 by a gentleman describing himself as an engineer,—"for improvements in the construction of fireproof and other buildings,"—consisting of the formation of the floor arches as three sides of a polygon, in place of circular segments, the illustrative diagram showing the *exposed bottom flanges* and *tie-rods*, which render such construction anything but fireproof. These few instances hardly illustrate the energy with which inventors have recently turned their attention to fireproof structures, about as many as eighty patents having been granted in the last five years as so bearing on the subject; the majority, except those I have mentioned, and those of Mr. Brannon and Mr. Hyatt, being of very small importance. Many hope to obtain success by the circulation of water through hollow walls and floors; others by making the roof and floor shallow tanks, ever ready to discharge their contents on all below, by providing every compartment of a building with a central rose, connected with a large reservoir; by perforating the entire ceiling connecting it with a water-tank; or by perforated tubes connected with the street mains, and distributed over the building in such positions as to command the whole or any part. And on the occurrence of a fire to automatically bring the water to bear upon it; but all these devices are foreign to the subject for consideration this evening.

Among the active patentees, Mr. Philip Brannon deserves special mention; his inventions all merit careful consideration; the successful experiments in which buildings constructed of his material have resisted fire, and its apparent non-conducting powers, are probably familiar to all. The application of concrete in the form of so-called "stone felt," to the production of doors appearing likely to form far more efficient protection from fire than it has obtained by the familiar iron door, deserves more attention than it has received; and the application of the same material for the protection of that portion of the timber framing of the cupola of St. Paul's accessible to the visitors, which has been inspected this week by the members of the Conference, reflects great credit on Mr. Penrose for having adopted it, and on Mr. Brannon for having so well carried out the work.

Mr. Lascelles is also working in the same direction, or rather, is advancing far beyond what has hitherto been done; and as a result of the endeavours of these gentlemen we may now erect a comfortable residence, in which combustible material, even in the fittings, shall be the exception,—the joinery, doors, window-frames, and all, being in concrete.

The inventors who have taken up this subject appear in many instances to be merely groping their way, and it is but seldom that their patents are the results of, or are supported by, well-considered and systematic experiments; and to this deficiency of scientific application the slowness of the progress hitherto made may be mainly attributed.

However, the most recent, and in some respects probably the most important, contribution to the literature of fire-resisting construction, is the well-illustrated volume printed last year for private circulation, by Mr. Thaddeus Hyatt, whose lens lights and pavement-illumi-

nators are so well known, and who has obtained a large number of patents relating to the subject. This essay is entitled,—"An Account of some Experiments with Portland Cement Concrete, combined with Iron as a Building Material, with reference to economy of metal in construction, and for security against fire in the making of roofs, floors, and walking surfaces," by Thaddeus Hyatt, which I thus summarise:—

Commencing by a review of the systems of so-called fireproof constructions as illustrated by Fairbairn,—"On the application of cast and wrought iron to building purposes," 4th edition, 1870,—Mr. Hyatt repeats what has been thirteen years ago urged in this room, that the original mistake as to the ability of naked iron to resist heat and flame has vitiated every floor construction of the kind; leaving out of account the unprotected iron columns on which the girders rest; the bottom flanges of all the girders are naked and exposed to flame; this flange being the tie, the integrity of the whole beam is dependent on it; soften the tie by heat, the resistance of the beam begins to give way, and the destructive influence of combined load and flame act till the beam is destroyed, and he arrives at the conclusion already attained by Whichcord, Hornblower, and others, that fireproof floors cannot be made if the bottom flanges of the beams are left exposed or too lightly covered.

To make fireproof floors it is necessary to know the law of heat conduction: with respect to the material relied upon to protect the bottom flanges of the beams, in order to calculate the thickness of material needed to give protection during the hurry determined on as the limit of time for the fireproof capacity of the floor; in a floor where the sole or main reliance for strength is in iron, the first thing to be done is to protect it with a fireproof coating on all sides sufficient to give it a power of resisting fire during the number of hours required.

In the Lens-light Works, Farringdon-road, an experimental building for the display of his inventions, and well deserving of a visit, Mr. Hyatt has introduced the construction shown on the diagrams.

With regard to the fire-resisting capabilities of Portland cement concrete, experiments were made with brick-shaped blocks, composed of one part cement to two of crushed bricks. At one month old, when heated to redness for six hours in a furnace, taken out and partially plunged into water, the end that came in contact with the water fell instantly to pieces and disappeared; similar blocks heated in the same way, and left to cool in the open air, became disintegrated within periods varying from six to forty-eight hours, the results being uniform as to samples that had been exposed to the same degree of heat and for the same length of time.

With a view to reduce the amount of iron in the construction of a floor, Mr. Hyatt proposes to utilise the power possessed by concrete of resisting compression in combination with the tensile force of iron, by omitting the web and upper flange of the iron beams usually employed in floor construction, and leaving only a tie bar 2 by ½, and a series of experiments on concrete beams made on this principle, and varying in weight from 200 to 900 lb. each, the bearing being 5 ft., appear to confirm his theory; about fifty such beams were broken by Mr. Kirkaldy, and the results appear to show that the iron was perfectly held while the beam was under strain, and that the two materials worked in perfect harmony, and that the union of tie metal with concrete equalled in strength riveted or rolled beams.

Not finding satisfactory results from the use of ordinary cement, Mr. Hyatt, having invented an improvement in the manufacture of Portland cement, which increased its fire-resisting capabilities, used such new cement in the following experiments:—To ascertain the length of time required for heat to penetrate concrete layers of different thicknesses, a furnace was built, the top of which consisted of a slab of concrete of three different thicknesses, a flat bar of iron being let into each step with the effect of leaving 2 in., 3 in., and 4 in., respectively under the bars, two small squares of metal, lead, and tin, were let into each bar, and needles made to rest thereon, so that on the melting of the metal the needles should sink. From the observations taken, the Thermal Chart exhibited was constructed, showing that, in three hours after the fire was lighted, the iron, protected by 2 in. of concrete, was at 260 deg., in five hours it was 650 deg., at the end of twelve hours 900 deg., or red-hot in the dark; while the iron protected by 4 in. of concrete did not, in five hours and a half, exceed 212 deg., in eight hours and a half, 450 deg., and at the end of twelve hours, 550 deg., or less than the melting point of lead.

A more complete test of the action of fire and water on an actual floor-section was made on a slab 6 ft. long, 2 ft. wide, and 7 in. thick, supported at the extreme ends only. The tie metal in gridiron form was placed at the middle of the thickness, 3 in. of concrete being above and 3 in. below; a load of 300 lb. to the foot over the whole surface was obtained by bricks piled up, the deflection under this load for a span of 5 ft. being 1-32nd of an inch; the fuel was arranged to form an incandescent bed 6 in. thick, at 1 ft. below the under face of the concrete slab; the fire being kindled at six o'clock in the morning had by eleven become an intense heat perfectly uniform over the entire surface, and the bottom of the concrete was also at a glowing red heat all over; at this intensity the fire was kept up till four p.m., when the slab deflected 3-8ths of an inch; a stream of cold water was now thrown forcibly against the bottom of the slab for some twenty minutes and the load was then removed; the under side of the slab was uninjured, and the next morning, the slab being entirely cold, the deflection had disappeared. A second trial was made; during the firing the slab deflected as before, but the load was left upon the slab, which upon cooling returned to its original level, lifting the load with it.

This brief summary of Mr. Hyatt's treatise is sufficient to show its value and importance, and to suggest the expectation that experiments so well conducted will be renewed, and farther important results obtained.

There is one material to which I have not yet alluded, and whose merits as available for fire-resistance have not received universal recognition—it is wood. For, although in large fires timber posts and girders have sustained comparatively little injury,—while iron columns and girders, thought to be "fireproof," have been utterly destroyed,—any form of construction in which the angles and edges of the wood were protected from fire action was not devised till Mr. Hyatt's patents of 1871 and 1873, who, adopting the principle that to use timber in a way to have it fireproof, it is only necessary to have enough material prepared to lay the timbers side by side, so as to expose to flame only the upper and under surface. In 1876 Messrs. Evans & Swain obtained letters patent "for the construction of floors and roofs of great strength and simplicity, and possessing perfect fireproof properties;" they, like Mr. Hyatt, take advantage of the property which solid timber possesses of resisting the action of fire for a lengthened period, provided the fire attacks it only on the surface, and does not play round it. They take ordinary wood joists of any uniform depth and any thickness,—2 in. or 3 in. preferred,—place them side by side close together, and bring them laterally into close contact by bolts or spikes, and as a protection to the under-side drive in flat-headed nails and render it with a thick coat of plaster. Solid staircases can also be built up in a similar manner. This form of construction has been subjected to the usual course of successful experiments and appears to possess much merit; it has been used by Mr. Ewan Christian in a public office, and is now being adopted in an extensive range of new warehouses, in course of erection at the East India Docks, under the direction of Mr. Manning. And with the sanction of the Wharfs and Warehouse Committee, the system being adopted in place of that originally required by the committee, viz., wrought-iron girders and concrete or brick arches, supported by cast-iron columns covered with 4 in. of terra-cotta,—timber story-posts being also used,—a saving in cost of construction amounting to about 9,000*l.* having been thus effected.

There are other systems for combinations of timber and terra-cotta,—fire-clay and concrete casings to protect the timber,—such as those of Mr. Thwaite, Mr. Moore, and Mr. Butler, but I leave their consideration to the discussion.

These brief and somewhat discursive notes will suffice to show that within the last few years the true principles which should govern the efforts to produce really fire-resisting construction, have been receiving some appreciation, and that very considerable advance has been made towards the realisation of the possibility of producing a building worthy of being designated as fire-proof. The discussion which will follow will no doubt add much to the information we now possess, and consideration of the subject this evening give a wide extension to the knowledge of those principles by which every attempt in this direction must be guided.

To the discussion which ensued we shall return.

THE INSTITUTE DINNER.

ON Tuesday evening the Royal Institute of British Architects celebrated the conclusion of an arduous session, and the holding of the Fifth General Conference of Architects, by a dinner at the Freemasons' Tavern, Great Queen-street. Mr. Charles Barry presided, and was supported by a large number of fellows, associates, and honorary associates of the Institute, as well as by many gentlemen attending the Conference. Covers were laid for about 130. Amongst other gentlemen, there were present Sir Richard Wallace, bart., M.P.; Sir Rutherford Alcock, K.C.B. (president of the Royal Geographical Society); Mr. E. Armitage, R.A.; Mr. Basil Cooper, B.A.; Mr. J. R. Carroll (Dublin); Mr. John Lanyon; Mr. John Dixon, C.E.; Mr. E. J. Smith (president of the Institution of Surveyors); Mr. F. Ouvry, F.S.A.; Mr. T. Gambier Parry; Mr. Thomas Hawksley, C.E.; Mr. Charles Lucas (Lucas, Brothers); Mr. Barlow (as representing the President of the Institution of Civil Engineers); the Right Hon. Lord Crewe; and other distinguished guests, whose names will be found associated with the various toasts. Grace was said by the Rev. Canon Barry, D.D. The toast of "The Queen, the Patroness of the Institute," having been duly honoured,—

The President, in proposing "The Prince of Wales and the other members of the Royal Family," spoke of the services which H.R.H. was continually rendering for the promotion of the fine arts in this country. Honoured as he (the president) had been by H.R.H.'s desire that British architects should be officially represented at the Paris Exhibition by the president of the Institute, he could not refrain from testifying to the Prince's courtesy and consideration, as well as to his intelligent appreciation of the work of the architect. Out of the two hours and a half H.R.H. had devoted to the examination of the English Fine Art section, he had devoted half an hour to the Architectural Room. He (Mr. Barry) accompanied H.R.H. on that occasion, and could say that hardly a drawing escaped H.R.H.'s notice, many being the subjects of inquiry and intelligent criticism on his part. It could only be hoped that the general public would, in visiting the Royal Academy, spend an equally large proportion of their time in the Architectural Gallery. He (the President) had ventured to remind the Prince that, as Patron of the Institute, he could do them a great service if he could take the chair at that dinner. From H.R.H.'s engagements that was not practicable; but the following letter would dispel any doubt,—did any exist,—as to H.R.H.'s goodwill towards the Institute:—

"Hôtel Bristol, Paris, May 7th, 1878.

Dear Mr. Barry,—I am desired by the Prince of Wales to acknowlege the receipt of your letter of the 4th instant, and to inform you that while fully sympathising with you in the object which you have in view, and which you have set forth so clearly in your communication, he regrets that the state of his engagements will render it impossible for him to accede to your application that he should preside at the next annual dinner of the Royal Institute of British Architects. Should you think proper to renew your request next year, his Royal Highness will be happy to give it every consideration.—Believe me, yours truly,

(Signed) FRANCIS KNOLLYS."

That intimation would, if such a thing were possible, add to the enthusiasm with which the toast he had the high honour to propose would be received. The President concluded with some graceful words regarding H.R.H. the Princess of Wales, and, it is hardly necessary to add, the toast was received with acclamation.

Mr. John Whichcord, V.-P., proposed "The Army, Navy, and Reserve Forces," coupled with the name of Colonel Chesney, R.E., president of the Indian Engineering College, Cooper's Hill.

Colonel Chesney replied.

Mr. G. E. Street, R.A., proposed "The Houses of Parliament," coupled with the names of the Right Hon. Lord Houghton, and the Right Hon. Robert Lowe, M.P. As to the House of Commons, he said that although from the great majority of its members architects could not hope to expect much more than criticism as to the cost of public buildings, yet, when occasion arose, they were capable of appreciating the value of good architecture, whatever its cost, as was evidenced in the case of the new Houses of Parliament. To erect those buildings, they employed the first man of his day, and the result was unique and unequalled throughout Europe.

Lord Houghton, in responding, said he was proud to know that many members of the order to which he accidentally belonged took a deep interest in so noble a pursuit as architecture.

Mr. Lowe, in responding on behalf of "The House of Commons," said Mr. Street's remarks had suggested to him that the House of Commons might be compared to Mrs. Gilpin, "for though on pleasure bent" (*pace* the adjournment over the Derby Day), it "had a frugal mind." Personally, he had always desired to encourage and to promote the interests of the profession of architecture, and with that idea in view during the time that he had the honour of filling the office of Chancellor of the Exchequer, he had several admirable schemes on hand for the architectural embellishment of the metropolis. First, he had a scheme for placing the new Law Courts on the Embankment. Next he had a scheme for placing the Mint on the Embankment; but this was objected to on the ground that the site was too sacred to be polluted by such a building, although he had since discovered that it was now consecrated to the orgies of a public-house. Next, he had a splendid scheme for placing the War Office on the Embankment, but in that he was also overruled. The worst of it all was that there was not a man in England who did not believe that it was the House of Commons that wanted to do all these things, and that it was his "stinginess", which prevented them from being carried out. The right hon. gentleman went on to say that he honoured and respected most sincerely the noble profession so many of whose followers he had the pleasure to see around him, and upon whom, at the present time, a great and important trust devolved. He had lived a great many years in the world, and it had been his fate to witness what he conceived to be a melancholy degeneracy in most things. He had lived in the

times of great poets and writers, who had passed away, leaving no successors behind them. If he were correct (as he feared he was) in thinking that England was losing the crown of literary pre-eminence, of which she was in full enjoyment up to within the last forty or fifty years; and if that loss could not, as he ventured to think, be compensated for by the works of the engineers, however great their utility, and no matter how scientifically devised, it was at least the duty of the architects of the present age to endeavour to leave behind them buildings of such excellence and monumental character as would enable posterity to say that, although the later years of the reign of Queen Victoria were not so brilliant in literary achievements as were those of previous epochs, yet the people who lived then must have been a glorious and a great race to have produced such magnificent works of architecture as were identified with them. The distinguished architects whom he saw present would no doubt do their best to deserve such appreciation of their works by posterity.

The President, in proposing "The City of London and the Corporation," coupled with the name of the Lord Mayor, said it was only meet and proper that they should be favoured with the presence of his lordship, for the head of such a corporation as that of London was, in effect, the Ædile of the great city over which he presided, and it would be desirable if the Lord Mayor became, *ex officio*, one of the new class of members, the Honorary Associates.

The Lord Mayor replied.

Mr. A. J. B. Beresford-Hope, M.P., proposed "Art, Science, and Literature," coupled with the names of Mr. Frederick Leighton, R.A., Mr. F. J. Bramwell, C.E., F.R.S.; and Dr. S. Birch (of the British Museum).

Mr. Leighton, in responding for Art, said he might be allowed to say that so ardent a devotee of architecture as the proposer of the toast, and so enthusiastic a lover of Science for her own sake as Mr. Bramwell, would excuse him for saying that most assuredly it was in architecture that the union of Science and Art was most strikingly exhibited and the full power and resources of their consenting harmony revealed. Mr. Bramwell would agree with him in saying that no architect had ever erected a monumental building which would endure who had not erected it by the light which Science was able to afford him. But it was reserved for Art, in the shape of painting and sculpture, to invest architecture with additional beauties, and to clothe it with further graces. Wherever we turned,—to buildings of whatever age,—this was found to be the case. The Assyrians and Egyptians called in the aid of the painter to chronicle on the walls of their palaces and temples the exploits of their kings and rulers. Later on, when Ictinus had raised upon the southward brow of the Acropolis at Athens a building exhibiting the most subtle beauties that had ever arisen from the hands of man, Phidias crowned it with the images of the majesty of the gods; and when, yet later, in the Middle Ages, architecture sought new forms and a new life in our northern climes, we found the union of art and architecture still indissoluble. In our Gothic cathedrals, the reverent love for nature which characterised all the northern nations led them to represent in sculpture on every capital the flowers of the field, and all manner of beasts and fishes; whilst the mysterious splendours of colour on window and wall deepened the poetic significance of those marvellous structures. He would not stay to inquire how far the union between architecture and the sister arts continued to the present day, as it should continue; but would say that he felt glad that the Institute had, within the past year, testified, in the most marked and signal manner, to its recognition of that principle in admitting to its ranks members of the sister arts. He believed that the step thus taken, based as it was on so sound a principle, could not fail, sooner or later, directly or indirectly, to bear good fruit.

Mr. Bramwell, in a humourous speech, responded for "Science," and

Dr. Birch replied for "Literature."

The President, in proposing the toast of the evening, "Prosperity to the Royal Institute of British Architects, and Success to the Conference," expressed the opinion that it was desirable that such dinners should take place annually, so that the members of the architectural and kindred professions might mutually benefit by social intercourse. Such gatherings would help architects to work together with the view of maintaining and increasing the regard in which they were held by the public,—notwithstanding what had recently been said to the contrary,—by uniformly discharging the many duties which devolved upon them, whether æsthetic, practical, or fiduciary, in a way to command the appreciation of those who were capable of giving it, and respect, at any rate, from those who were not so well able to understand the functions of the architect, and his place in the social economy. These were the primary objects which the Institute had in view, and which, indeed, constituted its *raison d'être* as a corporate body. As to the Conference, the organising committee had devoted much time and thought to the making of all necessary arrangements. It was, therefore, only right to state that the committee was presided over by Professor T. Hayter Lewis, and that its members were Messrs. Charles Fowler, T. Roger Smith, J. Douglass Mathews, T. H. Watson, H. H. Statham, and B. A. Paice (president of the Architectural Association), the zealous and energetic secretaries of the committee being Messrs. Arthur Cates and R. Phené Spiers. The toast divided itself into two parts, and he should put it thus: "Continued and increasing prosperity to the Royal Institute of British Architects," coupled with the name of their country member, Mr. Honeyman, of Glasgow; and "Success to the Conference of British Architects of 1878," coupled with the name of Mr. Phené Spiers. He regretted to say that Professor Lewis and Mr. Cates were unavoidably absent.

Mr. Honeyman and Mr. Spiers responded.

In proposing the next toast, "The Honorary Associates," the President said that in founding this new class of members, the Institute had acted on the belief that there were many noblemen and gentlemen of wealth and position,—whether found in the ranks of the Legislature, or amongst those who were engaged in practising the kindred fine arts or in the pursuit of science, or amongst the public which comprised so many with cultivated minds and natural taste,—who would gladly welcome the opportunity to know architects better by associating with them in the common ties of membership. He was glad to see that the new class of members was represented at that board by such distinguished representatives, the name of one of whom, the Right Hon. Lord Houghton, he begged to couple with the toast. Lord Houghton, as president of the Art Union of London, and in other ways, had done much for the promotion of the fine arts.

Lord Houghton, in responding, expressed his admiration for the art of architecture, with whose professors he felt it a high honour to be associated. He thought that Mr. Lowe was disposed to take too despondent a view as to the position of literature at the present day.

Mr. Cockerell, in felicitous terms, proposed "The Visitors," coupled with the name of M. Charles Lucas, of the Société Centrale des Architectes, Paris.

M. Chas. Lucas, in response, made an effective speech, in the French language. He expressed his high sense of the honour of being called upon to represent the architects of France in that distinguished assembly, and thanked the Institute and the Conference for the courteous reception accorded to him by all, specially naming the President and Mr. F. P. Cockerell, Hon. Sec. for Foreign Correspondence. He said that he had been much struck by the beauties of modern English architecture, whether inspired by Greek, Roman, French, or Early English productions. The presence of the Lord Mayor,—the chief magistrate of the great City of London,—should augur well for the co-operation of art and commerce. M. Lucas, after expressing the hope that he should have the pleasure of seeing many members of the Institute at the International Congress of Architects (to be held in Paris, at the Palais du Trocadéro, from the 29th of July to the 3rd of August next), concluded by expressing his thanks to Messrs. Octavius Hansard and C. J. Phipps for the excellent arrangements they had made in connexion with the dinner.

The concluding toast was "The President," which was proposed by Sir James M'Garel-Hogg, M.P., chairman of the Metropolitan Board.

As will be in some degree apparent from the foregoing reports, the dinner went off with the greatest *éclat*, thanks to the admirable arrangements made by Messrs. Octavius Hansard and C. J. Phipps, in conjunction with the secretary of the Institute, Mr. William H. White.

ON ARTISTIC IMPROVEMENT OF THE POORER LOCALITIES OF LARGE TOWNS.

WITH SPECIAL REFERENCE TO THE EAST OF LONDON.*

It is impossible, I hope, for any one in the habit of running in and out of London on the various suburban railways, which have lately grown into such an enormous locomotive system, not to be seriously impressed, now and then, with the nature of the scenery over which he is conveyed on the top of the railway company's viaducts. Regarded in this light, the impartial march of the iron road over the tops of whole square miles of house-roofs, besides its positive advantage in getting us to our destination by the shortest cut, has the moral advantage of letting us see something instructive and sobering to the mind while *en route*—something which is not otherwise seen except by those who go forth especially to look for it. Driving through or or out of East and South London by the ordinary routes, or taking the tramway communications now laid down in the principal lines of road, a stranger to those parts may very easily be deceived as to the real character of the district he is passing through. He goes along the centre of a wide road, flanked by respectable-looking shops and houses, and here and there a small tree or two, a sparkle of bright fresh green amid the perspective of dull brick; and even this perapective of dwellings and warehouses, seen for a long distance along a stretch of road, is not without its picturesque properties; indeed, some of my East-end friends declare that Commercial-road is more picturesque than any street view west of the Bank. But, however that may be, the railway viaducts have taken most of us behind the scenes. From the East London terminal stations—from Broad-street, Fenchurch-street, and Bishopsgate, we pass over and look down into heaps upon heaps, one may say, of dirty brickwork, intersected by smaller courts and alleys, or bordered by infinitesimal back yards that seem the receptacles for all the unsightly lumber and refuse which can be crowded into them. To appreciate fully the excessive ugliness of the districts which lie between the main lines of road, we must visit and inspect them more in detail; but the railways serve to give a rapid and comprehensive bird's-eye view, and a very depressing spectacle it is.

Now, as to the sanitary deficiencies of the poorer and more crowded parts of our large towns, there has undoubtedly been, though late in the day, a great awakening in the public mind recently; and though all progress in regard to a matter so long neglected, and which leaves so vast an accumulation of work to be faced, must seem comparatively slow, still a great deal is being done; important legislative machinery has been framed for facilitating schemes of sanitary reform; sanitation, as it is sometimes called, has become an almost popular subject, and large blocks of "model dwellings," providing for the poor the opportunity of living in cleanliness and decency, are already in existence in many parts of London, and are likely to be followed by others. And perhaps nowhere has more attention been given to sanitary questions than at the various congresses and other meetings of this Association for some time back. But little or nothing has been said as to the possibility of rendering the poorer quarters of great towns not merely more healthy, but more beautiful (or, should we rather say, less ugly) than they usually are. Yet the necessity for something of interest at least, something of the picturesque in character and aspect, is even greater in the poorer than in the richer parts of a town. The wealthier inhabitants not only have many more sources of interest and enlivenment within their reach, but they have also the power of change of scene by taking holidays out of town, which their poorer brethren very seldom have. The more need then that some consideration should be given to the possibility of securing, for those who must pass most of their lives in streets and courts, something of variety, interest, and beauty in the aspect of their surroundings. The subject, of course, has no special reference to London more than to other large towns, except that the magnitude of the area built over is so immense, and the difficulty of escape from it for change of scene proportionally greater. But in offering a few suggestions on the subject, I named the East End of London, partly because it was owing to recent

* By Mr. H. Heathcote Statham, F.R.I.B.A. Read at a meeting of the Social Science Association, May 27th.

pretty frequent visits to East London that my thoughts were drawn to the subject, partly because the subject thus, in Bacon's phrase, "comes home to our business and bosoms," and is likely to do so still more; for though the East End is still a *terra incognita* to most of the dwellers in the West, there are indications that this will not always be so, and there is already a small band of those who are desirous to break down the middle wall of partition which separates the two Londons, so that perhaps ere long the architectural amelioration of the East End may become an object of even direct and immediate interest, on other than merely philanthropic grounds, to the dwellers in the West.

It must be admitted that the area to be dealt with is so great, and the accumulated difficulties of the problem so formidable as to give some excuse for the suggestion made to me the other day, that the only thorough remedy was to sweep away the greater part of East London bodily, inhabitants and all, and begin afresh; but this plan, though there is much to be said for it in theory, would run counter to many still surviving prejudices in regard to life and property. All we can aim at just now is to consider in what particular points it might be possible to bring about improvement in the aspect of things, positively and negatively; to suggest ideas, to get them talked about, and to trust that, if there is anything feasible in them, they will, by degrees, bear fruit in action.

Now, if we come to consider wherein would lie the difference between ugliness and attractiveness in a locality which has necessarily to be nearly covered with buildings, I think we should find it depend mainly on three conditions,—the materials used, the design or the method of employing them, and the spacing and arrangement of the open areas in relation to the portions built over; or, in other words, the general laying out of the grounds so as to give variety and effect, and produce points of interest and climax. There is another element in the contour of the ground; for it is scarcely possible to make a town otherwise than picturesque which is built on a site with much variety of levels; but this is a matter we have to take as we find it; and, as to materials, we are, of course, limited, in the poorer quarters of a town, by considerations of cost. Unless we wish to æsthetically pauperise, so to speak, a whole neighbourhood by presenting them with beautiful materials, we must restrict the buildings to such materials as are commensurate in cost with the return that is to be regarded as possible; and at present, as we all know too well, brick is the staple commodity, and has, for the most part, held its place so far in spite of much that has been said against it. Now, there is no doubt that good brick is a fine building material in itself; but it has a great facility in holding soot and dirt, and, from the nature of its surface, it is almost impossible to give it any efficient cleansing; hence arises the peculiarly grim and grimy effect which the old brick streets of East London have, and which, in itself, would go far to render them dreary in appearance even if there were more attempt at picturesque manner or design in the buildings. Yet it is difficult to say what we can propose, economically, to substitute for brick, which will be any material improvement. The suggestion has not unfrequently been made, that for town houses where there is much smoke a material capable of being readily washed should be used. The late Sir G. Scott was much interested in this idea, and spoke strongly in favour of it; but then he was referring to buildings where a certain amount of expenditure on appearance was contemplated. But to recommend glazed brick (which is about the only washable building material we have at present) as a material for East-end building, as in some well-intended suggestions by a lady which I read the other day, is unpractical, as it is nearly three times the expense of ordinary brick, and, therefore, entirely out of the question in cases where the problem is how to secure a remunerative return even for the cheapest properly-constructed building. The building of tenements in lofty blocks of many stories, so as to reduce to its minimum the first cost of land and foundations, and get the greatest amount of rental from a given area of land, of course, offers more margin for a little expenditure on appearances. A word about that just now. But for dwelling-houses of ordinary size, even if we allow two stories of tenements one over the other, it seems difficult to know where to find any spare funds for decorative treatment; the simple brick wall, with square holes in it, provided the materials and workmanship are honest and good of their kind (which is a *sine qud non*), runs away with all the margin. There is, however, one material for building about which much has been said by architects of late years,—concrete walling,—concerning the advantages and disadvantages of which divers rather contradictory opinions have been expressed; but which it would certainly seem worth while to make more trial of in its application to buildings where economy is an object. The relative cost of concrete walls, as compared with brick, varies with the locality and the immediate facilities for obtaining the raw materials. In some parts of the country, concrete building has been done at less than half the cost of brick. Here, in London, we may say that concrete dwellings, especially if a good many were carried out by the same contractor, who would use the same apparatus over and over again, could be executed at about two-thirds the cost of equally good buildings of brick. "But what about appearance?" it will be asked by those who know what concrete walls ordinarily look like. Well, there would certainly be no gain in that way if we merely substituted concrete for brick; but then we must regard the one-third cost of the brick building which is gained as so much let loose to spend upon making the buildings look characteristic and interesting. Let us see then what can be done with our concrete building. In the first place, concrete walls are usually built in heights of about 2 ft. at a time, and when what has been put in has sufficiently set, the apparatus is raised for another layer of 2 ft. There is here an indication, in the very method of working the material, for breaking up the dead flat surface of the wall by strongly marking the joints of the various layers, like what in masonry is called "rusticated" work, by using for one course moulding boards with a simple pattern, of which the concrete, before hardening, would take the impression, so as to produce a decorative band; and it appears to me that it might be quite possible to vary the tone or colour of the alternate bands slightly by mixing a little colouring matter in the concrete, or varying the materials of which it is composed, so as to produce a simple kind of polychromy. But this emphasising of the horizontal layers of the wall could only be regarded as a suitable treatment for the lower story, to which it would impart an appearance of strength, by marking strongly the horizontal lines of the structure. To continue such a treatment up to the roof, though it would give us a brighter tone than brickwork, would only produce a kind of "streaky-bacon" architecture. But in the upper portion we can produce a great deal of interesting and even brilliant colour effect by building in, at appropriate points, a row or two of coloured tiles, which can be "washable," so as to have a chance of preserving their brightness; and we might press into the service even humbler materials than these. A very jewelled effect might be produced by a judicious use of green-bottle-ends built into our wall, as may be seen done in the gables of Northamptonshire cottages; and coloured and glazed pottery, in the shape of circular plates, set in cement in the wall surface, would form charming centres of coloured decoration of an almost indestructible character. Then the use of concrete in itself almost naturally suggests the use of plaster as a finishing material, and a material easily capable of ornamental treatment in a very inexpensive manner by impression on the surface when wet, by which means, even if nothing more ambitious in design is attempted, what would otherwise be a cold, dead surface may be diversified by a diaper giving it tone and shading.

But we can only apply plaster advantageously in this way if we get the ground for it with something of a panel character, so as to have a definite bounding edge, as builders say, to "stop" the plaster. And this suggests the employment of an old method of construction in this country, that of timber-framing, only under much more suitable circumstances. A great many of the old half-timbered houses of England are composed of timber-framing filled in with brickwork, a construction of which it is difficult to find the *raison d'être*, since fitting the brickwork to the spaces is more troublesome and more expensive than merely building up with brick in the ordinary way. But concrete is a more suitable material for filling in spaces of irregular shape; and an oak timber framing, filled in with concrete and plastered between, would probably prove as durable a wall as one could wish for, and give relief and picturesque effect at the same time. Timber is forbidden by the Metropolitan Building Act as part of the exterior walls of a house, no doubt from the idea of danger from fire. But this is an unnecessary fear if we are dealing with oak, which is found in practice to be one of the most fire-resisting of materials, and would be more especially so when in close combination with concrete and plaster, which are among the few practically incombustible building materials in use. A construction of oak framing and concrete would hardly be a saving over brick over a whole building, but the plain lower story of concrete would leave us margin for the oak above, which, unfortunately, is in the present day much more expensive than it need have been had our large natural stores of this timber been husbanded and kept up, as they well might have been, instead of being permitted to dwindle away through lack of attention and forethought.

The fact is that, as a practical question, there would not be half the objection on the score of safety from fire to such a construction, which there is to the wooden erections generally put up over the front entrance of shops, and to the support of the whole superstructure (where there is the ordinary show shop-window) on a single iron column. But this matter of the shop-fronts belongs to the æsthetic as well as to the practical part of the subject. When an immense number of buildings are massed together nothing tends more to give them a look of meanness, insecurity, and probable decay, than a palpable want of solidity in construction, more especially when involving an obvious sham. And this is the case with the shop front, in most quarters of London, but the result is more especially unhappy in the East-end streets. We have miles upon miles of these painted band-box shams put up over and round the shop entrances, which represent no inconsiderable sum of money, which are always getting to look rickety and out of repair, and then furnish excuse for the indulgence of a vulgar taste for gaudy and barbarous combinations of colour, in painting them up to look smart again. This flimsiness and show are unfortunately only too characteristic of the game of brag which modern tradesmen will probably say that they *must* play whether they like it or not; architecture in these matters is the expression of habits of life, and if trade were carried on upon a basis of always supplying the best thing instead of always professing to do so, it would not be necessary for each shop-owner to try to out-do his neighbour in the show that he can make in his front, and to put up a flimsy mock construction in front of the real building. It will be a great step towards making street architecture in towns more dignified if one could inspire tradesmen with a preference for honest though plain building in their shop-fronts, instead of these pieces of joiner's scenery; for when you get a mass of buildings together, anything like ricketiness and want of stability tells more against their effect, does more to produce a sensation of squalor, than almost any other characteristic.

Returning for a moment to our decorative suggestions, there is a method of external decoration which is peculiarly suited for combination with concrete, since it again employs the cognate material, plaster: I mean the process called *sgraffito*. This, it is hardly necessary to explain, is a method of producing designs in black and white, by covering over a layer of black with a very thin coat of white plaster, and then producing a design in outline or silhouette by scratching away the thin white coat, so as to leave a design either in black on (apparently) white ground, or *vice versâ*. Shaded drawings in relief can also be made by hatching with thin lines, like an engraving on a large scale; though this style of treatment, more interesting perhaps in itself, is not so well suited for decorative effect. *Sgraffito*, however, can hardly be added as a decorative feature to working-class tenements, with due regard to economy. But the ground for it, the black and white plaster panels, can, in a cement building, be prepared and made ready for the artist without exceeding the limit of economic outlay. The drawing and executing of some such designs might in that case form a very agreeable and instructive occupation for some of those who I hope are now learning drawing in the Board Schools, and who will be able to help to bring sweetness and light into their future homes thereby. Nor would it be

too much to expect that dwellers in other localities would be willing to turn some of their talents and opportunities to account in giving some of their attention to the decoration of less favoured districts. That is, I think, a legitimate kind of charity: it is not the same as giving away land at a reduced rate because it is for working-men's dwellings, from mistaken feelings of philanthropy: in giving of your artistic acquirements to promote the enjoyment of your fellow-man who is in want of something to interest him, you give what he specially seeks, "not yours, but you." So also it may be suggested that among the many who are now finding an intellectual pastime in modelling, may be those who would willingly give some of this joyful labour of their hands to decorate the homes of those whose labour is often otherwise than joyful. In the case, however, of the very large blocks of many-storied buildings, such as are now being erected, or have been recently erected, I conceive that it ought to be possible to contrive a margin in the expenditure for providing for a higher class of decoration than has usually been attempted in such buildings.

And this brings us to the question, are these great blocks of model dwellings, which we now find in so many places about London, and for which several fresh sites are already appropriated, altogether admirable? When we walk through some of the poorest streets of Bethnal green, and contrast the small, grimed, and tumble-down looking houses which line them, with the solid and substantial blocks of buildings erected by Sir S. Waterlow's Company in the neighbourhood, and reflect further that these latter are scientifically planned and provided in regard to sanitary requirements, and that the others certainly are not, we, of course, feel that a great step has been made. But I think we can hardly as yet accept this system of providing dwellings for the poorer class in towns by means of great mill-like stacks of buildings as the model method of procedure for the future. For one thing, I cannot but think, whatever may be said to the contrary, that the sentiment of "home" must be a good deal interfered with by this plan of making a great hive of human beings grouped together in one great building; or if it be said that many of those thus housed never had any sentiment about home, the growth of it is, at least, prevented. At the same time, this objection to the model houses scheme is made far stronger than it need be by the manner in which they are built. While this subject was in my mind, I have been looking over several of these big erections in different parts of London, and everywhere experienced the same kind of feeling of oppression, arising from the unnecessarily grim, square-set, and what I can only call workhouse, air which is imparted to them. They have a dreary, official aspect, which makes one feel as if one must have done something wrong before one went to live in them. About the management of these buildings I do not know much; but I heard or read the other day of some people objecting to live in one of them because "they could not abide to be drilled in that way." There might or might not have been reason in the objection,—some people are the better for being drilled,—but what I here complain of is that the buildings look like it, and that it is much better they should not do so. The practice of making one great symmetrical block, with the same projections, windows, &c., repeated in dreary succession from end to end, at once conveys the idea that the life inside them is to be conducted on the same kind of wholesale system. Now, it is utterly unnecessary to give to such buildings this forbidding and official appearance. There is not the slightest reason why the whole block of buildings should be a system of mechanical repetition of the same parts, and then another block put alongside of it cast in the same mould, only turned the other side about, as if a suitable plan of one dwelling having been made, nothing remained but to stick as many of them together as possible, or as if the thing were made in lengths of a mile at a time, and pieces of suitable size cut off and put down in different parts of the town. There is no reason for this, except to save some one the trouble of thinking about it a little. It is not a question of cost of labour and materials. It would cost nothing but a little thought, and a little of that kind of perception which we commonly call "taste," to give a picturesque variety to these masses of building, so that they might be something like an addition to the architectural interest of the locality, and that the inhabitant might attach a distinct association, at least, to his own part of the building and his own entrance, and not merely know it as the fifth door in the row. If this kind of variety were given to the buildings, there would be a certain interest in their appearance, even apart from any decorative treatment; and, indeed, decorative treatment had much better be omitted entirely unless it is to be something very different from what has mostly been attempted hitherto. It is vexatious to see such buildings rendered still less homelike by the addition of bad and tawdry ornamentation, in the shape of pilasters and window-dressings cast in artificial stone, in a style which, at the best, could only be called "handsome"; but which, as carried out in some of the model dwellings, may rather be termed "'andsome" without the aspirate. If we are to give the poorer classes what is called "Classic" detail and ornament, let it, at least, be good Classic, from which they may learn something in regard to refinement of form and style in design. But I should be disposed to say, if you endeavour to decorate the poorer quarters of towns, do not be too artificial; if possible, let your decoration be such as will afford suggestions or reminiscences of that natural beauty which the poorer dwellers in towns so seldom have a chance of seeing in its reality,—something which will add life and piquancy to the street in which it is carved or painted. It is wonderful how much a bit of ornament, which seems to recall the life and growth of nature, will interest those who have to get nearly all their idea of nature by hearsay and recollection. A small tradesman in the East End showed, with interest, to the clergyman of his parish, his room covered with one of Morris's paper designs: "Seems as if it was all a-growing," was his comment; and this is what interests people under such circumstances,—something which seems to have life and growth, not mere conventional forms of architectural ornament, treated without the refinement or finish which is necessary to give them any value. Rather than this, it is far better to trust to mere outline and grouping and tone of the various materials for effect, and let so-called ornament alone altogether.

It must be admitted that the existing Metropolitan Building Act, with its preventive clauses in regard to forbidden materials and to the deadly sin of letting any portion of a building project or overhang, is a great impediment to picturesque architectural character, and in some ways quite unnecessarily so. In the City thoroughfares east of the Bank are not a few good substantial-looking old houses which overhang in their upper stories, giving more room inside, and very much improving the general effect by giving shadow and breaking up the straight line of street, and doing no harm to any one that I can see. The mischief of such incidents in building is not in themselves, but in their being attempted with bad and faulty construction. Here, again, we have the connexion between architecture and morality. If people could be trusted to build carefully and honestly, there would be little need of a Building Act, except to settle or prevent disputes as to party walls; but as this is not the case, all the excrescences of building have to be pared off by wholesale regulations which destroy the righteous with the wicked, and operate so as to lead to the conclusion that whatever is picturesque and characteristic is wrong, and that sanitary building is especially and indissolubly linked with ugliness. It is surely time to try if it is not possible to combine the picturesque with the healthful in building.

If the principle of model dwellings in great blocks is to be continued, one thing is certain,—that a much wider road-spacing ought to be insisted upon between buildings of such a height than generally exists at present. Even if we regard these immense blocks as only occasional resources for relieving pressure on an overpopulated district, they ought to be regarded as setting free a certain portion of ground as open space. If we could imagine all the parts of London where small houses are wanted rebuilt in houses of even two stories of tenements one over the other, we at once double the house-room over a given area, and ought to have spare room to widen the narrow alleys and enlarge the main streets and open places; and it would be worth while to try the experiment of building street houses of this class so that another story could be added to them with no practical difficulty and little disturbance of the inmates; so that when a district became overcrowded, and the demand for house-room in a certain quarter exceeded the supply, it would be merely necessary to add another story of dwellings. The facility for doing this would be much increased by the adoption in such cases of flat roofs, which would form the floor of the upper story when or if it was added, and in the meantime would afford in fine weather a recreation place for the dwellers below. Modern resources in the way of concrete and iron and cement leave no difficulty in making flat roofs (of course with a sufficient fall of the surface), and I have often thought their introduction in towns would prove in many ways very useful and advantageous.

The question of general arrangement of roads and open spaces is one which ought to be directly affected by the model dwelling movement,—by the principle of building houses vertically over each other, since this system necessitates, and ought, if properly managed to leave room for, much larger and wider streets than at present exist in East London, with the exception of the principal thoroughfares. These, such as Whitechapel High-street and Commercial-road, are large wide avenues; but there is much want of a breaking up of the intermediate crowded districts by wider streets, such as will afford more light and better circulation of air. And it is very desirable that such openings, in the parts nearer to the river, should be made at right angles to the river, so as to give the interest of distant glimpses of the water and the shipping, and act as ventilating conduits to lead the comparatively fresh air from the river up further into the town. The natural tendency in the growth of a town on the banks of a river is for the principal streets to run parallel to the river; and it is therefore desirable that some special thought should be bestowed on securing wide and open cross-communications, with the objects just mentioned. Another point to be arrived at in arranging new lines of street is to give prominence to any building that has any architectural beauty or interest, so as to make it as effective as possible in giving picturesque character to the neighbourhood. Some of the older East London churches have much that is very fine about them, which is nearly lost now. The visitor who goes to St. George's in the East for the first time meets with what may be called almost a *coup de théâtre* when, walking down the small and uninviting street from which the churchyard opens, he suddenly finds himself before a noble ornamental iron gateway, through which he sees the lofty façade of a large church thoroughly dignified and grandiose in appearance in spite of some odd and corrupt detail; and his next thought is (if he has any eye for architectural effect) what a pity that this fine front and gateway, with its overhanging trees, should not be visible down a vista of half a mile of road, instead of being only come upon accidentally in a corner. Unfortunately, the tendency seems to be to neglect and even spoil such chances where they exist. Spitalfields church, which also has a fine and effective portico that might be made the centre of some better surroundings, possesses likewise a very spacious churchyard planted with trees, which formerly extended right through from Commercial-street to the parallel thoroughfare of Brick-lane, so that both streets had the benefit of the trees. Not only is this space shut away from the public and unused, but lately the new schools have been built across one end of the space, cutting off the vista and depriving Brick-lane of its sight of the foliage.* In the building of new churches in East London a great mistake seems to have been made for some time back in the endeavour to build a number of small churches as economically as possible (churches at 4,000*l.* a piece or so), whereas it would be far better to concentrate the funds on a few large ones which would give the same accommodation and add something like architectural grandeur to the sites on which they were placed. How effective a large church may be in such a neighbourhood is seen in the case

* In reference to another open space, the locality known as "Mile-end waste," a clergyman in East London writes as follows:—"At the sides of the great artery of the East End are two banks sloping gently to the pavement. The banks are now mud-heaps, on which brawlers, mountebanks, and preachers collect. There is no authority to make such people move on, or to prevent the place being disfigured by rubbish and advertisements, in consequence of a difference between the vestry and the lord of the manor. The place, now so ugly, might be laid out with trees, seats, and fountains. So laid out, it would preach daily to thousands a lesson of order, if not of beauty. Proposals have been made to the vestry to assist in laying the ground out, if some guarantee could be given for its being kept up." Here is another opportunity for improvement almost, as one may say, going begging.

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of the new church in Whitechapel High-street, the tower of which also, when completed, will be an effective object, seen along a great part of Fenchurch-street and Aldgate, the tower being nearly central with the line of the latter street. One other suggestion may be made, which is not without its practical difficulties, but is worth considering; the possibility, namely, of introducing a little ornamental water in the form of basins or canals (in conjunction with fountains) into open spaces. Care must be taken to get sufficient flow through it to prevent stagnation, and it is no doubt an experiment to be tried with some caution, but water is so invaluable in brightening up a scene by its reflected light and colour that it seems worth while to try it.

After noticing some special things which give chances of picturesque effect, we may, on the other hand, notice some which are terrible eyesores, and which might be less so. In the first place, the large warehouses, which are necessarily erected in many parts of East London, and which form immense blocks of brickwork overlooking the street and shutting out the sunlight. In quarters entirely given up to warehouses this is of less consequence, though even there it might surely be an object to render such buildings grand and striking in effect, than which it might almost be said nothing is easier; the elements of architectural effect are all there and have only to be rightly used. But when such buildings are contiguous to inhabited quarters, it is rs lly a kind of moral duty in the owner who erects them, who, in all probability, is a wealthy man, living out in a pleasant country-house himself, to render them something which will add life and interest to the locality in which they are built, and not be only a new and gigantic shadow over it. In some quarters, notably in some parts of Wapping, this attempt has been made in a very laudable way; in other places, no thought of the kind has been given. The railway companies have an enormous power in their hands for making a place ugly or the reverse, and some of their large terminal stations are certainly on the whole improvements of the neighbourhood in which they are built, and would be more so if it were not for their hideously ugly expanse of iron roof. It would be possible, I think, to make a railway station almost as fine an object as a cathedral, but the attempt has hardly ever been made in the right spirit yet. The sin of the railway companies in regard to the East End consists rather in the horrible bridges which they put up over the streets, masses of iron girders at the sides, and in some cases the under side covered with a kind of ceiling formed of waste pieces of rusty corrugated iron, concealing the lower edges of the girders, and put together regardless of finish. This kind of thing is only done at the East End, where the theory seems to be that appearances are of no consequence; and unless the West End takes up such matters, those whom they immediately affect have little chance of making their voice heard. There is another source of architectural beauty and interest in towns,—the gasometer. A great outcry against gas has been made by æsthetic people lately. In the little light blue books which are being published by Messrs. Macmillan, to tell us how to put art into our houses, gas is never mentioned without denunciations in the most withering terms, chiefly because it is supposed to be unwholesome and to spoil things. This, however, is because people have persisted in burning gas without making the slightest provision for carrying off the products of production and the heated air from their rooms,—a mere want of common sense; and when people do what is contrary to common sense they generally suffer for it. A much more serious charge against gas is that it presupposes gasometers; and what to do in mitigation of the ugliness of the gasometer it is, indeed, difficult to say. We might illuminate them with pious texts or moral maxims; indeed, the whole Sermon on the Mount could be got on to one of them large enough to be read for half a mile round. A Utopian idea of architecturally getting rid of them did occur to me the other day. There is usually a certain amount of free ground round a gasometer. It is not necessary to have the workshops close up to it. Might not a gas company and a model-dwelling company purchase ground and go in for the thing together, the model dwellings being built in a circle round the gasometer, thereby affording opportunity for a *coup d'œil* almost equal to that of the Colosseum, shutting out from view a hideous object, and all in the way of fulfilling practical ends? It is possible, however, that the gasometers will remove themselves, in the ordinary course of events, before many years are run out. There are indications that electric light is not unlikely to take the place of gas.

As to the agency by which any improvements such as those above suggested (supposing them to be desirable) can be carried out, that, indeed, is a very large and very difficult part of the subject. We might propose and carry a resolution that it is desirable that East London be rebuilt; but who is to do it? The question is partly mixed up with one upon which there is some, though I think not much, difference of opinion; namely, whether efforts to provide improved and pleasanter dwellings for the poorer classes should necessarily be planned on the basis of a remunerative investment. No sane person, one may suppose, will have any doubt that as a rule they should be so, as the only sound principle to go upon; there is only this to be suggested, on the other hand, whether through long neglect of the problem the evils to be cured have not got to such a crisis that only a great and exceptional effort can make any impression upon them or give any new start to improvement; and whether it is not even to the interest of one-half the community, putting aside percentages for the moment, to expend some of its wealth in enabling the other half to make a beginning of living in more cheerfulness, comfort, and health, which will be returned in the general advantage accruing to the whole community from the better health and happiness of its most hard-working portion, in the next generation, if not in this; and whether, under the circumstance, too unyielding an adherence to the economic system is not likely to amount to a putting in practice of the sixth commandment in the form in which it is put in Clough's bitterly sarcastic verses called "The Modern Decalogue":—

> "Thou shalt not kill—but need'st not strive
> Officiously to keep alive."

But that kind of striving is just what is required,—not merely to provide ordinary sanitary conditions, but to make life for the poorer classes in towns something pleasanter than it is,—something more than mere existence. Good drainage is a great thing; but man cannot live by drainage alone. Of course, those to whom we should have the most direct right to look for assistance in improvements are the owners of East-end property. About the relations of owners and property in that part of London, I do not know much; but I believe it is for the most part in small properties in a great many hands, which is, of course, an additional difficulty in the way of enlisting landlords in the good cause, as the presumption is that, under these conditions, few of them are likely to have much margin in the way of available capital to lay out; and, indeed, I know that not unfrequently there is great difficulty experienced in compelling landlords of East London property even to do what is their legal duty in keeping houses in proper repair. But it is to be hoped that no discussion of such a subject, even if it can lead to no immediate practical result, is entirely thrown away if it sets any one thinking about it who has not before done so.

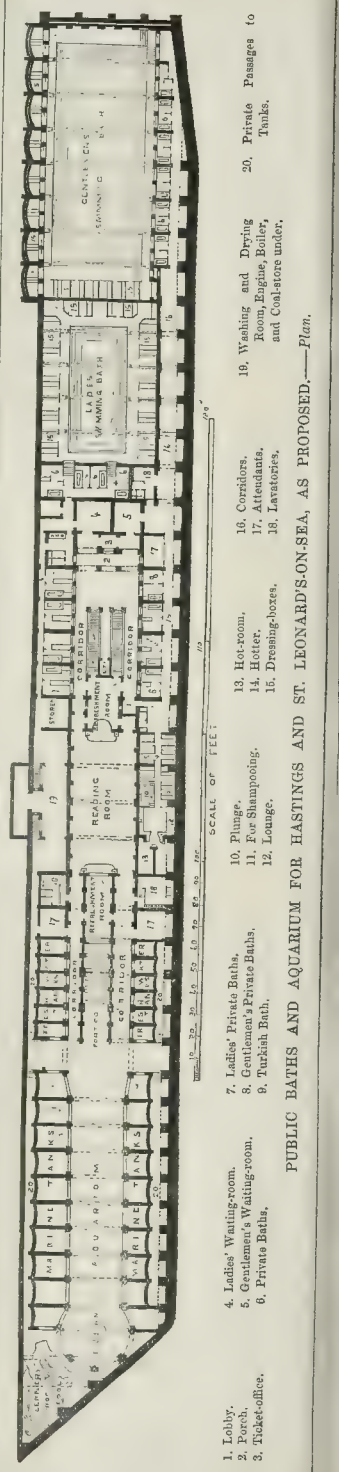
PROPOSED HASTINGS AND ST. LEONARD'S PUBLIC BATHS AND AQUARIUM.

MR. THOS. BRASSEY, M.P., has opened a portion of the building contemplated by the projectors of this establishment,—namely, the Baths. We give some illustrations, including a plan and description of the whole scheme.

The baths occupy the western portion of the site, and are to be approached by a double flight of steps leading to an open portico, on one side of which will be placed the entrance to the gentlemen's baths; that to the ladies' being on the other. Between the two entrances will be a check-taker's office.

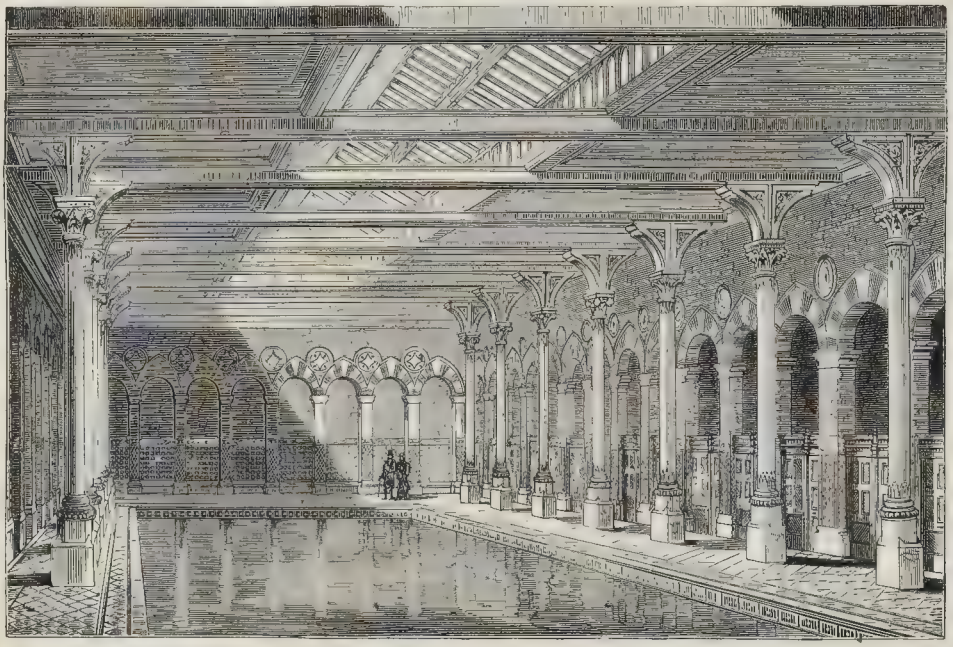
On either side of the large open area will be placed the first-class private baths for the two sexes, four in number, each consisting of a bath-room, with dressing-room and convenience attached. These will include every description of bath,—hot and cold, fresh and salt water, slipper, shower, douche, medicated, vapour, hot air, and various hydropathic packs and foments.

Besides these, six more private baths are provided on the gentlemen's side, and three on the ladies', each having access to the swimming-baths. These will be supplied with hot and cold, fresh and salt, water only.



1. Lobby.
2. Porch.
3. Ticket-office.
4. Ladies' Waiting-room.
5. Gentlemen's Waiting-room.
6. Private Baths.
7. Ladies' Private Baths.
8. Gentlemen's Private Baths.
9. Turkish Bath.
10. Plunge.
11. For Shampooing.
12. Lounge.
13. Hot-room.
14. Hotter.
15. Dressing-boxes.
16. Corridors.
17. Attendants.
18. Lavatories.
19. Washing and Drying Room, Engine, Boiler, and Coal-store under.
20. Private Passages to Tanks.

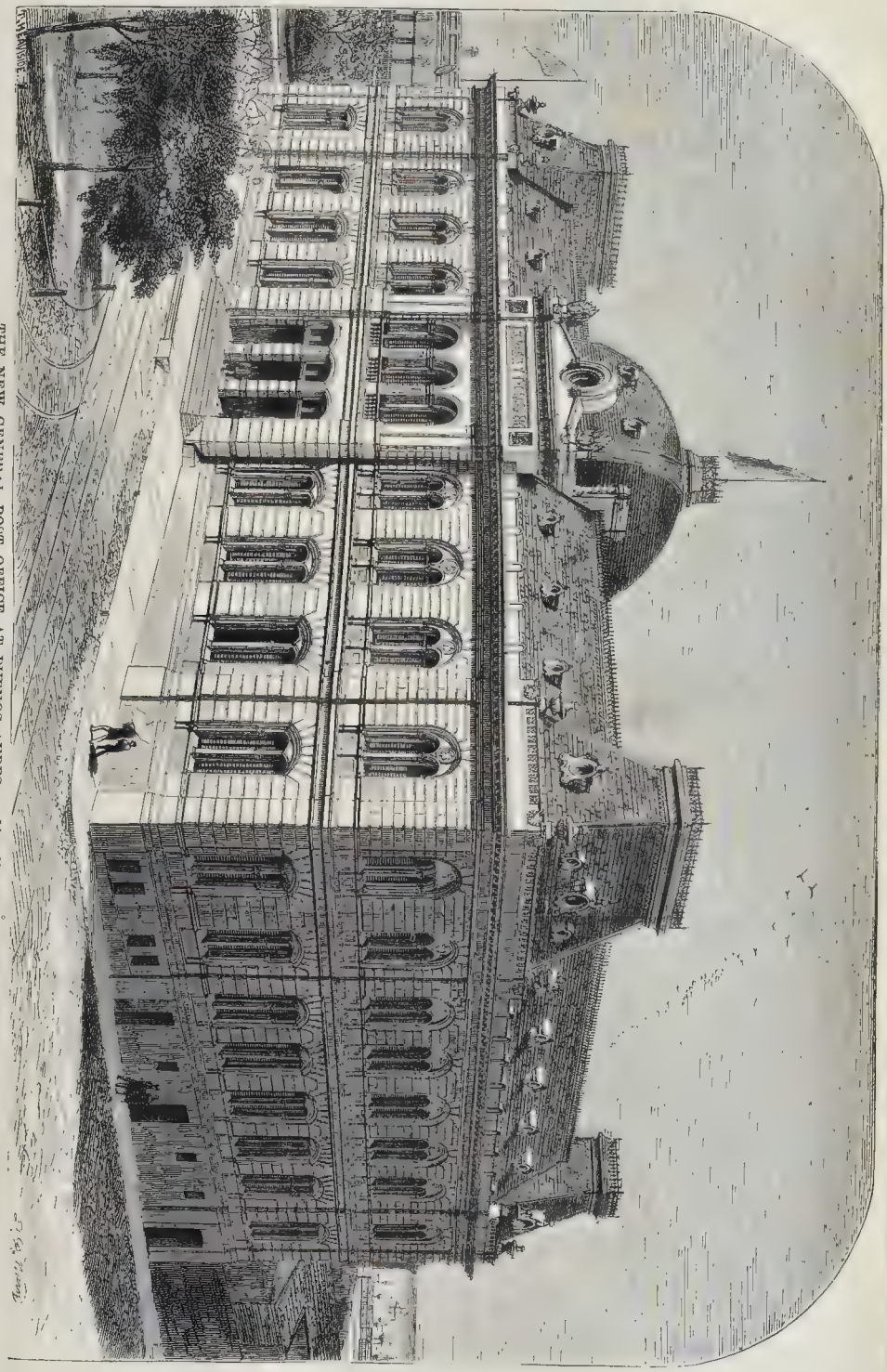
PUBLIC BATHS AND AQUARIUM FOR HASTINGS AND ST. LEONARD'S-ON-SEA, AS PROPOSED.—*Plan.*





PROPOSED HASTINGS AND ST. LEONARD'S PUBLIC BATHS AND AQUARIUM.

MESSRS. CROSS, JEFFERY, SKILLER, & WELLS, ARCHITECTS.



THE NEW GENERAL POST OFFICE AT BUENOS AYRES.—MR. HENRY ÅBERG, ARCHITECT.

The gentlemen's swimming-bath is approached by a spacious corridor, 8 ft. wide, and has an area of water 100 ft. by 40 ft., with dressing-boxes on two sides.

The ladies' swimming-bath will be fitted up similarly to the one just described. The water will be kept in motion by jets round the edge, and will be made tepid by means of steam-pipes. The depth will vary from 3 ft. 6 in. to 6 ft. 6 in.

Lavatories and conveniences, attendants' rooms, and also a separate waiting-room for ladies and gentlemen, are provided.

To make the bathing establishment complete, a small Turkish bath will be attached. The whole of the sea-water will be filtered, that for the private baths being pumped up into cisterns, and that for the swimming-baths being let in and out according to the tide.

The Aquarium, which may or may not be carried out, was placed in the original scheme at the eastern end of the site. It contains two rows of marine tanks, eight in number on either side of a promenade 20 ft. wide, terminating in a circular end, with a fountain in the centre. Beyond this it was proposed to construct a grotto, or cavern, space for table aquaria, and twelve fresh-water tanks in two corridors, with cloak-rooms, office for curator, and room for aquarium manager.

In the centre, between the baths and aquarium, and accessible from both, it was proposed to place a large room 65 ft. by 30 ft., with refreshment-bars, &c., which could be fitted up as a reading-room, lounge, billiard, or concert room, as thought desirable.

The architects engaged are Messrs. Cross, Jeffery, Skiller, and Wells.

THE NEW GENERAL POST OFFICE AT BUENOS AYRES.

THE new Post-office is situate in the Plaza, 25, de Mayo, on the site of the old fort, the headquarters of the Spanish Viceroys in former times, before the inhabitants had thrown off the yoke of the old country.

Alongside is the old and unsightly National Government House, erected long before the people or their rulers took any interest in the appearance, conveniences, or comfort of their structures. For some years past a notable change in this respect has been gradually developing itself, and many imposing private and public buildings are now to be seen in and around the city. And, although the taste displayed is often of a very questionable character, and indicates too frequently a straining after effect, at variance with all recognised architectural principles, a more healthy tone seems to be setting in at last, and the grotesque vagaries of the Italian bricklayers, hitherto prevailing, are now decidedly on the wane.

The frontage of the building forming the subject of our illustration comprises 50 mètres, with a depth of 35 mètres. The ground-floor contains all the necessary offices for the receipt, delivery, and transmission of letters, in addition to a complete suite of rooms for the telegraph department.

On the upper floor are found the private apartments of the Director-General, with spacious and convenient offices for the very large administrative staff the exigencies of the service now demands, owing to the Republic having entered into the Berne Postal League.

The decoration of the interior is handsome and effective; notably so in the grand entrance and staircase hall, which is embellished with a bold allegorical design in sgrafito,—the first example in the country of this style of decoration.

The cost of the entire building, including all the necessary furniture, amounts to four million dollars paper currency, or about 28,000*l.*, which contrasts well with the extravagant sums previously lavished on some of the other public buildings.

The architect of the work throughout is Mr. Henry Åberg, a diploma'd ex-pupil of the Stockholm School of Fine Arts, whose designs for a continuation of the same building to replace the present unsuitable Government House was a feature amongst the Argentine exhibits in the Philadelphia Exhibition.

The Obelisk is alongside of its destination, and the removal of its iron case is being commenced. We postpone particulars, however, till the work is further advanced.

"LA CAPITANIA GENERAL DE PUERTOS" AT BUENOS AYRES.

THE "Capitania" in Buenos Ayres has been erected from the designs of the architect of the Post-office, Mr. Åberg. It forms the headquarters of the port captain-general, under whose orders are all the other ports of the Republic. The duty of this official is to exercise a supervision of the river police and pilots, and to regulate generally all matters appertaining to shipping and kindred affairs.

The building is situate immediately in front of the passengers' mole, and is, consequently, the first and most prominent object attracting attention on landing. It extends from the beach to the street behind, which is on a higher level, and here is installed the Department of Agriculture, immediately in front of the English church.

All the offices requisite for such an establishment are found conveniently arranged. On the ground floor is a large open court, and the general quarters for the sailors attached to the department. Above are the apartments of the captain-general, and rising from the roof is a square signal tower, whence is obtained an excellent view of the river and the shipping in the outer roads.

Singular to say, the present occupant of the post of captain-general is a doctor in medicine.

The total cost of the entire building is about 16,000*l.*

MEDALS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE last ordinary general meeting of this Institute for session 1877-78 was held on Monday evening last at Conduit-street, Mr. Charles Barry, president, in the chair.

Mr. W. H. White, the secretary, announced the decease of Mr. Matthew Thompson, of Newcastle-on-Tyne, Fellow.*

Mr. F. P. Cockerell introduced to the president M. Charles Lucas, who had been deputed by the Société Centrale des Architectes, Paris, to represent that body at the Conference. Mr. Cockerell also read the following letter:—

"*Société Centrale des Architectes,*
Fondée en 1840, Déclarée d'Utilité Publique en 1865,
Séant à Paris, Quai de l'Horloge, No. 23.

Paris, le 29 Mai, 1878.

A Monsieur Charles Barry, Président de l'Institut Royal des Architectes Britanniques.

Monsieur et Honoré President,—La Société Centrale des Architectes étant dans le désir de se faire représenter à la Conférence Générale qui doit s'ouvrir à Londres le 3 Juin, 1878, a désigné Monsieur Charles Lucas, Secrétaire-rédacteur pour assister à cette Conférence et lui en rendre compte.

Nous vous prions donc, Monsieur et honoré Président, de vouloir bien considérer Monsieur Charles Lucas comme Délégué de la Société Centrale, et de lui communiquer, à ce titre, tous les documents de nature à l'aider dans sa mission.

Veuillez agréer, Monsieur et honoré Président, l'assurance de notre considération de la plus distinguée.

Pour le Président, Membre de l'Institut,
Le Vice-Président,
EDMOND DE JOLY.

Pour le Secrétaire-principal, le Secrétaire-adjoint,
E. CERNESSON."

Among the recommendations for membership read, there occurred the names of Mr. John Oldrid Scott, who desired to be admitted as a Fellow; Lord Seaton, who sought to become an Honorary Associate; Mr. Charles Edward Barry (a son of the president), who desired to be admitted as an Associate; and Mr. Charles Henman, an old Fellow of the Institute, who wished to be transferred to the class of Honorary Associates.

The following gentlemen were then balloted for and duly elected, viz.,—As Fellows: Mr. Edward Hughes,† of Huddersfield; and Mr. James Thompson, of Glasgow; as Honorary Associate: Mr. John Clutton, of Whitehall-place.

The secretary announced several donations to the library, including two drawings of Venice, presented by the widow of the late Mr. Wightwick. Thanks were accorded to the donors.

The President also called attention to a number of engravings of old city churches in London, which had been secured by Mr. Kershaw, the zealous librarian, who was ever on the alert to make the Institute collection of engravings of these churches as complete as possible.

* Recorded, with some particulars of his career, in the *Builder*, p. 543, *ante*.

† As mentioned by Professor Donaldson, Mr. Hughes's nomination paper was signed by the late Sir Gilbert Scott, and is probably the last official document connected with the Institute bearing his signature.

THE ROYAL GOLD MEDAL.

The President, addressing Mr. Waterhouse said:—It is a personal gratification to me that it becomes my duty this evening to be the medium of conveying to you the outward symbol of the high esteem in which you are held by your professional colleagues. It is unnecessary for me to explain to you, an old member of this Institute, the meaning and intent of the Queen's Gold Medal, which has now for many years been so graciously committed to our body, and as to the annual destination of which her Majesty is always ready to take our advice. No personal favour originates or can confer this honour. It is absolutely free and open to those—and those only—who, in the opinion of their colleagues and rivals, merit it. This being so, I can sympathise with and fully appreciate the feelings of pardonable pride with which you will receive it.

You have this year been chosen by your colleagues here from among many worthy men and eminent architects like yourself. The Council's recommendation has been ratified and endorsed by the concurrence and approval of all the members of this Institute, and you deservedly find yourself one in a list of eminent men to whom this medal has before been accorded. Their ranks have unhappily been recently thinned by the death of some of those most distinguished amongst them in the past and present generation; but their places will, I cannot doubt, be filled by those who, as in your case, are no unworthy successors.

That this is no metropolitan honour, but an Imperial one, is evidenced by the choice in you of a man who, beginning his practice in the provinces,—becoming there by his rare merit distinguished as an architect,—has followed up that early promise by coming to London, there also to hold his own and increase his fame by the erection in the metropolis of buildings which are worthy sequels to his provincial triumphs in such works as the Assize Courts, Owen's College, and, latterly, the magnificent Town-hall of Manchester. Here in London your fame may well rest on so successful a work as the Natural History Museum promises to be when it has been completed and received its final impress from your hand.

I can well believe that the well-known modesty of your disposition will shrink from these references to your title to receive this medal, but as president of this Institute it is my duty, even if it were not my pleasure, to record some few of the works which own you as their author. Besides those to which I have referred, it is but right to allude to the great works done by you at Balliol, Pembroke, and Caius Colleges at Cambridge, to your great hotel at Liverpool, and the Seamen's Orphanage in that city, to the numerous mansions of our nobility to which you have added architectural beauties,—in all parts of England,—of which I will spare your susceptibility the detailed list, as they are doubtless well known to, and admired by, many now in this room. Suffice it to say that whether in municipal, ecclesiastical, or domestic works you have fully shown yourself, in the best of all senses, "A Master Mason."

We in this Institute are not alone in according to you well-merited honour. It is pleasing to us to remember that this present year has seen you elected as an Associate of the Royal Academy, and we feel that in your person that body has only justified its own position in professing to be the representative of all the fine arts amongst which we architects proudly claim that our art should be recognised to even a larger extent than is or has been the practice of that rather exclusive body.

May you live long to enjoy the honour thus conferred upon you, and I hope I do not misunderstand the ambition of a true architect if I anticipate that this honour done you by your compeers will be amongst those most cherished by you, whatever higher or further dignities may be in store for you.

Mr. Waterhouse, who was very cordially received, replied as follows:—Mr. President and gentlemen,—It is somewhat unfortunate that when one most wants words, they are not at his command. I wish I had them to-night, and fitting words, to express to you the deep sense I have of the honour you have done me in recommending to her gracious Majesty my name as that of your chosen recipient of the gold medal this

year. This distinguished honour has come upon me very unexpectedly. I have no right, I feel, to criticise in any way the award in this case; but, Mr. President, in the midst of the flattering words you have just uttered, you have forgotten to mention one circumstance which I think I shall not be improperly revealing "state secrets" in mentioning now, and that is, that if one or two members of the Council,—I speak for myself as one,—had done their duty as they ought to have done, somebody else would have been making this acknowledgment to you now—("No, no."). I cannot conceal from myself, gentlemen, that there are others who have claims to this great honour far in excess of my own. Of course it would be idle in me, after the long catalogue of my shortcomings that the President has presented you with, to pretend that I have not had great opportunities, thanks to those who have accorded to me their generous confidence; but I confess it is somewhat humbling to me to reflect that there are others who have had fewer opportunities, but who yet have done better work, who have not yet had their gold medal. These reflections have forced themselves upon me repeatedly since the day I heard of your generous determination to award me this most distinguished proof of your regard. Many of those, and, indeed, I may say *all* of those, who have preceded me in this high honour, have been men who have been distinguished for their learning and attainments in a way that I can make no approach to: they have been distinguished for archæological knowledge and research as well as for their genius as practical architects. I accept this medal at your hands as a proof that you are willing to recognise one who would put in a plea for architecture to be considered, on *some* occasions at any rate, as distinct from style or archæology. I thank you, in conclusion, most heartily. You have given me a possession which will always be amongst the most precious that I can possibly have, and it will not only be felt so by me, but by all my descendants as long as I have any. (Mr. Waterhouse was repeatedly cheered during his speech).

OTHER MEDALS AND PRIZES.

The President then proceeded to distribute the other medals and prizes offered by or through the Institute, the recipients being warmly applauded. Mr. Barry said:—It is now my pleasure to aware the prizes which have been gained in the various competitions which have taken place during the past year within the walls of the Institute. The *Soane Medallion** has been worthily gained this year, in a contest between more than the usual number of competitors, by Mr. H. M. Robinson, who is unfortunately ill and unable to be here to receive it. The secretary, in transmitting it, will, I am sure, convey to him that appreciation of his merit which you would have manifested by your applause had Mr. Robinson himself been here. The *Tite Prize* of 30*l.*, which was not awarded last year, has this year been gained, and fully gained, by Mr. Henry Tanner. I have much pleasure in presenting Mr. Tanner with this prize. The name of it brings back to our memories one of the most practical architects who ever lived, but who has now passed away. He who gains this prize must needs be a practical man himself. The *Grissell Gold Medal* has been gained by Mr. W. G. B. Lewis. This prize was founded by a very hard-working and successful man, and I hope Mr. Lewis will be like him. An extra prize, a *Medal of Merit*, in the same competition, has been awarded to Mr. J. Martin Brooks, whose father is well known in this room as a very old and esteemed member of ours, and it must be a pleasure to him, as it is to us, to see one of his sons coming forward thus early and gaining one of our prizes. The *Institute Medal* and 5*l.* 5*s.* have been awarded to Mr. G. H. Shackell. This is the first prize Mr. Shackell has gained here: I trust it will not be the last. An extra prize, in the shape of a *Medal of Merit*, has been awarded in the same competition to Mr. Fred. Pinches, who is, unfortunately, not here to receive it. A second extra prize, in the form of a *Certificate of Honourable Mention*, has been awarded to Mr. B. Priestly Shires. This is the third prize in the competition: Mr. Shires will, I hope, let it lead to the first. The *Pugin Travelling Studentship*, which always attracts a great many competitors, has been gained this year by Mr. G. W. Browne. I am sorry Mr. Browne is not here, as I should have liked to introduce him to you. I am sure he will in future days be known to many of us. He has, as I have already announced, gained the Pugin Studentship this year, and gained it very worthily. The competition for the studentship always seems to be very attractive, and results in the production of some excellent drawings. This was peculiarly the case this year; in fact, there has been so much excellent work submitted that there was a general desire on the part of the Council to award extra prizes. The generosity of an old and respected member of the Institute, now, alas! deceased (Mr. Edmund Sharpe), enabled them to award as an extra prize the *Sharpe Prize* of 10*l.*, which has been gained by Mr. W. J. Millard. It is offered in the shape of books, which will enable Mr. Millard to proceed with the studies which he has so successfully entered upon. In addition to this, the Council felt that a second extra prize, in the form of a *Medal of Merit*, was due to Mr. Sydney Vacher, who was only third on the list because there were a first and second. With this pleasing ceremony we conclude the ordinary business of our session,—a session which has been one of some degree of labour and trial, but one fraught with a great deal of happiness to many of us.

The General Conference of Architects then commenced its deliberations. We give elsewhere a copious report of the first four days' proceedings, as also of the Institute Dinner, which took place on Tuesday evening.

* With the sum of 50*l.*, added under the usual conditions of Continental study.

MYCENÆ.

On the 29th ult., at the Society of Arts, Mr. William Simpson read a paper on "Mycenæ, Troy, and Ephesus," illustrated by a large number of his own capital drawings and sketches. It will be found in the journal of the Society, where those who are interested in the questions raised by Dr. Schliemann will doubtless seek it. We print a portion of Mr. Simpson's observations on Mycenæ:—

Mycenæ was, according to the story, the capital of King Agamemnon, who commanded the Greeks in the expedition to Troy. It is almost hidden in a corner of the plain of Argos, where it is situated in a ravine between two prominent hills. Portions of the old walls forming the Acropolis are still standing. Some parts of them are yet good, and in such condition that they might be useful for defence in the present day. Without the walls are the remains of some tombs, and a fragment of an old Cyclopean bridge; and that may be said to be all that has been left of the ancient capital of Argos. It is not much, but when time is considered, we may marvel that even this much has been left to us. According to the usually accepted history, Mycenæ was destroyed in the year B.C. 468, and the place was supposed to have been deserted at that time, and to have remained so ever since. The absence of population may perhaps explain why it has withstood the ravages of so many years; to this may be added the lucky circumstance that there was also no town close at hand to use the old walls as a convenient quarry. The place seems at a very early date to have dropped out of history, and to have been lost, or, at least, forgotten; to these causes, perhaps, we owe the existence of some most interesting specimens of early building, and the safe preservation of the oldest specimen of sculpture in Greece, that is, the lions over the gate of the Acropolis. This obscurity in which Mycenæ was shrouded can be evidenced by what Strabo says, for he states that it had been razed by the Argives, and that in his time not a trace of the city was to be seen (lib. vii., c. iv., 10). The out-of-the-way corner in which this old city] stands, may explain why so little was known of it, and will account for Strabo not finding the spot, or it may lead us to understand why those whose information he had trusted chanced to be unconscious that the old Cyclopean walls were still visible.

A century and a half later, Pausanias seems to have had more success in seeking for the capital of Agamemnon, and his description of it is so exact that we may assume he visited the spot and saw it with his own eyes. As this author writes with all the minuteness of an inventory, it may be as well to give his words. He says,—

"Among other parts, however, of the enclosure which still remains, a gate is perceived with lions standing on it, and they report that these were the work of the Cyclopes, who also made for Prœtus the wall in Tiryns. But among the ruins of Mycenæ there is a fountain, called Perseæ, and subterraneous habitatious of Atreus and his sons, in which they deposited their treasures. There is also a sepulchre of Atreus, and of all those who, returning from Troy with Agamemnon, were slain at a banquet by Ægistheus. For there is a dispute between the Lacedæmonians, who inhabit Amyclæ, and the Mycenæans, concerning the sepulchre of Cassandra. There is also a tomb here of Agamemnon, and of his charioteer, Eurymedon, and one sepulchre in common of Teledamus and Pelops, who, as they report, were twins, and the offspring of Cassandra, and who, while they were infants, were slain by Ægistheus at the tomb of their parents. There is likewise a sepulchre of Electra, for she was given by Orestes in marriage to Pylades, from whom, according to Hellanicus, she bore two sons, Medon and Strophius. But Clytemnestra and Ægistheus are buried at a little distance from the walls; for they were not thought worthy of burial within the walls, where Agamemnon and those that fell with him were interred." (lib. ii., c. xvi.)

Although these words were written over seventeen centuries ago, in the main they give a fair account of the place as it exists at this moment.

The principal part of the walls are of the most primitive style of Cyclopean masonry; that is, of large and seemingly unhewn stones, without mortar or cement of any kind. Where such rough stones leave wide spaces between, these openings are filled up with smaller stones. . . . .

Many suggestions have been made by way of explanation of these two lions and the pillar, but as yet no definite conclusion has been arrived at. One theory is that the pillar was a symbol which had reference to the Persian solar worship,—another conjecture made the pillar sacred to Apollo under the title of Agyieus, in which character Apollo was the guardian of streets and public places, and that he would thus be the appropriate deity of gates and vestibules. I will give a quotation from the "Iphigenia in Tauris," which we may suppose is an authority on matters of this kind. It is Iphigenia, the daughter of Agamemnon, who speaks. She says:—

"Methought, that having changed this barb'rous land
For my dear native Argos, there once more
I dwelt and slept amid my virgin train;
When, lo! a sudden earthquake shook the ground;
I from the tott'ring chamber frighted fled,
And where I stood aloof, methought, beheld
The battlements disjointed, and the roof
From its aërial height come tumbling down.
One only pillar, as it seem'd, remain'd
Of all my father's house; whose capital
Was with dishevell'd golden tresses hung,
And, stranger yet, with human speech endow'd.
This pillar, reverently acting then,
The duties of the function here enjoin'd me,
I purified with water, as ordain'd
For sacrifice, and as I wash'd, I wept."—v. 44.

This only pillar she identifies with her brother Orestes, and a few lines further on she adds:—"For sons are pillars of a family." As representing the son, the pillar is thus a symbol of the continuation of the family, and of the stability of the house. To this Iphigenia adds another function, which is quite in keeping with the involved nature of ancient symbolism. She, believing that her brother was dead, purified the pillar with water, as ordained for sacrifice, thus making it a funeral stele, or altar. The lions, in this view of the subject, would thus become the guardians of this sacred column, and at the same time they would be the guardians of the gate, and of the house of Pelops. It would be curious if the lions at church doors, which were common about the twelfth century in Italy, could be traced back to this ancient example at Mycenæ. The gate, as a seat of justice, is most ancient, and the church-door became a place, in the Middle Ages, where decrees were published; the lions were such a recognised feature of the door, that many of the proclamations and documents began with the formula of "*Inter Leones.*" (De Caumont, p. 168.)

Another important consideration is the origin of the style of sculpture on this slab. Up to the present, scarce even a guess can be made as to the date which ought to be assigned to it. The art upon it is good,—so good that it implies progress and a considerable period of time to reach the condition of culture necessary to produce such work. It stands alone, and unconnected with any other specimens of art in Greece. We have no other works which could be pointed to as the steps leading to the state of development indicated in the high finish of these lions. They seem to belong to a different school from that of the later Greek art. The problem has been as to where the influence which produced this style came from. The usual explanation has been that of an Asiatic contact. This theory, of course, involves the still broader theory that the first influence which gave birth to Hellenic art came from Asia. The strong resemblance in the style of art on these lions at Mycenæ and the sculptures

from Nineveh, has naturally led to the supposition that the style came originally from the valley of the Euphrates. Or it may have been in some allied school which flourished in Phœnicia, for we know from Homer that Sidonian art was, at an early period, much valued by the Greeks. From the most remote period there was a constant communication between Greece and the north-west corner of Asia Minor, and this link would also explain how art-knowledge, or even the artists themselves, might be transported from the one region to the other. The story of Pelops coming from Lydia, and being able to give his name to the whole Peloponnesus, may be partly, or even wholly, mythical; and yet the probability is, that some migration of power, or of race, took place, and with it would, no doubt, be carried whatever superiority in art the invading race may have chanced to possess. The Greek authorities seem also to favour this idea. Pausanias states,—and we may suppose that he gives the explanation which was current at his time,—that the gate and the lions upon it were the work of the Cyclops, "who also made for Prœtus the wall in Tiryns." Now, Prœtus, according to the story, had been for some time an exile from the Peloponnesus, at the court of Iobates, the king of Lycia, and from Strabo we learn that the Cyclopes came from Lycia. Thus far there seems to be an agreement in the tradition as to the direction from which these workmen came. When we ask as to who or what these Cyclopes were, nothing like a satisfactory answer can be derived from the allusions to them which we find in the Greek authors. According to Strabo, there were seven of them, and they were called Gasterocheires, or "hands and stomachs," because they subsisted by means of their art. These Cyclopes from Asia seem a very different race from those described as belonging to Sicily, who had only one eye in the middle of their foreheads. The only point of resemblance between them was, that both were connected with labour and with art. Those of Sicily were supposed to be the assistants of Vulcan, and were, of course, metal-workers, whilst the Cyclopes of Asia were stone-builders. As the stone age dates before that of bronze, we may assume it as probable that the Asiatic Cyclopes belonged to a more primitive period. The questions connected with these ancient art-workmen are very important, and are very tempting to go further into in a paper for a society such as the Society of Arts, but I must limit my remarks, and proceed with the subject. . . . .

It was just within the Gate of the Lions, and close to the outer wall of the Acropolis, where Dr. Schliemann made his excavations. Here he came upon the five tombs,—a sixth has since been discovered by M. Stamataki,—which yielded such a harvest of golden treasures. Instantly on discovering these tombs, Dr. Schliemann declared to the world that he had found the graves of Agamemnon and of those killed with him, by Ægistheus, on their return from Troy. The value of this declaration may be estimated when it is known that our best archæological authorities on such matters, both here and on the Continent, cannot agree as to the probable date of the objects which have been found; and I may add, that there is a very wide interval of time implied in this uncertainty by the various theories which have been suggested. The few sculptured stones which were brought to light most certainly do not belong to the same style of art as that on the Gate of the Lions. The work on the lions is good, and the men who produced them are fully entitled to be called artists; but it would be an abuse of that term to apply it to those who executed the ornaments and figures on the stones lately found in the excavations of Mycenæ. Whether they belong to a primitive period, and were the early efforts of art, or that they indicate a deterioration in taste, and ought to have a late date assigned to them, is one of the questions at issue; and, unfortunately, the materials necessary to guide us in giving a judgment on such a point are as yet rather scanty.

One very remarkable monument was uncovered in these excavations, and it might be said that every feature connected with it was new to the student of Greek archæology. On this account it was rather a puzzle to explain its purpose. When fully laid bare, it presented much the appearance of being what we understand by a Druidic circle. A close inspection showed that the slabs had been wrought, and that they were carefully fitted to each other; round a portion of the circle a second circle of slabs was still standing; this second circle was concentric with the first, and only about 3 ft. apart; at one place there remained a few slabs, which formed a covering between the two circles. These horizontal slabs were mortised into the perpendiculars. That these covering slabs were originally all round the circle was evidenced by the existence of the mortises on many of the upright slabs. These were distinctly visible, and the conclusion which had to be formed from this was, that when the structure was complete, it must have formed a circular ledge or seat. It was nearly 100 ft. in diameter, and the whole suggested the idea of an arena, or place for some public performance. At the point of the circle nearest to the Gate of the Lions the entrance to this enclosure still remains.

It was while sketching on the spot that I was able thus to realise what the place had been at first, and recalling the description of the Shield of Achilles, where there is a crowded assembly, and the trial of a case is going, the poet says, that "the elders sat upon polished stones, in a sacred circle" (Iliad, lib. xviii., v. 503). The word rendered "polished" might also be given as "smoothed," or "worked," as applied to the stones; and thus we have a Homeric description which agrees perfectly with this discovery at Mycenæ. On sending home my sketches to the *Illustrated London News* of the spot, I suggested this explanation of it, and in addition to the account in the Shield of Achilles, I added a reference to the Agora of the Phæcians (Odyssey, vi., v. 265), which is also described as being round in form. Additional references have been made by others as to the circular character of ancient Greek Agoras, and this theory is now that which is generally accepted in regard to this monument.

It would be a very important point if it could be determined whether the Agora was appointed at this spot after the tombs, or if the important personages had been buried there as a mark of honour. Instances of Agoras, with tombs and monumental shrines within them, did exist. Pausanias mentions that among the Megarenses there is a senate in the place which was said to be the sepulchre of Timalcus (lib. i., 42). He also states that these same people built their place of consultation "in such a manner that the sepulchre of heroes might be contained within its ambit" (lib. ix., 43). In the city of Elæa he also mentions a stone sepulchre, and states that it "is in that part of the forum which is in the open air" (lib. ix., 5). Themistocles died at Magnesia, where he was buried, and according to Plutarch a very handsome monument was erected to him, "which still remains in the market-place." Herodotus states that "there was, and still is, a shrine dedicated to Adrastus, son of Talaus, in the very forum of the Sicyonians" (v. 67). In the Agora of Corinth, according to Zenophon, there was the sepulchre of Euphron. Some of these instances seem to imply that the place of public assembly was arranged so that the ashes of the heroes who were buried there would give a sanctity to the place. The circle of stones upon which the elders sat, as described on the Shield of Achilles, is called a "Sacred Circle," which confirms this idea. Where persons of distinction have been interred in an Agora, or had a sepulchral monument raised to them, it has evidently been done as a mark of high honour. Hence, in whatever way we may interpret the graves discovered in the Agora of Mycenæ, we need not hesitate to accept the theory that they were individuals of high repute, and that they must have been held in considerable honour by the inhabitants of the place. The amount of golden objects found with the bodies, the value of which has been estimated as equal to 5,000 British sovereigns, becomes another evidence in confirmation of this.

There is another class of monument at Mycenæ which I consider to be of great importance, as bearing not only on the archæology of that place, but also in relation to the whole question of the origin of Greek art or architecture. These are the so-called Treasuries, of which there are two almost perfect specimens at Mycenæ, and a number of smaller and ruder examples as well. There are others in various parts of Greece, one of the best known amongst these being the Treasury of Minyas, at Orchomenus. Still, none of these are in such good preservation as that of the so-called Treasury of Atreus. It is a splendid dome of wrought rectangular stones, about 50 ft. in diameter, and about the same in height. The stones are laid in courses horizontally, and not arranged on the principle of the arch, this being the primitive mode of construction for domes nearly all over the East. The stones of this dome are not large, but the entrance is formed with two very large blocks, which do duty as lintels. One of these, the inner one, is 27 ft. long, 17 ft. wide, and 3 ft. 9 in. thick. The second block is not so large as this, but still is an enormous mass of stone. Strong as these blocks are, the builders here again give us an illustration of the care with which they did their work, for over these huge lintels they have left a triangular opening similar to that at the Gate of the Lions, so as to relieve them from the weight of what was above, thus identifying the two structures as belonging to the same school of architecture.

In speaking of this monument I have used the term "so-called Treasury," and I have done this because I dissent entirely as to the character which is thus implied by the name. I had been familiar with the structure before my visit to Mycenæ from the usual representations of it in architectural works, but I had never thought seriously as to its purpose. An inspection of a building on the spot leads to a more intimate knowledge, and the mind at the same time generally demands an answer to such questions as the why and the wherefore. A very few minutes' inspection was enough to satisfy me that this monument was an ancient tomb, and I see no reason yet to alter that judgment. The influence which led me to this conclusion was that I felt myself forced to accept the fact that it belonged to that class of ancient monuments which are described as "chambered tumuli." It so happens that I have seen and made drawings of a good many of these monuments in various parts of the world, from our own prehistoric burial mounds even as far as the old tombs of the Myng dynasty near the great wall of China. Within this very wide geographical space there are some considerable differences in the ancient places of sepulture, still there are some marked features which are common to a large class of them, and these features are to be found in the Mycenæ examples. The so-called Treasury of Atreus being formed into the side of a hill, its character of being a tumulus is not at first apparent, still we can yet see that the earth has been heaped up over the top of the dome, just sufficient to tell us that it is a heaped-up mound. All doubt is removed by the character of the third and fourth so-called treasuries, which are not dug out of a hill side, and when they were constructed must have stood up as distinct mounds. That these structures were not treasuries, in the usual meaning of that word, can be made very evident. Had Atreus, or any other king of "rich Mycenæ," ever made for himself buildings in which to deposit his wealth, he would have made such places within the walls of the Acropolis. Security would have been the first consideration, and that such was not the purpose of those who constructed these so-called treasuries is evident from the fact that they are not within the old Cyclopean walls of the stronghold. This entirely precludes the notion that their object was the keeping of valuables. As they cannot have been treasuries, we have necessarily to fall back on their character of being tombs. Here only can we find safe footing, for we can explain that it was owing to their being tombs that they derived the reputation of being treasuries. All over the East every large and important tomb was looked upon in the past, and is so considered down even to the present moment, as being the depository of wealth. The pyramids of Egypt have always been supposed to contain immense treasures. The great mounds of the Bin Tepé, near Sardis, are also supposed by the people in the region to contain unheard-of wealth, which will yet be found when these old burial heaps are opened. Thus it is easy to explain why these ancient places of sepulture have attached to them the name of "Treasuries."

I think it is important to realise the true character of these remains, for Dr. Schliemann has, in his work lately published, entirely ignored their claim to be considered tombs. Accepting them in this light, I think that the next conclusion must be that these are the tombs mentioned by Pausanias in the quotation which has already been given. It will now be understood why Dr. Schliemann refuses to admit the sepulchral character of these monuments, for he claims that the tombs discovered by him in the Acropolis are those mentioned by that author. The probabilities against his theory

are supplied by himself. In his work on Mycenæ, at p. 102, he asserts in a very positive manner that he has found the sepulchres as described by Pausanias, yet he is forced to confess that the tombs which he has lately excavated, as well as what he calls the tombstones above, could not have been seen by Pausanias, for "when he (Pausanias) visited Mycenæ, about 170 A.D., all the sepulchral monuments had for ages been covered by a layer of prehistoric *débris*, from 8 ft. to 10 ft. thick, on which an Hellenic city had been built, and had again been abandoned about four centuries before his time, after having added a layer of Hellenic ruins, 3 ft. thick, to the deep strata of pre-historic remains. Thus, he could only have known of the existence of these sepulchres by tradition." The statement in this last sentence being given without any reason to support it, it must go for what it is worth. The probability of a tradition lasting for so many centuries, and coming down from a pre-historic age after all outward trace of the grave have disappeared beneath so many layers of rubbish, does not commend itself to our minds. Neither does it commend itself as agreeing with the words of Pausanias, who makes no allusion to any tradition, but speaks of the tombs as existing, and refers to them in the same terms as he does to the wall and the Gate of the Lions; hence, we may suppose that he saw them on his visit.

There is one very important point which I wish I could do justice to in this paper, but I can only allude to it, and that is, that these so-called treasuries and the Gate of the Lions belong to a style of architecture entirely different from that which we have been accustomed to call Greek. The term Pelasgic has been applied to all early Hellenic remains; but the word, like many others, is a doubtful one, particularly as we do not as yet know from what source the influence came, nor are we quite certain of the race who first produced it. This much we may safely say, that it is older than the style which we associate with the idea of Classic Greek. We can also say that this style had an entirely different origin from that of the later Greek. The Greek temple is an imitation, in stone or marble, of a pre-existing wooden type. The Mycenæ remains have not the slightest indication of a wooden origin. The style began from the first with stone, and with the placing of one stone on the top of another. Most probably the rude Cyclopian walls were the first efforts at it. The third and fourth treasuries are very primitive attempts; in fact, they are more like the dolmens of our own Druidic monuments than anything else. In them we can see the rude beginnings of the style which led ultimately to such a splendid monument as the so-called Treasury of Atreus. Its substantial masonry has endured through a long course of ages, showing the careful work of its builders. It was all covered within with bronze. The holes of the bronze nails are still visible. In the British Museum there are one or two fragments of marble, with ornament upon them, which are supposed to have been part of the ornamental incrustation which was originally over the whole of the doorway, and of which Professor Donaldson made a restoration over thirty years ago.

I have identified the style of architecture of these monuments with that of the Gate of the Lions. The supposition that the builders of these last came from Asia Minor has to depend upon what is little better than traditional evidence, but this evidence finds support in the following quotations from Athenæus, which bears on the original constructors of these tumuli. He says, "You can see everywhere in the Peloponnesus, but especially in Lacedæmon, very large mounds which they call the tombs of the Phrygians, who came with Pelops" (xiv. 12). Athenæus is a late author; still, whatever value this statement may have, it goes so far to prove that those who introduced these mounds into Greece were the same as the Cyclopes, whoever they may have been; and it is also evidence that these mounds were not treasuries, but were tombs, as I have endeavoured to explain them. It may be added that Æschylus describes the tomb of Agamemnon as "the mound of his sepulchre" ("Choephori," v. 4). Sophocles does the same. He makes *Electra* say, "For when I came to my father's ancient tomb, I see from the top of the mound," &c. ("Electra," 894).

It does not seem to us that Dr. Schliemann's attribution of the indisputable tombs found by him is much damaged by the foregoing. It is right to add that Mr. Simpson's objections as to Dr. Schliemann's identification of the Homeric "Ilium" are stated with much less qualification than in the case of the Mycenæan tombs. Nevertheless, he is obliged to add,—"Although I consider these late explorations at Hissarlik as most unsatisfactory in regard to the identification of the Homeric Ilium, yet I would say, if such a place as Troy ever existed, I should give the preference to Hissarlik over that of Bonnarbashi. The real truth is that neither of the localities can be reconciled with the Ilium; but Hissarlik, I think, presents the fewest difficulties."

THE HEALTH AND SEWAGE OF TOWNS.

CONFERENCE AT THE SOCIETY OF ARTS.

CONTINUING our report,* we have to note that the first subject dealt with in the course of the second day's proceedings was that of the discharge of sewage into the sea.

Mr. Henry Robinson, C.E., read a paper, in which he observed that,—

"A very general impression prevails that if a town is situated close to the sea it is necessarily in a more advantageous position than inland towns, respecting the disposal of its sewage, as it has only to avail itself of its proximity to the sea to get rid of its sewage by discharging into it. That this is an erroneous impression the experience of most of our watering-places proves, and it is therefore desirable to offer a caution to those who are contemplating adopting a similar course. In the Local Government Board Blue Book of 1876, one of the conclusions arrived at is as follows:—

'That towns, situate on the sea coast, or on tidal estuaries, may be allowed to turn sewage into the sea or estuary, below the line of low water, provided no nuisance is caused; and, that such mode of getting rid of sewage may be allowed and justified on the score of economy.'

This has been often quoted as encouraging the adoption of this method of sewage disposal, and it is to be regretted that the report gives no data whatever (such as are abundantly available), by which the qualifying expression, 'provided no nuisance is caused,' would be shown to apply to a great number, if not the majority of cases. It might have been stated that, to avoid a nuisance, the sewage must be discharged into the sea at a point not only below low-water, but where there is a well-ascertained current which would carry it permanently seaward. A point of discharge complying with these conditions is but seldom found to exist close to the town, but has to be reached by long and costly outfall sewers, or rather tunnels. At the outfalls there should be a continuous movement seaward during the twenty-four hours, instead of an oscillating action to and fro, resulting in a return of the sewage, and its deposition along the shore, not only at the outfall and its immediate neighbourhood, but also at distant places to which the tide carries. . . . .

The difficulties attending the discharge of sewage into the sea would be diminished were it not that it has a higher temperature and a lower specific gravity than sea or river water, which causes it to rise to the surface; and if it is not carried seaward at once, part of the suspended solid impurities are deposited on the coast wherever there is still water and no tidal current, whilst the rest of the suspended, together with the dissolved, impurities float on the surface, and are carried backwards and towards by every tide, decomposing and liberating gases (sulphuretted hydrogen being one of the most offensive) injurious to health, and polluting the air.

In some cases, by means of long outfall sewers, the sewage is carried clear away from the place producing it, as at Brighton. These practically become elongated cesspools, in which noxious gases are generated, and are liable to be forced back into the town drains, and thence into the houses. In these long outfalls, also, the solids deposit, and involve both expense and difficulty to remove. Even if the places producing the sewage really get rid of it in this way, they are frequently simply transferring it to others, a set of the tide carrying it so as to cause mischief and nuisance elsewhere. . . . .

The authorities of Glasgow have had the question of how to get rid of their sewage under consideration for a long while. A Royal Commission investigated this case, and although the result of this was to advise the adoption of a scheme to carry the sewage twenty-seven miles in a tunnel to the sea, at enormous cost, and although this advice was similar to that previously given, the authorities took the matter into their own hands, and appointed a committee of their body, which has recently presented an exceedingly able and interesting report, giving the results of their investigations. The conclusion they arrive at is not to adopt the recommendations to discharge their sewage into the sea, but to discharge it into the river Clyde after it has been purified by chemical treatment."

Mr. Shoolbred expressed a general concurrence with the views set forth by Mr. Robinson in his paper, and said that the common but erroneous idea that when the sewage was turned into the sea it was at once carried away, was due to a misconception as to the action of the tides. The tidal wave, or the influence caused by the tide on the motion of the water, was confounded with the tidal impulse, which was a force moving at a considerable rate over the whole surface of the water, at the rate, probably, of hundreds of miles an hour, but fortunately for the dwellers on the earth the tidal current did not travel at a greater rate than from six to eight miles an hour. It was too often the case that the casting of sewage into the sea resulted in the deposition of a loathsome slime upon the neighbouring coast. This had been the case at Liverpool, where the estuary of the Mersey had its banks covered with a slimy sewage deposit. This fact was recorded in the first part of the Rivers Pollution Commissioners' Report, as far back as 1869, and things were gradually getting worse, on account of increase of population. Great evil had been wrought in connexion with the discharge of sewage into the sea by the proneness of engineers and others to move in one groove. If sewage outlets had to be made into the sea, such points should, if possible, be fixed upon as would prevent the sewage being caused by tidal currents to return and impinge against the coast whence it was discharged. He had seen with great pleasure that at the congress on water supply, held two days previously, a resolution had been passed urging the desirability of dividing the country into water-shed areas for all purposes of water supply. He should like to see some similar geographical division made for purposes of sewage utilisation or removal.

After some remarks by Dr. Dominichetti, Mr. Cresswell, and Mr. Young,

Mr. Alcock, of Sunderland, moved the resolution of which we have already given the text.* It was seconded by Mr. Ernest Turner, and after a long and somewhat tedious discussion on various suggested verbal amendments, was carried unanimously. In the course of this discussion,

Dr. Wright, of Cheltenham, spoke of the desirability of adopting the principle laid down in the resolution. He said that at Charlton Kings a very good system of drainage was provided by the local authority; but it was afterwards found that many of the house-drains connecting with the sewer had been laid with the fall the wrong way! In his opinion nothing but a well-laid system of house-drains and public sewers would prevent the formation of sewer-gas, and it was of the utmost importance that all drains connecting with the sewers should be laid by the direction and under the control of the local authority.

Mr. Hewson, of Rochdale, said that pretty much the same powers as those mentioned in the resolution had been possessed by the corporation of Rochdale for the last five or six years, under a local Act, and had worked very satisfactorily. In Rochdale, all house-drains were laid by "authorised contractors," appointed by the corporation. The work was done at a fixed schedule of prices, and the result was a great gain to the ratepayers. Any attempt at overcharge, or any imperfection in the work done, rendered the offending contractor liable to be struck off the list and debarred from executing such work in the town. One clause in the local Act was to the effect that all drains, whether within or without the premises to which they belong, shall be under the surveillance and control of the corporation, and shall be altered, repaired, and kept in order, at the cost of the owner or owners. Wherever it could possibly be avoided, no drain was allowed to pass beneath a house, and every train was trapped and ventilated.

Dr. Holden, medical officer of health, Hull, said he supported the resolution because he felt that by it Mr. Alcock was hitting the right nail on the head. He could speak from experience of the great evils which arose from the very imperfect and scamped way in which house-drains were laid, especially in very many new dwellings. Speaking generally, he hoped the resolution would be made as strong as possible, —that, in fact, it would insist on compulsion. The word "may" might in all sanitary legislation be advantageously changed into "shall." So long as sanitary legislation was permissive and optional, so long would it be to a great extent inoperative, for, to serve their own purposes, speculating builders and others interested in house property got elected upon town councils and local boards, through raising the cries of "economy" and "protection of the ratepayers' pockets."

Dr. Lawrence Hamilton proposed an amendment in the following terms:—"It shall be the compulsory duty of the local authority to take into its own hands the complete system of house-drainage, which shall be executed at the cost of ratepayer or freeholder, as in each case may seem desirable to the said local authority." This amendment was subsequently withdrawn, at the instance of Dr. Child and the Chairman (Mr. Stansfeld), who pointed out that to enter into the question of cost would be to needlessly complicate the matter. It was sufficient for the Conference to lay down the broad general principle embodied in the resolution, leaving details

* See p. 555, *ante*.

* See p. 557, *ante*.

which would arise in the adoption of that principle for settlement as they arose.

Dr. Fox, of Cockermouth, supported the resolution, because he thought that if the powers mentioned in it were conferred upon local authorities the result would be to remove the objections entertained in some quarters to the water-closet system.

The discussion was continued by Mr. Walsh (Halifax), Dr. Yeld (Sunderland), Dr. Woodward (Worcester), the Mayor of Devonport, Captain Douglas Galton, Dr. Chesshire, and Dr. Syson, who all spoke in favour of the principle embodied in the resolution.

The Conference then proceeded to the discussion of the last item on its programme, viz., "Whether any further legislation, of a compulsory or permissive character, is needed for bringing about a better sanitary condition of towns or dwellings, or any change in imperial administration." On this subject,—

Mr. C. N. Cresswell, barrister-at-law, read a paper, in which he said:—

"Legislation has dragged its slow length along while events have galloped with portentous haste, and neither imperial nor local efforts keep pace with the needs and expectancy of the nation. In 1876, a popular excitement induced a palliative measure in the Rivers Pollution Prevention Act, but that measure has failed of its purpose, and given to wrongdoers a quasi-legislative sanction for their delinquencies and incapacity. At the same time, the Thames Conservancy Acts (1857 and 1867, after much ado about nothing, have suffered a palsy, and received their *quietus*,—for a time, at least, in the Lower Thames Valley Drainage Act of last year. In the meantime, a cry has gone up for water, with a rattle of food and abhorrence of man as well as the requirements of our great staple industries. Every river, from the Tay to the Dart, has been contaminated with the refuse of homestead or factory. The salmon kelts of West moreland and Cumberland are in process of destruction by a parasitic fungus plant, the newest development of sewage pollution, and, while professors dispute as to final causes, and means of prevention, the patient public wails for the *Deus ex machina*, in the form of some miraculous intervention to save the nation from the natural consequence of their own apathy and ignorance. In the presence of these and other startling phenomena, where shall we seek the signs of progress, or compute the net results of practical sanitation?

The national anxiety finds relief in a popular cry,—that fear of generalisation so much extolled in shallow minds, inasmuch as it relieves them of the pain of thinking for themselves, and saves time by precluding argument.

Centralisation, it is said, is the fruitful source of these sanitary shortcomings, and it is above all things needful to revivify the civic life and vigour of the people, in order to resist the centripetal tendencies of our time. It is but a half-truth, after all; for the action of a central authority is as necessary to the body-politic as the motive power of the heart to the circulation of the human system. Nevertheless that action may be strained and abused, as we see too plainly in the modern tendency towards meddling and muddling with subordinate authorities in matters far beyond the scope, and outside the functions of, imperial control.

In this respect it may be expedient to reorganise the Local Government Department, and re-adjust it on its own proper bearings. Further legislation in this direction will rid us of that red-tape and circumbendibus, which encompass every limb and paralyse the functions of local bodies, reducing independent self-government to the shadow of an empty name. From the investigation of a grand scheme of arterial drainage to the contents of a workhouse plum-pudding as a wide range of official supervision, yet nothing is too large or too minute for the elephantine prehension of the Whitehall department. There is a veritable plague of inspectors abroad, and the native stubbornness of the provincial mind, although it may need the spur and impulse of the central authority to set it in motion, resents this constant yoke of official supervision, which will not permit the expenditure of a few pounds or the construction of a workhouse pig-stye without a local inquiry and departmental sanction.

This was not the intent of those who framed the Public Health Acts, nor is the system compatible with the divine right of self-government. The functions of Imperial administration end where those of local self-government begin; each has its proper uses in the economy of the State; and there is scope enough for each within its own particular province. The Rivers Pollution Prevention Act is in point. Such is the superfluity of safeguards and precautions in the provisions of that Act, that none save a Government department would venture to put it in force—nor can a sanitary authority take any proceedings under it without the consent of the Local Government Board. Here then was a field for the energies of Government, where both the resources and influence of the State might be usefully employed.

Yet nothing has been done to enforce or direct the operation of an Act which is, as it were, still-born, and truly a most lame and impotent piece of legislation! On the contrary we can cite cases where local enterprise has been hampered; and official interference has blunted the edge of many a bold resolve on the part of those who have striven humbly but honestly to help themselves.

Reading and Oxford have been permitted to embark with a light heart upon a grand experiment of sewage utilisation, because the method of disposal coincides with the procrustean theories of the Local Government Board. According to the rigid formula now in vogue in high places, every authority is required to fit the same bed, and conform to the same standard, without regard to local conditions, or the measure of local resources. If we appeal for aid and light to the great central Luminary, it makes but one sign; and recognises but one shibboleth in the darkness. Irrigation is their grand characteristic; and as all roads lead to Rome, so all official intervention tends in one direction. If the Government be right, this is the be-all and end-all of sanitary progress, and the Conference may dismiss all other modes of treatment as irrelevant and futile. It is a gloomy prospect for the Lower Thames Valley, where the suggestion sounds like a sorry jest, and land consists of tennis-lawns and croquet-ground relieved here and there by paddocks at a rent of 60*l*. per acre per annum. In this quarter, 'union of districts' is the latest development of sanitary enterprise, but the conception is still in the process of gestation, and when brought to maturity may prove to be a monster of terrible import and insatiable appetite. At present it is regarded with more sympathy by engineers, than by the ratepayers concerned, and despite the favourable augury of official approval their minds are disquieted within them. * * * * *

There is, however, a ray of light in the darkness. The Bill now before Parliament for the constitution of County Financial Boards or Local Parliaments in every county, promises to unloose the deadlock of sanitary administration. The complex machine creaks upon its hinges, but a new lever is forthcoming to help on the work.

These county boards should do the work of local supervision, not only sanctioning loans, but granting them out of local funds contributed within the district, and secured by the best of all safeguards, viz., the resources of the immediate district, developed and improved by the expenditure of moneys so obtained. The power to authorise the purchase of lands for sanitary objects,—at present only attainable by an Act of the Imperial Legislature,—if conferred on these new constitutions, would relieve sanitary authorities from the elaborate procedure of the Lands Clauses Act, while the utilisation of local resources would put a stop to that drain on the national exchequer which has already excited alarm in high quarters. Those who furnish the means and those who sanction the outlay would alike be on the spot to watch and control the work, and thus, in lieu of local government in leading strings, hampered by perpetual inquiries, constant adjournments, delays, taught to look to Jupiter rather than to self-help, and leaning too often upon a broken reed, we should at length realise that kind of authority which our president (Mr. Stansfeld) foreshadowed from his place in Parliament as having 'vitality, cohesion, adaptability, strength enough to resist the centralising tendencies of the day,' and providing the means of political education for all classes of the people.

There are enough of questions to occupy the time and attention of superior authority at Whitehall. The Pollution of Rivers Act, the investigation of scientific processes, the definition of local areas, and simplification of local, the solution of statistical data in order to determine the course of future legislation,—these and cognate subjects appertain to imperial administration, and would enable the department to regain its proper sphere of usefulness. It is because the latest instance of Government has been conceived in this spirit, and is capable of still wider development in this direction, that it deserves the earnest support of the Conference; and we trust that members will not separate without recording their approval of the general scope of the Bill, thereby strengthening the hands of its supporters in and out of Parliament.

Having thus indicated the need of further legislation in three great directions, we propose

1. The protection of the ballot in the election of members of local boards, in order to counteract the influence of small tenement proprietors, always and everywhere the interested opponents of sanitary progress.

2. The appointment of medical superintendents in each county or division of a county.

3. The first great step towards decentralisation by the constitution of county boards, so as to habituate the people to self-government, and prepare them for the eventual introduction of provincial Parliaments.

I have yet to mention another indispensable factor in the work of bringing about that "better sanitary condition of towns and dwellings," which is the real aim and object of these conferences, viz., a loyal resolve, on the part of all concerned, whether governors or governed, to do the work which they have undertaken to do. Local authorities do not move unless there be pressure from without as well as from within. It is not in the nature of such bodies to initiate improvements *mero motu*. Their bent and tendency is one of resistance to all reforms which involve a possible increase of the rates; nor can I recall a single instance during the past twenty years where a corporate body has volunteered to improve the condition of things around it, except the constant pressure from without to spur to the task of their lagging energies. Sanitary progress is a monotonous tale of injunctions granted, or informations filed, at the instance of individual inhabitants, for the abatement of nuisances which the corporate authorities had suffered in silence, connived at, or ignored; and the reason is obvious, viz., that the boards consist in great part of the principal delinquents, or their satellites. Even Parliament is not proof against the canker of vested interests, and legislative measures of great pith and moment their currents turn awry by reason of timid acquiescence or untimely concessions."

Sir Henry Cole said that although he was inclined to say a word on behalf of the Local Government Board, which, after all, could not be expected to be wiser than the people themselves, the pertinacity of the Board in insisting upon the adoption of one pet nostrum for the settlement of the sewage question had been justly condemned by the reader of the paper. The Board seemed to forget that its own officer, Mr. Rawlinson, in the report issued by the Board two years ago, said,—"Land irrigation is not practicable in all cases, and therefore other modes of dealing with sewage must be allowed." The Board, he thought, might be almost worth what it cost if it would collect and collate information as to the working of sanitary schemes and appliances. The experiences, whether of success or failure, and the causes which eventuated in success or failure, might be and ought to be systematically collected by the central authority, the Local Government Board, and periodically published, for the behoof of local sanitary authorities at large. As a case in point, Sir Henry directed attention to the excrement-tub used in Warrington. This, he remarked, was exceedingly simple, but he doubted whether the Local Government Board knew anything about it. In place of a costly spring lid or similar contrivance, to prevent the spilling of the contents of the tub, a piece of sackcloth was laid across the top before the wooden lid was put on, the cloth acting as a kind of late, and preventing spilling. Sir Henry Cole referred to some returns on sanitary subjects recently presented to Parliament at the instance of Lords Stafford and Rosebery, and said that though these returns contained much valuable information they remained on the shelves of the Stationery Office, and the cost and trouble of preparing them was of little benefit to the public at large. It should be the business of the Local Government Board to give publicity to the valuable information which was to be found buried in Blue Books and Parliamentary papers. As to the sanitary state of London, it was a discredit to any and every Government which had been concerned in it that the metropolis was exempted from sanitary laws which were enforced in the provinces. It was a sort of "Arabian Nights" fact that the Metropolitan Board of Works enjoyed the monopoly of polluting the Thames. London, in fact, was the only place in the country which, to the scandal of sanitary legislation, had a prescriptive right to be beastly.

Mr. Henry Robinson, C.E., submitted the next paper. He endeavoured to show that some of the clauses of the Public Health Act Amendment Bill, as amended by the Select Committee, left the same opening for obstructiveness or indifference as in the past. He said,—

"The President of the Local Government Board stated in the House of Commons, this Session, that recent legislation on the subject had scarcely yet been allowed time to work, and that he saw no reason at present to seek for further compulsory powers on behalf of his department in reference to local authorities. It is to be hoped that a discussion at this Conference will tend to make the existing compulsory provisions of the Public Health Act operative, and to increase them by the Amendment Bill (not, however, as now drawn) to the fullest possible extent, as the time has arrived for the adoption of strong measures."

Dr. Lawrence Hamilton defended the Local Government Board on the ground that, in his opinion, it did its work, on the whole, very well,—a fact largely due to the ability of its medical, engineering, and chemical advisers. He devoutly hoped that the Warrington "stink-tub," so much admired by Sir Henry Cole, would not come into extensive use, which, indeed, it was not likely to do, for a more filthy contrivance it was difficult to conceive, and the dangling corners of the sackcloth, saturated as they would become with offensive matter, were eminently calculated to spread zymotic diseases broadcast.

Mr. Monson spoke strongly in favour of the adoption of vote by ballot in the sanitary as well as in the Parliamentary franchise, and mentioned several cases of coercion, intimidation, and corrupt practices by candidates for membership of local boards.

Mr. Alcock, of Sunderland, spoke of the great necessity which existed, on sanitary and other grounds, for the enactment of a general Building Act, applicable, as to its broad general principles, such as dimensions of bedrooms, height of ceilings, &c., to the whole of the country, but subject to such modification in detail as varying local circumstances and materials might render necessary or expedient.

Dr. Child said that the best argument in favour of further legislation was that existing legislation had almost completely failed in many respects. The Local Government Board needed reorganisation, for at present its administration was impeded and hampered by officialism and red-tape. In fact, it had carried to a perfection unknown in any other country this side of Turkey the art of "how *not* to do it."

Mr. Freeman, of East Dereham, spoke of what he alleged to be the arbitrary conduct of the Local Government Board and of its inspector, Major Hector Tulloch, in endeavouring to force a costly system of sewage irrigation upon that town, in spite of conditions which he (Mr. Freeman) and the local board thought to be adverse to the success of such a scheme. In this case, it was alleged, the Rural Sanitary Authority, which consisted mainly of farmers, had no interest in the town of East Dereham, as they did not reside there. The Rural Sanitary Authority had employed Mr. Baldwin Latham to prepare a scheme of drainage and irrigation which would cost 30,000*l*., and the Local Government Board had endeavoured to bully the people of East Dereham into the adoption of that scheme.

Mr. Baldwin Latham denied that the scheme referred to by Mr. Freeman would cost 30,000*l*. In point of fact, less than half that sum was to be borrowed for works both of sewage and water supply. He asserted that the local board represented by Mr. Freeman had been formed with the sole object of "scotching" proposals for sanitary improvement.

Dr. Yeld, of Sunderland, read a paper on "the necessity for legislation empowering Urban Sanitary Authorities to prevent the proprietors

of houses erected before the constitution of local boards from building upon the whole of the open space belonging to such houses." He remarked that,—

"Whilst every facility is now given to local authorities by the Legislature for dealing with properties which, by reason of want of light, air, ventilation, and from other causes, are unfit for human habitation, and also for making bye-laws to regulate the building of new properties, in which provision can be made for a certain amount of space adjoining each house to be left for open-air space, no such provision is made whereby such authorities can deal with properties built before local boards were constituted; so that, unless some such provision be made, large sums of money may be spent on an improvement scheme in one part of a borough, whilst at the same time, in another portion of the same borough, a condition of things may be gradually coming into existence, similar, in many respects, to that which in the first instance made it necessary to put the Artisans' Dwellings Act into operation. These remarks apply more especially to municipal boroughs incorporated within the last forty years.

In the borough of Sunderland scarcely a Council meeting passes at which plans are not passed allowing owners of property to build upon open spaces attached to properties built before the Corporation came into existence.

The local authority is at present powerless to prevent such additional building going on. Some few years ago the Council brought an action to test their power in this respect, when the verdict was given against them, it being held 'That the building was not a new building within the meaning of the Act, but only an addition to an old building.'"

Dr. Syson said no doubt there was room,—and a great deal of room,—for further sanitary legislation, but it was questionable whether existing legislation had been taken advantage of to the fullest possible extent. In order to duly enforce existing powers, it was necessary to reorganise the Local Government Board, which at present hopelessly muddled up Poor Law work with Health work. He would constitute each of these a separate department. Only by such a reorganisation would the country get any valuable result for the enormous sums of money now annually spent in sanitary work. He was not averse to "permissive" legislation, as a matter of expediency, as we had to learn to walk before we could run.

Mr. Edwin Chadwick, C.B., said some strong things had been uttered about the Local Government Board, and those who made those statements should be called upon to substantiate them. He agreed with those who said that one function of the Board should be to collect into one focus the sanitary experience of the whole country, and that was now being done. Had the work been commenced some years ago, a great many of the questions which perplexed the Conference would have been settled, or in a fair way to be settled. It should not be forgotten, in the midst of the outcries against the Board, that one of its most important functions was the protection of reversions,—the watching over the interests of the ratepayers of the future. That was a very large function, and he was almost afraid that if the administration of the Board came to be inquired into very closely, it would be found that the Board had been, if anything, too lax on behalf of the future, and too prone to fall in with the schemes and proposals of the present day. One of the greatest misfortunes attendant upon the administration of the Local Government Board was that its chief, the president, was also a Cabinet Minister and a member of Parliament, and only held a political tenure of his office. Under these circumstances, it was impossible that he could give proper consideration to his duties, and the consequence was that they were delegated to secretaries and others. As so much had been said as to the mal-administration of the Local Government Board, he begged to move,—"That this Congress is of opinion that the organisation of the central sanitary authority, the Local Government Board, is grievously defective, and ought to be the subject of Parliamentary inquiry." He was sure that the Board would pass satisfactorily through the ordeal of such an investigation.

Ultimately, Mr. Chadwick withdrew this proposition.

Dr. North, medical officer of health, York, said it was possible to over-legislate on sanitary as on other questions, and such over-legislation was to be deprecated, especially if it tended too much towards centralisation. He thought that the compulsory powers conferred by sanitary legislation were sufficient on many points provided the local authorities saw to their enforcement.

The Chairman (the Right Hon. James Stansfeld, M.P.), in a speech of considerable length, summed up the two days' proceedings. He pointed out, with reference to amendments in the law, that the Public Health Consolidation Act of 1875 had the merit of dividing the subject matter, which was really local government, into a series of parts. This was a very convenient division, and was intended to facilitate future amending legislation, so that a private member might deal with the amendment of a part of the Bill without the necessity of rendering himself critically familiar with the whole enactment. It had been proposed that there should be separate imperial supervision for Poor Law matters and for public health matters. That was, that the Act should be repealed which added the Medical Department of the Privy Council to the Poor Law Board, and which converted the latter into the Local Government Board. That Act was his. He was responsible for it. It was therefore natural that he should defend it. He must say he did not think it would promote simplicity in organisation if the administration or the supervision of the administration of the Poor Law were separate from that of local Government; for in Poor Law administrations sanitary questions arose. Workhouses must be built in accordance with sanitary regulations; and paupers must be dealt with in accordance with sanitary laws. The right hon. gentleman expressed an opinion that it would be well to enlarge the area of local self-government, and by ennobling the work procure the best men of the neighbourhood to undertake it. That would be the case with county boards, upon whom he would put the duty of preventing the pollution of rivers, the conservancy of the rivers, and other powers, so that they should stand between the local sanitary authority and the Local Government Board. By the creation of county boards they would at once change the centre of gravity of the whole system. A county board could hold its own. It could not be dealt with by the Local Government Board in the same way that a local sanitary authority could. Passing then to the Local Government Board itself, Mr. Stansfeld remarked that, like other great departments of the State, it was admirably served, but he maintained that it needed to be reorganised, and that the permanent head should not be a secretary, but a manager, a man who, like Moltke, went about the office whistling, with his hands in his pockets, who never had a pen in his hands, but who did the thinking, and supervised his subordinates.

Mr. Cresswell then moved the resolution which we printed last week (p. 557) in favour of further legislation, especially with reference to County Boards, and this, having been carred unanimously,

On the motion of Dr. Syson, seconded by Mr. Chadwick, a vote of thanks was given to Mr. Stansfeld for his conduct in the chair.

The Chairman, in acknowledging the compliment, said he trusted these conferences would be continued in future years, and that the council would enlarge their scope. He then declared the Conference at an end.

Besides the papers of which we have already given the substance in our extended report, the following papers were submitted to the Conference, though not read, viz.:—"Additional Information respecting Water-carried Sewage-treatment," by Mr. J. C. Melliss, C.E.; "Water-carried Sewage and Cement Manufacture," by Mr. James Richards; "Sewage Precipitation," by Mr. William White; "Remarks on the Cost of Systems given in the Local Government Board Blue Book on Sewage," by Mr. J. C. Melliss, C.E.; and "On Some Defects in the Public Health Act Amendment Bill, as amended by the Select Committee of the House of Commons," by Dr. F. T. Bond. We may in a future issue complete our report of the Conference by giving summaries of these papers.

In connexion with the Conference, an exhibition of sanitary appliances was held in premises lately occupied by Messrs. Tod-Heatley & Co., adjoining the house of the Society of Arts. The exhibition was of more than usual interest and extent. We noticed amongst the exhibits Banner's patent ventilating cowls, traps, &c., with working models; specimens of iron pipes, traps, and so on, treated by Professor Barff's anti-corrosive process; a number of sluice-valves, stop-cocks, hydrants, &c., sent by Messrs. Beck & Co., of Great Suffolk-street; Bostel's valveless water-closet, in one piece of white earthenware; Boyle's well-known self-acting air-pump ventilators (with working models); Doulton's sanitary stoneware, Stanford's patent joints, Mansergh's trap, gullies, &c.; Harescough's patent spring-lid excreta receptacle; Hart, Son, Peard, & Co.'s ventilators in many forms; Hodges & Butler's silicated stone drain-pipes and paving slabs; Lambert & Son's water-waste preventers, fire-cocks, &c.; Moule's earth-closets; Muller's patent water-meter; Oakes & Robinson's patent filter-press, "for rapidly and economically extracting moisture from the semi-fluid products of sewage-precipitation works"; Parker's dry-earth closets; the "Pulsometer"; cement manufactured by Scott's Sewage Company from the sewage of Burnley; the Sanitary Engineering and Ventilating Company's appliances; Smeaton's trapless water-closets; Stott's system of ventilation as applied to sewers and to ships (shown by working models); Stiff's sanitary stoneware and "interceptor" sewer-air trap; the Union Water Meter Company's meters; and a variety of filters and other appliances by various patentees and manufacturers, too numerous to mention.

MEMORIAL OF THE LATE SIR GILBERT SCOTT, R.A.

MEETING IN THE CHAPTER-HOUSE, WESTMINSTER.

On Saturday last, a public meeting, convened under the auspices of a committee recently appointed at a meeting held at the Royal Architectural Museum, was, by permission of the Dean and Chapter, held in the Chapter-house of Westminster Abbey. Mr. A. J. B. Beresford Hope, M.P., president of the Museum, occupied the chair, in the absence of the Duke of Buccleuch, who had been expected to preside. The attendance was not numerous.

The Chairman, in opening the proceedings, said they were met to do honour to the memory of a great architect, none other than Sir Gilbert Scott, by whose genius the noble building in which they were then assembled had been called out of the abomination of desolation, and restored to its present condition. He was not only the restorer of that Chapter-house, but of innumerable other buildings, and he was, moreover, a great creator of buildings proceeding from his own design. It was proposed by the committee that the memorial should take the form of a brass or some personal monument of that kind, over, or, as nearly as possible over, the resting-place of Sir Gilbert Scott's remains. That was the first consideration, and a sub-committee might be appointed by the meeting to carry it out and make all necessary arrangements with the Dean and Chapter. This personal memorial would not, it was hoped, absorb all the money that the proposal to do honour to the memory of so great and good a man would call forth. With the residue it was proposed to establish a teachership or professorship in connexion with the Architectural Museum. This would be to continue a work in which Sir Gilbert Scott took the utmost interest,—a work, in fact, which he might almost be said to have died in doing. The Architectural Museum was greatly and mainly of his foundation. It was a labour of love to him in his prime, and when he was old and famous, and his time overtaxed, he gave himself up to the drudgery of compiling its catalogue. The object of the Museum was to teach the class of artists who did not exhibit in gilt frames, on private-view days or shilling days, but those who executed the carving, stained glass, metal-work, and enamel-work to be seen in so many of Sir Gilbert Scott's buildings,—in other words, the working artists who carried out the architect's designs,—the men who were seeking to equal the productions of their Mediæval predecessors. To devote money to the founding of a teachership would be to carry on Scott's own personal work in the Museum. In concluding his remarks, the chairman stated that he had received letters of apology for inability to attend from various noblemen and gentlemen, but before he named any of them he must refer to the absence of Mr. M. J. Lomax, the curator of the museum, who was prostrated by a very severe illness. Letters had been received from Mr. A. B. Mitford, secretary to the Office of Works; Lord John Manners, M.P.; Mr. Thomas Webster, R.A.; Mr. Calder Marshall, R.A.; Lord Harding; the Dean of Durham; the Bishop of Ripon; Sir Henry Hunt; Lord Ripon; Mr. T. H. Wyatt; Mr. Barry, president of the Institute; the Bishop of Carlisle; Lord Carnarvon; Mr. W. Cowper-Temple; Lord Alwyne Compton; Mr. E. W. Cooke, R.A.; Mr. J. F. Bateman, president of the Institution of Civil Engineers; and others of the Committee.

The Dean of Lichfield moved the following resolution:—

"That this meeting, desirous of commemorating the character, the genius, and the works of Sir Gilbert Scott, in some desirable and appropriate form, invites the assist-

ance of the public towards carrying out a personal memorial in Westminster Abbey, and the endowment of a professorship or studentship in connexion with the Architectural Museum."

The mover, in the course of his remarks, spoke in high terms of the personal qualities of Sir Gilbert. One of his most striking characteristics was his intense reality, combined with simplicity. He was thoroughly real in all that he did, and the enthusiasm with which he had thrown himself into his profession was well known. As to his extreme simplicity, he was ever ready to communicate to others from his large stores of knowledge. There was no reticence whatever about him. These were qualities which in conjunction with his great ability, deserved public and honourable recognition.

Mr. Walter Cocks seconded the motion, and expressed the hope that the result of the appeal would be to raise a much larger sum than was contributed in memory of Pugin.

The Dean of Westminster, in supporting the resolution, said that various remarks and suggestions had been made in the newspapers and elsewhere on the subject of the proposed memorial, and therefore he wished to say that he did not think it would be the desire of the Chapter, nor was it his own desire, that the memorial should take the form of carrying out any of those special works in and about the Abbey which no doubt Sir Gilbert Scott himself was so anxious to see undertaken and completed. There were three such special works which he desired to see effected. One was the completion of the stained windows of the Chapter-house; another was the beginning, if not the completion, of a new cloister which should join on to the Abbey, and suffice for the interment of the illustrious dead during the next thousand years. The third special work was the completion of the restoration of the northern entrance to the Abbey, which was of old the great entrance, and might still be made an entrance worthy of the Abbey. As far as Sir Gilbert Scott's feelings were concerned, it was impossible to imagine any architectural constructions in which his memory could be more fitly enshrined than in the carrying out of these works,—and it would be enshrined in them whoever carried them out. But he (the Dean) felt that the carrying out of these three great works was essentially the business of the Government, or of the public, or of the Dean and Chapter, either jointly or collectively. The northern porches the Dean and Chapter were endeavouring to do themselves, although they would not be able to carry out Sir Gilbert Scott's wishes as completely as they should like unless they received a great deal more help from the public. The stained windows for the Chapter-house had been long promised by the Government; but there appeared to be some obstacle,—not, it was to be hoped, insuperable,—to the fulfilment of that promise. With regard to the proposed cloister, that was a work which could only be undertaken by the Government. He quite concurred with the objects set forth in the motion.

The Bishop of St. Alban's moved an amendment to the effect that the latter part of the motion, after the word "Abbey," having reference to the endowment of a professorship ["teachership" is meant], or scholarship in connexion with the Architectural Museum, be omitted, and that the following words be substituted:—"And the restoration of the three western porches of the Cathedral of St. Alban's, his last great work, and in which he expressed himself deeply interested during the last few days of his life, would be a fitting memorial of the genius and character of Sir Gilbert Scott." In support of his amendment, his lordship spoke of the importance of the work at St. Alban's, and of the interest which Sir Gilbert was known to have felt in its progress. He confessed he had no great faith in the utility of an endowed professorship or studentship in connexion with the Architectural Museum.

Mr. O. E. Coope, M.P., seconded the amendment, and in support of the previous speaker's depreciatory remarks as to the utility of endowing a teachership or scholarship, cited the case of the Gresham lectures, founded by Sir Thomas Gresham. The professorships were endowed, and the professors gave a certain number of lectures per year, but nobody went to hear them. The proposed work at St. Alban's would make the building the grandest and longest in the kingdom.

The Chairman, before putting the amendment, reminded the meeting that the Gresham lectures had failed to be of service because, while the professors were provided, the students were not obtained. In the case of the Architectural Museum there was already a large and crowded class of students and art-workmen all eager for such knowledge as could only be imparted to them by an able professor or teacher of the industrial arts connected with building. However true it might be that St. Alban's Cathedral would be the longest in the kingdom when the porches were restored as proposed by Sir Gilbert Scott, the remark had no special significance, seeing that the meeting was not met to promote a monument to the memory of the deceased Scottish giant.

The amendment was then put and negatived with but three dissentients. The original resolution, was about to be put as a substantive motion, when

The Hon. Dudley Fortescue suggested another course. It was unfortunate, he observed, that there should be any contention on the subject, and he thought the meeting then and there assembled was of hardly sufficient magnitude to decide authoritatively as to the form which the memorial should take. He begged to move as an amendment, that all words in the original resolution after the word "Abbey" be omitted, —in other words, that the resolution be limited to the carrying out of the personal memorial.

The Bishop of St. Alban's seconded the amendment.

The Chairman said that any further delay would only jeopardise the success of the movement. It had been urged as a reason why the memorial should take the shape of the completion of the porches of St. Alban's Abbey that the abbey was Sir Gilbert's "last work," and that he died wishing to see the porches completed. But it was forgotten that Sir Gilbert had died equally desirous of seeing the prosperity of the Architectural Museum insured. All that was wanted to insure its prosperity and usefulness was a comparatively small sum. Surely England could find enough money both for the Museum and for St. Alban's. Probably when the porches of St. Alban's were completed the work would be done by men who had acquired skill in their craft through the aid of the Museum.

The Dean of Lichfield expressed the hope that there would be no further delay, and that the original resolution would be carried in its entirety as proposed. Delay would be very detrimental to the objects the committee had in view. If those interested in the completion of "last works" upon which Sir Gilbert Scott was engaged were all to put in a claim to have their special works completed *in memoriam* of Sir Gilbert Scott, there would be no end to contention. The west front of Lichfield, equally with St. Alban's, was a "last work" of Sir Gilbert Scott, and was in progress at the time of his death. If justice were to be done to his memory the meeting could not do better than confine itself to the sensible, practical resolution which he had had the honour of moving.

The Archdeacon of Middlesex spoke to the same effect, and

Mr. Ash, as a workman who had derived benefit from the teaching he had received at the Museum, earnestly pleaded for the resolution in its entirety.

The amendment having been put and negatived, the original resolution was carried, with only three dissentients.

The Archdeacon of Middlesex moved that a committee be appointed to carry out the objects of the foregoing resolution.

Professor Hayter Lewis, in seconding the motion, said what was proposed to be done had his fullest commendation and support.

The motion having been carried, the meeting closed with a vote of thanks to the Chairman (proposed by the Hon. Dudley Fortescue and seconded by the Bishop of Rochester).

A Statue of the late Mr. Alderman G. L. Ashworth, a former mayor of the borough, was unveiled on Saturday, at Rochdale, by Mr. T. B. Potter, M.P., in the presence of a large assemblage of spectators. The memorial occupies a prominent position in the public park, and is the work of Messrs. W. & T. Wills, sculptors, London. The pedestal, 12 ft. high, is of Classic design, and composed of axed granite blocks, mounted on two sets of massive steps, also of granite. The statue, 8 ft. high, is carved from a single block of Sicilian marble, and its likeness to the deceased Mr. Ashworth has been pronounced by members of his family to be excellent. The total cost has been 800*l*.

ON THE PRESENT AND FUTURE WORK OF ENGINEERS IN REFERENCE TO PUBLIC HEALTH.

THIS was the title of an address, delivered by Mr. W. Donaldson, M.A., at the annual meeting of the Sanitary Institute, held on Friday, the 31st ult., but the lecturer confined himself mainly to one portion of this work, namely, the disposal of sewage. We print a portion of the paper:—

Intermittent downward filtration by irrigation over wide areas affords the only means of readily overcoming all the difficulties of sewage purification. Purification by continuous drenching of the land, generally called intermittent downward filtration, cannot be successfully carried out without the use of settling-tanks; that is, not without the necessity of piling up heaps of sewage sludge which has very little manurial value. The getting rid of this sludge must, therefore, entail a yearly loss. It is true that on many, probably on the majority of irrigation farms where utilisation and purification are combined, these tanks are used for the clarification of the sewage before it is turned on to the land, but there is, however, not the least necessity for their use. If the sewage is kept in motion, the fine sediment is deposited evenly over the surface of the land during the process of flowing, and does not leave any visible indications of its presence, if there is an adequate area of land under irrigation. It is, of course, necessary to separate all solid bodies from the sewage by means of screens, but the total of these screenings is very small. At Reading, including the deposit of heavy sand in the screening tanks, the average daily quantity does not exceed three-quarters of a cubic foot per thousand, but at Reading the duplicate system is strictly carried out, and the sanitary authority has not to deal with the road grit nuisance.

Colonel Jones has adopted these settling-tanks on the Havod-y-Wern Farm, and is now engaged experimenting on the sewage sludge with the hopes of making it saleable at a profit. He may possibly find a profitable market for the small quantity deposited in the tanks at Wrexham, but his success will only be partial. Until manure made from sludge can be sold at a price which will admit of carriage to a long distance, the use of settling-tanks must entail a yearly loss.

In my opinion, the want of success on irrigation farms has been in no inconsiderable degree owing to the half-hearted way in which the advocates of utilisation have taken up the question. They ought to have regarded purification as quite a secondary consideration, because utilisation must necessarily accomplish successful purification. The problem which they have hitherto attempted to solve has still been, how few acres will effectually purify the sewage of 1,000 people? The exact converse ought to have engaged the whole of their attention, how many acres will the sewage of 1,000 people effectually fertilise. The nuisances occasionally experienced on sewage farms, which are the main cause of the difficulty of acquiring land, need never occur except in those cases in which the minimum standard of acreage requisite for purification has been adopted.

Sir Joseph Bazalgette at the discussion by the Sanitary Institute in March, 1877, upon the mode of treating town sewage, arguing from the example of London, came to the conclusion that it would not be possible to obtain land in the neighbourhood of large towns in sufficient quantity and suitable quality and free from residences, for the purpose of sewage farming. He comes to this conclusion because London with a population of 4,000,000 would require an area of sixty square miles, which, expressed in another way, is an area less than eight miles square. London is, however, about ten times larger than any other town in the kingdom, so that arguments against the adoption of irrigation derived from the example of London, even if well founded, are not applicable to any other case. In my opinion, however, the argument is not in any other respect well founded. Surely in a food-importing country like England, the more acres the sewage manure will not only fertilise, but render at least doubly more productive than they can be made by any other manure, the better for the people. It is not necessary that the area required for irrigation should be either in the immediate neighbourhood of the town from which the sewage has been sent, or free from residences. If a sufficient area is used, no nuisance will be occasioned, and sentimental

fears on that head can easily be allayed by interposing a belt of unirrigated land.

If the Town Council of Manchester can bring water from Thirlmere to Lancashire and sell it at a profit, it is clear that sewage may be conveyed to an equal distance and also sold at a profit if its commercial value is equal to that of the water. For the purpose of comparing the values of the two commodities we must not adopt as the standard of the value of the water the price at which it is sold after having been distributed throughout the district to each set of premises, but what it is worth in the service reservoirs. In order to ascertain its value in the service reservoirs we must deduct the cost of distribution, which includes nearly all the cost of management and maintenance, not from the price at which it is sold for household purposes, but from that at which it is sold in large quantities for commercial purposes, because Waterworks Companies do not sell any water at a loss. Taking all these points into consideration we cannot assign a higher value than 2d. per thousand gallons to the water in the service reservoirs previously to distribution.

In the Reports of the Rivers Pollution Commissioners the manurial value of sewage is said to vary from a maximum of 2d. per ton in dry weather to a minimum of ¼d. when the sewage is diluted with storm water. According to these estimates the value of crude sewage varies from 2¼d. to 9d. per thousand gallons.

I am well aware that you will not regard the theoretical estimates of analytical chemists as evidence of much value in support of my views as to the actual value of dry weather sewage, because it is the general opinion that this value can never be realised. I shall therefore endeavour to show you that this view of the question is erroneous, that in reality the smallest value is in all cases actually realised by the production of magnificent crops, and that the failure takes place in the next stage. The full value of the crops is not realised. Irrigation farms in the hands of practical farmers who understand the art of making the most of the farm produce cannot fail to pay handsome returns in hard cash, but practical farmers keep their balance-sheets to themselves.

On the basis that the sewage of 100 people can properly fertilise only one acre, and at the rate of 20 gallons per head of sewage, which is a high estimate where the separate system is in force, one acre will require annually 730,000 gallons. We have now to consider what that acre of land under sewage irrigation is capable of producing. One acre sown with rye grass will produce five or six crops a year,—fully 60 tons of grass. This is sold at prices varying from 10s. to 20s. according to the demand and the locality of the farm. Estimated at only 10s. per ton the gross return would be about 30*l.* per acre. From corn and root crops the gross return is worth from 20*l.* to 30*l.* per acre. Against this amount is to be debited rent, taxes, working expenses, and interest on farm capital. If the land is let at an ordinary agricultural rent, 12*l.* a year ought to cover all the yearly charges under these heads, and a balance of from 12*l.* to 14*l.* per acre would be left to divide into tenant's profits and payment for the sewage as a manure. If this be divided equally between them the amount paid for the sewage would be over 2d. per thousand gallons. If 3*l.* a year per acre in addition to interest on sunk capital be considered a fair tenant's profit, the value of the sewage would on that basis be more than 3d. per thousand gallons.

In Colonel Jones's pamphlet on the Havod-y-Wern Farm it is stated that the average net profit for five successive years amounted to 3*l.* 4s. 4d. per acre. The rent paid by Colonel Jones is nearly 5*l.* per acre, so that the rates and taxes must be proportionately heavy. As he is only tenant, he puts on the debit side a yearly sinking-fund, to recoup himself for capital sunk in permanent improvements, which amounts to about 7s. per acre; with this addition the total net profit made by Colonel Jones is about 3*l.* 11s. per acre. This, however, represents only part of the whole profit. The cows fed on the farm are owned and kept by another man, who is presumed to live on his profits, but publishes no accounts. There are only 92 acres, so that the profit made by the cow-keeper cannot well be less than 30s. an acre. If the rent paid by Colonel Jones had been an ordinary agricultural rent, his profits would have been increased by a deduction of fully 3*l.* 10s. from the debit side in the amount charged for rents, rates, and taxes. Making these allowances, the total net profit made on the Havod-y-Wern Farm has been, on an average of five years, fully 8*l.* per acre.

The successful disposal of sewage crops is at the very root of the whole matter. To state that there is a difficulty in finding a market for them in some cases is tantamount to saying that there is no home demand for milk, butter, cheese, and beef. The produce must be consumed on the farm and converted into food for man before it is brought into the market. This work can only be successfully carried out by private enterprise. So far, therefore, as the interest of Sanitary Authorities are concerned, the only point to be considered is the question of the rent at which they will be able to let irrigated land.

NATIONAL WATER SUPPLY.

WE supplement our reports* of the recent Congress on Water Supply at the Society of Arts, by giving summaries of papers submitted for consideration, though not formally read or discussed.

Mr. William Bennett, member of the Liverpool Water Committee, submitted a paper in which he said:—

"I look upon it as the compulsory duty of all Corporations or private companies, who obtain Acts of Parliament for the supply of towns, 'to supply pure water to the population' irrespective of trade peculiarities. I consider that it is a duty the manufacturing and trading community owe to themselves to develop the great natural resources of the kingdom, so as to adapt them to the varying specialities and wants of districts. for, as Mr Bateman says in his evidence, Manchester wants a different water from Liverpool; and I recommend that all large towns, such as Liverpool, which has water from a large river at command, should encourage the formation of a private company for the supply of water under high pressure to be used as a motive power, the company agreeing, for the privilege of laying their pipes, to supply gratuitously at any required pressure such mains for the suppression of fires, as may be laid down by the authorities. By this course the inhabitants of large towns secure a good and wholesome water for domestic use, the manufacturers obtain the best kind of water for their 'varying specialities,' and by the supplying of water at a high pressure, from a costless source, a motive power can be introduced into all kinds of works and offices free from the risks of fire, or explosions, and the nuisance of smoke, and in addition salt-water baths can be supplied, and fire mains kept constantly charged, and instantly adjusted to the exact pressure best suited to the site. Liverpool is now supplied from public and private wells with more than twenty-one millions of gallons of spring water daily; by deep boring, this quantity may be materially increased, and, by using water obtained solely from deep borings, the quality will be in all respects 'unobjectionable for domestic use,' as stated by Dr. J. Campbell Brown, the analyst employed by the Liverpool Corporation. A boring is now being made at Liverpool 26 in. in diameter, and 1,000 ft. deep, in the expectation of adding to our supply ten million gallons per week. A few similar bore-holes made in the immediate neighbourhood, it is thought, will supply pure water for domestic purposes for the next century."

Mr. J. W. Willis Bund contributed a short paper, in which he said:—

"1. A large and comprehensive scheme of a national character with regard to the water supply of the country is practicable if a proper body is appointed to watch over it, and money provided to carry it out.

2. The country is by nature divided into a number of watersheds, and it was obviously intended that the supply of water, given by nature to each of those watersheds, should suffice for it.

3. Any really national scheme must, therefore, be based upon the principle that each watershed has *primâ facie* a sufficient supply of water for its wants.

4. If it is not so, the deficiency must arise from two causes: (*a*) the natural character of the district has been artificially altered; (*b*) the natural sources of supply are not available.

5. As to (*a*), this may arise from the increase of the inhabitants, or the introduction of manufactures, and on its being shown that the supply was insufficient from these causes, then the district might be allowed to obtain a supply from another district where there was a greater supply taken for the existing and probable wants of that district required.

6. As to (*b*), this must arise from some act of the inhabitants of the district; every means should therefore be taken to render such supply available, and, until it was clearly proved that all such means had been used and exhausted, no district should be allowed to resort to another for its water supply.

7. An account should be taken of the water supply of each district, showing what is, and what is not, available, and if the supply of any is deficient, steps should be at once taken to utilise the existing source at present unavailable.

8. When that was done, if the supply was still inadequate, application might be made to some central authority asking leave to take water from another district.

9. Before the leave was granted, the applicants should prove to the satisfaction of the central authority (1) that they had utilised all their available sources of water, (2) that the supply of water to the district from which they proposed to take it was more than ample for any reasonable increase of population for a long period of years, (3) that all the districts through which the works abstracting the water passed should have on payment a right to be supplied, either at the present or at a future date.

10. No scheme to take water from another district should be submitted to Parliament that did not comply with the requirements of the last section."

Sir Henry Cole contributed a short paper in which he asked for consent to the following propositions:—

"1. That as the law already forbids poisoning the people by bad air, it should be admitted that every one has a right of obtaining pure water in sufficient quantity for his daily life as far as practicable.

2. That water fit for dietetic purposes can only be supplied after proper filtration; consequently no river water, except at the very source of it, is pure enough, and well-waters generally are rarely sufficiently pure for drinking purposes. The Duke of Somerset recently declared the use of rivers for drinking must be given up. As a general rule, the sparkling gaseous waters pumped up from the metropolitan wells and wells generally are dangerous to health. Throughout Birmingham the well-water is more or less poisonous, and unfit for drinking. The water in wells in cottage gardens is generally tainted by drains, and the water of ponds ought not to be used even for cattle.

3. That pure water will increase the health and vigour of the people, and provide the best antidote to intemperance."

Sir Henry went on to say that it appeared to him that,—

"The plans now being discussed by London, Liverpool, and lately settled for Manchester, suggest the practicability of an extended action under national sanction.

That great districts should be bound to look after the supply of water, with regard to the neighbouring small towns and still smaller villages.

That the spirited example set by Manchester, of supplying a limited district, be accepted as wise and beneficial, and that the principle be applied to the whole kingdom, to be mapped and parcelled out into a sort of water heptarchy, with federative powers.

And that for reasons of economy and excellence of supply, the nation, through Parliament, should cause all great reservoirs to be provided for supplying the proper quantity of pure water, leaving towns and villages to construct all the local arteries. * * * *

The scientific application of known facts, with the present amount of knowledge, would not appear to be difficult, so as to cause an adequate number of reservoirs, for the whole of the United Kingdom, to be provided. England and Wales might be divided into seven districts, and under a local Commission. Let each district be confided to a competent well-known engineer, to prepare the plans necessary for it, and let these form a united Board for the discussion of general questions. I am informed, by one who has made the subject of water supply his study, that a year would be ample time to devise a general national scheme.

The general financial principles to govern the scheme should be the work of the Government. The capital required might be a hundred millions of pounds or more, but what is that, looking to the cost of railways, not quite so important as pure water?"

Mr. J. Bailey Denton's paper contained the following passages:—

"As it is the wish of H.R.H. the Prince of Wales to ascertain 'how far the great resources of the kingdom might, by some large and comprehensive scheme of a national character adapted to the various specialities and wants of districts, be turned to account for the advantage of the general body of the nation at large,' I desire to express my conviction that if by the term 'large and comprehensive scheme of a national character,' it is suggested that one scheme of works or one mode of supply can be devised which shall be applicable to the whole country, I am not of opinion that such an object is practicable. The great difference that exists in the rainfall as a source of supply, the diversity of surface, the variety of soil upon which the rain falls, and the irregular denseness or sparseness of population in proportion to space, forbid the realisation of such an idea.

I am, nevertheless, perfectly convinced that if there existed (1) a proper conservancy of rivers extending over the whole area of their basins, (2) an exact knowledge of the hydro-geological conditions of each river basin, and (3) legal facilities for dealing with the water rising up within, and flowing through, and existing under private properties, there would not be a single village in the country but might be abundantly supplied with pure water.

To render river conservancies competent to exercise that control over river systems which would preserve riparian and private rights, while securing to the public the enjoyment of the chief element of health,—pure water,—the first step to be taken should be the collection of all existing information bearing upon the surface and subterranean waters within each river basin, prepared on such a form as to be immediately available and capable of enlargement as fresh information may be obtained. At present there is no reliable record of such data within the reach of either local authorities or engineers, although a mass of information exists in a scattered and very costly form, in the Ordnance and Geological Survey Departments, which might afford data whereby neglected springs and subterranean waters might be turned to account. Were this information obtainable in an authoritative shape, the indisposition of the owners of landed estates to place at the service of sanitary authorities the sources of supply which they possess by territorial right would cease to operate as injuriously as it now does.

Numberless examples of what may be done in the way of water economy, by the use of wheels, turbines, rams, and pumps, and in the way of storage, for village supply, are to be found scattered over the whole face of the country. If these instances, instead of being disregarded, or only cursorily mentioned in Parliamentary Committees, were carefully examined and described in a popular, but practical form, the serious want of water experienced in villages and rural districts, which induced H.R.H. the Prince of Wales to come to their rescue, would vanish in a great majority of cases, though, so long as permissive laws stand in the place of compulsory laws in a matter of such vital consequence to every one as pure water, and boards of guardians are the judges of the time and course of action, so long will the present state of things exist."

Professor Frankland, in a short paper, said:—

"Although I cannot see how a comprehensive scheme of water supply of a national character could be carried out without both waste of capital and interference with manufacturers, I consider that the adoption of a few general principles in legislation would be of great advantage in procuring a fair distribution of water, and preventing needless waste. Thus:—(*a*) The withholding of permission from towns, &c., to go to a great distance for water until both the before-mentioned sources of wholesome water have been exhausted. (*b*) Where a distant source is allowed, the securing of a necessary provision for intermediate towns, villages, and hamlets. (*c*) In large towns,

* See pp. 534, 568, *ante*.

the separate supply of water for manufacturers, street waterings, and outdoor purposes generally. (d) The sale of domestic water by meter to all houses above a certain rent.

The waste of domestic water is a crying evil, which can only be efficiently remedied by the compulsory use of meters. In Glasgow, 38 gallons per head are used for domestic purposes; in London, 28 gallons; and in Malvern, where the meter system is in use, 7½ gallons per head. Ten gallons daily per head is amply sufficient for domestic purposes, and would probably never be reached if the water were sold by meter.

By separating the indoor from the outdoor supply, and selling the former by measure, the quantity of wholesome water required would be reduced to one-third or less, and there would be no risk of unwholesome water being used for dietetic purposes through carelessness or mistake."

Mr. Joseph Parry, C.E., of Liverpool, contributed a paper, in which he made the following suggestions and recommendations:—

"1. To divide the country into water-shed districts.

2. To appoint an engineer to each of the principal water-sheds, whose duty it shall be to deal with all matters relating to water supply, the pollution and appropriation of rivers, streams, springs, and underground waters.

There are twenty-five watersheds exceeding 500 square miles in area. These, with smaller sheds added, might be distributed in the manner I propose among fifteen or twenty engineers. Several engineers are at present engaged in the protection of public interests in rivers under Conservancy Boards, Commissioners, Fishery Boards, and other bodies. As far as practicable, all such interests, often conflicting, should be placed under the one engineer.

(a.) The salaries of the proposed engineers to be paid either entirely by Government or partly by Government and partly by contributions from the several sanitary authorities and other public bodies interested in the work done, and no further charge to be made for services rendered or plans prepared.

(b.) The engineers to advise sanitary authorities on all questions affecting the water supply and disposal of sewage; but restrictions to be placed on the preparation of plans for authorities employing their own engineers, or for places exceeding a given population. To take no part in the ordinary management of waterworks.

(c.) To report to the local sanitary authorities any impurity or deficiency; and in certain districts to be specified to prepare plans and estimates for works required.

(d.) Failing action on the part of the sanitary authorities, the circumstances to be reported to the Local Government Board.

In many cases it would be sufficient to call attention to the polluted state of a supply, and explain the means by which the evil could be remedied, to insure prompt action by the inhabitants or authorities concerned. In other cases, and perhaps in numerous cases, it might be necessary to exercise compulsion. And, having regard to the interests involved, there should be no hesitation in arming the Local Government Board with compulsory powers to deal with such cases, within reasonable limits as to cost.

(e.) The engineers to report annually to the Local Government Board; also to report on all Waterworks Bills promoted within their districts.

A system such as is thus briefly sketched would form a link which is now wanting between the Government and the country; would give to the people, through their local sanitary authorities, the practical advice and assistance the want of which is often the only cause of failure to remedy the evils from which the people suffer; would spur indolent, interested, and careless authorities into useful activity; would strengthen weak authorities in proceedings against powerful landowners and manufacturers; would diminish greatly the expense and the risks of private Bill legislation; would afford means of enforcing the provisions of the Act for preventing the pollution of rivers; would diminish the present costly conflict of selfish interests; and would secure for the use, enjoyment, and benefit of the people generally the natural resources of the country."

THE PROTECTION OF IRON SURFACES FROM OXIDATION OR RUSTING.

WITH reference to the notice in our last issue of Mr. Bower's process, Mr. Tweedie wishes it understood that, as a matter of fact, to Mr. Bower alone must the honour of discovery be assigned, as he, Mr. Tweedie, has merely acted as the chemist in his employ, and his experiments have been simply the working out of Mr. Bower's ideas.

What we said in our last having, naturally, excited interest, some fuller particulars will doubtless be welcomed. The history of the discovery is interesting. Mr. Bower having, in some experiments he had conducted, about ten years ago, for the production of non-illuminating gases (one of them being the production of hydrogen by passing steam over red-hot iron), observed the fact of steam having the power to alter the surface of the iron. Want of leisure prevented him from following up this observation until Barff's process was brought into notice, when his early experiment recurred to him, as well as the idea that the oxygen, as it exists in our atmosphere, would serve the same purpose as well as, or better than, the oxygen as it exists in water or steam. A few experiments were at once performed, and proved this supposition to be a correct one.

Mr. Bower having thus elicited the fact that air would effectually coat the iron with the much-desired film of magnetic oxide, at once commenced an elaborate series of experiments to ascertain the exact conditions of success, and although many of the experiments proved far from encouraging, yet by indomitable perseverance, and at a great expense, the efforts of that gentleman have been at last crowned with success.

The following experiment merits, from the extraordinary result, some attention. Mr. Bower had the idea that the hot blast, as used for the production of pig-iron, would not only heat the iron to the requisite temperature, but would also supply the oxygen for the production of the magnetic oxide; and by the courtesy of Messrs. Cochrane & Co., of Dudley, he was enabled, many months ago, to try the experiment. A square bar of cast-iron was exposed to the action of the hot air for about twelve hours, when the bar was withdrawn, and found to be firmly and thoroughly coated with the magnetic oxide. This coating has protected the iron perfectly from the oxidising action of moist air, although subjected to the most trying tests, and at the present time the coating is as firm and homogeneous as when first withdrawn from the blast, the iron having rusted only where the oxide has been purposely removed, and even there not the slightest trace of lateral rusting is to be detected.

It will be advantageous here to give the composition and mode of formation of the various oxides of iron to enable us to understand clearly the *raison d'être* of the process. When iron is first exposed to the action of moist air, it abstracts one atom of oxygen, and forms the protoxide of iron or ferrous oxide FeO; such an oxide has an intense affinity for more oxygen, and becomes speedily converted into sesquioxide of oxide or ferric oxide Fe_2O_3; this oxide, better known as rust, in contact with metallic iron, again becomes converted into ferrous oxide, according to the equation

$$Fe_2O_3 + Fe = 3\,FeO$$

This ferrous oxide being again brought into contact with a fresh supply of oxygen, is reconverted into ferric oxide or rust, and so the action goes on continually in this way disintegrating the iron.

If iron be, however, exposed to the action of steam or air at an elevated temperature, instead of the above oxides we get a curious oxide formed known as magnetic oxide of iron, and also by many chemists as ferroso-ferric oxide, its formula being Fe_3O_4, making it apparently a compound of ferrous Fe O and ferric-oxides Fe_2O_3. The exact molecular arrangement of this interesting body must still be regarded as a debateable point; one thing, however, is certain, and that is, that this magnetic oxide is not susceptible of change or conversion into rust by the action either of oxygen or moisture under ordinary conditions.

It is obvious, then, that this magnetic oxide offers itself as a specially good material for coating iron articles requiring protection from rust, and if we can get it on the iron as a firm, hard, coherent coating, we have solved an important problem, and have given to the world the best possible means of protecting iron, and thus incidentally vastly extending the applications of that useful metal.

This has been done, as already mentioned, by Professor Barff, by the action of superheated steam, the details of which process are sufficiently well known, and also by the process of Mr. George Bower, to which this article draws particular attention, as the application of air itself at a suitable temperature must possess advantages over the use of superheated steam, both as regards economy and the ease with which it may be applied.

The method hitherto adopted in the working of the air process has been simply to expose the iron articles in a large retort or chamber, the temperature of which is raised to a point dependent on the ultimate use to which the articles may be applied, and which ranges from a very dull to a bright red-heat. Air is then passed in, and the inlet and outlet pipes closed as perfectly as possible, and at the end of every hour the air is renewed and the inlet again closed. After exposure in this way for some hours, the time varying with the nature of the articles, the iron will be found to have received a perfect coating of magnetic oxide, the colour of which varies between a light and a dark grey, or neutral tint of so delicate a nature as to absolutely dispense in many cases with the use of further ornamentation by painting, &c.

The coating has been subjected to the severest tests, and has invariably resisted all attacks of both air and moisture, and there is thus every reason to believe that this process will, when completely developed, entirely supplant every other method of protecting iron from rust.

The cost of coating iron in this way is estimated at about 1*l.* per ton of iron; but there is this peculiarity appertaining to the process, that whether the ton of iron be a solid cube or mass of that weight, or whether it be distributed over thousands of articles, involving an enormous increase of area, the cost remains practically the same.

THE ALTERATIONS TO THE INSTITUTE PREMISES.

WE have been rather pressed to give an opinion on the scheme for altering the premises in Conduit-street, so as to afford more accommodation for the increased requirements of the Institute. Under these circumstances we may be excused for giving the opinion, which, perhaps, we should hardly have volunteered otherwise, that the plan as it stands is a mistake, and will not do. Sketch-plans are in the hands of all the members of the Institute; plans, we may observe, with no scale attached to them, a rather odd omission in drawings made by an architect for architects; but the principal dimensions of the rooms are figured, and, therefore, the general arrangement can be judged of on reference to these plans. Considerable ingenuity is shown in the arrangement of the rooms, so as to make the most of the space, but we believe most members who take the trouble to examine the plans will agree with us in thinking that the placing of the meeting-hall on the upper (second) floor of the building is a mistake, which ought to be fatal to the scheme. It is all very well to say that the hall is only used for the fortnightly meetings, and that, therefore, a climb to it is of less consequence; but the meetings are the main objects of the whole building, and the meeting-room should be on the principal floor. There is another practical objection to this feature in the scheme. The meeting-room is exactly the one in which light is of least consequence, as it is hardly ever used except at night; on the other hand, the reading-room is the place where light is most wanted, and it will be most inadequately supplied by the window shown at one end of a long room; in fact, except on very bright days, half the reading-room, as shown, would be practically useless. The library, also, is just the room in which a top-light is most wanted, in order to leave the walls clear for bookshelves. The present library is nearly full, and the three windows take up a great deal of wall-space which might be utilised for this purpose. It therefore seems to us only a matter of common sense that the library and reading-room should be on the upper floor, where they will have the top light, even leaving out the question of the undoubted propriety, architecturally speaking, of placing the principal room on the principal floor.

There are other criticisms to which the plans appear to us to be open, but we will not say any more now; the scheme will, we believe, be discussed at a special meeting of the Institute, and perhaps something will be struck out which will satisfy all demands. But we are distinctly of opinion that any satisfactory scheme must include retaining the meeting-room on the main floor. There is one other point that the drawings suggest, which we should not like to pass over. It may be hardly fair to take mere sketches as any basis for judging of architectural design; still, we observe that the meeting-hall is represented as decorated with pilasters, panels, and festoons or garlands from one pilaster to another. We do not wish to speak disrespectfully of such orthodox and well-worn architectural garniture, but, on the whole, is not this rather too hackneyed? And if the central body of architects are designing a room for themselves which will be taken by outsiders as an example of their own artistic taste and predilections, had they not better either invent something that will be admired as artistic and original, or else leave decoration alone altogether?

We should have been glad to give our support to any plan by Mr. Phipps, whose abilities and success as a theatre architect are too well known to need commendation from us; but, having been asked for an opinion, we are led to confess that we cannot regard the plan circulated to members as very successful, or as likely to give permanent satisfaction if carried out; though it must, of course, be admitted that the problem of getting the accommodation into the space required, with due regard to cost and to the interests of others in the building, is not an easy one.

EXTENSION OF THE KENSINGTON INFIRMARY.

AT the last meeting of the Kensington guardians the Infirmary Committee reported that it was desirable to purchase the whole of the piece of ground adjoining the workhouse, on which the infirmary of St. Margaret's and St. John's stood, which would shortly be in the market. This would provide for a needed enlargement of the infirmary of the Kensington Board, and also for the establishment of a vaccination station. The committee, therefore, recommended that application be made to the Local Government Board to authorise the guardians to treat for the purchase. Mr. Brandreth opposed the purchase on the ground of expense, and said the guardians should not give way to a building mania. Mr. Cockerton said there was such a demand for space in the infirmary that patients had to be hurried through into the workhouse before they were fit for it. Adverting to Mr. Brandreth's remarks, Mr. Murlis observed that he was also opposed to a building mania; but this piece of ground was valuable to the guardians, and should be purchased while there was the opportunity. The recommendation of the committee to purchase the ground was adopted.

THE NEW UNIVERSITY OF LEYDEN.

IN the international competition, as regards the plans and drawings for the proposed new university buildings at Leyden, the names of three of the architects who had won premiums were, owing to some accident, missing, and they were accordingly advertised for in some of the chief Continental papers. The winner of the first premium, with the motto, "Vivat Academia," is Professor L. Bohnstedt, of Gotha, who may be remembered as having carried off the first prize in the competition for the new Houses of the German Imperial Parliament. The second premium was taken by Messrs. Tarring & Wilkinson, of London; the third by Messrs. E. & W. Mengelberg, of Utrecht; the fourth by O. Spetzler, of Boehum; and the fifth by Messrs. Brekelbann & Wiegand, of Hamburg.

CONGRESS ON NATIONAL WATER SUPPLY.

SIR,—In your valuable journal of Saturday last, it was stated by Professor Frankland, at the second day's sitting of the Conference, that the experiment of water-supply by meter had been tried in Great Malvern, and it was found that seven gallons and a half per day for each person sufficed. In furtherance of the above statement, allow me, sir, to add that the system of water supply by meter for sanitary and domestic purposes has been in operation here over six years, and that it has fully answered the purpose intended, viz., the prevention of waste; and further, that from eight to nine gallons per day for each person are ample.

From experience, I have no hesitation in saying that the above system can be carried out in any town with similar results.

JOHN E. PALMER, Town Surveyor.

Great Malvern.

P.S.—Great Malvern is, I believe, the only town in England which supplies its inhabitants by meter for sanitary and domestic purposes.

PROCRASTINATING BOARDS.

SIR,—Can any of your numerous correspondents recommend a cure for the lethargy that has so long been inherent, and rendered every effort of the Littlehampton Local Board of Health of no avail for good, either now or hereafter? The Board has taken more than twenty years to make up their minds whether to have drainage or continue the good old system of cesspools in juxtaposition with the wells. The Duke of Norfolk has very liberally offered to bear one-half of the expense of a thorough system of drainage, providing the Board will enter into a bond to commence the work forthwith, and have it done under proper superintendence, but the Board decline to enter into any such bond, and wish for another twenty years to consider such "a very serious matter." I have just met some of the Board, who are growing over having passed, they say, such a resolution. The talents of some Boards are said to be under a bushel; I am certain that the talents of the Littlehampton Board cannot be above a bushel, but considerably under. A VISITOR.

Baths and Washhouses for Chelsea.—At the last meeting of the Chelsea Board of Guardians, it was resolved to establish public baths and washhouses for the parish. A site is in view.

THEATRES AND MUSIC-HALLS.

Elephant and Castle Theatre, New Kent-road.—This theatre is to be rebuilt, and with better exits and entrances. It will have two circles above the pit, namely, the dress-circle and gallery, besides private boxes. Each portion of the house is to have not less than three exits and some more. The contract has been let to Messrs. W. Bracher & Son, builders, of Great Ormond-street, Queen-square; Messrs. Pashley, Newton, & Young, of Red Lion-square, decorators; and Messrs. Z. D. Berry & Sons, of Regency-street, Westminster, gasfitters. Mr. J. T. Robinson, of Bloomsbury-square, is the architect.

The London Pavilion, Tichborne-street.—A few months ago six architects were invited to send in plans for the alterations of the above hall. On Thursday, in last week, Mr. Loibl, the proprietor, invited all who had sent in plans to dine with him. The letters then were opened, and cheques were given to the three successful architects. The first premium was given to the motto of "*Bonâ Fide*," Mr. J. T. Robinson; the second, to the plans bearing the motto "Pavilion," Mr. Flack, of London; and the third, to the plans under the motto "Boaz," found to be by Messrs. Wilson & Willcox, of Bath.

ART-UNION OF LONDON.

THE following are the chief works chosen up to this date by prizeholders:—

From the Royal Academy.—"Little Záarah," J. Sant, R.A., 155*l.*; "A Primrose Morning," J. Clayton Adams, 100*l.*; "Folklore," C. Gregory, 100*l.*; "A Moorland Stream," W. S. Morrish, 80*l.*; "Sunny Hours," D. W. Wynfield, 80*l.*; "The Crab," E. Hume, 78*l.* 15*s.*; "A Day-dream," W. Dendy Sadler, 63*l.*; "The Wanton Troopers," Marcella Walker, 50*l.*; "The Heir come of Age," R. Redgrave, R.A., 50*l.*; "The Mill-head," Alfred Parsons, 42*l.*; "Mother and Child," Mr. Sparkes, 42*l.*; "A Corner of the Forest, Inverary," Georgina M. Greenlees, 40*l.*; "Place Fell, Ullswater," Alfred Powell, 36*l.* 15*s.*; "Kept In," W. H. Weatherhead, 35*l.*; "A Competitive Examination," Kate Perugini, 35*l.*; "The Woods in Spring," C. Gibbs, 25*l.*; "From a Sketch in the Simplon Pass," G. H. Browne, 20*l.*

From the Society of British Artists.—"The Legend of the Poignard," J. C. Waite, 80*l.*; "Suk al Ghûrijeh, Cairo," E. M. Chevalier, 60*l.*; "On the Conway, near Llanwrst," A. B. Collier, 50*l.*; "A Country Forge," J. M. Barber, 50*l.*; "On the Thames, Cookham," D. Law, 45*l.*; "A Welsh Homestead, near Beddgebert," W. H. W. Foster, 45*l.*; "A Sunny Afternoon, Surrey," A. Powell, 42*l.*; "The Twelfth of August on the Moors," E. R. Breach, 40*l.*; "La Belle Fleuriste," A. F. Paten, 31*l.* 10*s.*; "Between the Showers," R. Crafton, 30*l.*; "The Bird Rock, near Towyn, North Wales," B. Evans, 30*l.*; "Durham," A. A. Glendinning, 30*l.*; "The Pride of the Port," A. C. Stannus, 67*l.*; "A Visit to the Antiquarian," G. Van de Bos," 55*l.*; "Landscape and Cattle," Miss L. Von Perbandt, 40*l.*; "Sunny Days," J. C. Waite, 35*l.*; "Stepping-stones, Betws-y-Coed," F. Turner, 30*l.*; "The Day's Decline," T. S. Croxford, 30*l.*; "A Shepherdess," J. M. Bowkett, 25*l.*; "Near Tintagel," T. S. Croxford, 25*l.*

From the Royal Scottish Academy.—"By the Burnside," Inveraman," Alexander Fraser, R.S.A., 80*l.*; "Old Boatyard," P. S. Nisbet, 60*l.*; "On the Thames," Dr. Law, 36*l.* 15*s.*; "The Heart of the Trossachs," Jas. Hamilton, 25*l.*

From the Society of Painters in Water-Colours.—"Moonlight—Vessels running for Swansea Harbour," Edward Duncan, 60*l.*; "Mussel Gatherers, Conway Marsh," H. C. White, 45*l.*; "Derwentwater," Charles Davidson, 43*l.* 10*s.*; "Chatillon, Val d'Aosta, on a Misty Morning," Collingwood Smith, 35*l.*; "View of Bamborough Castle, Wreck Ashore," Jno. Callow, 21*l.*

From the Institute of Painters in Water-Colours.—"Garden Spoil," G. G. Kilburne, 70*l.*; "Waiting for the Ferry-boat," J. H. Mole, 63*l.*

From the General Exhibition of Water-Colour Drawings. "The Cottage by the Brook," Arthur Shelly, 25*l.*

THE IDEAL SANITARY INSPECTOR.

IN a good lecture on "Sanitary Reform," delivered at Alva some little time ago, and just now published, Mr. Kenneth M. Macleod says,—"As the Sanitary Inspector is an official of recent growth, I shall, before giving an account of his special work, give you a description of the qualifications he should possess to fit him for his important but dangerous work. He should b e the owner of a good sound constitution, he should have sufficient sense and self-denial to follow the rules laid down by competent authority to preserve it so, including temperance and strict regularity, to repel, as far as possible, an attack on himself of the infectious diseases he is daily coming in contact with. He should have a pleasing address, and be as much as possible calm and collected. He must be conversant with the proper principles of house construction, ventilation, and drainage, with the best modes of carrying out the same according to the circumstances of individual places. He should have a knowledge of all kinds of traps, water-closets, and all their fixings; be able at a glance to detect a structural defect preventing the admission of light or ventilation, and in an intelligible form point out a remedy; and, if need be, draw a neat little pencil sketch of the defect for consideration of the owner or occupant who is to be asked to make the alteration. He must have an observant eye, a quick ear, and a sensitive nose. In meeting with owners and occupants he should be more forward to hear than to speak. In no public duty more than his, is Carlyle's favourite maxim more applicable that 'silence is golden.' When speech is necessary he should confine himself to the matter in hand, explaining only what needs to be explained, and persuading where persuasion is likely to be of use; to see, to hear, to smell, to note, and to report—that sums up his work as an Inspector. In doing this work he will have to restrain his temper, practise patience, and learn to endure hard speeches without answering back. He must, by observation, educate himself to detect at a glance the kind of infectious disease with which any patient he may discover, or be sent to, is affected; and, in such cases, be ever ready with a kind word to cheer up patients and their desponding friends. He should bear himself with a sympathetic aspect to the many bereaved ones,—widows, mothers, and orphan children,—he will so frequently meet with in the performance of his duties; kindness must characterise his every movement on epidemic duty, and rude behaviour or supercilious officialism should find no place in his conduct. He should acquire a knowledge of the different kinds of disinfectants, and know those best fitted for safely and effectually disinfecting fever localities, and the changes scientific authorities assert they effect on the atmosphere or article operated upon, and be able to explain the same if asked by any doubting delinquent who refuses to apply them. It is hardly needful to add that, in addition to all these qualifications, he must be of a courageous spirit, have no fear of infection, and be ever ready to join an attack on infected strongholds."

CROXTED LANE.

SIR,—This favourite lane being the property of Dulwich College, possibly the governors may feel bound to obtain the utmost present return in ground-rents. Therefore, if desired to preserve it for recreation, the loss of revenue has to be considered. The governors, however, have evinced a decided care for the trees on the estate, and the leaseholders are bound by covenant to preserve them. But should this ground be condemned to the fate which has overtaken many other beautiful spots, and be devoted to building, there is one important point not to be forgotten in setting out the plans, and it is this,—the backs of the houses should not be exposed to the view of passengers by the adjacent railway. Only take a ride on it from Clapham to Herne-hill, see how close the houses are built to its banks, observe the exposure of bedrooms, kitchens, closets, back courts, &c., all in a row, with their varied accompaniments of household work, washing, and other details, interesting enough in domestic life, but inappropriate for public exposition, and appearing to compete for the credit of turning private affairs inside out; and then say whether decency and comfort are possible in such dwellings. We hear and read much of improved habitations, yet here behold a deliberate abandonment of propriety and privacy, destructive of respect for home. This railway was laid out through a pleasant open stretch of country, green pasture varied by gardens and villas, but all that has disappeared, and at present the view from the windows of the railway carriages is a panorama of disagreeables, often disgusting. Let us hope that by enlightened management Croxted-lane may not be made to increase the evil. H. C.

THE PRESERVATION OF IRON.

SIR,—Mr. Tweedie has expressed to me his concern that by some error you have associated his name with the development of my air process of preserving iron from rust. Will you kindly allow me to say that the discovery was not the result of accident, but of long experiment?

The *accident* incident, to which your notice of my process refers, was one probably to a letter I wrote in March, of last year, when Professor Barff's discovery was first announced at the Society of Arts, stating that but for the accident of my having some ten years ago used some old iron in an experiment I was then making instead of new, I should doubtlessly have forestalled the Professor.

Mr. Tweedie has been of great service to me in conducting some recent experiments; but the specification of my patent was published before I had even the pleasure of his acquaintance. JOHN BOWER.

DUBLIN (SOUTH) CITY MARKETS COMPANY'S COMPETITION.

THE directors of the above company instituted limited competition for the best design for laying out a large plot of land lying between William-street on the east, Great George's-street on the west, Exchequer-street on the north, and Jade-street on the south, and intersected by Drury-lane. The competition was limited to ten architects, who all sent in designs on the 10th of May last. These were submitted to Mr. Alfred Waterhouse, A.R.A., of London, who reported on the same to the directors, and advised as to the relative merits of the designs, having regard to the objects and requirements of the company, and with the following results:—

1. (Northern Light)	Messrs. Lockwood & Mawson,	Bradford.
2. (Con Amore)	Messrs. O'Neill & Byrne,	Dublin.
3. (Agere)	Mr. J. N. Deane,	Dublin.
4. (Eblana)	Mr. J. H. Bridgford,	Dublin.

are respectively entitled to the premiums of 60*l.*, 120*l.*, 80*l.*, and 50*l.* offered by the directors.

The architects whose design is placed first will be employed to carry out the work, and the premium awarded to the design will merge in the commission. The selected plan shows a market-hall on the main block, surrounded by a belt of shops, distinct from the market-hall, facing the surrounding streets, and suited to the character of the frontages. The whole of the smaller plot, lying between William-street and Drury-lane, is treated as part of the market-hall, and the roof is carried across Drury-lane.

A broad gangway, 30 ft. in width, runs through from William-street to George-street, about 350 ft. in length; and a cross gangway from Exchequer-street to Jade-street, of similar width, and about 300 ft. in length. The market-hall itself is a parallelogram, 246 ft. long by 112 ft. wide, and will afford accommodation for such retail traders as are usually provided for in covered markets, while the outside frontages to the various streets have been divided into shops, with dwellings or offices over, and of various frontages and depths, according to the relative value of the different frontages. Space has been left between the rear of the houses and the market-hall for the admission of light and air to the backs of the shops and houses.

The roof construction provides for the admission of the chief portion of light into the market-hall from the north, so as to prevent the intrusion of the direct rays of the sun. The whole of the basement story is excavated for cellarage and appropriated as a large bonded store, the central portion (200 ft. by 75 ft.) and inclined gadways thereto being vaulted in brickwork.

It is proposed to construct the buildings throughout in a sound and substantial manner, and with due regard to economy. The rubble work to be of black calp, the basement story and inside walls of Tullaghmore common brickwork, and the back and internal elevations with County Dublin stock bricks.

The principal fronts are to be faced with dressed red brickwork, relieved with moulded bricks and enrichments in terra-cotta. The style of architecture is a simple type of Gothic, and relies for effect more in grouping than on minute elaboration of detail. The windows between the wings and the centre are treated in a simple manner, with double reveals and arches in brickwork finished with a roll moulding. The angles and central gateways are somewhat more ornamental in character, the latter being thus easily recognised as forming the approaches to the market-hall. The estimate of cost submitted by the architects is 69,775*l.*

VERTICAL TUBE VENTILATION.

SIR,—My attention has only just been drawn to a correspondence which appears to have been going on for some weeks in your journal, on the subject of the ventilation of our public buildings.

It has been clearly shown that authorities differ as to whether there is more or less carbonic acid at the top of an inhabited room than near the floor level, but, as the law of the diffusion of gases becomes better known and understood, it is generally considered that this is, whatever its amount, is evenly distributed in a given volume of air. However this may be, it is not a matter of much consequence if means exist for rapidly changing the air of an apartment so that it has not time to get "vitiated," in the full sense of the word,—that is, to have added to it such a per-centage of carbonic acid gas, &c., as would be injurious to health.

Now, as to the best means for securing circulation, or constant change of air in a room without creating unpleasant draughts, it is noticeable that in discussing the merits of the vertical tube system, some of your correspondents start with the assumption that there is a collection of stagnant and vitiated air at the top of the room, which is disturbed by the incoming, vertically-ascending current of fresh air, and driven down towards the floor; but that appears to me a somewhat unreasonable proposition,—first, because the constant inflow of fresh air will not admit of the collection of the stratum of "vitiated" air; and, secondly, because the fresh or cold air *mixes* with the warmer air already in the room.

Even assuming that the action of the vertical tube system entirely depends upon the difference of temperature,—that is, the higher temperature inside than outside the room, which I do not admit,—such difference in temperature is not necessarily due to the exhalations of the occupants, and the heat engendered by the combustion of gas (as one of your correspondents puts it), but may be caused by the healthy heat of a fire or other suitable warming apparatus.

It has been proved beyond all reasonable doubt that, for influx of fresh air by natural pressure, the vertical tube system, when judiciously applied, is the best known method for all ordinary apartments, for the simple reason that, by means of the tubes, it is possible to introduce considerable quantities of cold air into a heated apartment without causing unpleasant draughts, the air being warmed at the top of the room before it descends to the open fireplace or other outlet.

In smoking or billiard rooms, and in public halls or rooms where a number of people congregate and much gas is burned, it is often advisable, and even necessary, to provide an exhaust-ventilator or suitable extract-shafts from the top of the room, and although this may appear to, and does to a great extent, spoil the theory of the vertical tube system, it is found in practice that the two work very well together.

Some advocates of the vertical tube system have claimed too much for it, forgetting that it is only a means (although a very excellent one) of bringing air into an apartment, and that it is equally important to provide an efficient means for extracting the air.

In large buildings if power can be applied for working the exhaust, in order to get a constant action, so much the better; air will enter through the tubes in all states of the atmosphere.

With regard to the objections made by Mr. Hood to the introduction of large quantities of cold air into public buildings, I believe that any reasonable quantity of cold air may, without discomfort, be introduced by means of the vertical tubes, provided the air-inlets are well distributed and the building properly warmed; and if, as a matter of economy, warmed air should be supplied to the different apartments of a large building, that it may with advantage be delivered through vertical tubes rather than horizontally through perforations in the skirting or through open gratings in the floor. H. C.

DISSENTING CHURCH-BUILDING NEWS.

Halifax. — The Stannary Congregational Church, Halifax, was recently opened. The building is in the Gothic style. Facing into Stannary-street, and close to the school, is the principal entrance. Advantage has been taken of the rapid fall in the ground to form classrooms and vestries on the basement. At the south-east angle of the building is the tower. A slated spire surmounts the tower, rising to a height of about 65 ft. The large gable, facing Richmond-street, has in its centre a large five-light window, the head tracery of which consists of five richly cusped circles. The Alma-street side of the building corresponds with the Stannary-street one. Internally, the chapel is 118 ft. long, 57 ft. wide, and 50 ft. from the floor to the ceiling. It is surrounded by galleries on three sides, the fronts of which are ornamented with rich arcade work, and all the seats, of pitch-pine, are open. The roof to the nave is wagon-headed in form, and is supported by cast-iron columns, with carved capitals, and which carry pointed arches, rising above the gallery level. A boldly moulded arch, supported on each side by cylindrical shafts of new red sandstone, resting on corbels, and bearing carved capitals, opens into a raised recess, nearly level with the galleries. In front of this recess, or chancel, just within the nave, is placed the platform, 24 ft. by 20 ft. The north aisle is set apart for the organ, which we understand is to be built by Messrs. Conacher & Co., of Huddersfield. The choir are to be seated in the centre of the chancel. The large five-light window, 27 ft. high and 13 ft. 9 in. wide, is filled in with stained glass, by Messrs. Powell Bros. The whole of the internal joiners' work is of the best selected pitch-pine, unstained, but varnished. The gallery levels have been arranged to work in with the levels of the adjoining schools, so that the scholars can assemble in their place for service, by passages direct from the school and classrooms. The church is heated with hot-air, upon a principle worked by Messrs. Taylor & Parsons, of Bradford. Accommodation is provided for 1,500 worshippers, 750 on the ground-floor, and 750 in the galleries. The architect is Mr. F. W. Petty, of Halifax, and the work has been admirably executed by the following Halifax contractors:—Masons, Messrs. Hopkinson & Sons; joiner, Mr. James Smith; plasterers, Messrs. Bancroft & Son; plumber, Mr. R. P. Stafford; decorators and painters, Messrs. White & Stringer. The gas-fittings have been supplied by Messrs. Freeman & Collier, of Manchester. The total cost is estimated at 8,000*l.* or 9,000*l.*

Books Received.

Maps of Old London.

MR. EDWARD STANFORD, of Charing-cross, has republished, in cheap and accessible forms, two well-known maps of London in early days. One shows London in the reign of King Charles I., being a *facsimile* of Newcourt's map of London in 1658, engraved by Wm. Faithorne: the "Cities of London and Westminster and the Svburbs thereof, together with ye Burrough of Southwark and all ye Throughfares, Highwaies, Streetes, Lanes and Common Allies wth in ye same." The second shows London in 1741—5: "An Exact Survey of the City of London, Westminster, ye Borough of Southwark, and the Country near ten miles round, begun in 1741, and ended in 1745, by *John Rocque*, Land Surveyor, and Engrav'd by *Richard Parr*." Both are exceedingly interesting to residents, antiquaries, and others, concerned in noting the growth of the metropolis. Being drawn to a scale enhances their value topographically, as districts can thereby be definitely traced through the various stages, from fields to the centres of dense populations and spheres of great manufactures.

Miscellanea.

"The Bell" at Edmonton.—The old "Bell," at Edmonton, made famous by Cowper's poem of "Johnny Gilpin," has recently been demolished, and a large modern tavern is being erected on the site. An extensive outbuilding connected with the hostelrie was left standing in the grounds, and has been used as a carpenter's shop since the new house was commenced. Here staircases, doors, window sashes, and other internal fittings were prepared ready for fixing, and on Wednesday evening, last week, the shop contained a large quantity of finished work. Between six and seven o'clock one of the carpenters removed a glue-pot from the fire and placed it upon the ground. Shortly afterwards his attention was attracted by a roaring sound, and on turning round he found a heap of shavings near the fireplace in flames, and it is believed he pulled off a red-hot cinder at the time he removed the glue-pot. The flames extended with extraordinary rapidity, and the building with the contents was entirely destroyed. Unfortunately, too, workmen's tools, worth nearly 100*l.*, were included in the general destruction. No engine attended, and the fire was allowed to burn itself out.

Proposed Church of St. Saviour, Woolcot Park.—The design of Mr. J. Bevan, Bristol, in accordance with the report of Mr. B. Ferrey, the architect, to whom the designs submitted in limited competition were referred, has been accepted.

The Utilisation of Sewage.—A meeting was held on Monday afternoon at Stafford House, presided over by the Duke of Sutherland, for the purpose of discussing the national importance of General Scott's Cement Process in preventing the pollution of rivers, as adopted at Burnley, Lancashire. The Chairman said that a meeting was held at Stafford House in 1872, and Scott's Sewage Company was formed a year afterwards. Ever since then the directors had been trying to show to the world that General Scott's process was a right one. It had been tried at Burnley, and the time had come when it should be shown how the process worked there. When he himself went into the company it was not with the notion of making 5 or 10 per cent., but with the idea that it was a national work. Sir Henry Cole showed specimens of the filthy sludge of Burnley, which, he said, was of about the same description as that of other towns, which, by having lime put into it in proper quantities, became clarified. With a sufficient quantity of lime the water was quite clear. The deposit contained what was necessary for making cement. General Scott's system at Burnley, instead of sending the stuff into the river, purified it, and made cement of the sludge. Towns must learn to pay to be clean; this company could produce a clear effluent; and if a town would pay for it the question was solved. The system he was speaking of was more particularly applicable to London, for if there was one place in the country that had a monopoly for filth it was the Thames. To make London clean in its water would cost only 6d. per head. We may return to the object of the meeting.

The County Government Bill.—The Joint Committee on State Medicine of the British Medical and Social Science Associations have addressed a memorial to the President of the Local Government Board, in which they submit:—1. That until all powers of local government are entrusted to one authority within improved areas of jurisdiction, registration districts offer the most suitable areas of representation in any scheme for improved county government and administration. 2. That the County Board to be constituted under the Bill should be a representative body, having full powers to administer joint institutions to execute joint works for all or some districts within the county, as the case may be, and to exercise control over all local authorities when in default, and when necessary to join with adjacent counties for purposes affecting the interests of both.

Victoria (Philosophical) Institute.—The annual meeting of this Institute was held on Friday, last week, at the house of the Society of Arts, the president, the Earl of Shaftesbury, K.G., in the chair. The honorary secretary, Capt. F. Petrie, read the twelfth annual report, from which it appeared that the number of members steadily continued to increase, the total number being now 756. A considerable number of those who had joined during the year were American and Colonial members, and the extension of the Society's influence abroad, especially in America and the colonies, had been marked; and the members were congratulated upon the fact that such support added greatly to the efficiency with which the Society's objects were carried out. The address was delivered by Principal Rigg, D.D., and contained a review of various systems of philosophy now popular.

Land in Worcestershire and Gloucestershire.—In July Messrs. Glasier & Sons will offer for sale the well-known Middlehill estate, and the whole of the manors of Buckland and Laverton, with the Advowson of the Rectory of Buckland. They contain in all about 2,783 acres. The Mansion-house of Middlehill was for many years the depository of the celebrated library of the late Sir Thomas Phillipps. The mansion is easily susceptible of restoration and improvement, or the materials would save great expense to any purchaser desirous of rebuilding on any of the numerous exquisite sites in the locality, the undulating and picturesque grounds about the house being richly-timbered and of a park-like character, with every facility for the formation of an ornamental lake. The present income is about 4,360*l.* a year.

Saving Life at Sea.—The Council of the Society of Arts offers its Gold Medal for the best means of saving life at sea, when a vessel has to be abandoned suddenly, say with only five minutes' warning, the shore or other vessels being in sight.

St. Michael's Church, Bude, Cornwall.—This church has been considerably enlarged, and has 150 additional sittings. A new chancel and transepts have been built in the Early English style corresponding with the existing building, which was erected about forty years since. The walls are of Trerice stone; the windows and dressings, of Bath stone. The roofs open of red deal lined with boarding between the rafters. The chancel is floored with Minton tiles; the steps are granite. The architect is Mr. Ashworth, of Exeter; Mr. Heard and Mr. Thorne of Bude, are the contractors. The stone carving by Mr. Hems; iron-work by Messrs. Rowe, Exeter. The consecration of the new portion took place on the 23rd ult.

Geniality amongst Antiquaries.—Seventy-two Fellows of the Society of Antiquaries, desiring to show their regard and respect to Mr. Ouvry on his retirement from the office of president, gave a dinner in his honour at the Albion Tavern, Aldersgate-street, on Friday, the 31st of May. The Earl of Carnarvon, now president, was in the chair, and in the course of the evening proposed Mr. Ouvry's health, which was drunk with great cordiality. Mr. Ouvry, in reply, gave an interesting history of his connexion with the Society since 1849. Lord Acton proposed the health of the Chairman; and, thanks greatly to Mr. Edwin Freshfield and Mr. Henry Hill, who acted as honorary secretaries, everything passed off delightfully.

Morecambe Winter Gardens and Aquarium.—The new baths at Morecambe are completed, and will doubtless be well attended. The building adjoining them, which has the appearance of a miniature Crystal Palace, has so far progressed towards completion as to provide an ornament for the promenade by the sea. In it an aquarium is to be formed, and in the upper story there is an orchestra so arranged that musical and dramatic performances on a large scale may be conducted there. It is intended to decorate the place with greenhouse and exotic plants, so that during the cold portion of the year it may form a very attractive winter palace. The building has been designed by Messrs. Waugh & Isitt, of Bradford.

Institution of Civil Engineers.—In the past twelve months there has been a net increase of 133 members, 79 associates, and 66 students, while the honorary members remain the same. These several classes now number 1,072, 1,770, 524, and 16, respectively,—together, 3,382, as against 3,104, at the same period last year, being an increase of the rate of 9 per cent. During the recent session, 95 associates have been transferred to the class of members; 56 members and 208 associates (56 of the latter having before been students) have been elected; and 143 students have been admitted.——The President's *conversazione* passed off satisfactorily. We shall give some considerations on the subject in our next.

Alexandra Dock.—The ceremony of cutting the first sod of the extension of the Alexandra Dock, South Wales, was performed by the managing director of the company in the presence of a number of merchants connected with the trade of the port. The new dock will extend 2,800 ft. in length, and will cover an area of twelve acres. It is expected that notwithstanding the existing depression there will before long be such an influx of shipping into this port that the present accommodation would be too limited.

A Public Hall for Old Hill.—Mr. G. A. S. Best has signified his intention of presenting a public hall to the inhabitants of Old Hill, Staffordshire. The building will cost 5,000*l.*, and will comprise a lecture-room, library, workmen's reading-rooms, refreshment-bar, and depôt for the sale of pure literature. The plans have been passed by the Local Board, and the building will shortly be commenced.

Wood-work.—A correspondent writes,—"You speak of a drawing, why not mention the result of it? In your notice of the Architectural Drawings at the Royal Academy you commend the carved walnut chimney-piece and low bookcases shown in No. 1140, 'Dining-rooms, 52, Princes-gate.' These were very well executed by Messrs. A. J. Arrowsmith & Co., of Bond-street."

Trade Book: Iron.—The new edition of the Trade Book issued by the Thames Bank Iron Company, of Upper Ground-street, contains useful illustrations and lists of prices.

TENDERS

For the reconstruction of Nos. 60 & 61, Above Bar, Southampton (damaged by fire), for Mr. Reuben Newman. Mr. W. H. Mitchell, architect:—

Dyer	£1,430 0 0
Sanders	1,398 0 0
Rowland	1,355 0 0
Crook	1,290 0 0
Stevens & Son (accepted)	1,280 0 0

For additions to Homerton Workhouse. Mr. George, Judge, architect:—

Larke	£7,299 0 0
Thompson	7,140 0 0
Roberts	7,134 0 0
Langmead & Way	6,969 0 0
Shurmur	6,876 0 0
French	6,870 0 0
Cox	6,598 0 0
Wood	5,556 0 0
Boyce	6,314 0 0
Hearne	6,173 0 0
Lewis	6,169 0 0

For new infirmary buildings, covered way, &c., and additions to existing buildings, at the Staines Union, for the Guardians. Mr. George Judge, architect. Quantities supplied by Mr. W. H. Brayshaw.—

Boyce (accepted)	£3,994 0 0

For the erection of an additional wing to warehouse, Stoney-street, Nottingham. Mr. S. Dutton Walker, architect:—

Stevenson	£1,375 0 0
Woolf	1,320 0 0
Underwood	1,280 0 0
Fish	1,275 0 0
Hind	1,260 0 0
Bell & Son	1,252 0 0
Jelley	1,250 0 0
Hodson & Facon	1,240 0 0
Messom	1,237 0 0
Bailey (accepted)	1,199 15 0

For external repairs to the School for Indigent Blind, Southwark. Mr. Richard W. Drew, architect. Quantities by Mr. Thomas M. Deacon:—

Smith & Co.	£2,790 0 0
Holland & Hannen	2,693 0 0
Baker & Son	2,625 0 0

For alterations, &c., at the "Lord Belgrave," Spur-street, Leicester-square. Mr. R. E. Worsley, architect:—

Hockly	£778 0 0
Lamble	770 0 0
Thomas & Butler	759 0 0
Hatchman	725 0 0
Temple & Foster	684 0 0

For the erection and completion of five warehouses, White Hart-street, Paternoster-square. Mr. George Vickery, architect:—

Crabb (accepted)	£9,000 0 0

For proposed vicarage at Forest-gate, Essex. Mr. George M'Donell, architect:—

Page (accepted)	£2,430 0 0

For pulling down Nos. 24, 25, & 27, Rood-lane, City, and erecting a block of offices upon the site of 5,000 ft. in area. Mr. Alexander Peebles, architect. Quantities supplied by Messrs. Fowler & Hugman:—

Nightingale (accepted).	

For rebuilding premises, No. 4, High-street, Southampton. Mr. J. G. Poole, architect:—

Sanders	£1,298 0 0
Stevens & Son	1,244 0 0
Bailey & Son	1,249 0 0
Hole (accepted)	1,146 0 0

For detached house at Thurlow-hill, Dulwich, for Mr. M. Pope. Messrs. Batterbury & Huxley, architects:—

Young	£1,335 0 0
Nightingale	1,282 0 0
J. & J. Greenwood	1,223 0 0
Lathey, Bros.	1,190 0 0

For additional studio, Haverstock-hill, for Mr. H. R. Robertson. Messrs. Batterbury & Huxley, architects:—

Cox	£382 0 0
Gould & Brand	365 0 0
Eddy	298 0 0
King	245 0 0

For repairs, &c., to the Victoria Theatre, Waterloo-road. Messrs. Batterbury & Huxley, architects:—

J. & J. Greenwood	£561 0 0
Nightingale	535 0 0

For three villa residences, Thurlow Park-road, Dulwich, for Mr. A. Rich. Mr. Walter J. Miller, architect:—

Mitchell	4,500 0 0
Mould	4,352 0 0
Lamble	4,323 0 0
Higgs	4,233 0 0

For finishing four houses in Upland-road, Peckham, for Mrs. Gordon. Mr. Wm. Paice, architect:—

Bodien (accepted*)	£1,260 0 0

* Subject to contract.

East Bury Vicarage.—The surveyors state that no tender has been accepted. Our authority was Mr. Groome.

TO CORRESPONDENTS.

W. J. D.—J. T. R.—H. C.—C. L.—E. B. R.—J. N.—J. O. H. P.—T. M. D.—A. S.—J. D.—B. & H.—B. & S.—W. M.—E. & Co.—J. B.—H. & S.—W. S.—J. W. S.—E. W. & Co.—W. H. R.—G. P.—W. S.—U. W. (get proper advice on the spot).—Dr. H. S. (shall hear from us).—Bridges (next week).—E. T. B. (thanks).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

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GENERAL CONFERENCE OF ARCHITECTS, 1878.

IN resuming our notes* of this Conference, which was brought to a close on Friday evening in last week, we may, in passing, congratulate all concerned on its success. Especial mention should be made of the fact that its success was largely due to the exertions of the honorary secretaries to the Conference Committee,—Messrs. Arthur Cates and R. Phené Spiers, — who, in conjunction with the Secretary of the Institute, Mr. W. H. White, had made the most satisfactory arrangements for the convenience of members of the Conference, and for facilitating the work of those who have had the arduous task of chronicling its proceedings. The visits to the New Law Courts, and to the New Natural History Museum, which will be described hereafter, were fraught with many practical lessons. This was especially the case with Mr. Waterhouse's new museum at South Kensington, inasmuch as that building exemplifies, on a scale unprecedented in this country, the capabilities of terra-cotta as a constructive and decorative material. The visit to Mr. Kirkaldy's Testing and Experimenting Works in Southwark-street (the advantages offered by which are perhaps not so fully appreciated and made available as they deserve to be) was equally interesting. Of the visit to St. Paul's Cathedral we gave some notes last week†. The visits to Dorchester House, Bridgwater House, and Grosvenor House afforded opportunities for seeing some famous works of art not always accessible. The Conference meetings proper, though not in any instance very largely attended, were nevertheless very successful, for in each case the able papers read elicited good, practical discussions, the speeches being, as a rule, brief and to the point.

THE CORROSION OF IRON.

As mentioned in our report last week, at the Conference meeting on the evening of Wednesday, the 5th inst., Professor T. Hayter Lewis occupied the chair, and Professor Barff read a long and interesting paper on his process for preventing the corrosion of iron, of which we now give some portions.

The Chairman, in introducing the lecturer, said Professor Barff was well known to most of the audience as a gentleman of great scientific attainments. In addition to that recommendation, he had extra claims upon them as artists, inasmuch as he held the important position at the Royal Academy of professor of chemistry, —the adviser of our painters, in fact, on all questions as to the use of colours and pigments. In that capacity he had doubtless conferred great benefit upon painters, and on the world of art in general.

Professor Barff then read his paper. He said:

The process which I am now about to explain does not consist in coating the surface of the iron with any applied substance, but in changing the iron itself by the addition of oxygen into an oxide which is not affected by atmospheric influences. The agent employed is superheated or dry steam. I am frequently asked how steam which is generated from water, which is wet, can be made dry. The three substances, water, ice, and steam, are all chemically the same; they are of the same composition, and are formed by the union of 16 parts by weight of oxygen, and two parts by weight of hydrogen. These gases when set free by the decomposition of either of these substances occupy certain measures or volumes; the 16 parts by weight of oxygen occupy one measure or volume, and the two parts of hydrogen occupy two volumes, each exactly the same as the volume of oxygen. If two measures of hydrogen and one of oxygen be put together, and be caused to unite, they will form water; if this water be formed at the temperature of 212° Fah., or 100° C., the volume of the steam formed will be the same as that of the hydrogen. When ice is heated it does not get warmer if it is at the temperature of 32° Fah. or Zero C., but it melts, and when melted is water at the same temperature; also when water is heated to 212° Fah. it gets no hotter however much it be heated, if the vessel which contains it is open to the air, but the additional heat converts it into steam at 212° Fah. Now this steam being generated in contact with water, takes up water in suspension along with it, and is called saturated steam. If, however, a quantity of this saturated steam be heated by itself, and be allowed to expand, the water which is held in suspension is also converted into steam, so that if the presence of water be necessary to constitute wetness its absence will constitute dryness, and the steam in the first case —*i.e.*, the saturated steam—will be called wet; and that in the second will be called dry. Now this dry steam can be heated to any temperature. Steam in the dry state is a colourless transparent gas, and when heated it expands at the same rate as other gases or nearly so. Steam is invisible; no one has ever seen steam. What we see and call steam is not steam, but condensed water vapour in a state of very fine division. All gases when they come in contact with water take it up and hold it in suspension. The warmer the gas the more water it will take up. This is easily seen in a hothouse or a washhouse; the air becomes highly charged with moisture, and this moisture is deposited as water on the cold windows, proving that as the air is cooled it holds less moisture in suspension; but at no time is the moisture visible in the air until it condenses. In operating upon iron with steam for forming the protecting coat the steam must be dry, *i.e.*, it must hold no water-vapour in suspension; for, if it do, another oxide of iron is formed as well, which is what is called red rust. There are certain metals which decompose water, some at the ordinary temperature of the air, others at high temperatures, and some metals do not decompose water at all. The way in which they decompose water is by taking from it its oxygen, and setting free its hydrogen. Potassium and sodium, and some other metals, decompose water at the ordinary temperature of the air, and these metals, uniting with the oxygen of the water, form what are called oxides, and hydrogen is set free. Thus potassium forms its oxide potash, and sodium soda. In these cases, however, some of the hydrogen,—that is, one half, remains with the oxide, forming a hydrate; but I need not here do more than mention this. Iron decomposes water or steam at a high temperature, *i.e.*, at a red heat; all the oxygen of the steam unites with the iron, and all the hydrogen is set free. If the steam be in the saturated state when the iron is submitted to its action, I discovered that the oxide formed does not adhere firmly to the iron; but if the steam be superheated or dry, the oxide does adhere very closely to the iron. In this case it seems that the moist steam first forms the red oxide of iron, and this is reduced—by the hydrogen set free—to the metallic state, and it is in a state of fine division; and this finely-divided iron is then, by fresh steam, converted into the black oxide. Having passed through these changes, it will manifestly have lost its bond, and although it adheres for a short time, it is before long thrown off; rusting is then set up on the surface which it covered. All chemical actions take place in definite quantities. Iron unites with oxygen in several different proportions; for example, 56 parts of iron unite with 16 parts by weight of oxygen, and what is called protoxide of iron, a ferrous oxide, is formed. Now this oxide is very unstable. In the presence of oxygen and moisture it is very rapidly changed into another oxide, twice 56 parts by weight of iron and 16 of oxygen, *i.e.*, ferrous oxide unites with the same weight of ferrous oxide, so that 2 (56) of iron and 2 (16) of oxygen together unite with or take up another 16 parts by weight of oxygen, forming another oxide called peroxide of iron, or ferric oxide, and this is the substance known as iron rust. It seems clear that the first action of oxygen on iron is to form the ferrous oxide, and this, as I have explained, gets converted rapidly into ferric oxide. Now, imagine the surface of a piece of iron in moist air to be thus coated, it will not be difficult to understand that the entire oxygen which this ferrous oxide takes up to become ferric oxide is passed on to the iron beneath it, forming with it ferrous oxide; and that the first ferrous oxide formed takes up more oxygen, and becomes ferric oxide again. This process goes on continuously till all the iron is in time converted into ferric oxide. The ferrous oxide then acts as a carrier of oxygen to the iron, causing it to be changed throughout its mass into oxide. Now, this action does not take place with other metals which are used in building, because these metals do not form the oxides in the same way in which iron does. Take lead for example: it only forms one oxide by the direct action of oxygen upon it; and, when its surface is covered with oxide, no further change takes place, except that the oxide becomes converted into carbonate by the carbonic acid gas in the air. The whole of the

* See pp. 579-586, *ante*.
† See p. 582, *ante*.

metal which is changed from the metallic state is changed in a short time, so that no further action goes on unless the coat formed be removed mechanically: hence it gives for ages protection to the lead beneath it. A similar action takes place with zinc, and also with copper. All these metals are known to last well when exposed to air, if they be not attached to the place where they are applied by other metals which with them cause galvanic action. Besides the two oxides of iron which I have mentioned, there are others, one only of which will need our attention; it is called the magnetic or black oxide. It is supposed that this oxide is made up of the other two, viz., the protoxide and the peroxide; for, if we add together the weights of these oxides, we shall have three (56) parts by weight of iron, and four (16) of oxygen; and this is the proportion in which these elements unite together to form this black oxide.

Many experiments which I have performed tend to confirm this view of the consitution of magnetic oxide of iron, but I need not trouble you with a relation of them, as they are of more interest to chemists than they possibly can be to you; and they in no way bear on the industrial application of magnetic oxide to the arts. A piece of perfectly dry clean iron will not oxidise in dry air. Moisture is necessary to cause the oxygen of the air to unite with it; and whenever iron is exposed to moisture ferric or red oxide of iron is the result. But when iron is burned in *dry* air or oxygen, this red oxide is not formed; the black oxide is produced. If, however, an experiment be carelessly performed to illustrate this, if the air or oxygen be not *dry*, then some red oxide will be formed along with the black. The black magnetic oxide of iron is not affected by oxygen in the presence of moisture, and thus it affords a protection to the iron upon which it is formed. Long before I brought my process to its present state, I felt that if I could make this oxide adhere firmly to iron, it would resist the ordinary rusty action; and when I showed my first specimens to scientific and practical men they expressed their opinion that the principle was correct. They felt sure that whatever difficulties might be encountered, they could be overcome. And the difficulties have been great, for it has taken more than two years to bring the process into such a state that commercial men could regard it as of practical utility. When I read my paper before the Society of Arts, on the 14th of February, 1877,* Admiral Selwyn said, in the discussion which followed, that "in New Zealand you could find any quantity of this substance which had remained totally unchanged, even by the action of salt water, during all the centuries which had elapsed since the creation of the world." Nor have I ever met with any one who knows anything about the subject who has the slightest doubt as to the enduring properties of the black oxide of iron. The only doubt I have ever heard expressed is whether this substrnce can be artificially formed so that its own particles will stick together and adhere firmly enough to the iron on which they are produced. I believe now that there is no doubt on this point, for many have proved it to be so hard that it will wear away a rasp before it can be removed from an iron surface.

I will now proceed to explain *how* the process is conducted. At first I used to allow water to pour down a pipe from a height of about 34 ft., into a coil consisting of some 80 ft. of iron pipe of about ⅜ in. bore. This pipe was contained in an iron cylinder, so arranged that a fire might be lighted in its centre, the flames of which could surround the pipe in order to make it red-hot through its entire length. The water was held back by a tap, and when the pipe was hot enough it was allowed to run into it,—the water entering at the lower end of the coil. The water which first reached the red-hot pipe was converted into steam; this was driven on by that behind it; and so the steam, passing through the red-hot coil, became superheated as long as the coil was kept hot enough. The water was kept back by the force of the steam, so that it only entered a short distance; the steam thus generated and superheated was then conveyed into an ordinary glass-painter's muffle, entering at the back. This muffle, to prevent the condensation of the steam, and to raise the articles to be heated to a sufficiently high temperature, was heated by a fire in the ordinary way. After the muffle was charged, sufficient time was allowed for heating its contents; then the door was closed and luted with fire-clay, and the superheated steam was turned on. From four to six hours was the time to which the small articles then treated were exposed to the action of the superheated steam. These smaller specimens before you were exposed for about this time. Certain difficulties arose from this method of generating the steam. I need not tell you what they were, as I have now quite abandoned it. I may, however, mention one,—and that was, the liability of cooling the coil when the fire had to receive fresh coal. In this case the steam got wet, and red oxide was formed which, as I have already explained, interferes with the durability of the coating. To prevent this, too, much care and constant watchfulness were required to render the process commercially successful. The apparatus I now employ consists (first) of an ordinary boiler, in which steam is generated, usually at a pressure of 40 lb. to the inch. My boiler is a very strong one, as it is adapted to other experiments; one which is safe at 40 lb. pressure is sufficiently strong for this work. From the boiler the steam passes into a tight iron box, where it parts with some of its moisture, for the steam is saturated; from this box it passes into the superheater at its original pressure. The superheater consists of two stacks of pipes placed in a furnace parallel to one another, with a space of about 15 in. between them. These stacks are supported on dwarf walls of fire-brick, and are connected together so that the steam traverses the whole length of all the pipes, which is about 36 ft. The pipes are 1½ in. bore, and are kept at a red heat, or even at a higher temperature. The steam in its passage through them becomes superheated, and when it issues from the end it would set fire to the wood. The end of the superheater-pipe is connected with the back of a chamber built of fire-bricks. This chamber is 5 ft. long, 2 ft. 6 in. wide, and 1 ft. 6 in. high, arched at the top. Beneath it is a fireplace, and up its sides flues pass, so as to insure it being uniformly heated. It is closed with an iron door, faced with fire-tiles, 1¼ in. thick, which is easily raised by a balance-weight. When it is closed, to work the process, the fire is lighted beneath the chamber, and it is heated to a temperature of about 700 deg. or 800 deg. Fahr. All this time the superheater is being raised to a proper temperature,—that is, to a cherry-red heat, and the steam is got up to 40 lb. in the boiler. The chamber is then opened, the iron articles are placed in it, and kept there until the temperature rises again to from 700 deg. to 800 deg. Fahr. The door is then luted with fire-clay, and the steam is then let in gently,—not with the full force that it has at a pressure of 40 lb. The great object is to keep the chamber full of steam during the operation, and to effect this a slight, but very slight, pressure is kept up. This is effected by a ⅜-in. pipe placed at the upper part of the front of the chamber, close to the door. The pipe rises for about 2 ft. 6 in. vertically, and then bends down to beneath the fireplace of the superheater, where it discharges excess of steam and the hydrogen evolved in the operation. At the top of this exit-pipe, before it begins to bend, a valve is placed, suitably weighted, to prevent undue pressure in the chamber.

In the discussion which followed,

Mr. J. T. Wood said the lucid manner in which the Professor had explained his valuable discovery and its application left him (Mr. Wood) very little to say, were he ever so scientific, which he did not pretend to be in the least. Of course the invention would be of the greatest advantage to architecture. Amongst small matters, for example, he might instance the screws which the carpenter invariably put into his mouth and wetted with his spittle, so as to make them more easily driven home. They afterwards rusted in the wood. Screws treated by Mr. Barff's process, however, would take no harm under such circumstances. Everything in iron that the architect could design or specify, in fact, whether constructive or ornamental, could be advantageously treated by the process. Knockers, latches, and small articles of that kind, instead of requiring to be painted, would have the beautiful blue-black lustre imparted to the iron by the process. Professor Barff had told him (the speaker) of his invention a year ago, and at that time he heard that Professor Barff had been offered a vast sum for the patent, but he would not part with it, and the public were indebted to him for not doing so, as he was the more interested in perfecting his discovery and rendering it practically available for various uses in engineering and architecture. Every one present would hope that the process would be as commercially successful as it appeared to be technically satisfactory. He begged to move a vote of thanks to the Professor for so kindly coming forward and giving so lucid a description of his important discovery.

Mr. Carroll, in seconding the vote of thanks, said, that coming, as he did, from unpractical romantic Dublin, to practical unromantic London, he felt surprised that a paper of such surpassing interest should not have drawn a larger audience. Probably the thinness of the meeting was due to the fact that it clashed with the doings at Epsom. He suggested that, in future, the Conference should be so arranged as not to fall in the "Derby" week.

The Chairman explained that the Conference committee had been misled by the almanacks, all * of which had put down the Derby to be run on its usual day, viz., the last Wednesday in May, instead of the first Wednesday in June.

Mr. Carroll said that, as showing the necessity for the adoption of some such process as Professor Barff's, he might mention that, in order to attend the Conference, he came through the Britannia tubular bridge over the Menai Straits, and was greatly shocked to see the way in which that structure was rusting away. He was travelling with an engineer who had had something to do with the erection of the bridge, who remarked that he never felt so near eternity as when coming through the tube. There was no doubt a process of rusting going on which must eventually, unless checked, have the effect of making the bridge come down with a crash. He believed that tons upon tons of rust were extracted from the tube every month. It would be very interesting to know whether Professor Barff's process could be in any way applied to such structures as that *in situ*. For small articles, or for the component parts of bridges and similar structures before being built up, the process, if found to be permanently successful, would be of undoubted value. He should like to know what was the actual cost of the process as a percentage added to the cost of paint and other would-be preservative coatings.

Mr. Reed said he understood Professor Barff to say that in treating bolts by his process there was an appreciable increase in their diameter, and this, as it seemed to him, would militate against the usefulness of the process as applied to the ironwork of roofs, &c.; for the thread on the bolt would be increased, and the thread in the nut would be made of less diameter, thus preventing the parts being fitted together. He should also like to know whether it was possible to treat by the process large pieces of roof, such as T-iron rafters, say 60 ft. long?

Mr. Kershaw, C.E., said that Professor Barff had mentioned 40 lb. as the pressure of steam at which he had conducted his experiments. Was it not possible to attain the end in view with less pressure of steam, and, if so, with how much less? He (Mr. Kershaw) took it that the steam was merely the medium of conveying the heat, the pressure being immaterial. He asked this question, because it involved a point which would materially affect the cost of using the process. He took it that the treatment of large structures, such as the Britannia tube, *in situ*, would be impossible, for it would involve the construction of boilers or containers large enough to contain the objects to be treated.

Mr. Dawson remarked that it was unnecessary to speak of the importance of the subject, which was one of the utmost practical value and importance. He thought that the Professor's paper would be productive of great good. He gathered from it that the protective coating of black oxide was imparted to the iron articles treated by means of superheated steam, and that the thickness of the coating was about the thousandth part of an inch.

Professor Barff said the thickness of the coating varied with the duration of the process. For most small articles that would be about the thickness.

Mr. Dawson, continuing, said he should like to know which would be most benefited by the process (if there was any difference) ordinarily,—thoroughly good cast iron, or thoroughly good wrought iron,—because it was always found in practice that wrought iron rusted much sooner than cast iron. With regard to treating such

* See *Builder*, vol. xxxv. (1877), pp. 180-182.

* Not so; that useful compendium, "Whitaker's Almanac," allots to the event its correct date.

structures as the Britannia tube *in situ*, he apprehended that the sole but insuperable difficulty was the provision of a chamber sufficiently large to contain the article to be treated. But of course the treatment of such structures *en masse* was impossible. On the other hand, he took it that the whole of any built-up structure of iron could be treated by the process before erection, provided that a container could be made large enough to take in the largest single pieces of the structure,—which, he supposed, it would not be difficult to do. But then, how about the rivets? If they were treated by the process before hand, would not the making them red-hot and hammering them destroy the preservative coating which had been applied to them? Probably in the case of bolts and nuts, the screwing-up by a spanner would not destroy the surface of black oxide. As to the advantages of the process if brought to perfection and generally adopted,—especially if the cost were not very great,—it would be waste of words to dilate upon them, for it would be one of the most magnificent inventions of the age. The Professor had mentioned the lamp-pendant which had been treated by his process, and fixed up in one of the western lobbies at St. Paul's Cathedral. On the occasion of the visit made on the previous day to the cathedral, Mr. Penrose had directed attention to the pendant, which had, he understood, been in its present position for the past ten months. From his (the speaker's) careful observations, it was only right that he should mention that in certain parts the pendant *did* show signs of rusting, such rust appearing in the form of small rings, all of which, as far as he could observe, were opposite where the welding had been effected. These rings were all of red rust, but there was no indication of spottiness or "pock-marks," showing, as he gathered, that the red rust did not get under the black oxide.

Mr. Burden said that if the process could be applied without materially enhancing the cost of the articles treated, it would be of incalculable benefit for architectural purposes.

Mr. Nevill said he should like to know whether hammering upon the surface of the metal would have the effect of destroying the protective coating of black oxide. This was a point of great importance, for any preservative process for ironwork ought to be capable of standing a fair amount of wear and tear. It was satisfactory to hear that the surface was not affected by ammonia.

Mr. Skidmore, of Coventry, said that if Professor Barff's process were only applicable to iron articles of minor size, it would be of incalculable value, whatever might be its possibilities of application to such structures as the Menai Bridge. With regard to that bridge, he could testify to the enormous quantity of rust which it yielded, the man engaged in clearing it away being a veritable red man. As a worker in iron himself, he should gladly welcome any process which would preserve ironwork from its insidious but ruthless destroyer—red rust.

Mr. T. H. Watson asked whether any special preparation of the metal was necessary before submitting it to Professor Barff's process? He asked this question because all the objects exhibited presented a certain cleanness and finish of surface and texture which it was not customary to see except in specimens of cast-iron work made from very carefully-prepared patterns. From something that dropped from the Professor as to the effect of the process upon very small articles, it occurred to him (the speaker) that the finish was partially, if not wholly, due to the process itself. Were the articles subjected to any treatment after the process, in order to secure a satisfactory finish of surface? Anyhow, from an artistic point of view, it was quite unnecessary to stipulate that the cost of the process should be small. The attainment of such a finish in ironwork at once elevated the metal almost to the level of bronze and the costlier metals for the purposes of art. Many of the objects exhibited were equal in surface texture to copper or bronze. As to colour, it was very pleasing, for it was not absolutely black, having a dark bluish-grey tinge, utterly unlike that of the Berlin black used by stove-makers. At the same time, the material could not be mistaken for any other than iron. He should like to know whether Professor Barff could tell the meeting the effect of age upon iron treated by his process? Would it "age" in anything like the same way as bronze or copper?

Mr. Bailey said he should be glad to know whether the expansion and contraction of the metal would crack or otherwise affect the preservative coating.

Mr. Arthur Cates said that even omitting all consideration of such large structures as bridges, the importance of preserving which from decay was exceedingly great, the application of such a process as Professor Barff's to architectural ironwork,—much of which would otherwise, if left exposed, speedily decay,—was, as had been said, of incalculable value. It was pitiable to see the way in which beautiful ironwork was perishing away through the formation, by the action of the atmosphere, of the red ferrous oxide. Coating with paint, even if it were always effectual, when repeated over and over again completely destroyed the charm of the smith's handiwork. Professor Barff's process, however, had the great merit of not only not injuring the surface, but of heightening its beauty. When it was remembered that a great deal of beautiful ironwork had utterly disappeared owing to the action of rust, it would be agreed that it was impossible to overrate the importance of Professor Barff's process, provided that it fulfilled the expectations which had been formed of it. Professor Barff had not referred to the domestic applications of the process, as exemplified in the saucepan exhibited, and which, though it had been in constant use for some months, showed no perceptible signs of wear, nor was it furred or coated in the interior, as tinned or enamelled saucepans were apt to become. The only objection against the saucepan, and that was a fanciful one, was the blackness of its interior. Another very important application of the process would be the protection of iron pipes used for the conveyance of water. There had been many attempts to produce conduits which would not be affected by the chemical agents suspended in the water. There had been tin-lined lead pipes; glass or glass-lined pipes had been proposed and tried; enamelled iron, galvanised iron, and all kinds of materials had been used, some of them with partial success; but Professor Barff's process seemed to be the nearest approach to perfection that had yet been attained in that direction. As several of the pipes could be stacked in the vessel or container for subjection to the process, iron pipes so protected would not be appreciably dearer than those not so protected, while they would be much cheaper than and immeasurably superior to lead. In this way the many disadvantages and inconveniences attending the at present almost indispensable use of lead pipes would be avoided. With reference to the hardness of the coat of black oxide deposited on the iron by the process, he had before the meeting made some inquiries of Professor Barff on the subject, from whom he learnt that the coating resisted the action of a file upon the surface, the only perceptible effect of filing being that the file itself became burnished, no effect being observable upon the specimen filed. That was a very important point. The resistance of the coating of oxide to a shock or impact was a point which Professor Barff had not touched upon. It would also be desirable to know something of the manner in which iron thus prepared resisted the action of considerable heat.

The Chairman, in putting the vote of thanks to the meeting, said it seemed to be the general opinion that, if Professor Barff's invention were successful,—as they all hoped it would be, and as the Professor himself, as a chemist, believed it would be,—it would be one of the finest inventions, so far as architects and engineers were concerned, that had ever been brought forward. When it was recollected that enormous treasures of art in iron had been lost through the action of ferric oxide, or red rust, the importance of the process, even from an antiquarian point of view, would be seen. There were in the British Museum a few,—a very few,—specimens of Assyrian ironwork which had been preserved almost by a miracle. These would give some idea of the enormous amount of artistic wealth that must have been lost through the action of red rust. Reference had been made to the slow but sure destruction going on by the rusting of the ironwork of the Menai Bridge; the same destructive process was to be seen at any of our metropolitan railway stations and bridges. He had recently seen whole courses of stonework, in buildings by Sir Chistopher Wren and his pupils, almost totally destroyed by the rusting and expansion of the iron cramps with which the work had been tied together. If iron could be so treated by the Professor's process as to permit of its being safely used for cramps, it would in itself be of very great advantage, for at present it was necessary to use bronze, copper, or slate,—the latter being by no means a satisfactory material for cramps, and the others being too costly. Galvanised iron, though introduced to the world some years ago with a great flourish of trumpets, and at that time considered to be perfectly imperishable, had not been a success, for the rust was found to go on behind the coating of zinc. The question arose whether Professor Barff's process would come to grief in any similar manner? He (the speaker) from what he had heard of it, and from what was stated by Admiral Selwyn when Professor Barff read his paper before the Society of Arts, did not think this would be the case.

The vote of thanks having been carried by acclamation,

Professor Barff replied to some of the questions raised during the discussion. In answer to Mr. Carroll he said his process could not be applied to structures *in situ*, because every article to be treated must be raised to a temperature above red heat. He could not give any exact idea as to cost, but he might state that a superheater 5 ft. long by 2 ft. 6 in. by 1 ft. 8 in., which would hold a great many moderate-sized articles, would cost about 5*s.* for fuel during ten hours' working. That was his own experience, although it could, probably, be done for less, for he did not pretend to be studying the economical aspect of the process. His sole object at present was to do the thing well, leaving the question of economy to take care of itself. The process could, of course, be most profitably worked continuously, night and day, with relays of men. This method of work was being pursued by Messrs. Spencer, of West Bromwich, who were working his process under a royalty. The cost under such circumstances would certainly be nothing at all approaching to that of galvanising. In answer to Mr. Reed's question, it was necessary to make bolts or nuts which were to be treated by his process of such dimensions as to thread and nut that, although before being subjected to the process, they would not fit, yet after treatment they would fit. This could be done with the greatest nicety. As to treating pieces of roof 60 ft. long, they would require an enormous chamber. Then, as to the questions of hammering and riveting: when rivets which had been treated by the process were heated or hammered, or pressed in by the riveting machine, the coating of black oxide was undoubtedly removed. This was, he confessed, a difficulty, but one which he thought he should succeed in surmounting. He was now trying experiments with an apparatus for re-oxidising the heads of the rivets *in situ*,—although, for that matter, even though he were unsuccessful, he did not think it would be of very great moment, for only the head of the rivet would be exposed, and it would not be possible for a rivet to rust right through. In answer to Mr. Kershaw's question, the extreme pressure of steam used in working was 40 lb., but sometimes it would not exceed 25 lb. But one point of the greatest importance was that there should always be such a sufficiency of pressure as to exclude the oxygen of the atmosphere. In answer to another speaker, the thickness of the coating of black oxide would vary according to the duration of the exposure of the article to the superheated steam, and according to the bulk of the article treated. In oxidising a thick mass of iron, the pores would become thoroughly closed, and as no more steam could enter, the material operation was at an end. If, on the other hand, thin sheets of iron were treated by the process, they could be oxidised almost right through, leaving only a thin film of good metal in the centre. This rendered the metal very brittle and easily broken, hence the necessity of care in the treatment of thin pieces of metal. Both wrought and cast iron were equally benefited by the process. As to the appearance of the surface of iron treated by his process, it was solely the result of the process, nothing being done to prepare it. He had not seen the pendant at St. Paul's, but Mr. Penrose had told him that it had not rusted. The indications of rust referred to by Mr. Dawson might have been caused by the workman who fixed the pendant abrading the surface of the coating with his pincers or gas-tongs. At any rate, it was satisfactory to hear that the rust, whatever its cause, was localised. As to the question whether the surface of the protective coating was strong

enough to bear hammering, he thought it was at any rate, it could not be removed unless wilfully. The coating did have a tendency to chip when continuously hammered, but a nail treated by the process could be driven by the hammer without injury. In answer to Mr. Watson, no preparation of the surface was required beyond the removal of red rust (if any existed) by pickling the article in dilute sulphuric acid. Time would not "age" iron treated by his process,—at any rate, not in the sense in which copper and bronze were affected by long exposure. In answer to Mr. Bailey, the expansion or contraction of the metal did not affect the preservative coating in any way. He observed that the Conference was on the following evening to discuss the subject of fire-proof constructions, as to which he might be allowed to say that it would be a very great thing if the ironwork in them were oxidised by his process, as it would then be a very long time before the iron could be burnt away. He believed that in most systems of fireproof construction wet concrete and cement were placed in immediate contact with iron girders, and hence rust must be set up. He could only say, in conclusion, that two years' experience and observation had thoroughly convinced him of the permanence of the results attained by his process.

GENERAL BUILDING REGULATIONS FOR THE UNITED KINGDOM.

At the Conference meeting on Thursday afternoon, the 6th inst., Mr. J. Whichcord presided, and the above was the subject for discussion.

The Chairman, in opening the proceedings, observed that the papers to be read would be of great practical interest, particularly to non-metropolitan members of the profession, although all must be deeply interested in so important a subject. He would not make any prefatory remarks himself, reserving what he had to say until the close of the discussion. He desired, however, in some measure to congratulate the Congress upon the programme that had been prepared. Though that programme contained subjects of extreme practical importance, art questions and matters relating to the *dilettantism* of architecture were by no means absent. The subject to be discussed on that occasion involved matters of imperial interest, inasmuch as it dealt with the laws belonging to buildings over the whole kingdom. If one subject more than another could be selected as appropriate to a general conference of British architects, representing different localities, that subject was the suggestive one of general building laws for the whole of the kingdom.

Mr. J. Douglass Mathews then read his paper on "The Model Bye-Laws as the Basis of a General Building Act." Of this paper we gave the substance last week (pp. 583-584).

A paper by Mr. Joseph Boult, of Liverpool, was then read by Mr. Cates, who stated that Mr. Boult represented the Liverpool Architectural Society. That Society had considered the Model Bye-laws with considerable care, and in November last the council made a report on the subject touching upon many points which were deserving of further discussion.

In his paper Mr. Boult said,—

"Before entering upon the consideration of the model bye-laws as a basis for a National Building Act, it seems desirable to cite a few principles which are embodied in recent legislation, and which therefore may be accepted as axiomatic:—

1. That all trading operations should be subject to as little legislative interference as is consistent with the public welfare.

2. That it is desirable to have in force such regulations as will secure stability in buildings and reduce the risk from fire.

3. That it is also desirable to have in force such regulations as will secure those provisions for drainage, cleanliness, and ventilation which are essential to health.

4. That as the conditions under which buildings are erected vary indefinitely with the purpose, the site, and the materials, the legislative requirements should be as few and as elastic as is consistent with the securities referred to above; and that the imperfections of language should be amended by a tribunal having also discretionary power to relax provisions the purpose of which is otherwise attained.

Other principles, which are not so axiomatic, and require some explanation, are as follow:—

1. That the experience of what are called model lodging-houses, such as the Peabody-buildings in London and other large towns, combined with that of barracks, workhouses, and schools, furnishes abundant evidence that what is termed density of population is not so detrimental physically as has been hastily assumed; because, in such buildings as are referred to the rate of mortality is much less, with a density of 1,500 persons to the acre, than it is in ordinary small houses, with a density of only 250 to the acre.

2. That the health of a community is much more dependent upon food, clothing, and personal habits than upon the arrangements and construction of dwellings or workshops; for however perfect may be the arrangement and construction, they may be entirely neutralised if the food is bad, the clothing deficient, and the personal habits filthy. . . .

3. That the measure of sanitary regulation, absolutely necessary, is to be sought in those buildings in which the arrangements of all kinds are of the simplest or rudest description consistent with shelter, the test being afforded by the rate of mortality as compared with that in buildings of the very best character for people of the same habits.

For nearly forty years the writer's attention has been directed to the sanitary requirements of large towns, especially in Liverpool; and in 1867 he directed the attention of the sanitary authority of that town to a property known as Richmond Fair. Originally constructed for a cloth-hall, like those in use in provincial fairs, the several shops or stalls, built round a hollow square, have been converted into dwellings, which, in the majority of cases, consist of one room only; they are arranged in two flats, access to the upper being attained by two staircases and covered galleries; a few of the upper houses have a second story, and some of them have the advantage of a window front and back; the rents, he was informed, range from 1s. 9d. to 3s. 1d. per week; the conveniences are in common, and the buildings generally in a dilapidated condition. One of the buildings entered was occupied by a craftsman, who was out of work, had tried 'portering,' his wife said, but had not earned anything for some days. The dwelling consisted of one room only, say 200 ft. in area, and 9 ft. high. The inmates were the man, his wife, a son of sixteen, and three young children; there was one bed; those that could not be accommodated in that slept on chairs; the rent was 2s. a week. This seemed a fair sample of the bulk of the property, which consists of eighty dwellings, and covered altogether about 2,200 yds. of land. At the rate of five inmates to each dwelling, the total population would be 400; or at the rate of 880 persons to the acre, or of 563,200 to the square mile,—a density rarely exceeded. Yet, with all the disadvantages indicated above, and the absence of personal cleanliness, the writer was assured by residents that the general health is extremely good; one person said they never had cholera or fever, and people never die here except from old age. These reports of the sanitary condition of this property receive general confirmation from the District-Registrar, who said the mortality was very low, and chiefly confined to infants and old people; he thought there had been one death from cholera. Inquiry in the neighbourhood elicited that the conduct of the inhabitants was very good.

Most of the dwellings above referred to are built "back to back," abutting on the property of another owner, therefore the only space "uncovered by buildings" is the hollow square, from which it may be inferred that open space on more than one side is not *essential*, however desirable it may be. Many persons seem to think that a window front and back secures thorough ventilation; such an arrangement certainly secures a thorough draft, when both the windows are open, consequently they seldom *are* open at the same time. In fact, careful observation shows that windows, as a rule, are never open, even in houses of the first class; and fireplaces, when not used as such, are usually closed with a register or a chimney-board. The advantages of open spaces around buildings appear to be both over-estimated and misunderstood. A building at the corner of two streets is more favourably situated than another which has merely a frontage to one street with a small court and narrow passage in the rear; much more favourable is the position of a building which is bounded by three or four streets. To compel a part of the space so situated to be left unbuilt upon will, in many cases, involve what appears to be the wanton waste of valuable property. If the area of uncovered space is in due ratio to the cube of building, its appropriation as street, square, garden in common, or otherwise, becomes comparatively indifferent, care being taken to prevent the space from being cut up into small, confined, neglected, and dirty patches,—the usual aspect of courts attached to small houses in towns.

If the space must be cut up, then it appears desirable to make the separate portions subsidiary apartments for cleansing purposes, covered over by a roof or upper story, with as little inclosure vertically as practicable. For, as respects the inhabitants of small houses in small streets, it may be observed that, though they seldom open their windows, they usually keep the house-door open whenever the weather permits; and in Richmond Fair it is habitual to keep the door open even in stormy weather, the verandahs giving the needful shelter. It is, of course, very desirable that this mode of 'keeping open-house' should be encouraged, as the cubic capacity of the living-room is thereby indefinitely increased.

4. The prejudice which prevails against water-traps as a security against the escape of sewer-gas into houses, appears to arise from forgetfulness of the very obvious facts that in a well-ventilated sewer, drain, or pipe, the gas cannot accumulate so as to exert any pressure; and, that it is so diluted by admixture with atmospheric air as to be harmless. It is possible for the water actually in contact with the sewer gas to imbibe a small quantity; but the occasional change of the water in the trap will remove any injury from that cause. After having had daily experience for several years past of the use of several hundred water-traps, by the tenants of an important estate, the writer is confident that a well-constructed water-trap, if properly applied and protected by ventilation, is a perfect precaution against any danger or annoyance through the escape of sewer-gas.

5. To a similar oversight must be attributed interruptions to the unbroken stream of drainage which are sometimes designedly introduced into drains, the danger of deposit, and of consequent local fermentation, being disregarded. As fermentation does not usually commence until some hours after any substance has been exposed to the air, it appears obviously desirable that, where fermentation is to be avoided, the substances should be removed with the least practicable delay; and, consequently, that the connexion of drains of all kinds with each other, and with the sewer, should be as direct as possible, without the intervention of cesspools or even traps; that in vertical pipes all traps should be placed as high as possible, so as to secure the greatest hydrostatic head, and the utmost scour. Neglect of these provisions, and the adoption of unnecessary traps, from over-anxiety to prevent the admission of sewer gas, have led too much annoyance and expense. It is clear that in a drain which is unavoidably almost level, any interruption, however trivial, weakens the scouring power of the stream, and favours the accumulation of sewer-silt, than which nothing can be more objectionable from a sanitary point of view. All such deposits are most favourable for the evolution of gas and the growth and propagation of germs.

The great annoyances which sometimes arise from drainage as at present constructed, appear due more to the negligent way in which the work is usually executed than to the arrangement and position of the drains themselves. It is desirable that every part of a system of drainage should be accessible in the readiest way which is practicable, so that any defect may be easily remedied, and additional drains connected with it at the least expense and trouble. It is probable that the imperfections arising from slovenly workmanship would be prevented, if no one is allowed to lay drains unless he is licensed for the purpose by the Sanitary Authority of the district; and by subjecting all persons so licensed to penalties for defective work, whether arising from the materials or the labour. In this way the men employed would be responsible for the proper construction of the drains according to the plan laid down for them.

6. Local Boards usually require the deposit of one or more of the drawings of a new building; in some cases they are very exacting in this respect.

This requisition is open to grave objections, as disclosing the internal arrangements,—which, in various factories, is detrimental to the proprietors,—and as tending to deprive the architect of his *quasi*-copyright in the design, drawings, and specification. It is difficult to see in what way the Sanitary Authority is benefited by such injurious demands. Cases have occurred in which the drawings required have been deposited, and found to be in accordance with the regulations of the Local Authority, but in which the buildings have proved to be not in accordance with the same regulations, the deviations not having been detected until the buildings were approaching completion. The deposit of drawings, then, appears to have the effect of beguiling the surveyor into false security, and of preventing that watchful inspection which is often very essential. That the plans of drainage should be submitted for approval is in many cases very desirable, as modifications in the system may be suggested and adopted with advantage; but it is otherwise with the general distribution of space throughout the structure; for in that the proprietor, or vendor, according to the received principles of trade, must be presumed to be the best judge. Of course, the regulations or bye-laws of the district must be enforced; but that can be done most effectually in the structure in which the deviation from the bye-laws,—that is, their evasion,—is most likely to be attempted.

7. The experience acquired under the Metropolitan Building Act appears to show that its provisions are better enforced by practising architects than by surveyors appointed for that purpose exclusively; and it seems very

desirable that the system of supervision which has prevailed for so long in the metropolitan districts should be extended throughout the country. In rural districts, where the amount of building is very limited, and architects but sparsely scattered, it is probable that two or more local Boards will appoint the same architect their district surveyor. In this way the Boards would secure the assistance of men of superior intelligence, and, probably, of more honourable character,—both qualifications essential to the impartial and reasonable execution of statutable enactments.

It has appeared to the writer that, for the purpose of a conference, it was preferable to propound general principles which should govern the compilation of bye-laws for the regulation of building, than to enter on a discussion of the model which has been issued by the Local Government Board. When the principles are established it ought not to be impossible to frame a code which shall harmonise with them. A discussion of the model bye-laws themselves would involve a mass of detail which would prolong the discussion unreasonably and impracticably.

Any one who will compare the principles enumerated above with the model bye-laws cannot fail to see that they are utterly irreconcileable with many provisions in the latter. The defects of the model bye-laws have been very fully considered by the council of the Liverpool Architectural Society, and their objections stated in a report dated 6th of November, 1877.

That report has been republished in some of the professional journals, and is probably known to many of those who attend the conference. In the tenor of that report, which he assisted to prepare, the writer wishes to express his concurrence."

Mr. Cates also stated that Mr. Heneyman, who took great interest in the discussion of this subject, and who, at the last Conference, read a paper* containing suggestions many of which were embodied in the report on the Model Bye-laws submitted to the Local Government Board by the Institute, had been suddenly called back to Glasgow, but he had left the following notes to be read to the Conference :—

"The greatest care should be taken in framing a General Building Act to keep out all reference to sanitary matters, except such as are necessarily dependent on structural details. These, it will be found, are few, and can easily be defined. It would be the duty of the surveyor under the Building Act to see that they were attended to,—the *sanitary* authority, as distinct from the *local* authority, should have nothing to do with it. The tendency is (especially in Scotland, where the existing Health Act is greatly inferior to the English Act) to confound the two, which would inevitably lead to confusion. For example, the Glasgow authorities are at present seeking to have it enacted, as an addition to their present building regulations, that no room in a domestic building shall have less than 10 ft. height of ceiling. Now, this is utterly absurd as a building regulation. If such regulations as Nos. 55 and 58 of the Model Bye-laws are attended to, a house may be as healthy with even 8 ft. of ceiling as with 10 ft., *if, after it is built*, the officers under the Public Health Acts do their duty, and prevent overcrowding, &c. People should be bound to erect houses with proper provision for light and ventilation, but arbitrary restrictions, which have no *necessary* connexion with the healthiness of the dwelling, should on no account be tolerated. I have repeatedly seen, both in town and country, two houses both exactly alike so far as the building was concerned, built by the same builder and finished exactly alike, with high ceilings and windows, and fireplaces in each room, presenting the most striking contrast in the matter of health, which no building regulations conceivable could have prevented, but which the provisions of a Public Health Act most certainly could. In the one you might find a man and his wife and a couple of children: everything bright, airy, and wholesome. In the other, the same houshold, with the addition of four or five adult lodgers; the fireplaces, except the kitchen, filled up with boards, and most probably papered over; and everything filthy, stuffy, and stinking.

Can the Conference, backed up by the Institute, bring about either of these practical results?—

1. Induce the Government (by memorial, deputation, or otherwise) to take the matter up in earnest, and give us a Building Act pure and simple, suitable for both urban and rural districts, throughout the whole country (not forgetting Scotland).

Or, failing this,—

2. Can the Conference, or the Conference through the Institute, bring some pressure to bear upon local authorities promoting private Bills dealing with this matter, to induce them to take the advice of architects practising in their locality before deciding upon the details of their measures, or the advice of the Institute, or of local societies through the Institute?

If there is not to be a general Act, it is, I think, of the very first importance that the framing of numerous independent Acts should not be left in the hands of local authorities themselves. It might be expected that the authorities in such a city as Glasgow, for example, when desirous of obtaining new building regulations, would be glad to have the advantage of receiving the opinions of such men as compose the Glasgow Institute of architects—many of whom are, from their extensive and varied experience, well qualified to give most valuable advice. But what is the fact? Without giving the architects, or any other class of the community, any opportunity of discussing the details, they, with unseemly haste, seek to get Parliamentary sanction to regulations of the most preposterous character (one of which I have already referred to) affecting vested interests and the value of property to a serious extent. The Glasgow Institute have, of course, protested against the course which has been adopted, but, obviously, where they are ignored with such marked intention they can hardly with dignity offer their advice. *Can the Conference do anything to convince self-sufficient Corporations how senseless and detrimental to the interests of the community such conduct is?* If not, much mischief must soon be done if the regulation of buildings it to be left to private legislation."

To the discussion which ensued we shall return.

* *Builder*, vol. xxxiv. (1876), p. 634.

CONCRETE AND FIRE-RESISTING CONSTRUCTIONS.

At the Conference meeting on Thursday evening, as already stated, Mr. George Godwin presided, and Mr. Arthur Cates read the paper which we printed last week (pp. 585-86).

Mr. Godwin, in opening the proceedings, observed that the two subjects to be discussed were matters of extreme importance, as all present would know very well. In fact, they had only to recollect that there were more than 2,000 fires every year in London alone, and that the money-loss thus sustained, irrespective of the loss of life and the amount paid for insurance, must be counted by millions annually, to fully appreciate this. Yet, nevertheless, we, strange to say, went on in the same insane way as of old in building "match-boxes" rather than houses, mainly, as it had always seemed to him, from two causes; firstly, our iniquitous system of building on short leases,—a system which was gradually handing over to the landowners the greater part of the accumulations of the middle classes; and secondly, the want of precise knowledge as to how best to avoid the evils attendant on the prevalent modes of construction. If Mr. Cates's paper and the discussion which might follow should tend to make that knowledge more precise, the Conference would, in that alone, have done a great thing.

Mr. Cates having read his paper,

The Chairman said they would now be glad to hear any gentlemen who had anything to say on the subject, and he thought it would be well if the meeting would follow the reader's suggestion that they would confine their remarks, in the first place, to fireproof construction, leaving their observations on concrete proper to the afterpart of the discussion. The time had gone by when it was necessary to inquire whether concrete was a good building material or not; concrete when it *was* good, was "very good."

Mr. Matthew Allen said he was a practical builder, and his attention was first drawn to the question of concrete in connexion with the erection of dwellings for the working classes. Up to the time he took out his patent it was impossible to build, as a remunerative speculation, large blocks of workmen's dwellings, on account of the Building Act demanding that all the balconies, passages, staircases, &c., must be fireproof. He found that by burning clay or refuse from gas works, and mixing the burnt material with Portland cement, he obtained a fireproof material which possessed the additional important merit of great strength. Such was its fire-resisting capability, that he was now using it for furnaces as if it were fireclay. As already mentioned, he had at first taken out a patent for the material, but after the lapse of four years he surrendered his rights in the patent, and gave it up for the benefit of the public. He was glad to find that the material was now being very largely used. He had carried out his principle of construction in new buildings for the Industrial Dwellings Company, over which Sir Sydney Waterlow presided. In those buildings the lintels, steps, copings, keystones, and, in fact, everywhere where stone would otherwise have been used, his artificial stone or concrete was used, made in moulds to the required shape and size. He had since carried out a block of buildings,—middle-class dwellings,—in Manor-road, Stoke Newington. Here the staircases and ceilings were entirely of his fireproof material, and, in fact, there was not a bit of wood in the whole construction which could not be removed without disturbing a brick. Until people got to know that it was just as easy to build both for stability and immunity from risk by fire, there would not be much improvement. A brick would exist for generations,—for ages, indeed,—uninjured; it was not possible to calculate its duration. Wood, on the other hand, was, if not burnt up, rotted to pieces in a very few years. As regarded fireproof bressummers, he thought the principle Mr. Hyatt had acted upon was the correct one; but he used about five times too much iron, and had not got enough concrete over the top of the iron. With all the lintels he (Mr. Allen) had used,—with a small piece of iron running through each,—he had never once had a failure. He treated iron in a building just as the bones were treated in the animal economy, *i.e.*, clothed it. As the bones gave strength to the human frame, so the iron gave strength to the various parts of a building; but just as it was needful to cover bones with flesh, so was it necessary to cover iron in a building with some incombustible material. Buildings erected on his principle would, he felt sure, be as perfect at the end of the lease as when just completed. Looking down on London from the dome of St. Paul's on the previous day, it was apparent at a glance that the city was being rebuilt,—had, indeed, been half rebuilt already. But how? As if it were built expressly to burn. Costly stone fronts many of these new buildings had, but they only concealed from the outside the 9 in. by 3 in. joists which supported the floors, and which, once a fire took place, would allow the building to be completely gutted,—would, indeed, feed the flames. Then, again, there were well-holes and staircases which seemed expressly intended to spread a fire when once it broke out. In ordinary houses, why should quarter-partitions be tolerated? Why not have 4½ in. brick walls? The new Building Act was going to make staircases still more perfect as agents for spreading fire, by compelling an opening to be made at the top,—by taking out the "damper," in fact. Of all subjects that could be discussed by that Conference, he thought fireproof building was first in importance. As a practical builder he was prepared to build fireproof buildings. His plans had been before the Metropolitan Board of Works for many years, and highly approved of by that body. He thought the time was not far distant when the architect and the builder would see the necessity of working more harmoniously together to attain the end in view. It was not pleasant for a builder of fifty years' experience to be told by architects that he did not know his business. Clerks of works were brought up as foremen in builders' shops, and architects generally got the best of them to act as clerks of works, and, in many cases, to teach them what they did not know themselves. The architect had an important part to fill in connexion with building; but, after all, he was not everybody. The diagrams on the walls, and concrete construction generally, testified to the fact that builders, and not architects, led the van.

Mr. Cates reminded Mr. Allen that the drawings on the wall and the paper which had been read referred to two systems of fireproof construction which had been devised by architects, viz., the systems adopted by Mr. Hornblower and Mr. Whichcord respectively.

Mr. Allen replied that in those systems of construction fireclay was used. Of course, it was a very good material, but was far too expensive. He claimed that the concrete which he used was equally as good as fireclay for

heat-resisting purposes, and it was certainly much cheaper. Mr. Lascelles, the well-known builder, of Bunhill-row, had used, and was using, the material very extensively for a great variety of purposes, constructive and ornamental. It could be used for mullions, sashes, and doors, and it was possible to do without woodwork altogether.

Mr. Charles Fowler said that one reason why, as he thought many years ago, architects were unable to adopt fire-proof or fire-resisting construction was, that there had not been discovered, or there was not generally known, any material which, used with iron, would answer the purpose of protecting the iron. Our neighbours across the water in France had got such a material in abundance, and they largely availed themselves of it in floors and partitions. That material was the coarse plaster of Paris, which resisted fire admirably; and the floors of Parisian houses, which had now been used for a generation nearly, were based entirely upon the principle of bedding the iron in the material. It was found that floors constructed on that principle were very strong and very light, and, incidentally, such floors had been found to be fireproof. In this country it was quite recently that we had discovered a material which would answer the purpose of making iron structures fire-resisting. Mr. Matthew Allen appeared to be one of the first to adopt such a material. Others had followed in the same direction. There was one difficulty which arose from the use of fireproof construction throughout a building, and that was resonance. But although it seemed to be impossible to get fireproof buildings, carved, as they might be said to be, out of one solid block of material, without resonance, fortunately a new material, "slag wool," had cropped up. This material was obtained by driving a jet of steam into the waste slag as it came from the smelting-furnace, the result being a kind of incombustible cotton, tangled about and capable of being turned and twisted anyhow. It possessed the great advantages of being non-resonant and indestructible by fire. Such a material would be of incalculable value for putting behind partitions and between floors in order to deaden resonance. It was a question with many who had considered the subject how far cement concrete and ironwork could be trusted to adhere perfectly and work well together. Most, if not all, of the patentees of systems of fireproof construction, involving the combination of iron and concrete, adopted some artificial means for increasing or creating the adhesion of the two materials, such means often consisting in winding iron wire round the bars or plates of iron. If such expedients were really necessary, it would be interesting to know to what extent the stability of the structure depended upon them. He confessed that they had the appearance of being rather dangerous. Although, in case of fire, the concrete would no doubt protect the ironwork, yet the heat must penetrate the concrete and expand the iron, perhaps to an extent sufficient to disintegrate the concrete. Although a building so constructed would resist the action of fire once, was it equally certain that it would successfully withstand a second fire? In other words, was a so-called fire-resisting structure as strong and as fireproof after a fire as it was before? For instance, would Messrs. Waterlow's building in Finsbury, referred to in Mr. Cates's paper, be equally successful in standing a second ordeal by fire? Until these questions had been answered by practical experience it was difficult to feel perfect confidence in systems of construction which combined the use of two such diverse materials as iron and concrete.

Mr. Matthew Allen said perhaps he might be allowed to add to his former remarks by saying that, as to the question raised by the last speaker, whether his concrete would bear a second, or even a third or fourth fire, about five years ago he had used the material for setting a hot-water boiler, and it had stood a very great heat very constantly ever since.

Mr. Alexander Payne said that in reply to Mr. Fowler's remarks he might mention a case in which concrete had been used in connexion with iron and exposed to a great heat. About three years ago he had to carry out a manufactory at Oldham, in Lancashire, in which there were several large drying-floors. The flues from these were brought from one end of the building and there collected into a chamber lined with fire-brick from which one large main flue passed to the chimney. This chamber was covered with a dome of Portland cement concrete, with wrought-iron ring ties bedded into it to prevent the thrust. This was an instance of Portland cement concrete exposed to great heat and with iron embedded in it. With a view to this meeting he had written to the secretary of the company for whom the manufactory was built to ask if the concrete cover or dome had ever cracked or shown any weakness from the effects of the heat, and he sent the following reply from the manager at the works:—

"The underground flues are level until they meet the main flue just outside the end wall. At this junction they are covered by a concrete dome with stone slab 3 in. thick on the top. Although the heat at this point must have been immense at times, I never saw any signs of the concrete cover cracking."

Mr. W. R. Pullen, as the representative of Mr. Thaddeus Hyatt, invited gentlemen interested in the subject of fire-resisting constructions to visit Mr. Hyatt's new building, the "Patent Lens Light Works," Farringdon-road. He was sorry to say that Mr. Thos. Rickett, who had conducted many of Mr. Hyatt's experiments, was unable to attend the meeting.

Mr. Wm. H. White wished to be allowed to add something to what Mr. Fowler had said as to fire-resisting construction in Paris. The Parisians had been for many years far ahead of us in England in all matters relating to buildings intended to resist fire. When, in 1840, iron joists began to be generally used in Paris, owing to the strike of carpenters, the system of construction adopted was not new in itself, for just as the iron joists were embedded in plaster of Paris, so in the same way the wooden joists had been for at least a century and a half surrounded with plaster. All the wooden floors made in the time of Louis XIV. were constructed in that manner. Indeed, the very complaint just made by Mr. Matthew Allen about our miserable and dangerous 9-in. by 3-in. wood joists was identically the same as that made by Evelyn in his diary 200 years ago, when he compared the rough, inflammable wooden floors of London with the horizontal solid partitions and careful parquetry he had seen in Parisian houses.

Mr. J. Douglass Mathews said that the observations already made in the paper and in the discussions tended to show that, however perfect as fire-resisting structures some of the floors referred to might be, their cost would preclude their use. That was especially the case with the methods put forward by Mr. Hornblower and one or two others. It seemed to him that, until the question of cost could be solved, we should have to continue using "9 in. by 3 in. joists." Could that question of cost be solved? It certainly appeared to him that Mr. Allen had solved it in a very satisfactory manner, inasmuch as he was able to produce a fireproof floor and ceiling at a very moderate cost. It was now beginning to be generally recognised that the smaller the quantity of iron used in fire-resisting floors the better. Now, instead of iron being, as formerly, the chief material, concrete was paramount. He thought that the experiments which had been made by Mr. Hyatt would give architects very great confidence in concrete. Mr. Brannon used so very little iron,—it could hardly be called more than wire,—in his floors, that one almost feared to adopt them. He (Mr. Mathews) had made use of some of Mr. Brannon's iron doors, and remarkably light and satisfactory they had proved to be. One of the systems not mentioned in the paper was that introduced by Mr. Moreland, which, as at first carried out, consisted of light lattice girders with corrugated iron laid across them, and covered with concrete. Mr. Moreland ultimately came to the conclusion that the corrugated iron was of little or no value except as a centering, and it was discarded. Another system not mentioned in Mr. Cates's paper was that of Messrs. Homan & Rogers,—"Phillips's" plan,—which appeared to be a very satisfactory one. One great obstacle to the use of some of these fire-resisting "floors" was that, instead of being floors, they were only ceilings to the apartments below, the floor proper being laid on the top of them. If the floor formed part and parcel of the construction, it would be much better. One great disadvantage attending the use of concrete was, as Mr. Fowler had remarked, its too great facility for conducting sound.

After some remarks by Mr. Roberts, an operative plasterer, who claimed to have been the originator of some of the methods of construction referred to during the meeting,

Mr. Jennings observed that the chairman had made reference to the losses entailed by the destruction of houses by fire, but, on the other hand, any one would find, by calculation, that the interest on the money expended in rendering buildings fireproof would be much greater in amount than the sums paid for insurance. Therefore, as a matter of pounds, shillings, and pence, although it might be said that a great deal of money was lost, it was not wholly lost, or the insurance offices would cease to be remunerative concerns. He thought that the whole subject of fire-resisting constructions was one which architects would do well to take up and study, for to most of them opportunities would often occur of carrying out such systems where the cost was not too great. One important point connected with the subject was that buildings supposed to be "fireproof" were often made to carry such great weights on their floors that they fell in almost directly the heat affected the iron supports. The law ought to insist upon such structures being made stronger, or else they should be less heavily weighted. There was a strong feeling at the present time that stone staircases would not withstand fire, but he never knew a case in which a stone staircase had not lasted long enough for all who were in the house to pass down it.

Mr. Swain said that he believed his firm (Evans & Swain) were the only patentees who had devised a fire-proof wood staircase, with the soffit and risers protected by plastering, the treads being removable. Although, as the last speaker had said, it was possible that a stone staircase would last sufficiently long to enable those in a burning house to escape, the safety of the firemen and salvage corps men should by no means be forgotten, for they had important duties to perform in rescuing property. Unless staircases could be made of a really fireproof material, the firemen would not venture on them. Mr. Tozer, chief of the Manchester Fire Brigade, had expressed his opinion that the staircase introduced by the speaker's firm was the best he had seen, and he should have no objection in allowing his men to pass up or down upon it, though it might be surrounded by fire. Mr. Tozer also expressed a similarly favourable opinion with respect to the fireproof floors * introduced by his (the speaker's) firm.

Mr. Drake said that he had had twelve years' experience in the erection of concrete and fire-resisting structures, and ten years ago he had perceived the non-necessity for heavy iron girders. He had used light bowstring girders, and had constructed a number of very light but remarkably strong floors in various parts of the country. He had also constructed several concrete staircases, with iron imbedded in them. The steps of one of these, erected in 1871 at his own house, had a bearing of 2 in. into the wall, and every step had stood the test of being weighted with 15 cwt. After all that had been done in the use of concrete and iron, it was still a moot point what amount of iron ought to be used,—where, in fact, it was necessary to begin to supplement concrete with iron. He thought Mr. Hyatt was deserving of great thanks for the experiments he had carried out and published for the benefit of everybody.

Mr. Homan remarked that it was a mere matter of calculation as to the amount of iron required. Mr. Allen's remarks had been very practical and very sound. Iron should always be covered by the concrete, because when so covered it was practically indestructible by fire. As to insurance, he was sorry to say that insurance offices, as a rule, did not favour fire-proof construction. When he (Mr. Homan) first introduced his system, he brought it before the notice of two fire offices, the Sun and the Alliance, and they agreed that where his system of construction was adopted they would charge the minimum rate of premium. He asked them to charge only something like the Paris rate of premium on such buildings, viz., from 4d. to 7d. per 100*l.* insured, but they refused, with an implied intimation that they did not intend to commit the "happy despatch." His firm (Homan & Rogers) last year finished the Howe Bridge Mill, in Lancashire, and the owners, owing to the fire-resisting construction, saved in insurance premiums to the extent of 600*l.* a year. Other mills similarly constructed were saving on fire premiums to the extent of from 400*l.* to 900*l.* a year.

Mr. Butler explained his system of rendering fireproof the ordinary wooden floors supported on timber joists. By means of terra-cotta or fire-clay tiles or slabs, and concrete and plaster, he was able to render such floors fireproof,

* Described in *Builder*, vol. xxxv, (1877), pp. 116, 566.

at a cost of about 2*l.* 10*s.* per square of 100 ft. Some experiments had been tried that afternoon, in the presence of Mr. Vulliamy (the Superintending Architect to the Metropolitan Board of Works) and a number of district surveyors, on a specimen floor constructed on that principle in Victoria-street, and with the most perfect success,—a fire having been burning under it for two hours without having the slightest detrimental effect on it.

Mr. A. D. Dawnay remarked that the construction of a flooring which should be capable of being adjusted in its parts for various strengths to meet the requirements of either dwelling-house or manufactory, composed of such entirely incombustible materials as were usually at hand, at a cost likely to induce an almost universal use, practically engaged his attention some ten years ago, at about the time when rolled iron joists were first imported into this country from Belgium in a general way. And in conjunction with others, a system was perfected which, though not absolutely unknown in some of its details, was wholly new in others. He referred to that of rolled iron joists and concrete of various compositions. At about the time referred to a system known as Fox & Barrett's was already in use. This consisted of rolled joists of various depths placed at an average distance apart of 2 ft., with fillets of wood laid between them bearing on the bottom flange with about ⅛ in. spacing. Concrete, either of Portland cement or lime, and broken brick or ballast, was then filled in to any required thickness. There was also a system in use in Belgium and France consisting of rolled iron joists, but having a lacing of hoop-iron over and under, which was embedded in the concrete. This system needed a flat centring being first fixed to receive the concrete. Fox & Barrett's system provided its own centreing in the wood fillets. On mature consideration it appeared probable (he spoke without the slightest prejudice) that, in case of a fire occurring under a Fox & Barrett's floor, the wood fillets would be partially or wholly destroyed, and the stability of the concrete endangered. The French system offered practical objections on account of the form of binding the hoop-iron rather than as to its incombustibility. Between these two kinds of floors a third was originated. In this, instead of wood fillets or hoop-iron, small bars of ⊥-iron, 1 in. by 1¼ in. to 1 in. by 2 in. according to the span, and having their ends jawed and set up to clip the flanges of the joists, were fitted between at 4 in. and 6 in. spacing. A centreing was then erected, and the concrete poured in in the usual way. With the ⊥-bar plan the iron joists were placed 3 ft. and even 4 ft. apart, it being found upon experiment that the concrete, assisted by the bars, was amply strong. Floors had been constructed in this manner for working loads of 3 cwt. and upwards per square foot, with 6 in. of concrete. The cost per square nine or ten years ago for iron and concrete was from 5*l.* to 8*l.* when joists only were used, and in the case of large spans needing a sub-division by girders, the cost was as much as 10*l.* The expensiveness of the system proved a considerable drawback, and many expedients were resorted to to lessen the cost; one was to abandon the jawing of the ⊥ bars, and simply set the ends up to correspond with the bevel of the flange. This, in turn, was given up, and the bars were cut to dead lengths, and laid upon the flanges. By this means, and adopting a 6-in. gauge, ordinary floors were constructed at 4*l.* 10*s.* per square; and, taking a large building having a fair proportion of corridors, at 4*l.* per square. In several instances, when unusually strong floors have been required, and depth could be spared, curved—either elliptic or segmental—⊥ bars and arched concrete had been successfully used between girders spaced 7 ft. to 8 ft. apart, and in 25 ft. to 28 ft. bearings. The arching of the concrete answered as a casing to the girders, excepting only to the soffit or bottom flange, but which in ordinary cases did not exceed 5 in. in width. The versed sine varied between 8 in. and 12 in. Arched concrete between deep joists 5 ft. apart, with a versed sine of 5 in., answered admirably well, both as regarded strength and resistance to fire. In the arched system with girders he found that there was practically no combined thrust exerted against the walls, and especially was this the case with elliptic arching. The cost of this method was from 6*l.* to 8*l.* per square, including girders. As opportunity served, he conducted experiments upon various spans, and came to the conclusion from the results that owing to the immense strength of well-made concrete, a saving might be effected by placing the joists closer together and giving up the ⊥-bars entirely. There was some difficulty in this at first, for want of a better form and section of joists. Circumstances, however, were propitious, and new sections were forthcoming. He ultimately adopted a plan of placing iron joist-binders at from 7 ft. to 10 ft. apart, and filling in between with light joists 15 in. to 18 in. apart. By this method the concrete wholly embedded the small joists, and became transversely joggled into the binders. This arrangement he still adopted, and found it not only a very economical, but a very strong combination; a floor of 6-in. by 5-in. binders, 15 ft. span, and light 3-in. joists of 7 ft. lengths, 16 in. apart, with concrete well mixed, composed of 8 of Thames ballast to 1 of 117 lb. Portland cement, formed a most rigid and satisfactory structure, capable of a safe working load of 1½ cwt. per square foot. Spans of 20 ft. and upwards were similarly constructed in bays divided by main girders and subdivided by the binders and small joists. Of course, the ultimate well-being of such work lay in the concrete. If it were done slovenly, or composed of indifferent materials, the result was one of imminent danger. Lime concretes were not, in his experience, satisfactory. If Thames ballast were used it should be perfectly free from loam or foreign deposits, and not too coarse. If the former, it might fall without notice; if the latter, it would not work up "fat." A short time since he constructed several squares of pit-ballast concrete and Thames-ballast concrete side by side, mixed with the same make of cement. After the work had remained three days he had the centreing struck. That made with pit-ballast fell almost without notice about an hour after, but the other remained sound and good. Ballast concrete was the heaviest construction per square; next came broken bricks to pass a 1½ in. ring. Of the two, he preferred the latter; it was lighter, and though more "hungry" than ballast, except when a good proportion of clips and fine particles were produced in cracking, it gave an excellent floor. By experiment on a small scale, the broken brick concrete was undoubtedly the best in a fire. The ballast did not get injured, but the exposed surfaces of pebbles and flints which might happen to form excrescences on the surface blew and cracked, and would convey to the inexperienced an idea that it was unsafe. Bricks, being already burnt, had no tendency to fly. Next to bricks, he had largely used burnt ballast or burnt clay. This made an excellent and the lightest floor, but it was very "hungry," and took more cement than ballast or broken bricks. A soft, cakey, or crumbling ballast should be avoided, and only a hard-burnt brittle kind used, containing its own fine stuff also hardly burnt. Too much care could not be bestowed upon burning clay for fireproof floors if a good result were desired. As to cement, it was beyond controversy that bad cement spoiled any work. One advantage of the system he was describing was that the ceilings were perfectly flat, and might be plastered immediately upon the concrete without any preparation,* which in common work might be finished with two coats. It was found in the early construction, that the situation of each joist might be traced in the ceiling by a line of whiteness uncommon to the general surface. This was owing to the non-absorption of moisture by the iron, but after a few times of clearcoling and distemper, the whiteness disappeared. In the present method, the concrete was kept down below the binders ⅛ in., leaving a kind of channel with a side key for a roughing up of Roman cement and haired mortar, and it was allowed to set before the plastering was laid on. Work so executed left no trace whatever of the joists or binders. It might perhaps be thought that in an extensive fire considerable expansion might take place, and thus not only endanger the concrete, but the walls; but so far as experiment had gone that was not the case. There did not appear to be a sufficient bulk of iron in each joist of a floor to cause a destructive expansion, and in consequence of the undersides being protected by ¾ in. of plastering and ¾ in. of concrete or Roman cement filling in the heat did not act upon the iron with any serious result.

Mr. W. H. Lascelles, of Bunhill-row, exhibited and explained a number of his many and varied applications of concrete to building purposes. These comprised mullions and other architectural features which have been supplied by him for buildings erected by Messrs. R. Norman Shaw, R.A., A. Waterhouse, A.R.A., Gilbert R. Redgrave, the late W. Fogerty, and other architects. Mr. Lascelles remarked that not only doors, but window-sashes could be, and were, being constructed of concrete, with a very small quantity of iron embedded. The concrete used in all his productions was the same as that introduced by Mr. Matthew Allen.

Mr. Godwin, in closing the discussion, after a brief reference to the mention made by Mr. Cates of his early bantling, the "Essay on Concrete," to which the first medal of the Institute was awarded in years gone by, said that time would not allow of the further discussion of the subject, or of special reference to concrete proper, as to which much more might be said hereafter, particularly as to the possibilities of treating concrete artistically, with great usefulness. There were one or two disjointed matters as to which he wished to say a word. Reference had been made to the matter of cost, and some gentlemen had at once put aside the question of the desirability or the practicability of attempting to erect fireproof constructions, on account of increased cost; but cheapness of first cost ought not to be aimed at to the exclusion of all other considerations. It should be one of the duties of architects to endeavour to persuade the people that to build well was to build cheaply. On the Continent, they did not sacrifice everything to cost,—although it was true that abroad they did not labour under the incubus of our system of short leases. Only that morning he had received a letter from Dr. Schliemann describing a house he was building for himself in Athens. In that house the floors were formed of fireproof arches covered with a concrete mosaic floor, and there was no wood whatever in the house except the doors. If that could be done in Athens, why should not we do it in London? One inference to be drawn from the discussion was that a great deal too much iron was used in some fireproof floors as hitherto constructed, and no doubt in many cases less iron would suffice, provided that the concrete was good; for in using concrete it should always be borne in mind that unless it were thoroughly well done, with good materials and by men who could be trusted, it was a deception and a snare. For instance, though he did not wish to throw cold water on Mr Brannan's process, to which allusion had been made, he had vividly in mind an instance where somebody who did not perhaps understand Mr. Brannon's mode of construction had formed a large roof over a shop, which ultimately fell, the materials never having properly aggregated, and killed a man who was below. Now, he did not mean to say that there was the least error, either in the theory or in the prescription, but what he did insist upon was that unless concrete work was well done, it was worth nothing. To show how slowly things were taken up and pursued in England, he was reminded by what had been said in the discussion as to the use of plaster of Paris that twenty years ago Mr. William Hosking, who did many original things, formed a floor in one of Clowes's printing-houses precisely in the manner referred to, embedding the whole of the woodwork in plaster of Paris. He believed that the floor stood to this day, and had succeeded admirably; but it was curious to find that, when such a thing had been attempted, and found to succeed, and was spoken well of, yet nevertheless, it was allowed to die out. He trusted that what had been said then, and what might be printed in the "Transactions" of the Institute and in the professional journals, would lead to a thorough review of the whole question, and to an endeavour to lead to an authoritative decision as to the best methods of fire-proof construction. Architects would pass through an exhibition of building appliances and materials, but few of them thought of using any of the appliances or materials they saw there. Of course, as he well knew, difficulties arose to prevent the introduction of novelties, either with the client as to their cost, or from the architect's disinclination to incur responsibility for their possible failure. Mr. Jennings had remarked, upon the subject of cost, that it was practically more advantageous to build houses that would burn rapidly than houses that were fire-proof, because, by means of insurance, the owners of the property were compensated for loss by fire

* The floors and staircases of the new wing of the Charing-cross Hotel, and the promenade roof of the Hastings Aquarium, just opened, are similarly constructed.

but such an argument hardly needed to be refuted. Were such a system to be generally pursued in other matters, the nation would soon be reduced to poverty.* The question of fireproof staircases was a very important one, and had received an interesting illustration in the case of the concrete stairs described by Mr. Drake as having sustained a load of 15 cwt. on each step, one end only being inserted into the wall. With a fireproof staircase there could be no possible objection to having an opening at the top, as objected to by Mr. Allen, and, indeed, it was in most cases necessary for ventilation and health. Want of time precluded him from making further remarks, as one point would lead to another, but in bringing the discussion to a close he would wish to thank the several gentlemen who had attended to afford the meeting information as to their own patents and contrivances, which had been done in the most reticent and admirable manner, without any display of self-seeking or the urging of personal claims. Having announced that a visit would be made on the morrow to Mr. Kirkaldy's Testing Works, where, he said, many valuable "wrinkles" might be picked up, Mr. Godwin concluded by moving a vote of thanks to Mr. Cates for his paper, which was an able synopsis of what had been done in the way of concrete construction, and, this having been carried by acclamation, the meeting terminated

VISIT TO KIRKALDY'S TESTING WORKS.

ON Friday morning a visit was made to Mr. David Kirkaldy's Testing and Experimenting Works, 99, Southwark-street. The principal entrance to the premises is appropriately enough inscribed with the motto, "*Facta non Verba.*" The patent testing machine was shown in operation under thrusting stress, testing specimens of wood. The particulars of these experiments, together with some information as to Mr. Kirkaldy's testing machine, and what is done by it, we have given on p. 624.

THE ROOF OF THE CORN EXCHANGE, MARK-LANE.

At the Conference meeting on Friday afternoon, the 7th inst., the following paper by Mr. Edward I'Anson, F.G.S., was read by Mr. T. H. Watson, in the unavoidable absence of the author. Mr. E. M. Barry, R.A., presided:—

The Old Corn Exchange in Mark-lane, London, having fallen into decay, and the market, which had already been considerably increased by an addition to the area of the original market space, being still insufficient, an adjoining piece of land has been acquired, and a new Exchange is now in course of erection on the enlarged site. The building will be about 100 ft. in width, and, after long deliberation, it has been determined that it shall consist of a block about 40 ft. in depth next Mark-lane, containing, on the ground-floor, the staircase, vestibule, &c., and on the first floor a flour-room; and in the rear of this block a central area or nave surrounded on three sides by aisles. The nave will be 60 ft. in width, and the aisles each 20 ft. The nave is separated from the aisles by an arcade, the arches of which have a span of 20 ft., and the height to the top of the cornice over the arches is 30 ft., measured from the floor. The roof over both aisles and nave is carried by curved ribs of wrought iron, each of which springs from the floor, has a span of 100 ft., and rises to a height of 61 ft. 9 in. from the floor, and is seated over one of the columns of the arcade. That part of the rib which spans the nave is semicircular. At the floor level each rib is bolted down to the brick pier built to receive it, and secured to one of the iron girders which, running across the Exchange from side to side to carry the floor, acts also as a continuous tie applied at the springing or lowest part of the rib. The iron ribs, like the columns of the arcade dividing nave and aisles, are 20 ft. apart from centre to centre. As to the construction of the roof, which has been the result of most careful consideration, I do not here purpose to make any remarks, my present object being only to describe the iron ribs which it has been decided to use in order to carry it.

The profile of the rib having been determined, the question was what section should be given to it, and under the advice of Mr. William Barlow, C.E., the following dimensions have been adopted:—The depth of the semicircular portion which spans the nave is at the apex 2 ft., and gradually increases, until at the point where it springs from the top of the nave arcade it is 3 ft. 10 in. in depth. The depth of that portion which spans the aisle is, for the vertical part 1 ft. 9 in., and for the curved part 2 ft. The rib is made up of top and bottom plates, web and angle irons. The dimensions of these parts are (with the exception of the web, which, as before stated, varies in depth) uniform throughout, and are as follows:—

Top and bottom plates, 11 in. wide and $\frac{5}{8}$ of an inch thick.

Angle irons, $4\frac{1}{2}$ in. by $4\frac{1}{2}$ in., and $\frac{5}{8}$ of an inch thick.

Web, $\frac{3}{8}$ of an inch thick.

The ribs have a tie at the feet, as already described.

It will be observed that the object to be attained was a rib which should bear upon the arcade but exercise no thrust upon it, and that the whole rib, securely fastened at the bottom, should be perfectly rigid throughout. In order to test the capabilities of the rib, a small tin model was made, and, being heavily weighted, showed a tendency to rise from its seating on the arcade, demonstrating the necessity for giving considerable stiffness to that part of the ribs which would span the aisle. This model represented correctly to scale the span and height of the rib, and also its profile, but did not represent with anything like accuracy the sectional areas.

On Mr. Barlow's advice, a model was made of two ribs one-fourth full size. These were constructed of wrought iron, and built up with flanges, plates, and angle irons all riveted together, and were accurate representatives in every detail of the proposed ribs. They were made by Messrs. Moreland, and carefully tested at their works in Old-street, St. Luke's, by Mr. Barlow.

To conduct the test they were placed on balks of timber, at the proper distance apart, and tied at the feet by iron ties. They were connected by purlins of iron placed in the exact position the purlins will occupy in the work. There were six purlins in all, three on each side of the roof, and all placed at levels above the springing of the rib from the arcade; that is, there were no purlins on that part of the rib which spans the aisle. As in the building the load will be received by the purlins, and by them transmitted to the rib; the test loads were suspended from the purlins also.

The following is a table of the loads successively applied, and the resulting deflections, the loads being in cwts. and the deflections in inches:—

Load on lower Purlin.	Deflection.	Load on middle Purlin.	Deflection.	Load on top Purlin.	Deflection.
$6\frac{3}{4}$	·01	$6\frac{3}{4}$	·06	$6\frac{1}{4}$	·07
10	·01	10	·06	$7\frac{1}{4}$	·08
15	·03	15	·11	$11\frac{1}{4}$	·13
20	·05	20	·16	15	·19
25	·06	25	·19	$18\frac{3}{4}$	·24

Under the last load, viz.: 25 cwt. on lower purlin, 25 cwt. on middle purlin, and $18\frac{3}{4}$ cwt. on top purlin, the extrusion at the point where the rib springs from the nave arcade was $\frac{1}{4}$ of an inch on each side; that is, $\frac{1}{2}$ an inch for the entire span from arcade to arcade.

The greatest load applied to the model was equivalent to about three times the calculated maximum of dead load which the rib will have to sustain in the building. When the weights were removed the model ribs resumed precisely their original form, no part having shown signs of undue strain.

The experiment was considered satisfactory, and the ribs destined to carry the roof of the new building are now being constructed under Mr. I'Anson's directions.

In the discussion which followed,

Mr. P. W. Barlow, F.R.S., in response to a call from the chair, said the roof was peculiar in its construction. It was of a form that had never previously come before him, and he hardly knew how to calculate its effects. He could get at them by approximation within certain limits, but inasmuch as the roof involved a double support, there was a degree of complexity about the structure which seemed to him to make it necessary to make the experiments referred to in Mr. I'Anson's paper. In the very much smaller model, made by Mr. I'Anson, there was a tendency to rise at a point over the line of the arches, when a weight was put upon the top. When, however, the roof came to be tested by the large model, that tendency did not show itself. He (Mr. Barlow) noticed that, as described in the paper, there was an increase in span to the extent of half an inch in the model, which would have been equal to 2 in. in the full-sized structure. He believed that some modification was to be made in the weights to be placed on the ribs. Instead of the masonry which it was at first intended to carry up on the purlins, iron and wood work would be used. The lights were to be vertical, stepped one tier above another, and formed in the walls carried upon the purlins, the space between each tier consisting of a horizontal flat of lead.

Mr. Haslehurst, from Mr. I'Anson's office, in answer to a question, said that the roof consisted of a series of vertical lights, and was covered with lead and glass arranged in strips.

Mr. T. H. Watson expressed regret that there were not some detail drawings exhibited, as they would have enabled the meeting to judge of the structure as a whole much better. He thought, however, that the form of the roof as a whole was extremely satisfactory, and enabled the architect to construct a roof depending upon small points of support. In order to get rid of the tie altogether, the expedient had been adopted of constructing a kind of counterfort. He should like to know from Mr. Barlow if he was satisfied as to what strain the girder below the level of the floor would have to bear in addition to carrying the floor. He noticed that the purlins varied in positions, some being placed nearer the extrados, and some nearer the intrados, there being three positions in all. The line that might have been drawn through those three points was suggestive of a curve, which might possibly have been found more beautiful than the extremely simple and almost barbaric beauty of the semicircle, which latter form had been adopted in the design. That form, although well suited to stone constructions, did not appear so specially suited for ironwork, which was a material which would have allowed of the use of another and more graceful form.

The Chairman (Mr. E. M. Barry, R.A.) said that in the paper it was stated that "the greatest load applied to the model was equivalent to about three times the calculated maximum of dead load which the rib will have to sustain in the building." Perhaps Mr. Barlow would kindly explain that. He understood that the model in question was about one-fourth of the full size. Was the weight applied one-fourth of what might be supposed to come upon the full-sized structure when finished?

Mr. Barlow.—No; one-sixteenth.

The Chairman said he should like to have the opinion of Mr. Barlow as to the value of models as tests of a structure. How far did the experience of engineers enable them to rely upon models as tests of strength? In the case of the Menai Bridge, designed by the late Robert Stephenson, the models tested were made, if he (the speaker) recollected aright, before the form of the structure was finally decided upon. Were engineers generally satisfied as to the general accuracy of the data derived from testing models?

Mr. Barlow, in reply, said that models would give perfectly accurate results if tested under precisely similar conditions to those in which the finished structure would be placed; but it was not always easy, or even possible, to ensure such similarity of conditions. Reference had been made to the Menai Bridge. Now, as a general principle, of course the increase of sectional area would increase with the square of the span, the weight of the structure itself went on with the cube of the span, and the deflections went on as the span. Now it required that one's head should be clear upon these three points. In the case of Mr. I'Anson's roof, where the weight of the structure itself was not a material part of the weight it had to sustain, an increase in the weight of the structure did not materially affect the span. But in the case of a very large structure, such as the Menai Bridge, one was obliged to take into consideration the weight of the structure itself. The model of the Menai Bridge was not tested under the same conditions as those of the bridge itself. The model was made of 75 ft. clear span, and in order to minimise trouble and expense, it was tested with all the weight in the middle instead of being spread all over the structure. Although

* The frightful results of such a principle as applied to ships will occur to most minds.

that was a very good test for the upper and lower members of the structure, it was not a good test for the sides, which in the structure of the tube itself were, owing to the misleading results of the test, made much too thick. In fact, there could be no doubt that the Menai Bridge was now labouring quite as much to support its sides as to carry the trains that crossed it. He said this with no disrespect to the memory of its designer, Robert Stephenson, than whom no man took more pains to make his work perfect; but the fact was that when that structure was designed engineers did not know so much about the application of iron to engineering purposes as we in the present day did. One thing perfectly clear was that no Menai tube would ever be made again.

The Chairman, in closing the discussion, congratulated the meeting on the interesting information which had been elicited from Mr. Barlow, not only upon the subject of the particular roof in question, but upon other important matters. It was to be regretted that the construction of the roof was not more fully illustrated by detail drawings, in addition to the section shown on the wall, but they had heard Mr. Barlow's expression of opinion that it would be a very successful and satisfactory work. That such would be the case would also be inferred from the fact that the structure was in the able hands of their old and esteemed friend, Mr. I'Anson. The roof was interesting to architects not only as exhibiting a somewhat novel application of iron on a large scale to an architectural work, but also as exemplifying the way in which the architect and engineer could work together, hand-in-hand. That was a matter of very great importance. The architecture of the future could scarcely fail to be modified by the scientific knowledge we now possessed of iron and other materials. It might almost be said that iron had been "discovered" as a building material within the time of the present generation. The construction of the great engineering works which had marked the present age would not have been possible without that extended application of iron to constructional purposes which had been the peculiar work of the engineers of our time. Architects had, perhaps, been a little behind-hand in the use of iron, and had been somewhat prone to stand aside and criticise what their brothers the engineers were doing. To criticise was not generally a very difficult task,—certainly it was not difficult in the case of the unartistic aspect of some engineering structures; but now that engineers had proved to the public at large the convenience of iron construction, architects were bound to avail themselves of the advantages offered by its use in their own designs. Wherever the architect and the engineer would unite their talents, the result was the more likely to be satisfactory. In the days of the Greeks, there were few constructional difficulties in the works they undertook. Going back still further, we found the works of the Egyptians exceedingly massive, yet, apart from the mere question of removing enormous blocks of stone from place to place, there was not much to be learnt from them as to construction. With the Romans, the introduction of the arch led to the use of smaller stones, while enabling wider spaces to be spanned than would have been possible with a trabeated system, and Roman architecture became in consequence, more interesting from the constructional point of view. There was very little doubt that had the Romans known as much about iron as we did they would have adopted it in their buildings, and would have taught us something of value as to its application. Passing to Mediæval times, there was the same readiness to resort to ingenuity of construction as was manifested by the Romans. Although necessarily limited as to the width of his arches, the architect of the Middle Ages was continually anxious to enlarge them, and to add to their height. We knew how such anxiety often culminated, — at Beauvais, for example,—in disaster. It could not be doubted that the architects of the Mediæval period would have ceased to restrict themselves to their comparatively small spans and often timid construction had they been masters of such a material as iron. At the present day, he thought architects were a little too apt to content themselves with looking backward to the construction of olden times, both Classic and Mediæval, without attempting to bring the resources of their art to bear on the materials placed at their disposal by modern science, and while they had been thus looking backwards, the erection of a great many important structures had passed into the hands of engineers altogether. Now, he believed that it was altogether out of the question that the art of construction should be in the hands solely of either architects or engineers. Both professions had plenty of work in their respective spheres. But it was greatly to be desired that the members of the two professions should work harmoniously together and should help each other. Engineers could aid architects in such structures of large span as had been described by Mr. I'Anson in his paper; and architects ought to be able to assist engineers in making some of their constructions agreeable to the eye, and rather more "things of beauty" than we were often accustomed to see in engineering works. In conclusion, he congratulated the meeting on having had so interesting an example of the combination of the architect and the engineer brought before it, and on the success of the Conference generally. As that was the last meeting that would be wholly identified with the Conference (the meeting to be held in the evening being partly in connexion with the Architectural Association) it was only right that thanks should be tendered to those who had assisted to make it a success by allowing the members to visit important works and buildings. The Conference had had the advantage of visits to St. Paul's Cathedral, the new Natural History Museum, and the new Law Courts, the various architects in charge of those buildings kindly placing themselves at the disposal of the visitors. Therefore he had great pleasure in moving that the thanks of the Conference be tendered to Messrs. Penrose, Waterhouse, and Street for permitting visits to be made to St. Paul's, to the Natural History Museum, and to the new Law Courts respectively; to the Duke of Westminster, the Earl of Ellesmere, and Mr. Holford for permitting visits to their picture-galleries at Grosvenor House, Bridgwater House, and Dorchester House respectively; and to Mr. Kirkaldy for arranging a visit to his testing and experimenting works in Southwark-street.

This was, of course, agreed to *nem. con.*, and the meeting came to a close.

TROY AND MYCENÆ.

At the final Conference meeting on Friday evening, the 7th inst., Mr. Bowes A. Paice, president of the Architectural Association, occupied the chair, and after some business connected with the Association had been transacted,*

Mr. T. Roger Smith read a long and interesting paper on rude Stone Monuments," to which we shall return.

Dr. J. S. Phené, F.S.A., followed with a paper on "Troy and Mycenæ," of which the following is an abstract, prepared by the author:—

The subject selected in this case was the construction of mural and architectural works by the builders of Cyclopean and other masonry in these localities. The reader regretted that by the title of the paper he was confined within geographical limits, from which he must deviate a little. Troy was passed over quickly, it being pointed out that there was little or nothing at Hissarlik to interest an architectural audience, the early masonry being (with one exception, consisting of an example of rectangular masonry of no particular character) rude stones placed without order, which Dr. Schliemann thought had been built up with mud used as mortar, but which appeared to him (the reader) to have had their interstices filled with earth by the rain and washing-in of centuries. Though near Bunarbashi, there was a tendency to pyramidal construction, similar to what he had found abundantly at and near Mycenæ, from Epidaurus as far westward as Hysiæ. The masonry of Mycenæ he divided into two classes, extremely opposite in design. "The enormous masonry of the walls, untouched by any tool, either in quarrying or construction, and the equally enormous masonry of the 'Treasuries,' wrought to perfection and highly polished, of probably the same period as the walls of the lower Acropolis." The first, or early Cyclopean work, was traced from the quarries to its position in the structures. The stone was evidently not worked by tools, and was shown to have been procured by taking advantage of certain fissures arising from natural weathering, which, by the insertion of dry wood and its subsequent saturation, would cause it to be easily detached from its bed. These fissures often approximated to the forms of the polygons found in basalt, and to this fact was attributed, not only the quaint forms of the ruder Cyclopean work, but by elaborating the suggestions of nature, the finished and often beautiful polygons of a later date, which preceded the graceful curves found in this kind of work in the base of the temple of Apollo, at Delphi and elsewhere. It was pointed out also that the ruder and earliest masonry of this sort was so similar in appearance to the natural rock on which the primitive cities were built, that although it formed their defensive works, they might be readily passed by the casual marauder, from their similarity to natural elevations; and that, on the contrary, when an imposing and threatening effect was required, natural elevations were enclosed by walls of masonry, which, rising from a level plain, as at Tiryns, gave an appearance of lofty towers and structures, which were, for a great part of their height, merely coatings to the natural rock. The architectural designs were dwelt on, and the bastion-like construction of Tiryns, though arranged with artistic engineering, was shown to be only such a coating to a rocky projection, the removal of which would have been troublesome, while it added immensely to the severe appearance of the fortress. With respect to the more artistic architecture of the Treasuries, the sculptured lions over the gateway, the decorated columns to the Treasury of Atreus, and the tombstones excavated from the sepulchres by Dr. Schliemann, it was shown that, though varying in artistic merit, the designs (principally those of the often-repeated spiral ornaments) agreed, and not only agreed with each other, but also with the gold ornaments found in the sepulchres. This, it was inferred, gave evidence of the introduction of a particular kind of foreign art workmen, as the design was not Greek.

It was first shown, in treating of the triangularly-arched galleries at Tiryns and Mycenæ, and the triangular openings above the lintels to the Treasuries and great gateway, that these, together with the battering, or inclination of the walls, and the diminishing width, towards the top, of the architraves to the entrance to the great Treasury, gave a strong evidence of Egyptian work; and that, as Strabo asserted, the builders of Tiryns came from the south coast of Asia Minor, *i.e.*, a place near to, and then in direct commercial intercourse with, Egypt, the introduction of Egyptian art was probably accounted for; and as *pyramids* were found over the whole of the Argolic district, and one of these pyramids had in it a gallery with the same triangular arch, this point seemed fairly established; but, that these constructions by Egyptian builders were subsequently decorated by men of another nation, seemed also clear. The decorations had been attached to the structures and were no part of them, and seemed of Asiatic design, and it was suggested that if the gold ornaments might be considered as having been any part of the spoil from Troy, it was probable that with them the victorious Greeks would have brought from Asia skilled workmen, who executed these decorative works for Agamemnon, and, perhaps, the stones found in the sepulchres (which are of inferior work, but similar designs) after his death, and under less strict supervision. Such workmen would probably have had a knowledge of Asiatic art generally, so that this view of the question would not be affected, even if subsequent discovery should prove these designs to have had their origin in districts from which either the Persians or Assyrians had issued. The use of the gold masks in burial pointed to a date earlier than Homer, and of course long previously to the Persian war and the battle of Platæa, or we must have found some account of it in the Greek poets. If subsequent discovery should show them to have been in use in the lands of the Assyrians or the Medes, it must have been there also a very ancient custom, at least coeval with or prior to the Trojan war.

The various quarries had been visited several times by the lecturer, who described their difference, and the modes of quarrying adopted. The huge Cyclopean blocks, procured, as he considered, from the facility afforded by natural fissures, and the usual quarrying by deep cutting, as in the coral rag beds in the Tretus Pass, from which the stones for the Agora and the sculptured slabs had been obtained. Of the former, he had found many rocky elevations east of Tiryns, literally scaled of their former weather-fissured coatings. A number of examples of progressive Cyclopean masonry were referred to as those discovered by the reader in the Island of Samothrace, and ranging from the

* Report of which will be given in our next.

most primitive unwrought stones to carefully-made polygons, examples of which were submitted by him to the learned societies of Athens. The great care in selecting suitable stones for quoins and other parts of structures upon which permanent stability depended was pointed out as always traceable, even in the rudest Cyclopean work; and to this, and the species of toothed bond formed by the jagged surfaces of the naturally angulated blocks, often laid as headers and stretchers as in modern brickwork, was to be attributed, he considered, the unaltered positions of masonry, which had remained vertical and undisturbed through many decades of centuries, though subjected to innumerable shocks of earthquakes. These walls had no buttresses, mortar, or any other than this natural bond. From this, he considered, was derived the knowledge of the tenacity caused by friction from the close-fitting joint, as shown in the tretagonal masonry of the subsequent Hellenic and Etrurian work, an example of the durability of which he had given in a short article in the *Builder* of the 4th of August last year, on the walls of Fiesole. The origin of the polygonal forms arose, it was suggested, from smoothing down the rude angulated fissured surfaces, instead of the waste of material and labour which would have been necessary to square them. The elevation of the vast blocks was described as simple and easy, the rude Cyclopean walls almost always acting as retaining walls to a natural elevation, hence an inclined plane was always at hand. That when such walls exceeded in height such natural elevation, their breadth was so great, sometimes 25 ft. in thickness, as at Tiryns, that an artificial incline of earth sufficient to raise the blocks successfully to the height required, was only necessary at any one point, as, once being raised, the blocks could be drawn along the summit of the wall itself on a rude platform or tramway of trunks of trees to the desired point. Examples of such inclined planes still existed, as was shown from photographs and descriptions by authors. The paper terminated with several quotations from Greek writers, referring to the custom of having the most honoured of their deceased leaders buried within the area of the Agora,—a custom still kept up even with us where the church or cathedral forms the centre round which the civic court, judicial hall, the market, and its occupants are collected. This was brought forward to show that the enclosure to the dolmen lately discovered by Dr. Phené in Brittany* answered the descriptions by Homer, Pausanias, and others, as much as the Agora at Mycenæ, although the form of the Brittany one was oblong, and the Greek form circular. It was pointed out that the oblong was a local peculiarity of the dolmens of the part of Brittany where the island of Aval was situated. It was also shown that the term grand or great, applied to the island adjoining Aval, was in no way authorised from its dimensions, except as being the larger portion of the island of Aval, which had evidently been divided by the sea into two parts.

Notes of the discussion on these two papers will appear in our next issue.

THE JUBILEE OF THE INSTITUTION OF CIVIL ENGINEERS.

THE *conversazione* of the President of the Institution of Civil Engineers, held on the 3rd current in the galleries of the India Museum, is worth more than a mere cursory notice. Independently of the full illustrations of the latest progress of science which are brought forward invariably on such occasions, a special interest attaches to the date of Mr. Bateman's *soirée*. It took place, within a day, on the fiftieth anniversary of the granting to "Thomas Telford, of Abingdon-street, in our city of Westminster, esquire, a Fellow of the Royal Societies of London and Edinburgh, and others of our loving subjects," of a royal charter of incorporation, given "more particularly for promoting the acquisition of that species of knowledge which constitutes the profession of a civil engineer, being the art of directing the great sources of power in nature for the use and convenience of man, as the means of production, and of traffic in states both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation, and docks, for internal intercourse and exchange, and in the construction of ports, harbours, moles, breakwaters, and lighthouses, and in the art of navigation by artificial power for the purpose of commerce, and in the construction of machinery, and in drainage of cities and towns." It is not often the case that a legal document, especially in the English language, speaks in terms at once so comprehensive and so precise. The duties of an engineer, and to some extent the future of the profession, are indicated in words which we shall, perhaps, not be wrong in attributing to the suggestion of the veteran Telford himself,—the founder of an institution which, from the modest dimensions of an evening meeting of working men, has risen to be the entertainer of crowned heads; and now enumerates nearly 3,400 members of different grades.

"The directing the great sources of power in nature for the use and convenience of man," is a noble form of words. It is worthy of the pen of Bacon. It may well remain as the title-deed of the profession, for which we should venture to propose the motto, taken from the same classical English source,—"*Nature minister et interpres.*" And yet it is impossible to read the summary of the branches of science contemplated as exhausting this direction of the sources of power in nature fifty years ago, without becoming aware of how great has been the progress of science during that busy half-century. One item is omitted in Telford's charter which was not at the time unknown, and the failure to allude to which must have been mere oversight. In speaking of the drainage of cities and towns, a matter which is, at the present time, of far more urgent necessity than was the case in 1828 (for the reason that the half-century has witnessed the increase of the population of the United Kingdom from twenty-four millions to thirty-three millions), no mention is made in Telford's charter of the no less important works of drainage which have added nearly a million of acres to the areas of Lincolnshire and of Norfolk, producing rich crops of corn from localities formerly tenanted by the heron and the wild duck. Sir John Rennie, when looking back on the noble works of that nature which he had executed,—the Eau Brink Cut, the Norfolk Estuary Cut, the Nene outfall, the Witham improvement, and the Ancholme drainage,—pointed out that it was easy yet to add three new counties to the kingdom, by reclaiming lands from the estuaries of the Humber, the Firth, the Tay, the Clyde, the Solway, Morecambe Bay, and the Mersey; to the gain of six millions sterling worth of crops added to the produce of the country. In 1831, only three years after the date of the charter of the Institution, Telford was engaged, together with Rennie, in carrying out the Nene outfall. Indeed, the vigorous old man shortened his days by his neglect to change his clothes, or to take any precaution but,—if it may so be called,—that of sitting by the fire to evaporate, after a thorough drenching at Crab Hole, near Lynn. It must, therefore, have been a mere oversight, as before remarked, that words were omitted from the charter which would have foreshadowed the execution, not only of these noble English works, but of the drainage of Lago di Fucino, of the Haarlem Lake, and of the Zuyder Zee.

But if the steady development of this branch of the application of the sources of power in nature has produced such results within the half-century, and has so much more yet in store to reward the intelligent application of labour and of capital, there are other parts of the duty of the engineer which have been altogether transformed, or even newly called into being, since the 3rd of June, 1828. "The means of traffic," rightly referred to in the charter, have undergone such a revolution during the time over which we glance, that the advance made in the whole preceding period of the history of civilisation shrinks to almost nothing in comparison. And the art of transmitting intelligence, omitted from Telford's summary, has undergone a yet more magical and incalculable development. The only advance that could be made on the speed obtainable by her Majesty's well-appointed mails, on the Holyhead, the Shrewsbury, or the Devonport roads, eked out, perhaps, by the employment of a mounted messenger to and from a post town, was the clumsy and unreliable *semaphore*. Slow in its movements, taking minutes for the transmission of a word, an open secret to all who could read the few inartificial signals, useless by night, useless in a fog, the semaphore was our only telegraph in 1828. And it is not only by the discoveries of Wheatstone and his followers that an instantaneous mode of communication, with certitude and secrecy, which puts a girdle round the earth in less than the imagined forty minutes of Shakspeare, has been placed within our reach. We are only learning the A, B, C of the wonderful alphabet of the transmission, record, and intensification of sound. Among the objects which attracted most attention in the galleries of the Indian Museum were the telephone, phonograph, phonoscope, microphone, and other instruments connected with the electrical transmission of sounds, to which Professor Bell's marvellous discovery has given rise. It has taken ninety years to develop our application of artificial power to the purposes of locomotion, from the first self-moving land-carriage, made by Joseph Cugnot, a Frenchman, in 1769, to the actual condition of our railway service. "Puffing Billy" is now sixty-five years old. Stephenson's improved Killingworth engine, the first that was put upon springs, was completed in 1815. The competition between the Novelty, the Rocket, and the Sanspareil, which was the real birth of the passenger locomotive, was on October 1, 1829; a year and four months after the royal charter was obtained for the Institution of Civil Engineers. If we compare the slow progress made by the early inventors, men of pith and power as they were, with the rapid advance that the last few months has witnessed in the development of the wholly new method of electric transmission and reproduction of sound, we may form a very exalted idea of the improvement in the use of its powers that has been communicated to the human mind. As to the future progress of science, he would be more bold than wise who should propose a limit or a measure. And perhaps the most cheering part of the whole subject is the consideration that it is not only in its possessions, but in its functions, that the scientific mind has made so fast an advance in all the appliances of science, in manipulation of metals, in micrometric precision of observation, in ready application of mathematical analysis. The engineer of to-day has a full laboratory of tools and tables where those of the time of Telford had only appliances of the rudest nature. One of our great road-makers is said to have taken the levels of the lines he selected by means of holding up his shoe full of water, to obtain a horizontal line of sight! The electric telegraph opened a new chapter in the advance of science. Although it was for the purpose of obtaining a ready record of the letters intimated by the make and break of the electric current that the dash-and-dot system was devised, the application of it is one of such simplicity that its range is almost boundless. Thus the defenders of a besieged city or fortress can communicate with their friends outside, to a long distance, by flashing a mirror in the sun, or by the employment of a torch by night,—on the plan of the Morse code. Exactly the same might have been done in the time of Archimedes. But the mind was not then sufficiently awake to avail itself of a method at once so simple and so potent. This increase in the power of the mind to avail itself of the resources placed at its disposal by nature is a greater triumph of science than even the wonderful manipulation of those resources displayed in the construction of the locomotive, or the 100-ton turret-ship.

It would be a manifest exaggeration to say that it is exclusively the Institution of Civil Engineers that has to be thanked for that mighty stride in the education of mankind. But that it has had a share, and through its members at least a very important share, in this unexampled and bloodless victory, there can be no doubt. The men to whom we owe the steam-engine; its application to locomotion by land and by sea; the demand for a corresponding improvement in the art of signalling, which produced the electric telegraph, with its audible as well as with its visible methods of use; to whom we owe the extraordinary development of projectile power, and the corresponding increase in the power of resistance, are the men contemplated by the charter of 1828 under the unpretending style of "others of our living subjects." It was the object of the alchemist to put nature to the torture; he wearied himself, and made but slow progress, after all, in the effort. It has been the task of the engineer, since the days of Galileo, and more particularly since those of Watt, to put plain and straightforward questions to nature; and never have they been put altogether in vain.

If we glance at the proceedings of the Institution of Civil Engineers during the session that has just closed, we shall be able to form a not

* See *Builder*, p. 510, *ante*.

inadequate idea of the vast field over which scientific inquiry is now ranging. On the 13th of November, 1877, a valuable contribution was made to the history of civilisation, as affected by industrial progress, in a "Review of the Progress of Steam Shipping during the last Quarter of a Century," by Mr. Alfred Nott, M. Inst. C.E., of Liverpool. On the 11th December, a description, by Mr. W. J. Doherty, Assoc. Inst. C.E., was given of the cofferdams used at Dublin, Birkenhead, and Hull. The report of the council was received on the 18th of December, when Mr. J. F. Bateman, F.R.S., succeeded Mr. G. R. Stephenson in the chair. Mr. Bateman's inaugural address was delivered on the 15th of January, 1878. It alluded to the growth of the Institution, to the increase of railways, quarries, mines, iron-works, and canals, in the United Kingdom; to the education of the engineer both at home and abroad; to the telephone, which was not at that date described as accompanied by the three other instruments above referred to; and to the meteorological and geological conditions affecting the floods and river outfalls of England. On the 22nd of January the subject of recent improvements in dynamo-electric apparatus, a subject where the engineer joins hands with the chemist, was treated of by Dr. Higgs, Assoc. Inst. C.E., and Mr. Brittle, Assoc. Inst. C.E. Siemen's dynamo-electric machine and electric lamp were next described. The comparative cost of gas and electricity as a source of light was discussed; and the employment of the currents of magneto-electric machines for electrotyping and electroplating was stated to have long superseded the use of the voltaic current.

The evaporative power of locomotive boilers and the action of the blast-pipe formed the subject of a communication from Mr. J. A. Longridge, M. Inst. C.E., on the 12th of February; "Liquid Fuels" were discussed by Mr. H. Aydon on the 26th of February; on March 5th, the paper read was "On the Hooghly Floating Bridge," by Mr. B. Leslie, M. Inst. C.E.; "Railway Appliances at the Philadelphia Exhibition of 1876" were described by Major Douglas Galton, C.B., F.R.S., on the 12th of March. The striking fact gathered by the author from the Exhibition of Railway Cars at Philadelphia was, that while the comfort of railway travelling has been practically stationary in Europe for the last twenty-five years (he might have added "or retrograde," if he had recently travelled in a second-class carriage of the South-Eastern Railway Company) it had been rapidly developed in the United States to a standard above that of Europe.

On the 26th of March Mr. H. Davey, Assoc. Inst. C.E., contributed a paper on "Direct-acting, or Non-rotative Engines and Pumps." The Huelva Pier of the Rio Tinto Railway was described by Mr. Grosar, Assoc. Inst. C.E., on the 2nd of April. Mr. Ed. Bazalgette, Assoc. Inst. C.E., gave a paper on "The Embankments of the River Thames," on the 9th of April. Three bridges on the Punjab Northern State Railway were described by three different authors on the 30th of April. "The Construction of Steam Boilers adapted for very High Pressures" was brought forward by Mr. J. F. Stannery on the 7th of May. "The Design generally of Iron Bridges of very large Spans for Railway Traffic," by Mr. T. C. Clarke, M. Inst. C.E., of Philadelphia, formed the subject of discussion on the two concluding evenings of the session.

It is not only by the preparation and discussion of papers by members of their own body that the Civil Engineers have advanced the objects contemplated by the charter of incorporation during the past year; their admirably-constructed theatre has been freely lent for the proceedings of the Mechanical Engineers, and other scientific gatherings. Of the annual meeting of the Mechanical Engineers we gave a report at the time. The reflection can hardly fail to suggest itself to the mind that the division of the subjects of discussion was hardly in accordance with the special titles of the separate bodies. The appliances for raising sunken vessels, which were described in most instructive detail at the Mechanical meeting, form an integral part of civil engineering. The same may be said of the construction of docks, and the relative cost of the light and heavy traffic on railways; the discussion of which attracted so much attention on the 11th and 12th of April last. It may be permitted to hope that the juxtaposition into which two such eminently practical and useful associations as the Civil and Mechanical Engineers are thus drawn, by the courtesy of the council of the former, and the enlightened and active exertions of the two able secretaries, to whom the two institutions owe so much, may lead to some organic arrangement, which may spare valuable time, and give each body a yet higher status by association with its fellow.

There is no doubt that the engineers of the United Kingdom, a vast body of men under all the branches, — civil, mechanical, naval, telegraphic, and operative (or, as they call themselves, amalgamated)—of the profession would take a far higher position, both as public bodies and as individuals, than is actually the case, if they could overcome the old-fashioned English dislike to organisation. In all other civilised countries organisation regulates the position of the engineer to his great and manifest advantage. It would have been scarcely possible for that great misfortune to the country as well as to the profession,—the overloading the railway share-market by the construction of so many "contractors' lines,"—to have occurred, had the profession been properly organised. Engineers would then have shunned to take the position of the servants of contractors,—an abandonment of the original modest pride of such men as Robert Stephenson and his immediate pupils which has been attended with disastrous results. No engineer would, in that case, have lain under the stigma, whether deserved or otherwise, of having taken large commissions or large presents from his contractors. Charges of that nature, if actually published, would have been investigated by any court or tribunal that represented the profession, and either the stigma would have been removed, or the subject of it, if it proved to be deserved, would have been rendered incapable of a repetition of the offence. By raising the tone of the profession the confidence of the public would be secured, and in lieu of the large sums of English money which have evaporated in foreign loans, we might have had the full employment of a large body of men, who would have struck new fountains of wealth, and by works of drainage, of irrigation, and of reclamation, added largely, not only to the produce, but to the actual solid acreage of the United Kindom.

The example recently given, in the discussion of an engineering subject in another theatre, of the advantage of proceeding by definite resolutions, and of thus not only publishing opinions, but adding to the dominions of positive science, might, no doubt, be advantageously followed by the different sections of the great body of engineers. The junior chamber, so to speak,—we mean the mechanical engineers,—have also set a very excellent example to their elder brethren by the freedom with which the debates are open, not only to the reporters of the press, but to intelligent visitors, who are anxious to take a part therein. Something of the nature of organisation can hardly fail to ensue if it come to be considered that any explanation or discussion which is not followed by a division, or, at least, by a vote, is to a great extent a lost sitting.

Above all, the Institution of Civil Engineers would at the present time but increase its claims on the respect and admiration of the public, by giving careful attention to those expressions of its charter which refer to traffic both for internal and external trade,—especially with reference to internal navigation. The examples of France and of Belgium cannot be too distinctly held up before the eyes of the English public. In France the development of inland navigation has gone on side by side with that of railways, to the great enrichment of the country as well as of the railway shareholders, ten per cent. dividends accompanying the concurrence of canals. In Belgium, where the tariffs have been lowered on the railways of the State, and every measure has been adopted (as has been the case in certain parts of England) to strangle the canal traffic, practical bankruptcy is the result. The statistics of the mineral trunk and non-mineral trunk lines in England point in the same direction. On the other hand, the important discoveries made by no less hard-headed a man than Fairbairn, in 1831, remain where he left them. So late as 1853 Sir W. Fairbairn recalls the fact that "although at speeds of from five to eight miles per hour the resistance to vessels drawn through narrow channels increased more rapidly than the squares of the speed; at from eight to fourteen miles,—when the vessel rose to the surface and *skimmed* upon the water,—the force of the resistance was so greatly diminished as to reduce the obstruction to the vessel's progress continually under that ratio." When we see, not only the practice in France, but the 18 per cent. dividends of such undertakings as the Leeds and Liverpool Canal, we cannot but suggest that this question of internal navigation,—a mode of communication to which we owed so great a part of our material progress before 1829,—is one to which the attention of the Institution of Civil Engineers may be called with admirable results in the session of 1878-1879.

MURAL DECORATION:

ARCHITECTS AND PAINTERS.

THE question of the relative position of architect and painter, in regard to the pictorial decoration of buildings, has always been rather a vexed one, and received some consideration and discussion in connexion with Mr. Armitage's paper at the opening meeting of the Conference on Monday week. The result of the discussion (printed in the *Builder* of last week) was rather odd in some respects. Mr. Armitage, as will be seen by our report of his paper, gave as one of the reasons for failure in the attempt to combine mural decoration with architecture the frequent want of proper understanding between the architect and the painter, intimating pretty clearly that the architect generally did not give sufficient consideration beforehand to the requirements of the painter as to lighting and wall-space, and admitting at the same time that the painter was commonly somewhat too desirous of exercising his own individual pleasure and judgment irrespective of the general scheme of the architect. This we take to be very much the truth in the main. But the tone of the discussion was mostly quite the other way: and certainly it was refreshing to find architects professing their entire humility and subordination to the superior genius of the painter, and painters gracefully admitting that the architect was necessarily the presiding genius in all association of architecture with the other arts. It would be still more refreshing, no doubt, if we found these two principles more frequently acted upon in practice. We say advisedly, the two principles, for they are both correct, and not contradictory, if rightly regarded.

The position laid down by Mr. Aitchison, who contributed one of the two really practical and pointed speeches to the discussion of the subject, that architecture was an entirely subordinate art in its interest to that of painting,—that wherever the representation of the human figure and human life was concerned, there the artistic interest was highest,—is undoubtedly true. In spite of the platitudes, many and grievous, which have been uttered by architects and architectural writers, extolling architecture as the parent of all the arts, and so forth, it must be obvious that the highest conceptions of human genius and human feeling cannot be displayed in walls and towers and window tracery, in plan and "skyline." It is a foolish and mischievous criticism which asserts the contrary. Architecture has, however, very large interests apart from its artistic side, in its connexion with the history of the past and the habits and needs of the present, in the number of practical and scientific problems interwoven with it, and in the important influence which it has upon the aspect of great cities and on the general beauty or ugliness of the framework of our daily life. And it was, perhaps, a pity that Mr. Aitchison did not touch upon this side of the interest of architecture (which he would not be likely to forget or overlook), instead of rather chilling the sympathies of his audience by so pitilessly handing down architecture to "the lowest room" with no extenuating circumstances. Still it is sometimes well to have one side of a subject put in an uncompromising manner; it is more likely to lead people to think, or at least to strike their attention, than a more cautious expression would be. The other side, however, of Mr. Aitchison's view of the matter is this: that while architecture cannot alone compete with sculpture and painting, and while any addition of decorative painting to architecture is the addition of a new and higher interest such as the architect alone cannot hope to excite, there does rest with the architect the very responsible and important task, too often neglected, of forming or planning the whole architectural and decorative scheme from the commencement, and indicating the general idea, the details of which the painter is to carry out to their perfection. To put it more plainly, what we mean is this: that where it is intended that a building should be ultimately decorated

with mural painting, the whole scheme should be conceived from the first, and the architectural details should harmonise with and, where possible, be suggestive of the pictorial subjects which are to form the crown of the whole. And it appears to us that it is directly the province of the architect rather than of the painter to conceive or invent the idea of the whole result, though he cannot carry it out himself; to say that here there shall be a series of paintings illustrating such a subject in connexion with the objects or associations of the building; there we shall have a sculptured frieze suggesting a comment on the main purport of the illustrations; and so on. He ought, if possible, to know what painters and sculptors will undertake the work, before the building is commenced; to consult with them as to the space, the lighting, the number of compartments required; to ascertain what their method of treatment would be, and (if it appears necessary) to accommodate or modify his architectural scheme to enable them the better to work with him. But with these limitations we do think that the architect may fairly lay claim to be the initiating mind of the whole scheme of combined architectural and mural decoration, however humbly he may think of his own art in detail in comparison with that of the painter.

Mr. Street would have gone further than this, and seemed rather inclined to claim for the architect the right to drill the painter into proper obedience in regard to the style and treatment of decorative pictures. He was so far in keeping with the general feeling of the meeting in regard to the painters, that he conceived it was their business to say what subjects could or could not be treated in particular portions of a building,—in fact, to give the idea of the whole thing. But the painter having given the idea, he would then subject him somewhat to architectural leading-strings, and refuse to have anything to do with him unless he would paint in the proper style for architectural decoration. The justice of this, of course, depends very much on what we consider to be the real requirements of mural decoration. That it is not to be pictorial in the ordinary sense,—not to make any attempt at "chiaroscuro" (it was quite pleasant to hear this old-fashioned piece of artistic "slang" brought out again!), everybody is pretty well agreed, and Mr. Armitage did not omit to urge this in his paper. But Mr. Street's comments really led to the conclusion that the only good or desirable wall-painting was that which was conceived in a Mediæval spirit. The list of painters whom he named as having executed successful works in mural decoration must have amused those who know anything of art politics and parties in London, so completely did it infer that in one school alone was any good to be found. We do not think new life and interest will be given to modern architecture by the addition of Mr. Spencer Stanhope's eccentricities to the walls of our buildings, at all events, whatever may be said for one or two stronger though very abnormal and artificial painters who were named. What is mainly wanted in mural decoration is a generally good effect of colour (unless this is obtained from other sources of decoration), and fine but not too elaborate or realistic form. We have before pointed out that in regard to general style a remarkably fine and suitable precedent is to be found in the outline designs of Flaxman, which possess all the qualities requisite in modern mural decoration (colour, of course, excepted); which are Classic in style without being merely imitative in sentiment, presenting, in fact, modern feeling in the language of Greek art; and which represent the *juste milieu* between realism on the one hand and formal stiffness and severity on the other hand. This *juste milieu* is what is required in such designs; a sufficient freedom and power of drawing to satisfy the requirements of modern criticism, which refuses to be fed on Mediævalisms; a sufficient severity of style to harmonise with architectural design and with the monumental character we demand from pictorial designs executed in imperishable material, and forming part of a permanent structure. Mural paintings based on such a style as that of Flaxman would harmonise equally with either a Greek or a Gothic building, if the building were good in itself. To invent Mediæval painting to suit a Mediæval style of building is simply to make a dead art instead of a living one.

The importance of the practical point brought forward by Mr. Street in regard to the difficulty of getting the highest class of art applied to small buildings in out-of-the-way places (where above all it is, perhaps, desirable) will be readily perceived; and the suggestion that a kind of work should be adopted capable of being executed in the artist's studio in town, and reproduced or set up elsewhere independently of his personal assistance, although not new, is well worth consideration.* In one of the speaker's conclusions on Mr. Armitage's paper there is, however, a fallacy. He objected entirely to the idea that mural paintings were injured by juxtaposition with stained glass, and instanced buildings where there were frescoes in conjunction with strongly-coloured stained glass; but in pointing out the reason for the success, the employment of very low tones in the frescoes, so as to suggest no competition with the windows, he practically confirmed Mr. Armitage's remark. It merely comes to this,—that it is impossible to employ reflected colour and transmitted colour on equal terms in the same decorative scheme. If there is decided colour in the windows, the wall-paintings cannot possibly compete with it; they must occupy a subordinate position; and a painter who is at all dependent on the colour-design of his mural paintings of course feels this, and feels that his art is thrown away in such a position. Mosaic is the only wall-decoration that can stand against stained glass; and even then we opine that one or the other must lead in regard to colour; they can hardly blend; the two methods of lighting the colour cause it to affect the eye so differently.

It is matter for congratulation that the new class of Honorary Associates of the Institute seem inclined to render their adherence to its ranks something more than nominal, and we hope others will follow the agreeable precedent thus set by Mr. Armitage, whose paper was one peculiarly fitted to bring architects and painters together on common ground, since it dealt with the subject from an eminently practical and not from a merely artistic point of view. It is, perhaps, characteristic of this practical tendency of the paper and the discussion, that we had none of the usual enthusiastic prophecies which turn up so often when mural painting is mentioned, as if the adoption of that method of art-production was sufficient in itself at once to insure a revival of artistic power and genius equal to what existed in the greatest age of the art of painting,—as if the mere painting in one medium instead of another would create genius and give great ideas and a great style to those previously destitute of such gifts. It is well to be hopeful, and we have no doubt, and have always asserted, that a more extended adoption of mural painting would do at least this,—it would raise and foster a more extended public interest in art, and desire for artistic illustration, than is now the case, when pictures are confined to special galleries entered by only a small section of the people. But there is no conclusion to be necessarily drawn that this state of feeling would produce great (or greater) artists, unless indirectly by fostering a greater demand for good art, which would lead more men of intellect to turn their attention to it. If, indeed, mural painting were to be practised under the feeling advocated by Mr. Street, that the painter should be checked from "revelling too much in the modern power of drawing," the result would be to give a retrograde rather than a progressive movement to the painters' art. The painters might very well reply that it was part of their mission to prevent the architect from revelling too much in mere antiquarianism and the affectation of stiff and semi-barbaric style, the danger which seems always to beset mural painters as well as designers of stained-glass windows. And again we say, as an antidote to this, turn to such art as Flaxman's, and take that as a *point de départ*, working out further the combination which he suggested of Greek artistic feeling with modern sentiment, and there will be far more chance of doing something that will have life and interest in it for modern times than by going back to Constantinople and Ravenna, to an art combining imperfect execution with superstitious sentiment.

London Bridge.—The Corporation Bill, seeking powers to widen London Bridge, at the cost of 75,000*l.*, has been withdrawn.

* Here, again, we observe that the suggestion as to having designs mainly in outline, which are more easily capable of repetition or reproduction by another hand than colour designs, points to just the style of production which Flaxman practised with such beautiful results.

SANITATION AT THE PARIS EXHIBITION.

In the great concourse of human industry and invention now evoking the attention of all Europe, sanitary science holds here and there a prominent place, though it has been strangely neglected in some sections. We cannot at present pretend to do more than merely introduce the subject, for many of the most important constructions are not yet completed; notably the new system of cottage hospitals, extensively adopted in the French army, and which are built solely for the purpose of realising practically the newest discoveries in hygiene. Again, it was only on Friday, the 31st ult., that the annexe devoted to anthropology was opened, and on Sunday the workmen's exhibition was inaugurated. In both of these there are many things of special interest from an architectural, artistic, and sanitary point of view. The former embraces all vital statistics, and possesses a rich collection of tables demonstrating the connexion between meteorological changes and the fluctuation in the rate of mortality in different districts and countries. This and general climatic influences, and the nature of the soil, should be taken into consideration in the construction of houses and the selection of dwellings; and might explain away many a complaint unjustly levied against the architect, the builder, or the engineer. Without discussing all the grave problems propounded in this section of the Exhibition, it may be remarked, in passing, that the chief result will be the revelation that Portugal possesses arrow-points, ornamental stones, &c., perhaps in a greater profusion and, in any case, as handsomely worked and as well preserved as those which anthropologists have discovered in Ireland. Further, it will be seen by some admirable specimens to what extent the art of carving bone was practised at the epoch of the glaciers, and that the polished stone period varied very considerably, not only in different countries, but in different districts.

Quitting these traces of pre-historic industry to investigate the work of our day, we cannot say that the Exhibition afforded us unmixed pleasure. In group 3, class 20, we found, for instance, some French hardware that did not betoken any more knowledge on sanitary matters than the relics of the age of bronze exposed in the Anthropological Museum. There were tesselated stoves which had nothing new about them and could not help to solve the vexed question of the ventilation they so gravely impair. The Armentières potteries display drain-pipes that are about as common and as inefficacious as it is possible to imagine. They are totally innocent of any attempt to check the ascending tendency of sewer gas, and there is no sign of any sort of communication with a ventilating-shaft. It is difficult to conceive why these things were exhibited at all. The manufactures from the departments of the Oise and the Herault are not preferable; and the Haute Loire presents the public with old-fashioned and discarded filters such as were used in the time of Louis Philippe. The hardware cooking utensils, saucepans, frying-pans, coffee-pots, &c., were more interesting; and, in these days of gas stoves, might in many instances be used with advantage in English kitchens. These objects are all exhibited in an annexe situated between the main building and the École Militaire.

Close at hand there is a charming Russian house, where Jablockkoff's process of lighting by electricity is to be exhibited. The best exhibition, however, of this process is that given every evening in the streets of Paris. Certainly the Rue de l'Opéra, the Place de l'Opéra, the Corps Législatif, and the Arc de Triomphe, illuminated by electricity, are among the most marvellous and beautiful sights Paris has to offer to its visitors. The vivid and yet pale moonlight glow of the burning carbon produces a fairy-like effect which is most difficult to reconcile with everyday life. This new method of illuminating involves a sanitary question of great importance. The injurious emanations of gas, its rapid consumption of the oxygen we should breathe, renders it in many circumstances highly injurious to health. The difficulty of supplying a theatre with sufficient pure air is greatly increased by the extensive consumption of gas within its walls. Dr. Angus Smith calculates that the burning of two candles produces as much carbonic acid as the breathing of one man. But what will be the result of



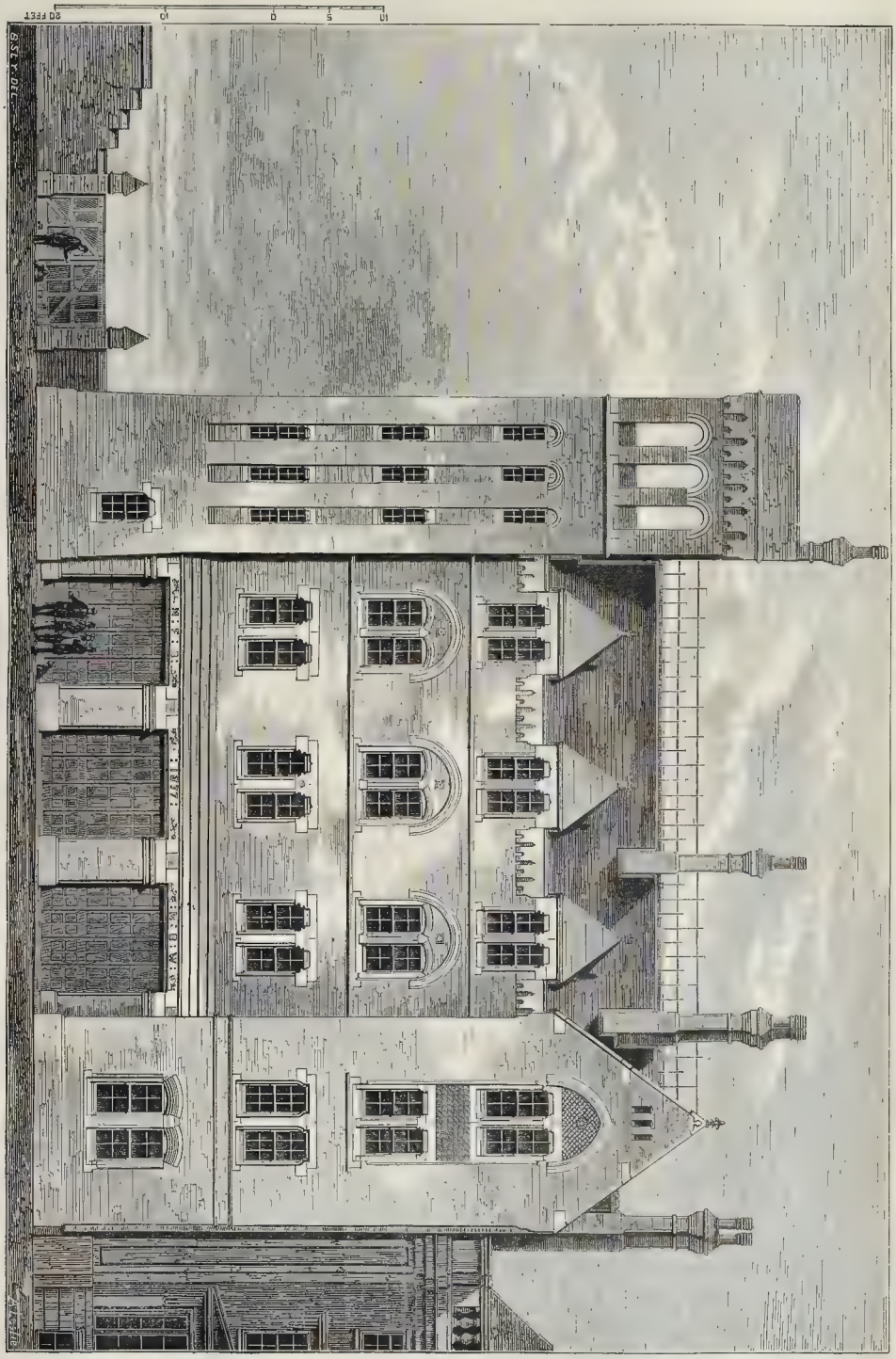
THE PARIS EXHIBITION: THE SÈVRES STAND IN THE EXHIBITION BUILDING, CHAMP DE MARS.

the illumination of public buildings, theatres, &c., by electricity? We regret to say that, in answer to inquiries, it was stated that no experiments have been made for the purpose of elucidating this important phase of the question, and the Société Générale d'Électricité would do well to take it into consideration. There is no doubt that electricity will offer many advantages over gas from the hygienic point of view. The Russian pavilion, where this method will be explained, is also remarkable for its decorations in pure Russian style. The only difference is that the wood-carving is merely varnished and not painted in the gaudy colours which find so much favour in Russia. This structure is so remarkable that nearly every day a new purchaser presents himself. The design of the wood fretwork is the same as that found ornamenting the petticoats and the household linen, of the peasantry, and the silk embroidery of the wealthier classes.

Continuing our way round the outskirts of the buildings, we passed many other constructions of equal interest, and found in the Dutch agricultural annexe a curious model of a farm made by the pupils of the École des Métiers de Cromingue. From a wall, 5 ft. high, a gigantic roof, reaching to an elevation of perhaps 30 ft., covers the principal building. On one side, under this broad shelter, are carts, sledges, agricultural implements, and pig or sheep styes; on the other the stabling, and over it the hay-lofts. At the end of this barn-like structure, and opening into it by a door, is the farmer's house, in which two of the bed-rooms are devoid of fireplaces, and are abominally ventilated. The constructors of this farm have still much to learn before nearing the ideal.

The Belgian annexe comes next, and this is indeed a remarkable exhibition, where many hours of useful study might be spent. All that relates to education and the construction of schools will be found here; and we must return to this annexe before we can do it full justice. Here will be seen a model of a class-room of M. le Belot's celebrated school. The walls are surrounded by mottoes, proclaiming his principles of education; and further the managing committee invites all inventors to send models that may serve for the practical education of the pupils. The committee organises geographical excursions; it has a large collection of specimens for teaching all the natural sciences, &c. Efforts are made to develope physical strength simultaneously with the acquisition of learning; and we are told that,—"This school is secular, believing that the father should direct the religious instruction of his child. The schoolmaster should only inculcate the spirit of tolerance and the sentiment of respect for all sincere convictions." The education given is of a purely practical description, and we need scarcely remark that sanitary matters are not neglected. There are drawings illustrating the artificial means of ventilation employed to keep the air of the class-rooms pure; a shaft and furnace have been built expressly for this purpose. Apart from the lessons given within the walls, innumerable excursions are organised for the same purpose. Thus we have before us an account given of the examination by the pupils of the canalisation of the Senne and the Brussels sewers. On other occasions the pupils were taken to visit the docks at Antwerp; or to examine large printing-works and a paper-mill. Woollen factories, breweries, quarries, brickfields, the potteries, etc., have all formed the subject of these educational excursions; and it will be readily understood how this form of instruction must interest young pupils, and tend to develope any latent faculty which might otherwise have remained dormant within the dull precincts of the old-fashioned schoolroom.

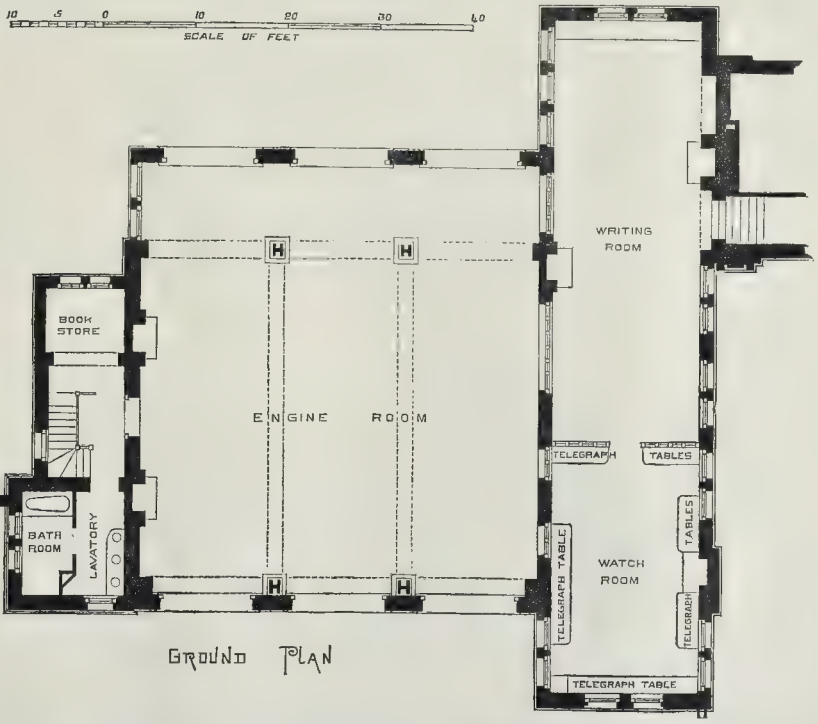
We add to the illustrations of the International Exhibition, which early appeared in our pages, a view of the building erected in the vestibule for the display of the works contributed from Sèvres, which is certainly superior to many of the other architectural *pièces de circonstance* which are profusely scattered about. We have other illustrations in progress.



NEW CENTRAL FIRE BRIGADE STATION, SOUTHWARK BRIDGE ROAD.—MR. GEORGE VULLIAMY, ARCHITECT.



FIRST FLOOR PLAN



GROUND PLAN

CENTRAL FIRE BRIGADE STATION, SOUTHWARK BRIDGE ROAD.

NEW CENTRAL FIRE BRIGADE STATION.

THE Central Fire Brigade Station has been opened, and we give an elevation of the new part and plans of two floors. It stands on the site of Winchester House, Southwark Bridge-road, and is the largest fire station in the metropolis, the ground being 1¼ acre in extent. Winchester House, as it originally stood, set back from the road, formed three sides of a quadrangle. What has been done principally in the way of new building is that a block has been added to each of the wings. This new addition on the front line represents the engine station, writing room, and watch room on the ground floor, which is capable of containing the largest engines, and the three stories above are intended as quarters for some of the men and the officers. There is a watch-tower 78 ft. high springing out of this block, with communication from the top of the watch-room by a speaking-tube. Up aloft on this tower, and commanding a good view in every direction, a watch will be kept, so that a fire illumination anywhere will itself be an alarm that will put everything in order for turning out when the exact intelligence comes. The front portion of Winchester House is devoted to the use of Captain Shaw, the frontage to the road, where the garden was, being used as a fire-escape yard, and the other two sides of the edifice, looking into the quadrangle, are for more quarters for the men, and the basements for education, bath, and washing-rooms and hose-shops. This quadrangular courtyard, a broad, open space, will be used for the purpose of exercising the men, especially in fire-escape practice. There is a dummy front of a house on one side, with window-like apertures at the top opening on to the roof. The roofs are so arranged with a level platform that the men can practise running about at a considerable height. The other block added contains stabling accommodation for the horses, so that the stables are immediately opposite the engine-station, and no time will be lost in getting the horses "put-to." At the rear of all these are a large smithy, workshops, and storerooms, while there are several outbuildings, including a long fire-escape shed. The buildings are of brick, dressed with stone. The alterations and additions have all been effected within twelve months, the contractors being Messrs. Hook & Oldrey, of Kensal New Town, and the architect is Mr. G. Vulliamy, assisted by Mr. Mott. The ground, with the buildings upon it, cost the Metropolitan Board of Works 35,000*l.*, which was increased to about 38,000*l.* by the purchase of certain leaseholds and trade interests. The cost of the buildings is 32,000*l.*, making the total about 70,000*l.* There is accommodation for 52 firemen (28 married and 24 single), 14 horses, 16 engines, and 20 fire-escapes.

As already mentioned, our illustrations relate only to the new portion, the engine station.

THE LETTING OF DRURY-LANE THEATRE.

As Mr. Chatterton's lease of Drury-lane Theatre will terminate about midsummer, the directors have publicly invited tenders for a new lease of the establishment, for a term, as is understood, of five years, and it is stated that there are several applicants in the field, rumour giving it out that, amongst the tenders sent in, more than one is on the part of certain members of the aristocracy. Mr. Chatterton, it is said, is desirous of again becoming the lessee, and, along with others, it is known that he has made an offer for a renewal of the lease. We understand, however, that it is by no means certain that it will be accepted, as the directors are said to have resolved upon letting the house to the highest bidder, provided other conditions and references are satisfactory. We believe that, whoever may become the lessee will have to incur a considerable outlay in structural alterations and improvements, one of the stipulations in the new lease being that the lessee is to expend about 1,200*l.* on a new stage, and also to redecorate the house both externally and internally. Mr. Chatterton is said to have made an offer to bear a moiety of the cost of these improvements and works. The time for sending in tenders for a lease of the building expires to-day.

Hastings Baths.—The whole of the iron-work for this building, of which we gave illustrations in our last, was supplied by Messrs. Matthew Shaw & Co.

MR. KIRKALDY'S TESTING MACHINE AT WORK.

THE testing-machine in Southwark-street is an old story now; but so much interest was excited in it on the occasion of the visit to it, on Friday last week, of a number of architects attending the Conference, that it may be opportune to say a little about the machine and its work, especially because, owing to the crowded state of the room on the occasion, and the brief explanation, necessarily inaudible to some of the party, we suspect that all who saw the operations of the morning did not quite "grip" the leading principle of action of the machine; and to readers who have never seen it a brief description of it, and of what was observed generally on that occasion, may be interesting.

On entering the testing-room at the back of the office, a room about 40 ft. to 45 ft. long, what we see is this, as well as it can be described without diagrams:—Down the centre of the room runs a ponderous iron erection, we may call it, consisting of a massive bed-plate 3 ft. or 4 ft. wide, and running great part of the length of the room, terminating at either end in a solid iron casting or frame rising about 5 ft. from either side of the bed-frame. Extending from one end to the other of this framework we see three pairs of mighty cylindrical steel rods, varying from about 9 in. to 6 in. in diameter, three on each side, leaving a clear space along the middle. Of these the uppermost and thickest pair are fixed, and are merely for connecting the castings at either end, and forming a great rail tying the whole together. If now we go to the farther end of the machine we find that, beyond the end of it, there is the horizontal cylinder of a hydraulic ram, having the solid casting for its base of operations, acting with its back to the end of the main framework, and thrusting its piston outward at the further end. The piston thrusts against a massive iron crosshead travelling on wheels laid on rails at either side the length of the piston-stroke, which is 3 ft. or 4 ft., though in practice the piston is seldom required to move more than a fraction of an inch in one experiment. To this cross-head are attached the second set of cylindrical rods, which we will call the tension-rods, and which we see running back on each side of the machine below, and a little within the line of the main constructional rods first mentioned. For the greater part of their length the tension-rods are tapped with a screw thread, and they run through a very heavy transverse travelling-frame of solid iron, which, by means of large cog-wheels acting on the screw, can be moved backwards and forwards to different positions on the tension-rods so as to adjust itself to the length of the object to be operated upon. Of the third pair of rods we will speak just now. This transverse travelling-frame is what immediately acts, in most cases, upon the material to be tested. Between the travelling-frame and the ram end of the machine we see, on the bed-frame and between the tension-rods, a smaller transverse casting facing the travelling-frame, and apparently fixed; for the present we will consider it as fixed, and call it the thrusting-bed. Now suppose it is desired to subject something to compression or thrusting strain, say a piece of timber 5 ft. in length: the travelling-frame is adjusted by means of the screw on the tension-rods, till there is just 5 ft. between it and the thrusting-bed; the piece of timber to be tested is then dropped into its place with its two ends resting in seats in the travelling-frame and the thrusting-bed, and lying parallel with the length of the machine; the water is then pumped into the ram, which imperceptibly but irresistibly draws the travelling-frame, by means of the tension-rods, towards the thrusting-bed, compressing the timber lengthways between the two surfaces. If, however, it is desired to subject something, a bar of iron for instance, to a *tension* strain, the object to be operated is put in on the other side of the travelling frame, furthest from the ram, and is attached to the travelling-frame, and its other end anchored firmly in the solid casting at the end of the machine. When the ram is put in action the tension-rods pull on the traveller as before, and the traveller in its turn pulls on the object to be tested. Thus the same motion of the same hydraulic ram does both tension and compression: if the object is to be tested by compression, it is put in *between* the traveller and the ram and crushed by being pulled up against the thrusting-bed; if it is to be tested by tension it is put in on the further side of the traveller from the ram, and attached to it, and when the ram moves it is drawn out and torn asunder. The advantage of this consists not only in making one ram do for both kinds of trial, but in using the tension-rods, the part on which the heaviest work comes, always in tension, in the strongest way for the material. The only portions of the machine which are in compression in either case are the piston of the ram and the heavy fixed cylindrical rods connecting the two ends of the frame, and which distribute the recoil force of the ram over the whole machine.

But while there is all this provision for the application of tremendous force in testing, what is the provision for measuring and registering the force applied? That is the most important and the most beautiful point in the machine, wherein its most peculiar speciality consists; for the means of mensuration of the strain applied is intimately connected with the method of applying the strain, of which, indeed, it forms a part. In examining the means of registering the strain, we now come to the use of the third and lowest pair of great circular rods which we described as traversing the length of the machine in parallel lines. These rods are connected with the piece which we have called the thrusting-bed, against which the end of the material subjected to thrusting strain impinges. And this thrusting-bed, though we were considering it, *pro tem.* as a fixed point, is in reality not so. When thrust against in the course of testing, it is retained in its place by the lowest pair of parallel rods above mentioned, which are then in a state of violent tension. These rods pull on the heel of a ponderous horizontal iron lever placed at right angles to the main frame of the machine, and turning upon a fulcrum close to the line of the pull, leaving a long leverage on the other side of the centre, so that the pull upon it near the fulcrum is greatly multiplied at the further end of the lever. This further end in its turn pulls (again at right angles) on two lighter steel rods, which lastly pull on the heel of a steelyard rising and falling between them, and provided with sliding weights and a graduated scale on the usual principle. When, therefore, a piece of timber, for instance, is tested by thrusting strain, the thrusting-bed against which it impinges pulls, by means of its connecting-rods, on the heel of the horizontal lever, the lever (through its steel connecting-rods) pulls on the heel of the steelyard, the strain being thus conveyed round two right angles, and the ultimate result is to raise the tip of the steelyard. The sliding weight on the latter is then moved forward, till it brings the steelyard level again, the hydraulic pressure is increased till the steelyard is again raised, when the sliding weight is moved further on, till the point is reached at which the specimen under test crushes, when (if the crush is sudden) the steelyard immediately drops through the sudden relaxing of the pull being felt all round through the various connexions. The strain that has been reached is read off by the man at the steelyard with each shift of the sliding weight. When a specimen is to be tested for tensile strain, the difference is merely that the pull is made direct upon the heel of the horizontal iron lever, without troubling the thrusting-bed and its connecting-rods.

The peculiar advantage of this method of applying strain is that the strain is made not against a dead resistance, but against a system of levers which have a certain *give* in them, so that any sudden jar or shock which would vitiate the fairness of the test is avoided. The elasticity of the material tested is allowed its full operation, and when a material possessing elasticity is under test, the steelyard is seen vibrating up and down with every vibration of the material under test, which renders the strain momentarily greater or less. But another important advantage is that the possibility of error in the results is nearly eliminated. Every one who has been called upon to watch tests by the light of the ordinary pressure-gauge of a hydraulic ram must have been troubled with scepticism as to the reliability of this way of getting at the results,—a scepticism perfectly reasonable when we consider that so ordinary a complaint as rust in the piston or matrix of the hydraulic ram would make a material difference in the pressure registered on the gauge, so that a testing ram in such a condition would always be registering in favour of the material tested. But in Mr. Kirkaldy's machine the measure of the test is the raising of a certain weight which can never alter and can

always be measured with certainty; any clogging in the action of the hydraulic ram has no effect whatever on the pressure or the register of it, and the only possible element of error is in friction at the fulcrums of the levers through which the pressure passes to the steelyard. The possibility of this is reduced to a minimum by causing all the centres to bear upon "knife-edges" of steel, so that until these get appreciably blunted by use the friction on centres is practically hardly worth taking account of. This reliability of the result was obviously not appreciated by all those present on the occasion we are referring to, as one gentleman asked rather pointedly about the effect of variations of temperature on the results, from the expansion or contraction of so long a series of metal connexions; a matter which has absolutely nothing to do with the result, any more than it has with the correctness of a pair of scales. The machine is, in fact, a scale in which pressure is *weighed*, and the friction on centres is the only vitiating influence, and that, as we have seen, is reduced to an inappreciable element.

One or two other details in the working of the machine may be mentioned here. When it is desired to test something requiring a lower pressure than any which the steelyard registers, the steelyard is counter-balanced; it has a second arm on the opposite side of its fulcrum, which can be weighted so as to cancel a certain amount of the weight registered on the steelyard scale. On the other hand, if an extra heavy pressure is required, the tip of the steelyard can be immediately and readily connected with the heel of a second steelyard working above it in the same plane, but hung the reverse way, by which the pressure is at once multiplied in a great ratio. There is also a special provision for registering the compression or tension of the object under each stage of pressure. The person overlooking the test sits on a bench placed across the trough of the machine between the parallel rods, immediately overlooking the specimen, while close under his eye is a circular horizontal dial-plate, with an indicator working on it, like the finger of a clock, which is connected with the moving part of the machine so as to indicate any variation in the length of the specimen by a circular movement of the finger on the dial; the motion being greatly multiplied on the outer edge of the dial, where the graduated scale is, so that even a movement of $\frac{1}{1000}$ of an inch can be read on the dial-plate by the eye. As the man at the steelyard reads off each increase of pressure, the head operator notes down the tension or compression on the dial,—so much compression at a pressure of so much per square inch; and when the pressure gets high he also glances at the test specimen itself to see how it is behaving, and by this means and the reading of the dial combined, he is able to stop the operation at the critical moment when the material, if tried further, might possibly give way suddenly and fly; this has happened once or twice, but without any injury, fortunately, being done to any one. On the occasion of the Conference visit, the first specimen put under test was a cylinder of English oak, 25 in. sectional area and 4 ft. 2 in. long. To those who had not seen the operation before it must have been really curious to see the gradual action of the pressure exerted endways on this very solid-looking bit of wood. The machine is so perfectly adequate to its work that there was not even the slightest perceptible tremor to tell the lookers-on of the enormous force that was being exerted under their very noses, so that one was hardly conscious that the testing had begun when Mr. Kirkaldy said "Now look at the specimen," and one saw the piece of oak slowly and quietly taking the shape of a very elongated S, assuming a perceptible double curve; presently a few cracks and a bulge followed, and the pressure was stopped. Similar pieces of ash, elm, and Dantzic fir were subject to the same test. They gave in different ways, the surface almost always bursting first where any knot was. One specimen (the elm, if we remember rightly) gave by crushing up entirely in the direction of its length without twisting sideways at all; it "telescoped," in fact, and when taken out appeared to be made of two cylinders one thicker than the other, the one half having bulged beyond the face so as to leave a kind of rough fillet all round. The fir gave very suddenly, the steelyard weights coming down on the floor with a thud, but it took a very high pressure first.

The museum of fractures, occupying two or three stories above the testing-room and workshops, was inspected with great interest, and affords a great many hints and suggestions as to the behaviour of materials under various circumstances, and as to the manner in which testing may be used to determine the best and strongest form of using the material. Thus, for example, there were to be seen in one room various forms of the link or eye-piece of tie-rods for suspension-bridges and iron roofs, showing where the fracture had taken place in the various forms; in the first form tested the fracture was in the link itself, and by repeated testings it was discovered that the shank of the tie-rod could be reduced about one-fourth in thickness before reducing it to the same breaking strain as the link part; and, of course, when the breaking strain is not the same in every part of the rod, that in which it is greatest represents so much superfluous material which is thrown away. After repeatedly changing the form of the link and the proportion of metal in it to that in the shank, a form was eventually obtained in which in repeated experiments, the shank and link broke, on the whole, impartially, sometimes one part giving first, and sometimes another, so that it was then apparent that a form of equal strength in every part had been obtained. Of course this kind of investigation involves a large number of experiments from which to strike an average; but the testing of materials in isolated cases, to obtain certainty, where there is a desire to economise material without going too near the limit of strength, is the most ordinary part of the work done; and even where there is no supposed approach to the limits of strength, a test has a wonderful effect in removing all anxiety from the mind of the architect. In some cases results are obtained very different from what had been supposed to be the limit of strength before testing, as in one case of an iron standard which had been condemned as insufficient for its purpose, and which gave way only at a strain about three times the safe margin for the work for which it had been calculated. This was, perhaps, an exceptional instance; but we believe that architects, when they do their own iron-work, generally make it much stronger than necessary. The museum of tested objects includes beams and balks of various sizes, chain-links, stone and concrete blocks, rivet-plates, iron rods in nearly every shape and size, railway rails, and a multiplicity of other things, the histories and conditions of each test being all (we conclude) on record. Among the objects attention was drawn to some long pieces of Deodar pine from India, sent home for testing and report, and which we were assured had shown under test a bearing power equal to oak. There is an enormous supply of this wood if it can be economically got at, so that it is worth while to know something of it. On the whole, it would be difficult for a party of architects to have spent a morning in a way more practical, and at the same time interesting, than was afforded by the courtesy of Mr. Kirkaldy.

It may be interesting to give the results of the tests made in the presence of the visitors on the 7th, which have been furnished to us by Mr. Kirkaldy, and stand as follows:—

Description.	Test. No.	Ultimate Stress.		Stress, Lb.—Depression, Inch.					
		Total.	Per sq. in.	25,000	50,000	75,000	100,000	Final.	Set.
	M	lb.	lb.						
Oak, English	1612	93,240	3,729	·028	·069	·119	—	·682	·321
Ash, „	1613	75,630	3,025	·031	·088	·316	—	·910	·352
Elm, „	1614	102,310	4,092	·020	·052	·088	·179	·508	·139
Fir, Dantzic	1615	117,620	4,704	·019	·052	·082	·121	·475	·328

The figures, of course, do not represent average strengths of the various woods represented, which can only be arrived at by a number of tests on pieces taken from various logs; they give the strength only of the single specimens tested. Mr. Kirkaldy notes "The specimen of fir tested being free from knots and straight-grained gave way very suddenly, whereas the others, more especially the oak, having knots and being crooked-grained, yielded more or less gradually."

The last column of figures, headed "set," represents the permanent depression of the specimens after recovering as far as their elasticity would allow.

Value of City Property.—The old freehold house, No. 35, Bucklersbury, with an area of 2,208 ft., has been sold, by Messrs. Philip D. Tuckett & Co., for 21,250*l*.

FROM PARIS.

LET it make the fortune of the Rue du Sentier and the Boulevard Montmartre or not, the Exhibition has undeniably given a fillip to a number of important public departments. The building and kindred trades have profited, for the first time since the anti-communard reaction, when a fever of re-construction prevailed, and piles were sunk and foundations laid everywhere from Bercy to Batignolles. This fact is so evident, and has been so generally commented upon by the technical and artistic press, that an old idea of the Empire has at last been taken up, and the *Moniteur* of the 29th of May announces the institution of a Commission Supérieure des Bâtiments Civils et Palais Nationaux. This superior committee is supreme in an artistic as well as in an administrative and financial sense, and it will have consultative and executive authority all over France. The names that are guarantees for its artistic competence include Viollet le Duc; De Labord, the Perpetual Secretary of the Fine Arts Academy; the sculptors Dubois and Mercié; Guillaume, the new Director of Beaux Arts; Garnier, the architect; Alphand, the well-known Inspector-General of Roads and Bridges; while the industrial and economical authorities number six or seven members of the Institute, as many senators, and several "inspecteurs de bâtiments civils."

One of the early works of the new committee should be the reconstruction of the Tuileries, which has been decided upon, *en principe*, by the Government and the committee of the Chamber appointed to deliberate upon the question. But a Republican majority was not likely to sanction the entire restoration of the palace of the Medicis and Bonapartes. It is decided that only the portions yet subsisting are to be consolidated and restored. The external walls are to be strengthened and made whole; new partition walls are to be built where necessary, and old ones repaired; the roofs are to be re-adjusted with a view to the new destination of the building. All walls rising above the piazza will be reduced to that level; the end walls and terraces will be reconstructed, and a lateral façade applied to each of the pavilions, de Flore and de Maroan, or what is left of them. The committee sternly enjoin that the spirit of their recommendations shall not be departed from: that is to say, that no attempt shall be made to restore the palace as a dwelling-place. It is to be an archæological museum, or to receive the overflow of the Luxembourg picture-galleries, which are now far too narrow to house the modern art-treasures of the nation. A separate garden will surround the Musée des Tuileries.

Political influences have been at work in other ways than those of reconstruction. They have originated, or, at any rate, fostered a *furore* for statues and commemorative stone and marble, that appears to be breaking out all over the country, and occasionally in somewhat unpleasant fashions. After the Voltaire statue, which is likely to remain adrift for some time, now the exuberant enthusiasm of the centennial has evaporated, the marble effigy of Thiers will attract all Paris to the École des Beaux Arts from the 16th to the 21st of this month. The town of Nancy opened the competition, and the successful piece of statuary will be erected there. Again, there are to be festivals at Mâcon in August, on the occasion of the inauguration of Lamartine's statue; while Marceau is to posture on a pedestal in Versailles, and the astronomer Le Verrier disport himself in marble shaped by M. Chapu in the environs of the Observatory.

Another semi-political measure is the contemplated erection of some memorial in the Rue de Rivoli, on the site of the Riding School, where the Convention proclaimed the monarchy abolished for ever in France,—a premature reckoning without the hosts who might arrive that merits a signal recognition in the opinion of M. Cernesson, municipal councillor and conscientious Republican. The site is now occupied by No. 230, Rue de Rivoli and a wing of the

Hôtel Meurice; but there are already half a score different opinions put forth as to the real spot where a monarchy fell, and an empire was born to the noise of the Vendémiaire guns.

M. Bardoux, the Minister of Public Instruction, has projected a novel institution, which seems to be destined to render important aid to the cause of technical education. It is a Museum of Pedagogy, whereof the title is infinitely less attractive and commendable than the purpose. In addition to the collections of educational instruments, books, statistics, &c., the museum will be especially strong in plans of school-houses, models of colleges, and schemes for the erection of economical communal classes.

Whoever has finished his long journey from Calais at the Place Roubaix must remember, with a keen recollection of the wind, or rain, or sun that there tortured him, the monster court of the Gare du Nord. The roofing in of this small Sahara is just being completed. The area covered is 2,500 mètres. Two spaces of joists are established, each of a length of 22 mètres. The joists number eight for each space, and rest on twenty-four columns of really extraordinary lightness and elegance. A middle file of columns supports half the weight of this vast framework, and of these supports there are only seven,—a fact which speaks eloquently as to the excellence of the work. The entire achievement cost 320,000 francs,—a sum which most Paris builders consider wonderfully modest.

Among the buildings most recently opened at the Champs de Mars are the pavilions of the Press and the Shah. The first is a light airy edifice with the air of an opéra comique châlet, but excellently disposed and fitted within. The Persian potentate's *pied à terre* is chiefly remarkable for possessing a crystal roof and appended thereunto a crystal gaselier of gigantic proportions.

INSTITUTION OF MECHANICAL ENGINEERS.

THE second number of the proceedings of the Institution of Mechanical Engineers contains five papers which were read at the Spring Meeting of the Institution in April last, together with full reports of the discussions that ensued. The papers read were,—1. "On the Appliances and Operations for Raising the Wreck *Edith*, at Holyhead," by Mr. L. M. Kortright; 2. "On a Floating Dock upon an improved System, at the Victoria Graving Docks," by Mr. C. Elwin; 3. "On the Cost of Working different descriptions of Railway Traffic," by Mr. F. R. Conder; 4. "On Experiments relative to Steam Boilers," by Mr. W. Boyd; and 5. "On the Construction of Vessels to resist High Internal Pressure," by Dr. C. W. Siemens. Special interest attached to the first discussion, in consequence of the recent losses of the *Vanguard* and of the *Eurydice*. The *Edith* lay in only 36 ft. of water, at low spring tide, and at a distance of only 40 chains from the end of the pier at Holyhead. She was in the fair-way of shipping entering and leaving the old harbour, so that it would be difficult to imagine conditions in which the process of lifting would be at once more desirable and more likely to be accomplished with success. Great skill was displayed in the design and application of the method employed, and there seems to have been no difficulty in the way of money. And yet it took eighteen months to bring the wreck into shallow water, and the total cost of the operation was equal to the prime cost of the vessel. When this is borne in mind it may well be considered that attempts to raise the *Vanguard*, lying in 120 ft. of water, on a soft bottom, in an unsheltered position, far from the land, "could only result in failure, and the probable loss of a large sum of money." It is more than doubtful how far the same remark is inapplicable in the case of the *Eurydice*. Of Mr. Conder's paper we gave some account at the time of the meeting. Mr. Price Williams remarked, with regard to it,—"One result of this interesting and important paper, he hoped, would be, that the railway administrators might be induced to afford the means of drawing more reliable conclusions as to the cost of the traffic. He was aware that some railway companies held it was better for the public that they should not know the cost of carrying a passenger and carrying a ton of goods. On the contrary, he maintained it was essentially their interest, as it was the interest of the public, to know the exact facts, as by that means alone would the public be able to help the railway authorities themselves in economising in any form and way." The President remarked that "the eagerness with which the discussion had been carried on showed the great interest taken in this matter by engineers, whatever might be the case with railway shareholders." The papers relating to steel boilers and to resistance to pressure are of a more technical nature, dealing as they do with matters of great importance. The volume of Proceedings is a valuable addition to the rapidly-increasing library of the English engineers.

THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS.

THE annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors was held at Southport on Friday, the 24th ult., under the presidency of Mr. Ashmead, of Bristol, when there was a considerable gathering of engineers and surveyors from different parts of the country.

The principal subject discussed at the meeting was the main outfall sewer at Southport, designed by Mr. Mansergh, C.E., which is just upon the point of completion. A description of the sewer, compiled by Mr. Crabtree, the Borough Surveyor, was read. The writer, after giving an account of the growth of the town, and of the consequent great necessity for a system of sewage, minutely described all the constructive features of the sewage works in detail, from which it appeared that the total length of the sewers is 9 miles 1,401 yards. The arrangements for the flushing of the sewers were described as being of the most perfect character, and it was explained that one of the sewers (that in Nevile-street) is flushed from the public baths, which have one bath containing 65,840 gallons, two of 50,000 gallons each, one of 55,228 gallons, one of 45,668 gallons, one of 40,608 gallons, two of 28,000 gallons each, or a total of 332,000 gallons, which in the summer season are emptied every night, and in winter twice a week. At the conclusion of the paper, which was read by Mr. Morrow, the Assistant Borough Surveyor, the members of the Association proceeded to visit the main outfall sewer, now approaching completion, Mr. Morrow accompanying the party, and explaining the details of the different objects visited.

On the return of the party to the Town-hall Mr. Ashmead again took the chair, and invited discussion, upon which

Mr. Lemon, of Southampton, the past-president of the Association, made some practical remarks in reference to the sewage works which they had just inspected. The town appeared to be of an exceptionally flat gradient, and very special means seemed to have been devised for preventing any deposit in the sewers. In reference to the flushing arrangements, he thought they were very complete, and would have the desired effect. The velocity they had seen was very good, but he was told that on ordinary occasions it was only at the rate of 1 ft. 6 in. per second. That was a very low fall, and as engineers they knew that was not sufficient to keep the sewer clean. Whether the flushing would have the desired effect or not, time alone would show. Of course he did not wish to criticise a scheme which had been designed by such an able engineer as Mr. Mansergh, but he was rather opposed to the principle of what he considered reservoir sewers. He thought it was far better to have a sewer suited to the capacity of the work it had to do. Here sewage was provided for by means of reservoirs. There were advantages in this system over the reservoir system in this way, that the deposit was washed down by the sewers into the reservoir, and was in a position where they could get at it rapidly. The sewers generally appeared to be of broad good capacity, judging from the size of the town. He understood the population was about 32,000. Of course it was a district which increased at an enormous rate, and he should like to know what was the prospective population provided for under the drainage scheme. As regarded the ventilation scheme, he agreed with the principle of having direct outlets into the streets. It was, in his judgment, the best mode of sewer ventilation.

Mr. Thorburn, of Birkenhead, said he thought that at a place like Southport, which was built on sand, and where there was a substratum of sand, it required very special arrangements to provide for the efficient discharge of sewage, and the plans seemed to have been designed with very great care, and appeared to have been equally well worked out.

Mr. Lemon wished to know if any observation had been taken of the current of sewage after its discharge from the outlet? He asked the question because it was only the other day that he had been instructed by the Southampton corporation to prepare a scheme for the purification of the sewage of the borough, the council not being satisfied about the discharge into the sea. It was very often of an unsightly appearance through being taken out by the tide and washed back again. In these days of sanitary science they were expected to do something better than discharge the sewage into the sea.

Mr. Morrow, in reply, said Mr. Mansergh had gone carefully into those matters, but he was not aware of the result. Mr. Morrow added that their sewage scheme was computed for a population double that of the town at present.

After some further discussion, a vote of thanks to the Chairman concluded the proceedings.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

AT a meeting of this society on Thursday, the 30th ult., a paper was read on "The Design and Construction of the Portishead Docks," by Mr. M. Curry, jun., A.K.C. Lond., Assoc. Inst. C.E.

The author described and illustrated by a series of coloured wall-diagrams and photographs—(1) The site and general design of the works, which, being on the site of the Portishead Pill, or estuary, at the mouth of the Avon and on the Bristol Channel, will afford for Bristol further accommodation for its ocean steam-traffic. The velocities of the tides, the great range, 48 ft. at high springs, with rapid rise, 12 ft. per hour, and the tendency to silt, &c., were described; and the nature of the site, a deposit of soft mud on the red marl with new red sandstone, and to which the foundations were carried. The jetty, with the outer quay-wall, forms a guiding pier of 970 ft. to the entrance. The lock is 566 ft. total length, 66 ft. wide, and 41 ft. deep, to accommodate a ship 450 ft. by 65 ft. beam. There are two pairs of wrought-iron gates having single skins, and which weigh but 72 tons per leaf; also a floating caisson. The dock, 1,800 ft. by 400 ft. wide in bottom, has an area of twenty acres, besides a timber-pond of fifteen acres, with a quay-wall along the railway wharf, and formed to a slope on the opposite side. (2) The mode of construction. The cofferdam, 530 ft. long, with puddle-chamber, 7 ft. wide, and piles 55 ft. long, was carried across the mouth of the estuary, but on the eve of completion failed, from the unstable nature of the mud bottom. The masonry entrance with outer return wall was then completed by tidal work,—a half-tide timber trench being driven through the mud, with a staging for wagon and crane roads, and by a temporary dam of iron lattice girders with outside planking, the water was effectually shut out, enabling the rest of the works to be constructed free from tidal interference. In the lock the masonry along one wall was first got in and used as a buttress for strutting the trench of the opposite wall and the moving bank behind it, the invert being formed last of all. The dock was excavated by hand labour, and the material removed to the quay banks by locomotives, winding inclines, and swing roads, the bottom being too soft to allow the use of mechanical excavators, excepting the chain pump and an elevator used for the slurry. The author, who as contractor's resident engineer, had set out the works, concluded the paper with (3) a sketch of the development of the Port of Bristol, showing the necessity for the new docks.

In the discussion which followed, Messrs. A. C. Pain, Howard, Street, Love, and the President, took part, and the proceedings terminated with a vote of thanks to the author for his very valuable and interesting paper.

The annual meeting was held on Thursday, June 13.

CLEOPATRA'S NEEDLE.

SIR,—Say a word for a lightning conductor. Ditto to pick in the hieroglyphics with gold or blue. Ditto as to the back slums behind the Embankment gardens, opposite. The gardens serve as a "dickey" to a dilapidated shirt.

R. T.

ON SOME OF THE LIABILITIES OF URBAN AUTHORITIES IN THE EXECUTION OF WORKS.

THERE are very few Acts of Parliament passed of any importance which have not sooner or later to be explained by the courts of law. The Public Health Act of 1875 forms no exception to this rule. The point in regard to it upon which we intend to offer a few remarks is one of a good deal of practical importance, and is worth the attention both of Urban Authorities and the owners of property.

The principle involved relates to the extent of the authority of Urban Authorities for what may be termed voluntary works,—that is to say, works which they themselves are not bound to execute. Of course, no Urban Authority is liable to proceedings of any kind, legal or not, for not undertaking works in regard to the execution of which no duty is cast upon it, but there is a difference between the primary liability to undertake works, and the undertaking of works voluntarily, and the liability towards third parties which arises in consequence of and during the performance of such work.

Now the principle which, shortly stated, seems to be applicable to this class of facts, is that when an Urban Authority voluntarily undertakes work connected with its sanitary duties it is liable for any consequences which may result from such work. If, on the other hand, the work be such as is outside the scope of its duties, and the undertaking of which is, accordingly,—to use the technical term,—*ultra vires*, beyond its authority or power, then they are not as a corporate body liable for the consequences which result from such work. This proposition may be illustrated, and its practical application and importance shown, by certain facts which have recently afforded ground for legal argument and for judicial decision. The case itself is that of Hall and Others *v.* The Mayor and Corporation of Batley (47 *Law Journal* Reports, Queen's Bench Division, p. 148). The circumstances, shortly stated, were these: in May, 1876, the Urban Authority, that is to say the defendants, constructed a sewer in Wellington-street, in Batley. Passing over some intermediate facts of no importance, the time arrived when it became necessary for a new drain to be made from the mill of the plaintiffs, either to a cesspool, since the mill was more than 100 yards distant from the main sewer, or into this main sewer itself. That would be under the provisions of Section 23 of the Public Health Act of 1875; and under the same section, after the notice had been given to the owner of the premises that such work was required, if he did not take it in hand then the Urban Authority would do it, and charge the cost to the owner.

Accordingly the plaintiffs were quite willing that the work in question should be done, but instead of doing it themselves they requested that it should be done by the Urban Authority, or rather by its workpeople, and that the Authority should be paid a proper sum by the plaintiffs. In fact, the Urban Authority was placed in exactly the same position as regarded the work as if it were an ordinary contractor, between whom and the owner of the premises an agreement to do certain work had been made. The workmen of the Urban Authority accordingly set to work, and during its progress had to dig a trench for the drain under the paved footway. This trench was dug close to and considerably deeper than the foundation of the plaintiffs' building. Moreover, it was done all at once, without underpinning, and without merely opening it as the work proceeded. The very natural consequence of this clumsy manner of proceeding was that part of the mill subsided, and a good deal of damage ensued. Nor is it wonderful that there was yet a further consequence, namely, an action by Messrs. Hall & Co. against the Mayor and Corporation.

The case was decided in favour of the plaintiffs, upon the grounds which we have already mentioned as the guiding principle in such cases. If, on the other hand, the Urban Authority had entered, to quote from Mr. Justice Lush, "into a contract to build a house, or a wall, or to do any other work unconnected with its functions as a sanitary body," then it would not have been liable for this damage. It may be asked, was the Urban Authority well advised in undertaking this work at all? As it seems to us, it was most reasonable that the mill-owners should request the Authority to perform it, and most proper that it should accept the offer. The Act requires that the work shall be one by one party or the other, and surely the owner may waive the option given him by the Act, if he pleases, and agree with the Urban Authority that the needed work shall be made by it. For it is precisely the work which it is required to do in the event of the owner declining it himself; its workmen are acquainted with the system of drainage existing in the locality, and with the character of the locality itself, and should be the most competent and the most proper persons to undertake the work. The moral, therefore, of this case seems to be, in addition to the principle which it unfolds, that Urban Authorities should be careful to have experienced and prudent workmen. Large powers are being continually given over to public bodies, and it is most important that no opportunity should be lost of pointing out how frequently the necessity is shown of careful superintendence of those who perform public works. There is a greater tendency to carelessness in those who work for public bodies than for private persons, and it is most important that they should be kept strictly to their duty. In that light, therefore, the examples we have given may be useful, as well as exemplifying the working of a part of the Public Health Act of 1875.

A YEAR'S WORK AT THE BRITISH MUSEUM.

IT is almost impossible for those who merely visit the British Museum for the purpose of study in the gigantic reading-room, or to inspect the curiosities collected in some one department, to grasp the unique and magnificent character of the Museum as a whole. The treasures of every sort of literature, of art, and of natural history are really prodigious; but a glance at some parts of a single year's work (*i.e.*, from March, 1877, to March, 1878) will make its special character more clearly visible. But though we can hardly hope to present a very systematic view of such a *mélange* of matters as is presented to our view, still even to touch partially on this subject cannot fail to interest many of our readers.

To take for our first example the Department of maps, charts, plans, and topographical drawings. Here, to take only one portion of the year's work, 230 atlases and 2,759 maps have been obtained, and eight volumes and 593 maps and drawings have been presented. Many of these are not of a kind which would have a more than merely curious interest for the readers of the *Builder*, but some among them are of a highly attractive character. For example, the Rev. Precentor and Prebendary Walcott presented 226 drawings, views, ground-plans, and engravings of churches, castles, and abbeys in England and Wales. Then, again, there are twenty-four plans of British earthworks, quite a unique collection; and then we have a most curious map of the Tagus, with a plan of Lisbon, showing the embarkation of Catherine of Braganza, which was presented by the late Sir William Stirling Maxwell, and which was taken from the unique etching in the print-room by Dirk Stoop. But, as we have said, these are merely examples of innumerable new acquisitions. To turn next to the department of Oriental antiquities, we need not dwell on the various arrangements of what the Museum already possessed, but may go at once to some of the 239 new acquisitions. Of these, among the most noticeable is the ivory torso of a small figure of Aphrodite from Thebes, a terra-cotta figure of Horus borne in a chair by two priests, the latter of the Roman period, to which the following also belong: a bust of Isis, of large proportions, and a very curious lamp in the shape of a horse. Then, again, there are a collection of objects from Van, presented by Sir Henry Layard, including such interesting things as a plate representing the walls of a city, and a terra-cotta figure of the goddess Neith in Phœnician archaic style. When we reach the Department of Greek and Roman antiquities, it is difficult to choose examples from among the thirty-three new objects. There are, however, to take the two first, a plaster cast from a fragment of the frieze of the Parthenon, formerly at Cataio, and now the property of the Archduke Carl Ludwig, of Austria; and secondly, a marble slab, from a Roman arch at Salonica, with a Greek inscription containing the word *politarchos*, which was the title of a magistrate at Salonica.

Passing on to the Department of Prints and Drawings, we come upon a large number of objects which have been acquired during the past year. Indeed, no fewer than 10,374 acquisitions have been made, and the fact that of these 2,411 examples have been presented, says a good deal for the generosity of individuals. For there is no very great generosity shown by a man who bequeaths some precious object at his death, but there is a good deal of self-denial shown by the person who, during his life-time, presents some much-prized relic to the nation. For every one knows that collectors have a certain pride in being able to point out to their friends such and such unique and valuable object. But when this object is labelled among thousands of others with the name of the donor, it is lost in the multitude which surrounds it. Probably the most interesting of the new objects in this department, and we should say, on the whole, the most curious, is the highly-important collection of drawings, 1,417 in number, illustrating the manners and customs of the Chinese at the present day, their trades and shops, ceremonies, scenes in domestic life, modes of punishment, views of buildings, landscapes, and other subjects. All these are by native Chinese artists, some being very highly finished in water-colours, the rest drawn with the pen in outline. Added to these are eight small Chinese sketch-books. So that we have here not only a pictorial description of Chinese life and manners, but also specimens of Chinese art, which would of themselves be valuable. For this unrivalled collection the nation is indebted to Miss Reeves. Then, again, among the engravings we find a sequence of twenty small prints engraved in the "*manière criblée*," and coloured, illustrating the Ten Commandments; and, more curious still, the consequences attending the transgression of them. Rhymed inscriptions in Latin and German accompany the designs, the German text being in the Swabian dialect. The place of their production was probably the district lying between Basle and Strasburg, and the date is spoken of as probably the last quarter of the fifteenth century. The set is, however, unique, as far as is yet known, and has not been hitherto described by any bibliographer or art-historian. Next there is the Great View of Cologne by Wenzel Hollar, engraved on four plates, presenting a view of the whole extent of Cologne and Deutz, with their fortifications. Of the first edition there are only two other copies extant,—one at Cologne itself, the other in the Imperial Library at Vienna. These few examples will, we are aware, give but a poor idea of the labour which is going on in cataloguing and arranging old and new works at the British Museum; but they show to some extent, at any rate, how new treasures are annually and continually flowing into our great national museum, and how from every quarter of the globe, from the distant East, and from the humble villages of England, new specimens of the works of Nature or of the ingenuity of man are being added to what is in itself a history of the world.

A ROOM FROM JAPAN.

WITH the aid of Dr. Dresser, the Governor of Kioto, and a master of the ceremonies, who appears to take the place in Japan of a district surveyor, Mr. Streeter, the jeweller, of New Bond-street, obtained and has fitted up a Japanese room of high character, in which all the necessary points of etiquette have been attended to. For example, in all the good houses of Japan, a niche is arranged in one room in which the Mikado would sit if ever he entered that house. As the god-incarnate of the Shinto Church, the Mikado could not sit in that niche unless the post which forms its boundary at one side was of unplaned wood, the walls of this niche undecorated, and the roof formed of one piece of wood. "The master of etiquette arranges the parts of the dwelling so as to suit this and other purposes." The room is low and small, and of unpainted wood, planed to such a degree of perfection that sand-paper might be suspected if it were not positively stated to the contrary, and put together without nails. The workmanship throughout is, in fact, wonderfully good, and we advise some of our young joiners who intend to elevate their trade to go and look at it, as well as some of our richer readers, who might like to buy it. Could its fellow be equally well made in England? We doubt it. But we have no doubt when we ask the same question in respect of a silver tea-service, oxidised and ornamented with gold and enamels, to be seen at the same establishment, for we know very

well that the answer must be in the negative. Is not this a shameful fact, and ought we not all to feel ashamed of ourselves?

THE OLD KENSINGTON WORKHOUSE AND SPECULATIVE BUILDING.

SOME time ago the combined vestries of St. Margaret's and St. John's, Westminster, agreed to sell the old workhouse at Kensington, but at a meeting of the vestries last week, the question of disposing of the building again came up for discussion on a recommendation from the parish property committee to the following effect:—That having regard to the large amount of speculative building in progress in the immediate neighbourhood of the workhouse property, in Marloes-road, Kensington, belonging to these parishes, and also having regard to a heavy failure in the building trade, they recommend that it be ascertained whether the Kensington and Chelsea School District are still open to treat for taking the premises for two years certain. It appeared from a statement by Mr. Aston that the Kensington School authorities did not wish to take the property, but that the Chelsea managers desired to secure it. He said that the managers were not likely to give the enormous sum of 2,500*l.* yearly for the place (which was asked), but probably they might hold to their former proposition of a rental of 1,800*l.*; and he moved that the previous resolution of the vestry, agreeing to sell the property forthwith, be rescinded, and that the building be let to the Kensington and Chelsea School authorities for two years and a quarter, at a yearly rental of 1,800*l.* Several members opposed the proposal, and advocated an immediate sale of the building, Mr. Harris observing that 21,000*l.* had been offered for the property, whilst Mr. Horn, in urging a sale, said he had no doubt the property would realise 50,000*l.* or 60,000*l.*, Mr. Aston, however, contended that as the land was freehold, the delay would cause no loss whatever, and that at the expiration of the period he had mentioned they could sell it to better advantage than at present. The proposal to let the building was adopted.

ELECTION OF FOUR DISTRICT SURVEYORS.

As most of our readers will know, Mr. Henry Baker, "the father of the District Surveyors," recently died.* He had held the appointment of District Surveyor for St. Pancras for the remarkable period of fifty-three years. During that time, the district, like all our suburbs, has wonderfully changed by the spread of our "province of bricks and mortar" over what were once green glades and pleasant pastures, and on Mr. Baker's death the Metropolitan Board of Works decided to cut up the district into three parts, east, west, and north. To fill up the vacancies thus created (as well as a fourth, caused by the resignation by Mr. J. H. Good of the District Surveyorship of All Saints, Poplar and St. Mary's, Stratford,†—which he had held for a great number of years), was one of the first items of business on the *agenda* of the Metropolitan Board of Works on Friday, the 7th inst.

Before proceeding to the election, Mr. George Vulliamy, the Superintending Architect, submitted a report relative to the remuneration of the district surveyor *ad interim* of St. Pancras, Mr. R. L. Sibley, who was appointed to that position on the 3rd of May. Mr. Vulliamy stated that the average annual amount of fees received in the district during the three years ending with 1877 was 946*l.* The estimated proportion of that amount, which was due to Mr. Sibley during the time he had acted as interim surveyor, was 81*l.* As the district was to be divided into three portions, and as the fees for work done by Mr. Sibley had not been collected by him, Mr. Vulliamy recommended that, in consideration of Mr. Sibley surrendering his claim to the fees in favour of the surveyors to be elected, each of the successful applicants for the three districts of St. Pancras be asked to pay the sum of 27*l.* to Mr. Sibley for services rendered by him.

This was agreed to, and,

On the motion of Mr. Selway (acting for Mr. Furniss, the Chairman of the Building Act Committee), it was resolved:—

"That the number of candidates in each case be reduced by one vote to six; that the names be then put to the vote *seriatim*, and that the candidate having the least number of votes be struck off at each voting.

That the appointment of District Surveyors do continue during the pleasure of the Board, and be subject to the condition that they shall make no claim for compensation in case a diminution of income shall at any time hereafter arise from any reduction or alteration of fees by the Board, or from any change of system which may be adopted, either as to the office, its duties or emoluments, or from any division, reduction, or re-adjustment of districts.

That the appointment of District Surveyors be subject to the condition that they shall furnish the Board with information of those cases in their districts in which the orders of the Board, or the requirements of the Local Management Amendment Act, 1862, with regard to the width or entrances of streets, or to any building, structure, or erection, or projection therein, beyond the general line of buildings, are not complied with, and of those cases in which the limitations contained in the Building Act as to the cubical contents of buildings are exceeded.

That the District Surveyors to be appointed this day be required to keep their district offices open daily from ten a.m. until four p.m.

That in the event of a candidate who already holds a similar position being elected to either of the vacancies, he be required to resign his previous appointment."

The following is a list of the whole of the candidates for each of the four surveyorships:—

Aitchison, G.*†; Allom, A.; Badock, J. B.; Baker, W. A.†; Bell, R. B.; Bovill, A.; Bromilow, J.†; Brooks, C. W.; Burden, R. H.; Carritt, E.; Clarkson, J.; Conder, A.; Dale, D. R.; Edmeston, J. S.; Ferguson, J. M.; Grose, V. J.; Hammond, F.; Karslake, L.; Large, W. A.; Leonard, W. C.; Lovegrove, H.; McDonell, G.; Nash, W. H.; Notley, F. C.; Payne, A.; Quilter, J. S.; Stone, F.; Stone, T.; Street, E.†; Tasker, W.; Todd, F.; Turner, J. G.; Turner, S.†; Wallen, F.; Williams, T.; Willis, T. W.; Young, J.

Proceeding in accordance with the foregoing resolutions, the preliminary voting was taken in each case, to reduce the candidates to six. We have not space to give the numbers recorded for each candidate in the preliminary votings. The subsequent voting in the case of each district was as follows:—

St. Pancras West.

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Final Vote.
Bovill	25	21	22‡	20	16
Clarkson	23	23	23	18	—
Grose	34	29	22‡	—	—
Payne	19	16	—	—	—
Wallen	33	32	29	32	20
Willis	16	—	—	—	

Mr. Wallen was therefore elected.

St. Pancras North.

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Final Vote.
Aitchison	19	17	14	—	—
Bovill	27	23	20	27	28
Clarkson	23	24	22	17	—
Grose	30	19	19	24	16
Hammond	10	—	—	—	—
Willis	19	10	—	—	—

Mr. Bovill was thus the successful candidate.

St. Pancras East.

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Final Vote.
Aitchison	21	23	22	16	—
Clarkson	29	27	26	23	21
Edmeston	12	—	—	—	—
Grose	28	28	25	25	23
Payne	16	14	15	—	—
Willis	14	12	—	—	—

Mr. Grose was therefore successful.

All Saints', Poplar.

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Final Vote.
Allom	15	15	14	—	—
Carritt	14		—	-	—
Clarkson	33	34	37	33	36
Payne	21	19	17	14	—
Williams	15	11		—	—
Willis	21	20	25	18	12

The successful candidate in this case was Mr. Clarkson, who, like the other "lucky ones," thanked the Board for his election and promised to serve them well.

THE NEW PUBLIC RECREATION-GROUND FOR LEWISHAM.

THE public recreation-ground at Sydenham, for the benefit of the residents within the district of the Lewisham Board of Works, which was formally opened the other day by the Earl of Dartmouth, is 17½ acres in extent, has cost about 10,000*l.*, although not yet quite completed. The land alone cost 8,500*l.*, towards which the Metropolitan Board of Works contributed one-half; and the trustees of the Lewisham Charities 1,000*l.*; the inhabitants of the Lewisham district, including Sydenham and Forest Hill, contributing the remaining portion. Under the Act of Parliament obtained last year, which sanctioned the purchase of the land and the laying-out of the ground, the Lewisham District Board of Works are bound to maintain the ground as a place of recreation for ever, and to keep it in a good state of repair. The ground, which has been converted into a handsome resort, is situated just below the Sydenham Railway Station, and contains some fine old oak timber. A portion of it, comprising five acres, has been levelled for cricket and other sports; and one point in the cricket-ground is that it is almost square, and is surrounded on all sides by fine old oaks, beneath which seats have been fixed, where the visitors will be able to sit and watch the sports. The ground has been planted with shrubs, and serpentine and other walks have likewise been constructed. Sir James Hogg, chairman of the Metropolitan Board of Works, was present on the occasion of the opening of the grounds, and during the proceedings he remarked that the Board had been able, during a few years, to keep for the people at large not less than 1,300 acres of open spaces, and they hoped to be able to get 300 or 400 more during the ensuing session of Parliament. He was glad that the inhabitants of Sydenham and the district had not waited until the beautiful ground they were standing upon had been filled up with bricks and mortar, but had looked before them and secured it.

THE LEGAL ASPECT OF CONTINUOUS WORK FOR WORKMEN.

IN an appeal case, Marsh *v.* Bagnall, argued in the Exchequer Division of the High Court of Justice before Chief Baron Kelly and Mr. Justice Hawkins, the moot point as to employers being compelled to find continuous work was decided.

It was first tried as a test case in the Gateshead County Court. The plaintiff, Marsh, claimed 2*l.* for wages which he alleged to be due to him in respect of twelve working-days, under a notice to leave, when the defendant neglected and refused to provide him with continuous work.

The defendant contended that four days' work actually provided was a reasonable amount of work to find under the then existing circumstances, and that employers were not bound to provide more than reasonable work; that more work was not provided, and that plaintiff and others were refused permission to leave during the currency of their notice, in the expectation of their services being fully required.

The judge of the county court held,—"That under the contract of hiring the obligation on the part of the defendant was to find work for the plaintiff when work was to hand; and he could make no distinction between the period when the plaintiff was serving the defendant under his contract and that when he was under his notice to leave," and directed judgment for the defendant to be entered.

Against this decision the plaintiff appealed by a special case. The Court upheld the decision of the county court judge, and dismissed the appeal.

THE SOUTH LONDON MUSEUM PROJECT AND THE SURREY GARDENS MUSIC-HALL.

ALTHOUGH the efforts which have on more than one occasion been made to establish a museum in South London have hitherto been attended with failure, there is a probability that the laying out of the Surrey Gardens Estate for building purposes, which is now in progress, will be accompanied by the carrying out of the first-named object, and that on the Surrey side of the Thames a museum and gallery will shortly be established. As is well known, the large music-hall and theatre form a prominent feature in connexion with the gardens now undergoing conversion. We believe it was originally the intention of the freeholders, Messrs. Sutton and Dudley, to take down the structure in clearing the ground for general building purposes. It appears, however, that this resolve is not now intended to be carried out, and that the freeholders have voluntarily made an offer to convert the music-hall and theatre into a museum and library, together with picture and other galleries, for the general benefit and instruction of the residents in South London. The proposal is accompanied with what seems to be a very liberal offer, in addition to the con-

* For a brief memoir, see *Builder*, p. 451, *ante*.

† The southern portion of the parish of St. Mary, Stratford-le-Bow, has, by resolution of the Board, been added to the district of Bethnal-green East, of which Mr. Thomas Blashill is Surveyor.

* District Surveyor for Woolwich.

† Not candidates for All Saints', Poplar.

‡ On a vote as to which of these names should be retained for the fifth vote, the numbers were:—Bovill, 22; Grose, 19.

version of the structure. In the event of a committee of responsible gentlemen being willing to undertake the working of the proposed institution, the owners will grant a free use of the buildings when converted, at the nominal rent of 5*l.* per annum for three years, to be renewed at the end of that time for another three years, should the project succeed, and after that period to grant a lease of ninety years on the same terms. The freeholders having communicated their proposal to a number of gentlemen in the locality interested in the establishment of such an institution in this part of the metropolis, a meeting has been held at which there was an interesting discussion on the subject of schools of art, museums, and free libraries; and ultimately it was resolved to convene another meeting of a more public and general character in order to make the proposal fully known. This meeting is immediately to be held, when it is expected that several gentlemen of influence interested in literature and science will attend and take part in the proceedings. It is confidently expected that with such an exceptionally advantageous offer the project will be warmly taken up and adopted, and that the authorities at South Kensington may be induced to give their encouragement and support. The hall was built some twenty years ago, Mr. Horace Jones being the architect.

THE PROPOSED NEW ASSIZE COURTS AND SHIRE-HALL AT BEDFORD.

THE TOWN COUNCIL *v.* THE MAGISTRATES.

MR. ALFRED WATERHOUSE has been called in by the authorities at Bedford to prepare plans for the new Shire-hall and Assize Courts, which it is proposed to build at Bedford for county purposes as well as for the transaction of the borough business; but it appears that there is some misunderstanding between the Town Council and the Magistrates at Quarter Sessions as to the kind of building which shall be erected. The Magistrates seem to wish to have the present Courts altered, and the Chairman of the Quarter Sessions is said to have given instructions to Mr. Waterhouse to prepare plans for utilising the existing Courts, although a joint-committee of the Council and the Magistrates had desired him to furnish designs for an entirely new building. In the course of a discussion which took place on the subject at the meeting of the Town Council last week, Mr. Alderman Horsford stated that he had reasons to know that Mr. Waterhouse entirely objected to carry out the Magistrates' proposal, and, from what he had heard, Mr. Waterhouse would have nothing to do with the project unless he was allowed to carry out a new building which should be suitable both for borough and county purposes. The plans which Mr. Waterhouse had already laid before them were extremely well adapted for both these purposes.

Alderman James Howard (at present high sheriff of the county) deprecated the chairman of Quarter Sessions intervening between the joint committee and giving instructions to the architect, and also to their surveyor, with reference to the proposed buildings. He repudiated both steps, when the joint committee of magistrates and the town council had not finished their labours.

Alderman Coombes said the great interest which the borough had in this question was that they should have a building giving every accommodation required by the judges, so as not to lose the advantages of Bedford continuing the assize town of the county. He did not attach very much importance to the advantages which the new building would offer to them as a borough. The great object was to have a building worthy of the town and county, and to secure to Bedford the continuance of its being the assize town.

The feeling of the Council was unanimous in adhering to the original project.

Cardinal Manning has laid the foundation-stone of a new Roman Catholic Church at Quex-road, Kilburn. The new building is from the designs of Messrs. Pugin, Ashlin, & Pugin, and will be constructed of brick and stone, in the Gothic style of architecture. Only one-half of the church has as yet been contracted for, the designs comprising a temporary sanctuary and sittings for 430 persons. The cost of the present portion of the structure is estimated at 6,000*l.*

THE SCOTT MEMORIAL.

SIR,—At the time of the formation of the committee for founding a memorial to the late Sir G. G. Scott, various suggestions as to the form the memorial should take were made, and amongst them was that of completing the Architectural Museum, as previously urged, too, in your pages. This suggestion appears to have been overlooked, and the proposal to found a scholarship at the Museum, and place a tablet in Westminster Abbey, seems in highest favour just now.

While readily admitting that a tablet is not only desirable but necessary, I would respectfully urge that before a scholarship the completion of the Museum itself has a prior claim.

Sir G. G. Scott often said that the collection of details of Classic architecture was miserably inadequate; and, if I am not mistaken, his last gift to the Museum consisted of casts of Classic ornamented mouldings. The school, too, requires enlarging, and its fittings and furniture need various additions and alterations to make them thoroughly efficient. Sir Gilbert always took a great interest in the school, and was ever ready to do anything in his power to promote its welfare.

Were the subject fully considered and fairly discussed, I feel that most people would agree with me that no more suitable memorial could be proposed than to make the Museum and school worthy of the name it bears and the profession to which it belongs.

OWEN GIBBONS, late Curator, R.A.M.

MURAL PAINTING.

SIR,—In listening to the discussion on this subject, which followed Mr. Armitage's paper at the Royal Institute of British Architects, I must say that I was somewhat surprised to find that the word "decorative" was used by most of the speakers to express a kind of art which, from its slighter and less perfect description, could be executed at a cheaper rate than the best; and this when every one connected with art ought to know, that the finest works of art that have ever been executed in painting and sculpture have been "decorative" works. To wit, the Phidian sculptures of the Parthenon and the frescoes of Michelangelo and Raffaelle. These works were certainly beyond all pettinesses, and simpler and grander than the common ruck of art, yet not on that account the less complete, but rather of a completeness requiring the utmost skill to effect. There is nothing so simple as simplicity, and nothing so difficult of attainment. But this simplicity is a very different thing to slighter and cheapened work, and ought to receive the very highest remuneration that could possibly be afforded. The promulgation of this fallacy with regard to the slightness of "decorative" art is tending to reduce mural painting to a kind of stencilling, which may be supplied wholesale and retail by the art-manufactories. Of course, I do not advocate the employment of easel-picture painters on mural decorations, nor easel-picture prices for mural work.

Art applied to monumental purposes requires an altogether higher training than that necessary for the ordinary painter for exhibitions. In England people are still so ignorant of the principles of art as not to be able to discriminate art from art. You shall find all heaped together under the same category by the silly reviewers. The mistake made in the Houses of Parliament was made from this very want of power to discriminate between the different requirements of different kinds of art; the consequence was that ordinary easel-picture painters who were quite unversed in the kind of art and unpractised in the methods required of them, were employed upon the work. The ignorance on these subjects is so crass, that if Morland, Sir Joshua Reynolds, Gainsborough, Hogarth, and Sir Thomas Lawrence were living, I have not the least doubt they would all be invited to decorate St. Paul's.

It is strange, too, to find any one in these days advocating the use of stained glass, save and except in very moderate quantity, in conjunction with important mural works. Colour upon an opaque surface must always compare disadvantageously with that transmitted at a vastly higher pitch through glass. The more florid style of Gothic may be acknowledged to be unfit for pictorial decoration upon a large scale; its surfaces being so crowded with ornamental panelling that little space remains for the pictures. Another objection to the application of painting to Gothic architecture is the use of stained glass. A decoration so suitable in many instances to Gothic windows is incompatible with the due effect of paintings on the walls, the colours of which require to be displayed by a colourless, and at the same time a sufficient, light. This objection is met by the consideration that stained glass is not desirable nor usual in all Gothic buildings to the extent to which it was employed in those of a sacred character. Its application elsewhere was generally less profuse, and might be so contrived as not materially to interfere with the quantity or the quality of the light. But the full power of glass-painting could never be tolerated by good taste where mural painting is to reign.

I must again endeavour to rescue fresco from its detractors. Fresco was used in preference to all other methods by the great Italian masters, as may be gathered from a glance at that list of works which I have appended to my treatise on Mural Decoration. I do not know any Englishmen who by their study and practice are qualified to give a reliable opinion on fresco-painting. A great many frescoes have been retouched. The truly British notion of expecting works of art to be executed in materials which shall last till domesday did not enter the minds of the Italians. A fair lease of the beauty was all that was expected of the materials which preserved it. The artists at Westminster dabbled with the materials of fresco, but never knew how to use them. They had, indeed, the very finest material, the very finest lime,—a lime finer than that used at Munich:—

MUNICH.		DURDHAM DOWN.	
Carbonate of Lime.....	80	Carbonate of Lime ...	99·6
Ditto of Magnesia.....	20	Bituminous matter ...	0·2
	100	Earthy matter and oxide of iron.....	0·2
			100

The limestone was procured from Durdham Down, near Bristol, and was burnt, slaked, grouted, and the putty carefully stored, according to the Munich directions, which were furnished, through me, by Professor Heinrich Hess. A finer lime could scarcely be obtained. I myself painted a fresco with it, which was exposed to wind and weather for many years without the colours in any way suffering. The enduring qualities of this specimen were recorded in the *Athenæum*.

When we talk about the humidity of the climate affecting fresco, under fair conditions, it is mere nonsense, for the basis of fresco is good mortar, and we know that good mortar has remained perfectly sound from the time of the Roman occupation until now. Of course, if the best of mortar be exposed to a constant saturation of saline humidity it will decay; but this is a condition that can generally be guarded against.

I believe I have discovered a method which, in its simplicity and durability, will supersede all others. But, after all, method is a matter of quite secondary importance. It is, above all things, necessary in the interests of English art, both pictorial and industrial, that mural painting should be encouraged. And after thirty or more years' talking about it, it is time that something were done. Unfortunately, talking in England appears to be taking the place of action.

W. CAVE THOMAS.

DAMAGES FOR DEFECTIVE DRAINAGE.

JOHN THOMAS LENCH, No. 9, Nicholay-terrace, sued Brian Helm, of No. 10, Nicholay-terrace, and Charles R. Cutler, of Newgate-street, City, solicitor, for 50*l.*, for damages to brickwork, joists, sleepers, flooring, staircase, and other parts of the plaintiff's house and premises.

Mr. Willis, solicitor, appeared for the plaintiff, and Mr. Norton, barrister, for the defendants.

It appeared from the evidence of the plaintiff that the house No. 9, Nicholay-terrace, was much injured by the damp, and there was water in the basement, which was traced to arise from the defective drainage of the adjoining house No. 10; and on opening the ground it was found that the pipes were not properly laid or of a proper character; and the attention of the first-named defendant was called to the circumstance, when he said he must have it looked to, but nothing was done to remedy it.

It was endeavoured to be shown, on the part of the defendants, that the injuries to the plaintiff's house had not been caused by the imperfect drainage of the adjoining premises, but the judge said he was quite satisfied that the dampness of the house No. 9, and the injuries it had sustained, arose from the defective drainage of No. 10, and that it was only a question of damages.

Judgment was given for the plaintiff for 25*l.*

VENTILATION.

SIR,—Dr. Pettenkoffer has not, to my knowledge, recorded the temperature of the air collected by him for the purpose of determining the quantity of carbonic acid gas at the upper, as compared with the lower, parts of apartments; but Professor Roscoe's similar experiments show the quantities of this gas in 100 parts of air and the corresponding temperatures to be as follows:—

Temperature.	Carbonic Acid. Near ceiling.	Near floor.	The quantity of carbonic acid near the ceiling is to that near the floor as
12·5°c.	·2390	·2459	1 to 1·03
14·5°c.	·3305	·3253	1 to ·98
15·0°c.	·2696	·2948	1 to 1·09
16·0°c.	·1213	·1276	1 to 1·05
16·0°c.	·1382	·1684	1 to 1·21
23·0°c.	·3212	·2637	1 to ·82

If Mr. John Mackenzie's theory, as stated in your recent issue, were correct, the proportionate quantity of carbonic acid gas near the ceiling should decrease as the temperature increases; but the above table shows that no such rule exists; for, although the extremes happen to satisfy his proposition, yet, taken altogether, the differences are most irregular, and therefore do not do so.

Mr. Mackenzie, as is usual with most writers on this subject, ignores the effects of diffusion; but if he would only take this important element into consideration, the impossibility would be seen of laying down any but uselessly intricate laws for discovering the position of any particular kind of gas in any particular portion of the atmosphere of an inhabited room.

H. SAXON SNELL.

THE SHAM USEFULNESS OF COWLS.

THE result of the experiments to test the exhaust cowls exhibited at Leamington last year made by a committee appointed by the society called the Sanitary Institute of Great Britain, appears to have surprised most persons. It runs as follows:—

"The sub-committee appointed at Leamington to test the ventilating exhaust cowls, beg to report that they have given the matter their most careful attention, and carried out at the Royal Observatory, Kew, an elaborate series of about 100 experiments on seven different days, at different times of the day, and under different conditions of wind and temperature. After comparing the cowls very carefully with each other, and all of them with a plain open pipe as the simplest, and, in fact, only available standard, the sub-committee find that none of the exhaust cowls cause a more rapid current of air than prevails in an open pipe under similar conditions, but without any cowl fitted on it. The only use of the cowls, therefore, appears to be to exclude rain from the ventilating pipes; and as this can be done equally, if not more efficiently, in other and simpler ways, without diminishing the rapidity of the current in the open pipe, the sub-committee are unable to recommend the grant of the Medal of the Sanitary Institute of Great Britain to any of the exhaust cowls submitted to them for trial.

W. EASSIE,
ROGERS FIELD,
DOUGLAS GALTON."

May 30, 1878.

FLORAL EXHIBITION BUILDING IN IRON, MANCHESTER BOTANICAL GARDENS.

IN a notice of the Whitsuntide Flower Show, the *Manchester Courier* gives the following description of the new building just erected:—

The tent,—for tent it may be called,—is supported on an iron framework, is 324 ft. in length by 60 ft. in breadth, and contains therefore an area of about 2,200 square yards. The space thus placed at the disposal of the committee is ample to receive all the plants sent to them for exhibition, and visitors, who must remember with pleasure the enchanting sight which has before been afforded them, when, standing on the mound of earth placed at one end of the building, they are face to face with the perfect blaze of colour that the assembled plants present to their view, may anticipate in the coming show a finer spectacle than any they have yet been called upon to admire. The interior of the pavilion has been laid out in promenades and terraces, so as to increase the effect when it is filled with plants. The designs from which it has been erected were prepared by Messrs. W. & G. Higginbottom, architects, of St. James's-square. The ironwork has been carried out by Messrs. Edward T. Bellhouse & Co., engineers, and the covering of sail-cloth canvas supplied by Mr. Sullivan, tentmaker, Hulme. Along the sides, at the square end next the main road, leading to Stretford, and at the hexagonal end near the ornamental lake, fifty-five cast-iron columns, of special design, are ranged 12 ft. apart, connected at the top by scroll-work spandrils, and below by diagonal wrought-iron rods, covered at the intersections by cast-iron foliated shields. The curved roof principals are on the "bowstring" type, each of 60 ft. span, with oblique ties and light diagonal bracing. At the crown of the arch of the roof the ridge is raised in graceful curves, harmonising with the lines of principals, in such a way as to give the necessary support and inclination to the canvas, at a point where a quick passage of rainwater is essential in order to keep the inside dry and comfortable. It will be quite possible at any future time for the committee to glaze the roof.

WORK IN STORE FOR THE ENGLISH BUILDING TRADE.

THE judgment, recently given by the Railway Commissioners, in the case of the Corporation of Hastings *v.* The South Eastern Railway Company, cannot fail to create work for builders at the various railway stations deficient in accommodation, and they are numerous.

The Corporation of Hastings called on the South Eastern Railway to enlarge the Hastings Station; to provide better booking-offices, waiting-rooms, refreshment-rooms, and general accommodation therein; to lengthen and deepen the existing platforms, and to provide additional ones; better warehouse room for goods; to provide cattle-pens, and additional sidings for cattle-trucks; to enlarge the platforms of the St. Leonard's Station; and a new approach.

The railway company pleaded that these alterations would involve a large expenditure of money in the construction of buildings, acquisition of land, which were wholly unreasonable and unnecessary, and that the Railway Commissioners had no statutory jurisdiction to compel railway directors to create new buildings, &c.

Amongst numerous witnesses examined for the Corporation, Mr. Saunders, builder, of Hastings, said he frequently used the station for the conveyance of building materials. Some lime consigned to him was destroyed by its being uncovered from the rain at the Hastings station. Timber was delayed in delivery from the same incommodious station. It was necessary for his teams to cross the metals to get at the trucks in the siding. Loaded trucks of timber and materials were shunted to and fro to make room for other trucks. Under the best of circumstances it took a cart half a day to get a load from the railway to his yard. This was owing to want of building accommodation and more sidings.

Mr. Breeds said he had a quantity of building materials delivered at Hastings, and had frequently complained of their delay in delivery. He experienced the greatest difficulty in getting at his goods for want of railway accommodation.

Mr. Thorpe, late mayor, said the St. Leonards station required pulling down altogether. The Hastings station served a very large district outside the borough.

Mr. R. A. Hills, architect and surveyor; Mr. Jeffery, architect and surveyor; Mr. William Andrews, surveyor to the Corporation of Hastings, who estimated the yearly increase of houses at 250; Mr. Price Williams, M.I.C.E., and others, also gave evidence on the same side.

Mr. Walter Vernon, architect and surveyor, thought that the probable estimate for the little improvements demanded would be for St. Leonards 6,000*l.*, and for Hastings station 2,500*l.* The witness severely criticised the conditions of the stations.

The want of statutory jurisdiction having been over-ruled by the Court, Sir Edward Watkin, chairman of the railway company, was examined at great length, and said there was a sort of rule adopted by their company that any profits above what would pay five per cent. dividend should be divided with the public in the shape of additional accommodation. They enlarged and increased their accommodation at stations under a certain system, and did something every year. The Hastings station was constructed in 1851, and had been enlarged from time to time. As to the St. Leonards station, he thought the accommodation quite sufficient. The property was their own, and their duty was to serve their customers, and not to consult any town as to their plans.

Mr. Brady, the Chief Engineer to the Company, Mr. Miles Fenton, manager of the Metropolitan Railway, and Mr. Grierson, manager of the Great Eastern Railway, were of opinion the accommodation was adequate.

In a lengthened judgment, Sir. F. Peel, Chief Commissioner, virtually found the company guilty of all the long string of charges brought against them by the Corporation of Hastings, and decreed that remedial measures should be promptly taken. They are to lengthen and widen their platforms; provide more covered platforms, and a covered approach for carriages; more booking-office access; more waiting-rooms; and more space for goods.

So heavy a series of indictments against a powerful railway company has never before been sustained since the formation of the Railway Commission, and the thin end of the wedge having been inserted, other Corporations, ill provided with railway accommodation, are taking steps towards a reform.

Lightning.—During a thunderstorm which occurred in Perthshire recently the monument to General Sir David Baird, bart., the hero of the storming of Seringapatam in 1799, was struck by lightning, and irreparably damaged. It is situated on a bill between Crieff and Gowrie, and in 1832 cost over 4,000*l.* We conclude there was no conductor?

THE GERMAN AND PRUSSIAN BUILDING TRADES.

AT the last census of the German Empire, when the total population was found to be 42¾ millions (42,727,360), including 25¾ millions (25,752,404) belonging to Prussia, an enumeration of the various trades and manufactures was made, the results of which have been in part made known in anticipation of the official report. One of the novel features in this trade census is that the number of firms in each branch of industry has been officially ascertained, together with the number of operatives employed by each establishment. The building trades form one of the nineteen great groups of occupations, and present the following results:—Architects, 3,594 firms, employing 8,816 persons; building contractors, 4,703 firms, 67,947 persons; masons and bricklayers, 101,380 firms, 177,918 persons; masons and bricklayers, 101,380 firms, 177,918 persons; carpenters, 63,889 firms, 127,979 persons; glaziers, 13,306 firms, 20,331 persons; painters and polishers, 26,067 firms, 48,048 persons; plasterers, 309 firms, 833 persons; tilers, thatchers, slaters, 11,789 firms, 17,294 persons; asphalters and paviors, 3,314 firms, 6,218 persons; stove-setters, 836 firms, 1,213 persons; chimney-sweeps, 3,386 firms, 6,616 persons; and well-sinkers, 1,779 firms, 2,784 persons. Thus in the German Empire altogether there are 234,334 separate firms, giving employment in all to 485,997 persons in the various occupations classified under the head of building trades. Of these numbers rather more than half belonged to Prussia, the total number of firms in that kingdom being returned at 119,772, giving occupation to 244,589 persons. The figures show that out of every 88 Germans there is one person employed in the building trades, while the number of persons dependent on those trades for a livelihood, reckoning the families and servants of the masters and operatives, may, at a moderate calculation, be estimated at three times that proportion. That is to say, there would be at least one person in every 29 of the population supported by this great division of industry.

HEXHAM HYDROPATHIC ESTABLISHMENT.

A COMMENCEMENT has been made with the erection of a new hydropathic establishment at Hexham, Northumberland. The undertaking is in the hands of a Limited Liability Company, with a capital of 30,000*l.*, in 10*l.* shares, and was initiated in 1876 by an agreement to purchase Westfield House and grounds,—a residential estate most picturesquely situated within a mile of the town. During the past few years the town has unfortunately suffered from its evil reputation in a sanitary sense, the death-rate having reached the alarming figures of 28·00, 30·50, and 33·60 per thousand in the years 1873, 1874, and 1875 respectively. Last year, however, as the result of a Local Government Board inquiry, extensive alterations were effected in the flushing and ventilating arrangements of the sewers (constructed about thirteen years ago), and important additions were at the same time made to the sewerage system. It is hoped that these works, together with the greater amount of attention now devoted by the authorities to the removal of nuisances, and to sanitary matters generally, will result in greatly improved conditions, and render the town a a desirable place of resort, for which it is eminently adapted by the natural beauty and salubrity of its position. Mr. W. L. Newcombe, of Newcastle-on-Tyne, is the architect to the Company, and the contract for the necessary extensive additions to the buildings has been obtained by Messrs. Reed, of the same town. It is expected that the establishment will be ready for the reception of patients next season.

HORSES AND ASPHALTE.

SIR,—Can nothing be done to save our horses from the tortures and dangers they now endure through the asphalte pavement of our City streets? This pavement may be looked upon with favour by business men because of its noiselessness; but after twenty years' experience as a riding-master I consider it gross cruelty to horses, and positively dangerous to man, to ride or drive on pavement so paved, especially after a slight shower of rain. About a week ago, when returning from Rotton-row, where I had been riding with some of my pupils, I had to pass through King-street, Cheapside; a slight shower having fallen, I dismounted, and had my horses led; and although without burden of any sort, a sure-footed and very valuable animal, led with the greatest care by myself,

fell with such force that it has not yet recovered from the shock. It was the merest chance that a heavily-laden wagon did not pass over the forelegs of the animal, as the street was as slippery as glass. Had a rider been on its back a broken leg would have certainly been his fate.

I have written to the secretary of the Society for the Prevention of Cruelty to Animals, as it is high time they took the matter up. I am also forming a committee of my pupils and gentlemen who have suffered inconvenience from this pavement, so as to rid London of a nuisance too long meekly tolerated. If any of your readers will aid me in this good work, their cards will be highly esteemed by

F. A. EVANS.

DISSENTING CHURCH-BUILDING NEWS.

Northampton.—Gold-street Wesleyan Methodist Chapel, Northampton, is about to be improved and enlarged, at a cost of 1,200*l.*, from plans prepared by Mr. S. J. Newman, architect. The proposed alterations will include the repewing of the lower part of the chapel, enclosing the gallery stairs, altering the front of the gallery, erecting a new orchestra and rostrum, making new ceiling, and re-slating the roof, and the re-lighting and ventilating of the building.

Soho Hill, Birmingham.—On the 9th ult. the memorial-stone of a new Congregational chapel was laid at Soho Hill, Birmingham. The cost of the site was 2,965*l.*, and the contract price for the erection of the chapel and schools, and class-rooms in connexion therewith, is 10,973*l.* The architects are Messrs. Bidlake & Fleeming, of Wolverhampton, and the builders, Messrs. Horsman & Co., of the same town. Provision will be made to seat a congregation of 1,200 persons.

Brighton.—A new iron church, recently erected by the Wesleyan congregation in Brighton, upon the Preston-road, near the Viaduct, was opened on Tuesday. At the end of five years it is proposed to build a permanent chapel in the place of and upon the spot of the newly-opened iron structure. The church is covered with galvanised corrugated iron, the interior lining and pews being of varnished deal. It is estimated to accommodate about 310 persons. From end to end the building measures 70 ft., its breadth is 31 ft., and its height to the ridge of the roof about 23 ft. It has been built by Mr. W. F. Dennis, of London. The cost has been about 1,000*l.*

Books Received.

The Construction of Roads and Streets. By HENRY LAW, C.E., and D. K. CLARK, C.E. Illustrated. London: Crosby Lockwood & Co. 1877.

THIS work consists of two parts. The first is a treatise on the art of constructing common roads, written by Mr. Law, which has been revised and concluded by Mr. Clark, who has prefixed an historical sketch of the roads of England. It is a remarkable fact that while the island is scored from north to south, and from east to west, by the long straight lines traced by those great engineers, the Romans, the art of road-making is one that appears to have been almost entirely lost in this country after the termination of the four centuries of Roman rule. The same thing has occurred in other countries, notably in Syria, but has there been quietly attributed to the barbarism of the people. The viability,—to use a long word for lack of a short one,—of our turnpike-roads is chiefly due to the invention of Mr. Macadam. But the mode introduced by him, sixty years ago, of covering a rounded surface of earth with small broken stones, which are ground and compacted by the wheels of the vehicles into a hard uniform surface, has been in practice on the breccia roads of Italy time out of mind. The utter absence of good roads in England a century ago is a matter which would now be incredible, were it not so well attested.

It would have been well if Mr. Clark had collected a little information as to the introduction of the turnpike system, the length and cost of roads constructed under it, and the mode in which the later introduction of railways rendered the self-supporting system inefficient. As it is, his sketch is hardly to be called even a diagram of the history of our roads. In 1864 1,000 turnpike trusts existed in England, and 200 had been abolished. In 1821, as we learn from Sir John Rennie's life, 24,581 miles of turnpike road existed in England, and 8,000 in Ireland. In 1837 the debt on the turnpike trusts stood at 7,500,000*l.*, and the annual receipt from tolls was 1,509,985*l.* In 1869 the receipts had sunk to 934,233*l.*, and the expenditure was 929,340*l.* The length of turnpike roads existing in 1864, according to the report of the Local Government Board, was 20,636, to which has to be added 106,573 miles of highways. A work devoted to the subject of roads should give a *resumé* of these and similar facts. It should tell us what was the cost of road-making in the time of Telford, and give something of an engineering history of this essential element of civilisation. In this the work before us is sadly defective.

Mr. Law describes the laying out of a road, laying stress on the use of a map marked with contour lines, which, of course, reduces the task of the designer to a minimum, but for which the road-maker in India or Australia cannot be advised to wait. He speaks of the ordinary elements of construction, and gives a useful chapter, illustrated by tables and by formulæ, of the resistance to traction on common roads. This is followed by chapters on sections and inclines; on repairing and improving roads; on construction of roads, foundation and superstructure; on paved roads and streets; on hedges and fences; and on taking out quantities. There is a want of order and of system, as will be observed from the preceding list of chapters, in the work, but much valuable information is brought together in the pages.

In the second part of the volume Mr. D. K. Clark treats of the recent practice in the construction of roads and streets. The first chapter tells of the materials employed in such construction; and affords useful data for comparison between Macadam, asphalte, and wood. Three chapters are devoted to the first mode of covering; and the questions of cost, wear and tear, and resistance to traction, are fully illustrated. The cost of speed, when horse-power is employed, is remarkably shown from observations made by Mr. Farey. At two miles and a half per hour a horse will draw with a force of 100 lb., and the day's work will amount to 2,000 mile-pounds. At ten miles per hour the traction is reduced to 28 lb., and the day's work to 420 mile-pounds. Another curious observation is taken from Sir John MacNeil, to the effect that 1 lb. of iron, in shoes, is worn away for sixty-three miles run by a horse, while 193 miles are run by a coach for the loss of 1 lb. worn from the tires. Comparing the weight of a horse with that of a coach the reverse might have been expected to occur. The observations show how much more destructive the hammering action of the horse's foot at a trot is than the rolling action of the wheel; and this gives light as to one of the sources of economy attainable by the introduction of steam as a locomotor power. Sir John MacNeil's proportions for the generality of roads are as follow:—

Cause of wear.	Fast coaches. Per cent.	Wagons. Per cent.
Atmospheric changes.....	20	20·0
Wheels	20	35·5
Feet of horses that draw the vehicles	60	44·5

The stone pavements of London, Liverpool, and Manchester, are described in considerable detail. Very much valuable information as to paving has been collected by the City Surveyor, Mr. Haywood, and has been fully employed by Mr. Clark. It may be useful to observe that the hardest and most durable stone is not so suitable for City paving as that of a somewhat softer nature. On the former the horses slip so constantly as to cause a serious interruption to the traffic. At the cost of a partial abrasion of the surface of the stone the greatest economy is secured all round. Mr. Clark says, "The hardest granites have invariably caused so much dissatisfaction that they have to be removed before they have been down many years. For instance, Penmaenmaur greywacke paving was laid in Newgate-street in 1851, and it was removed after a trial of two years and a half, as it was the cause of repeated complaints of slipperiness and noisiness. The Aberdeen blue granite sets have been for the most part employed in the construction of City pavements; they are considered to be the best, taking together the first cost, the durability, and the absence of slipperiness."

On the great question of the best pavement for London, as to which we gave consideration in No. 1,828 of the *Builder*, much useful detail will be found in Mr. Clark's book. It may be remembered that we found it hard to decide between the relative advantages of wood and of asphalte. The cost of the two is approximately the same. Safety, according to the observations of Mr. Haywood, is greater on wood,—the falls of horses being as 1·7 on asphalte to 1 on wood. To what was then remarked we wish to add the *per contra*, that the physiological test,—which is certainly the most important of all,—is in favour of asphalte. The perfect ease of running over the homogeneous surface is much less trying to the human nerves than is the succession of small blows given and sustained by the wheels on wood. In the increasing stress that is daily thrown upon the human system by the requirements of business, the question of quiet is perhaps the most important of all those that have to be considered with regard to the construction of roads.

A short chapter on stone tramways in streets is principally based on a "Report on Stone Tramways in Italy," by Mr. P. Le Neve Foster, jun., C.E. Some familarity with these roadways enable us to speak of them in very favourable language. Tramway is perhaps an improper term. The principle on which Turin and other Italian cities are, to a great extent, paved, is that of laying large blocks of smooth, well-jointed stone for the wheel-tracks, with pitched foot-ways for the horses between. For light rapid traffic this rigid roadway is disadvantageous, being destructive to the horses and to the vehicles,—throwing, in fact, the wear and tear off the road on to the moving stock. But for slow heavy traffic, and even for that mixture of heavy and of light traffic which is found in the commercial parts of London, nothing could be much better. Penmaenmaur stone, carefully dressed, might be found most admirably adapted for the wheel tracks; and if for the horse tracks the best wood paving were employed, we should probably have a compound pavement that would unite the chief elements of durability, ease of traction, cleanliness, and safety in the most thorough manner. We should still hear the loud rumble of the wheels, but cannot expect to have everything we desire. We recommend all those who are interested in the subject,—and what Londoner is not?—to consult the information afforded by "The Construction of Roads and Streets."

It may be useful, in reference to that account of the turnpike roads and highways of England, which a book on the construction of roads ought to contain, to add some notes as to the roads of France, taken from the *Revue des Deux Mondes* for June 1st, 1878. The area of France, it will be remembered, is 204,100 square miles, or about half as much again as the area of the United Kingdom. "There exist at this moment," says the *Revue*, "on the French territory, about 38,000 kilomètres of national roads, 46,000 kilomètres of departmental roads, and 360,000 kilomètres of vicinal roads." It has been calculated, from official documents, that the stone annually required for the repairs of the national roads amounts to forty-five cubic mètres per kilomètre. The Reviewer deduces from this estimate that the stone required for the annual repair of all the roads of France would form a hill of two kilomètres and a half in circumference and 400 mètres high. According to figures given by Mr. Clark, the cost of maintaining 123¾ miles of the suburban ways of the metropolis come to 534·5*l.* per mile, of which 238·6*l.* per mile was the price of granite and other hard stone. This figure, with an addition for flints and gravel, amounted to about 4d. per square yard, or 3s. 4d. per yard run of road. About forty cubic yards of granite, and 100 cubic yards of flint per mile, are the resulting quantities, the wear being 7½ in. deep over the whole surface of the roads in the year. This is seventy-five per cent. above the ratio of the French roads. But when it is remembered that in the one case we deal with suburban lines of way, and in the other with the national highways of a whole country, the comparison is favourable to the English road-maker.

We may add that the average cost of the maintenance of the turnpike roads, as they formerly were called, in England, in 1875, was 35*l.* 15s. 3d. per mile. In Wales, the cost was as low as 26*l.* 3s. 8d. per mile. As far as information has been collected, the ordinary road traffic has rather been diverted than destroyed by the introduction of railways. In France this is stated positively; the diminution of travelling on the truck lines, to which the railways run parallel, being fully made up by the increase of traffic on older lines. As far as the United Kingdom is concerned, the only information which we have seen referred to on this subject is based on the number of horses employed in subsidiary traffic, which is, we believe, considerably larger than that taken off from the

long lines. The re-establishment of the stage-coach, moreover, on certain favourite lines of road, during the summer, is a feature not to be lost sight of. Though our roads are superseded by our railways, for long distances, their importance to the country is rather increased than diminished by the enormous impulse given to our traffic,—and all that concerns their best and most economical construction and maintenance is of extreme value to the engineer.

Miscellanea.

The Old Workhouse, Lambeth.—At the weekly meeting of the Lambeth Board of Guardians, Mr. Hedley, one of the inspectors of the Local Government Board, attended for the purpose of addressing a few words to the Board with respect to the proposal to sell the old workhouse premises in Princes-road. He did not think, in making an application to that effect to the Local Government Board, the Board had fully realised the effect of their doing so, because he did not think the circumstances of the parish would justify such a proceeding. It was only that time last year they had in the workhouse 144 more persons than it was certified for, and now there were more in the house than there should be, whilst the place set apart for lunatics was wholly unsuitable. Nothing was more prejudicial to the proper administration of relief than for a parish to be short of workhouse accommodation, especially one like theirs, where they were spending 15,000*l.* a year in out-relief. A long conversation took place upon the subject, which the chairman closed by stating that when the guardians decided upon going to the enormous expense of building the new infirmary, they only did so after finding that the old building in Princes-road was quite incapable of improvement, and he therefore did not see what good they would now do by keeping such a building.

Manchester.—An institution for the adult deaf and dumb has been erected in Grosvenor-street, by Messrs. Robert Neill & Sons, at a cost of about 3,500*l.*, from the designs of Mr. J. Lowe, architect, Manchester, which were selected in competition. The principal elevation, fronting Grosvenor-street, is faced with Yorkshire stone, and is somewhat ornate. The building is designed in the Early English style, and internally is arranged in the basement as a gymnasium, and on the ground floors as a reading-room, coffee-room, secretary's office, class-room, and conveniences. The upper floor is devoted to a lecture-hall, with galleried floor. It is octagonal on plan, well lighted from the roof, and has a vestry and other requirements. The foundation-stone was laid by Mr. Hugh Birley, M.P., on June 2, 1877, and the building was opened on the 8th inst. by the Bishop of of Manchester.

One Way of Learning to Swim.—Lieut.-General J. E. Alexander, in view of the great numbers of lives recently lost through the inability of the unfortunate persons to swim, advocates the adoption of the following plan for teaching natation, which he says he has himself employed successfully. He says,—"Swimming may be taught in two days in this simple and inexpensive manner:—A pole 8 ft. or 10 ft. long is secured and projected from the stern of a boat; an iron ring at the end of the pole. A man rows the boat slowly in smooth water; another stands up in the boat and supports the learner by a girth round the chest, and a rope passed through the ring of the pole. He directs the learner how to make his strokes with his arms and legs (frog-like); supports him easily in the water, and gives him confidence. The third day he may dispense with the support."

Artisan Reporters for the Paris Exhibition.—At a meeting of the Birmingham Chamber of Commerce this week, the question of sending skilled artisan reporters to the Paris Exhibition, as advocated by the Prince of Wales in his letter to the joint Commission (published in the *Builder*, p. 415, *ante*), was discussed. Several manufacturers strongly supported the proposal, and offered subscriptions, after which, on the motion of Mr. J. S. Wright, seconded by Mr W. Wiggan, it was resolved,—"That a committee be formed to take into further consideration the expediency of sending artisan reporters to the Paris Exhibition, to confer with the Society of Arts thereon, and, if necessary, to call another meeting on the subject to take such other steps as they may deem necessary."

The Walter Press.—The *Daily News* of Saturday says:—"The great increase in our circulation having rendered the machinery,—seven Walter presses,—no longer adequate to produce the numbers required, an eighth Walter press, ordered a few weeks ago, has this week been erected in the machinery room of the offices in Bouverie-street, and was yesterday morning brought for the first time into use. The result, which is an extraordinary one, deserves mention in the history of machinery. Yesterday morning the eight presses, working simultaneously at the astonishing rate of 104,000 perfect copies per hour, accomplished the printing of no less than 120,000 copies of the *Daily News* in time for the departure of early newspaper trains.—*Times*.

New Cemetery, Darlington.—A memorial of the late Joseph Pease has recently been presented to the town in the form of a cemetery of fourteen acres, and the chapels and lodges in connexion therewith. Each member of the Town Council has received notice to inspect the buildings on the 19th inst. The Town Council, to mark their appreciation of this munificent gift, have erected, in a conspicuous part of the cemetery, a memorial of freestone and Sicilian marble, 23 ft. high. There are four panels in the base, and there is a suitable inscription on each. The shaft is formed by clustered columns, terminated by moulded caps, weatherings, and carved finial. The architect, both for the buildings and the memorial, is Mr. Geo. Gordon Hoskins, of Darlington.

Cleopatra's Needle.—The preparations for erecting the obelisk continue to progress. Two courses of the granite outside blocks of the base which will bear the monolith have been laid on three sides of the base, and the brickwork to fill the centre is being laid. Men are at work getting ready the scaffolding to enable the monument to be set up, and progress is being made in stripping the iron plates off the circular ribs of the *Cleopatra* ship. By permission of Mr. John Dixon, the Civil and Mechanical Engineers' Society will visit the works on Saturday next, the 22nd inst.

Robbing the Cambridge Slade Professor of Fine Art.—At the Marlborough-street Police-court, on Wednesday, William West, cabman, and Matthew Murphy, described as a horsekeeper, were charged on remand with being concerned in stealing a portfolio, containing engravings of the value of 1,500*l.*, and a black bag, the property of Professor Sidney Colvin, of Trinity College, Cambridge. The robbery took place from a cab which had been engaged to convey the Professor from the Savile Club. The magistrate expressed his intention of committing the prisoners for trial.

Ropemakers' "Fields," Limehouse.—At the last meeting of the Limehouse District Board of Works, with respect to a reference from the Board as to the condition of some houses in one of the courts in Ropemakers' Fields, Limehouse, Dr. Rogers reported that, after inspection, he had taken proceedings at the Thames Police-court, the result of which was that an order had been obtained from the magistrate to close the houses forthwith, and until they were repaired to the satisfaction of the Board.

Proposed New Laundry at Paddington Workhouse.—At the last meeting of the Paddington Board of Guardians, a report from the Workhouse Structural Arrangement Committee, recommending the construction of a new laundry, and that Mr. H. H. Collins, the architect, be engaged to prepare plans and specifications for the new building, was adopted.

The Society of Engineers will, on Monday next, visit Messrs. Doulton's potteries at Lambeth, afterwards proceeding to the well-known engineering workshops of Messrs. Maudslay, Sons, & Field, and thence to the Blackfriars Goods Station of the London, Chatham, and Dover Railway, to see the hydraulic machinery.

Want of Work.—There were 121 applicants, according to the *Sanitary Record*, for the office of Surveyor to the Corporation and Urban Sanitary Authority of Leamington, at 300*l.* per annum. How many of them, we wonder, could discharge properly the duties of the office?

The District Surveyors' Association.—The members of this important association dined together, as of old time, at the Albion, in Aldersgate-street, on Wednesday evening last. Mr. Edmund Woodthorpe presided genially, and some pleasant speeches were made.

New Esplanade, St. Leonard's-on-Sea.—A new esplanade, about 2,000 ft. in length, was formally opened on Wednesday at St. Leonard's-on-Sea. The work extends the parade at Hastings and St. Leonard's to about three miles. A luncheon was given by the Rev. J. Alton Hatchard in celebration of the occasion.

The Architectural Association's Annual Dinner will, as announced by advertisement, take place on Tuesday evening next.

TENDERS

For schools, teachers' house, boundary walls and fences, and asphalte play-grounds, at Sutton Bridge, for the Long Sutton School Board:—

Girling & Son	£1,820 0 0
Goodman & Ream	1,770 10 0
Dawson	1,567 0 0
Allister	1,549 0 0
Waterman & Bateman	1,543 0 0

For rebuilding No. 11, James-street, Cannon-street, for Mr. Stark -

Holist	£300 0 0
Palmer	675 0 0
Moyle & Son (accepted)	674 0 0

For four houses, Green-lane, St. Helen's. Mr. James Rimmer, architect. Quantities supplied:—

Belsher	£2,198 0 0
Harris & Sons	1,990 0 0
Barton	1,990 0 0
Harrison	1,989 0 0
Whittaker & Forster (accepted)	1,985 0 0

For additions to Fortescue House, Twickenham, for Mr. W. Williams, and the committee. Mr. E. P. Loftus Brock, architect:—

Downs	£1,825 0 0
Nye	1,680 0 0
Messom	1,548 0 0
Brass	1,440 5 6
Ennor, Julian, & Co.	1,350 0 0
Matlock	1,087 0 0
Haynes (accepted)	1,078 16 6

For rebuilding No. 45, Gerrard-street, Soho. Mr. C. F. Hayward, architect:—

Langmead & Way (accepted).

For alterations at the Dolphin, Tonbridge-street, Euston-road, for Mr. J. Ayars. Mr. J. R. Furniss, architect:—

Hatcham	£142 0 0
Kent	108 0 0
Schister	72 10 0

For building coachhouses and stables at the rear of Crogsland-road, Chalk Farm-road, for Mr. George John Smith. Mr. James R. Furniss, architect:—

Toms	£965 0 0
Rowe	912 0 0
Durnford	847 0 0
Steed	864 0 0
White (accepted)	697 0 0
Scrivener	696 0 0

For additions to Dynmore, Watford, Herts, for Mr. H. S Sherry. Mr. C. A. Legg, architect:—

Allen	£726 0 0
Chadwick	634 0 0
Waterman	599 0 0
Turner	595 0 0

For New Marine Hotel, Hythe, Kent, for the South Eastern Railway Company. Mr. F. W. Porter, architect. Messrs. Williams & Gritten, surveyors:—

A.—*For Concrete Works only.*

Langmead & Way	£6,486 0 0
Naylor	5,990 0 0
Drake	5,935 0 0
Belham & Co.	5,934 0 0
Higgs & Hill	5,499 0 0
Adcock	5,204 0 0
Slade	5,196 0 0
Prebble	5,060 0 0
Perry & Co.	5,000 0 0
Clemmins	4,539 0 0
Braid & Co.	4,368 0 0
Fowler	4,312 0 0

B.—*For all other Trades.*

Prebble	£26,030 0 0
Slade	24,749 0 0
Belham & Co.	22,886 0 0
Naylor	21,890 0 0
Perry & Co.	20,790 0 0
Higgs & Hill	20,494 0 0
Adcock	20,262 0 0
Fowler	20,032 0 0
Clemmins	19,692 0 0
Langmead & Way	19,349 0 0
Braid & Co.	18,830 0 0

For dwelling-house, &c., to finish, Harefield-road, Uxbridge. Mr. Godbolt, surveyor:—

Salmson	£3,600 0 0
Hunt	2,486 6 6
Cave	1,953 5 6

For building seven cottages at Mortlake, for Mr. H. Ashman. Messrs. Trees & Innes, architects:—

Tozer (accepted)	£1,150 0 0

For alterations and additions to No. 63, Bridge-street, Swindon. Mr. W. H. Read, architect:—

Webb (accepted)	£291 0 0

The Builder.

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Roadways, Railways, and Waterways.

AMONG the latest developments of mechanical theory is the general solution of the machine problem proposed by Professor Reuleaux. This is dependent on the proposition that the machine, from a kinematic point of view, must be divided into pairs of elements instead of into distinct elements. A large and learned volume, entitled "The Kinematics of Machinery," in which the principle has been carried out, has already engaged our attention more than a year ago.

There is a corollary which may be derived from the doctrine of the kinematic pair which has not yet received specific attention. It is possible that very important results may spring from its consideration and demonstration. It is this. As the elements of any machine, or complex system of machinery, are to be reduced to pairs, from a mechanical point of view, so may they be considered as pairs from an economical point of view; and the question will then arise, how far are we likely to arrive at definite results, which shall combine all the certitude of science with all the utility of practice, by the formal consideration of the economic pair of elements, in the same manner that Professor Reuleaux has taught us to consider the kinematic pair of elements?

The case to which attention should first be directed in this novel inquiry is one of primary social and industrial importance. It is that of the transport of bodies from place to place. The rapidity of the growth of our scientific industry is shown by the fact that this phrase no longer comprehends, as it did at the commencement of the century, the whole question of communication. Messages are not bodies. The necessity which formerly existed for the transmission of a written document is no longer absolute. The words of a speaker can be intimated at almost or quite the rapidity with which they are spoken, by a series of larger or shorter flashes, of louder or softer ticks, or dots and dashes, at any distance within the range of the electric telegraph. Nay, the far more wonderful discovery of the telephone,—which was deferred rather than hastened by the experiments with the magnetic needle, — promises to render distance a very surmountable obstacle to the most intimate and unmistakable conversation.

Omitting, then, for the present, as a separate branch of inquiry, the subject of the transmission of thought, whether by signs or by sounds, it is proposed to regard the question of the economical aspect of the elementary pair or pairs which form the machinery for the transport of bodies. Such is the general problem. The most important cases for consideration will be those of the transport of the human body itself (or passenger traffic) and of the transport of goods or merchandise. Minor divisions, no doubt, exist, but their consideration may, for the present, be postponed.

We pass over the primary question of automatic or self-contained power. The admirable mechanism by which the man walks, or the horse trots, and even trots with the man on his back, is a subject for the physiologist, rather than for the engineer, to discuss. Our present business is with machines made by man; not with the mechanical functions of the human or of the animal body, although it is to the exercise of these functions that the measurement of the force of machines is even to the present time referred. We still use the conventional unit of the horse power in speaking of a machine; though we have to specify whether that horse power be nominal, indicated, or delivered. We start, then, with the machine.

The economic pairs of elements which form the foundation of machinery for transport are primarily three, according to the fact whether the transport is to be effected by air, by water, or by land. The consideration of the first pair, by the use of which the aëronaut attempts to emulate the bird, we at present omit. In water and in land transport, four distinct cases demand attention. These are, first, transport by sea. Second, inland transport by river or canal. Third, land carriage by horse power. Fourth, land carriage over an artificially prepared metal surface, either by horse power or by mechanism.

Whichever of these four pairs of elements we consider, we shall find that a certain natural limit is imposed both on the weights to be transported, and on the speed at which that transport is to be effected. These questions of weight and of speed are, indeed, secondary; but they are, nevertheless, of extreme importance. The present question is the economic cost of each element of each pair.

Let us commence with ocean traffic. Here the fixed element, over which the mobile element is propelled, is provided by nature. It exists, in certain localities, without need of preparation or of maintenance. Economically regarded, it is afforded absolutely without cost. It may, however, simplify the inquiry to regard port and harbour dues, or any costs attendant on embarking and disembarking, as those of the watery road. For a long voyage these costs will be almost infinitesimally small. For a coasting voyage from port to port, along a well-lighted shore, they may prove considerable. But if they tell upon net earnings, they in no way involve outlay of capital on the part of the transporter. His whole outlay is concentrated upon the mobile element of the pair. His capital is invested in the construction of vessels, and his yearly payments are devoted, mainly, to their maintenance and propulsion.

It is thus evident that a very great advantage is secured to the transporter by sea, from the fact that a fixed element, capable of resisting any strain that may be brought to bear on it, and offering the minimum amount of friction to the moving element, is provided for him gratuitously. His whole expenditure can thus be concentrated on the provision of the movable element of the pair, and in the impartation of motion. As to this, indeed, he is also provided with a motive power that costs him nothing. It is, however, objectionable, on the ground of its incertitude. From the time that the first canoe was launched on the sea, by neolithic, or perhaps by palæolithic mariners, down to the revolution effected by the discovery of Watt, the mariner had depended on the gratuitous but uncertain service of the wind as a propelling power. When it became evident, somewhat slowly, that the mechanical power of heat was applicable to the propulsion of ships, the great object first sought by the naval engineer was to use steam as an auxiliary to sails, and to take advantage of the ready service of the wind whenever it blew. This idea has been only recently discarded. It is, however, the latest decision of the naval architect that auxiliary steam power is a mistake. The *gratis* service of the wind involves a cost greater than that of coal—the cost of time. The navy of the future will be mechanically propelled; and sailing vessels will remain only in the possession of the yacht club or other non-commercial owners.

The shipowner, then, provided with the immovable element of his machine pair gratis, and provided with a motive power which is better worth applying than the gratuitous service of the wind, is to a great extent unrivalled as a carrier. If shipowners were a united body, and arranged for the division of business without mutual competition, the rate of freight would be fixed at the figures that would bring the largest returns, taking into consideration quantity, as well as price, of transport. As it is, the rates are subject to mischievous fluctuations. The freight of corn from Calcutta, which last year was quoted at 70s., is to-day quoted at 20s. In July, 1876, the freights from the Danube to England fell to 4s. 6d. per quarter, which is less than 1-12th of a penny per ton per mile. If vessels could be found to charter at this rate, as was actually the case, the profit made when, as in the following November, freight reached 9s. 3d. per quarter, must have been considerable. No *data* have been as yet collected to show the comparison of the constructive cost, and of the earning per annum, of a given class of vessel per ton. But it is said not to be unexampled that a vessel should earn its own cost by its gross freight within a year. This may be considered as the outside benefit which normally can be derived from the utilisation of a single element of the economic pair. If in this case the working cost be half the gross returns, we may perhaps consider that we have the most favourable instance of transport, viewed from the economical standpoint.

In the second case of water-carriage, that of internal communication, a cost attends on the provision of the fixed element of the pair. In the most favourable case, that of navigable rivers, this cost is low. The average cost per mile of the 4,138 miles of internal navigation in England, for construction or putting in navigable order, was 3,335*l.* The expense of the Birmingham Canal,—one of the most lucrative ever made,—did not amount to double this cost. Allowing 7 per cent. for interest and depreciation, the annual charge, in the latter case, for the fixed element of the pair is only 420*l.* per mile. The original 1,000*l.* shares in this canal were divided into thirty-two parts, each of which, in the year 1865, was saleable at about 948*l.*, paying 4 per cent. on that price. The tonnage on that canal, in 1868, was 6,982,773 tons: the impost of 0·0014d. per ton per mile would therefore pay the cost of the fixed element of the pair. At the other end of the scale, the Suez Canal, which has cost 70,000*l.* per mile for works alone, has been raised to the large paper cost of 162,000*l.* per mile by the financing adopted in order to float the undertaking. This cost is for the fixed element of the pair alone. The moveable element, both in capital and expenditure, is provided by the owners of vessels who use the canal. In this case the charge of ten centimes per ton per mile is cheerfully paid, in order to effect a saving of some six or eight weeks of voyage. The value of the saving of time as an element of income is thus most signally illustrated.

The propulsion on canals is yet in a state of infancy. Horse-power is for the most part used. The remarkable results of the application of speed to fly-boats on canals, according to the experiments of Fairbairn, have been neglected in consequence of the attention concentrated on railways, where a much higher speed was attainable with certitude. The cost of horse-towage on the English canals has been estimated at 0·35d. per ton per mile. In France it has been reduced to 0·27d.; at which price steam screw tugs have been employed in England. Boats with engines on board have reduced the cost of propulsion to 0·20d. per ton per mile. On the Aire and Calder navigation the cost of steam haulage up and down the stream is as low as one-eighth and one-tenth of a penny per ton per mile. The cost of vehicle is lower, per ton, in canal boats than in any other means of transport. With ample traffic, and economical working, canals, as presenting the cheapest form of both the fixed and the moveable elements of the machines, are at this moment in some instances the best paying modes of transport. It may be confidently expected that they will again play a considerable part in internal traffic, as the scientific appreciation of the value of this pair of elements is very highly in their favour. The causes which have strangled the traffic of most of the English canals have not been either mechanical or (properly speaking) economical.

The third pair of elements to be considered is afforded by the conduct of vehicles drawn by horses over an ordinary road. An element of cost here comes in which is unfelt in ocean traffic, and which is not always very perceptible in canal traffic. This is the overcoming the natural elevations of the country. In canals this is now for the most part effected by locks, and, when water is plentiful, loss of time is the chief objection. On roads, the limit of horse-power is soon attained, when the hills to be surmounted are steep. The cost of the fixed element in this mechanical pair is due first to the effort to diminish or equalise the resistance of gravity, which is effected by grading the road, involving more or less earthwork and masonry; and secondly, to the effort to diminish the running friction, and to equalise it as between summer and winter; which is effected by paving or metalling the roads, so as to present a hard level surface to the wheels of the vehicles and for the feet of the horses. The cost of the roads now constructing in India varies from 1,500*l.* per mile where the works are light and labour is abundant, to 2,700*l.* per mile where the works are heavy and labour scarce. This is for construction alone. About 300*l.* per mile has to be added for metalling; the width of the road, exclusive of side paths and fences, being 16 ft.

For the maintenance of a macadamised road the cost in the metropolitan district amounts to 250*l.* per mile, equivalent to 2s. 10d. per square yard, per annum. A minimum cost is that of the highways in Sunderland, which does not exceed 25*l.* per mile per annum. Both original cost and (and that in a higher degree) annual outlay, must be regarded as functions of the traffic. In some of the London streets this may be considered to have attained the maximum, at least for the hours of daylight. For the best wood pavement the first cost of laying is 18s. per yard. The highest annual cost of maintenance returned is in Lothbury, where for twelve years it has averaged 3s. 4d. per square yard. A 30-ft. carriage-way, accommodating four lines of vehicles, will thus cost for maintenance, in an extreme case, 2,933*l.* per annum, exclusive of the interest on the sum spent in grading the road.

In regarding the modes of transport in the abstract, we thus see that a cost which is proportionate to the wear and tear caused by the traffic, and which rises to a considerable sum for a constant traffic, is necessary for the permanent element of the paved or metallic road. It should, however, be borne in mind that this cost is rather matter of public necessity than of commercial import. We have now no instances of roads made and maintained by contractors, or private individuals, as paying speculations. To some extent, therefore, the traffic that makes use of the public highways holds a similar position to the ocean traffic. In that, the stationary element is provided free of charge by nature. For ordinary road traffic it is provided, free of direct charge to the users, by the State.

The second part of the expenditure on this mode of transport, that of the cost of the provision and impelling of the movable element of the pair, varies according to the character of the traffic, and according to the speed. We may take as a case of average condition that of the London General Omnibus Company. In this instance the gross annual receipts are equal to 125 per cent. of the cost of the moving stock, in vehicles and horses. The dead weight moved is almost exactly double the net or paying weight. The cost of carriage per ton-mile gross is 3·8d. per mile. The amount of capital invested by the company is so small as to afford a fair dividend at a moderate rate of profit on the yearly outlay; and the gross revenue amounts to a charge of but little more than 4d. per ton-mile gross of passengers and vehicles. We have here an instance that is very favourable as far as the free provision of the fixed element, and the comparative low cost of the movable element is concerned. Propulsion is costly; but the small amount of margin required for profit renders the enterprise sound and remunerative under able and honest management. With increased speed of transit the cost per ton-mile gross will increase, as with reduction of speed it will diminish. Further data as to the extremes are desirable.

In the fourth of the cases which we have proposed to examine, the effort has been made, first, to diminish running friction; and, secondly, to increase velocity, by means of mechanical propulsion. For this end, the immovable element of the kinematic pair has to be provided by the carrier, as well as the movable element and the working cost. In the first instance, at Killingworth, the saving of friction was the main object proposed. In the earliest and rudest efforts this class of resistance was reduced by from 50 to 75 per cent. by the introduction of an iron bearing surface for the wheel tracks. In the later perfection of the railway, the running friction is reduced from 45 lb. per ton, which is that offered by a road in good order, to 7 lb. or 8 lb. per ton; or to one-sixth of the most favourable case of ordinary road. This saving, however, does not represent an equal saving in cost, except in the case of an absolutely level road. The resistance offered by gravity increases in exact proportion to the incline to be surmounted. It has been the rule of the most thoughtful engineers so to lay out their roads that the force of gravity should equal the resistance of running friction on a descending gradient; so that this resistance on a level would not be more than doubled on the ascent. Thus Sir J. Macneil graded his mail-coach roads at 1 in 50; and Mr. Stephenson laid down the ruling gradient of 1 in 330 for the London and Birmingham Railway.

The cost, however, at which the fixed element of the kinematic pair is thus provided is very heavy, and it is a cost which falls entirely on the carriers. With the general decline in the net earnings of railways that has of late years been the rule, the companies have ceased to give more information than has been dragged from them by law. It is thus necessarily difficult to distinguish the cost of the paid and of the mobile element in the railway system. In the United States of North America the cost of the two elements together is under 12,500*l.* per mile. In the United Kingdom it is 39,000*l.* per mile. In England alone it rises to an average of 45,444*l.* per mile. On the Metropolitan District Railway it has risen to the enormous price of 683,866*l.* per mile. In this last instance the cost of the movable element is one-fortieth of that of the fixed element. On the chief passenger-lines the cost of the moveable element rises from 2·5 to 7·86 per cent. of the total outlay, according to the increase in the heavy traffic. On the trunk lines with heavy mineral traffic, the cost of the movable element rises from 9·16 to 16·92 per cent. of the total cost. In the last instance, that of the North-Eastern Railway, the total cost per mile is 37,078*l.*, of which 6,320*l.* is the cost of the movable, and 30,758*l.* that of the fixed element. On the Brighton, the cost of the former is 4,230*l.*; that of the latter, 61,755*l.* per mile. The gross income of the North-Eastern Railway, in 1876, was 4,429*l.* per mile per annum; that of the Brighton was 4,954*l.* per mile. The cost of the fixed element depends mainly on the physical features of the country, unless the amount of traffic be so great as to require additional lines of rail. In the cases we have cited the gross earnings are not so different in amount as to complicate the question; but the character of the traffic varies fundamentally. The North-Eastern derives 37 per cent. of its income from the trasport of minerals. The Brighton derives only 7 per cent. of its income from that service. The annual gross earnings of the latter are equal to 115 per cent. of the cost of the moveable element; those of the former are only equal to 70 per cent. of that cost. If we separate the accidental from the essential features of the case, and regard the cost of the fixed element, as before said, as dependent on the character of the country, we find how much better adapted is this mode of transport, economically considered, for passenger than for heavy traffic. In fact, on the metropolitan lines a movable element, costing 18,000*l.* per mile, earns an annual gross income of 36,000*l.* per mile, a procedure which is the most lucrative to be met with under any conditions. The high cost of the fixed element, however,—605,600*l.* per mile,—is such as to reduce this high rate of margin to an ordinary return.

The cost of propulsion per ton-mile gross under this arrangement of elements is not directly ascertainable on the English railways. The most cheaply worked railway in the world is the East Indian. On that, the cost of running a ton of loaded train for a mile, including all expenses, is only 0·172d. On the average of the India guaranteed lines, the cost is 0·260d. On that of the chief French lines it is 0·254d. In America it rose (in 1873) to 0·50d. In New South Wales to 0·558d. On the Metropolitan Railway the cost has been calculated at 0·437d.; but this is enormously augmented by the frequent stoppings and startings at high speed. It follows that the cost of carrying a ton of loaded train on a railway varies from 0·17d. to 0·56d. per mile. From the saving thus effected, as compared to the 4d. per mile of the road traffic, is derived the means of paying interest on the large sums laid out in providing the fixed element of the kinematic pair of the railway system.

It is, however, perfectly clear that the advantage thus secured applies chiefly, if not entirely, to passenger and light merchandise traffic. The extreme case of the East Indian Railway, where coal costs only 5s. per ton, and where labour is one-twelfth the price current in England, does not give a lower cost of transport than that of sea-borne freight from the Danube, or of river and canal borne freight on the Aire and Calder Canal. It is about the same cost as that of the sea-borne freight of coals from Sunderland or Newcastle to London. But in the case of the East Indian Railway provision has to be made for recouping the cost of above 20,000*l.* per mile for the way and works. In the case of the three great lines which compete with one another and with the sea for the privilege of bringing coal to London, the fixed element has cost 42,626*l.*, 46,561*l.*, and 47,784*l.* per mile respectively. The further investigation of the problem stated by M. Reuleaux, therefore, is full of instruction for those who have money to invest in industrial enterprise.

THE NATURAL HISTORY MUSEUM AT SOUTH KENSINGTON.

A CONSIDERABLE number of the members of the Architectural Conference assembled on Thursday, the 6th inst., to go over Mr. Waterhouse's large building under the direction of its architect. On the face of it the special interest of the building lies in the fact that it is the largest experiment yet made in terra-cotta building, or more strictly terra-cotta design, for the material has little to do with the construction, and is mostly only a facing. The visitors, however, were first invited to look at the plans and hear a few words from Mr. Waterhouse in regard to the history of the building, which is probably remembered by a good many of our readers. The late Captain Fowke had made plans which probably had high merit of their own, but on investigation proved incapable of being worked into any arrangement satisfactory to the views of the British Museum authorities, who had, of course, a considerable voice in the matter, as the real object of the building is to form a "chapel of ease" to the great Bloomsbury establishment, and by taking the Natural History portion of its stores to leave the original building free to be entirely devoted to antiquities. Mr. Waterhouse is so complete a master of planning that it will surprise no one to hear that his plan for the building was in its original form exceptionally good and suitable, and it will not surprise many to hear that its best and most characteristic feature was spoiled by official interference, as that is the way we do things in England. The plan provided for the stuffed and preserved animals representing living species in one of the front wings, and for the geological or rather palæontological remains of extinct species in the other wing; and this arrangement is nearly kept to in the actual building. But the original plan provided that in the one-story galleries which run back at right angles to the front block, and which are set apart for the smaller classes of objects contained in cases, there should be between the public galleries a parallel series of semi-private narrower galleries or corridors for the use of scientific students, and that the cases should be so placed as to open upon both, but with the side towards the public gallery hermetically closed with fixed glass, while the sides or backs of the cases towards the scientific students' corridor should be arranged so as to be easily opened for the better and closer inspection of the objects by those who had special reasons for studying them. This was an admirable example of the thoughtful arranging of a plan with the object of rendering it as useful as possible for its purpose, or rather of fitting it to two separate purposes; but the British Museum would have none of it, on the ground that they cared nothing for scientific students, and that the exhibition was for the unscientific public, who were to be the first object of consideration, and therefore it was ruled that the cases must be placed so that the British public could circulate all round them. It does not appear that the original plan would have placed any obstacle in the way of inspection of the contents by the general public, while it would have provided special convenience and facilities for persons whose aims were beyond mere amusement, and who would be specially glad of quiet and seclusion for carrying on their investigations; and though Mr. Waterhouse made no complaint against the Museum authorities, we certainly do complain, and think that a rather stupid thing has been done, and a good plan spoiled.

In regard to the purely architectural part of the subject, the general effect of the building is very satisfactory, and in some points much more than satisfactory. In regard to some parts of the front elevation, we have doubtful feelings; the dormers along the roof-line are a little heavy in design and outline, and considering this, and that the building is in general characterised by a massive style of detail, founded on the Romanesque more than on any other previous style, we cannot help thinking the ground story deficient in mass and solidity for the superstructure. This story, however, eventually will not be much seen from the road, if, as we understand, and regret to hear, a wall is to take the place of the present light open railing. Access to the building from the Cromwell-road will be obtained for carriages by two inclined planes sweeping round in a curve from each extremity of the ground to meet in front of the centre doorway; the platform opposite the doorway extends into two projecting bastions, between which comes the flight of steps up to the doorway for foot-passengers. The central entrance, with its deeply-recessed great archway, with richly ornamented terra-cotta shafts and archivolts, and bas-reliefs in the same material in the space over the doorway, has a very fine and rich effect indeed, heightened still more by the agreeable warm tone of the material. Passing through this door, we come through the vestibule into the centre hall, a great oblong apartment, the length of which is at right angles to the principal front. We made some comments, chiefly laudatory, on this interior *apropos* of the drawing of it in the architectural room at the Academy; the points which we then thought open to criticism we still think so, but the beauties of the architecture come out better in reality than in the drawings. There is a general look of mass and solidity about the whole which is truly architectural; and the recesses in the side on the ground floor, between the main piers and roof-shafts, add very much to the *ensemble* by their effect of shadow. These bays or recesses have a practical value in providing for the arrangement and grouping of objects with a special light from the back of each recess; they also were objected to by the Museum authorities at first, on the ground that there was a difficulty in getting the whole hall sufficiently under the eye of the attendants and keepers, who would have to be continually moving about to see that no mischief was nefariously done in these recesses. There is reason in this objection, but it was overruled in favour of the advantages of lighting and arrangement presented. At the further end of the hall from the entrance is the main staircase to the first floor,—hardly yet commenced, however. On reaching the top of this staircase, on either side of the hall we return towards the front of the building along arcaded corridors over the ceilings of the recesses before mentioned, and then further ascend to the level of the first-floor of the front building on a wide staircase which is carried on a flying archway over the hall, beneath which we had passed on entering. The look of this great arch, and the stair and balustrading surmounting it, is very fine from the upper end of the hall; it makes quite an unusual feature in a grand palatial style. Over the staircase the roof-shafts carry solid arches in brick and terra-cotta supporting this portion of the centre roof, and which look so well and so architecturally solid and monumental as to make us the more regret that this mode of carrying the roof should not have been employed in the other bays of the hall instead of the iron principals, which, as we noticed in speaking of the drawing aforesaid, look far too light to go well with the substructure from which they spring. The piers which flank this flying staircase have a kind of tree-stem ornament up the angles, up which climb terra-cotta monkeys in various attitudes, modelled with a good deal of spirit and vivacity. The apartments forming the first floor in the front block of building (and to which the corresponding rooms on the ground floor are nearly similar), present each a long room divided into three aisles by piers apparently of terra-cotta, which, however, is only an outside casing to the iron standards which are the real supports of the floors above. The result is pleasing to the eye, but not quite satisfactory to the judgment. The apparent terra-cotta piers entirely conceal the support, and hardly look as if they could carry anything themselves, and yet seem too good and solid a material to be a mere facing. The design of these piers is certainly novel and pretty. They are oblong in plan, the longer side parallel with the length of the room, and consist of a kind of pedestal about three-fourths the height of the room, the remaining portion breaking into four pilasters square on plan, and with foliage ornament on the outer faces and the capitals: the "pedestals" in the particular room in which the visitors first met (and which we believe is to be devoted to marine fossils), are decorated in a very pretty and piquant manner by very low reliefs of fish and other aquatic creations, worked on various blocks here and there in an accidental sort of manner, and as if from the inspiration of the moment in working the material, the general face of which is relieved also by waving lines symbolical of water, with an ornament of conventionalised aquatic plants delicately modelled in very low relief just above the plinths. The effect of this treatment is very refined and unusual, and gives a picturesque interest to what would otherwise be surfaces of bare jointed terra-cotta: we presume the other rooms which follow the same general design are similarly treated, in character with the objects for which they are intended. The only thing in the terra-cotta work we do not quite like in these rooms is the little arcade under the ceiling, which seems out of keeping in scale and architectural style with the rest of the detail, and, moreover, takes away the appearance of abutment from the segmental drop arches over the windows, which just range with these little arcades. In this room was shown a small section of the terra-cotta facing and brick backing of the main walls, put together on the floor, to show the manner of bonding of the terra-cotta into the brickwork. Every other block in a course of terra-cotta is made as a kind of large hollow brick, going far enough into the wall to have half-a-brick bed in addition to the average thickness of the terra-cotta slabs; the blocks between these, with the same face externally, are only thin slabs (about 1¼-in.) with no bond, of course, into the brickwork, but retained securely in their places by a rebated edge fitting to a corresponding rebate in the hollow block on either side. These hollow blocks are filled up internally with concrete before being set in their places. The method of setting and trying the piers surmounting the iron standards was also illustrated; in this work slate dowels are employed to facilitate the true building up of the pier in the first instance. It was mentioned as a *raison d'être* for these terra-cotta casings, that they served to render the construction more fireproof by covering up the iron,—quite a sufficient reason, if they will really achieve that object, which, however, we should think would require that the spaces between the terra-cotta and the iron should be filled up solid with fine concrete. There is a great deal more ornament about the building than we have space now to describe; panels everywhere adorned with busts and designs of animal life, in a style very well combining spirit and character with sufficient conventionalism. The plaster ceilings to the main rooms and corridors we regretted rather: the material, or something like it, is necessary for the sake of light, but the panel designs in which it is worked are not interesting, and (again) seem out of keeping with the main feeling of the architecture.

But taking the building as a whole, its architect is to be congratulated on having produced a remarkable work, eminently suited to its intended purpose, and presenting, in the interior especially, unusual architectural interest both of *ensemble* and detail, and forming a very fine illustration of what can be done with terra-cotta as a material for architectural embellishment on a great scale.

PRESERVATION OF FINE INDIAN BUILDINGS, AND INSTRUCTION IN INDIAN ARCHITECTURE.

WE have reason to believe that a Resolution has been forwarded by the Viceroy of India to the Secretary of State for confirmation, which will declare that,—"The preservation of ancient monuments of historical or archæological interest is an essential duty of every civilised Government. The Government of India has received from its predecessors an inheritance of such monuments which, for variety, extent, completeness, and beauty is perhaps unequalled, but certainly unsurpassed, throughout the world. So vast, indeed, has been this inheritance that the full magnitude of it can only be gradually ascertained: but a few years ago the first authorities on the subject were of opinion that only one-half of the remains known to exist had been explored; while the result of the recent excavations at Gandhara and Bharhut indicates the value and variety of the sculpture, the art-treasures, and the pictures of social life in ancient days, which further research is likely to recover from the numberless buried cities of this empire."

We understand that the Government of India will be prepared to guarantee to each of the local Governments a minimum annual contribution in aid of local resources, the amount of which will be fixed for five years, and subject to revision at the end of each such period, and will look to these Governments to provide from other sources the rest of the funds which may from time to time be necessary for the preservation of their ancient monuments. It will also recommend the appointment of an officer to superintend the preservation of ancient monuments and to collect and diffuse information as to ancient

systems of Indian architecture, their materials, and methods of construction.

This resolution is founded on a minute prepared at the end of last year, by Sir Andrew Clarke, minister of Public Works in India (formerly director of works of the Navy), which is sufficiently interesting to be made public. We print it in full:—

Reverting to my note of the 1st of February last, I now submit, for the final approval of his Excellency, the following review and proposals: —

1. An application was made on the 22nd September, 1875, for an annual grant of Rs. 35,000 from imperial funds, for the preservation of works of antiquity and art in the North-western Provinces. It was at first agreed to sanction this sum for a term of five years, but the financial department in March, 1876, limited the grant to one year, and left its continuance dependent upon the state of the finances. The Government of the North-western Provinces in December, 1876, then announced having set apart Rs. 551,259 from local funds for the purpose, and when this sum is expended, it is for us to decide if the necessary cost of completing the work can be afforded or not. When the latter announcement came before us, I deprecated accepting any responsibility for finding the balance of expenditure, on the grounds of other more urgent wants being neglected, but I was far from desiring to depreciate the importance of keeping the fine monuments of this country in repair. In February last I recorded my opinion that the grant-in-aid for five years should be restored. In fact, when the original proposals were made in 1875, I advocated an imperial service, and I most strongly agree with the opinion expressed by the Viceroy in his minute of January last, in which he says:—

"The preservation of the national antiquities and works of art ought not to be left exclusively to the charge of local Governments, which may not be always alive to the importance of such a duty. Lieutenant-governors who combine æsthetic culture with administrative energy are not likely to be very common, and I cannot conceive of any claims upon the administrative, initiative, and financial resources of the supreme Government, more essentially *imperial* than this one."

2. The Public Works Department has been accused of acts of barbarity in regard to old buildings, and in now accepting the responsibility that lies upon it of keeping these monuments in repair I seek to remove a reproach which has in it more or less of truth, by proposing a systematic imperial survey of architectural buildings in India, which should have for its aim:—

First, to be in concert with the Director-General of Archæology and various local Governments and administrations in regard to the preservation * of buildings.

Second, to provide the means for producing a standard work on Indian architecture,† for use in the engineering colleges and schools of this country, as well as in the Public Works Department.

The arguments for attaining these objects by an imperial service are that local efforts and interest for preservation are spasmodic, and buildings are left to be repaired or to go to ruin, according to the interest taken by governor, lieutenant-governor, or chief commissioner. A general supervision can alone detect what it is of the first importance to *preserve* amongst all the thousands of Indian monuments. As regards architecture, native styles do not belong to particular administrative areas, and can only be examined from a broad and imperial point of view. The best monument in a province may not be the best type of a particular style for the whole of India, and to make elaborate records of everything locally interesting would, for architectural purposes, be an extravagant and useless process.

3. Before making definite proposals, it will be useful to state briefly what has been done:—

Although much has been written at various times on Indian architecture, there exists no one work which deals in detail with its varied forms in the same way that Classical and Gothic architecture has been described by writers whose works are now standard authorities. It is true that Ram Raz, a Hindu, endeavoured many years ago to write a treatise * on the rules of native architecture, but it is merely a collection of fragments from a variety of ancient works, and even this was obtained with difficulty. Kittoe's architecture † gives some useful details of buildings, but those selected for illustration are not of the best styles. The various Asiatic societies' journals have many accounts and illustrations of architectural interest, and the amount of picturesque illustrations of buildings by means of drawings, and latterly by photography, are abundant.‡ None of these, however, furnish adequate matter for teaching Indian architecture to either natives or Europeans.

Between 1862 and 1865 Lord Canning employed General Cunningham on an archæological survey of India, and much valuable work was done. Lord Lawrence abolished the appointment.

In 1866, two beautiful volumes were published on the architecture of Beejapore§ and Ahmedabad‖; the latter work was brought out under the auspices of Mr. Hope, and both contain drawings and details to scale which leave little to be desired. During the Paris Exhibition of 1867 an interest was awakened in England for Indian architecture, which led Sir Stafford Northcote in 1868 to make the suggestion to the Government of India to conserve and record the most remarkable of the ancient monuments in that country. Government accordingly passed a measure encouraging amateur photographers in the taking of views of architectural buildings, and offered to pecuniarily assist them in so doing. Soon after a more comprehensive measure was initiated by Sir E. C. Bayley, by which the surveying of Bengal, Madras, Bombay and the Upper Provinces was assigned to various parties who were charged to record, as far as possible, the measurements, and take photographs of buildings and monuments, and plaster casts of carvings and sculptured figures. This system, under the administration of Lord Mayo, produced many important results; drawings and casts of elaborate buildings were made by Mr. Locke in Bengal, and Mr. Burgess in Bombay; and Captain Cole in the Upper Provinces, surveyed buildings in Kashmir, near Agra, and those near Delhi. The results of some were published by the Secretary of State, the Arundel Society, and otherwise. Advantage of this organisation was taken by the South Kensington Museum authorities, who obtained casts of various Indian subjects, and exhibited them in a special Court. As this and other work proceeded, Government determined in 1870 to reappoint General Cunningham to investigate the archæology of India, and the publication of his reports has thrown new light on many obscure points, whilst Mr. Burgess's researches in Bombay have added greatly to available information.

In 1875, as alluded to before by me, Sir John Strachey organised a system for recording and restoring fine buildings in the North-Western Provinces. Many valuable and important works have been undertaken and are still going on. In 1876 the Duke of Buckingham made an effort to establish an Archæological Department in Madras.

Mr. Fergusson's new volume on the History of Eastern Architecture constitutes an exhaustive general review, but it does not pretend to be more. He says in his introduction, "without preliminary or subsequent study it can hardly be expected that so new and vast a subject can be grasped, but one volume may contain a complete outline of the whole, and enable any one who wishes for more information to know where to look for it, or how to appreciate it when found."

4. When all the information, such as plans, drawings, and photographs, have been collected together, much still remains to be done before we are in a position to judge as to what buildings should be preserved, or to what extent they should be restored. The localities of the best architectural buildings are for the most part well known; what is required is, that they should be carefully surveyed and measured, and that we should be made aware of the state of their preservation. In this way, too, some necessary materials would be completed for elucidating the systems of the natives in the construction and architecture of their buildings and works of public utility.

5. The building arts of Hindus and Muhammedans are falling into disuse, and becoming corrupted by European influences, hence the importance of studying Indian architecture and construction as it once existed. The practical use of encouraging such a branch of study among natives in the engineering and other colleges of India lies in the fact that native styles are in many cases the most suitable for public buildings in this country. They suit the native habits and tastes, and in many instances better meet the demands of comfort and health in fierce heat, than the styles of more temperate Europe. There can be little doubt that buildings for native purposes, such as the following, should be built in some style of native architecture:—Temples, Mosques, Palaces, Colleges,* Schools, Markets, Hospitals, Asylums; whilst those specially for the comfort and wants of Europeans, such as residences, churches, offices, railway buildings, &c., are more appropriate in some European style adapted to the various climates of India.

6. Innumerable evidences are daily springing up, all of which prove that European rule has hitherto tended to debase Indian art. Hindu brackets, Mogul arches and domes, Gothic windows, and Greek columns are considered suitable features to introduce together in the same design by the modern native designer; as he is taught no better, the evil increases with every new large native building, and many hundred thousand pounds are annually misapplied, whilst we have the power of encouraging the older and purer methods of building. In advocating the use of native architecture for *some* buildings, I wish to guard myself against a possible charge of seeking to introduce an elaborate and costly style. No doubt, many old structures of this country were exceedingly costly, and would be impossible to reproduce without returning to a system of forced labour, but both Hindu and Muhammadan buildings are to be found which are perfectly plain and good in design on account of the correctness of their proportions. It is as easy to have a simple Hindu or Muhammadan design as it is to have a simple Italian one, and both Hindu and Muhammadan buildings may be simple, whilst Gothic styles demand much elaborate detail.

7. Modern Indian architecture, besides being corrupted by foreign styles, is also frequently debased by the wrong use of plaster in imitation of stone. In ancient buildings there was always a consistency between material and style, but this consistency threatens to vanish, and become a thing of tradition. Plaster is constantly being used, when there exists a certainty of its crumbling away in a few years from exposure. Ornament expended in such a material is absolutely wasted. I understand that in Gour in Bengal, where stone is not procurable, there are many buildings of good honest brick, ornamented with pillars and details in hard-baked clay, taking a beautiful polish. Terra-cotta details are often to be found elsewhere, and in studying such old work the use of durable material may be revived.

8. There should be two kinds of survey undertaken by the new Imperial Department:—

(1.) Survey for purposes of preservation or repair of fine old buildings.

(2.) Survey for collecting all information about the construction and details of different styles of architecture.

The first step is for existing information to be reviewed. Reports, drawings, plans, photographs, and private works should be examined, and the general condition of well-known buildings throughout India should be ascertained from existing reports and from Local Governments.

The survey should then be commenced and *materials* collected: —

(1.) For ascertaining the cost of preservation or repair.

(2.) For compiling a standard text-book on Indian architecture. No means should be spared to make the illustrations as excellent as possible; and just as the Roorkee College has its work on

* Restoration should, in my opinion, be rarely undertaken; it is impossible to perfectly reproduce old work, and the cost of trying to do so is almost always excessive.

† To be a text-book on the different styles of building, as distinguished from records of objects of mere antiquarian interest, which is fully cared for by General Cunningham.

* Ram Raz's Architecture of the Hindus, &c., 1834.

† Kittoe's Illustrations of Indian Architecture from the Muhammadan Conquest downwards. Calcutta, 1838.

‡ See works of Babu Rajendra Lalla Mittra, Buchanan, Hamilton, Burgess, Cole, Cunningham, Daniell, Fergusson, Impey, Lyons, Rousselet, Tod, Wilson, &c.

§ Architecture of Beejapore, photographed from drawings by Captain Hart and A. Cumming, C.E., and on the spot by Colonel Biggs and Major Lock, with Text by Colonel Meadows Taylor and J. Fergusson.

‖ Architecture of Ahmedabad, 120 photographs by Colonel Biggs, with Text by T. C. Hope, Bombay C.S., and Jas. Fergusson.

* Such works do not come directly within the province of Government, but it is our duty to endeavour to encourage in them a good and pure style of native architecture.

engineering compiled for the special purposes of India, this work could be the means of instructing natives and others, and be used in all schools and colleges throughout India. By such means alone can Government make a beginning to teach natives the skilful art practised by their ancestors,—now almost a tradition. As regards preservation, time and decay wait for nothing, —not even famines,—and it may be worthy of consideration to spend some amount of relief in the cost of preventing old buildings from utter ruin.

9. In carrying out these general measures, none of our existing organisations should be disturbed, but the object should be to utilise all information, to make up deficiencies, and to bring all efforts into harmony.

10. Having thus pointed out what I consider to be desirable in this matter, and anticipating that these proposals are in accordance with the views which his Excellency has expressed to me, I would propose that Captain Cole, R.E., be entrusted with this work.

I would provide him with a draughtsman or two, and thus relieve him of the mere mechanical portions of his existing duties, by which means this measure will be initiated at a trifling expense.

Captain Cole has had many years' experience in architecture, and from 1868 to 1870 was employed on the archæological survey of the North-Western Provinces, and in making casts of fine architectural subjects, and I see by the Home Department Proceedings of December, 1876, that last year the Madras Government before its famine offered him the post of Archæological Surveyor of Southern India on Rs. 1,200 a month.

A. CLARKE.

VISITS TO DOULTON'S, MAUDSLAY'S, AND BLACKFRIARS STATION.

THE SOCIETY OF ENGINEERS "ON THE SURREY SIDE."

ON Monday last, some sixty or seventy members of the Society of Engineers, headed by Mr. R. P. Spice (president), Mr. J. Bernays (vice-president), and Mr. Perry F. Nursey (secretary), spent about five hours in visiting the three establishments named above.

Arriving at Messrs. Doulton's potteries, at Lambeth, at twelve o'clock, the visitors were conducted over the extensive premises by Mr. Henry Doulton, who kindly gave full and lucid explanations of all that was to be seen. The dexterity, almost amounting to magic, with which the potter converts a mass of "slip," or wet clay, into a jug, jar, bottle, or flower-pot, was watched with much interest. As will be known to most of our readers, the potter uses very few tools, his chief aids being that ancient appliance the "wheel" (or lathe), upon which the clay is made to revolve, and his hands. It is not necessary that we should go much into detail in describing what is done in Messrs. Doulton's establishment, inasmuch as, in past volumes, we have gone somewhat fully into the subject.* In addition to the ordinary stoneware articles, such as blacking-bottles, ink-bottles, spirit-kegs, filters, &c., Messrs. Doulton manufacture of the same material worms for stills, large jars (suggestive of "The Forty Thieves") for chemical purposes, and the well-known drain-pipes. The stoneware jars and receptacles for chemical purposes are made in large numbers, and many of them of very large capacity. This ware, as is very well known to technical readers, is glazed by means of salt, which is thrown into the kilns when the contents are at an intense white heat, and uniting with the silica in the clay, forms a dull and infinitesimally thin, but impermeable glaze. This salt-glazed stoneware is the only material that can be used for chemical purposes, and the production of the large vessels required is somewhat expensive, on account of the risk of imperfection, for the smallest "pinhole" would render useless the largest jar intended for the storage of chemicals. The visitors witnessed the manufacture by steam-power, directly applied, of some stoneware flue-pipes, of some 8 in. or 9 in. diameter. These were made at the rate of four or five per minute, the clay being forced through a mould or die by pressure. They have no sockets; but socketed drain-pipes are made by the same means, and the socket put on by what may be called the "parting touch" of the machine. But of stoneware pipes, and stoneware generally, a great deal has been said in the *Builder* in past years.* We may, however, state here that the clay used comes principally from Devonshire, Cornwall, and Dorsetshire, and contains a large proportion of silica. Of the same ware the visitors saw in process of being "thrown" on the wheel some of the old-fashioned "Toby" jugs, which are a characteristic and staple product of the Lambeth potteries. The raised figures, trees, windmills, &c., are stamped out separately, and then applied to the surface of the jug, in the same way as in Wedgwood ware. But, as our readers know, prosaic and utilitarian as are these applications of stoneware, the material has of late years, thanks to the intelligent enterprise of the Messrs. Doulton, been ennobled by the handiwork of the artist. The excellence of design and variety of colour which are combined in the Doulton ware have been frequently commended by us. The ware is no unworthy successor of the *Grès de Flandres*, and as it is fired by direct application of the heat of the kiln, without being placed in saggers, the colours are blended and harmonised in such a manner as to contribute in no small degree to the artistic effect. The capabilities of the material, and the range of colour available, have only been brought out by long-continued and costly experiments, united with the artistic efforts of Mr. John Sparkes, head-master of the Lambeth School of Art, and some of his pupils.† No two articles are ever produced alike, except occasionally when a *pair* may be required; but under such circumstances only *one* pair is produced. Latterly, Messrs. Doulton have sought to introduce this ware as a material for the permanent polychromatic decoration of buildings. In their anxiety to show the undoubted capabilities of the material, in applying it to their new buildings in High-street, Lambeth,‡ and on the Albert Embankment,§ they have, as many think, somewhat "overdone" it.

Although the visitors on Monday last were engineers, they were shown some few things of special interest to architects. First and foremost, we must mention the new reredos for York Minster, which is being executed by the orders of Mr. Street, the subject being the "Crucifixion." It is to be in terra-cotta, and the visitors saw it in process of being modelled. Mr. Tinworth is the artist engaged on this work, which he is treating entirely in his own way. Although not yet complete, the work promises to be very successful. We have already‖ noticed with commendation some of Mr. Tinworth's productions, and it may be interesting to state that this rising artist was, only a few years ago, a working wheelwright. Becoming a student of the Lambeth School of Art, however, he evinced an amount of latent artistic power fully sufficient to justify his adoption of an artist's career. Other items of interest to architects were a series of twenty-four capitals being modelled in terra-cotta for St. Bede's Roman Catholic College, Manchester.¶ As bearing on the recent discussion at the Architectural Conference on "Mural Painting,"** we may put on record that the visitors were shown two paintings on tiles,—one, "The Pilgrim Fathers," by Mrs. Sparkes; and the other, "The Lion in Love," by Mr. Symons. In both these works, however, the joints showed up much too prominently. These pictures were originally intended to form part of Messrs. Doulton's show at the Paris Exhibition, some particulars of which we gave a short time ago (p. 304, *ante*). After inspecting some of Messrs. Doulton's specialities in the way of stoneware traps, sewer invert blocks, vitrified stoneware sinks and urinals, Stanford's patent joint for stoneware pipes, not forgetting the blue Staffordshire bricks, copings, ridge and paving tiles, &c., made at the firm's works at Rowley Regis and Smethwick, the visitors departed, all thanking Mr. Doulton for his kindness in accompanying them over the works.

Proceeding to the world-renowned engineering works of Messrs. Maudslay, Sons, & Field, Westminster Bridge-road, the visitors were received and conducted over the extensive premises by Mr. Crosland. The vast establishment is almost entirely, if not exclusively, devoted to the production of marine engines. Many of our costliest ironclads, and whole fleets of our ocean-going steamers, to say nothing of men-of-war and merchant steamers for foreign nations, are propelled by machinery which has been made by the firm. As was indicated in a descriptive sketch which appeared in the *Builder* in 1860,* the establishment has grown from very small beginnings to its present extent and pre-eminence. The founder of the firm, Henry Maudslay, was the architect of his own fortune. But to proceed with our record of the visit of the Society of Engineers on Monday last. The visitors were first of all shown a large number of models (in motion) of the various types of marine engine which have been in vogue and made by the firm since the introduction of steam navigation. The inspection of these models in their proper sequence was most instructive. Proceeding into the "shops," the visitors were struck by the comparative absence of works in progress. The prevalent depression in trade and the long-continued threatening aspect of the political horizon, have made themselves felt, as elsewhere, in Maudslay's factory, for whereas there is very little work in progress for our mercantile steam-ships, defensive preparations are absorbing most of the activity of the establishment at the present time. When the establishment is in full work, it gives employment to 1,400 or 1,500 hands, and, with the two subsidiary establishments on the banks of the Thames (at Westminster Bridge and East Greenwich), to 2,000 hands. Proceeding to the "erecting-shops," the visitors saw four pairs of engines in progress for her Majesty's ships *Orion* and *Belle Isle*,—the two ironclads purchased of the Turkish Government. The peculiarly-devised machine for turning the ponderous crank-shafts excited much interest. Passing through into one of the lathe-shops, the visitors saw at work two of the vertical-cylindered "table" engines made by the founder of the firm, and bearing date 1824 and 1825 respectively. These engines have,—subject, of course, to repairs and renewals in some of the most vital working parts,—continued at work for more than fifty years,—and still have plenty of work in them. This says something for the excellence of the firm's productions. The foundry has one peculiarity of arrangement,—*i.e.*, it is on the first-floor level, supported on brick arches. It seems that this peculiarity was dictated by accidental circumstances; but it has since been found of inestimable value, inasmuch as the pits are always above the ground level, and, therefore, always dry. This is a point of exceptional importance, for if the foundry floor were on the level of the ground, the pits would be below the level of the Thames, and always damp, the factory standing on a portion of the low-lying once marshy ground of Lambeth. The boiler-shop was inspected by the visitors, but not much was going on there, the principal portion of the boiler-work being carried on at the firm's premises at East Greenwich. In one of the erecting-shops the visitors saw a number of screw-propeller blades in course of erection and finishing. Some of these weighed about twelve tons each. They are of brass or gun-metal, cast in three pieces (where there are two blades), the blades being fixed to the boss or central portion by means of bolts. It is customary to make the screw-propellers of some merchant vessels of cast-iron, but it was stated that this material has a tendency to become quite rotten by the action of the salt-water upon it,—that it becomes, in fact, neither more nor less than plumbago; therefore, brass or gun metal is the most reliable, and the cheapest material for the purpose in the end. One of the screw propellers seen by the visitors on Monday last was that of the Government despatch-boat *Iris*. This propeller was being polished all over in order to minimise friction with the water. We are told that this is the first time this expedient has been resorted to. In the coppersmiths' shop the visitors encountered

* In the *Builder* for 1857 (vol. xv., p. 169), we published a general account of "Lambeth and its Potteries," which included some interesting information as to Messrs. Doulton's potteries and their productions.

* In vol. xviii. (1860), pp. 241-3, will be found an article containing and commenting upon the salient portions of a paper read at that time before the Society of Arts by Mr. Edwin Goddard. Some interesting remarks made by Mr. John Doulton, in the discussion which followed, are reported on p. 242 of the same volume.

† We gave some illustrations, which afford a very good idea of the character of the ware, in the *Builder* for 1874 (vol. xxxii., p. 390). These illustrations accompanied a paper read at the time by Mr. Sparkes before the Society of Arts. In that paper, and in a subsequent one by the same author read before the Architectural Association in 1875, reported in the *Builder*, vol. xxxiii., pp. 297-298,—the ware and its production are very fully described.

‡ Messrs. Tarring, Son, & Wilkinson, architects. Illustrated and described in the *Builder* for 1876 (vol. xxxiv., p. 1192-5).

§ Described in the *Builder* for 1877 (vol. xxxv., p. 422).

‖ *Builder*, p. 304, *ante*.

¶ Messrs. Dunn & Hansom, architects. See p. 546, *ante*.

** *Builder*, pp. 579-582, *ante*.

* Vol. xviii., p. 441.

the deafening din of workmen engaged in making copper steam-pipes, &c. In the smiths' shop, which contains a large number of forges, the visitors saw the 15-ton steam-hammer at work. [There are a larger one of 30 tons, and one or two smaller ones.] In the pattern-shop and in one of the fitting-shops the workmen were engaged on some apparatus for torpedo boats for the Government. The apparatus in question is for the discharge of the Whitehead "fish" torpedos, and consists of air pumps and reservoirs (the latter consisting of stacks of steel tubes) for storing compressed air as a motive power for the discharge of torpedoes. The steel tubes are made to sustain a working pressure of no less than 2,500 lb. per square inch. One of the steam-engines for working these air-pumps was being tried at work. Incidentally we may state that all engines, &c., are put together in the erecting-shops, and worked by steam before being sent out, all work for the Government being tried in the presence of an inspector from the Admiralty. In reference to the large store of patterns which the firm has accumulated during its long and honourable career, we may state that they are stowed away in large numbers between the roof timbers of many of the shops. In passing through one of the shops, the visitors saw a venerable old gentleman, evidently somewhat infirm, though far from inactive, moving about and superintending operations with intense interest. We learnt that he is one of the old foremen of the establishment long since retired from active work, but who, after passing some fifty or sixty years in the establishment, continues to feel an active interest in all that is going forward, and he enjoys the privilege of being free to come and go whenever he likes. His name is Peterson, and in his younger days he worked alongside of Joseph (now Sir Joseph) Whitworth in Maudslay's factory. The history of the establishment, in fact, constitutes an important chapter in the annals of British industry. While the firm has been well served by some of the most skilful artisans of the age, it has, to its honour be it said, not been unmindful of its obligations to them, and has sought in many ways to conduce to their comfort and social well-being. It is to be hoped that the establishment will soon be fully occupied in ministering to the wants of a revived activity in trade and commerce. Having thanked Mr. Cresland for his courtesy in conducting them over the establishment,

The visitors proceeded to the Blackfriars goods station of the London, Chatham, and Dover Railway, where, in the absence of Mr. Wallis, the goods superintendent, they were, under the guidance of Mr. McPherson, chief clerk, shown the very complete hydraulic machinery in the form of lifts for raising trucks from the ground to the railway level, cranes for loading and unloading trucks, and "cat-heads" or capstans for hauling the trucks from point to point. The machinery, which was erected some twelve or fourteen years ago by Sir W. G. Armstrong & Co., is very complete, and possesses the great merit of being very economically worked, one steam-engine sufficing for the whole of the hydraulic apparatus. Having thanked Mr. McPherson for his explanations, the visitors left the company's premises, many of them winding up a very agreeable and instructive day by dining together at the Guildhall Tavern.

ON ARTISTIC IMPROVEMENT OF THE POORER LOCALITIES OF LARGE TOWNS,

WITH SPECIAL REFERENCE TO THE EAST OF LONDON.

AT the close of the paper on this subject read by Mr. H. H. Statham at a meeting of the Social Science Association,*—

Sir Antonio Brady said the paper read was admirable and suggestive. As an old inhabitant of East London he could testify to the horrible bricks and mortar abounding there, which was almost a disgrace to the age. Any one who had been to some of those curious old cities on the Continent, as in Holland, would remember how they valued a sky-line, than which nothing tended more to the beauty of landscape. Mr. Beresford Hope, while president of the Institute of Architects, did much to impress the notion of a sky-line. People going through the streets of London would notice an improvement in this respect, while buildings for commerce showed more beauty. If all the fine buildings in London could be put together, our city would be far from the unbeautiful place it is. But as London was by degrees being rebuilt, such a lecture as they had heard that night would go far to revive the taste of the people in future. People of large fortunes who built large buildings in London had a deal to answer for if they did not lead the taste of the people so that they might be improved in their æsthetics as well as in their sanitary condition. Some years ago they had the opportunity of building an East London Museum to improve the taste of the people. Lord Lennox then read a paper, in which his lordship showed there were 19,000 drawings of our great artist, Turner, not made use of which ought to be. It was proposed that they should be lent to different towns that would provide for their safe-keeping. It would be better if artists and those having the custody of such works would leave them to the nation; but it was small encouragement for them to do so when they were tied up by law in the way they were, so that the trustees could not make the use of them they should do. All those things depended one on another, and when once the people had a taste for pictures, &c., we should have improved dwellings. There must be broader streets, or the lofty buildings towering to the heavens will interfere with the circulation of the air, while the folly of cutting up streets so that proper circulation was impossible could only be cured by the influence of such a lecture as they had listened to.

Mr. William Botly had always advocated that there should never be less than 80 ft. between rows of cottages, so as to secure proper ventilation, sewerage, gas, &c. With respect to curves and crescents being ornamental, as the paper suggested, there were some objections to such things, for they were not considered by many so healthy as houses in straight lines. When the British Association, and the Social Science Association, held congresses in Glasgow and surveyed the town, it taught a lesson, for no place in the kingdom had made greater sanitary advancements. He was shown one row of houses, built in a crescent, worth from 80*l.* to 100*l.* a year each: they were last year ordered to be pulled down, being considered unhealthy. With regard to water-courses, however good they might be at first, they eventually became ditches and very unhealthy. In Salisbury, where that system of supply had ceased, and recourse been had to a different one, the death-rate had been brought down from 26 to 17 in the 1,000. With respect to the height of houses, Edinburgh has a law whereby houses were limited to a specified altitude in proportion to the street. People therefore had a better chance of seeing the sky and breathing fresh air.

Mr. Serjeant Pulling said the remedy for the existing state of things lay with the Board of Works. Time was when art was king, when Sir Christopher Wren had all the power, and had the noble chairman been in possession of the same authority of late years he might, possibly, have been able to achieve the suggestions made in the paper. If the Board of Works had the power when improvements were suggested, they might call in scientific assistance and put a veto upon the ugliness under which this city suffered. There were changes, however, going on. There were public institutions, held for public trust, which had been built over within the area of the City of London, spots that were once devoted to public purposes for recreation. He instanced the whole of Moorfields, now covered with houses, but granted to the City of London for the same common purpose of recreation. Smithfield again, once used for racing, granted to the City for the same common purpose, all built over with large buildings, but unfit for an open space. He asked them to look at the case of the great Corporation of London, and to look at the instances of small parishes, with churches, with certain ground around them. The churchyards gradually diminished, were circumscribed and built over, and became an eyesore. There was, however, a revival on that point, for everywhere a spirit had set in for turning those wretched places into gardens. They could not now make amends for the breach of trust and the defaults of those who had passed away; but they could do this, that when a scheme for a public improvement was in future made, a prohibition against building over vacant spaces could be issued, and so preserve them intact for the public enjoyment.

Mr. Safford had in his twenty-one years' experience of the East of London observed a latent desire for taste amongst the lowest classes. He stated that it was noticeable that those public-houses which were most decorated with pictures, and showed a slight artistic taste, were most frequented by the poor. He thought terra-cotta might be more usefully adopted. Building in concrete might be more extended, and the material might be brought to an extremely fine face. Another thing was Etherean marble, which could be procured at a small outlay, and was valuable. He agreed with regard to the difficulty of the water question. Carrying a stream of water through the streets would be very well if we were in a place like the Salt Lake City, but in Whitechapel he was afraid it would not do, as it would be made the receptacle for dead cats, &c. Moreover, the owners of those houses were not the right class to assist in such a matter. More compulsory taking of land was required. In Southwark there were a number of houses with gardens very close to London Bridge. There was plenty of room in Southwark for building workmen's dwellings without erecting them so lofty. The regulations in those buildings, such as that a man was not to repair his own windows, &c., and the congregating of large families, led to incessant quarrels, and the whole management of such places was distasteful to the people living in them. A man should have an interest in his own house. He urged the more frequent planting of trees; the giving people flower-shows, museums, and arts, and the increase in the number of such museums as that at Bethnal-green; they took the people from public-houses, and by doing that they took them away from swelling the great army of the criminal class. Therefore, every farthing spent in increasing beauty and cultivating taste was saving the payment of thousands in reformatory schools and prisons.

Mr. Ford took an opposite view to that of the paper read. They must take the streets as they were, and the houses also. It was utopian to talk of demolishing old streets and creating new ones for our own generation. There was no reason why in future properties an improvement should not be made in respect to the sky-line and the formation of streets. They must avoid water-channels in future, which only harboured disease. The great question would be, where and how to plant trees so that boys should not destroy them, or lay down gas-pipes the leakings from which would not kill the roots. He agreed that our architects were endeavouring to get as near to the moon as possible.

Mr. Rowland Hamilton remarked that the paper said all buildings and workmen's dwellings should be self-supporting and remunerating; but there was a point beyond that, where a certain amount of expenditure might be incurred with unmitigated advantage to society in general, which arose out of the condition in which we found ourselves. We have to remedy the errors of several generations and compete with a vast evil. It was the history of past failures they had to study. It was the risk of first experiments and acquiring knowledge of companies which might be formed for improving the dwellings in poorer parts of towns to which the Limited Liability Act might be applied. When those Acts were first discussed they were regarded from two sides:—1st. The danger they created by inflating a vicious kind of monetary speculation. 2nd. They were regarded as likely to ameliorate the condition of the poor and develop many useful industries. Experience had shown that the public had been very much more hearty with the abuse than with the use of this Limited Liability Act. Nevertheless, there were many companies which might be established with the safeguard limiting the loss which might be undergone, and yet those undertakings might be entered into with a large and liberal spirit. They must not be the subject of lax mismanagement, which would vitiate the enterprise and do away with experiments altogether.

The Rev. Thomas Marsdon thought the habits of the people had led to the erection of houses towering up to the skies. Trade was diffusing railways all over the country, and houses followed suit. What was wanted was small cottages with gardens and wide streets. They could not depend on landlords for that; if done at all, it must be done by the Board of Works. He defended churchyards against being converted into recreation-grounds, declaring it a sacrilege. He respected ancestry, and thought it would be a pity to do anything in churchyards against feelings so sacred among all nations.

Mr. Arntz said when Parliament dealt with the subject it permitted itself to be governed by

* See p. 587, *ante*.

the rights of society and the rights of property. That created a difficulty in dealing with a question of this kind, because Parliament had said that no buildings should be erected in any new street of greater height than the width of the street, also that the building should not go beyond the line of front of particular streets. Good as those regulations were they were prevented from carrying them into effect by little hitches in law courts. He thought the views of the last speaker, although antiquated, must be respected, because they were held by such a large and powerful class, who could enforce them. They must look to future enlightenment and education to remove such prejudices.

Mr. Aitchison remarked that Hume said that where there were no great philosophers and metaphysicians they would not expect to find good carpenters or wheelwrights; and so where there was no great taste among the upper classes they could not expect to find it among the lower. If they were to have anything like taste for beauty the desire for it must be spread among all classes. As far as ornament went, until some large portion of the population had some desire for a particular thing, ornament would be useless; for at present the only ornament we had now was what we copied from some other nation, or some other epoch, which this nation considered as beautiful; but, as far as we were concerned, there was nothing in nature that we admired or cared for. Many of Mr. Statham's suggestions might be put into practice. At present, as far as he could see, as regarded taste, there was some kind of feeling for arithmetical proportion —not that the openings and spaces should be put haphazard without regard to one another. He thought it was a mistake that we should overlook beauty in all the things about us, either in our buildings, our furniture, or our dress; and an endeavour should always be made to impress strongly on mankind a desire, a love, and an appreciation for the beautiful.

Mr. E. C. Hope did not think we had arrived at that low state mentioned by the last speaker. There were examples existing now of what had been done, and which might very well be duplicated and increased in London. He mentioned several estates, covered in a few years by very agreeable designs, which were excellent works of art. Old buildings might be made better; but it was of no use attempting to rebuild a whole town; but opportunities, constantly occurring, for improvement should be seized upon. He thought, by a little generous circulation of opinion on the subject, they might get persons together who would be satisfied with a moderate return for an investment, and an improvement in the localities complained of.

The Chairman (Lord Henry Lennox) said if proof were wanted that the buildings in poor localities were not satisfactory, any discussion of the subject at a meeting like that must tend to do good and improve the state of things. He did not understand that the reader intended any violent or revolutionary measures with regard to the pulling down of houses, but merely that houses requiring embellishment should receive it. Health was the first consideration in any expenditure of money for improving the dwellings of the poor. Happily health was not antagonistic to beauty; it required space, and when they had the latter it was easier to give beauty than when the space was confined to a narrow area. His lordship did not agree with the Rev. Mr. Marsden about burial spaces, for the more of such things in London for free air to pass through, the better. He himself subscribed last year for converting a churchyard, no longer used, in the East End, into a garden with trees, and so enabled the poorest who could not go any distance from their homes to take an airing on a Sunday afternoon. He had ancestors, and he should consider their remains rather honoured than otherwise by the burial-grounds being converted into recreation-grounds for the hardworking sons of toil of London. He was sorry to say the Office of Works had very little power over the poorer districts of London; but it had power to put a veto on any peculiar monstrosity in any buildings within its jurisdiction. He had done so, but had met with the fulmination and the thunders of contractors. That kind of veto might be exercised. He could only regret, wishing as they did to see towns improved, that the duties should ever have been divided between the Office of Works and the Office of Woods and Forests, making it necessary to have divided action, which made it difficult to carry out any works of the kind. This was not the first time he had taken up the question of open spaces. When he first took office, Bethnal-green was standing in a horrible ploughed field; and his predecessor, Mr. Ayrton, against whom the public took such antipathy, said: "Do what you may, my dear Lord Lennox, you will never get that space made into a garden: the Treasury will not hear of it." His lordship, however, went down with Sir Antonio Brady, and subsequently it was consecrated for the use of the public, and had since been used by all the working classes in that densely populated neighbourhood.

Mr. Statham, in reply, remarked that his suggestion about ornamental water supply was only tentative; but still he thought it could be done without injury to health, and that when the people saw it was there for their good they would not illtreat it. The gentleman who thought they could do without rebuilding should walk through some parts of Bethnal-green, and he might see reason to reconsider his opinion. The intention of the paper was not, however, by any means, to advocate the wholesale rebuilding of London; but only the making use of every opportunity for improvement as it occurred. Hardly six months passed but something was done which could not easily be undone, and unless those interested in the subject kept an eye on alterations, and endeavoured to get the right thing done, no progress could be made, and opportunities for improvements would be continually thrown away.

CONTINUED PROGRESS OF RAILWAY CONSTRUCTION.

THE HALF-YEARLY MEETINGS.

THE half-yearly meetings of the railway companies, just brought to a close, have been of a rather protracted character, having only concluded within the last fortnight with the meetings of the Scotch and colonial companies. The proceedings show that very extensive works are still in progress by several of the great companies, whilst further undertakings of considerable magnitude, and involving a large outlay of capital, are contemplated. In illustration of the enormous sums which have within a comparatively recent period been sunk in railway construction, it may be incidentally stated that Sir Edward Watkin observed at the meeting of the *Manchester and Sheffield Company* that within the last ten years the sum of 310,000,000*l.* had been expended on new lines and buildings in the United kingdom.

At the meeting of the *London and North-Western Company*, Mr. Moon, the chairman, made an important and marked declaration in reference to trade unions and Government regulations which had affected railway-making and other works of construction. Adverting to the general depression of the trade of the country, he said he trusted it would come round again, though there did seem something wrong when we found foreign states competing in our own districts; and when we were undersold by foreigners in our own markets in glass, manufactured iron, in screws, and many other things. "I believe," said the speaker, "that is largely owing to the Government regulations, and the restrictions of trade-unions. I have calculated that there is a loss of something like the labour of a million and a half of men following the restrictions which trade unions have put upon their members in regard to the work they are to do, and the hours they are to be employed. I can see no advantage which accrues to the community, except that we are suffering from a competition which we ought to be able easily to encounter and to beat. The only fear that we have in this country is that the trade-unions and the Government Regulations,—because Government now interferes in every act of every manufacturer in the country,—will together do what such restrictions have done all through the world's history. It will be found that these attempts to regulate trade will drive it from the country, because capital is of no country, and will not stand such regulating; and certainly masters will not stand to see their business going, because men, instead of doing what they have to do with all their might, will really only do little more than half the work they did in old days, and allow themselves to be beaten out of the field by foreigners who can and do more work in a day. We hope, however, that the country will right itself, and that we shall right ourselves. I mention that because otherwise we should have no sanction for the large amount of capital which we want you to spend, if it were not for our faith that the country will right itself, and that trade will revive. But we are passing now through a very dangerous crisis; the threads of the trade of the world seem to be entirely broken, and how to piece them nobody seems to know." The report stated that the amount of capital expended for general purposes during the half-year was 277,005*l.*, and that the amount required for similar purposes during the current half-year was 281,200*l.* In addition, the proprietors were requested to vote 855,643*l.* for works in progress, 250,000*l.* of this sum being required for the completion of the Market Harborough and Nottingham joint lines; 168,000*l.* for the completion of the Bettws and Festiniog extension lines; 81,000*l.* for the completion of a new dock at Garston, near Liverpool; the remaining portion being for additional siding and other accommodation, and for additional engines and carriages, lands, and minerals. We also gather from the report that further new works on a scale of very great magnitude have been resolved upon, for which a large capital will be required. It is mainly for the construction of relief lines and the enlargement of stations in the counties of Lancashire and Yorkshire, the report observing that having regard to the annually increasing traffic in these counties, and to the length of time it will require to complete the works, it is no longer prudent to delay their commencement. The sum of 750,000*l.* had been spent upon block signals and stations, and an improved system of signalling generally, and the wages of the additional men required for working these signals was 50,000*l.* a year. In connexion with this expenditure the chairman stated at the meeting that some people who ought to know a great deal better had said that railway directors thought first of the dividend, and then of the safety of the public, which was a scandalous libel. He observed that the block system extended over 1,200 miles out of the 1,600 miles, and it was being extended continuously. He added that they must not suppose, however, that, even when it was completed, the block system would ensure absolute safety. The human eye and hand must always be responsible to a certain extent, and if the block system failed, which it would occasionally, the catastrophe was likely to be worse than under the old régime, when the driver was always on the watch. A novel feature in the report was a statement that an additional steamer for the trade between Holyhead and Dublin had lately been built by Messrs. Laird, Brothers, of Birkenhead, of steel manufactured in the company's works at Crewe. Clarke & Webb's continuous brake had been adopted by the company, after having been tried in every conceivable way. Already 1,300 carriages had been fitted with the brake, and the rest were being fitted with it as quickly as possible. They had established a shop at Wolverton for the purpose, which had standing-room for 110 vehicles.

It was stated at the meeting of the *Midland Company* that the amount of capital which had been expended in works during the past half-year was 1,091,000*l.*, 279,000*l.* of which had been expended on lines opened for traffic, and 539,000*l.* on lines in course of construction. The estimated further outlay on these new lines in the current half-year was 1,240,000*l.*, and the chairman observed that he was sorry they could not keep the expenditure on the lines below that sum. A large proportion of the amount was for land, for when they began to buy land in large towns now, the cost, in many cases, was frightful, but they could not help it. They were obliged to obtain it at the best price they could. The Whitecross-street Goods Station was now completed, and at work, the expenditure upon it up to the present time having been 130,000*l.*, but they had yet to expend a further sum of 14,000*l.* on some further works still required there. Considerable additional expenditure had been incurred in the removal of bridges owing to the necessity of substituting bridges of iron and masonry for the present wooden structures. The works of the Poplar line and docks had been commenced; as also the Manchester South District Line, and the earthwork and construction of the tunnels and bridges were progressing satisfactorily. They were likewise making a very large extension at the north end of Liverpool. The chairman stated that the new locomotive shops at Derby had cost them, up to the end of the last half-year, no less than 195,000*l.*, and in those shops, which were now at work, they had some of the newest and best machinery

which money would buy. In answer to a question from a shareholder, the chairman stated that he could not say that the sum of 3,809,000*l.*, which was set down as the estimated further expenditure on capital account, would be sufficient to complete the whole of the works that they had engaged to complete. Following up this answer of the chairman, Mr. Baines said that from long experience, and looking over the vast extent of the Midland system, he was led to the conclusion that it was not possible to close the capital account. Their line extended almost over the whole country, from Scotland down to the English Channel, on both sides of the kingdom, and the demand upon them was perpetually increasing. And it was impossible with such demands upon them, to avoid making such extensions as would enable them to discharge the duties they owed to their district.

From the proceedings and report of the meeting of the *Great Northern Company*, it appeared that during the half-year the outlay on capital account was 888,000*l.*, of which 163,980*l.*, was on lines open for traffic, and 725,000*l.* on new lines in course of construction. The expenditure in the engineer's department was 157,165*l.* A further sum of money had still to be expended on the Farringdon-street goods station; but it would be satisfactory to the shareholders to know that, although the directors contemplated, before that station was opened, the carriage of goods would amount to 100,000*l.*, they were now doing work to the amount of 140,000*l.*, so that the money there expended was well laid out. Upon the block and signalling system they had expended 23,137*l.*, and on the brake-power they had expended 15,000*l.* They had applied Smith's vacuum-break to 400 of their carriages and eighty-five engines. They were also trying experiments with other inventions, including the Westinghouse Automatic Brake and Clarke's brake, of which the London and North-Western Company thought very highly. The directors, however, were still of opinion that Smith's vacuum-break was the best yet invented, basing their judgment upon the satisfactory manner in which it worked upon their own line.

The *Great Western Company's* report stated that the accommodation at the Paddington station, being utterly inadequate, especially for the traffic from Slough and other suburban places, the Board had decided to construct a second arrival platform at Paddington, by which the present inconvenience and delay would be done away with. The new lines between Westbourne-park and Bishop's-road stations were nearly completed. Adverting to the Severn Tunnel, the report stated that the heading was now 2,000 yards under the river from the Monmouthshire side; and the material through which it was driven continued to be of a favourable nature, and almost free from water. The tenders which had been received for the construction of the tunnel, and of the works in connexion with it, were none of them such as the directors could accept; and it had, therefore, been determined to continue the heading, and to proceed with the sinking of the necessary shafts, so as more effectually to prove the nature of the stratification through which the tunnel will be driven, in the belief that, when this has been done, the construction of the tunnel may be contracted for on more favourable conditions. The three temporary shafts required for the construction of the tunnel itself have been let to contractors on satisfactory terms. At the meeting the sum of 251,000*l.* was voted for new works in progress, 50,000*l.* of this amount being for the widening of the line between Paddington and Slough; 20,000*l.* for the new line at Paddington, between Bishop's-road and Westbourne-park stations; and 20,000*l.* for the enlargement of the station and additional offices at Paddington.

The report of the *South-Western Company* stated that the enlargement and improvements at the Waterloo terminus were nearly completed, as also the diversion of the main line at Nine Elms, and the extension of the goods lines to Clapham Junction, and the re-arrangement of the goods yard at Nine Elms would be carried out now that the extra room gained by these diversions had been obtained. The directors trusted that only a very short period would elapse before all the works in Plymouth and Devonport, which the Company, under the sanction of Parliament, was entitled to use, would be fully completed. Mr. Watson, a shareholder, complained that the Hounslow and Isleworth district was not well served by the directors, and he urged a curve being made from Twickenham to Hounslow, where building was rapidly going forward, and where land which a few years ago could have been bought for 200*l.* an acre was now selling at 600*l.* an acre.

Two of the chief features in the proceedings of the *London and Brighton Company* were the reference to the expenditure which had been incurred in introducing the block and interlocking system and the Westinghouse brake; and also the contemplated expenditure by the Company on the improvement of the harbour of Newhaven, in Sussex. In reference to the latter, the chairman explained that the directors had undertaken it because the Newhaven traffic was growing rapidly, both with Dieppe and with Honfleur, and a variety of other ports on the French coast; but that it was cramped just now by the shallowness of the water there, and the Harbour Commissioners there had not the means of raising the capital to make the improvements. The estimated cost was 300,000*l.*, of which 100,000*l.* were for improvements in the navigation; 100,000*l.* for a breakwater, which it was believed would make it a harbour of refuge and call for vessels going up and down Channel; and 100,000*l.* as a reserve sum for making floating docks in the event of its position as a great harbour having been secured. It was believed that on these works being carried out the Company's traffic to Paris by way of Dieppe would be largely augmented.

At the meeting of the *South-Eastern Company*, the Chairman, Sir Edward Watkin, stated that in conjunction with the London and Brighton Company, the directors had agreed to complete the line from Edenbridge to Croydon, the estimated cost of which was 130,000*l.* Also to widen the line from Caterham Junction to Croydon, and to make a number of other works. There were beautiful sites for villa residences, and they might expect on the Surrey and Sussex line the same traffic as they had found on the Caterham branch.

It was stated at a meeting of the *Great Eastern Company* that the capital expenditure for the half-year had been 110,000*l.*, and that the directors had repaired and rebuilt a large number of timber bridges and viaducts out of revenue. The remainder of the Alexandra Palace branch, which would give proper accommodation to the Palace, was under construction, but as it happened to be in London clay, it had been impossible to make excavations during the winter. The Bishopsgate Station frontage works were in progress. It was intended to utilise this frontage, and to have warehouses overhead.

The *North-Eastern Company's* report stated that the capital expenditure during the half-year had been 527,809*l.* The Dearness Valley branch, which was originally constructed for mineral traffic, had been recently altered and adapted for passenger traffic. At Hull a new line of about a mile in length would be required to connect the company's railway with the new dock proposed to be made by the Hull Dock Company.

The chief features of the proceedings at the meetings of the *Metropolitan and Metropolitan District Companies* were the discussions at the meetings of both companies in reference to the Inner Circle Completion line, when the recommendations of Sir John Hawkshaw as to an alteration in the authorised route, were upheld by both companies.

The report of the *North London Company* stated that the whole of the extensive and important works undertaken by the company at Poplar would be completed by the end of July. The district they occupied was very thickly populated, and in their improvements and extensions they had had to use their compulsory powers of purchase. The chairman said some people had cried out that it was a great shame of them to turn people out of their houses and properties; but all he could say was, that the people they had bought out had been exceedingly well compensated for the property they had had to give up.

The *Lancashire and Yorkshire Company's* report stated that the directors had during the last year made considerable progress in the purchase of the property required for the enlargement of the Exchange Station at Liverpool, an improvement which had long been necessary owing to the constantly increasing passenger traffic in that important town.

At the meeting of the *London and Blackwall Company*, it was resolved to raise the sum of 300,000*l.*, to be expended on the improvement of the Fenchurch-street and other stations on the line.

THE "BLACK AND WHITE" EXHIBITION.

THE sixth annual exhibition of works in black and white is one of great variety and interest; in fact, one of the best which has been seen since this idea was started. There is much less reason than there sometimes has been to complain of the prevalence of mere smartness of sketching exhibited in "original drawings" for illustrated papers; and the great proportion of the drawings consist of really artistic and, in its way, serious work. There is only one point in the exhibition in regard to which a word of protest, or at the least a note of interrogation, may be called for. This is the occupying of a whole side of a screen by the works of one artist, Mr. Edwin Edwards, a very able and artistic master of etching, we admit, whose productions we have always regarded as among the ornaments of this exhibition, and of whose etchings we have certainly no objection to see almost any number for their own sake. But knowing that there is a great competition for a place in this exhibition, and that many good drawings are turned away, we cannot but think that the dedication of so much space to the work of one contributor, however good in itself, is somewhat disproportionate, and argues a certain degree of favouritism in the selection which cannot but excite a natural and pardonable dissatisfaction among other contributors, who find themselves shut out under the sole plea of want of space, when nearly fifty works by one favoured contributor are conspicuously hung. There is a great deal of complaint in other exhibitions in London of the close-borough system, which renders it almost impossible for those who are outside the charmed circle to get a good place, or even any place, for their drawings. The Black and White Exhibition was formerly a tolerably free and impartial one, and we hope this prominence given to one contributor in the present exhibition is not to be the precedent for a system of open favouritism. So far as Mr. Edwards's etchings are concerned, we have little but praise for them: they are admirable specimens of the art; but we do not see why in so small an exhibition any one contributor should occupy so much of the hanging-space to the exclusion of others who have their claim to recognition.

As usual, the works of Mr. Leon Lhermitte, in charcoal, are among the finest things in the collection; we specially noted the mastery of this material of expression displayed in the bright atmospheric effect of the garden scene entitled "Mont St. Père au Printemps" (51), and the pathos of the "Femmes des Pêcheurs" (315), which reminds one of Israels in feeling. "Une Rue à Landerneau" (72) is a fine study of the sordid picturesqueness of a street view interesting in a certain way from its very monotony and dulness. M. Lhermitte almost introduced this method of execution into the Black and White Exhibition, and for two or three years had it nearly his own way; but our own countryman, Mr. J. W. B. Knight, runs the French artist very close in his fine work called "Gathering Nets for Night Fishing" (29), a remarkable instance of the interest that can be extracted from so simple a subject of fisher life: there is not an attempt at presenting the scene with any extraneous effect, nothing but the presentation of the facts in a broad unpretending style, the dark masses of net on the ground serving to connect the figures, and give breadth to the whole composition. In treating such a subject, the material, charcoal, seems itself to supply something of the vague idealism which gives a poetic atmosphere to the whole, and removes it from the region of common-place. We must content ourselves with noting, in the order of hanging, some of the works which struck us as worth remark for excellence or originality and point of a special kind. Mr. Ellis's "Banquet of Life" (57), a design for mural decoration, though only a small-scale drawing in pen outline, has much interest and beauty of conception; it represents life as a feast at which men and women sit in the enjoyment of the moment, hardly noticing the fact that every now and then a figure retires silently from the table and disappears down the steps leading to the nether world: worked out on a large scale there would be scope for much grandeur and pathos in this design. "Strangers and Pilgrims," by C. T. Garland (66), is a remarkably clever

study of two dogs guarding the luggage in some locality strange to them, and which seems to puzzle them greatly; there is real and very clever humour in this. Near this is a beautiful little sepia drawing, by J. W. Waterhouse, the artist who is making his way in the Academy, but who has never done anything that we have seen so good as the face of "the flower-girl" in this little drawing (70), a beautiful bit of modelling and expression. We are not familiar with the name of Mr. W. Britten, but his two studies for figures in a picture of the "Stranded Raft" (77) make us wish and expect to know more of him. The French painter, M. Bertrand, sends a small red chalk study of the picture of a drowned girl, which every one will remember occupying the place of honour in Mr. Wallis's gallery some three or four years ago; and Mr. Anmonier has a fine study of "Easton Broad, Suffolk" (91), similar to his Academy picture of last year, but not a replica. Mr. F. Powell's "Loch Fyne Herring-boats" (111) is a beautiful and delicate drawing, though this artist loses by the want of colour more than some others. A small etching by Miss Catherine Nicholls "On the Wensum,—Dry Point" (163) has much freedom and power; "Port de Ruysdael d'après Turner" (165) is an exquisite little etching by M. Rajon; and "Fondamenta di Ponte Lungo, Venice" (181), is an etching of Mr. Bradley's showing his finest qualities of tone and freedom of handling, and remarkable for the effect of the battered and tumble-down Classic architecture, the present of which contrasts so curiously with its past. These illustrate the true qualities of etching, breadth of effect and freedom of line: we dislike a "neat" and finished etching, it is a throwing away of the real capabilities of the art. The top of the room, however, abounds with fine etchings, among which the two little figure-studies by Mr. C. Keene (211, 235), and the fine rich, yet free, work by M. Casanova, "Le Sourd" (218), may be specially noticed: also the fine and powerful "Head of an Old Man" (223), by Miss Emily Ford. On the other hand, we cannot help singling out for reprobation the etching by M. Léon Richeton (256), pretending to be "La Source, after Ingres,"—good in execution, but in drawing a mere travesty of a beautiful work, and not in the least resembling the modelling of the figure in the original: it ought never to have found a place in the gallery.

"Only a Face at the Window" (325), a crayon study of a girl's head, by Mr. Lexden L. Pocock, strikes us as very charming. Next we note Mr. Marks's original study for "Convocation" (348); and further on Mr. Lionel Smythe's "Waiting" (374), a number of Boulogne (?) fish-selling girls waiting for the boats on the steps of the quay, and presenting admirable drawing and discrimination of character. Mr. G. Addison's "Charcoal Study" (366) for a quiet river landscape has much beauty and poetic feeling; beauty too there is of no ordinary kind in the red crayon study of a girl's head by Mr. David Carr, under the title "Morning" (383). "Below Bridge" (395), by Mr. Page, is an idyll of Thames waterside life, finely told and felt; and further on Mr. Clifford exhibits an unpretending but beautiful and feeling portrait of that heroine of modern life, Miss Octavia Hill, in which the best expression of the face is beautifully caught. We may notice a fine drawing called "An Architectural Patch-work" (465), by Mr. Brewer, and over it Mr. Graham's powerful sketch for a picture of two figures, under the title of "The Philosopher's Breakfast" (466).

The door-screen is interesting for Mr. Poynter's original studies for various figures in his "Atalanta's Race," nude studies for the pose and action of the figures in the group of spectators; and the other screen, besides the collection of etchings before mentioned, contains a good many admirable works. Indeed, we have only indicated a small proportion of the things worth looking at in this very interesting exhibition.

"THE ORATORY" COMPETITION.

SIR,—As you may like to inform your readers, I write to say that the designs sent in competition for our new church will be on view in the part of our buildings called St. Joseph's Hall, on Tuesday, Wednesday, Thursday, and Friday of next week, from 10 a.m. to 5 p.m. The presentation of an address card will be sufficient introduction. The award has not yet been made.

EDWARD S. KEOGH, Of the Oratory.

South Kensington.

NEW CARLISLE BRIDGE, DUBLIN.

THE present bridge is about 70 ft. in width, and the plans adopted for its alteration, improvement, and extension were those of Mr. B. B. Stoney, the eminent engineer of the Port and Docks Board. According to these plans the new bridge will be widened to the full breadth of Sackville-street, and will be flat, so as to harmonise with the level of the adjoining streets. This will necessitate the lowering of the roadway of the present bridge 3 ft., so that the remodelled structure will run evenly from the site of the O'Connell monument to the place where Smith O'Brien's statue stands. The general design of the new bridge in architectural effect will be an exact counterpart of the existing one, with this exception,—that the alteration in the level will cause the new arches to be elliptical in form instead of semicircular, though their width will remain the same. The great obstacle to be avoided in improving the bridge was the adoption of such means as would in no way interfere with the traffic, and with this view, Mr. Stoney's plan provided the adding of two new side bridges to the present bridge, of about 45 ft. width on each side, so that the whole bridge, when completed, will be 154 ft. wide over all: comprising two roadways of 51 ft. each, two side pathways of 18 ft. each, and a central pathway for the convenience of tramcar passengers, 15 ft. in width. By means of these side bridges, the traffic can be continued while the alteration of the present bridge is being proceeded with, and so as to allow the whole space thereon to be used as a carriage-way, temporary wooden foot-bridges will be erected outside the parapets. The first operation deemed necessary was to drive a series of cross-piling immediately outside the foundations of the existing bridge, so as to prevent any of the strata on which it rested escaping when the excavations were being made for the foundations of the new sides, which are considerably deeper than those of the old structure. The borings had to be made into the rock at each side, for the purpose of making the contour of the bottom of the great iron caissons, described later on, suit the irregularities of the rock underneath. The old quay walls at Eden Quay, Bachelor's Walk, Burgh Quay, and Aston's Quay had to be taken down, and replaced by foundations sunk to a great depth below low water, to form the abutments from which the new arches spring to the centre piers. The arrangements for the construction of these centre piers by means of caissons is very interesting, as each of the four caissons weighed between 80 tons and 100 tons, and had to be lowered on to the solid rock evenly and with the greatest care,—their gradual sinking registering the progress of the work inside them. A platform for each of these bell-shaped, bottomless tanks was first provided by driving a series of piles outside the proposed width of the caisson. On the heads of these piles, longitudinal timbers were placed of sufficient strength to sustain the great weight, and to allow the big vessel to slip down inside. These caissons, which were from 18 ft. to 21 ft. in height, were 45 ft. long, having sloping sides, so that the width at the top was about 10 ft. while at the bottom it measured 17 ft. They were constructed of plates of wrought iron, ½-in. thick, strongly bound together with angle arms and T-irons. Having been thus erected on the platform over the exact site they were to occupy, upright staging, enclosing the whole outward surface of each caisson, was raised on the platform itself. This consisted of long balks of timber, considerably overtopping the height of the caisson, and across them great longitudinal timbers were placed. Suspended from these cross timbers were six or eight screws, according to the weight of the caisson,—for those on the north side of the river were 20 tons heavier than those on the south, as the rock came nearer to low water on the south side, and did not require so great a depth. These screws, 2 in. in diameter, were for the purpose of lowering the caissons with great caution and accuracy, and were attached to the sides of the huge vessels by means of lugs. Each screw was about 10 ft. in length, and was passed through the balks, upon which it was secured through an octagonal nut which rested firmly on a stationary block casting placed on top of the cross timbers. The lowering was carried on by a series of levers turned uniformly round at the same rate of speed on the top platform. These levers moved the nut, allowing the screw to go down 1 in. at each revolution, and, being simultaneously turned, the level of the caisson was maintained, and an equal strain preserved on each screw. The distance from the top of the platform to the foreshore was 21 ft., and of course the screws were not of sufficient length to permit the caissons to be lowered on to the bed of the river, but auxiliaries were brought into play in this way: as soon as the screws had been lowered down to within two or three of the last threads at the top of the nut, a clamp bar, just sufficient to allow the screw to be relieved, was suspended from the balks above, and attached to the caisson below. Then a 6-ft. link of 2 ft. 6 in. round iron, with couplings and pins at each end, was attached to the lug, and the screw run up again to its full length, being then attached to the link. This was done to each screw separately all round, and the same operation was repeated each time that it was necessary (the clamp bars being, of course, removed the instant the screws were tightened), till the caissons rested on the foreshore, which stood about 15 ft. above the level of the rock. Then came the work of excavation for that 15 ft., through boulders, clay, and other matter, till the solid rock was reached at about 20 ft. below low-water level. The interior of the caisson is divided into ten compartments, and the work of excavation is executed by divers and dredgers. The diver uses the ordinary indiarubber overall and brass helmet, with air-pipe at the back of the head, and works on an average from two to four hours at a time. The stuff detached from the bottom of the river is thrown into the centre of the caisson by the excavators, is raised by small vertical dredgers and spoons worked by crab winches, ejected into barges, and removed away to sea. This labour has been necessarily slow, especially as the divers have to work in the dense waters of the Liffey at such a depth below the surface. However, all the difficult portion, we are happy to say, has been mastered. Two of the cassions now rest on the rock level. When all the caissons are so placed on the solid rocky bed, they will be filled with concrete, which will be passed down through the water in closed self-acting boxes, which will open as they are lowered to the place where their contents are to be deposited. When the caisson is completely filled up to the level, or say from 1 ft. to 2 ft. above low water, a series of heavy ashlar granite blocks will be placed over the concrete, and from these, like the abutments, the arches will spring. The caissons will remain permanently fixed where they lie, and will be a protection to the concrete while it is hardening. It is of no matter if they get corrugated, for by that time the Portland cement concrete will have become hard and substantial as the rock on which it rests. The foundations of the abutments on Eden quay and Bachelor's-walk have been built up to the level of the springing of the arch, and those on the south side are now in progress,—the mason work at Burgh-quay being about to be commenced,—so that in a short time it is expected that the arches of the side bridges will be placed. The stone is cut to the necessary size, and is nearly all on the ground, and everything is in readiness for turning the arches. It is anticipated that the side bridges will be completed and have traffic going on them by the 1st of April next.

The water was excluded from the foundations of the abutments upon a principle pointed out by Mr. Stoney, namely, the erection of timber coffer-dams, wherein the use of clay and puddle was avoided, and whole-balk sheet-piling substituted. The piling was 12 in. square, closely driven together in twos or threes, and caulked both internally and externally with oakum, like the sides of a ship. It was considered injudicious to excavate down to the rock immediately adjoining the roadways of the quays at each side,—a depth of 21 ft. below low-water; and consequently a series of bearing piles, 3 ft. apart from centre to centre, were driven into the rock, and their heads cut off about 8 ft. below low-water, the ground being excavated to that level. They were filled round with concrete up to within 1 ft. of low-water, when a series of ashlar granite blocks were laid to bind the mansonry work immediately underneath the springing of the arches. The front row of bearing-piles was a continuous row of close sheeting. Within the coffer-dams the water was excluded by pumping engines, and the heavier materials deposited by steam hoists. This work, though very extensive, progressed more rapidly, of course, than that within the caissons, where it was executed by divers. It is only right to mention that as an additional

security to the quay walls, a set of whole-timber sheet-piling was driven immediately behind them. The great quantity of piling and sheeting about the abutments and round the foundations of the old bridge, the construction of timber coffer-dams, &c., required an immense amount of pile-driving operations, which were performed by Mr. Doherty's patent self-acting pile-driver, worked by means of steam upon an endless chain, so that the motive power of the engine is always felt. The length of the stroke, or height of fall of the ram, is regulated by a pin, placed at whatever height the stroke is required from, in the face of the wooden derrick. The self-action is imparted by means of a very ingenious arrangement. When the driver falls, a piece of iron projecting on its face acts upon an india-rubber spring in the body of the ram with just sufficient force to throw the nipper forward into the pitch of the revolving chain. The latter carries the ram up till it is again disengaged by striking the pin in the front of the derrick, and this goes on continuously. The pumping has been performed by horizontal centrifugal pumps, throwing great volumes of water when required. Head travellers, of 72 ft. span, and capable of lifting 10 tons, have been erected over the site of the new side bridges, and are ready for setting the concrete in the caissons, and placing the arch stones in position. Mills for mixing mortar and concrete are erected at each corner of the proposed new bridge. The parapets of the bridge, when completed, will on each side be set off with four three-light ornamental lamp-posts, made in the Foundry du Val d'Osne, Paris, and similar to those in the Place du Concorde. Three five-light gaseliers of a similar design will ornament the central footpath.

THE BERESFORD-PLACE BRIDGE, DUBLIN.

THE new bridge at Beresford-place, for which no name has been as yet suggested, will be a "swing" structure for the purpose of enabling vessels to take berths between the Custom House and Carlisle Bridge. It will consist of two stone arches,—one on each side of the river, having respectively a span of 37 ft.,—and two waterway passages of 40 ft. on each side of the central pier or platform on which the swing rests. The width of carriage road will be only 20 ft., with two 7-ft. trottoirs, but provision is made that, should it be deemed advisable at any time to dispense with the swing and close the navigation for larger vessels above that point, the bridge can be changed into a permanent four-arch stone one, by merely throwing two arches from the central pier to each of the side piers on which the land arches rest, and the width can be increased from 20 ft. to 70 ft. Unlike Carlisle Bridge, where the difficulty of maintaining the old structure uninterrupted for traffic retarded the advance of the works, here considerable progress has been made. The land abutments, wing walls, and arch on the south side are now completed, together with the central pier: so two-thirds of the serious work have been performed, the north arch and northern abutments remaining only to be put in place. The construction of the abutments was similar to that for Carlisle Bridge, but the arrangements for the erection of the piers were different. Instead of using caissons, a gigantic coffer-dam was erected, enclosing the site of the proposed south pier and wing walls. This was formed of a series of piles and close sheeting made water-tight by clay or puddle. It was 220 ft. in length, and extended 100 ft. into the river, being supported by a number of struts and wales. The most interesting feature in connexion with the building of this bridge was the getting into place the mason work of the central pier on which the ironwork of the swing rests, and that has been already built up to within 1 ft. or 2 ft. of high water. The coffer-dam adopted by the contractor for this work consisted of an extension of the system partially adopted at Carlisle Bridge; but, considering that the erection was in the centre of the river, surrounded by 34 ft. of water at high tide, with a pressure on all sides equal to about 16 lb. to the square inch, the difficulty of the task may be readily understood. The dam was made by a single row of whole-sheet piling, 38 ft. to 40 ft. long, driven round the space to be occupied by the proposed wall, in close contact. As the water was pumped out by steam pumps, worked by a 80-h.p. engine, numbers of ship-carpenters were employed in caulking the joints, until the whole,—about 220 ft. long by 24 ft. wide,—was made perfectly water-tight. In all cases the piles were driven down to the solid rock,—and, considering that the ground through which they were sunk consisted of coarse and fine gravel for about 6 ft. overlying a bed of clay of about 5 ft.,—it is astonishing that they were able to take such hold in the comparatively shallow depth of tenacious earth. When the interior space was freed from water, the earth was removed from the centre by steam hoists, and deposited in lighters which conveyed it away. It is supposed that it was from this excavation the very offensive effluvia, which almost sickened people in Sackville-street and its environs for a month, arose. The sulphuretted hydrogen, which had been forced down by the density of the water, escaped as the rock was stripped over a surface of 78 ft. by 20 ft., at a depth of 20 ft. beneath low water mark. It rose in such volume that neutralising agents, such as chloride of lime and chloralum, had to be employed to counteract the gas and permit the workmen to continue at their labour. The east wind which prevailed during the month of April carried the disagreeable evaporation up stream, but now that the masonry has been placed the unpleasant odour has discontinued.

To give an idea of the magnitude of the works, we may state that there are seven steam-engines of various sizes employed on the works at Carlisle Bridge, and five steam-engines, between thirty and eight horse-power, at Beresford-place Bridge, in pile-driving and pumping, and several hoisting steam-cranes. There are overhead travellers and gantreys also worked by steam, which is employed wherever they can be brought into use. At both works the number of men employed amounts to 450. The whole is being carried out under the immediate superintendence and from the designs of Mr. Stoney, by Mr. W. J. Doherty, the contractor. It is estimated that when completed the two bridges will cost about 115,000*l.*

HOW OBAN GREW.

FASHION has a greater share in building towns than she is credited with; and landowners are not slow in discovering sites on their estates where tourists, pleasure-seekers, and traders are likely to congregate. Of late years steam has afforded access to out-of-the-way places that were scarcely worthy of mapping, and one of the most notable instances is the rise of the town of Oban, on the coast of Argyleshire. This, however, is partly owing to the late Duke of Argyle, who, near the end of the last century, wishing to encourage building on his estate, got plans prepared, and offered very favourable terms. Long leases, for ninety-nine years, were offered to any one who would undertake to erect a house, according to plan, for a nominal rent; half a crown a stance being the common rate on the site of Oban.

Two brothers of the name of Stevenson, who had a contract for building a bridge at Muckairn, on learning such favourable terms, were not slow at improving the occasion. They invested their own capital and raised money by ways only known to enterprising builders, and not only built extensively, but they helped greatly to bring trade to the place.

Steamboat traffic was, however, one great aid in the development of this out-of-the-way town, and has caused Oban to become the centre of communication for all places on the West Coast of Scotland.

At present the hotels and lodging-houses are numerous and well built, and during the summer months these are resorted to by thousands of tourists from all parts of the world.

A gauge of the extension of new buildings may be taken from the fact that the rental of 1846 amounted to 1,719*l.*, while in 1877 it "slated" up to 14,562*l.*, and extensive building operations are in full swing.

American Society of Civil Engineers. The tenth annual convention of the Society was opened at Boston, on Tuesday, June 18th, 1878. Sessions for the consideration of professional subjects, and one for the transaction of business have been held, in the Hall of the Massachusetts Institute of Technology, on Boylston-street. Excursions were made and a number of papers read.

TENT WORK IN PALESTINE.

THE book which is published under this title* is a record of the survey made for the committee of the Palestine Exploration Fund, under the command of Lieutenant Conder, R.E., who in two volumes gives us the result of his observations of the country while making the survey, with some account of various incidents of the expedition, many of which fully justify the author in the remark that surveying in Palestine is not a holiday task. There seems, indeed, to have been no small amount of roughing it to be gone through, and considerable experience of the disagreeable tendencies of the natives of the country, whose behaviour must have been eminently unsatisfactory, whether they were strangers to the party or *employés* connected with it; for, even in the latter capacity, they seem to have been very ready either to make themselves positively disagreeable on imaginary provocation, or to show themselves negatively worthless by preparing to decamp when their employers were in difficulty, and most wanted faithful service. On one occasion, when all the Europeans of the party were ill, it needed all the exertions of one faithful attendant to keep the rest from leaving them all in the lurch, a catastrophe averted partly by the practical logic of the author, who, on overhearing their cook threaten an immediate flight, called out that the road to Jerusalem lay past the opening of his tent, and that if he saw the cook pass the opening he would certainly shoot him: an argument which produced the desired effect. In general, the author tells his story clearly and well, and in a sufficiently interesting manner, without the slightest attempt at fine writing. It must not be supposed that the book is in any degree an official account of the survey: about actual work little is said; it is a narrative addressed to the general reader, and the object is to trace out in the features of each district the connexion with Biblical events which are related as having happened there, and to give new reality and meaning to them by comparing the account with the actual appearance of the country, and with the existing names, customs, and traditions. The basis of this method of treatment is that the customs and names of the East are practically unchanging. "Immutability is the most striking law of Eastern life. The Bible becomes a living record to those who have heard in men's mouths the very phrases of the Bible characters." This line of reasoning Lieut. Conder brings in support for the most part of the received traditions of localities mentioned in the Old and New Testaments, the former especially; and in many cases the preservation, in a more or less recognisable form, of the original names of localities, as well as the coincidence of the character of the landscape with that described in the Bible in connexion with the incidents recorded of such localities, leaves very little doubt that we see the scenes substantially unaltered, with which the Old Testament historians were familiar. Into all the probabilities or improbabilities of these topographical speculations, however, we cannot here enter, nor are they, as far as we gather, offered as unanswerable logical conclusions, but rather as impressions derived from personal observation. It is sufficient to say here, in regard to the book as a whole, that whoever goes over it in conjunction with the portions of the Biblical narrative severally referred to will probably get a new idea of the real aspect of the country, and of the point and meaning of much of the Bible narrative, and that a somewhat vivid reality is imparted to many of the descriptions by the author's quick eye for minutiæ,—the colours of the landscape, the nature and habits of the birds frequenting it, and so on. We may, however, touch a little more in detail on some passages which have a more directly architectural or archæological interest, and suggest a good deal to architectural readers, though written from the point of view of an amateur.

Baalbec is not a new subject certainly, but it is always interesting to get the impressions of a new visitor about remains so full of interest, and Lieut. Conder's description of the famous ruins is very picturesque and vivid. He approached the temple from the town, ultimately

* "Tent-work in Palestine: a Record of Discovery and Adventure." By Claude Reignier Conder, R.E., Officer in Command of the Survey Exhibition. Published for the Committee of the Palestine Exploration Fund. In two vols., with illustrations by J. W. Whymper. London: Bentley & Son. 1878.

by "riding through a dark tunnel of huge masonry, and looked back on the green paradise of foliage, while in front a glaring dust-heap indicated the ascent into the great enclosure; hence we emerged into the centre of the ruins," the enormous size of which was not appreciable at first sight, only on going up to them and finding the bases of the columns higher than a man's stature; but this deception as to scale has nothing to do, Mr. Conder, with the building being of "graceful proportion," an old heresy of amateur writers on architecture, which it is amusing to meet with once more. A "well-proportioned" building is that which shows its size and scale; to look smaller than it really is is the very last quality to be quoted as a merit in any architectural design. In the case of Baalbec, probably the deception as to scale simply arises from the fact that only a part of the building is left, and that it stands in the middle of a waste place with no immediate object of comparison. It is melancholy to hear that the six columns which form the remnant of this monument of Roman grandeur are in a very precarious state, the bases having been undermined by those dear civilised beings, the Turks, in the effort to get at the metal dowels supposed to be in the centre of the columns; and Mr. Conder says that any winter may bring the destruction of the eastern column, and perhaps of the next two. Surely it is worth while to try to get some effort made to preserve this unique monument of architecture from further destruction. The urgent necessity for preservative measures here was pointed out in our pages some time ago. The description of the evening scene at Baalbec is worth quoting:

"The sun was getting low as I sat sketching the six columns, which stood out dark and decisive against the glowing sky. A stork stood on one leg on the cornice, his mate was in the nest below. As I turned eastward the scene was yet grander. The Temple of Jupiter was in dark shadow, with a foreground of tumbled columns, like fallen giants, sprawling over crushed blocks and ruined cornices. The wall on which I sat was battered in by the thud of one huge shaft tossed against it. Beyond it, simple, the rich tracery of the Moslem *mihrab* on the south wall was visible, and behind this, again, was the dark foliage of mulberries, poplars, and willows, and the bare grey hills, tipped with crimson from the setting sun."

The chapter on Bethlehem, "a long town of solidly-built stone houses, crowning the summits of two knolls," is interesting, and gives a different conception of the place from what most of us are accustomed to associate with it. It is almost startling to hear of Bethlehem as a "thriving modern town," in respect of which quality it is contrasted with Hebron, which the author characterises as entirely a city of the past. A detailed description is given of the basilica at Bethlehem, where the columns are "monoliths of red and white marble, painted with figures of saints, now dim with age, and scrawled over with the crests and titles of knightly pilgrims of the Crusading ages. The capitals are of the Corinthian order, debased in style, with the cross carved on the rosettes of each." The plan of the basilica, the author notes, resembles very closely the description given by Eusebius of Constantine's buildings over the Holy Sepulchre at Jerusalem. For the exceedingly curious description of the Christmas festival in the Bethlehem church, with its mingling of the picturesque and the barbarously superstitious, we must refer the reader to Mr. Conder's pages; though if he is very tenacious of his poetic and hallowed associations with Bethlehem, he might do more wisely to avoid the perusal.

The passage through Damascus, on the way to Baalbec, gives occasion for some interesting notes on the architectural and other characteristics of the city. The exterior the author describes as mean and unattractive in effect; no great wall bounds the city, which looks on approach like a straggling village of mud houses, with here and there a minaret rising above them. When they came to their hotel, they at once appreciated the real glory of Damascus, its interiors. "The house was built round an ample paved court, its inner walls of stucco, painted in horizontal bands of white, red, and blue. In the centre was a large square basin surrounded by little jets, whence the water trickled slowly. It was shaded by tall lemon and orange trees, peaches, and plums. On one side of the court opened a diwân, a cool lofty apartment, with raised floors, surrounded by low sofas, and with an octagonal fountain in the narrow central passage. The roof of this central part was more lofty, and clearstory windows let in a subdued light." The city retains its unmixed Oriental character: "no French fashion or Gothic building destroys the general effect;" and the social characteristics are in keeping with the outward appearance.

A chapter is devoted to the sacred buildings at Jerusalem, about which a good deal has been said recently. Mr. Conder gives his history of the Dome of the Rock with the same certainty as if the facts and theory which he brings forward were uncontested and incontestable, and without making even the slightest reference to the well-known theory of Mr. Fergusson, which, considering the rather loose nature of Mr. Conder's own architectural criticism and description, is showing hardly decent respect to the opinions of a very eminent architectural critic and historian. He reproduces the old idea that the "Dome of the Chain" was the model of the Dome of the Rock, in spite of their entire difference in plan, and ignores entirely the bearing on the question of such buildings as the Lateran Baptistery; and he explains the style of the Dome of the Rock by saying that it belongs to that obscure period of Saracenic art when the Arabs had not created an architectural style of their own, and when they were in the habit of employing Byzantine architects to build their mosques. He quotes, "among the rare specimens of their work at this time," the Mosque of Amrou, at Cairo, commenced in 642 A.D., and he quotes Mr. Fergusson as an authority to the effect that this building "probably now remains in all essential parts as left" by the two Caliphs who rebuilt it; but he forgets to add that Mr. Fergusson also expresses the opinion that it has nothing whatever in common with the architecture of the Jerusalem building.* This is the only reference in the chapter to the author of "the Temple of the Jews," and we must say that this method of treating him is, to say the least, not very ingenuous. The fact is, the whole Palestine Exploration party are obviously in arms against Mr. Fergusson for having disturbed their holy places; and, finding his arguments from architectural style awkward to deal with, seem to adopt the policy of ignoring him; but whether his theory be right or wrong, it will hardly be met in this manner. Indeed, it appears to us that a disproportionate amount of attention has been given, in connexion with the proceedings of the Exploration Society, to the investigations of levels of rocks, and "beautiful scarps," and so on, and too little study, and in too uncritical a spirit, to the actual architectural remains and the story they have to tell. What will interest most readers more in the Jerusalem chapter is the graphic description of what the author calls, in language apparently by no means too strong, the "annual orgy" which takes place within the Church of the Holy Sepulchre, when the populace meet to receive the "holy fire" given out through the opening of the Sepulchre. One or two bits of his description we quote, for they give some idea of a scene which, to Western Christians of the nineteenth century, seems literally incomprehensible as a sacred rite. The author on two occasions (in 1873 and '75) obtained a place in the Latin gallery west of the Sepulchre, and looking down on the rotunda. A double line of Turkish soldiers kept a narrow lane, on each side of which the crowd was packed in such a way that "to say that you could have walked on their heads conveyed but a poor idea of its compactness." They had been standing in their places more than ten hours; the Greek Christians, mostly Syrians, being worked up into a state of hysterical frenzy that did not allow them to be quiet for a moment; every now and then a man would struggle on to the shoulders of the crowd, or was pushed along over their heads as if he were swimming; these adventurous persons becoming leaders of the chants, of which the principal was "Hádna kúber Sáid—ná!" (This is the tomb of our Lord!). The scene when the natives of Jerusalem arrived is almost incredible:—

"A long wave of human beings bursting in from the south, and surging along the narrow lane. Many were stripped to their vests and drawers, in regular fighting costume. They rushed at the fire-hole, and the first-comers thrust their arms into it to keep their places. The effect of this crowd within a crowd, a moving wave, ploughing through two packed masses, was very curious. No sooner was it pushed and swept into place, and the lane cleared, than it burst into one loud shout of repetition,—

"Hádna kúber Sáid—ná!"

which was repeated twenty or thirty times at a breath; and a big man was hoisted up, and fairly pounded the walls of the Sepulchre with his fist, shrieking the same refrain, and pointing at the chapel with his fingers, while the crowd joined in the last syllable,—a tremendous shout of 'Ná!'"

* In his latest work Mr. Fergusson observes that the recent rebuilding of the Mosque of Amrou has all but obliterated its ancient features.

Such is modern Christianity in the East, apparently! And there is worse than this, which we have not space to quote.

We reproduce from Lieut. Conder's second volume the frontispiece representing "an early Christian tomb," * since it is of interest just now as further illustrating the remarks which have appeared in Mr. Fergusson's recent work in regard to the prevalence of the vine as a decoration (no doubt, symbolical) in Jewish and early Christian tombs and places of worship; concerning which that writer observes that a number of fragments of vine ornamentation, torn from some desecrated building in Syria, adorn the apse of the church of Murano at Venice; and the vine ornament also occurs on the soffit of the horizontal beam extending from column to column in the Dome of the Rock, a fact which is certainly very significant as bearing on the præ-Mahommedan origin of that building, as no one pretends that the beam is transported from any previous building. Of this particular illustration, however, we are told nothing except the vague statement that it is "an early Christian tomb"; at all events, if there is any remark in the book as to the place, date, and other circumstances connected with the illustration, we have not been so fortunate as to find it. We may note that in the second volume is an account of a collision with native prejudice much more serious than those we have previously alluded to, ending in a free fight, in which the author very nearly lost his life. He succeeded in getting the assailants punished, converting into a moral victory what was in the first instance a material defeat, so effectually, that on his companion, Lieut. Kitchener, revisiting the place two years later, their former assailants humbled themselves completely before the representative of the Franks; and probably European *prestige* in the neighbourhood has gained not a little by the courageous and firm manner in which Lieut. Conder behaved in reference to this affair.

We have only space to observe that, passing over a good deal that is very interesting in regard to the character and topography of various parts of the country, the book concludes with an interesting and suggestive chapter on the possible future of Palestine, in regard to which Lieut. Conder is of opinion that there must be a radical reform in government, encouraging a spirit of enterprise and improvement in the making of new roads, and other public works, especially a system of irrigation for developing the fertility of the land, and improvements in the sanitary condition of the towns. The native population are, he says, quite as well aware of the deficiencies of their country as any foreign visitors, and are desirous to pass into the hands of wiser and stronger rulers, and he considers the best chance for the future of Palestine would be its occupation by some strong European power which would recognise the value of the natural resources of the country, and develop them. "Till such a change occurs, the good land must remain a desolation."

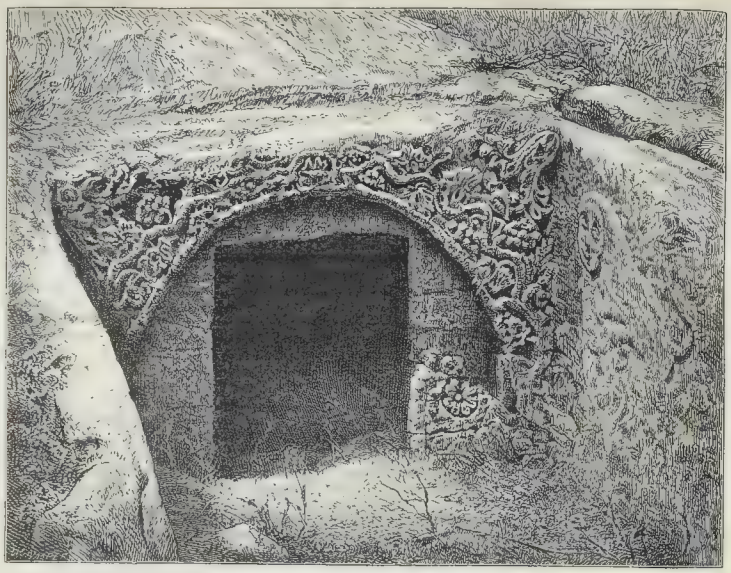
ST. MILDRED'S CHURCH, BREAD-STREET.

SIR,—This little church, out of sight and out of mind, is full of the most beautiful Classic work inside. I find a church dedicated to St. Mildred existed here as far back as the year 1333, and, being destroyed in the Fire of London, was rebuilt with the rest by Wren. St. Mildred was a Saxon (?) lady, daughter of Mer Walden, brother to Penda, king of the Mercians. Nothing can exceed the beauty of the Classic details of the interior of this quaint City church. Never did the works of nature,—fruit and flowers, wreaths and garlands, with its fine domed ceiling, surrounded by an enriched moulding of fruit work,—better adorn the "House of Prayer." Wren's master-mind truly was to be seen in the beautiful manner he has designed the details of this church interior. The pulpit and sounding-board are a masterpiece of the carver's art in oak.

I repeat what the late Sir Gilbert Scott said,—"This shameful desecration and destruction by the Ecclesiastical Commissioners ought to be stopped by some one in authority, for this scandal is already a disgrace to any Christian City."

R. PAYNE.

* See p. 644.



AN EARLY CHRISTIAN TOMB.*

A BRITISH VILLAGE AND CROMLECH IN CARNARVONSHIRE.

NEAR the coast of north-west Carnarvonshire, and within a mile or two of the village of Llanaelhaiarn are three mountains in close juxtaposition with each other, and popularly known as "The Rivals,"—possibly from the fact of their summits being very much the same in height. On one of the lesser peaks is the ancient British fortified town known as Tre'r Ceiri,—the town of fortresses,—which we have illustrated. The engraving has been made from a photograph on wood taken from a much larger camera-lucida drawing made on the mountain-top by the writer of these notes last autumn, so that the general appearance of the town, its neighbouring mountains, and sea-coast, may be looked upon as correct in all its details. The view is taken from an immense heap of large, loose, and sharp stones, piled up cairn-like, at one side of the ruinous village, and on the highest point of the mountain. The view of the neighbouring country from this look-out point is grand in the extreme: on one side is the rocky sea-coast, and on the other a mountainous and precipitous country.

The mountain on which Tre'r Ceiri is built is 1,400 ft. above the sea; but although the elevation is comparatively low the ascent of the face of the mountain, owing to the immense number of large, loose, and sharp stones, is extremely difficult. As the summit is approached, tier after tier of these loose stones of trap-rock have to be surmounted; they slide about under every step, and so cut the boots and shins that it is almost impossible to make headway. These immense terraces of stones have not got into position by accident, but they were, doubtlessly, designed to answer as outworks of the fortifications of the town above. So effectually do these stones answer their purpose of retarding an ascent, that to this day the approach to the town by the rocky side is most difficult, and cannot be made without numerous falls amongst the treacherous stones. A safer and much easier path for the ascent is from the road to Nevin from Llanaelhaiarn; but this path is difficult to find without a guide. When the small and almost flat summit of about five acres is neared, a perpendicular wall, 15 ft. high and 15 ft. broad, made of loose stones piled one upon the other, and, of course, without cement, has to be surmounted before the houses of the town can be seen. The wall is roughly flat on the top, and in some places, where the natural defences are weak, there is a series of two, or even three, walls. The entrances are three in number, with structures which would answer for guard-houses and a true sally-port. The single wall is on the precipitous side (which is so difficult of ascent), whilst the double and treble series of walls are on the flatter and more exposed positions.

The houses of the town are arranged in five larger groups, four smaller groups of four or five houses each, with a few other houses built against the inner side of the great protecting wall. The houses vary much in size, some not being more than 6 ft. in diameter measured from the inside, whilst others measure as much as 12 ft. or 15 ft., with walls 5 ft. thick. In several instances there are two rooms (if such they may be termed) to a house, the first room leading into a second. Most of the houses are circular, or rude squares with broadly-rounded angles. Most of the dwellings have an opening which must at one time have served for a door; but in many instances, there is no door at all, so that the ancient occupier probably got in at the top. In one house there is a recess on the ground line 18 in. high, and as many broad, formed by two supporting stones and a rude lintel at the top. This is considered by the Rev. E. L. Barnewell to be a cupboard, in which the pre-historic occupant kept his "things." No trace of a roof is to be seen in a single instance; but probably the roofs were originally formed of branches of trees overlaid with skins of beasts, with possibly a supporting pole in the centre. Unless, however, these roofs were very securely fixed, the storms of wind which so often scour over these mountains would make short work of them. When or by whom this fortified town was built no one knows; its position and structure show its great antiquity, and its age is not likely to be less than 2,000 or 3,000 years. During two visits made by the writer, no flint-implements or flint-flakes were found, and no instances are on record of flint implements being found in this position, though roughly-hewn celts have been met with on other mountains in North Wales. Not a trace of the men who built this town can be seen, except in the ruins of the town itself and its protecting walls. The men possibly lived on this bleak and exposed summit during the summer, but during the winter months it is more probable that the inhabitants retired to the woody valleys. There is a little water on the mountain-top, and as clouds are almost constantly resting on the crest, every little hollow gets supplied with the ever-necessary water.

Not far from this ancient fortified town (and the village of Clynnog) there stands in a field close to the seashore the magnificent cromlech here illustrated. It is remarkable for its grace, and on account of the cap-stone being profusely dotted all over the upper surface with the mysterious "cup-markings" of which so little is known. The cup-like hollows on the cap-stone of this cromlech might easily be overlooked, as the stone is rough, weatherworn, and covered with lichens; but on a careful examination it will be observed that the depressions are equal in size, and evidently worked in ages long past by man; a small number of depressions occur on the edge of the stone. A few years ago a letter appeared in the *Times* stating that the cromlech had been overturned, and that masons were at that time squaring the stones for the repairs of a neighbouring farmhouse; strangely enough, a second letter appeared, confirming the first, but neither of the correspondents had any foundation for his report, as the cromlech was intact at that time, as it is now.

There are several other cromlechs, single stones, and avenues of undressed stones in the immediate neighbourhood; some of these are marked on the Ordnance maps, whilst others are not.

* See p. 643, *ante*.

THE STREET OF STRANGERS: PARIS INTERNATIONAL EXHIBITION.

ONE of the attractions of the Paris Exhibition is certainly the international street, with its specimens of architecture of all nations in past and present styles, a pleasant and interesting promenade, in which variety offers every possible charm. Here the eye is pleased with the modest Greek and Danish mansions, and dazzled with the many-coloured Spanish façade, or lost in wonderment at the solid Belgian specimen which has been constructed in so short a space of time. The Austro-Hungarian and Italian façades are also worthy of note; but the most remarkable is that of Portugal, which has had modelled, the same size as the original, the magnificent doorway of the convent of the monks of Jeronimus, or Hieronimus, which still stands in the environs of Lisbon, in close proximity to the old watch-tower and fortress of Belem, at the mouth of the Tagus. The style is a mixture of the Gothic and Moorish, the former predominating.*

* The drawing we have engraved was made from a careful photograph, produced by M. Pierre Petit, of Paris.

PREHISTORIC STRUCTURES IN CARNARVONSHIRE.



A Fortified British Village on a Welsh Mountain Top.



Cromlech, with Cup-markings, near the Foot of Mountain.



THE STREET OF STRANGERS: PARIS INTERNATIONAL EXHIBITION.

GENERAL CONFERENCE OF ARCHITECTS, 1878.

WE this week conclude our very copious reports* of the proceedings of the Conference. In our number a fortnight ago (pp. 583-584), we printed the substance of a paper by Mr. Douglass Mathews, and last week (pp. 610-611), papers by Mr. Boult and Mr. Honeyman respectively, on "General Building Regulations for the United Kingdom." Last week (pp. 615-616), we printed a paper, by Dr. Phené, on "Troy and Mycenæ," which was preceded by an interesting paper on "Rude Stone Monuments," by Mr. T. Roger Smith, both these papers being discussed together. It only remains for us to give a report of the discussion on the papers "On General Building Regulations," the substance of Mr. Roger Smith's paper, and a report of the discussion on it, and on Dr. Phené's paper.

GENERAL BUILDING REGULATIONS FOR THE UNITED KINGDOM.

In the discussion which followed upon the reading of Messrs. Mathews's, Boult's, and Honeyman's papers,

Mr. T. Chatfeild Clarke, in moving a vote of thanks to the authors, said Mr. Mathews's paper appeared to be a most careful analysis of the model bye-laws. Mr. Boult's paper also contained several valuable suggestions; and with regard to Mr. Honeyman's paper, and especially its last point, it was desirable that the Conference should be reminded that in the Buildings Act Amendment Bill now before Parliament, there was a clause under which arrangements were to be made that in future, bye-laws adopted by local authorities shall be submitted for examination to the Institute of Architects and the Institution of Surveyors, by whom they would have to be approved before being sanctioned by the Local Government Board. That concession was the result of a suggestion thrown out by Mr. Honeyman. It was a very important point gained, and it had been, he believed, most graciously conceded. With regard to two or three of the general questions raised in the papers, he thought that although architects ought to be, and were, as a rule, willing and desirous to afford public sanitary officers every facility for understanding their plans, it would be a fatal mistake for them ever to consent to furnish to the local authorities full copies of all plans, sections, elevations, and detail drawings. Such a requirement was not only unfair to the architect, but it was unnecessary. He had, in giving evidence before the Select Committee on the Metropolitan Buildings Bill, protested against a proposal of the kind which was contained in that Bill as drafted, and the objections to it had had such weight that that point also had been very graciously conceded,—in substance, at any rate. Such regulations would not only impose upon the professional man a great deal of unnecessary labour, without recompensing him for it, but it would also deprive him, to some extent, of the copyright of his drawings. As to another point touched upon in the papers, he very much doubted the wisdom or desirability of conferring very large dispensing powers, with regard to the requirements of an Act of Parliament, upon any body of men. He agreed that the higher in social position were the men, the higher would be the character of the local authority, and the greater safety would there be for the public interests, but to place too great a dispensing power in the hands of such bodies, and especially in the hands of the smaller ones, was not wise; in fact, it could only lead to increased difficulties and much mischief. The true policy, as it appeared to him, of building legislation, was that advocated by Mr. Boult, viz., the laying down of certain leading principles applicable to the whole kingdom, and upon the lines of which, and only in accordance with which, should buildings be permitted to be erected anywhere,—taking due care, of course, to make those leading principles sufficiently elastic to allow of bye-laws being made in conformity with them to suit peculiar requirements of locality or material. The subject was one of great interest and importance, and although it was not possible for the Conference to discuss it in detail, they might usefully indicate what should be the scope and tenour of a Building Act applicable to the whole country,—an Act which should be so framed as not to in any way fetter or discourage building speculation, provided always that due precautions were taken for the public health and safety in respect of sanitary arrangements and construction. In London, as was perfectly well known, it was exceedingly difficult to construct houses for the working classes which, while meeting all sanitary requirements, were remunerative to their builders. If all sanitary and structural requirements were attended to in buildings of that class the margin of profit was so small as to offer small inducements to capitalists. Unnecessary and vexatious requirements in a Building Act for the whole country were therefore to be deprecated, as they would have the effect of increasing the cost of workmen's dwellings especially, and lead to overcrowding and other evils.

Mr. E. B. Ellice-Clark, borough engineer of Hove, said that having for some fifteen years been a town surveyor, he could say that he had never found the least difficulty in obtaining from architects and builders complete plans and sections of all buildings erected in the towns where he had held appointments. And he would further say, that, so far as his experience and observation went, it was a gross libel upon town surveyors and other local officers to impute to them, as the last speaker seemed to do, that they made any improper use of the plans entrusted to them by architects to aid them in the discharge of their duties as public servants. The local officers were nowadays, except in a few of the smaller towns, professional men, many of them being architects, and, from personal knowledge of nearly every borough surveyor in England, he could say that he did not believe that one of them would make surreptitious or improper use of plans coming under his cognisance. As a matter of fact, in the vast majority of instances the plans were not of such great value or novelty as to be worth notice, and he felt compelled to say that the plans submitted by professional architects were not, as a rule, nearly such "workable" plans as were submitted by builders. But, that question apart, he wished to disabuse the minds of architects of the idea that some of them seemed to entertain, that local surveyors were likely to make use of their plans; they were too honourable to do anything of the sort. He thought Mr. Douglass Mathews had taken the right course in his paper, and he agreed with his conclusions, with one or two exceptions. He had gone very carefully through the Model Bye-laws issued by the Local Government Board, and had come to the conclusion that they were, as a whole, impracticable, unworkable, and inquisitorial, and he was greatly surprised to hear that any portion of them had passed through the ordeal of examination by the Royal Institute of British Architects and a kindred society, for they contained provisions which were absurd and impossible to carry out. Mr. Mathews had, no doubt, raised a very important point in laying it down as a principle that the regulation of building construction and materials should be separated from purely sanitary details and the construction and laying-out of roads and streets. There were, undoubtedly, many town surveyors who, architects by profession, were fully competent to supervise the erection of buildings of all classes; but, on the other hand, there was a large number of surveyors, more especially in the smaller towns, who had not sufficient knowledge of architectural construction and building materials to enable them to deal properly with the plans which came before them, or to supervise the buildings when being erected. But such officials, where they existed, were fast dying out or being superseded. It should be remembered, however, that the too often unjustly sneered-at local board surveyor had grown with the times, though as a recognised official he was not yet a quarter of a century old. With the exception of such large towns as Liverpool, Glasgow, Manchester, &c., there were very few towns whose sanitary and structural affairs had been under qualified supervision for more than twenty-five years. It was undoubtedly quite true that even at the present time there were many small places where the local board "surveyor" was something between a parish beadle and a carpenter, but still the large majority of town surveyors were fully competent to deal with the subjects treated of in the Model Bye-laws. It was highly necessary that in such large towns as Liverpool, buildings should be under the control of a separate department. There must surely be enough work, in Liverpool alone, to occupy the full attention of eight or ten official building surveyors. Whatever the cost, it was to the public interest that bad and unhealthy building should be prevented. The full and complete supervision which was necessary would find honourable and not badly-paid employment for a number of architects. He did not think that the Model Bye-laws, as issued by the Local Government Board, would be adopted in any town. He had consulted the surveyors of a large number of towns, and, with three or four exceptions, strong disapproval had been expressed with reference to the requirements of the bye-laws, which were in some respects so stringent that local bodies would not dare to carry them out. The fact was that the people wanted educating as to structural and sanitary requirements, and until they were better educated on those points it would be impossible to carry out such a code of bye-laws as that put forth by the Local Government Board. In the South of England the people were more prepared to adopt such bye-laws than such places as Hanley, in Staffordshire, where 4½-in. party-walls were general. The provisions of the bye-laws as to the widening of streets clearly showed that the Government was attempting to effect, or to cause to be effected, public improvements at the expense of individual property-owners. Indeed, cases were conceivable, and very possible, in which a man, after complying with the requirements of the bye-laws as to setting back property pulled down for rebuilding, would only have a depth of 3 ft. for building upon. Absurdities of that kind abounded in the "model" bye-laws, and it was only reasonable to expect that the Local Government Board would have been more careful before giving its *imprimatur* to such a mass of impracticabilities. Had all the architects and borough surveyors of the country been consulted, and advantage taken of the assistance they were capable of affording, the result would have been far more satisfactory. Although, however, it was quite true that the Bye-laws went too far, in some respects further than the Metropolitan Building Act, in others they did not go far enough. One provision of the bye-laws was that no wood whatever was to be put in any party-wall, no matter how thick the wall might be. That was simply ridiculous. In the case of bressummers carrying house-fronts over shops, instead of looking at them in the proper light, and prescribing the depth of the beam according to the span and the weight of the superstructure, they simply said that in addition to whatever bearing the bressummer might have upon the party-wall, it should have an additional bearing of 4½ in. on a corbel. He did not think it would be possible to bring old buildings undergoing repairs or enlargement in the same category as new ones in respect of supervision, or, if it were possible, the difficulties and complications would be exceedingly great. There was "ample scope and verge enough" for such supervision in respect of new buildings alone, and those who knew what was going on in the suburbs of many of our towns would admit that some provisions far more moderate than those contained in the Model Bye-laws would be of great advantage. Whatever might be said in disparagement of local authorities, he thought they were improving. But, as he had before hinted, the great thing was to educate the people themselves. There were many towns which had had good bye-laws for the last twenty or thirty years, but they had made no attempt to carry them out, because the public were not educated up to them. He did not think it would be possible to frame a statute which would meet the requirements of the whole of the country, and therefore recourse must be had to bye-laws, which should be amended or renewed from time to time, as might be found desirable.

Mr. T. Roger Smith said he had never so fully appreciated the desirability of a general Building Act for the United Kingdom as he did at that moment. However, after what had been said

* See pp. 579-580, 607-610, and 624-625, *ante*.

by Mr. Ellice-Clark, who was so well acquainted with the operation of bye-laws, he thought it was quite clear that the general run of the building regulations in the Model Bye-laws were above the heads of the public, who undoubtedly wanted educating on these points. It was useless to expect that town councils and borough authorities could do much, however willing they might be, to enforce building bye-laws; and he had been somewhat reluctantly led to the conclusion that further and compulsory legislation on the subject was necessary. Of this he was quite sure, however, that any compulsory legislation on the subject would exceed rather than fall short of the stringency of the provisions of the Model Bye-laws. He had had occasion to go carefully through that portion of the Model Bye-laws which dealt with buildings, and he must say that his experience as a district surveyor did not lead him to regard them as being of such undue stringency as Mr. Ellice-Clark had suggested. Taken as a whole, he thought their requirements were reasonable, and if generally adopted people would soon get out of their bad methods of building. He was surprised to hear Mr. Ellice-Clark speak of the bye-law which prohibited the insertion of timber in party-walls as a hardship. Any one who had had much to do with old property would fully appreciate the necessity of such a provision. As a case in point, the buildings on Adelphi-terrace were a year or two ago falling to ruin, simply owing to timber having been built into the party-walls, and probably not less than 10,000*l.* had been spent in reinstatement. However thick the party-wall, timber should not be built in it. If ever a Building Act were passed for the entire kingdom, the less minute its regulations the more likely was it to be efficient and workable. The more it dealt in broad, general principles, the more it confined itself to laying down leading rules, avoiding *minutiæ*, the better would it be. That such an Act was wanted was proved by the speech of the last speaker.

Mr. Douglas, of Glasgow, said that in that town the subject was just now engaging much attention. The municipal authorities were trying to get additional powers for the Dean of Guild Court, but they had not shown their wisdom by consulting the architects and surveyors of the city. He was glad to find, however, that the Royal Institute of British Architects had been recognised and consulted by the Local Government Board as to the formulation of the Model Bye-laws. As to depositing copies of plans with local officers, architects had to do it in Glasgow, and they felt it to be a very great hardship. They had to lodge a complete set of working drawings, and for large works that entailed a very considerable expense, which was not recouped. As to the improper use likely to be made of drawings so deposited, it was not always possible to obtain legal proof of an offence, even though there were no doubt as to its perpetration.

Mr. Lynam, borough surveyor, Stoke-on-Trent, said that for something like twenty years he had occupied the position of town surveyor, and for about half that period he had been in the habit of receiving plans from architects and builders who submitted them for examination; but he could not in any way endorse Mr. Ellice-Clark's remark that the plans which were submitted by builders were more practical and understandable than those submitted by architects. On the contrary, it was his experience that builders' plans were, as a rule, very imperfect and unsatisfactory, and it was often utterly impossible to make them out at all. He thought Mr. Ellice-Clark was under a misapprehension when he said that the bye-laws compelled private property-owners to give up their land for public improvements without compensation, because, although the bye-laws compelled the setting-back of property when rebuilding, there was no bye-law that he knew of which compelled the property-owner to surrender the land; he could still fence it in or enclose it. He, as an old town surveyor, agreed with Mr. Roger Smith in thinking that the model bye-laws, as a whole, were not unworthy of adoption, but he could not see his way clear to speak in favour of a general Building Act for the country at large. It might be inferred from Mr. Ellice-Clark's observations that building bye-laws were exceptionally difficult to carry out in the Potteries, but such was not the case.

Mr. Matthew Allen said he had had many years' experience as a practical builder, and he quite agreed with the advisability and, indeed, absolute necessity, of excluding timber from all walls, whether "party" or external. He had, to clear the site for some large blocks of workmen's dwellings he had erected, pulled down a great deal of small property in the neighbourhood of Finsbury, and he found the timber embedded in the walls to be completely rotten, and the walls were rendered unsafe. What else could possibly be expected, when the timber was floating in the docks to-day, and cut up and put into the walls to-morrow? From the very moment that the timber was embedded in the walls, decay commenced. For his part, he would have no wood at all in the carcass of a house. Why not, for joists, use T-iron bedded in concrete? and why not, for lintels, use concrete? It would be a very great advantage, and one well worthy of the support of architects, if in any future Building Act there could be inserted a provision prohibiting altogether the use of wood in the carcasses of houses. As to drainage, he thought it ought never to be carried under houses. He had read through the Model Bye-laws, and, speaking as a practical builder, he could not see anything very objectionable in them. They went too far on some points, and not far enough on others.

Mr. John Hebb (Assistant Architect, Metropolitan Board of Works) said he thought Mr. Ellice-Clark had somewhat misapprehended Mr. Chatfeild Clarke's remarks in objection to that portion of the Model Bye-laws which provided for the depositing of plans with local officers. He was quite sure that Mr. Chatfeild Clarke had no intention of aspersing such a respectable body of men as the borough surveyors of England. It was not to be supposed for one moment that those gentlemen themselves would make any improper use of the drawings submitted to them. What was felt, however, was that the requirement was unreasonable and unnecessary, and was likely to lead to abuses. Architects' drawings deposited at public offices passed through many persons' hands, and were in some cases liable to be "hawked about" and perhaps copied. As to Mr. Ellice-Clark's general remarks, he (Mr. Hebb) felt that so far as his experience went he could not admit that the requirements of the Metropolitan Building Act were too stringent. On the contrary, he thought they were too lax in many respects, and it was much to be desired that they should be made more stringent. It was impossible to discuss the Model Bye-Laws in detail at that Conference,—that could better be done in the committee-room,—but with regard to the general principles which should underlie the making of bye-laws, he thought they should be as few and as simple as possible. He also agreed in thinking that there should be the smallest amount of dispensing power in the hands of the administering body. One of the greatest difficulties with regard to the administration of the Metropolitan Building Act arose from the dispensing powers which had been given to the body charged with its enforcement. There was a great tendency to strain those powers, sometimes unduly. It would very much strengthen the hands of officers charged with the administration of Building Acts if there were no dispensing powers,—in other words, if the requirements of the Act were absolute. He was surprised to hear Mr. Ellice-Clark defend the practice of embedding timber in walls, for it was a continual source of failure in buildings, as all district surveyors knew full well. On the whole, it could hardly be said that the Model Bye-laws erred on the side of excessive stringency.

Mr. Carroll, of Dublin, said he was not quite sure whether it was intended that the Model Bye-laws should apply to Ireland, but if such was the intention, they would require certain modifications in many points in order to be reconcileable with the modes and requirements of building and with the materials available. In Dublin, nearly all foundations were of stone, and therefore it would be necessary to materially alter the dimensions laid down in the Model Bye-laws for foundations.

Mr. Arthur Cates said that many of the speakers appeared to be under the erroneous impression that the Model Bye-laws as issued by the Local Government Board were to be taken to include the entire wishes of the Board and its advisers with respect to building and sanitary regulations. It should be borne in mind that the Model Bye-laws had been prepared under considerable difficulties and restrictions. It would have been useless, and foolish to boot, for the Board to have issued bye-laws which would be inapplicable or *ultra vires*. The bye-laws as issued had been prepared under the 157th section of the Public Health Act, but it so happened that the powers conferred by that section were not so extensive as could be wished for the purpose of framing a code of bye-laws which should be complete and capable of general application. The Board had endeavoured to make the bye-laws as perfect as existing statutory powers would allow, and of course if the statutes could be extended and improved the bye-laws could also be made more thorough and satisfactory. It was matter for consideration whether the Local Government Board ought not to be entrusted by Parliament with more extended powers with reference to the authorisation and confirmation of bye-laws. He regarded the Model Bye-laws as a first step towards the attainment of a general Building Act, whether framed on the broad general lines suggested by some of the speakers, or whether more in detail. The Local Government Board had neither the intention nor the power of compelling the adoption of the Model Bye-laws, as they now stood, either as a whole or in part; they merely put them forward as a hint or guide to local authorities as to the points to be attended to in the framing of building and sanitary bye-laws, and there was no doubt whatever that in that way they would be of very considerable value. They were already being considered and adopted in various parts of the country, and could not fail to do a great deal in clearing the way for improved sanitary and building legislation applicable throughout the country.

Mr. Charles Fowler said that Mr. Cates had rightly defended the Model Bye-laws as being framed under very limited powers. It had been assumed by one of the speakers that the imperfection of the bye-laws, in some respects, was a thing for which the Institute was partially responsible; but that was not the case. The Institute had recommended a great number of improvements, and many of their suggestions had been adopted, while others were rejected for want of statutory power, and partly for reasons unknown to the Institute. It must be admitted, therefore, that the Model Bye-laws were not so perfect as architects could wish them to be. He had been astonished to hear Mr. Ellice-Clark, as the Local Board surveyor of an important town, express his opinion that the bye-laws were impracticable, on account of their alleged excessive stringency. The Institute committee charged with the consideration of the draft of the Model Bye-laws obtained a great deal of information from architects and local officers in various parts of the country, and they found the widest diversities in the requirements of local bye-laws, even in contiguous districts, and there was a remarkable concurrence of professional testimony in favour of something like uniformity and consistency as to general principles.

Mr. T. H. Watson said that while he was in favour of the limitation of dispensing powers in the administration of Building Acts and local bye-laws, he was not prepared to say that such dispensing powers should be altogether abolished; but whatever dispensing powers were retained might with advantage be taken out of the hands of the elective body.

The Chairman (Mr. Whichcord), in putting the vote of thanks, summed up the discussion, and said he thought the papers read had elicited some good practical observations on the subject, which might, he thought, be again brought up for consideration at the next Conference. Mr. Cates had admirably explained the *raison d'être* of the Model Bye-laws, with which, as issued to the public, many suggestions made by the Institute had been incorporated. Although nominally made by the Institute, however, those recommendations embodied the general opinions of architects throughout the country. He entirely agreed with those speakers who advocated the reduction of the dispensing powers of elective authorities to the narrowest possible limits. At the same time, he did not see the practicability of abolishing dispensing powers altogether, for building was conducted under such varying circumstances that an absolutely rigid and fixed code of rules would be unworkable in all cases, except at great sacrifice. It was satisfactory to know that, in the Buildings Act Amendment Bill now before Parliament, the Metropolitan Board of Works had taken powers to make bye-laws which should clearly define what sites might be built upon, and in what cases concrete was to be laid over the site. Hitherto speculating builders had been allowed, without let or hindrance, to build houses on mud-shoots and all kinds of abomina-

tion. He agreed with all that had been said in condemnation of the practice of inserting timber in party or external walls. It had been incidentally suggested during the discussion that Model Bye-laws should, if possible, be framed bearing upon the vexed questions which arose as to light and air. Such questions were a source of abundant litigation and expense, and it would be very desirable for the Institute to direct its attention to the subject, with the view of seeing whether it were practicable to suggest any guiding rules or principles which might be of assistance in such matters. While the objections which had been made to the depositing of unnecessary plans were very cogent, it should at the same time be remembered that great inconvenience had arisen from the fact that under the Metropolitan Building Act there was no power to interfere with the internal construction of a house.

The vote of thanks having been carried by acclamation, Mr. Douglass Mathews briefly replied, and the meeting ended.

RUDE STONE MONUMENTS.

The following is the substance of Mr. T. Roger Smith's paper, already referred to :—

The nineteenth century will be remarkable for nothing so much as for the extension of our knowledge, it has overstepped boundaries which once seemed final; and among other extensions of our powers we for the first time possess the means of going back beyond the boundary which hitherto limited our knowledge of the past. Till lately our utmost range backward was reached when we came to the earliest written inscriptions and books. We are striving to extend our retrospect into pre-historic life, which, now for the first time systematically understood, forms a chapter of the deepest interest in that new volume, if I may so term it, of the book of knowledge which modern research is placing within our reach. If I here for a moment linger over that which has come to light concerning pre-historic men and their ways, it must be distinctly understood that I do not wish to imply that the structures we are to consider belong to any special prehistoric age. . . . .

Mr. Fergusson has divided the objects which he includes under the general name which stands at the head of this paper into five groups :—Tumuli, that is, mounds; (2) Dolmens, that is to say, table-stones, popularly but incorrectly called cromlechs; (3) Circles; (4) Avenues; (5) Menhirs, that is to say, standing stones; and I propose to follow his divisions, but to dwell chiefly on what I have been able to see myself, and on objects of which, thanks to the kindness of Sir Henry Dryden, Professor Hayter Lewis, Mr. Payne, Mr. Blashill, and other friends, I am able to offer you some illustrations.

The simplest monuments actually made of rude stone which present themselves are the small stone mounds, or tumuli, often called cairns. On the summits of the Welsh hills they are to be found in numbers; they are there perfectly circular, of considerable size, of a regular conical shape, though not very steep, and they often possess a well-marked cup-like depression, like a crater, at the summit. They are to be found also in many parts of Great Britain, especially in those localities which are naturally a little difficult of access. In some cases cairns and mounds must have been intended to serve some other purpose than that of ordinary sepulchres, as many of them are of enormous size, and must have consequently commemorated either the burial of our great men or of a large number of people, or some great event. In Wiltshire there stands what, I believe, is the largest of these mounds which Great Britain contains; it is called Silbury Hill. It is circular, and, according to Mr. Fergusson, no less than 552 ft. in diameter at its base. It rises with a regular well-formed slope to a height of 130 ft., and has a flat top 100 ft. in diameter. Nothing can well be more striking than this magnificent mound, which commemorates we know not what, but seems certainly to have been a memorial or monument of something or some one. Excavations have been made in it, but no discovery of human remains is recorded. When I said that Silbury Hill was the largest of these mounds in England, I ought perhaps to have said the largest untouched one, for in several instances they were occupied during our troublous historic times as good spots on which to build a castle. Basing House, near Basingstoke, for example, stood upon an ancient British mound. It has even been suggested that the vast mound now crowned by the great round tower at Windsor Castle was another. The more moderate-sized cairns have frequently proved more really worth examination than the very large ones. Often, on opening them, some sort of stone chamber, often termed a cist, has been found, constructed more or less rudely, in the very heart of the cairn, and whether such a chamber existed or no, some relic or other generally repays the explorer.

The next remains are dolmens. These seem to be closely allied to the stone chambers in the heart of the cairns just alluded to. A dolmen in Gaelic (or in the ancient Bréton tongue, which is closely allied to Gaelic) means table-stone. Such a structure always has a flat stone at the top, and this is supported sometimes by three upright stones, standing well apart, and sometimes by three or more flat stones forming the sides and end or ends of a chamber. A dolmen is sometimes prolonged, forming an oblong chamber, and sometimes has a passage, walled and roofed in stone, as an access to it. One in which a man can stand upright is a very large one; and yet, from the enormous thickness and bulk of the masses of stone used in its construction, a dolmen with a chamber of very moderate size is a most impressive and dignified structure. Many dolmens are buried in mounds of stone or earth, others are perfectly visible at the present day, and it is a matter on which antiquaries are not agreed whether these last were not covered with mounds, or, at any rate, were not formed with the intention of being so covered. I do not know that this very much matters for my purpose. What I want to point out is that these unknown constructors, who may not have cared so much as we do for the artistic effect of their works, raising structures where they had the advantage of the natural forms of unhewn stone, and constructing them as solidly as they knew how, put into them a perfectly lavish expenditure of labour, and an enormous excess of strength, and doing so, have accomplished what few trained architects have even approached. They have produced works the appearance of which have a solemnity, a dignity, and a power almost, if not quite, as touching and as impressive as the grandeur of the finest natural rocks or caves. Dolmens are not unknown in this country. There is, for example, one not far from Maidstone, known as Kitt's Cotty House. There are several fine ones in Anglesea, and there are many in various parts of England, Wales, Scotland, and Ireland; but, to see them at their best, you must cross the Channel, and traverse the north-western corner of France, reaching the wild south-western coast of Brittany, just north of the mouths of the river Loire. Here you are in the district called the Morbihan, and I shall, in describing what is there to be seen, ask permission to make use of some notes written by me during my visit there, as, although they have seen the light before, they are more likely to be graphic than anything I could now write :—

"The Morbihan is an unfamiliar name in England, and the Department of France which bears that name, and which forms the south-eastern portion of Brittany, does not lie in either of the routes ordinarily taken by the bulk of English travellers in France, yet it possesses attractions of no ordinary description, being famous amongst antiquaries for possessing what Mr Fergusson describes, and with justice, as 'the most remarkable group of megalithic remains not only in France, but perhaps in the whole world.' Names in the Morbihan are all striking; they are all derived from the ancient tongue of Brittany, and fall upon the ear with a very uncouth ring. Karnac, Lochmariaker, Plouharnel, Quiberon, have an unmistakably different ring from the ordinary titles of French towns and districts, and one which harmonises well with the unspeakable strangeness of the objects which await the traveller. The air is pure, the country picturesque, and the seaside life of the fisher folk must still retain not a few of the aspects presented by the ways of those far remote people who raised the stones and carved the undecipherable emblems which have lasted so long and are so full of mystery.

The number of these stone chambers in the district is very large, so much so that in the course of a single day, much of which was taken up in other ways, nearly twenty were visited by me. Usually the chamber is large enough to stand upright in without difficulty, and is roofed by one enormous slab of granite; the entrance passage, where that feature occurs is not so high as the chamber, and in many instances it is necessary to crawl on hands and knees in order to explore it.

Near Erdeven a group of three dolmens exists, all of which are enclosed in one mound of earth; and when, some years ago, these were first opened, many curious objects were found such as axe-heads (celts) in fine hard stone, and ornamented in gold. Many of these objects are still preserved in the best room of a little village inn on the roadside hard by. These remains lie thickest about the peninsula of Quiberon, a rocky tongue of land, which lends its uncouth name to a bay of some size, crowded with islets large and small, very favourable to the cultivation of oysters, and so furnishing plenty of occupation to the hardy fisher-people who live in the village, or are scattered about here and there in sheltered nooks. On crossing this peninsula from its western side near the village of Karnac to Lochmariaker on its eastern shore, a singular variation in the dolmens is discernible. At Karnac there is hardly a dolmen upon which any sculpture can be discerned; but at Lochmariaker, less than ten miles distant, it is constantly met with. The finest of these sculptured dolmens is situated on an island a mile or so east of Lochmariaker, known as the Goat Island, or, in Bréton, Gave Inois.

The dolmen is under an enormous mound of stones. It is totally dark within, and is under the charge of a guardian, who provides a light, and has the key of a rude door, which has perhaps prudently—been fitted to its entrance. On passing this door we find ourselves at once in a straight passage rather more than 40 ft. long, and about 5 ft. wide, terminating in a chamber about 8 ft. square. Both the passage and the chamber are formed of granite slabs, and roofed with the same material, the chamber being almost entirely covered by one single stone of enormous size The passage is high enough to stand upright in, and the chamber is higher, in both cases the roof is of plain stone, and nearly level The great wonder of the place, however, lies not so much in its size, or the largeness of the blocks employed in its construction, as in the sculpture which covers its sides. From entrance to chamber every stone on both sides is carved, and most of the stones are completely covered with carving The objects represented are few; that is to say, there is but little of the sculpture which can be recognised as representing things with which we are familiar. A few celts, *i.e.*, axe-heads, are very distinctly visible on one of the slabs, and a very fairly distinct representation of serpents is found on another; while a third appeared to me to bear what was intended as a somewhat conventionalised lily, both flower and leaves being tolerably distinct.

The bulk of the decoration is, however, made up of curling lines; circles within circles meandering over the whole surface, and executed in firm, bold, channelled lines of considerable breadth and depth, and in fairly true curves. The marks conveyed to my mind the impression that they must have been laboriously produced by some scratching operation, and not with tools in any way analogous to a chisel and hammer Without pretending to say that the resemblance is close, there is an aspect about the whole sculptured wall, especially when looked at rather in the mass than in detail, which recalls the sea. Nothing could well be more probable than that these ancient people building this splendid structure, whether tomb or not, on a sea-girt island, should desire to imitate the waves of the ocean; and the endless succession of curves and wavy lines is perhaps quite as good a representation of them as could be expected from persons with a very rudimentary power of drawing, working on a most intractable material, and with tools that in all probability required the expenditure of immense labour to produce even a moderate result. There is, however, a veil of mystery over these objects which has not yet been lifted, and which adds not a little to the wonder and pleasure with which the visitor gazes upon a work so strange, so rich, and so solitary, buried away in the heart of a vast stony mound, heaped up by hands long since forgotten, upon the rockbound shores of this tiny islet. By whom and when, and for whom, one cannot but ask, was all this done, and what did it all mean?"

We now come to a series of remains which are essentially British, namely circles of standing stones; by this is not meant that such circles are exclusively British; but only that they are extensively numerous in this country, and that no other European examples equal the finest of our own. Stonehenge must be a familiar name to every one of us; but probably few in this room are ignorant of the fact that circles are to be met with in very many parts of England and Wales, especially in the most picturesque, or, in other words, the least accessible districts. A very famous one, known as Long Meg and her Daughters, of which Mr. Payne has kindly given me some particulars in explanation of his plan, is situated about six miles from Penrith, and about one mile from the little village of Salkeld, on a site nearly level, but sloping a little to the south-east, and with a fine view of the great moorland mountain of Cross Fell. There is only one circle of stones to be traced, the arrangement of which will be seen on the plan. The only rule in placing the stones seems to have been to place them further apart when larger, and closer when small. Here and there are stones considerably larger than the rest; these are shown by a cross on the plan, and the dimensions of some of the principal stones are also given. Circles occur of all sizes, from ten or twelve paces in diameter to about 100 ft. On the Derbyshire moors and the Welsh hills they occur constantly, and if many are famous others are little known. I have myself found a small circle of large flat stones, of which about two-thirds were still erect, while the remainder lay as they had fallen on the top of a grouse-moor near Chatsworth, in Derbyshire, and I could not find that any resident in the locality was aware of its existence. There is a fine circle of stones about 100 ft. across near Keswick; and a good example of a stone circle, though much ruined, exists on the southern slopes of Penmaenmawr, in North Wales, a mountain which also shows traces of a stone rampart, enclosing a camp at the summit, and retains several well-formed cairns,—that is, mounds of stones. Such circles consist of large stones, as a rule, of tolerably uniform size and not unfrequently flattish, set up on end, buried sufficiently in the ground to obtain a foundation, and standing a short distance apart. Very often a circular mound encloses the stone ring. In my little Chatsworth circle, which was thirteen paces,—or say 45 ft.

across,—these stones were all flat, averaging 2 ft. to 3 ft. wide, and those which remained erect stood about 3 ft. or 3 ft. 6 in. out of the ground, with the spaces between them about equal to the width of the stones themselves.

The most famous stone circle in Europe is in Wiltshire, and is familiar to persons who know nothing whatever about the numerous megalithic remains of other kinds to which it is allied. Of course I refer to Stonehenge. This fine monument strikes me as being one of the most impressive and telling structures for its size that I have ever seen. No illustration of it conveys any adequate idea of its appearance, though you may obtain a very good notion of its general arrangement from plans, photographs, and diagrams. Stonehenge stands quite alone upon a high part of Salisbury Plain, a desolate rolling kind of down with no house or tree of any sort. It was surrounded by a circular earthen mound, which, if it ever was high, has been very much washed or worn down by weather and time. This was 100 yards across. In it stood a great circle of high stones, tolerably square, and (speaking from memory) about 15 ft. high, and connected together by horizontal stones going from one to another. Within this circle was an inner and higher ring, not quite circular, but of a horse-shoe shape, formed by ten very fine lofty stones planted in five pairs, and each pair united by a stone laid across the top of both. These stone posts and lintels are worked with two cup-shaped hollows in the underside of the lintel, while two corresponding projections are formed on the ends of the uprights, and fit into them, forming tenons and mortises. There were also a considerable number of tall stones, but of less height than those described, which are of a bluish granite, and must have come from either Cornwall or Ireland. These are most of them overthrown, and of the larger and heavier ones a considerable number have fallen and strew the ground. Still a very large proportion remains standing,—grey with age, weather-worn, yet stoutly erect to testify to the great skill and energy of those unknown inhabitants of our island,—our predecessors certainly, perhaps our ancestors, who raised them. It is hardly possible to exaggerate the impressiveness of Stonehenge, and this, of course, is greatly increased by our entire want of certainty about those who raised it, and the object which they intended it to serve. I think it not at all improbable that the enclosure may have been completed by woodwork between the stones, and may have been roofed, which could not have been a difficult matter to those who could master the very great difficulty of putting up the stones. If so, it is more than possible that to us its appearance as a ruin is more impressive than the aspect it would have presented had we seen it when it was a completed building, with a large amount of timbering partly encumbering the stones; but, however this may be, its actual impressiveness can hardly be exaggerated.

There exists in the same county (Wiltshire) another monument which is more extensive, and far more ruined than Stonehenge, and which, when complete, must have been hardly less astonishing. I allude to Avebury,—very near to the large mound, which bears the name of Silbury Hill, and which has been already described.

Avebury consists of an enormous enclosure, very nearly but not quite circular, consisting of an artificial trench, outside of which is raised an enormous rampart or mound of earth. Although time, and the interference of the inhabitants,—for a village is built within the circle,—have very much damaged this rampart, enough of it remains to show that it was a surprising work, rising to a great height, and of enormous thickness, and with well-marked entrances. This earthen enclosure was about 1,200 ft., that is to say, 400 yards, or not far from a quarter of a mile across. Within this was constructed a ring, consisting, when complete, of about 100 enormous stones, but for our knowledge of which we are largely indebted to Sir Richard Colt Hoare, a distinguished antiquary, who published an account in 1812, for the farmers have between that time and this thrown down and destroyed the greater part of the stones which were erect in his day, partly as an amusement, partly to get them out of the way, and partly for cutting up into building stone. Within the great earth rampart, then, this circle of large stones was formed, and in the space so enclosed, two circles of stones, not symmetrically placed, and each more than 100 paces across, were formed. Enough of the stones which formed these is standing for us at the present day to trace them out, though their grandeur has been very much ruined.

But we have not yet done with this Avebury monument. It was approached up an avenue about 50 ft. wide and three-quarters of a mile long, and made of very large stones standing in pairs. When I say very large, I mean stones 20 ft. high, or thereabouts, and some 4 ft. square. Even in its ruin, this avenue is very impressive; and though most of the stones have disappeared, and many of those which remain have been overthrown and now lie flat, there is quite enough remaining to show that our obscure forerunners had their own ideas of dignity and impressive effect, and were quite equal to the task of carrying those ideas into effect on an enormous scale.

I am now, having been led to the subject of stone avenues by the Avebury one, going to ask you to cross the Channel with me once more and return to Brittany. Here you will encounter no circles, but stone avenues even more remarkable than the one at Avebury, and stone pillars of great size:—

"The spot which we will first visit is Karnac, a very small French country town already alluded to, a mile or so away from the Bay of Quiberon. Here is to be found the most remarkable of all the pre-historic monuments of Brittany, namely, a series of avenues of stones extending over miles of country; and, notwithstanding the attacks of time and the worse damage inflicted by human force, still in a state of admirable perfection. These avenues are not single lines of stone, like the great one at Avebury, but are disposed side by side, and formed by rows of large stones, so arranged as to give ten or twelve parallel lines. The distances apart vary to some extent, but average about ten to twelve paces, so that where there are ten avenues the width of the monument is something more than 100 yards. Three such series of stones succeed each other, extending in a curved line over a space not less than two miles, and in each case beginning with stones of moderate size and somewhat irregular spacing, and proceeding to larger and more evenly placed stones, and on to still larger ones, until the series ends with a row of very large stones indeed (as much as 20 ft. high each), very evenly ranged. Towards the head of each series the avenues are strongly marked, perfectly regular, and in many places so well set out that the stones give true lines when looking either directly across or diagonally over the group, as well as when looking back from the head of the series towards the beginning.

It is impossible to convey to those who have not seen the thing itself anything more than a very meagre conception of the arrangement of these stones, while to give any notion of their solemn, wild, unearthly, impressive dignity, standing alone, grey and weather-beaten, on an open breezy heath, is simply impossible. The first series of avenues, called the lines of Kerlescant, run almost true east and west, though their lines suffer a slight bend. Where they end occurs an open space of considerable size, now partly occupied by a fine plantation. This has been enclosed by a mound on the north, and by very large flat stones, placed on edge and close together on the other three sides; and of these, perhaps one-fifth are standing to the present day. Thus, when complete, the arrangement of this part of the monument was that the parallel avenues should lead up to a large enclosure of square shape, dominated by a mound.

Proceeding farther towards the west, an interval of perhaps 500 paces separates the enclosure just referred to from the beginning of the second series of large stones. In this interval no stones occur, but when we have passed it we begin to recognise the commencement, at first not very distinct, of a new series of avenues. These, after a short time, become once more unmistakably traceable; but this time they run in a direction about south-west. As before, the regularity of arrangement grows to be more marked, and the average size of the stones is greater as we proceed along the monument; we finally reach still larger stones, and when we come to the front it is formed of fine upright blocks of granite (the material of the district) spaced and ranged with much precision.

If there ever was a stone enclosure here, most of the traces of it have been removed, but there are several stone buildings forming the hamlet of Kermario, and, including a mill hard by and the thin stones which would have been used to form an enclosure had there been one, may have served as a quarry. This is, however, a mere conjecture; certain it is that the principal object now visible is a half-ruined stone dolmen of great size.

Again an unoccupied space has to be traversed, and by-and-by a third series of stones is begun. This, like the Kermario lines, of which it is a direct continuation, runs in a south-westerly direction, and it continues till near its front the finest and largest stones in the whole series are met with; the front line includes several magnificent monoliths, certainly approaching 20 ft. in height. The termination of this third series of avenues was an enclosure, similar in position and construction to the one at Kerlescant, but which had, as far as can be made out, almost a semicircular shape on plan, the chord of the semi-circle forming the face of the avenue. A hamlet named Maenac has, however, been so built that many parts of this enclosure are interfered with, and it is only with difficulty that it can be made out.

Mr. Fergusson's theory is, that these stones are a memorial of some great military triumph, and represent an army on the march and an army in order of battle; but others feel that the constructors of these astonishing structures appear to have had an idea identical with that which the ancient Egyptians developed so grandly, and by the aid of appliances evidently quite unknown to the rude architects of this megalithic monument. An avenue of permanent objects has been employed in both cases to lead up to a sacred enclosure; and it seems as if, in the absence of any other power of adding to the dignity of the objects of which the avenue was composed, those ancient people had determined to gain nobility by increasing the number of avenues.

At a distance of some two miles and a half north-west of the Karnac monument stands the similar one of Erdeven, and the whole intervening space bristles with large stones and dolmens, sufficient at any rate to show that the entire region was one where the inhabitants desired to establish memorials, even if the intervening stones were not intended in some way to link the two monuments together. In the Erdeven monument, we have a series of avenues formed by ten to twelve lines of stones, running nearly due east and west, and extending about a mile. The lines in this enormous monument are weakest near the centre,—that is to say, the stones there are the smallest and the spacing least regular. They are distinctly marked as they approach the east and west ends, and are terminated at the west by a series of very fine stones. The monument is not, however, so striking as those at Karnac: it has been more interfered with by cultivation and by the destruction of the stones of which it is composed, and if it led to any enclosure at either one end or the other, there seem now few traces, if any, of such an object. Two or three isolated groups of large stones stand in its neighbourhood, and if a clue is ever found to the arrangement and intention of the whole, these groups must be taken into account.

One other description of rude stone monuments is found in Brittany, namely, an isolated standing stone. To this is given the Breton name of Menhir; and were it not that the grouped stones in this district are so interesting as to eclipse all other objects, there are sufficient solitary menhirs in the neighbourhood of Karnac and Lochmariaker to attract the antiquary. One such stone, at least, must not be omitted from a notice, however hurried, of the wonders of the Morbihan,—a stone which one cannot look upon without astonishment, even although it is now prostrate and broken into three pieces. It lies in the outskirts of the hamlet of Lochmariaker. When whole, this menhir must have exceeded 60 ft. in height by about 12 ft. across,—that is to say, it was nearly as high as Cleopatra's Needle and more bulky, so that it was quite as unwieldy and probably quite as heavy; and if we consider what a feat it is for people who can command iron tools, steam engines, and all modern mechanical aids to quarry, transport, and, above all, to set up an obelisk of this size, we cannot but be filled with wonder when we behold this mass, which the unknown forerunners of the present fisher people must undoubtedly have prepared and transported to its site and set up."

In bringing these remarks to a close, I have to confess that I am perfectly aware that they present only glimpses at a great subject, and give a fragmentary and imperfect account of what might have been much more systematically put before you. But I have confined myself almost entirely to what I have actually seen, and have mentioned nothing which is not easily and pleasantly within reach of you all. The object of this paper is by no means to tell all that is known about rude stone monuments, still less to involve you in archæological discussions, but to describe a few of the most imposing specimens, and especially to show that they possess qualities which make them well worthy the attentive study of architects. There is probably no building of the same dimensions so impressive as Stonehenge, and it would be hard to conceive of any mode of making use of great space to such advantage as at Karnac.

We cannot take leave of these monuments, and especially of the noble ones remaining in our own islands, without feeling some pride in the work of those far-off people, whoever they were, and whenever they lived, who once had as much right as we now have to call these western lands their own. It is not a little pathetic thus to interrogate memorials which have been struck dumb by lapse of time, tombs of we know not whom, memorials to commemorate we know not what. But yet living in the full glare and busy rush of a civilisation which, if enlightened and advanced, is not the less tumultuous and distracting, it is almost refreshing to cast our eyes back into the darkness of the far-off past, and to try to fancy who and what the men were who did such astonishing works; and I am not without the belief that, if we realise how well they did this work, it may prove instructive also.

In the discussion which ensued,

Professor T. Hayter Lewis said that Mr. Roger Smith had so thoroughly gone into the subject, bearing in mind the brief period available for the reading of a paper, that there was not much to be said in the way of discussion. The study of rude stone monuments, though not strictly architectural, was one that was capable of investing large portions of English and Welsh scenery with an interest over and above that due to natural beauty or romantic situation. The eye of the student of such remains would be able to read the landscape in a way that would be impossible to those who had paid no attention to the subject. What to ordinary observers were merely so much heather and heaps of sandstone had a story, however vague it might be, to tell to the student of ancient remains. On Dartmoor, for instance, were to be found remains of "beehive huts" and other indications of man's residence there at a very remote period, and amongst the Welsh hills, on Penmaenmawr, were to be seen the remains of one of the finest pieces of British fortification extant, and the surrounding hills were covered with Druidical remains of all kinds. As to the date of these remains, Palgrave, in his interesting and extremely valuable work on "Arabia," had spoken of them, in a phrase which had now become almost idiomatic, as records of "the speechless past," and as that was so, it was not possible to speak confidently as to their age. There was

scarcely a piece of carving or ornamentation, however rude, nor anything of any character in them, to give the least clue to their age, or to the men who reared them. Where anything that could fairly be called inscriptions or carving were to be found, they were so imperfectly understood as to be of no assistance to the inquirer. In Sardinia, in Wales, in whatever part of the world these remains were found, they were ever "speechless." Sometimes it was possible to obtain some information, if only of a negative kind, from a thorough examination of the site. As an example, Professor Lewis cited the case of Avebury, in Wiltshire, where a Roman road traversed the plain and ran almost close up to the large mound known as Silbury Hill. Controversy at one time arose between antiquaries as to whether the hill was pre-Roman or of subsequent date to the construction of the undoubtedly Roman road. The site was excavated, and it was found that the Roman road ran round the hill. The supporters of the pre-Roman theory of the origin of the hill held this to be conclusive proof of the correctness of their views; but, on the other hand, those who believed that the hill was thrown up subsequently to the formation of the Roman road contended that the site of the hill was originally a marsh, over which the Romans would not carry their road, but diverted it and carried it round the margin of the morass which was now covered by the hill. This was only one example of the difficulties which would present themselves in the effort to find out the date of these old remains. A striking point in connexion with the subject was the singular resemblance 'or "family likeness" which such remains in all parts of the world bore to each other. That they must date from a very remote period indeed was proved by the utter desolateness of some of the lands in which they were found. Palgrave, in his work on "Arabia" before mentioned, said that in one place he came upon a circle of stones formed of trilithons so large as to remind him of Stonehenge, which they so strikingly resembled that it was difficult for him to realise that he was not on Salisbury Plain. He had also found many works in the neighbourhood of the Red Sea, which were curiously similar to those existing in Britain. It was certainly open to doubt whether some antiquaries were correct in their inclination to assign a comparatively modern origin to these remains. For his (the speaker's) own part, he was inclined to think they were incorrect. As to the uses to which these masses of stone were devoted, he thought there was no doubt that numbers of them, such as L'Ancresse, in Guernsey, were of sepulchral origin; but in others, such as Kit's Coty House, in Kent, he did not see how that could possibly have been the case; it might perhaps have been an altar or a *bema*. With reference to Dr. Phené's paper on Mycenæ, it was many years since he (the speaker) was at Mycenæ; but no place he had ever visited had been more interesting. Ever since his visit, he had for years prior to Dr. Schliemann's splendid discoveries suggested to his students, in the course of his lectures, that if they ever had the opportunity to go exploring, the place where they might hope to be successful was Mycenæ, from the fact that the remains were known to have been left untouched, and that whatever was buried in the ruin of the Treasury of Atreus would probably be found there still. This had proved to be the case, just as the Germans had found such priceless treasures at Olympia. With respect to the theory of Dr. Forchhämmer, he concurred with Dr. Phené in thinking that it could not be possible that the discovered treasures were Persian. In conclusion, he moved a vote of thanks to Mr. Roger Smith and Dr. Phené for their able and interesting papers.

Mr. J. T. Wood, in seconding the motion, said that, alluding to the cairns and mounds found amongst the Welsh hills, Mr. Roger Smith had spoken of the existence in them of crater-like depressions. A fairly flat portion of the hill-side was chosen as the site of these structures, and a circle of cut stones had been first of all built in order to form a pedestal from which was to rise the pyramidal pile of loose stones. In examining some of these remains, he found that they had been despoiled by the removal of some of the stones from the apices and casting them down the sides, and he had discovered one of the crowning stones of a mound lying under a heap of uncut stones.

Mr. W. F. Potter said, that some years ago he was in Cornwall, where he examined most of the so-called "cromlechs" and Druidical stones, and subsequently he visited Stonehenge. He was greatly struck at the vast difference between the character of the work at Stonehenge and that of the so-called "cromlechs," or Druidical stones. Stonehenge appeared to him to be the work of a highly civilised people, for the excellence of the workmanship was evident to this day, the marks of the masons' tools and the sharpness of the arrises still remaining. Another specially distinguishing characteristic of Stonehenge was the largeness of the stones. On the other hand, some of the Cornish remains seemed to be imitations, by a barbarous people, of the work at Stonehenge. In connexion with the subject, Mr. Potter alluded to an interesting article which appeared in the April part of *Chambers's Journal*, on "Lundy Island."

Dr. Phené offered a few remarks on Mr. Roger Smith's paper, and upon the drawings exhibited. He observed that, for several years past, he had now regularly devoted some portion of his time to Brittany, which was a most interesting field for the student of rude stone monuments.

Mr. R. E. Pownall having made a few remarks,

Mr. Phené Spiers spoke in support of the vote of thanks, in which he wished to include the names of Sir Henry Dryden, bart., and Mr. Simpson, for their kindness in sending the drawings exhibited on the walls.

The Chairman (Mr. Bowes A. Paice) then put the vote of thanks, which was carried by acclamation.

Mr. Roger Smith, in reply, expressed his gratification at the amount of discussion the subject had received. Professor Lewis, in his interesting speech, had entered upon the vexed question of the date of these remains, and Dr. Phené and other speakers had touched upon the question as to how far some prehistoric monuments had been artificially shaped, and how far they owed their appearance and contour to the hand of Nature. The latter was a point as to which he found it very difficult to come to a conclusion, even in sight of the remains themselves. With regard to Mr. Wood's question, his (Mr. Smith's) opinion was that the depressions which he noticed as existing in a considerable number of mounds or hills in the neighbourhood of Penmaenmawr could hardly have been caused merely by the rifling or spoliation of the mounds, for the bottoms of the depressions were very evenly formed, the indentations being saucer-like in form, and so extremely sharp and clear in their outline that they hardly appeared to have been touched since the day they were formed. His impression was that these depressions might have been used as places in which to light fires for funeral pyres, beacons, or other purposes. With regard to menhirs, the point raised by Dr. Phené was a most interesting one, and he hoped the Association would ask him to read a paper on those prehistoric remains, as the idea as to their being beacons was one very well worthy of consideration. As to the avenue at Karnak, the question as to what it might once have been belonged to the region of speculative discussion, and therefore he would not enter into it, although he hardly coincided with Dr. Phené's views on the subject.

Dr. Phené briefly acknowledged the vote of thanks, and thus concluded the Fifth General Conference of Architects.

WINTER GARDENS, BLACKPOOL.

THE Blackpool Winter Gardens are approaching completion, and will be opened on the 1st of July. The site upon which the buildings have been erected consists (according to the *Blackpool Gazette*) of an irregularly-shaped plot of land, with about twenty corners, and abuts upon Leopold-grove, Adelaide-street, Victoria-street, Oak-street, Adelphi-street, and Church-street. In the instructions to architects the directors stipulated that provision should be made for a promenade not less than 200 yards in length, by 30 ft. in width, and also for a concert-hall or pavilion capable of accommodating about 3,000 persons, and that the large house on the grounds should be utilised if possible. The main building is a large concert-hall, or pavilion and promenade combined. The concert-room is 133 ft. 6 in. by 72 ft. 3 in., and is placed concentrically with and within the promenade. It will, it is calculated, comfortably seat 3,000 persons. With a view to requirements in the future, the orchestra has been so constructed as to be made into a stage, so that if, by-and-by, the management see fit to give theatrical performances, a very short time and a very little trouble will fit up a stage from 30 ft. to 35 ft. deep, with all the necessary dressing-rooms and accommodation. Outside the concert-room, and encircling it, is a promenade with a glass circular roof, the floor of which is about 3 ft. higher than the floor of the concert-hall. This promenade is 30 ft. wide, and is separated from the concert-room by a sort of wooden portcullis, or sliding sash, something after the manner in which the concert-room at the Crystal Palace, Sydenham, is divided off from the nave. The object of this is to enable the whole to be thrown into one great concert-room, should occasion require it to be done. In this way from 6,000 to 7,000 persons can be provided for. This promenade is provided with plenty of statuary, ferns, palm-trees, &c. From one corner of this walk there is an entrance to the covered skating-rink, a building of glass and iron, 135 ft. by 88 ft. This adjoins the open-air rink, and with it will give an area of about 35,000 square feet, open and covered, for skating purposes. The covered portion is so constructed that it can be used for other purposes, such as a smaller concert-room. The architect of the building is Mr. Mitchell. The main building is of brick, relieved with stone dressings and terra-cotta.

The following contractors have been engaged upon the work:—Messrs. Cardwell & Sutcliffe, brickwork; Messrs. Fielding & Sons, masonry; Messrs. Curwen & Swain, Limited, joinery; Messrs. Laidlaw, Son, & Caine, ironfoundry; Messrs. Whiteside & Walmsley, plastering; the Val de Travers Company, asphalte; Messrs. Braby & Co., Limited, zinc work; Messrs. Minton, Hollins, & Co., tiles; Coalbrook Dale Company, fountains; Messrs. Edmondson & Co., stained glass; Mr. W. E. Rendle, patent glazing; Mr. G. L. Seed, slating; Mr. J. Coulston, plumbing; Mr. J. Peake, heating; Mr. J. Crankshaw, terra cotta; Mr. S. Pills, bar-fittings; Messrs. Bruccianni & Co., plaster figures. The decorations are by Mr. Dugan. The total cost is put at 50,000*l*.

BRITANNIA TUBULAR BRIDGE.

SIR,—The Directors of the London and North-Western Railway Company have called my attention to a statement recently circulated in some of the daily papers respecting the condition of the Britannia Tubular Bridge, carrying the railway over the Menai Straits, and more particularly to the discussion at the General Conference of Architects, as published in the *Builder* of the 15th inst. At this Conference Mr. Carroll is reported to have stated with regard to this bridge, that "there was no doubt a process of rusting going on, which must eventually, unless checked, have the effect of making the bridge come down with a crash," and that he "believed tons upon tons of rust were extracted from the Tube every month."

At the same meeting Mr. Skidmore is also stated to have said that he "could testify to the enormous quantity of rust which it yielded."

I can, from an intimate personal knowledge of the structure, most unhesitatingly assert that these statements are utterly without foundation, and, as they are calculated to alarm railway passengers, I, in their interest as well as that of the railway company, publicly challenge the accuracy of the statements which Mr. Carroll and Mr. Skidmore have thought proper to make.

I may add that within the past few years I have, in conjunction with Mr. Ramsbottom, late mechanical engineer to the railway company, most carefully examined this bridge, as well as that over the River Conway, when the ironwork was found practically free from rust, the cells or chambers comprising the top and bottom members of the tubes perfectly clean, and the edges of the plates as sharp as when first placed in position.

These bridges are subjected to a periodical and critical examination by the resident engineer of the district, and I feel confident that, with the care and attention they receive in common with all other structures on this railway, there is no practical limit to their endurance.

WILLIAM BAKER,
Engineer-in-Chief, London and North-Western Railway.

The Congress on Domestic Economy, in connexion with the Society of Arts, will be held at the town-hall, Manchester, on the 26th, 27th, and 28th of June.

ARCHITECTURAL ASSOCIATION.

THE closing meeting of this Association for session 1877-78 was held, as already mentioned, on Friday evening, the 7th inst., in the rooms of the Royal Institute of British Architects, the portion of the proceedings which included the reading of Mr. Roger Smith's and Dr. Phené's papers, and the subsequent discussion, forming part of the General Conference of Architects. Mr. Bowes A. Paice, president of the Association, occupied the chair.

On the motion of Mr. Page, a vote of thanks was accorded to the architect for allowing the members to visit the new vestry-hall at Hampstead on the previous Saturday.

The chairman said he had received a letter from M. Charles Lucas, secretary of the Société Centrale des Architectes, Paris, inviting the Association to send one or two delegates to represent it at the International Congress of Architects to be held at the Palais du Trocadéro, Paris, from Monday, July 29th, to Saturday, August 3rd.

Mr. S. F. Clarkson moved that the president-elect (Mr. H. L. Florence) and Mr. R. Phené Spiers be elected as delegates. The latter gentleman was well known in Paris, and was personally acquainted with most of the leading French architects.

Mr. J. Douglass Mathews seconded the motion, which was agreed to *nem. con.*

Mr. Phené Spiers subsequently stated that M. Lucas, who had been in London attending the General Conference of Architects, had manifested great interest in the Association, and had requested him to explain its mode of working, its classes, &c., to the architects of France. No society conducted on similar principles to those of the Association existed in France.

The thanks of the Association were given to Mr. Paice for the courtesy and assiduity he had displayed in the discharge of his duties as president of the Association during the session.

It was announced that, in order to perpetuate the memory of the late Mr. Edmund Sharpe, M.A., and his connexion with the Association, a committee had been appointed to undertake the publication of the drawings illustrating the last excursion made under his guidance, being that to the district of "Charente" in the South of France. This committee, having carefully gone through the drawings (numbering about 200 specially prepared for photo-lithography), consider they will form a quarto volume similar to Mr. Sharpe's later works on the "Mouldings and Ornamentation of the Transitional Period," "Cistercian Abbeys," &c. The publication will consist of about sixty plates, with descriptive letterpress, and it is proposed to issue the work to subscribers at a guinea and a half each copy. The committee say they feel confident that "the valuable character of this memorial as an architectural work will secure for them the co-operation of the profession generally, in addition to which it will be especially interesting as a recognition of the disinterested services rendered by Mr. Sharpe to the profession for many years, both by his valuable publications and by the various excursions which he originated and successfully carried out for the benefit of architectural students." By the permission of the Council of the Institute, a small selection of the original drawings has been placed in their library for inspection. Mr. John S. Quilter, of 10, Brunswick-square, is the secretary to the committee.

JAPANESE WORK.

Mr. Spiers called attention to some curious Japanese woodwork, &c., brought over by Dr. Dresser, and specimens of which were exhibited on the walls of the Institute meeting-room. Mr. Spiers read a short communication from Dr. Dresser, who, after expressing regret that his duties as a juror at the Paris Exhibition would prevent his attendance, went on to say:—"What I wished to call your attention to was certain pieces of wood lattice-work; carved, lacquered, inlayed, and *cloisonné* panels; metal-hinges, lock-plates, and finger-plates; and other works which appear to me to be of special interest to architects. The lattice-panels are made in many patterns; indeed, in design they are almost infinite, and I submit for your respectful consideration that they be used as ventilating panels in room-doors; as enrichments in cabinets; for both dwarf-blinds in our windows,—replacing the very modern cane-blinds,—and for outside sun-shutters, instead of Venetian shutters. In the latter case they would have a considerable thickness, and be formed of close varieties of lattice-work, so that a very small obliquity of the sun's rays would be necessary in order that shadow be secured. Other panels, which may be said to consist of a simple combination of carved and perforated work, I propose to use in dados, rails, and panelled friezes, by placing them, either in their present state, or when stained black, upon a gold or coloured background,—and in this way they are used in the smoking-room of the Prince of Wales's pavilion which Messrs. Gillow & Co. have arranged in Paris. When the dado rail is made of these carved perforated panels, I think that I should fill the panels of the dado with a kind of plaited bamboo-work, or with inlaid woods of quiet character. The plaited work of which I speak is made in many patterns, and is of the soft yellow colour natural to the bamboo, or is stained to various shades, and it has the advantage that by glue, or other cement, it can be applied closely to a surface without the intervention of any space in which vermin may collect. This material I should also use in the panelled covings of cornices. The carved perforated panels can be made of any size; and inlays of any pattern, from the most minute to the more simple, can be got in pieces either small or large. Panels for the doors of rooms can be had from Japan carved in very low relief, or formed of lacquer work; or a spray in lacquer work may be drawn on a panel which is otherwise of plain unpolished wood. Small doors, such as those used for cabinets, and the fronts of drawers, are to be had with panels of carved ivory, lacquer on ivory, *cloisonné* enamel, iron inlaid with gold or silver, or of fine wood inlays; and I submit for your consideration that wherever work involves the expenditure of a considerable amount of skilled labour, it will be found cheaper to bring the work from Japan. Metal hinges, lock-plates, and finger-plates, can be had formed of iron inlaid with gold and silver, or of wrought-iron only; and finger-plates of porcelain, either blue and white, or of Satsuma character, are also made in Japan. In submitting these suggestions to you, I simply beg that you give the matter your kind consideration. If these importations from Japan would be useful to us, I ask that you kindly assist me in trying to introduce them, for if we, as architects, do not patronise what is good in art as associated with building, the people cannot do so."

Mr. T. Roger Smith then read a paper on "Rude Stone Monuments," which we print elsewhere.

The scrutineers appointed at the commencement of the meeting (Messrs. R. Henry and W. H. A. Belling) reported that they had examined the voting papers, and the following were the officers elected for the Session 1878-79, viz.:—

President.—Mr. H. L. Florence.
Vice-Presidents.—Messrs. Seton Wells and W. L. Spiers.
Committee.—Messrs. S. Flint Clarkson, A. C. Cooper, T. Garratt, E. B. I'Anson, F. G. Knight, W. Hilton Nash, B. A. Paice, A. Payne, W. Scott, and W. H. White.
Treasurer.—Mr. J. Douglass Mathews.
Librarian.—Mr. R. E. Pownall.
Secretaries.—Messrs. E. G. Hayes and R. C. Page.
Solicitor.—Mr. Francis Truefitt.
Assistant Librarians.—Messrs. L. A. Shuffrey and J. W. Stone.
Auditors.—Messrs. T. E. Mundy and F. Hemings.
Registrar.—Mr. Thomas H. Watson.

With this announcement the business of the session terminated.

The annual dinner of the Association was held on Tuesday evening at the Holborn Restaurant, Mr. Bowes A. Paice, the retiring president, in the chair, supported by about sixty members and friends. The usual loyal toasts having been proposed from the chair, and duly honoured,

Mr. Hugh Stannus, in fitting terms, proposed "The Army, Navy, and Reserve Forces," coupled with the name of Captain H. C. Boyes, of the London Rifle Brigade (one of the past presidents of the Association), who responded.

Mr. E. C. Robins, in proposing "The Architectural Association and its late worthy President," remarked that the Association had much upon which to congratulate itself since the old days when its *habitat* was Lyons Inn Hall. He deprecated the retirement from all participation in the work of the Association of many of those senior members of the profession who owed a great deal of their advancement to their connexion with the Association, and congratulated the Association upon having had so courteous and indefatigable a president as Mr. Paice during the past year.

Mr. Paice responded.

Mr. R. Phené Spiers, in proposing "The President-elect, Mr. H. L. Florence," adverted to that gentleman's successful career as a student, he having won the Gold Medal and Travelling Studentship of the Royal Academy, and the Soane Medallion of the Institute.

Mr. Florence, in response, attributed much of his success to the instruction he had received through the work of the Association.

Mr. Bovill proposed "The Treasurer," Mr. J. Douglass Mathews, who, in response, alluded to the possibility that, in consequence of the proposed structural changes to accommodate the Institute in Conduit-street, the Association would have to seek fresh quarters. The relations subsisting between the two bodies were, however, most cordial, and no doubt the Institute would do all in its power to obtain the increased accommodation it required without incommoding the Association. The advantages of the two societies remaining under one roof were obvious.

Mr. Quilter, in proposing "The Honorary Secretaries," spoke of the ability and zeal with which those gentlemen discharged their duties.

Messrs. E. G. Hayes and R. C. Page responded.

Mr Vinall proposed "The Committee, Librarian, and other Officers," coupled with the name of Mr. S. Flint Clarkson, who replied.

The Chairman, in proposing "The Royal Institute of British Architects," touched upon the subject referred to by Mr. Douglass Mathews, and re-echoed that gentleman's observations. He referred to the courtesy which had been displayed towards the Association by the president of the Institute, Mr. Charles Barry, and congratulated the Institute upon the success of the recent Conference, a success largely due to the honorary secretaries, Messrs. Arthur Cates and R. Phené Spiers.

Mr. Spiers, whose name was coupled with the toast, responded, endorsing what had been said as to the readiness of the Institute to consider the requirements of the Association. At the same time, he insisted upon the absolute necessity of the Association's maintenance of its own independence.

Mr. Lacy W. Ridge proposed "Prosperity to the Sister Arts," coupled with the names of Messrs. W. Wynfield and J. D. Linton, both of whom returned thanks.

The only other toast was that of "The Visitors," proposed by Mr. E. C. Lee, and coupled with the name of Mr. Thompson, who responded.

The proceedings were enlivened by songs given by Messrs. Dale, Haselhurst, E. C. Lee, Hayes, Riddett, Black, R. P. Spiers, Molyneux, Boyes, Stannus, and Pink.

ENLARGEMENT OF THE LAMBETH CEMETERY AT TOOTING.

THE OPENING CEREMONY.

THE cemetery at Tooting belonging to the parish of Lambeth has just been enlarged, and the ceremony of consecrating the additional ground was performed by the Bishop of Rochester last week. The great increase in the value of land in every suburb around London is shown in the cost which has been incurred in acquiring this addition to the cemetery. The cemetery itself is comparatively modern,* the original area consisting of about 30 acres, which were purchased at a cost of 300*l.* per acre. The expenditure incurred in laying out and draining the ground, and in the erection of chapels, lodges, walls, and fences, amounted to 12,423*l.*, bringing the total cost of the cemetery up to upwards of 21,000*l.* The adjoining land purchased for the extension of the cemetery—11 acres in extent—cost 500*l.* per acre, and it is worthy of remark, as showing the value of land in the locality, that two days after the purchase of the land had been effected by the parochial authorities, 700*l.* per acre was offered for it. The expense of preparing the ground for interments in the cemetery as extended, by the erection of walls, fences, and road-making, has been about 3,300*l.*, the entire cost of the enlargement, including the land, being close upon 9,000*l.* It is stated that the South-Western Railway Company, whose line passes within a short distance of the cemetery, contemplate making a siding from their main line to the cemetery-grounds.

SANITARY IMPROVEMENTS AT ASCOT RACECOURSE.

SINKING AN ARTESIAN WELL.

SEVERAL structural and other improvements have been made at Ascot, where the annual races have been held this week. One of the most prominent of the works on the course is that now in progress, and which will not, for some time to come, be completed. It consists of an artesian well, which is being sunk in the hollow in the centre of the heath. The boring is being carried out by Messrs. S. Baker & Son, of Southwark Bridge-road, a depth of about 50 ft. having already been reached. Iron cylinders, 6 ft. 4 in. in diameter, were sunk at the commencement of the work, but the great influx of surface-water rendered the use of the boring-tool necessary, and it has been ascertained that this laborious operation will have to be continued until the chalk is reached, and a pure supply of spring water obtained. Amongst the other improvements which have been effected on the course is an entrance through which the royal *cortége* comes upon the course, a rearrangement of the stand for the exclusive use of the members of the royal family, together with a renovation of the grand stand and the stand for the Master of the Buckhounds, all of which have been carried out under the superintendence of Mr. W. Seabrook, her Majesty's Inspector of Palaces.

The Royal Academy. — At a general assembly of the Royal Academy of Arts held on Wednesday evening, Mr. W. F. Yeames, painter, was elected an Academician, and Mr. Frank Holl, painter, and Mr. E. Crofts, painter, were elected Associates.

* In the *Builder* for 1854 (vol. xii., p. 223), we gave a view of the cemetery and buildings, then in progress, from the designs of Messrs. Wehnert & Ashdown, architects.

"THE GROSVENOR."

THE Middlesex magistrates have wisely reconsidered their refusal to confirm the licence given to the restaurant attached to the Grosvenor Gallery, and have revoked their first splenetic decision. We heartily congratulate Sir Coutts Lindsay on the unanimous expression of goodwill which the refusal on the part of the magistrates evoked, at the same time expressing, for ourselves and the public, our sense of the benefit he has conferred on us by the provision of so fine a set of rooms, and the consequent opportunity for an annual exhibition with a special character of its own, and which we have no doubt will prove a permanent and increasing boon to the artistic world of London.

COMPULSORY PURCHASE OF WATERLOO BRIDGE.

THE arbitration proceedings in regard to the compensation to be paid by the Metropolitan Board of Works to the shareholders of the Waterloo Bridge Company, in respect of the throwing open to the public of this bridge free from toll, under the provisions of the Toll Bridges Act of last Session, were commenced at the offices of the Institution of Surveyors in Great George-street, on the 30th of April. The Bridge Company claimed a sum of 750,000*l.*, and the arbitrators appointed to consider the amount to be awarded, were Captain Douglas Galton, Mr. Nutter, Q.C. (selected by the Bridge Company), and Mr. F. M. White, Q.C. (appointed by the Metropolitan Board of Works).

In the course of the investigation Mr. Galsworthy stated that his valuation of the bridge amounted to 563,361*l.*, and of the arches under the approaches 26,000*l.*, making a total of 589,361*l.*, to which he added 10 per cent. for compulsory purchase, his total valuation being thus roundly 619,000*l.*

We give the evidence of another of the witnesses on the side of the company, as reported in the *Metropolitan*:

Mr Edwin Fox said that, inasmuch as the bridge was a substantial structure, that would last for all time in all human probability, and inasmuch as it was situated in the centre of the most active the world, not also permanent character in regard to increase of income, which had declared itself by the experience of more than a century, he looked upon it as a property to be governed by a maximum multiplier upon the rental produced. He had accepted the evidence of the engineers as to the condition of the bridge, and had arrived at the conclusion that the increase of income was likely to be regulated in the future at the same rate as in the past. He calculated that the annual increase in the revenue from the bridge would be 25*l.* In estimating the value of the Waterloo Bridge he deducted the gross expenses of 3,776*l.*, which left an annual income of 18,829*l.* in 1876, which he estimated would be maintained for the next five years. His total valuation of the bridge itself, with its increasing income, was 563,343*l.* In addition there were the arches north and south of the bridge, which he had reckoned as ordinary investments to produce 23,897*l.*, making a total of 587,244*l.*, to which he added ten per cent. for forced sale, making a total of 645,968*l.*; and he also added to this 50,000*l.*, on the ground that at present the bridge and approaches were more extensive than necessary to earn the income. In cross-examination Mr. Fox admitted that, as a whole, his valuation was equal to thirty-five years' purchase, and that this was a higher value than attached to Consols. His estimate was based on the increasing value of the income of the bridge.

Mr. Henry Law, C.E., Sir Joseph Bazalgette, Mr. C. Hutton Gregory, and others, on the part of the Board, gave evidence to the effect that the bridge was in a dangerous state, and that a large expenditure upon it was required.

Mr. Robt. Vigers, surveyor, putting this on one side, said his figures were,—value of bridge tolls, 358,000*l.*; arches on the Middlesex side of the river, 7,095*l.*; ditto on the Surrey side of the river, 11,139*l.*; gas company's rent, 2,100*l.*; making a total of 378,334*l.* Then there was an allowance of ten per cent. for forced sale. He thought twenty years' purchase of the tolls, considering all the circumstances, was a fair price, and he had taken them on that basis because he thought them somewhat analogous to freehold house property.

It is understood that the arbitrators have awarded the company 475,000*l.*

CHESTNUT.

SIR,—A place of worship, built for the French Protestant Refugee Huguenots, about 200 years ago, in Glebe-place, King's-road, Chelsea, is undergoing repair by Mr. Tink, builder. Mr. Lane, his foreman, acquaints me that the inner framework of the roof is chestnut, and that it is of considerable interest. Any of the gentlemen of the architectural profession may see into the building just at the present time during alterations.

SAVILL HAYWARD, Minister.

THE WOMEN'S HOTEL, NEW YORK.

THE Women's Hotel, of which our New York correspondent gave some particulars when it was opened (p. 428, *ante*), is a complete failure, and is to be abandoned immediately. We termed it "an imperfect experiment." If we had known at the time all the regulations that were to be imposed on the occupants we should have spoken of it as a fore-doomed failure. Judge Hilton, who, as executor of the Stewart Estate, has carried out the undertaking, says:—

"You can run a hotel for men exclusively, but for women you can't. They would rather stay at the boarding-houses, and put up with half rooms, poor fare, and shabby furniture, and have the society of gentlemen, than take the luxuries of Stewart without them. It is natural, and you can't change them. The hotel was meant for ladies who earn their own living, but with all our efforts we could not get more than fifty boarders, and fifteen of these ought not to be there, for they don't earn their living, and are there merely for economy. The accommodations were equal to all and the best woman in the nation can obtain, but women will not accept any help based on the condition of separation from men, and the free admission of men would have subjected the house to gossip and eventually to scandal."

This may be one reason for the collapse, but there are others; the strictness and unwisdom of some of the regulations, the sort of espionage kept up over the going and coming of the inmates, and the refusal of admission, in the first instance, to three-fourths of the applicants for rooms.

TEWKESBURY.

A NEW Wesleyan Chapel was opened here on the 5th inst. by Dr. Pope, president of the Conference. It is on the site of the old Market-house in the centre of the town, and owing to the narrowness of it, only the front elevation is seen. It is set back 40 ft. from the street, the space thus obtained being laid out as a garden.

The style is Gothic of the fourteenth century, and the elevation consists of a gable containing a five-light window, flanked at the angles by octagonal buttresses, on the top of which are pinnacles springing from carved string-courses. The entrance is in the centre by a porch with coupled columns of blue Pennant stone, with carved and moulded bases. The materials of the front are yellow local stone, with Bath dressings.

The interior is designed to seat 320 on the ground-floor, with 50 more in a gallery above the entrance; no side galleries are contemplated. There is a three-sided chancel lighted by three windows, filled with stained glass subjects from the life of our Lord, executed by Mr. Bourne, of Birmingham, and the gift of Mr. Collins, the builder of the chapel.

The roof of the chapel and chancel is open-timbered, the feet of the principals resting on carved stone corbels. The chancel arch is moulded and has respond shafts of red Mansfield, with carved caps and bases, on which are sculptured figures at prayer and praise. Mr. Martin, of Cheltenham, did the carving. There are quasi-transepts to the chapel, in which there are three windows. The cost is about 3,000*l.*

The architect is Mr. Charles Bell, of London, and the builder Mr. Collins, of Tewkesbury, by whom the partial restoration of the abbey, under the late Sir Gilbert Scott, has been executed.

WANT OF HARBOURS ON THE NORTH-EAST COAST OF SCOTLAND.

THE Commissioners appointed to inquire into the harbours off the coast of Scotland having reported that the harbours off the north-east coast are totally inadequate both for refuge from storms and convenience, the Board of Trade are shortly to devise some extensive schemes to remedy so dangerous a state of maritime matters.

The Treasury, however, have before them an awkward instance of the incapacity of some engineers and builders to erect works to withstand the storms that rage on the Scottish coast. For instance, the country has expended no less a sum than 140,000*l.* to improve the harbour of Wick. Immense boulders of stone braced with clamps of iron, and set in concrete foundation, supposed to be impregnable to the assaults of the wildest storms, were, when nearly finished, swept away like so much matchwood in a few hours, and the masons, when they came to work in the morning, are reported to have fairly cried at the sight before them, for they had prided themselves at being at last successful in building a barrier that would stand for ages as a conquest of man over the sea.

So disheartened has the Government become at the "Wick" experiment as to cause the Treasury to withhold further expenditure in that direction, and if engineers or architects cannot devise some irresistible bulwark, the old-fashioned groynes must again be trusted to. Now, this is a sorry look-out for 200 miles of coast from the Forth to the Orkneys, and as Parliament annually votes only 3,000*l.* for improving the harbours of Scotland, that sum will go but a short way in erecting groynes.

At Peterhead and Fraserburgh, the local authorities are beginning to make some fresh experiments to secure good havens, and aided by the Public Works Loan Commissioners and encouraging reports of scientific builders, it is expected that more satisfactory results will follow than in the Government experiment at Wick.

THE RELATION OF ARTIST AND ARCHITECT.

SIR,—It may throw some light on this vexed question if it be made more generally known that all the great works of Pericles's age were carried out under the direction and supervision of Phidias. The entire host of artists and artist-workmen, of every kind, assembled at Athens were occupied in following out his ideas,—even the weavers and embroiderers of the tapestries which were to form the draperies of the colossal statues of Jupiter, Minerva, &c. If the artist held sovereign sway at the grand climax of Grecian art, it is paralleled by the regality of Michelangelo, and of Raffaelle at the culmination of the great Italian epoch. It cannot for one moment be doubted that that artist who is supreme in his mastery over the human figure must be king of arts.

The most promising sign of the art-times is the fact that architects now recognise the fact that the students of the sister arts must, in the beginning of their career, pursue the same curriculum of study, and that the study of the specialities of the three arts should not be entered upon till that preliminary course has been satisfactorily passed; they recognise the fact that architects must be artists.

The following studies ought, in the primary course, to be common to the three professions:—1. The science of proportion. 2. Anatomy. 3. Perspective. 4. Drawing and modelling ornament. 5. Drawing and modelling the figure. Second Course, Specialities:—*Painter.*—The science of colour; painting. *Sculptor.*—Carving in marble; bronze casting. *Architect.*—The science of colour; the principles of construction; masonry; carpentry, &c.

The Germans who strove to observe the order and manner of working which was pursued in the palmy days of Italian art, designed their buildings with reference to the mural decorations, for these would be the fullest exponents of the building's purpose. One has only to glance at the dismantled Parthenon to be convinced that architecture is the setting of painting and sculpture.

In Munich, commissions were given to the mural painters and to the sculptors several years before the edifices were commenced. The painters and sculptors were, therefore, prepared to proceed with their work when the carcass was finished. A scaffolding which could easily be ascended by inclined planes, and worked upon without the least trepidation, was always prepared for the fresco painters.

W. C. T.

ASPHALTE AND HORSES.

SIR,—In reply to Mr. Evans's rather amusing way of advertising himself in connexion with asphalte paving, allow me to call his attention to the following extract from the Paris letter of the *City Press*:—

"Regarding the city itself as an exhibition no less interesting than that now open on the Champ de Mars, the student of municipal law and local administration may profitably make note of a few things. Here is a city of groves and palaces truly; but it is also a city of asphalte. But on a 'greasy' day the streets of Paris are not strewn with prostrate horses as the streets of London are, very much, indeed, we think, to our own disgrace. A little party of social, sincere reformers have been perambulating the streets of Paris lately, and they found that in the course of fifteen days, some five of which were rainy, they did not see a single horse down or any interruption of the traffic through the treachery of asphalte. It is the seasonable scattering of sand that makes all the difference, although mere water in plenty will render asphalte as safe in wet as in dry weather, as the *City Press* has often urged, pointing in support of the proposition to the safety of horses on asphalte during heavy rain."

J. E.

DISTRICT SURVEYORS' FEES.

SIR,—Knowing how desirous you are to see questions from different points of view, will you allow me, *apropos* of Mr. Walker's letter inserted in your columns recently, to make a simple statement?

Some short time since I carried out some works under three different contracts, for which three different notices were sent to the district surveyor. The contracts amounted to 45,000*l.*, and the fees charged amounted to 112*l.* 7*s.* 6*d.* The surveyor himself visited the works about six times, and his representatives about twelve times, therefore each visit would be paid for at the rate of 15*l.* 15*s.* and 1*l.* 10*s.* respectively.

Surely Mr. Walker's lines have not fallen to him in pleasant places. W. S. JOSOLYNE.

*** We insert our correspondent's letter, and have no doubt the district surveyor will be able to show special reasons for the charges.

SIR,—I have read with some interest the communication of Mr. Robert Walker in your issue of the 1st inst. I have no doubt that Mr. Walker is most anxious to do his duty, and that for the responsibility imposed upon him he is very inadequately remunerated. Every right-minded person must deeply sympathise with him in the matter of the accident in the Haymarket, which those who know him are quite aware he deplores most keenly.

I wish, however, to say one word on behalf of the general public. At present, any one who desires to build or improve may have to consult not only the district surveyor, but the police authorities and the authorities at the Metropolitan Board of Works. The present system is intolerable. For myself, I strongly advocate clothing the Metropolitan Board of Works with adequate authority to deal with all matters in regard to improvements and dangerous structures. At present, the wretched builder is in the position of a wrestler with the Siamese twins. When he has Chang down, then Ising comes on. Those who have had to do business with Mr. Vulliamy and the officers of the Metropolitan Board of Works invariably meet with courtesy and all the assistance that the authorities in Spring-gardens can render,—which, I am sorry to say, is very little. Let any one walk round the parish of St. Martin's-in-the-Fields, and the fact is obvious that Mr. Robert Walker ought not only to be better paid, but ought to have some one at hand to aid him in his onerous duties.

FRED. JAS. TOMKINS.

CASES UNDER METROPOLITAN BUILDING ACT.

RAISING CHIMNEY SHAFTS.

ON Friday, the 7th inst., Mr. Jarvis, district surveyor of Camberwell, summoned Mr. Lacy, builder, before the magistrate at Lambeth Police-court for having raised the chimney-shafts to a house, Talfourd-road, Peckham, to a height beyond that allowed by the Building Act.

The builder made no defence, but promised to amend the irregularity. The magistrate accordingly adjourned the case for ten days, to give the builder the opportunity of complying with the Act.

FIREPROOFING DEALS.

SIR,—Will any of your correspondents afford me information in respect of a process for rendering ordinary deal boarding non-inflammable?

The process should be simple and capable of application without special plant, and be, as to material, tolerably inexpensive. I have thought whether alumina dissolved in sulphuric acid, and diluted down to a strength at which it would just "singe," and not char the boards, would do?

B. P. B.

THE BEAN-FEAST BORE.

SIR,—Applications for contributions towards "bean-feasts," "outings," &c. have once more commenced to flow in; may I venture, therefore, to appeal through your columns to builders to put a stop to this heavy tax upon merchants? I believe very few respectable builders now countenance it, but still it is necessary to forbid lists of firms being issued, to prevent the annoyance.

MERCHANT.

Hastings Baths.—Sir: Permit me to say that the three important glazed roofs for this building were designed, in conjunction with the architects, by Mr. Archibald D. Dawnay, C.E., of London, and he was afterwards entrusted with their construction and erection.—A. TWYMAN.

REBUILDING "THE COTTAGE" AT VIRGINIA WATER.

VISITORS to Virginia Water, who at present are numerous, will have noticed the handsome new building which has just been erected in the place of the old tea-rooms, or, as they were better known, "The Cottage," which has disappeared. The new building has not been erected exactly on the site of the structure which it replaces. The latter was close to the fishing-temple, but the new building has been erected upon a more elevated site, selected by Prince Christian, the ranger of Windsor Great Park, and faces the middle of the lake, from which there is a charming prospect. The building has been erected under the direct supervision of Mr. R. Howe, clerk of the works at Windsor Castle, who met with considerable difficulty in obtaining a good foundation, owing to the marshy nature of the ground. Eventually, however, this was overcome, by the site being covered over with concrete to a depth of 18 in., upon which the superstructure has been built, the walls being of brick, with Bath stone dressings. The staircase is of polished pitch-pine, and the front and garden entrance-doors are of oak. It is stated that the old cottage which has been demolished was more than 150 years old, having been built, as stated, in the early part of the eighteenth century. A spring on the hill at the rear of the building supplies "The Cottage" with water.

Books Received.

The Practical Dictionary of Mechanics. By E. H. KNIGHT. Illustrated. London, and Cambridge, Massachusetts: Cassell, Petter, & Galpin. No date.

EIGHT lines of original preface introduce Knight's mechanical dictionary as an American work, which appears to have been merely reprinted by Messrs. Cassell, Petter, & Galpin. By leaving the reader to form his own conclusions on this point, the value of the book has been rendered more doubtful than would otherwise have been the case. Peculiarities of spelling which have been adopted on the other side of the Atlantic are distasteful to English scholars; and when printed in London without comment or remark are not unlikely to be set down to simple ignorance. But above all things, injustice is done both to the purchaser and to the author of the work by the omission of the date. It is lamentable to see the spread of this slovenly and worse than slovenly habit. The value of a book, map, or other publication, if undated, is materially diminished. The plan was introduced for purposes foreign to the well-being of literature. Its origin was probably the desire to continue the sale of old maps, or books of reference after their interest had been superseded by new discoveries. Such a method, applied to a map, simply destroys its reliability. A dated map, if good in other respects, can never lose its value as the record of the state of geographers' knowledge of the country it represents, at the time of publication. For all historical inquiry this kind of knowledge is essential. Remove the date, and nothing remains but a map which at some unknown time may have been as explicit as the circumstances of the case allowed, but which, as that time is lost, is little more than waste paper.

The same remark applies to all cyclopædias and scientific works. An old book may be of quite as much value to the student, for many purposes, as a new one. For some purposes the value of the old one, so that the date be known, is indeed far higher. Publishers who omit this essential element of the respectability of their works should be fully warned of the consequences. We much regret to see that a literary journal has lately adopted the most objectionable,—not to say scarcely honest,—method of omitting the date on the title of the books which it reviews.

In the present case it is the more unpardonable that the date should be omitted, from the fact that the information contained is brought down fully and fairly to the present time of writing, namely, the first half of the year 1878. Not only, for example, is a very full and excellent account given of the telephone, and of the knowledge attained of the nature of the vibrations which are sensible to the human ear as sound, but we actually find "Microphone, an instrument for increasing the intensity of low sounds by communicating their vibrations to a more sonorous body, which emits a more audible sound."

This admirable definition of a word new to science leads to the remark that Mr. Knight has not done justice to a work of extraordinary research and great literary, as well as scientific, ability, by the title he has chosen. The phrase "practical dictionary" is, in itself, somewhat of a misnomer. All dictionaries are intended for practice. The volume under notice is, in truth, a repertory of mechanical invention. As such it is a work of great merit and great utility. As a dictionary it is by no means what is required by the student. A dictionary means a book which gives information as to words. A dictionary of mechanics should be a book which would contain such clear definitions of all words used by mechanists, or mechanics, as to enable any one to understand any book written on mechanical subjects, or to make proper use of technical terms. As such, the example we have given before of the definition of the word "microphone" is admirable, and would be very hard to improve. An equally good explanation is given of "phonograph," while under the equivalent name of "phonautograph," a duplicate article enters into much fuller detail. Under "Telephone" nearly ten columns of information, interspersed with numerous cuts, are given, citing works published as late as 1876, and giving an admirable *resumé* of discoveries up to that date. This is a fair instance of the fidelity and intelligence with which Mr. Knight has brought together an immense body of detailed information, and constructed a mechanical cyclopædia which is an honour to the press of the United States.

But if we regard the work as a dictionary, we must comment on the absence of scientific, as distinguished from purely mechanical, words, even when the right understanding of these words lies at the very threshold of mechanical study. Thus, if we look for the word "heat," we find definitions of that term as it is used by the smith, and also of latent and specific heat. But of heat as a mode of motion, or an equivalent of mechanical power, not a word occurs under the head. Again, "light" is defined as (1) an illuminating body; (2) a nautical signal; (3) an opening in a vessel; or (4) a pane of glass. As to "light," in physics, nothing is said; nor do we find under this head,—under "colour," "spectrum," or "vibration,"—any notice of the refrangibility of the different rays of light, or of the laws of vibration of light or of sound. The word "refrangibility" does not occur in the dictionary. No doubt the writer had the intention to draw the line somewhere between the theory and the practice of mechanics. This, however, is a great mistake. At all events, the preface should have clearly stated the principle on which the work was constructed. If it falls into the hands of the self-teaching student, he will miss the very guiding principles necessary to pilot him through the intricacies of innumerable details.

With the exception of these faults, the suppression of the date, the description of a cyclopædia as a dictionary, and the omission of the purely scientific element, Mr. Knight's volume is one of unusual merit. It is without precedent in our experience that a writer should collect such varied, detailed, and recent information, and present it with such literary ability and due discrimination of the relative importance of the quotations and abstracts made, as is evinced by the different sizes of type employed. The woodcuts, moreover, are for the most part admirable, and will be new to the English reader. We wish to call the attention of authors and publishers on this side the Atlantic to the great superiority of the American mechanical draughtsmanship as compared to our own. To avoid any invidious comparison with the work of any recent English author, we will refer to a scientific work in which questions of expense cannot be supposed to have been allowed to lower the character of the illustrations. Such is the case, for instance, with the Transactions of the Institution of Naval Architects. We recommend any one who wishes to know what mechanical drawings usually are, and what they may be made, to compare the full-sized plates in that volume with the drawing of Westinghouse's atmospheric brake for railway cars, on p. 356 of Mr. Knight's book, or that of Krupp's 1,200-pounder breech-loading rifled gun at p. 448. The Americans have introduced a mode of ruling mechanical drawings which, combined with great clearness and firmness of outline,

makes them more intelligible representations of machines than is the case with our usual mode of delineation. Even in the smaller cuts, the beauty of the ruling is generally marked. Take as an example the representation of steam-pistons, with different modes of packing (figure 3,759), where perfect clearness is introduced into very minute figures, by the excellence of the ruling.

It is, of course, impossible for a reviewer to read a work of 2,831 pages, containing 7,395 illustrations in the text. And to attempt to indicate all the *lacunæ* in such a work would be to claim an encyclopædic knowledge which is,—to say the least of it,—out of fashion. We may, however, note that it is extraordinary to miss such a word as "meta-centre," which is just one of those for which a technical dictionary is required. In attributing the invention of the tube-well to an American, some injustice is done to a simpler, and we believe much earlier, form of the appliance in this country. Under "printing" and "printing-machines" we miss any reference to that beautiful improvement in the process of composition which was introduced by a Polish inventor, and consisted in marking the letter at the back as well as on the face of each type. In any future edition of the Dictionary of Mechanics we hope, too, due notice will be given of this logotype method.

Under the head "Atmospheric Railway" we find the usual error, to the effect that the failure of that method of propulsion was due to mechanical difficulties. The cause lay very much deeper. It was physical, and, therefore, insuperable. It depended on the rapid influx of terrestrial heat into the exhausted tube, which at once raised the tension of the rarified air. Thus the steam-engines on the South Devon Railway were actually at work pumping out the heat of the earth; and nearly red hot they became in consequence.

The extraordinary inventive power of the Americans is, it may almost be said, the chief motive of the book. We fail to notice under "Drill," or even under "Dentist's Drill," a most beautiful machine of that description, which we saw in the hands of one of the most eminent London dentists six or eight years ago; and in which the use of concentric coils of wire enabled the operator to combine the rapidity of mechanical movement, with the accuracy of a hand instrument. This was an American tool.

It will be seen that there is room—no doubt, ample room—for additions and improvements to this work. But as it is, it goes far to fill an enormous gap in our literature, and is a book for which no small amount of gratitude is due to the industrious and able author.

Miscellanea.

Fall of Platform at Liverpool.—A very startling accident, though unattended with fatal consequences, occurred at the Philharmonic Hall, Liverpool, on Tuesday night, when nearly 800 children fell through a temporary platform. It had been announced for the past week that a "grand concert by 1,000 children, selected from the Liverpool Day Schools, assisted by a powerful choir of adults," would be given in the hall that evening, the entertainment being in aid of the Teachers' Orphanage and Benevolent Fund. For the accommodation of such a large number of children a temporary wooden platform had to be erected on the top of the permanent orchestra. A few minutes before seven o'clock the children, numbering about 800, had taken their places upon the platform in readiness for the commencement of the entertainment. The doors were about to be thrown open to the public when the accident intervened and prevented the proposed concert taking place. Without the slightest warning several of the supports at the lower part of the platform broke, and the whole construction gave way, the children *en masse* being carried along with it. When some degree of order had been restored, it was found that none of them had been seriously injured, and from the nature of the disaster it is almost a miracle that so many escaped without loss of life or limb. The platform consisted of twenty-four tiers of seats, made of American white pine, 1 in. thick by 9 in. breadth. The seats rested on eight bearers running from top to bottom; while the principal supports, screwed into the orchestra, were not more than 1 in. thick. The weakness of the platform evidently lay in these supports. Who supervised?

The Artisans' Dwellings Act.—The arbitrations under the Artisans and Labourers' Dwellings Act, 1875 (Golden-lane and Petticoat-lane schemes), have been proceeding during the past two or three weeks at Guildhall, before Sir Henry Hunt, C.B. The arbitrator in a Garter-court case fixed the value of the freehold at 2,875*l*. Mr. Curtis and others claimed 5,300*l*. Mr. Clark appeared for the claimants, and Mr. White for the Commissioners of Sewers. Mr. Clark said the freehold extended from 3 to 19, Garter-court, and had been let on a building lease for the term of sixty years from December, 1876, at a ground-rent of 125*l*. a year, to Mr. Yeo for building purposes. There was a covenant in the lease that the land had to be covered by 1879. The reversionary interest of the freeholder after 58½ years had also to be taken into consideration. Mr. Stephen Hickson, land surveyor and valuer, was examined by Mr. Clark in reference to the value of the land. He stated that the building area in question was 3,640 superficial feet; he considered the value of the land to be 1s. 9d. per foot, which included old material, which represented 358*l*. 10s. per annum. If the calculation was made on a twenty-five years' purchase, the land was worth 7,962*l*. The interest of the lessee was worth 3,121*l*. He valued the premises at 4,891*l*. 10s., to which had to be added 10 per cent. for compulsory sale, making a total of 5,021*l*. 10s. The arbitrator pointed out that he could not entertain the proposal for adding 10 per cent. The Legislature had so determined.

Working Men's Club and Institute Union.—The report presented at the annual meeting, held in the Jerusalem Chamber, Westminster, on June 3rd, and just now published, states that the council have been obliged to suspend the publication of their "Journal," for want of adequate funds. In other respects their operations and the extension of their work have been curtailed for the same reason. From the uncertainty and variableness of the income they are often placed in a position of much embarrassment and anxiety. Opportunities of taking up fresh branches of work have either to be abandoned, or, if pursued, it is under the fear that a sudden diminution of receipts may perhaps make it difficult to carry on even the current work of the society. The council make an earnest appeal to those who appreciate the importance of the object in view to help this society to persevere in its useful course. The balance-sheet is made up to March 30th last, and at that date the liabilities of the society amounted to 234*l*. 12s. 10d. Its financial condition has never been so unsatisfactory at any previous period.

The Way of all Theatres—The Theatre Royal, Plymouth, was entirely destroyed by fire on Thursday night, the 13th. The performance was over, and the theatre closed shortly before 11 p.m. on Thursday. A few minutes afterwards smoke was observed to be issuing from the building by the lessee's son, Mr. Albert Newcombe, who was passing at the time, and who at once raised an alarm, having in the meantime seen flames at the upper windows. The fire-engines were on the spot in a few minutes, but notwithstanding their promptitude and the mass of water that was poured on the building, the fire had in the short time gained such a hold on the premises that they were entirely destroyed at 1.30 a.m., when the roof fell in, leaving nothing remaining but four bare walls. The Lands Committee of the Town Council of Plymouth, to whom the theatre belongs, have commissioned Mr. C. J. Phipps to prepare plans for the rebuilding, and the works are to be completed by Christmas.

The Fine Arts Jury, Paris Exhibition.—The jury of the Fine Arts group have elected their officers. They are as follow:—Bureau of the group:—President, M. Tullo Massarani (Italy); first vice-president, M. Meissonnier (France); second vice-president, M. Gude (Sweden and Norway). First section (paintings in oil and drawings)—President, Mr. Frederick Leighton (England); vice-president, M. Robert Fleury (France). Second section (sculptures and engravings on medallions)—President, M. Cavalier (France); vice-president, M. Fraikin (Belgium). Third section (architecture)—President (M. H. von Ferstel (Austria-Hungary); vice-president, M. Lefuel (France). Fourth section (engraving and lithography)—President, M. Henriquet Dupont (France); vice-president, M. Burgers (Holland). The visits of the jury to the Exhibition have commenced.

"Les Beaux Arts."—Under this title Mrs. C. J. Freake has written a *comedietta en deux actes*, which has been represented with great success at Cromwell House, in the presence of a large and critical audience. The principal parts were sustained with admirable efficiency by Lady Sebright (*Protectrice des Beaux Arts*), Miss Louise Swift (*Femme de Chambre*), Mr. Cotswold Dick (*Poëte des Dames*), and Mr. Charles Colnaghi (*Chef d'Orchestra*). As to Miss Swift, her little maid on the stage was as good as her big dogs on canvas. It was so true to nature that the art in it was forgotten. It says something for the versatility of the esteemed author of the play when we add, that the music too of some of the songs was composed by her.

Overcrowding.—A weekly paper says,—"How many know how the inhabitants of Holborn Buildings live, and how few suspect that Blind Conn inhabits one of the houses, which he sublets in a manner that should startle all sanitary reformers? One room is partitioned off into four compartments, each of which can be had furnished (?) at 1s. a night. Between 70*l*. and 80*l*. a year for a single chamber in a Holborn slum! It is enough to make an ordinary lodging-house keeper's mouth water. All Mr. Conn's lodgers use the same kitchen and other domestic conveniences with a disregard for privacy and decency that would shame a Zulu Caffre."

Certainty as to Posting.—A pamphlet has been issued by Mr. A. Clifford-Eskell (Simpkin, Marshall, & Co.), upon "Booked Letter Receipts," and their uses, advantages, and reasons for adoption. The matter contained is worth reading, and the fact that the Post-Office authorities have already decided to try the experiment of issuing, at a charge of ½d., certificates of letters, newspapers, or book packets received at four of the leading provincial towns indicates the importance they attach to the proposed plan. We cannot, however, bring ourselves to think that the plan would be adopted to any very large extent by the public.

Rattening.—Two cases of rattening have occurred at Rotherham. Two builders named Darlow and Stephenson have large brickyards, and recently they discontinued employing unionists. Early in the morning their yards were visited by a number of men, who destroyed everything they could lay their hands upon. Over 30,000 bricks were trampled upon and rendered useless; steam and water-gauges were broken, and four wheelbarrows placed on burning kilns. No damage was committed at a neighbouring yard, the owner of which employs union men.

Midland Counties Art Museum, Nottingham Castle.—The guests invited to meet the Prince and Princess of Wales at luncheon on the 3rd of July next, on the occasion of opening the Museum, have been informed that the luncheon will not take place, in consequence of the lamentable death of the Mayor of Nottingham. This gentleman, Mr. Alderman Ward, who had assiduously promoted the Castle Museum Scheme, fell from his horse a few days ago and fractured his skull. On the eve of the fulfilment of his hopes he was removed.

Society of Arts' Conversazione.—The council and members of the Society of Arts gave a *conversazione* on Wednesday evening last at the South Kensington Museum. The guests were received by the council in the Architectural Court, where the audience chamber of the Palace of Akbar Khan at Fathpur Sikri, near Agra, with its remarkably carved central throne pillar, formed a wonderful reception-room.

Honours.—The riband of the Legion of Honour has been given to most of the architects, engineers, and contractors engaged on the Paris Exhibition buildings in the Champ de Mars and at the Trocadéro.

The Foreign Cattle Market—The markets committee have delivered into the Court of Common Council a report for authority to expend 7,000*l*. in the execution of works required at the foreign cattle market, Deptford.

TENDERS

For the erection of three cottages and one shop at Forces Gate, for Mr. Boswell. Mr. C. R. Peters, architect:—

Steer & Acock	£1,578 0 0
Tillett	1,490 0 0
Walker	1,200 0 0
Charlton	1,183 10 0
Webb	1,175 0 0
Warrilow	1,155 0 0
Westen (accepted)	1,100 0 0

For Kensington Vestry-hall and Offices. Mr. Robert Walker, architect :—

		Less for Alternative Main Roof.	Add for Wainscot to Entrance-hall.
Wall, Brothers	£30,158	£633	£64
Dove, Brothers	25,440	570	125
Trollope & Sons	25,294	568	156
Thorn	25,245	600	160
Brass	24,982	518	135
Stimpson & Co.	24,978	521	141
Sewell & Son	24,861	503	136
Adamson	24,800	568	126
Chappell	24,394	537	130
Lucas & Son	24,275	568	156
Ashby, Brothers	24,200	500	200
Macey & Son	23,975	555	136
Conder	23,889	512	200
Braid & Co.	23,850	562	143

For rebuilding Horstead Church, Norfolk, exclusive of tower. Mr. R. M. Phipson, architect :—

	Church.	Chancel.
Downing	£2,146	£471
Chapman	2,010	546
Baldwin	1,866	453
Durrant & Evans	1,637	435
Cornish & Gaymer*	1,496	440

* Accepted.

For the restoration and benching of the nave and aisles of Wingfield Church, Suffolk. Mr. R. M. Phipson, architect :—

Cornish & Gaymer	£1,150	0	0
Holsworth	1,060	0	0
Calver	1,051	0	0
Grimwood	970	0	0

For the restoration of Rushall Church, Norfolk. Mr. R. M. Phipson, architect :—

	Church.	Chancel.
Cornish & Gaymer	£1,175	£433
Hawes	916	400
Wells & Ludkins	852	350
Grimwood (accepted)	864	330

For building a new bridge at Wortwell, Norfolk. Mr. R. M. Phipson, architect :—

Grimwood (accepted)	£1,043	0	0

For gas fittings, Norwich City Lunatic Asylum. Mr. R. M. Phipson, architect :—

Palmer	£828	10	0
Cornish & Gaymer	800	0	0
Land & Co.	795	0	0
Bank (accepted)	750	0	0

For the restoration of Ringshall Church, Suffolk. Mr. R. M. Phipson, architect :—

Crowe	£1,089	0	0
Cornish & Gaymer	1,050	0	0
Grimwood	825	0	0
Tooley (accepted)	750	0	0

For a new mission-room in connexion with St. Matthew's Church, Marlborough-road, Chelsea. Mr. John T. Lee, architect. Quantities by Mr. W. Thornicraft :—

Jones & Davies	£1,073	10	0
Lawrence	1,058	10	0
Brass	1,038	19	0
Tongue	1,016	18	11

For two houses in the St. Albau's-road, Watford, for Mr. Clement Heaton. Mr. John T. Lee, architect. Quantities by Mr. W. Thornicraft :—

Turner	£2,456	0	0
Axford	2,411	0	0
Clifford & Gough	1,977	0	0
Chadwick	1,778	0	0

For a house in the Hanworth-road, Hounslow, for Mr. J. O. Carter. Mr. John T. Lee, architect. Quantities by Mr. W. Thornicraft :—

Smeed	£1,180	0	0
Beauchamp	1,039	0	0
Brunsden	1,015	0	0
Hiscock	931	0	0

For additions to No. 82, Chalk Farm-road, for Mr. G. J. Smith. Mr. J. R. Furniss, architect :—

R. White (accepted)	£1,196	0	0

For house, shop, bake-house, oven, &c., at Shere, Surrey, for Mr. Sherman. Exclusive of bricks, tiles, and sand. Mr. Dibble, architect :—

Heselgrave	£442	0	0
Miles	427	0	0
Hamblin, Brothers	425	0	0
English	385	0	0
Edser (accepted)	369	0	0

For house, Horsham-road, Dorking, for Mr. Strong. Exclusive of masonry, plumbing, glazing, and painting. Mr. Dibble, architect :—

Bricklayer's, Slater's, and Plasterer's Work.

Edser	£445	0	0
Heselgrave	374	0	0
Clear jun. (accepted)	320	0	0

Carpenter's, Joiner's, and Smith's Work, including Bellhanging.

Canter	£316	0	0
English (accepted)	254	0	0
Grinstead	224	0	0

For house and stables for Mr. T. T. Fox, Farnborough, Kent. Messrs. Ernest George & Peto, architects. Quantities by Messrs. Stoner & Sons :—

Payne & Balding (accepted)	£5,612	0	0

For four cottages on Chislehurst Common, for Mr. C. Morley. Messrs. Ernest George & Peto, architects. Quantities by Messrs. Stoner & Sons :—

Wright	£2,080	0	0
Otway	1,750	0	0
Arnaud	1,634	0	0
Payne & Balding (accepted)	1,598	0	0

For house in Elmfield-road, Bromley, Kent, for Mr. J. Bourne. Mr. W. R. Mallett, architect :—

Arnaud	£2,197	0	0
Grubb	2,042	0	0
Payne & Balding (accepted)	2,018	0	0

For new farm buildings at Aikton, for Mr. D. Bragg. Messrs. Hetherington & Oliver, architects :—

H. & R. Court (accepted)	£562	0	0

For additions to stables, &c., at Sundridge Park, Bromley, Kent, for Mr. E. H. Scott. Mr. J. M. Anderson, architect :—

Payne & Balding (accepted)	£2,382	0	0

For house at Derry Down, St. Mary Cray, Kent, for Mr. Pollard. Mr. G. St. Pierre Harris, architect :—

Dunn	£945	0	0
Payne & Balding	875	0	0
Tredwell	786	0	0
Winter	765	0	0
Wright (accepted)	722	0	0

Accepted for building a new house at Arthur-street, Penrith. Messrs. Hetherington & Oliver, architects :—

Campbell (mason, &c.)	£554	12	0
Pattinson (joiner)	242	14	9
Porter & Dixon (plumbers, plasterers, and painters)	197	10	1
Barton (slater)	52	0	0

For erecting a house for Dr. C. E. Collins, East Grinstead. Mr. T. Taylor Smith, architect :—

Charlwood & Beard	£1,232	14	0
Markin & Quickenden	1,169	0	0
Charlwood, Brothers	1,163	5	0
Steer	1,110	7	9
Godley	1,015	0	0

For additions to residence, near Ringwood, Hants, for Mr. H. T. Armitage. Messrs. Lee, Brothers, & Fain, architects :—

Witt & Alexander	£4,300	0	0
Hammerton, Bros., & Vine	3,855	0	0
McWilliam	3,853	0	0
Hoard, Bros., & Walden	3,496	0	0
Sibley	3,439	0	0
Jenkins & Son	3,405	0	0
George	3,350	0	0
Crook	3,177	0	0

For the erection of proposed residence, at Wimbledon for Mr. A. A. Rankeu. Mr. J. Tolley, architect. Quantities by Mr. W. F. Meakin :—

Nightingale	£4,483	0	0
Shaw	4,344	0	0
Faulkner	4,135	0	0
King & Son	4,125	0	0
Macey	4,060	0	0
Marriage	4,000	0	0
Ward & Son (accepted)	3,715	0	0

For the erection of blocks of cottages for the Dulwich Cottage Company, Limited. Mr. E. J. Tarver, architect. Quantities by Mr. G. E. Bagg :—

Ward (accepted).

For the erection of new banking premises, Bank-street, Carlisle, for the Clydesdale Banking Company. Messrs. Hetherington & Oliver, architects. Quantities by Mr. Crowcroft :—

	In Local Red Stone.	In Corncockle Red Stone.
Hill & Beaty	£9,725 17 10	£9,776 17 10
Sproat, Bros	7,622 16 8	7,867 12 8
Irving	7,586 17 1	
Metcalfe		7,530 10 0
Warburton	7,104 0 0	7,304 0 0
Milburn	6,760 14 0	7,014 14 0
Beaty, Bros.	6,759 8 7	6,919 8 7
Forrest	6,648 3 10	6,748 3 10
Court	6,591 10 0	6,747 10 0
Armstrong*	6,275 13 0	6,418 9 0
Latimer	6,262 10 6	6,354 6 6
Batey & Forster	6,194 0 0	6,294 0 0
Beattie & Co.	6,163 0 3	6,284 16 3

* Accepted in local red stone.

Sutton Bridge Schools.—The estimate of the architect, Mr. J. D. Dawson, was erroneously included in the list of tenders sent to us.

TO CORRESPONDENTS.

J. B.—L.—C. S.—C. L.—S. H.—J. J. E.—A. & B.—R. P.—F. B.—A. J. M.—H. & O.—P. & B.—A. T.—L. M.—J. M.—J. H. & Son.—J. J. & Co.—R. T. S.—C. F.—J. L.—H. B.—T. E.—C. J. P.—T. B—T. N.—F. S. B.—C. A. G.—F. J. D—Professor L.—S. R—Mr. F. A. Evans. Several persons have sent their cards for our correspondent (re "Asphalte"), but we must decline interference.—G. C. & Co. (pamphlet has not reached us).—C. R. C. (next week).—W. C. (next week).—J. E. E. (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXXVI. No. 1847. SATURDAY, JUNE 29, 1878.

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Shops and Houses for Central London.

THE practical man, who, oddly enough, often eases his misgivings with a poetical quotation,—such as "Whatever is, is right,"—is never tired of telling reformers that it is a very difficult thing to fit new houses to an old capital, and a still more difficult thing to fit an old capital to new houses. While admitting the continued impeachment, we assume that it is, or that it will soon be, possible to find in Central London plots of building-land 90 ft. deep and 55 ft. wide; and we assume that each extremity of the 90 ft. fronts a thoroughfare: that is to say, a plot, resembling some of that land still unlet in the new opening at Charing-cross, where the building-plot has a frontage to a main thoroughfare (Northumberland-avenue) on one side, and a frontage to a bye thoroughfare (Northumberland-street) on the other. We will, therefore, fondly imagine that we have in our possession two plots of London soil,—either in Soho, or Bloomsbury, or around St. Martin's-lane,—containing a superficies of 9,900 square feet: that is to say, a piece of land 110 ft. broad by 90 ft. deep, having a frontage of 110 ft. to a main thoroughfare, and a similar frontage of 110 ft. to a bye thoroughfare. For better explanation let our readers at once refer to the plan we publish, in our present number, of suggested houses and shops;* and having done so, they will be prepared to accept or controvert the following propositions:—

1. That the substructure of new buildings erected in the neighbourhood of Soho, Bloomsbury, and St. Martin's-lane, must be devoted exclusively to commercial purposes.

2. That the superstructure (except when in rare instances required for storage of goods) must be distributed in residences.

3. That the building be divided horizontally into two distinct layers of shops and residences, and that the entrances to each layer be distinct from one another.

4. That the layer of residences be subdivided horizontally.

5. That the entrance to each shop, both on the main and the bye thoroughfares, be direct from the street.

6. That there be one common entrance from the street to a certain number of residences.

7. That, to effect the last four propositions, there must be a courtyard, and that, therefore, the common entrance to the residences should be a carriage-way admitting directly into the courtyard.

8. That such court-yard, being surrounded by lofty walls, must not be entirely enclosed on all its sides.

9. That the doors to the principal stairs ascending to the residences be approached from the carriage-entrance, under cover, by both carriages and pedestrians.

10. That to residences of six rooms and upwards there should be a special staircase for servants and tradespeople.

11. That the stairs both for masters and servants be lighted directly from the courtyard.

12. That both staircases be in charge of and under the constant surveillance of a porter.

13. That the porter, represented by functionaries employed by the landlord of the building, be non-resident, or, rather, that no residential accommodation, other than a lodge, be allotted to him.

14. That the stairs, both for masters and servants, be enclosed with solid walls of brick; that they be lighted directly from the courtyard; and that there be no skylight to any staircase.

15. That no openings for borrowed light be made through the staircase-walls into the residences, and that the necessary door into each residence be of oak, or of some equally fire-resisting wood.

16. That in the service staircase there be placed a goods-lift; and where there is no service staircase, that a goods-lift be placed in the staircase leading to the different residences.

17. That the horizontal divisions between the layer of shops and the layer of residences be a solid, fire-resisting party-floor, and that the horizontal divisions between the different residences be similarly composed.

18. That each residence be sub-divided into three parts,—one for day habitation, another for night habitation, and the third for the service.

19. That the basement-story under each shop form part of, and be let with, each shop.

20. That small cellars, to be let with each residence, be constructed beneath the courtyard.

21. That no openings of direct communication be made between the shops and the courtyard.

22. That no communication whatsoever be made between the basement belonging to the shop layer and the cellars belonging to the layer of residences.

23. That no lights or communication whatsoever be made between the shops and the covered passage into the courtyard.

24. That no trap-doors or open grates be in any wise made outside the street-frontage walls, such lights or traps to be upright; and that trap-doors or grates, when required, be made within the courtyard.

It will be seen on reference to our illustration that towards the main thoroughfare we have divided the frontage of 110 ft. into two blocks, approached by two carriage-passages leading into two courtyards; while towards the bye thoroughfare we have similarly divided our frontage into two blocks, but instead of carriage entrances and courtyards we have placed a large staircase between the blocks. This staircase (H), entirely open to the air on both sides, admits air into the inner area formed by the two courtyards. Thus, with the aid of the two carriageways, which are closed only by iron gates (E), a current of external air is maintained between the two external thoroughfares through the courtyards. It is just this central staircase which forms, so to speak, part of the street, that has compelled us to take two plots, of 55 ft. frontage each, rather than build only on one plot, The central stairs (H) admit to comparatively small dwellings situated on either side upon each story; and the street-door of each dwelling on the stairs (H) is at D. Though the tenants of these dwellings profit by the courtyard, entered from the main thoroughfare, they are unable to descend to it or enter it; nor are the tenants of the blocks fronting the main thoroughfare able to pass through the stairs (H) into the bye thoroughfare. Indeed, one shop alone is entered from both thoroughfares, and that, in practice would probably be obviated by the division of the said shop into two parts. At the same time the four or five shops in each block could by the removal of partition-walls (etched on the plan and supporting nothing) become one large shop or two ordinary shops at the will of a lessee, or by mutual arrangement of lessee and lessor. To recapitulate, our plots of, together, 110 ft. broad by 90 ft. deep, are covered by a building consisting at most of SIX SHOPS, each with a basement-story, to which communication is obtained by a private stair, and of at least TEN DWELLINGS served by a common stair entered directly from the street pavement—a stair forming, so to speak, part of the street—and the foregoing SIXTEEN shops and houses front the bye thoroughfare; while towards the main thoroughfare, where greater altitude is possible, we can obtain at most FOUR SHOPS—consisting of three stories (basement, shop, and mezzanine), each story communicating with the other by a private stair—and at least EIGHT RESIDENCES, making a total of TWELVE shops and houses in a frontage of 110 ft. Of these eight residences four are in each block, and each block is approached by one carriage entrance, one principal staircase, and one service staircase. The building plots, therefore, contain TEN SHOPS complete in themselves, and EIGHTEEN RESIDENCES complete in themselves, the whole erected on an area of less than 1,000 ft. The arrangement of the shops, the courtyard, and the staircases, upon one half of the combined superficies of 110 ft. by 90 ft., is shown on the plan (see illustration)

* See p. 672.

at the top of the page; while the plan in the middle of the page, just over the etched portion, represents the distribution of rooms in every residence upon every story of the superstructure. To the non-technical reader we may venture to add that an exactly-similar distribution of rooms must be imagined to exist upon the portion etched at the bottom of the page.

Now, to describe the eight residences, the principal windows of which face the main thoroughfare. The entrance to four of these residences is at E, beneath a lofty archway, about 20 ft. high, and some 9 ft. wide in the clear, and closed by iron gates. The staircase to these four residences, one on each story, is at S; it is approached through the lobby A, the entrance to which is closed by folding doors. The porter's post is here; it is so placed that he commands a view of the street, of the staircase S, of the archway to the service-stairs, and of the entire carriage-passage into the courtyard. No windows or doors, communicating with the shops, should be introduced under this carriage-passage; by avoiding this the residents in the superstructure, on entering the building, do not see or even suspect the nature of the occupation to which the substructure is devoted. Our plan demonstrates this excellent rule: a carriage or cab entering at E deposits its burden at A, under cover; continuing into the open courtyard, it turns round the fountain (F) and drives out at E to the street. A cart with goods enters in the same manner, but proceeding directly into the courtyard, deposits its burden at the foot of the service-stairs, whence goods may be hauled to any story by the lift. In fact, a pedestrian caught under the entrance-passage by a carriage or a cart is safe upon the raised stone footway, which runs on each side of the entrance and round the courtyard. But we are already on the stair S,—constructed of wrought iron and Portland cement concrete, covered with polished oak treads, and guarded by an iron rail,—and we enter the first-floor residence through the oaken door D, into a hall or vestibule, 9 ft. 6 in. by 8 ft. 6 in. in size. All the residences in each block being similar in distribution, it is immaterial which we describe,—so we will take the first-floor residence, merely premising, in order to be exact almost to affectation, that the height in the clear of the topmost residence is 18 in. less than that of the first-floor, which is 11 ft. high in the clear. The three parts into which each residence is subdivided are respectively approached from the hall where we now stand. The door leading to the service portion exactly faces the entrance-door (D), while another door next to D leads into a private passage, through which the three bedrooms are reached. The hall itself forms a reception-lobby, into which the two sitting-rooms,—a dining-room, 18 ft. by 13 ft., and a drawing-room, 17 ft. by 13 ft. 6 in.,—open. A side-door from the dining-room leads into the service-passage, at the end of which is the kitchen-door. Our service accommodation is much larger than would be tolerated or even thought necessary in Paris, Rome, Vienna, or Geneva, but English tradition in this matter being essentially extravagant, we have unavoidably devoted a more than proportionate space to the kitchen and offices. Thus the service portion consists of a kitchen and a scullery, measuring together 22 ft. 6 in. by 13 ft., of a pantry and a wine-store, of two closets for crockery and coals, of a servants' water-closet, and of a double-bedroom, about 17 ft. by 13 ft. in size. A passage separates the cooking section of the service accommodation from the servants' sleeping-room, for we conclude that in such a residence two female servants only would be employed; and this passage also affords communication with the service-stair, with the w.c., and the store-closets. A larder, contrived at L, is necessarily of small dimensions in the heart of a capital where provisions are bought in small quantities, and obtainable in the same or the adjoining street at any hour of the day. A principal water-closet is placed behind the dining-room, and approached from the passage leading to the service portion of the residence. The principal night accommodation consists of three rooms, each with a fireplace; one room, 18 ft. by 13 ft., another 14 ft. by 13 ft., and a third, which might be used as a gentleman's dressing-room, 13 ft. 6 in. by about 7 ft. 6 in. Some people may urge that in this portion there should be another w.c., but it is injudicious in such residences to multiply conveniences of this kind, for it is easy, the rooms being all on a level, to get from one part to another. The position of the w.c. next the hall, and yet shut off from it,—and which can be approached from the hall as well as from the sitting-rooms, without passing through the hall,—is really the proper one for a residence of eight rooms.

We will now go round to the bye thoroughfare and inspect the smaller dwellings, which are approached by the big open staircase. These stairs should be of Portland cement concrete, supported by a skeleton of wrought-iron; the treads should consist of thin slabs of hard stone. It may be urged by many that this staircase will be a source of annoyance to the inmates not only of the dwellings it serves, but also to those who inhabit the opposite residences. Perhaps so; but the annoyance will not be worse than that experienced at the back of houses in some of the best squares and streets in London; in this case a person on the open staircase will be always at least 40 ft. from any of the windows of the residences on the opposite side of the courtyards. The policeman would have charge of these stairs, and therefore they would be far better taken care of than the vast majority of stairs in London houses occupied by several families and groups. Our open stairs* would be lighted all through the night, and the external door to each of the ten dwellings upon them would, to all intents and purposes, be a street-door exposed to the air. Only by such an arrangement of an open external staircase can fresh air be continually admitted into the interior of "insulæ" in Central London, and in the heart of large cities; on such conditions alone can the many bedrooms, lighted from the interior of the "insula" be rendered healthy and comfortable. These thoughts have occurred to us as we have been mounting the stairs (H), and looking over the parapet on each landing, first into the street and then into the courtyards. We are now, therefore, in one of the dwellings and have entered through the door (D), over which is a large fanlight sufficient to take away the obscurity that would otherwise exist in the passage giving access to the various rooms. The ten dwellings, five on each side of the stairs (H), are exactly alike in arrangement; each consists of five rooms,—a sitting-room, 13 ft. by 11 ft.; a kitchen; and three bedrooms, two of which are each 12 ft. by 10 ft. There is a store-closet opening into the passage, and that might, if necessary, be used as a coal-store; we are inclined, however, to believe that the enclosure shown next the kitchen fireplace will be used for coals. A linen-closet opens into one of the bedrooms, and there is a w.c. next the entrance-door. The rooms are small, but the superficial space devoted to the whole dwelling is very small, and the rent must be comparatively low. Such a dwelling in Continental cities would be approached through the usual courtyard, and by the service-stair of a larger block of houses. But that method has had its day, and its disadvantages are acknowledged. Our own opinion is that, while dwellings for different grades of population should never be approached from the same staircase, people of widely different occupations, and even of different social status, may, in a crowded centre, occupy the same block of buildings, provided only that the staircases by which they ascend to their dwellings be separate and distinct. We may add that the proximity of slightly inferior dwellings on one side of a courtyard, and approached from a bye thoroughfare, cannot much affect residences, such as we have shown on the other side of the courtyard, which are proached by a carriage-entrance from a main thoroughfare.

We may have something to say at a future time about the construction of shops and houses such as we have ventured to suggest in the accompanying plans. Suffice it for the moment that the principal drain-pipes should pass beneath the courtyard and under the carriage-passage into the main sewer; that the courtyard should be laid with wood paving; that a gutter to receive the rain-water, and the water used daily to flush the yard, should pass partly under the stone footway, which runs round the courtyard, and on either side of the carriage-entrance, into gullies fixed right and left of the iron carriage-gates; that, with regard to the superstructure, not a soil-pipe should be embedded in any wall, nor a gas-pipe concealed in any floor; and that, last not least, not a naked iron support, whether girder or column, should be erected in any part of the building. In constructing houses of this description, great facility is afforded to support the minor vertical partitions by absolutely solid party-floors of Portland cement concrete, containing an iron skeleton. In our plans it will be seen that the principal walls and chimney-breasts are carried down honestly to the foundations, and that, consequently, false bearings are avoided. The bearings also, with the exception of the centre shop-opening, fronting the bye thoroughfare, are comparatively small, averaging about 10 ft. in width. Over such openings the French method of coupling rolled-iron joists, securing them with wrought-iron collars,—forming solid lintels of them with some description of concrete,—may be advantageously adopted. But of course these things mean a far greater outlay than is required in the miserable shop and lodging-house even now rising in Central London. They also mean, however, a far greater number of tenants, and of a better class than can be found to occupy new houses in the neighbourhood of Soho, Bloomsbury, or St. Martin's-lane. How to obtain these tenants is perhaps another thing, but much will depend upon the way in which the care-taking and general superintendence of such blocks of shops and houses are organised; and that organisation we propose to discuss on another occasion.

* The objectors to a staircase open to the street, and they are probably numerous, will urge that the hospitable steps will be the refuge of homeless men, women, and children, as well as of bad characters. Then put an iron railing and gate at the street entrance, and let the gate be closed after a certain hour of the night. The open staircases of the metropolis are, however, well kept: witness those of the Holborn Viaduct and of Waterloo Bridge.

We began with a hasty reference to the time-honoured practical man who based a stale argument on a hackneyed poetical quotation,—a happy combination of practice and poetry. But of a truth "Whatever is, is right;" and the "is" of real habitation in Central London is that buildings are occupied in isolated shops, in whole stories or floors, and in single rooms. Though the house that even fifty years ago exactly suited a particular locality of the metropolis,—say round Covent-garden,—is now being re-erected with even worse wooden floors than before, the mode in which it is tenanted is totally altered. It is not exclusively occupied by a single family; it is let in flats, or stories, or rooms, and we are forced to repeat this inevitable truism. Consequently the wise man who has found out, perhaps to his cost, whence the defects of present house accommodation in Central London originate, or where the blot lies, should plan new houses specially fitted to be let in flats, stories, and rooms,—should plan shops specially fitted to be let singly and without the burdensome adjunct of an entire dwelling-house over head. The fact to be got by heart is, that for Central London *building-plots should be broad in frontage to the street, and of comparatively small depth*; say 60 ft. broad by 70 ft. deep, or even 60 ft. square. There should be more open thoroughfares, and few, very few, enclosed and vitiated internal quadrangles. Of course, where it is possible to obtain frontages to two thoroughfares, as in the plan we have suggested, building-plots of 60 ft. broad by 120 ft. deep would suit admirably. We are not speaking without due reflection; we speak with renewed confidence, because many things actually accomplishing or accomplished point to the likelihood that the evils of which we have so long complained are approaching the state that, in this country, heralds the commencement of a cure. The new houses built on the old-fashioned system in Central London, and which for years have remained without a tenant, are more numerous than many sceptical speculators and investors will probably admit. We have two immediately in our eye, one erected some four, the other some three, years ago,—and in the very heart of the busy town. Each is planned as an old-fashioned "shop and house." In one (never yet let) an attempt is prolonged to let shop and house together for the sum of 650*l.* per annum, exclusive of taxes; in the other the owner uses the shop for his trade purposes, and offers the superstructure (never yet let) of three stories at 300*l.*, 200*l.*, and 100*l.* per annum, inclusive of taxes. Neither of the blind investors, perhaps, admits that his inability to let lies in a radical defect of house-plan and of distribution of building plot. According to their own mode of argument, times are bad, money is tight, the waiting man wins, and so on. The waiting man believes that in a short time he will get the rent he asks, and he will forget the years during which he received nothing; at the worst, rents must rise: But the result will be, as it has been demonstated in

other places, that the house which is worth nominally 650*l.* a year, and which has remained unlet for four years, will go the fifth year of asking to the annual tenant willing to try it at 500*l.*; and that the story worth nominally 200*l.* will go to a tenant for 150*l.*,—a similar diminution being accepted for the other floors of the unfortunate house. We have cited no fancy cases. The object we have in view is to show investors, and even speculators, that though it is generally *impossible* to make 650*l.* a year out of an ordinary old-fashioned new house in Central London, it *is possible* to make 1,300*l.* a year out of two new adjoining houses, provided only that they be planned and constructed with just a suspicion of science, and the landlord's duty of superintendence be organised with just a trifle of cosmopolitan experience.

THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.

THE newly-formed Society for the Protection of Ancient Buildings held a meeting last week, at Willis's Rooms, of which many of our readers will have seen a report in the daily papers, and which is a curious illustration of the phenomenon of reaction. In saying this we are by no means implying any disapproval of the meeting, or even entire disagreement from its views; on the contrary, with a good deal of what was brought forward we sympathise, and even where we do not, we of course feel it desirable that persons who have strong views on an important subject should express them. What strikes us is the entire absence of any consciousness on the part of those who lead in this movement (or this stoppage of movement rather, for the object of the society seems to be purely negative) that they are merely playing just the same part on the one side, in regard to ancient buildings, as was played on the other side thirty or forty years ago; prompted apparently by very much the same motives, and appealing to popular feeling in much the same kind of way. When the ecclesiological movement commenced, meetings were held of which this one is in its style the very model,—meetings where æsthetic noblemen or gentlemen took the chair, which were largely supported by ladies, who were ready to believe, with the whole of their dear souls, in the nobility and paramount importance of the objects which they were asked to hear discussed, and burning eloquence was brought forth, with a kind of tone of appeal to Heaven,—an "O Lord, how long?" calling upon all persons with any faith of any kind, any belief in art and beauty and religion, to subscribe money forthwith for resuscitating with pious care the noble structures of our forefathers, which had been smitten by the hand of the Pagan or Protestant (the terms were synonymous), and cried to us for restoration and re-beautifying. And here, after the lapse of less than half a century, we are having the whole thing over again on the other side. Really, one must be pardoned if it is impossible to avoid a smile, when we find the same spirit, the same eloquence, which in the last generation flourished the banner of "*donec templa refeceris*," all forthcoming again; the same appeal to popular feeling, but all in exactly the opposite direction. The only difference is that the religious element is now wanting. Since the days of the ecclesiological revival, the sympathies of the æsthetic part of England have moved from Mediæval enthusiasm and superstition to the nearly opposite pole of a mild and dreamy paganism, typically represented in the poems of the hon. secretary of the Society, for the Protection of Ancient Buildings, who has candidly labelled himself

"The idle singer of an empty day."

Of his own idleness the poet is the best judge; but the day,—the present day,—is anything but empty, if people would only live in the present and not in the past.

This dreamy and lugubrious feeling, that nothing in our own day is worth having, and that we are all lost and helpless in regard to everything in the way of art, is partially at the root of the almost exaggerated fear which is now expressed of losing anything of the art of a former day. That feeling, as expressed by the promoters of the movement we are referring to, really amounts to a kind of abject fetichism, a bowing down in an unquestioning humiliation before every brick put in its place by any of their ancestors; a declaration that we are all blockheads now, and can do nothing,—which, of course, the members of the Society are welcome to declare of themselves, but which they must not expect any one else to accept as a dictum from them. A great man, who should not too carelessly have given his name to a popular cry, wrote to the meeting to express his sympathy, and to say that in his opinion it would be a sinful piece of barbarism to do otherwise than religiously preserve Wren's City churches, "as precious heirlooms, many of them specimens of noble architecture, the like of which we have no prospect of being able to produce in England again." Now, this is just a specimen of the exaggeration which does harm to what might, if better conducted, be called a good cause. There is no question whatever that to remove an interesting building of any period, merely for some piece of doubtful convenience in the way of street-line or building site, is a piece of barbarism. It is needless to say that against such proceedings we have protested times without number, long before the Society for the Protection of Ancient Buildings was thought of. But we have also always recognised, what these good people seem unable to recognise, that there are cases when the reasons on the side of demolition are the stronger. When an old building stands in the way of improvements that are absolutely required for public health and public convenience, it must be removed, and there is an end. To decide otherwise would be to act contrary to common sense, and to set up a principle of action in regard to such matters which has never been known or thought of in any of the great periods of architecture, or in any period previously to the arising of the Society for Protection of Ancient Buildings; and when the building is to be preserved, in many cases a true and calm criticism must honestly say that it is preserved for its historical interest less than for its beauty. This is especially the case in regard to many of the City churches, which appear to form the principal *casus belli* just at this moment. Many of these, those of Wren included, though mostly well planned (for that was a practical age,—much more practical in regard to architecture than the present one), have in reality little or nothing to recommend them in architectural design. In many of them the detail is very poor, and in some positively tawdry; and when Mr. Carlyle therefore declares that these are "such as we have no prospect of ever again being able to produce in England," he is saying the thing which is not. Better buildings than many of Wren's churches have been produced in England since his time, and will be produced in the future; and such rash judgments as these are just what do harm to the cause of the preservation of buildings. Practical men, who may be concerned one way or another in the question of the removal of some ancient building of no great beauty or value, who read these enthusiastic generalisations, at once set down the persons who make them as mild lunatics, and consequently refuse to listen to their appeal on some other occasion when they may be quite right, and when the threatened demolition is really unnecessary and deplorable. If the Society for the Protection of Ancient Buildings wish to do real, practical good, they must be more considerate and measured in their language and their statements, more broad in their sympathies, more prepared to recognise the claims of the present day as well as of the past, and be not unmindful of Talleyrand's maxim, "*Surtout, point de zèle.*"

We have observed that the agitation on this subject was "partially" due to the melancholy conclusions of certain people as to the inherent worthlessness of the present day. We said partially only; for it is impossible to blink the fact that the apostleship of a new revival has a great deal to do with all this lamentation. "We fight no 'battle of the styles,'" said the hon. secretary in his opening remarks. "*Qui s'excuse s'accuse*" is the only comment one can make on this remark under the circumstances. It was obviously prompted by the very consciousness of the fact that the promoters of the Society and its operations are identified, and are well known to be so, with the Queen Anne revival, and that the whole movement has mainly sprung out of a jealousy on the part of the latest school of revivers in regard to the doings of their predecessors (and partially their contemporaries), the Gothic revivers, and the little respect with which the latter have often treated Queen Anne and Jacobean work. This disrespect we admit did exist, and was a "grievance," though there are cases in which we conceive that an architect would be entirely justified in removing a piece of bad pseudo-Classic work, however historically curious, which had really spoiled the interior of a fine Gothic building. Architecture, as we have once or twice endeavoured to remind people lately, is really, after all, art as well as history; and that a building which has been "historically" spoiled should be restored to something like its pristine completeness of design and feeling is not in every case an act of vandalism. And though the present revival, with all its concomitant and rather contradictory enthusiasms, is in one sense exactly the same thing over again as the Gothic revival, it is a movement with less to justify it, less in it that is intellectually and spiritually to be respected. It is not the revival of a great and complete style, but of a mongrel one; and it is impossible for those who have watched its progress, and the temper and spirit in which it has been "worked," not to feel that the desire to come into professional success in connexion with a new cry has had a great deal to do with it, and that this feeling is again very predominant in connexion with the anti-restoration movement which has developed out of this last revival. The campaign has been conducted in a spirit of personal attack and almost of slander against those who had already achieved success (in many respects highly merited) in the line of Gothic revival, which leaves abundant excuse, at least, for questioning the purity and unselfishness of the motives of those who have been most forward in conducting it.

There was one other remark made in the course of the meeting of the Anti-Restoration Society, which could hardly do otherwise than provoke a smile among lookers on. This was the ingenuous lamentation of Mr. Percy Wyndham, who, in moving the adoption of the report, said that "people who knew little of architecture were too much disposed to trust those whom they believed to be well informed;" the inference, of course, being that the public had been led blindfold by the restoring architects, and believed whatever was told them. It is unquestionable that in many cases people knowing nothing of architecture have adopted and parroted the opinions of the late Sir G. Scott, and other eminent Gothic architects, on questions of restoration; and they might have done worse than that, perhaps, some of us may think. But in what a society of cultured and balanced natures Mr. Wyndham must move if he never hears anything of this kind about Queen Anne architecture, and the sins of restorers! Or is it that, like so many other people, he can only see defects and absurdities in the opposite camp and not in his own? Certainly, evidence has not been wanting to ourselves that this second-hand faith and conviction, not according to knowledge, is as rife in the anti-restoration camp as in that of the ecclesiologists. The absurdities that we have heard from æsthetic young (and old) women about the beauty and fitness of the Queen Anne style and its practitioners, coupled with remarks upon Gothic displaying the most abject ignorance of the very basis, not merely of that style but of architecture itself, have caused us many a laugh (in our sleeve, of course), not the least when they have proceeded from ladies who have undertaken the practice of architecture in the wake of the new movement, without even taking the trouble to find out first what architecture is. It is by these followers of a fashion without understanding it (by no means confined to the fair sex) that a great deal of the fuss about restoration is being made; and even though part of what is said may happen to be true, one cannot attach any importance to opinions formed so largely on fashion and prejudice, and so little on knowledge and calm judgment.

Clayhanger, North Devon.—The interesting church of this parish is about to be restored, under the direction of Mr. Hine, of Plymouth. The manor of Clayhanger formerly belonged to the Knights Templars, who had a hospital here, and were the patrons of the church. The earliest portions of the church—which is small, and consists only of nave and chancel—belong to the early part of the thirteenth century. The nave is occupied by the original massive seats, with carved bench-ends of the fifteenth century. The chancel-screen was in 1810 converted into a gallery-front, but is now to be restored and replaced in its proper position. The roofs, now decayed, are about to be reconstructed after the ancient model, in oak; and the floors and windows, also in a bad state, will be restored.

THE MORAL OF A STRIKE.

THE year is half way through, and the termination, or anticipated termination, of a second great conflict has enforced the lesson taught by the strike which was in full operation when 1878 began. We wish to look at the matter from a practical point of view. We lay aside for the moment any consideration as to the moral character of a strike; as to its effects on the relation between master and man, or between one craft, or branch of a craft, and another; as to its bearing on the productive power and on the general welfare of the nation. We wish to put to the working men a question so simple that its reply cannot be shirked; or, at all events, that it must be pretty plain to every one what shirking it means. It is a question on the reply to which very much of the future welfare of the manufacturing industry of Great Britain will depend.

The cost of the masons' strike, the earliest of the two great conflicts to which we have referred, has been estimated at about 60,000*l.* to the operatives, and at least an equal sum to the employers. We are not about to enter into detail. From our present point of view, a question of 5,000*l.* or 10,000*l.*, more or less, is comparatively unimportant. There was a long and a persistent contest,—a contest which, with some exceptions, was kept within the limits of legality on the part of the men, but which the upshot showed to be altogether a mistake on their part. Fifty or sixty thousand pounds worth of time has been thus absolutely lost by the masons' craft. Any amount which has been subscribed from other sources has, indeed, alleviated the suffering caused by the struggle, but has in no way diminished the non-production. Nor is the loss sustained by the masters any advantage to the men. On the contrary, the need to recoup such loss is more likely to be operative in the opposite direction; and to prevent or defer a rise in wages on the arrival of better times for us all. But what we chiefly desire to point out is, how, up to the very last week of the strike, the masons were assured that they had only to hold out, and that success was sure. At the time when a very simple knowledge of arithmetic, if applied to the facts which ought to have been known, would have shown the utter hopelessness of the contest, the strike-flag was flaunted as gaily as ever, and the assurances held out to the starving masons were undiminished in confidence to the very moment of their utter collapse.

In the Lancashire strike there has, it is true, been a less confident tone assumed from the beginning. But then the magnitude of the movement has been enormously greater. Seventy-five thousand pounds per week is said to have been the amount of wages which the operatives were advised to give up! Three hundred thousand mouths had to be fed! A week's contest thus cost more than six months of a local dispute like that of the London masons; and no auxiliary aid could be expected. The daily gap was too large for the friendly help of other unions or other classes of operatives. The advance towards starvation was not only perilously rapid, but was absolutely unchecked. With every one who took a dispassionate view of the case the upshot was certain from the first.

For there is no doubt that the strike was a great advantage to the masters. It would have subjected employers, as a class, to very grave moral blame had they simply closed their mills for nine weeks, without reason assigned, or alleviation offered to the workmen; but if they had been guided only by those economical considerations which are relied on by the advocates of strikes as justifying such violent measures, they would have done well so to do. The strike did this for them. It saved them from nine weeks' work at a loss, and it diminished the stock of goods in hand by a sixth part of a year's production. The aims and wishes of the masters, as far as these were independent of the well-being of their people, were carried out as fully by the strike as if it had been a lock-out. The men played the game of the masters.

We intimated, when the contest first assumed an acute form, that information on certain points was essential to its wise determination. Since that time we have received much information, but far from all that we require. But what would have been said of our responsibility, or of that of any public writer or public man, who, admittedly only partially informed of the facts, had counselled an act so serious as a discontinuance of the daily work needed to support 300,000 souls? And this is the question which we wish to put to the working classes, craft by craft, and man by man,—What do they think of the wisdom of the counsel which advised them to encounter such terrible, such useless, and such purposeless suffering?

We say not a word as to anything but want of wisdom. We leave aside every other consideration. We only glance at the fact that such disastrous incidents as the destruction of mills, or even of private houses, are matters but too likely to occur when a state of private war has once commenced. But look at the utter folly of the thing! Look at the exhaustion of savings, the pawning of furniture, tools, clothes,—the actual pangs of hunger,—all incurred at the advice of the advocates of class disunion, with no other upshot than that of relieving the masters from pressure,—from pressure for payment of non-remunerative wage-outlay, and from pressure from unsold stock! Can any mistake be more contemptible, as an instance of the result of guiding one's daily conduct,—conduct on which bread depends,—by the advice of some one else, and not by the light of common sense?

We are the last persons to oppose the union of working men, of trades, or of crafts. Neither as public writers, nor as private employers or advocates, has such been the custom with those who hold the principles long advocated in the columns of the *Builder*. All that we ask is, that union, not disunion, should be the object of the craftsman; and that he should take advice only, or chiefly, from those persons who will take the trouble to qualify themselves to give it. It is no lofty intellectual stature,—no great ability,—no high-sounding name—that is requisite to qualify the workman's friend. Plain good sense and unflinching honesty are pretty nearly all that is required. Let us be understood in the use of the word "honesty." We do not accuse any one of the want of it, in the sense of being a pickpocket. We do not insinuate that the secretaries or managers of unions or councils put their hands in a surreptitious manner into the pockets of their constituents; on the contrary, we believe that many of these officers are sadly underpaid. If they exist at all, and if they are paid at all, they should be so supported as to be able to give enough time to the service of their unions to be of some use as councillors. They should be enabled to ascertain facts; to find out for themselves, and thus to be able to bring before their brother craftsmen, those facts on which the upshot of any question must actually hinge. To give counsel in the absence of such knowledge is to evince that want of intellectual honesty to which we refer. We all have our prejudices. Some of us have pretty strong ones. And we should be likely to resent any crusade against our prejudices, even on the part of those who might imagine that they were better instructed on the subject than ourselves. But it is one thing for a man to hug his own prejudice, and to shut himself up in its wrong, and quite another thing to dare to give counsel to others on such a basis. This is the point on which there is so sad a lack of honesty amongst us. How often is it the case that energy, persistency, aggressiveness of missionary spirit, is in exact proportion to density of ignorance on the part of the volunteer teacher? As a rule, we fear that this is the case. The perfectly-informed man is usually calm. He may, if he is a testy person, be provoked at the little heed that is given to his counsel. He may be pushed off his balance by finding that a man whom he knows to be wholly ignorant of facts which he has himself collected by long and patient study, but who has a loud voice and a front of brass, will obtain attention and credence, by appealing to the passions of the audience, while the man whose care is to ascertain and to promulgate nothing but truth is neglected or ridiculed. But it is true that honesty of this kind is very rare, and also that it is very little appreciated.

But the food of 300,000 mouths is too serious and too practical a matter to be risked for the sake of defending an untenable position, urged by ignorant men. Here it is no question of opinion, no matter of give and take, no drawn battle. In pursuance of certain definite rules of conduct, which we, and most impartial judges, hold to be mistaken rules, certain counsel was given to the operatives of Lancashire, nine or ten weeks ago. The upshot has shown, not only that the advice was mistaken, but that it was so thoroughly mistaken and ignorant that the following of it has not only caused much misery, but has had the very opposite effect to that which was intended. If it was intended to curse the paymaster, it has blessed him altogether,—omitting, of course, the lamentable incidents of which the projectors and advisers of the strike would hesitate to assume the responsibility. Will not this painful and terrible lesson have some effect? Will it not open the eyes of the working-classes to the utter folly,—however well meant,—of the advice which tells them that there is a conflict between the interests of capital and of labour, and that the welfare of the operative is something not only different from, but opposed to, that of his employer?

We earnestly plead that this counsel may be not hastily rejected. It deserves careful consideration by two classes of men, the leaders and the led. To the first we would say, Have you considered the very serious responsibility which you take upon yourselves by coming forward as the guides of your fellow workmen? Allowing your motives to be unexceptionable, or as much so as is possible in the curiously woven tangle of public and private interests, have you taken the means to make yourselves competent judges in a matter involving such calamitous results if you happen to be in the wrong? To improve the position of the working man is a noble aim. It is not an aim peculiar to the workman. Outside of any craft or union there exist as true friends to labour and to the labourer as can live under any union rules. They tell you that you take the wrong way to effect your common object. Nor is it a matter of their opinion alone. Fact comes in to back them. On the two last occasions on which you have had the courage of your opinions,—and that at the cost of others as well as of yourselves,—the event has proved that you were wrong. The suffering incurred by your counsel has fallen chiefly, if not altogether, on the working classes; and their social position, as far as affected by it, is worsened instead of bettered. It is certain that you were not in possession of facts adequate to base the policy of a strike upon. Yet you advised it. Can you not see that you were wrong? If so, be men,—say so at once. Secure the respect of your victorious opponents as well as of your misled and beaten followers; and assure us all that you will never again counsel a battle without having better counted the cost.

To the mass of those who follow, rather than lead, we have very similar advice to give. Remember, industrious brothers, that those of your friends who are not within your ranks have an admiration for your courage, patience, and perseverance far greater than you imagine, or even than you may yourselves possess. What they deplore is, to see such noble moral qualities not better illuminated by the sage counsel of sound common sense. We do not come forward to urge upon you that under no considerations should you use the power which is in your hands for the improvement of your social position in any manner that is at once real and effective. But we are anxious that you should not, by violent attempts at such improvement, actually do yourselves harm. That this is what you have been doing, for six months in London, for nine weeks in Lancashire, there is no possible doubt. What evil you have suffered you best know,—and you know, not only that you have suffered it without compensation or advantageous result to yourselves, or to your families, but that you have suffered it because you have taken bad advice. If you, all or any of you, had known ten weeks ago what was the state of the market,—what was the demand, what the supply, what the weekly production and consumption, and at what prices and in what quantities Europe, America, and India are competitive as producers, you would not have ceased work, willingly, for a day. If half a loaf is better than no bread, certainly nine-tenths of a loaf are better than none at all. Working brethren, do not do it again.

And so we come back to the question we desire to put to the whole industry of England. Is it not wise to ascertain those facts on which, experience has shown, the rate of wages depends, with that certitude which is possible to those who are resolved to obtain it, rather than to fight first and to find them out by bitter experience? If the working men would take our advice, a strike would become indeed an irresistible weapon. For it would never be taken up by any except by those who, as sensible, prudent, well-informed men, were reasonably certain of success.

M. CHARLES BLANC ON THE AVENUE OF NATIONS.

PARIS EXHIBITION.

MONSIEUR CHARLES BLANC, who for so long was Minister of Fine Arts during M. Thiers's Presidency of the French Republic, is a critic whose voice exercises a wide-spread influence, and whose opinions have the advantage of being based on intelligible theories. We do not hesitate, therefore, to take into account M. Charles Blanc's most recent criticism, particularly as it applies to one of the illustrations we published in our issue of June 22. The Avenue of Nations at the Paris Exhibition forms the subject-matter of this illustration, and of M. Blanc's last essay. Unfortunately, in rendering some account of this production, which has just appeared in the columns of the *Temps*, we shall find, as a nation, but scant material for self-congratulation; but quite as much as we anticipated when we saw what the gentlemen who took upon themselves to represent English architecture in the Avenue of Nations had thought fit to erect. M. Blanc opines that England has taken little or no pains to produce anything original, although we note that the cause to which this unfavourable result is attributed does not detract from our national merits. The English people, we are told, have no originality in their school of architecture, because England is essentially the refuge of individualism, and the country where the sentiment of home is the most deeply engraved. Monuments which are built to express general ideas cannot exist in countries where no general idea is entertained, where public opinion and taste run in a thousand different channels. Nor is it customary for us to express a common sentiment by the erection of a public monument. M. Blanc recognises, however, that there are some very fine monuments in England, but these, he maintains, are models of the edifices of other nations, they are due to the inspiration of foreign architects,—a fact which even English archæologists themselves have from the time of Thomas Hope acknowledged. In the sixth century England received with the Roman Catholic religion the Roman style of architecture, which was soon modified by the advent of the Saxon. In the eleventh century the Normans imported the taste they had displayed in building the church of the Mont St. Michel and many other marvels of a similar description. In the eleventh century Canterbury Cathedral is a magnificent expression of a period of transition which gives rise to the ogival style, a style borrowed from French artists in the thirteenth century. The only innovation in the art of building, which according to Charles Blanc, is thoroughly English, is that known as the Tudor style; and even this school is qualified as one of decadence. But if England has not built public monuments remarkable for their originality, the country is dotted with private dwellings that might well serve as models.

Under these circumstances, M. Charles Blanc is not surprised to find that there is nothing remarkable in the English specimen of architecture exhibited in the Avenue of Nations. We have a structure of a mongrel Gothic; that is to say, a building in which the Tudor and Renaissance styles are mingled. These are cut up by lines, and different materials, and alternating colours, and again split into fractions by applications, on a diminutive scale, of enamel and porcelain; little columns are divided by rings, sculpture is affixed haphazard, ceramic specimens are squeezed back into corners, and there are recesses under ogival arches, with guillotine windows to complete this unsavoury medley. Such is M. Charles Blanc's uncomplimentary opinion of the English façade. He is better pleased with the wooden structure bearing Mr. Collinson's name, whom he compliments on his good taste for not seeking to imitate stone with wood, for his skilful grouping of the different styles of wood and of shading calculated to enhance the charm of sculpture.

If the English are not rich in inventive faculty, how much poorer must be the Americans, and, in fact, all Federative States, where individualism flourished in the midst of huge agglomerations. The specimen of American architecture does not reveal even the smallest trace of artistic conception; it is suited, at best, for some drinking-bar of Philadelphia or Chicago.

The Swedish and Norwegian structures are far more interesting; they are, at least, expressive of the history, and the romantic history, of civilisation contending against barbarism. At first these structures were of but one floor, protected by small windows, protected by spires, and with doors which, though raised from the ground, were low, so that none could enter without stooping. Nevertheless, these houses were still accessible. The roofs were so low that the brigands set them on fire, or clambered up them and discharged their arms down the chimneys. Hence it was judged advisable to raise a second story at either extremity of the building, so that the inhabitants might defend themselves under cover against the thieves who had scaled the lower roof. Finally a gallery was built round the second floor, and hence the Scandinavian wooden house and domestic fortress of which we have so fine an example in the Avenue of Nations. This structure is truly expressive of the history of a people struggling in a wild country.

Italy, whence so much might be expected, seems to have failed to produce a favourable impression. Porticos and arches in painful profusion support nothing, and recall in some sense the features that have been so severely criticised in the new Paris Opera-house. The Italian frontispiece is poorly ornamented and cut up by mosaics.

The Japanese, on the other hand, have achieved an undisputed triumph. The artists of Yeddo have brought from their isle every piece of wood used in the structure; and these are expressive of primitive simplicity combined with refined taste. The pillars are covered with bronze, where, touching the earth, they are most likely to rot. The cross-beams are slightly upturned at the extremities, but this is done so delicately and so slightly that the Japanese clearly understand the absurdity of curling upwards what is meant to be strong and to resist weight. Placed between the Italian and the Chinese façades, the Japanese demonstrate by contrast what is odd and inexplicable in the first, and the insignificance of the latter. The Chinese have applied a design suitable for a pavement to the decoration of their walls.

Spain comes next, and here it is frankly acknowledged that the country possesses no style of its own, and must be content with that borrowed from the Arabs, and of which the Alhambra is a tolerable specimen. By attributing to herself the architecture of the Moors, Spain presents an elegant specimen of that school.

Austria-Hungary gives expression to the Germanised Renaissance style of ornamentation, which is tolerably graphic and typical; while the Russian house brings us from a civilisation which has already become too old, and introduces a form of barbarism which is full of promise and strength, and thoroughly characteristic. There is an ostentatious display of Russia's wealth in timbers, and a barbaric and indiscreet show of vivid ornamentation.

The Swiss façade is another manifestation of M. Blanc's theory that peoples among whom individualism is supreme have no national style. A simple Swiss cottage would have been far better than the indescribable structure before us.

Belgium wished to distinguish herself, and has succeeded. At the same time, its originality is chiefly due to the richness of the materials employed. The mixed grey marbles of the Hainault, the black marbles of Namur, the red marble and the small granite of Flanders have all been skilfully employed on the Champ de Mars. The Belgian structure is remarkable for its solidity, and the sensible employment of the materials with which it is built, but it bears, on the other hand, the stamp of the faults of the Renaissance. On all sides we are troubled by the contemplation of tormented profiles and irrational embossment. The surfaces are disturbed, divided, and covered with designs of the Tuscan style. Balconies, galleries, balustrades multiply one over another, and even the roof is interrupted in its course so that a statue may be thrust into view. These are some of the characteristics of the Renaissance which in travelling from Italy to Flanders seems to-day to be held in particular favour in Belgium. It recalls Rubens's house in Antwerp, the Jesuits' house in the same town, and many other structures erected by the Jesuits in France, Italy, and Germany.

Denmark also conforms to the style of the German Renaissance; and Greece, which at one time gave so many models to the world, has nothing whatsoever to offer but a wretched little lodge resting on enormous Roman modillions The Persians, Tunisians, Siamese, are only represented by diminutive structures which would not suffice to contain the porter who minds the gate at an Oriental palace.

M. Charles Blanc pauses, however, before what he considers to be the imitation of the entrance to the church of Coimbra, which was in the foreground of our illustration, and which represents the Portuguese share in the Avenue of Nations. In this structure he finds a medley of Gothic statuettes, with an ogival arch and some Arabian details. It is a gross mixture of the Roman with the Tudor styles, of the Gothic school with the Moorish importation, of the South with the West.

Fortunately, and in conclusion, Holland offers some consolation for all these disappointments. Here, at least, sober use has been made of the modest brick. The Dutch have shown taste and refinement where the Belgians would have been guilty of exaggeration. By using ornamentation with moderation, by avoiding an extravagant display of the various materials employed, and by raising an elegant tower, the Dutch have proved once more that though architecture should be based on sentiment and reason,—the latter should be the predominating consideration.

All these criticisms bring M. Blanc to the reiteration of his theory, that monumental architecture is never initiated by a country where individualism reigns, and where the people are divided in their religious beliefs. Egypt, India, or Greece when united in her heroic struggle against the Persians, Etruria, antique Rome, the lands of Islam, France of the Middle Ages, are the countries where the marvels of high architecture were created; and these triumphs of monumental building can only produce themselves where general ideas or principles dominate over individual aspirations, where there is a community of grand sentiments, and a union of public thought.

SLATE QUARRIES.*

THERE is no production of nature in which it might be thought that the wants of man are more distinctly anticipated, or even indicated, than is the case with slate. The material presents, indeed, a considerable degree of stubborn resistance to any attempt materially to modify its shape. Its durability is as great as is its stubbornness. No attempt to submit it to the changes of form assumed by metals, or even to the more mechanical action of the chisel, as in the case of marble or fine stone, will succeed. But in this very stubbornness, durability, and persistence of form lies the key to the part destined for the slate in the works of man. It forms a natural roofing material. Not that it is confined to that purpose. When large thick slabs of slate are easily extracted, we have an excellent material for pavement, for walling, or for furniture requiring great strength and regularity of surface, such as a billiard-table. But as a material for roofing the slate is so admirably adapted, and requires so little labour in preparation, as compared with any other substance, that the only wonder is that its application, as a general rule, should have been of such comparatively recent origin. The Cilgwyn slate quarry, indeed, at Nantlle, was worked in the twelfth century. Very old workings, to which no date is at present assigned, exist at Brynhafodywern, at Llanberis, and in one or two other spots. But with these exceptions the date 1750 is the earliest given for the continuous working of any slate quarry in North Wales. And the early years of the present century are the first that bear witness to any serious development of this natural resource; while many quarries have been opened within the last fifteen or twenty years.

In the year 1765 the site now covered by the Penrhyn Quarries was let in small takes to eighty men, who each paid a rental of 1*l.* per year. In 1780 the produce of these quarries was 1,000 tons per annum. In 1800 the exports had risen to 20,000 tons. In 1872 the sale of roofing slates alone from the Penrhyn quarries amounted to 85,500 tons, yielding a net profit to the proprietor of considerably more than 1*l.* per ton. The total production of slates in the British Isles is estimated by Mr. Davies at 750,000 tons, of which 600,000 tons come from North Wales. The profit derived from the whole production may be taken at a million sterling; while the labour, directly or indirectly supported by the industry, must cost at least twice that amount.

* A Treatise on Slate and Slate Quarrying; Scientific, Practical, and Commercial. By D. C. Davies, F.G.S. London: Crosby Lockwood & Co. 1878.

On an average of three slate "bargains" in the Festiniog district the average weight of 1,200 slates (the slate "thousand") of 20 in. by 10 in., is 2 tons 4 cwt. If we suppose the slates to be double, allowing for lap, the thousand will cover 8·33 squares of roofing, which allows 5·3 cwt. to the square. According to an American price-list, quoted on p. 177, 1,200 slates of this size weigh 1 ton 17 cwt. 3 qr., and will cover 72 square yards of roof. This gives 5·8 cwt. to the square. Both number and weight of slates vary according to size, from the princess, or "first quality," which measure 24 in. by 14 in., to the smaller "doubles," of 12 in. by 10 in. The cost in quarry per ton on the average given above was 1*l.* 3s. 7d. The average value was 3*l.* 15s. 9d. per ton, leaving a gross profit in quarry of 2*l.* 12s. 2d. per ton; which management, carriage, interest of money, and other expenses may reduce by some 23s. to 26s. per ton. The extraordinarily remunerative character of the property, when in work and honestly managed, needs no comment.

The prices at which slates are to be sold are fixed annually by the great quarry-owners, and followed pretty closely by all the rest. The prices for last year ranged, for the first extra quality of slate, from 16*l.* 15s. per 1,200 of 26 in. by 15 in. slates, weighing 4 tons, to 1*l.* 2s. 6d. per 1,200 of 10 in. by 6 in., weighing 10 cwt.

"A noticeable feature of slate-quarry enterprise in North Wales," remarks Mr. Davies, "is the number of private owners of quarries. The trade has been built up and made what it is, for the most part, by men of high standing, of intelligence and capacity for business, and of indomitable energy also, who have not been above superintending their own quarries, having first mastered the details." The contrast between the steady and satisfactory state of this great industry, and the violent and ruinous fluctuations which the practice of unchecked competitions has introduced into the iron trade, is very striking. The large profits of the quarries are such as to show that if the trade was thrown open the price of slates might be reduced by from 20 to 30 per cent. But the question is, who would benefit by the change? Not, we apprehend, the householder. A steady and remunerative industry would be rendered as shifting and uncertain as is the case in all those branches of business in which competition has displaced co-operation. Wales would, it is very probable, be ruined by an unchecked competition in the slate trade, and it is difficult to say who would be really the better for it.

Mr. Davies's treatise is an unusually good example of a thorough and workman-like monograph. The illustrations, indeed, are very rough, but they serve the purpose of the writer; although we note that in the outline map we find no indication of the locality of Wenlock, from which little Shropshire town the uppermost group of the North Wales slates is named. The book opens with a general view of the geological elements of the subject, gives the mineral composition of the slate rocks, and indicates their distribution in the Principality. It describes the characteristic phenomenon of cleavage, and enters into particulars as to the Carnarvonshire, Merionethshire, and Llandeilo strata. So great is the familiarity of the writer with the localities, however, that he is rather too apt to indicate them only by their unpronounceable Welsh names, without either marking them on the map, or referring them to the counties in which they lie. A brief account is given of slates raised in other than the Welsh districts of Great Britain and Ireland, and in foreign countries. The book then proceeds to sketch the early history of a slate quarry, and to describe the manner and cost of its development. The whole of this part of the work is illustrated by actual practice, and is unusually thorough and lucid. There is, indeed, only one addition that we would desire to the full information supplied as to the working of a slate "bargain"; and that is the adoption of the mode, which is now usual in the engineering publications of France and of Italy, of stating the number of days' work actually given in the year to any particular branch of work. We find (on p. 143) that the average wages per day on three slate bargains in quarry in the Nantile district, were 8s. 7d., 8s. 9d., and 4s. 4d. respectively. Some explanation is necessary of so great a difference of price in so close a connexion. Payment by poundage is the usual method employed; but what the statistical student requires to know is the result of this payment reckoned per hour, and the average number of hours given to his work by the quarry-man.

We dwell upon this important desideratum, not on account of the slate industry alone, but because of its general bearing on the question of labour in the United Kingdom. Mr. Davies's book is so thorough that it requires but little more to make it exhaustive; and such a work is desirable, not only for its own sake, but as a model. For it is by the publication of competent treatises of this nature, with reference to various special industries, that the influence of those who stir up war between labour and capital may be best counteracted. If we had in our hands, for example, at the present moment, such a work on cotton-spinning as is this treatise on slate, with the further information we suggest, and that not taken from Lancashire alone, but from the cotton-mills of the United States also, the question now producing so much mischief in our own country would be advanced far towards solution. It would, at all events, then be possible for a writer in pages like our own to indicate with unerring certitude the point where the truth lies between the contending parties.

As to the slate trade itself, Mr. Davies is not apprehensive of the results of foreign competition. Not very long ago, he tells us, 150 picked men were taken from the Bethesda district to work in some slate quarries in America, which are not more distinctly indicated than by that somewhat large geographical term. He is of opinion, however, that even if labour were abundant in those districts of the American Continent in which slate is found, "the slates of that country so far would not compete with the Welsh slate for lightness, combined with strength. Our exports to America are as large as ever, and many of the men are returning to the Old Country." It is, however, instructive to compare the weights and prices of the best blue slates, shipped at Port Madoc, Carnarvonshire (p. 150), with those of American slates delivered free on railway trucks at Liverpool (p. 178). Taking the largest ordinary size, 24 in. by 14 in., the Welsh slates weigh 3 tons 10 cwt., and cost 15*l.* 5s. per thousand of 1,200. The American slates weigh 3 tons 5 cwt. 2 qrs., and cost 18*l.* 10s. Making allowance for freight from Port Madoc, the Welsh slate is considerably the cheapest. Thus far, however, we are informed, the slates sent over have been heavy, somewhat irregular, and rather pyritous. All the while Welsh slates are being sent to America.

For further details we refer those interested to the work itself; which Mr. Davies has completed with such industry and skill, that we are glad to see the announcement of a treatise on "Metalliferous Mines and Mining" as in preparation by the same author. The hope expressed in the preface, "That the book may be of value and use to all those who are interested, either scientifically, commercially, or professionally, in the subject of which it treats," is fully realised. It is also very interesting to learn that a Welsh translation of the book is about to appear, for the benefit, chiefly, of the slate quarrymen, who are a reading and intelligent class of men.

OLD ENGLISH PLATE.

How many persons who purchase plate, old or new, can tell whether, if professedly old, it is really of the age it professes to be, or whether, if new, it is of standard purity and of its professed market value? Mr. Cripps's book on the subject* gives information which may enable any one, with due attention and pains, to qualify himself for acting with effect on the recommendation of the proverb, *caveat emptor*. The whole of the marks used by the Goldsmiths' Company at various times for placing their *imprimatur* on a piece of plate are here tabulated and arranged in a manner easy for reference. These marks are threefold,—the maker's mark, the assayer's mark, and the royal mark, placed on the article (whatever it might be) in the order above named: the maker having been compelled by law (passed in the reign of Henry VII.) to affix his own mark to whatever object he made, before it was sent out of his hands; the second mark was fixed after the metal had passed through a satisfactory assay, and consisted of a date-mark, usually a letter of the alphabet which stood for the date of a certain year or a certain decade; and the king's mark being orginally, as ordained in the reigns of Henry VII. and VIII., a leopard's head crowned, which mark of the leopard's head has continued to be the principal royal mark at Goldsmiths' Hall to the present day, only that for the last half-century or so the crown has been discarded, and the mark confined to silver, gold having its separate mark, a crown and the carat number (18 or 22), from 38 Geo. III. It is somewhat singular, as the author observes, that it should not have been till so late in the day that a separate marking was adopted for gold. Mr. Cripps gives the following brief summary of the dates from which the various classes of marks originated:—

"1. The leopard's head, from 1300.
2. The maker's mark, from 1360.
3. The annual letter, from 1438.
4. The lion passant, from 1545.
5. The lion's head erased, and figure of Britannia, from 1697.
6. The Sovereign's head, from 1784."

No. 5 was used during a period (1697—1720) during which the leopard's head crowned and lion passant were discontinued. The leopard's head, it should be observed, is to be traced to the lion in the royal arms of England, which was originally called leopard, or "leopart," and lion, indiscriminately; the "leopart" in old French heraldry being, in fact, the same as the "lion passant guardant," so that the latter mark, used for a considerable period along with or alternately with the former, is only really a substitution of "the whole animal" for the head. It is worth while to take note of Mr. Cripps's complaint that "the appearance of the stamp has from time to time been altered, and always for the worse." In 1729 the lion was deprived of his beard and mane, and in 1823 of his crown, and his face reduced to the semblance of a cat. It is curious what trouble we take in modern times to destroy whatever is picturesque in our every-day articles, even in such small matters as this.

The reason the year of assay was indicated by a letter which had to be interpreted, and not by the date plainly given, we suppose must be traced to that love of a "mystery" of the craft which is so common a feature in all trades, and more especially to be expected in a trade which, like that of the goldsmith, has always been necessarily restricted to a comparatively small number of makers, especially in its earlier days. A very large list of makers' marks in chronological order is given, with the name of the maker where this is known, but that is in comparatively few cases. Here, again, we see the practical tendency of modern days in such matters; for, whereas the earlier marks of the sixteenth century are mostly symbols, a star and moon, a heart, a flower, and so on; as we come later in date, bare initials take their place, and symbols become rare.

Some of Mr. Cripps's reflections on forgeries are amusing, and ought to suggest caution to purchasers of old plate. At present the Queen Anne and George period is the most imitated; not, however, merely in obedience to a recent fashion in art, but because the first series of forgeries were mostly of seventeenth-century work, and the Queen Anne plate then acquired a high character as being usually genuine, so that it is now attacked by the forger as the most profitable field of operation, "and the market is flooded with the plain and fluted plate of those reigns, which is made to all appearance, both at home, and abroad for importation hither, by the wagon-load." There is comfort for the wary purchaser, however, in the fact that the forger is not uncommonly also a blunderer, and does not properly learn his work; he will, for instance, place upon the plate a date-letter along with a maker's mark known to have been adopted at a later date than that indicated.

"Again, what would the reader say to finding that two specimens of Queen Anne plate, with their gadrooned edges, courthand date-letters, and all, some five or ten years apart, and by quite different makers, should prove, on a careful examination of the ornamentation, to have come from the same *atelier*, a certain small defect in one of the tools used having left its fatal sign on both articles alike?"

The chemical process by which gold is assayed to test its right to hall-mark may interest a good many readers, even among those who are

* Old English Plate, Ecclesiastical, Decorative, and Domestic; its Makers and Marks; with improved Tables of the Date Letters used in England, Scotland, and Ireland. Founded upon the Papers and Tables of Octavius S. Morgan, F.R.S., F.S.A. By Wilfred Joseph Cripps, M.A., Barrister-at-Law. With Illustrations. John Murray. 1878.

not likely to be called upon to form a judgment upon extensive purchases of plate; the operation is one, it will be seen, requiring considerable delicacy and care in manipulation.

"For gold, to a portion of metal scraped off the article to be examined (say about eight grains), after being accurately weighed, is added three times its weight of silver, and a proper proportion of lead, the latter by wrapping the gold and silver in a piece of sheet lead. The whole is placed in a small shallow porous crucible made of bone ashes, called a *cupel*, and exposed to a bright red heat; the metals melt, and while the silver and gold combine, the lead and alloying metals become oxidised, and the oxides are absorbed by the cupel, leaving a button of pure gold and silver. This button is then flattened, rolled out into a strip, which is then coiled into a sort of screw, called a 'cornet'; this is placed in hot diluted nitric acid, by which the silver is dissolved and the gold alone remains; the cornet is then treated with stronger nitric acid, washed, and lastly made red-hot; when cold it is weighed again, and the difference between its present weight and the original weight of the scraping carefully determined. For silver the process is much the same, a certain portion, usually about ten or twenty grains, is scraped off the article, some being taken from each separate part; this is wrapped in lead of proportionate weight, and the whole heated on the cupel. The result is the same as in the case of gold, except that the resulting button is of pure silver only; the difference between the weight of this button and the original weight of the portion operated upon shows the amount of alloy.

Of this process a minutely-detailed account is given in a small book published in 1675, called 'A Touchstone for Gold and Silver Wares,' and the process is now carried on at Goldsmiths' Hall in precisely the same manner as then, even to the mode of folding up the papers to contain the scraping of the metal to be assayed. If the article examined is found to be of the required fineness, the marks are stamped upon it with punches; but if the metal is not of the proper quality, the article is crushed, and so delivered back to the maker. It is scarcely credible that every separate part of every separate article made of gold or silver (with the few exceptions that will appear later) in this country, go through this process of examination, either in London or in one of the provincial assay towns; but such is the fact, and the public are greatly indebted to the companies of goldsmiths, and especially to the great London guild, for the effective protection afforded by their vigilance against the frauds which prevailed in earlier times."

The illustrative portion of Mr. Cripps's book is very well carried out. He gives a brief but comprehensive sketch of the history and development of the principal classes of objects in English gold and silver work,—chalices, mazers, jugs, tankards, &c.,—noting their characteristics in different periods; these chapters being interspersed with well-selected and well-executed woodcuts of the best and most typical specimens extant in each class. Thus, without wading through a lengthy and cumbersome volume, those who want to know something in a general way of the characteristic excellences of English goldsmith's work find here a sufficient outline of it, interesting and reliable as far as it goes, and calculated to promote a wish to investigate the subject more. Indeed, we have seldom met with a book of this kind which is more successful in telling the reader just what he wants, and expects to learn from it, in a laconic but not dull manner, and without anything which is superfluous to the proper general understanding of the subject.

How the Phonograph came to be Invented.—An English patent of last year, taken out by Mr. Edison, clearly shows that his mind was being prepared for the conception of the phonograph. In that patent he describes a means of recording ordinary telegraph signals by a chisel-shaped stylus indenting a sheet of paper, enveloping a cylinder or plate, along the line of a groove cut in the surface of the latter. These indented marks were to be capable of re-transmitting the message automatically over another wire if required. Here, then, was the soil prepared, and the vibrating disc of the telephone was the seed needful to germinate the phonograph. That seed was dropped into it by accident. "How did you discover the principle?" asked a newspaper reporter of Mr. Edison. "By the merest accident," replied the Professor. "I was singing to the mouthpiece of a telephone, when the vibrations of the voice sent the fine steel point into my finger. That set me to thinking. If I could record the actions of the point and send the point over the same surface afterward, I saw no reason why the thing would not talk. I tried the experiment first on a slip of telegraph paper, and found that the point made an alphabet. I shouted the words "Halloo! halloo!" into the mouthpiece, ran the paper back over the steel point, and heard a faint "Halloo! halloo!" in return. I determined to make a machine that would work accurately, and gave my assistants instructions, telling them what I had discovered. They laughed at me. That is the whole story. The machine came through the pricking of a finger.—*Cassell's Magazine.*

BROMPTON ORATORY CHAPEL COMPETITION.

A NUMBER of designs for replacing the small ivy-covered chapel at the Brompton Oratory with a more ambitious building have been exhibited this week in the room at the Oratory called St. Joseph's Hall. Of these, two have been selected for the first and second premium; that marked "D. O. M.," by Mr. Herbert A. Gribble, for the first; and "Janua Cœli," by Mr. H. Clutton, for the second. We may take this opportunity to observe, in reference to many competitions besides this one, that if public opinion and the criticism of an architectural journal are valued at all in these matters (as one must conclude they are when it is specially made known publicly that the drawings are on view), it would seem more sensible to defer the adjudication till after such an exhibition had been made, so as to give opportunity for expressions of opinion which might then be of some value to those most concerned, instead of making the decision first, so that criticism comes too late to have any practical result.

From the study of the drawings it is obvious that Classic architecture has been demanded as a *sine quâ non*, which, indeed, is only reasonable, considering the style of the present buildings; and the inspiration of the designers seems drawn in great measure from either St. Paul's, St. Peter's, or Santa Maria della Fiore. Domes, as one need not say, abound: large domes, small domes, high domes, and shallow domes,—some of them presenting that remarkable faculty of carrying a heavy weight at the crown of a flat section of dome, which is only to be found in competition domes. The first design we come to, "Che sara sara," is Florentine in external feeling, though borrowing Wren's cone for the construction of the dome and lantern. Considerable use is made of the effect of different coloured stones in striped courses; the design is generally rich, but somewhat heavy, and also costly. Most of the plans, it may be mentioned, approach more or less to the simple basilica type,—a long nave with an apsidal termination; even where there is a crossing, and the dome is placed over it, the crossing is often not emphasised on the plan. All the plans have side chapels opening out of the nave. In this case the chapels and their entrances form an important part of the interior design; in others they are more secondary. To proceed: we next come to

"Faith," which is approached by a semicircular colonnade from the road, like the Vatican approach on a (very) small scale: the interior, with a barrel-vault with arches springing from coupled columns dividing each bay, is the best part of it, especially as shown in the little perspective sketch of the interior; the detail is dreadfully *rococo*.

"In Gloriam S. Philippi," with a lofty dome and a very ornate interior consisting of a large order with a subsidiary order and cornice in its rear, in approved style; the interior detail good, but the dome weakly treated.

"D. O. M." (first premium, as mentioned above). Almost the same as the last named in internal treatment, both derived from St. Peter's, but in this case there is more breadth and mass in the subsidiary order and its architectural accessories; there is a low dome designed for internal effect only. The west front (the lanterns over the flanking towers especially) is strongly reminiscent of St. Paul's. In short, there really is very little originality of any kind in the design, but it is very well carried out for what it is, and the drawings are fine. The nave, which is in three bays, has a domical roof over the centre bay: a good effect is produced by the bold treatment of the entry arches from the nave to the side-chapels, which spring from coupled detached columns. The building would be a costly one in proportion to the ground covered, and the exterior effect is decidedly heavy.

"Ut Puto" differs in plan from most of them, in having a square end instead of an apse, the sanctuary being bounded on three sides with a light open colonnade; over it is a dome treated with much picturesqueness of design, with large openings, each with two columns, divided by a solid wall with buttresses. This introduction of these masses of wall between the colonnade is evidently suggested also by St. Paul's, but treated with originality; the design is one of considerable merit.

"Lætatus sum": general design weak, but a fine effect of plan from the manner in which the floor spreads under the dome; the coloured view of the interior is much superior to the other drawings in which the design is set forth.

"Con Amore": a beautiful set of drawings of a very nice design, betraying Gothic sympathies in dispensing with "orders," and trusting to arcading and fenestration. There is an internal dome; but, externally, the only feature rising over the main building is a side tower. The chapels are prettily treated, and the principal drawings accompanied by sketches of various portions of the building. There is a great deal that is good in it.

For "Red Dot in a Circle" and "Pavia" there is not much to be said. "May 26th" is a design chiefly remarkable for a fine and effective plan on the principle of a wide central area, in which it differs from almost all the others; from this central space eight chapels open at the sides and angles, in a manner which would produce a remarkable effect of interior perspective. The dome is exceedingly reminiscent of Santa Maria. Portions of the exterior are gracefully treated, but the plan is the point of the design.

"Janua Cœli" (second premium): a long nave, with chapels alternately octagonal and circular opening from it; a low dome over the crossing. The design recalls Vanbrugh and Hawksmoor: it is a ponderous mass of rustication externally, with a window here and there in it. The design may justify its place in the selection by a certain unity and simplicity of treatment, and by the fact that it harmonises with the existing centre buildings; but assuredly it is not beautiful in itself, though susceptible of considerable internal effect.

"Fortiter et fideliter": one of the best designs, a picturesque and original treatment of Italian features in a manner suggestive of Gothic sympathies; what would be generally the west front (the building is not Orientated) is of elegant design, and flanked by a pleasing campanile. The plan shows, like some others, an ambulatory and arcade on either side of the nave between it and the chapels. The interior treatment is very refined and graceful.

"Lætamini in domino": worth mention for its interior perspective view, which is really brilliant and powerful: but the plan wants purpose, and the detail is very tawdry.

"Non timeta": a tasteful, quiet Palladian design, looking better in elevation than in perspective.

"Domine dilexi decoram domus tuæ, et locum habitationis gloriæ tuæ": a fine plan, in which an effect of length is arrived at by dividing into five bays the length which most of the plans divide into three only; beyond these the floor space spreads under the dome into a wide area with angle chapels. There are fine points in the exterior perspective, but the design depends on sculpture to an extent which would make it very costly; the dome is unpleasing in outline, and of doubtful stability.

"Italian": a design showing some genius and originality, though with serious faults. The entrance-front, which is much the best part, is flanked by two Classic spires very successfully treated; the whole design aims at Gothic multiplicity of effect on the basis of Classic (not very pure) detail. The tiled roofs are shown, and form part of the design. The motto is a misnomer, for "Italian" is just what the design is not, essentially. The dome springs right off an arcade of open lights, has a rather flat section, and carries a large lantern: it could not possibly be built as shown, unless it is intended as an iron construction, of which, however, there is no indication.

"Lumen de Cœlo": in this case the light from heaven has been a light that has "led astray," for it has prompted the designer to a large and very ugly bulbous dome; but there is considerable merit in the plan.

"Veronæ": a wild, powerful architectural fantasy, illustrating its motto by a great tower of solid masonry, with put-log holes and everything complete, in the style of the city of the Scaligers. There is considerable ability of a kind both in the exterior and interior perspectives, but the author must have made the design for his own pleasure merely; he could surely never have expected that it would be carried out.

"St. Philip": a design of considerable merit and picturesque effect, but apparently intended as a stone upper story on a substructure of brick, we presume to make a show from a distance and keep the part unseen from the

public road plain: not a very right principle of building, nor complimentary to the Brompton brotherhood.

"Laudamus" we mention to point a moral, in regard to the fact that its author adopts, in an exaggerated form, one of the worst features in the interior of St. Paul's dome, the hanging inward of the pilasters on the face of the cone. The drawings seem to be the work of an inexperienced hand; the author is not the only person who thinks himself safe in copying the mistakes of a great architect.

"Quam dilecta": a very fine set of drawings of a good but costly design, of a Classic type, verging towards "Queen Anne," but not without original features. The front towers are very picturesque in the treatment of the lantern stage; the principal exterior perspective, a fine pen-drawing, looks exceedingly well (perhaps better than the actual building would), and the interior is a still better coloured drawing, very rich and harmonious in effect.

"Roman Remains" is obviously the work of a young hand; "New and Old" probably ditto; in the latter there is a certain semi-grotesque power in the coarse pen-drawing of the exterior perspective.

"Domus Dei" fails in regard to plan from want of climax of any kind; the design, in the spirit of Sansovino, is exceedingly elegant and refined; there is a light cupola over the entrance-front and a dome over the sanctuary, designed without quite sufficient connexion with the plan: the flat ceiling shown in the interior perspective is a drawback, but the external perspective shows a fine effective composition, especially in the exterior treatment of the side chapels, and is a very fine drawing.

"Joy" shows a fine plan, well arranged both for effect and convenience; the front elevation has a very elegantly-designed centre, contrasted effectively with the bare stalk of a tall campanile, which is crowned with a graceful lantern. The three or four remaining designs it is hardly necessary to mention, as they present no special point for remark, except that one or two of them are manifestly absurd.

The prevalent defect of the whole set is lack of originality, and we should say the premiums had been given to two of the least original designs of the number; two, however, which are free from positive defects of any importance, except as to the heavy and uninviting exterior of the second premium design. We understand that Mr. Waterhouse assisted in making the selection.

A GUIDE IN THE BRITISH MUSEUM.

AN instructive morning meeting of the Society of the Fine Arts was held on Thursday, the 20th inst., in the Elgin Room of the British Museum, on which occasion Mr. Newton gave the large gathering a most interesting and learned discourse on the Parthenon, and on the acquisition of those Phidian masterpieces in the midst of which they were assembled. Mr. Newton also referred to the untoward destruction of some of the fine groups of the pediments, and to the interesting confluence in that room, from various sources, of many fragments which have since been restored to their proper places among the Pedimental Figures, the Metopes, and the Frieze. This is, indeed, turning the Museum to educational advantage. Several other meetings of a similar kind were, we believe, held within its precincts during the last week. Mr. Newton and the Museum authorities deserve great praise for the readiness with which they second this movement. This kindness was thoroughly appreciated by the large concourse of the Society assembled, and a cordial vote of thanks was returned to Mr. Newton at the conclusion of the meeting.

The Surveyorship of West Derby.—An adjourned special meeting of the West Derby Local Board has been held, for the purpose of appointing a surveyor for the district out of the six selected candidates. The salaries asked by the candidates varied from 200*l.* to 300*l.* The six candidates were,—Messrs. E. H. Allies, Sheffield; A. Creer, Halifax; W. Bower, Stoke-on-Trent; C. H. Lancaster, Liverpool (borough surveyor's office); E. M. Touzeau, West Derby; and W. Thomas, Manchester. Ultimately Mr. Allies was appointed, at a salary of 300*l.* a year. Mr. Allies was assistant to Mr. P. B. Coghlan, late borough surveyor of Sheffield. There were sixty-two candidates.

SANITATION AT THE PARIS EXHIBITION.

THE Belgian Annexe of "*Produit Divers*," to which allusion was made lately, contains many architectural drawings, &c., which cannot be fully appreciated without some knowledge of recent legislation. These plans and models are, for the most part, based on the Decree of the 14th of August, 1873, granting 800,000*l.* for the building and furnishing of elementary schools. This grant facilitated the intervention of the Central Government in local affairs, and led to the propagation of good hygienic principles in the most forsaken and ignorant rural districts. According to the law, the Communal Council has to determine what structures are necessary for educational purposes, and a Permanent Committee decides whether the plan adopted by the Council be in keeping with the financial resources of the district. Every year, at a particular period, the Government decides whether it can help these local endeavours, and employ some portion of the 800,000*l.* grant to lighten their burdens. If the decision be in the affirmative, half the total expense is defrayed by the Government. But, on the other hand, the Government insists that certain precautions should be taken, and these are laid down in a Circular from M. Delcour, the Minister of the Interior. It is the practical realisation of the regulations thus initiated, which may in part be examined at the Exhibition.

In planning the erection of a school, the local authorities are informed that if they desire assistance from the Government they must see to "the nature of the soil. The site and its salubrity should be subjects of special attention." Article 1 of the Circular of November, 1874, stipulates that the site of a school must be on dry and open ground, away from all miasmatic influences, and all noises of a troublesome nature. The school should be accessible without difficulty, and free from any surroundings,—unwholesome industries, for instance,—which might be injurious to the health of the pupils. Thus there is a special clause to the effect that no school should be built within 150 yards of a cemetery. In calculating the necessary school accommodation for a district, the number of likely pupils may be estimated in the proportion of 15 per cent. on the total population. All that may engender humidity must be carefully avoided, and schools facing the south-west must be protected by an inner wall separated from the outer wall by a space of at least 5 centimètres. How far these rules, laid down by the Belgian Government, have been realised is a matter which can scarcely be judged by a visit to the Exhibition; but it is at least important to know what are the regulations our neighbours consider as indispensable. On the other hand, so far as the actual buildings are concerned, the reports and drawings exhibited give us ample details and illustrations. These are, in fact, plans conceived expressly for the purpose of carrying out the Government regulations, and thus, in accordance with these latter, we find that the size of the rooms is based on the rule that each inmate must possess around him 4 mètres 500 decimètres cubic of space. It is further suggested that the rooms should be rectangular, with the angles rounded, and lateral windows looking, if possible, towards the south-east and the north-east. The number representing the window-space should equal at least one-twentieth of the cubic capacity of the class-room, and these windows should open at the top.

Ventilation and sewer-gas are the objects of particular and stringent injunctions. The Minister of the Interior insists on the necessity of supplementary methods of ventilation in the evening, when the rooms are lighted up, and the air consequently becomes more scarce. Apertures immediately over the gas-burners are strongly recommended. The heating of the schools should be so contrived as to maintain a mean temperature of 14° to 10° centigrade, and the air of each room should be renewed completely at least twice in every hour. The closets are to be constructed out of doors, and as far away from the main building as possible. There should be at least one closet for every fifteen girls and one for every twenty-five boys, with two urinals for each thirty males. Where sewers do not exist, concave watertight soil-pits should be built, with a ventilating-shaft, to prevent the accumulation of noxious gases. The seats are so contrived that a thorough and continuous draught passes immediately under the pan, which conveys the ascending sewer-gas to the large and general shaft built for the ventilation of the closets. By thus saving the pan from the ingress of sewer-gas, one of the most frequent causes of enteric fever is avoided. Another rule states that the closet ventilating-shaft must be higher than the most elevated part of the school roof.

Taking all these regulations into consideration, and then examining, as far as possible, how extensively they have been applied, it will at once be seen that Belgium is in advance of many other countries in her school hygiene. Indeed, it is surprising how so small a country gives so admirable an example to its huge neighbours. How much Russia, Germany, and France have to learn from Belgium before they are able to distinguish themselves by taking equal care of the health of their school children, will be readily appreciated by those who examine something more than the mere surface and glitter of the Exhibition. Unfortunately, the very sections which convey the best and the most practical moral lessons are, as a rule, dull and unattractive in appearance. Statistical charts, though conveying the most important information, do not constitute an ideal ornamentation for the walls of an exhibition. Heavy Blue Books are not calculated to attract visitors who, as a rule, expect to be amused; and even architectural drawings are shunned when, close at hand, the art galleries are resplendent with the greatest paintings from all nations. The Belgian annexe, which we have passed to describe, is consequently, and, comparatively speaking, deserted. The details are passed unobserved; nor do the maps, plans, drawings, and models of the Belgian universities, and industrial or technical schools, attract any more attention. But outside this section, where, in the various little pavilions of different nationalities, strange drinks and liquors are sold by wonderful waitresses, decked in the peasant dresses of far-off countries, the crowd gathers and takes greater interest in the colour of a Russian skirt, and the flavour of the pink annette from Holland, than in the health and education of the coming generation.

Paris.

SIR JOHN VANBRUGH AND HIS CRITICS.

A THOUGHTFUL review of the architectural works of Vanbrugh must excite surprise that they should have been the objects either of extravagant praise or severe censure. They seem to me the natural outcome of the school of his immediate predecessor, Wren, whose productions were not wanting in picturesqueness of outline. They may, at least, be considered the genuine offspring of the style of St. Paul's Cathedral and Bow Church, brightened by the fancy and feeling of the poet-architect as a diagnosis. Common sense would teach him that there was no necessity for a mansion 600 ft. or 700 ft. long to be bounded above by one straight line, like the National Gallery. It was perfectly natural that he should make the different masses of a building,—one containing state-rooms, another ordinary rooms, a third servants' rooms, of different heights; and, for the rest, there was sufficient inspiration at home in the Tudor Gothic and the Elizabethan architecture, to say nothing of the infinitely varied skyline of nature in mountain and forest scenery, without the French châteaux, to account for greater picturesqueness than is displayed in his works. It was natural that he should go beyond Wren in picturesqueness. Wren was attracted to architecture by its prosaic side; Vanbrugh by its poetic. Wren, who had previously exhibited no poetic fancy, came up to it from abstract science; Vanbrugh came down to it from dramatic poetry,—from an ideal world of beautiful and majestic forms, in which, no doubt, his youth had been passed. In short, the key to Vanbrugh's architectural character is found in the fact of his being a poet, as that of Wren's in his being a mathematician. Wren had invented astronomical instruments, and was author of scientific theories and improvements; hence construction was play to him. Vanbrugh was dramatist, and had written comedies; hence designing airy architectural shapes was easy, and the works of the dutiful pupils of Inigo Jones would look tame to him. He would take the columnar orders through his imagination rather than through his judgment. A painter or sculptor coming among architects would have made some commotion, and shown some variation

on their works, as did the Italian painter-sculptor-architects, who made the style more picturesque and sculpturesque than Palladio, who was architect only; but a poet, whose domain is commensurate with the imaginative faculty,—a poet practised in the difficult task of portraying the heart of man and everything else of which an image may be formed in the mind by combining the elements of existing things,—would naturally go farther. A poet possessed of any considerable measure of "the vision and the faculty divine," entering upon the practice of architecture, must be like an angel coming down to trouble it, and show what miracles it can produce despite the intractability of stone, so infinitely inferior in flexibility to words.

But it was not merely the exercise on his works of the exuberent fancy and imagination that produced the witty satire, and gave the brilliancy and point that charms in the "Provoked Wife," that constitutes the merit of Vanbrugh. It was something more valuable than these. The great defect of the architecture of the school of Inigo Jones, though it has elements which give it interest and value for all time, is that it is too Italian and unnational,—not sufficiently modified by considerations of place and time, and does not adequately reflect English feeling and character. A chief merit of Vanbrugh is that he boldly Anglicised the Italian architecture of his predecessors; did away with its southern exotic character, by greater massiveness below, as well as by more lightness above, and by making the windows always prominent features. Inigo Jones's works, however beautiful, were little else than Italian architecture; those of Vanbrugh, who had perhaps scarcely heard of Bernini, then so potential throughout Europe, were not. "The style of no age, of no country," says Walpole, meaning it as reproach, "appears in his works"; the reason is, the style he found had passed through the alembic of his mind, and become English.

But it was a step in architectural composition before the analogous step was made in the leading fine art, poetry. The school of Inigo Jones in architecture corresponded to the school of Pope in poetry, the so-called classically correct school, which boasted its superiority in language, in numbers, and sentiment to that of Donne and Drayton, but to which the memory and the judgment contributed more than the imagination and sentiment. While the architecture which Vanbrugh found when he commenced the practice of the art corresponded to this school, his own works evince the vigour of thought and warmth of feeling and fancy which belonged to the later and truer school of poetry that was inaugurated by Cowper and Burns, and was followed by Wordsworth, Scott, Coleridge, Shelley, and Keats, producing something like a revival of the Elizabethan spring before it was tinctured by imitation of the French.

This is why they were lampooned by Pope and Swift. There was some inconsistency in so original and profound a thinker as the author of "Gulliver" becoming an assailant of Vanbrugh; but to Pope and his school it was natural he should give offence. The homely English subjects of Cowper and Burns, had they appeared fifty or sixty years earlier, would probably have excited similar ridicule. Such poems as Cowper's "Lines on the Receipt of his Mother's Picture," or Burns's "Cotter's Saturday Night" would scarcely have been relished by Horace Walpole.

This, I say, is why Vanbrugh was assailed, and not, as Sir Uvedale Price erroneously remarks, for his faults. These the critics of his day, I fancy, were unable to detect. He was reproached for not being correct according to canons of criticism which, having no foundation in nature and reason, he did not acknowledge. As Walpole truly says, "he broke through all rules"; but they were rules of the architecture of another climate, and had no force on English ground. If he made his columns, for instance, of more massive proportions than the Italians, he did so for a good reason. He obeyed higher laws than he broke; the heaviness for which he was blamed, and which appeared in the basement of his compositions, not in the upper part, was not only a means of adapting them to our rough stormy climate, but it was one great means by which he united them to the ground, producing the quality that won him the praise of Sir Joshua Reynolds, by whom alone of all his critics he appears to have been understood. It shows that he had what the ancient Egyptians and Greeks, and the Mediævalists, had, but what few modern architects have exhibited in their works,—a proper sense of an æsthetic whole. "He understood," says the great artist just mentioned, "light and shadow, and had great skill in composition, and perfectly understood in *his* art what is most difficult in painting,—the conduct of the background, by which the design is set off to the greatest advantage. What the background is in painting is the real ground on which the building is erected; and no architect took greater care that his work should not appear crude and hard; that is, it did not abruptly start out of the ground without expectation and preparation." This may be said of Blenheim, where various bold projections of various heights form the foreground to the main building. Above, in the upper part, it is not heavy. Blenheim is not what Pope calls it, "a laboured quarry above ground," any more than St. Paul's is. It is more like a forest, heavy below and light above, which is the general character of nature. And though in that building, as in some others, he was influenced by the composition of our old castles, he had too much sense to make it a sham castle.

If it wants grace of detail, which it most likely does, it has that inimitable grace which sincerity and strong feeling communicate to the most homely compositions, whether in architecture or poetry, and is more truly classic in spirit than the so-called correcter works of Burlington, Webb, and Hawksmoor, and others of the contemporary school; and an example to after-time of the right appropriation of architectural examples. Faults it has, as I said above, but they are what neither Pope nor Horace Walpole was able to detect, and which probably escaped the eye of Reynolds,—if, indeed, his technical knowledge of architecture had made him aware of them. The greatest of them is, that it had not the unity of parts or masses that the whole, or rather the basement, has to the ground. Blenheim Palace is not what Sir Uvedale Price calls it,—a well-combined whole: no two of its blocks are united by the coincidence of their entablatures. Castle Howard is similarly faulty, but in a less degree: its lateral galleries at least have more unity with the projecting wings and pavilions with which they terminate. The varied outline for which Vanbrugh has been praised should have been obtained by the addition of attic or minor orders of varied heights, or by the clearstory arrangement, as the Gothic and Elizabethan buildings which suggested his picturesque outline might have taught him.

But he cut the Gordian knot instead of untying it, and produced his picturesque sky-line by breach of the grammar of the art, which possibly, as he did not come into the profession by the door, he was not very well acquainted with. What is more surprising, the same fault has been committed by men who were well acquainted with the grammar of the art,—by Von Klenze in the Glyptothek, at Munich, for example,—the wings of which are not joined to the body as nature joins body and wings in her organised structures.

The triple temple of the Acropolis of Athens is, I am aware, looked to as an authority for this practice. But it is counter to the general teaching of the Greek architecture, which I think, should silence that of any single example, and I believe the Erechtheium would have been more beautiful if it had not been an exception to the Greek continuity of entablature.

While Vanbrugh exhibited in most of his works a richness of profile that cannot fail to charm, yet there is really no surprising splendour in his compositions. What is the picturesqueness or variety of outline of Blenheim Palace, or Castle Howard, or Grimsthorpe, or King's Weston, compared with that of Litchfield or Ely Cathedrals,—unfading flowers of poetry, blossoming through the night of ages in stone? Nor would Sir Joshua, I think, have attributed to him the merit of invention had he known or recollected the richness of his resources,—the materials on which his imagination had been fed. Vanbrugh did not plant the standard of architecture in any direction farther into the unknown, as the Gothicists did in the Middle Ages, as the Saracens did in Spain, in Egypt, and in Hindostan. But if he did not create a new style, he did what was nearly equivalent to it. He rightly organised and adapted the elements at his command, and leavened all with the natural and acquired richness of his own mind.

I have only to express my regret, which I doubt not is widely shared, that his works in his previous walk, equally honourable to his intellect and imagination, should be, in any measure, discreditable to his moral sense.

SAMUEL HUGGINS.

THE DOME OF THE ROCK.

SIR,—Having read carefully the able review of Mr. Fergusson's "Temples of the Jews," which appeared in your columns on the 1st inst., I should be glad to be allowed to point out one or two architectural indications which have not, as far as I know, been previously discussed, and which seem to have an important bearing on the question of the date of the Dome of the Rock.

The main architectural features which have been criticised are the columns, the arches, and the beam running between the pillars. It appears that most architects agree as to the character of the columns, assigning them to the fourth century. I would, however, point out that the capitals of the different pillars are not all of one design (as are those of Constantine's basilica at Bethlehem). The two very different sketches of capitals in the Dome of the Rock which are given by you in illustration, serve to show this, and after making careful sketches of the twelve pillars supporting the drum, I find that only three are of one pattern, the rest differing not only in design, but in proportions and in outline. There is also a sensible difference in the diameters of the shafts and in their lengths. Thus the blocks above the pillars of the arcade are of different heights, in order to make the spring of the arches all on one level. The square blocks of marble at the bases of the shafts were removed in 1874, and inside them the old bases were found. These also differ from one another in their mouldings, and in one case it appears that one of the shafts is upside down, and that its base-mouldings are immediately beneath the capital, which has been placed above.

The natural deduction seems to be that these pillars were collected from some other building or buildings, and utilised by the builders of the Dome of the Rock. This we know to have been a common practice of Arab builders, and in the case of the Mosque of Amru (which Mr. Fergusson states to be now pretty much in the condition in which it was left by that very 'Abd el Melek who claims to have built the Dome of the Rock), the columns have been torn from older buildings, and much resemble those under consideration.

With regard to the connecting beam, I leave it to architects to decide whether it is strictly correct to institute a comparison between such a beam and a stone cornice found in an Italian building. It is, of course, a constructive impossibility to build a stone cornice between the pillars in the way in which this wooden beam is introduced, and there seems hardly to be any constructive similarity between this tie-beam and the arched cornice of the Golden Gateway. If we look nearer to the spot than Thessalonica, we shall find this kind of tie-rod used at Damascus, and in the Mosque of 'Amru at Cairo, without mentioning the cases of the Dome of the Chain and the Aksah Mosque, in Jerusalem.

Having had the opportunity of walking along this wooden cornice, and of examining it when under repair, I may be allowed to remark that it has probably been constructed at two periods. The original beam, which is shown in your illustration, had a rectangular cross section, and the face was ornamented with bronze, the ornamentation running inside the marble cap, which was built up round the stone block above the capital at a later period. To this beam a wooden cornice has been added, and is attached by cramps, which are visible when it is seen from above. It seems thus probable that the attached cornice is later work.

At the Golden Gateway we find a stone cornice deflected into an arch, and, from the style, De Vogüé has dated the building as of the fifth or sixth century. To this the reviewer demurs, but he will, I believe, find that the conclusion was based on comparison with other dated examples of strikingly similar appearance found in Northern Syria. If we wish to form an accurate conception of the style in which Constantine's basilicas in Palestine were built, it seems hardly necessary to refer to Rome. At Bethlehem we have a building of Constantine's, which has escaped the destruction which overtook nearly all the early buildings in Palestine. The columns resemble those in the Dome of the

Rock, but they support a flat architrave on which the wall of the clearstory rises, and the arched cornice is not found in that building.

A contrast has been pointed out between the Aksah Mosque and the Dome of the Rock, but surely any one well acquainted with the two monuments will see an equal dissimilarity between the Dome of the Rock and the Golden Gateway. In the outer wall of the former the arches are, as the reviewer points out, struck from two centres. In the Golden Gateway the arches are semicircular. In the numerous Byzantine ruins which occur in Palestine, the semicircular arch is used, and in one fine example, which I discovered in 1873, the curved cornice also occurs in a Byzantine monastery of Samaria (Deir el Kulah), though the building is unfortunately not dated. If, then, the Golden Gate were Constantine's work, how comes it that he used semicircular arches there, but pointed arches in the Dome of the Rock, while Justinian reverts to the semicircular arch? On the other hand, in the Mosque of 'Amru, at Cairo, which, as before noticed, was rebuilt by 'Abd el Melik, we find the arches to have just the slightest approach to a point (as described by Coste in his "Architecture Arabe," resembling those of the Dome of the Rock.

The question appears to me to be, therefore, whether it is not safer to compare the Dome of the Rock with the few known specimens of early Arab work rather than with European examples of fourth-century style, and whether Mr. Fergusson's architectural criticism is sufficiently accurate to outweigh the evidence of Arab and Christian historians, and that of the Cufic and Arabic dated inscriptions which run along the sides of the Dome of the Rock.

I will not enter into the historical and topographical difficulties raised by Mr. Fergusson's views; but, in conclusion, I would beg to answer the charge of neglect which has been brought against the Jerusalem explorers with regard to excavation in the vault which Mr. Fergusson supposes to be the crypt of his basilica. The vault in question was discovered by Captain Warren, R.E. The south wall is of rock, with rock piers projecting into the chamber. The roof and north wall are of modern masonry, with pointed arches. The east and west ends are choked with rubbish.

I would first point out that the Rock rises suddenly west of the vault to a level higher than that of its roof, so that excavation could not be pursued much further in that direction, while the present surface falls so fast that if the vault ran further eastwards it would very soon appear above the surface.

In spite of this, every effort was made to re-enter the vault in question. Not only did Captain Warren do his best, but I repeated the attempt in 1872, 1873, and 1874.

Even had a more adequate sum been offered than that which Mr. Fergusson promised, the difficulties could not, I feel convinced, have been overcome. Spades, picks, and other instruments must first have been smuggled into the Haram, and the excavated earth would have had to be removed. To do this secretly would have been next to impossible. To do it openly it was necessary not only to bribe the sheik of the mosque (which might have been possible), but to bribe or get rid of the black guardians of the Haram. These fanatics are not to be bought at any price; and as they are always present at night, and not controllable by the sheikh, the prosecution of such excavation either at this spot, or anywhere else in the Haram enclosure, remains at present an impossibility.

Mr. Fergusson was, no doubt, unaware of these attempts, or he would hardly have charged the Palestine Exploration Fund with neglect.

CLAUDE R. CONDER, Lieut. R.E.

Barley.—The foundation-stone of the new church of St. Bartholomew, Earley, was laid by Mr. Walter, M.P., on the 12th inst. The church, which will accommodate 600 persons, is to be built from the designs of Mr. Alfred Waterhouse, A.R.A., by Messrs. Stephens & Bastow, of Bristol, who have taken the contract. Mr. Young is the foreman, and Mr. Barr clerk of the works. It will be built of red and grey bricks, with Bath stone dressings, and will be in the Early English style; and is to have, when completed, north and south aisles, divided from the nave by granite columns, with capitals and bases of Dunting stone. The roof will be of open pitch pine, and covered with Broseley tiles.

THE ARCHITECTURE OF THE THAMES.

IT may seem a paradox to speak of the architecture of the Thames, but it is the best mode of enclosing in one comprehensive title the buildings which are scattered along the banks of our chief stream from Oxford to London. They are in various counties, in different villages, in several towns, but they all belong to the valley of the Thames.

We pointed out some weeks ago* in these columns how accessible and cheap a field Normandy is for those who desire to unite at once change of scene and opportunities of architectural study. As the summer grows apace, we may devote a short space to a glance at the architectural subjects which an inland voyage down the Thames presents to any one for whom such matters are an attraction. For it is rather too much the case that those who make this very charming expedition do so with too single-minded a purpose of simply descending the river. But the manner in which such an expedition should be undertaken is to make the river the actual route, to set apart each day but a compacatively short distance, such as fifteen miles, and then to engraft, so to speak, on this some other pleasure, such as sketching, botanising, or the viewing and study of some of the architectural objects by which the Thames flows down. Between Oxford and Richmond, five or six days may be easily spent in this manner; between Oxford and Windsor, four or five days can be fully occupied; and there is no difficulty in prolonging the descent to a greater length of time.

And we naturally presume that most persons will choose rather to descend† than ascend the river; for, though it is a slow-flowing stream compared to the Severn or the Wye, yet to journey up against the current gives much unnecessary labour to those who ply the oars, without any counterbalancing advantage.

To begin with, at the very offset of the voyage, or rather before its commencement, there is Oxford to be seen. But Oxford is a town where day after day may be passed at any period of the year, for, to use Mr. Matthew Arnold's line, "She needs not June for beauties heightening." We therefore pass on on our expedition, merely pointing out that those who do not know, or who desire to add to their knowledge of, Oxford, will find it a starting-point where they long may linger.

But a mile and a quarter now brings us to the village and water-mill at Iffley, where is the church of St. Mary, surrounded by its green graveyard, its waving chestnuts, and stately elms, with the quiet river and the ancient mill below. It is undoubtedly one of the finest specimens of Norman architecture in England, and in its admirable proportions, good state of preservation, and in the fair scenery by which it is surrounded, as remarkable in its own way as the grand and stately cathedral of Durham rising on the heights above the Wear.

The west front, with its beautiful doorway and circular window, the noticeable mouldings of the interior arches of the tower, the two side doorways on the north and south of the church, enable the visitor to grasp in his mind a Norman church in its entirety, and he will pass on down the river, not only with fresh knowledge acquired, but with the remembrance of a really beautiful piece of English landscape firmly engraven on his mind. We do not dwell at any greater length in description of the place, for most of our readers will be able to read of the respective features of this church in Rickman's "Gothic Architecture"; we touch upon it and descend the Isis. Passing by Sandford we are within a mile and a half of St. Peter's College, Radley, which we described in a recent number of the *Builder*,‡ and then, leaving Nuneham Courtney, approach the town of Abingdon. Here "distance lends enchantment to the view," for the well-proportioned spire of the church of St. Helen, on the banks of the river, the red-tiled buildings, and the picturesque bridge, give a general view of much picturesqueness which, when approached nearer, loses a good deal of its attractiveness. This bridge, indeed, with its six pointed narrow arches, standing sturdily across the river, is not unworthy of notice, for it was built so long ago as the year 1416, and its erection was quite an historical event in the annals of Berkshire. In the old hospital at Abingdon, some quaint lines of a primitive kind bear witness to the importance with which it was at one time regarded,—

> "Kynge Henry V. is his fourthe yere,
> He hath i-found for his folk a brig in Berkscheere,
> Where cartis with carriage may go and come clere,
> That many winters afore were marred in the myre.
> For now is Culham Hythe (ferry) come to an end,
> An all the contrie the better and no man the worse."

Some fifteen miles from Oxford by water, the Thame joins the larger Isis, and a little above the confluence of the two streams lies the large village of Dorchester, which can be reached from the main river by following the winding Thame through meadows and beneath willows for a quarter of a mile. The glory has now departed from what was once a city, and once, too, the largest see in England, embracing as it did what are now the dioceses of Winchester, Salisbury, Bath and Wells, Lichfield, Worcester, and Hereford. But even yet Dorchester Abbey, as it is usually called, or, more properly speaking, the Church of SS. Peter and Paul, bears witness to the great ecclesiastical past which belongs to this Oxfordshire village. The abbey itself, 300 ft. in length, stands on rising ground above the Thame, but possesses only the remains of its former greatness. There are some slight remnants of the ancient Norman building; there are some sedilia in the Decorated style; there are three knightly monuments of the reign of Edward III., whereon the warriors are engraved life-size, in their chain armour. There is some noticeable ancient glass still remaining, and there is a very unique Jesse window on the north side; there are also various other details of interest to the student of architecture. But even as it stands it is an object well worth attention, recalling, as it does, the days when ecclesiasticism was in power in the fertile plains of Oxfordshire, and when a great religious centre occupied the site of the quiet agricultural village on the banks of the Thame. But unlike the church of Iffley, its ancient splendour has departed, and whereas the former is equally ancient, it yet bears its years with no loss of beauty or of form.

We forbear to do more than merely mention the pretty church at Clifden Hampden, standing on the rocks above the river, or yet the Church of St. Thomas, at Goring, among the fairest scenery which the Thames can boast. In each will be found some details of interest for the architectural student. But a longer stay should be made at Sonning, where the church was restored in 1853, where Lord Stowell lies buried, and the south aisle is of the period called Decorated. Of a different character, after we have passed the noble reach of water at Henley, are the remains of Medmenham Abbey, which once was an ecclesiastical building, but in later years, after it ceased to be a religious house, was turned into the scene of the revellings of a club, who took for their motto the sardonic words "Fay ce que voudras." But yet with the simple pointed arches of the remnants of the abbey, facing the river as it glides by the grass plot among which the ruins stand, it forms a very noticeable object, and one which, for the architect or the general visitor, cannot fail to have attractions.

There is, perhaps, no more attractive bit of the Thames than that which takes in Bisham Abbey and Church. The river bends round in a broad and sweeping curve, the grand elms overhang the right bank of the river, and, among them, in park-like meadows sloping up to the tree-covered ridge behind, are the abbey and church of Bisham. The former, now a dwelling-house, contains many things of interest, and, with its fine lancet window, projecting oriels, and picturesque grey gables, is—apart altogether from its historical associations—an eminently picturesque sight. The church, having been restored some seventy years ago, is just now at the end of a second restoration and enlargement, the south aisle having been considerably lengthened. But when the newness which it now necessarily wears has worn off, when the whiteness of the stones and the red tiles of the roof tone down, it will become more in harmony with the scenery, the abbey, and the associations of this charming spot. The last place we will mention before reaching Windsor is Bray, of which, by the way, there is at the moment a delightful view by George Fripp in the Exhibition of the Society of Painters in Water-Colours, showing the reach of the Thames, glowing in the evening light, and the square church-tower rising from

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* See p. 427, *ante*.

† It may be useful here to state that Mr. John Salter, boat builder, of Oxford, supplies boats at fixed prices for this journey. Thus, a "gig," to hold three or four, costs 2*l.* to Henley, 2*l.* 5*s.* to Windsor, 2*l.* 10*s.* to Richmond, the length of time allowed for the descent being a week.

‡ See p. 559, *ante*.

among the trees. A good deal of the building is either Early English or Decorated, but this tower, the most noticeable object from the river, is of considerably later date than the rest of the church. But the place is associated in most people's minds more with Simon Allyn, the weathercock-like sixteenth-century Vicar of Bray, whose main principle in life was to live and die Vicar of this pleasant spot:—

"And this is law, I will maintain
Until my dying day, sir,
That whatsoever king shall reign,
I'll be the Vicar of Bray, sir."

It would not be difficult to go into greater detail respecting the places we have briefly touched upon, and respecting others which lie somewhat away from the actual silent highway along which our holiday-maker has been supposed to be pursuing his travels, and to say something also as to the secular buildings on the route. But we have said enough to show that whilst the muscles may be braced, the mind and the eye may be employed, it may be, in pondering over the white masses of the water ranunculus or the purple campanula, half hidden in the grass, or, if architecture be the subject of study, over the ancient buildings which lie in these sequestered villages by the side of the Thames.

SHEFFIELD.

THE picture which Wordsworth drew, in his "Excursion," of a "huge town, continuous and compact," over which "the smoke of unremitting fires hangs permanent," where a rumbling stream "turns a multitude of dizzy wheels," and where still there are "crazy huts and tottering hovels," may fairly be applied to Sheffield. Ancient in date, the records of the town supply remembrances of the Conqueror; its manor furnishing facts in relation to the notable people who have been connected with it, and its castle furnishing prison to cardinal and queen before an iconoclastic Parliament demolished it. Not by its own participation in feats of arms, or in the pomp and circumstance of war, has Sheffield been made so famous as by furnishing the weapons for others. It is claimed that, in the days of the archers, it supplied their arrowheads. Its cutlery had renown so far back as Chaucer's day; but till pack-horses gave place to other means of conveyance, its trade did not grow rapidly, nor its bounds extend. From the time of the extension of navigation on the Don to the town it began to rise in importance and extent, and its trade to grow. But twoscore years ago, even, it was the dark shadow only of its present self. In its valley, sheltered with thickly-timbered woods, it produced its knives and forks, tools, and plate, its square townhall in the Haymarket, its old Gothic parish church, and its infirmary, being amongst the chief architectural attractions. In addition to its six churches, even then it had twenty-two dissenting chapels; it had its hospitals and dispensaries, its literary and philosophical society, and two or three institutes and libraries; four weekly newspapers were issued in those days; but a veracious chronicler states that "amusements appear to be a secondary consideration, as scarcely any town equal in extent possesses fewer resorts for the votaries of fashion and gaiety." Trade was then comparatively small; four anvil-makers were recorded, and eleven auger-makers; the Britannia-metal makers numbered thirteen only; five cutlery-manufacturers only appear, whilst eighty-nine file-manufacturers were recorded; and there were in the staple trades of Sheffield variations as great from what is now known. These were the pre-railway days, when the Royal Mail from Leeds, the Hope from Halifax, the Telegraph from Birmingham, the Royal Union, and a score of other coaches and cars, dashed into the town to the Tontine, the Commercial, the Falcon, King's Head, and other inns; when carriers were many by road, and the "conveyances" by water of Pickford, Smith, Laverack, and Hunt, left the Canal Wharf daily. These days of the four weekly papers,—*Iris*, *Independent*, *Courant*, and *Mercury*,—have passed away, and with them three of the four old recorders of Sheffield have vanished. Its iron manufacture had made great strides from the days when Camden described it as being remarkable "for blacksmiths, there being much iron digged up in these parts," but it was still small. In the wide district of Sheffield a committee included the regions from Chesterfield to Chapel, and found in 1796 about fourteen blast-furnaces there, with a yearly production varying from 250 tons to 1,000 tons,—an output which about forty years ago had risen to more than double that amount. In a narrow range now, Sheffield encloses nine or ten furnaces, but the growth is rather in capacity of production than in number; but the change is the greatest in the production of steel by the newer processes, for the Sheffield firms own 18 out of the 110 Bessemer converters in Great Britain, and a considerable proportion of the furnaces for the Siemens-Martin processes. In its district, also, fifty-one collieries are sinking or working, so that its coal-producing capacity is very large. With coal around it, with vast iron, steel, and cutlery works within and on its borders, the growth of Sheffield has been great, and though in some of the departments of these trades its growth is menaced by the planting of these industries elsewhere, yet it is evident that the meridian of the commerce of Sheffield is not passed.

How has Sheffield grown? In its population, for at the beginning of this century the five townships of Sheffield, Ecclesall, Brightside, Attercliffe, Nether Hallam, and Upper Hallam, had only a population of 45,725, which was doubled by 1841, rose to 185,000 by 1861, at the time of the last census was 239,946, and is now believed to reach 270,000. It is interesting to notice that whilst in seventy years the population of the townships of Sheffield has nearly trebled, that of the townships of Eccleshall has been multiplied ninefold, and that of Brightside twelvefold. In the wide borough there are about 45,000 municipal voters, and nearly 40,000 Parliamentary voters, so that representation has advanced with population. There is also a growth of disease and misery, and thus its public hospital records 90 in-patients, with large numbers of casualty and other cases treated weekly, and in connexion with its women's hospital 150 cases are weekly dealt with, whilst hospitals for eye and ear and other special forms of disease add to the curative influences the cutlery town is proud of. It has other and more pleasant aspects: its public parks are green oases in its dingy streets; its museum admits 3,000 visitors weekly; and four public free libraries set the example to more pretentious towns. Unhappily, there is a considerable proportion of "bibulous clay" in Sheffield, and in the borough 1,200 persons are yearly proceeded against for drunkenness—a fourth of whom are women, and the whole number gives a proportion of 1 person apprehended for drunkenness in about 222 of the population. The fact that the greatest number of apprehensions take place on the Monday graphically points to the source of the evil, and temperance reformers would point to the 566 public-houses, and the 935 beer-houses as the means. The police force is 320 in number,—not excessive for an area of over 23,000 acres. In its local governing bodies, in its associations, in its varied provisions for the needs of its people, the great "city of steel" may well claim to be notable not only by reason of age and extent, but also because of their intrinsic value, as the representations of the works of a free and industrious people. There are the tokens of a vast population in the fact that nearly a score of despatches of letters take place from its post-office daily, and that in addition to the chief office there are sixty-eight receiving-houses, pillar and wall letter-boxes. Seven banks, in addition to saving-banks, transact its financial business. Its churches are more numerous by far than in the days referred to, its places of worship for dissent in all its shades are not only more numerous but more ornate and larger than in the past; and in some cases there has been in the last score of years a very great advance in the numerical strength, as well as in the influence of some of the forms of dissent, whilst in the growth of wealth in the last two or three generations some of the religious bodies of the town have found a reason to rejoice in the golden favours that have been showered upon them. Sufficient facts have been given to show what great progress Sheffield has made in this generation.

But it is in its industrial aspect that Sheffield may best court investigation. It is still the home of the steel trade, in spite of the efforts of some localities to centre it elsewhere. The cementation process is carried on almost exclusively there, and, as we have seen, the newer processes are also largely centred there also. According to the factory returns, there were employed in the cutlery trades in Sheffield over 8,400 persons; in the file, saw, and tool trades, over 6,900 persons; and in the sundry metal trades 4,500 persons; but in addition, much of the work is done beyond the boundaries of the borough; and there are also foundries, plating and brass works, machine shops, and other trades. Great companies have arisen of late, such as those of John Brown, and Cammell & Co., some of which turn out files in countless numbers; another rolls out sheet steel for pens, forms springs, shapes axles, tires, and runs out wire; whilst in another immense armour-plates are rolled; and, finally, in another department, Bessemer iron is made and rolled into rails. But there are companies formed also for the manufacture of special articles. Large firms exist, manufacturing and dealing in varied branches of the steel, cutlery, file, and metal trades, and there are "small masters" who deal with these on a lesser scale, and who furnish in some degree one of the problems of Sheffield. Centring these and other allied trades in its bounds, Sheffield is dingy and noisy,—necessarily. In the day its streets are gloomy, its lanes reecho with the sound of the steam-hammer, the whir of the wheel, the roll and the rattle of machinery, and the monotonous sounds which prove the presence of Tubal Cain's descendants as fully to the ear as the innumerable signs of the workers in metal do to the eye. The waters near run grimy, smoke is in the air, dinginess clings to the buildings, and there is a general gloom over the place. By night, however, it becomes spectacular: the traveller by train sees in approaching the furnace belching forth a hot halo, and sending out a stream of white-hot iron which scorches the air; the rolling-mills are alight with the glow from furnace and from dropping molten charges; now and then a Bessemer converter is seen sending forth its shower of sparks and flame, whilst vast factories appear, alternating with long rows of streets which put off in the night their smeared and grimy look, and by red-lighted windows tell of the home.

Thus, poorly pictured, Sheffield sends its lines of streets undulating for miles. As a town it was not born great, but since the days of Huntsman, it has achieved greatness. It does not appear probable that it will grow in the same ratio in the future as in the past, for the conditions of its great manufacture are changing. One of our chief customers for hardware is not only beginning in some degree to manufacture her own, but she is also beginning to export to us her productions, and we have therefore increased competition to meet both at home and abroad. There is, moreover, a growth of the steel manufacture in other parts of the United Kingdom which is likely to affect in considerable degree that industry in Sheffield. Few parts of the kingdom have large deposits of iron ores suitable for conversion into steel; in the one where large deposits are found there is an absence of coal, and this to some extent balances the cost of production by giving to coal-owning districts an advantage in the manufacture also. But situated as Sheffield is, though it has cheap fuel, it has to bring its crude iron from some distance, and it has heavy charges to pay for the transmission of the product to ports for shipment,—charges which steel-manufacturing places on the seaboard escape to a very great extent. In some degree these facts may affect the future of Sheffield, at any rate, so far as the heavier and coarser branches of its industries are concerned, but in the lighter and more artistic applications of steel, it is as yet unrivalled. It has felt deeply the depression in these trades, because it depends so largely on them, and because its industries are so greatly influenced by the condition of the foreign trades, and by the political state of the world. Beyond its commerce, there is in Sheffield much that is interesting, and much also that deserves the earliest attention of its public-spirited citizens. The conditions of labour of some of its workmen have been improved of late, but much remains still to be done in this respect, and the homes of the people in the older parts of the town need improvement,—in some instances, improvement off the face of the earth. These workmen themselves, too, who have so largely made Sheffield what it is, are still too conservative in opposition to needful changes in their trades, and still too much led by their trade societies, so that, with the keeping up so generally of "Saint Monday," the state of the city of steel is as yet far from what it should be, though in nearly every respect it should be gladly noticed that there are great changes for the better in recent times. Much has been done, but much remains yet to be done, before Sheffield can be considered in that state of corporate prosperity and happiness to which vast populations should aspire.

LONDON BRIDGE STATION.

FOR some years past Mr. J. P. Knight, general manager, and Mr. W. J. Williams, traffic superintendent, of the London, Brighton, and South Coast Railway, have been much exercised as to the best means possible for increasing the facilities for the conduct of the main line and local traffic at London Bridge Station, which has for a long time been very much strained. In 1876 Mr. Williams submitted to the directors and chief officers a plan for the re-arrangement of the "yard," as it is technically called, and the consolidation and completion, in accordance with such re-arrangement, of the signalling and points. Whether the obstructions were mechanical or financial we know not, but the plan is now being carried out under the direction of Mr. Banister, the chief engineer of the company, in concert with Mr. Knight, the general manager, and Mr. Williams, the originator of the design. The changes may be briefly described as the extension of two additional lines into the station, and the conversion of two single into double platforms, to be available for arrival or despatch. The improved station will have eleven lines of rails, each served by a platform, and each available for trains both outward and inward bound. This unusual system of working necessitates a signal for every operation, and, as may be supposed, a very careful system of signalling and interlocking of points and signals, which has been entrusted to the experienced signal engineers, Messrs. Saxby & Farmer, who will now doubtless direct attention to the London Bridge Station of the Brighton Company as their latest *chef d œuvre*. A number of detached signals and signal boxes are to be superseded by two structures, that have, the one the distant signal-box—98 levers, and the other, the home signal-box, as many as 280 levers!—the largest number probably in any signal-box in the world.

In making the alterations, a number of not very sightly huts and buildings have been cleared off, and substantial buildings erected to supply their places. These include a range of guards' and drivers' waiting-rooms, locomotive foreman's room, &c., that support a tank containing 110,000 gallons of water, with a pumping-engine house attached. The brick-work is in picked stock-brick, the semicircular window-heads marked out with red malms and blue Staffordshire strings.

CLEOPATRA'S NEEDLE AND ITS WORKMEN.

WE have had the opportunity of carefully inspecting the now familiar Cleopatra's Needle. It has been exposed partially to public view, and a little at least can be readily seen from the Embankment. We call attention to it now, and while it is in its present *bonâ-fide* state, as it is while in that state that such a monument is really and truly interesting to the lover of past art and methods of workmanship. So much indeed,—may we not say everything?—round and about us of our own antiquities has changed and been modernised, that a glance,—as here,—at a genuine "antiquity," in its rough and time-worn state, is quite a novelty,—a something really strange to see, and leaving an impression not to be got at in any other way. The preparatory work, it may be mentioned, of providing a pedestal for it to stand on is rapidly progressing; and it is earnestly to be hoped that this too elaborate pedestal will not dwarf, and make quite secondary, the monolith itself. We here propose to make note of it as it now is, and while it tells so simply its own story, and to call attention to the workman's part in the granite cutting and carving of it, and which, to say truth, needs no added work to make it attractive.

So many descriptions and accounts of this "Needle" have been already given that it must needs be familiar to most, but there are yet one or two things connected with it which have been hardly noticed; but they are vital elements in the matter notwithstanding. A word or two, then, may at the present juncture prove useful. We are told in an authoritative book on Egyptian history and antiquities, that of all works of Egyptian art in simplicity of form we ask note of this—colossal size, and unity and beauty of sculptured decoration, none can be put in comparison with the obelisks. The Cæsars of Rome vied with the Pharaohs of Egypt in their admiration of the obelisk, but it is not said that these same obelisks were put up in the places where they were found, because they were pretty to look at, or as attractive monuments; they were, indeed, and simply, pieces of the temple furniture, just as much so as any item of church furniture is a thing of use and necessity in a church of to-day. Obelisks never stood alone and isolated as this one on the Thames Embankment is to stand, but always in pairs, and immediately in front of some building or pylon; so that in approaching them, and getting sight of them, they were seen detailed against the huge mass of walling near which they stood, and were thus seen at their very best, their long shadows being all but a part of them.

The use and origin of the obelisk is yet as debateable as ever, and why these were placed at the entrance of the great temples, and always in pairs, is not apparent, and whether or no any pause or ceremony took place on the occasion of the long procession when passing between them into the Temple is not known, and can be only conjectured. All that we do know is, and of this we may feel quite sure, that they were not cut out from the quarry, and brought to their places, at such a vast cost of labour, for the mere sake of putting a something in the places where they stood, but that they had a peculiar and highly significant meaning, and were, indeed, essential parts of the Temple apparatus, whatever that might have been. It may be that, could we be quite sure of the hieroglyphic reading, this would be explained. Objects so conspicuous and so striking must need have been highly symbolical in purport, and must have been as open books to be read in the passing by them. This absence of a building, of which the obelisk formed a part, and the fact of the ever-present but mysterious writing on it, would startle the old Egyptian builders and workmen not a little, could they but return for a brief moment, to look at their work on our river Embankment.

But our object at present is not to go into the history, and even uses, of the obelisk, but to make note of its artistic character, and of the cutting of the hieroglyphics on its huge surface. We have examined this with some attention, and would recommend the study of it to our stone-carvers. The actual material out of which this monolith is cut is hard granite, and right good tools and skilful hands only could have made impression on it. This granite-cutting is remarkable in many ways. It is not simply the carving out of the hard and intractable substance the forms we see, but the indications of manner which are to be noted in the doing of it. Large, and apparently rough, as the granite-cutting is, there is the constant presence of the artist workman to be seen in it. The surfaces are not all of a uniformly dull flatness, as such work would now be made, and as it is done when "lettering" is cut out of stone; but a thorough knowledge of the form and even life of the object represented is here, when such object admits of it. We would here ask the attention of those who have to do with such specimens of the workmanship of so long a bygone day to note this, so that no attempt whatever may be made at "re-cutting," or mending, or "restoring," as it would be called, of the work, or even repolishing it. If this be done, all the antique life of the work goes. We hear that this is under consideration, but if so, before it is done, may we suggest casts of the hieroglyphics, and thus that, at least, a true record be preserved of them.

These hieroglyphics should be studied while the obelisk is where it now is, on a level with the eye. One thing, by the way, little as we know about the matter, was intended by those who erected obelisks, and that was that they should be as ever-open books, to be readily and easily read, they always standing on a low block of granite, so as to admit of this. The letters were close to the eye as could be, and even when near the top of the monolith were so large, and so deeply incised, that they could be readily read from top to bottom. Indeed, the longer this magnificent granite cutting is looked at, the more do you wonder at it, and at the skill with which it is done. In the clear sunlight of Egypt these hieroglyphs show themselves with an almost startling precision and distinctness. The old Roman was justly proud of his lettering on his buildings, and right well he did it, but it quite pales before such works as this, where the *forms* even admit of vitality in the rendering of them. Again, then, may we express a hope that they will not be tampered with, but left as the antique carvers cut them, and no attempt made to "polish" or recut them, or, indeed, in any other way to destroy or mar their individuality and antique expression.

We are here looking at this huge monolith as a specimen of the work that in its time was done in Egypt, and we cannot but wonder at the power of such work, when contrasted with what is now possible. Compare the mechanical appliances *then* and *now*, and well may we wonder at the skill and patience of the old Egyptian quarrymen and granite-cutters, who managed to subdue even this huge mass, and to cut it out of its natural bed, and to afterwards move it into its place. Nothing, indeed, would seem to have been too huge for the Egyptian workmen: blocks, however large and weighty, were quarried and moved long distances, and then set up with an ease and skill which might appal even our mechanical and steam-aided powers. Indeed, we hardly know which to wonder at most, the power displayed by the old workmen in the cutting out and the moving of such huge masses of so hard and solid material, or at the artistic skill and feeling afterwards displayed in the "ornamenting" of them. We have much to learn even in these advanced days, and but few able to doubt it; but if any do so, why here is a proof in point, and he who runs may here read.

We do not intend just now to say a word on the pedestal, but would remind lovers of genuine antiquity that those who designed this monolith never dreamed of anything of the sort threatened!

It is impossible to make note, however slightly, of this really magnificent example of the skill and artistic power of the working artists of Egypt without an earnest hope that no attempt will be made to add to it anything that can be avoided.

It may here be of interest to mention that an Arab writer, in the twelfth century, notes that the obelisks had even in his day "copper caps" on their tops; but these without doubt, he hints, were after-additions by those who had conquered the country. Our object now should, as we think, be to preserve this monument as an *Egyptian* antique, and as one purely and solely Egyptian, and thus to see it, as they of Egypt of old saw it, in all its simplicity and harmony of outline and strength of granite cutting. An obelisk is in itself so simple an object that it is impossible to add to it without, at the same time, taking away from it. Like a Stonehenge block, it cannot be added to without injury.

[A description of the means to be adopted for erecting the obelisk will be found on p. 679.]

ST. PHILIP'S BUILDINGS, COLMORE ROW, BIRMINGHAM.

NEW OFFICES OF THE MIDLAND LAND AND INVESTMENT CORPORATION.

THE business of this corporation having outgrown the accommodation of their old premises, the directors determined to erect new buildings specially adapted to their increasing requirements. It appears, from the last annual report of the corporation that the subscribed capital is 248,900*l.*, of which 62,225*l.* only has been called up. The reserve-fund stands at 100,000*l.* The last dividend was at the rate of 15 per cent. The market value of the shares, with 5*l.* paid, is 12*l.* 10s. The operations of the company are restricted to dealings in freehold and leasehold estates and properties, either by way of purchase or loans.

The ground and first floors, fronting Colmore-row, are occupied by the company, the corner on the ground-floor being the banking-room, over which is the Board-room, the requisite offices for the manager, secretary, surveyor, and clerks fronting Church-street. The other portions are let off in suites of offices. Beneath a well-lighted basement is a sub-basement, let off as vaults.

The frontage to Church-street is 150 ft. The exterior is of Bath stone, and the interior finishings and fittings are of mahogany. The total cost was about 20,000*l.* The buildings have been designed and carried out under the superintendence of Messrs. Bateman & Corser, architects, of Birmingham.

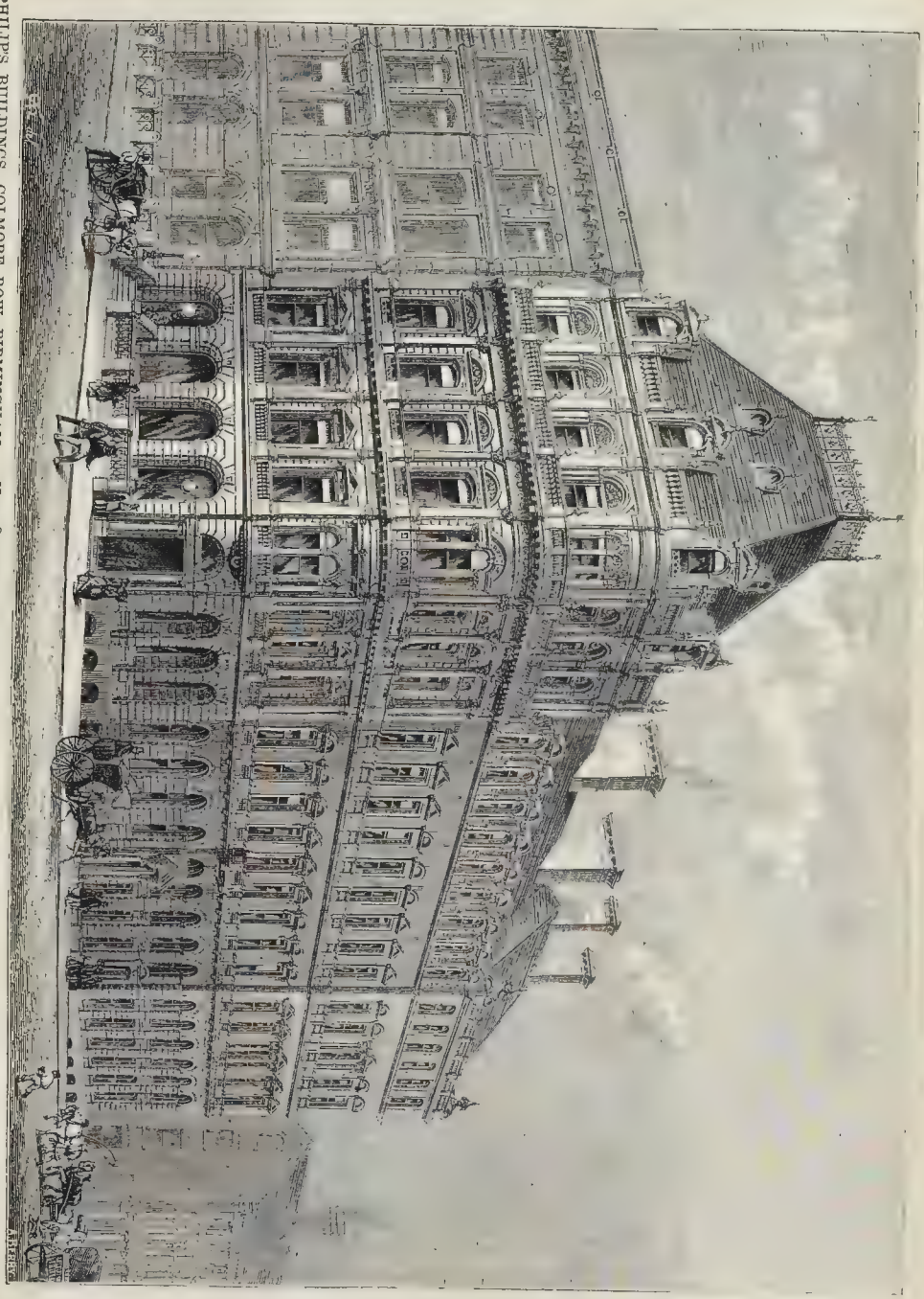
Value of London Property. — Messrs. Herbert Bean & Co. have just sold the freehold premises No. 19, High-street, Borough, containing a ground floor area of 797 ft., for 6,250*l.*, being at the rate of 7*l.* 16s. 9d. per foot.



A. Entrance-lobby to four residences.
B. Principal bedrooms.
C. Flues from the basement story.
D. Entrance to a residence.
E. Carriage gateway; position of iron gates.
F. Fountain.
H. Open stairs serving ten dwellings.
L. Larder.
S. Principal stairs to four residences.
b. Bedstead.

[See p. 659, *ante*.

SHOPS AND HOUSES FOR CENTRAL LONDON: NOW SUGGESTED BY "THE BUILDER."



ST. PHILIP'S BUILDINGS, COLMORE ROW, BIRMINGHAM.—NEW OFFICES OF THE MIDLAND LAND AND INVESTMENT CORPORATION.—MESSRS. BATEMAN & CORSER, ARCHITECTS.



NEW CHURCH AT LONIGO, VENETIA.——PROFESSOR GIACOMO FRANCO, ARCHITECT.

NEW CHURCH AT LONIGO, VENETIA.

THE foundation-stone of the handsome church forming the subject of our illustration was laid on the 24th of June in last year, in the presence of the civic and ecclesiastical authorities and a large concourse of people. The new church in course of erection is situated on the Piazza dei Cavalli, where formerly the old castle stood. The architect is Professor Giacomo Franco, of the Academy of Venice.

The style of the building is an adaptation of the Romanesque of the eleventh century, of which there are numerous examples, the most notable of which, among others, being the churches of St. Michele of Pavia, of St. Andrea of Venice, and St. Zeno of Verona.

Its principal façade is divided into three parts by flat buttresses, the two outer sections, supporting the towers, being of smaller, the centre division of larger, proportions. In the central compartment are three doors; two openings, each crowned by a horizontal architrave enclosed in an exterior arch, supported upon two columns, form the smaller doors. In the principal entrance, however, are four columns supporting an arch, richly moulded, and surmounted by a tympanum.

The cupola, which from the outside appears as an octagon and in two stories, springs from the place where the nave meets the transept.

The total length of the church, which, when completed, will have seven altars, is 229 ft. 6 in., its breadth 98 ft. 6 in.*

* By a rare accident, these particulars were given with a view of a church published by us in March last (p. 321, *ante*), and which, in fact, represented the church of "Our Lady of Perpetual Help," erected in Boston, U.S., the correct particulars of which we now print.

CHURCH OF OUR LADY OF PERPETUAL HELP, BOSTON, MASSACHUSETTS.

THE Mission Church of "Our Lady of Perpetual Help," in Boston,* is remarkable both as a testimony to the missionary activity of the Redemptionist Fathers in America and as a building.

A rapid sketch of the labours of the Fathers may, therefore, well preface the account of the architecture of the new church. The first Redemptionists came to America about forty years ago from Germany, and began their activity in a miserable hut at Rochester. At that time there was a great want of clergy in the country, and German Catholic immigrants were especially forsaken. To supply this want, the Fathers, who were gradually reinforced from Germany, founded communities at Rochester, New York, Pittsburg, Baltimore, Philadelphia, Buffalo, New Orleans, Chicago, and elsewhere. The activity of the missionaries, however, was not confined to German Catholics; they soon extended their scope, with the growth of the order, to other nationalities; and thus at the present day there exist at New Orleans, by the side of the German, also an English and a French church. They also erected English missionary houses at St. Louis and New York.

About six years ago the Fathers acquired in Boston,—where, not so very long ago, Catholics were persecuted by the Puritans of the New England States as dangerous to the country,—an estate, in order to found an English mission. Soon the old buildings of which they had become the owners were changed into a convent; and by the side of it rose a small wooden church, erected under the protection of "Our Lady of Perpetual Help." Since then ten or more Fathers have been actively employed in advancing the objects of the mission in the several parts of New England. For the many Catholics of Boston the small wooden church was soon too confined.

* A view of which, erroneously described as a new church in Venetia, will be found on p. 321, *ante*.

The success attending their work encouraged the Fathers to begin the construction of a suitable edifice, and Mr. William Schickel, well known as an ecclesiastical architect in America, was commissioned to prepare plans. The foundation stone was laid in the spring of 1875, and in April last the church was dedicated by the Archbishop of Boston, the whole being completed with the exception of the towers. The style adopted is the Romanesque, principally on account of the severe climate of Boston, the aim of the architect having been to combine simplicity with solidity.

The new fane stands on a hill, and towers above the whole city of Boston. Its outside length is 215 ft., its breadth in the cross-aisle or transept, 115 ft.; the total height of the towers is to be 200 ft. The inner width of the nave is 40 ft., and its height 70 ft. An octagon cupola of a diameter of 40 ft. and an interior height of 110 ft., springs from the crossing. The materials are stone found near the church, cased with granite; all the cornices and portals are also of granite, and the windows are of a hard grey sandstone.

In the interior, columns of polished granite, with capitals carved in stone, support the arches separating the nave from the side-aisles; over these is a triforium, above which is a clearstory. The sanctuary is a semicircle; round it the arrangement of the arcades of the nave continue. In the sanctuary and at the ends of the cross-aisle six altars are placed; a seventh has been put in the semicircular lady-chapel attached to the western end of the cross-aisle. The rounded arch is rigidly adhered to throughout.

THE HEALTH AND SEWAGE OF TOWNS.

WE complete our reports* of the recent conference on this subject at the Society of Arts by giving summaries of those papers which, though submitted to the Conference, were not formally read or discussed.

Mr. J. C. Melliss, C.E., submitted a paper giving additional information respecting water-carried sewage treatment. He referred to the works of the Rivers Purification Association at Coventry,† as to which he remarked:—

"It appears worthy of notice that each year's experience has the effect of reducing the cost of dealing with the sewage. This is brought about in various ways, but perhaps chiefly through improvements in the method of manufacturing the chemicals employed. It will, doubtless, be remembered that the works at Coventry included several buildings and a large amount of machinery for drying the sludge into a portable manure by artificial heat.‡ This is not now found desirable, as the sludge is sold or disposed of in the immediate neighbourhood of the works in a similar condition to farmyard manure, and to bring it into this condition presses are about to be employed instead of the drying-machine. These alterations will dispense with some 4,000*l.* worth of buildings and machinery, which are now no longer in use at the Coventry works. As some of these changes have only very recently been put into operation, it may be as well to defer for another year giving the reduced cost of working, when accurate accounts can be supplied. It has upon former occasions been stated that Coventry is representative of a thoroughly manufacturing town, so far as its sewage is concerned, and does not afford data for a direct comparison with towns having domestic sewage. Information relating to domestic sewage may, however, now be obtained from the town of Hertford, where the same process is in operation, and where the sewage is of a domestic character. The Corporation of Hertford have made a contract similar to the Corporation of Coventry, and the following particulars of the treatment of the sewage of this place may be useful.

Hertford is situated on the River Lea, whence the New River Company derive part of its water supply, and purification of the sewage needs to be efficiently accompanied, the population is 7,169. The average daily flow of sewage, owing to a very large leakage of subsoil water into the sewers, was once as high as 1,600,000 gallons, but is now estimated at 1,000,000 gallons, or 140 gallons per head of the population. Water-closets are in general use.

From the year 1858 to 1875, the sewage was subjected to the lime process, and then was dealt with for a time by the Phosphate Sewage Company, under the impression that a valuable manure would result from its treatment. The expectations were not realised, and a short time ago the lime process was reverted to, but failed to accomplish the requisite degree of purity, and the Coventry process replaced it. The works are exceedingly simple, and the effluent water after chemical treatment is passed through artificial filters instead of the high land as at Coventry, there being no land available."

"Water-Carried Sewage and Cement Manufacture" was the title of a paper submitted by Mr. James Richards, secretary of Scott's Sewage Company (Limited). The author remarked that by the process, as now to be seen in operation at the Company's works at Duckpits, near Burnley, Lancashire,—

"A clear effluent is obtained, possessing improved fertilising properties, if required for agricultural purposes, but which otherwise may be allowed, without detriment to water, to flow into any river, whilst at the same time, all the nuisance arising from the noxious sludge is avoided by its conversion into Portland and other hydraulic cements, which compete in quality and price with the best cements sold in the neighbourhood.

The Corporation of Burnley, some years ago, were prohibited by injunction from allowing the effluent from the sewers of the town to flow into and pollute the river Calder. The Corporation and Scott's Company entered into a contract, whereby Scott's Company engaged to produce, and have produced, a clear effluent, the injunction has been put aside, and the effluent now passes into the river, and the Corporation has recorded its satisfaction at the results.

The works at Duckpits have been erected by the Corporation of Burnley, after the designs of Mr. W. B. Bryan, C.E., and exemplify the latest scientific views on the subject, in order to deal with all the sewage of the town and district except the floods of storm water, which pass through the sewers, and at times are great, caused by the heavy rains, which in 1876 varied from 38 in. to 44 in. at Burnley.

The Corporation deliver the sewage into the tanks, and then Scott's Company purifies it by lime precipitation and filtration through coke. The clear effluent passes into the Pendle water, which joins the river Calder.

The sludge, always an offensive difficulty, which has not hitherto been dealt with satisfactorily, is entirely cleared away by its conversion into Portland, hydraulic, and Roman cements. All cements that have hitherto been made have been sold or used in the works.

Some doubts have been expressed, if in the wide extension of this system, there will be a sufficient demand for the cements; but they may be answered by remembering that as long as buildings are wanted, and concrete walls are cheaper and more durable than brickwork, the use of cement is practically unlimited. . . . . .

The total cost of the cement process gives satisfactory results in the effluent, and disposes of the sludge at a rate as cheap as the average cost of the several experimental processes stated in the Local Government report of 1876; and will not exceed 7*d.* in the pound yearly on the rateable value, unless the local circumstances are very unfavourable."

Mr. William White presented a paper entitled "Sewage Precipitation,—a Recommendation." While admitting that irrigation is the best mode of dealing with sewage, wherever practicable, he remarked that:—

"It is certain that there are many towns so situated that irrigation is an impossible prescription, unless at ruinous expenditure; and there are other towns where the sewage is so contaminated with manufacturing refuse as to render it a source of blight instead of fertility.

Communities so circumstanced are, therefore, compelled to resort to precipitation; but left without competent counsel and guidance, they are apt to fall into the hands of adventurers whose promises are as liberal as they are fabulous. What do the run of town councillors know of the chemistry of sewage? And yet on such councillors is laid the burden of selecting the process whereby foul waters are to be turned into clean. Left to act according to such light as they can command, it is not surprising that they become responsible for many absurdities. One has not to go far to find sewage subjected to treatment which effects little improvement at considerable cost. There is a town in Staffordshire where, at this hour, sulphuric acid and lime are simultaneously run into the current of the sewage, and where mayor and aldermen go about proclaiming that nothing can be more successful than the system they have adopted.

Again, if one fact has been made clearer than another, it is that the sludge deposited from sewage is worth little or nothing to the farmer; and yet a town council recently entered into an onerous contract on the faith of obtaining 20*s.* per ton for their raw sludge.

Again, there are many sewage works where sewage already alkaline is dosed with lime, and an effluent considerably more pernicious than the original sewage turned into the rivers. On some occasions remonstrance is met with the observation, that although the treatment may do little good, it is necessary to do something to satisfy the Local Government Board; and apparently the Board is easily satisfied.

Now, what I wish to maintain is, that it is a grave mistake for the Local Government Board thus to leave towns to their own devices in the matter of sewage precipitation. I have nothing to say against irrigation, the ideal method of sewage disposal, but where irrigation is impracticable, the most efficient method of precipitation should be indicated or recommended. And to do so to good purpose, it would be advisable to issue a Commission to examine and report upon methods of precipitation. It is of great importance that the proper use of lime should be defined, so as to check its perfidious and inadequate employment. Should lime be proved useful, there are other precipitants, such as sulphates of aluminum and iron, the chlorides of iron, aluminum, and calcium, and the various solutions of the phosphates of calcium and aluminum. Along with the definition of the uses of these chemicals would go a classification of various classes of sewage, contrasted or blended, domestic or manufacturing.

In short, without such information and guidance, it is matter of luck whether a public body that 'goes in' for precipitation does not commit some incredible folly. . . incredible, I mean, to a chemist. The ignorance and assurance that stalk about delivering judgment on sewage purification have to be met to be appreciated, and it is high time that they be confronted with sound information."

Mr. J. C. Melliss also submitted some "Remarks on the Cost of Systems given in the Local Government Board Blue-book on Sewage." He remarked that,—

"In the year 1875, the Local Government Board appointed a committee to inquire into the several modes of treating town sewage. In the following year this report was made, printed, and published. . . .

The committee arrive at certain conclusions from the results of their labours; and conclusions 5, 7, and 8 are as follow:—

5. That, as far as we have been able to ascertain, none of the existing modes of treating town sewage by deposition and by chemicals in tanks appear to effect much change beyond the separation of the solids, and the clarification of the liquid. That the treatment of sewage in this manner, however, effects a considerable improvement, and, when carried to its greatest perfection, may in some cases be accepted.

7. That town sewage can best and most cheaply be disposed of and purified by the process of land irrigation for agricultural purposes, where local conditions are favourable to its application, &c.

8. That land irrigation is not practicable in all cases, and therefore other modes of dealing with sewage must be allowed.

These constitute the pith of the conclusions as far as they touch upon treatment of sewage by land irrigation and chemicals; and they are very generally interpreted to, and on the face of them do, favour the employment of the former method. A careful examination of the figures as regards cost of treating sewage by land irrigation and by the employment of chemicals, given in the abstracts which accompany the report, pages xxxvii. to liv., however, will show plainly that in the majority of cases land irrigation is more costly than where chemicals are employed; so that, in fact, the data do not support the conclusions. This is a fact which perplexes sanitary authorities, and deters them from making progress when desirous, as they naturally are, of obtaining what they require in the most economical way. . . . .

Nearly two years have elapsed since this report was published. Its inconclusiveness has had the effect of encouraging local authorities in a policy of stagnation, and it does not appear that the Local Government Board have taken further steps in the matter. This is to be deeply regretted, as, considering the very large sums of money that have been spent in dealing with sewage, and the large sums of money that must still be spent, the importance of the subject cannot possibly be overrated. Much useful information is being brought together by the Society of Arts, as well as by private individuals, but the Local Government Board alone possesses the power to obtain full information on this subject. It therefore rests with that Department, either as at present constituted or probably enlarged so as to grasp and deal with the enormous sanitary interests now committed to its care, to continue these inquiries, and without any partiality to enlighten sanitary authorities, and through them the ratepayers, as to the best and most economical methods to be employed, and to define what are the general local conditions which would govern the selection of one system as preferable to another."

In conclusion, we have to mention the paper by Dr. F. T. Bond, "On Some Defects in the Public Health Act Amendment Bill, as amended by the Select Committee of the House of Commons." He remarked that—

"The Bill is an excellent illustration of the way in which the numerous defects and shortcomings of the Public Health Act may be dealt with in a practical way by taking special sections of it which relate to separate subjects, and making a careful inquiry into the legislative amendments which are needful and practicable in regard to them. Such amending Bills have a reasonable prospect of passing through Parliament, even when not undertaken by the Government, where a Ministerial measure for the amendment of the whole Act would have but a remote chance of success.

The machinery which the Public Health Act Amendment Bill—which relates chiefly to water supply—provides for the discovery of cases of insufficient supply of water in rural districts, and for the rectification of such defects where their existence is satisfactorily established, is excellent up to a certain point. The owner of a house which is not provided with a supply of drinkable water within reasonable distance can be compelled by the sanitary authority to provide such a supply, if it can be obtained at a reasonable cost, or at one which represents the capitalised value, on an average, of the water-rate which such an owner can be obliged by the law at present to incur for a house where a system of public supply by pipes exists. . . . .

The next step which a sanitary authority is empowered to take, is the natural sequel to the first, and has been evidently suggested by the provisions which the law at present makes in regard to allied matters, such as drainage and closet accommodation, viz., that where the owner of a house neglects or refuses to do the work which he is thus called upon to do, the sanitary authority may do it for him, and may either recover the cost from him by summary procedure, or may charge it upon the premises as a private improvement expense, for which the authority is empowered to levy a special rate. Now, it is at this point that it seems to me that a hitch is likely to occur in the working of the machinery created by the Bill. There is no doubt that there is a large number of cottages to which its provisions are applicable, which belong to owners who are worth the powder and shot of legal proceedings to recover the cost which the sanitary authority may incur in remedying their default. In such cases the course of procedure will be very simple, and sanitary authorities will have no inducement to refrain from adopting it on account either of the risk or the trouble in which it may involve them. But every one who knows much of rural districts must be aware that a very large, possibly the largest, number of houses which will thus require the office of the sanitary authority to be promoted on their behalf, either belong to owners who are so utterly impecunious as to be unable to provide the means which will be necessary to carry out the works required by the sanitary authority, or their ownership is so tied up amongst several holders with various degrees of interest, that it is practically impossible to get them to do anything, and the sanitary authority must do it on their behalf.

Now, the first point which suggests itself here is to inquire whence the capital is to come which will be required to pay for the works which sanitary authorities will thus have to carry out. . . . .

So far as the Bill runs at present, there appears to be no alternative but for the sanitary authority to raise the sums required for these works by rate. Now, although this rate will only be a temporary one, and although the amount raised by it would be eventually repaid, so that the district from which it is raised would not, in the long run, be at any loss from it, it is very desirable to avoid having recourse to it, if it be possible to do so, since the rural mind is much more ready to apprehend the mere intention of raising a rate, and to resent it, than to grasp the fact that such a rate would be only a loan on the part of the district to the owners of the property benefited. There is, however, one provision which may be suggested as being calculated to meet this difficulty, and which might even create a desire on the part of sanitary authorities to carry out energetically the provisions of the Act, and that is, to enact that where the cost of the contemplated works is proposed to be defrayed by a private improvement rate, the sanitary authority may, in making the rate, add to the sum assessed on the premises for the repayment of the cost of the works, such additional sum as may be required to pay interest on the capital borrowed for carrying them out. . . . . It is only fair that if the money required in order to rectify the shortcomings of landlords has to be borrowed by rates imposed from time to time on the other inhabitants of the district, the latter should be compensated by not only being paid the loan back in its entirety, but with such interest as would cover use of the money itself, together with a contribution to the general expenses of the sanitary authority. If such an arrangement were made, and a landlord were required to pay, say 8 or 7 per cent. on the cost of the works executed in thus improving his property, he would be no loser by the transaction, and the sanitary authority would be a distinct gainer. I believe that if this principle were extended to sanitary improvements of all kinds, *i.e.*, if sanitary authorities were empowered to themselves undertake works for the sanitary improvement of certain property, and to charge private improvement rates, which would not only cover the cost of the improvement, but would leave a moderate margin for the benefit of the authority itself, a large field would be opened for the improvement of such property throughout the country, which both authorities and the owners of such property would be glad to cultivate.

The advantages of such an arrangement would be obvious. It would place local authorities in the same relative position with regard to the owners of property in their own district as the Public Loan Commissioners, representing the nation, now hold in regard to the authorities themselves, by giving such owners the help of the general commercial credit of the authority upon which to borrow money for the sanitary improvement of their property, just as the authorities now avail themselves of the credit of the nation for the same end in regard to their schemes; with this important difference, that the sanitary authority, being on the spot, would be able to exercise a more efficient control over the expenditure of the money which it could lend than the Public Loan Commissioners can.

There is, however, another possible solution of this difficulty which may be suggested, and that is, that the sanitary authority should be empowered to borrow the money required for carrying out these works directly from the Public Loan Commissioners, in the same way as it can do at present in the case of schemes of large extent. . . . .

I believe that if the provisions which I have thus suggested were incorporated with the Bill, they would not only remedy defects in it which will, I fear, if not removed, greatly interfere with its practical success, but they would make it a model on which to re-mould other portions of the Public Health Act, and thus greatly facilitate the much-needed amendment of the Act."

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* See pp. 555-557 598 600, *ante*.

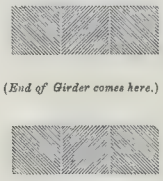
† Described in *Builder*, vol. xxxv., p. 1038.

‡ Described and illustrated in the *Builder*, vol. xxxiv. (1876), pp. 191-192, 466-467.

"CLEOPATRA'S NEEDLE":

HOW IT IS TO BE ERECTED.

ON Saturday afternoon last a large number of the members of the Civil and Mechanical Engineers' Society visited the works now in progress at the Adelphi Stairs, Victoria Embankment, for the erection of the famous obelisk which has, by the generosity of Dr. Erasmus Wilson, and the engineering skill of Mr. John Dixon, been brought to this country. The perilous vicissitudes of its voyage will be fresh in the recollection of our readers; we can only hope that no mishap of any kind will occur during its erection either to the obelisk itself or to those engaged in the work. The visitors on Saturday last were received by Captain Carter, who commanded that unique craft the *Cleopatra* cylinder-ship until wind and weather necessitated the abandonment of the vessel and cargo. Captain Carter was assisted in his explanations of the works in progress by Mr. Double, Mr. Dixon's manager. Briefly stated, the position of things is as follows:—The cylinder and its contents having been floated some three or four weeks ago over the temporary gridiron made to receive it on the up or Westminster side of the Adelphi Stairs, was, before being allowed to permanently rest on the gridiron, canted over on one side by the simple expedient of shifting the ballast. As canted over, the bottom of the vessel faced the Victoria Embankment, while the upper or deck side faced the Surrey shore. The vessel was canted over in order that that side of the monolith which is least "weathered," or, in other words, which retains the most sharply-cut hieroglyphics, should be parallel with and face the Embankment roadway. The side which will face the river is the most weathered of all, the remaining two sides, which will be at right angles to the Embankment roadway, being not so much worn. The vessel having been canted over, the first thing to be done was to begin pulling it to pieces. Nearly all the iron plates were removed, the ribs remaining intact, and the obelisk, wedged up from the gridiron, remained submerged at high tide. During low tide the obelisk, which has its point or pyramidion in the direction of Waterloo Bridge, has been slowly moved forward by means of hydraulic jacks, until, at the time of writing (Wednesday), the obelisk has emerged, point foremost, a considerable distance out of its iron shell, the apex nearly touching the stairs on the up or Westminster side. The next operation will be to raise the obelisk bodily to a height sufficient to clear, and to allow of its being traversed partially over, the landing between the two flights of stairs. When the obelisk has been centrally placed over this landing, it will be again raised to a height just sufficient to clear the two masses of granite (part of the Embankment structure) which will flank the obelisk when erected, and which masses it is proposed to surmount with sphinxes. Having attained this height, it will be moved laterally towards the Embankment roadway until it lies across the centre of each of the flanking masses or pedestals of granite referred to. The obelisk will be moved in all cases by means of hydraulic jacks, and carefully "packed" as the work proceeds, so as to prevent undue strains upon it. The obelisk having been got into the position indicated, *i.e.*, lying horizontally across the spot upon which it will stand, will be cased in its central portion with a wrought-iron jacket, about 20 ft. long, and riveted at the angles. This jacket will be made to fit pretty tightly by means of wedges of wood, and in order to prevent the stone from slipping out of this jacket a wrought-iron strap will be carried round from side to side under the foot of the obelisk. This jacket, which will weigh about 16 tons (making, with the obelisk, which weighs about 186 tons, a total of about 200 tons), will be fitted with strong projections or trunnions on the two sides facing the Embankment roadway and the river respectively, and these trunnions will rest upon two specially-made wrought-iron girders lying parallel with the obelisk itself. Each of these girders will be raised at each end by means of a hydraulic jack, and will work in and be guided by the recesses left in each of the four main uprights of the specially-designed scaffolding which will then have to be erected. Roughly speaking, these four uprights will form the corner boundaries of an oblong space 17 ft. by 8 ft. 6 in., the two longer sides being parallel with the obelisk and spanned by the girders before mentioned, and the obelisk projecting for about a third of its length beyond each of the shorter sides of the imaginary oblong described by the four uprights. These uprights will be about 50 ft. high, and will each consist of six "sticks" of timber, 12 in. square, arranged and bolted together three and three, parallel with the obelisk, with a space 19 in. wide between each six for the ends of the girders to work in, thus:—



(End of Girder comes here.)

These uprights will, of course, be thoroughly braced together and stayed and strengthened by raking struts, &c. Each end of each girder will be simultaneously raised and "packed," until the girders, supporting the obelisk in a horizontal position by means of the trunnions of the iron jacket before described, shall have attained a sufficient height to allow of the whole mass being swung round on its trunnions, so that its base shall be but a short distance higher than the pedestal prepared for it, when, all being right, it will be gently lowered to its position. The pedestal, we may say, will rest on a foundation of Portland cement concrete, carried down to a depth of 40 ft. to the London clay. This part of the work has been executed by the Metropolitan Board of Works, for and at the cost of Mr. Dixon. The pedestal itself will be of hard bricks, set in Portland cement, and faced with blocks of grey granite (the same as that used for the Embankment wall) of considerable size. Of this pedestal a portion has been already erected, but the remainder will have to be built up after the obelisk has been raised, by the means described, above the highest course of the pedestal. A shallow groove will be provided on the top, in order to allow of the removal of the wrought-iron strap, already mentioned. Although the four corners of the lower part of the obelisk are very much abraded, there still remain about 24 superficial feet of flat surface at the bottom, and this extent of bearing surface will, it is believed, be fully sufficient to ensure stability.

We believe that nothing is definitely decided as to the proposed sphinxes; but we may note that, in the "Visitors' Book," a gentleman has put on record the substance of a conversation he had with the late Mr. Joseph Bonomi, who expressed the opinion that, if sphinxes are to flank the obelisk, they should be of a date coeval with that of the obelisk itself. Mr. Bonomi only knew of two such sphinxes,—one in the National Collection at Paris, and another in the Duke of Northumberland's collection at Alnwick,—and he suggested that one of these should be adopted as the model of those which it is proposed to place in juxtaposition with the obelisk.

The work of getting the obelisk into position must necessarily proceed slowly. It is hoped, however, that the work will be safely effected by the end of August.

GAS AND WATER TYRANNY.

SIR,—On Wednesday last, a neighbour of mine in Walton-street, Chelsea, a ratepayer of a quarter of a century's standing, came home from his business out of doors to find the gas cut off in his workshop. He was not hard up for a quarter's gas, and the man who was sent to commit this act of violence was well aware of the fact that the gas account had always been paid for those premises by cheque regularly, but being armed with a special authority he was inexorable, and then and there proceeded to commit damage and trespass upon the premises of this old-established ratepayer. By-the-bye, it was not so very far from the place where the water was cut off to the danger of the health of the neighbourhood, just a year ago, as your readers were informed, that this act of tyranny was committed, and I want to know how it happens that gas and water companies have the power of health and disease, light and darkness, committed to them without reserve. How is it that railway and steam-boat companies cannot seize your property for debt without an action at law? How is it that tradesmen are not better protected against fraudulent customers?

Is it because such a lot of shareholders are in Parliament, in the vestries, and other representative assemblies, that they can do these things? Anyhow, I fancy these tyrannical gentry will have to use a little more discretion in committing their violent raids and sudden depredations upon the premises of citizens; or the time will come when a school-board educated public will kick such legal burglars out of their ill-gotten power, and protect the already suffering ratepayers from outrage.

PRINCE'S CRICKET GROUND.

OBITUARY.

The late Mr. Fogerty, Architect.—Mr. William Fogerty, whose death at a comparatively early age took place a few weeks ago, was the second son of Mr. John Fogerty, C.E., late of Limerick. A few years since Mr. W. Fogerty settled for a short time in London, and, subsequently, some time between 1871 and 1875, proceeded to the United States, where he designed some buildings. Returning, two or three years since, to his native land, he commenced the practice of his profession in Dublin, where he resided until his death. On his return from America Mr. Fogerty read some papers on American Architectural Practice at the Irish Institute meetings. We have not a complete list of his works to hand at present, but among others of the buildings he designed the following are mentioned in the *Irish Builder*:—The Protestant Hall, Limerick; the establishments of Cannock & Tait, George-street; Mr. Hogg's; Dr. and Messrs. Boyd's (now in course of erection); a mansion for Mr. Phelps, Castleconnel; the Munster Arcade, Cork; the Lunatic Asylum, Ennis; Mr. Revington's house, Ardagh; an Episcopalian church in New York; the Wesleyan College, Belfast; Violet Hall House, Bray; the residence of Mr. Edward Griffin, the son of the late Bishop of Limerick; the Smith O'Brien Mausoleum; and the monumental cross erected by the late Venerable Archdeacon Goold to the memory of his daughter. He was carried off at the age of 44, by a preventible disease,—small-pox,—sadly prevalent in Dublin at the time.

"SLAG WOOL."

THIS substance was referred to by Mr. Charles Fowler, in the course of the discussion on fireproof construction at the recent Conference of Architects (see p. 612, *ante*). The *Mining Journal* says that although slag wool is a non-conductor of heat, sound, and electricity, and also incombustible, it has not yet been used for many technical purposes, on account of its giving rise to the emission of free sulphur, ether, and hydrogen, and filling the air with fine penetrating dust. On the same authority, an invention recently patented by Mr. Charles Baatsch does away with these objections, and slag wool, prepared according to his invention, will neither emit dust nor sulphuretted hydrogen, even when brought into contact with acids. In preparing slag wool according to his invention, he first forms it into pads or bricks, according to the use the slag wool is destined for. For this purpose he uses perforated moulds, made of any suitable material, such as wirework, perforated metal, or wood. For certain purposes the moulds may be dispensed with, and the slag wool, where its surfaces are exposed to the air, may be painted over with an alkaline silicate. The invention is useful for many purposes; the slag wool so prepared can be used not only for lagging boilers, covering steam-pipes, and hot and cold water-pipes, but also in dwelling-houses, for stuffing floors and partitions to make them fire and sound proof. For these purposes it is specially adapted, as no vermin can live in it. When covering floors or roofs with slag wool, Mr. Baatsch, instead of employing bricks, first lines or covers the floor of roof with cloth or paper, well saturated with the liquid, and then applies the slag wool in its natural condition over this cloth or paper, and covers it with a similar coating of cloth or paper.

THE BRITANNIA TUBULAR BRIDGE.

SIR,—A letter appeared in your paper from Mr Baker challenging some observations of mine, made during a discussion which ensued on the paper read by Professor Barff before the Architectural Congress on "A Process for preserving Iron from Rust."

The assertion by a previous speaker, Mr. Carroll, that "tons upon tons of rust were taken monthly from the tubes of the Britannia Bridge," I thought then, as I think now, was founded on some misapprehension; it is, therefore, an error to suppose I affirmed an assertion with which my judgment did not agree. So far from this view of the instability of the bridge, I should not hesitate to travel weekly through it for the residue of my life. That which I affirmed was that all iron structures in their natural state are liable to rust and decay, and that some years since I had seen a boy come out of one of the tubes of the Britannia Bridge covered with rust; and that if the process for prevention of rust, such as the one under discussion, could be applied to large structures, the gain would be incalculable.

Incidentally, the prominence given to this question may result in some good, a communication having been made to me which leaves little doubt that large iron structures, already erected, may be made impervious to rust. This I purpose testing strictly, and shall be glad if my anticipations are realised.

F. A. SKIDMORE.

MONUMENTAL.

Lord Lyttelton.—A gateway has recently been erected in the churchyard at Hawarden as a memorial of the late Lord Lyttelton. It was made to the designs of Mr. Douglas, architect, Chester, by the St. Pancras Ironwork Company, of London, and is of wrought iron.

The Bishop of Brechin.—Shortly after the death of the late Bishop of Brechin, a movement was originated for the purpose of erecting a monument to his memory. At a meeting of the subscribers it was resolved that a recumbent statue of the deceased bishop should be obtained and placed in St. Paul's Church, Dundee, where he had so long ministered. The statue is now being erected in a niche in the east wall of the chancel. The statue lies below a canopy in alabaster, and about 3 ft. above the level of the chancel floor. The canopy is in the Early English style, and is richly moulded and carved. The arches,—two in number,—are cusped and supported by shafts of red and green marble. In the centre of the wall the arms of the late bishop have been accurately carved. The canopy, from its apex to the floor, is 15 ft. high, while it is about 9 ft. in length. The statue has been cut out of a fine block of marble. The deceased is represented in his official robes, his hands are folded on his body, his pastoral staff lying on his left arm. The monument was designed by the late Sir Gilbert Scott, and has been executed by Messrs. Farmer & Brindley.

Kirke White.—The proposed memorial of Kirke White at Cambridge has assumed a wider shape than was at first contemplated. At a meeting of subscribers held the other day, the Master of St. John's said it was understood when the old church was removed that some memorial should be provided to mark its site, and to record the names of the distinguished personages buried there, amongst whom were Kirke White. After some discussion as to the form of the memorial, the following resolutions were unanimously carried:—Proposed by Mr. J. D. Digby, and seconded by the Master of Trinity, "That this meeting expresses its approval of the proposal to place on the site of All Saints' Old Church a memorial cross." Proposed by the Mayor of Cambridge, seconded by Mr. Bulstrode, "That the cross suggested by Mr. Beresford-Hope, M.P., be adopted in its general design." It was resolved, on the motion of the Master of Trinity, seconded by the Mayor, that the committee be instructed to avail themselves of the professional assistance of Mr. Fawcett, the architect.

THEATRE WORK.

SIR,—I was in hopes your interesting account of the new Opera-house at Dresden would be supplemented by correspondents with some further information. There can be no doubt not a few architects travelling abroad, with sketch-book in hand, have visited this building during its erection, and must have been impressed with the careful workmanship throughout, and find that it would be difficult to point to any building in England of late years built with the same care, to the fullest intent and purpose of the terms of the specification. Any passer-by the New Law Courts may notice, on those portions already roofed in, a labourer with a piece of stone in hand, and a bucket of water, rubbing down the face-work, in lieu of cleaning down and pointing at the completion, as usually described in specifications. A great deal has been said about the prevailing inferior workmanship, and the British workman being blamed for it. If the public will accept the plea they must be content to pay for it. But there is another vital important arrangement at the New Opera-house, which requires more especially to be noticed,—the heating and ventilation arrangements by Dr. Weiss, whose standing in his profession is a sufficient guarantee for the success of the work intrusted to him; therefore, it seems, this much-vexed question has been dealt with with due care. Enough is being said, written, and paid for heating and ventilation; but has there been a system carried out in England with anything like the success we meet with in Paris, Vienna, and Dresden? A. A.

New Baths for York.—New baths for York, situate in St. George's Fields, have been commenced, according to plans prepared by Mr. Styan, the City Surveyor. Mr. Taylor is the general contractor.

NATIONAL PROVINCIAL BANK, LOFTUS-IN-CLEVELAND.

THIS building, erected for the Company by the Right Hon. the Earl of Zetland, was opened for the transaction of business on the 13th ult. The premises occupy a commanding site in the High-street, to which there is a frontage of 35 ft. The ground-floor contains the banking-room, 25 ft. by 17 ft., with manager's room, strong room, and lavatory adjoining. The first and second floors contain the necessary rooms for a manager's residence.

The external walls are executed in dressed stonework from the quarries of Lord Zetland, in the neighbourhood, and the principal woodwork is in pitch pine varnished.

The bank has been designed and carried out under the superintendence of Mr. Alfred J. Martin, architect, Darlington, the style being that of the Early French Gothic period.

Messrs. Farmer & Brindley, London, executed the carving.

BUYING WATERWORKS BY ARBITRATION.

A FEW weeks since the *Builder* noticed the sale by arbitration of the Stockton and Middlesbrough Waterworks to the two municipalities.

At the last meeting of the Stockton Corporation, it was explained by the Finance Committee that the Council required 400,000*l.* this month to join the Middlesbrough Corporation, who required the like amount to pay for the waterworks in question.

The Mayor and the Chairman of the Finance Committee had both been to London, endeavouring to borrow the little sum of money, and both these gentlemen said it was impossible to borrow the amount at 4 per cent.

In this fix, the Council deputed the Finance Chairman, Mr. Robinson, to immediately return to London, with power to obtain the loan of 400,000*l.*, on such terms, and in such a manner, as he might think advisable.

HORSES AND ASPHALTE.

SIR,—Referring to a letter in the *Builder* of the 15th inst., we assert that the remedy for these numerous and painful accidents is not that of discarding this, in many respects, valuable pavement, but the use of an anti-slipping horse-shoe, which we are preparing to introduce, after practical experience of its efficiency for a year in London streets.

J. JACKSON & Co.

ASPHALTE.

SIR,—Referring to Mr. Bradbury's letter in your impression of the 25th ult., from which your readers may infer that the present Asphalte Paving Works for the Municipality of Paris are being executed with Neuchatel asphalte, allow me to state that the asphalte now being laid in Paris, and referred to in your Paris letter of the 11th ult., is largely supplied from the mines of the Société Française des Asphaltes. JNO. KNIGHT, Sec.

VENTILATION.

SIR,—I shall be glad if you will kindly allow me to make a few remarks upon this subject, which is of such great importance, and has of late years been occupying a good deal of my attention. I admit it is a very difficult one to deal with; but it is much simplified by our keeping steadily in view a few elementary facts. No one denies that air or gas by being heated expands, becomes lighter, and ascends; when cooled it contracts and becomes heavier, and consequently descends.

It is generally admitted by those who have carefully experimented, that diffusion readily takes place between gases of different densities, even when divided by very fine material, and that when once mixed they will not again separate. Expired air is necessarily warmed by passing through the lungs, the carbonic acid is intimately mixed throughout; no experiments have yet shown that it separates, but, on the other hand, go to prove that it continues to diffuse itself through the surrounding air.

If we carefully study the experiments named in Mr. Snell's letter of May 18th, bearing in mind the above facts, we shall find that they are not so contradictory as at first sight appears.

Professor Pettenkofer's experiments show that in the ventilated wards the amount of carbonic acid in the air near the ceiling was about 50 per cent. more than near the floor; in the unventilated wards it was only about 18 per cent. in excess of that near the floor.

Professor Roscoe's seem to have been conducted in imperfectly or unventilated rooms (with the exception of that at Wellington Barracks, which is difficult to understand); the majority of these show an excess of from 2½ per cent. to 8 per cent. near the floor over that of the ceiling.

From these I think we are justified in saying that the expired air charged with carbonic acid ascends, in consequence of its heat, to the top, and would pass away if a proper outlet were provided; if not, it cools and descends, and if collected at this point would contain more carbonic acid for the same volume than at the top of the room, I think this accounts for Professor Roscoe's excess, especially when we remember that the only ventilation in his rooms was by the fire, and that the air was collected at about that level.

We must not overlook the fact that besides the carbonic acid there are certain sulphur products given off from the body, and from the combustion of gas which on account of their depressing effect upon us, should be got rid of as speedily as possible.

Any one who will take the trouble with a pair of steps to ascend above the level of the chandelier after the gas has been lighted will not long doubt as to in which part of the room the air is the worst. The expansion and diffusion of gases are acknowledged by all authorities on chemistry, and must not be put aside because they do not explain every phenomenon.

Space will not permit me to take up the question of draught; I have treated upon it in a small pamphlet, which I shall be glad to forward, free of expense, to any who may favour me with their address.

Leeds. JAS. ED. ELLISON.

CONGRÈS INTERNATIONAL D'HYGIÈNE, PARIS.

SIR,—The Council of the Sanitary Institute of Great Britain have appointed a committee, consisting of his Grace the Duke of Northumberland, president; Mr. Edwin Chadwick, C.B.; Dr. Richardson, F.R.S.; and Dr. Lory Marsh, to represent the Sanitary Institute at the Congrès International d'Hygiène in Paris, from the 1st to the 10th of August next.

During the Congress in Paris the Société Française d'Hygiène, with which the Sanitary Institute is affiliated, will entertain at a banquet on the 9th of August the members of the Sanitary Institute and their other Foreign Associates.

In addition to the committee, the following members of the Sanitary Institute have expressed their intention of attending and taking part in the French Congress, viz.:—Dr. Hardwicke; Mr. T. W. Evans, M.P.; Mr. Edward Cooksworthy Robins, F.S.A.; Mr. Lionel H. Shirley, C.E.; Mr. Edward Pritchard, C.E.; Mr. J. Wallace Pegge, C.E.

I shall be happy to receive the names of gentlemen desirous of attending the French Congress, whether members of the Institute or not, and to furnish them with the necessary "Bulletin d'Adhésion," as supplied to me by the committee of organisation in Paris.

20, *Spring-gardens, S.W.* LORY MARSH, M.D.

CHESTNUT.

SIR,—I have been to see the roof in Glebe-place (mentioned in the *Builder* last week, p. 655), and, instead of chestnut, find it to be as ordinary a piece of fir construction as one could find in any building of its date or since. Hardly a week passes but pieces of oak are brought to me with the statement that some workman has pronounced them to be chestnut, but this is the first case where I have met with soft wood so designated.

I should be sorry to use a harsh word, but I cannot help thinking that the propagators of these stories ought to have a severe talking to from somebody.

THOS. BLASHILL.

AN INVITATION FROM AFAR.

SIR,—I am located here (Caracas, Venezuela) for some time as architect, &c. Will you please desire some of your advertising patrons to forward me here some illustrated catalogues of building appliances suitable for these Spanish South American countries. All kinds of architectural stonework, concrete building appliances, mortar-mills, &c.—everything is 300 years behind the age here. An earthquake has, on April 12th, destroyed a small city some forty miles distant, and somewhat frightened these people. They desire to have their buildings improved and made secure against earthquakes. I propose to put in iron and wood skeletons, and to fill up with concrete, and, as nothing is manufactured in this country, we must get mainly from Europe. A. DERROM.

Address—"Col. A. Derrom, Caraccas, Venezuela."

*** We must leave our "advertising patrons" to use their own judgment as to complying with this request.

SAVING OF LIFE AT SEA.

SIR,—I have refrained of late from addressing you on this fearful subject. You recently gave a paragraph on the above. With the view to save, permit me to "fall in" and offer a few suggestions on behalf of the "blues" who are being drowned wholesale; some by the new-fangled ironclads, which topple keel upwards when butted.

The *Eurydice* was in full canvas; a squall capsized her; the ports were open (for ventilation and light); in a moment she was on her beam ends; the ingress of water soon sank her. It would be an easy matter to make all port-doors self-shutting and locking at low lurches, by a 16-lb. ball to roll out of a slott to detach the latch; all doors on that side would shut simultaneously. If you had 500 men on board all on the alert you could not rely on this being done. Companion and hatchways could be guarded by cork excluders; the wave that sweeps the deck would act on these till the water receded. The *Eurydice* was under all sail; there was no time to reef. Many a gallant ship has been lost from this cause; let us devise a remedy to prevent these disasters: india-rubber wind-valves sewn on the sails; these would open at every violent blast; they would act if taken aback; they could be made of any strength, length, or form; would offer no obstruction to furling and neat stowing, would not be costly, and would be very durable.

On the loss of our *Vanguard* you kindly published a plan of mine in the *Builder* (Jan. 13, 1877), showing how she might have been saved from foundering by a sail drawn under her. The Admiralty three weeks after issued orders that all Government vessels should be provided with it. I sent "my lords" my copy of the *Builder* (which they have stuck to), hoping for some recognition. They replied that it was one of their officials that invented it. I should like to run alongside this cocked hat inventing official; I would not flinch from his hull. They invent after reading all about it. R. T.

The Statue of Captain Cook has been set up temporarily in Waterloo-place. We will look at it.

Books Received.

A Manual of Naval Architecture, for the use of Officers of the Royal Navy, Officers of the Mercantile Marine, Shipbuilders, and Shipowners. By W. H. WHITE. London: Murray. 1877.

THE fundamental conditions of naval architecture differ so essentially from those which the terrestrial builder has to contemplate, that but little sympathy or professional intercourse exists between the followers of these two independent branches of the great structural art. The difference, indeed, is to a great extent the same as that which exists between statics and dynamics. The builder on *terra-firma* regards stability as equivalent with immobility. The ship-builder attaches a meaning of his own to the word; which he uses to indicate the tendency of a vessel to return to its erect and level position, whence it has been disturbed. So far does this difference of principle draw a line of boundary between the study of the two kinds of building in question, that we do not propose now to give any very detailed account of the full and exhaustive manual which Mr. White has offered to the public.

At the same time, it should be borne in mind that there are points common to all branches of structural design. And with regard to naval architecture, the introduction of iron has tended very much to increase the area of the common ground of study. The consideration of an iron ship as a girder is one that is comparatively novel. And all the investigation as to strains, and structural methods of resistance to them, is of primary value to the civil engineer, as well as to the architect. So, again, with regard to the resistance to be opposed to projectiles. The enormous increase already attained in projectile power is such as to have driven the naval architect to abandon the idea of protecting the whole side of a vessel with impenetrable armour. He is now restricting his attention rather to the construction of an impenetrable central citadel, in the midst of a vessel so built as to float even if riddled with shot. Of this central citadel, not only must the walls be protected by 2 ft. in thickness of solid iron against shot and shell, but the roof must be a dome of iron to resist vertical fire; and even the bottom, Mr. Reed anticipates, must be similarly guarded, as a protection against torpedoes. These requirements are such, that the eminent naval architect just mentioned more than half leans towards the "soup-plate" form of the Russian *Popoffka*, as that most available for the citadel ship of the future.

Within the last few weeks, however, the attack has so far gained on the defence, that it may be questioned whether the construction of enormous floating batteries, at the cost of half a million or more of money a piece, is likely to be much longer continued. A report made on the 7th of December last, to the United States Bureau of Ordnance, by Capt. Ericsson, the inventor of the *Monitor*, as to his experiments with an aggressive torpedo on the Hudson, states that, during the concluding trials, a torpedo, 22 ft. 6 in. long, weighing 1,400 lb., was expelled horizontally under water, by means of compressed air, at a mean rate of 53 nautical miles per hour for the first 250 feet. Also that, by discharging the torpedo at a certain inclination, it took an upward course, and, after passing through about 40 ft. of solid water, performed a flat trajectory in the air, entering the water again at a distance of 200 ft., then, moving near the surface, traversed the next 400 ft. in ten seconds, being at the rate of 23·75 nautical miles per hour. It must be remembered that it is not on the shock given by contact at the speed of a railway train that the destructive force of the weapon depends, but on the explosion at the moment of the shock.

At the same time with this news from America, we obtain accounts from Italy of the effects produced by enlarging the chamber of the 100-ton gun, and using the large grained powder known by the name of Fossano. The muzzle velocity has been increased from 1,424 to 1,585 ft. per second, and the energy of the projectile from 28,130 to 34,836 foot tons. With the Fossano powder, a velocity of 1,661·5 ft. per second, and an energy of 38,316 foot tons, are said to have been attained. What thickness of iron wall would resist such a blow we shall not pause to calculate. But it is not with so gigantic a weapon alone, that the attack is becoming irresistible. Sir William Armstrong has been advancing in the same direction with so manageable a piece as the 4-ton gun, with a calibre of 6 in. From this he is now able to discharge a 70 lb. shot with the muzzle velocity of 2,000 ft., and a 64 lb. shot with that of 2,070 ft., per second. The *vis viva* of the projectile is as the mass into the square of the velocity. The piercing power is inversely as the diameter of the hole pierced. Thus a 6-in. shot, with 1,000 foot-tons energy, would pierce armour which would require 1,167 foot-tons for a 7-in. shot, and 1,333 foot-tons for an 8-in. shot. The velocity of the 2,000 lb. projectile of the 100 ton gun is almost exactly that of the moon in her orbit. The 6-in. bolt has 33 per cent. higher velocity. To those who will take the trouble to work out the calculation it will seem pretty clear that the days of the ironclad are numbered. The foundering of the *Grosser Kurfurst*, on a cruise designed to strike England with awe, which result was attained in an unexpected manner, purely by bad seamanship, comes in as a different, but accordant, piece of evidence, pointing to the same conclusion.

A brief summary of Mr. White's fourteen chapters will show the thorough character of his book. The first is on the displacement and buoyancy of ships. Then follow (2) the tonnage of ships; (3) the statical stability of ships; (4) the oscillation of ships in still water; (5) deep-sea waves; (6) the oscillations of ships among waves; (7) methods of observing the rolling and pitching motions of ships; (8) the strains experienced by ships; (9) the structural strength of ships; (10) material for shipbuilding,—wood, iron, and steel; (11) the resistance of ships; (12) propulsion by sails; (13) steam propulsion; and (14) the steering of ships. The ninth and tenth chapters are those which will be found to contain the information most useful to any other than marine builders. It may be observed, however, that the question to which we have before directed attention, as limiting the range of the naval architecture of the future, viz., the resisting power of armour, compared with the penetrating power of projectiles, is not specially treated on by Mr. White.

As far as purely scientific inquiry is concerned, the chief interest lies in the eleventh chapter, which refers to those strikingly elegant experiments of Mr. Froude, which have opened an entirely new chapter to the naval architect. Mr. White cites the facts at which Mr. Froude had arrived in 1876; but on March 23rd, 1877, Mr. Froude read a paper at a meeting of the Institution of Naval Architects, which fully justifies the remark of a Cambridge man, who is the author of the received book upon hydro-mechanics which is current in that university, to the effect that the labours of that engineer have effected a complete revolution in the scientific theory of resistances. Mr. White has kept up with the progress of science, no doubt, as far as the date of publication allowed him to do; but Mr. Froude is making such rapid advance in a path which he was the first to tread, that a lapse of months now witnesses more advance in our intimate knowledge of the whole theory of naval resistance, and of the form of vessel best adapted for given tonnages or for required velocities, than has been effected, century by century, since the time of Euclid and of Archimedes.

We are glad that a feeling that it was due to Mr. Murray to give rather more than a passing glance at a work displaying so much patient ability as the "Manual of Naval Architecture" has led us to venture on remarks a little out of our usual line. They have, indeed, a very close bearing on the future of military, and even of civil, architecture. The question whether the sea shall command the land, or the land the sea,—a question to which attention was called by the siege of Gaeta some eighteen years ago,—is one profoundly affecting the very first duty of the architect,—consideration of site. And for all students of science, to whatever portion of the rapidly-enlarging field of study their chief attention may be turned, it must be matter of extreme interest to catch a glance at the latest result of the labours of three such ministers and interpreters of nature as the veteran Ericsson,—who must be almost, if not quite, the father of the profession,—Mr. Froude, and Sir W. Armstrong.

We can never forget the sense of awe with which, standing with Robert Stephenson on the footboard of the first locomotive placed on the London and Birmingham Railway, we witnessed the testing, after a few preliminary snorts, of the speed of the iron horse. The feeling of the moment was that of assisting at the birth of a more mighty physical revolution than had been witnessed in the previous history of the human race. The years that have since passed have only deepened the conviction of the magnitude of the change in progress. Those who are most concerned in the details of its course are perhaps less able to judge of the general advances of the work of the engineer than those who review it from a more impassive standpoint. In the half-century drawing to a close we have attained the speed of the swift for the conveyance of passengers, the speed of the planets for the flight of our projectiles, the speed of light for the transmission of articulated messages. We have bridged the Menai and the St. Lawrence, and have made the passage of the Atlantic a matter of hours. We have not only introduced iron as a material for ships, but we have so far exhausted the capabilities of that metal that we have thrown it aside for steel, which is now manufactured at a less cost than was iron when first rolled into rails. The first iron steam vessel, the *Aaron Manby*, was built in 1821, and lasted for thirty-four years. No ship was constructed wholly of steel in the Royal Navy before 1875. The *Iris* and the *Mercury*, armed despatch vessels, are now being built of steel. And Mr. White calculates that in a merchant steamer of about 5,000 tons displacement, 320 tons less material would be required for construction, and an equal amount would be added to the carrying power of the vessel, by building it of 1,280 tons of steel, instead of 1,600 tons of iron. As to the cost of either material, however, we obtain no information in the volume.

Tramways: their Construction and Working. By D. K. CLARK, C.E. Illustrated. London: Crosby Lockwood & Co. 1878.

GREAT attention is now being turned, not only in this country, but in various parts of the Continent, to the subject of what foreign engineers call "reduced" or "secondary" locomotives. The railway system, now in the forty-ninth year of its existence (for it must be dated from the competition between Stephenson, Braithwaite and Ericsson, and Hackworth, on October 1st, 1829), has assumed a certain fixity of type. We by no means assert the impossibility of further, and even of great, improvement. But the financial, now to a great extent counterbalance the mechanical, considerations of railway transit. The maximum speed which, with an expensive permanent way, kept in perfect order, was readily attainable on the broad gauge, has been reduced. Such velocity is only safe under conditions which are felt to be commercially unprofitable. In the same way the luxury obtained in some carriages,—we may instance those of the Namur and Liége Railway, more than twenty years ago,—has not been by any means generally introduced. Rather do we find a third-class carriage converted, as on the South-Eastern Railway, into a second-class, by the expedient of painting the word "second" on the door, and nailing a miserable scrap of American cloth to the seat, to make believe that it is a cushion. The practice of penning the third-class passenger into a sort of cattle-truck is less general than was formerly the case, since it has been unexpectedly discovered that it is this class of passenger who, like the pig in an Irish cabin, "pays the rint." But we cannot hold that improvement is either exhausted or in a fair way to be exhausted on the English lines.

It is rather to the extension of railway communication into the hearts of populous cities, on the one hand, and into districts only accessible with great physical difficulty, on the other hand, that the attention of engineers is now chiefly bent. It is the former of these two branches of development which forms the subject of the work now before us. "The modern tramway," says Mr. Clark," was first employed in the United States, where it was urgently wanted, in consequence of the inferior condition of the streets and roads of the large cities. The first American tramway was the New York and Haarlem line, of which the first section, laid on the main thoroughfares, was opened in 1832." The object of the book under review "is mainly to place before engineers, capitalists, and financiers, a succinct analysis of the past practice and the present achievements of tramways in the United Kingdom, as works of engineering, and as money-making concerns."

In the first chapter, on the introduction of tramways, Mr. Clark omits the notice which

ought to have been given of the long use, and gradual development, of the early tramways in England, on such lines as the Bullo Pill, the Cheltenham and Forest of Dean, and other coal and mineral lines. These tramways, at the time of the laying out of the Liverpool and Manchester Railway, were of narrow gauge, and constructed of cast-iron plates, each 3 ft. long, bedded on stone blocks, with a side flange rising above the tread-plate, or bearing surface. They were usually worked by horses; and were the more effective from the fact that the bulk of the mineral traffic usually ran down hill, leaving only the empty wagons to be dragged back. At some places, as at the Leckhampton Stone Quarries, the weight of the descending train was utilised so as to draw up the empty wagons, by a self-acting incline. It was the transference of the flange from the rail to the wheel which marked the transformation of the tramway into the railway; and which rendered possible the great increase in velocity which has wrought so unprecedented a revolution in our mode of internal communication.

We refer to the want of historic information in the volume before us, not on critical grounds, but for a practical reason. A very large part of the inventive genius of Englishmen is wasted, owing to the general unacquaintance of the labourer in every branch of mechanical improvement with the work of those who have preceded him. It thus occurs that the same thing is re-invented over and over again. It is, in consequence, not unfrequently the case that something which was, when first hit on, a palpable improvement; which was adopted, worked out, and ultimately superseded by a fresh improvement; is re-introduced later by some inventor ignorant of this fact; and that thus time, labour, and money are thrown away. Something of this kind may be traced in not a few projects for tramways, narrow-gauge railways, and similar undertakings. We do not mean to intimate that there is not a great field here open for mechanical improvement. But the subject is one in which it is eminently necessary to observe all that has occurred down to our own time. Not a few ambitious schemes might be pointed out which are, in fact, based on the re-introduction of arrangements which have, perhaps long since, been superseded, in consequence of the results of practical experience of their working.

Passing to the account given of modern tramways in the United Kingdom, we find, in Part I. of the volume, descriptions before us given of tramways in London, Leeds, Glasgow, Dublin, and the Vale of Clyde; of the reconstruction of the North Metropolitan Tramways; of their cost and of the methods of various inventors, carried out in different localities. Part II. describes the present practice of tramway construction in the United Kingdom. Nine chapters treat of those at Edinburgh, Dundee, Glasgow, Bristol, Leicester, Salford, Southport, Birkenhead, Manchester, and Liverpool. There is a chapter on foreign tramways, followed by one containing general conclusions on the design and construction of tramways.

The third part of the work enters into the subject of the general cost of tramways, and their working expenditure. Nine chapters, analysing different lines, are followed by one on the London General Omnibus Company, which gives details of much value as illustration of the comparative cost of different modes of working. An analysis of the capital cost of English tramways follows. On an average of sixteen lines, the cost per mile is given at 4,585*l.*, the highest being 5,527*l.*, and the lowest 2,764*l.* per mile. This is the cost of excavation, concrete, way, and paving. But over 130 miles of streets laid with tramways, the total capital cost averages 18,707*l.* per mile; and in forty-two miles of London, Edinburgh, and Dewsbury tramways the cost rises to 19,321*l.* per mile,—comparing somewhat unfavourably with railway cost, regard being had to the novelty of the accommodation afforded, and to the gain in time by use of the system. "Averages do not reveal extremes," says Mr. Clark, "and it may be stated that the capital cost varies from 28,000*l.* per mile for the London Street Tramways to 6,580*l.* for the Southport tramways."

Receipts and working expenditure form the subject of the two concluding chapters of this part of the work. In 1876, on 137 miles of tramway, worked by twelve companies, the average weekly receipt was 114·3*l.* per mile, which amounted to 32·8 per cent. on the capital outlay, the lowest take being 20·17, and the highest 43·0 per cent. on capital. The expenditure averages 75 per cent. on the receipts, which are taken to average 16d. per mile-run. This would give a general net return to the proprietor of 8 per cent. Mr. Clark has not worked out this result, and there is not that systematic unity in the mode of calculation in the different chapters which would enable us to be certain how far it is exact. It is, however, the apparent outcome of a comparison of his ultimate figures, as above quoted, and shows how highly deserving of attention is the subject of which the book treats.

Part IV. treats of tramway-cars, and Part V. of mechanical power on railways; full and well-illustrated details being given of the present condition of the tramway carriage and locomotive in the United Kingdom and elsewhere. The great point for consideration is the introduction of the best form of applying mechanical power to propulsion on tramways. The saving of traction power effected by the substitution of the rail for the ordinary pavement of the streets is very considerable, being as much as five-sixths of the higher figure. This, however only applies to level lines, and the moment an incline intervenes the economy rapidly diminishes. Thus in Edinburgh the cost for horse power is 7¾d. per mile run, against an average cost of 6¼d. per mile run, owing to the steepness of the streets. In Leith-walk the gradients average 1 in 32, and there is one portion of 1 in 14. Taking the resistance of an omnibus on the level at 45 lb. per ton, the difference of the resistance to be overcome by the horses on such an ascent is 70 lb. per ton, being an increase from 45 to 115 lb., or of 153 per cent. The traction on a good railway does not exceed 7 lb. per ton. The tramway resistance, judging by economical returns, appears to average about 1 per cent. of the load, or 22·4 lb. per ton. When the 70 lb. per ton due to the gradient is added to this, we have 92·4 lb. against 115 lb. for the common road. It is manifest that the saving in each case is so small, and that the irregularity of motive power required is so great, that it is very questionable how far horse tramways will answer on sensible inclines. On flat gradients the great loss arises from the frequent stoppages, the force required for setting the tram-car in motion being so much more than that required for keeping up the traction, that the horses are over-taxed, while apparently doing but little work.

It is a matter deserving the very serious attention of engineers interested in street tramways, how far this main source of the cost of horse-power may not be eliminated by the application of the principles of the accumulator. The power required for the rapid stopping of a tram-car is nearly equal to that required for the starting in excess of the steady pull required for maintaining the motion. It is quite within the limits of mechanical skill to accumulate the break-resistance, by hydraulic or other arrangements, and to apply it in aid of starting after the stoppage. If this were done, the work thrown on the horses would be equalised, and the great cost of horse-power, which amounts to 55 per cent. of the receipts on tramways, would be materially reduced. We offer the suggestion to those whom it concerns. Whatever may be the improvement in mechanical motor-power, there will always be many cases in which it will be a source of danger to have the locomotive running among vehicles drawn by horses, as in crowded streets. It would, we suggest, be better worth while to attempt to give aid to the animal by reducing that strain which is the real cause of exhausting his energies, than to seek altogether to supersede animal traction on street and city tramways. Mr. Clark's book is indispensable for the students of the subject.

The County and Borough Magistrates' List and Parliamentary and Official Register. By ADAM BISSET THOM. London: Butterworths.

To many of our readers this work will undoubtedly prove very useful, as it may be said to be a complete directory of the leading men and principal officials in each separate county and borough; and from the alphabetical arrangement, their professional or business avocations, and also their addresses, can be found at once. Justices of the peace include all ranks and professions, and it is, therefore, a great advantage to be able to identify any member, and to be thus able, in a measure, to judge of his position and probable influence Each county list includes, besides the lord-lieutenant, chairmen of sessions, and Parliamentary representatives, the principal officials, such as the clerk of the peace, the clerk to the lieutenancy, the treasurer, the surveyor, the chief constable, &c.; and a similar arrangement is carried out for each of the boroughs. The book also contains, among other information, a list of provincial newspapers, arranged locally, and a useful diary noting such days in the year as require to be remembered by business men.

CHURCH-BUILDING NEWS.

Aldrington. — The rebuilt church of St. Leonard's, Aldrington, near Brighton, was consecrated on the 8th inst. The church is a restoration, or reproduction, as far as may be, of the ancient structure, of which, in 1876, when the restoration was commenced, only a heap of ruins remained. The architects for the rebuilding of the church were Messrs. Carpenter & Ingelow. The church is built of closely-coursed flints with square facings, and dressings of Caen stone. The old work has been preserved and utilised as much as possible, the remains of the lancet windows and loose stones having been reinstated in the walls. The jambs of the tower arch are ancient up to a considerable height, and the angle stones of the tower buttresses were sufficient to indicate their heights and proportions. The new church is 26 ft. 6 in. wide, and 73 ft. long, and there is besides a western tower, 17 ft. square; the height inside is 18 ft. to the wall-plate, and 40 ft. to the ridge of the roof. The ancient chancel extended 28 ft. further to the east, and at some future time no doubt the present building will be enlarged on the old lines. The windows are all lancets, as the old ones were. Portions of tracery of an early character were found, and it is thought that they are probably of the date of Henry III., when the Abbey of St. Radegund became the patrons. The roof is of English oak, covered with tiles. The chancel is paved with Minton's tiles. The seating in the chancel is of wainscot oak, with rich carving on the ends, from the works of Mr. James Barnes, of Brighton, the builder. The carving has been executed by Messrs. Pepper, of Brighton. The font has a massive circular bowl of dark Derbyshire marble, and has been executed by Messrs. Pool & Son, of Westminster. The tower is surmounted by a timber and shingled spire. The belfry is furnished with a peal of five bells, from the foundry of Messrs. Taylor, of Loughborough. The windows at each end are occupied with stained windows by Messrs. Clayton & Bell. The hangings are by Messrs. Jones & Willis. In our volume for 1876 (p. 837) we gave some information about the church and the "Anchorite of Aldrington," William Bolle.

Lincoln. — The new church of St. Andrew, Lincoln, has just been consecrated. The style adopted is Early English, and the church comprises nave with continuous chancel, north and south aisles, and vestry on the north side. The nave is three bays in length, with lofty pillars and obtusely-pointed arches. Those on the south side formed part of the old church of St. Martin, and have been re-erected and form a key to the present chancel. The chancel is elevated four steps above the nave. The roof of the church is open-timbered, and the seats are of deal, stained and varnished. The building is constructed to accommodate 500 worshippers, but the original design contemplates the introduction of galleries, to provide for which projecting bands have been let into the pillars, midway between the bases and capitals. A spirelet has been built over the entrance to the vestry, in which a small bell has been fixed. The plans were prepared by Mr. Jas. Fowler, of Louth, and the work has been carried out by Messrs. Rudd & Son, builders. The heating and lighting of the building were entrusted to Mr. J. Elliott. An episcopal chair occupies a place on the north side of the chancel. This chair, which is of oak, and stands upwards of 7 ft. high, was the gift of Mr. S. C. Basker, joiner and builder. The total cost has been about 6,000*l.*

South Normanton. — On the 7th inst. the parish church of Normanton was reopened, after restoration. According to Cox, the building itself proves that it was erected in the days of the Normans, while reference is made to it in an old work as being in existence in the year A.D. 1220. The chancel, which is almost entirely new work, contains an old doorway

leading into the vestry. The present style of architecture is chiefly Perpendicular. A stained-glass window has been placed in the end of the chancel, at the expense of Mr. Josiah Spode, of Hawkesyard Park; also a smaller one in the west end of the south aisle, by Mr. and Miss Wright, of Hill-top. The church consists of a nave, chancel, north and south aisles, tower, organ-chamber, and vestry. The additions to the church are,—south aisle, organ-chamber, vestry, and about 130 sittings. The total cost of the works has been about 2,400*l*. Messrs. Rollinson & Son, of Chesterfield, are the architects; Mr. W. Askew, of Matlock, the builder; and Mr. Statham, of Matlock, the joiner.

THE ADORNMENTS OF THE OBELISK.

SIR,—Although it is too late further to discuss the question of site for the Cleopatra Obelisk, it may be not untimely even now to raise a protest against the supreme vulgarity promised in a programme which threatens to encumber the base of the obelisk with sham sphinxes of London manufacture.

The pedestal and all modern work pertaining thereto should, in the utmost degree, be thoroughly frank and modern, so that antiquity may be left to speak for itself, and history may not be mocked by spurious sphinxes and cheap affectations of an art whose extinction,—as in all cases of by-gone art,—is beyond recall.

If the sphinxes, why not stuffed camels and palms in tubs? These, with a few hired Arabs, or minstrels from Ethiopia, would but complete and give finish to a scheme which obviously aims at that fearful modern concoction—"a handsome Oriental effect." ANTHONY.

Miscellanea.

The "Comet Pump."—Under this title Messrs. Bartrum & Powell have patented a pump which has the merit of simplicity. A small circular piston of metal is made to rotate in a flat iron cylinder (the depth of which is little more than the thickness of the piston) in such a way, by means of an eccentric, that the piston meets the inside of the cylinder at certain points, and thus the vacuum is produced. By this action, on one side of the piston the water is drawn in through an opening in the cylinder and on the other side the water (that had been drawn in during the previous revolution) is discharged through a passage in the tail-piece of the piston, and so on, giving a constant delivery. The polishing action of the piston against the inside faces of the cylinder-covers insures, they say, a smooth and perfectly even surface being maintained; and any play between the ends of the piston and the cylinder covers can be readily taken up by reducing the thickness of the cover-joint. This pump works either way, will draw from 27 ft. 6 in., and has only two working parts, both of which are very accessible; and the working speed is lower than that of any pump in the market. It is, moreover, compact, taking up very little space, and the smaller sizes are very suitable for household purposes, and are easily worked by one person. There are many cases in which this pump would be found economical and efficient.

Automatic Fire Extinguisher.—At the invitation of Messrs. Lawes & McLennan, a number of gentlemen have witnessed the effect of the patent automatic fire-extinguisher, introduced by this firm. The invention (not a new one) consists of tubes permanently fixed in buildings, in the ceilings or cornices, as the case requires. These tubes are perforated, divided into sections, and connected with the water-mains in the street. Cocks and levers are fixed in supply-pipes, and are so arranged that the action of fire causes them automatically to admit water into the particular sections of the tubes that command the area on fire, and, by the position of the perforations, the water is so directed that the fire is extinguished. The experiments were made with a structure erected for the purpose after the model of a theatre, enclosing 12,672 cubic feet. A 2-in. perforated tube, 24 ft. long, extended down the centre of the erection, and was fixed against the gridiron. The experiments were successful. As an extra precaution the arrangement would be useful, but we should scarcely be disposed to trust wholly to it.

American Architectural Society.—The monthly meetings of the Society of Architects in Boston, U.S., have been brought to a close for the season. The *American Architect* says:—"A visible decrease must be admitted in the interest and usefulness of these meetings as compared with those of former seasons. This can scarcely be accounted for by the absorption of the members in the cares of an engrossing profession; perhaps more reasonably by the opposite theory, since it is no less true than exasperating that a time of leisure from enforced occupation is the least likely to be fruitful in those results which it would seem most natural to expect from it. It is when men are most driven by the pressure of imperative business that they are most apt to find time to use their minds to advantage in collateral pursuits. Be this as it may, it must be confessed that few seasons since the formation of the society have seen so little activity in those lines in which its enterprise has been used to manifest itself. Let us hope that the highly respected committee on providing business and entertainment, which has laid out in past seasons so much good work, will remember that the committee holds over the recess, and will, during the summer months, lay their heads together and devise a scheme which will start the society in October on a series of meetings more stimulating and useful than the best we can remember."

Model Lodging-house in Leeds.—Some time ago the Millgarth Mill, at the corner of Millgarth-street and Dyer-street, Leeds, was purchased by Mr. W. B. Denison, M.P., and Councillor Wray, with the object of turning it into a lodging-house, where at the cheapest possible rate lodgings might be had, combining the cleanliness and comfort of a well-conducted working-men's home. To adapt it to its purpose great alterations have had to be made to the interior of the old mill. Those alterations having been completed, the building has been opened. The sleeping-rooms have been divided into thirteen dormitories, containing about 180 beds. On the ground floor is a large reading and smoking room, 45 ft. by 30 ft., fitted with lock-up cupboards for the use of the lodgers. Adjoining is a lofty kitchen, fitted with cooking apparatus, where lodgers may cook their own food; and there are also lavatory, wash-house, drying-house, and superintendent's house. The whole of the rooms are well lighted and ventilated, and cold and hot water laid on throughout the building. The alterations of the building have been carried out under the personal superintendence of Mr. W. B. Perkin, of the firm of Messrs. Wm. Perkin & Sons, architects, Leeds.

The Growth of London.—An important return has just been issued by the Metropolitan Board of Works showing the "number of inhabited houses, population, and rateable annual value of the parishes and districts comprised within the metropolitan area in the years 1856 and 1876, or as near those dates as can be accurately stated." According to this return, it appears that the total rateable annual value has more than doubled itself within the twenty years. In 1856 the amount was 11,283,663*l*., and in 1876 it was 23,111,313*l*. The total number of inhabited houses had increased from 306,086 in 1851 to 419,642 in 1871; but in this column a decrease is shown in respect of the City of London. The number of inhabited houses in the City in 1851 was 14,483, but in 1871 there were only 9,236. In 1851 the population of the metropolis was 2,363,405, and in 1871 it had increased to 3,266,987. The figures given in respect of the year 1871 are of course those of the last Census. This return has been issued in view of a possible readjustment of the representation of the several vestries and district Boards at the Metropolitan Board of Works.

Royal Albert Hall.—The last opera-concert given here by Mr. Mapleson was a great success, the Hall being fully filled. His second concert will take place this, Saturday, afternoon (June 29th), and will include all the principal singers of her Majesty's Theatre. Mr. Mapleson has rightly considered the ability of the Hall to receive a vast audience, and made the prices for even the best places low.

Tynemouth Aquarium.—We may add to our account that the contractors are Messrs. Aldin & Bray, of Adelphi-terrace, Strand.

Great Yarmouth New Municipal Offices. Forty designs have been sent in competition.

Sewage Irrigation, Warwick.—The Sewage Farming Company who dispose of the sewage of this borough report a loss of 500*l*. upon the year's operations, as compared with a deficit of 1,200*l*. in the previous year. The directors have taken up among themselves one hundred of the unallotted shares.

Nairn Drainage.—The Nairn Police Commissioners have consulted Mr. Willet, C.E., regarding the drainage of the burgh. Mr. Willet has submitted plans for a scheme for the utilisation of the sewage on the Salt Marsh. The cost of the works exclusively for utilising the sewage would be 500*l*.

The Wood-working Machinery at the Paris Exhibition is being fully described in the *Engineer*.

TENDERS

For residence for Mr. G. Balls, Broomfield-road, Chelmsford, Essex. Mr. C. Pertwee, architect:—

Fincham	£880 0 0
Choat & Son	856 0 0
Roper	847 16 0
Wood (accepted)	778 0 0

For renovation and decoration of interior of Chapel of Ease, Holloway-road. Mr. George McDonell, architect.—

Williams & Co.	£595 0 0
Jones	454 0 0
Fullbrook	442 0 0
Hewitt	375 0 0
Smith (accepted)	348 0 0

For works at No. 1, Dane John-villas, Ramsgate. Messrs. Hinds & Son, architects:—

Goodchild	£270 0 0
Crickett	250 0 0
Duckett	236 0 0
Goodman	212 10 0
Osborn	205 0 0
Newby (accepted)	194 0 0

For Winchester Main Sewerage, Contract No. 5 (Sewers). Mr. James Lemon, engineer:—

Bugbird	£35,000 0 0
Stiff	27,890 0 0
Stevens & Son	26,698 0 0
Willcocks	25,500 0 0
Young & Co.	24,300 0 0
Crook	18,350 0 0
Crook (amended)	17,950 0 0
Love	18,197 0 0
Bull & Sons	17,950 0 0
Dickson	17,845 0 0
Marshall	16,953 0 0
Sanders (accepted)	16,208 0 0

For additions and alterations to Northerwood House, Lyndhurst, Hants. Mr. J. H. Carroll, Scarborough, architect. Quantities supplied by architect.—

Stephens & Bastow	£4,949 0 0
Young & Co.	4,847 0 0
Berry & Sons	4,750 0 0
Burkitt	4,700 0 0
Jenkins & Sons	4,485 0 0
Sanders	4,148 0 0
Crook (accepted)	3,795 0 0

For rebuilding Nos. 17 and 18, Walbrook, for Messrs. Dixon & Roe, wholesale and export stationers. Mr. John M. K. Hahn, architect:—

Higgs & Hill	£8,579 0 0
Chessum	8,050 0 0
Dove, Brothers	7,998 0 0
Brass	7,875 0 0
Shaw	7,822 0 0
Scrivener & Co.	7,818 0 0
Conder	7,702 0 0
Dowus & Co.	7,679 0 0
Ashby, Brothers	7,071 0 0
Perry & Co.	7,440 0 0

For the erection of central Fire Brigade stations, &c., for the Corporation of Bristol. Mr. Josiah Thomas, City Surveyor. Quantities by Mr. Arthur Deane:—

Krauss	£6,176 0 0
Eastabrook & Sons	5,980 0 0
Cowlin & Son	5,795 0 0
Church	5,694 0 0
Brock & Bruce	5,600 0 0
Howell	5,600 0 0
Hatherley	5,453 0 0
Humphrys	5,449 0 0
Davis	5,389 0 0
Wilkins & Son	5,3 0 0 0
Stephens & Bastow (accepted)	5,199 0 0

For converting four private houses into shops at Tyneham-grove, Lavender-hill, for Mr. J. W. Folkard:—

Lack	£231 0 0

For alterations and improvements to premises, Nos. 71, 72, and 73, George-street, and 62, High-street, Hastings, for Mr. J. H. Pearch. Messrs. Cross & Wells, architects:—

Womersley	£1,683 0 0
Cruttenden	1,685 0 0
Eldridge	1,655 0 0
Ditch	1,642 0 0
Vidler (accepted)	1,599 0 0

For a house and stables for Captain Edward Jekyll's Gobion Wood, Bedfordshire. Mr. W. White, architect. Quantities supplied by Mr. Edward Crutchloe:—

Temple & Foster	£5,250 0 0
Lathey, Brothers	4,534 0 0
Gregory	4,497 0 0
Foster	4,206 0 0

For new municipal offices for Blackburn Corporation. Mr. William B. Bryan, architect. Quantities supplied:—

Thornton & Sons	£7,736	11 0
Craven	6,936	0 0
Ives & Son	6,800	0 0
Hodgson	6,490	0 0
Woods & Son	6,400	7 0
Fielding	6,378	12 4½
Abbott	6,375	0 0
Arkwright & Terrel	6,300	0 0
Stones & Son	6,258	10 0
Higson	6,250	0 0
Edmundson, senr.	6,228	14 0
Booth	6,210	6 8½
Calvert	6,205	15 0
Warburton	6,200	0 0
Byrom, jun.	6,178	0 0
Coffey	6,140	0 0
Lewis	6,059	10 0
Marshall & Dent	6,049	0 0
Cronshaw	5,983	14 0
Arkwright	5,978	0 0
Whittaker (accepted)	5,896	0 0

For new lecture-hall, Ewell, Surrey. Messrs. Spalding & Evans, architects. Quantities supplied by Mr. Fleetwood:—

Roberts	£1,537	0 0
Hooker	1,498	0 0
King & Brown	1,483	0 0
Humphris	1,443	5 0
Keal	1,430	0 0
Colliver	1,390	0 0
Hards	1,385	0 0
Waller	1,370	0 0
Potter	1,350	0 0
Shearburn (accepted)	1,320	0 0

For alterations and general repairs at the Regent Tavern, Regency-street, Westminster, for Sir Henry Meux & Co.—

Blaniford & Co.	£225	0 0
Elmes	225	0 0
Charles	197	0 0

For the erection of a house at Betherden, Kent. Mr. A. Stanton Cook, architect. Quantities by Mr. R. Tarring:—

Slade	£1,500	0 0
Barber	1,410	0 0
Lee & Co.	1,258	0 0
Bingham	1,189	0 0

For alterations and additions to No. 9, Guildhall-street, Folkestone, for Mr. J. Minter. Mr. Burgess J. Reeve, architect. Quantities supplied:—

Hoad	£500	0 0
Webster	470	0 0
Brooks	380	0 0
Slade	310	0 0
Reason (accepted)	273	0 0

For completing carcass of shop and house, Folkestone, for Mr. J. B. Tolputt. Mr. Burgess J. Reeve, architect:—

Payne	£490	0 0
Hoad	450	0 0
Reason	425	0 0
Slade	420	0 0
Prebble (too late)	405	0 0
Holdom	374	0 0
Sims (accepted)	330	0 0

For New Congregational Church, Forest-green, Surrey. Mr. T. Heygate Vernon, architect:—

Mason	£565	0 0
Biass	534	0 0
W. & J. King (accepted)	495	0 0

For road and sewer, Cardozo-road, Caledonian-road. Messrs. N. Waymouth & Son, architects:—

Killingback	£955	0 0
Jay	886	0 0
Williamson	739	0 0
Rowley	685	0 0
Taylor (accepted)	685	0 0

For alterations and repairs to No. 9, Brunswick-square, Brighton, for Mr. H. Haig. Mr. A. Moseley, architect:—

Holt & Chappel	£1,666	10 0
R. & H. Pickersgill	1,531	0 0
Smith	1,501	0 0

For erecting the new church of St. Mildred, Burnt Ash, Lee, exclusive of tower. Mr. Henry Elliott, architect;—

Coles (accepted)	£5,200	0 0

For the erection of a coffee-house at Streatham-common. Messrs. Ernest George & Peto, architects. Quantities by Messrs. Stoner & Sons:—

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Jarrett	4,200	0 0
Goddard	3,939	0 0
Mason	3,927	0 0
R. & E. Smith	3,838	0 0

For alterations and additions to the George-yard Ragged Schools, Whitechapel. Mr. John Hudson, architect:—

Read & Son	£1,530	0 0
Morter	1,440	0 0
Jacobs	1,372	0 0
Killby	1,364	0 0
Little	1,269	0 0

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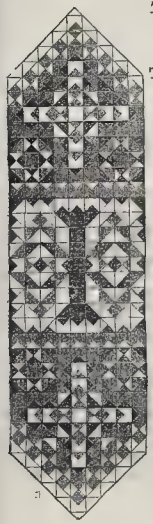
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The Geometry and Optics of Ancient Architecture.

It is not from any indifference in regard to Mr. John Pennethorne's large and important book on the above-named subject,* that we have somewhat delayed noticing it in detail, but rather from a feeling that a book which deals with so intricate a subject, and which represents the summing up of so much consideration and study on the part of its author, demands proportionately careful consideration on our part before recording our opinion on the results.

From Mr. Pennethorne's preface it appears that as early as 1830-5, when he was travelling as an architectural student, he had been impressed with an idea of the extreme accuracy of execution of the Greek buildings, and of the refinements of design which might be expected to be discovered in them when fully studied; and also of the relation of Egyptian architecture to that of the Greeks, as its basis both in regard to colour and form. In 1837 he again visited Athens, and made such observations as the then state of the ruins and the instruments at his disposal permitted; and at this time, as Mr. Penrose mentioned at a meeting of the Institute the other day, he discovered the curvature of the horizontal lines of the Parthenon (which, he says, had also been about the same time noticed, independently of himself, by Herr Shaubert, a German architect residing at Athens), which he approximately obtained, and also measured the entasis of the columns, and moulded in wax all the smaller curves of the capitals, cornices, and mouldings, and traced the sections on paper. Failing health prevented his doing more, and study of the subject convinced him that further and more accurate data were required for completing it. In 1860, during a period of enforced retirement owing to illness, the author looked over Mr. Penrose's work on the Parthenon and M. Beule's "L'Acropole d'Athènes," and found that most of the information he had wanted had been collected between the years 1846 and 1854. He then resumed the subject; was able to correct some errors in his theory as to the horizontal lines by the light of the superior accuracy and minuteness of Mr. Penrose's measurements, and worked out his views into the form in which they are stated in this splendid but almost too ponderous folio volume, the real object of which may be best described in the author's own words:—

"The observations which have been made on the remains in the Acropolis of Athens lead to the conclusion that these works were originally laid down and calculated with mathematical accuracy, and this being the case, we can inductively recover the laws by which they were designed, and demonstrate them by re-calculating the same works, step by step, in the same manner as have been demonstrated the laws in astronomy, and in all the other exact sciences: and it is some of the mathematical principles of the Greek architects and artists that I have endeavoured, however imperfectly, to recover and lay down in the following work

These principles were evidently the result of many centuries of careful thought and study by the leading scientific minds of the ancient world; we can discover the germ of them in the best period of Egyptian architecture, at least B.C. 1300; we can trace them through all the works of the Greeks which remain to us, either in Asia Minor, in Magna Græcia, or in Greece proper; and we find their greatest development in the Greek works of the age of Pericles, B.C. 450, at which period all the mathematical and artistic talent of the world was collected in Athens as a centre, and the accumulated knowledge thus brought together was applied by the Greeks to the restoration of their temples in the Acropolis which had all been destroyed by the Persians.

If the remains of ancient art are worth measuring and publishing, I see no reason why they should not be restored and laid down as they were originally conceived or designed, or why the scientific thought and intellect that was once brought to bear upon them, and which still exists in their ruins, should not be recovered and preserved to us."

The author obviously feels the necessity of calling attention to the exceptional refinement of perception in regard to geometric principles in building which probably existed at the period of the highest development of Greek architecture; and Mr. Penrose makes a somewhat similar observation in Chapter xiv. of his work on "The Principles of Athenian Architecture," where he remarks that in all probability the want of each optical correction was felt, and the correction made, separately, and as the result of a series of experiences; and that this will appear the more likely, when we consider the very long period during which the Greeks were working out the perfection of the Theseum and the Parthenon; "so that an amount of intellect, unparalleled in the history of art, was concentrated on a comparatively limited field, and time was given carefully to examine and obviate all the causes which tended in practice to distort the lines of architecture." It is necessary to bear such a consideration in mind, in order to conceive the possibility of the application to architectural design of refinements which in the light of modern practice would seem so superfluously minute; indeed, when Mr. Penrose not long since revived the subject at a meeting of the Institute of Architects, it was obvious that the younger generation of students, to whom the conclusions were new, were to a great extent sceptical. Whether it is possible to go too far and attribute too much to the intentions of the Greek architects is another question, which Mr. Pennethorne's work, to say the truth, is rather calculated to raise.

So far as Mr. Pennethorne's book is concerned with those refinements of curved lines in the steps, entablatures, pediments, and entasis of the columns, which have been so fully demonstrated by Mr. Penrose, and which are now accepted as recognised facts, it is unnecessary to say anything in detail about a subject which is now an old one. The only special interest which could attach to the demonstration of this part of the subject in a new work, would be in regard to the reasons for the special adjustments in question, if any new light were thrown upon them. Ever since the discovery of these curvilinear adjustments of line in the Parthenon and other Greek buildings, it has been a vexed question whether these were applied in accordance with a complete and logical theory of correction of optical illusion, or whether (in part, at least) their origin was artistic rather than scientific, and was the result of the experience of the eye in regard to the hard and rigid appearance of straight lines. In the former case they would obviously not be intended to be visible to the eye; in the latter they might be, though only to eyes trained to look for them. For example, the leaning inward of the columns was almost obviously intended to be seen, and was partly the result, we imagine, of a reminiscence of the sloping lines of Egyptian architecture, with which the Doric has such obvious hereditary connexion. Yet Mr. Penrose says of this characteristic:—"The parts are made to harmonise with one another with so much art that, on my first visit to Athens, though immediately sensible of an unwonted perfection in the Theseum and Parthenon, it was only after a considerable time and careful study I could assure myself that the unaided eye could judge which way the columns leaned;" but it is obvious that he could so judge, after his eye became accustomed to their refinements. His opinion, on the other hand, of the entasis, is that it was intended to be only just sufficient to counteract the tendency of a straight-lined cone or column to appear hollow; a tendency which every one has noticed, but as to the reason of which no two authorities are agreed. An attempt was made to formulate a scientific optical theory for it, with doubtful success, by Mr. Garbett, in his remarkable little book on the "Principles of Design"; Mr. Penrose suggested two or three reasons for the hollow effect of the straight-lined column, and the necessity for the entasis, without decidedly pinning his faith to any one of them; and Mr. Pennethorne comes to practically pretty much the same conclusion, or absence of conclusion, in his remark that "I am not aware, even with our present knowledge of optics, of any law by which we could accurately correct the optical deceptions that are to be observed in a building like the Parthenon," adding, in regard to the entasis of the column, "the outline is, I believe, a true mathematical curve, traced so as to be agreeable to the eye." That it is a true hyperbolic curve the evidence of Mr. Penrose leaves beyond all question; but the love of the Greeks for refined curves is sufficient to account for this, without supposing that this particular curve was selected as affording a true scientific correction of every specific and calculated optical distortion. In short, we believe the columnar entasis is artistic, not scientific, except in so far as the science of tracing a true hyperbola is concerned.

But it is otherwise with regard to the curves of the step and architrave and pediment lines in the end elevations. These, there can hardly be a shadow of doubt, arose from the observed

* "The Geometry and Optics of Ancient Architecture, Illustrated by Examples from Thebes, Athens, and Rome." By John Pennethorne, Esq., assisted in the drawing and colouring of the plans, and in the arrangement of the text, by John Robinson, Architect. Williams & Norgate, London and Edinburgh. 1878.

effect of the raking lines of the pediment in depressing the horizontal line of the cornice and architrave at its centre, and the curve was intended to be such as to correct this illusion. The angle at the apex of the pediment dominates the whole front, and is master of the situation in this respect. To make the straight cornice under it appear straight, it must be slightly raised in the centre, and the architrave of course also; and then the lines of the steps which form the base must necessarily follow, otherwise they would look hollow, and the centre columns too long, beneath the raised centre of the architrave. Then, as the architrave and cornice have assumed an upward curve, the raking line of the pediment must be slightly convex also, otherwise it would in its turn appear hollow in contrast with the convex line of the horizontal cornice. But the pediment angle in this way actually (though indirectly) affects the line of the steps on the return sides of the building also. For we have no doubt this is the real explanation of the curvature in the line of the steps on the flanks of the Parthenon. As Mr. Penrose has pointed out, the fact of the curvature being found in the *fronts* only of the temple of Neptune at Pæstum (which is an early example), and not on the flanks, is conclusive as to the curvature being originated by the pediment; and it was no doubt subsequently introduced on the flanks also, though in a lesser degree, in order to avoid the appearance of incoherence between the curved lines of the fronts and the straight lines at the flanks. In regard to the flank curvatures and the method of calculating them in relation to those of the front, Mr. Pennethorne's theory, stated and illustrated on pages 98 and 99, is not quite consistent with the measurements of these curves given by Mr. Penrose (plates 10, 11, 12), and would make the crown of the flank curves too high; whereas, on the south flank, at all events, the apex of the curve is hardly any greater in its rise than that of the fronts, in spite of the much greater length of the flank; so that it is evident the curve was not intended to be so much emphasised on the flanks. In another point, in regard to the deviations from the perpendicular in the columns of the portico, Mr. Pennethorne's theory seems quite unsupported by facts. He regards the portico-columns (all but the angle ones, which lean inwards considerably both ways) as being set at right angles to the curve of the steps, so that the three on the north side of the centre lean northwards towards the outer angle, and the opposite three southwards, towards the other angle, radiating like the sticks of a fan, and he refers to Mr. Penrose's measurements as rendering this evident. But if we turn to the minute measurements and notes of the east front (Penrose, plates 7 and 8), we find that the deviations of these columns from the perpendicular are almost infinitesimal, averaging ·006 in. (except in one case, which is noted as the effect of a shift), and that two of these minute divergencies are in the wrong direction for our author's theory; and as he, with ourselves, admits the minute accuracy of Mr. Penrose's measurements, it is obvious that there has been a little cookery of the facts to fit the theory. Our impression from Mr. Penrose's measurements is that all the portico-columns, except the angle ones, were intended to be vertical, so far as the front elevation was concerned, though they incline inwards towards the *cella*; but that the capitals and *abaci* were at right angles to the curve of the architrave, and therefore had an axis deviating more-or less from that of the columns beneath them, the joint immediately beneath the necking being slightly skew to the axis of the column.

This is clearly shown in the purposely exaggerated sketch given by Mr. Penrose on page 13 of his book; and we imagine Mr. Pennethorne has looked only at the measurements of the *abaci* in Mr. Penrose's plates just mentioned, and overlooked the figures at the foot of each plate which give the deviation of the shafts of the columns from the perpendicular.

So far we have been dealing with deviations and refinements with the idea of which we are already familiar. What is the special aim of Mr. Pennethorne's book, and what is unfamiliar to most readers,* is the proposition that the Greek buildings were designed so as to present, when seen in perspective from a certain point, a precise proportion of parts and dimensions in commensurate ratios, and that, in fact, the design, as intended by the architect, only existed as seen from that special point, and was worked out for that end with the greatest precision by means of trigonometrical calculations. The precise reasoning which first led the author to this conclusion we do not gather quite definitely from his pages; but his idea on the subject appears to have arisen first from the observation of certain apparently intended geometrical ratios in the plans and heights of Egyptian architectural remains, built or excavated, leading to a conviction that the Greeks, having in other points borrowed and improved upon the ideas of the Egyptians, would not have failed to seize this idea of geometrical proportion also and perfect it; and that the supposition of such a principle gives the best explanation of certain allusions to the problems of architectural design in Greek writers as well as in Vitruvius; as, for example, the remark quoted from Plato that "if artists in large works were to give the true proportions of beautiful things, the upper parts would appear smaller than is fitting, and the lower parts larger, through the former being seen by us at a distance and the latter close at hand,"—consequently, "artists, bidding farewell to truth, work out not real proportions, but such as will seem to be beautiful in their representations"; a passage which is, of course, suggestive of a very refined and exacting taste in regard to the adaptation of designs to the circumstances in which they were placed, such as no one will doubt that the Greeks did possess. Mr. Pennethorne's views on the subject may be further illustrated by the following remarks from the last section of his introductory chapter:—

"The laws of geometry were, by the Egyptians and Greeks, derived from a careful study of such natural forms as the sphere, the cylinder, the cone, and the prism, with the sections obtained by cutting through these solids at different angles; and the tendency which is found to exist in all these forms, either solid or plane, to exact proportions and true mathematical curves described by fixed laws, was very early discovered and applied to art, and the laws of ancient art will be found to be simply a practical application of these natural principles, thus:—

In Proportion, it was a principle that everything should combine in aliquot parts, and modern discoveries confirm this as a true law, which is illustrated by many facts in physical science.

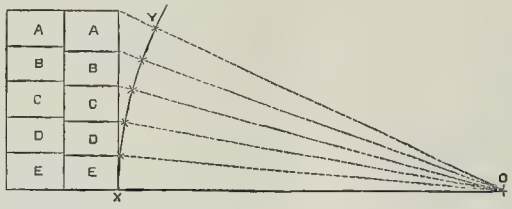
It was also considered necessary that all curvilinear forms should be the arcs of true mathematical curves, such as the Circle, the Ellipse, the Hyperbola, and the Parabola, and there is a tendency in natural forms, when undisturbed, to fall into one or other of these several curves.

The outline being thus made mathematically perfect, variety of colour was also considered as an essential part of every design, to give clearness to the ornaments, as well as to harmonise the design with all the surrounding works of nature, in which the greatest varieties of positive colours are found to exist.

Besides these general principles, it was requisite, when designing any large work, to convey the idea of the perfect design, as it existed in the mind of the artist, to the spectator through the medium of the eye; and to prevent any apparent disturbance, either in the proportions or lines, it was found necessary to introduce certain corrections in the vertical as well as the horizontal lines of the first masses; the position, therefore, of the spectator had to be determined, and confined by artificial means within the limits of certain visual angles, favourable for the contemplation of the general design."

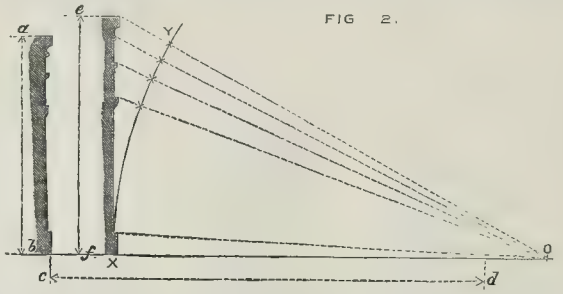
Such is the outline of the system which Mr. Pennethorne supposes to have been at the basis of Greek architectural design, the existence of which he proceeds to illustrate at length by a process of reasoning and investigation for the most part perfectly rational and logical in its conduct, however we may think it open to question in regard to some of its premisses and results. The nature of the problem practically, as conceived by Mr. Pennethorne, may be roughly illustrated by the accompanying diagram. If

FIG 1.



the spaces marked A, B, C, &c., in the left-hand column, are taken to represent so many equal vertical stages of a design to be seen by a spectator standing at O, it is obvious that some will be more distant from the eye than others, and will consequently subtend smaller visual angles than others, and appear smaller in the field of vision. Instead, therefore, of dividing out the wall itself into equal heights, let us project the whole height on the arc X Y, and divide it into equal parts subtending equal visual angles, and then, producing the lines from the point of sight through each point on the arc X Y, till they cut the perpendicular column, and dividing the latter accordingly, we get a series of vertical stages, which, though not really equal, will all occupy the same height in the field of vision. Figure 2 illustrates the appli-

FIG 2.



cation of this to the actual design of a building. Let *a b* represent roughly the profile of a Classic building in which it is desired that the superstructure shall bear a certain commensurate proportion to the height of the column or pilaster, when the whole is seen from a given distance, *c d*. If the intended proportions were carried out merely as designed in geometrical elevation, the cornice and architrave would appear too low; the intended proportions are accordingly, as before, projected on the arc X Y, struck from the eye as a centre (represented by the point O at the required distance from the arc of delineation), and the lines drawn through the points on the circle to cut the perpendicular give the proportionate heights in which the column and superstructure must really be designed, in order to appear of the commensurate proportions intended. It will readily be seen how the method is applicable to every portion of a design, so that all may be built so as to appear of any given definite proportion or ratio of dimensions when viewed in perspective from the proper point. No one of course pretends that there is anything new in the idea of designing parts of a building larger in elevation than they are intended to appear in perspective, in order to allow for the effect of distortion; though, from what we frequently see in executed buildings, it would seem that even this simple and necessary application of

* Mr. Penrose, in a footnote in his work, refers incidentally to a theory similar to that of Mr. Pennethorne, as having been started before that time, but without giving the name of its author; we presume he referred to the same reflections which are now published *in extenso* in the work we are noticing.

optical correction is often neglected where it might advantageously have been attended to. The specialty of the method illustrated in Mr. Pennethorne's pages, and which he believes was that practised by the Greeks, is that not merely generally pleasing proportion, but an absolutely commensurate ratio of dimensions when viewed in perspective, is considered a *sine quâ non*, and that with this end the whole building is to be trigonometrically designed for effect from a given point of view, from which only the intentions of the designer can be realised. We will in another article briefly consider the line of argument and investigation upon which this conclusion is based, and the value of the idea, critically regarded, in reference to architectural art.

DODONA DISCOVERED.

AMONG the thousand and one objects and collections which attract,—which distract,—attention at the great Parisian Exhibition, it may be pardonable if even a very painstaking and conscientious explorer should overlook a comparatively moderate collection of antiquities contributed by M. Constantin Carapanos. And yet these objects, comparatively few, and even in themselves not conspicuously remarkable, are symbols of the solution of a problem which has long interested students of Greek history, and been the puzzle and the opprobrium of topographers and travellers. Up to the present time, it has been the commonplace observation of classical and geographical treatises and dictionaries that Dodona was the only site of great interest in Greek antiquities, which still remained unknown, and seemed to baffle the most persevering attempts at identification.

The oracles of Dodona, interpreted from the rustling leaves of an oak tree, were consulted by the Homeric Ulysses, and the hero of the other Homeric epic, Achilles, invoked with observance the most solemn the god, Pelasgic Dodonæan, who, in remote locality, was served by priests with feet unwashed, and who slept on the bare ground. The oracle of which the vogue descended thus from the very night of legend, had recognised authority in the best age of historic Greece; and even in Roman times, and after plunder and devastation of its sanctities, its cessation is only noticed equivocally,—"it had in a manner"; or, "it had as good as come to an end." To the rustle of oak-leaves was added the casual jingling of suspended pans as the wind might agitate them, and no simpler machinery could be imagined for leaving free the sagacity or ingenuity of the administrators of the sanctuary to deal to the best of their judgment with the questions,—sometimes momentous enough and sometimes ludicrously trifling,—that were addressed to them.

Sufficient notices remained in ancient geographers and historians to certify that this mysterious site was on the borders of Thesprotia and Molottis, and could not be far from Janina, the capital of that Ali Pasha whose tyranny and cruelty only seem exceptional in the dealings of the Turks because they fell more immediately in the way of being witnessed by the Frank. One effect, however, of the unsparing tyranny of Ali Pasha was, that he engrossed it as a privilege in his own hands, and thus at the beginning of the century his country was safe for travellers from the European states,—from France and England, with which it was his interest not to embroil himself. So it was that Colonel Leake, Byron and Hobhouse, Hughes and Cockerell, severally or in company, traversed the country and made observations upon topography, antiquities, and manners, that it is still very pleasant to peruse. For those who had the advantage of personal intercourse with the late Professor Cockerell, and preserve a lively impression of the charm which he diffused around him, it is very agreeable to come upon traces from time to time among these travels of the influence of this charm in his earlier days,—upon notices of "our enthusiastic young friend,"—upon regrets for losing his "ever-entertaining and instructive society."

Of these travellers, Leake, Pouqueville, and Hughes made it their especial business to give attention to discovering the site of Dodona; and now that the lost has been found, there is something even amusing in following the ingenious and elaborate trains of investigation and reasoning by which they confirmed themselves in favour of false sites, while as perfectly familiar with the true locality and with indications that might seem to force themselves upon their notice as betraying it infallibly. But even these examples are, perhaps, less pregnant with warning to investigators than that of a much later traveller who picks up and puts together with accurate sagacity every point of evidence that establishes a case irrefragably, and when he comes to a point where he might naturally be prepared to affirm the inevitable conclusion, takes fright, and from some inability, as it would seem, to make a precedent by exercise of private judgment, falls back upon hesitation, and leaves the question in the air,—adjourns the controversy, bleeding, to another hearing.

Pouqueville,—"Pouqueville is always out," says Lord Byron,—made up his mind, under influence of another theorist, that a site so antique must needs be distinguished by remains of considerable Cyclopean architecture,—and had neither eyes nor reason for any locality where the feature was wanting. He pitched upon a height with such an acropolis as he had decided was essential between the two lakes of Janina, and thither, among others, Lord Houghton,—then Mr. Monckton Milnes,—was conducted, to be assured that the matter was settled beyond question. Yet some were wiser, and it is unlucky for them that the French consul, in condemning their hallucinations, does not think it necessary to mention their names. "I shall pass over in silence," he says, "the dreams of those who believe that the Olichinian Mountains (Olytzika of Carapanos) are Mount Tomaros, and the ruins near Dremichaux those of Dodona, to come to the topography of the valley of Janina, where we shall find Hellopia, the hieron of Jupiter, the Pelasgic *enceinte* inhabited by the Selli, Mount Tomaros and Dodona."

These dreamers, whoever they were, are now fully vindicated as being gifted with that first, —which is better than any second,—sight, the insight of clear, good sense. The recent discoverer, M. Carapanos, is a member of a family at Arta, on the Ambracian Gulf, and, like so many other Greeks, took full advantage of those educational opportunities which Athens now abounds with, before entering on a successful career, which established him as a banker at Constantinople. The study of the ancient authorities first disposed him to regard the site of the Dremichaux of Pouqueville as the probable Dodona, and this was encouraged by scattered antiquities discovered by the peasantry. Among these was one class of leaden tablets, destined to be of the highest antiquarian interest, which the peasants unfortunately were only eager for to eke out ammunition. There was the usual difficulty in obtaining authorisation from Constantinople, which, in one way or another, however, was, as usual, obtained at last. Acting upon this, M. Carapanos employed labour unstintingly to clear the ground, and since this work was done, has put into form, and printed his results, with full illustrations, in a careful and thoroughly well-edited publication. It must be said that no very important works of fine art, or even of archaic art, were obtained by the spade. By a rather odd coincidence, a bronze figure of a satyr, with the feet of a horse, was found, and might seem to justify the conjecture of an ancient critic, that Homer described Dodonæans, not as with "unwashed feet" (*aniptopodes*), but "horsefooted" (*hippopodes*). But what is decisive is the evidence of the inscriptions: the most important of these were scratched upon thin lead, and proved in many instances to be the text of inquiries made of the Oracle,—inquiries of marvellous range,—from the difficulties of diplomatists as to the stipulations to be insisted on in a treaty, to the perplexity of a sufferer by petty larceny.

The site is sufficiently bleak to answer the epithet which Homer bestows upon it,—"severely wintry"; it is in a depression between lofty mountains of bare white limestone at the top, and belted with forests above a lower cultivatable slope. The valley itself is at the crest of a watershed, but only exempt from floods by the escape afforded by subterraneous channels.

Of the place itself the remarkable characteristic is the association of a most disproportionately large theatre, with a very small fortified enclosure. The theatre is quite one of the largest as well as best preserved in Greece. Hughes gives the diameter of the semicircle as 450 ft., and that of the orchestra 130 ft. The rows of seats are given as between fifty-four and sixty, and calculated to accommodate 18,000 persons, or even 20,000 on occasion (Leake). The back of the cavea, as usual, is based on the solid side of a low hill; the advanced sides rested on vaults which were accessible in 1807, and until ruined by an earthquake a few years after. The masonry of fine hewn stone,—*isodomon*. It faces south-east. Hughes gives the circuit of the citadel above the theatre as only 770 yards by pacing; the walls 11 ft. or 12 ft. thick, and from 15 ft. to 20 ft. high; the masonry he calls pseudo-Cyclopean,—that is, of hewn stone, but jointed irregularly. Leake gives the area as equal to not more than a square of 550 ft. Another circuit of walls, scarcely 2 ft. thick, enclosed a lower area, and measured by pacing only 650 yards.

These ruins were the first which Mr. Hughes came upon when he started from Janina on an excursion taken expressly in search of the site of Dodona, which he thus came upon and left unsuspectingly. Yet he remarks with natural surprise on the extraordinary circumstance that a theatre of such vast dimensions should be attached to so diminutive a city. Nay, he even comes so near as to suggest as the only rational explanation that the theatre did not so much belong to this particular city as to the Epirotian tribes in common, or to scattered populations who assembled at certain seasons within the spacious common theatre for the enjoyment of public amusement or the despatch of public business. The sacred character of the comparatively defenceless town was still marked by traces of temples, but not so distinct as they had been a few years previously. In 1813 Pouqueville found the cella and bases of many columns overthrown which a few years before he had seen erect, and various sculptured stones had disappeared. Hughes let go his hold of his clue, as another, who succeeded in grasping it still more firmly, was to do after him, and concluded that the ruins were those of Cassopæa or Passaron, the capital of Pyrrhus, a very unhappy guess. He engraves a rough plan which agrees well with that of M. Carapanos; and mentions that while he was busied with it his friend and fellow-traveller, Mr. Cockerell, was making a drawing of the theatre. Is it possible that this may still exist and may be identifiable? If so the production of it would just now be of peculiar interest. That admirable draughtsman Lusieri also made drawings of this great theatre which he showed to Lord Broughton,—J. Cam Hobhouse,—at Athens; where again are these? They do not appear among the Lusieri drawings in the British Museum.

Colonel Leake, whose sagacity is not unfrequently at fault, but whose conscientiousness, assiduity, and learning never are, makes a most elaborate analysis of ancient testimonies, and collates them with his observations of topographical characteristics, but only to rest in the mistake that the city of Dodona was not Kastritza, a hill above the lake of Janina, and that the town of Janina was the site of the Dodonæan temple. He made some excavations at the true Dodonæan theatre; was it he who found the marble vase which Lusieri mentioned to Mr. Hobhouse had been dug up in the area of the orchestra?

But the nearest hit, which is a complimentary phrase for the unluckiest miss, was made by Dr. Wordsworth; it is to be found in his "Greece: Pictorial, Descriptive, and Historical," of which Lord Broughton says, that "it is a real Book of Beauty, and is as much like real Greece as the portraits in Lady Blessington's Book of Beauty were like their fair originals." However this may be, the Bishop takes up the clue that had already been clutched and then dropped again by the Rev. Mr. Hughes, pursues it with remarkable dexterity, and indeed does all that is requisite for unravelling its tortuosities, and only fails, as it seems, from an apprehension of casting a slur upon authorities by freedom of thought, and of sanctioning independent deference to palpable matters of fact. It would seem indeed only natural that ecclesiastics should have a finer apprehension of the characteristics to be expected in the settlement of a primæval priesthood than an officer of engineers, even though he were so accomplished a scholar as the late Colonel Leake. Even King Arthur's round-table knights prospered but ill, and were but ill-advised when they undertook the quest of the Grail. Dr. Wordsworth justly observed that the ruins of an oracular city must be expected to differ as much from those of a large or small capital or fortress as these from each other, and from this well-selected and commanding point of view he

proceeds to survey the veritable [site of Dodona, while still out of heart at discovering it with much less aid than "a response from the oracle itself." Certain inconsistent topographical notices are quite fairly disposed of by referring them to Dodona as an extended district, instead of inferring with others that they must all have been clustered about a centre. He then spots the ruins at Dramisus with the same true instinct which in old days governed the selection of a site for a Benedictine abbey. They stand in a plain, whereas the instinct of the Greek was to build upon and around the base of a considerable hill. All around, and in the midst, indeed, of one of the most mountainous districts of Greece, are pointed hills which rear their heads and present localities most available for citadels, most inviting. For the choice of a level site there must have been some sufficient reason, some deliberate intention. A city so strangely small,—upper and lower together, lying within a circuit of two miles,—could never have compensated by numerous population for such weakness of position. It could not, therefore, be the capital of Pyrrhus Passaron, as most usually supposed; but military weakness was consistent with social importance when the element of sanctity, as at Delphi, and as at Olympia and Elis, was taken into account. In the lower inclosure are vestiges of two temples: of one of them there were fragments of fourteen columns remaining,—more than are to be found altogether in the rest of Epirus. It is vexatious that not one of, the travellers gives a hint as to the style of these,—their material or workmanship, and design. The magnificent theatre,—one of the largest in Greece,—is without a parallel in Greece; as associated with a city so insignificant, it must have been built for the accommodation of crowds drawn to this centre by some influence which in ancient Greece had of necessity a religious impulse as its basis.

It must be said that the writer, in combining these considerations, is getting very "warm,"—to borrow a phrase from the game of "hide and seek" of the nursery. But, still further,—he adduces the fact that there are records of a Bishop of Dodona existing in the fifth century, and that the name which the place bears in imperial Byzantine documents of the time, is Bonditza,—to be recognised in the little church of Bodista, near the entrance of the plain from the direction of Janina. Here the explorer is more than "warm," and entitled fairly to cry out "found," but he suddenly drops his argument as if too hot to hold, and adds the lame and faltering apology for a conclusion:—"Considering these circumstances, and the inferences to be deduced from them, we feel disposed to inquire whether contemplating these ruins we are not treading the soil once hallowed by the presence of Dodona?"

It is not easy to imagine a much stronger ecclesiastical contrast than between an English bishop and the servitors of the Dodonæan oracle with whom unwashed feet were obligatory and bed linen an abomination. But otherwise there is a certain moral fitness in a successor from the land of the Druids so nearly discovering,—so narrowly failing to track out,—the haunt of the priests of the oracular oak. There is a lesson here which explorers of more than simple antiquities will do well to take to heart,—to have the courage of their opinions,—to do justice as liberally to their own originality as to that of others. It may seem undesirable in these days to encourage positiveness on the part of those who propound new views; but positiveness of the right temper, such as Mr. Fergusson gives us examples of, in asserting one's own conviction, is not the dogmatism that puts an end to argument. Discovery ever advances by conclusions leaping ahead of evidence,—of such evidence as can be grasped and fixed and forced upon the observations of others, especially of the unsympathic. At this stage the investigator may wisely keep his secret to himself; but inquiry then advances again most decisively by a discoverer assigning the full and just value at once to every new truth that he distinctly and positively proves; then in justice both to truth and to himself he cannot declare his belief too loudly and too positively. Only, as our example has shown, he must be capable of pushing aside authorities out of respect for his own better,—his own common sense, and have the sagacity, of which the chief secret lies in the courage to welcome novelty, to know when a truth is proved,—to know truth, in fact, when he sees it.

It is impossible to grudge to the Greek nation the satisfaction that one at least of the most interesting discoveries upon their own ground has been made by one of themselves,—by one who has shown himself worthy to have made it by the liberality with which he has placed his results before the world in a publication which relies simply upon fulness, accuracy, and studious illustration of whatever it is really of importance that the world should be informed of and have on record. What may be the fate of ancient Epirus in the rearrangement of power which is now at its crisis, it is not for us here to discuss, but it is impossible to look up the search after Dodona in the pages of English travellers, and not have a heavy heart sometimes as we read how inquiries of the victims of the sanguinary Pasha as to the chances of help from without are only answered by explanations that England must needs adhere to an English policy, and that this involved the support of a Government which it was impossible to approve. We may be artists and architects, and antiquaries, but it is as true of us as of Master Shallow and his wiser friends,—"We have some salt of our youth left in us,—we are the sons of women, Master Page," and why should an aspiration be suppressed that the time will yet come round when that healthiest, — that most English, relation of governors and governed which held in ancient Epirus shall be again restored? At that Passaron, which was so long falsely recognised at Dodona, the kings of Epirus were wont, after a solemn religious service, to swear that they would govern their subjects in accordance with the laws; and the subjects took a reciprocal oath that they, in accordance with the laws, would guard the monarchy. (Plutarch. Vit. Pyrrh.)

With the Greek, then, remains the merit of having rescued the question of the site of Dodona from all future cavil and conjecture, however pertinacious; but it still remains to do justice to the clear sense and good services of another English traveller who happily remains with us to be congratulated on the confirmation by the spade of what he has never hesitated to believe and to declare might be certainly inferred independently.

In the supplementary volume of Stuart's "Athens" (pp. 46-7, pl. 111) will be found the plan and details of the great theatre at Dramyssus carefully set forth by Professor Donaldson. It was in December, 1819,—some half-century since,—that the professor that was to be was on the spot. His plate indicates, by the inserted measurements, the labour that he bestowed upon the ruins. He describes it as constructed of the stone found near the spot, worked together with the greatest care without cement; at the same time the simplicity maintained throughout, and the almost total absence of ornament, were interpreted as indications of the remotest antiquity.

But even more interesting is it to find that Mr. Donaldson gave full force to the inferences which Mr. Hughes failed to draw from materials in his own appendix, the collation of ancient authorities respecting Dodona by Dr. Butler, of Shrewsbury. On the strength of these he renounced the site to which the very excellent Handbook of Greece of Mr. Murray still directs the traveller, or rather now the tourist, and discerned and decided that the disproportion which is so remarkable between the size of the theatre at Dramyssus and the extent of the town was to be accounted for by the necessity of the edifice being sufficiently capacious to receive the vast concourse of people who, on certain solemn occasions, were accustomed to flock to the oracle.

Preaching from Afar. — The *Halifax Guardian* says that a gentleman, well known in connexion with a firm of telegraph engineers in the town, has contrived to have his sermons at home. He placed a microphone in the pulpit of a chapel in the town, and connected it, by means of a private telegraph line, with a house more than a mile away. Every part of the service was distinctly heard by the owner of the house, with the exception of a few words rendered indistinct by the preacher becoming a little excited, and shaking the microphone, the presence of which he never dreamt of. During the week experiments have been made in the schoolroom of another chapel, and the singing of the scholars was transmitted and retransmitted over a number of telegraph lines with remarkable clearness. Carry out the arrangement completely, and one good preacher may stay in his own study and serve a whole town.

CHROMATIC AND DELINEATORY SCALE IN ARCHITECTURAL DRAWING.

THE visitors to our annual exhibitions, in Burlington House and elsewhere, cannot fail to remark a considerable difference in the pressure of spectators in different apartments. On the occasions, unfortunately becoming more and more rare, when some painting of admittedly the highest order forms the centre of an admiring crowd, this fact is easily understood. When we go a step beyond this, we may, perhaps come safely to the conclusion that the general taste of the public is chiefly struck with the exuberance of colour. We are not, it is admitted, a naturally æsthetic people. Northern and Western nations, as a rule, are deficient in the colour sense, as compared with habitual residents in climates where the retina is constantly stimulated by natural tints of intensity such as it requires something like the heat of the present summer to bring out. Thus we generally find that oil pictures, as more fully coloured, attract more attention than water-colour drawings. As to this, indeed, it must be admitted that recent years have witnessed a change. In the Grosvenor Gallery, for example, on a recent visit, it was remarkable how much more attentive were the visitors to the water-colour exhibits than to all but two or three of the oil paintings. For this, we apprehend, there is a reason apart from that more ready impressiveness by full colour which we have suggested to be a general characteristic of the bulk of the exhibition-going public. Water-colour drawing is rising in public favour as an art. It is made matter of study for the young; matter of occasional pursuit for those who are young no longer. If the number of persons who dabble in oil, and of those who try to produce some effect in water-colours, were to be ascertained, there cannot be much doubt that the latter category would be far more numerous. It is, then, as students, or as amateurs, or as observers in some way directly interested in the method of the water-colour draughtsman, that we consider that the bulk of spectators are attracted by water-colour drawings. It is not as a question of general taste, but as a mark of the extension of special study, that the change,—if it be such as we suggest,—may most readily and most satisfactorily be accounted for.

But while, for the above, or for whatever other reason may be suggested, the *queue* formed before such water-colour drawings as "Rose Red and Snow White," "The Manners and Customs of Monkeys," "Fish out of Water," or the remainder of the twelve remarkable drawings by Richard Doyle which hang in the Water-Colour Gallery provided by Sir Coutts Lindsay, is only equalled, in the adjoining rooms, by that which presses to scrutinise the microscopic delicacy of the faces in the "Passing Days" of Mr. J. M. Strudwick, or that is arrested by the audacity of contrast of the pretty dainty little dame in black tripping over the fallen chestnut leaves, the like is far from being the case with regard to architectural water-colour drawings. Of these, as is natural, at the Academy, for example, the *Builder* has long been in the habit of giving special descriptions. And, of course, these drawings command their own public, and that, it may be said, a cultivated and enlightened public. But it is undeniably a small one. Architectural drawings, as a rule, do not attract general attention. Architects will study them. Men who are in want of a house, or of an architect, may look them carefully over. Visitors from the country, who make it a point of conscience to take out their shilling's worth, and do not consider that to be done unless they have looked out the titles of the subjects inclosed in each numbered frame, will glance at them, unless beaten by sheer fatigue before they advance to such high numbers in the catalogue. But the fact remains—there is a woful thinning in the stream of spectators when we come to architecural compositions.

Why should this be the case? We may reply that for many persons *genre* or portraiture has a special charm; and especially that the amusement which may be drawn, or at all events expected, from *genre* pictures, is such as to attract the first notice of nine persons out of ten. As to portraiture, indeed, failing one of three powerful attractions, the ordinary contemporary portrait is rather a thing to shun than to study. These three are—rare and striking beauty in any element of form, tint, or expression; commanding skill on the part of the painter; or personal interest in the subject. When these are all

absent, the portrait of some local magnate in wonderfully blacked boots, becomes a sort of nightmare to the educated eye. With regard to landscape, again, there may be the charm of a truly poetic and masterful reading of some striking aspect of nature. There may be scenery so romantic that even a photographer fails to destroy its beauty, or to eliminate its charm; or there may be the interest excited by knowledge of the scene. When each of these elements of power to act on the imagination is absent, to look at a painted landscape is only like a glance from the window of a railway-carriage at some uninteresting bit of country.

But when we come to architectural drawing, there is to be found, at all events, the possibility of pictorial charm. What idyll, what epic, appeals more strongly to the imagination than does the presence of some great monument, around which the life of Europe has throbbed for centuries? We may look at it as an unbroken link with the historic past, as in the mighty roof which the Second William reared at Westminster, and which yet shelters that noble hall. We may look at it as a mute witness to grave secular change, as in the case of the palace of the popes at Avignon. We may recognise the abiding power of human genius, as in the domes of St. Peter's at Rome, or of St. Paul's in London. We may trace a thousand linked memories, of which the shadows flit under the lofty gloom of the vaulted roof of Westminster Abbey or St. Ouen's Church. We may recall the memory of Roman rule by the towers of London, Rochester, or St. Alban's,—reared as is the latter from the materials of Verulam. We may raise up in imagination the images of the royal, noble, fair, and famous personages who have built, or dwelt in, or been entombed under, so many sites which are rich in architectural and in landscape beauties, no less than in the undying charm of poetic association. We might go on and on and forget time and space and yet be far from exhausting the rudest list of the objects suited for the architectural draughtsman in which England is so rich, and of which the charm might be thought to be so magical.

If such is the case with reference to purely representative architectural draughtsmanship, something of the same charm might be thought to attach to the learned and tasteful efforts of the architect to reproduce, for the state or for the comfort of future generations, something of the grandeur or the well-adapted fitness of buildings in which our ancestors were wont to delight. It is not to the lot of every architect that it falls to rear a palace, or a noble hospital, or a great chartered school. But some of the architectural gems which have high, if not the highest, place in the imagination, are of a size and cost which it is within the range of our daily expenditure to reproduce, so that we have the taste. Italy is rich in such gems; but it is not necessary to travel as far as Italy to collect them for the portfolio. The little house in which Virgil is said to have breathed his last yet stands at Brindisi. It might be rebuilt with admirable success on the banks of Windermere, or even of those of the Medway. Many of the seventeenth-century manor-houses, farmhouses, and even town-houses of Surrey are worthy of the reproductive study of the architect. The devastation which has been wrought, within the last ten or twenty years, by "improvement," on one of the richest collections of English architecture of the eighteenth, seventeenth, and even sixteenth centuries, in the High-street of Guildford, is no less than a crime against architectural canons. Invention in architecture is perhaps only pardonable when restoration, reproduction, and congenial improvement and development have done their utmost.

We have dwelt on the capabilities of this branch of art at greater length than we purposed to do. But the reflections to which these hints may give rise are many and valuable. How is it that, if the range of the architectural draughtsman be so great, and the elements which should give value as well as charm to his work, are so numerous and so important,—how is it that we hear the casual visitor say to the party he is escorting through the exhibition,—"Oh, these are only architectural drawings"?

There is a remark made by Mr. Ruskin, in his last charming shilling's worth of art-gossip, which may go far towards the explanation of this difficulty. At all events, it furnishes a hint which it is worth while very attentively to follow out. In the Fine Art Societies' Galleries, 148, New Bond-street, may be seen a bit of unfinished architectural drawing of the rarest delicacy and beauty. And it is undeniable that this beauty depends essentially, in so far as remaining unsupported is concerned, on its being left unfinished. Complete the picture, as a tyro might say, and its chromatic perfection will be gone. How this is so, it is very fortunate that we are able to point out, and that on authority that will be unquestioned. The drawing in question is that of a portion of the Ducal Palace at Venice. "My own study," says Mr. Ruskin, "made in 1874, of the colour of the Ducal Palace in morning sunlight, comes as near, I believe, to the actual facts of the relation between dark and light in the *architecture alone* as attentive care can reach; and it is wholly impossible to get the drawing of the finer details, unless in this delicate and literally true tone, for all the local darks, such as those of the nearer prison-pillars in this sketch, lose their relative power if the lights are put in deeper tone. But the moment sky is added to such a study as this all its detail becomes ghostly and useless; the eye then requires the relation between the nearer buildings and the light at the horizon, or between their shadows and the light of the blue above, and all one's delicate work is lost."

The value of this profound piece of criticism is capital. As made by the cunning draughtsman himself on his own handiwork, it is unusually free from all disturbing influence. It may be accepted wholly, and in its full force. But any one who reads it as a mere apology for an unfinished sketch, or as a criticism on a piece of academical work, will lose the lesson it ought to convey to his mind. Mr. Ruskin's remarks are not always so luminous in their teaching, even if rightly studied. He is too apt,—it is a common infirmity of genius,—to give in a few fiery words the outcome of a long train of thought or of reasoning, and to leap gaps which are utterly insurmountable by those who have not followed the unrecorded intellectual process. We ought to regard such a remark as the above as illustrative of one very luminous case of a general rule. And the general rule is no other than this,—in all pictorial representations of architecture, fidelity, as well as beauty, depend on the observance of chromatic scale. The neglect of aërial perspective is destructive to pictorial effect on the one hand; and the neglect of chromatic balance in composition is no less destructive to that effect on the other hand.

Two principles thus stand out as essential to be observed by those who would distinguish between the architectural diagram and the architectural drawing. These are,—first, the necessity of observing scale in precision of definition; and secondly, the necessity of producing a true chromatic balance in composition. In the diagram, neither of these requisites obtains. It follows, conversely, that the drawing in which they are neglected may be a diagram, but it has no title to the name of a picture.

The essence of the diagram is, that, by a graphic representation, it conveys to the eye information which it is necessary to give in more exact detail than can be given either by words or by a general drawing. In our earliest examples of diagrams,—those which illustrate the propositions of Euclid,—exactitude is by no means required. No doubt the famous *Pons Asinorum* deserves a well-drawn diagram, with clear, even, lines, exact balance of the basal angles, and well-formed letters or figures to aid the demonstration. But the roughest scrawl of chalk on a board, or of a stick on the sand, will answer all the purpose of the most delicately-drawn diagram for geometric demonstration. Beauty in such diagrams consists in exactitude of draughtsmanship, and is, for the mathematician, a luxury,—not a necessary.

When we come to the architectural diagram we make a step in advance. We are yet at some distance from the mechanical drawing proper, which is needed by the engineer, and which ultimately must often be an actual full-sized delineation of the forms to be produced. Such is the case, for instance, with a casting. Before the wooden mould for a casting is made, a full-sized drawing has in most cases to be prepared, from which the model-maker copies his work and takes his dimensions. It is not, of course, always essential that this should be the case. But such may be taken as the normal mode of procedure

When we have to produce work which, on the one hand, is much too large in its dimensions to be drawn out full size, and, on the other hand, is guided by special methods, or by the application of spesial implements (such as the plumb-line or the square), during its construction, the diagram is, in its proper nature, intermediate between the rough mathematical indication of condition and the accurate delineation of actual contour. Scale is then introduced. An architectural working drawing is a diagram to scale,—exact, as far as the skill of the draughtsman goes, in its proportion, but conveying no pictorial information to the mind. The section of a building is a delineation as purely ideal as is the diagram of the "asses' bridge." The architect and the builder read its short-hand at a glance. But to the man who for the first time is shown a section, it is wholly puzzling and incomprehensible.

When we pass from section to elevation the same rule applies. A geometric elevation is, admittedly, as purely a diagram as a section. And what now comes to be observed is, that a perspective elevation is no less a diagram than a geometric one. A perspective elevation represents, from a given point of view, what a geometric elevation represents if seen from an infinite distance, or as viewed by parallel rays. That is the chief difference.

Now, when it is sought, by sketching-in trees and sky, and perhaps figures, to convert a perspective elevation into a picture, we attempt the impossible. Failure is more or less certain. A picture is—or ought to be—a conception of a whole; in which each detail is on a scale of due subordination. Further, the subordination of these details will depend on the laws of light and shade,—not on those of architectural necessity. A small, pierced, unglazed window, for instance, will assert its presence by a depth of shadow which will entirely distance the force of a main structural element of stability. This the painter will represent aright, because to him it will be visible, and, therefore, true. The architectural draughtsman will fail adequately to represent it, because it will be structurally unimportant, and thus, from his point of view, untrue. Thus the constant opposition between the requirements of the diagram, and those of the pictorial representation (not going so far as the true picture) is continually reappearing, and essentially irreconcilable.

Here comes in the charm of what are called, in technical cant, "bits." A single detail may be represented at once with the accuracy of a diagram, and with the force of a picture. This is impossible, to the same degree at all events, with a multiplicity of details. If we take the architectural drawings of Canaletto, in which we may almost be said to have perspective elevations, we have yet to observe:—First, that we have not so much the perspective of a single building as the general perspective of a group of buildings, which is quite a different thing; secondly, that the pictorial laws of light and shadow are the ruling elements of the linear composition,—not, necessarily, the structural lines; and, thirdly, that the details fade away in precision, in exact proportion to their pictorial unimportance. It would be a very different thing to build a house from a drawing by Canaletto, and to do so guided by a good perspective elevation. The former must be supplemented, either by the knowledge of the architect, or by means of additional diagrams. The latter may be so complete that, if a lens be applied, it will contain almost all the information positively needed by the builder.

In the diagram, absolute scale is wholly unnecessary; fidelity to relative scale,—speaking of the architectural diagram,—is the one absolute requirement. In the picture, absolute scale, or proportion, not only of part to part, but of whole to point of view, is the first necessity. Thus we may fill a sheet of paper with different sketches, each of them of the size most appropriate to give distinction to the features we wish to produce. The effect is admirable. This bit of paper may be beyond price. Attempt to combine the sketches into a picture, and the whole is utterly ruined.

A charming illustration of the truth of these views may be found in the collection of drawings by Mr. Ruskin, to which we have referred above. Thus, with the water-colour drawing of the "Ducal Palace," let the student compare the "Spire and Angle Window at Zug," or the stonework of Roslyn, or that of Lady Glenorchy's Chapel, Edinburgh. Here are truthful bits of delineation, in which architectural accuracy was the object of the delineator, and of which absolute fidelity to nature has made studies quite perfect in themselves. Compare these with the pencil drawing of the outline of the fresco of the "Sacrifice of

Job," in the Campo Santo of Pisa (25 R). This sketch, which is of unrivalled delicacy and beauty, is wholly unfinished,—a fact due, so far as memory serves us, to the state of the fresco itself. But, unfinished as it is, it has all the stamp of a picture. It is not a group of sketches,—a head here and a hand there,—it is only an imperfect, broken, but most precious adumbration of the relics of a mighty whole. An attempt to combine an accurate representation of the structural portion of the wall of the Campo Santo with a transcript of the dream of Giotto would be a predestined failure. We see how a man who has earned, by hard study and masterly work with brush and pencil, the right to speak with a sort of inspired dogmatism,—has wrought in these two different styles,—how he has reflected architectural detail, how he has conceived of the pictorial aspect of nature; but we cannot conceive that either the sketch of detail or the group of landscape should be combined with a perspective elevation from which a builder might construct a house, or after which a proprietor would order one to be built.

It is by keeping clearly in view the difference between the diagram and the picture, the technical direction and the pictorial conception, the requirements of architecture as an industrial art, and her requirements as a fine art, that architectural draughtsmanship may be redeemed from that degree of discredit which we fear too justly attaches to it. We have read somewhat between the lines of Mr. Ruskin's notes. But we have little doubt of the accordance of our remarks with the views which he would desire to support. The diagram is a production in which skill and industry will enable any patient and resolute student to attain ultimate excellence. It is producible by the genius of hard work. With all respect for Mr. Kingsley's quotation from Turner,—"I know of no genius but the genius of hard work,"—the production of anything that shall irresistibly charm as a picture requires something of a very different order. We should like to have an estimate of the amount of hard work, and *nothing else*, that would produce a rival to Mr. Ruskin's "long-coveted drawing of the Splugen."

SANITATION AT THE PARIS EXHIBITION.

To continue our observations on the various structures situated in the gardens outside the main building of the Exhibition, we fail to note anything of particular interest from a sanitary point of view, after leaving the Belgian annexe, till we reach the English machinery and agricultural annexe. Here we find the patent agate-centered ventilators of Messrs. Fellowes & Bates, of Manchester. This patent merits the consideration of persons interested in the subject. It consists of a cowl, or smoke-conductor. The hood is armed on its summit with curved vanes, which act as sails under the pressure of the wind, and cause the ventilator to revolve, while the side-vanes permit the escape of the vitiated air. Beneath the aperture an archimedian screw is connected with the hood, by means of a central cast-steel shaft, from which it derives its rotary motion, and thus produces a continuous up-current. The whole being pivoted on a polished agate bearing, there is no risk of fire from the giving way of oil-cup fastenings, and the wear and tear due to friction are considerably reduced. In large workshops, factories, &c., it is suggested that, to secure more regular action, and to obtain good ventilation even when there is no wind, steam or other power should be connected with the screw, so as to make the cowl revolve at a given rate whatever the condition of the weather. How far this ventilator acts in practice it is impossible to judge from the mere contemplation of the cowls exhibited, but the English commissioners have determined to try its efficacy in their own annexe. This is a long ill-ventilated building, which, when the sun shines, certainly becomes very hot; but we are to see what two ventilators, 36 in. in diameter, driven by steam, and two 18-in. ventilators driven by wind, can do to relieve the closeness. The firm have calculated that their 36-in. ventilator driven by steam should make 130 revolutions per minute. At this rate it will extract 5,600 cubic feet of air per minute. If the ventilator is smaller in diameter, the reduction does not correspond in due ratio, for an 18-in. diameter driven by power will only extract 900 cubic feet of air per minute; that is, a sixth instead of half the quantity of air drawn up by the ventilator twice its size. We would suggest, however, that these calculations should be gone over again by some person totally disinterested in the patent. If it can be confirmed by independent evidence that a ventilator 36 in. in diameter, costing, comparatively speaking, but a trivial sum, can, when working under power, draw out of a factory or other similar building about 336,000 cubic feet of air in an hour, the knowledge of the fact will prove of the utmost value to the proprietors of the patent and to the general public.

Leaving the English annexe, passing the Australian log-hut, which, with all its crevices, suggests at least ample ventilation, a little kiosk will be found erected by the society for providing limbs to the poor and mutilated. Here a young woman with a wooden arm, hand, and fingers, distributes circulars and explains all the conveniences of the apparatus which admirably replaces the lost limb. The Société d'Assistance aux Inutilés Pauvres, 43, Rue de Verneuil, Paris, has done much, with slender means, to relieve human suffering; and, while the ingenious mechanism of the false limbs supplied is really curious and worthy of inspection, the charitable objects of the association commend themselves more forcibly to public sympathy and support.

Not far from this exhibit will be found the magnificent ambulances of the French Society for the Assistance of Wounded Soldiers. Apart from a great variety of ambulance wagons, there is an entire ambulance railway-train. The train forms a long series of rooms united by platforms, so that the attendants can walk from carriage to carriage. One carriage is a store-room for provisions and medicaments, the next for linen, the third is disposed as a kitchen, with a large kitchener, a sink, and everything complete for the most extensive cooking; then there is the doctors' consulting-room and bed-room, elegantly and comfortably fitted up; after that we have a day-room or dining-room, with a number of benches and tables; finally, we have the carriages where the wounded must lie. One is fitted up with regular beds, the other so arranged that the stretchers themselves, hung from the roof, are used instead of beds. In the one carriage everything is done to ensure comfort; in the others the chief object is to take up as many wounded as possible. A railway train thus disposed is, to say the least of it, a strange spectacle; but when we consider the terrible meaning of all these preparations they strike a note of discord in the midst of this great gathering of peace, industry, and concord. A wooden ambulance, with the library of the society, partially hides the train from view, and next to it there is an ambulance tent for the beds, with the double canvas covering system of ventilation, which has been often described. The rough-and-ready warming system is also exemplified; and this tent recalls the tents established in the Avenue du Bois de Boulogne by the American Ambulance during the siege of Paris. Here, in consequence of the admirable ventilation, and the absence of hospital fever, operations which could never have been attempted within doors, were successfully accomplished. The value of ample ventilation was never so triumphantly demonstrated, and the wounded nursed in the American ambulance were certainly the most favoured by the chances of war. Nor is a canvas hospital incompatible with warmth, for we have rarely a more rigorous winter than that of 1870-71. A hole is dug at the back of the tent about 4 ft. deep. Here a stove is erected, and the heat is conducted by flues into the tent. We next come upon a long wooden hospital, so contrived as to be easily removed and reconstructed elsewhere. Between the two flank walls, perforated bricks, or plaster, or stucco composition may be introduced, and so contrived that a continual current of air can be maintained within the wall. For the ventilation of the ward itself, there are little openings on the level of the floor, one for each bed, and in the elongated lantern-shaped roof side openings about 1 ft. high and 3 ft. in length at a distance of 5 ft. from each other, allow the heated air to escape. That ventilation is the subject of minute study can be gathered from the fact that the four lanterns at the end of the ward are shut off from the room, and have tubes conducting the air they consume to the outside. Further, to ensure a plentiful supply of purifying light, there is nearly as much window-room as wall-space. The windows face each other, and are protected by protruding awnings which shade but do not exclude the light.

Nearing the bridge that crosses the Seine, we pass by Mr. Lascelles's reproductions of English cottages, which will not fail to interest the French and their foreign visitors, though the style of building is familiar enough to us. There is a cleanly neatness, combined with a certain picturesque effect, which distinguishes these typical structures.

Crossing the Pont d'Jena, and entering the Trocadéro gardens, we find, immediately to our left, the Café du Maroc, the Tunisian café, and a Turkish bazaar, where tawdry, and at times dirty, Orientals sell trinkets, and scent the air with the smoke of pastilles. The scene is picturesque, and, above all, strange to Western Europeans, but there is a catch-penny element about it which, if typical of Oriental bazaars, detracts somewhat from the dignity and imposing aspect of an International Exhibition. The diminutive reproduction of the Shah's palace at Teheran is an exhibit equally typical and far more dignified. We attempted in vain, it is true, to obtain from the Persian attendants some notion of the sanitary arrangements of the royal palace, but the scene in itself was ample reward for the trouble of the visit. The eccentric roof, imitating large crystals, the cool effect of the fountain playing in the centre of the ground-floor room, the beautiful carpeting, and the coloured light streaming through stained glass, on the swarthy faces of the Persian attendants, all contributed to embellish a picture which, if easy to criticise, as scarcely in keeping with the principles of high art, presented nevertheless all the charms of the wildest phantasy.

As an abrupt contrast, the Norwegian and Swedish wooden houses stand close by the Palace of the Shah. Here, at least, we can find the trace of some knowledge as to the preservation of health. An opening is formed under the floor of the rooms, and conducts the outside air to the back of the stove, where it is warmed, and then admitted into the room. The walls are of varnished wood, which can be easily washed. There are two walls, each of planks 1 in. thick, and the space between is generally filled up with sawdust and clay, which is considered an effective method of keeping out the cold. There are, we noted, generally some contrivances for opening the upper part of the windows; and the closets are, as a rule, built outside and away from the house, notwithstanding the fearful severity of the Scandinavian winter.

Still further to impress by force of contrast, the Chinese house and bazaar come next. Here there has been an evident attempt to build something gay, but which has, nevertheless, a melancholy element in its general appearance. This is due perhaps to the mournful slate-coloured roof combined with dull red wall paint. Within, the astounding Chinese drawing-room, with arm-chairs and little tables fastened all together in a row, the stools that seem like upturned drums, and the gaudy decorative work, are all well worth examining; but there is no one at hand to explain the more intimate details of the Chinese household life.

Turning back towards the centre of the Trocadéro, and on a higher portion of the incline, we find the Egyptian house, containing some very fine plans, in relief, and drawings of the Suez canal, and giving the fresh water canalisation which supplies the domestic want of the various stations along the canal. Here also is exhibited the cap worn by Livingstone and the revolver Stanley gave him. These, with some rough drawings, make silent but eloquent appeal against the African slave trade.

The Japanese garden now alone separates us from the avenue leading to the central fountains and waterfall. This garden, with the hut in the centre, its strange doorway, surmounted with a remarkable wooden cock and hen, are peculiar, quaint, and yet not forced and obstructive.

Coating for Woodwork.—Good lime slaked with sour milk, and diluted with water till it is about the consistence of ordinary whitewash, is recommended by the *Landwirth* as an excellent coating for woodwork. Fences, rafters, partitions, &c., are, it says, effectually protected against the weather for at least ten years by this application. The casein of the milk in combination with the lime forms a permanent film, which dries so quickly in warm weather that heavy rains falling directly after it has been laid on will scarcely affect the work.

FIRES IN THEATRES.

IN resuming our notice of Herr Fölsch's valuable work on "Theaterbrände," * a labour which affords us extreme pleasure, we think it advisable to lay some further information from its pages before our readers, before proceeding to discuss the important step taken by the Board of Middlesex Magistrates in issuing the regulations for preventing fires in buildings over which they have control.

A few additional statistics, taken from the list of theatres destroyed by fire, contained in the work of Herr Fölsch, will teach us, if instruction were needed, how highly dangerous our modern stages are. Nearly every theatre in London and Paris has been burnt down in its turn; in London alone, to the number of thirty-one. During the last thirty years, fifty-seven fires were officially recorded in London, and a great many fire alarms may have never come to the knowledge of the authorities. No better criterion of the combustible nature of play-houses can be formed than by looking at their respective ages. The author has been able to collect exact data with that view of 252 theatres. Of these, there have been burnt down:—

5	theatres	before opening;			
70	,,	in the first 5	years	after	opening;
38	,,	,, 6 to 10	,,	,,	,,
45	,,	,, 11 to 20	,,	,,	,,
27	,,	,, 21 to 30	,,	,,	,,
12	,,	,, 31 to 40	,,	,,	,,
20	,,	,, 41 to 50	,,	,,	,,
17	,,	,, 51 to 60	,,	,,	,,
7	,,	,, 61 to 80	,,	,,	,,
8	,,	,, 81 to 100	,,	,,	,,
3	,,	over 100	years	after	opening.

Total 252 theatres.

The abnormally great number of theatres burnt down in the first five years after being opened is explained partly by the fact that most of them were wooden erections, or merely provisional buildings, which, of course, are of the most dangerous nature. The above figures show that the average age of those theatres destroyed by fire amounts to about twenty-two years and three-quarters. Carrying inquiry a little further, we find that the 516 theatres burnt down were distributed over the globe as follows. They included:—

176 in the United States;
68 ,, Great Britain, exclusive of the Colonies;
63 ,, France;
49 ,, Germany;
45 ,, Italy;
26 ,, Austria;
24 ,, Russia;
17 ,, Spain and Portugal;
30 ,, the various European countries;
18 ,, the various extra-European countries.

A comparison of these figures does not permit of forming an opinion as to the more or fewer fires in theatres in the different countries; but they are a safe index of the care bestowed there in collecting the required data.

It is further interesting to observe the time when theatres generally burn down. On the average, about thirteen theatres are destroyed each year; the worst months being from January to March, the fewest fires taking place in July to September. Most of them have taken place in the middle of the week, the most fatal days in the month being, strangely, the 8th, 15th, and 22nd. Fortunately, of the many conflagrations chronicled in the work, only thirty-six broke out while representations were going on; but these have, on the other hand, been the most disastrous on record. Most of the fires took place in the middle of the night; taking the risk of theatres to catch fire during the day at one, 6·8 represents the liability about two hours after the conclusion of the performance.

Another point, which has been referred to only in passing in our former notice, and which is generally too much neglected, should not be lost sight of. It is the extreme rapidity with which conflagrations generally spread in theatres, leaving no time to save anything, and involving too often great sacrifice of life. A case in point is the destruction of the Berlin Opera on August 18th, 1843. On that evening the military ballet, "The Swiss Soldier," in which guns are fired and fireworks let off, was represented. At the inspection, half an hour after the end of the performance, there was not the slightest sign of fire. Soon after, however, flames were seen issuing from the right side of the stage, and ten minutes later the whole building was one mass of flame. The old Opera, like the present one, stood completely isolated, and yet it required the utmost exertion to save the surrounding buildings from taking fire. At the destruction of the Munich Court Theatre on January 14, 1823, it was with the greatest difficulty that another theatre close by, the Royal Castle, and other important buildings were saved. In too many cases it has not been possible to arrest the conflagration, and to confine it to the theatre on fire. Among the many catastrophes of this description of older date may be mentioned the first destruction of Drury Lane Theatre (January, 1672), when sixty other buildings were destroyed; the burning down of the provincial theatre in the courtyard of the Royal Palace of Amalienborg, near Copenhagen (April 19, 1689), when the destructive element annihilated the whole palace, the park with all its buildings, and endangered even the fleet in the roadstead.

Of the more recent fires of this nature, let us only refer to that of the English Opera-house, (February 16, 1830), when fifteen neighbouring houses were destroyed. The fire which broke out in the Olympic on March 29, 1849, either entirely destroyed or greatly damaged twenty other houses. It may be asked, confining the inquiry to London, in how many cases would a fire in a theatre *not* involve the destruction of surrounding property?

In looking into all these cases, let us not forget that through fires in theatres immense sums are year after year entirely lost. And yet we are not growing wiser. It is true that nearly all theatres are insured, and pay a high premium. But no one will assert that those premiums even approximately cover the heavy payments that have to be made by insurance companies, and through them by the public at large. Yet those pecuniary losses are nothing to the sacrifice of life which in nine cases out of ten accompanies fires in theatres. Quite apart from the vast number of lives (both of actors and spectators) that have been lost at the outbreak of fire during performances, the life of firemen and others whom duty calls to assist in extinguishing fires is greatly endangered in conflagrations of unusual vastness, and it is no wonder that we frequently hear of their falling victims in performing it. At the fire of Covent Garden Theatre, on September 20th, 1808, no less than twenty persons so employed lost their lives. At the destruction of the Royal Theatre, in Edinburgh, a great many lives were thus lost; and the list of fatal accidents to firemen in foreign theatres is equally large. This sad loss of life arises generally from the non-acquaintance of the firemen with the interior of theatres, the rapid spread of fire and smoke soon barring all egress to those who venture rashly too far into a burning building. Instances are reported where even those engaged in theatres, and supposed to know their way about them, have perished in attempts to save valuables. There is a terrible case on record, in which the cashier of the Kärnthnerthor Theatre of Vienna and his wife lost their lives under most distressing circumstances. The house was in full flames, when they both rushed back to save the cash-box. Before they could return, however, the flames had reached the staircase, and both died a miserable death, in full view of many people, because the grated windows behind which they were vainly calling out for help could no longer be reached and broken open.

Both more disastrous and of a far more shocking nature are fires in theatres, if they break out during performances. The great danger threatening hundreds and even thousands at the same time; the coincidence of many circumstances which, in ordinary cases, would appear trivial, but upon which depend the lives and the health of many people; the dire fate which makes victims of hundreds at the same moment, — all these combine to make up a picture against the recurrence of which we ought to guard, and yet against which so little has hitherto been done. In the work under notice, a list is given of thirty-six fires in theatres which occurred during representations. It is not our intention to particularise them here; but those of our readers who take an interest in them will not regret the time spent in perusing the part of the book dealing with them. For notwithstanding all that has been asserted to the contrary effect, viz., that fires in theatres rarely begin during representations, and that the catastrophe of Brooklyn was unexampled, they will see that experience says otherwise. Since 1770 no fewer than thirty-six were burnt down while performances were going on, and in most cases the loss of life has been frightful.

There is no doubt that effective measures against fires in theatres are imperative. While searching for the best means for preventing them, an inquiry into the origin of those fires is of great value. But in by far the greater number of instances it has not been possible to trace their causes. In this country the verdict of the jury is similar to that found after the destruction of Covent Garden Theatre, in March 5, 1856,—namely, "That the theatre has been destroyed by fire; but that there is not sufficient evidence before the jury to say how the same originated." In other countries where no such juries exist, in most cases, after a fruitless inquiry, the subject is silently dropped. The reason why, only in rare instances, the causes of the fire are established, is to be sought in the rapid spread and the destructive effect of the conflagration. The thick smoke arising at once obscures all observation; the extraordinary haste and confusion render even subsequent evidence of eye-witnesses unreliable, and such traces which might possibly lead to a discovery are obliterated by the rapidly spreading flames, so that there remain only assumptions upon which to proceed.

Most certainty exists with respect to fires which break out during performances. They are caused either by badly protected or naked lights, or by leaky gaspipes, or by careless handling of the gas, or by gas explosions. Other fires have arisen from the employment of petroleum for lighting, or through careless smoking, or through firing of guns or letting off fireworks. Fires, finally, have been caused by the faulty condition of the heating apparatus. In all these cases, carelessness with respect to all those dangerous appliances has been at the bottom of the outbreak. And yet we are going on in the same course.

It has already been remarked that the rapid inflammability of our theatres arises from the large quantity of material easily set in flames, and stored up within a narrow compass, which has been dried up by continually applied heat, and thus prepared for combustion, but also from the extensive way in which a theatre is lighted up. This danger is considerably increased not only by the frequent use of very thin stuffs, which are on that account set ablaze all the more rapidly, but also by the more or less fine or coarse threads of the canvas employed for decorations, which depend from them after frequent use, and which act like slow-matches for the fire. The dust also which settles on the decorations, and which consists mostly of thin fibres, favours the spreading of the flames, so that in an incredibly short time after they once get hold of the objects within their reach their extinction becomes a matter of impossibility. A fire breaking out must consequently be promptly stifled, or the whole house will be in flames. Experience tells us that such a danger sets in very frequently, or more often than is generally believed, in wider circles.

Theatres which are exposed almost daily to destruction by fire ought to be constructed as much as possible of fireproof materials. The application of the latter to buildings was fully discussed at the recent Conference of Architects, and it is needless to refer to it here again. We trust that the valuable suggestions made will be put into practice, especially for theatres.

Having thus pointed out the most essential features of the work before us, we may pass on to the second part of our subject, the regulations adopted by the Middlesex magistrates for the prevention of fires in concert-rooms, music-halls, and dancing-saloons. By a singular coincidence, the new regulations were brought to the notice of the public the same day that the issue of our journal containing the first article headed as above was passing through the press. Of the opportuneness of the precautions thus wisely taken, there can be no question; and an examination of the new regulations will, therefore, not be without benefit. It will assist us in forming an opinion as to their application to London theatres. A scrutiny of them will be all the more interesting if we view them by the light supplied by the excellent book we have referred to. There is only one exception we have to make to the regulations, and that is that they do not deal at all with the construction of buildings to be used for concert-rooms, music-halls, or dancing-saloons. For this purpose comprehensive rules ought to be laid down, and they will probably not be omitted in the legislation which is reported to be contemplated for theatres.

It is hardly conceivable that the measures taken by the Middlesex magistrates will be without some salutary effect in stirring up action in this

* See p. 423, *ante*.

direction. After the example set by that body, we should think the necessity of adopting similar provisions for theatres will be recognised. The protection of the theatre-frequenting public being absolutely necessary, we are sure Parliament will not be backward in furnishing the requisite authority. Action of some description has become a necessity, and the sooner it is taken the better for all concerned. It is a crying shame that thousands of lives should depend upon the good-will of theatrical managers and proprietors. Admonitions issued by the Lord Chamberlain are so much waste-paper. What is wanted are stringent regulations, non-compliance with which ought to be visited by such heavy penalties as would render it more profitable to proprietors of theatres to go to the expense of remedying the evils complained of than to expose themselves to the expense of prosecutions. The regulations issued by the Middlesex magistrates are to the point, and may well be applied also to the theatres, and as so much has been done with respect to buildings over which they have control, and which, it should not be forgotten, are ever so much less dangerous with regard to fire than theatres, it seems only natural that some decisive action should follow with a view to the better regulation and supervision of our playhouses. It will be,—in fact, has been,—admitted on all hands that things cannot go on as at present. Spasmodic efforts will do little to advance the reforms so much required.

Let us now, finally, consider the new Regulations, in connexion with their application to theatres, treating them *seriatim*:—

Exits.—1. "All doors and barriers to open outwards." 2. "All gangways, passages, and staircases, intended for the exit of the audience, to be kept entirely free from chairs or any other obstructions, whether permanent or temporary." 3. "All doors not ordinarily used for exit, but available as additional means of escape in case of alarm, to be indicated by printed notices or printed placards in plain characters." The point treating of the provision for ample and proper exits is such a vital one that we may well be permitted to add a few words to what has already been stated. No doubt the question is of the utmost importance. Upon its proper solution depend the life and safety of the public, which, without being able to test for itself the sufficiency and practical nature of the exits, and confiding to the humanity and conscientiousness of managers, and the care of the Government, frequents public places of entertainment, and very often fills all available space to the last place. This confidence, unfortunately, is too often abused. The heavy losses of life and health accompanying, in too many cases, fires in theatres are too well known to require confirmation. We are astounded at the absurdity which was disclosed at the destruction of the Canton Theatre, on May 25, 1845, how thousands of people were inclosed within four high walls with only one exit, the interior being filled with highly inflammable material—and attribute the frightful loss of life involved to Mandarin government. The catastrophes recurring with an almost deadly regularity show only too plainly that most of our theatres are no better off in that respect. The apathy of the public in the matter is something wonderful. Only when extreme cases occur in too close proximity for the public to slumber on in comfortable security are they roused up to such a pitch as to lead to the abolition of the most crying evils. Will any person care to say that the case is overstated?

Water Supply.—4. "An ample supply of water, with hose and pipes, to be available to all parts of the building, where possible, on the high-pressure main." It has already been pointed out that fires in theatres spread with such rapidity that, if energetic steps are not taken at once to suppress it, later efforts are, in most cases, unavailing. On that account, every theatre or place of entertainment ought to be supplied with ample means of extinguishing fires. The first requisite is a large supply of water, with pipes and hose to all parts of the house, to which may be added that one or more men, according to the size of the building, ought to be stationed in the different parts of the house, in charge of the hydrants.

Protection of Lights, Wet Blankets, &c., Gas-pipes.—5. "All fixed and ordinary gas-burners to be furnished with efficient guards." 6. "No white-metal gas-pipes to be used in the building." 7. "Where there is a stage or wings with scenery, the footlights or floats to be protected by a wire guard. The rows or lines of gas-burners at the wings are to commence 4 ft. at least from the level of the stage. Wet blankets or rugs, with filled buckets or water-pots, to be always kept at the wings, and attention to be directed to them by placards, legibly printed or painted, and fixed immediately above them. Some person is to be held responsible for keeping the blankets, buckets, &c., ready for immediate use. Hatchets or other means to cut down hanging scenery, in case of fire, to be always in readiness." Here also the old maxim holds good, that "prevention is better than cure." The great heat developed by gas is a danger which can only be safely met by carrying out strictly a series of precautions. In the first place, gas ought to be laid on systematically, and only the best workmen should be employed in fitting it up. Too often this is not the case. The necessary works are given to the man who tenders lowest. In all complicated arrangements, the advice and services of a competent man ought to be secured, even for smaller theatres. The gas for the stage and that for the auditorium ought to be supplied from separate meters, placed in widely different parts of the house, and, if possible, from different street-mains. The protection of the gas-jets ought to be of the very best description, and they ought to be guarded in all directions. In the best theatres of recent construction the lighting up is effected by electricity, another safeguard against the outbreak of fire. Besides the fixed lights, the exigencies of the modern stage require a great number of movable lights. The pipes, of necessity made of a flexible material, are exposed to constant rough usage, leakages occur, and it is a wonder that explosions of gas do not take place more often. The use of such pipes is to be greatly deprecated; it ought to be as sparing as possible. Altogether, the supervision of the gas-conduits and the meters should be placed in the hands of an experienced mechanic, who must be a man of quick resource in case of danger; for upon him, indeed, depend the lives of hundreds of people, prompt suppression of any outbreak of fire being the sole remedy. The same remarks apply to the person in charge of the heating apparatus.

Here it may not be amiss to point out the importance of making theatrical dresses, especially those of members of the ballet, of fire-proof material, or at least of such material as will not readily transmit flames. The cases in which performers, in too many instances most eminent artists, have lost their lives after unspeakable sufferings, are unfortunately only too numerous. Of casualties in English theatres, let us mention that of Miss Clara Webster, on December 14, 1844, at Drury-lane. Her dress caught fire on the stage; two days later she died of the consequences of her injuries. On February 10, 1863, the dress of a *danseuse* in the Princess's Theatre was ignited by Bengal fire in the transformation scene; she met with a happy release from her sufferings four days later. On April 29, 1870, in the theatre at Northampton, Miss Lily Davis fell on to the footlights, and died of her injuries. On October 8, 1873, Miss Ellen Pelly, a member of the ballet at the Alhambra Theatre, was almost burned alive on the stage; she expired shortly after at Charing-cross Hospital. All these cases prove that something ought to be done, but that effectual protection can only be secured by rendering the dress materials uninflammable. Those casualties might possibly have been prevented, or at least mitigated in their consequences, if wet blankets had been kept in readiness on both sides of the stage, which unfortunately is not the case in all theatres. The nonchalance and happy-go-lucky way of the authorities in this direction were stigmatised, for instance, in the verdict of the jury on the fatal case in the Alhambra Theatre, which was described, it is true, as an "accidental death," with the timid rider that wet blankets ought to have been kept in readiness, in order to quickly check similar occurrences.

It has been, we venture to think most unjustly, observed that in most cases the person injured had come carelessly too near a light. Artists, whether of high or low degree, are far too much engaged in their respective characters to be able to pay a great deal of attention to their surroundings. At present there is an abundance of proved means to render light stuffs and whole dresses incombustible. It may surprise a great many to be informed that fire-proof substances have been used for the last twenty years in the royal laundries for all curtains, ball dresses, &c. The example set by her Majesty has found imitation in this country. In some isolated instances it has been followed on the stage. Thus, in the Royal Park Theatre, at the representation of "Notre Dame," *Esmeralda*, surrounded by flames, was rendered fireproof by means of a Nicholl's patent dress. This fact was largely advertised last year. It is a great pity that such protective measures are taken in so few theatres.

Regulations.—8. "The regulations as to fire are to be always posted up, in some conspicuous place, so that all persons belonging to the premises may be acquainted with their contents." The importance of this provision is so obvious that further remarks are hardly required.

Inspections.—9. "An annual inspection will be made of all music-halls, particularly with regard to the appliances for the prevention of fire and accidents therefrom, and the means of exit from the building." As has already been insisted on in our former article, those inspections ought to be made at all times, no notice whatever being given to managers, so as to come upon them unawares, and so detecting at once any shortcomings, which otherwise, if notice were given, might be hidden.

Alterations.—10. "No structural alterations are to be made without the sanction of the justices of the special sessional division in which the building is situated, in petty sessions assembled, or their surveyor. Plans of all alterations so sanctioned to be sent to the office of the clerk of the peace, and reported at the following annual licensing day." Whenever it is found advisable to sanction any alterations, the latter ought to be of such a nature as to still further increase the safeguards against fire.

Conditional Granting of Licences.—12. "In buildings to which these regulations apply, licences will be granted only when the above regulations are carried out, and on the express condition that these and every other reasonable precaution against fire, or the danger arising therefrom, are adopted." It is high time that this regulation were applied to all theatres.

Responsibility.—13. "The person or persons in whose name the licence is granted will be held solely and entirely responsible for the carrying out of the above regulations for the due management of his music-hall, and for the safety of the public and *employés*." The responsibility here spoken of is very properly fixed upon the managers of public places of amusement. But the fact should not be lost sight of, that the public are greatly to blame in the matter as well. As it would be vain, however, to expect pressure to be applied on the part of the public, the responsibility of taking some steps rests upon the authority which is generally supposed to be entrusted with the guardianship of our theatres. That much-abused body, the Middlesex magistrates, have set an example which, while it deserves the warmest acknowledgment, we sincerely trust will find imitation in the case of our theatres. Even at the risk of becoming tedious by argumentative reiteration, nothing shall deter us from repeating arguments already advanced, believing that some good may result from their constant application. The public is greatly excited and stirred to its very depths by some dreadful disaster which each individual fears he might be involved in some of these days. But the momentary timidity passes off; a few months after a catastrophe the effects of the first impression have worn off, and perhaps a year hence the calamity is talked of with perfect indifference. This, it will be admitted, is an unvarnished statement with regard to the public. And it is equally true that the great mass of the public, at least in Europe, will not keep away from motives of prudence or fear from frequenting dangerous theatres. Curiosity and a love of sight-seeing will always gain the upper hand with them. The humanity, foresight, and intelligence of theatrical managers have led to many measures of precaution being adopted to guard against fire. But other proprietors of theatres are more or less indifferent to this question, or have been lulled into a state of security by a number of instances in which fortunately fires have been promptly quelled. Others, again, have only a sense for momentary gain, or else they are without the means of providing efficient safeguards. Little is to be expected from those engaged in theatres; actors and actresses, from long habit, are mostly indifferent to the danger. As has been pointed out, much is to be expected from fire insurance companies, for their interests, notwithstanding the high premiums paid for theatres, suffer greatly from their destruction.

The principal responsibility, however, rests with the Government which permits such a state of things to continue. It is to the authorities that we must look for an improvement. In America, public opinion is very powerful, and it has succeeded during the last few years in forcing theatrical managers and proprietors to adopt radical measures of safety. The United States Government are merely driven by the force of public opinion to devise the necessary measures and to make them obligatory. On the Continent of Europe people are so thoroughly used to let the respective Governments think and act for them in these and similar matters of public safety that little action on their part is required. We heartily approve of paternal government if it is directed to such laudable objects, and intercession on the part of the public would seem almost superfluous.

It is only in this country that we witness an amount of indifference which borders on criminality. An entirely ineffectual control is exercised by an authority which has to take care that our morals shall not be corrupted, but which dares not interfere where its interference is most needed. No fault can possibly be found with the Lord Chamberlain. He acts within the very much prescribed limits of his jurisdiction. It is to the conscience of our legislators that we must look for improvement, for safety of life and limb will hardly ever form a crucial question in any contested election. Perhaps they are awakening to the necessity of doing something. Is the action taken by the Middlesex magistrates a sign that better times are coming? It would be a scandal indeed if that were neglected to be done for theatres which has just been effected for music-halls and other similar places of entertainment. The magistrates have used the powers which are vested in them for a very wise purpose, and should their action lead to similar measures being adopted for theatres, the public will remember them with gratitude long after the institution of a licensing magistracy has passed away.

MEASURES AND WEIGHTS.

MUCH gratitude is due to the late Warden of the Standards for the patient and intelligent care that he has devoted to the important subject of official metrology.* The scientific questions involved in the use of weights and measures have long engaged the attention of some of our most eminent men of science, several of whom have been members of the various standard commissions appointed from time to time by the British Government. The International Metric Commission assembled at Paris a large body of scientific men from all civilised countries; but information on this important subject has been hitherto far from accessible to the general public, having been confined to a few papers published in the "Philosophical Transactions," reports of the several Standard Commissions, and a few other Parliamentary Papers. Of these the most important are the accounts of the construction of the imperial standard pound, by Professor W. H. Miller; and of the new imperial standard of length, by the Astronomer Royal.

The subject of measure and weight has been treated by Mr. Chisholm under the following heads:—1. Definition of weight and measure. 2. Ancient standards of weight and measure. 3. The restored standards, imperial standard pound and yard. 5. Secondary imperial standards, including multiples and parts of standard units. 6. Derived units of imperial weight and measure, with scale of multiples and parts. 7. The metric system. 8. Weighing and measuring instruments, and their scientific use.

In investigating the subject of weight,—our acquaintance with which, however, must be regarded as posterior, in point of history, to our study of measures of distance, of area, and of capacity,—no work that has come to our knowledge has hitherto stated the ultimate law of gravitation in its utmost simplicity. That statement is, that gravitation is a force inherent in matter, acting in radial lines; proportionate in its force to that property which we call the specific gravity of the matter in question, and undiminished by the fact of distance. Against the latter clause, of course, the objection will at once be raised that attraction is known to act with a force inversely proportioned to the squares of the distance separating the bodies attracting one another. But that fact, so stated, is an empirical deduction alone. From our preceding definition the line of inverse square is a logical deduction. For if the gravitating force of a planet, or any other body, act in radial lines, the portion of such force which can affect any other body must be in inverse proportion to the squares of the distances. This may be illustrated by supposing a series of concentric hollow spheres. The centripetal force, tending to a central mass, would be identical on the whole surface of each sphere. But if we took equal areas of the surface of each, the force acting on such areas would be proportionate to the part which these areas formed of the whole shell, or hollow sphere, to which they belonged. That is to say, the local attraction varies inversely as the square of the radius of the sphere. This conception of the unvarying action of the force of gravity is one of a very suggestve nature.

The determination by Colonel Clarke, and one according to Captain Kater's equivalent, of the length of the polar and equatorial axes of the earth, of the length of the meridian quadrant of Paris, and of the minimum terrestrial quadrant, which is that of long. 105° 34′ E., are given at p. 9. According to Colonel Clarke's results (which were computed from a combination of all the separate measurements of arcs of meridians in Peru, France, Prussia, Russia, Cape of Good Hope, India, and the United Kingdom), the length of the mètre at 32° Fahrenheit is equal to 1·09362311 yard at 62°; that is to say, to 3·28086933 ft., or to 39·37043196 in., instead of the more generally received determination by Capt. Kater of 39·37079 in. Sir H. James states, in his preface to Colonel Clarke's work, that the longest meridian is in 15° 34′ east longitude, nearly corresponding to the meridian which passes over the greatest quantity of land in the Eastern, and opposed to that passing over of water in the Western, hemispheres.

The chapter on the ancient standards of weight and measure is the least satisfactory part of the book, for the natural reason that the workmanship here is almost exclusively literary, and that the author is compelled to rely on authorities whose research and ideas of accuracy are by a long way inferior to his own. The statements of Babylonian, Assyrian, and Judæan weights have been investigated in the "Bible Educator" with a degree of care that demands recognition in any future work on the subject. The determination, taken from the Talmud, of the ordinary Jewish cubit of 48 barley-corns, or 16 English inches, is confirmed by the measurements of the High Sanctuary at Jerusalem, and of the Synagogue in Galilee, given in the recently-published "Tent Work in Palestine." A "cubit of the Sanctuary" of 25·20 in. in length is an entirely imaginary unit of measurement. It would correspond to a human stature of 8 ft. 4·8 in. But the determination of measures of length with any approach to what we now consider to be accuracy, is a matter of very modern date. Even with regard to that most important of ancient measures, the Egyptian cubit, accuracy as to which was of extraordinary moment, as measuring the promised value of the floods of the Nile, those authentic monuments, the Nilometers, show large discrepancies. At Elephantina a Nilometer built into a wall has a cubit of 21 in. Sir Gardner Wilkinson measured another as 21·4 in. Mr. Greaves found a cubit of 21·888 in. The present land derah of 7 palms gives a cubit of 21·847 in., which probably would have been considered by Egyptian metrologists as identical with the measure of Mr. Greaves. Thus there is ample evidence that the scientific, not to say supernatural, accuracy which certain theorists have attributed to the builders of the Pyramids is wholly impossible. In fact, calculations such as are freely supplied for the benefit of the architects of the time of Cheops would have been utterly impossible before the introduction of the Arabic numerals, and the invention of the value of place. We know what the Egyptian numerals were, and that they were even less fitted, if possible, for extended arithmetic operations than even the Roman numerals.

The glances at the history of the English standard units, which Mr. Chisholm attributes to the Saxons, will be read with interest. The relation of some of our measures with Phœnician and Babylonian metrology is a subject as yet comparatively untouched. Thus the queer-looking word "kilderkin," as well as its cognate, "firkin," is distinctly Aramaic; and the barley-corn, our unit of length, is the same. The extraordinary delicacy and care introduced in the determination of our modern standards merit attentive study. Professor Miller found, in 1844, that the previous determinations of the weight of the kilogramme varied among themselves from a minimum of 15432·295 to a maximum of 15438·355 Troy grains. The ultimate result of 166 comparisons, conducted with every conceivable precaution, was the determination of the weight of the *kilogramme des archives* as equal, in a vacuum, to 15432·34874 imperial grains, or 2·20462178 standard platinum pounds. This equivalent has been legalised in this country by the Metric Act of 1864. Mr. Chisholm truly remarks that "as a system of weights and measures constructed on strictly scientific principles, the metric system may fairly claim pre-eminence over all others." We can add our equally unhesitating testimony as to the great practical advantage experienced in its use.

We recommend any of our readers who may feel disturbed as to Egyptian or Chaldean measures or weights to compare such statements as before given as to the Nilometer cubit with the description of the vacuum balance of the Standards Department, figured at p. 173. When, with minds educated to conceive of such possible accuracy as is now attained, we glance back at periods before lenses were in use, before the ratio of expansion of metals was suspected, and before the value of place in arithmetic was known, we may well consider the unit of measurement attributed to King James VI. and I., viz., "the width of the black of my nail," to have been as positive a determination of measure as was required by the metric science but a few centuries ago. Mr. Chisholm's book is one of much interest and value.

* On the Science of Weighing and Measuring, and Standards of Measure and Weight. By H. W. Chisholm, Warden of the Standards. Illustrated. Macmillan, 1877.

THE STAIRCASE-HAND OF THE OLD SCHOOL.

A SKETCH.

STEAM power, rapid communication, international intercourse, machinery, cheap professional literature, journalistic and technical treatises, have worked great changes in recent years in the characteristics of all skilled workmen, but particularly in those of the building trades. The carpenter, joiner, mason, bricklayer, plasterer, painter, &c., of fifty years since was quite unlike his brethren of the above restrictive crafts to-day. In some respects he was a better, as also a more general workman, but his ways and methods were quite primitive and exclusive. Taking the carpenter, for instance, he was a compound operative,—a carpenter and joiner combined,—and, indeed, a cabinet-maker to some extent,—particularly if his practice lay in the provincial towns. The country carpenter was often what was termed a "hedge carpenter" to boot, who, besides executing house-work, was a maker of carts and barrows, and other farming implements, and not seldom a wheelwright and a millwright. The ordinary working carpenter, then, of forty or fifty years ago, was not only good at heavy work, but equally good at light work. As occasions offered, he was a maker of doors and sashes, good at roofing and partition work, handy at trimming and job work,—indeed, ready for any emergency or call, from laying a floor to putting up an ordinary staircase. The professed staircase and handrail hands of fifty years ago, and even much less in London and Dublin, and particularly in the latter city, were a peculiar class of workmen. When they worked at other work apart from staircases they had the choice of the nicest jobs in the workshop or buildings. They were much petted by employers and foremen, and over-praised, and as a consequence, held a very high opinion of their own abilities. Their knowledge of "lines" was greatly exaggerated, and so exclusive were they in their practice that they took care to surround the "setting out" of the plan and elevation of stair and hand-rail with all the mystery that it was possible to bring to bear upon their operations. Some of these operatives of the old school were Solomons and Solons in their way, and their uninitiated adult brethren and apprentices of the workshop, who knew nothing of the mysteries of stair-planning and hand-railing, treated them with great forbearance, if not respect. The staircase-hand of old was a most exacting and dictatorial workman, and ambitious to be an authority on everything in connexion with building. We have before us, in our mind's eye, as we write, a

picture of one of these old worthies, but it matters not to the reader in what particular city or town he once practised his calling, for our sketch will be found a fair reflex of the olden representative in most places. Our old staircase-hands wore spectacles, and they had a peculiar way of looking through them, or over the rims, that made them appear to be studious and wise, and perhaps otherwise. One of the apprentices in the workshop might consider himself greatly honoured if he was permitted to prepare the drawing-board for "setting out" the plan and lines for the staircase and handrail. The board was generally a number of leaves of deal or pine, cleated or clamped together, planed evenly on the top side. When this large drawing-board was ready, the staircase mystery-man either went into an adjoining department, or to a bench at the most distant part of the workshop to commence his "setting-out." His tools or instruments consisted of one or two well-pointed pencils, a large panel, wooden square, and a smaller steel blade square, a bevel, a trammel (sometimes called Price's trammel) for drawing ovals or ellipses, a large pair of compasses, a line or piece of cord, a lump of chalk, a smoothing plane for obliterating wrong tracings or unnecessary markings, a bradawl or two, a sharp chisel for repointing his pencil, a light hammer to drive a brad if occasion needed, and some other odds and ends. With these appliances the mystery-man went to work after due thought and deliberation. Lines wrongly drawn, or which did not please the drawing-master, if not planed out, were chalked out, and many other needful lines were drawn several inches beyond their necessary development and requisite intersections, and made to intersect other lines. This last trick was done to puzzle the uninitiated workman or aspiring apprentice who might be inclined to steal a look at the mystery-man's "lines" when he went to his dinner or to have his beer. The old staircase-hand of the school of Price, Pain, or Nicholson is now nearly an extinct genus. He put up his treads and risers, step by step, levelling each as he ascended, for his sleepers or carriage-pieces were fixed before hand. It would have been rank heresy to ask your old staircase-hand some years ago to prepare his string-boards, and put together his flights of stairs in the workshop. He did not dream of such innovation as making stairs like step-ladders in the workshop, and carrying them to the building to be "run up" in their places. He loved his story-rod, on which were marked the number of steps, and with his favourite rod he built up riser and tread accordingly from landing to landing, and from story to story, from basement to attic. Your old staircase-hand was more partial to wall skirting being scribed down to his steps than having a wall or inner string-board. The old staircase-hand was, in the true acceptation of the term, a regular stair-builder, building up step by step, and strengthening his work as he proceeded. But we must not enter into too many details for fear of raising the ghost of the departed.

In handrailing, our old staircase-hand was a mighty personage, whether in dog-legged stairs, stairs with newel posts, single or double, or with well-holes. His ramps and swan-necks were marvellous in their curves and sweeps, and his huge scrolls and twists at a later date were miraculous,—so he thought, and so did others of his surprised brethren, who began soon to feel an upheaving and a strange unrest, as if the good old times were drawing to their end. Give him his due, the old staircase-hand was, as far as his light allowed him, an honest, sound, and conscientious workman. Were he alive to-day, though, he would undoubtedly witness good staircase-builders in Great Britain, yet their manner of planning and working would give him a fit of epilepsy that he would never get over. He would be sure to witness, at the same time, hundreds of creaking, break-neck step-ladders, miscalled stairs, and handrails the thickness of walking-sticks, undulating up and down like the waves of the ocean. Every carpenter and joiner will tell you now he is a staircase and handrail hand, though we know thousands are not: they ought to be. There is no longer any mystery in the art; all that is needed on the part of the young workman is a little studious attention to master a few simple geometrical principles, and no carpenter, joiner, or mason should rest satisfied until he is able to "set out" and "put up" staircases and handrails of all ordinary forms, and in all situations.

The dear old methods of the handrailers long tenaciously clung to and worshipped have vanished, except in odd and out-of-the-way places. Several sacred templates and falling-moulds are dashed to pieces, improved cradling and cylindrical forms, for trying sections of the curved portions of the handrail upon, to see whether it had its proper pitch and curves, are abolished. "Springing [the plank," or glueing up the rail in several thicknesses, is exploded, or little practised; the step-mould and face-mould, with a centre line and a proper squaring, are all-sufficient with the needful cutlery tools, and the skill for using them well.

The literature of staircase building and handrailing has greatly expanded within recent years, and some useful British and American treatises have been published, but, like the Round Tower disputants of Ireland, some of our handrail instructors have puzzled themselves in striving to inform others. Desperate efforts have been made by some innovators of late years to save a little material in getting out the wreath and other curved portions of the handrails. It is certainly wise to save valuable material by practical methods of construction, so long as durability and graceful proportions are not sacrificed to cheeseparing economy, but as our subject is with the characteristics of the staircase-hand of the old school, we will conclude here, leaving the surroundings of the practitioner of the new school for treatment on a future occasion if necessary.

THE DOME OF THE ROCK.

SIR,—As Lieutenant Conder writes temperately, and in his own name, it would give me pleasure to answer in detail the statements he makes in his letter which appeared in your last issue, were it possible to do this without an expenditure of space and labour wholly incommensurate with their importance. It requires only a few lines to make an assertion, especially when there is no attempt made to support it by evidence, but a great many may be necessary to disprove it to the satisfaction of others, and, in this case, without numerous illustrations it would be impossible to make the argument intelligible. So far as I am capable of forming an opinion, all Lieutenant Conder's statements are based on imperfect or erroneous views of the architecture or archæology of the age he is treating of. But without going into the whole history of these sciences at that time his assertions cannot be refuted, while a simple denial leaves the question exactly where it was, dependent on the relative credibility of the assertors.

There is, however, one statement, with which he sums up all that runs through the argumentative part of his letter, so important in itself, and which touches so nearly the marrow of my argument, that to leave it unnoticed would be to confess it unanswerable. It is contained in the following paragraph (p. 668):—"If, then, the Golden Gateway was Constantine's work, how comes it that he used semicircular arches there, but pointed arches in the Dome of the Rock, while Justinian reverts to the semicircular arch? On the other hand, in the mosque of Amru, at Cairo, which, as before noticed, was rebuilt by 'Abd el Melik, we find the arches to have just the slightest approach to a point (as described by Coste in his 'Architecture Arabe'), resembling those of the Dome of the Rock."

My answer to this is, that there are no pointed arches, properly so called, in the Dome of the Rock.

To begin with the central pier-arches under the dome, which are the only ones about which there is any doubt, I have before me Arundale's original drawing, from which the section (plate vi. of my "Temples of the Jews") was engraved. The arches there are all circular, and struck from one compass hole, which is still remaining. In De Vogüé's section (plate xix., "Le Temple de Jérusalem") they do seem as if struck from two centres, but they have a key-stone, and the scale is unfortunately so small that it is difficult to say what was intended. From personal inspection on the spot, I can assert that the deviation from a true circle is so slight that it cannot be detected by the naked eye. My impression is that it is struck from three centres, and is, in fact, a stilted ellipse, like the arch of the Ecce Homo, which is certainly anterior to Constantine's time,—probably Aurelian's. Be this as it may, nothing would surprise me less than that these pier-arches should be of any shape. Assuming them to be of Constantine's time, it was the first attempt to carry a tall drum and dome on arches springing from the capitals of Corinthian columns, and in a country where the eye had long been familiar with the forms of pointed arches, though of horizontal construction,* the wonder rather is, that they did not boldly adopt that form, instead of so concealing it that it can hardly be detected even in a photograph.

Passing from these constructive arches of the great Dome, there is, fortunately, no doubt or hesitation with regard to all the other arches or openings in the Dome of the Rock; they are absolutely and unmistakably circular. Those of the intermediate arcade were measured and published by De Vogüé on a sufficient scale (plate xxi. of "Le Temple de Jérusalem") to leave no doubt as to their form, and in this he is confirmed by Arundale, and by photographs. We also know, for certain, from M. Le Comte's drawings, published by M. Ganneau (Quarterly Report, P. E. F., 1874, pp. 154, 155, and reproduced in my "Temples of the Jews," as woodcuts 49, 50), and from photographs, that all the external openings of the building, and all the arcades, are, without exception, circular-headed. In fact, in all its architectural features, the Dome of the Rock is as essentially the product of a round-arched style as any Classical building, and, in some respects, even more distinctly so than the Golden Gateway.

From what he says of it, I presume Lieut. Conder never saw the Mosque of Amru at Cairo; or, at all events, if he did, it was after its restoration, which has as entirely destroyed it as an historical monument as any of our churches after undergoing that process, and he consequently is dependent on M. Coste's most fallacious and incorrect restoration for his knowledge of it. Fortunately I saw it in 1839, before the mischief was done, and can confirm the accuracy of M. Girault de Prangey's far more detailed and accurate drawings ("Monuments Arabes," plates 4 and 5); but the story they tell is very different from that of Coste. From these drawings we learn that all the arches of the old parts, presumably of the original Mosque, resting on the Classical pillars, are unmistakeably circular. That the tie-rod between the capitals has no similarity to that of the Dome of the Rock, while all the openings in that part ascribed to 'Abd el Melik, are as clearly and distinctly pointed as the Arches of the Aksa at Jerusalem.† In short, if the restorers of the Amru, or the builders of the Aksa, had anything to do with the building of the Dome of the Rock, I hold it to be impossible that the pointed arch should not appear in its decorative and external features, which it does not. I can consequently only repeat my settled conviction,—for reasons I cannot recapitulate here, though they are all stated elsewhere,—that centuries elapsed between the building of the Dome of the Rock and the erection of the Aksa, but years only between the building of the Dome and the Golden Gateway.

I need hardly say there are several things in Lieut. Conder's letter regarding which my fingers itch to write a few lines. But I refrain: one thing at a time. The principal point of public interest in it, is this question of the pointed arches; the others are more or less personal; and when that is settled we may revert to the others,—if it is worth while. Meanwhile, what I would ask of Lieut. Conder is, that he should produce a drawing to scale, of one at least, of the pointed arches of the Dome of the Rock. He is an Engineer officer, and can both measure and draw. He was on the scaffold when it was up; "walked on the beam"; and has, doubtless, a sufficient number of notes and sketches to do this. If he would add a drawing of the pointed arches of the Aksa as a means of comparison, it would be useful. There would be no difficulty in getting them engraved. They may be as simple as possible, provided their outline is accurate. When we get these we shall know what we are about. So far as I know, no such drawings at present exist, and till they do, the public at least have not sufficient data before them from which to form a definite opinion regarding this most interesting question.

JAS. FERGUSSON.

* The gateway at Assos is a striking example of this, as drawn by Texier in his "Asie Mineure," and reproduced in my "History of Architecture," vol. i., p. 238, with several other examples.

† A portion of these were reproduced by me in a woodcut in my "History of Architecture," vol. ii., p. 509, woodcut 960.

THE LAND SURVEYORS' CLUB IN STAFFORDSHIRE.

THE annual summer outing of this Club took place last week, Staffordshire being the *locale*.

Most of the members and their friends arrived at Stafford on Tuesday evening. On Wednesday morning they left Stafford by rail at 9·15, proceeding to Rugeley (Trent Valley) Station, where they were joined by Mr. Bolam, Mr. H. L. Smith (solicitor to the Ingestre Trustees), and Mr. B. Tower. The party now included Mr. John Clutton (London), the senior member of the club; Mr. R. C. Driver (London), the hon. secretary and treasurer; Mr. V. Buckland (London), secretary to the Surveyors' Association; Mr. Penfold, secretary to the Institution of Surveyors; the Hon. A. L. Pelham; Col. Lane; Mr. E. Foden, agent to Lord Hatherton; Mr. Darling, agent to the Marquis of Anglesey; Mr. E. Turner, agent to Lord Zouche; Mr. Snowball, agent to the Duke of Northumberland; Mr. W. L. Dodgson, agent to Lord Boyne; Mr. F. F. Fox, &c., in all about fifty persons. From the Trent Valley Junction the Rugeley Town Station was soon gained. Here the party alighted, and after walking up the line for a short distance found awaiting them a colliery train to convey them to the Earl of Shrewsbury's pits at Brereton. This point of destination was soon reached, the party alighting at the Coppice Pit, so-called from the picturesque background which renders this pit unique, the foliage of a beautifully-wooded slope reaching almost to the mouth of the shaft. Here the party were joined by Mr. Robinson, the general manager at the colliery. From the Coppice Pit the visitors proceeded to Belfast Pit, and thence to the Brickkiln Pits of the Hayes Colliery. Here luncheon was partaken of underground, and the "upper crust" having been once more regained, the visitors took to the carriages which were in readiness to convey them by way of Rugeley and Shugborough Park to Ingestre, and thence to Stafford. *En route* they saw the colliery farm, which has recently been reclaimed from the Chase, and were assured that after a few years' cultivation it will have become excellent land. Wheat and potatoes were seen upon one side of the road; on the other was the native heather and gorse of the Chase. Soon Rugeley was reached, after which the visitors drove along the pretty bit of road that leads thence to Shugborough, between hedge-rows laden white with wild roses and the bloom of the elder-trees. After passing the gates of Shugborough Park, the first stroke of ill-luck befel the party. A thunder-shower compelled them to leave the carriages and seek the best shelter that could be found, and with some intermissions the rain continued till Ingestre was reached. Here the visitors were hospitably entertained by Mr. Bolam, at his house. An opportunity was also afforded of inspecting the raft-yard and workshops which are here. Every variety of joinery required upon the Shrewsbury estate is done at the workshops, which are under the direction of Mr. Pickering. The visitors were shown how an entire gate could be constructed in a very few minutes. Besides windows, doors, &c., there were also in course of construction the seats of a church and desks for the village school. Ingestre Hall having been visited, a pleasant drive through Ingestre Park brought the party in sight of Stafford, which was reached safely shortly before seven o'clock.

In the evening a dinner took place at the North-Western Hotel, Mr. John Clutton in the chair.

Mr. T. Huskinson, in proposing the health of the Earl of Shrewsbury, remarked that it had been the good fortune of the Club to have the opportunity of inspecting some of the principal seats in England, beginning with the Royal domain at Windsor, and though they had a very pleasant recollection of many of those places, they had to say that they had seen something that day of a distinctive character from what they had seen before, in having not only witnessed what was upon, but what was under the earth. Referring to the question of small or large properties and occupations, he said that the experience of successive years confirmed him in the belief that to the large properties and the large occupations of this country are mainly owing the position which English farming enjoys. That was his opinion, notwithstanding what might be said by philosophers and economists about the advantages of small properties and small occupations, which he did not believe were the factors from which useful results could be expected. On behalf of the club he thanked Lord Shrewsbury for affording them the pleasure and instruction they had all enjoyed that day in inspecting his estates.

On Thursday morning the visitors proceeded by rail to Uttoxeter, whence carriages were taken to Alton Towers, passing on the way Crakemarsh Hall, Woodseat, the residence of Mr. C. M. Campbell, M.P., skirting Rocester, and so on to the pretty village of Denstone, soon after passing which the entrance to the drive leading to the Towers was descried. Upon reaching the Towers, the visitors received a cordial welcome from Lord Shrewsbury, who entertained them at luncheon.

Soon afterwards the party left for Alton railway station, and before long were *en route* to the various places of their destination. A long and interesting report of the proceedings appeared in the *Staffordshire Advertiser*, to which we are indebted.

OBITUARY.

Mr. Arthur Wallis Colling, the clerk of the works at the new Law Courts, under Mr. G. E. Street, died on the 24th of June, after a short illness, in his 61st year, having held the office for eight years and a half. Mr. A. W. Colling, who was the brother of Mr. James K. Colling, architect, was noted, among those that knew him, for his knowledge of practical building, and was highly esteemed in that respect. He commenced his career many years ago as a clerk of works for several buildings under the late Sir Gilbert Scott, when that gentleman was in partnership with Mr. Moffatt. He afterwards was for several years in the employ of Messrs. Peto & Betts, and wholly superintended and carried out for them very extensive building works on the Great Eastern Railway, as well as, subsequently, others of a similar character on the loop-line through Lincolnshire of the Great Northern Railway. Having left their service at the termination of these works, he became engaged under the late Mr. William Burn, architect, and remained in his service until that gentleman died. Among many other works that he superintended while under Mr. Burn were some very important alterations and additions to Holkham Hall for the Earl of Leicester, and the erection of Montagu House, Whitehall, for the Duke of Buccleuch. At the termination of this large and somewhat difficult work he passed into the service of Mr. Street, as already mentioned.

Mr. H. W. F. Bolckow, the chief founder of the great iron industry of Middlesbrough, and its first mayor and member, died on the 18th ult. Mr. Bolckow was a German by birth. Thirty-six years ago he started in the iron trade, and was at his death the chairman of the colossal iron and coal company of Bolckow, Vaughan, & Company (Limited). Mr. Bolckow gave a public park to the town, which he represented in the Liberal interest. He was in his 72nd year.

Mr. Charles Mathews, the celebrated comedian, who died last week at Manchester, and was buried on Saturday at Kensal Green, was at one time identified with the architectural profession. His father had intended to make a parson of him, but Charles demurred, not being conscious of any strong vocation for the pulpit. "By way of compromise," as he used himself to say, it was arranged that he should become an architect, in which capacity he would have "something to do both with churches and theatres." He was accordingly articled to Mr. Pugin, from whose office he afterwards passed into that of Mr. Nash. In 1823, when in Italy with the Blessingtons, he made the acquaintance of Count Alfred d'Orsay, who expressed dissatisfaction that the young Englishman, who in the ostensible pursuit of architectural study had brought with him "so many sketch-books," should have made "so few drawings." After a while, on his return to London, he obtained an appointment as architect to a mining company in Wales, where he found abundance of work in the way of superintending the construction of storehouses, tramways, &c. In 1827 he went back to Italy on a professional tour in company with Mr. James D'Eville, the water-colour painter, with whom he had been associated in Augustus Pugin's office. They visited together Milan, Rome, and Venice, making drawings of the more important buildings, and contracting many pleasant friendships. These three cities elected Mathews a member of their several academies, and at Rome some of his drawings of the Duomo d'Ossola were exhibited. In 1832 he applied for and obtained the appointment of district surveyor for Bow and Bethnal-green,—a singular position for a man of Charles Mathews's cast of mind. He would seem to have held the appointment for about two years, when, awakening to the fact that architecture was "slow," he took to the study and practice of oil-painting, and with such success that a picture of his, "The Lake of Perugia," was exhibited at the Royal Academy, Somerset House, in 1835. In midsummer of that year he became, in consequence of the death of his father, part proprietor of the Adelphi Theatre, but after a few months' experience of the sweets of management he sold his share to Messrs. Ephraim Bond & Co., resolved to try his fortune as an actor, and disappeared from the architectural profession.

Colonel Cameron, R.E., C.B., director-general of the Ordnance Survey, died on Monday at Southampton after a short illness.

SCHOOL OF FINE ARTS, PARIS.

WE have just assisted at the banquet of the old pupils of the School of Fine Arts, at which not only most of the architects of Paris were present, but also a great number of former students of the École des Beaux Arts arrived from all parts of Europe. An English architect, Mr. Laurence Harvey, proposed a toast in the name of the foreign pupils, in which he thanked the French nation for the hospitality which this Art School affords to all foreigners. Considering that the high training given here is gratuitous, the school being maintained by public money, we feel sure many English artists who have been wholly or partly taught in Paris will be pleased to read *in extenso* what was said in their name. We give it in English:—

"The École des Beaux Arts is an Alma Mater whose fostering care is ever cherished by her grateful sons. No wonder if, responding to your kind invitation, I have hurried from London to tell you so; indeed, I only express the feelings of every travelled foreigner when I own that France stands alone for the earnestness of her artistic efforts, and the liberality with which she invites the world to share in her art-treasures. In France, art is not shoppy and self-seeking, but wooes the world for leave to do it good. And so the world loves France,—weeps when she weeps, and rejoices when she rejoices.

I now speak as an Englishman who has spent much of his time in Switzerland, Germany, and Italy. Everywhere have I met old *élèves* spreading the fame of the "École," and helping one another, in remembrance of the good days of yore.

Gentlemen, in the name of the foreign pupils of the École des Beaux Arts, I beg you to join me in drinking to the prosperity of France, and to that of her noble School of Arts."

THE GREAT CROSBY SCHOOLS.

THE Great Crosby Schools of the Merchant Taylors' Company are situated on ten acres of land upon the high road from Liverpool to Southport, and are built on the higher part of the ground, which slopes gradually to the south.

Close to the entrance-gates is the lodge; the schools occupy the central part, and the master's residence and garden the western extremity of the ground.

Over the principal entrance to the schools is a tower, 16 ft. square and 90 ft. high, containing in the upper part a chamber for clock and bell. The clock-face, 5 ft. 3 in. diameter, will be illuminated. The gable over the entrance itself is ornamented with carving, and the centre panel contains the arms of the Merchant Taylors' Company.

On the right of the tower is a hat and cloak room for boys, and a corridor leads to two class-rooms, 25 ft. by 20 ft., and to the large school-room, 60 ft. by 30 ft. To the left of the tower is a porter's room, storeroom, two class-rooms, 25 ft. by 20 ft.; and the western wing is occupied by the master's library, 30 ft. by 20 ft. A natural science lecture-room, 34 ft. by 25 ft., with a laboratory attached, 33 ft. by 10 ft. A staircase gives access to the kitchen on the upper story, and a large dining-room, 34 ft. by 34 ft., for the use of the boys who reside at a distance.

The style of architecture is Mediæval, executed in red brickwork, with dressings and ornaments of Stourton stone. The roofs are covered with banded green Westmoreland slates. The large school-room has an open timber roof of ornamental character. The circular tracery window at the north end, and the upper part of the bay window at the south end of this room, are filled with stained glass.

The building is to accommodate 250 boys, and is arranged for enlargement to receive 400.

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The grounds are planted with a large variety of trees and shrubs, and are prepared for two cricket-grounds, fives-courts, &c. The cost of the whole will be about 17,000*l.* The architects are Messrs. Lockwood & Mawson. The principal contractor, Mr. S. Webster. The heating apparatus has been supplied by Mr. W. W. Phipson, London; and the whole of the school-fittings by Mr. G. M. Hammer. Mr. W. R. Bennett was the clerk of works.

THE WEST MARINA ESPLANADE, ST. LEONARD'S-ON-SEA.

As already briefly mentioned in the *Builder* (p. 632, *ante*), the West Marina Esplanade has been opened with much rejoicing.

During the half century of its existence,* St. Leonard's, or "the New Town," as it was formerly called, to distinguish it from Hastings, has rapidly grown, and has become united with the older place for municipal and other purposes, so that now Hastings and St. Leonard's have become one large borough. With their extended area, the corporation of Hastings have very commendably begun to carry out public improvements in the western part of their district. By far the most important of those improvements is the new parade and sea wall at West Marina, where some of the finest mansions of the borough have been built. This new parade is nearly 2,000 ft. in length, with an average width of 50 ft., the old parade, which it has superseded, being only 20 ft. in width. The wall on the sea side is 15 ft. in thickness at the foundation, and the parade is raised above the road at the western end about 5 ft. The work has been carried out by Mr. Jenkins, the amount of whose contract was 10,500*l.* In addition to the parade, seven new groynes have been constructed, at a cost of, 2,600*l.*, this portion of the work being carried out by Mr. F. Winser.

The proceedings began with a luncheon at 105, Marina, the residence of the Rev. J. A. and Mrs. Hatchard, by whom the mayor and corporation, and other influential residents and visitors, were hospitably entertained. Some twelve years ago, when the control of the parade was in the hands of the commissioners, Mr. Hatchard, as one of that body, advocated the carrying out of an improvement similar to that which has now taken place.

SOCIAL SCIENCE CONGRESS.

THE following are the special questions selected for discussion in the Health Department at the forthcoming Social Science Congress at Cheltenham:—

1. The importance of complete disinfection, and the best means of providing for it by sanitary authorities.

2. On the better regulation of house building generally, and the best mode of improving the sanitary condition of existing houses.

3. How best to overcome the difficulties of overcrowding amongst the necessitous classes?

In addition to the above, papers volunteered on other subjects will be read and discussed.

Tin-plate and Wire-work Exhibition.—At the Crystal Palace, on Saturday last, Lord Carnarvon opened an exhibition of tin and wire work, which, with the object of encouraging good workmanship, has been organised by the Tin-plate Workers and Wire Workers' Company, an old City guild. Prizes were offered for competition to workmen, and although some firms are among the exhibitors, the prizes will be taken by the workmen engaged on the articles exhibited. The exhibition is held in the Bohemian Court, and includes articles both ornamental and useful. The Tin-plate Decorating Company, of Neath, South Wales, send specimens of iron and tin to show the various stages through which the metals go before the tin-plate is produced. Mr. F. W. Potter, Hill-street, Finsbury, exhibits samples of woven wire gauze for water-marking paper. One specimen of wire gauze has many thousands of meshes to the square inch. Mrs. Amelia Lewis, of Oldham, sends some improved cooking utensils, &c. The exhibition will remain open for some time.

* It was founded by Mr. James Burton, architect, and celebrated its jubilee in the early part of this year (see p. 330, *ante*).

ATLAS ELECTRO-PLATING WORKS, PARADISE-STREET, BIRMINGHAM.

THIS block of buildings, the principal front of which is represented in our illustration, has recently been erected for Messrs. Horace Woodward & Co., at a cost, including machinery, of 25,000*l.* The width of the frontage is 58 ft., and the buildings extend from Paradise-street to Edmund-street, a depth of 200 ft. The elevation to Paradise-street forms one of the most conspicuous of recent additions to the street architecture of Birmingham. It is constructed of Ancaster stone and red brick. The most prominent feature is a large central oriel window, two stories in height, terminating in a dormer. At the springing of corbelling for the oriel, and over the keystone of the principal entrance, is a figure of "Atlas."

Red and yellow terra cotta have been made use of in the tympana of the dormers, in the consoles and panels of the principal cornice and other portions. The panels above the central archway are filled in with discs of green terra cotta, and bosses of red polished granite are introduced above the semicircular window-arches.

The central entrance leads directly into Messrs. Woodward's show-rooms, the first of which is oblong in plan, 32 ft. by 14 ft. 6 in. The inner or principal show-room is octagonal on plan, and 40 ft. in diameter. In the angles of the octagon are black marble shafts, with stone bases and foliated capitals; from these capitals spring consoles carrying the cornice, and on the face of the consoles are small ornamental pendentive arches, by which the transition from the octagonal plan of the room to the circular lines of the cornice and ceiling is effected agreeably. The ceiling is elliptical in section, with enriched bands and panels, and has a central light.

The two side entrances give access to the front rooms, which are let as shops, and to staircases leading to the front rooms on first and second floors, which are let as offices.

Messrs. Woodward & Co.'s own offices also occupy part of the front buildings; and in the extensive premises farther back, accommodation is provided for their whole establishment, with workshops and rooms for casting, plating, gilding, stamping, modelling, and burnishing.

The elevation to Edmund-street is four stories in height, of plainer character than the one illustrated. The entrance-gateway to the workshops is in this front, and the boilers and engine are placed at this end of the building. The engine-stack is 110 ft. in height, and is very conspicuous on entering the town by Broad-street. It is square on plan, with moulded brick bands and cornice.

The buildings are provided with machinery adapted to the various processes carried on, and with all recent improvements; and altogether they present one of the foremost examples of the newer type of Birmingham manufactory.

The architect is Mr. Yeoville Thomason. The builders are Messrs. William Parker & Sons.

NEW COURT, LINCOLN'S INN.

THE new building, now on the point of completion (indeed, already partly occupied) which we illustrate this week, forms the first portion of what will probably become the favourite legal quarter of London. It occupies a site on the northern side of Carey-street, immediately opposite the New Law Courts, and close to that entrance of the courts which will be chiefly used by members of the legal profession.

New Court is the property of the Serle-street and Cook's-court Improvement Company, and will eventually occupy the entire block bounded by the two arms of Carey-street on the south and west, by Serle-street on the east, and by Portugal-street on the north, embracing an area of about 5,500 yards. The chambers will surround this site, and consist of twelve distinct houses, each having its entrance, its staircases, and its conveniences complete and self-contained. The entrances to the chambers, as in other legal quarters, will all be from the interior of the quadrangle,—a spacious square of about 1,600 yards, the centre of which will be planted as a garden, ensuring light and quiet to the chambers looking into it.

The south side of the court, which faces the New Law Courts, has been set back so as to give a largely-increased width to Carey-street. This, will be of very great value to the public, and it is to be hoped that the improvement of Carey-street will before long be completed by clearing away the unsightly buildings attached to the south side of New Square, and throwing the ground which they occupy into the street.

It is intended to limit the use of the New Court to members of the legal profession, or to such as may be in some way connected therewith. Adjoining the entrance-archway (which is immediately opposite the entrance to the New Law Courts), spacious premises have been prepared for the National Provincial Bank, who have a porch-entrance from Carey-street. At the south-western corner a similar porch opens into similar premises, and these are the only two entrances which the New Court will have from the surrounding streets, save the main archway at the south-east corner. The appropriation of the different floors scarcely needs description. The chambers are so arranged as to be conveniently occupied in suites varying from two to ten rooms. Each suite will have its own fireproof safe, in many cases two, within its own walls, and as such accommodation is peculiarly requisite for gentlemen of the law, a sub-basement, honeycombed with substantial firebrick safes, has been constructed under the greater portion of the building. Water-closets are excluded from the houses, except from the topmost floor, all such conveniences being provided under the pavements of the surounding streets, lighted and ventilated from the open areas. The exterior of the building is constructed of red brick and red terra-cotta, stone being entirely avoided. The masses of the structure are severely simple towards the surrounding streets, richness of detail being confined to such parts as the entrance-archway and tower, the cornice and parapet, and the string-courses.* The obtuse angle at the south-west corner is accentuated by a corbelled and gabled projection, forming the second prominent feature of that portion of New Court already built. Stone has also been avoided internally, the staircases being of iron, to which an artistic character has been given, with Hawksley's treads inserted so as to be easily renewable.

The general contractors are Messrs. Perry & Co. The terra cotta for all the parts below the cornice was supplied by the Watcombe Company; and that for the cornice itself and parts above, by the Architectural Terra-Cotta Company, of Mile-end, whose raw material was the London clay, used, like the Watcombe clay, without any colouring material whatever. The iron columns in one bank are encased with Watcombe terra-cotta, and those in the other with Della-Robbia ware, by Messrs. Gibbs & Canning, of Tamworth. The iron staircases and all ornamental metal-work have been supplied by Messrs. Hart, Son, Peard, & Co.; and the 200 strong-room doors to a special specification, by Messrs. Hobbs, Hart, & Co. Mr. Boyd's hygeistic grates are fixed in all the larger rooms, and almost every fireplace is made cheerful by tiled hearth and cheeks.

Mr. Waterhouse, A.R.A., is the architect, and Mr. W. McGill, the clerk of the works.

Discreditable Scene at a Fire.—On Wednesday morning in last week a fire broke out in the centre of the market town of Potton, Bedfordshire. It originated in a barn in the occupation of Mr. David Abbott, market gardener. An alarm was at once raised, and a fire-engine was quickly on the spot. This was taken into the yard of Mr. John Fane, butcher, the hose was connected, and a dam placed under the pump, but it is stated that just as the men were beginning to play on the building, the use of the water was refused, so that the Brigade were utterly powerless. The consequence was that the fire rapidly spread, many of the buildings in the vicinity being of wood, and thatch-roofed. The number of houses destroyed was twenty-two, mostly inhabited by poor people, who had not insured their furniture. Besides these houses, a great many outbuildings were destroyed, the fire having extended over three acres of ground. The *Bedfordshire Times* says,—"Undoubtedly all this loss and suffering resulted from the action of Mr. Fane in withholding water at the beginning, and, as might be supposed, the indignation felt by the poor people was very strong."

* Towards the quadrangle the numerous doorways, staircase windows, dormers, and other features, contribute to more picturesqueness of treatment than was practicable with the external elevations.



STREET ARCHITECTURE, BIRMINGHAM: THE ATLAS ELECTRO-PLATING WORKS.
MR. YEOVILLE THOMASON, ARCHITECT.



NEW COURT, LINCOLN'S-INN.—Mr. Waterhouse, A.R.A., Architect.

DOMESTIC ECONOMY CONGRESS, MANCHESTER.

THE second Annual Congress on Domestic Economy, held under the auspices of the Society of Arts, was opened in Manchester on the evening of the 26th ult., by a *conversazione* in the Town-hall.

The Mayor (Alderman Grundy) having welcomed the Congress to Manchester,

The Duke of Westminster returned thanks on behalf of the Society of Arts, and said that it seemed to him right and fitting that as the congress was held last year in the important town of Birmingham, it should be held this year in the great centre of the cotton industry. In conclusion, he read a letter from the Prince of Wales, who wrote:—

"As president of the Society of Arts, I request your Grace to have the kindness to express to the Mayor and Corporation of Manchester my thanks for the great and cordial assistance they have afforded to the Society of Arts in holding the congress for discussing domestic economy and elementary education in the city of Manchester in connexion with the educational institutions in Cheshire and Lancashire. The knowledge of domestic economy is a knowledge of all that makes home life moral and happy, and is at the root of the education of every young child. I rejoice that the subject has been connected with the public elementary education of the country."

The first meeting for the reading and discussion of papers was held on the 27th ult., when the Duke of Westminster, in a brief introductory address, said that there were two main difficulties in the way of congresses of this kind. The first difficulty was to obtain teachers, and the second those who were to be taught. No doubt the sense of the congress would be that the education of girls was the subject which ought to be sought for in the main, while the boys should not be neglected in these respects, for, as they all knew, on the female head of the house depended its management, so that it was upon them that the main responsibility rested. All of them knew something of the condition of the homes of the working classes both in town and country. They were equally bad, he was afraid, in the country as in the towns, but worst in the most crowded parts of great towns, though there were houses well kept, where order and method and cleanliness, and, as a consequence, health and happiness reigned, which formed a striking contrast to the ill-kept, miserable, and untidy homes of the great majority of the working classes. There was one other subject upon which he might enter—the connexion of intemperance with the question of these ill-kept homes,—how they acted and reacted one upon another. What was distressing in the case of Manchester was that the statistics showed that, while intemperance among the men was certainly decreasing, intemperance among women was increasing very considerably. That was the case in some parts of England, but especially in Scotland; and in Ireland he was afraid they were not much better. That was an unfortunate state of things, which required their very anxious consideration. It was bad enough when the breadwinner of the house took to drink, but he thought the congress would agree with him that it was worse when the female head of the house, and the manager of the household, who had to bring up the family, took to it. God help them in such a case, for no other help could possibly avail. He often wondered that more notice was not taken of the slatternly and untidy way in which the managers in so many English homes carried on their household duties. He urged the necessity of a regular system of education in cookery being given to girls, and said another reason why the congress was fittingly held in Manchester was that the death-rate of the city and of Liverpool was increasing. The work of the congress was one of great philanthropy, which concerned the happiness not only of thousands in this country, but of a still larger circle.

The Rev. E. F. M. M'Carthy submitted a short report, embodying the general views expressed at the Birmingham Conference of last year, and the reading of papers was then proceeded with.

Sir Henry Cole read a paper urging the expediency of establishing "national colleges" of domestic economy. He advocated the introduction of the teaching of domestic economy into public elementary schools as of the first importance to the future well-being of the people. It could not be expected, he said, that advanced instruction could be given in these subjects of domestic economy in primary schools, but elementary instructions might be given even in infant schools, and the first principles underlying all the subjects, such as those of cleanliness, neatness, order, method, carefulness, and the use of the hands, could be taught to all children of both sexes, and elementary teachers could be made to practise them. The elements might be laid in elementary schools, but it would be in secondary schools and night classes that the development of them would be found. Special teachers must be trained to give suitable lectures and demonstrations in large elementary schools to the advanced children only, and such teachers should be trained on principles analogous to those successfully carried out for teaching science and art throughout the country. State aid was quite as necessary, and perhaps more so, for domestic economy, as for any of the twenty-three subjects of science and art now aided by the State, and he suggested that her Majesty's Commissioners should endow such a college out of the surplus funds of the Exhibition of 1851. In a second paper, Sir Henry Cole pointed out the desirability of making Chetham Hospital a school of this character, and expressed a hope that the trustees might be induced to make it the first school of its class in the country.

The Dean of Manchester condemned the idea of establishing another training college, and said he did not see why in the colleges at present in existence such portions of domestic economy as were necessary to be taught should not be added to the curriculum. As to the teachers, they would be found in the very colleges where the science was taught. He had heard of a girl being asked to write an essay on the best way of making a bed. Some might think the thing right, but to him it seemed to be nonsense.

Dr. Vaughan (Roman Catholic Bishop of Salford) was very much inclined to agree with the Dean of Manchester. It would, he thought, be time to establish training colleges for this particular purpose when all other means of imparting education had failed.

On the subject of "Thrift in Schools," Mr. G. C. T. Bartley read a paper. He urged that thrift should be regarded as the habit of making the utmost and best use, not only of money, but of materials and time. It could not be taught like an abstract subject, but must be constantly exemplified and practically illustrated during school life. In a direct way thrift might be promoted by the establishment of penny banks in schools, by teaching children the meaning of insurance, and the giving up of something in the present in order to secure something better in the future. This might be done by anecdotes introduced into lessons of arithmetic. Teachers should endeavour, whenever possible, even in other subjects of instruction, to inculcate habits of thrift by example, homely illustration, and simple precepts. The great effect of thrift on temperance and social well-being, and the anomaly of thrift, had been left untaught too long. By thrift alone could pauperism, with all its attendant miseries, be abolished, and thrift must be an essential element in any movement by which the masses could be permanently and universally improved.

Mr. M. Parker (Leamington), Mr. Chancellor Christie, Mr. F. Curzon (organising secretary of the Yorkshire Union of Mechanics' Institutes), and Mr. Oulton (Liverpool) urged the advantages to be derived from penny banks being established in connexion with schools.

The Dean of Manchester objected to the care of the bank being thrown upon the teacher, and was supported by Mr. Bartley.

Sir Henry Cole said he believed if these banks had been established twenty years ago, and the children had then become accustomed to use them, it was his conviction that we should not have had to lament the late deplorable strike in Lancashire.

The Bishop of Manchester took the chair at the afternoon sitting of the Congress, and said there was one point which did not seem to have been taken into account in the papers read during the morning. It seemed to him to be most important that the conditions of life under which the great masses of the people lived in Lancashire should be taken into account. These conditions were such as to make the practice of domestic economy in the household extremely difficult, and, therefore, if it could be taught in the school it was all the more important.

The Rev. C. H. Collyns (Wirksworth) read a paper on the teaching of temperance in elementary schools, in which he urged that the general teaching of temperance should permeate the schools.

The Congress met again on the 28th ult., the Duke of Westminster presiding.

On the subject of "Health and Ventilation," a paper by Miss Lankester (secretary to the National Health Society), was read by Mr. Wood. The writer pointed out the necessity of teaching the laws of health to the young, which would raise among the poorer classes a demand for healthy conditions. She urged the necessity for open spaces in large cities, and gave an account of the work which had been done by the society of which she is the secretary. She advocated the conversion of dismal city churchyards into cheerful and bright pleasure-grounds, a work which, she pointed out, has been carried out in several London districts. Abundance of water, well-ventilated dwellings, and good sanitary arrangements were also urged in the paper as essentials to health.

A discussion followed, in which Mr. W. H. J. Traice, Mr. Bartlett, Mr. H. Pitman, and others joined.

The Bishop of Manchester said he could not but regard the views expressed by one or two of the previous speakers, and, to some extent, in the paper itself, as merely dreams, and utterly impracticable. If they could show any way in which the working classes could cultivate personal cleanliness they would be doing a great deal of good; but he could not understand how, in the conditions under which the working people lived, these dreams were to be realised. He invited the meeting to come down from the clouds. For one he did not wish to be considered one of the Laputan philosophers who dreamed dreams of a sort of ideal perfectibility which, as far as he could see at present, were not likely to be very immediately realised.

Miss Becker said she thought it was equally necessary that attention should be paid to the supply of pure air as well as pure water, and suggested that the authorities should determine to put down the smoke nuisance. If that were done the congress would not have been in vain.

The discussion was continued by Mr. J. Corbett, Sir Henry Cole, Mr. Fielden, and others.

Mrs. H. J. Roby (Manchester) read a paper on "The Dwelling: Warming and Ventilation," and Mr. Joseph Corbett (Manchester) a paper on "Ventilation."

The Rev. C. H. Collyns (Wirksworth) read a paper on "Food and Cookery, in relation to Teaching concerning the same in Elementary Schools." He urged the necessity of a knowledge of food elements, and the way to cook, especially in a thickly-populated country. The method he commended was, that children should learn something about their own bodies, and the purposes and uses of food; that they should also learn to cook the simplest substances, and how best to prepare them in order to obtain the cheapest and most savoury and most nutritive substance. He advocated the use of object lessons, in order to familiarise the children with the component parts of food substances.

Mrs. C. Clarke, lady superintendent of the National Training School for Cookery, contributed a paper setting forth the progress which the school had made. She said that instruction in cookery in public elementary schools as a branch of national education did not receive the encouragement hoped for from the various training colleges. From the 31st of March of last year, to the 1st of April in the present year, fifty-two students entered the National Training School to train for teachers, and forty-five diplomas to teachers had been granted. During the year 2,119 pupils had attended the school; in the year 1876-7 the number of pupils was 1,801. Besides the work done in the school, they had held sixty-nine classes in London and suburbs and the provinces, and they were prepared to open classes for cookery whenever they could obtain a suitable room, and a sufficient number of pupils. It was only by teaching the children of the working classes that any marked improvement in cookery could be attained among the people.

Miss Guthrie Wright (hon. secretary to the Edinburgh School of Cookery) read a paper on "The Extension of Teaching Cookery in Schools," in which she urged the importance of teaching cookery in elementary schools, by properly trained teachers.

Miss Emily Hall (hon. secretary to the Manchester School of Cookery) then read a paper on "The Teaching of Cookery in Elementary Schools." She urged that practical teaching should be given of such a kind as would be useful to the children in their after-lives;

therefore, only simple and inexpensive ingredients must be used, such as could easily be obtained by working women. The teaching, she thought, would fail to answer the end in view unless it included instruction in health matters generally.

A paper by the author of "The Official Handbook of Cookery" on "Domestic Economy Diplomas and Examinations for Cookery" was read by Mr. Bartley, in which the author urged the importance of an organised system of examinations in cookery in connexion with the National Training School.

A discussion followed.

Dr. Vaughan (Roman Catholic Bishop of Salford) said it seemed to him that there was a danger in reducing everything to a congress. People had eaten and lived for thousands of years without schools for cookery, and to reduce everything, even to the cooking of cabbages and potatoes, to a congress, seemed to him to be going altogether the wrong way. Let them have their theories by all means, but do not let them forget that they must depend to a considerable extent on the voluntary contributions of ladies and gentlemen, or the cost of establishing these schools would be one that would not be borne.

Mrs. Fenwick (Leeds) and Mrs. Fielden (Todmorden) replied to Dr. Vaughan.

The Chairman said the voluntary system had, no doubt, done much for this country; but, in the opinion of the people, it had not done all that should be done. It had been suggested to him that he should ask every lady who was willing voluntarily to assist in teaching cookery at elementary schools to hold up her hand. [Not a hand was raised.]

Miss Braun (Manchester) then gave some interesting illustrations of teaching children needlework.

Mrs. S. Fielden (Todmorden) read a paper on "The Advantages of Female Inspectors of Needlework in Elementary Schools." She condemned the system under which needlework was inspected by male inspectors, who really knew nothing of the work, and said that a woman trained to the needle from babyhood must be the better judge.

Miss Becker (Manchester), in a paper on the subject of amendments in the Education Code, said the importance of inculcating sound principles of domestic economy could not be overestimated. Increased attention was being given to the subject in connexion with the State, and it therefore behoved all concerned in the matter to bestow the most careful consideration in order that the efforts made should be wisely directed, for there was a danger that well-meant efforts to teach domestic economy might be misdirected, and there were symptoms that this danger was a growing one.

Mr. F. O. Ruspini (clerk to the Manchester School Board) read a paper on "The Working of the Education Code."

In the discussion which followed,

Sir Henry Cole said he hoped the congress would agree with him that the time had come when the revision of elementary education should be attended to. The Dean of Manchester seemed to be alarmed by a fear of an army of inspectors and their cost; but he (Sir Henry Cole) thought he could so arrange matters that the system of inspection should not only be more complete, but should not cost so much as it did now.

The Rev. Canon Toole said he feared that the houses of the people were not their homes as they once were, and, without a home, he was afraid to try to teach the people in the matter that had been under the attention of the congress would be of little use.

The Bishop of Manchester could not see how Sir Henry Cole was going to increase the army of inspectors without increasing the cost. He looked upon the remarks of Canon Toole as more sentimental than practical. The great demon which afflicted the working-classes was the demon of drink.

This brought the discussions on papers to a close.

Mr. W. Reyner Wood moved:—"That in order to obtain practical results from the Manchester Congress it is desirable that the executive and local committees remain in action until the next annual congress takes place, and that the report of the proceedings be published as early as convenient."

The Rev. W. J. Knox-Little seconded the motion, which was carried.

Votes of thanks to the Mayor for the use of the Town-hall, and to the Duke of Westminster for presiding, brought the congress to a close.

The *Manchester Courier* may be looked to for fuller notes.

LINCOLN DIOCESAN ARCHITECTURAL SOCIETY.

THIS society visited the town and neighbourhood of Great Grimsby on the 18th and 19th ult.

The Bishop-Suffragan of Nottingham read a paper on St. James's Church, Grimsby. He said that time was when seamen or fishermen, approaching Grimsby, saw six or seven churches rising above its houses, only one of which now remains. Two of these were there before the Conquest, the one perhaps represented by the still existing St. James's, the other by the lost St. Mary's, with its lofty tower, serving as a useful beacon to mariners until the sixteenth century, when it was pulled down. Besides these, there was the church of the Abbey of Wellow, founded for Black Canons by Henry I., 1110, unless this was identical with St. James's Church; that of the Benedictine Nunnery at St. Leonard's, founded 1185, by Henry II.; that of the Augustine House, founded 1280, and standing a little to the west of St. James's Church; that of the Templars, afterwards given to the Hospitallers of St. John of Jerusalem, on Spital-hill, without Bargate, dedicated in honour of St. Mary Magdalene; and that of the Franciscans, or Grey Friars, founded *circa* 1308. His Lordship referred to the various distinguishing features of the exterior and interior of the church, and, speaking of the chancel, expressed a hope that ere long it would be put in a state that was compatible with the remainder of the building.

An excursion was afterwards made in carriages to several villages in the neighbourhood. The first place stopped at was *Clee*, where the Bishop of Nottingham said that the tower of the church was one of the most ancient existing in the diocese, and there was reason to believe that it was built in the time of Edward the Confessor, if not before. It was well worthy of examination, both on account of its rudeness and its completeness. It all belonged to the earlier period, except the parapet above, which was of a later date. Of *Humberstone* Church, next visited, there was little to be said, except that it has a good Perpendicular tower in its entirety, and remarkable for its buttresses. The church had been rebuilt within the memory of man, and he trusted it would be again rebuilt within the memory of man. On arriving at *Tetney*, his lordship said the first point of interest was the tower, which was of the same date as the one they had just before visited. The company, after partaking of luncheon, proceeded to *Waithe*, where the Bishop said the church was possessed of one of those very ancient towers for which that part of North Lincolnshire was celebrated; and in this instance there was a peculiarity, inasmuch as it had been introduced between the nave and the chancel. Arriving at *Ashby*, the earliest portion of Ashby Church, his lordship remarked, was the southern wall of the nave, and outside towards the west end of the church was a portion of Early Norman architecture. Great alterations had been made in the church during the present century, and they were sad to contemplate; he hoped that a fresh restoration of the church would take place before long. At *Brigsley*, the Bishop said from first appearances that church might not be considered worthy of a visit, but a second examination showed that there were some features which were worthy of being inspected. Notwithstanding its superstructure, they found very clearly that the tower was of the Norman period; the chancel was of the Early English period, and there were two windows which belonged to the original fabric. On arriving at *Waltham*, the Bishop said he thought they must all feel refreshed by coming to a church which had been so carefully restored, and which was now so well fitted for divine service. The tower was an interesting specimen of the Early English period. *Scartho* was the last church visited. The tower was either Norman or Saxon, but the Bishop said he truly believed it belonged to the Saxon period. There were about seven or eight such in that part of Lincolnshire, but perhaps this was the best of all. He visited the church a number of years ago, and found it in a state of utter ruin, but now he had to congratulate the vicar and the parishioners for the admirable way in which it had been restored.

The annual dinner of the Society was held in the evening at the Royal Hotel, the Bishop in the chair.

A public meeting was afterwards held in the Town-hall, where the Society was received by the Mayor. An interesting paper on "British Hut Circles at Tetney" was read by the Bishop Suffragan of Nottingham, who introduced the subject as follows:—

"The art of building is the one that our Society studies, and this leads us to investigate all such specimens of ancient architecture as serve to illustrate the religious or secular history of the past, but especially those that are dedicated to God's service, from the earliest times. Thus we are occasionally led back from the thought of buildings constructed of marble, granite, stone, or brick, to consider those made of earth and sticks, or the simple materials of which the huts of many primitive people were composed, but little raised, as to art, above what beavers employ through mere instinct. Sometimes we study the crude architecture of the Saxon period, of which the once Cathedral Church of Stow still retains some remains, and at other times that of the Norman period, illustrated by the same venerable fabric, and many other examples, besides those of subsequent Mediæval centuries, indicating the gradual development of the construction and ornamentation of the churches and other buildings of that period, or of the grand old Tudor houses, with which our vernacular architecture concludes, before the irruption of a spurious Renaissance style destroyed not only the growth but the very *life* of English art as supplied to English building, so that we now live in a time that has no distinct architectural style of its own, and simply feeds upon the stores of the past, derived from foreign as well as English sources commingled in Babel-like confusion, commencing with Egypt and ending in the usual expressionless brickwork of the nineteenth century, from which all true art has fled. Perhaps it will be well, then, to advert to a happy time when architecture had a future before it, instead of only a past history, and especially as this will now enable me to unfold to you the discovery of some extremely ancient specimens of architectural remains at a spot not far distant from our present place of assemblage, viz., in the parish of Tetney."

The Rev. J. Wild, vicar of Tetney, followed with an interesting paper on Old Grimsby.

WATERWORKS.

Newbury.—New waterworks have been opened at Newbury. The well which supplies Newbury is situated in the valley at Northcroft, a short distance from the town, and is only 14 ft. deep from the surface, and 7 ft. in diameter. It was originally intended to carry it down to a greater depth, but at the depth of 14 ft. a strong spring was struck coming in from the chalk, and which yields from 20,000 to 34,000 gallons per hour. It was at first supposed that this was the valley water coming up through the gravel, and samples were therefore submitted to the late Dr. Noad, F.R.S., who pronounced it to be pure chalk water similar to that obtained from the North Kent Waterworks at Crays. From the well the water is pumped to a reservoir situated at Speen, at a height of 110 ft. above the surface of the well. The pumping station consists of an engine and boiler house, built with red brick, with strings of blue brick, and dressings of stone. The chimney-shaft is about 40 ft. high, and has an ornamental stone cap. At present there is only one engine and boiler on the works, but space is left in the building for another of each, which will be added when the increased demand for water renders it necessary. The water is lifted by four pumps, having cylinders 9½ in. in diameter, and 2 ft. stroke. The pumps are driven by a vertical engine of what is known as the Grover "Britannia" type, having an overhead cylinder 12 in. in diameter, with 2 ft. stroke. With this machinery over 16,000 gallons of water per hour are lifted into the reservoir at Speen. This reservoir is constructed of brickwork in cement, the sides sloping with a batter of 3 ft. to 1 ft. It is to be covered in with brick arches, and is provided with a valve chamber, 10 ft. by 6 ft. The reservoir is 42 ft. long, 30 ft. wide, and the height of the final water level is 15 ft. from the bottom; it is at present 10 ft. The reservoir is capable of containing 110,000 gallons. Pipes have been laid down throughout the greater portion of the town, and the services are being rapidly put in. The supply will be constant, and the charges are to be somewhat less than those in London. The engineer of the company is Mr. J. W. Grover, M.Inst.C.E., who has had charge of the undertaking since its inception three years since. The works were only commenced in May last year, and have been pushed on with such vigour that they are now nearly finished. The contractors are Messrs. Thomas Quill & Co., of London.

Halifax.—On the 28th ult., the members of Halifax Corporation paid a visit to the Widdop waterworks. The powers for the Widdop, or rather the Hebden scheme of the Halifax Waterworks were obtained in 1868, although it was not until 1871 that the first sod, preliminary to

the construction of the Widdop reservoir, was cut. At that time (says the *Halifax Guardian*) the supply of water for the town and district was derived from the high moorlands at the head of two large valleys,—that of the Hebble, the waters of which were gathered at Ogden; and that of the Lud, or Ludden, the waters of which were gathered at Warley Moor, Upper Dean Head, Lower Dean Head, and Castle Carr. Both these systems were connected, and their united waters ran by conduits to Ramsden Wood, where there is a receiving reservoir in the short valley below Mount Tabor. In addition to these was the large reservoir at Mixenden, for the purposes of storage, but notwithstanding that by all these resources storage room was provided for over 600,000,000 gallons of water, it was found during the droughty season of 1869 that there was not sufficient, and it was determined to proceed with the construction of the Works in the Hebden. Mr. Bateman, C.E., had long been engaged upon the designs for the scheme, which was to bring the waters of the Widdop, Greave, and Walshaw streams, into the general system of the Halifax supply, and with this end in view tenders were invited,—at the completion of the works at the head of the Luddenden stream,—for the cutting of a tunnel from Castle Carr, in the Luddenden valley, to Peckett Well, in the valley of the Hebden. Mr. J. Parkinson, who had constructed the Warley Moor and the three other reservoirs below it, was chosen for this work, and on the 13th of October, 1869, the first sod of the tunnel was taken off by Mr. Hutchinson, M.P., who was then mayor. This tunnel is about 2,508 yards long, being 4 ft. 6 in. in height, and about 3 ft. 9 in. wide, with a considerable fall towards Castle Carr. From the Peckett Well end of this tunnel a conduit is constructed, several miles in length, running along the face of the hill on the Wadsworth side, for a considerable distance, thence across the Crimsworth valley to Shackleton, forward to Walshaw, and under the moorland to Widdop. The site of the reservoir is admirably adapted for the purpose. High upon the hills forming the backbone of England, and near the boundary of the two counties of Yorkshire and Lancashire, the middle basin of the Widdop stream, which was of great length and depth, sloping away easily at the top, whilst at the bottom it was nearly shut in by the rising ground, was selected. At the bottom point an embankment has been thrown across the valley, 270 yards in length, and 77 ft. high at its highest point. This is composed of 145,000 cubic yards of earthwork, 30,000 yards of puddle, 3,500 of concrete, 7,100 of stone pitching, and 2,000 yards of soiling. There are the necessary floodways, and byewash, and the drainage area of the reservoir is 2,223 acres, with a water area of 92 acres, and its capacity is 654,000,000 gallons. The original expectation of the cost of the Widdop reservoir was 88,000*l.*, and the period of its construction was estimated at from two to three years. Unforeseen and almost unsurmountable difficulties, however, arose, and its construction has occupied seven years, whilst the cost is somewhere about 118,500*l.*

Innocuous Colours.—At a recent meeting of the Academy of Sciences a paper was read from M. Turpin, relative to a discovery he is stated to have made of certain brilliant colours which are said to be absolutely innocuous, and which, he urged, may be advantageously substituted for those now in use procured from mercury and lead. The first is a vermilion, which (according to *Galignani*) he obtains by taking a solution of the potassic or sodaic eosine of commerce (a coal-tar product), which, treated with an acid, throws down a precipitate of eosic acid. The latter, mixed with the hydrate of oxide of zinc, forms a very rich lake (eosinate of zinc), which may vary from the tint of the rose to a deep red, according to the quantity of acid employed. This colouring substance resists a relatively high temperature and sulphurous emanations. Pure fluoresceine (another extract from coal-tar) forms, with the hydrate of oxide of zinc, a brilliant yellow. And the combination of this substance, with the one above mentioned, gives a series of tinctorial matters varying from pale yellow to the deepest orange, according to the proportions used. These new substances, although soluble in water, can be employed for painting, for they are declared to be absolutely indecomposible by oils and essences, cover perfectly, and cost little.

ÆSTHETIC TASTES.

DEAREST MR. EDITOR,—Oh, how delightful, how ecstatic, it must be to you who have striven *so* long, as I once heard you say, to make good art cheap and cheap art good, to find how art is now permeating the houses and the hearts of the better people; how we talk about it,—how we think about it! I am just now doing my own house, and do so hope when it is finished that you will come and see it. I have a dado in every room, and such bright friezes, and am seeking piously for some old brass fenders. But this is not what I want to say just now. My object is a serious one,—a *very* serious one; it is to send you a proof beyond cavil of the spread of a *real* love of art. I was dining at dear Mrs. B.'s, of B— Hill (Oh! such a pleasant dinner! Everybody talking at once, and much of the talk quite understandable, though esoteric), and here I send you the darling bill of fare,—what we used to call the *menu*:—

"23 June, 1878.

A MYSTERY!

Overture in White.
Prelude in Brown.

Nocturne in Pink and Yellow.
Scherzo in White.
Fugitive Harmonies in Brown.
Symphony in White.

IDYLL IN PROSE.

Variation in Pink and Green.

LOVE AND LIFE!

Phantasy in Green.
Ethereal Rhapsody in White.
Arrangements in Amber and Cream.

GLACIAL CHAOS.

Decorative Subjects in Metal.
Fruit and Flowers, vaguely treated."

When I first read it, I felt as if I were in the dear "Grosvenor." I could not quite understand it at the beginning, but I found it all out as the dishes came round. Isn't it *sweet?* "Overture in White," you know the sort of soup at once; what *can* "Fugitive Harmonies in Brown" mean but quails? And as to the "Idyll in Prose," it brings a little lamb alive before you, green fields and all. The "Phantasy in Green" puzzled me at first, but the moment I saw Gooseberry Fool coming round, my mind was at ease. Do make this known, Dear Mr. Editor, and you will help us up a step in the Higher Culture. DAISY.

P.S.—If you *should* hear of a brass fender, please let me know. And what *am* I to do if friends come into my rooms in dresses of the wrong colour? They destroy all my green and blue harmonies. Oh, and I must tell you; at dear Mrs. B.'s there was a very distinguished lady-sculptor present, and she was the only person who said nothing about art all dinner-time!

OVER-PRODUCTION.

SIR,—The strictures you pass upon the conduct of the leaders of the stonemasons in the late strike in London are well deserved by them. Except the late joiners' strike in Manchester, no more unwise act on the part of a body of men has been performed in our time. From a state of affluence they have reduced themselves to a condition of poverty. All their means are gone, and at the present moment the income does not suffice to meet the expenses arising from sickness, superannuation, and out-of-work pay, so that it is seriously contemplated making a levy of the whole trade to raise funds. This state of things reflects very seriously upon the foresight of the leaders of the society, the principal of whom has since then astonished the world by announcing himself as a candidate for the representation of an important Midland borough in Parliament. This movement of the stonemasons was an aggressive one, taken at an inopportune time. But the action of the cotton operatives in Lancashire during the late lock-out was a purely defensive movement, and ought not, I think, to be classed with the strike of the masons. They simply desired to keep the rate of wages they had for some time past received, and which the employers, in a very autocratic manner, determined to reduce by 10 per cent., alleging that the supply was greater than the demand, and that it was necessary to reduce prices in order to induce greater demand. To this the operatives agreed, on the condition that the supply be also reduced by the stoppage of the mills two days a week. So that the self-denial of the operatives was shown not only by consenting to a reduction of 10 per cent., but they were willing and anxious for a further reduction of 33 per cent. in order that prosperous times might be more speedily arrived at. The estimated weekly production of the mills which were stopped in Lancashire is 40,000,000 yards of cloth, so that the effect of the proposal would have been to reduce the supply by 13,000,000 yards weekly. This would have assisted the employers in two ways,—first, by reducing the demand for the raw material one-third, and, consequently, affecting a reduction in its price; and, secondly, by limiting the output by one-third, have kept up the value of the manufactured article.

That this proposal was good mercantile economy there cannot, I believe, be a doubt, and although the employers in the cotton trade did not so consider it, yet the principle has been recognised and acted upon in most other branches of manufacturing industry in this country. Take iron and coal as examples. The excessive prices obtained for these products in 1873 attracted to them such a large amount of both capital and labour, that mines were opened and furnaces built in every direction, with the result that a large quantity of these minerals was forced upon the market, already supplied to excess, and prices have gone down to a point lower than they were before the rise. Many of the works then opened do not pay to carry on at present prices, and it was stated by Mr. Macdonald, M.P., recently, that out of nearly 1,000 furnaces, only some 400 odd are making iron at the present time; and the output of the coal-mines is stated in a current trade report to be only about one-third of their capabilities, and with miners working four days a week, and yet a portion of this is being stacked, and prices are falling.

The same condition of things obtains in the tinplate trade. Some time ago the employers recognised the fact that the supply was largely in excess of the demand, and wisely resolved to curtail production, in order to obtain a remunerative price for their goods. Some makers, however, did not keep to the agreement, and the trade is consequently in a very unsettled state. Most of our export trades are in a similar position. How is this? The answer seems to be, that the productive power of the world in manufactured goods, at least, is greater than its power to consume such goods. England was up to recent times looked upon as the workshop of the world. Our inventive faculty, coupled with industry and perseverance, and the possession of various metals and minerals easy of access, caused us to be applied to for almost every manufactured production, and the demand has in times past been so great that not only have our children been withdrawn from the cultivation of the soil, but large numbers of our best workmen have been sent abroad with the most improved machinery, to set up manufactories in those countries which grow the raw material. In addition to these, other nations of Anglo-Saxon blood have sprung up and become competitors instead of remaining customers, until, at the present moment, we present the strange spectacle of a nation which has neglected, to a great extent, the cultivation of its own soil to become manufacturers for the world, now having little export trade, and yet dependent upon others for most of the food we eat. That this state of things cannot long continue is, I think, self-evident. A nation which cannot, and does not, produce the great bulk of the food it requires, is in a poor way. Agriculture is the very foundation of the permanent prosperity of any country. History presents many notable examples of this fact. The recent strike, and long-continued depression in trade, will not, therefore, be an unalloyed evil, if it awaken the thought that too many of our operatives are engaged in the production of goods which are being made in too great abundance for the wants of the world, and that their efforts would be more permanently rewarded if they turned their own attention and that of the rising generation more directly to the cultivation of the soil. Let the cry be, "Back to the land."

E. GRIMES.

St. Luke's Burial Ground.—On the 27th ult. the St. Luke's Burial Grounds, Old-street, which have been converted, at a cost of 600*l.*, into a public recreation-ground, were opened to the public.

INSTITUTION FOR THE EDUCATION OF THE DAUGHTERS OF MISSIONARIES, SEVENOAKS.

ON the 26th ult. the Right Hon. W. E. Forster, M.P., laid the foundation-stone of the above Institution, which is intended for the reception of 100 girls of all ages and denominations.

The design is in the Old English style, and is purposely simple and of inexpensive materials, variety of outline being chiefly relied upon for effect. The architect is Mr. E. C. Robins, F.S.A. The building will be faced with red bricks (red Dumfries stone being used for the chief entrance only). The upper or third story will be faced with vertical tiling. Tiles will cover the roof, with wooden verge-boards to the gables.

The plan of the building is a parallelogram, with an open court in the centre, which, on the ground-floor, is divided by the intervention of the dining-hall. At the north end of the dining-hall are the kitchen and domestic offices; on the south is the chief entrance,—on the right and left of which are the chief mistresses' and committee and reception rooms and library, forming the south side of the quadrangle. On the east side are the school and class-rooms for the junior school, and on the left side are the school and class-rooms for the senior division of the school. A small infirmary is situated at the north-west angle connected by a covered way with the main building. The laundry and fuel stores are situated on the north side of the kitchen-court which intervenes between them and the domestic offices, housekeeper's rooms, and cookery school.

The upper floors are arranged for dormitories, on a similar plan to that adopted by the same architect at Milton Mount College, Gravesend, by which separate and distinct chambers are provided for each inmate, enclosed within large dormitories, well lighted and ventilated. The younger children, who are to be under the care of nurses, have no separate cubicles.

Bath-rooms, water-closets, lavatories, housemaids' closets, &c., are situated at the four corners of the quadrangular block of the main building, except on the ground-floor, where they are placed parallel with the eastern and western corridors in the open central area.

The servants' dormitories are over the domestic offices, and form the upper story of the north side. This side is two stories in height only; the other three sides of the square are three stories in height. The dining-hall is a one-story building, with open-timber roof, and it is only in this apartment that a little freedom is observable from the rigid economy which elsewhere distinguishes the design, so far as superficial decoration is concerned.

The cost of the land, foundations, lodge, and fencing, amounts to 5,000*l.*, and a further 10,000*l.* are required to complete the building, which is deficient in no necessary convenience. The site of the building, 3 acres in extent, is situated on the high ground between the Vine Hall Estate and Knowle Park, near the Congregational Church. The present institution is at Walthamstow, where it was first established some forty years ago.

PARLIAMENTARY.

The Public Health Act Amendment Bill has passed its second reading in the House of Lords.

Public Works Loans.—In the House of Commons, on Monday last, Sir H. Selwin-Ibbetson intimated to Sir G. Balfour that the Treasury proposed to issue from time to time, in continuation of returns already issued, statements of the loan transactions both of the Public Works Loan Commissioners and the Commissioners of Public Works in Ireland.

Secretaries, Social Science Congress.—The list of the vice-presidents of this year's Congress, which is to be held at Cheltenham, is being rapidly filled up. The committees for the several departments of the Congress are also nearly completed, and the following have consented to act as hon. secretaries:—*Law:* Mr. E. T. Brydges (Town Clerk, Cheltenham), Mr. James B. Winterbotham, and Mr. J. W. Gabb. *Education:* Rev. R. M. Chamney (Principal of the Training College), Colonel Grove, and Mr. Tyrer. *Health:* Drs. Wilson and Ferguson. *Economy and Trade:* Capt. St. Clair-Ford, Mr. W. McLandsborough, C.E., and Mr. Cochrane. *Art:* Mr. J. Middleton and Mr. J. March Phillips.

ARCHÆOLOGISTS AT WISBECH.

THE proceedings of the British Archæological Association at Wisbech are now settled, and stand thus:—

Monday, August 19th.—Opening meeting at Council Chamber, Wisbech, at 2 p.m. Reception of the president and members of the Association by the Mayor and Corporation, and delivery by the Earl of Hardwicke, president of the congress, of the inaugural address. Under the guidance of the local committee, the members and visitors will proceed to the Church of St. Peter and Paul, where the Rev. Canon Scott, M.A., will give an account of its history and monuments. Afterwards the party will inspect the museum of the town, the remains of the castle, and vaults in High-street and Market-place. They will then proceed to inspect the barrow opened specially for the Association, and Leverington Church, the Roman bank, &c. On return to Wisbech, the public dinner will be held at the Rose and Crown Hotel, at seven o'clock, where the Earl of Hardwicke will take the chair.

Tuesday.—Excursion to Ely; walk to Cathedral and be there at 10·30 for examination and description of the edifice by Messrs. E. P. Loftus Brock, F.S.A., Thomas Blashill, R. J. King, and others. Lunch at Ely. Leave by 2 p.m. for Magdalen-road station. Drive to Middle Level Sluice, church, and hall at Wiggenhall St. Mary; then to Wisbech. Evening meeting.

Wednesday. — Inspection of the following churches:—Walsoken, Walton, Walpole, and Terrington. At each church due arrangements will be made for an explanation and description of its history, architecture, and monuments. The party to leave for King's Lynn at 1·15, reaching there at 2 p.m. Luncheon at the Globe; then drive to Castle Rising, with possibly a visit to Sandringham House and church. Evening meeting.

Thursday.—By train for Swaffham. Carriages to meet them there and drive to Castle Acre. Proceed by train to Middleton Towers, where Sir Lewis Wincop Jarvis, V.P., will read a short paper on the early history of the place. Afterwards the party will leave by train for King's Lynn, where they will be received by the Mayor and Corporation, and, after luncheon, proceed to the examination of the churches, remains of town walls, regalia at town-hall, MSS., &c.; train for Wisbech; evening meeting.

Friday.—By rail to Thorney; examination of abbey remains; then set out by carriages for Crowland for examination of remains of abbey, the ancient bridge, and luncheon; then on to Deeping St. James, for inspection of church and old house there; then by train for Spalding; visit church and cell. Special train for Wisbech, stopping at two or more churches on the way back to Wisbech. Evening meeting.

Saturday.—By train for Stamford, for the inspection of the churches, and thence by carriages to Burghley House, which will be described and commented on. The encampment at Castor (Durobrivæ of the Romans), and then on to Peterborough, for a short visit to the cathedral, and thence by train at 6·30 for Wisbech, in time for the evening meeting.

Monday. — By railway to Cambridge, for examination of the churches, colleges, old houses, and other antiquities of the city. These investigations will be continued on the following day, Tuesday, 27th of August, when it is hoped the president will be able to attend the final meeting of the congress, and bring the proceedings to a close.

ARCHÆOLOGICAL DISCOVERIES.

Roman Remains, Binchester.—Recently some excavations have been going on at Binchester, the site of an ancient Roman city, which have resulted in the discovery of a portion of a wall, 30 yards in length, 6 ft. high, and 9 ft. in thickness, most of which is stated to be in an excellent state of preservation. It is built of dressed freestone, and underneath the wall there is a complete arch.

Roman Remains, Lincoln.—Some interesting Roman remains have lately been discovered in the Bail, Lincoln. Means have been taken, under the direction of Mr. F. C. Penrose, for the preservation and exhibition of the remains. The columns will stand in a lofty semi-subterranean chamber or area, lighted from the street. Mr. Penrose strongly urged the importance of the removal of the very mean tenements on the south, which conceal the southern half of the portico.

ARCHÆOLOGICAL SOCIETIES.

Leicestershire.—At a recent meeting of the Leicestershire Architectural and Archæological Society, the Rev. J. B. Dickson, LL.D., of Glooston, read a paper on "Fotheringhay Castle." He said that in Domesday book the name of the castle is spelled Fotheringeia; Leland wrote it Foderingeye; it subsequently was subjected to various alterations till the present Fotheringay, or Fotheringhay, was decided upon; and the origin of the term is traced to fédan—to feed—and ha, or hay—a meadow. The only authentic description of the castle discovered is contained in a survey in the twenty-first year of James I. It consisted of two principal parts. The first a keep on the higher mound, and the second a large fortification on the lower. The first was reached through a double moat, and consisted of two stories, called upper and lower chambers, containing "goodly lodgyngs." From this you descended by a broad staircase to the lower fortification in which the "Great Hall" was situated. The Nen and a mill-brook formed part of the double ditches. Besides the mill-brook there was a pond—both have disappeared. The castle must have been standing in 1624, thirty-eight years after Mary's death, and twenty-one years after the accession of her son to the throne of England. That it was ordered to be demolished by James has been proved to be erroneous; the real destroyers, animated by no penitential sentiment, were the owners of the castle and manor at a later date. It became, in fact, a quarry for building purposes. The only picture in existence of this castle is said to be at Windsor.

North Oxfordshire.—The North Oxfordshire Archæological Society recently had an excursion to Chastleton House, Church, and Camp. The church is replete with interest; it dates back over eight centuries, and is associated with many distinguished names in Oxfordshire history. The mural tablets in the chancel are chiefly memorials of the Greenwood family, the patrons of the living, and possessors of considerable property in the parish. There is also one to the memory of Sir Richard Westmacott, the sculptor, who is buried in the churchyard, and to his son, Horatio, a rector of the parish. The chancel and tower are comparatively modern; the latter was destroyed by lighting, and rebuilt A.D. 1689. It was probably at that time that the church was seated with the high inconvenient pews, and that the unsightly gallery was put up which it is now proposed to remove. The church is about to be restored, under the direction of Mr. C. E. Powell, architect, London. In the afternoon Chastleton camp was visited, and some excavations examined. This camp or earthwork is on an eminence "foursquare" in shape, and is said by Beesley to be British, but adopted, altered, and improved by the Romans.

Birmingham and Midland Institute. — The members of the Archæological Section of the Birmingham and Midland Institute held their second excursion for the season on Saturday last. Assembling at noon at New-street Station, they took train for Cannock, where the church, which is principally Late Perpendicular in style, was visited. On leaving Cannock for the Chase, a fine pair of sixteenth-century gates at the old Manor House received the attention of the visitors. The weather was at this time all that could be desired, the summer heat being most enjoyably tempered by a fresh breeze, which continued till the party had reached the Chase. A thunder-storm approaching, the party were constrained to make a more speedy journey to Pillaton than would otherwise have been the case, and fortunately reached the hall without any sprinkling. Pillaton Hall, upon which Mr. Everett read a short paper, was formerly an extensive moated mansion, and was for many generations the seat of the family of the Littletons. The existing portions of the ruins are principally the brick gatehouse, having semi-circular turrets and dome-shaped roofs. This and the chapel are of the early sixteenth century, the remaining portions being Elizabethan. The visitors proceeded on to Penkridge, and the church (a Perpendicular structure) having been inspected, the party returned to Birmingham.

Asphalte Paving at Aldershott. — The Brunswick Rock Asphalte Paving Company have recently completed the paving of Wellington-street, in that town.

THE CERTOSA AT PAVIA; AND THE BASILICA OF CONSTANTINE AT ROME.

I SEEK your kindly aid in obtaining certain information about these two buildings. I am desirous of stating the dimensions of the great south cloister at the Certosa, but can find nothing reliable. The fine work by Durelli gives a plan; but it appears to me that both the scales of mètres and of Milanese braccia are wrong. By the former the court measures 22·2 by 26·0, being equal to about 73 ft. by 85 ft. English; by the latter, it measures 37 by 43, being equal to about 64 ft. or 71 ft. by 74 ft. or 82·7 ft. English, according to the two values given to the Milanese braccia. One writer in English (I think it is "Murray's Handbook") gives the dimensions 334 ft. by 412 ft., which is probably about correct. Has any one of your readers ever felt the interest to measure the vast quadrangle, whilst there? The above dimensions taken from the scales are the clear open space between the arcading. Writers differ, too, as to whether the residences of the monks have one or two rooms on the upper floor.

I also cannot find any very reliable English measurements of the Basilica of Constantine, formerly called the Temple of Peace, at Rome. Mr. Gwilt, in the "Encyclopædia of Architecture," and Mr. Fergusson, in his "History of Architecture," have given a few general ones; the best, perhaps, are those supplied by Desgodetz in his "Antiquities of Rome," 1682. This grand ruin of a noble edifice must surely have found a measurer among the many English students who have visited Rome. Being desirous of adding the above dimensions in the respective articles in the "Dictionary of Architecture," I shall be obliged by having them as early as possible, the articles being in type, and would have been printed, but the hope arose that the measurements might be forthcoming. Hence this inquiry. WYATT PAPWORTH.

33, *Bloomsbury-street*.

RUDE STONE MONUMENTS.

SIR,—In listening to Mr. Roger Smith's and Dr. Phené's interesting papers on the above subject, it struck me that the great stone circles of Stonehenge and Avebury were probably great places of assembly, where the ancient British Eistedvoden were held, where the bards contended for prizes, and where chariot races and athletic contests took place. There is somewhere a record of a British bard having travelled in Greece, of his having either studied the Pythagorean philosophy, or under Pythagoras, and of his appearance, and of his costume. It is also recorded, if I recollect rightly, that this bard revisited Greece. There was, doubtless, a much greater degree of intercourse, in early times, between the civilisations on the shores of the Mediterranean and this country, more especially through the Phœnician argosies, than we are apt to imagine. The British Eistedvodt, which is now only thought of as a Welsh institution, bore, in its ancient integrity, a close resemblance to the Olympian festival. It formerly included both intellectual and physical contests. The intellectual contests in poetry and music alone survive. There is also, I believe, a tradition that Grecian characters were used in the bardic writings.

It also struck me that these colossal stones may have been the points of support to either temporary or permanent wooden constructions for roofs and seats. The skeleton roof being, perhaps, finally covered in with either skins or canvas, the large mound encircling all at Avebury might have served both for a *vallum* and as the pit for the masses.

These great stone circles were probably the rallying centres for religious ceremonies, for the discussion of public affairs, for national games, and for defence. W. CAVE THOMAS.

"THE ADORNMENTS OF THE OBELISK."

THERE is a medium in all things, and while it would be almost absurd to adorn the base of the London Obelisk with modern strange sphinxes, yet the monolith has another meaning to an English eye besides its archaic one, and that meaning is, as Professor Erasmus Wilson has expressly stated, to commemorate "British valour by sea and land." This can best be done by bas-reliefs and inscriptions upon the base of the Obelisk. Such bas-reliefs and inscriptions are rightly placed on the pedestals of the obelisks of Constantinople and Paris; in both instances also the machinery employed has been deemed worthy of representation; and it is only just to the interest and ability shown by Mr. John Dixon in the mechanical contrivances employed by him as well as the invention of the *Cleopatra* ship, to hand down to posterity the record of them upon the base of the monument, which, to a great extent, England owes to his exertions. W. R. COOPER.

"AN ACT OF BARBARISM."

SIR,—Will you allow me to call the attention of your valuable journal to an act of wanton and wilful barbarism which is about to be perpetrated?

The trustees of Blundell's School, at Tiverton, having become very wealthy, have determined to remove that school to a new site; and for no reason, except ignorance be a reason, have determined to pull down the old building, erected by the founder of the school in the reign of James I.! The building in question is one of the finest examples of the Jacobean style in the country, and is a most interesting and beautiful specimen of English scholastic architecture. Its destruction will be a crying disgrace to the age, and it is with a hope that you will raise your voice against this most wanton act of barbarism that I address you upon the subject. I may mention that Blundell's School has been very carefully delineated by Mr. Dollman in his "Civil and Domestic Architecture."

H. W. B.

ORGANS.

Gloucester Cathedral.—At a meeting of the Dean and Chapter of Gloucester, on the 27th ult., the subject of the reconstruction of the organ of the cathedral came up for consideration. Mr. Waller, the cathedral architect, presented plans of a new screen, to take the place of the present heavy and modern stone division between the nave and the choir. Mr. Waller's design (according to the *Gloucestershire Chronicle*) is in character with the stalls and oak-work, the screen being as nearly as may be a repetition of the stall-work of the choir, less a doorway with canopies in the centre, as at present arranged, the backs of the stalls being opened between the nave and the choir. The organ is arranged for in two divisions, one occupying the last of the arches on the south side of the nave, and the other the corresponding arch on the north side, so that the long-desired vista from either end of the cathedral will be obtained if this design be carried out. The old organ-cases will be carefully preserved, and erected in the north and south aisles at the backs of the two halves of the new organ. Unanimous approval of the design was expressed by the capitular body. The specifications for the organ have been given by Mr. Willis, of London, embodying suggestions made by Mr. Harford Lloyd, the organist.

Leek.—A new organ has lately been erected in the old parish church, Leek, by Messrs. Jardine & Co., of Manchester. It has cost between 1,200*l.* and 1,300*l.*, and contains 42 stops, three manuals (CC to G), 56 notes, and 1,798 pipes.

West Bromwich. — Mr. Alexander Brogden, M.P., has presented an organ, erected at a cost of more than 1,200*l.*, to the West Bromwich town-hall. The instrument contains 2,168 pipes,—viz., 793 to the great organ, 781 to the swell organ; the solo and echo organ combined, 464; and the pedal organ, 130.

Northenden.—A new organ has been presented to the parish church of St. Wilfred, Northenden, near Manchester, by Mr. R. P. Percival. It is by Messrs. Hill & Son, of York-road, N., and is worked by a hydraulic engine. It contains three manuals and pedal, with a tremulant, five couplers, and five composition pedals. In all, there are 1,108 pipes, the longest of which measures 16 ft. The case is of Dantzic oak, and was designed by Mr. Redford, architect, Manchester.

Salisbury Cathedral.—During the past few days two holes have been cut through the east wall of the north transept of the cathedral, and a space excavated in the concrete outside preparatory to the erection of the gas-engine which is to blow the new organ. Whether the arrangements which are being carried out are likely to mar in any degree the exterior view of that part of the building is not yet evident; but if they do it will, as a local paper says, be a matter of much regret. No doubt the plan has received due and competent consideration, but it is highly desirable to avoid, if possible, anything, however small, which may prove offensive to the eye, particularly in those parts which are exposed to public view, as is the whole of the north side of the cathedral.

Weedon.—A new organ has just been erected in Weedon Church, Northamptonshire, by Messrs. Bishop & Son, of Marylebone-road. It has cost some 400*l.*, and was originally built by Nichols, son-in-law of the well-known G. P. England, but has been entirely remodelled and very considerably enlarged, only a few of the swell pipes remaining from the old organ. There are eight stops in the great organ. The swell has six stops. There are three couplers: swell to great, swell to pedal, and pedals to great; and three composition pedals to the great organ. The organ is full compass, fifty-six notes, and all the stops go through. There are thirty pedal pipes.

DOCKS AND HARBOURS.

Madras.—A visit was recently paid by Sir Andrew Clarke to Madras for the purpose of inspecting and reporting upon the harbour works which have for some years been in progress with no satisfactory results, although large sums of money have been expended upon them. It is stated that Sir Andrew Clarke, while he does not totally condemn the harbour, is of opinion that the design will have to be very considerably modified before it can be of any practical use. It has been estimated that a sum of 700,000*l.* would suffice to complete the work, and provide Madras with a suitable harbour; but this estimate is considered by Sir Andrew Clarke to be much too low, and he calculates the outlay that will be required at two millions at least.

Aberdeen.—The Aberdeen Harbour Board met in committee on the 18th ult., when the whole question of the new works to be provided under the proposed new Harbour Bill was considered by a committee. In the first instance, it was resolved to drop all idea of extending the North Pier further at the present time, and Mr. Dyce Cay's proposal to build a dyke across the present channel of the river so as to divert its main current into the sea behind the south breakwater was given up. It was, however, resolved to construct new gates for the south entrance of the Victoria Dock, and also to lower the sill of the dock by from 2 ft. to 4 ft. It was resolved to carry on dredging for the widening and deepening of the channel, and to set apart a sum of 12,000*l.* for this purpose. The committee was unanimous in approving of the proposal to construct a graving dock, 40,000*l.* being the estimated sum. The new wharf in the old channel of the river for the North of Scotland and Orkney and Shetland Steam Company will also, it is recommended, be included in the works under the Bill, should it receive the sanction of Commissioners when finally reported on. For this purpose 8,000*l.* were set aside, and it was further determined to schedule a sum of 11,000*l.* for filling up the old bed of the river from the Timber Bridge to Ferry-hill. For the building of a quay-wall along the south side of the upper dock 21,000*l.*, and for erecting warehouse accommodation at the south side of dock, 3,000*l.* are to be asked. The total sum proposed to be borrowed under the new Bill is 120,000*l.* Details may be tabulated thus:—Graving dock, 40,000*l.*; dredging channel, 12,000*l.*; new dock-gates, 11,000*l.*; lowering sill of dock, 14,000*l.*; quay-wall (upper dock), 21,000*l.*; filling up old bed of the river west of the bridge, 11,000*l.*; new wharf for the North of Scotland Steam Company, 8,000*l.*; dock warehouses (say), 3,000*l.*,—total, 120,000*l.*

An Alleged New Mineral: "Vermicellite."—It is stated that Mr. C. E. Manby, analytical chemist, Barrow, has discovered a new mineral in the boulder clay of Furness. In a paper read before the Barrow Naturalists' Field Club, he says he names the new mineral vermicellite, owing to its similarity in many respects to the vermicellite of Pennsylvania, belonging to the mica group. The distinction between the metals appears to be a great increase of ferric oxide in vermicellite, a decrease of alumina, silica, and water, with the addition of new compounds, titanic and phosphoric acids, lime and soda.

ILLUMINATING GAS FROM WATER OR SEWAGE.

MR. STEPHAN, of Worcester, claims to have discovered a process of converting steam into a gas which can be used for illuminating purposes. Mr. Stephan, who has protected his invention by patents taken out "all over the world," has now made public some particulars of the process, which, if it is found to be thoroughly successful, will enable artificial light to be supplied at a very cheap rate. In the words of the *Worcestershire Chronicle*, under Mr. Stephan's process, "all sewage matter is to be easily disposed of, gas produced 'free, gratis, for nothing,' and yet an immense profit be made. He at first estimated the profit at 150 per cent., and this estimate he still clings to as correct. The only question is whether, taking all the advantages promised into consideration, 150 per cent. is really not below the mark!"—

The process is thus described:—

"A boiler, to contain water or sewage, as the case may be, is placed over a retort, underneath which is a fire-hole, the flues of this ramifying round both retort and boiler, and the heat passing through these flues causes both boiler and retort to be heated simultaneously. In the case of making gas from sewage or any animal refuse, solids and liquids are put into the boiler, and the liquid parts, being evaporated by heat, are passed, in the form of steam, through a pipe into the back end of the retort, where are placed a number of perforated iron discs. These are perforated in various ways, in order that the passage of the steam through them shall not be direct, but be impeded as much as possible, the result being that by the time the steam has passed through the whole set of discs it issues as hydrogen gas, the oxygen having been deposited on the iron in the form of magnetic oxide. Hydrogen would of course, on ignition, give off a flame of a pale blue colour, which would not be luminous. The gas is then passed through layers of limestone packed closely in the retort, and in its progress becomes saturated with carbonic acid. At this stage the light burns with a reddish tint. The residue, or solid matter of the sewage, is then brought into use. Having been allowed to subside in the boiler, it is found to be in the form of a dry, black, inodorous hydro-carbon, and in this state it is taken from the boiler and placed in the front part of the retort, next to the limestone already referred to. The application of heat causes an abundance of arbon to be given off, which, being absorbed by the lightly carbureted hydrogen (which the gas has become by passing through the limestone), it becomes highly luminous, incondensible, and permanent. The residuals from the retort are soda ash, lime for building purposes, cement, &c., and from the condenser an abundant supply of ammoniacal liquor, tar, pitch, and lubricating grease. All the above are of course derivable from the sewage and limestone, and some of these products would be extremely valuable for enriching the soil. Thus the sewage could, as so many people argue that it ought to, return to the land in the form of a fertiliser."

The above process (says the *Chronicle*) is applicable more particularly to towns. In carrying it out in practice it would be most convenient to have the gasworks erected near the sewage outfall; thus the sewage could gravitate into the works, without the necessity of pumping, and the gas being manufactured at a low level would readily rise through the mains to almost any height. Mr. Stephan declares that, with proper appliances, no unpleasant smell would attend the manufacture. No fuel would be required for heating the boilers and retorts; such an enormous quantity of gas would be produced by the consumption of, say, the sewage of Worcester, that there would be far more than would be necessary for the lighting of the whole town, and for supplying heat to the boilers.

Mr. Stephan has made a formal application to the Birmingham Corporation Gas Committee, for leave to experimentalise, at a portion of the gasworks there, with sewage.

PREVENTION OF DECAY IN WOOD.

A METHOD of treating wood to preserve it from decay has (says the *Mining Journal*) been invented by Mr. Waldemar Thilmany, C.E., of Cleveland, Ohio. After the wood has been steamed in a closed cylinder or chamber to drive off the sap, moisture, and other matters, a vacuum is created by the action of a pump; then the wood is charged with a solution of sulphate of zinc and iron, either combined or separately. The proportion should be about one pound of the sulphate to 100 lb. of water, more or less, depending upon the nature of the wood, and the purpose for which the treated wood is designed. The surplus liquid or residuum is discharged from the chamber, and then a solution of chloride of barium is forced or charged with the wood. The proportion of the chloride of barium used with the sulphate of zinc or of iron is about two-thirds by weight of that of sulphate of zinc or of iron in 100 lb. of water; that is to say, if three pounds to the 100 lb. of water of sulphate be used, then the chloride of barium solution would require to be about two pounds to the 100 lb. of water. The application of the chloride solution may precede that of the sulphate solution if more convenient, the object being to produce by chemical action within the pores of the wood an insoluble sulphate of baryta and chloride of zinc or iron, as the case may be. In carrying out the process the wood or timber is placed in a closed chamber of iron or copper, capable of sustaining the pressure to which it may be subjected by the steam or otherwise in the process—say, five to eight atmospheres, more or less. By these means the crude sap, moisture, and like matters are vapourised, and the soluble parts or matter of the wood eliminated and drawn off by a vacuum-pump, and a vacuum being formed in the chamber, the wood becomes very readily charged. There is then introduced under hydrostatic pressure a solution of either sulphate of iron or sulphate of zinc, thus filling the cells and pores of the timber therewith. The surplus solution in the chamber is then drawn off, and a solution of the chloride of barium introduced under hydrostatic pressure. Then, it is said, the elective chemical affinity directly decomposes the soluble zinc or iron salts, forming the insoluble sulphate of baryta and chloride of zinc or of iron in the cells and tissues of the wood, although the chlorides of zinc and iron are soluble alone, but when combined with the sulphate of baryta there is formed (according to the metal used) chloride of zinc or of iron, which becomes so united in the tissue of the wood that it cannot be washed out when exposed to the action of water or moisture, and by these means, together with insoluble sulphate of baryta, the decay of the wood is arrested.

In treating large timbers it may not be convenient to subject such pieces to the action of steam in a chamber. In such instances it is deemed sufficient to charge such timbers with the sulphate of zinc or of iron and the chloride of barium without subjecting the pieces first to the action of steam. These agents may be forced into and through the structure of the wood by hydrostatic pressure. In this manner the crude sap and albumen of the wood are driven off, and their place will be taken by the solutions of the chloride of barium and sulphate of zinc or of iron, and the result of this mode of treatment will be the same as when the wood is first steamed; but such treatment is only necessary for large timbers, the process being slower than when the wood is first steamed.

The cost is said to be comparatively slight.

STREET ARCHITECTURE IN THE PROVINCES.

Lincoln.—New business premises have just been erected in Silver-street, Lincoln. The style adopted is that of Flemish Gothic, of the fifteenth century, and the high-pitched roof and corner turret, the transomed windows, and quaint flat red tiles, as seen from High-street, are suggestive of the picturesque buildings of Bruges, Ghent, and other towns in the Low Countries. The buildings have been erected from designs by Mr. W. Scorer, of the firm of Watkins & Scorer, architects. It is intended to build other premises of a similar description on a vacant piece of ground adjoining.

Northwich.—A portion of the extensive business premises which are being erected in High-street, Northwich, for the executors of the late Mr. W. Beckett, has been opened. The style of architecture is "Old English," and the building occupies the space upon which three separate shops formerly stood, namely, Nos. 27, 29, and 31. The ground floor contains draper's shop, carpet shop, tailor's shop, tailor's cutting room, and general office. The architect is Mr. Harold Hignett, of Chester; and the builder, Mr. Richard Beckett, of Hartford.

Carlisle.—A new block of buildings has been erected for Messrs. Smith & Watt, of the firm of Little & Ballantyne, on the site of the old Bush Hotel, Carlisle. It is built of tooled red stone, is four stories in height, exclusive of basement and attic floors, and fronts to three streets, namely, 36 ft. to English-street, 65 ft. to the Viaduct, and 36 ft. to Blackfriars-street. The style of architecture is that of the Stuart period, and the building is surmounted by a Mansard roof. The cornice all round is inlaid with white tiles, decorated with floral designs. The most prominent entrance is that to the shop of Messrs. Little & Ballantyne. The new hotel has its principal entrance from the Viaduct. At one corner of the block is a shop fitted up for a fishmonger. The architect is Mr. C. J. Ferguson, and the builders are Messrs. Beaty Brothers.

BATHS AND WASHHOUSES.

Bermondsey.—The Commissioners of the Bermondsey Baths and Washhouses have recently issued their annual report, which states that since the opening of the establishment in 1854 both the baths and washhouses had been fully appreciated by the inhabitants. The number of bathers for the year ending the 23rd of March last had been 101,541, 5,555 of whom were women. The number of washers was 35,291, and the gross receipts 2,285*l.* 11s. 6d., which, after the payment of all expenses, left a balance in hand of 106*l.* 14s. 4d., the smallness of the balance being accounted for by the fact that the commissioners had decided on sinking a well, by which they hoped to secure a larger supply of water, of pure quality, at a considerably less cost.

Boston.—Mr. Wheeler, borough surveyor, Boston, Lincolnshire, has made an estimate of the cost of erecting new baths, near the Public Park, the baths to contain a salt-water swimming-bath open to the air, six hot-water salt baths, and a salt-water shower-bath, a house for the attendant, with all the necessary belongings. The estimated cost is 2,500*l.*, including boiler, engine, and fittings. Mr. Wheeler has also prepared plans of baths and washhouses. The building is arranged for twenty-four women washing at the same time, and provided with all necessary appliances, the estimated cost being,—land, 150*l.*; buildings, &c., 550*l.*; boiler, tubs, and engineer's work, 800*l.*—Total, 1,500*l.* Mr. Wheeler suggests two sites for the building, one in St. George's-lane, and the other on the Irby estate, both behind the White Hart, the former being the most eligible. The above suggestions will come before the town council.

DRAINAGE ITEMS.

Newton Heath.—The Newton Heath Local Board has, in connexion with the Droylsden-road drainage scheme, received tenders for the construction of a main trunk sewer from the present culvert near the Manchester Corporation Cemetery to Church-street, and from Crown Point to Scutchbottock. The tender of Messrs. G. J. Foote, of Bury, for the sum of 3,333*l.*, was accepted.

Withington.—Mr. J. Thornhill Harrison, C.E., has, on behalf of the Local Government Board, held an inquiry at the offices of the Withington Local Board in reference to an application by the Board for sanction to borrow 105,000*l.* for works of sewerage, and 3,000*l.* for private street improvements. The Board was represented by the chairman (Mr. E. H. Fuller) and several members; Mr. Newton, C.E.; the surveyor (Mr. J. Swarbrick); and the clerk (Mr. G. Evans). The money required for private improvements is intended to be expended in the paving and sewering of Withington-road, Whalley Range, and Lloyd-street, Chorlton-on-Medlock. The larger sum is required for the construction of a sewer, recommended by Messrs. Cawley & Newton, to relieve a large portion of Withington and Lady Barn district of its sewerage, and will afterwards form a part of a larger scheme which is being prepared for the drainage of the whole district. Opposition was not offered against either application.

Suck.—The *Belfast Newsletter* says that the O'Conor Don, M.P.; Mr. Wills Sandford; Gen. Mitchell, R.A.; and other spirited and enterprising landowners in the West of Ireland, have set an example of perseverance and self-reliance which we heartily commend to those who are anxious to promote the drainage of Lough Neagh. Although the Suck Drainage Bill only received the Royal assent last month, the gentlemen who compose the Drainage Board have already met for despatch of business, elected a secretary, also Mr. J. Lynam, C.E., as engineer, and have issued certain advertisements calling for tenders to carry out the drainage project. The works,—none of a difficult nature,—are expected to cost about 130,000*l.* The river Suck, freed of a number of eel weirs and ancient milldams, and allowed to flow untrammelled in its natural channel, will remedy the disgraceful state of things entailed by annual flooding of many thousands of acres, and the whole district will be materially improved by the drainage.

COMPENSATION CASE.

MARSTON *v.* THE METROPOLITAN BOARD OF WORKS.

THIS was a heavy compensation claim (heard in the Sheriffs' Court, Red Lion-square, on the 26th ult., before Mr. Under-Sheriff Burchell and a special jury), amounting to upwards of 23,000*l.*, by the freeholder of the Café de la Régence, at the corner of Windmill-street and Tichborne-street, Haymarket, required for the formation of the new street from Piccadilly-circus to Oxford-street, under the Metropolitan Street Improvement Act of 1877. A special jury was summoned, and at the sitting of the Court only nine answered, and it was arranged to try by that number without praying a tales. The jury proceeded to the *locus in quo*, and took a personal inspection of the freehold, &c.; for which compensation was claimed, and afterwards returned to the court to hear the evidence.

Mr. Serjeant Parry and Mr. Lord appeared in support of the claim; Mr. Philbrick, Q.C., and Mr. Freeman for the Metropolitan Board of Works.

After some consultation, counsel informed the Court that the parties had agreed upon a sum to be paid as compensation to Mr. Marston as the freeholder of the property, and that sum was 17,050*l.*

Mr. Under-Sheriff Burchell instructed the jury to return a verdict for that sum by consent, and it was thereupon recorded.

ARBITRATIONS.

Carlisle Town Improvement.—Three lots of property which are required by the Corporation of Carlisle for the purposes of town improvement were the subject of inquiry on the 20th ult. by a court of arbitration in the County Hotel, Carlisle. The first property is situated on the west side of Devonshire-walk, and partly faces Caldew Bridge, and consists of four tenements, which bring in a gross rental of 37*l.* 14s. per annum. Mr. J. C. Hetherington, architect, valued the property at 760*l.*, adding ten per cent. for forced sale, 836*l.* Mr. Hodgkinson said the figures given were fair and equitable. On the other side Mr. C. P. Hardy considered the present rental fair, and assessed the property at 512*l.* 10s. 8d., and adding ten per cent. the figures became 563*l.* 15s. 9d. Mr. Banks, town surveyor, Kendal, made the gross value 558*l.* 3s.—Decision was reserved. Mr. Hedley, Newcastle (instructed by the town clerk), was arbitrator for the Corporation; Mr. Brierley, Preston (instructed by Mr. Ostell, of the firm of Messrs. J. R. Donald & Ostell) was for Mr. Jordan, the owner of the property; and Mr. Fenwick, of Leeds, was the umpire. The court was called upon to assess the value of the inn belonging to Mr. J. T. Hill. Mr. Wannop, for the owner, explained that the rent was 43*l.*, but was merely nominal, as the owner's daughter was tenant. Mr. Hill, who claimed 1,300*l.*, gave evidence, and the decision was reserved. This was also the case respecting a cottage in the same neighbourhood. It contains three rooms, and the owner claims 320*l.* for it.

Middlesbrough Sewerage.—The award of Mr. T. Gow, umpire in the arbitration proceedings between the Middlesbrough Owners, Miss Brown, and the Corporation, has been received. It is dated the 8th ult., but it was not taken up till last week. The first claim was a joint one, by Messrs. Pease and Miss Brown, they claiming 4,237*l.* 10s. The umpire has awarded 1,599*l.* 9s. in respect of land damage, 72*l.* for silting up to the time of arbitration proceedings, and 648*l.* for prospective silting, making together 2,319*l.* 9s. In the second claim, Messrs. Pease asked for 2,200*l.*, and the umpire has awarded 1,250*l.* The third claim was by Miss Brown, who sought to recover 4,142*l.* 70*l.* have been awarded for occupation of land in putting down a sewer, 210*l.* for silting up to the time of arbitration, and 1,800*l.* prospective damage by silting, making 2,080*l.* The total sum awarded is 5,739*l.* 9s., and the Corporation will also have to pay about 550*l.*, the umpire's charges, and some 1,500*l.*, the other legal expenses. A special case has, says the *Darlington and Stockton Times*, been granted as regards the amounts awarded in respect of silting, but should the Court rule against the claimants, the Corporation will doubtless be compelled to deodorise the sewage before it is sent into the river.

Chesterfield.—The dispute between the Chesterfield Corporation and Newbold Local Board to decide the price which the former should pay to the latter for 4 acres, 2 roods, and 11 perches of land for a sewage-farm has just been decided. Both boards required the land for the same purpose, but Chesterfield obtained Parliamentary powers first; hence the dispute. Newbold Board wanted 1,600*l.* for it, and the Chesterfield Corporation offered them 1,000*l.* The arbitrator, Mr. J. Coleman, of Derby, has awarded 1,020*l.* as a proper price for the land, each side to pay its own costs.

HOSPITALS AND INFIRMARIES.

Hertford.—The Hertford Infirmary has lately been considerably enlarged, from plans by and under the superintendence of Messrs. Smith & Austin and Mr. T. Tayler Smith. The new portion of the building covers nearly as much ground as the old; the ward space is nearly half as much more than it was originally, and with the new sanitary conveniences the institution may be considered as being doubled in size. The cost of the new works will amount to 3,000*l.*, or thereabouts. Mr. Farley acted as clerk of the works, and Messrs. George Ekins & Son, of Hertford, were the builders.

Plymouth.—It is proposed to abandon the present building used as the South Devon and East Cornwall Hospital at Plymouth, and to build a new hospital on an elevated site in the neighbourhood of the prison and workhouse. The proposal is meeting with some opposition, on the ground that the present site is the most convenient, and sufficiently open and airy, having the Hoe Park, Princess-square, and the Corporation buildings in its immediate neighbourhood.

RAILWAYS.

Dover and Deal.—On the 29th ult. the ceremony of cutting the first sod of a short connecting link of railway between Dover and Deal was performed by Earl Granville, the Lord Warden of the Cinque Ports. The South-Eastern and the London, Chatham, and Dover Companies have combined to carry out this important link of communication. Mr. Mills is the engineer of the line, and the contract has been taken by Mr. Walker, of Cannon-street. The cost will be about 200,000*l.*, and the work is to be completed in 1880. There will be two stations on the line, one at Walmer and one at East Langdon (for St. Margaret's). There will be a tunnel, about a mile in length, before the line joins the London, Chatham, and Dover Railway at Crabble, about a mile from the middle of Dover.

Ballymena and Larne.—In the House of Lords, on the 24th ult., the Ballymena and Larne Railway Bill was read a third time and passed. In the course of the debate, the question of gauge cropped up. Lord Waveney called attention to a clause under which the promoters would be compelled to purchase more land than was absolutely required for the making of the railway. In some parts of Ireland the gauge was 5 ft. 3 in. while in places where that gauge could not be made, the lines were allowed with only a 3-ft. gauge. In this case, the line would be of 3-ft. gauge, but a clause had been inserted to compel the promoters to purchase sufficient land to construct, if necessary at some future time, the broader gauge. This was a hardship, because it was impossible that the broader gauges could ever be constructed, or, if made, could be of any use in connexion with this particular line.——The Lord Chancellor said the purchase of the additional lands would put the promoters to the extra expense of 500*l.* per mile for no useful purpose.——The Duke of Marlborough, in the interest of the smaller railways of Ireland, trusted their lordships would not insist upon the insertion of a clause to compel the purchase of land for the construction of the broader gauge. The 3-ft. gauge was sufficient for mineral and agricultural traffic, and would in no way come into competition with the broader gauges throughout Ireland.——Lord Redesdale said he was only carrying out the provisions of the existing law in seeing that this clause was inserted in the Bill, the object being to prevent the construction of competing gauges in Ireland.

Millbrook.—The east window of the new church at Millbrook, Hants, has lately been filled with stained glass by Messrs. Hardman & Co., at a cost of about 400*l.*

CHURCH-BUILDING NEWS.

Westminster.—St. Margaret's Church, Westminster, was re-opened on Sunday last, after restoration, towards which the Queen has subscribed 100 guineas. Among other contributors have been the Dukes of Buccleuch and Westminster, Lord Hatherley, the Speaker, Colonel Edwards, M.P., Sir Henry Hunt, and many others. There is a deficit of 3,000*l.* An altar-cloth has been presented by Sir Walter and Lady James; a credence-table of marble and alabaster by Sir Stafford Northcote, whose third son has just been ordained to the curacy; and an eagle lectern, from an antique pattern, by Mr. J. B. Vacher. Painted windows have been presented by Miss Wainwright and the family of the Messrs. Trollope. The galleries and high pews have been swept away; the space wasted by lobbies and passages has been thrown into the church; the west window has been opened; the tracery of all the clearstory windows, and of as many of those in the aisles as funds permitted, has been restored to its original condition; the plaster ceiling has been replaced by one of solid oak, a new reredos has been erected, and the old false apse of lath and plaster has been removed. The tiles throughout the church are the gift of Mr. C. Minton Campbell, M.P. The restoration was superintended by the late Sir Gilbert Scott, and since his death by his sons. Some interesting historical and architectural details of this church were given in a paper lately read by Mr. G. H. Birch, before the London and Middlesex Archæological Society, and reported in the *Builder* (p. 509, *ante*).

Barton.—The rector (the Rev. A. Blomfield) and churchwardens of Barton (Beds.) have issued an appeal for aid, to enable them to raise 1,200*l.* for the restoration of the parish church, dedicated to St. Nicholas, which in its oldest parts dates from the thirteenth century, and in its newest from the reign of James I., but which, the appeal states, "is in a woefully dilapidated condition, externally and internally," being patched up inside and outside in plaster, cement, paint, and colour-wash. In the words of the appeal, "There are peculiar circumstances belonging to this parish which render the fulfilling of the work a most arduous labour. The acreage of the parish is about 2,300 acres; two-thirds at least of these belong to 'The Manor,' or 'Willes's Estate.' Nearly all the farms, and much of the cottage property, belong to the 'Willes's Estate.' This 'Willes's Estate' has been for years, and is likely to be for ever and aye, in Chancery. The beneficiaries of this 'Willes's Estate' are five,—one has nobly contributed 100*l.*, three plead poverty and 'No interest,' the fifth is a lunatic. Application for an order of contribution from the lunatic's estate has been made, a year and a half ago; but up to this date with no result. So that the landed property, that involves two-thirds of the parish, nearly all the farms and numberless cottages, gives 100*l.* only towards this all-needful work." The plans of the proposed restoration have been prepared by Mr. W. O. Milne, of London, and sanctioned by the Bishop of Ely.

Hitcham.—The parish church of Hitcham has been re-opened, after restoration under the direction of Mr. G. E. Pritchett, architect, Mr. Robert Tooley, of Bury St. Edmunds, being the contractor. The church, which is dedicated to All Saints, consists of nave, north and south aisles, chancel, south porch, and tower, and belongs for the most part to the Perpendicular period, but the chancel is of an earlier date. The tower is unusually fine, and contains a peal of six bells. The nave roof, a high-pitched one of handsome proportions, adorned on the hammer-beams with emblems of the Tudor period, was repaired some time ago; but previously to the recent works the interior of the church was greatly disfigured by a gallery which blocked up the tower arch, and by the presence of old-fashioned pews, whilst the floor of the nave was raised so as to hide the bases of the columns, and so dwarf their proportions. All this is now altered. The western gallery has been removed, throwing open an elegant arch, disclosing a fine west window of three lights. The pews have also been abolished, and in taking these down the workmen discovered considerable remnants of the old oaken benching, the ends being richly and variously carved, with poppy-head terminations. These await restoration. The floor of the nave has been reduced to its proper level, and the chancel is now approached by a flight of five steps, with

two others at the altar-rails, within which the floor has been laid with Maw's encaustic tiles. The rest of the chancel is paved for the most part with fine old ledgers, which have been bereft of memorial brasses, not one of these remaining. Between the ledgers the floor is laid with plain red tiles. The nave and aisles have been repaved with brick. The total cost has been about 1,500*l.*

Pockley.—The parish church of Pockley, near Helmsley, Yorkshire, has just been restored and enlarged, at a cost of about 1,700*l.* A small chapel of ease was built here in 1822 at the cost of Mr. Charles Slingsby Duncombe, which has now been transformed into a village church, dedicated to St. John, and stands near the site of an ancient mansion, probably the residence of the owners of Pockley before the union of this manor with that of Helmsley. The Earl of Feversham, the lord of the manor, has subscribed handsomely towards the cost of the work. The church, which is in the Norman style of architecture, has been restored under the superintendence of Mr. Scott, architect, London, and a new chancel has been added to it. There have also been added a new roof to the nave, a new porch at the southern side, a new vestry, and a new tower. A melancholy event in connexion with the work occurred last September. This was the death of the contractor for the woodwork, Mr. Smith, of Helmsley, who fell from the scaffold whilst working at the north-east corner of the chancel, being instantly killed. Since his death the work has been completed by Mr. Ellis, of Helmsley. For the present the church, which will seat about 150 persons, has to be supplied with chairs.

Maidenhead.—The church of SS. Mary and Andrew, Maidenhead, has been re-opened, after restoration and enlargement. The church was built in 1825, as a chapel-of-ease to the churches of Bray and Cookham, upon the site of an ancient chapel; it had seats for 800 persons, and half of them were free for ever; the pews, of the old, uncomfortable high style, ran round the sides, and movable seats occupied the middle. There was an organ-gallery at the west end. The building was devoid of chancel and vestry. An ecclesiastical district having been assigned to the church, the vicar, the Rev. Dr. Kearney, set to work with a view to the restoration and improvement of the building, and the result is that a new chancel, organ-chamber, tower, and vestry have been added, and other improvements effected. The tower, which is 60 ft. high, is of yellow brick, with Bath stone dressings, and contains two bells; the clock has been replaced. The chancel is paved with Minton's tiles, and the body of the church is boarded. Messrs. Bloomfield & Forster were the architects, and the contract was given to Messrs. Silver & Son, of Maidenhead, for 2,200*l.*; the rebuilding of the organ cost about 200*l.*; and other incidental charges, including the heating of the church, amounted to 300*l.*

South Bank. — This populous suburb of Middlesbrough is about to be provided with a new church, to meet the increasing requirements of the district. The designs for the new church are by Mr. C. Noel Armfield, of the firm of Messrs. Armfield & Bottomley, of Middlesbrough and Whitby, who, with five other architects, were invited by the committee to send in competitive drawings. The committee decided to take the opinion of an eminent architect, who decided that Mr. Armfield's design was the best, and it was accordingly adopted by the committee, and the building will be begun almost immediately. The church measures about 145 ft. in length and 55 ft. in width. The plan consists of nave, aisles, choir, and chancel, south transept, in which will be placed the organ, and two vestries on the north side of the choir. The chancel terminates in a semi-octagonal apse, and over the crossing of the transept and choir is reared a central tower about 30 ft. square, terminating in a saddle-back roof. The church will have fixed seats for about 750, but there will be spare room in which about 200 more might be seated in chairs. The style of architecture adopted is simple Lancet.

East Haddon.—East Haddon Church has just been reopened, after restoration, which has been carried out under the direction of Messrs. E. F. Law & Sons, architects, by Mr. Robert Young, of London. The church is partly in the Decorated style, and consists of a nave, south aisle and porch, chancel, and embattled tower surmounted by pinnacles. The south aisle and porch were rebuilt in 1839, and the tower in 1673. The whole of the church has been restored where at all dilapidated, but no alteration of the main features of the church has been made, nor has any of the detail been tampered with. The only addition is the introduction of a new organ-chamber and sacristy on the north side of the chancel. The chancel is paved with Maw & Co.'s tiles. The carving was executed by Mr. Chas. Phillips, of Northampton. The total cost of the whole of the works is about 1,400*l.* for the church, and 380*l.* for the chancel.

Hay Mills.—The new church of St. Cyprian, Hay Mills, has been consecrated by the Bishop of Worcester. The building, which has been erected from the designs of Mr. F. B. Osborn, architect, Birmingham, is in the thirteenth-century style, and consists of nave, north and south aisles, chancel, priests' vestry, porch, tower, and spire. The materials used are red brick, with stone dressings. Including a gallery at the west end, the church will accommodate between 400 and 500 persons. Several windows have been filled with stained glass by Messrs. Hardman & Co., as memorials of various members of Mr. Horsfall's family. The elaborately-carved reredos, of stone, with black marble background, is by Mr. Ruddock, of London. A large amount of decoration has been carried out in the chancel and on the chancel arch by Messrs. Hardman & Co. The entire cost of the church (some 6,000*l.*) has been defrayed by Mr. James Horsfall.

DISSENTING CHURCH-BUILDING NEWS.

London. — Tonbridge Chapel, Euston-road, one of the largest and oldest in that part of London, has just been reopened, after thorough restoration. The works have been carried out from the designs and under the immediate superintendence of Mr. Henry Hall, architect. The chapel is of the square old Congregational style, and of Classic design. The additions and alterations are in the same style, freely treated. They embrace new windows throughout, these being glazed with semi-opaque cathedral-tinted glass. The galleries have been taken down and re-erected at a more acute angle. Their fronts and seatings are all new. The old-fashioned pews in the body of the chapel have been removed, and the entire area is now reseated with open benches of modern style. The unsightly great lobby at the west end of the building has been cleared away, and smaller and more suitable ones substituted. All the woodwork throughout is of pitch pine, and varnished. An arched recess, moulded and carved, has been sunk behind the pulpit, and the walls generally and the ceiling have been painted and coloured. The gasfittings are new, and altogether the building, which, prior to the restoration, had fallen into a lamentable state of decay, now presents a very different appearance. The contractor for the whole of the works was Mr. Harry Hems, of Exeter, the foreman of works being Mr. J. T. S. Berridge. About 1,000*l.* have been expended.

Outlane. — The new chapel which is built facing the main road at the upper part of Outlane, Halifax, was opened on Thursday, June 20. It will accommodate about 500 worshippers in the body and gallery, the latter completely encircling the interior. The whole available floor-space, even to the principal part of the aisles, is fitted up with seating, the latter mostly hinged to let down when not required. The chapel is 54 ft. long, 39 ft. broad, and 29 ft. 9 in. high. The gallery is approached by three staircases, two to the front leading from the main vestibule, and one at the back from the lobby, giving access to the large vestry and basement containing the heating apparatus, &c. The total cost of the new chapel and boundary walls, including the formation of approaches, will be about 2,000*l.* Mr. T. Lister Patchett was the architect; the contractors were, for the masonry, Mr. T. Bottomley, Lindley; carpenter's and joiner's work, Messrs. Schofield & Boocock, West Vale; smith's, &c., work, Mr. T. A. Heaps, Huddersfield; painting and staining, Messrs. Earnshaw Brothers, Lindley.

Gore.—The foundation-stone of a new Congregational chapel at Gore, Radnorshire, has been laid. The building, which will be Early Gothic in style, will, when completed, seat 160 persons. The walls throughout will be built of local stone, with Grinshill stone dressings, and the roof will be covered with Welsh slates. The joiner's work, including pulpit and open seats, will be of red deal, stained and varnished. The total cost will be 1,000*l.* Mr. Fleeming, of Wolverhampton, is the architect, and Mr. Griffiths, of Walton, Old Radnor, is the builder.

Leek.—Mount Pleasant Chapel, Leek, has been re-opened, after extensive renovation and enlargement. The whole of the works have been carried out from the designs and under the superintendence of Mr. W. Sugden, architect, Leek. The builder was Mr. N. Bennett, of Burslem. Mr. Henry Stevenson, of Leek, has done the plumbing, glazing, painting, and gas-fitting; and Mr. Constantine, of Manchester, supplied the heating apparatus.

Swansea.—A new Wesleyan chapel at the Mumbles, Swansea, fronting the Bay at Oystermouth, has been opened. The building is from designs by Mr. Totton, architect, Swansea, and is built in the style of the transition from Norman to Early Gothic. At either side of the main entrance is a tower, only at present carried a little above the eaves. The interior is fitted up in pitch pine of the simplest construction, there being no display of sham carpentry. The roof is open-timbered, ceiled in between purlins and along the tie-beam, above which it is provided with means of ventilation on Professor Thomson's system. The building is heated by hot-water pipes, and lighted by ornamental wrought-iron coronas and gas-brackets, which were made by Messrs. Letheren & Co., of Cheltenham, the heating and gas-fitting being done by Mr. Bonnett, of Swansea. The aisles are laid with Messrs. Minton & Hollins's tiles. The builder was Mr. Thomas White, the total cost, including the school-building in the rear, being 2,600*l.*, exclusive of lighting, fencing, and heating. When side galleries are added the chapel will seat 600 people.——Hermon Congregational Chapel, Plasmarl, has also been opened. The memorial stone of the building was laid about a year ago. The building is Gothic in style, and has been erected by Mr. Thomas White, of Swansea, from the designs of Mr. Thomas Freeman, Brynhyfryd. The building affords sitting accommodation for about 750 persons. The front is built in range work of native blue stone, relieved with Bath-stone quoins and buttresses.

Huddersfield.—A new Baptist chapel in New North-road, Huddersfield, was lately opened. Mr. T. W. Helliwell is the architect. The style is that of Fourteenth-century Gothic. Accommodation is afforded in the nave, transepts, and galleries for 900 persons. The front elevation in New North-road rises to a height of 66 ft. to the apex of the roof. On the upper side is a tower and spire, rising to a height of 135 ft. The total cost has been upwards of 9,000*l.*

Spilsby.—A new Wesleyan chapel which has been erected on the site of the Old White Horse Inn, in the Market-place, Spilsby, has been opened. It is in the Early Gothic style, and will seat on the ground-floor and galleries upwards of 500 people. The warming will be by Grundy's hot-air system, available to both chapels and schools. There is a large school in rear of the chapel, with five class-rooms. The architect is Mr. Charles Bell, of London, and the contractors are Messrs. Hunter & Son, of Spilsby. The total cost has been about 4,800*l.*

Little Staughton.—The old Baptist meeting-house at Little Staughton, built in 1766, has been restored from plans by Mr. Wm. Jackson, architect, St. Neots; Messrs. Edey, Elgood, & Osborn being the general contractors; and Mr. Currington, the decorator.

CHURCH OF THE ORATORY, BROMPTON.

SIR,—Now that we have had an opportunity of seeing the designs submitted in competition for the new church of the Oratory at Brompton, and of judging of Mr. Waterhouse's decision, may I ask, in the interests of the profession generally, and in that of the competitors particularly, that Mr. Waterhouse's report be published in your paper in order that we may see how the other designs stand in his opinion, and the reasons he gives for preferring the ones he does.

The talent displayed in the majority of the designs, and the expense connected with the getting up of the drawings, surely entitle one to think no objections can be raised to this being done.

AN OUTSIDER.

THE "COMET" PUMP.

SIR,—Presuming on the courtesy always shown by you in all matters relating to the *Builder*, we venture to make a few remarks relative to the description of the "Comet" pump that appeared in the "Miscellanea" of your last edition, in which the action of the piston is described as "meeting the inside of the cylinder at certain points." This hardly conveys a correct idea, as the piston does not only come in contact with the cylinder at certain points, but travels evenly round the inside surface of the cylinder, throughout each revolution.

The action, though somewhat difficult to describe, is at once understood by all who have inspected the "Comet" pump we advertise to be seen at work.

BARTRUM & POWELL.

MASTERS AND MEN.

Aberdeen. — At a meeting of the operative plasterers held last week, it was resolved to accept the new bye-laws submitted by the masters, and thus the anticipated strike has been avoided.

Bristol.—The operative plasterers of Bristol, who asked in December for a rise of 1d. an hour, have notified to the masters, who wished to postpone the question, that if ½d. an hour be not granted they will cease work.

Edinburgh.—The operative plasterers of Edinburgh came out on strike on the 22nd ult., and the employers have since been endeavouring to obtain hands in Dundee and elsewhere. They offer to pay 9d. an hour and travelling expenses to Edinburgh. At a meeting of the Masters' Association last week, a letter was read from Mr. Craigie stating that he had been in communication with a few architects and builders, who had, wholly without solicitation, offered the Association, as assistance towards bringing the strike to a successful termination, a sum of 500*l.*

——At an aggregate meeting of operative joiners held last week, a report was submitted by the delegates appointed to meet the employers in conference with reference to the modification of the existing bye-laws. In this report it was stated that several alterations had been suggested by the masters on the existing regulations; and after discussion the meeting unanimously agreed to adopt these proposals. The alterations include an extension of the "walking points to the Parliamentary boundaries," and the abolition of the weekly warning, two hours and a half (the time allowed for grinding tools) being all that is to be required on either side. Another point is, that whereas, under the present system, masters are required to pay men employed outside for the same number of hours in winter as are worked by men inside the shops, it will hereafter be the rule that outside men be paid only for the number of hours which the daylight allows them to work.

Glasgow.—A meeting of the operative plasterers on strike in Glasgow, against the reduction of their wages from 10d. to 9d. per hour, was held on the 26th ult. The chairman stated that the number of employers in Glasgow who had consented to pay 10d. per hour was thirty-four, and he had no doubt their number would soon be increased.

Perth.—The wages of the Perth joiners were, on the 24th ult., reduced from 7½d. to 7d. per hour.

Runcorn.—The Runcorn joiners, who struck work on the 1st of May for a rise of wages from 33s. 6d. to 36s. per week, and a reduction of working hours to 53½ weekly, after being on strike for two months, have discovered that trade is depressed, and have entered their workshops on the old terms.

Sunderland. — A strike in the Sunderland building trade commenced on the 24th ult., about a dozen of the employers having been unable to induce their workmen to accept the reduced terms they proposed. At a meeting of the bricklayers on the previous Saturday, it was reported that fourteen masters, employing eighty men, accepted the offer of the body of the bricklayers to take 34s. per week in lieu of 36s. during the summer months, and 32s. per week in lieu of 34s. 6d. and 32s. 6d. during the winter season, and only twelve or fourteen men need come out on strike. At a meeting of the joiners, held at the same time, it was stated that 100 men would resume work at the old rate of pay, 8½ per hour. It is estimated that upwards of 100 joiners came out on strike; forty of these are union men.

Welsh Slate Trade.—The whole of the men employed at the Pantdreiniog Slate Quarry, Betheada, have struck work because, owing to the dulness of trade, the manager (Mr. G. Williams) declined to re-let three bargains which, it is stated by the management, have for some months been worked at a loss.——One hundred quarrymen, employed at Rhos Slate Quarries, Bettwsycoed, have struck work, owing to wages dispute. The slate trade at the present time is very dull, and a general reduction of wages throughout the slate-quarrying districts of North Wales is considered imminent.

Burslem.—The new schools which have been erected in connexion with Bethel Chapel, as a memorial of the Rev. Dr. Cooke's ministry, have been opened. The buildings have cost upwards of 1,500*l.*

Books Received.

The Engineer's Valuing Assistant: being a Practical Treatise on the Valuation of Collieries and other Mines; with New Sets of Valuation Tables. By H. D. HOSKOLD, C.E. London: Longmans. 1877.

HAVING been in past years extensively engaged in valuing coal and other mines, Mr. Hoskold found that the labour connected with the necessary and frequent calculations involving the use of rules derived from first principles became so tedious, that he determined, once for all, to prepare full and complete series of tables, to be employed in valuation as labour-savers. Not only will it be found that this useful purpose is carried out by the volume, which Messrs. Longmans have had the good sense to issue sturdily half-bound, but a very great advance in the accuracy, as well as in the speed, of many calculations will be secured by the use of the "Engineer's Valuing Assistant."

Some idea of the labour which Mr. Hoskold, by thus facing it once for all, has encountered, and thus saved to those who consult his tables, may be found from reading the mere titles of the eighteen tables which occupy more than 220 pages of closely-printed, though distinct, octavo. Table I. shows the sum to which 1*l.* will amount in *n* years up to 100 at thirty-six different rates, calculated to ten places of decimals for each percentage to nine per cent., to six places to 15 per cent., and to five places to 25 per cent. Table II. shows the sum to which 1*l.* will amount in *n* years up to 100, by half-yearly and quarterly payments, at the rate of three per cent. Table III. shows the sum to which 1*l.* will amount in *n* years up to 100, at twenty-one different rates, from ¼ to 10 per cent., to ten and six places of decimals. Table IV. shows the present value of 1*l.* due *n* years hence, up to 100 years, at rates from three to ten per cent., and up to fifty years at rates from 11 to 25 per cent. Table V. serves to illustrate the redemption of capital, giving the sum necessary to be annually invested to produce 1*l.* in *n* years, at rates as before. Table VI. gives the present value, or year's purchase, of 1*l.* per annum in *n* years; allowing interest to a present purchaser upon his purchase-money at various rates. Table VII. gives the present value, as in the preceding table, supposing the creation of an annual redemption fund, at the rate of 3 per cent. per annum. Table VIII. carries further the same calculation, allowing 3½ per cent.; and Table IX. the same at 4 per cent. per annum. Tables X. and XI. give the present value of 1*l.* per annum in *n* years, deferred for different periods,—allowing different rates of interest to the purchaser, and redeeming the investment by an annual fund. Table XII. is one of original idea, and considerable importance; giving a comparison between the old or ordinary tables of the present value of 1*l.* per annum, and a portion of the new tables in this work, which allow a purchaser interest on his purchase-money or capital invested at one rate per cent., and redeem the capital so invested another rate per cent. "Immense sums of money," Mr. Hoskold says, "are frequently spent in the purchase of mineral properties, and it is a common occurrence that much more is paid to secure them than they are really worth, and cases coming within experience are by no means few where the estimated value has exceeded the true value by 40 or 50 per cent., due in many cases to the employment of an erroneous year's purchase. Table XII. exhibits the source of such discrepancies." Tables XIII. to XVII. deal with various cases of difference in interest paid or received; and Table XVIII. gives decimal equivalents for every farthing in the pound, calculated to eight places of decimals. Mr. Hoskold certainly has not shunned sheer hard work, however much he may spare to his readers.

We have called attention first to these tables, although found in the last part of the volume, from the fact of their universal utility in all cases where it is desired to calculate anticipated, deferred, or differential values, irrespective of the nature of the property to which they relate. In Part I. Mr. Hoskold gives remarks on the valuation of mineral property, and matters connected therewith. He dwells on the necessity for firms of *bona-fide* mining engineers in large commercial centres, and urges that "an engineer should be a financier," "an engineer should be a geologist," "an engineer who reports on property should bring out every point in favour of or against it." Sound rules!—the value of which is illustrated by the yet pending proceedings as to the too-well known Emma Mine.

Part II. deals with construction of tables of values, with rules and formulæ. Part III. gives practical examples in valuing collieries, iron, and other mines, royalties, leaseholds, freeholds, life interests, &c. For all those who take interest in these matters, or who underlie any responsibility connected with them, Mr. Hoskold's book will be found an indispensable *vade mecum*. It is well and clearly printed by Messrs. Spottiswoode, and concludes with a good index. It is rare to see so thorough a piece of literary workmanship.

VARIORUM.

THE new number of the *Magazine of Art* gives some interesting comments on David Cox:—"In the year 1841 David Cox may be considered to have attained his full strength as a landscape-painter. It is certain that within a few years of this date he produced many of his finest works, both in oil and water colours. If he ever knew anything of the Higher Life in Art he knew it then; if his works are manifestations of it at all, they were full of it then. In that year he sent two of his paintings to the Society of British Artists,—'A Heath Scene' and 'A Water-mill.' There is no reason to suppose that these pictures were not well placed; though the painter himself appears to have been a little doubtful as to his mastery of the material, which was comparatively new to him; for, after seeing them in the exhibition, he wrote to a friend that they 'looked chalky for want of glazing, which could not be done, as the day appointed for touching, &c., was during my short visit to Birmingham.' Next year, however, he was again a contributor; but his works were either rejected or hung less favourably. Whether they were again sent in an unfinished state, and the committee hesitated a second time to incur the risk of their remaining so throughout the season, there is no evidence to show; but the loss to the society was irretrievable; under the urgent advice of a friend, David Cox resolved to send there no more. He then painted for the British Institution, another well-known London exhibition; but the treatment he received there appears to have been still more unfavourable. His pictures were again and again rejected. Thus he wrote, "I suppose David knows that my picture is rejected at the Institution," and again, "I am sure there must be worse there." His friend, who resented so deeply his disappointment at Suffolk-street, was equally indignant with the hanging-committee of Pall-Mall. But the advice "to send no more" was not so easy of application; it would simply have had the effect, as we shall see presently, of shutting out from every exhibition in London the paintings of one of the greatest of England's landscapists. As for the painter himself,—generous, courageous, large-hearted,—he was content to say, in the sweet humour so characteristic of him, "I begin to feel quite furious, and therefore hope to succeed much better." Nevertheless, we do not wonder when we read a little further on that he did not send much more to the British Institution."——The following, from *Great Industries of Great Britain*, should make men think,—"Industrial work of various kinds may produce in the lungs of the operative—consumption, bronchitis, asthma; in their hearts—palpitation, intermittent action, bloodlessness; in their stomachs—dyspepsia, vomiting, diarrhœa, constipation, colics; in their skin—ulceration and irruptions; in their brains and nervous systems—headache, dizziness, paralysis, neuralgia. There is no doubt whatever that by far the greater number of these maladies might be eliminated from the catalogue, if proper precautions were insisted on by the employers, and carried out by the workers. The issues at stake are, it will be seen, of serious importance. The annual death-rate in England and Wales being taken at 25 in the 1,000, that of the industrial community stands at 27 in the 1,000. The former figures represent an annual mortality of 125,000 in the 5,000,000, the latter of 135,000 in the 5,000,000; consequently, industrial disease robs us of 10,000 lives annually. When there is added to this death-roll the great physical suffering which accompanies trade diseases, the loss of wages during periods of prolonged sickness, surely our earnest attention is urgently demanded to a sanitary reformation. There are about 900 factory surgeons through-

out the kingdom, and right well are their duties discharged, in spite of miserable pay. But their powers of beneficial interference are too narrowly bounded by stringent 'regulations.' They, of course, have the privilege of sending in 'reports' to the Local Government Board; but, as a satire on State sanitation, it is from these past and present reports that the facts regarding existing preventible trade disease are gathered. The central authority has the strength of a giant; but it is, as all local governing bodies know, chained in the fetters of a stolid, immovable officialism. Were the factory surgeons intrusted with more extensive powers, a happier era might dawn on us; but, as it now stands, they are well-nigh sick of pointing out evils that are ignored, and of suggesting remedies that nobody will use."

Miscellanea.

Statistical Society.—At the meeting of this society at their rooms, King's College, Strand, there was an adjourned discussion on Mr. Newmarch's paper "On the Progress of the Foreign Trade of the United Kingdom," read at the previous meeting of the society. In that paper Mr. Newmarch showed that from 1856 to 1877 the total declared value of imports had increased from 175,000,000*l.* for 1856-9 to 380,000,000*l.* for 1875-7; while the exports for the same periods were respectively 121,000,000*l.* and 210,000,000*l.* The conclusions Mr. Newmarch drew from an examination of the data he had collected were that, tried by every statistical test, the experience and example of the United Kingdom during the last thirty years proved that the rapid extension of the foreign trade, the marked growth of incomes and profits at home, and the growth, quite as marked, of accumulated capital, had accompanied and had been in a large degree produced by steady adherence to the free-trade maxims of cultivating the imports, and leaving the exports to cultivate themselves; of regarding the benefit of the consumer as the paramount object to be attained; and of considering that the cheapness of production, and the development of the productive forces of the world, were the most powerful means for increasing the comfort and prosperity of the great body of the people of all civilised States, and of preventing wars and reducing armaments. Mr. Bourne took exception to Mr. Newmarch's arrangement of the figures in some of the tables, and said that since 1872 it would be found there was a progressive and alarming increase in the imports. According to Mr. Newmarch's theory, this was a proof of prosperity, but if in 1877 we had 89,000,000*l.* worth more food imported than in 1873, how was it that the country was not prosperous? He maintained that we must either be drawing upon previous accumulations of capital or else we were creating debts. The lesson to be learned from a review of our position was that we ought to reduce our extravagant expenditure—in the higher, the lower, and the middle classes. We must spend less; we must economise our time, instead of wasting it in holiday-making and drunkenness; we must lessen the excess of our imports and increase the amount of our exports, and seek to cultivate new markets abroad.

Artisans' Dwellings for Birmingham.—The *Birmingham Gazette* describes some designs for artisans' dwellings which have been prepared by Mr. T. J. Perry, architect. The designs (which are for buildings intended to be erected in the more populous parts of large towns) have been prepared, as we gather, merely as a suggestion for utilising some of the land which will be cleared under the Birmingham Improvement scheme. The dwellings are in flats. Each dwelling is complete in itself, and contains a large living-room, two bed-chambers, scullery, pantry, and coal-house. The rentals are calculated at from 5*s.* to 7*s.* per week, according to the size of the rooms and the story they are upon.

Clerkenwell Green.—A meeting has been held for promoting the improvement of Clerkenwell "Green," and making it a little more presentable to the eye of the passer-by. Such improvement has long been needed, and its necessity has been made more apparent by the construction of "Clerkenwell-road,"—the new thoroughfare from Old-street to New Oxford-street.

Smeed, Dean, & Co.'s Brickfields at Sittingbourne. — The *East Kent Gazette* recently gave a long and interesting description of the extensive brickfields of Messrs. Smeed, Dean, & Co. (Limited), at Sittingbourne. The brickyards are divided into three sections, viz., the Upper Field, the Central Field, and the Lower Field. Altogether they find employment for over 500 hands, and the company pay in weekly wages during the summer about 1,300*l.* They make on an average nearly sixty millions of bricks in the season; and probably during the time Mr. Smeed had the fields up to last season, a period of some thirty years, the manufacture has reached the enormous total of over 1,500 millions. Steam pugmills and all the most approved modern appliances appear to be used, and the company seems to be fully alive to its obligations to its workpeople, having erected permanent brick-built sheds for the moulders, &c. The company owns quite a little village at Snip's Hill, where many of its workpeople are housed, and where it has recently carried out a complete system of drainage.

Thrift of the Working Classes at Leicester.—A remarkable illustration of the thrift of the working classes in times of bad trade is afforded by the returns of the Leicester Savings Bank for the six months ended the 20th of May, just issued. Notwithstanding that all branches of local trade have been unusually depressed, the number of depositors and deposits show an unusually large increase. There has been an increase in the number of accounts of 1,028 since May last year, while the number of transactions since the 20th of November last was 16,305, or an increase in the half-year of 1,623. The total amount which passed through the bank during the half-year was 145,821*l.*, as against 85,674*l.* in the corresponding period last year, while the total amount of deposits invested was 302,682*l.*, as against 281,645*l.* in the corresponding period last year.

Coventry (Rural) Sewage Works. — At the last weekly meeting of the Coventry Guardians, Mr. G. Pretty in the chair, the following report of the Rural Sanitary Authority sub-committee was read by the clerk, and, on the motion of Mr. Deacon, seconded by Mr. Booth, was adopted: — "Your committee beg to report that they have visited and inspected sewage works in course of construction and completed at Stechford, Yardley, Acock's-green, and Knowle, embracing broad irrigation, precipitation, and filtration, the whole of which have been and are being carried out by Mr. Edward Pritchard, C.E. Your committee were particularly impressed with the manner in which the whole of the works were being carried out, but before recommending any one system they would ask that your clerk be instructed to invite Mr. Pritchard to come over and give his opinion as to the system best adapted to the districts under consideration."

Society of Arts. — The one hundred and twenty-fourth annual general meeting of the Society for the Encouragement of Arts, Manufactures, and Commerce, took place on the 26th ult. at the offices of the Society, Mr. W. Hawes presiding. The report submitted showed that during last session the Society had been actively engaged in a variety of subjects in connexion with the progress of arts, manufactures, and commerce. The chairman moved the adoption of the report, which was seconded by Mr. Campion. To this Mr. Ford moved an amendment that the report be first circulated amongst the members, and that its adoption be deferred. The amendment was lost, and the report was then adopted.

The Trade Unions Congress.—The next congress of the trades societies will be held in Bristol on Monday, September 9, and the five following days. The Parliamentary Committee state that "the report of the year's work will be one of great interest and importance. This, combined with the almost unprecedented position of our industries, and the exciting events of the past twelve months in labour disputes, should be of sufficient importance to make the coming congress the largest ever held."

Worcester Model Dwellings Association. The property of this Association having been disposed of, a winding-up meeting of the shareholders has been held, Mr. G. W. Hastings in the chair, when the accounts of the treasurer, showing a balance in hand of 65*l.* 5*s.* 5*d.* for division among the shareholders, was received and approved.

Tewkesbury Abbey Restoration.—At a meeting of the committee for the restoration of Tewkesbury Abbey, on the 21st ult., Sir E. A. H. Lechmere in the chair, an estimate for the restoration of the porch and the lowering of the approach from the street was produced, the amount being 247*l.* 10*s.*, and the same was accepted, subject to the architect's approval. The Freemasons of the provinces having subscribed the sum for the repair of the chapter-house, a cordial vote of thanks was passed to them. Mr. T. Gambier Parry announced that after carefully inspecting the roof, he was of opinion that, owing to the bosses being in a mutilated state, it would be better not to attempt any colouring; and he also stated that the effect of the bosses would be very good without any colouring whatever, an opinion shared by several of the committee, and it was accordingly decided to consult the architect as to whether it would be expedient to leave the bosses, &c., in their present state, and if so, what should be done with the two bays already coloured.

New Public Buildings, Rugeley.—Two foundation stones of the new public buildings at Rugeley were laid on the 26th ult., one by the Earl of Lichfield, and the other by Mr. W. B. Salisbury, chairman of the local board. The site (which is given by the Earl of Lichfield) faces the Market-square and a new street which is to be laid out from the Market-square to St. Augustine's Church. The style adopted is Geometric Gothic, and the materials employed are red bricks, with Bath stone dressings. The building principally consists of a market hall (which is to be entered from the square by a porch), 66 ft. in the extreme length, 41 ft. in width, and 40 ft. in height; a series of local board-rooms and offices, including a large room which can be used for an assembly-room, and accommodation for the petty sessional business and the police-station. There will also be accommodated the fire-engines, the volunteer armoury, the police cells, and numerous public offices. The contract is for 6,500*l.*, the contractors being Messrs. Bradney & Dawson, of Wolverhampton, and the architect, Mr. W. T. Foulkes (of the firm of Foulkes & Ryland), Birmingham.

The Canal Boats Act.—This Act came into operation on Monday last. It seeks to secure the education and protection of 70,000 "little boaters," whose home is in the cabin of a canal-boat, for which object Mr. George Smith, of Coalville, has been working since 1872. The main features of the Act are,—the separation of the sexes, and the bringing of the cabins under sanitary arrangements, so as to prevent the spread of infectious diseases and the fearful overcrowding. The regulations recently issued by the Local Government Board state that all boats, barges, and flats, must be registered, marked, and numbered, and that there must be not less than 60 cubic feet of free air space for each person above the age of twelve, and not less than 40 feet of space for each child under the age of twelve. The children will be brought under the Educational Acts by being deemed residents in the place to which the boats are registered as belonging. We did something towards the movement ourselves in earlier days.

Dulwich College Picture Gallery.—On the 25th ult. the members of the Council of the Royal Academy paid their annual visit of inspection to the [picture-gallery of Dulwich College. The greater number of the pictures in this fine gallery were collected before 1807 by the celebrated picture-dealer, Noel Joseph Desenfans, for Stanislaus, king of Poland. They were originally intended for a national gallery at Warsaw, but the misfortunes of the king, which ended in the dismemberment of the Polish kingdom, prevented the completion of the design, and after the death of the king in 1798, the pictures were left in possession of the collector. Desenfans sold several of them, but also added considerably to the collection before his death, in July, 1807. He left his pictures to Sir Peter Francis Bourgeois, R.A., who, acting, it is said, on a suggestion of John Philip Kemble, left his pictures by will to Dulwich College, subject to annual inspection by the Royal Academy.

Tree-Felling at Blairgowrie.—A number of trees on the Walton Feus belonging to Dr. Rattray have been felled by steam-power. An iron band is placed round the tree a few feet from the ground, and it is drawn clean up by the root.

Lighting by Electricity.—At the meeting of the Metropolitan Board of Works on the 28th ult., Mr. Elam moved:—

"That the engineer be instructed to place himself in communication with the municipal authorities of the city of Paris, with a view of informing himself of the process and cost of the electric light as now used in the streets of that city, and that he do report such information as he may obtain to the Works and General Purposes Committee, with a view to their considering and reporting to the Board as to the advisability of making an experiment with that light upon the Thames Embankment."

He said he believed the light was commercially successful in France, but, without expressing an opinion on that subject, he was anxious that an experiment might be tried in London. Mr. Roche said it was not a question of expense for the Board. It should be the aim of the Board to light the Embankment in the most efficient manner. After some discussion, it was decided

"That it be referred to the Works and General Purposes Committee to consider the advisability of trying an experiment of electric lighting on the Thames Embankment."

An Old Scheme Recalled.—On Wednesday in last week, at the invitation of Mr. J. O. Lever, the founder of the London Steamboat Company, a party of ladies and gentlemen, including the Lord Mayor, went for a trip to and from Sheerness by the saloon steamer *Alexandra*. In proposing, at a *déjeûner* served on board, "The health of the Lord Mayor," Mr. Lever alluded to a plan, originated by himself, for reducing by nearly one-third the distance between the mouth of the Thames and London Bridge. For effecting this plan he advocated the making of a canal at a cost of 10,000,000*l*., which could be done by levying a rate of 3d. in the pound, and the value of land, labour, and all kinds of property for thirty or forty miles around would thus be increased. He believed it would create London a free port, by which the commerce of the country could be quadrupled.

The Rollright Stones.—Mr. J. Tom Burgess, F.S.A., writes:—

"Among the ancient monuments in Mid-England, the rude stone circle known as the Rollright stones, with the dolmen and pillar-stone known respectively as the 'Whispering Knights' and the 'King Stone,' are the most interesting. With the exception, perhaps, of the 'Addlestrop Geese,' they are the sole representatives of this class of monuments in the Cotswolds and the valley of the Warwickshire Avon. On visiting them a few days ago I was grieved to find that, though far removed from railways, they were not sacred from the rude hand of the spoiler, for they now furnish another instance of the necessity for the active interference of those who wish to preserve our national monuments. Since my last visit they have been chipped and otherwise defaced. For many centuries they have been guarded by superstitious reverence; the relic-hunters have but little reverence for anything save the terrors and penalties of the law. The sooner, therefore, the Bill for the preservation of these and other similar monuments becomes law, the more likely are they to be preserved for future generations."

Mortuary for Bethnal-green.—At the last meeting of the Vestry of Bethnal-green, a report was presented by the Sanitary Committee, stating that they had considered the question of erecting a mortuary in the parish churchyard. The Chancellor of the Consistory Court had refused to allow such a building to be erected within 50 yards of any dwelling-house, and the part of the churchyard which was opposite the Vestry-hall, complied with that condition. They, therefore, recommended that spot. The surveyor had prepared plans, which had been approved by the committee and the rector, and the estimated cost of the building was 1,650*l*., exclusive of vehicles and furniture, these latter probably costing 100*l*. more. The report was adopted.

Mansion at Old Warden.—A new mansion for Mr. Shuttleworth is in course of completion at the picturesque village of Old Warden, Beds. The building (of which a full description appears in the *Bedfordshire Mercury*) is Tudor in style, and has a clock-tower, 100 ft. high, abutting on the main block. The clock and bells were supplied by Messrs. Cook & Son, of York. The stables and coach-houses are fitted up with the appliances of Messrs. Musgrave, Belfast. The whole of the buildings have been designed by Mr. H. Clutton, architect, Messrs. Cubitt & Co. being the builders, and Mr. Wilson Bennison the clerk of works. The gardens are being re-arranged under the superintendence of Mr. Edward Milner.

Mr. and Mrs. German Reed's Entertainment.—"An Artful Automaton," by Arthur Law, music by King Hall, is the title of a new second part, announced to be produced at St. George's Hall, on Wednesday next, the 10th inst. F. C. Burnand's successful piece, "Doubleday's Will," and Mr. Corney Grain's justly popular sketch, "The Paris Exhibition," will still be retained on the programme.

Struck by Lightning.—On Sunday, the 23rd ult., Kirkstall Abbey was struck by lightning, and a stone, weighing between 2 cwt. and 3 cwt., was thrown down from one of the pinnacles near the west door. Fortunately this was the full extent of the damage done to the fine old ruin.——On the same day the lightning struck the tower of the new infirmary building at Highgate, and did damage to the extent of between 200*l*. and 300*l*. The Holborn Guardians, having some doubt as to who was responsible for the damage, as the building was in the hands of the contractors, the matter was referred to the building committee for consideration and report.

Mechanical Power on Tramways.—The Select Committee appointed to inquire into the propriety of sanctioning the use of steam on tramways have advised that no impediment should be put in the way of mechanical aids, and that local authorities should be at liberty to make such agreements as they think best for their districts; but that the Board of Trade should have power to interfere to prevent either promoters from being unfairly dealt with, or the public from being defrauded in agreements. They further suggest that there should be a periodic revision of fares.

The Post-Office.—The *City Press* says "The immense growth of postal business again points to the necessity of removing the chief office from St. Martin's-le-Grand to a spot where more room can be obtained, and there is a probability of the vacant land by the Embankment at Blackfriars, belonging to the Corporation, being taken for the purpose." If this be true (although if we recollect aright the *City Press* itself contradicted the same rumour when it was in circulation some months ago) it is one more instance of the "hand-to-mouth" manner in which our public works and buildings are dealt with.

United Presbyterian Church, Perth, Competition.—Ten architects were asked to furnish plans for the new North United Presbyterian Church, Perth. Eight have complied with the request. The general conditions laid down to the architects were to furnish plans for an edifice capable of seating 1,200 persons, and the estimated cost not to exceed 7,000*l*. In all the plans which have been furnished the Greek style has been followed, and in each there is accommodation provided for the erection of an organ.

Cleopatra's Needle and the Sun-dial.—Amongst the Egyptian Antiquities in the British Museum, there is a fragment of a sun-dial, No. 778. Below this relic will be found the statement that it was discovered at the base of the obelisk called Cleopatra's Needle, and that it was presented to the Museum by J. Scott Tucker, esq., in 1852. Can any of our Egyptologists inform us, in what way this fragment was connected with the said obelisk, or can our astronomers throw any light upon it?

Prizes in Architecture, University College, London.—The following prizes have been awarded to students in Professor T. Hayter Lewis's classes, viz.:—Fine Art, Senior Class: Donaldson Silver Medal, F. D. Topham; Certificates, E. R. Hewitt and A. G. Morton. Junior Class: Prize, R. E. Smith. Construction, Senior Class: Prize, F. D. Topham; Certificate, R. H. Willis. Junior Class: Prize, W. W. K. Clarke; Certificates, W. Grellier, A. G. Morton, A. J. Gale, and J. D. Butler.

Honour for a Sheffield Art-Student.—Mr. Charles E. Wilson, one of the students of the Sheffield School of Art, has started for the Paris Exhibition, on a commission to make sketches of several of the exhibits for the English Commissioners. It is stated that the attention of Mr. Cunliffe Owen was first attracted to Mr. Wilson's work by his drawing of a panel of the Ghiberti gates, which drawing was purchased by the authorities at South Kensington.

The Electric Light for the Metropolis. At a meeting of the Chelsea Vestry on Tuesday, Mr. Fisher moved, and it was resolved to instruct Mr. G. H. Stayton, C.E., their surveyor, to report fully upon this subject, with a view to its adoption, for which purpose he is to visit Paris.

Painting on China.—H.R.H. the Princess Louise (Marchioness of Lorne) visited last week the Exhibition of Paintings on China by Lady Amateurs, at Messrs. Howell & James's Art Pottery Galleries, and has allowed her name to be added to the list of patrons of the Exhibition.

The Bath Meeting of the British Medical Association will be held from the 6th to the 9th of August. During the stay of the Association a museum will be arranged at the Assembly-rooms. The objects which will be there brought under notice will include drawings, diagrams, or models illustrating the ventilation of hospitals and private dwellings. The local hon. secretary is Mr. R. S. Fowler, of Bath.

Police-station, Moss Side, Manchester.—A new county police-station has just been opened at Moss Side. It is situated in a densely populated part of the district, at the corner of Raby-street and Heywood-street, and contains accommodation for a resident inspector, a sergeant, and five constables. The station has been erected at a cost of 1,750*l*. by Mr. George Napier, of City-road, Manchester, from the designs of Mr. Redford, architect, Manchester.

Horsemonger-lane Gaol, Newington, will, it is said, shortly be closed. The Government is stated to have offered the site to the Surrey magistrates, in satisfaction of their claims under the Prisons Act. Should the magistrates accept the offer at the ensuing quarter sessions, the prison will be pulled down, and the site used for building purposes.

Royal Academy.—On Thursday evening in last week, the president and council of the Royal Academy of Arts held their annual *soirée* at Burlington House, Piccadilly. It was numerously attended, nearly 2,000 persons being present. Two correspondents suggest that the council should throw open the exhibition, by tickets, on one Sunday afternoon.

Excursion of the Architectural Association.—It has been decided to visit some part of Yorkshire, and Mr. James Fowler, of Louth, has consented to conduct an excursion to the south-eastern portion of that county, with Hull as head-quarters. The excursion will take place in August, commencing Monday, the 12th, and ending Saturday, the 17th

Value of Property in Aldgate.—The freehold property Nos. 37 and 38, Aldgate High-street, within a few doors of the Aldgate Station of the Metropolitan Railway, covering an area of about 1,820 square feet, was sold by auction by Messrs. Fuller, Horsey, Sons, & Co. at the Mart, on Wednesday last, for the sum of 5,350*l*., or at the rate of nearly 3*l*. per square foot.

New Corporate Offices and Town-hall, Huddersfield.—The "double event" of opening the new corporate offices and laying the foundation-stone of the new Town-hall at Huddersfield came off on the 26th ult. Mr. J. H. Abbey, the borough surveyor, was the architect in both cases.

TENDERS

The Directors of the London and North-Western Railway Company have accepted the tender of Messrs. Baker & Firbank, of Dewsbury, for widening that portion of the Liverpool and Manchester line between Barton Moss and Cross-lane stations, a length of about five miles and a half.

For the erection of factory buildings and warehouse for Messrs. H. Hodson & Co., Sugar-house-lane, Stratford, E. Mr. Arthur A. West, architect:—

	Iron Shop.	Paint Shop and Warehouse.
Dove Bros.	£1,060	£1,615
Wells	1,018	1,491
Hosking Bros.	949	1,397
Morter	925	1,370
Bangs	868	1,338

For new house at the Brown Animal Sanatory Institution, Wandsworth-road, for the Senate of the University of London. Mr. J. Slater, architect:—

	House and Offices.	Fence, Walls, &c.
Snelling	£944	£80
Gill	839	64
Ashwell & Stevenson	830	75
Sheffield & Prebble (accepted)	773	64

For additions to the National Schools at Fisherton Anger, Salisbury. Mr. Fred. Bath, architect. Quantities supplied:—

Hopkins & Son	£598	10	0
Plowman	540	0	0
Sawkins	531	0	0
Tryhorn	490	0	0
Williams	465	0	0
Harris (accepted)	448	0	0

For pulling down and rebuilding No. 33, Norton Folgate, Bishopsgate, E., for Mr. Wm. Barker. M. J. H. Rowley, architect. Quantities supplied by Mr. Wm. Allport:—

Downs	£1,683	0	0
Belham & Co.	1,628	0	0
Scrivenor & Co.	1,598	0	0
Garrard	1,583	0	0
Boyce	1,530	0	0
Johnston	1,470	0	0
Smith & Son	1,464	0	0
Wagner	1,396	0	0
Johnson	1,373	0	0
Marr (accepted)	1,258	0	0

For alterations and additions to house and stables, and a gardener's cottage, at Barnet, Herts, for Mr. F. A. Bevan. Mr. John Usher, architect:—

Foster	£5,700	0	0
Twelvetrees	5,680	0	0
Ashby & Horner	5,452	0	0
Edey	5,306	0	0
F. & P. J. Wood (accepted)	5,287	0	0

For the erection of the Paddington Branch of the London Joint-Stock Bank. Messrs. Isaacs & Florence, architects. Quantities supplied by Mr. L. C. Riddett:—

Kinninmont & Son	£6,823	0	0
Hook & Oldrey	6,316	0	0
Mark	6,270	0	0
Ashby & Horner	6,150	0	0
Killby	6,084	0	0
Browne & Robinson	5,997	0	0
Patman & Fotheringham	5,975	0	0
Scrivener & Co. (accepted)	5,845	0	0

For alterations, repairs, and bar-fittings, to the Simon the Tanner, Long-lane, Bermondsey, for Mr. J. Parker. Mr. H. R. Cotton, architect:—

Andrews	£1,036	0	0
Simpson	1,045	0	0
Toms	930	0	0

Re-tendering for new schools, Silver-street, Notting-hill, for the London School Board. Mr. E. R. Robson, architect:—

Thompson	£6,535	0	0
Higgs & Hill	6,278	0	0
Brass	6,230	0	0
Tongue	6,190	0	0
Downs	6,179	0	0
Wall Bros.	6,175	0	0
Hobson	6,169	0	0
Hook & Oldrey	6,150	0	0
Grover	5,996	0	0
Stimpson & Co.	5,970	0	0

For schools, Latimer-road, Notting-hill, for the London School Board. Mr. E. R. Robson, architect:

Wall Bros.	£9,876	0	0
Grover	9,684	0	0
Brass	9,413	0	0
Pritchard	9,374	0	0
Higgs & Hill	9,234	0	0
Nightingale	9,231	0	0
Kirk & Randell	9,183	0	0
Stimpson	9,180	0	0
Boyce	8,954	0	0
Tongue	8,905	0	0
Hobson	8,899	0	0
Hook & Oldrey	8,870	0	0

For enlargement of schools, Hollydale-road, Peckham, for the London School Board. Mr. E. R. Robson, architect:—

Brass	£3,837	0	0
Nightingale	3,770	0	0
Hook & Oldrey	3,651	0	0
Downs	3,622	0	0
Pritchard	3,544	0	0
Tyerman	3,530	0	0
Lathey Bros.	3,476	0	0
Gerrard	3,473	0	0
Kirk & Randall	3,391	0	0
Higgs & Hill	3,390	0	0

For alterations and additions to the Devonshire Arms public-house, Marloes-road, Kensington. Mr. Alfred Williams, architect:—

Hockley	£1,499	0	0
Blistrard & Son	1,398	0	0
Turrell	1,334	0	0
Hook & Oldrey	1,249	0	0
Matthews	1,237	0	0
Stimpson & Co.	1,183	0	0

For warehouse, 36 & 37, Monkwell-street, City. Messrs. Joseph & Pearson, architects:—

Scrivener & Co.	£9,893	0	0
Langmead & Way	9,949	0	0
Williams & Sons	9,940	0	0
Killby	9,700	0	0
Braid & Co.	9,645	0	0
Ryder	9,278	0	0
Brass	9,153	0	0
Bangs	9,140	0	0
Adamson & Co.	9,100	0	0
Ashby Bros.	9,062	0	0
Conder	8,936	0	0
Browne & Robinson	8,927	0	0

For Vicarage-house and Mission-rooms, St. Olaves, Mile End. Mr. Peter Dollar, architect:—

	Vicarage.	Mission-room.
Foxley	£2,445	£675
Lawrence	2,242	639
Langmead & Way	2,170	600
Browne & Robinson	2,115	617
Browse	2,054	580
Johnson	1,997	493

For Wesleyan Chapel, Stamford-street, Blackfriars. Mr. James Weir, architect. Quantities by Mr. Maylard:—

	Portland Stone.	Bath Stone.
Hoare	£6,891	£6,816
Haward Bros.	6,853	6,705
Dearde	5,497	5,366
Lucas Bros.	5,493	5,245
Ansell	5,448	5,248
Hill & Higgs	5,440	5,360
Rider	5,388	5,143
Lathey Bros.	5,350	5,210

For house and offices, at Pirton Grange, Herts, for Mr. W. Hanscombe. Mr. T. C. Sorby, architect. Quantities by Mr. John Scott:—

Miskin	£7,512	0	0
Thompson	7,228	0	0
Gammon & Sons	7,150	0	0
Higgs & Hill	7,080	0	0
Lathey Bros.	6,700	0	0
Twelvetrees	6,310	0	0

For alterations at The Griffin, Charles-street, Finsbury, for Mr. Reilly:—

Staines & Son (accepted)	£172	10	0

For the erection of a warehouse, No. 92, Wood-street, City. Mr. James W. James, architect:—

Braid & Co.	£3,712	0	0

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Mr. P.—E. P. B.—H. & O.—I. W. I.—H. J. & Co.—E. T.—F. C. M.—O. B.—J. B. E.—H. F.—L. & W.—C. O.—E. P.—J. S.—J. K. C.—N. & Co.—E. G. R.—R. & Co.—N. W.—W. H. W.—G. W. F.—J. S.—W. T.—H. R.—L. Bros.—G. H. S.—W. B. R.—J. W. M. E.—I. & F.—C. E. P.—H. G.

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The Fortune Theatre.

WE are sorry to be compelled to upset the rumours of some of our contemporaries, but in the interest of lovers of archæology, and as faithful chroniclers of passing events, we are bound to say that the grave report that "the *original* playhouse of Alleyn, the founder of Dulwich College" is soon to be pulled down for Golden-lane and Playhouse-yard improvements, is so far wrong that this very building was destroyed more than two hundred years ago.

The revival, however, of the once world-renowned name of "The Fortune" Theatre suggests to us so many interesting reminiscences of a bygone age, that we think a few particulars of its playhouse and district, and of the times of the early days of theatres, and of Shakspeare and his brother actors, will not prove out of place at the present moment, seeing how many changes are being made in the parish of St. Luke,—the once "suburban retreat" of the City aristocracy in the days of Queen Elizabeth.

It is but a century ago that Old-street and the City-road were included in the postal "Suburban" district; but 300 years since it was a pleasant country ramble to take a walk out of the City through Cripplegate, or Moorgate, or Aldersgate, across the fields to that district which we, in the nineteenth century, know as by any other name than that of Classic speech. If the earliest map of London, dated about 1560, be referred to, it will be found that but few houses existed beyond the City walls; and if Clerkenwell was in the suburbs, Islington was truly in the country, Goswell-street being known as the way to St. Alban's. Marksmen with the longbow practised in Finsbury and Spitalfields, while several windmills outside Moorgate exhibited a picture of real rural life. We are told of the cross at the end of Golden-lane being decorated in May-time with garlands of flowers around which the lads and lasses of old London kept village festival. A few houses stood in "the lane" between Barbican and Old-street, but from where the present St. Luke's Church stands to Shoreditch was not a single house! Of course, Chiswell-street was unbuilt, and a few dwellings only where Whitecross-street stands; so it will be pretty well understood that "North London" in the days of Elizabeth, just outside the City walls, was a truly rural place, and therefore a walk "in the country" could then be enjoyed without having to take a five-mile trip by rail to get there.

Such being our district three centuries ago, we will now have something to say about our theatre.

It was in 1574, by a patent dated May 10th, that "James Burbadge, John Perkyn, John Lanham, William Johnson, and Robert Wylson, servaunts to our trustie and wel-beloved cosyn and counsellor, the Erle of Leicestre," were allowed "to use, exercise, and occupie the art and facultie of playinge comedies, tragedies, enterludes, stage playes, and such other lyke," except during the time of prayer and plague within the City. This was the *first* royal grant of a patent for the performance of stage plays in this country, and immediately raised the opposition of the Corporation of London, which continued with more or less vigour for many, many years. At the date of the patent, and long before, the great nobility had their *private* theatrical servants, but until 1574 royalty had not given them a *public* licence. When the patent was obtained the opposition of the City caused the actors no ordinary trouble, and the only way to get out of the difficulty was to set up their playhouse in those privileged places not under the Lord Mayor's jurisdiction, and thus we see why the Blackfriars and the Whitefriars and Dorset Gardens theatres existed for so long a time under the very nose of his lordship, simply because they happened to be within the precincts of the old monasteries of the Black and White friars.

The two earliest theatres in or near London were both situated in the parish of Shoreditch. One was called "The Theatre" and the other "The Curtain." Both existed in the liberty of Holliwell—the district of the Holywell attached to the old monastery or priory, the water of which well, however, in Stow's time, had "much decayed" from its once "sweet, wholesome, and clear" character. The Collections of Mr. Halliwell-Phillips inform us that the earliest notice yet discovered of the Theatre is a lease dated the 13th of April, 1576, and, curiously enough, granted by one *Giles Allen* to James Burbadge of four houses, two gardens, and a barn, between Finsbury Fields and the highroad from Bishopsgate to Shoreditch. For a premium of 20*l.*, a term of twenty-one years at a rental of 14*l.* per annum, Burbadge was permitted to erect "a theatre or playinge place," and if 200*l.* were expended, a renewal of the lease was to be granted. This playhouse existed until 1598, when continual disturbances having taken place, a Privy Council order closed it, and in December or January the 'wood and timber" which composed it was carted away by force "unto the Banckside in the paryshe of St. Marye Overyes," where Burbadge, Street, and others erected a new theatre. The "Curtain" is first noticed in 1577, as then in existence, so it was probably erected the previous year. It had been built on a piece of ground belonging to the old monastery, and we are told its exact site is now covered by Gloucester-street, situate between 36 and 38, Curtain-road, which would be pretty correct, if, as we suppose, the old monastery stood between here and Holywell-lane, on the site of the New Great Eastern-street. And, Stow in 1598, assists us in this supposition, when he says,—"And neare thereunto [the priory] are builded two publique houses for the acting and shewe of comedies, tragedies, and histories for recreation. Whereof one is called the Courtein, the other the Theatre, *both standing on the south-west side* towards the field." How long the "Curtain" existed we know not; it closed early in the reign of Charles I., although Malone says, that in its latter days it was used by companies of prize-fighters amusing themselves within its walls! But as one of the conditions of the erection of the Fortune was the closing of the Curtain, we shall see that even in those times the law was often defied.

The first and earliest theatre in the City was opened by Burbadge within the Blackfriars monastery walls, also in 1576, and between this date and 1600 no less than eleven places of amusement or playhouses were opened, of which five were situate on the north, and six on the south, side of the river. The lord mayor's opinion of them was not of the best. He thought them "ordinary places for vagrant persons, maisterles men, thieves, horse-stealers, whoremongers, cozeners, conycatchers, contrivers of treason, and other idle and dangerous persons to meet together, and to make their matches." This was a pretty strong opinion to have of our early theatres, and shows but too plainly the civic antipathy to them.

But about this time a great change was on the eve of being made by Edward Alleyn, founder of the College of God's Gift, Dulwich, and of the Fortune Theatre, Golden-lane. The son of Thomas Alleyn, innholder, of the "Pye," in Bishopsgate, he was born September 1st, 1566. He commenced his theatrical career in 1588 or 1589, and in 1592, having made some way in his profession, he married Joan Woodwards, daughter of Philip Henslowe's wife. The following year, becoming interested in partnership with the Bankside theatres, he and his company, on account of the plague, strolled "abroad,"—that is to say, into the country,—and "from Chellmsford the 2 Maye, 1593," he wrote to "my good sweethearte and lovinge mouse," as he fondly called his wife, the letter still preserved at Dulwich. In 1600 he erected the Fortune Theatre; was proprietor of the Bear Garden, and in 1606 lord of the manor of Dulwich. In 1613 he commenced, and in 1619 completed, the foundation of his College, the Royal licence describing him as "Chiefe master, ruler, and overseer of all and singular our game of beares, bulls, mastive dogs and mastive bitches." Nearly every one nowadays knows the celebrated Dulwich College, so we shall not here

peak of its history; but as the ground in St. Luke's upon which the Fortune stood was part and parcel of the College revenues, is it not fair to suppose that St. Luke's (wherein he founded almshouses in 1620) should share in the benefits of the College? And yet the southern parishes deny the right! Alleyn's first wife died on June 28, 1623, and on the 3rd of December following he married at Camberwell, Constance, daughter of Dr. Donne, Dean of St. Paul's; and she in 1630 (after Alleyn's death), became in turn the wife of Samuel Harvey, whose grandfather and uncle were both Lord Mayors of London. Alleyn died on either the 21st, 25th, or 26th of November, 1626 (he was buried on the 27th in Dulwich College Chapel), but the exact date of his death is unknown. But to show how the College venerated their founder and looked after his relics, his gravestone was allowed to stroll away and to remain for years in the grounds of a tavern at Dulwich, and it was at last presented by Mr. Webb, the owner of the "Half-Moon," to the Governors in March, 1867. (See the College Minutes, p. 31.) Where is it now? We heard the other day it was buried among some rubbish in an outhouse! Now, the governors of Alleyn's noble foundation during the past two centuries have done many curious things and been inclined for many remarkably strange freaks, for they have had a wealthy estate to back them; but we do hope, for their own credit's sake, that they have by this time done their utmost to preserve their benefactor's gravestone at least, and will prevent it from again "strolling" from its proper place, the College Chapel, wherein his remains are buried.

The site of the Fortune Playhouse and surroundings, now the district known as Playhouse-yard, situated between Golden-lane and Whitecross-street, was partly purchased by Alleyn, previously to 1600, from a resident in the Isle of Man; but the inheritance he bought in June, 1610. On the 12th of January, 1599-1600, the Earl of Nottingham wrote to the Middlesex justices desiring them "to permit and suffer" "my servant, Edward Allen," to proceed in the erecting and finishing of a new house on "a plott of grounde neere Redcrosse-streete, London, verie fitt and convenient"; for the Queen, "in respect of the acceptable service which my said servant and his companie have doen and presented before her highness to her greate lykeinge and contentment, as well this last Christmas as att sundrie other tymes, ys gratiously moved towards them with a speciall regarde of favor." The cause of the new building was stated to be "in respect of the dangerous decaye of that house which he and his companye have nowe *on the Banck*, and for that the same standeth verie hoysome for resorte of people in the wynter tyme." This was the Rose Theatre, Bankside, which Alleyn, it was stated, had been compelled to close (although others re-opened it); yet he found the Middlesex justices very divided in their opinion of the necessity of "the new howse"; so much so, that Lord Nottingham wrote again to the same magistrates from "Richmond, 8 of Apprill, 1600," stating that Alleyn "hath bestowed a greate some of money, not only for the title of a plott of grounde situate in *a very remote and exempt place neere Goulding-lane*, theare to erect a new howse, but allsoe is in good forwardnes aboute the frame and workmanshipp theareoff," and therefore "doe hearbye requier you and everie of you to permitte and suffer the said Edward Allen to proceede in the effectinge and finishinge of the same new house, without anie your lett or interruption towardes him or anie of his workmen; *the rather because another howse is pulled down instead of it.*" The machinery which Alleyn and his backers had set to work for the furtherance of his design appears to have been an agreement with St. Giles, Cripplegate, to contribute to the maintenance of their poor, for the parochial authorities, in their petition on his behalf said:—"Wee could be contented that the same might procede and be tollerated for the reasons and causes following: Fürst, because the place appoynted out for that purpose standeth verie tollerable *neer unto the feildes and soe farr distant and remote frome any person or place of accompt, as that none cann be annoyed thearbie*; secondlie, because the erectours of the said howse are contented to give a very liberall portion of money weeklie towards the relief of our poore, the nomber and necessity whereof is soe greate that the same will redounde to the contynnall comfort of the said poore."

The theatre was accordingly erected and opened early in the year 1602, and although Philip Henslowe's name does not appear in either of the documents just quoted, it is evident he was Alleyn's partner, for his name appears in the agreement made with Peter Streete, the carpenter, dated January 8, 1599-1600. Alleyn tells us in his diary the cost "for building the playhouse 520*l*.," but Mr. Collier thinks that this sum must also have included the decorations and fittings, Streete's agreement being 400*l*. Any way, the theatre was finished and opened and in full working order by the month of October, 1602.

While Alleyn was engaged in the erecting of his playhouse, some active correspondence was going on (as we have already noted) with the Privy Council, the Lord Mayor, and others, against the increase of such places of entertainment. The documents are preserved among the State papers. In June, 1600, the Lords of the Council ordered:—"That there shall be about the Cittie *two houses and no more*, allowed to serve for the use of the common stage-players, of the which houses one shall be in Surrey, in that place which is commonly called the Bankside, or thereabouts, and the other in Middlesex"; that "the house now in hand to be built by the said Edward Allen is not intended to increase the number of the playhouses, but to be *instead of another named the Curtaine, which is either to be ruined and plucked downe, or to be put to some other good use*; it is likewise ordered that the said house of Allen shall be allowed to be one of the two houses, namely, for the house allowed in Middlesex, and the one for Surrey to be the 'Globe.'" Now, it will be seen that in this document the "Curtain" is named as the theatre to be closed; while in Lord Nottingham's that on the Bankside is mentioned. What effect this limitation had upon the profession is proved by the fact that in December, 1601, the Council ordered prompt inquiry into the disturbances of late, and the wilful neglect of carrying out their previous orders.

As may be supposed, the registers of St. Giles's, Cripplegate, contain many entries showing the existence of players in the parish; and Malcolm, in 1803, gives a long list of extracts, between 1600 and 1652. In 1607 appears the startling entry,—"Edward, sonne of Edward Shackspeere, player, base-born, 12 August." This was an illegitimate child; but who "Edward Shackspeare" was has not yet, we believe, been discovered. Curiously enough, Mr. Collier found in the St. Saviour's register the same year,—"Dec. 31. Edward Shakespeare, a player, in the church."

Although we do not intend to go into the history of the stage at this period, it is worthy of remark that Alleyn must have made a large sum of money by his theatrical performances and speculations, and must also have lost a large sum by his peculiar inclination of always being in the law courts. In one case alone, the dispute about Henslowe's will, 1616, we find no less than twenty-one orders in Chancery issued; and yet Alleyn's peculiarity descended to the managers of his college.

In January, 1618-19, the Corporation, in referring to former Privy Council orders, issued its mandate for the suppression of the Blackfriars Playhouse, the reason given being, "The owner of the said playhouse, within the Blackffryers, and under the name of a private house, hath converted the same to a publique playhouse, unto which there is dayley so great resort of people and so great multitude of coaches, whereof many are hackney coaches, bringing people of all sortes, that sometymes all their streets cannot conteyne them," &c., and as a result, great crushing, quarrels, and other annoyances. This interesting order is alluded to in "Notes and Queries," fourth series, vol. vii., p. 183, in an article on Ben Jonson, which gives a copy of a curious bill, dated 17th September, 1619, of a charge of 4*s*. by one Thomas Cooke, for carrying "of two messages two severall tymes from the Court at Whithaell into London, *by Cripellgatt*, to warn Mr. Ben Jonson, the poet, and the players at the Blackfriers to attend hys highnes that night following at Court." Oldys says that Ben Jonson lived in Bartholomew-close. Mr. Noble adds, "If Oldys is correct, it is certain that, although the close is not in Cripplegate parish, it warrants the messenger styling it 'by Cripplegate,' that being to him, as to other Londoners, a distinguishing landmark. But if Thomas Cooke went to the (Fortune) Playhouse, which was in the parish, his description would be correct."

In 1621 the Fortune was burnt to the ground. Alleyn simply notes in his diary:—"Dec. 9. Md. This night at twelve of the clock the Fortune was burnt," and this is all he says about the calamity. But John Chamberlain, in his news-letter to Sir Dudley Carleton six days later, says:—"On Sunday night here was a great fire at the Fortune in Golding-lane, the fayrest [often erroneously written first] playhouse in this towne; yt was quite burnt downe in two houres and all their apparell and playbookes lost, whereby those poore companions are quite undon; ther were two other houses on fire, but with great labour and daunger were saved." Now, without doubt, this was at first a great loss to Alleyn; but he does not appear to have allowed much time to elapse before he rebuilt the theatre. Within six months there are numerous entries in his diary relating to its erection. "A large, round, brick building, and not a square wooden house as before." In one of the entries he notes:—"Dinner at the Hart, in Smithfield, with the builders of the Fortune." Could that have been the house mentioned in a lease in the writer's possession, dated 4th August, 1681, of a messuage or tenement called "The White Hart," in St. John-street, in the parish of St. Sepulchre, West Smithfield, together with the brewhouse adjoining? The Fortune was re-opened in 1623, but somehow or other Alleyne, to a certain extent, repaid himself the cost by dividing the property into twenty-four shares, letting each share on lease for fifty-one years, at 5*l*. 6*s*. 11*d*. per annum, and 4*l*. 13*s*. 4*d*. premium towards the cost of the erection. By this means he raised a sum of 1,000*l*. and a yearly income of 128*l*. 6*s*. And yet there were several lawsuits over this co-partnership. According to the indentures, the site of the buildings is stated to measure 130 ft. east to west, and 131 ft. 8 in. from north to south. In front of the new theatre stood a "picture" of Dame Fortune, which Haywood notices in 1633.

It was in June, 1628, that Sir Francis Nethersole wrote to the Queen of Bohemia a curious news-letter (which we have seen), in which he says:—"All I will adde more to this letter at this time shall be a strange accident which happened on Fryday last, when Dr. Lambe, of whome your Majesty hath heard so much, being *at a play at the Fortune*, was there espyed by certaine prentices and others, who fell upon him at his going home, and though he thrice housed himself for shelter yet they being increased to a great number forced him to be putt out of one after another, still banking him with nubess and stones, till at last they left him for dead, and he dyd the next day. A prodigious discredit, for which the mayor and sheriffs have been sharpely reprehended, and the Citty may chance be fined, but that will not bring the man to life againe." This gives a pretty fair picture of the doings of our apprentices in "the good old times." Three years later (1631) a petition went to the Bishop of London lamenting the nuisance of the existence of the Blackfriars playhouse, and praying him to use his best endeavours to get its final suppression. In this document it is stated, "these players still have and use all sumer," the Fortune, thus proving to us that the theatrical season was when the daylight was strongest. In 1639 a news-letter from Edmund Rossingham to Viscount Conway gives us another extraordinary view of the times, and by no means uninteresting to us of to-day. One paragraph is worth printing:—

"Thursdale last the players of the Fortune were fined a 1,000 li. for setting upp an altar, a bason, and twoe candlesticks, and bowinge downe before it upon the stage; and although they alledge it was an old playe revived and an altar to the heathen Gods, yet it was apparent that this playe was revived of purpose in contempt of the ceremonies of the Church." This was nearly two centuries and a half ago.

In 1649, we are told by Mr. Collier that the soldiers occupied the interior of the theatre and destroyed it. Then in Goffe's "Careless Shepherdess," 1656, it is said:—

> "I'll go to Bull or *Fortune*, and there see
> A play for twopence, and a jig to boot."

And, finally, in 1661, came the closing scene. An advertisement in the *Mercurius Politicus* for Feb. 14-21, tells us that the site and buildings are "to be lett to be built upon," and that the ground, which stands between Whitecross-street and Golden-lane, is sufficient for the erection of twenty-three tenements. That such an event did take place we have been able to prove by inspecting a Chancery decree, 13 Charles II

(1661-2), arising out of the twenty-four share copartnership, wherein after describing the dimensions of two plots of ground as 128 ft. and 128 ft. east to west and 48 ft. and 54½ ft. north to south, it recites certain agreements of building houses thereon; and in another decree 13 William III., A.D. 1701, relating to the same property, it is said that Beven, who had taken the lease, had erected twenty-three houses "whereon an old tenement called the Trumpett," and "*where the old playhouse stood*," &c., and we further learn that subsequently twenty-seven houses existed on the site in the Playhouse-yard and Golden-lane.

By this it is evident that Alleyn's Fortune Playhouse the second was pulled down in 1661-2. And it is also certain that on the 17th of April, 1872, the governors of Dulwich College (by virtue of their new Act) put up for sale the freeholds of fifty-one dwelling-houses, and two sites of vacant land, having a total frontage of 60 ft. to Golden-lane, and 63 ft. to Whitecross-street, and occupying an area of 22,070 square feet. The houses comprised,—22 in Playhouse-yard; 6 in Parrott-court; 9 in Ball's-court; 11 in Lion-and-Lamb-court; Nos. 50, 52, and 54, Golden-lane, the site of vacant land in rear of No. 56, and the site of five houses, 185 to 188A, Whitecross-street—the whole of which was of the value of 1,063*l.* 8s. per annum. One of the stipulations in the conditions of sale was that Playhouse-yard was to be widened from 18 ft. to 25 ft.,—an improvement which a visit to the locality will show has been carried out. And this was the estate which Edward Alleyn, by Letters Patent from James I., dated 21st June, 1619, included in his noble gift for the foundation of Dulwich College, in these words: "And alsoe all those messuage, lands, tenements, gardens, hereditaments, and buildinge, of our said servante, Edward Alleyne, called or knowne by the name of *the Fortune*, situate and being in Whitecrosse-streete, Golding-lane, in that part of the parishe of Sainte Gyles Without Crepplegate, London, which is within the County of Midd.: which the said Edwarde Alleyne lately boughte and purchased of Danyell Gill, of the Isle of Man, and others." The site had been a fortune to him, and it has since proved one for his college.

The facts contained in this article have been collected after considerable research, and are worth preserving in the columns of our journal, especially at the present time, when so many changes of old landmarks are taking place about London.

YARMOUTH MUNICIPAL OFFICES COMPETITION.

MORE than forty designs for the proposed municipal buildings in Yarmouth are now hanging in the large room of the existing town-hall on the quay overlooking the Yare, and we have seldom seen a collection of this kind showing so high an average of merit in proportion to the amount of the gain to be expected.

The new building is to stand on the site of the present one,—on a tolerably wide area of ground called, on the east and south sides of the building, "Hall Square," while the large expanse of open quay opposite the north front is called appropriately "Hall Plain." The area for the new building extends somewhat beyond the line of the old one each way; the ground rises a little towards the town, and the east frontage on the town side is at an oblique angle, which is the only disadvantage of the site. Otherwise, there could hardly be a more attractive site for a building of the size (limited to 24,000*l.*),—open on all sides, and with the west front facing the river and the north front facing the large expanse of open quay before mentioned.

The instructions, besides stating the usual requirements of a town-hall, including assembly-room, courts and their accessories, town-clerk's and other municipal departments, stipulate for ample staircase and approaches to the assembly-room, the principal entrance to be on the north side; while it was strongly recommended that the assembly-room should be on the west side, a recommendation which seems to have been generally followed. The instructions naturally lead to the north front being the principal one; but it is rather surprising to us that few of the competitors seem to have aimed at giving much emphasis to the west front, which is chiefly seen from the river, and therefore affords so much suggestion for picturesque treament. We proceed briefly to comment on the designs *seriatim*, taking them in the order of hanging:—

"Beacon" (in red letters) evidently attaches considerable importance to the use of the building for entertainments; he takes up a large part of his ground-floor with a hall and staircase, from which the business offices also open in a rather unscientific manner. It is desirable, when a building is used partly for practical and partly for festive purposes, to keep the two departments distinct. He gets the law courts entrance and staircase separate, entering from the east; the use of circular lines for the two staircases necessitates a great many awkward angles in the plan. The assembly-room on the first floor occupies the river front,—the position directed in the instructions. The design is Italian, with a pilastered order on a rusticated basement, pleasing but commonplace, and with a very weakly-treated cupola on the north side.

"Beacon" (in blue letters), a second set, superior to the first in plan, as the square lines of the main staircase work much better, and more picturesque and effective in design, which is Late Jacobean, still on a rusticated basement, but with very free treatment, the entertainment portion separated from the other part in the design. Towards Hall Plain, however, the design is almost too lopsided and "picturesque," but with much more force than the other.

"Roma" looks a more compact plan than the last, but will not bear inspection in detail. The surveyor's room has a west aspect, and a very inadequate window-space. The author has got over the oblique line of front on the east by dividing the wall into a series of rectangular breaks, which is, perhaps, the best way. The design is a very symmetrical Florentine Italian, with a centre tower, which has no reference to the plan, and no adequate substructure.

"Old English": the same idea as No. 2 plan of "Beacon" in regard to design, the entertainment portion kept in a separate block, but better managed, less rambling. The tower is central in the line of the north front, but an angle tower as regards the principal block of building. The design savours more of modern French Renaissance than of "Old English," and is vulgar in detail, but well composed as a whole. The plan is in the main convenient, compact, and well arranged, the courts particularly so; some parts of the ground-plan depend too much on borrowed light, and the cloak-rooms are a little too prominently opposite the main entrance.

"Thought": a Geometric Gothic design; well-executed drawings, and the south front has good points, but neither design nor plan can be recommended.

"Leo" and "Munus" are showy designs in Italian and Gothic respectively, with little to recommend them.

"Use": a fine set of drawings, the work of a more practised hand in planning than any of the above-named. The ground-floor well and compactly arranged; there are four entrances, but their uses are well discriminated; the author, however, shows "stairs to muniment-room," without showing where the room is obtained, and he ought to know that it is very undesirable to place lavatories, as at the north-east angles of first and second floor, so that they may become passages from one set of rooms to another. The design is a powerful treatment of Early Gothic, but expensive. The assembly-room is one of the few which shows an orchestra, but the ceiling is semicircular in section,—the worst form for music.

"N'est pas" (*sic*): the author's architecture is better than his French; the design is a very clever and picturesque one, combining reminiscences of Inigo Jones in detail, with an admixture of the "horizontal stripes" manner. Towards the river a pretty effect is obtained by the open arcade and light order contrasted with the solid angles of the building. The clock-tower towards Hall Plain is very picturesque, and the plan is a very good one, combining effectiveness in the entertainment portion, with compactness and practical suitability.

"Bona Fides": the author has a good notion of a general plan, with cross corridors appropriated to special departments; but the plan is very defective in detail. The design is a plain brick one, with mullioned and transomed windows; it would hardly look so well in execution as in the drawings.

"Keep Watch": the plan has clever points, especially in the arrangement of the main floor, where the law courts are canted to follow the oblique line of the east front, and are very compactly planned and well connected with the rest of the plan; but some of the ground-floor offices (*e.g.*, the surveyor's) are most insufficiently lighted. The author shows a music platform and an organ in the assembly-room, but again the ceiling is made a semicircle, another instance of the prevalent ignorance in regard to acoustic effect. Design, Queen Anne, with quoins and large arched windows, not without a certain breadth of effect.

"Stability": a set of small drawings, apparently the work of a young hand; there are absurdities both in plan and elevation, but also evidences that the author thinks for himself. He makes a note on the plan that he has moved the constable's room from its required position at the north-east angle, because the light there was so important to the surveyor, a fact which some more showy competitors entirely ignore; and he places the muniment-room at an external angle, because in case of fire it will thus have the less heat to bear. The perspective view shows a bit of really picturesque and original design in the tower and north-west angle. "Stability" will probably do better than this.

"Sub Spe" has been going in to win, and sends a most elaborate set of drawings, with alternative designs in Early Gothic and Queen Anne, of which the former is the best, and would make a solid-looking and satisfactory building. The plan deserves higher praise, and is one of the best, remarkable for the order, symmetry, and simplicity of arrangement which it shows, providing complete inter-communication by an internal corridor round four sides of a parallelogram on the cortile principle. The only real defect of the plan is insufficient window-space in apartments where light is specially wanted: a defect common to a great many of the designs.

"Hope" is another (apparently) student's design; but this time we must be content with hoping the best,—for the future.

"Knowledge is Power,"—a beautiful set of drawings, got up like copper-plate engravings almost, and presenting a very good and symmetrical plan; the arrangement of the judges and magistrates' rooms and courts is especially good. As in some other good (in the main) plans, there seems no attempt to render the treatment of and the entry to the assembly-room effective, or to guard it from draughts. The design is of a simple Geometric Gothic character, almost ostentatiously plain, the main story corbelled out and oversailing; this would be more effective if the ground story had a little more force of treatment.

"East Coast": an ably-schemed plan on the central cortile principle, and the planning of and access to the courts very cleverly managed. The design is of very simple Italian detail, on a rusticated basement, grouped with a certain touch of Gothic feeling; it looks "hard" in the elevations, but very well in the pencil perspective, a sketch showing true architectural feeling and an entire absence of vulgarity or claptrap.

"A Circle with horizontal Streaks": a beautifully-drawn design of pronounced Early Gothic type, somewhat French in feeling, with an admirable plan; the whole the work of a thoroughly-skilful and practised hand. Like one or two others, the author accepts the oblique line of the east front, and adapts his east rooms and corridor to it, getting rid of the odd angles very cleverly by throwing them into areas and inferior rooms. The surveyor's office has the proper (north) light, and the courts and accessory rooms are most compactly planned, also the municipal offices; and there is not a foot of room wasted. Almost the only fault that could be found with the plan is that the east and west corridors on the ground-floor would be rather insufficiently lighted. The design is very pure in detail, sufficiently symmetrical, but in regard to fenestration expressing more or less the internal varieties of plan. The design is of the highest merit in its way; perhaps a trifle foreign-looking for the neighbourhood.

"Ex et nostra Jura": the plan has points of similarity with the last-named, but is not so successful in its grouping. The design is Gothic of an English domestic type, quiet and picturesque, except in regard to the tower on the north front, which is rather ambitiously designed with an open stone arcaded lantern; the tower and lantern are a little thin and wiry, and the detail generally might be improved, but there is much merit in the whole, and the tower would be a fine and characteristic object from a dis-

tance. An alternative plan is appended, with Classical elevation; not so good.

"Congress": this is meant for a very grandiose design, but it only succeeds in being tawdry, and the plan is a mere labyrinth.

"Well Considered": a rather grandiose and rich Classical design, strictly symmetrical, and very well proportioned in detail. A large and ornate main story with circular-headed windows rises above a rusticated basement with square windows; rusticated masses at the angles, crowned with "pepper boxes," and a tower in the centre of the north front, which looks very elegant in elevation, but not so satisfactory in the perspective, where we see that it is set back from the front and stands on the slope of the roof. The main design looks very well in the large perspective drawing, but the author has shirked the difficulty of the oblique angle of the east front, which would sadly throw out his cubical composition. The plan is a good practical one, though not equal in this respect to some others, and is very defective in treatment in parts; *e.g.*, the manner in which the principal entrance corridor leads to a mere corner of the principal stairs projecting into it, and the assembly-room is poorly treated on plan. The large perspective seems to have won the design favour, and it looks fine in a somewhat hackneyed manner, but it would be a very costly one to carry out, and would not look so well from other points.

"One of Many": a plan with very good points in it, especially noticeable for the arrangement and lighting of the entrance passages and corridors, and the accessory rooms to courts and assembly-room. The entrance to the town-clerk's offices is badly placed in an ill-lighted corner, and the surveyor's offices have bad light and aspect, but apart from these defects there is much to commend in the plan. The exterior design is English Geometric Gothic, treated in a very refined and pleasing manner, and very suitable for its purpose, and the upper stage of the tower is good. There is the acoustic mistake of a circular ceiling to the assembly-room again; but in the main this is a very good design, both practically and artistically.

"Comma in a Circle": a very fine set of drawings of an elaborate (and expensive) Gothic design of Continental leanings; the plan is open to criticism in regard to the confined space allotted to public entrances, to the courts and municipal portion; the main staircase, and the lighting generally, well managed: the muniment-room, however, opens out of the public waiting-space instead of direct from the town-clerk's department. The large exterior perspective looks very fine, and the treatment of the upper stage of the tower is original and exceedingly effective; but, besides its costliness, the style appears to us somewhat pretentious for the locality.

"Yorkshire": the plan is too rambling, and indicates want of experience; the exterior is a Classic design, with some originality and cleverness, but sadly vulgar in detail.

"Let the Best win": a magnanimous motto, which would leave no chance for the author, who has not a notion of planning; but his exterior design (Gothic) has some commendable originality, especially in the treatment of the west front; the perspective is, in fact, very pleasing in general composition and manner, though rather scratchy in execution.

"Phœnix": a plan which looks well at first from its symmetry on paper, but the simplicity is more apparent than real; there is a want of purpose and grouping, and such mistakes as a lavatory and w.c. for general use close to the door of the ladies' cloak-room, &c. The author deserves credit, however, for his first-floor plan, which is good in its arrangement of approaches to the courts and assembly-room, and he is one of the few who has attempted to give some special dignity to the assembly-room entrance. The almost total isolation of the two halves of the building on this floor might, however, prove inconvenient. The design is Italian, with a simple treatment, without any order, looking well *en masse*, but common-place in detail; the author, like some other competitors, treats the building as a symmetrical cube, carefully avoiding the point of view from which the oblique side would come in. This should be borne in mind by those who have to adjudicate on the drawings; it is impossible that a rigidly symmetrical design can be made to do upon an unsymmetrical site, and if any one of these symmetrical cube designs is chosen, it will either have to be altered, or the blunder will be obvious after it is built.

"Saxon": the plan is very good, in regard to entrance-halls and corridors; the columned principal entrance-hall is good; but, considering the general merit of the set, there are curious defects in detail,—such as the access to ladies' and gentlemen's cloak-rooms, and the ladies' and gentlemen's retiring-rooms opening right out of the end-wall of the assembly-room, &c. This is a pity, for the exterior design (Jacobean with Elizabethan touches) is one of the pleasantest and most picturesque in the room, and also one of the most suitable to the general character of the town and locality. The author sends a water-colour sketch of an alternative Gothic design, which also has considerable merit. He seems to be more of an artist than a practical man.

"D in a circle": the plan is utterly without system,—*e.g.*, witnesses' room on the west side of the ground-floor, while the courts are at the east side of the first floor, and other absurdities. It is astonishing that any one who is even able to draw out a plan neatly should not have learned better than that.

"Caller Herrin": a plan rather wanting in system, and ineffective in regard to main entrance and staircase. The design is a good one, of mingled Jacobean and Queen Anne characteristics, with very effective fenestration, and a picturesque tower. Architecturally, it would have considerable claims, but the plan would require so much improvement as almost to amount to a fresh scheme.

"Lux" is one of the few for which nothing can be said either in regard to plan or design.

"Utility": a motto which one is sure to find attached to one of the most unpractical designs in a competition. The whole merit of this design is artistic; the exterior perspective is a really pretty and tasteful Early English building, designed apparently with true architectural feeling, but practically it is full of defects—dark corridors, absurdly small windows to the business rooms, one corner of the tower standing on a very small and insufficient pier coming down in the middle of a committee-room, &c.

"B in a Triangle": the author of which states that he has adopted the English style of the sixteenth century. If he can find any of the details he uses in buildings of that century he may make a new contribution to architectural history. Apart from this mistake, his design, which is shown in a very fine set of drawings, has some merit and picturesqueness, but is little more than a working up of details, wreaths and scrolls, in the pseudo-Classic way that has come into fashion; it is a draughtsman's design rather than an architect's. The plan shows a pretty good general arrangement on the ground-floor, but with many defects of detail, some of them amusing; *e.g.*, the ladies' cloak-room has lavatory and w.-c.s attached, but the gentlemen are supposed to be superior to these needs of nature.

"Finis coronat Opus": the perspective view shows a building with a Classic order, and portico on a rusticated basement, in the style often supposed to be proper to town-halls, and sufficiently well treated, though with nothing to distinguish it from scores of other buildings of the same class. As to the plan, if the author had spent some of the time in studying arrangement and lighting which he has bestowed on lining out the cornices and ceilings of his rooms, he might perh aps have done better. He ingenuously labels one room, "dark closet," but the same description would apply to nearly all the corridors and many of the rooms.

"Luke xxii. 24"*: we may class this also as a draughtsman's design: it is in the "Jacobean-Elizabethan-Gothic" style, with tall chimney-stacks, and looks well in the perspective view, which is an exceedingly good pen-drawing, and the whole set are capitally drawn; but it is only necessary to glance at such points in the plan as the lighting of the surveyor's offices, and the placing of the w.c.s in the cloak-rooms, to see that the author has bestowed none of the practical consideration necessary to produce a convenient and healthy building.

"B and Arrow in Circle": a set of drawings deserving attention; both ground and first floor plans are remarkably compact and economical of space, and the different departments well placed for concentration and communication; the defect is that the corridors on ground-floor are almost entirely dependent on borrowed light through the rooms, and the upstairs committee-rooms are lighted from a very narrow central area. The design is in the style we should be inclined to differentiate as "Manchester Gothic," rather heavy and chamferesque in detail, but it does not show to the best advantage in the plain-lined elevations (there is no perspective): it has the merit of distinguishing the internal arrangement very well in the treatment of the exterior, and a dignified river-front is obtained by the treatment of the range of windows of the assembly-room, which is the best part of the design. The tower seems a little narrow for its height, even allowing for the effect of geometrical elevation.

"Garianonum": this set of drawings is by a clever hand, but the plan will not do—it is too full of angles and elbows, and the corridors are too narrow. The best point is the "ante-hall" to the assembly-room, over the entrance porch. It is astonishing to find in a design obviously not by a novice such an absurdity as the idea of providing w.c. and lavatory accommodation for judge and magistrate in an apartment in the middle of their rooms, and lighted through the floor of the room over. Where is the ventilation for the w.c. to come from? The exterior is a rather heavy but grandiose Italian design, with a rusticated order above a rusticated basement; the main entrance marked by a low square tower with a Doric order and cupola; the whole is rather heavy, but is treated with true architectural feeling.

"All's Well": a very ambitious Gothic design, differing from nearly all the others in having the principal part of the design at the angle (N.W.), instead of the centre of the north front, in the shape of a large and elaborate but not very effective tower. The author has given rather a gewgaw effect to the elevations, which they might not have in execution, by leaving a good deal of rather thin tracery white against the black tinting of the windows; but there is considerable merit in the two Hall Squa e e'evations, though the thing generally is quite overdone and exaggerated. In the plan the doors are too narrow, but there is a good deal of merit in the arrangement of the entrance-hall stairs, cloak-rooms, and lines of communication generally. It is a mistake, however, to keep the public staircases to the two courts entirely separate and so far from each other; one staircase should admit the public to either. The design is not one likely to be chosen, but it is a spirited effort, probably by a young designer.

"Pom": an obviously youthful effort, showing some feeling for breadth of treatment in the exterior design, though singularly unsuitable.

"Y in a Triangle": the plan is almost absurd, with long rooms with little windows at the end, and staircases got in almost anyhow; yet the elevations and perspective, in a quiet, tasteful, Italian manner, are very commendable, and look like the work of a good hand. It is difficult to believe they are by the same hand as the plans.

"Labor et Spes": a very defective plan; cloak-rooms with hardly any light, and no external ventilation for closets, &c.: the design, as in the last case, much better; a quiet, unassuming Early Gothic design, of English character, looking very well in the perspective. It is astonishing how many more people seem able to design (or, at least, to *draw*) than to plan.

"Virtute non Viris": the author has rather primitive notions of planning, for he puts w.-c.s as the culmination of long vistas of corridor, and the ladies' cloak-room directly facing the principal entrance-door. The ground-plan, however, is not without good points. The design seems an experiment in search of originality, with rather singular results.

"Circle": like the last, an obviously young effort; the author seems to have some notion of effect in regard to the approaches to the assembly-room, but spends a great deal of space on them. The design can hardly be seriously criticised.

In concluding our remarks on the drawings, we should like to say a word in regard to the choice of a design in reference to the prevalent character of the place. Yarmouth is not, and is not likely to become, a *grand* town, but it is a very characteristic and picturesque one, and we cannot but feel that the erection of a building of a very formal Classic character would be out of keeping with the associations of the

* "And there was also a strife among them, which of them should be accounted the greatest."

place. The site itself is irregular in plan; the building stands unsymmetrically at the end of a long open space, and on a quay where shipping are constantly lying, and the character of the adjacent parts of the town is homely and picturesque, rather than what is sometimes called "handsome." All this seems to suggest a building picturesque and slightly domestic in style, rather than palatial: a building of the latter character would seem an interloper. The flat nature of the surrounding country, and the neighbourhood of the sea, would render a tolerably high tower or lantern effective from a long distance, and one or two of the designs offer good suggestions for a picturesque way of doing this without attempting anything too costly.

Having regard, lastly, to the unusual amount of labour, and, on the whole, of ability which the collected drawings display, we earnestly press on the authorities the necessity of calling in an able and impartial professional adviser to adjudicate, so that at least the many who must be disappointed in the result, may not have the additional mortification of having to complain of injustice from a choice based on insufficient practical knowledge of the subject.

THE COOK STATUE.

THE colossal bronze statue of Captain Cook, now temporarily erected in Waterloo-place, opposite the Athenæum, has become the centre of a good deal of attention, arising, perhaps, as much from interest in the man and his history as in the figure as a work of art. We retain in England a very loyal and lasting admiration for those who in times past have done something to identify their country with great discoveries, and with deeds of enterprise and heroism; and among such names that of Cook is certainly not the least, and claims all the higher honour from the fact that he really and truly became a martyr in the cause of geographical discovery. There is, therefore, no doubt as to the fitness of such a mark of honour to his memory as the erection of a statue on the shores which he added to the English empire: the work cannot count among the number of merely "official" statues which have too often been set up on English soil. Whether the statue, regarded from an artistic point of view, is so entirely satisfactory, may be a matter of question. Mr. Woolner, the author of the work, has enjoyed for some time a great and well-merited repute as a memorial sculptor. Since the lamented death of Foley, indeed, his reign may be said to have been undisputed, and his claim to distinction is ratified by a good many fine and highly successful works, among which we recently recognised and paid all due honour to his statue of John Stuart Mill on the Thames Embankment. We shall not, therefore, be suspected of any feeling prejudicial to the artist if we say that we cannot quite regard this Cook statue as an equal success with some which have preceded it. The moment chosen by the sculptor is that when Cook first caught sight of the land which he was expecting to see, and he is supposed to give expression to his feeling by raising his right hand with an action which one may suppose to be accompanied by the exclamation, "There it is at last!" or some equivalent phrase. At the same time the left hand, holding the telescope, is dropped,—the telescope is no longer wanted. This is dramatic and real, no doubt; but the question forces itself upon one,—Is it a suitable incident for sculpture? It is very well, of course, to see once, and one feels that the action in itself is appropriate; but in the case of a statue which is to stand for an unlimited time exposed to public view, we very much question whether such an attitude and *motif* will not in the end be felt to be unsuitable to sculpture,—to be even in a degree annoying to those who have to see and pass it every day. It must be admitted that the idea is not commonplace. Mr. Woolner seldom or never is commonplace, and this is a good deal to say; but at the same time we cannot but feel that sculpture,—more especially open-air sculpture with a memorial object, should, above all things, be calm and quiescent in feeling and design; and that a pointed and momentary action which at first appears impressive ends by becoming somewhat annoying and irritating to a daily spectator. As far as this special work is concerned, the deed is done, and criticism is, we presume, too late; nor have we any wish to say that the work is not a success. But some allusion to the marked action of the figure, as a possible source of ultimate failure, seems called for; the rather in consideration of the somewhat overstrained and exaggerated praise which has been lavished on the work by certain critics, who seem to be under a special impulse of admiration for everything executed by its author.

Apart from this question of want of repose, the statue seems successful. The face shows considerable character and individuality, and the sculptor has shown much ingenuity in treating a costume in itself little suited for sculpture, making the most of the folds of the coat as a means of relieving the surface and getting light and shade. Still, we cannot say that the work commends itself to our judgment as a whole, having regard to the special aims and requirements of sculpture, and to principles which some may think old-fashioned, but which even now cannot be departed from or ignored without producing dissatisfaction. The unsatisfactory effect would have been to some extent counteracted if the left hand, at all events, had been in an attitude of repose and quiescence; but this is hardly the case; the arm is dropped from what we may suppose to have been its previous position with the telescope, but it is only half dropped, it is not in repose; the hand still grasps the telescope, and the weight of it still rests on the arm which is only partially depressed. Thus the whole figure is in a transition state of action, and this we hold to be a mistake in sculpture, in spite of the many excellent qualities in which no production of Mr. Woolner's is wanting.

ARCHITECTURAL AND SURVEY CONDITIONS OF THE PROPOSED TOWER BRIDGE.

THE subject of the proposed Tower Bridge is one of great importance. Regarded from an architectural point of view, the proposal contemplates the erection of a noble structure of the first class, the successful execution of which would form a striking ornament to the great water-way to the metropolis. The highest skill requisite for the engineer, the most perfect taste competent to the architect, would be taxed to produce a design worthy of the country and of the age. But there is a special reason why all persons interested in architecture, and desirous of the preservation of our existing monuments, should support the project of a bridge or other crossing of the Thames in the vicinity of the Tower. Humiliating as the confession may be, it must be admitted that it is to the adoption of some scheme of the kind that we are now bound to look for the best chance of the maintenance of London Bridge. In spite of those architectural reasons which, perhaps, commercial men may be pardoned for undervaluing; in spite of those engineering considerations, brought forward once and again in our own columns, which it might have been anticipated that no men possessing ordinary common sense could undervalue, the City authorities seem determined, if they can do it, to tinker, or, as they say, widen, London Bridge. It is quite possible that the days of this noble structure, as well as those of its graceful sister, named in honour of the Agincourt of 1815, are numbered. The Thames is, year by year, becoming more and more alive. The causes which have lately been detected as operative on the Po and other great European rivers, are actively modifying the channel of our metropolitan stream. In 1799 the range of spring tides at London Bridge, as ascertained by Russel and Greaves for the Trinity Corporation, was 15 ft. In 1877, according to the paper presented by Mr. J. B. Redman, C.E., to the Institution of Civil Engineers (read March 27th, 1877), the range was 20 ft. 9½ in., giving an increased range of 69 in. in seventy-eight years—an increase hard upon 1 in. per annum. Of this increase as much as four-fifths is probably caused by the additional height to which the river rises at high water, from 9 in. to 12 in. being the lower depression of the low-water line.

These observations show that nearly a third more water rushes up with the flood past London Bridge than was the case in 1799; and, independently of soundings, it is clear from this fact alone that the channel must be deepened by the increased scour. As to the actual comparisons of depth, they must be taken with some reserve, as there is some danger that they may be so framed as to point to a foregone result. But, as the matter is brought before the public, it is stated that the channel of the Thames through London has been lowered as much as 10 ft. since the removal of the great obstruction to the tide caused by old London Bridge. It is stated that between the years 1823 and 1865 the low-water level between London Bridge and Teddington Lock has been lowered to an average extent of 3 ft. There is no doubt that it has been considered necessary to protect Waterloo Bridge by strong stones around the piers,—a procedure which has caused a backing up of the water. We desire to avoid being thought alarmists; and the more especially so from the recollection of the storm of hostile comment excited by our remarks (*Builder*, Nov. 14, 1868) on the danger to which we feared that the stability of this beautiful structure was exposed. The engineer to the Metropolitan Board of Works now declares that it will be necessary to protect the piers by additional piling; and the account which, within the past week, we have received from an architect who, though unconnected with the bridge, lies under some considerable responsibility with regard to important structures in the metropolis, is so definite and, we may add, so threatening, that we prefer recommending those who take an interest in the subject to look at the Middlesex abutment of the bridge for themselves rather than say more at the moment.

This much, then, must be clear to the most limited capacity (supposing the slightest elementary knowledge of the features of a bridge to be possessed), that with the volume of tidal oscillation of the Thames increasing, the volume and rapidity of its land-floods increasing, and the channel of the river deepening, the foundations of London Bridge cannot be with safety tampered with. These foundations were, according to the wish of the corporation, laid in a spot not approved by the engineer. "It should be observed," says Sir John Rennie ("Autobiography," p. 174), "that the old bridge stood, as it were, upon a hill, the foundations of the piers being from 28 ft. to 30 ft. above the bottom of the river immediately above and below it, occasioned by the great fall and scour produced by the contracted waterway." The new piers had to be founded in water which was 28 ft. deep at low-water spring tides. The piles of the coffer-dams were driven 25 ft., and the bearing piles within the coffer-dam 22 ft., into the stiff London clay, which formed this sub-aqueous hill. How perilous such a position may become, notwithstanding the casting of stones into the deep holes worked by the old scour, in consequence of the erosion of the channel of the river, must be tolerably obvious; and when we add that, after the fifth arch,—the first on the Surrey side,—was keyed, "upon levelling the piers it was found that the east end had subsided from 10 in. to 14 in. more than the upper or west end," which, Sir John Rennie adds, "I could account for in no other way but that there had been a greater scour here than at the upper end, and that the piles had been, to some extent, laid bare," it is evident that it is a matter of imminent peril to attempt to throw any additional weight on the foundations of London Bridge. It may be added that the foundations of Cannon-street and Charing-cross Bridges were sunk 25 ft. into the bed of the river, and for the most part penetrated stiff London clay with beds of septaria. In the present state of matters we find that old Blackfriars Bridge and old Westminster Bridge have been successively undermined and thrown down by the change in the Thames attendant on the removal of the barrier caused by old London Bridge. Waterloo Bridge shows signs of distress. London Bridge, to say the least of it, demands careful watching. Under these circumstances it is unquestionable that anything which may divert the mischievous industry of the City authorities from an attempt to widen London Bridge must be welcomed by all who are anxious for the preservation of a very noble structure; and that feeling is a very great point in favour of the erection of a bridge at the Tower.

But the more desirable, in the first instance, the construction of such a bridge may appear to be, the more needful is it that the wisest steps should be taken, and the fullest information collected, before a Bill on the subject is brought into Parliament. As to the architectural features of the three designs somewhat hastily printed by Sir J. Bazalgette, we may have a word or two to say. But we have no little way to make before we come to the question of elevation. The fact that a gentleman who knows so much of the traffic of the East of London, and who has personally done so much to link together

the opposite shores of the Thames, as Mr. P. W. Barlow, should feel so strongly on the subject as to publish a pamphlet "to prove that a new bridge east of London Bridge is unnecessary," is in itself a reason for caution. The Metropolitan Board can very ill afford to make any more Parliamentary mistakes. And if a Bill for the crossing of the Thames east of London Bridge is to be passed at their promotion, they will have to adopt a line of policy very much more cautious and wise than that which has cost them (we have been informed) many thousands of pounds for the two abortive Water Bills of the present Session.

The fact that the traffic over a Tower bridge must be, to a great extent, created rather than diverted, is one which, so far from absolving the promoters from the obligation to prepare full and accurate tables of existing traffic, renders that obligation all the more imperative. We have first to remember how the facility of crossing the Thames at the spot where a bridge has existed certainly from the time of the landing of the Romans at Shoeburyness, in the second invasion of England, under the reign of the Emperor Claudius, has determined the whole stratigraphy of London. To the east of that ancient north road which runs through Bishopsgate-street, all the eastward and westward running roads have a tendency towards a centre a little to the north of London Bridge. On the south there is somewhat more irregularity, owing to the fact that while a city lay on the north of the Thames, a marsh lay on the south; but there is still the same disposition to be observed. The earlier commercial stratigraphy of London has thus grown up on two principles. One is that the river is to be readily approached, all along its course, as a main channel of commerce; the other, that the river could not be crossed by vehicles east of London Bridge. It is not only possible, but to be expected, that if an eastern bridge is built, first traffic, and next the rebuilding and straightening of streets, will follow the new centre of intercourse. But this is not a thing to be jumped at. We must know accurately what traffic exists which such a bridge would serve, and what facilities are offered to this traffic by the construction, before we presume upon the creation of new traffic, or even on the diversion of any considerable portion of that now existing.

As to this, Sir J. Bazalgette's report is rather conspicuous for the absence than for the presence of anything like a careful study of statistics. The Appendix gives, first, the distances between the existing metropolitan bridges. This is an aid to a study of the map of London. It then gives gradients of some existing thoroughfares in the metropolis, and also of the approaches to the metropolitan bridges—useful information, to a certain extent; but only really useful when the character and amount of the traffic over these gradients, and the manner in which it is affected by them, is also ascertained. Lastly, it gives distances by alternative routes over London and Tower bridges; an aid, as in the instance of the first appendix, to the study of the map,—but a matter of but little available use without the addition of a statement of the traffic using the existing lines, and of the advantages offered, not only in distances on plan, but in work to be done by a horse, by the using of the proposed rather than of any existing route.

In addition to these inadequate appendices, Sir J. Bazalgette adds a note "illustrative of the large amount of heavy traffic carried on in the vicinity of the proposed bridge." But the instances cited have nothing to do with crossing the river. They refer only to that part of the traffic to which we have before referred as radiating from the wharfs and banks of the river itself into the city and country. "4,000 casks of butter" may, very probably, be despatched from Brewer's Quay in one day; but it does not follow that one of them is carted over London Bridge. It may be true that half of them are. It may be true, on the contrary, that all the foreign butter taken by the Surrey merchants and tradesmen is landed on the south bank of the river. These are points which it is needful to settle. 3,000 vehicles may pass through Eastcheap, 7,000 through Gracechurch-street, and 2,000, chiefly heavily laden, through Thames-street, daily, as Sir J. Bazalgette says. What has that to do with a new bridge? What we want to know is the course and amount of the present traffic, and the reason that exists, from the determination of this element, for concluding that a bridge near the Tower will divert a considerable portion of it. That such will be the case we should, in the first instance, anticipate. But confidence can scarcely be placed in a recommendation which so decidedly blinks the very cardinal features of the case as does this note of the engineer to the Metropolitan Board of Works.

With regard to the population lying east of the new proposed bridge, which Sir J. Bazalgette puts at 813,000 on the northern bank, and 390,000 on the southern bank, and for whose convenience, as pedestrians, he claims a saving of from half a mile to a mile and three-quarters by the use of the new route, the same remark occurs. Is there any traffic of note now across the river,—by boat, or by the small Tower tunnel? What has become of that steam ferry, of the opening of which we heard so much, but which might be at the Antipodes for any thing we have heard of it since? Mr. Haywood, we believe, has taken the traffic, both horse and foot, over London Bridge. Has Sir J. Bazalgette ascertained how much of this traffic runs westward on the south of the bridge and then returns to the eastward on the north, or *vice versa*? Without these facts we are nowhere. It is the duty of an engineer who undertakes so great a responsibility as the recommendation of an outlay of a million and a quarter of public money, to gather up and properly collate the fundamental facts before he enters on the more easy and fascinating occupation of the design of a mighty bridge. Here Mr. Barlow comes on the scene, and does so, we regret to find, in a manner eminently unsatisfactory. It would have been most welcome if Mr. Barlow had come in to fill up the gaps which the Board of Works appear not to have observed in the report of their engineer; and to point out how much relief his knowledge of East London authorised him in expecting from the construction of a bridge near the Tower. We confess to disappointment at the fact that Mr. Barlow's view is directly opposite to this. But, that being the case, we are scarcely less disappointed that he should have given us no further information than he has done. No one would have grudged sixpence for a pamphlet of eighty lines, — albeit, it is a price for the matter contrasting very much with that paid for a weekly or daily journal,—if those lines had been conclusive. But they are not. Mr. Barlow produces a disagreeable effect; and that is all. The figures which he cites are not so marshalled as to carry to our minds the same inferences that they suggest to Mr. Barlow. We decline to believe, until further proof, that there are 57,000 fewer passengers daily crossing London Bridge in 1878 than there were in 1865. True, Mr. Barlow does not say there are, but he intimates as much. If such be the case, it ought not only to be proved, by direct enumeration, but explained. What has become of them? When we see the daily traffic of 1867 compared with the January and February traffic of 1875, we see an unfair comparison. We do not see how the figures of 161,874 daily passengers in 1867, and 104,159 in 1875, are arrived at. Pending further instruction, we think that imperfect data must be used. Having said so much as he has done, Mr. Barlow owes it to his own dignity and repute as a volunteer writer on the subject to say something more,—something that, one way or another, may be of use.

It is true that when he says, "the passenger-traffic of the whole district" (that is, apparently, of the Bermondsey and Tooley-street line of road) "is represented by one omnibus every quarter of an hour daily, and the daily number of carriages of all kinds passing to Tooley-street and from London Bridge was found on investigation not to exceed one-eighth of the traffic over London Bridge," we must be pardoned, in the public interest, for asking for chapter and verse, as to the investigation on which his statement is founded. We should like dates, and numbers. An investigation of that nature is, as we have before intimated, in our opinion, the first duty of an engineer consulted in such a matter. If it has been made, and if the outcome is as Mr. Barlow says, what is the meaning of the report of Sir J. Bazalgette to the effect that Great Tower-street, Eastcheap, London Bridge, and Tooley-street would, by the new bridge, "be relieved of the additional crowding from traffic which is foreign to them, and which, by being carried through them, is unnecessarily destructive to the despatch of business within the City and beyond it?" On the one hand we have the "constant blocks" in these streets of Sir J. Bazalgette's report. On the other hand we have the one omnibus per quarter of an hour, and the one-eighth part of the bridge traffic, of Mr. Barlow. Which are we to take?

The fact is that the whole matter has yet to be brought from the region of the wildest guess work into that of sober engineering report. What the public interest demands is, that in a matter of such essential national importance no local body should rush in to produce a theatrical effect; or to have the opportunity of laying out a million or two of public money, without proper consultation with those other public bodies under whose care, charge, and responsibility London has grown to her present grandeur. In speaking of a bridge over the Thames, the first public body to be consulted should be the Thames Conservancy. It is a body of the highest corporate dignity, charged with important functions, which it has discharged to the public satisfaction; and its sanction would clothe any project of the Metropolitan Board of Works with a respectability which has unfortunately hitherto been too often wanting. Mr. Redman, in the discussion at the Institution of Civil Engineers to which we have before referred, said "the Thames Conservancy Board had shown that they fully appreciated the fact that every vertical inch of tide, and every ton of water, was of vital importance to the sanitary and commercial prosperity of London." Mr. Firth, in whose large and industriously collated book on "Municipal London" veneration for the powers that be is signally conspicuous by its absence, in giving tables of the income and expenditure of the Thames Conservancy Board since its formation, says,—"As far as the accounts and reports of this body can be accepted as *indicia*, we should say it was one of the most useful and well-managed organisations that take part in the government of the metropolis, or of any place within its limit." The report of the engineer to the Thames Conservators, objecting to a low-level bridge at the Tower, is cited by Sir J. Bazalgette. In order for any scheme of the kind to come before the public with that weight and authority which should ensure success, the sanction and hearty approval of the Thames Conservators is a first requisite.

Next comes the officer of another authority. The City Architect and Surveyor has, from time to time, given results of statistical observations of the first value. It is more than probable,—judging from the terms of some of his former reports, that he could, merely by consulting the records of his own office, throw a flood of light on the question before discussed of the traffic over London Bridge, and of the channels into which it is divided. It seems that the City Bridge Committee, in 1877, reported in favour of a low-level bridge between Little Tower Hill and Iron Gate Stairs on the north side, and Horselydown-lane and Stairs on the south side of the river. It is, therefore, to be supposed that the Bridge Committee, or the City Architect, have before them that statistical evidence as to the need and advantage of an eastern communication, which evidence the Metropolitan Board of Works seem to consider so unnecessary. And it must be remembered that before any one is in a position to enter on the discussion of the respective advantages of high level, low level, or subway, it has to be shown that it is wise and proper to lay out a million or so for any structural mode of crossing.

Instead, therefore, of a scramble who shall first propose a grandiose scheme to Parliament, the public interest demands a much graver and more dignified course. The City authorities, from their prescriptive rights, may claim to be first consulted. We think there can be no doubt that they erred grievously, fifty years ago, in compelling Rennie to adopt a line for new London Bridge, which has been attended with serious disadvantage. They are now, in our judgment, in manifest and demonstrable error in wishing to widen London Bridge. The more reason that they should come in contact with other authorities, no less interested in the conservation of the river and its approaches than themselves. A committee of conference of the Bridge Committee of the Corporation, the Conservators of the Thames, and the Metropolitan Board of Works, would be a body commanding by their officers ready access to all the main facts on which the final decision should be based, and one of which the dignity and *prestige* would rightly command general respect.

We have left ourselves no space in which to revert to the purely architectural question. On that we shall have something to say, perhaps, by-

and-by. But the main point to bear in mind is, that it is not merely the engineering question of how to cross the Thames, which is on the *tapis*, but (supposing a bridge to be decided on) the architectural character of a bridge spanning the most ancient, and in some respects the most important, highway to our metropolis.

We see no excuse either for lavish expenditure on the one hand, or, on the other hand, for that poverty of invention, disguised under the undeserved name of economy, which has already afflicted the Thames with some of the ugliest structures ever erected on our planet. We trust that some eminent representative of the architectural profession may have, at least, a consultative voice in the matter, and that the bridge, if bridge there be, may have some of the merit of such a structure as the noble arch over the Dora Riparia, at Turin, instead of being (in words of which few will doubt the authorship) one of those "changed by modern art into gridirons, with blinkers at the sides to keep you from seeing the river, unless you are dropped into it, and burnt to prevent your being drowned." We put in a claim that architecture should be represented in any serious discussion as to a new Thames bridge, and that such a structure shall not be regarded, if it is to be carried out, as a mere question of engineering.

THE RECOMMENDATIONS OF THE COPYRIGHT COMMISSIONERS IN REGARD TO WORKS OF ART.

THE Royal Commission appointed in 1875 to inquire into the laws and regulations relating to copyright has at length made its report. The death of its first chairman, the late Earl Stanhope, who took a peculiar interest in the subject, both from his own literary labours and his legislative efforts in regard to it, was a serious blow at the very beginning of its career. So that practically it was not until the spring of 1876, after the readjustment of the first Commission, or, rather, the appointment of a second, that the investigation into the subject of copyright actually began. We do not intend to touch upon those portions of the report which are connected with literature, but the parts which affect the fine arts are of sufficient interest to the readers of the *Builder* to deserve some notice at our hands.

It is obvious that whether or not actual changes should be made in the principle of copyright in works of art, the present law requires consolidation and assimilation. For there now exists a copyright in engravings and similar works for a term of twenty-eight years from the date of publication,—a protection which originated in the year 1735 under the Act 8 Geo. II., c. 13. But when we come to the more important class of paintings, and the scarcely less important one of drawings and photographs, we find that the term of copyright in these works of art is, by a later Act passed in 1862 (25 & 26 Vict., c. 68), the life of the artist, and seven years after his death. Moreover, there is, under 54 Geo. III., c. 56, ss. 1 & 6, a separate term for sculpture, since the copyright in a statue endures for fourteen years; and if the artist is living at the end of this period, then for another fourteen years. The absurdity of such inequalities is quite obvious; it is ridiculous that if two sculptors produce each a work in the same month, and one lives for fourteen years and one month, and the other for thirteen years eleven months and ten days, the family of the former should have a copyright for another fourteen years, whilst the children of the latter must be deprived altogether of their father's right. Such being the case, and since it is unnecessary for us to point out its unreasonableness further, we may say at once that the Commissioners make the following suggestions for the amendment of the present law: — "We, therefore, propose" (Report, p. xviii.) "that the term of copyright for all works of fine art other than photographs, shall be the same as for books, music, and the drama, namely, the life of the artist and thirty years after his death. We further recommend that it should be open equally to subjects of your Majesty and aliens to obtain copyright in works of fine art; but aliens, unless domiciled in your Majesty's dominions, should only be entitled to copyright for works first published in those dominions."

In regard to sculpture there is also a further recommendation that every form of copy, whether by sculpture, modelling, photography, engraving, or otherwise, should be included in the protection of copyright, and that copies of statues from the antique should be as much protected as original modern works. So much as to the primary right to copyright in works of art, but there yet remain some secondary questions which have given difficulty to the Commissioners. These relate to the assignment of copyright on the sale of a picture. For at present the author of a picture has the sole right of copying or engraving it, unless it be sold, in which case the painter cannot retain the copyright unless expressly reserved to him by an agreement in writing. But, on the other hand, this right does not belong to the purchaser unless there is also an agreement to this effect. The consequence is that the copyright of many pictures now becomes public property, but from the fact that most of these are in private houses no consequences follow.

The Commissioners, after going through the various views which have been put before them, finally arrive at the conclusion (Report, p. xx.),—"That in the absence of a written agreement to the contrary, the copyright in a picture should belong to the purchaser or the person for whom it is painted, and follow the ownership of the picture." And they enlarge, or rather make, this recommendation clearer by stating that they would not allow the artist to make *replicas* of a work which has been sold, without the consent of the owner. The creator of the picture would have, after its sale, no more rights than any one of the general public.

It will have been noticed that in the term of copyright in works of art generally, photographs were expressly omitted. The Commissioners, in regard to them propose that the term should be thirty years from the date of publication, and that in regard to them and also in regard to engravings, prints, and similar works, the property in the negative or in the plate should remain in the possession of the artist, but that when a photograph is taken on a commission copies should not be sold or exhibited without the consent of the person who gave the order (Report, p. xxi.). It would appear that an attempt was made by the Institute of British Architects to induce the Commissioners to reserve a right to the reproduction of a building for twenty years, and to recommend that copyright in architectural designs should be reserved to the author from the date of erection of a building or the sale of the design. Both these recommendations the Commissioners refuse to entertain, though they give it as their opinion that architectural designs are protected as drawings by the Fine Arts Act, which protection, under the proposal which we have already noted, would be continued. There is, however, a great deal of force in Sir James Stephen's remark in his note of dissent to some parts of the general report (p. lvii.), that "I cannot understand why an artist should have a right to prevent a statue from being photographed, while an architect has no right to prevent the building in which it is exhibited from being photographed." But it must not be assumed from this that Sir James Stephen is in favour of the general principle: what he points out here is that it is unjust to protect the sculptor and give no rights at the same time to the architect.

Besides these main points, there are a few others of less importance, dealing with what we may term the police part of the question,—that is to say, with the search for illegal prints and the seizure of piratical copies which are being hawked about the country. These need not now detain the reader.

We have thus far only given the actual recommendations of the Royal Commissioners, together with some statements of the present position of the question, so that the effect upon existing things will be made clear. But it is obvious that discussions will hereafter arise whenever these recommendations come before the Legislature upon the principle of the subject which is directly touched by some parts of this report, and notably by the remarks of Sir James Stephen. In the first place, we are inclined to think that, assuming, as we do, copyright in works of art is desirable, it should be for a fixed term of years from the date of publication of the work in question. The sole reason for the proposed term,—namely, the life of an artist, and thirty years afterwards,—is the difficulty which is said to exist in proving the date of publication. But for a good many years the term has counted from the date of publication, and though there may sometimes be difficulties in proving it, yet, on the whole, it is much fairer that every work of art should be protected for a limited and certain period, than that there should be practically different terms for different creations of the artist.

But after all, this question of the actual term for which a copyright should exist is very subsidiary to the point whether it is advisable that there should be a term of years in works of art at all, or whether it should only be limited to certain kinds of work. There is a vast difference between works of literature and works of art. This distinction is exceedingly well put by Sir James Stephen, who says, "I approve of copyright in books, because the MS. has no money value till it is printed, and because when it has been printed every copy is of equal value, so that unless a copyright law existed, the author of the most valuable book would have no money reward for writing it. For the same reason, I approve of copyright in engravings, photographs, and other works of art capable of being mechanically reproduced in large numbers, each copy being of the same or nearly the same value as the original. I do not approve of copyright in pictures and statues, because a picture or a statue has a value of its own which is not affected by its being copied. I think that such productions are sufficiently protected by the ordinary law of property, for no copy or cast of a picture or statue can be made without the consent of the owner."

The primary object of copyright is to protect the creations of a producer from being copied, so that authors may be induced to bring forth creations for the benefit of the world at large. Immediately they themselves are benefited, and consequently the world at large is benefited by the production of pleasing or instructive works. But it is evident that under the proposed law, and, indeed, under the law as it now stands, a painter or a sculptor will not obtain, and does not obtain, any material benefits. The copying of a picture or a statue is in reality prevented by the ownership of the person who possesses it, and if all copyright in works of art were to be abolished to-morrow, artists might be not one bit the worse. When a picture has once passed from the possession of the artist, it is in reality an advantage for him that it should be as widely known as possible, and even in cases where a picture is sold for the purpose of being engraved, it would be just as valuable, because the person who bought it would have the sole ownership, and consequently the sole control over it, so that he could prevent any unauthorised person from engraving it. This is evident from the way in which works, say of Sir Joshua Reynolds, the property of private individuals, can in effect be only copied by authorised persons. Further, the Commissioners state that it has been proved to them that when a picture is now sold no mention of the copyright is usually made, so that the right to it in theory is lost, though in fact the possession of the owner practically answers the same purpose. All this, we must say, is contrary to our own experience. The copyright of the majority of important pictures now painted is, we know, reserved, and becomes often the subject of a separate commercial transaction, the amount received for the copyright in some cases that we have known exceeding that paid for the picture itself.

Whether radical changes in principle result or not from this Commission, there can be no doubt that it has done good service by pointing out the anomalous state of the existing law, and suggesting its simplification. Not the least valuable part is the individual labour of Sir James Stephen, who has added an appendix, containing a digest of the existing law, and in a parallel column the changes proposed by the Report, so that whatever changes do take place, there is a reasonable hope that the law of copyright will in future be clearly laid down in a concise and intelligible code, and that intricacies and verbosities of Acts, such as that of 56 Geo. III., c. 56, will wholly disappear from the statute-book. We can only hope that this Report will soon become law, so that, at any rate, literary and artistic persons will have no difficulty in understanding the legal position of a creator of works of literature or art.

House Property. — Messrs. Newbon & Harding sold by auction the freehold residence, No. 34, Soho-square, let at 150*l.* per annum, for 3,820*l.* The freehold premises, No. 15, Dean-street, Soho, let at 55*l.* a year, realised 1,420*l.* In both cases over twenty-five years' purchase.

THE CREUSOT WORKS.

THERE is a similarity to be recognised between the vast Creusot Ironworks and those described in these columns some time ago, of the great gun-founder, Krupp, at Essen, in the Rhine valley. Under the motto, "All for Iron and by Iron," 24,000 persons inhabit a little world of their own, without the interference of judges or police, their affairs being administered by a Mayor, who is, at the same time, a manager. One idea is dominant among them,—how to get up coal enough for use, and, with its aid, how to melt, hammer, flatten, or turn iron into tools that shall do the same, in their turn, with other iron until it assumes form and strength sufficing for the construction of ships, locomotives, bridges, rails, and so forth, down to the smallest trifle in the stock of the ironmonger or the locksmith. Creusot is admirably situated, almost in the centre of France, with free communications on every side, and its industry, concentrated upon the most useful of metals, has a history of just upon a hundred years; but the fluctuations of its fortunes were many, and often disastrous, until the Schneiders, unappalled by the millions already sunk, started the huge manufactory into fresh life, and made it what it is, with its special branch railway and canal, the double town created by itself, and, as at Essen, the contrast between the rows of old and those of new forges. There is a central court, with a row of the former on its right, maintained rather as monumental than as useful,—though they are condemned to shortly disappear,—and on its left a range of workshops with, about a hundred yards further on, the gigantic new furnaces planted like towers along the way. Still farther is the main foundry, with, extending in a line from it, the coppersmiths' and hand-anvil buildings, all roofed with Montchanin tiles, the coke-furnaces, and then a black expanse, where the coal comes up level with the surface of the ground. Six trains a day, of twenty wagons each, feed these hungry fires, and the distance they traverse is no slight one, so wide are the intervals between the several mines. Every now and then a feeder breaks off from the line, and is lost in a tunnel in which, though far away, a strong red light is gleaming. The hill of Rême, however, has the reputation of being the richest in all the group, and the shafts leading down into its depths, as well as crossing and recrossing them, are of immense extent. About 100 yards from the entrance a man can raise himself on the truck into a sitting posture; at twice that distance, he can stand upright, and the thickness of the metalliferous stratum is said to be still increasing. Here, of course, the work is more actively carried on, just as a miner wielding a pick can employ it more ably when erect than when bent double on his knees. From the one mine visited,—that of Mezenay,—three million tons of ore have already been extracted, and it is, of course, the pride of all Creusot. The men, moreover, who pass so large a proportion of their existence in its subterranean semi-darkness, have not the solemn and silent aspect of most workers underground, but are generally clamorous with gaiety, good-humour, and health. One cause may be that, in their annals, fatal accidents have been singularly few. A chain-cable winding on a drum drags them up with their loads to the point whence a tramway descends; a single push puts the cars in motion, and they require no further impulse until their contents are tilted into the furnaces below,—placed at a considerable distance off. Some of the cars have false bottoms, which open mechanically as they pass over the furnace-mouths. It is at this point that attention is attracted by the domestic arrangements of Creusot, since the workmen's houses are scattered far and wide in the vicinity. For five or six shillings a month the iron-miner has a share in a house, with a kitchen, a loft, a cellar, and a garden, four families living usually under one roof,—two on the ground-floor and two above, the latter having separate staircase. In an edifice centrally placed is the general store, where wine, bread, and groceries are sold at cost price, or where meals may be had at a common table. It is computed that, by paying thirty-five shillings a month, a Creusot workman can command a clean room, whatever washing he desires, and food, including bread at all times, and without a limit.

But Creusot does not depend for iron upon the hills of Mezenay alone. It imports large quantities of mineral ore from Berry, the Franche-Compté, Charolais, the neighbourhood of Digoin, from Elba, and from Algeria. These supplies are all brought by train, and flung, almost without stopping the trucks, into the enormous receptacles prepared to receive them, a crowd of invalids, women, and people too old for hard toil being always at hand to prevent waste by picking up any fragments scattered in the hurry of the process. It is, indeed, the coal-wealth of the valley that attracts so prodigious a quantity of iron to be wrought up in its furnaces and foundries; for, as we see, it stands upon a coal-bed which yields an average produce of 200,000 tons a year, of various qualities, but all more or less utilised; half of it being converted into that which the French style "metallurgical coke," in the preparation of which a large number of furnaces, constructed upon an imposing scale, are employed. These are built in tiers, and fed from the railway branches, so that three trains may often be seen at a time standing one above another, on a level with the ground, and at 12 yds. and 18 yds. above it,—a costly arrangement, but which has been found not more costly than its results are profitable. All the qualities and sizes of the coal are, by elaborate processes, separated each from the others; the dirt is washed from among them by powerful water-machinery; and different forms of furnace are designed for their consumption. Numbers of the men engaged in these operations present a strange aspect, with their head-dresses of iron, resembling divers' helmets and metallic masks pierced with small apertures for sight and breathing. It is their duty to ascertain at what moment the coke is at perfect heat, and to release it from below, while drawing down a fresh supply of material from above. The "grand-furnaces" then come into action. They are either round or square towers, from 40 ft. to 60 ft. in height, strengthened round by cast-iron columns, two deep, enclosed within a lining of brick a yard in thickness, and enclosing, in turn, another lining of masonry, peculiarly hard and fire-resisting. The technical names for the several parts would convey no practical meaning to the reader's mind, because they include such terms as "the brawler's mouth," "the ear," "the belly," "the lady," and "the gentleman." When one of these structures is newly erected it is not considered as perfectly dry and fit for use until its interior has been filled with fire, at a white heat, for from fifteen to twenty days. When this has been done, the serious process of lighting begins. The lower part is covered with straw, billets of wood, and dry faggots; upon these a heavy layer of pure coke is allowed to fall in through the top, and then coke and ore in equal parts. But the present object is less to describe the Creusot processes than to suggest an idea of the Creusot establishments. Everything is on a colossal scale; the four blowers, which are really only bellows of a peculiar form, are worked by steam-engines of 800-horse power, and their roaring is enough to frighten a stranger; other immense mechanisms regulate the collection and distribution of gas throughout the works; and each furnace is expected to yield at least 30 tons of molten metal a day, irrespective of failures and flaws, for the supply of the forges, the whole of which, at present in action, are comparatively new. They cover, it is estimated, with the yards attached, twenty-five acres of ground, two parallel ranges of buildings extending to a length of 1,600 ft., with a space of 120 ft. between them. In one of these stand six stupendous steam-hammers, and in another two steel planes, each driven by two hundred horse-power, and the process of bringing the incandescent metal to these engines is a very remarkable one to witness, and not less so the action of the hammermen themselves, who, for their own protection, literally wear suits of armour, huge boots, impervious to splinters and molten drops, arm-coverings of wrought iron, thick leather aprons and metal masks, the wearing of which, however, they say, intensifies the effect of the heat. Beneath another roof Cyclopean scissors are clipping mature bars into bits as though they were gold wire; and next to this is the group of construction workshops, for the shaping of railway-iron, but more especially for the building of locomotives; but these do not call for particular description. To attempt a general idea of these works—they produce 100,000 tons of iron annually, 60,000 tons being consumed by rails, 10,000 tons in sheet-iron, and 30,000 tons in locomotives, ships, bridges, and machinery of every kind, to the value of 30,000,000 fr.; they employ 10,500 workmen, who receive fair wages, whose children are taught, and whose sick and superannuated are cared for. There is a permanent medical staff, with a hospital, a library, a concert-room, and a cost-price market. It is interesting, now and then, to glance over these great industrial establishments of the Continent, and contemplate, if only in a run-and-read manner, their economy.

ST. MARGARET'S CHURCH, WESTMINSTER.

WE printed a few weeks ago an interesting paper, by Mr. G. H. Birch, the Hon. Secretary of the London and Middlesex Archæological Society, on the history of this church, the interior restoration of which is now approaching completion. The result of this restoration is not only a matter of congratulation in itself, but it is also a somewhat significant example, just at present, of the real value of restoration when carried out in a legitimate way and for a legitimate object. A mere comparison with the church as it is now and as it used to be, internally, ought in itself to be a sufficient answer to those over-excited enthusiasts who denounce every attempt at restoration as an act of vandalism, and who would preserve everything that has once been done, however mean, ugly, and paltry, merely because it *has* been done. Those who knew St. Margaret's in its old dingy, dilapidated, and disfigured state, may find matter for unmingled satisfaction in the fact that out of this chaos a really beautiful interior has been raised, far less by actual and positive restoration than by mere clearing away of what ought never to have been there. There might possibly have been a word to be said for the beautifying carried out in what has been termed the "Churchwarden era,"—for the whitewashing and gallerying and pewing,—when it was all new work; when the bill had just been paid, and the promoters of the work were glorying in the renovation of the interior which their wisdom had effected. But when the plaster had become dingy and begrimed, and the woodwork out of repair, there was at least a valid excuse for removing what had never been anything but a disfigurement, and reviving the former design, which had been obscured temporarily by these squalid additions.

St. Margaret's now comes out as a remarkably fine example, for its size, of the Late Gothic interior, the suitability of which to modern worship, on account of its slender piers and open spacing, cannot but be acknowledged, even by those whose architectural tastes predispose them towards an earlier and more robust phase of Gothic. There is much in the appearance of the interior, as at present seen, which reminds us of the open and spacious naves of some of the Norfolk and Suffolk churches of the same date. The mouldings are shallow, and rather wanting in force, certainly, as is the characteristic of the style; but there is a refinement in the effect which goes to atone for this. The dignity, and at the same time the practical fitness, of the arcade design are very much enhanced by the unusually high base of the piers, which, in the absence of the seating, gives dignity and character to the design; and when the floor is covered with seats, is practically good as raising the base so as to render the foundation of the design visible, in place of seeing the piers, as one often does see them in such cases, rising from amid a mass of seats with no visible base. The low-pitched panelled oak roof has a very good effect, merely requiring a little gilding to relieve it; the agreeable combination of gilding with oak has already been tried in the chancel-screen with very good effect, securing a certain amount of brightness and glitter without obscuring the tone and character of the wood. The only thing in the new work which we feel disposed to view doubtfully is the tiling of the chancel-floor. It is surprising that people cannot apparently be happy or devotional in church now without the glitter of glazed tiles, which form really a very commonplace and tawdry source of effect, and give a real point to some of the objections made by the anti-restoration society against the mania for making everything in an old church look brand-new, and destroying the repose of the interior: this is more especially felt in an interior so essentially quiet and reticent in its architectural expression as this one. It seems a pity that no less obtrusive flooring than glazed tiles can be found for restoration work.

The celebrated window at the east end of

course remains *in situ*; to many it will always be probably the most interesting portion of the interior, on account of its historical and archæological interest. To the accepted opinion as to its beauty we demur. It is a specimen of unusually good figure-drawing for old stained glass; but the mass of blue on the ground is an objection to it in point of colour even now, and must have appeared more so before it was toned by age.

The only alteration at present noticeable in the exterior is the substitution of stone tracery for the wretched bars which had been inserted in place of the original tracery. We may presume that the "neat" exterior will be left as it is, since there is nothing left to restore without absolute recasing and designing the whole afresh. We might suggest, however, the removal of the mean-looking little porch at the west end (which looks worse than ever now that the windows adjacent to it have been restored), and its replacement, if necessary, by something a little more architectural in character.

ART MUSEUMS AND THE PUBLIC.

A SHORT debate, which was originated by Mr. Hermon last week, in the House of Commons, in regard to the desirability of affording greater facilities to the public in visiting the National Gallery, gave rise to some suggestions which ought to be kept in mind. The remarks arose in regard to an old grievance as to the entire closing of the National Gallery for a whole month in the autumn,—a proceeding which has often been the subject of protest; but Mr. Hermon added to this the suggestion that the Gallery was closed at too early an hour during part of the year, and the inquiry whether it was necessary that two days in the week should be set apart for students; moving that, in the opinion of the House, "further facilities might be afforded to the public to view this magnificent collection."* This brought up a reference by Lord F. Hervey to the restrictions in regard to the British Museum. The practice of closing this institution at periods very inconvenient to the public has been the subject of so much repeated protest that it has at last been altered, and periodical closing for a week at a time substituted, at fixed times, the announcement of which is affixed to the prospectus of the Museum. But the setting apart of "students' days" is adhered to, and is considered by some people as a grievance; and though, of course, every one may be able to ascertain before going or taking his friends there whether the particular day is an open one or not, the fact is that it is very difficult often to keep in mind which are the closed and which the open days at the two great galleries, the days not being the same, and being apt to get confused in the memory, and people cannot always be looking them up again.

As to the inconvenience of the system of closing for a whole month there can be no two opinions. With a shorter period, a visitor may be able to stay a day or two longer than he intended, or change the date of his visit a little, and so accomplish his object; but there is nothing to be done with a month, when one finds oneself in the middle of it, and with little time to spare. And unfortunately there seems to be a kind of recognised practice of closing picture galleries for a long period in this way. A friend observed to us in connexion with this subject that on the only occasion when it happened to him to spend a week in Edinburgh, he found the Scottish National Gallery closed "for that month," consequently he had never seen it to this day. And this is probably a specimen of what happens to many who are not often able to visit London, and who in this way find one of the most important and instructive picture collections in existence closed against them, and perhaps have not for years another opportunity of seeing it. In regard to this point we do hope that some decided action will be taken by the Government,—a remark which we make the rather because we observed that, in Mr. Cross's reply on the occasion, while concurring with much that had been said, he mentioned this point more doubtfully than any other, and only suggested that perhaps arrangements might be made so that the whole collection need not be closed at the same time. But this would be very little advantage to any one who wished to see one special part of the collection more than another, and who only found free access to the Italian school when he wished to look at the Dutch school, and could only accomplish his object by prolonging his stay for perhaps a fortnight. We most decidedly think this ought to be altered, and that short terms should be taken for the necessary closing of the Gallery, and these carefully selected so as to fall in periods when the fewest visitors may be expected.

The prolonging of the hours of admission in the summer months, when there is daylight for two or three hours beyond the present closing time, is surely a matter of no real difficulty in regard either to the British Museum or the National Gallery. Many men who are closely occupied all day would be glad to avail themselves of such an opportunity of more frequently visiting collections from which at present they really are practically debarred.

The question of students' days is not such an easy one. The use made of our large galleries by students varies very much in different instances. At South Kensington, three days in the week are called students' days, and the influx of the non-student part of the public is gently checked by the imposition of a charge of 6d. for entrance. But, as a matter of fact, when students are there on free admission days, they do not seem to be much incommoded by the other visitors. South Kensington is so rambling a place, so full of quiet corners to work in, that it seldom seems at all crowded, and the moderate number of working students seem able conveniently to perch themselves out of the way of collision with the regular traffic. As to the British Museum, from our recollection during visits on both students' and public days, our impression is that, for some reason, students come in greater numbers on the public days than on the others. Lord F. Hervey remarked upon this, on the occasion we are referring to in the House of Commons, and said that after he had the other day, with some difficulty, obtained leave to bring in some friends on a students' day as a special favour, "not a single student was to be seen, nor anybody except the officials, one of whom was reading a comic weekly paper." It seems hard that any slur should be cast on an official for beguiling his very dreary task of watching all day by reading a comic paper; we only hope, for the sake of the official, that the paper was *Punch*. But the general justice of Lord Hervey's complaint our own observation enables us to corroborate. An indignant art-student assailed Lord Hervey in a letter in Monday's *Times*, charging his lordship with having said that that there were three students' days in the week, which he did not say, and with having gone among the mummies to look for art students, of which there is at least no evidence. But for ourselves we can only say that we have frequently visited the print-room on students' days, and in reaching it have traversed nearly the whole length of the Greek or the Egyptian galleries, and not seen one student; the place being utterly desolate except for the silent white-wanded official. On the other hand, we have rarely been in on public days without seeing a number of students with drawing-boards, sometimes very much in the way of the public, and sometimes surrounded by them in turn, so much so that printed slips have been placed on the top of the drawing-boards to the effect that "you are requested not to look over," or "not to crowd round," the students drawing. So that it is obvious that students do make considerable use of the Museum, but that they prefer to come rather on public days than on students' days. There must be some reason for this; what it is we do not understand; but we have seen enough to feel quite sure that there is reason in Lord F. Hervey's complaint; and we should say that only advantage would result from a discontinuance of the closed days.

With the National Gallery, the case in regard to students is again quite different from that of the establishments at either Kensington or Bloomsbury. There no one can go in on a students' day without seeing that any proposal to admit the public freely on those days might cause inconvenience. The place is crowded with easels, and hard-workers before them, and any large influx of visitors would interfere most materially with the work. Why the student element should be so much more flourishing at the National Gallery than at the British Museum; whether it is that old pictures are more attractive than old marble; or whether the management at Trafalgar-square gives a more liberal and courteous welcome to the student, we are unable to say; but the fact is obvious to any one who has seen the National Gallery on a students' day. If any arrangement were made for admitting non-students on these days, it should be only by a restrictive charge of not less than half-a-crown, which would keep out all but those who had some special reason for coming on those days, and were not mere idlers. Lord F. Hervey cited the practice in a good many foreign galleries, where the public were freely admitted along with the students, and inquired why this could not be done also with a public "so easily regulated as the English." That is true of the English public in regard to all regulations of which the reason is obvious to them; but the fact is, that in this particular kind of thing the English public is an exceedingly stupid public. It cannot see that staring over the shoulder of an artist at his work disturbs and fidgets him; it cannot see that speaking and moving about at a concert disturbs the performers. In these things the English public requires rather more than less restriction than at present exists. But it appears that the National Gallery is the only establishment of the kind in London which can make out a good case, on the basis of the actual facts of the relation between their students and their other visitors, for retaining special days for students. The small charge made at South Kensington on what are termed students' days keeps the galleries quite sufficiently clear. The British Museum has hardly the shadow of a claim to continue its exclusive arrangement, and until better reason can be shown than at present exists for closing it for two days in the week, we opine that it should be thrown open every day to all comers, either with or without a small charge. The chief change required at the National Gallery is as to the times of closing, which might be easily carried out, and which would render the place accessible to many who at present can scarcely get into it, and also prevent disappointment and reasonable complaint from those who find themselves shut out during the whole of perhaps the only month they may be able to be in London for years.

OUR COAL SUPPLY.

WHETHER we define coal roughly with George Stephenson as "bottled sunshine," or with Dr. Siemens as the "accumulation of solar energy of bygone ages," we must trace to the extensive deposits in Britain much of those resources which have contributed to its industrial greatness. We have widely-varying views held as to the exact extent of these stores; we have an increasing demand upon our resources; and we have a variation both in the proportions contributed by the different coal-producing districts, and also in the uses by the chief industries consuming this coal. Great Britain has been prodigally endowed with this potential force. Although it forms so small a portion of the habitable globe, it has a coal area of about 11,900 square miles of coal, out of the 270,200 square miles which are supposed to be the coal area of the globe; and its stores of fuel are drawn upon in a much more than proportionate degree. The coal production of the world has been estimated at nearly 300,000,000 tons yearly, and of this about 134,000,000 tons are extracted annually in Great Britain. That annual extraction has been for a considerable time increasing,—not continuously, but by bounds, with intervening years of depression between. We have no accurate returns of the production before the year 1855, when the output of the kingdom was about 64,450,000 tons; in ten years it had increased to 98,150,000 tons; and though the working of the Mines Regulation Act checked for a year the increase, yet in the last year for which the official returns are procurable the output of coal was for Great Britain and Ireland about 134,000,000 tons. It has been a question much debated of late years, what the duration of our coalfields will be, or, in other words, how long they will support the great and increasing drain upon their supplies of fuel; and it is evident that the question cannot be yet very definitely answered. On the one hand the available coal supply of the kingdom cannot be definitely stated, and on the other, the consumption of coal varies, and the variation is likely to be much increased. At the meeting of the British Association in 1863, at Newcastle-on-Tyne, the pre-

* It appears that, owing to Parliamentary forms, there was no opportunity of taking the sense of the House, so that Mr. Hermon's motion remained as an expression of personal opinion.

sident, Sir William Armstrong, drew attention to the rate at which the country was "expending those seams of coal which yield the best quality of fuel, and can be worked at the least expense." At that date the quantity of coal raised in the kingdom had reached what Sir William Armstrong called "the enormous total of 86,000,000 tons," and the average annual increase was 2,750,000 tons. Taking these two facts as base for calculation, and assuming the available coal in the kingdom to be then about 80,000,000,000 of tons, the deduction was reached that there would be an exhaustion of the supply in 212 years. Other speculations and calculations followed, and ultimately a Royal Commission was appointed, which gave an estimate of the available coal in the known British fields in seams not less than 1 ft. thick, and at depths not exceeding 4,000 ft. In round numbers, the estimate was 146,480,000,000 tons. With a production not exceeding that now known, there would be no complete exhaustion of coal for more than 1,000 years; but with the increase continuing, the duration of our coal-fields becomes uncertain, and whilst it has been placed as low as 110 years, the more general estimate is threefold that period. But, on the one hand, the period might be lengthened by fresh discoveries of coal, by greater economy in its use, or by the use of other kinds of fuel; and on the other the increase in the consumption might cause a more speedy exhaustion, so that conjecture is to some extent useless. In some of the coal-yielding districts, the coal-fields extend under the sea; in others, there are other circumstances which prevent full tabulation of the extent, and thus the amount which may be at some time available is indeterminable.

As to the sources of our own coal supply, we have accurate figures in the valuable "Mineral Statistics" issued from the Mining Record Office. In the last volume issued, our coal production is stated as 133,344,766 tons for the year. The most productive coal-field is the early famous northern one, spread over a large portion of the counties of Northumberland and Durham, which produced 31,991,623 tons, the great bulk being from the South Durham part of the district. Next, we have Lancashire, which yielded 17,390,000 tons. Yorkshire comes next, producing 15,055,275 tons; then Staffordshire and Worcestershire, which together raised 14,158,615 tons; Wales (chiefly from the southern division) raised 14,180,586 tons; Derbyshire, 7,025,350 tons; Monmouthshire, 4,499,985 tons; Nottinghamshire, 3,415,100 tons; Gloucestershire, 1,257,547 tons; Cumberland and Westmoreland, 1,401,603 tons; Leicestershire, 1,005,000 tons; and Warwickshire, Cheshire, and Somersetshire, quantities under a million tons, bringing up the total to that stated, with the exception of 18,665,552 tons from Scotland and 124,936 tons from Ireland. The varying coal-fields thus drawn unequally upon, form often large basins, the largest being that of the South Wales, the estimated quantity of available coal in which would more than keep up the present large output for 2,000 years. But in other districts the available supplies are much less, and in some instances the best seams are working thinner and to greater disadvantage. The proportions in which the various districts contribute to the output are, therefore, changeable, affected not only by the condition of the district, but also by the variations in the demand for coal, and the class most in request.

As to the uses of coal, we have, in a table published in the "Mineral Statistics," the basis for the best estimate as to the extent to which the different industries and sources of consumption use the coal. From the coal raised in the United Kingdom we have first to deduct the proportion exported, which is about a tenth. On the portion retained for home use, the manufacture of iron makes the largest demand, claiming about a quarter of the remainder; whilst for steam-power in various manufactories, a quantity almost as large is taken. That used for domestic purposes was estimated at about 20,000,000 tons; for gas manufacture, 6,560,000 tons; and in collieries and mines, 9,500,000 tons. There are other minor uses which, with those just named, may be given with the per-centage of the whole they use, as follows:—Exports, 9·27; iron manufacture, 30·21; other manufactures, 23·50; used at collieries, 6·25; gas manufacture, 5·75; railways, 2; steam navigation, 2; domestic uses, 17·20; and the balance, 3·82 per cent., is applied to various miscellaneous uses, such as water-pumping, melting of metals other than iron, &c. These proportions are continually changing, and it is satisfactory to notice that, whilst there is an increase in the output of coal, and more especially in the demands for certain uses, there is now generally a greater economy in the use; that is to say, that there is an attempt to obtain from the coal consumed a larger portion of the theoretic heat. In the iron trade and other manufactures, on railways, and in the domestic consumption, there is considerable economy thus being practised now. At the close of last century, according to Mushet's estimate, it took 9½ tons of coal to make a ton of pig iron; whilst at the present it does not take much more than 1½ ton of coal to make that iron, and a further large saving in this direction is being made by the utilisation of "waste gases" in the blast furnaces. In the manufacture of Bessemer steel, there is, by the adoption of the "direct process," a very large saving of fuel; and the better class of boilers and engines in use now obtain much more force with a less expenditure of fuel. And though in the quantity of gas used for domestic purposes, there is not so extensive a development of the economical use, there is an encouraging commencement in that direction. This great increase in the economical use of coal, or the better use of the force it embodies, must counterbalance the increased need for that force which would otherwise have caused an indefinite increase of our output of coal; and in some the uses of other forms of fuel will contribute in the same direction. Thus, though we have to record a growth of the quantity of coal raised, and a corresponding increase in the rapidity with which our coal supplies are being exhausted, there is also a greater use made of the quantity brought to bank, whilst as these economies are carried further, their effect must be to check the rapidity of the growth, if even they do not cause a diminution in the demand. The latter is indeed, unlikely, for there are portions of the supply used in a manner which must increase. Our exports of coal have risen in the last ten years only from 10,000,000 tons to 16,000,000 tons; the quantity used on railways is growing with the growth of the railway system; and the quantities used in the manufacture of gas and for steam-power are being continually expanded. But as the lowest estimate now assigns to our coal supplies a duration of many scores of years, and as we may add to the known supply by the working of coal at greater depths than calculated upon, or by the discovery of additional reservoirs of buried power, we may rest assured that our coal-supply is for the present inexhaustible; and in the remote future it is unlikely that we shall depend upon it for motive power to the extent and in the direction we now do.

THE LIABILITY FOR INJURIES TO BUILDINGS CAUSED BY ARTIFICIAL ERECTIONS ON ADJOINING LAND.

THE varied uses to which persons put their land without causing any injurious consequences to their neighbours make it not a little difficult, for those who have not devoted some period of time to the study of the law, to know precisely the exact legal rules which govern all the relations of neighbouring landowners. A man may have done some act which, though legal in itself, was done, so to speak, "at his peril," without damaging any of the property of those who live around him. Forthwith some neighbour proceeds to do this identical thing on his land, but from some cause or other unfortunately *does* injuriously affect his neighbour's property, and thereupon is both vexed and astonished to find what he has done has been all the time done, as we have said, "at his peril." It will not, therefore, we think, be by any means a waste of time to indicate briefly the leading rules in regard to the liability which persons incur by placing artificial erections on their land. Of course we are not now concerned with actual buildings,—houses, warehouses, and so forth,—so much as mounds or erections on which buildings are placed, reservoirs and other kindred structures, which may be fairly classed within the somewhat wide term, "artificial erections," for these are days when people seek by ingenious means to increase the gifts which nature has bestowed, to utilise earth, air, and water in so many different ways, so that various principles of law,—not new, indeed, in themselves, but new in the mode of their application,—now so frequently have to be noticed, that quite a fresh body of legal rules has sprung into existence.

But in regard to the point under discussion, the difference between two broad principles comes into strong relief. It is a well-known rule that a man must use his own property so that he does not injure his neighbour. *Sic utere tuo ut alienum non lædas* is the convenient Latin form in which this maxim is usually and more concisely quoted. But, on the other hand, there is a rule of equal force, and of great generality, which lessens the effect of this first-quoted proposition, or which in its turn may be considered the leading rule, qualified by the one we have already mentioned. This rule is, that persons may lawfully,—that is, regardless of the consequences,—use land for any purpose for which it might in the ordinary course of the enjoyment of land be employed. Of course, these two maxims seem at first sight antagonistic to one another; because, if the latter be acted upon, the first must often become a dead letter; and, on the other hand, if the first be fully enforced, the enjoyment of land and property must be frequently restricted. They must, in fact, be considered, in order to be made intelligible, as one proposition, and then we find that they give us a plain rule by which the liability for artificial erections on land may be tested. For we can well say that a man must not use his property so as to injure his neighbour, subject to the exception that he may use it regardless of the consequences, if he is engaged upon what is conveniently termed "the natural user" of his property. This rule will be made quite clear by some examples, which in themselves will serve as useful hints to any one engaged in building or similar operations; and by them we shall further see in what a "natural user" consists, and consequently when a man may do certain work with impunity.

The leading case upon the subject was one decided a few years ago by the House of Lords, Rylands *v.* Fletcher, 3 Law Reports, English and Irish Appeals, p. 330. In this instance, some land-owners were also the owners of a mill, and they constructed a reservoir upon their property, under the superintendence and agency of an engineer and contractor, and it happened that after the reservoir was constructed and in use, the weight of the water broke through certain vertical shafts, and finally penetrated into the plaintiff's mine below. These are the facts briefly stated, but they are only necessary so far as to make it clear to the reader that there was no negligence or blame on the part of those who constructed the reservoir; nevertheless, the owners were held liable for the damage that ensued; and the principle upon which this liability was upheld was that to which we have already alluded, that the land was being used for what we may term an unnatural purpose. It was an artificial erection on neighbouring land which was the real cause of the damage. This was how the Lord Chancellor expressed the cardinal point of the whole matter:—"The defendants, treating them as the owners or occupiers of the close in which the reservoir was constructed, might lawfully have used that close for any purpose for which it might in the ordinary course of the enjoyment of land be used; and if, in what I may term the natural user of that land, there had been any accumulation of water, either on the surface or underground, and if by the operation of the laws of nature that accumulation of water had passed off into the close occupied by the plaintiff, he could not have complained that that result had taken place"; and further on he continues:—"On the other hand, if the defendants, not stopping at the natural use of their close, had desired to use it for any purpose which I may term a non-natural use, for the purpose of introducing into the close that which in its natural condition was not in or upon it, and if in consequence of their doing so the water came to escape and to pass off into the close of the plaintiff, then it appears to me that that which the defendants were doing they were doing at their own peril." We have taken these words *verbatim* from Lord Cairns's judgment, because they express in the plainest and most untechnical language, and in a way which any person can comprehend, the very important principle which governs this and kindred cases. Another case quite lately decided will further elucidate the proposition. In this instance a railway company placed on their own land a large quantity of soil, clay and other substances, which formed an artificial heap of considerable size. This was deposited against a wall, which also belonged

to them, and against this wall in its turn rested the plaintiff's house. In consequence of the surface of the defendant's land being thus raised above that of the plaintiff's, the water percolated through the wall and into the plaintiff's house, and when he brought his action the defendants would not admit their liability for any damages caused by their work, since they considered they were using their land in the way in which land may ordinarily be used. The Court of Appeal, however, would not take this view, and decided that since the water percolated through the wall in consequence of an artificial erection the company must pay for any damage done to the plaintiff's house. The actual reasoning of the judges in this case (Hardman *v.* North-Eastern Railway Company, 47 *Law Journal* Reports, C.P. (App., p. 368) was very clear, but in fact it was, in slightly different language, the reasoning of the present Lord Chancellor, which we have already given. It would be possible to multiply these examples, but in the reservoir and in the mound of earth we see excellent instances of the bearing of this rule. But it must be borne in mind that it is subject to this qualification, that if the proximate cause of the damage should be something which may be termed a *vis major*, or, as it is sometimes called, the "act of God," then that the person who has done the work in question will not be liable. This exception was established by a case in which a reservoir had burst, owing to an unprecedented fall of rain; but, at the same time, it is necessary to warn our readers against relying too fully on this exception, for the case to which we allude has since been questioned. Moreover, according to the reasoning of Lord Cairns, that a man who makes such use of his land does so at his peril, it is somewhat difficult to see how this exception can be properly established, because it is not a question as to whether there was any negligence proved. This has nothing to do with it. A man does it at his peril, and any injurious consequences, however caused, except, of course, if produced by any act of the complaining party himself, must, it would seem, cause a liability to arise.

But we can hardly quit the subject without saying a word upon the natural user of land. The most familiar examples are the working of mines, in which, unless negligence is proved, no liability attaches for damage caused by people working them, since the owner of a mine has a right in the use of his property to work for and take his coal. Again, we see common instances of this in the way in which a man may build a house so as to intercept his neighbour's view, it may be, of a pretty hill-side or a pleasant vale. Here he is using his property in a natural and proper manner, for land is meant, among other purposes, for the erection of houses, and so one man cannot complain even though his property may be depreciated in value by the loss of some of its picturesque attributes. Or, again, suppose a man erected a wall in his garden of some height, but not of any unprecedented or extraordinary kind, a high but not unnaturally high wall, and that it fell in a strong wind and broke the neighbouring conservatory to bits. Here, unless there was negligence in the construction of the wall, there would be no liability attaching to the owner of it, because it was, though an artificial erection, yet one which, in the ordinary course of employment of the land, it would be proper to raise. Other instances, no doubt, will occur to our readers' minds by which they may still further elucidate this principle. But we have said enough to show the theoretical basis on which the rule in question is grounded, and the instances given from actually decided cases will make the way clear for its full understanding by any one who is interested in the subject. The cases decided upon it during recent years show its importance, and help us considerably to grasp not only this aspect, but the actual principles in question.

Glasgow Institute of Architects.—The members of the Glasgow Institute of Architects had their annual excursion on the 27th ult., when they visited Carlaverock Castle. The excursion party included Messrs. Campbell Douglas, James Sellars, jun., James Thomson (of Messrs. Baird & Thomson), Honeyman, Burnet, M'Clure, Skirving, M'Leod, and Halket. The following local architects also joined the excursion, viz., Messrs. Barbour, Halliday, and the brothers Crombie. On returning to Dumfries in the evening, the party dined together in the Commercial Hotel.

ARTISANS' DWELLINGS ACT.

It is discouraging to sanitary reformers to find, as they do year after year, their labours defeated by the procrastination of the authorities. The Legislature passes Acts of Parliament that are intended to lead to *immediate* sanitary improvements, but the result is "much cry and little wool."

The Artisans' Dwellings Act of 1875 is, so far as results, almost a dead letter; and yet from a return published by order of the House of Commons, relative to improvements proposed and undertaken under the "English and Scotch Artisans' Dwellings Act," it appears that resolutions for schemes affecting twenty-one areas have been adopted in London. In four instances, the schemes, for various reasons, have not been proceeded with. In one, the claims of the owners of property affected are, or were, before the arbitrator; while, as regards the remaining sixteen, although the resolutions respecting them were passed in March, 1876, the preliminary step of surveying the sites is about the amount of the work done.

As regards the Metropolitan Board of Works, official representations have been made affecting fifty-eight areas, one of the chief of which is that large plague-spot from Drury-lane to Lincoln's-inn-fields. In only nine cases have schemes as yet been sanctioned by the Home Secretary, and in not a single instance have operations for clearing these dens been yet begun.

The Parliamentary return exhibits the like dilatoriness in the country. Schemes have been sanctioned by the Home Secretary for improvements under the Act in nine English provincial towns. In twelve others it is stated that the Act is "under consideration," but nothing has been done.

THE NATIONAL BUILDERS' ASSOCIATION.

The annual outing and dinner of the members of the Bristol Master Builders' Association took place on Tuesday, the 2nd inst., Frome, Longleat, and Heaven's-gate being the places chosen for the trip. In the afternoon the dinner was held at the George Hotel, Frome, Mr. W. H. Cowlin presiding. The toast of the day was that of "The National Association of Master Builders of Great Britain," and Mr. E. J. Hatherley, in submitting it, spoke at length, and quoted from an article in the *Builder* of the previous Saturday, in which he said it was clearly proved that 60,000*l.* was lost to the men in wages in the recent strike in the building trade. The men had been and were led away by agitators, who taught them any demand they chose to make would be successful if they only held out. The name of Mr. Clay, the president of the National Association was coupled with the toast, and that gentleman, in responding, referred at some length to the disputes with the men in the North of England, which led up to the formation of the National Association. The men had become so impudent and so arrogant in their demands, that not only members of the building trade, but others outside it, saw and expressed an opinion that some decided action should be taken by the masters. The Association was formed, and they had on its council men of considerable wealth and great business ability, and who had guaranteed for the year to pay their own expenses. The present Association was very different from the one of eight or ten years ago. The new organisation had appointed a most energetic and excellent secretary, at a salary of 150*l.* a year, whereas the secretary eight or ten years ago received no less than 700*l.* per annum. They therefore had an opportunity for making the effort successful,—an opportunity such as he believed they had not previously possessed. While speaking of the workmen with whom the employers had to deal, he might explain that he usually divided them into three classes. There were first the valuable workers, as he would term them: those who felt a responsibility in their work,—who had in most cases families, and who were seldom willing to support the unreasonable demands made sometimes on the capitalist. Then there were the young men who moved about in our large towns, men who had no objection to go into any strike when persuaded to do so; and, thirdly, there was the class of men who had got tired of work altogether,—men gifted with speech, and who found by using it in agitations they could obtain the easy existence they wanted; these made use of the impetuous and unreasonable lot of young men,—whom he was not blaming so very much, because they had not been told better, and because they did not know better,—to obtain the ends they desired, and the quiet-going valuable workers dared not oppose the torrent of these rash young men and cunning agitators, the men who had got tired of work. He was quite confident the most respectable portion of the working classes were driven into the struggles, and he had been told by men who years ago worked at the same bench as he did, that there were no peace and quietness for them if they went against the agitators. If the fair and reasonable class were left alone the employers would have little trouble in their business. To try and counteract these evils to which he had referred the Association had been organised, and, as Mr. Hatherley had said, if the builders threw aside their petty jealousies it might prove an immense boon. One thing he warned them against was recklessly taking work for ruinous prices, just for the sake of having the contract. There was room for all, and all should get a proper value for their work. In concluding, Mr. Clay proposed the health of the president of the Bristol Association. There was no man in England, he remarked, who stood higher with the builders of the country than Mr. Cowlin; let them, therefore, stand by him, and give him every assistance they could.

THE PHYSICAL, INTELLECTUAL, AND MORAL ASPECTS OF SANITARY WORK.

At the annual meeting of the Association of Sanitary Inspectors of Scotland, held in Glasgow on the 26th ult., Mr. William Mackison, C.E., burgh surveyor, Dundee, was elected president of the Association, and afterwards delivered an address, in the course of which he said he held that every person was bound in duty to take an interest in his own health, and to do what he could to improve its condition. Nay, more, that every person was bound to interest himself in the advancement of his neighbour's health. No one took proper care of his own health who neglected or refused to look to the good of his neighbour's; for, according to the present state of things, no one could be exempted from the attacks of contagious or infectious diseases, which in such circumstances would, so far as they were concerned, be allowed to develop amongst insanitary neighbours and neighbourhoods. There was clearly laid upon all, without exception, the duty of doing what was necessary and within their individual capabilities to conserve and promote the health of others as well as their own,—an arrangement most wise and reasonable; and the converse was equally true, that public health could not be essentially promoted without attention to personal health. During the past year, generally speaking, the health of the country had been very satisfactory and marked, and he was sure this would not only be to each a matter of deep thankfulness and gratitude, but also a cause of great encouragement. However favourable the season might have been to the health of the people, or however social relations might have favoured this, there could be no doubt that this favourable condition, at least to some, if not to a very considerable extent, was owing to the arduous labours, the skill, the appliances, and the wise provisions brought to bear by the members of the Association upon the unhealthy and insalubrious parts of our towns and villages, and on the careful supervision and treatment of districts and individuals affected by contagious and infectious diseases. No other result could have been expected. Let them continue to labour zealously and with renewed courage for yet greater results. They were only on the threshhold of great sanitary achievements. Every additional advance would bring about fresh results. Great application was necessary to maintain what was gained, but greater efforts and new appliances were still wanting to perfect what had been done, and to break in upon new courses. Medical men had boldly asserted that some diseases were preventible, and that others could be rendered less virulent. If that were so, it laid upon the guardians of public health very great and grave responsibilities indeed. The successes of the past ought to prove a guarantee for the future. There was surely no greater inducements needed to awaken every latent energy and to stimulate to greater action those who were charged with such responsibilities

than this,—many lives annually saved,—many families left unbroken,—many otherwise helpless ones provided for,—many pangs of sorrow spared,—much pauperism prevented,—much strength and vitality left to the nation. The sanitary work accomplished during the past few years by public authorities throughout the country in removing, under statutory powers, great sections of over-built-on, over-crowded, and unhealthy parts of many towns for the purposes of town improvements and for works of a public nature was now producing a favourable effect and improvement on the health of the inhabitants of these towns. But they must not localise the beneficial results to these places. These good results could not be fully traced. The inhabitants of one town were continually intermingling with those of other towns and surrounding districts, and such coming in contact and constant interchange of habitation could not, under such favourable and improved circumstances, fail to leave a healthful impression on the country. How much disease was communicated by one person to another and from one place to another? The rooting-out, therefore, of the hot-beds of spreading diseases in the manner alluded to was a most necessary and important work. Public authorities must not be deterred nor cease from the noble, urgent, and imperative remodelling of the bad and dangerous localities under their jurisdiction when by such work so much good resulted. There are three courses which should be pursued in the great work of improving public health, and to these he called attention. Take first physical, as it is best known and believed in. Under this branch he remarked that, in order to good health in populous places, a thorough system of well-constructed sewers and drains, carefully ventilated and prudently trapped, was necessary, and it was requisite that into these be led all water from the roofs of houses, sub-soil drains, soil-pipes, and the surfaces of all courts and streets. It was, however, important that the sewage from the main sewers should be discharged in such a way as neither to pollute streams nor to injure health. This was a difficult question, and was now justly receiving very careful and full consideration. The proper flushing of the drains should be well looked to. The occupiers of houses should flush well the branch drains and the public authorities the large sewers. In this, as in all sanitary matters, joint action would be of great value. Where there was a proper water-supply, why should it not be an understood thing that every day at a fixed hour,—say at the general breakfast hour,—a flush of water should be passed down all house-drains. These accumulated flushings would go very much to sweeten the condition of the main sewers and prevent accumulations of dangerous matter. By thus acting in concert at one hour, or in separate districts at different fixed hours, the flushings would more certainly be attended to than without regulation. A printed instruction might be hung up in every dwelling to this effect. Where proper drainage did not exist it should be at once introduced. Monetary considerations should not be allowed to stand in the way. Existing drains should be carefully surveyed, and their condition ascertained, as nothing could justify the continuance of old ill-constructed sewers, full of deadliest accumulations, and, besides, highly offensive. No town or village of any importance should be without a plentiful supply of pure water, the use of which should be freely taken advantage of for properly cleansing and flushing out all back yards, passages, and places, where organic matter might accumulate and become injurious to health. The low price of iron makes the present a favourable time for having such work executed, and he trusted that in needful places party discussions and unnecessary wranglings will not be allowed to stand long in the way of having done whatever was absolutely necessary for the health of such communities. In those places where an ample supply of water had been introduced there should be no lack of public drinking-fountains, no matter how plain and simple, if substantial, it being always conditional that no water be drawn therefrom for other uses. There was no reason why a person who might not be able to afford a bath in his house should not have one at a moderate price provided for him; it was necessary, and public health would gain by the introduction and use of public baths wherever practicable, and put under proper management. Public baths must be wisely considered in their construction, and got up in such a way as to induce the public to take the frequent use of them. Such baths might be plain and inexpensive, but they must, nevertheless, be conveniently and comfortably laid out, and free from all untidiness and look of dinginess. Every encouragement should be given to establish habits of cleanliness. The healthy state of a town depends very largely upon its being kept in a clean condition, and the cleansing should be performed expeditiously and at such times as will least touch the convenience and comforts of the community. But without well-paved streets and back courts and passages, no system of cleansing, however good in itself, could be effectively carried out. Too much attention therefore could not be given to the questions of paving and cleansing. In every old town there are buildings unfit for human habitation. These should be found out, and either remedied or condemned. Great care also is needed in the examination of and sanctioning of new dwelling-houses. Such houses should be thoroughly lighted and ventilated, and have the necessary conveniences provided and properly placed. It was also desirable that independent doors should be provided, and that all doors be so arranged as to prevent direct draughts upon fireplaces and those parts of rooms where the occupants naturally sit. The proper ventilation of all dwelling-houses requires the greatest attention. The people needed to be educated in the abundant use and value of pure air. Isolation where infectious and contagious diseases exist was necessary and effective, and proper disinfecting agents should be freely used whenever required. Something would require to be done to relieve families dwelling in single or two-roomed houses, in cases of trouble getting into them. It was far from being a right thing for a number of persons to be sleeping in the same room with the sick person, and even in the case of death, sleeping and taking their food in the same room in which the corpse was lying. It had occurred to him that, in connexion with large tenements of dwelling-houses, a special room or rooms should be set apart for needful cases. Such accommodation would, as a matter of necessity, require to be conveniently placed and comfortable. Coming to the intellectual part of his subject, by which he meant the use of instruction to guide surely the hand of the operator, he said it was of the very first importance that the principles of health should be most thoroughly investigated, and that men of science should receive every encouragement to go deeply into scientific inquiries and experimental research. Much knowledge has yet to be gained, and he considered that a system of health should be taught at all schools,—be made imperative,—and the various school boards throughout the country might with credit to themselves show the good example of training up a child in whatever leads to the maintenance and improvement of personal and general health. Such teaching would show grand results in a very few years. Much health was destroyed by ignorance in the use of common things, and this part of sanitary work must not be left out of the reckoning. As to the moral course by which he meant to have the people taught the higher duty of self-preservation, and of the duty every one owes to another in the relations of human life, he thought there was much work here for our religious teachers. When the moral instincts of man were thoroughly awakened and rendered sensitive how vigorously he went to work. He attached supreme importance to the higher moral teaching of the people in the great social duties, responsibilities, and moral obligations that rest upon them. It was a grand achievement to get command of a man's intellect, but grander far to obtain influence over his moral nature. Every opportunity therefore should be taken, and every legitimate means used to impress the consciences of the people as to the due observance of what was right and necessary to their own and their neighbours' health and happiness. He trusted the result of their associated efforts would be the increased use of means, the more intelligent use of appliances, and the firmer belief in rendering the fullest possible service to their fellowmen.

A vote of thanks having been accorded to Mr. Mackison for his address, it was resolved:—"That the name of the association should be changed to that of the Sanitary Association of Scotland, and that the membership be open to all persons interested in the promotion of public health."

THE KING OF THE BELGIANS' PRIZE.

AT the last meeting of the Court of Common Council, a report was brought up from the Improvement Committee on the reference of the 17th May, 1877; "on the letter of the Society of Arts relative to an offer by the King of the Belgians of a prize, to be awarded, at the next International Sanitary Congress, to that municipal authority or private association which shall, by the improvement of the dwellings of the wage classes, effect the greatest reduction of their death-rates at the lowest cost;" and with sundry particulars in reference to Corporation-buildings and Viaduct-buildings, and recommending that a copy of the report be forwarded to the Society of Arts. The committee stated that the interest of the whole question centred in the results which had followed, and might be expected to follow, the erection of improved dwellings, and as the Corporation had shown a practical interest in the subject by the erection in 1865 of Corporation-buildings, and in 1875 of Viaduct-buildings, they thought the most suitable reply to the letter would be the various particulars connected with those buildings. From Corporation-buildings the net annual receipt was 2,226*l.*, or over 4 per cent. on capital, and the average death-rate was 20 per 1,000, the population of those buildings being 822. The Corporation-buildings cost 54,568*l.*, and the Viaduct-buildings 13,023*l.* Over 220 distinct and separate sets of apartments, with every internal accommodation conducive to cleanliness, health, and comfort, were provided, and now tenanted by upwards of 1,000 persons; and though the return upon outlay had been quite a secondary consideration, the results showed that a return of 4 per cent. continued to be maintained, notwithstanding that the sites cost more than usual from their central position. The report was adopted.

CARVED BENCH ENDS, DUNSTER CHURCH.

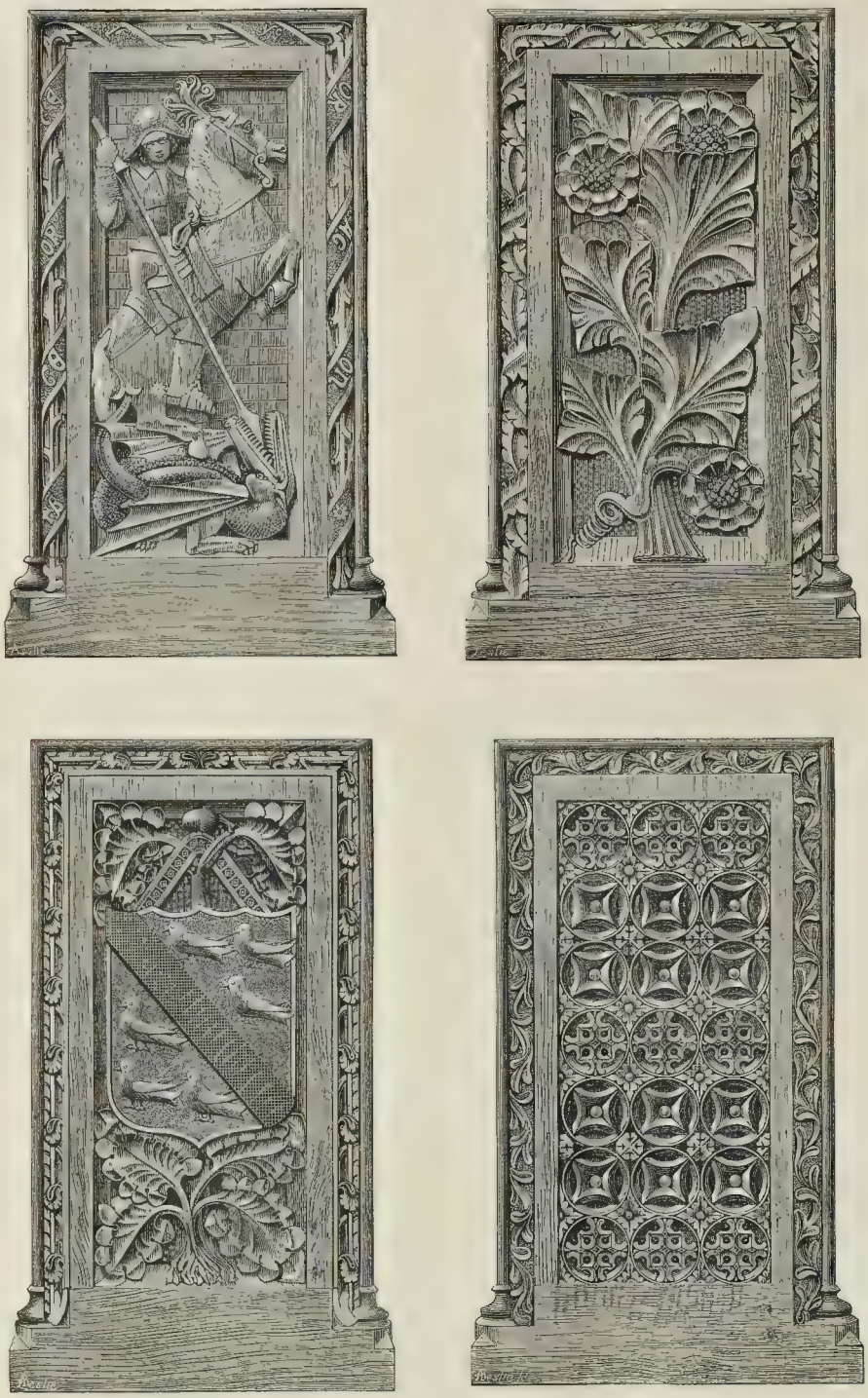
THESE four illustrations of carved oak bench-ends have been taken promiscuously from amongst more than a hundred equally ornate, now in the nave and aisles of the recently restored Church of St. George, at Dunster, a picturesque little town near the Bristol Channel coast of Somersetshire. The building, of the re-opening of which some account was given in the *Builder* for September 30th, 1876, has been renovated almost, if not altogether, at the cost of Mr. G. F. Luttrell, the owner of Dunster Castle, from the designs of Mr. Street.

Although no existing bench-ends remained in the church previously to restoration, yet during the early part of the works several quaint and interesting fragments of the former seating were found underneath the flooring, and these have formed the basis for the new work. As will be at once seen from the illustrations, the type is similar to the Perpendicular detail which is thrown so profusely into Somersetshire and West of England wood-work generally; indeed, the ornamental details in many of the designs of the new work have been altogether gleaned from fine old examples existing in other parts of the country.

The first illustration, "St. George transfixing the Dragon," is somewhat remarkable for the quaint Napoleon-crossing-the-Alps sort of hat this saint militant is crowned with, and which has been copied from an existing piece of sculpture of a similar nature in the neighbourhood. The inscription, on the ribbon around the border, runs,—"St. George and ye Dragon." The foliage in the second engraving, although unusual, is strictly of a local character; whilst the third represents the arms of the donor of the wherewithal for the recent restoration. The diaper upon the remaining end is similar to some on the old work discovered.

It may be interesting to add that the panels upon every bench-end throughout the church vary, and that the border enrichments are also all different. The return mouldings on the inner edge of the bench-ends are carved as well as are the fronts. The carving of these ends, and the rest of the work, was executed under the superintendence of the architect by Mr. Harry Hems.

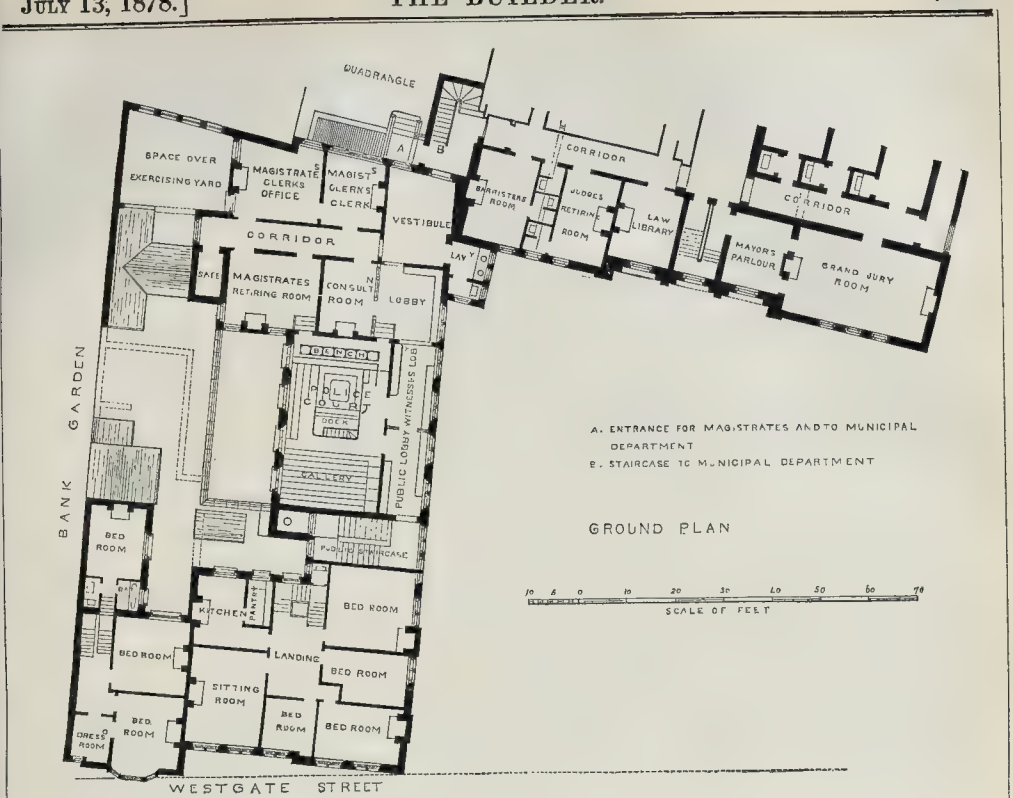
A Monster Steam Hammer.—It is stated that Herr Krupp is about to manufacture a steam hammer weighing 120 tons, with a fall of four mètres, and at a cost of 200,000*l.* (?)



CARVED BENCH ENDS, DUNSTER CHURCH.



NEW MUNICIPAL BUILDINGS, CARDIFF.—MESSRS. JAMES, SEWARD, & THOMAS, ARCHITECTS.



MUNICIPAL BUILDINGS, CARDIFF.

NEW MUNICIPAL BUILDINGS, CARDIFF.

These buildings, which form an addition to the Cardiff Town-hall, were commenced more than a year ago, and are now approaching completion. The wing on the left, stretching forward to the roadway, is occupied by the police-station, with superintendent's residence attached, police-court, having prisoners' cells beneath, and offices for some of the borough officials. The high wing with pediment roofs contains a new council chamber and offices for town clerk, the whole wing being erected on an already existing block which forms the rear of the Town-hall. Cardiff has long felt the want of more space in all its municipal arrangements, and the enlargements now being carried out may be regarded as a prelude to further works, which the rapid increase of the borough, —especially since its amalgamation with the suburbs of Roath and Canton,—will make necessary. Since the commencement of the present contract, it has been decided by the Corporation to erect a new corridor in the interior of the buildings, to connect the assembly-room with the new council chamber, by means of which the efficiency of the reception-rooms will be greatly promoted, and better communication between all parts of the building will be obtained. It was at first intended to have erected a new council-chamber and town clerk's offices only, but the necessity of new police and other buildings had become so apparent, that a plan for those buildings which Messrs. James, Seward, & Thomas had prepared was set aside, and they were eventually instructed to prepare a more extended scheme, including what has been above described.

The view which we publish is taken from Westgate-street, the most direct thoroughfare between Canton and the Great Western Station. There is besides another front towards St. Mary-street, the chief street of the town, which, being quite new, possesses a more architectural character than the one that we illustrate, many features in which have been dictated by lines in the old building.

The contract, for 13,000*l.*, was taken by Mr. Jacob Biggs, of Roath; the heating and ventilating arrangements are being carried out by Messrs. G. N. Haden & Son, engineers, Trowbridge; and the sanitary work is being done by Mr. Geo. Jennings.

The architects are Messrs. James, Seward, & Thomas, of Cardiff, the drawing from which our engraving is made being one of those selected to illustrate recent English buildings in the Paris Exhibition.

WALLASEY SEWERAGE WORKS.

CENSURE.

At a special meeting of the Wallasey Local Board, the report of Mr. E. Pritchard, C.E., on sewerage works in Wallasey was laid before the Board. It appeared that a number of ratepayers had complained by memorial that the sewers were inadequate for the work they had to do, and were not in accordance with the plans and specifications of the surveyor. Mr. Pritchard, in pursuance of the instructions of the Board, had examined the sewerage works, and stated in his report that having considered the requirements of the district, he was of opinion that the system of sewers, as designed by Mr. Lea, the surveyor, was a sound one, and reflected considerable credit upon him as a designer. Such sewers, constructed as shown by plans, sections, and specifications, would have been sufficient for the requirements of the district. The sewerage, however, had not been constructed in accordance with the plans, sections, and estimate as submitted to the Local Government Board, the chief omissions being the concrete foundation for the sewers in "faulty" ground, and the construction of manholes. The works were generally well executed and constructed where the subsoil was sound, but in the unsafe and faulty ground the reverse was the fact.

The following resolution was passed:—"That having had under consideration Mr. Pritchard's report on the Wallasey sewerage works and the surveyor's reply, and also the verbal replies to questions put to the surveyor by the committee, they are of opinion that the course taken by the surveyor in ordering verbally deviations and omissions from the works as specified, without asking the consent of this committee, calls for their most severe censure, and they beg to record their extreme dissatisfaction with the manner in which the work has been superintended by the surveyor, and recommend that the works be taken out of his hands, and that Mr. Pritchard be requested to complete the examination and to superintend the completion of the works as nearly as possible in accordance with the plans and specifications approved by the committee and the Local Government Board."

Mr. Skinner held that a partial failure only had been revealed, inasmuch as the length condemned was only three-quarters of a mile out of seven miles of sewerage. The matter was not a very serious one, after all, and he believed that the contractor was quite willing to do certain work in rectification.

Bakehouses in Whitechapel.—At a recent meeting of the Whitechapel Vestry, the sanitary inspectors, Messrs. Battram and Wrack, brought up a report stating that they had just completed an inspection of the whole of the bakehouses in the district, and that there were several of them totally unfit for the purpose of being used for the making of bread or pastry, owing to their defective construction, the same being underground, badly lighted, and ill-ventilated. Some of the bakehouses have latrines in them. The bakehouses used by confectioners are generally in a filthy condition. The matter was referred to the Works Committee, with power to take such measures as they might deem fit.

THE POLLUTION OF RIVERS.

AN address on "The Pollution of Rivers, and its Effects upon the Fisheries and the Supply of Water to Towns and Villages," was delivered at the Royal Institution, Albemarle-street, on the 3rd inst., by Mr. Frank Buckland, M.A., Inspector of Salmon Fisheries, under the auspices of the Sanitary Institute of Great Britain.

Mr. Buckland remarked that if we considered that the population of the United Kingdom consisted of over 30,000,000 of people, every individual of whom, whether rich or poor, required daily food, it behoved those in authority to pay the strictest attention to every source of food supply which was capable of being increased in any way. England being in an insular position, was much dependent on foreign sources for the supply of corn, cattle, and other products. Hence the necessity of cultivating our "water-farms." Of late years agriculture had developed itself into a science, whereby, through the instrumentality of human intelligence and industry, the land was made to produce crops as heavy as the earth could be induced to yield. It was not until a few years since that the culture of the waters—aquiculture—had received the attention it so richly merited. Year by year, however, the serious attention of the rulers of the land had been directed to this important source of national wealth. With his colleague, Mr. Spencer Walpole, he had had the honour and privilege of inspecting during the last thirteen years most of the rivers of this country. Before going into details of pollution and its effect upon fish life, it was advisable to consider the sources of water supply to all living creatures on the face of the earth. The general outline of water supply had been summarised by his father, the late Dean of Westminster, in the "Bridgwater Treatise," where the writer noticed the adaptations of the earth to afford supplies of water through the medium of springs. In connexion with that subject, the lecturer referred to a model of a "natural water factory," which, by the kindness of the Mayor and Corporation of Manchester and Mr. Bateman, C.E., he had been enabled to exhibit in the room—that "factory" being Thirlmere Lake, in Cumberland, where one could witness the Great Creator's mode of giving a supply of water to us poor human creatures. To the lecturer's mind this Thirlmere was a natural reservoir, made by the hand of the Creator to contain water which ought to be put to use for the service of man, should that use be required of it. The same beneficent Power which, as his father had shown in the "Bridgwater Treatise," stored coal on the strata of the earth, had placed lakes full of water among his mountains. Reference was then made to a map by Mr. Stanford, of Charing-cross, which showed that England and Wales were watered by three principal watersheds. Fish, by their presence or absence in a river, afforded a test even superior to that of chemical analysis as to the fitness or unfitness of certain waters for human consumption. Pointing to a diagram of an ideal salmon river, to show the many difficulties and dangers which the salmon had to encounter from nets and weirs and other enemies, but more especially from pollutions arising from chemical and other works, Mr. Buckland said that the best salmon rivers in England and Wales were nearly all suffering from pollutions of some kind or other,—generally from mines at the top, and chemicals, paperworks, and other factories, as well as sewage from the towns through which they flowed. In noticing the action of pollution upon fish, he wished to mention a little but yet important fact which he thought had hitherto been overlooked by fish culturists, and that was in reference to the organ of smell. If a salmon's head were examined it would be found that there was a nostril on each side of the head. This nostril was protected by a double valve of a very peculiar construction. Pollution, therefore, might, and often did, not only poison or injure the fish, but deter it from making progress up a river. It was the sense of smell, moreover, which in his belief was the chief agent in enabling a salmon to discover its own river, for it had been pretty well ascertained that a salmon would prefer to go back to his own from another river. The fact of smell in fish as bearing on polluted salmon rivers could also be well proved by the fact that sea trout invariably preferred water which was stained by peat-moss. Having given some instances of that in connexion with different streams, Mr. Buckland dwelt at some length on the question of the pollution of rivers by town sewage, and urged the importance of measures being taken to prevent such pollution, as the source not only of mischief to the fish, but it might be of serious epidemics that might fatally affect the homes of England. Speaking of sewage deposits at Canterbury, of the importance of utilising sewage for agricultural purposes, and of the practicability of removing the solids from rivers by means of catchpits or sieves, the lecturer said it was probably not generally known to the public the reason why these banks of fœtid mud are not more pernicious than they are. Below the exit of the sewer at Canterbury, which joins the Stour at Fordwich, the bed of the river was a mud bank instead of pure gravel. Having taken samples of this mud home, he found that by a wonderful balancing power of nature, which ordained that nothing in creation should be lost, when it had settled, this mud bank was the habitation of thousands of living creatures of three or four different species, whose food consisted of the (to us invisible) portions of putrid animal and vegetable matter, which they, by converting them to their own uses, prevented from increasing to such an extent as to become directly injurious to human health. The presence of these animalculæ, &c., in the Serpentine was the unrecognised reason why the Serpentine did not injure the health of those who rode in Rotten-row or drove in the Park. The same might be said to some extent of the sewage of the Thames. Many instances might be given of the pernicious practice of allowing town sewage to flow into our ill-used rivers. Take the Thames. In the present state of scientific engineering and affluence of the great metropolis, was it any longer to be tolerated that the various towns on the Thames above London should be allowed to contaminate the public waters? No, certainly not. He considered that it was absolutely necessary that all towns and villages on the banks of the Thames and its tributaries should be compelled to keep their sewage out of the public water highway. That it was not impossible to carry this matter out with success had been proved by his friend the late Mr. Menzies, deputy surveyor of Windsor Park, who had laid out so admirably the sewerage works at Old Windsor, and also those connected with the town of Eton. The tolerance of pollution placed into the Thames might under certain circumstances endanger, if not erase, the lives of our wives and children, and even undermine the health of the greatest, yet most unsuspicious, rulers of the land. The motto of the Houses of Lords and Commons should be "Sanitas sanitatum, omnia sanitas." We were informed that the Barking sewage outfall had accumulated mud to the extent of 9 ft. or 10 ft. in places where there used to be good fisheries. On the other hand, it was only right to mention that the Barking outfall had done a service to the Thames fisheries, inasmuch as of late flounders and eels had been caught from London Bridge down to the Tower. He was also informed that it was sometimes possible to catch flounders in the neighbourhood of Westminster Bridge and the Houses of Parliament. For many years past he had placed large numbers of young salmon, artificially reared, in the upper waters of the Thames, but none of them were known to have yet returned as adult fish. He was afraid that this terrible pollution at Barking might be one of the causes, if not the cause, why these fish did not return to the river, as there was no reason to suppose that some of the smolts did not at least go to the sea, though he was afraid they would hardly get through the Barking sewage with impunity. With regard to the effect of river pollutions upon human health, Mr. Buckland referred his hearers to the language in which it had been dealt with by his colleague, Mr. Walpole, as addressed through the Home Secretary to the Houses of Parliament in 1874, and, in conclusion, he said,—"If these pollutions were by law kept out of the rivers within her Majesty's realms, I feel sure,—and write it most advisedly,—that the fisheries would vastly increase in their salmon-producing powers in a very few years; and it is, therefore, most lamentable to think that at the present time, when there are so many mouths to be fed, and so many markets comparatively salmonless, manufacturers and mine-owners, who form a relatively small proportion of her Majesty's subjects, should be allowed to inflict, directly and indirectly, such a vast evil on the public in general. The above-mentioned individuals and companies for the most part reap no inconsiderable profits from their industrial operations, but while endeavouring to increase their own profits they treat with indifference the welfare of the public, and an important source of food not only to themselves, but to the public in general. I would not wish, for the sake of the fish in the river, by any means to put down or in any way interfere with the commercial industries either of manufactories or mines in this country, but at the same time, I make bold to assert that it is quite possible that both industries can co-exist and flourish side by side. That their co-existence is possible I am sure if only there sprang up a real desire among the miners and manufacturers to do their duty in this respect towards the public by going to some pains and expense in the matter. It is hardly within my province to go deeply into the question of the utilisation of sewage. The principal point I want to be urged is that it should not be placed in the water to the prejudice and injury of my clients the fish."

ENGLISH WORKMEN AND THE PARIS EXHIBITION.

THE movement initiated by the Prince of Wales for sending artisan reporters to the Paris Exhibition is attracting considerable attention in the various manufacturing districts of the kingdom. Birmingham, Bristol, and Edinburgh have already reported to the committee sitting at the Society of Arts that active steps are being taken to promote this important work, and subscription lists have been opened for aiding to defray the expense of sending over skilled workmen in various trades. Already many of the City companies have promised subscriptions.

The Leicester Town Council have decided to send ten representatives of the industries of the town to the Exhibition, to report upon the special technicalities of the manufactures displayed there. The estimated cost of the deputation will be 100*l.*, and it has been raised partly by a grant from the Leicester Chamber of Commerce and partly by subscription.

At Barrow-in-Furness a movement has been set on foot for sending eight or ten artisan-representatives to report upon what they can see at Paris. The movement at Barrow was initiated by the Barrow Field Club, at the instance of Mr. J. M. Norman, who has charge of the telegraph system of the Furness Railways.

Wolverhampton does not seem to be quite so impressed with the importance of the subject, for (according to the *Staffordshire Advertiser*) the proverb that "what is everybody's business is nobody's business" has received an illustration at Wolverhampton in relation to the suggestion addressed to mayors of boroughs by the Society of Arts as to the desirableness of sending artisan reporters to the French Exhibition. The Mayor thought it could best be carried out by employers of labour in Chamber of Commerce assembled, but the Chamber having assembled and taken the matter into grave consideration, came to the conclusion that as there were so many employers and so many trades, the business was one for everybody who was anybody in the manufacturing world of Wolverhamptom, and not for its Chamber of Commerce. So no artisan will go to Paris to come back and report what masters and men must do to get and to keep "orders for abroad." Rather a misfortune this, when "foreign orders" have so long been so scarce in Wolverhampton, while foreigners come there for orders and are not always "sent empty away."

OBITUARY.

The Rev. J. G. Joyce, F.S.A., rector of Strathfieldsaye, died on the 28th ult., after an illness of three weeks' duration. He was well known amongst antiquaries in connexion with the explorations at Silchester.

Sir Thomas Duffus Hardy, the Deputy Keeper of Public Records, died on the 22nd ult., after a short illness. Among the many works with which his name is associated, that of the "Monumenta Historica Britannica" (printed by command of her Majesty) is the most notable.

Preston Borough Surveyorship.—On the 3rd inst., at a meeting of the Preston Town Council, Mr. Hudson Reah, of Darlington, was unanimously appointed borough surveyor, *vice* Mr. R. H. Hunter, at a salary of 600*l.* a year.

ROYAL ALBERT HALL.

On Wednesday evening next, the 17th, Mr. S. Brandram will recite a variety of fine things, including the "Lay of Horatius," selections from "As You Like It," and Tennyson's last poem, "The Revenge," and the opportunity of hearing this remarkable reciter will be afforded to large numbers of persons at small cost, in consequence of the capacity of the Hall. This, we maintain, is the advantage offered by buildings of extra large size, and ought to be kept steadily in view by those who manage the Albert Hall. We should be glad to see some of the most able lecturers of the day regularly on the stage here, enlightening large audiences drawn together by small charges. On the 17th Miss Anna Williams as soloist, and the London Vocal Union, will add their attractions to those of Mr. Brandram, so that a very large gathering may be fairly expected. We are, personally, so desirous to see the Albert Hall extensively utilised in the promotion of art, science, and literature, and affording refined enjoyment, that we go out of our way to urge the public to assist the council in every well-meant endeavour with that end in view.

THE FACTORY CLUB AT NORTHFLEET.

Northfleet grows and is thriving, and we are glad to hear it. The place owes much to the cement works, and Messrs. Knight, Bevan, & Sturge, one of the largest firms, have much contributed to the extension of which we are speaking. At the sole cost of Mr. T. Bevan, a Factory Club-house, with hall, billiard-room, smoking-room, class-rooms, and kitchen has been built, chiefly for the use of the large staff of workmen employed by the firm to which that gentleman belongs, but also for the use of the men of Northfleet generally. This building was opened on Monday, the 1st inst., the interest of the event being increased by its also being the day on which Mr. Bevan's son attained his majority. We would add that in addition to this liberal gift to his workpeople, which has cost 10,000*l.*, Mr. Bevan has offered to meet any deficiency which may arise in getting the club into thorough working order. He has also shown his confidence in his own men by entrusting them with the management of the club. The men have drawn up their own code of rules.

The building includes a large hall (with galleries at either end), in which 1,000 persons can be accommodated, and a number of rooms in the basement, with wings at the back, one of which contains the kitchen offices, lavatories, and the other a billiard-room. The building itself is mainly erected of red and white bricks, but relieved by columns in cement, Italian in style, in addition to which there are facings and cornices of a similar material. The hall, which is approached by two spacious entrance lobbies, is 95 feet long and 42 ft. wide, by a height of 24 ft. 6 in., lighted by large windows on both sides; the galleries, which are included in the above area, give additional accommodation of 24 ft. by 15 ft. at each end, with a room over the lobby, whilst the mansard roofs contain rooms for a hall-keeper. At each end of the building is a slated tower, with a flag-staff, and margined with ironwork which, with the cresting of the roof between the towers, was supplied by Macfarlane, of Glasgow. The whole of the external ornamental portions, including the rusticated base, the pilasters, caps and bases, the brackets and balusters of the balconies, and the central group of figures, which bear Mr. Bevan's coat of arms, are executed in Portland cement, the general surfaces being faced with red bricks with bands of black and white. The entire building is heated with hot water, and every room is ventilated by special arrangements for the free ingress and egress of air, the foul air being collected and drawn off by one large air-shaft at the back of the building. The basement is divided into a number of rooms on either side of a central corridor; they are all 12 ft. high, and are intended for committee and class rooms. The kitchen is fitted with ranges, gas-stoves, &c., and under it is an extensive lavatory for the use of the men. The billiard-room, which is lighted by a turret, is 26 ft. by 21 ft., and beneath it is the heating apparatus with coal-store. The internal finishings of the large hall are executed in pitch pine; underneath one of the galleries is a bar, fitted up for the supply of refreshments, and the whole of the fittings, seats and tables, are also of pitch pine. The architects were Messrs. Parr & Strong, of Finsbury-square, the senior partner of which firm resides in Gravesend; and their designs have been carried out mainly by men in the employ of Mr. Bevan at the cement works, Mr. Briggs being the foreman in carpentry, and Mr. Wright foreman of the bricklayers. The water for the heating apparatus is supplied from the works of the firm, and the gas from the Northfleet Company's works. The double event excited much enthusiasm in Northfleet and the neighbourhood.

CASTLE-DONINGTON BURIAL BOARD.

Several designs for mortuary chapels have been submitted in competition, the accepted design being by Mr. John Wills, of Derby. The chapels will stand at right angles to each other, with a porch to give access to both. This porch is constructed so as to shelter from the weather, as the cemetery is in a very exposed position. Over the porch is a tower 30 ft. high, carrying octagonal pinnacles at the corners, and a spire 40 ft. high, or 70 ft. from the ground. Each gable of the chapels will have square pinnacles on the corner buttresses, all the finials of which (as well as finials of tower pinnacles and spire) will be carved with natural foliage. The style of the buildings will be Early English, all the windows having trefoiled heads, except those in the gables, two of which will have circular windows with trefoils, and the other will have a window with mullions and head of Geometrical tracery. The roofs will be open to the rafters, which will be boarded on the under-side. Each set of principals and ties is constructed with a rib under in such a manner that it forms a lancet arch, and coming down by the side walls will finish on Bath-stone corbels, carved with lilies, &c. The lodge includes a living-room, kitchen, scullery, tool-house, and offices on ground floor, and three bedrooms over. The works were sharply contested among the local builders, and were eventually let to Mr. Brooks, of Sawley, at 1,310*l.*, his tender being the lowest.

ARCHÆOLOGICAL SOCIETIES.

The Royal Archæological Institute is to hold its annual meeting this year at Northampton. At the meeting of the Town Council on the 1st inst., it was moved, in accordance with the recommendation of a committee,

"That an address from the Town Council on the visit of the Royal Archæological Institute to Northampton be drawn up by the Town Clerk, and read, on the reception of the Chairman and members, on the 30th day of July next."

This was carried, and it was afterwards moved by the Mayor,

"That on the above occasion the chairman, and members and officials of the Archæological Institute, the ladies who accompany them, the president, patrons, vice-president, and local committee, be entertained by the Mayor and Corporation at luncheon, after the inaugural proceedings, and that the expense thereof be defrayed by subscriptions of the Mayor, Town Council, and chief officers of the Corporation."

This was opposed by a small section of the Council, led by a Mr. Adams, who (according to a report in the *Northampton Mercury*) seems to have rather peculiar notions as to the objects of archæological societies. He is reported to have said:—

"So far as I can gather as to its usefulness, the association is composed of a body of gentlemen who have a very great deal of time on their hands, and it is a very healthy occupation for them, that of arresting the natural decay of old fossilised architecture, which must of necessity some day go into the past and into oblivion. They can only arrest decay for a little while. The time must come when it must pass away, notwithstanding all their endeavours to maintain it."

In spite of this eloquence, the motion was carried. In a brief editorial comment the *Mercury* says:—

"About a year ago a certain section of the Council was in favour of opening our local museum on Sundays. The same gentlemen are apparently ignorant of the fact that none have done more to enrich the museum by loans and gifts than the antiquaries, from whom they now withhold their sympathy—and their money too. There will, however, be no difficulty in raising, from those who can appreciate the labours of the association, the necessary funds to give the Institute a suitable reception."

Newcastle Society of Antiquaries.—A successful excursion in connexion with this society took place on the 4th inst., the places visited being Cilurnum (The Chesters) and Procolitia. The members from Newcastle arrived at Chollerford Station about noon, and were there met by other members of the society. Having first visited and inspected the remains of the Roman bridge over the North Tyne, the members crossed the water at The Chesters, and inspected the remains of the Roman station of Cilurnum, particularly the remains of the forum in the station recently excavated by Mr. Clayton. The party then proceeded to The Chesters, and viewed the collection of antiquities, and Mr. Clayton entertained the members at luncheon. After inspecting the antiquites in the house, the party proceeded by carriages to Procolitia, inspecting on the journey the various remains, such as the turret and the remains of the vallum in the limestone bank, Teppermuir. On arriving at the station at Procolitia, the excavations now proceeding were inspected, and the party then viewed the well of Coventina, where the large collection of coins and other antiquities was found. Throughout the day the various remains visited were ably described by Dr. Bruce.

THE LONDON SCHOOL BOARD AND BETHNAL-GREEN VESTRY.

The Bethnal-green Vestry have just passed a resolution peremptorily requesting the London School Board to take down a building which the Vestry allege the School Board have illegally erected. It appears that the Board are erecting some school buildings in Pritchard's-row, within the parish, and that in doing so they have made an encroachment in violation of the Metropolitan Building Act. A correspondence has taken place between the two bodies on the subject, and at the last meeting of the Vestry a letter was read from Mr. Robson, the architect of the Board, in which he stated that the Works Committee of the Board had considered the question of the encroachment unintentionally committed in erecting the building, and that he was instructed to say that the Board had no intention of violating the rules of the Vestry, but he submitted that the structure was no part of the school building. Considerable discussion took place on Mr. Robson's communication, in the course of which Mr. Ewin stated that the Works Committee of the Vestry had gone thoroughly into the matter, and they were satisfied the building was an encroachment. He moved that the School Board be requested to pull down so much of their property as stood upon the public highway. In moving the resolution he said it would be a dangerous precedent to permit a powerful body like the School Board to encroach upon the footways; for if they did so, how could they consistently refuse to allow a tradesman to bring out his premises to the same line? The motion was unanimously agreed to.

AN EARLY BOOK ON ARCHITECTURE.

The Library Committee of the Institute of Architects have just purchased a very rare book, known to most architectural authors as "The First and Chief Grounds of Architecture," &c., by John Shute, paynter and architecte. Printed by John Marsh, fol., 1563.

This work is the earliest production in England relative to practical architecture. No copy exists in the British Museum library. We believe there is one in the Bodleian. The Institute librarian (Mr. S. W. Kershaw, M.A.) had been searching for it in catalogues for some years, and it was only discovered by him a few days ago, and secured by Mr. Wyatt Papworth, from the bookseller. Shute was sent to study in Italy by John, Duke of Northumberland; he died September 25th, 1563, and was buried in the church of St. Edmund, Lombard-street.*

Wide Diffusion.—The *Engineer* is becoming facetious. Witness the following paragraph:—"An ingenious American announces that he has made a discovery which throws the telephone and the phonograph into the shade. He says he has contrived a process by which a hen sitting in a certain spot can hatch any number of eggs in remote corners of the farmyard. The advantage of this is, as he justly points out, that while one hen does the work of incubation, the rest are relieved from the pressure of purely domestic affairs, and can engage in other occupations. The machinery by which all this is effected is called the 'henophone.' A dreadful punster of his acquaintance says it is much 'phonier' than the other 'phones.' Who claims the invention?"

* See Godwin's "Churches of London," vol. ii.

TUNNEL ACCIDENT IN GERMANY.

A SERIOUS accident happened on the 28th ult. in a tunnel in course of construction near Schwelm, on the Düsseldorf-Hörde Railway, in which seven men were killed, and two were seriously injured. Although works for excavating the buried men were commenced at once, life was found extinct when they were reached. The formation where the fall took place is limestone of the finest description; a vein of clay was met with, and though it was thought that the necessary precautions had been taken to meet all eventualities, by shoring up with strong beech supports, the superincumbent weight proved too much. Only half an hour before the accident the works had been inspected by the superintending engineers, and not a sign of the movement of the rocks was perceptible. The catastrophe took place so suddenly that not one of the men engaged had time to escape. Only the two men injured, who were at work close by, saved their lives by jumping. As far as can be judged at present, the accident was caused by a sudden separation of the rocks which were imbedded above and laterally into the layer of clay, losing their support by the opening made by the tunnel, and crushing the timbers by their weight.

CLAY AND THE POTTER.

THIS is the title given to a lecture now being delivered by Professor E. V. Gardner, at the Royal Polytechnic Institution, and a very interesting lecture it is. The lecturer says that to refresh his memory, and to make the lecture as practical as possible, he visited Messrs. Stiff & Son's pottery, Lambeth, who afforded him every facility in examining their works. The Lambeth potteries owe their origin to some Dutchmen who, about 200 years ago, came to England and started a pottery at Lambeth on a very small scale. Gradually has this pottery enlarged until at this time Lambeth has been almost entirely converted into a pottery district. The potteries now stretch along the river front and extend back, covering acres and acres of ground. The original business of the Messrs. Stiff was established in 1751 in a portion of the palace of the Bishop of Hereford; the present proprietors came into possession in 1846, and in the short space of thirty-five years they alone have covered many acres of ground with their factory, and have elaborated a business which employs many hundreds of workmen, some most ingenious and extensive machinery, which requires thousands of cubic yards of kiln-room to perfect its manufactures. This factory has become so important as to be provided with an extensive private dock to meet the demand and convenience of home and export trade. The manufacture of the new enamelled ware for ornamental and decorative purposes is peculiar. It is produced in the same manner as a jug or vase. After leaving the thrower's hands, it is decorated by the modeller or enriched by some artistic designs in form and colour. It is then placed in the kiln and exposed to an intense white heat for several days. The requisite firing having been given to the pottery, it is glazed. Sodio-chloride, or common salt, is thrown into the kiln, is vapoured by the intense heat, and coming in contact with the pottery, a chemical action occurs. The salt decomposes, and attacking the clay, forms a silicate of aluminum and sodium therewith; while the hydrochloric acid formed in the process escapes. The clays used at Messrs. Stiff's come from Poole in Dorset, or from Teignmouth in Devon, and are directly fitted for manufacture into potter's dough. They are carried to the mill-room and placed under a pair of edge-runners, by the action of which they are ground to powder. A scraper follows the stones of the mill, and drags the ground clay over a grating, through the openings in which the fine powder falls, the coarser portions are carried on by the scrapers, and are turned under the stones to be reground. The finely-ground clay which falls from the mill has to be mixed and incorporated with water. We cannot, however, just now describe the whole process. During the course of the lecture some remarks were made in connexion with drain-pipes. Nothing, said the lecturer, charmed me more in my visit to the factory of Messrs. Stiff than the performance of the plunger drain-pipe-making machine. It occupies two floors of a large building, and consists of a steam cylinder 3 ft. 6 in. by 4 ft.; within the cylinder is a piston. The piston-rod is attached at its lower end to a plunger; this plunger stands over and fits a dough-chest. The bottom of the dough-chest has a mould attached which forms the socket of the pipe. At one time the cylindrical portion of the pipe and the socket were made in two distinct operations, and were afterwards luted and joined together. Pipes so made have many defects which are remedied by the method of manufacture we now describe. The dough-chest is first filled with dough; then the engineer actuates a steam lever, when with a mighty blow down comes the plunger, and forces the clay into every crack and cranny of the socket mould; the next motion of the machine removes the socket-mould, and raises a table to support the pipe in its passage out of the machine. A second blow from the plunger delivers the socket-pipe complete,—a wire cuts off the pipe to a proper length, and a travelling table removes it from the machine. This machine will turn out from twelve to fifty drain-pipes a minute, according to their diameter. Pipes of 18 in. or 2 ft. diameter are manufactured at the rate of forty or fifty an hour. These Lambeth stoneware drain-pipes have made the fortune of our London potters, and are largely employed, not only in this country, but almost everywhere. London is arterialised and drained by thousands of drain and water pipes; many of them are made of this "Lambeth ware."

LOCAL GOVERNMENT.

A MEMORIAL of the Joint Committee on State Medicine of the British Medical and Social Science Associations has been presented to the Right Hon. G. Sclater-Booth, M.P., President of the Local Government Board. It shows,—

"That your Memorialists have seen with much satisfaction the introduction of a Bill into Parliament in the present session to amend the law relating to the administration of county business, and to make further provision for county government.

Your Memorialists are strongly of opinion that the constitution of local Government districts, and the present anomalous condition of their boundaries in relation to the carrying out of sanitary measures, offers serious obstacles to good local government.

They hope that the Bill brought in by the Government may be so altered as to provide for a re-arrangement of county boundaries, especially in cases where local districts include parts of more than one county, and where physical circumstances with relation to drainage and water supply require an alteration of existing limits.

They would also strongly urge the importance, in order that thorough efficiency and economy may be attained, of all powers of local government affecting an uncombined local district being exercised by one authority."

Further, that "The question of water supply to the rural districts in England is one of momentous importance at the present time, and your Memorialists would rejoice to see the powers of the County Board made adequate to overcome the difficulties now attendant on every attempt to meet the existing wants of these districts, so that a sufficient supply of pure water may be insured to the whole population of the country. Many other important sanitary and financial questions, and many matters of local government, such as drainage of districts and incidence of rating, can only be effectively dealt with by full powers being given to a joint board, which shall fairly represent interests now frequently conflicting, as between district and district, and between owners and occupiers of property."

MONUMENTAL.

Izaak Walton.—In October, 1876, a project was started by the then mayor of Stafford (Mr. J. Shalcross) for placing a marble bust and tablet of Walton in St. Mary's Church, where the "Father of Anglers" was baptised on September 21, 1593. A committee was formed, and an appeal made to the public for the necessary funds, which was handsomely responded to, and the execution of the work was entrusted to Mr. Richard Belt, a pupil of the late Mr. Foley. The bust, which is from a likeness of Walton by Housman, in the National Gallery, taken when he was in his 79th year, is now completed. Arrangements are being made for the inauguration of the memorial on August 9, the birthday of this national favourite and Staffordshire worthy.

The Duke of Wellington.—A marble relievo, "Peace; or, The Soldier's Return," has (says the *City Press*) just been completed by Mr. Bell, by order of the Corporation. Mr. Bell, twenty years ago, executed and erected the monument to the Duke of Wellington in Guildhall. The composition above referred to was an alternative one with that which was selected for the monument now in Guildhall, which represents the battle of Waterloo. The relievo represents the return of Wellington and his army after the peace following the battle of Waterloo. The Duke on horseback occupies the centre of the composition; on his right side is represented Victory breaking the sword of averse battle; on the other, Peace sheathing ours. Above are representations of Plenty and Fame; on either side are the returning soldiers meeting their families, and beyond these on either side are the people welcoming the return of the great Duke and his victorious soldiers.

Rev. D. Sutherland.—A monument to the memory of the late Rev. David Sutherland, East Church, Inverness, has been erected in Tomnahurich. It forms a conspicuous object on the north terrace, rising to the height of 24 ft., in the Celtic style of sculptured stones, the characteristic features of which it bears. The structure is of red sandstone from Dumfries, and has been completed by Messrs. D. & A. Davidson, Inverness, from the designs of Mr. G. Craig, Highland Railway.

CLUBHOUSES.

Prestwich.—Mr. R. N. Philips, M.P., has laid the memorial stone of a new Liberal Club at Prestwich. The building is designed in the "Free Classic" style, and is being built in brick and stone. It will comprise a large billiard-room for three tables, cardroom, refreshment-bar, commodious reading and committee rooms, lavatory, &c. There will be the usual offices, and a large assembly-room capable of seating about 400 people. The architect is Mr. Thos. Thorp, Whitefield. The building was commenced in April, and it is expected that it will be finished some time in October. The estimated cost, including furnishing, is 2,500*l.*

North Shields.—A new building, which has been erected in Northumberland-square for the North Shields Club, has been formally opened. The front is of stone, and the external appearance is substantial. The cost of the building, inclusive of site and furniture, was about 5,000*l.*

ARCHÆOLOGICAL DISCOVERIES.

Ancient Tombs.—During the pulling down of the old church at Middleton-in-Teesdale, a few days since (says the *Darlington and Stockton Times*), many ancient tombstones, some of them Saxon (?), were found in the walls. Three very fine monumental slabs and the lid of an ancient stone coffin may now be seen in the Rectory gardens, alongside the old windows, which have been transferred thither perfect from the north side of the old church.

A Supposed Pictish House. — The *Montrose Review* reports the recent discovery of a subterranean cave, or Pict's house, on the farm of Pitcur, tenanted by Mr. John Grainger. The discovery was first made by some of Mr. Grainger's servants, who, when ploughing a field, came accidently on a flagstone about 460 yards to the north of the ancient castle of Pictur, the remains of which are still standing. The stone having been removed, a large hollow space was discovered. Subsequent explorations carried on by workmen employed by Mr. Grainger have revealed a large underground passage or cave, enclosed by stone walls on either side, and covered over with stone flags. The form of the cave is irregular, and varies in width from 5 ft. to 7 ft., and is in height from 6 ft. to 8 ft. From 60 ft. to 70 ft. in length has been cleared of rubbish, without any signs of either end having been reached.

An Approach to "Perpetual Motion."—A magnetic clock, invented by D. Drawbaugh, of Milltown, Pennsylvania, is sufficiently remarkable to be worth description. The magnetism of the earth, an inexhaustible source of power, is made to oscillate the pendulum; and the simplicity of all the works gives an assurance of the least possible friction. At a certain point the movement of the pendulum itself shuts off magnetic connexion with the earth, and at another point restores the connexion, thus securing the conditions necessary to produce its oscillations. The works are so ingenious and simple that it is no wild assertion to make that, were it not for the unavoidable wearing out caused by even the smallest amount of friction, the clock would run as long as the solid earth endures. This clock is hung against a board partition, with all the works exposed, subject to the jarrings of machinery and obstructions from dust settling upon it, yet, since March, 1877, it has been running continuously and uniformly, with only slight reported variations, as tested by transit observations at noon.—*Harrisburg Telegraph.*

TITHES IN THE CITY OF LONDON.

ST. BARTHOLOMEW'S HOSPITAL *v.* PHILLIPS.

THIS was a suit (heard before the Master of the Rolls on the 2nd inst.) brought by the Corporation of London, as Governors of St. Bartholomew's Hospital, to establish their right as lay impropriators of the tithes of the parish of Christchurch-within-Newgate to tithes, at the rate of 2s. 9d. in the pound, on the rent of property within the parish.

The claim was founded on a decree made in pursuance of a statute passed in the thirty-seventh year of the reign of Henry VIII.

The principal defence was that after the Great Fire of London, it being impossible to ascertain how the property was previously rated, it was agreed that certain payments should be deemed the ancient payments, and should thenceforth be considered the customary payments, and that these payments amounted for the whole parish to about 200*l.* a year. A Bill was introduced into Parliament by the Governors of St. Bartholomew's Hospital, fixing the amount of the tithes for the whole parish, to be levied by a rate, at 1,200*l.* per annum until 1867, and thenceforth at 2,400*l.* per annum; but this Bill had been opposed by the governors of Christ's Hospital and the defendants, Messrs. Tylors, and the Bill had stood over to await the result of this suit.

At the hearing it was stated that the parties had agreed to a compromise of the suit upon the terms of the suit being abandoned, each party paying their own costs, and all opposition to the Bill to be withdrawn, so that it might be passed this session.

The Master of the Rolls expressed his approbation of the terms of the compromise, and said that if the case had gone on he might have been compelled to decide in favour of the plaintiffs' claim, but he considered it was not a claim which even "charity" ought to fully insist upon.

COMPENSATION CASES.

THE following cases were heard last week in the Sheriff's Court, Red Lion-square, before Mr. Under-Sheriff Burchell and special juries:—

KEMP AND OTHERS *v.* THE METROPOLITAN AND ST. JOHN'S WOOD RAILWAY COMPANY.

This case, which occupied two days, was in reference to some land at West End-lane, which was required for the new line from the Swiss Cottage to Harrow. It was stated that Sir Spencer Maryon Wilson had a right of way.

Evidence was given on both sides, and in the opinion of the surveyors for the claimants the value was put at about 3,000*l.*, while for the company the price was fixed at between 1,200*l.* and 1,300*l.*

The jury eventually assessed the value at 1,750*l.*

GARNER *v.* THE METROPOLITAN BOARD OF WORKS.

This was a claim for the leasehold interest and reversion of the Eight Bells public-house in Mare-street, Hackney, the site of which was required for public improvements.

In June, last year, the claimant had purchased the lease, which had about forty-seven years to run, at auction for 3,050*l.*, at a rental of 120*l.* a year. The Metropolitan Board of Works had paid Mrs. Envill, the tenant, 6,350*l.*, she having paid a premium of 4,000*l.*, and it was estimated that at the end of the term the premium would increase to 5,000*l.*, as public-house property was "going up," and the principal question was, what was the value at the present time of the reversionary interest in the premises? The premises were old and inconvenient, and, to depreciate the value, it was urged that by the time the lease expired public-house property might decrease in value. The lease was worth twenty-five years' purchase, to which 10 per cent. was to be added for compulsory sale, and 500*l.* was asked for the reversion. In the claim 3,800*l.* was asked, and by the evidence for the Board 3,062*l.* was put as a fair value.

The jury assessed the compensation at 3,150*l.*, and it was then stated that the Board had offered 3,156*l.*, and the verdict being 6*l.* under the offer, the claimant would have to pay his own costs, which it was believed would amount to between 400*l.* and 500*l.*

Verdict accordingly.

REREDOSES.

Stamford.—A reredos has been erected in St. John's Church, Stamford, as a testimonial to the rector, the Rev. D. E. Jones, who has completed the forty-fifth year of his ministry. The work, which was designed by Mr. Browning, and executed by Mr. Hilliam, cost 160*l.*

Mold.—A new reredos has just been placed in the parish church at Mold, at the expense of Mrs. Philips, of Rhual, in memory of her husband, the late Captain Philips. The centre part of the new structure is divided by small projecting buttresses into three panels. These buttresses are carried up before the mullions of the window, and finish with moulded caps, on which stand carved angels. The centre panel is filled with the Agnus Dei. The other panels are filled with tracery, and in the centre have medallions containing the emblems of the passion, and the crown of thorns and the crown of glory. Contrary to the usual manner of such works, what may be described as the most important features are placed at the ends, at the intersection of the angles of the chancel walls. A column is carried up on each side of the table. The caps of these columns form pedestals on which are placed figures; the one on the left-hand side of the table representing our Lord bearing His cross, the other the figure of Christ after the resurrection. The work is executed in veined alabaster, the figures being in white alabaster, and has been carried out by Messrs. Hardman & Co., of Birmingham, from the designs of Mr. John Douglas, architect, Chester.

PARSONAGES AND CLERGY-HOUSES.

Much Birch.—A new vicarage is in course of erection at Much Birch. Mr. Ewan Christian is the architect, and Mr. Cullis, of Tewkesbury, is the builder. The total cost will be about 2,000*l.*

Edinburgh.—The memorial stone of a new parsonage for All Saints' Episcopal Church, Edinburgh, has been laid by Bishop Cotterill. The parsonage occupies a site between the church and the row of houses on the north-east side of Brougham-street, and, when finished, will complete the pile of buildings in that neighbourhood, including mission home, schools, home for the aged, and a public hall, connected with this church. Mr. Anderson is the architect, and the estimated cost of the building is over 3,000*l.*

Sheffield.—At the cost of the Duke of Norfolk, a clergy-house has recently been erected for the priests of the Mission of St. Vincent de Paul, White-croft. The building is situated at the junction of Solly-street and Garden-street, within a short distance of St. Vincent's Church and schools. The structure is entirely of brick,—the style being Renaissance of the close of the seventeenth century. The architects are Messrs. M. E. Hadfield & Son. The total cost of the building, including furniture and site, is stated at 11,000*l.* Mr. M. J. Dowling was the general contractor; the joiner's work having been carried out by Messrs. Dealey & Homer; the plumbing and glazing by Mr. Corrie; and Messrs. Manuel & Son have executed the oak furniture and fittings.

NEW CEMETERIES.

Hadlow.—Mr. George Friend, architect, Maidstone, has prepared plans for the construction of a new parochial cemetery, within a short distance of Hadlow-common, as the churchyard has scarcely any space left for interments.

Dallington.—A short time ago, an intimation having been given by the Secretary of State that the churchyard must be closed, it became necessary for a new burial-place to be provided by the parish. A Burial Board was formed, and Earl Spencer presented the Board with a site, consisting of about two acres. Plans for laying it out into three portions,—the consecrated, the unconsecrated, and the reserved,—were prepared by Mr. Ingman, architect, Northampton. The entrance is from the Harlestone-road, the paths being covered with broken slag. It is proposed, and, indeed, the Board has resolved, to accept tenders for building a lodge; and it is estimated that the cost of the whole work will be 1,000*l.* Sufficient space has been left to build, at some future date, two chapels immediately at the entrance to the cemetery. The ground was consecrated on the 28th ult. by the Bishop of Peterborough.

DRAINAGE MATTERS.

Farnham (Surrey).—The Local Board of this town have lately received a report from Mr. James Lemon, C.E., of Southampton, whom they had consulted upon the sewerage and utilisation of sewage of their district; in which it is proposed to utilise the sewage by irrigating certain lands near the Union, and to the north-east of the town. By the adoption of this report, all possibility of polluting the river Wey, which runs through the town, will be precluded. The land proposed to be irrigated being higher than the town, pumping will have to be resorted to, it appearing that no land suitable for the purpose is obtainable at a level which will admit of the town being sewered by gravitation.

York and Cambridge Towns (Parish of Frimley).—The Rural Sanitary Authority have taken steps towards the sewering of their district, by consulting Mr. James Lemon, of Southampton, thereon.

WATER SUPPLY.

Clacton-on-Sea.—A trial boring, with a view to obtain a supply of water from the chalk, has been proceeding at this rapidly-increasing watering place for some time, under the direction of Mr. Jabez Church, C.E. Water was struck at a depth of about 280 ft. from the surface, but proved, on examination, to be considerably charged with salt; this having been shut out, the boring was continued, and at 405 ft. water was again reached, which rose to within 35 ft. of the surface, and promises to provide an abundant, pure, and fresh supply. It is intended (according to the *Chelmsford Chronicle*) to sink an artesian well at once, and to establish waterworks, the Act for which (in conjunction with the gas-works already in working order) was obtained two years since.

Barrow-in-Furness.—The Barrow-in-Furness Corporation are constructing a new reservoir at Pennington, capable of storing 200,000,000 gallons of water.

Dereham.—At a meeting of the Dereham Local Board on the 26th ult., it was resolved to instruct Messrs. Russ & Minns to report as to the best means to be adopted for obtaining an improved water-supply for the town.

Frome.—The sinking of the experimental well at Egborne, by the contractor, Mr. Charles Barnes, to whom it was let by the Local Board, is progressing satisfactorily. When 23 ft. had been reached, boring was tried, in the presence of Mr. Tomlinson, the engineer, and at a further depth of 3 ft. or 4 ft. water was struck, and it is believed that the supply is most copious.

Alfreton.—The Alfreton Parochial Committee met on the 4th inst. to consider tenders for the construction of the Butterley and Lindway reservoirs. It was agreed to accept that of Messrs. Coulson & Co., of Birmingham, whose tender was 6,355*l.* There were four tenders, the highest, 7,762*l.*, and the lowest, 5,968*l.* Mr. Coke, the engineer, stated that the pipe-laying between Butterley and Lindway would commence in a few days, and that no doubt the inhabitants of Alfreton would be supplied with water before Christmas.

Arbroath.—Some weeks ago, the Police Commission, by a majority, resolved to allow private houses to take in water at the rate of 6d. for every 1,000 gallons. This scheme was held up by its promoters as a public boon, but it is stated that up to the present time there has been only one application for a supply of water to a dwelling-house under the resolution.

Dorchester.—The Town Council have decided to take no action on the report recently presented by Messrs. Gotto & Beesley, in consequence of the heavy expense it would involve the town, amounting, with the drainage scheme, to about 17,000*l.*, and at a meeting, on the 2nd inst., it was resolved to instruct the borough surveyor (Mr. Norman), who has recently been to London to consult some engineers on the subject, to prepare the necessary specifications, in order that the work might be at once proceeded with, the surveyor's plan providing for additional pumping power, by which 40,000 gallons of water may be raised per hour, instead of 30,000 as at present.

Wimbledon.—At a meeting of the property-owners and inhabitants of Wimbledon, it has been resolved that "The present water-supply of Wimbledon being unsatisfactory, both as regards quantity and quality, it is advisable that the Local Board should, with the least practicable delay, take steps in pursuance of the Public Health Act, 1875, to carry out a scheme of water-supply, according to the published report of Mr. S. C. Homersham, C.E." Mr. Homersham proposes to obtain his supply from the chalk, by sinking a well at Wallington. The total cost of his scheme he estimates at 55,000*l.*

Effect of the Hot Weather on a Railway.—The *Manchester Guardian* says that the excessive heat a few days ago, which was about 120 in the sun at Wigan, had a singular effect on the railway metals between Wigan and Manchester, on the London and North-Western line. Near Platt-bridge Station the up-line to Manchester was found bulging for eight lengths in the shape of an S, at one point the metals and sleepers having been bodily moved nearly 2 ft. The rails appear to have been set too tightly, and on the heat expanding them they had been twisted out of their original course. Fortunately the mishap was discovered as a passenger train which stops at the station approached.

PARLIAMENTARY.

The Public Health (Ireland) Bill.—In the House of Lords, on the 5th inst., the Duke of Richmond and Gordon, in moving the second reading of this Bill, said that its object was to extend to Ireland advantages which had been already bestowed upon England. The Bill was a long one, extending to 294 clauses, and it dealt with twenty Acts now in existence in Ireland in relation to this subject. The Bill was strictly analogous to the English Public Health Act, except in this, that it incorporated the Burial Grounds Act of Ireland. He hoped that their lordships would approve of the principle of the Bill, and give it a second reading. Viscount Powerscourt approved generally of the Bill, but gave notice that upon a future occasion he should bring up a new clause. The Bill was read a second time.

Hyde Park.—In the House of Lords, on Monday evening, the Duke of Rutland asked why the gravel which had usually been laid down between the Marble-arch and Hyde Park-corner, and between the end of Rotten-row and Queen's-gate, had not been laid down this year; and whether there was any objection to building shelters in case of rain in Rotten-row and Battersea Park. In reply, the Duke of Richmond and Gordon said that the proposal referred to could not be carried out in consequence of the First Commissioner having received so many complaints as to inconvenience to pedestrians from gravel being placed upon the paths. The shelters could not be put up without incurring considerable expense, and they would probably not be sightly objects.

ACTION BY A "STEEPLE JACK."

SMITH *v.* PERRY.

IN this case (heard in the Bow County Court last week, before Mr. J. B. Dasent, judge), the plaintiff was described as a "steeple jack," and the defendant was a builder. The action was brought to recover the sum of 20*l.* for pulling down a chimney-shaft and cleaning the old bricks. There was a counter-claim for 31*l.* 10*s.* for damage alleged to have been sustained through the alleged negligence of the plaintiff in pulling down the shaft.

The plaintiff's claim was admitted, and the counter-claim was gone into, in support of which it was stated that the defendant was engaged to do certain work for the East India Dock Company. A portion of the work was to pull down a chimney-shaft. The plaintiff was engaged to do that, for which he was to charge 20*l.* Instead of getting on the top and knocking it down brick by brick, he pulled it down by a chain fastened round the top, similar to the mode of pulling down trees. The consequence was that the chimney did not come down straight as it should, but fell upon a boiler, breaking it so as to render it valueless, except for scrap iron. The boiler belonged to the persons whom the defendant had contracted to do the work for, and he (the defendant) had paid them 31*l.* 1*s.* for the boiler.

In answer to the counter-claim, the plaintiff said that when he was engaged to do the work, he told the defendant he would *pull* it down for 20*l.*, but if he was to *take* it down his price would be 30*l.* Upon that the defendant said that he would have it *pulled* down. With regard to the damage done to the boiler, he admitted that it was caused through the chimney falling on it, but it was no fault of his. Before pulling it down, wedges were driven in, so as to bring 10 ft. off first, but instead of it breaking there, it broke 35 ft. down, which he afterwards found was owing to a defect in the chimney, which had been built over thirty years.

His Honour said with regard to the plaintiff's claim, it had been admitted, and therefore must be allowed. As to the counter-claim, he was of opinion that the plaintiff had been guilty of no amount of negligence in pulling down the shaft, and he should allow the defendant 20*l.* for the damage to the boiler, and the costs to be divided between the plaintiff and the defendant.

A "Steeple-Jack" in Sussex.—The *Sussex Daily Post* says that the vane on the steeple of Hurst Church being out of order, the rector (Canon Borrer) offered 10*l.* to any one who would climb up (a height of 130 ft.) and send it down for repair. The offer was accepted by a man named John Bishop, formerly a sailor, who, having got into the clock-tower, lassoed the pinnacles of the windows at the base of the steeple, and, having by this means passed a rope round the building, actually walked up the steeple. The feat was accomplished by a method well known to sailors, the climber holding the free ends of the rope, and planting his feet firmly against the object climbed, keeping the rope at a safe tension. As the climber advanced he jerked the rope upwards and so progressed to the top. He safely reached the top, and sat there for four hours whilst the vane was being repaired, when he replaced it.

WATERLOO BRIDGE.

SIR JOSEPH BAZALGETTE, in a letter to the *Metropolitan*, writes:—

"Mr. Fulton, commenting upon the proceedings at the recent arbitration for the purchase of Waterloo Bridge, makes the positive statement 'that a good portion of the change of the bed of the river in the immediate vicinity of the bridge has occurred since, and in consequence of, the construction of the Thames Embankment.' This statement is, however, as inconsistent with the testimony of all the witnesses on both sides as it is with the actual facts.

Mr. Williams, the assistant clerk and surveyor of the bridge, said 'that no material "change" had taken place in the bed of the river under any of the arches since 1868,' and in confirmation gave a tabular statement of the soundings which he had taken every month, and which gave the following result:—

	Depth of Water.	
	1868.	1878.
Second arch from Middlesex side	27·6 ...	26 6
Third arch from Middlesex side	26·0 ...	26·3
Fourth arch from Middlesex side..... ..	28·0 ...	27·0
Fifth arch from Middlesex side	26·0 ...	26·0
Sixth arch from Middlesex side	26·0 ...	27·0
Seventh arch from Middlesex side . ..	25·9 ...	24·9

Further, Sir John Hawkshaw, in his report upon the bridge, said:—'Comparing the sections I have made with the soundings each year from 1868 up to and inclusive of 1877, I do not find that the depth beneath the bridge has been increased by scour.'

And Mr. Abernethy said:—'I am of opinion for a long period of time there has been no change in the bed of the river, say for ten or twelve years.'

The soundings taken by Rennie in 1814, Telford in 1823, Law in 1843, and Burstal in 1856, show a progressive deepening in the bed of the river to the extent of 10 ft., while the recent soundings taken by Sir John Hawkshaw, Mr. Williams, and Mr. Chatterton, prove that no material change has occurred since 1870, the year in which the Embankment was opened.

In the face of these facts, it is certainly incumbent upon Mr. Fulton to explain upon what authority he bases the statement quoted above.

As the plan designed by me for the protection of the piers of the bridges, after very careful consideration, received the approval of Mr. Gregory, Mr. W. H. Barlow, and Mr. Henry Law, who concurred in the opinion that it was the best and most economical plan which could be adopted, I am not the less concerned to find that Mr. Fulton considers it 'absurdly expensive.'

He suggests as a substitute 'depositing chalk, Kentish rag, or concrete round the piers,' but appears to forget that the free navigation of the River Thames is not altogether a secondary consideration, and that the conservators of the Thames, as well as those navigating steamers and other craft, might possibly object to the existing obstruction caused by the materials heaped round the piers being further increased."

"CERTAINTY AS TO POSTING."

SIR,—In a recent issue you were kind enough to call attention, under the above heading, to a pamphlet of mine "On the Advantages of Booked Letter or Postal Receipts," wherein you approved of the plan generally, but took exception to its introduction on the ground that you thought it would not be adopted to any great extent by the public.

In justice to myself, and with your usual courtesy, I trust you will allow me a small space in your excellent journal, whilst explaining the nature of the scheme, to draw attention to the simple fact that the calculation of the annual profit revenue of 260,000*l.* to the Government was based upon the very circumstance mentioned by you that the plan would be used in a very moderate degree, although with every probability of its increasing in value and importance as it became better known and understood.

There are 14,000 post-offices in the United Kingdom, and for my calculation to be on the safe side, I have given a ridiculous margin of 12,000 offices, only taking 3,000 offices into consideration. It is not to be supposed that 2,000 offices *only* would sell booked letter receipts, but that every one, with few exceptions, would do so, and if used to the extent anticipated the revenue would far exceed the sum I have named. The advantages are these:—

"Undoubted certainty that the letter which was booked (for which a postal receipt was given) was posted at the cost of only one farthing (the smallest coin of the realm)."

In courts of law the undoubted proof of posting would dispense with all other expensive and troublesome evidence.

Government would be spared needless inquiries after missing letters, often never posted, and investigation would begin only at the office where the postal receipt was given.

Greater accuracy, which would prevent errors, unstamped letters, and illegibility.

Messengers would be bound to be honest.

These receipts would only be used for important letters enclosing cheques, orders, countermands, &c., and may be resorted to or not, as the public think proper.

Thus, briefly, I give your readers an outline of the plan which Government has so indifferently, partially, and almost secretly put upon its trial.

Should further information be desired, Messrs. Simpkin, Marshall, & Co., Stationers' Hall-court, will forward the pamphlet referred to on application.

A. CLIFFORD-ESKELL.

Diocese of Ely.—At the recent Ely Diocesan Conference, a committee reported:—1. That in their opinion it is not desirable to abolish the regulation requiring an elevation and ground-plan of the building to be sent in with the application for aid, but that it be within the discretion of the committee to dispense in special cases with the requirement of such plans in the first instance. 2. That it is advisable that a diocesan architect should be appointed, to whom plans may be submitted before grants are made, if in any case it should seem desirable to the committee. The report was adopted.

MEDIÆVAL CHURCHES IN THE ISLAND OF CYPRUS.

SIR,—Will you use the influence of your widely-circulated journal to call the attention of the authorities to the valuable remains of Mediæval church architecture existing, but, alas! in a sad state of ruin and neglect, in the island of Cyprus? As our Government are about to take that island under their protection, it is to be hoped that they will insist upon the Turks respecting and abstaining from the destruction of these most important monuments of Mediæval Christianity. Amongst the most interesting of these remains are the ruins of two churches at Famagusta. One of these is in the Romanesque style of architecture, and appears originally to have formed a regular Basilica church, with three apses at the east end. It appears, from sketches which I have seen, to be of considerable size, and was probably erected about the time of our Richard "Cœur de Lion." This most remarkable building is now converted into a fort. The other church, which is believed to have been the cathedral, is a still more interesting building, Sketches of it represent it as being a veritable fourteenth-century Gothic church of large dimensions, and of quite a Northern type. The west front, which is tolerably perfect (except the spires, which are gone), somewhat resembles that of Lichfield Cathedral in general disposition of its parts, but bears a still stronger resemblance to some of the French west fronts of the Middle Pointed style. There are three large doorways, with straight-sided gabled canopies overhead. Over the centre of these is a magnificent window of six lights, with a wheel in the tracery; above the side doorways are long double-light windows, and over these again the belfry windows, which are also of two-lights. There are small remains of the nave, which appears to be converted into a mosque, and the choir and transepts have entirely disappeared. It is said that this beautiful church was erected by the Venetians, but the architecture seems quite to contradict this. It is evidently either French or possibly English work. The Venetians became masters of Cyprus in 1471, but the remains of this church are certainly of an earlier date, and seem to suggest a date at least a century earlier, if not a century and a half.

These churches are described and illustrated in "Le Brun's Voyage en Orient"; and some small woodcuts from sketches by F. Arundale serve as illustrations to the play of "Othello" in Knight's "Shakspeare." Some very good water-colour drawings of these buildings, and other points of interest in the island, were exhibited in London about ten years ago; but I cannot recollect the name of the artist. I also have an impression that a descriptive account of these churches appeared some years back in the *Ecclesiologist*.

A gentleman who saw these buildings a few years back informed me that their Turkish owners had allowed them to fall into a terrible state of neglect, and no means were taken to preserve them from destruction, and it is with the view of interesting you, and through you the English public, in the preservation of these curious relics of the past, that I now write this letter.

H. W. BREWER.

ROYAL ACADEMY ARCHITECTURAL SCHOOL.

The following have been admitted:—

Students of the Upper School:—F. Baggallay, R. W. Collier, H. B. Cullern, A. Frampton, R. W. Gibson, J. H. Ince, A. Tietman, O. C. Wylson.

Students of the Lower School:—J. B. Bare, J. H. Buckeridge, A. D. Gregg, T. G. Howell, C. Howse, J. M. Jones, F. Miller, G. Petrie, G. Wheelhouse.

Probationers:—E. J. M. Allen, C. J. Bradley, F. Dickson, T. Gordon, T. E. Hatch, C. E. Holmes, J. J. Jones, M. J. Lansdell, T. C. Lees, A. J. Murray, J. B. Phillips, C. A. Smith, T. B. Whinney.

South London Short of Water.—Complaints are made of the extreme scarcity, not to say the absolute absence, of water at Peckham. The water companies lay the blame on the speculating builders, for not providing sufficiently large cisterns; but we know of houses in Brixton where, even with capacious cisterns, the supply is very meagre.

THE ORATORY COMPETITION.

SIR,—"An Outsider" in last week's *Builder* refers to "Mr. Waterhouse's decision," and suggests that his report should be published.

Will you allow me to say that Mr. Waterhouse was not called in to act as referee in this competition, but simply to give the Fathers of the Oratory his opinion of the several designs?

The decision is therefore that of the Fathers (as in their original advertisement they said it should be). Mr. Waterhouse's report is in no sense an award; it makes no attempt to place the designs in the order of their merit, and it was never intended for publication.

20, *New Cavendish-street.* J. WILLEY.

MASTERS AND MEN.

Glasgow.—The Glasgow glaziers came out on strike on the 29th ult. against the proposed reduction of their wages from 7½d. to 7d. per hour, but a temporary arrangement has been come to between the Glasgow glaziers and their employers, under which they continue work at the former rate of pay.——At a meeting of the Glasgow Master Plasterers' Association, the members explained the position they occupied in regard to the work they had on hand, and although the plasterers' strike had now lasted a month they were still receiving assurances of sympathy from the architects and builders of the city.

Kirriemuir.—On the 29th ult. all the operative masons in Kirriemuir, numbering about 100 hands, came out on strike, in consequence of notice having been given by the masters of a reduction of 1d. per hour.

North Wales.—Mr. Parry, arbitrator in the strike at the Rhos slate quarries, which has continued for five weeks, has decided adversely to the men, who have accepted the decision.

Edinburgh.—A meeting of master plasterers was held on the 28th ult. The feeling was very strongly in the direction of resisting the demands of the men. A letter was read from the secretary of the Glasgow Employers' Association, intimating that the determination of the employers there was still unchanged, and that several of the masters who had not at first acted in concert with the Association were now doing so.

Staffordshire.—The Staffordshire nailers have struck against a reduction in prices proposed by the masters.

THE SUNDAY SOCIETY AND THE GROSVENOR GALLERY.

SIR,—Through the praiseworthy liberality of Sir Coutts Lindsay, the proprietor and director of the Grosvenor Gallery, New Bond-street, we are enabled to announce that the Summer Exhibition at this Institution will be open on the three undermentioned Sunday afternoons, between the hours of two and six:—

On Sunday, July 14th, the Gallery will be opened free to the subscribers and members of the Sunday Society; and on July 21st and August 4th to the public, by tickets, which will be issued by the Sunday Society. These will be forwarded by post on receipt of stamped envelope. All applications to be by letter to the Honorary Secretary, 19, Charing-cross.

In order that these visits may be as instructive and interesting as possible, the Society has published a special catalogue, price 3d., which must be obtained before the visiting day.

So very few are the opportunities possessed by large numbers of the people for the study of art collections, that we have no hesitation in asking you to give publicity to Sir Coutts Lindsay's generous endeavour to increase them.

ROSEBERY, President of the Sunday Society.
W. H. CORFIELD, Chairman of Committee.
MARK H. JUDGE, Honorary Secretary.

No. 19, *Charing-cross, S.W.*

Cheap Refreshments in the Parks.—On the 27th ult. the First Commissioner of Works received a deputation from the Working Men's Club and Institute Union. Sir Harcourt Johnstone, M.P., in introducing the deputation, stated that working men had represented to the society that the poorer classes were unable to pay the prices demanded by those who supplied refreshments in the parks, and that permission was sought for stalls at which tea, coffee, &c., should be sold at the prices generally charged in the streets. Mr. Randle, of the Coffee Taverns Company, having stated that the company would supply what was wanted, the First Commissioner expressed his sympathy with the object in view, and said he would allow the experiment to be tried in the first instance in one park, selecting Battersea Park for this purpose.

CHURCH-BUILDING NEWS.

Bledington.—The little village church of Bledington, Gloucestershire, is in process of restoration, under the direction of Mr. J. E. K. Cutts, architect, London. The cost will be about 1,500*l.*

Claybrooke.—The ancient parish church of St. Peter's, Claybrooke, has been reopened, after restoration. Before undergoing repair, the chancel, which is described as a remarkable specimen of the best period of Leicestershire Fourteenth Century Gothic, was crumbling away with age, while the roof of the nave, arcades, and body of the church were in a similar state. The work of renovation was commenced in 1876. The old-fashioned high and many-sided pews, with the galleries, &c., at the south and west ends, have all been removed, and a new floor of deal laid down, with ordinary tiles in the aisles and borderings. Rush-seated chairs have been provided as the seating accommodation. The chancel has been entirely restored, and the floor laid with encaustic tiles from the Lugwardine Works, Hereford. A re-arrangement of the painted glass edging of the windows has been effected, the old windows have been partially restored, and some extra canopy to the other windows has been supplied by Messrs. Bell & Co. Heating apparatus, on a method devised by the Rev. C. P. Peach, has been fixed. Mr. G. E. Street, R.A., is the architect, the builders being Messrs. Roberts & Son, of Weedon. The cost will be nearly 3,000*l.*

Blackpool.—The Bishop of Manchester consecrated St. John's new parish church, Blackpool, on the 25th ult. The new church is capable of holding 1,200 persons, and has been erected on the site of the old parish church, at a cost of about 12,000*l.* It is built of Longridge stone, and consists of a nave 98 ft. by 36 ft.; north and south transepts, 26 ft. by 25 ft.; north and south aisles, 63 ft. by 19 ft., and a chancel 30 ft. by 25 ft. The nave is 60 ft. in height to the apex of the roof; the chancel 51 ft. 6 in. to the ridge of the roof, and transepts 54 ft. At the south-west angle of the church, a tower, 14 ft. square internally, rises to a height of 139 ft., and is capped with four turrets.

Cambridge.—On the 27th ult. the foundation-stone of St. Philip's Church, Mill-road, Cambridge, was laid by the Hon. Mrs. Sugden. The builder is Mr. Pate, of Seaford-street.

Beckenham.—On the 22nd ult. the Bishop of Dover consecrated the new Church of the Holy Trinity, Beckenham. The church, which has been built from the designs by Messrs. Daukes & Clarke, of Serjeants' Inn (the contractor being Mr. W. Tongue, of Plumstead), at the cost of Mr. Francis Peek, in memory of his parents, William and Mary Peek, on ground given by Mr. Albemarle Cator, is in the Geometrical style. It is faced internally with Bath stone, and externally with Kentish rag, with Bath-stone dressings. The church is capable of accommodating between 900 and 1,000 people.

Walton.—The new church at Walton, Liverpool, was opened for service on June 16th. The church, which occupies a site on the east side of Rice-lane, is Early English in style. Exteriorly the walls are built with Yorkshire parpoints, relieved by dressings of Stourton stone. Green Westmoreland slates, surmounted by a bluish grey ridge cresting, form the covering of the roofs. For lack of funds, the tower and spire, which form part of the design, are left for erection in the future. The church will hold 600 or 700 people. The sole contractor for the building was Mr. James Leslie, Miller's Bridge. The benches were supplied by Mr. S. Webster, Miller's Bridge; the altar by Mr. W. Bond, Waterloo; the stained-glass window by Messrs. Wailes & Strong, Newcastle-on-Tyne; the heating apparatus by Mr. Bramham, Liverpool; and the carving by Messrs. Norbury & Co., Liverpool. Mr. Edmund Kirby, Liverpool, was the architect.

Stoke Abbott.—The parish church of St. Mary the Virgin, Stoke Abbott, has been reopened, after restoration. The work, which has cost about 2,000*l.*, was entrusted to Mr. C. Trask, of Norton-sub-Hamdon and Doulting, the architect being Mr. J. P. St. Aubyn, of London. The church has not only been repaired, but considerably enlarged, a new north aisle having been added to the church, thus providing nearly 100 extra seats. The ancient, but very ugly, gallery which formerly stood at the west end of the church has been removed.

Handsworth Woodhouse.—The new Church of St. James, Handsworth Woodhouse, has been consecrated. It comprises a chancel, 30 ft. by 20 ft.; a nave, 67 ft. by 25 ft.; and a south aisle, 60 ft. by 16 ft.; with south-west porch, organ-chamber, and vestry. The building is Early Geometric Gothic in character, and is built of stone, the walls being faced with Dunford Bridge stone, with dressings, &c., throughout of red Treeton ashlar. The roofs are covered with green Westmoreland slates, finished with red tile cresting. The fittings of the chancel, consisting of altar-table, stalls, lectern, and pulpit are all of carved oak, by Mr. H. Hems, of Exeter. The warming is by hot water, on the high-pressure system, by Messrs. Bacon & Co., of London; and the lighting is by large gas coronæ and brackets, made by Messrs. Thos. Brawn & Co., of Birmingham, who also were entrusted with the wrought-iron boundary railing and gates. The general contractors for the building works were:—Masons', slaters', and plasterers' work, Mr. W. J. Greenwood, of Woodhouse; carpenters' and joiners' work, Mr. J. Spink; plumbing and glazing, Mr. J. Easton; and for painting, Mr. Sharples, Sheffield. The whole of the work has been executed from the designs and under the superintendence of Messrs. Innocent & Brown, architects, Sheffield.

Portswood.—A new chancel is being erected at Christ Church, Portswood. It extends eastwards about 48 ft., and is 28 ft. wide. Messrs. Colson & Son, of Winchester, are the architects, Mr. Amey being clerk of the works, and Mr. W. H. Chapman, of Woolston, the builder. The cost will be about 2,800*l.*

DISSENTING CHURCH-BUILDING NEWS.

London.—A private meeting of friends of the Church of Scotland was held on the 26th ult., at Lord Gordon's, 50, Eaton-square, with a view of consulting about the propriety and possibility of erecting a John Knox Memorial Church and Institute on the Embankment, and endowing the same. After some remarks from Lord Gordon and a promise by him of a subscription of 1,000*l.*, a large committee was appointed to carry out the project, which is expected to cost 60,000*l.*

Spalding.—The memorial stones of a new Free Methodist Chapel at Spalding have been laid. Messrs. Bellamy & Hardy, of Lincoln, are the architects.

Blackley.—On the 22nd ult., the memorial stones of a new Baptist Chapel and school at Blackley, near Elland, were laid. Mr. C. F. L. Horsfall is the architect. The new chapel will occupy a site about 50 yards to the south of the old building. It will be Classic in style, with a frontage to the south-east. The entrance to the front of the chapel is a portico, with two entrances. The chapel will have 600 sittings, and will accommodate 150 scholars in addition. The school, which is under the chapel, will accommodate over 300 children. A minister's house will adjoin the chapel.

Wotton.—A new Congregational chapel at Forest-green, Wotton, near Dorking, has just been commenced, the foundation-stone having been laid by Mr. W. J. Evelyn, the lord of the manor. The building is to be erected by Messrs. King, of Abinger Hammer, and will seat 150 persons. The total outlay will be upwards of 500*l.*

Durham.—A new English Presbyterian Church in Waddington-street, Durham, has been opened. It has been built from plans prepared by Mr. John Henry, architect, Durham. It is Early English in style, and parallelogram in form, being 57 ft. by 33 ft. internally, and 36 ft. in height to the ceiling, with two vestries behind, over one of which is a small room. The exterior is of Tow Law rock-faced blocking, Ingleby stone being used for the windows and other dressings. The seats, pulpit, and fittings are principally of pitch pine, varnished. The building will accommodate 400 persons.

SCHOOL BUILDING NEWS.

Rugby.—The new "Subordinate Schools," Rugby, have been lately completed. We note that the gasfittings throughout the schools and the master's house have been supplied by Mr. W. R. Shrivell, of London, and fixed by Mr. John Jacomb, of Rugby; that the lavatories and watercloset fittings have been supplied by Messrs. Beard, Dent, & Hilliers, of London; that the bricks used came from the Berkswell yards, the stone being Box Ground; that Mr. Boon, of Coventry, was entrusted with the laying

down of the "sovereign" paving required; that the lobbies are to be warmed and ventilated with Elsley's pyro-pneumatic stoves; that the large schoolroom is fitted with Pierce's "fresh-air warming and purifying grates" (supplied by Mr. Elsley); that most of the rooms in the master's house are fitted with Barnard, Bishop, & Barnard's "slow combustion" stoves; that many of the windows in both school and house have been glazed with the "dead-light" glazing of Messrs. Brown, Boreham, & Reynolds, of London; and that the bell for the bell-cote was supplied and hung by Messrs. Mears, of Whitechapel. The architect was Mr. J. Clarke; Mr. Claridge, of Banbury, being the contractor, and Mr. E. Thurbon the clerk of works. The statue of Lawrence Sheriffe, which is placed at the front porch, is the work of Mr. N. Hitch, of London.

Northampton.—The Sunday Schools in connexion with Doddridge Chapel, Northampton, have recently been considerably enlarged, so as to accommodate 1,200 children. A new heating apparatus, by Messrs. Blake & Co., Coventry, has been fixed. The architect was Mr. W. Hull, and the builder was Mr. George Heap. The contract was for 1,168*l.*, exclusive of furniture and gas fittings.

STAINED GLASS.

Donington.—One of the windows in Donington parish church has just been filled with stained glass, as a memorial of the late Captain and Mrs. Gleed. The subject is the Resurrection.

Lincoln. — The windows given by the parishioners and friends to the memory of the late churchwardens of St. Martin's parish, who both died within a few days of each other, have just been placed in the church. They consist of a three-light window in the north aisle, representing "Christ in the House of Bethany," and two windows in the porch, representing "Christ as the Good Shepherd" and "Christ as the Sufferer." The whole of the twenty-three stained-glass windows now in the church have been executed by Mr. Henry Hughes, of London.

Halifax.—The large window over the south-east door of Holy Trinity Church, Halifax, has just been filled with stained glass by Messrs. Ward & Hughes. The subject is Our Lord at the entrance to the tomb of Lazarus, with Mary and Martha at His feet. The legend beneath gives the words "Thy brother shall rise again." The window is a memorial of the late Mr. William Robinson.

Hempstead Church, near Gloucester.—A memorial window to the late Mr. and Mrs. Walker, of Highfield House, Gloucester, has just been placed in the above-named church by their son, Mr. C. B. Walker. The subjects are from the life of St. John the Baptist, and the window was executed by Messrs. Camm, Brothers, Birmingham.

Proposed Public Library for Kensington. — A somewhat excited meeting of ratepayers, resident in the parish of St. Mary Abbotts, Kensington, was held on the 5th inst., to determine whether the Public Libraries Act should be adopted in Kensington. At the outset an objection was raised to the meeting by a ratepayer, on the ground of illegality, but the demurrer was overruled by the chairman, who explained that the meeting was summoned under an authoritative requisition to the overseers of the parish. Amidst frequent interruptions, the chairman proceeded to advocate the establishment of free libraries, in view of their advantages to the community at large. A portion of the meeting emphatically declined to endorse this opinion, and the result was much unseemly wrangling, which culminated in a resolution, proposed from the body of the hall, declaring in effect that the heavy burden of Imperial and local taxation rendered the adoption of the measure inexpedient. Mr. Arthur Arnold moved as an amendment that the Act be put in force. Dr. Gladstone stated that it would be possible to accept the proposal without erecting a single building for the purposes of a library, as the existing School Board schools might be utilised. The vote of the meeting having been taken, the numbers as announced by the chairman were 87 for and 97 against the amendment, so that the proposal to adopt a free public library was negatived by a majority of 10. The meeting then broke up in some confusion, during which an informal vote of thanks was proposed to Mr. Heywood for his liberality and public spirit in offering to the Vestry a free library at Notting-hill.

Books Received.

Rational Spelling: a conservative Scheme for National Spelling Reform. A Letter addressed to the Right Hon. the Earl of Beaconsfield, by Dr. George Harley, F.R.S. London: Hodgson & Son. 1878.

THE only way in which this pamphlet can be called "rational" is in a comparative sense, in that it is somewhat less unreasonable than some other schemes of spelling reform which it denounces. But the whole craze for spelling reform involves an entire forgetfulness of the fact that language is a matter of philological history, and not of mere sound or mere convenience of writing. The author, for example, spells *accidentally* "axidentaly"; thereby at once obliterating the original Latin meaning of the word, and its derivation from *cado, cecidi*, "to fall," and the interesting analogy between this Latin expression and the old English "it fell out," &c. We suppose *incidentally* would be "insidentaly," so that the two words, both from *cado*, would appear to have a totally distinct origin. *Committee*, on the same principle, instead of asserting its derivation from *cum* and *mittere*,—a set of people sent or deputed to act together,—would be "comite," and would appear to come from *comes*, "a companion." It s useless to waste words upon such teaching, which we are certain the common sense of the mass of educated people will never admit. A trifling acquisition of brevity and apparent consistency (only apparent) in spelling would be dearly bought at the cost of such an emasculation of the language. The matter concerns all whose business it is to use the English language as a vehicle for their thoughts, and we here enter our protest against it, as the pamphlet has been sent to us, by its esteemed and accomplished author, presumably for the expression of an opinion.

Miscellanea.

A Carpenter's Clock.—A noteworthy instance of mechanical skill, ingenuity, and perseverance is reported by one of the Scotch papers. It seems that the clock on the church-steeple of the village of Longforgan has long been stopped. Sums of money have been more than once raised to repair the old machinery, but all efforts to set it going proved unsuccessful. This state of affairs, it is said, "weighed heavily on the mind" of a carpenter in the village who had tried his hand at the clock and found the machinery in a very dilapidated state. However, he devoted his leisure hours to studying the principles of clock-making; and at last, thinking that he saw his way to manufacturing a new clock, boldly commenced the work. He not only made most of the models for the different wheels, but even several of the tools for adjusting and perfecting the respective parts when moulded. Having other business to perform, he could only employ himself on the clock during spare hours; but at last he finished the work, and with his own hands placed it in the steeple. It has now, we are told, been there for some months, and keeps time with admirable accuracy.

Decoration of Zinc.—A chemical process for covering zinc with coloured coatings has lately been described by Dr. L. Stille in the *Engineering and Mining Journal*. The articles of zinc are first brightened by scouring with quartz sand, moistened with dilute muriatic acid, putting them quickly in water and then wiping dry most carefully with white blotting-paper. To insure success, however, it is necessary to employ zinc as free as possible from lead, and to have it bright like a mirror. When these conditions are fulfilled, the metal may be coated with a variety of beautiful colours by immersion in a solution of alkaline tartrate of copper for a shorter or longer interval of time, depending on the colour that is desired. The solution is made by dissolving three parts of air-dried tartrate of copper in caustic soda lye, containing four parts of hydrate of soda to forty-eight parts of water.

Victoria (London) Dock Extension.—The Society of Engineers will visit the works in progress for the Victoria Dock Extension, Silvertown, North Woolwich, on Tuesday next. On the occasion of the visit of the Society last year, we gave some account of the works (vol. xxxv., p. 727).

Unproductive Shop-building.—The *Builder* has projected a scheme for the erection of shops and dwelling-houses combined, which is designed to supersede the present system by becoming immediately productive. We cannot attempt to give the details of a plan which our contemporary has elaborated for covering an assumed area in Central London,—say in Soho,—in a manner which will prove remunerative. The space is supposed to be a piece of land 110 ft. broad by 90 ft., having a frontage of 110 ft. on a main thoroughfare, and a similar frontage on a by-street in the rear. On reference to the plan, we find the usual formal row of houses dispensed with, and one large structure with shops judiciously placed here and there, and with staircases, private rooms, &c., on the ground-floor, intermixed. Our object is in no degree to describe the ideal structure, which can so well be understood by referring to our contemporary; but our desire is to express approval of any idea which shall improve the appearance of London architecture, and at the same time save the pockets of capitalists. The prevailing notion is to construct a row of shops, and pile the dwelling-rooms above them in the old-fashioned style, though there is not the old-fashioned use for them. Formerly, the upper part of a tradesman's house was occupied by himself and family; now it is usually let out for offices. It happens, though, as our contemporary observes, that new houses built on the old-fashioned system in Central London remain for years without a tenant, and two instances are given where the buildings, since their erection three or four years ago, have not yet been let. 650*l.* is a high price to pay for a house and shop, and people will not take floors at 300*l.*, 200*l.*, and 100*l.* per annum, arranged on the perpendicular system. Where there is a good frontage, the flat system is undoubtedly the best mode of building.—*Metropolitan.*

Manchester and Salford Sanitary Association.—The annual meeting of this Association was held on the 1st inst., the Bishop of Manchester in the chair. The report for the year gives a *resumé* of the work of the committee during that period, and states that the sub-committee appointed last year to investigate the condition of cottage dwellings in Manchester had completed their report, copies of which had been supplied to the Manchester City Council and the Salford Town Council, with memorials on the subject. During the year, six lectures on subjects connected with health had been delivered, and the weekly returns of diseases and deaths in Manchester and Salford had been compiled and published. The balance-sheet for the year showed the income of the Association to have been 242*l.*, and the expenditure to leave a balance in hand of 47*l.* 5*s.* 10*d.* It was resolved, on the motion of the Bishop of Manchester, "That the action of the committee in establishing a sanitary inspection department of the Association be approved, and that the committee be requested to take such measures as may be deemed fit to ensure the successful working of the department."

Exhibition of Fans.—The annual competitive exhibition of fans, under the auspices of the Worshipful Company of Fanmakers, was opened on the 2nd inst. in the hall of the Drapers' Company, Throgmorton-street. Over 1,250 specimens are included in the catalogue, ranging in description and price from the hand-painted silk or cambric fan with a pierced wood-handle, the value of which is but half a guinea, to painted specimens enriched with lace edgings and jewelled handles, which are valued at 200*l.* or 300*l.*

A Portland Cement Testing Room and Laboratory.—Mr. Faija, of 4, Great Queen-street, Westminster, has constructed a laboratory and testing-room where Portland cement can be tested. Each test, except when especially required otherwise, will consist of tests for weight, fineness, tensile strength, expansion, and contraction. Such a testing laboratory is likely to prove very useful to engineers and contractors.

Apprentices.—At the Wandsworth Police-court Joseph William Murphy, stonemason, was charged by his masters, Messrs. Lathey Brothers, builders, of Battersea, with absenting himself from work, and refusing to fulfil the terms of his apprenticeship. Mr. Bridge ordered him to return to work forthwith, with the intimation that any similar charge in future would be attended with serious consequences.

Metropolitan Drinking Fountains Association.—The annual meeting of the Metropolitan Drinking Fountain and Cattle Trough Association was held on the 2nd inst. at Willis's Rooms, Lord Kinnaird in the chair. Mr. John Lee (the secretary) read the report, which stated that:—

During the past year the society had, owing to the constant demands upon its funds for the erection of new fountains and troughs, been obliged to expend not only the whole of the legacies and subscriptions, but also to sell out an amount invested in Consols as a nucleus for a future reserve fund. The Society had during the past year erected no fewer than eighty-one new troughs and fountains, making the total number now erected in the metropolis and suburbs 361 troughs for animals and 367 fountains for human beings. The association had, therefore, more than 700 fountains and troughs under its care, all of which were visited, cleaned, and reported at the office of the society's agents once or twice, and most of them three times, a week; and the number of men, women, and children who drank at the various fountains was supposed to be nearly half a million daily, whilst nearly 2,000 horses, besides oxen, sheep, and dogs, frequently drink at a single trough in one day. The Society had originally used iron, stone, and wood as materials for fountains and troughs; but as all these had proved to be alike unsuitable and unable to stand the rough wear and liability to accidental damage to which they were necessarily subjected, the committee had decided to use henceforth nothing but granite, and to replace when possible the old wooden troughs by those of more durable material. The total amount of donations, subscriptions, and legacies received during the year had been 4,558*l.*, showing a total falling off in the receipts compared with those of last year of 1,375*l.* Towards meeting this deficiency, an old supporter of the association, Mr. Barlow Kennett, had generously offered to contribute 50*l.* provided the remainder of the amount be made up in similar sums or in larger or smaller donations before the end of July. The total amount expended had been 5,081*l.*, or 523*l.* more than the receipts, and as the amount left in hand by the sale of 1,000*l.* Consols would be still further reduced by the claims of the various water companies, prompt and liberal contributions were needed if the Society was to continue its work on the same scale as before.

The London Institution, Finsbury-circus. A special general meeting of the proprietors of this Institution was held in the theatre, Finsbury-circus, last week (Mr. De la Rue, the president of the Institution, in the chair), for the purpose of considering and resolving upon the report of the Board of Management on the proposed enlargement of the Institution. The Chairman, in opening the proceedings, said the committee had been considering for the past nine months what would be the best means of extending the facilities to be afforded to the increased membership of the Institution. Greater requirements now existed than at any former time, seeing that 600 new annual members had been recently admitted. Mr. Clifton, the architect, had prepared plans which embraced all the suggestions for the requirements before them. These improvements could not be carried out without a large expenditure of money (about 13,000*l.*). The Board recommended, firstly, that the proposed alterations and enlargements be carried out; secondly, that application be made for an Act of Parliament to realise the funds in the coming session, in order that they may be dealt with or sold by the Board; and thirdly, that in the meantime contracts be entered into. A long discussion followed, after which the Chairman moved:—"That the proposed alterations and enlargements be carried out." A show of hands was taken, and the motion was declared to be lost.

The British Museum.—The Bill, prepared and brought in by Mr. Walpole, Mr. Lowe, and Sir John Lubbock, to enable the trustees of the British Museum to remove portions of their collections, has been issued. In enacts that, in order to provide room for the reception of additions which are from time to time made to the Museum, the trustees may remove the collections belonging to the departments of zoology, geology, palæontology, mineralogy, and botany to the Natural History Museum now in course of erection at South Kensington, and all or any of the pictures now in the Museum to the National Gallery. It is also announced that Mr. Theophilus G. Pinches has been appointed to the post left vacant in the British Museum by the death of Mr. George Smith, and he is stated to have begun his official career as an Assyriologist by an important discovery with respect to the chronology of the reign of Cambyses. The discovery, which is based on the tablets in the late Mr. Smith's collection, is said to have already received the approbation of Sir Henry Rawlinson and Dr. Birch.

Testimonial to an Antiquary-Journalist. Mr. J. Tom Burgess, F.S.A., until lately editor of the *Leamington Courier*, and now of Berrow's *Worcester Journal*, has been presented with a purse of 150 sovereigns, gold watch, and chain, in recognition of his ability as a journalist, and of his researches as an antiquary.

Floodings in the Metropolis.—The floodings which take place in certain parts of the metropolis whenever there is an exceptionally high tide or an extra-heavy rainfall within a few hours were brought to the attention of the Metropolitan Board of Works at its meeting on the 5th inst. by deputations from Limehouse and St. Pancras. Mr. Roche stated that a committee of the Board had the subject under their consideration. It was perfectly clear, he said, that portions of the metropolis had been seriously injured by the recent inundations, and he took it to be the duty of the Board to see that the cause of such a state of things did not continue to exist. He hoped that when the Committee concluded their labours they would bring forward a comprehensive plan for the prevention in the future of the recurrence of such disasters as those of which complaint had been made. We hope so too, and trust that the Committee will use all expedition, these periodical floodings being productive of much misery and disease.

The Social Science Congress.—The standing committees of the several departments of the Social Science Association have met and selected the special questions for discussion at the forthcoming Congress. We have already (p. 696, *ante*) mentioned the subjects that are to be discussed in the Health Department. In the Economy and Trade Department the following will be the topics:—1. What are the economic principles that should regulate the borrowing powers of local corporations? 2. What are the causes of the present depressed and stagnant condition of industrial enterprise, and what are the best remedies? 3. What means can best be adopted to secure to the wage-earning classes a due provision for old age? In the Art Department:—1. How can street architecture be best improved with due regard to economy? 2. How can a sound knowledge of music be best and most generally disseminated? 3. By what means can good examples of art be brought within the reach of the population of small towns and villages?

Berkshire Archæological Society. The members of this society and their friends, to the number of about one hundred, visited London on Thursday last, for the purpose of seeing Westminster Abbey, St. Margaret's Church, the Chapel of the Houses of Parliament (formerly St. Stephen's crypt), and the Chapel Royal, Whitehall. Dean Stanley, Canon Farrar, and Canon Knollys, acted as *ciceroni* at the Abbey, the Church, and the Chapel Royal respectively, Mr. Fred. W. Albury, the hon. sec., giving a brief description of St. Stephen's Chapel. Luncheon was partaken of at the Westminster Palace Hotel, Mr. Charles Smith, F.R.I.B.A., vice-president, in the chair, in the unavoidable absence of the president, Sir John Conroy, bart. We shall give a report of the day's proceedings in our next.

The Norwood Schools.—At the meeting of the Lambeth Board of Guardians, on the 3rd inst., a discussion arose on a letter from Mr. Foulsham, architect, in relation to the plans proposed by him for the alterations at Norwood schools. The writer also asked whether the report which had appeared in the papers, stating that the Guardians had determined to advertise for plans, was correct. The clerk replied that the newspaper report was correct.—Mr. Hearson thought that as Mr. Foulsham had been engaged by the Board to draw out the plan, they were morally bound to continue his services.—Mr. Andrew could not entirely agree with the last speaker, but he believed that Mr. Foulsham should be paid for the work he had done, and be allowed to compete with the rest. It was decided to advertise for designs.

The London Trades' Council and the Artisans' Institute.—It is stated that arrangements are being made to transfer the management of the Artisans' Institute, Castle-street, St. Martin's-lane, to the London Trades' Council. The offer of the trustees and principal is clogged by no other conditions than that the Trades' Council should continue to work it as an educational institution.

New Court, Lincoln's Inn.—We would add to our notice of this building that the red facing bricks for the fronts were manufactured and supplied by Messrs. M. H. Blanchard & Co., of Bishops Waltham.

An Exhibition at the Antipodes.—It is stated that an International Exhibition is to be held in Melbourne in 1880.

Stained Glass in France.—Monseigneur Dupanloup proposes to illustrate Joan of Arc's career by ten painted windows in Orleans Cathedral and to restore the old expiatory monument. He has issued an appeal for subscriptions, in which he says:—

"To us Joan of Arc is a warrior, a victim, and likewise a saint; but as it appertains to the Church alone to adjudge her this grand title of Saint, twelve of my venerated colleagues and I a few years ago addressed the request to the Holy See. We then opened at Orleans the preliminary investigation required by the canon laws; the Court of Rome has now that investigation in its hands, and we await with confidence its decision."

A jury will choose the best plan, and the cost is estimated at 150,000f. All who subscribe or collect 100f. will have their names inscribed in gold letters on marble tablets in the cathedral!

A Modern "Grotesque."—It is reported from Germany that Hoedel, one of the would-be assassins of the Kaiser, has already been gibbeted in effigy by the stonemasons of Cologne Cathedral. His body has been made like that of a quadruped, while his claws grasp a revolver in one hand and a newspaper in the other.

Manchester Statistical Society.—On the 18th a testimonial will be presented to Mr. W. E. A. Axon, in recognition of his services as honorary secretary to the Manchester Literary Club and Manchester Statistical Society. Mr. H. H. Howorth, F.S.A., will make the presentation.

TENDERS

For alterations and repairs to the Victory Tavern, Greenwich. Mr. Henry Roberts, architect:—

Bridel	£356 0 0
Davis	345 0 0
Hockley	340 0 0
Murrin (accepted)	335 15 0

For adding new wing and repairs, to No. 13, Stoke Newington-common, for the Incorporated Society of Licensed Victuallers. Mr. J. Groom, architect:—

Wall Bros.	£620 0 0
Lambie	420 0 0
Grimwood & Son	398 0 0
Whitby	376 0 0
Nicholls & Co.	365 0 0
Mattock Bros.	313 0 0

For painting and repairs to Bolingbroke Schools, Battersea, for the London School Board. Mr. Robson, architect:—

Ramsey Bros.	£435 0 0
Stevenson	429 0 0
Higgs & Hill	339 0 0
Phelps & Price	343 0 0
Mark	303 0 0
Nicholls & Co.	293 0 0

For painting and repairs to Board Schools, New-road, Wandsworth. Mr. Robson, architect:—

Mattell	£443 0 0
Phelps & Rice	413 0 0
Nightingale	409 0 0
Nicholls & Co.	406 10 0
Hobson	323 0 0

For Snodland Drainage, (No. 1) pipe sewer, for the Malling Sanitary Board of Directors, Town Malling. The tanks to be measured and valued. Mr. F. C. May, surveyor:—

Neave & Son	£898 7 6
Harman & King	695 0 0
Marchant	625 0 0
Ames (accepted)	580 0 0

For infectious hospital, Basingstoke, Hants, for the Urban Sanitary Authority. Mr. Jas. Gibson, architect:—

Sims	£1,428 10 0
Stevens & Bastow	1,426 0 0
Prout	1,396 0 0
Goodall	1,388 10 0
G. Batten	1,359 10 0
W. W. Batten	1,349 7 6
Pelham	1,300 0 0
Jennings	1,280 0 0
Musselwhite	1,262 10 0
Tigwell	1,245 0 0
Walter	1,220 0 0
Riley	1,194 13 0

For alterations and repairs to No. 106, Brompton-road, and converting the same into a coffee-palace for women only. Mr. E. Gregg, architect:—

Stimpson & Co. (accepted).

For alterations to St. Paul's Schools, Waverley-road, Paddington. Mr. E. Gregg, architect:—

Mark	£248 0 0
Thomas & Butland	237 0 0
Stimpson & Co.	173 0 0
Temple & Foster	149 0 0

For the erection of two houses in Oxford-street, for Messrs. Bonham & Sons. Mr. Gill, architect:—

Patrick & Son	£4,375 0 0
Holland & Hannan	4,045 0 0
Patman & Fotheringham	3,985 0 0
Stimpson & Co.	3,935 0 0
Bywaters	3,858 0 0
Blandford	3,789 0 0
Shapley	3,750 0 0

For alterations at the Rose and Crown, Broad-street, Bloomsbury, for Mr. German. Mr. J. Viney, architect:—

Jackson & Todd	£345 10 0
Atkinson & Walker	288 0 0
Patman & Fotheringham	266 0 0
Shapley	265 0 0
Godden	175 0 0

For seven houses, Hanbury-street, Whitechapel, after allowing for old materials. Mr. E. Clarke, architect :—

Grunwood & Sons	£2,494 0 0
Lucas & Sons	8,980 0 0
Clements	8,850 0 0
Lathey Bros.	8,790 0 0
Stimpson & Co.	8,180 0 0
Morter	8,127 0 0
Wall	7,999 0 0
Eaton	7,945 0 0
Vears & Co.	7,893 0 0
Brass & Son	7,501 0 0
Howard	7,300 0 0

For erecting a double cottage at Curtisden-green, Goudhurst, for the Rev. J. J. Kendon. Mr. Wm. Theobalds, architect. Reduced estimate :—

Tully	£439 0 0
Martin (accepted)	417 0 0

Accepted for various works at the School for Imbecile Children, Darenth, Kent, for the Managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, architects :—

Entrance Gates, &c.

Kirk & Randall	£380 0 0

School Furniture and Fittings.

Hammer	150 0 0

Joinery Fittings.

Perry & Co.	639 0 0

For painting and other work at the workhouse and infirmary, Marloes-road, for the Guardians of the Poor of the Parish of St. Mary Abbotts, Kensington. Messrs. A. & C. Harston, architects. Quantities supplied :—

Lemon	£2,507 14 0
Lucas & Son	2,178 0 0
Bool	1,908 5 9
Harrison & Wood	1,624 0 0
Chapman	1,486 19 2
Lewis	1,403 0 0
Turrell	1,337 0 0
Lathey Bros.	1,240 0 0
Whitford	1,218 0 0
Galton	1,176 0 0
Croft	1,154 0 0
Derby (accepted)	1,104 0 0

For erection of ten cottages, Prospect-place, Woodford, Essex, for Mr. Blumson. Mr. J. Harris, architect :—

Thorp	£2,930 0 0
Forrest	2,791 0 0
Steel	2,756 0 0
Judd	2,381 0 0
Pobert	2,092 0 0
Barrow	2,015 0 0
Walker (accepted)	1,684 0 0

Accepted for the general maintenance and repairs to the Royal Naval Hospital, Yarmouth, Norfolk, for two years, for the Lords Commissioners of the Admiralty :—
Gibbon & Mitchell.

For the erection of a detached villa residence at Friern Park, North Finchley, for Mr. C. Vere. Mr. G. R. Fletcher, architect :—

Cooper	£1,425 0 0
Mansbridge	1,397 0 0
Gibbon & Mitchell (accepted)	1,260 0 0

For rebuilding the Marquis of Granby public-house, for the Westminster Brewery Company. Mr. Budd, architect :—

Hockley	£1,276 0 0
Godden	1,263 0 0
Taylor	1,222 0 0
Lamble	1,185 0 0
Hobson	1,167 0 0

For alterations at the Crown and Sceptre, Shad Thames, for Mr. Shuter. Mr. Budd, architect :—

Hockley	£693 0 0
Godden	647 0 0
King & Son	634 0 0
Taylor	617 0 0
Lamble	598 0 0
Hobson	567 0 0

For the erection of a new steam laundry, Dorchester, Dorset. Mr. Geo. J. G. Gregory, architect :—

Bull & Sons	£2,070 0 0
Davis & Son	1,629 0 0
Guy & Son (accepted)	1,494 15 0

For alterations to Forest Lodge, Tulse-hill, for Mr. E. Buntyen. Messrs. A. & C. Harston, architects :—

Goad	£937 0 0
Colls & Sons	838 0 0
Sheffield & Prebble	837 0 0
Johnson	833 0 0

For rebuilding Anderton's Hotel, Fleet-street. Messrs. Ford & Hesketh, architects. Quantities by Messrs. Gardiner, Son, & Theobald :—

Kirk & Randall	£28,497 0 0
Adamson & Sons	27,991 0 0
Shaw	27,973 0 0
Ashby & Horner	27,880 0 0
Brass	27,855 0 0
Feto Bros.	27,791 0 0
Ashby Bros.	27,547 0 0
Nightingale	27,473 0 0
Rider & Sons	27,368 0 0
Scrivener & Co.	27,365 0 0
Conder	27,302 0 0
Browne & Robinson	27,037 0 0
McLachlan & Son	27,036 0 0

For rebuilding two warehouses, Aldermanbury. Messrs. Ford & Hesketh, architects. No quantities :—

Crabb (accepted)	£2,911 0 0

For Castle Donington cemetery buildings, chapel, and lodge. Mr. J. Wills, architect. Quantities by the architect :—

Hood	£1,823 0 0
Nixon	1,740 0 0
Bakewell	1,667 0 0
Johnson Bros.	1,628 0 0
Stephenson	1,578 0 0
Bullock & Bastow	1,470 0 0
Garton	1,465 0 0
Sharman	1,308 0 0
Brooks (accepted)	1,303 10 0

For alterations and additions to house, Chichester-road, Park-hill, Croydon, for Mr. C. A. Brassert. Mr. Horace T. Bonner, architect :—

Hooker	£683 0 0
Hobbe (accepted)	593 10 0

For alterations and additions to All Saints' Schools, Lambeth. Mr. J. C. McMurdie, architect. Quantities by Mr. Alfred Wright :—

Tarrant & Son	£836 0 0
Cumming & Mullins	827 0 0
Phelps & Rice	816 0 0
Marsland	808 0 0
Gibbon & Mitchell	796 0 0
Cullum	745 0 0

For the erection of a villa residence, Overhill-road, Dulwich, S.E., for Mr. J. Fletcher. Mr. Alfred Wright, architect :—

Gale & Thompson	£1,148 10 0
Marsland	1,148 0 0
Phelps & Rice	1,065 0 0
Gibbon & Mitchell (accepted)	975 0 0

For the erection of five shops in the Bow-road. Messrs. W. Waymouth & Son, architects :—

Shurmur	£1,647 0 0
Wyeth	1,535 0 0
Niblett	1,520 0 0
Sawyer	1,444 0 0
Sheffield & Prebble (accepted)	1,273 0 0

For new north aisle to St. Saviour's Church, Hans-place, for the Rev. G. W. Weldon and the Churchwardens. Mr. E. P. Loftus Brock, architect :—

Brass	£2,895 0 0
Pink & Son	2,857 0 0
Dove Bros.	2,675 0 0
Mattock Bros.	2,473 0 0
Haynes	2,250 0 0
Stimpson	2,248 0 0
Bowman & Scowen	2,100 0 0

For female refuge, Cambridge-heath :—

Ashby Bros.	£1,689 0 0
Pritchard	1,665 0 0
Sewell	1,656 0 0
Browne & Robinson	1,640 0 0
Conder	1,620 0 0
Scrivener & Co.	1,614 0 0

For iron railings and gates, &c., Bunhill-fields Burialground, for the Honourable the Corporation of the City of London. Mr. Horace Jones, architect :—

Gunn	£550 0 0
Conder	408 0 0
Monk	407 0 0
Mowlem & Co.	340 0 0

For the erection of York-gate Residential Chambers (Block No. 1), for Mr. R. L. Cripps. Mr. Augustus E. Hughes, architect :—

Simpson & Son	£9,630 0 0
Perkins	9,273 0 0
Falkner	8,587 0 0
Sheffield & Prebble	8,473 0 0

For road-making and sewers, for the British Land Company, on their estate at Dulwich. Mr. Henry B. Michell, surveyor :—

Harris (accepted)	£942 0 0

For the erection of two houses and shops, Leytonstone, for Mr. C. Kipping. Mr. J. W. Forge, architect. Quantities supplied by Mr. Arthur B. Hudson :—

	Allowed for timber supplied.	
Earl & Son	£1,625	£200 0 0
Sargent	1,544	170 10 0
Hoskings Bros.	1,425	200 0 0
Egan	1,354	186 0 0
Arber	1,342	205 0 6
Clogg (accepted)	1,216	142 0 0

TO CORRESPONDENTS.

Dome of the Rock.—A letter from Lieut. Conder in reply to Mr. Fergusson has reached us, and will appear in our next.

N. W. (declined).—W. P. (call in the District Surveyor).—G. I. B. G.—J. D.—S. R. L.—H. B. M.—S. L.—H. G.—H. T. B.—E. C.—J. B. E.—T.—W. C.—Dr. S.—R. P. S.—W. W. & Son.—J. W.—K. P. L. B.—O. M.—M. H. J.—W. H. C.—J. W.—Mr. McM.—B. A. H.—F. L. C. P.—T. & R. (we cannot say now).

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

The Builder.

VOL. XXXVI. No. 1850. SATURDAY, JULY 20 1878.

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Geometry and Optics of Ancient Architecture.

IN a recent number we gave a general description of the theory in regard to the geometry of Egyptian and Greek architecture,* which has been stated and illustrated in so elaborate a manner by Mr. John Pennethorne in his recently-published work. We will now look at his conclusions, and the method of arriving at them, a little more particularly.

The subject of Egyptian architecture and its geometrical development is only touched upon, however, so far as to break ground for the application of geometry to Greek architecture, by exhibiting traces of this application in the art from which that of the Greeks was, in great measure, undoubtedly derived. The instances given from Egyptian art and architecture in regard to the observation of fixed geometrical proportions are, therefore, very slight and unimportant, and might be passed over, except that they illustrate at the outset a tendency too readily to find what he is looking for, which seems to us to have beset the author throughout his book, and to have led him to attach weighty meanings to things which are quite possibly the result of accident, or, at all events, are easily capable of another interpretation from that which he gives them. On plate 1 we have first the reproduction of a figure given by M. Prisse d'Avennes, in his "Histoire de l'Art Égyptien," which our author describes as a "drawing of sculpture, laid down according to the Egyptian canon of Proportions, where the artist has first traced the divisions of squares in red lines and then outlined the figures in dark ink, guided by certain established proportions." Now, there is really nothing whatever in the example to indicate the existence of any such "canon." All that we see is a figure drawn on a space which is, certainly, covered with equal squares made by lines crossing at right angles, but the relation of the lines and spaces to the drawing does not appear to be upon any system, or to require any explanation more profound than that they were merely made for the purpose of copying or transferring the figure, just in the same way as a modern engraver copies a picture. The plans of excavated chambers given, the dimensions of which divide into aliquot parts each way, really show no more than what is done in modern house-planning every day: a room is made 20 ft. by 16 ft., because somewhere about those proportions are required, and as some figures must be given, it is simplest to write down measurements in round numbers. The mere existence of a measuring rule of standard length (and we must suppose the Egyptians to have possessed such things) would naturally lead to commensurate ratios in such a case. Another example is given, in which the length of the chamber equals the height and width combined, and the proportions of the three measurements are coincident with those which would result from the working out of the eleventh problem in Book III. of Euclid, "to divide a line A B into two parts at a point H, so that A B × B H = A H²." Mr. Pennethorne says,—"I give the dimensions as they were taken, for the relation between the lines can hardly have arisen from accident, and it is singular if we should find in Egypt a practical application of one of the problems of Euclid." Surely we may add that it would be very singular that people should take the trouble to illustrate such a problem in this manner, when the observation of these proportions could have no possible practical value in relation to the object of the excavation. And we must feel compelled to regard also with decided scepticism the notion that the heights and projections of the two columns from Medinet Haboo are purposely scaled according to a given modulus, as shown by Mr. Pennethorne in Plate II. When in the case of Greek and Roman orders we find the height of the column with a direct ratio to its diameter, of course it is obvious that there was an intentional proportion. But in the case of Medinet Haboo, to which temple the author seems to have given special attention, the only direct proportionate ratio that he is able to give is that in one case the whole height is divisible into fourteen parts, of which three go to the entablature and eleven to the column, and in the other case into thirteen parts, three to the entablature and ten to the column. He calls these parts *moduli*, but it must be observed that they have no relation, like the Greek modulus, to the width of the column; they are merely obtained as the measure which will divide the two principal sections of the height into similar aliquot parts. When we come to the details, which the author wishes us to believe are all regulated in relation to a fresh modulus derived from the width of the abacus, we find that no ratio can be obtained except by subdivision into smaller parts, and then we have the base = 4 parts, shaft = 33½ parts, bell of capital = 8½ parts, abacus = 4 parts; and the other column is just as irrational in its heights; the only point that seems like an intentional correspondence is that in each case the abacus and base seem to be of the same thickness. Now, with all respect to Mr. Pennethorne, we must be pardoned for saying that such a mode of procedure is as "irrational" as the results obtained from it. At this rate, all an inquirer has to do is to reduce the elevation of a design to such minute parts that you can get a common divisor for every portion of it, and then you may prove anything, to those who are willing to believe. But, in fact, the very appearance of the architecture is against the supposition. There is such a manifest refinement in the appearance of Greek architecture that one is prepared to believe in further refinements of principle; but in the case of Egyptian architecture the mere appearance of the details suggests that "it were to consider too curiously, to consider so."

We come with more expectation, therefore, of finding fact and theory in accordance, to the field of Greek architecture, which, moreover, we take to be really the *raison d'être* of the book. If the reader will take the trouble to refer to our diagram on page 686, *ante*, and the remarks accompanying it, he will see what is the theory of Greek architecture which it is Mr. Pennethorne's general object to prove: that the buildings were designed to appear to the eye in certain rational proportions of parts, and that the executed heights were modified in order to appear in the precise proportion desired when viewed from the proper point: and thus, that although the heights were designed in certain rational proportions on the geometrical elevation, or in the given measurements, the actual measurements were altered in execution in accordance with trigonometrical calculations as to the visual angles at which the various parts would be seen. The author appears to have been led to take up the theory from remarks in Greek literature, some of them in contemporary literature (Plato more particularly), some reproduced by Vitruvius as representing the known principles of Greek architects on record in his day. The investigation of the subject Mr. Pennethorne pursues by an inductive method, the object of which, in his own words, is, "First, to clear the several Athenian remains of Greek architecture of the irrational quantities that by measurement may be found to exist, and to substitute instead the nearest magnitudes which shall be found to be commensurable with one another. Secondly, to express the ratios between the commensurable magnitudes in the simplest numerical forms, instead of the actual dimensions, and then, by comparing together the several selected examples of the Doric and the Ionic orders, to ascertain, when thus cleared and reduced, whether any general and constant proportions can be discovered that may serve as a basis for the calculations that may be requisite to determine the corrections that Plato and Vitruvius allude to, when they refer to the second kind of Proportion, namely, the apparent Proportion."

In other words, the executed heights in the principal examples of Greek architecture are found to come very near to, though not quite to coincide with, the heights which would result from certain definite proportions between the height of the order and the length of the upper step, which Mr. Pennethorne appears to assume as the basis of the geometrical elevation. He

* See *Builder*, p. 686, *ante*.

therefore takes in succession the various examples and assumes that they were designed to appear in this definite or rational proportion, and then proceeds to consider whether the slight divergence from these precise proportions can be accounted for on the supposition that they were intended to correct the effect of perspective, and to give true apparent proportions when seen from the proper point of view.

We cannot undertake here to follow Mr. Pennethorne in detail through the calculations on which he bases the results which he wishes us to accept as in favour of his theory. We have gone through them with considerable care and attention, but they could hardly be made intelligible to our readers without diagrams of some elaboration. These we would have been prepared to give, very possibly, had our conviction been that the theory was one which was sound in its basis and likely to be permanently adopted as the key to the method of the Greek architects. But this we do not think. We must, therefore, refer those who feel sufficient curiosity about the subject to go into it further, to Mr. Pennethorne's book and his numerous and elaborate diagrams. We must content ourselves here with a few remarks as to the difficulties which would be involved at the outset in accepting Mr. Pennethorne's theory, and some of the features in his method of stating the argument which seem to us absolutely to require further explanation and justification before he can ask any one to accept his views as correct in detail; although we willingly admit that his statement of the subject is in itself exceedingly interesting, and likely to be very suggestive in regard to collateral questions of architectural design, even though we do not accept it as correct in the main.

In the first place, then, the supposition of a building in which the main object is to attain certain mathematically correct ratios of proportion when seen in perspective necessarily presupposes that it is to be seen from one point of sight only. From any other but the right point all the science and refinement are thrown away. So far, however, from considering this as any obstacle in the way of the acceptance of the theory, Mr. Pennethorne seems to consider it almost his strong point. He gives a very carefully-executed plan of the Acropolis and its buildings, showing the two points of sight, opposite the north-west and south-east angles respectively, from which the two designs, as he calls them, were to be seen correctly; for it must be observed that the author is so convinced of the paramount importance of this perspective adjustment in the eyes of the Greek architect, that he considers the *design* to consist in this, and speaks of the two ends of the Parthenon, which, as far as their purely architectural features are concerned, we are accustomed to regard as identical, as "two separate designs." To our thinking, the first and most obvious criticism on such a theory is, that if the Greek architects worked on this principle they wasted their time and science in a very foolish manner. To design a building so that it could only be properly seen from a certain point, or at all events to spend all their time and calculation in fitting it to be seen from that point especially, when there were hundreds of other points from which it might be looked at, and to make this optical correction in relation to the one point the central object of the architect's labours, appears to us to involve a disproportion between the means and the end too absurd to be entertained for a moment; and which the Greeks, with all their science and refinement, were far too practical to have fallen into. There is another objection to the application of this system to the Parthenon in particular (the building on which Mr. Pennethorne dwells most) which may be noticed just now. But the whole theory, as given in his pages, presents difficulties and contradictions which it seems to us impossible to get over.

In the first place, in regard to the mere question of the heights of the various portions of the order in relation to their base (the upper step), we are to understand that these heights are modified from the "given heights" (or what would be the correct proportionate heights in geometrical elevation), in order to allow for the effect of perspective; but that the horizontal measurements are never so modified, but are executed in accordance with the first given measurements. To begin with, this seems rather like a convenient suiting of the theory to the facts. The horizontal dimensions of the main portions of the building are found to have rational proportions, so that the theorist who is looking for rational proportions everywhere has no need to modify them. The heights are found to be irrational,* and therefore the theorist has to suppose them as modified, and to account logically for the modification. We are really a little edified by the *naïveté* with which the author tells us that the horizontal dimensions "are found to be" always the same as the original given measurements; as of course the real meaning of this is only that they will suit his theory on that supposition. But if we are to suppose such a refinement as the modification of dimensions in order to preserve a certain proportion to the eye in perspective, why, we must ask in the first place, should this be applied to vertical and not to horizontal dimensions? The latter are as much distorted by perspective as the former, and the correction of the distortions is as easily calculated in the one case as in the other; and as the author (as we shall see just now) assumes that the buildings were intended to be seen in an angular and not from a front or flank view, the one correction is as necessary as the other for perfecting the optical correction. However, suppose that we admit the fact that for some reason vertical proportions were optically corrected, and horizontal proportions left as first given; let us look at the results in regard to the vertical heights only, eliminating horizontal perspective altogether from the statement of the problem. On plates I. and II. of Part II. Mr. Pennethorne gives sections of the east and west porticos of the Parthenon, on the same principle as that roughly illustrated in our diagram (fig. 2, p. 686) above mentioned, showing the projection of the given heights on the section of a sphere of which the eye is the centre, and the executed heights determined by rays drawn through points on the spherical diagram till they cut the perpendicular plane on which the real elevation is executed; and he subjoins tables of the differences between the intended proportional effect and the executed heights. Now if this were the principle on which the heights in the vertical design were regulated, a glance at the diagram aforesaid will make it obvious that to a spectator viewing the building from the ground level (which is the position assumed by Mr. Pennethorne in regard to the Parthenon) the optical corrections would result in a continually increasing excess of the executed height over the proportions of the geometrical elevations, as we ascend from the base to the top of the building. Thus, if in the first given proportions the heights of column, entablature, and rise of the pediment, are to each other as 6, 2, 2; then, in order that the several parts should subtend these proportional visual angles, it would be necessary after we had fixed the apparent height of the column, to make the entablature rather more than 2, and the rise of the pediment again still more, the distortion increasing as the building rises higher from the level of the eye. But when we refer to Mr. Pennethorne's tables, in which he gives in two columns what he calls "first given quantities obtained by proportion" and "true dimensions from calculation" (the latter being supposed to be the *executed* heights), to our astonishment, we find that the differences between the calculated heights and executed heights are utterly irregular, sometimes *plus* and sometimes *minus*, instead of the differences increasing in ratio as we ascend. In the corrections of the east portico of the Parthenon, for instance, we have the following:—

	First given quantities obtained by proportion.	True dimensions from calculation.	Additions and subtractions resulting from correction.
Column	33·7733	34·2490	+ 0·456 ft. = 5·5 in.
Entablature ...	11·2596	11·1590	− 0·103 ft. = 1·2 in.
Stylobate	5·6298	5·6786	+ 0·048 ft. = 0·6 in.
Whole height..	50·669	51·074	+ 0·406 ft. = 4·8 in.
Pediment	13·136	12·454	− 0·682 ft. = 8·2 in.

The left-hand column here represents the proportional heights of the various parts as they would be first drawn in geometrical elevation, to carry out the theory of proportion of parts which Mr. Pennethorne believes to have been intended; the next column ("true dimensions") exhibits the heights as they would have to be executed in order to assume those proportions from the point of view of the spectator; and then the author refers to the actual heights of the Parthenon given on another plate to show how nearly his results coincide with the real heights obtained from measurement. So they do, and how he made them do so he knows best; but it is beyond us. Just look at the two columns of figures. The height of the column, which is to *appear* as 33·7733 ft., is increased in execution by 5·5 in. to allow for perspective distortion. The entablature, which is to bear a fixed relation to the column, both in the first given proportions and in the executed result, is *decreased* in execution; the whole height is *increased* by 4·8 in., and then the rise of the pediment, which is furthest from the eye, and therefore would require most increment to correct the effect of perspective, is *decreased* in execution by 8·2 in., and this by way of preserving in perspective its true proportionate relation to the whole height of the order, which has been *increased* in execution! Unless Mr. Pennethorne can give some explanation of this process of reasoning other than we have been able to find in his work, it is useless to say a word more on this part of the subject,—he has simply refuted himself by his own figures.

So far, the proportionate heights are considered as having a direct ratio to the actual (not apparent) length of the upper step. When we come to consider the whole building as designed to be seen from the special point of view which Mr. Pennethorne considers it to be calculated for, we come upon quite a different order of ratios, in which the proportion to be observed is between the length of the diagonal line connecting the extreme visible points of the building, and the height and proportions of the whole block as seen in perspective. It is observable that in estimating this proportion between the cubical block of the temple and its diagonal line, the author does not take the upper step as the extreme of the design, but the stylobate, the diagonal line being taken as that between the extreme angles of the stylobate.* This point of view the author regards as capable of absolute demonstration in regard to the Parthenon. He says:—

"Now that the Acropolis of Athens has been partly excavated, and we are again able to trace the original lines of road, and to follow the exact route taken by Pausanias in his ascent to the Propylea, and in his inspection of the several works of art in the interior of the Acropolis, we shall perceive that all the roads and interior platforms were so arranged by art that, at every point where a complete view could be obtained of each design, the work was presented to the eye of the spectator so as to be seen only from an angular point of view; and to suit these angular points of view Plato informs us that 'artists worked out not real proportions, but such as seem to be beautiful in their representations when seen through the view taken from a favourable point.' It is well known that the eye can only see, without moving, a limited extent of view, which may be defined by a visual angle embracing 45°, and in the plan of the Acropolis we shall see that sufficient space was left, when required, to allow of the eye taking in the whole extent of each design within the given visual angle; we thus obtain two angular views of the Parthenon, viz., a north-west and a south-east angular view."

Thus, a triangle being formed upon the diagonal line as a base, such that the base shall subtend an angle of 45°, the distance of the spectator is at once approximately fixed at this angle, and further regulated by placing him so that he shall have an equally good view of the front and flank of the building, and the whole heights and proportions are then supposed to be designed with special reference to their precise and mathematically correct conformity, as seen from this point, to a given rule of proportion. Those who wish to follow out the calculations by which the design of the building on this principle is demonstrated, we must refer to Mr. Pennethorne's pages. We cannot ourselves see any use in continuing the subject, because as we hinted above, there is one fact which, in regard to the Parthenon at least, vitiates the whole theory. This is that, as every one knows, the designs of the two fronts and flanks are identical, except as regards the sculpture, and some slight irregularity of level at the angles (which, however, neither Mr. Penrose nor Mr. Pennethorne considers to be connected with optical correction), while the ground on which the spectator must stand to be in the right position for the two angular views is about 10 ft. higher at one end than at the other; and it is thus obvious that the calculations in regard to the visual angles which apply to one end of the building cannot apply to the other. Mr. Pennethorne by no means overlooks this; on the contrary, he has a special explanation of it. Most of our readers will remember that there is an irregu-

* It may be necessary just to observe, that we are here using the words "rational" and "irrational," as Mr. Pennethorne uses them, in their literal Latin sense, as meaning that which has, or has not, a definite "ratio" of quantity or measurement.

* But, in spite of this, he proposes (p. 58) to consider the temple in perspective as "a solid bounded by planes containing the *middle step* and the fascia above the corona": so that here is a third datum. Such a confusion of method in itself shows the artificial nature of the theory, and the difficulty there is in getting it into anything approaching a consistent form.

larity in the platform on which the Parthenon stands, and that at the east end it projects somewhat further beyond the line of steps than at the west end. This is the author's solution of the difficulty. By thus projecting the platform of the building at the east end, a longer diagonal is obtained, and the spectator's position is thus thrown further off, and by that means the proportions which were suitable to the view from the lower level at the north-west angle are rendered equally suitable to the higher level of the spectator at the south-east angle. So that the spectator's whole appreciation of the refinement of proportion of the design from this point of view depends upon his directing his attention, not to the diagonal proportions of the main building, but to the extension at one end of the platform on which it rests! Certainly, we think the Greek architects, if they have got a presentation copy of Mr. Pennethorne's book sent across Styx to them, must pray to be saved from the friends who expound them in this fashion. All we will say is, those may believe it who can. To our thinking, nothing could more strikingly show the futility of the attempt to evolve a consistent theory of the kind which Mr. Pennethorne has spent (unfortunately, as we think) so much trouble and pains over, than the shifts to which he is obliged to have recourse to make it even appear to fit into a consistent whole. Our own scepticism, in turning over this part at least of his book, "grows by what it feeds on," and we cannot but think the author has been tempted into expending a great deal of ingenuity on a shadow, by giving a too literal and precise interpretation to the passages of Plato and Vitruvius, which he repeatedly quotes in support of his views. The passage which he quotes (p. 52) from the latter, to the effect that it is the part of the architect to adapt his symmetry and magnitudes to the nature of the position, and, "by diminutions and additions, to qualify the symmetry till it appears rightly adjusted," does not really appear necessarily to imply anything more than such adjustment of details to their position, as every architect who designed with care and judgment ought to make. We may very reasonably suppose that the Greek architects gave more consideration to this, and carried it out more systematically, than has ever been done since; but that they bestowed such an amount of calculation upon the unsatisfactory result of producing a building which could only be seen rightly from one point of view, and split hairs over refinements which would have, even then, to be rather taken on trust than seen by the eye, Mr. Pennethorne has not convinced us, and we should think the conclusion very little creditable to the practical sense which was as much a characteristic of the Greek mind as its æsthetic refinement.

We have used the word "unfortunately" in regard to the extent of study and pains which have been given to this part of the subject of Mr. Pennethorne's book, but it must be understood that we only applied that adverb to the particular portion of his treatise of which we have been speaking, and which, though including what is obviously intended as the central point of his work, is by no means the whole of it. Taking the book as a whole, its production is an occurrence quite the reverse of unfortunate, although we must consider the main point in it as "not proven." And even in regard to this portion, although we cannot for one moment entertain the idea of buildings being designed for a special point of observation (which would, in fact, reduce architecture to a kind of scene-painter's art), we may say that the subject of the modification of designs in execution from their original proportions in the geometrical drawing is so important to a certain extent, and has been so much neglected in modern architecture, that the discussion of the subject, even in a manner involving some erroneous conclusions, may be useful in drawing attention to it, and leading to some practical results from it in modern building. Other chapters, on the application of the conic section curves to the details of Greek architecture, on the proportion and design of the columns, on the Egyptian origin of Greek ornaments, and on the design of Roman buildings and their details as compared with those of the Greeks, are of great interest, and too much praise cannot be bestowed on the profuse and elaborate nature of the illustrations which are given in every part of the book, many of which are exceedingly useful and valuable diagrams to have by one, even independently of the text which they illustrate. Among many illustrations which we cannot here even refer to, is one to which we direct attention, because it is very curious as a record of an ascertained fact, and because of the question which it suggests in regard to Egyptian architecture: this is the diagram (plate I, part iii.) of the plan of the roof of the inner court of Medinet Haboo, showing the lines of the cornice both internally and externally as curved inwards with a horizontal deviation from the straight line, so as to present a convex line towards the court, and a concave line externally. The deviation is 4¼ in. on the longer sides (104 ft.), and 8½ in. on the other two sides (80 ft.). It is no doubt highly interesting to find such curves in such a position, for if on testing other examples of Egyptian architecture similar curves were found in what have been hitherto accepted as straight lines, our ideas of the most ancient of existing styles might unquestionably be very much modified, and the curved lines of Greek architecture would receive a new illustration in regard to their origin. Only we should put a note of interrogation to the idea of accepting this instance as a decisive proof that the Egyptians consciously practised such a correction. It would have been far more conclusive to us if the lines had been convex towards both the exterior and interior, as in that case they would in each instance have corrected a tendency to hollowness in the line exactly similar to that which led to the vertical entasis of the Greek column. But the hollow exterior line, it appears to us, would have only exaggerated a tendency to hollowness in the centre of each face when viewed in perspective; and we are disposed to think that it is quite possible that the curve is the result of a tendency of the colonnade to settle inwards in the lapse of time, while the angles are, of course, confined from doing this by their mutual buttressing. This idea certainly receives colour from the fact that Mr. Pennethorne himself, in the course of these early studies, discovered by measurement a horizontal "sag" inwards in the architrave of one of the faces of the Parthenon, which Mr. Penrose in his subsequent observations showed conclusively to be the result of displacement, as Mr. Pennethorne admits in the present work. The point is worth notice, because it is very possible that owing to the appearance of this book, and other causes, increased attention will be given to the study of optical curves in ancient architecture, and it is as well that any investigators who take up the subject should be on their guard as to the possibility of horizontal displacements in buildings which have stood for many ages, such as may lead to entirely erroneous conclusions as to the methods of the original builders.

Whatever our opinion as to some of the theories put forth, and the conclusions deduced from them, we cannot but feel that a hearty vote of thanks is due to an author who has been at the trouble of laying before the architectural world his ideas upon subjects so full of interest, in so elaborate and sumptuous a work, which must no doubt be, like virtue, its own reward to its industrious and indefatigable author; and most of those who go through it will probably be able to echo on their own part the sentiment with which the author concludes his introductory chapter:—"If I have been led into errors, I have had my reward in the study of much which is beautiful in art, in geometry, and in nature."

House Rents and Wages in America.—While landlords and towners of real estate are feeling poor from inability to obtain such high rents as formerly, it must be remembered (says the *Boston Post*) that the loss is comparative. Prices of almost everything else have also largely depreciated. Moreover, tenants constitute a very large majority in cities and large towns. If the poor and middling-interest classes can obtain cheaper rents, so much the better for those on whom the stringency bears most heavily. Again, Boston is not the only city where the depreciation in rents and prices of real estate is felt. From a late statement of the *Baltimore American*, it appears that house-rents in the "Monumental City" are lower than before the war. Real estate is said to be cheaper than at any time within twenty or thirty years. There, as here, one prominent cause of low prices is the large number of sales made, and in the market to satisfy mortgages. Houses that rented a few years ago for $1,100 per annum can now be had for half that sum. The same is true in New York, Philadelphia, and all Western and Southern cities. The shrinkage in prices is a universal fact.

IS THE HEALTH OF EAST LONDON WORTH ATTENTION?

WITH the heat, and with much of the true charm, of an old-fashioned July, unmistakable indications of a holiday season of unusual activity are setting in. The subject is one of no small interest in a sanitary point of view. It is our wish not to swell the chorus of remarks which are likely to issue from the press, as to the charm of a summer holiday, the propriety of enjoying one, the best localities to select for the purpose, and the like; but to look a little deeper into the causes of a phenomenon which is, year by year, assuming a greater social and financial importance.

Apart, then, from the questions of fashion, of habit, or of caprice, what is the main cause which has led to so signal a change in the notion of what is necessary for the proper enjoyment of the summer as that which has occurred within the memory of those who are by no means very old men? We do not speak so much of the need felt by persons who pass a busy or a sedentary life in a great city or town, of a respite, in which to fill their lungs with pure air, and to look,—for a few bright and precious days,—at the fair face of nature. We refer rather to the imperative necessity which most well-to-do persons now annually find press on them for a change of locality in "the season," however salubrious may be their homes. And yet when we come to search for the main cause,—apart from any question of diversion of the mind from the daily routine,—we shall find it to be much the same everywhere. The same influence which urges great and small to a summer emigration,—apart from the minor causes to which we have referred,—is due to the constantly increasing density of population, and the corresponding increase of pressure on the elements of sanitary welfare.

Of course, it is in the great centres of population that the pressure is most severely felt. But it must be remembered that throughout England the population has doubled within the lifetime of men who are not what we call extremely aged, and this general duplication has been intensified in certain spots,—London doubling its population within forty years, and certain new centres of activity, such as Wolverton, Crewe, or Birkenhead, increasing at a much more rapid rate. The average density of England and Wales is 384 souls per square mile. But in Middlesex the density rises to 680, and in London to 25,666 souls per square mile, or, in the most densely-populated parts of London, to 40 inhabitants per acre.

In the neighbourhood of many towns there is no doubt that the air itself becomes so laden with the products of respiration and of combustion, that the lungs may be severely affected, at all events, in the case of the younger and feebler members of society, and that the need of inspiring a purer air may at times be felt to be absolute. This increasing pressure, indeed, to a great extent has wrought its own relief. The merchants and larger tradesmen who formerly took a pride in adorning the City abodes in which their childhood had been passed, now enjoy their suburban villas, and come to London daily by railway. In the central parts of London the density of population,—at all events, in the night,—has much decreased, and cannot be said to be on the increase. But the more we simplify the local problems, the more we complicate the general problem. Where for so many acres of densely-populated towns we substitute four or five times the area of less densely, but still somewhat thickly-inhabited country, we are not diminishing the total pressure on what we may call the sanitary elasticity of the country. And it is not the human chimney alone,—the consumption of pure air in the process of respiration,—that has to be borne in mind; nor is it the domestic consumption of carbon, and the canopy of gloom, with descending "blacks," that invades places not long since pure, and bright, and genuine country, that has to be regarded. The increase of luxury and of comfort has led to the introduction in great numbers through the country of novel manufactories, paper works, cork works, biscuit works, factories of all sizes and kinds, each of which may be a source, not only of private, but of national wealth; but the unchecked emanations from which are, in constantly increasing numbers, poisoning both the air and the water of England.

Thus then it happens, not only when the member of Parliament whose sessional work is

over goes down to his county or borough, or when the merchant, or tradesman, or professional man, takes his dearly prized yearly holiday, that the nooks and corners of England in which he was accustomed to find occupation for his rod, or his gun, or his butterfly net, or his botanist's case, are sensibly becoming, year by year, less attractive; at the same time that the residents and neighbours of the country towns which, in years past, attracted holiday-makers or home tourists, are themselves added to the number of emigrants. In many cases, indeed, this change is to a certain extent self-supporting. Thus the owner of a villa in or near some bright country town must have his annual month or two by the sea,—but he lets his own house meanwhile. In point of fact, it is not unfrequently the case that, under the rule of fashion or of caprice, a family will leave a thoroughly healthy, convenient, charming house, and pack themselves into comparatively wretched lodgings,—thus insuring a "change of air" which is anything but a change for the better. So much the worse for them. But so much the better not only for the seaside lodging-house keeper, who lives on the fruit of that summer migration, but for the inhabitant of the city who finds change and health in the country home from which the owner has,—we often must think very foolishly,—fled.

As to this, however, all that the medical man, the sanitary reformer, or the public writer can do, is to call attention to the facts,—and to point out how often the form is followed at the cost of the essence, and the idea of change is dissociated from the fact of advantage. But with regard to the original cause of all this movement,—so far as it is tangible, there is something more to be said. The pressure on our elements of public health is yearly becoming more severe. We have spoken of the air. It is, however, on the water that the most injury is inflicted,—and as to this, there is enough going on, day by day to give rise to the most serious disquietude.

This is no new theme. Commission after Commission has reported as to the pollution of our rivers and streams. Slowly and reluctantly the Legislature has been led to condemn practices which,—under the Common Law of England, as it was administered in the time of Elizabeth,—would have brought prompt and condign punishment on the perpetrators. We have sometimes felt serious doubt how far the Rivers Pollution Act was really a step in advance. That doubt, held with modest hesitation, because it involved a legal question, has lately been repeated and enforced by competent judges; that is to say, by eminent barristers. It is the opinion of some men who are entitled to be regarded as authorities that the chief effect of the Rivers Pollution Act has been obstructive: that in stating certain offences, and providing penalties for them, in certain modes, it condoned very much which, by the old Common Law of England, would have been summarily punished. But the hitch lay here,—who was to go to the cost and labour of invoking the law? We fear that that hitch has been only very slightly amended,—if, indeed, it prove at all to have diminished.

The difficulty lies here, as we have before pointed out. The enforcement of the law is a disagreeable duty. Private individuals usually shun it. The new public authorities are shy on the subject. They think it is well to let sleeping dogs lie. They are afraid of retaliation. Thus it happens that the Rivers Pollution Act is but of doubtful utility; and that the destruction of the waters of the country by manufacturing and domestic refuse is proceeding at a rate which is certainly full of menace for the salubrity of large districts of England.

The difficulty found in the enforcement of laws which are chiefly of public benefit,—not giving to individuals, as a rule, advantages for which they find it worth their while to litigate,—was met, in old times, by the useful but ignominious functions of the common informer. Into the question of the morality of that mode of administration it is not necessary now to enter. But what has hitherto not received due attention is this. There exist, throughout the country, numerous authorised authorities who are clothed with a considerable amount of power, and from whom the country have the right to expect the fulfilment of a duty that is yearly becoming of more importance. We should be glad to see a Governmental inspection of rivers and streams, if it tended to keep them pure. We could even pay,—if with small respect,—a punctual commission to the public informer, if in no other way could we detect the practices which are injurious to our streams. But, in the mean time, what are the conservators about?

There are thirty places, lying in fourteen counties, to which Commissions of Sewers have been directed under the 23rd of Henry VIII., cap. 5. The oldest date of the outstanding Commission in any of these cases is Oct. 3, 1837, for the Rape of Arundel. There are twelve places, lying in seven counties, to which Commissions of Sewers have been directed under the 24th & 25th of Victoria, cap. 133, part I. Of these the earliest date of recommendation by the Enclosure Commissioners to the Home Office is February 24, 1862; and the latest is April 6, 1871. Under Part II. of the same Act have been constituted no fewer than 190 drainage districts of various magnitudes. A recent return to an address of the House of Commons, dated 9th April, 1878, gives a short description of the area embraced in each district, the county in which it is situated, the year, chapter, and date of the local Act, the name or titles of the authority, and the name and address of the clerk or secretary. This useful return, which was moved for by Mr. Arthur Peel, can be obtained of Messrs. Hansard for the modest price of 3d., and we commend it to the consideration of those of our readers who take interest in the salubrity of our waters.

At the same time, it should be borne in mind,—and the reflection is anything but satisfactory,—that the attempts of the most important of all these 232 Conservancy Boards and Commissions to carry out one main feature of their duty are at this moment receiving the most determined opposition from another local body, which was originally called into existence for a purpose closely akin to the objects, or at least a part of the objects, of the appointment of the Conservancy boards. By section 58 of the Act cited (the Land Drainage Act of 1861, 24 and 25 Victoria, cap. 133) penalties are imposed on persons who cause to flow, into any of the waters administered by the Commissioners, any unclean or polluting liquid. Thus, although the main objects of the protection of banks and channels, the regulation of outfalls, and the supply of water for irrigation, may be regarded as the primary objects of the Commissions issued in virtue of the law, it is clear that their duty is to be taken as in harmony with the more recent enactment of 1876 (The Rivers Pollution Prevention Act, 39 and 40 Victoria, cap. 75), under which it is an offence to carry into any stream any solid matter so as to interfere with its due flow, or to pollute its waters; a proscription which we shall see repeated in various Acts of Parliament. These wise and essential provisions, the enforcement of which is thus clearly enounced as forming a part of the duty of River Conservators and Commissioners, are even more pointedly expressed in some of the special Acts of Parliament contemplating the discharge of Conservancy functions. Thus by the Thames Navigation Act of 1866 (29 and 30 Victoria, cap. 89) which vests in the Conservators of the River Thames the conservancy of that river from Staines to Cricklade, the Conservators are bound to "cause the surface of the River Thames to be (as far as is reasonably practical) effectually scavenged, in order to the removal therefrom of substances liable to putrefaction." By section 63 persons are prohibited from opening into the Thames within the district above defined any new sewer or drain, or allowing any fresh supply of polluted liquid to pass through such new sewer. By clauses 64, 65, and 66, power is given to the Conservators to compel the discontinuance of existing sewerage works which pollute the river. By the Thames Conservancy Act of 1857 (20 and 21 Victoria, cap. 147), which incorporates the Conservators, penalties are imposed on the discharge of any ballast into the Thames, or for unloading, putting, or throwing into any part of the Thames, or on any shore or ground below high-water mark of the river, any rubbish, earth, ashes, dirt, mud, soil, or other matter, or allowing any offensive matter to flow into the Thames.

It is thus clear that, from 1857 to 1866, the Legislature has consistently endeavoured to arrest the degradation of the banks, the choking of the courses, or the fouling of the water of any English river or stream; and notably and expressly so in the case of our chief river, on which depends so much of the health and prosperity of the metropolis. At the same time (in view, no doubt, of the long neglect of all persons concerned to enforce penalties for obstruction or pollution of rivers) a certain time was given, with power to the Commissioners to enlarge it, for effecting the discontinuance of nuisances existing at the date of the passing of the several Acts of Parliament. In 1864 a second Thames Conservancy Act was passed, amending the principal Act; and in this, while the technical offence of throwing obstructive matter into the river is extended to its banks and tributaries within three miles, there is a clause imposing penalties for suffering any washing or other offensive substance produced in making or supplying gas, *or any other offensive matter*, to flow or pass into the river Thames. This Act refers to the Thames from Staines to the termination of the river proper, at Yantlet-creek, where the jurisdiction of the Conservators terminates.

It was in 1858, when the offensive condition of the Thames through London itself caused such well-founded fear of pestilence, that the Metropolitan Board of Works was empowered to carry out works "for the improvement of the main drainage of the metropolis, and for preventing, as far as may be practicable, the sewage of the metropolis from passing into the Thames within the metropolis." This was a step in advance; although admittedly only a part of a general scheme for the restoration of the purity of the Thames. The Public Health Act of 1875 (38 and 39 Vict., c. 55) expressly declared that nothing in its enactments should authorise any local authority to make or use any sewer, drain, or outfall, for the purpose of conveying sewage or filthy water into any natural stream or watercourse, or into any canal, pond, or lake," until it is "freed from all excrementitious or other foul or noxious matter." Any local authority was empowered, with the sanction of the Attorney-General, by clause 69 of that Act, to take proceedings to prevent pollutions of streams. This provision brings the local authorities under a degree of responsibility very similar to that of the conservators and commissioners of rivers and of drainage. Nuisances are defined by clause 91, and the provisions of the Act are declared not to affect other remedies.

Against, or rather in mitigation of, this effective body of legislation, comes Clause 19 of the Rivers Pollution Prevention Act of 1876. "Where any local authority, or any urban or sanitary authority, has been empowered or required by any Act of Parliament to carry any sewage into the sea, or any tidal water, nothing done by such authority in pursuance of such enactment shall be deemed to be an offence against this Act." Such a saving clause, for temporary reasons, was no doubt essential. But this clause must be taken with Clause 16, which declares that the provisions of the Act shall not affect other remedies. In Clause 18 the powers of the Thames Conservators, of the Lea Conservators, and of the Metropolitan Board of Works, are exempted from the operations of the Act. As to the intentions of the Legislature, the Act, which thus expressly leaves the settlement of this question as to the discontinuance of nuisances thrown into the Thames below Staines in abeyance, must be read together with Clause 92 of the Lea Conservancy Act, with Clause 61 of the Thames Conservancy Act of 1864, with Clause 102 of the Thames Conservancy Act of 1857, with Clause 3 of the River Pollution Prevention Act of 1876, and with Clause 69 of the Public Health Act of 1875. All these clauses concur. Omitting legal phraseology, what the law says is this:—Pollution of rivers, by sewage or otherwise, shall be put a stop to. But reasonable time shall be given to public bodies who have already been authorised to commence works, which at present are imperfect as failing to purify their effluent water. Not a hint is given in any Act of Parliament that any exemption from this duty can be otherwise than temporary.

In fact, it is only necessary to turn to the provisions of the Metropolis Management Act of 1855 to see that disinfection of the sewage was contemplated as part of the authorised scheme. The Metropolitan Board of Works was authorised by Clause 135 to cause the sewage and refuse from such sewers to be sold or disposed of as they see fit, *but so as not to create a nuisance*, and the money arising thereby shall be applied towards defraying the expenses of such Board. In a treatise on the law relating to the Pollution and Obstruction of Rivers (by Clement Higgins, M.A., Barrister-at-Law, published last year), p. 169, it is stated as the ruling in the case "Attorney-General *v.* Metropolitan Board: "Neither is the Board authorised by this section to turn into a navigable river or

stream the sewage of an entire district, so as to create a nuisance." It was held that an action would lie against the Metropolitan Board for the injury of premises by works executed by the Board, under their powers. On March 14th, 1865, a report on the main drainage of London was presented by Joseph William Bazalgette, C.E., to the Institution of Civil Engineers, and was debated by that body for four evenings. In this debate, Mr. G. W. Hemans "thought there was reason for congratulation . . . . that the whole of the sewage, north and south, was concentrated at two distinct points, so that it would be handed over to other parties for the purposes of utilisation. *The re-distribution and utilisation of sewage formed a natural consequence of the main drainage.*" Mr. Bidder remarked, "It must not be forgotten that in bringing the whole of the drainage to Crossness, or to any other point on the side of the river, it had been brought where it could be dealt with. At present, it was thrown into the river in such a way as to be obnoxious, and difficult to manage." "The laws of this country were all that could be desired with regard to the protection of rivers: the only difficulty was to put these laws into operation." Mr. Bazalgette stated, in reply, that the sewage "if made to flow down to some low district, as had been done, and concentrated at a point where it could be conveyed with very little lifting, or by gravitation, over agricultural land, and at the same time to a point where it would cease to be a nuisance to the metropolis, he thought that was the cheapest and best arrangement which could be entered into." And at the end of his speech, Mr. Bazalgette justified the "granting the sewage to a company for the period of fifty years," on the ground that this company were about to expend 2,000,000*l.* of money, and to benefit the ratepayers of the metropolis, who were not called on to expend one penny in this great utilisation scheme.

There is only one outcome of the evidence, to which we have directed the attention of our readers, which avoids the stultification of the legislature, and the charge on the Metropolitan Board of Works that they obtained powers under false pretences. For not only have we the formal statement of the engineer as to his object in concentrating the sewage at Crossness; and the admission on the part of all men of eminence in the profession that its discharge raw into the Thames was an inadmissible nuisance; but we find an arrangement for the disposal of the sewage sanctioned by the very Act which constituted the Board of Works.

The outcome of evidence, then, which respect for Parliament, respect for the Metropolitan Board of Works, and respect for the character of their engineer, render the only one that is not offensive, is this. No one dreamed, in 1855 or in 1865, that the Thames was to be excepted from the general protection which the common law had always given, and which statutes had rendered, in certain cases, more ready of enforcement, for the protection of English rivers. No one dreamed that costly works, authorised for the "preventing, as far as may be practicable, the sewage of the metropolis from passing into the River Thames within the metropolis," were authorised by Parliament with the intent that the sewage of London should be permanently discharged into the river, in a crude state, at points whence a portion of it returns with flood-tide far above bridge, or, indeed, into any part of the estuary. Powers were taken for the immediate relief of the most pressing danger; contemplating the abolition not only of that, but of all sources of danger, and giving to the Metropolitan Board of Works, without fixing the limit of toleration, the same kind of consideration which the whole concurrent *corpus* of legislation on the subject declared should be discretionally given to public bodies who were struggling with the difficulty of the open question—how best permanently to deal with sewage.

To contend that the whole course of recent sanitary discovery and sanitary legislation is to be ignored in the one case in which the largest population is concentrated on the smallest area in the kingdom, is to raise a kind of argument which courtesy finds it difficult to characterise. That the conservators of the Thames are bound by the responsibilities of their charge to inquire into the steps which the Metropolitan Board of Works are proposing, in order to complete their statutory duty of keeping the sewage of London out of the river within the limits of the metropolis, and of so dealing with it as to avoid nuisance, we hold that no impartial and well-instructed person can deny. That their representations should be met, as they have been met, not by a request for further time, but by a plain denial that any duty was left unfulfilled, or any nuisance committed, is one of those pleas in the teeth of all proved facts which rarely prove of ultimate advantage to those who offer them. We have taken some trouble to examine, item by item, the replies given by the engineer of the Metropolitan Board to the report of Capt. Calver. We have no space now to enter on this subject, and can only say that it is a matter of deep regret, not so much for the mischief of the individual case as for the discredit thrown on public institutions, to see the spirit and the tone in which the remonstrances of the rightful guardians of the river have been met. One thing we can show very clearly, time and space being fit, and that is, that if the recent report to the Metropolitan Board of Works be accepted as correct, two results will follow,—one, that all the sanitary legislation of the last twenty years has been entirely mistaken and mischievous; the other, that the metropolitan drainage system is in course of rapid silting up. We hope to take occasion to put these outcomes of Sir J. Bazalgette's statement beyond the possibility of contradiction. In the mean time we only have to put the broad question,—Is the sanitary condition of the river Thames below Staines, that of the riparian population, of the people employed at the docks, and of those concerned in the shipping, a subject which the Legislature has ever contemplated as being left exposed to the unabated nuisance of the permanent discharge of the crude sewage of four millions of people, at two points of concentration, into the river, for three hours per tide?

SOME THINGS WHICH INTEREST US AT THE PARIS EXHIBITION.

On the Paris or eastern side of the fountains and waterfall that divide the Trocadéro gardens, there is not much to interest the sanitarian, unless we descend to the banks of the Seine. On this side of the Trocadéro will be found the aquarium, which will scarcely impress Englishmen who are familiar with the rich collection of fish exhibited at Brighton. The exhibition of the Woods and Forests is more peculiar. Here are samples of all the work done in the forests of France; the wooden spoons the foresters carve, and the traditional wooden sabot which in French caricature is as emblematic of the proletaire as the gend'arme's heeled boot of Imperialism. By the side of these trophies are models and plans demonstrating how fierce, reckless, mountain torrents have been drilled and disciplined and subdued into running along smoothly through an artificial canal, so that, instead of cutting rocks in two, occasioning landslips, destroying the verdure and trees, these erratic watercourses are converted into mountain irrigators, which greatly enhance the value of the surrounding timber. But the contrast given of certain torrents in their wild state, and in what we might term their present cultivated condition is scarcely calculated to satisfy the artist and the lover of nature. In the one case we have a magnificent landscape, alive with numerous waterfalls; in the other, bricks, and stonework, and walls, and smooth water, and trees each at a given distance from its neighbours, standing in rows like so many soldiers in the drill-yard waiting for inspection.

Behind this exhibit are various wooden structures; the one is devoted to the artificial germination of seeds in glass cases, procured by heat, atmosphere, and gases supplied in given quantities, so that the seeds may grow independently of all external circumstances. Another hut contains entomological specimens; on the whole, a somewhat poor collection, if compared to what has been done at the Exhibition in other matters; and there is also a little kiosque containing meteorological instruments. These, however, were not yet in working order. Finally, we reach the Algerian pavilion, surrounded by an Algerian village. On this spot there is an indescribable clatter of voices; the Algerian waiters of the rival *cafés* invoking visitors in a variety of languages to partake of the syrup of dates, the cétral syrup, or else to accept some araki. The latter liquor, tasting like pure absinthe mixed with a few drops of syrup, and flavoured with aniseed, is a treacherous concoction, which should only be taken with precaution and not drunk in the broiling heat or after great fatigue. In the Algerian pavilion it will be seen that the eucalyptus is, at last, receiving the cultivation it merits. There are many samples of this the most beneficent of all trees, as also of preparations made from its leaves; notably a powder and some cigarettes. These latter are being prescribed for bronchial affections, and doubtless the smoke has also a disinfecting influence. In all cases, it is most refreshing to inhale the odour of the eucalyptus-leaves after the fatigue of visiting the Exhibition; and when we consider the mischief this tree can dissipate, the miasmatic influences it so effectually neutralises, we feel in its presence the sublime poetry of nature expressed by its bounteous harmony in supplying the remedy with the evil, leaving it only to our intelligence to avail ourselves of the one to neutralise the other. Thus districts which formerly none dare approach may now be planted with the eucalyptus, the unhealthy emanations feeding the tree, and the tree, in its turn, not only purifies the air, but supplies us with magnificent timber, and with leaves that contain valuable medicinal properties. Nature rarely gives us a more beautiful lesson; and we are glad that its teaching was not forgotten at the Paris Exhibition.

Turning westward, and leaving these miscellaneous exhibits, we once more approach the bridge. Before crossing over the Quai Billy will be found the exhibit of the Union Céramique et Chaufonnière de France. Here there is a great variety of bricks, of perforated bricks, of tiles, piping, brick flooring, revolving hardware cowls, &c.; but though these samples are interesting from a commercial point of view, we failed to notice anything very new. Some more samples of this description can be found on the other side of the Trocadéro building, between the right wing and the Avenue du Trocadéro. It will be remembered that we examined some more French hardware at the very opposite extremity of the Exhibition, that is to say, just opposite the École Militaire, at the end of the Champ de Mars. In consequence of this gross mismanagement, it would be impossible to view in rapid succession, and compare the various specimens of French bricks and hardware used for building purposes, unless we possessed seven-leagued boots.

On the other side of the Quai Billy, but before crossing the Pont d'Iéna, and running parallel with the Seine, are the important exhibits of the Génie Civil, the Travaux Publiques, &c., comprised in Class 66. Unfortunately, and though we have visited this section repeatedly, we failed, as a rule, to find any attendants able to explain the various exhibits. We were generally advised to call on the firms themselves, though these are situated in all parts of the town, and some of them in the suburbs, not to mention the provincial exhibitors; but if this be really the only method of obtaining information, we are tempted to inquire what can be the good of an exhibition? The full benefit of a stove or a warming apparatus cannot be appreciated by the mere contemplation of a certain number of iron pipes, or the exterior of a brick or enamelled oven. Thus, on entering the building devoted to class 66, objects displayed by the celebrated firm of Messrs. Geneste, Hersher, & Co. were the first to attract our attention. These gentlemen have been entrusted with the ventilation of the great hall of the Trocadéro Palace, of the new Hôtel de Ville, and that of many other buildings of great public interest. The wheel which, in its revolutions, sets the air in motion is here exhibited, together with many plans and drawings, but till these gentlemen choose to leave some documentary record of the systems they employ or depute some competent person to attend and give explanations, we must refrain from noticing their all-important exhibit. Again, we find another exhibitor, M. C. Pétiaux, Architecte de Travaux Publiques, who offers to travel any distance, second class, and without claiming any fee, so as to demonstrate how his system will preserve any public or private building from the ingress of damp or injurious gases; but we have not the slightest hint given us as to what is the nature of the system he proposes to employ. There are, however, many other systems and materials exhibited here for keeping out damp, and, in fact, for rendering houses air-tight,—a result which cannot be contemplated with unmingled satisfaction. M. Jacoux, for instance, conceives that he has secured comfort and health for his customers by supplying some special wadding which shall fit with such perfection the chinks of the doors and windows

that no emanations, no damp, can ever enter inhabited houses. Unfortunately, and especially in French houses, the unwholesome gases are generated within perhaps more than without, and with persons who do not understand the importance of ventilation, a draughty door or window may save the health of the family. The cements, the waddings, the gutta-percha fittings, the registers for chimneys, all present grave dangers where sanitary science is ignored; for they prevent the accidental ventilation which so often replaces, more or less effectually, the absence of proper and regulated methods for exhausting foul and supplying fresh air. While, therefore, thoroughly approving the attempt to prevent unpleasant draughts, and the more useful endeavours to keep out damp, we feel ourselves bound to protest that these measures, if unattended with additional means of ventilation, may cause graver dangers than those which they obviate. Among these contrivances, Messrs. L. Caron & Dupuis's water-tight plasters are well worth examining. They are not mixed with oil, and there is, therefore, no action created by the admixture of grease with the saline humidity resulting from the plaster. The Préservatif Leo, as it is called, has the power of resisting acids and the salts of ammonia, and can, therefore, be used with advantage in stables. The Société des Enduits hydrofuges, of Gasny (Eure), have patents also based on the repudiation of linseed or olive oil as the foundation of paint. These oils only borrow from the colours, with which they are mixed, their preservative qualities, whilst the plasters in question are stated to possess a preservative character quite independently of the colours.

Whether this is so or not, no opportunity was afforded of judging. Unfortunately many French exhibitors imagine that it is only necessary to issue a fulsome prospectus, detailing all the advantages of their exhibits. No chemical details are given in proof of their assertions. There is no testimony from independent authorities on the subject. The public, and even critics, are expected to repose blind faith in the assertions of a commercial circular. Under such circumstances, French exhibitors do not do justice to themselves, and will, we fear, be neglected, at least by foreign visitors, who would otherwise take the greatest interest and pains in the study of their inventions.

Messrs. J. Bigot-Renaux, of Rouen, have understood better and entered more fully into the spirit of an exhibition. Their patent joint for water-pipes is exhibited, with water at hand, to test its efficiency, and an attendant to explain the system. This is as simple as it is effective. It consists in allowing one joint to come over the other. A roll of very superior gutta-percha is placed between the two, and tightly jammed by means of a fastening attached to the rims of the pipes. This joint is not only watertight; but, if the level of the roof or wall gives, the elastic allows the piping to bend at the joints without admitting any escape of water. The first experiments of this system were made by Messrs. Mackintosh & Co., in 1847, and subsequently by Mr. Thomas Wickstead, C.E., in London, when it was proved that gutta-percha joints could support very high pressure, and cost 22 per cent. less than lead soldering. The system was largely employed in Germany, and now the 12,000 mètres of cast-iron water-conduits that run over the roofs of the Paris Exhibition are joined together by J. Bigot-Renaux's patent.

The walls of this, the Class 66, are ornamented with drawings of great interest, and might form the subject of very interesting lectures on sanitary engineering, &c. Among others, we noticed plans for the distribution of water to the town of Rouen; other plans for improving the water supply of large towns, and drawings of the submarine tunnel between England and France. The model, also, of a cheap house, six stories high, was especially interesting, as it is a fac-simile of houses that have actually been built. No details were, however, given relating to the water supply, and we were not a little surprised to find that there was but one closet for every three families, and that it was situated next to one of the three kitchens! Outside the building, and facing the Seine, but resting against the walls of the Annexe, will be found a large number of patent [illegible] Here Messrs. Rogier & Mathes, of Paris, exhibit some of the genuine French closets, which, disgusting as they undoubtedly are, may nevertheless be preferred, from a sanitary point of view, to the imperfect and filthily-kept imitations of the English system. Indeed, this section is one of the least creditable to France as a nation. There are some signs of dawning knowledge,—some patentees have sought to make air-tight traps; but others have boldly sent models which have been denounced and condemned over and over again as most pernicious to public health. Decidedly, specialists and foreign organs of scientific and public opinion ought not to lose any opportunity of protesting against the barbaric uncleanliness, indifference, and ignorance still prevailing in France with regard to the dangers of sewer gas, and as to the necessity of cleanliness in respect to these matters. It is strange that a nation so brilliantly gifted, and in advance of many of its neighbours, should still linger on the verge of barbarism when dealing with some all-important and fundamental sanitary questions.

CYPRUS ISLAND AND ITS ANTIQUE ART.

So much has been said and written on the one absorbing subject of the "War in the East," and those engaged in it, that it would seem to be all but impossible to add a fresh word to it. For months has it been absorbing public attention in almost all kinds of ways; but, with all this, but very little or nothing has been dwelt on appertaining to even the *present* state and human condition of the disputants in their peculiar modes of life and special surroundings; still less so on the state of their art and fine art, if there be any such, *now* and in *past* days. But now that things are so nearly or quite settled, those comparatively unobtrusive matters will and must come more and more into view, and we shall long to know a something clear and definite about the ways of life and the *art* of such places as Cyprus, which has, as it would seem, by a sudden decree of fate, come into our English hands, and is to be in time, we must presume, made English, and changed and turned from East to West. What *that* will be must be left to the future, and we should hardly dare to speculate about it; but what it is now, confining ourselves here to things artistic, would be a very curious matter, indeed, to find out fully and clearly, and to get a glimpse, at least, of how the *present* in such a place has grown out of the *past*, and what that past was. It is a magnificent chance, and it will be a pity if it be not taken advantage of, and some lessons drawn from it.

How much there is yet to be done in and with matters in these out-of-the-way regions it would indeed be hard to estimate, for the general and whole-world tendency now is to level all things, and to repeat in one place what has been done and is doing in another and a more conspicuous one. Cyprus is sufficiently out of the way, as things are, but in the future it must become in the way, and the present inhabitants of it, who live, as it would seem, pretty much like gipsies, will be as much astonished at our advent in their island as would the antique inhabitants of it have been in the days of Japhet, and when it was called Chittim, of Old Testament renown. Its "antique" days are most surely numbered. We need not tell its history; the Phœnicians,—those yet mysterious people, who travelled so far, and into so many places,—were among its first settlers, probably, as in so many other cases, driving out before them a yet more primitive race. Colonies afterwards came into it from Greece, and to one of its heroes was attributed the "invention" of the hammer, the anvil, and the tools used to this day even in metal working. It must needs have been invaded, too, by Asiatic colonies; but what,—history, and tradition, and fable put aside for the moment,—is certain is the indelible impression on the art-remains found in it, sometimes deeply buried in the earth, of the archaic Greek methods of work and art-feeling. Its history at one time is certainly buried yet deeply in its soil.

It is quite impossible, then, to glance at any authentic object from this small but world-famous island, without being struck by its Greek or Etruscan,—to use that convenient but most uncertain word,—spirit; or, if the term be better and more descriptive, and more scientific and exact, and nearer, its archaic Greek feeling and character. The early Greeks most certainly found their way into it, and worked in it, and have left us records of what they then did,—evidences of their art-power and skill. It would be curious, and not a little instructive, to know, with anything like certainty, for how long in Cyprus this archaic-Greek mode of doing art-work, and this style of work, lasted, and the precise date of it. We have but little indeed to guide us here. It is the work itself only that can and must be studied, and we would hope that the opportunity will not be lost of diligent inquiry and research now that this island of Cyprus has passed into our careful keeping, and before it is too much disturbed by "modernisings" and "improvements." We here more specially refer to the archaic Greek history of the island, and to its antique Greek remains. In the cities and towns, and in out-of-the-way places, there yet remain vast undiscovered stores of antiquities which might throw some light on the disputed origin of the Greek idea of art, individualised as it was in the old world, and yet is.

It would thus be not a little instructive to see if possible a little more clearly than we now do into the origin of Greek art, and into the beginnings of it when in its very rudest state. Here and there, may be, as in some few objects in the British Museum, we really do so, and there have been found objects in this very island of Cyprus which the rudest and the most primitive of Greeks might certainly have been the authors of. There is far more chance of getting at such in a sea-surrounded island, and in a colony, than in Greece herself, for the very absence of notice and the positive neglect in such localities insure their preservation. No one heeds them. We do not positively assert there is this treasury of antique art, but it is worth a little painstaking and research to look for it before the chance is lost, and while the matter would doubtless enlist a good deal of antiquarian, if not public sympathy and support. The time is hardly arrived, perhaps, for a full appreciation of the importance and art value of a complete historic series of any particular phase of art, but it would be not a little interesting and to the purpose to prepare the way for it, and to help to provide the materials for it. The fact of the probable increase of the antiquity department in the British Museum, by the migration of the Natural History Section to South Kensington, all but invites it.

There is, too, here, even in the few specimens of pottery we have been able to closely examine, evidence of a fact which will, some day or other, though it may be distant, be thought worth the looking into here in this island: it is the difference to be found in the drawing and work of the individual workmen who have executed and "ornamented" the cups, and plates, and vases. This difference, by not a few accomplished antiquaries and art-writers, has been attributed to differences in style and date; but the difference and distinction may really lie in the distinct art capacities and powers of design and drawing in the individual workmen. Each workman, however rude he may have been, has worked as an artist; just, indeed, as much so as any one of our Royal Academicians in the painting of an oil picture. So that not only is any certain given subject differently treated, and differently "designed" and put together, but the handwork of each workman is distinct, and evidences an ever new capacity,—no two men ever producing a precisely like result. Our belief is, that some startling evidences of this will yet come to light, and that a careful search in Cyprus Island would, in all probability, prove it: the more particularly if care be taken to keep the several "finds" together, each locality furnishing evidences of individualised work, though the style of art would be the same. We do not see how this can be well doubted.

Another singular fact in old-world history may here find confirmation, viz., the travelling propensities of the men of old days; for we see here amidst these remains evidences of the workmanship of the Egyptian and Assyrian artist-workmen, evidently done on the spot, and by those coming from Egypt or Assyria, and working in their own national way, and with but little, if any, reference to the art about them. In the old world, with its isolated ways of work, and with its simple ideas undisturbed by foreign influences, its very weakness made its strength, for the whole power and art-skill and inventiveness of each national workman, whether Greek, or Egyptian, or Assyrian, lay in his narrow—if you will, and single, and individualised style of art. He never dreamed of copying: he worked with the means and ways of his own country, and time, and style of art, and applied all readily without effort to all things coming under his special art-trade or

vocation. And this is the glory and strength of the old world's fine art, and the pride of its artists and workmen. A slow process, may be, and a narrow one, but a quite sure one, and thoroughly national in each case, and truly and visibly representative of the times in which each such artist lived. Whether rude and rough in his work, or learned and refined, the true national art expression was always there.

Our main object in thus looking hastily at what there now is of antiquity in Cyprus, is to call attention to how much more there probably is still buried, not only underground, but put away in out-of-the-way spots, which have been but little, if at all, in these days visited; and to urge on those who have the power not to lose the opportunity which our occupation of it will offer for further and more thorough search. We feel quite sure of the result, and that it would repay the trouble and expense. We have the more particularly, it is true, dwelt on the *antique* days of Cyprus, but have not forgotten its more recent history, and the advent into it of a race of men, the Turkish, who, we fear, in the general excitement have been a little forgotten. The Turk is still an occupant in Cyprus, and rules there to a certain extent; and his mosques must form a very striking feature, architecturally, in the aspect of the towns and cities, and even small villages. But slender justice has been done, perhaps, to the architectural and art capacities of the Turk,—all things, as always with the unfortunate and unhappy, go against him. But for all this he knows how to build and how to work artistically and nationally, and he most surely lives in a capital city without rival in the world for its natural and built-up "picturesqueness." No wonder that they from the cold North look with such longing and eager gaze at its fast-barred gates!

THE MICROPHONE.

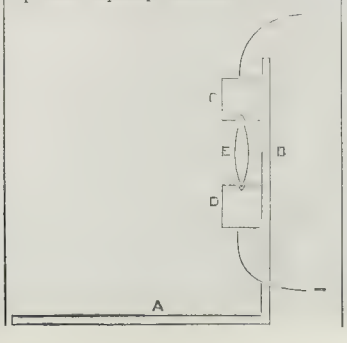
THE microphone, the latest wonder in the sphere of acoustics, is not an independent machine: it is a supplementary apparatus to the telephone. Before proceeding, therefore, with the description of the first-named instrument, we may recall to mind the construction of the latter. In the telephone, a magnet is enveloped in wire, and opposite to one of its poles stands an iron plate capable of vibration. If electric currents pass through the wire in quick succession, the magnetism of the magnetic rod is changed by each of these currents and the iron plate more or less strongly attracted, *i.e.*, it vibrates, the number and force of the vibrations corresponding to the number and force of the electric currents.

In ordinary telephoning, the electric currents with which the work is effected are produced by a second telephone, in which the sound-waves cause directly vibrations of the iron plate, and thereby changes of the magnetism, and thus indirectly electric, recorded currents. This has the advantage of the electric currents corresponding very exactly to the modifications of the vibrations of sound; but this disadvantage, that they are extremely weak. Soon after the invention of the telephone, therefore, it was endeavoured so to change the instrument as to make it fit for working with more powerful battery currents, and it was hoped to render it practicable for very great distances. Most, if not all, of these constructions have, up to the present time, not been very successful ones (but this difficulty may yet be overcome); one, however, although it has not led to the desired end, has produced curious lateral results, one of which is the microphone, with which it is our object to deal.

In order to understand the principle of the apparatus, the following should be known. A galvanic battery possesses, opened or closed, a certain "electro-motive power,"—that is to say, a certain force which separates the two electricities. When opened, *i.e.*, if its poles end freely and unconnectedly in the air, this power shows itself by filling the one pole with a certain amount of positive, the other with an equal quantum of negative electricity. When closed,—*i.e.*, if its two poles are connected by a wire,—the positive electricity flows away from the positive, the negative from the negative end; the electro-motive power, however, continues to transport new electricities to the two poles, their flow is unceasingly kept up, and a continuous stream of the two electricities through the wire is created, and this flow is the electric or galvanic current. Its volume depends upon the electro-motive force; the greater the latter is, the more electricity is transported to the poles, and the more flows through the wire. But it depends also upon something else. All the parts through which the current passes oppose to it a certain resistance; it is as if electricity could move in the wires and in the other conductors only with a certain amount of friction. The strength of the current is the smaller, the greater the resistance. The exact relation between the volumes here to be considered were first recognised by the late Professor Ohm, of Berlin; the law known by his name, which since 1827 has become the foundation of the whole science of galvanism, runs as follows:—"The strength of the current is equal to the electro-motive power of the battery, divided by the resistance of the whole conduit." If a given battery is used each time, its electro-motive power is a given unchangeable volume; if the resistance, for instance, is made three times stronger, the current becomes three times weaker, and *vice versâ*.

Now, the resistance of the wire is the greater the longer and thinner it is. If the current is conducted through a wire that may be shortened (for instance, by dipping it into quicksilver, or by winding it round a metal cylinder), at each shortening the current gets stronger in a certain proportion, at each lengthening it becomes weaker. Resistance is especially great in places where two metallic pieces touch each other loosely. This is very easy to understand, for contact is imperfect, and electricity finds only few points where it may pass from one metallic body to another. If, therefore, a place is provided in the conduit where a current passes through two conductors only loosely in contact with each other, it is considerably weakened, and if the two conductors are pressed firmly upon each other, a perceptible increase of the current is soon created.

Let us now suppose a battery-current having such a loose point of contact connected with a telegraph. This might be effected in the following simple manner. One battery-wire is fastened to the wire-coil of a telephone, and thence conducted to a metallic plate; the other battery-wire is secured to any metallic object of a suitable weight, say, an ordinary iron nail, and this laid on the plate. The current passes, but it is weak, because it meets with great resistance at the point of transit from the nail to the plate. Its next effect is, that it imparts to the magnet of the telephone a certain permanent magnetism, of which we may assume (the contrary would cause no essential difference) that it is equal to the magnetism which the magnet possessed originally. The iron plate of the telephone is consequently attracted with a certain magnetic force, and is permanently maintained in any position. If pressure is exerted on the nail, the contact with the plate is increased, the resistance becomes less, the current stronger, and in consequence the magnet is more powerfully magnetised: the iron plate is attracted more strongly. If the plate is touched, a momentarily better contact is effected by the push, consequently a momentary attraction of the plate; the telephone clatters at the same time as the nail. Hughes, the inventor of the type-printing telegraph, made this experiment, at first in a simple manner, with two nails touching each other; he then perfected it, and thus became the inventor of the remarkably sensitive instrument to which he has given the name of microphone. It is so simple that anybody can make it by means of two small pieces of wood and three pieces of charcoal. The diagram below represents its principal features.



Two small boards, taken by Hughes originally from a cigar-box, are fixed to each other rectangularly; one (*a*) lies horizontally upon the table, the other is fixed vertically to the horizontal one. Two small blocks of charcoal (*c* and *d*) are glued on to *b*; their size is immaterial. The upper one has a small semicircular indentation on its lower, the lower one on its upper side, and in these indentations a small charcoal rod (*e*), pointed at both ends, is inserted. From the charcoal blocks *c* and *d*, two wires, the one direct, the other through a telephone, lead to an electric battery, which for wires of a moderate length may be very weak; a Daniell element is more than sufficient.

The little rod, on account of the holes in which it stands, cannot fall out, touching the blocks of charcoal only loosely; the current, consequently, that passes through the telephone is weak while the apparatus is at rest, as already pointed out. If it is shaken, the little rod vibrates between the two fixed blocks of charcoal, touches them more firmly, and the current becomes stronger in consequence of the decreased resistance, the plate of the telephone moving audibly. Now, the apparatus is so sensitive that it is not necessary to touch it in order to produce such a movement in the telephone, a sound-wave being sufficient to cause such an effect. Especially if a sound-source, for instance a musical-box, is placed on the plate *a*, the apparatus acts like a sounding-board; all its parts, consequently also the movable charcoal rod, participate in the vibrations of the musical-box, each vibration causes an increase of the current, and thereby a vibration of the telephone; in other words, the telephone reproduces all the sounds produced on plate *a*, and if it is held to the ear, the music of the musical-box is heard quite plainly.

The charcoal in question is the hard, sonorous cake made of charcoal-dust which, known as retort coal or Bunsen coal, is used generally for galvanic elements. Hughes describes it as the best of the simple materials in use, because it does not burn nor is liable to rust, and furnishes a loose contact. But it may be improved by heating it to a red-heat, and then suddenly plunging it into quicksilver. Its numerous pores become quickly filled with small balls of quicksilver, and if the system is disturbed, not only does one piece of coal touch the other, but the small beads of quicksilver approach more closely to each other, and touch each other better, so that they also contribute to increasing the strength of the current.

Thus prepared, the instrument is so highly sensitive as to be able to perform for the ear what the microscope does for the eye: it brings to us sounds which the ear unarmed cannot perceive; on that account it has been named "microphone." If a watch is put on the wooden plate, its ticking is heard quite plainly in a telephone half a mile off. If an insect is put on it in a box, the sound of its tread is heard, and it is possible to distinguish the comparatively heavier step of a humble-bee from the lighter touch of the fly. The instrument as now constructed reproduces especially well sudden, clattering, and sonorous sounds; sounds of less strength and the human voice are reproduced only as a confused noise. But it only requires a glance at the form of the apparatus described to convince ourselves that no great exactness can yet be expected from such a primitive tool, and that there is a vast range for improvement. The latest invention by Hughes opens up to science pure and simple a vista of diving into and listening successfully in many regions where hitherto everything that passed was to us shrouded in silence. Whether it will prove of benefit to the practical sciences, future researches will show.

A Parochial Dispute.—The old Guardian Board of Clerkenwell, to whom College House, Highgate, belongs, has threatened legal proceedings against the Holborn Union for taking illegal possession of the ground. College House was, prior to the amalgamation of the parishes, one of the workhouses of the parish of Clerkenwell, but after that event it was handed over to the Union. The Union is now building on the site an infirmary, which will cost nearly 150,000*l.*, and, for the purpose of erecting a laundry, College House is ordered to be pulled down. The Clerkenwell Board is stated to have defied the Union to take such a step without their consent; but the latter have resolved to proceed with the demolition of the old building at once.

HARROGATE.

Or origin "humble and obscure," Harrogate has acquired fame. It was once an undistinguished part of the great forest of the barony of Knaresborough, but if even it had been known to the Romans, as some have conjectured, it was down to two centuries ago a mere site of scattered huts of "humble husbandmen." To Captain William Slingsby, of Scriven, it owes the first recognition of the virtues of its waters, which gradually built up its fame. In the seventeenth and eighteenth centuries, the "mineral waters near Knaresborough" became more fully recognised; and gradually, divided by invisible lines, two villages,—High and Low Harrogate,—grew up in different parishes, and under different ecclesiastical jurisdictions. Baths began to be formed, hotels to be built, and places of recreation to be constructed; the wells were enclosed; "pump-rooms" built, and eventually Harrogate became the nucleus of the fashionable health-resort we know. Before the commencement of the railway era it was "considered the principal watering-place in the North of England," and it was estimated that under the disadvantages of coach-traffic, its visitors numbered annually 10,000. At that time it was a resort for the gentry and clergy; it abounded with academies and schools; had half a dozen boarding-houses and ten hotels; there were promenade-rooms and a "reading society," baths, spas, and places of worship; but manufactures were nearly at their present low ebb,—a linen manufacturer and a bleacher comprising the bulk. These were the days of coaches; and the "Telegraph" ran from Leeds to Newcastle, with the "Hero," the "Red Rover," and the "Times"; the "Royal Mail" ran from Shields; the "Union" to Ripon, and the "Courier," and others of these old-world modes of communication crossed in their routes at the fashionable watering-place. The population in this early day of the development of Harrogate was small,—some 2,000 or 3,000, and its growth was then slow. When the Leeds Northern line was opened, and partial railway facilities gained to the rising watering-place by the opening of a station at Starbeck, there was an impulse received which, since the acquisition of a more direct and nearer route, has been accelerated, and now Harrogate is undergoing all the changes which towns in the second stage of growth know.

It has already acquired not only many of the institutions of towns, and to these it has added some of those which are the special addenda to town life; and the state of some of these show tolerably plainly the growth of the town. It boasts of cottage and bath hospitals, furnishing accommodation for scores of patients; its Board of Improvement Commissioners is just getting fairly into its arduous duties; a police force of forty-six persons constitutes the guardians of the division in which it forms the most important part. It possesses now a dozen churches and other places of worship; whilst its pump-rooms, rinks, and lounges minister as fully to the world. It is becoming a large postal centre: in summer about 10,000 letters and papers are daily received and sent, and in winter the number shrinks to about one-half. A staff of six execute postal duties, and about a dozen, telegraphic; but those numbers both contract slightly in the winter. The enumeration of its residents or visitors; the tabulation of its trades, or its facilities of comfort, or its attractions; the numbers either of its poor or its police,—would do little to describe this notable watering-place. Its large, roomy, and convenient hotels must be visited to be appreciated; its public buildings must be seen to have their architectural beauties fully known; and its charms of sun, and shade, and spray must be experienced instead of being told. To the great towns of the south of Yorkshire it is becoming more and more an indispensable resort, for to it the merchants and toilers of Leeds, Bradford, and more distant places, resort,—to reside, to stay the month or six days that constitute their various holidays, according to position and length of purse.

The fact that it has, so to speak, a very wide gathering-ground, gives to Harrogate a certainty of extensive usefulness as a health resort. Except Ilkley, in the one direction, which is small, and very different in the nature of its attractions, and the seaside resorts, which are distant, there are no competitors in the district to which the well-to-do, who like "sun and sulphur" can resort; and as there is, around and within a reasonable distance from it, a very large population, to which it is the "lungs,"—the great summer breathing-space. This population is attracted to it by its known repute, that certainties a varied company, of entertainment as varied, and of pleasant scenery and pure air. Basing its claims to the patronage of the public on these, Harrogate has added to its natural charms something of moment in the past, but in recent years it has not done so much, being content to rest on its oars. But the fame it has acquired will not allow it to stand still, and thus it is now in what may be called the second era of growth, its outskirts being now ragged with the buildings that are encroaching thereon and that are spreading out the town, just as aforetime the two branches that form it now spread themselves out towards one another. But whilst there is this material growth known just now, and that growth is of the most real and abiding character, depending in considerable degree on the residential attractions Harrogate presents, yet there is not now to the full such a sowing of seed as there should be to ensure a continuance of the growth in the future. There does not appear to be in Harrogate sufficient of the corporate public-spiritedness which there ought to be, and without which continued growth is rendered uncertain. It has the natural advantages of pure air and beautiful surroundings; it has given itself many of the essentials that are needed by such health-resorts, and as a consequence it has now reaped fame and enjoys the reward thereof; but it needs to keep pace with other places yearly brought nearer to its visitors by better railway competition, and therefore more enabled to enter into competition with it for them. In the race for this great summer and autumnal visiting traffic, there is a continual need for the towns entering into it to add to their attractions, and to adapt these in some degree to the varying dictates of dame Fashion. Harrogate needs to bear this in mind, and if it would apply it, it need not fear for its future, assured in Poe's words, "that evil things, in shape of sorrow," shall not "assail its monarch's high estate."

WORKS IN EDINBURGH.

ANOTHER step has been taken towards the restoration of St. Giles's Cathedral. Plans have been prepared by Mr. William Hay, architect, for the incorporation of the south transept with the restored chancel, and these have met with the approval of the Town Council. The transept, which, since the division of the cathedral into three churches, has been designated the "Old Kirk," was one of the charges abolished by Act of Parliament, about fifteen years ago, and has for a few years past been occupied by the Trinity College congregation, whose place of worship had been acquired and demolished by the North British Railway Company for the extension of their station. This congregation having now obtained possession of a new church erected for them, leaves the old kirk vacant and at the disposal of the authorities. In its present aspect the south transept of St. Giles's is anything but attractive, being encumbered with heavy galleries and unsightly crowded pews. Incorporated with the old kirk there is a chapel, called the Preston aisle, which is separated from the chancel by stone partitions built up between the bays, three in number. These partitions are to be removed, and the space fitted up with oak benches, similar to those in the chancel. To the east of the transept, and beyond the south aisle of the chancel, is situated a chapel, designated Montrose Aisle, beneath which lie the remains of the "Great Marquis." This chapel has been used as a vestry for the old kirk, and the spaces between the piers built up. The piers and stone vaulting are intact, and all that requires to be done for restoring the chapel to its original character is to remove the obstructions between the piers, so that it may be open to the chancel. The Preston aisle, which is to be incorporated with the chancel, is to be screened off from the transept by a wood screen, 35 ft. in length, provided with folding doors, and having open tracery in the upper stage. The remaining portion of the transept is to be offered to the Order of the Knights of the Thistle as a chapter-house, the Order having had no such accommodation since the destruction of the Chapel Royal at Holyrood. Should the Order avail itself of this offer, the transept and its western chapel will be thrown open, the unsightly pews and galleries removed, and a throne for the sovereign and canopied stalls for the knights substituted. In the restored chancel a powerful organ, blown by hydraulic power, has been placed, so that this part of the cathedral may now be considered complete as to its fittings. What with stained glass, reredos, organ, and other additions, a great transformation has taken place in the scene of Jenny Geddes's attack upon "black prelacy," but, as showing that her spirit still survives, a reverend Doctor of Divinity, and a member of the School Board withal, has thrown out hints to the City arabs that it would be a meritorious act to smash the painted windows. But the schoolmaster is abroad in a different direction from that in which the Reverend Doctor would have.

As to the Cathedral of St. Mary, the windows of the nave are now being glazed, those of the southern clearstory are filled in with coloured glass with the heraldic devices of the donors, and the remainder with tinted cathedral glass. A paper war has been raging as to the question of letting part of the sittings in the cathedral. It appears that by the will of the testatrix she provided that the clergy were to be paid from the proceeds of the seat-letting; but it is contended that to appropriate the seats of a cathedral is contrary to precedent, and unseemly and unadvisable. The question remains behind, from what source are the clergy to be paid?

Two new established churches are in progress. The first of these, at Parkside-place, St. Leonard's, is approaching completion. The design has been prepared by Messrs. Lessels & Son, architects, and is an adaptation of Early Scottish Gothic. It measures 82 ft. in length by 56 ft. in breadth, exclusive of a projecting recess for an organ 17 ft. by 26 ft. Behind this recess is situated the vestry and a large class-room.

The interior is to be fitted up with galleries, and will afford accommodation for a congregation of about 1,000. The cost, exclusive of site, is about 6,750*l.*

A prominent feature of the design is a tower and spire at the north-west angle, which rise to a height of 120 ft. The exterior presents a rather gaunt and unpleasing aspect, devoid of expression or force of character, which might have been given even with the means at command. Severity is one thing, want of expression another.

The other church, which is in progress, is situated at Mayfield, near the entrance to the Craigmiller Blind Asylum, and is designed by Messrs. Hardy & Wright, architects, in the Thirteenth Century style of Gothic. The building is to consist of nave, aisles, and transepts. The arcading of the nave is to rest on stone shafts, with moulded caps and bases. The roof is to be of framed trusses, and a gallery is to be thrown over the vestibule at the end of the nave. The interior is to accommodate a congregation of 850, to which fifty additional may be obtained by utilising the aisles. The design embraces a tower and spire, which are not to be gone on with in the meantime. The estimated cost of the building is about 5,200*l.*

The Mayfield Free Church is approaching completion. It is Early Pointed in style, with somewhat of a French character, and consists of nave and transepts, with a recess at the east end for the pulpit, which has somewhat the semblance of a chancel. This recess is lighted by windows about 6 in. broad and about 15 ft. high, which are more singular than beautiful. There are some good points about the building, however, particularly the treatment of the flanks of the transepts, in which the architect has not been afraid to allow blank wall space.

The Clockmill property, which abutted upon the Queen's Park to the east of the palace of Holyrood, has been acquired by Government, and the high walls surrounding it removed. This addition to the park, consisting of upwards of six acres, and having some fine trees upon it, adds greatly to the amenity of the neighbourhood. This ground, which formed an encroachment upon the natural boundary of the park, had been acquired by a private speculator, with the view of erecting lofty workmen's houses upon it, a calamity from which the city has been saved by the exertions of the Cockburn Association.*

In connexion with the City improvements, and to improve the communication between Bristo-street and Nicholson-square, the unsightly garden

* The Cockburn Association takes its name from the late Lord Cockburn, who took a warm interest in the amenity of the city, and wrote a pamphlet upon "The Best Way to Destroy the Beauty of Edinburgh."

in the centre of the square has been slightly curtailed, the dilapidated parapet and railing superseded by new and handsome ones, and the garden itself laid out in an attractive manner.

West Princes-street-gardens, too, are undergoing considerable improvement. A new terrace-walk has been formed with broad flights of stone steps at each end, which have stone balusters and piers on each side. A bequest of 1,500*l.* has been left by Mrs. Ross (the widow of the gentleman who presented a fountain to these gardens) for the erection of a covered rock garden, a structure in regard to which the Cockburn Association remarks that, however interesting it may be in itself, it could not be erected on any prominent part of the gardens without detracting from their amenity. "The charm of the gardens consists in their presenting in the midst of the city a considerable expanse of greensward ornamented by trees, and capable of further ornamentation by means of flowers, which, if judiciously laid out and sufficiently protected, will form a delightful promenade for the citizens, and will continue one of the most ornamental features of the city so long as it is preserved, as far as possible, from the intrusion of erections of every description."

The effect of the handsome new terrace erected to the north of the Bank of Scotland can now be fairly appreciated, for although it looks raw and new as contrasted with the surroundings, it will soon acquire tone, and the dignity it lends to the Bank building will be enhanced.

The new Canongate school is approaching completion; at first it was stated that the estimates received amounted to nearly 600*l.* below the probable estimate, but now the School Board complain that additional calls are being made upon them. The building, as we formerly stated, is designed by Mr. William Beattie in the Scot-Flemish style, and accommodation is provided for 800 pupils, at a cost of about 7,500*l.*

OPENING OF THE "EMPRESS" BRIDGE, INDUS VALLEY STATE RAILWAY.

SOME thirteen years ago Mr. Brunton, C.E., made the first survey of the 500 miles which are between Mooltan and Kotri, with a view of connecting them by a line of railway, and ever since then a devoted band of engineers has been struggling to bring to a completion a work which, unhampered, they would have finished easily in three years; as it is, although of all the projects which the Government of India has undertaken of late years, it is perhaps the most self-evidently important, yet, according to local authorities, it has been the one most of all "muddled and meddled" with, surveyed and re-surveyed, and starved financially, till the line had become wellnigh a byeword. Now the railway down the valley of the Indus is practically completed, and a selected few have witnessed the formal opening by Sir Andrew Clarke, R.E., of the bridge across the Sutlej river, which joins for the first time the Punjaub to the Bhawalpur State.

We learn that the bridge consists of sixteen spans, each of 250 ft. clear. The foundations of the abutments and piers are all alike, each consisting of three wells, in a line, about 19 ft. in diameter, with deodar timber curbs, and sunk to a depth of 100 ft. below low-water level. The internal space is filled with alternate layers of hydraulic concrete and sand, saturated with water up to within 3 ft. of low-water level, while this 3 ft. is filled up with solid masonry. Externally, the wells are cylindrical from the curb up to 10 ft. below low-water, from which point the centre wells are corbelled out to a square, and the outer wells are similarly corbelled on their inner sides only. The masonry throughout consists of hard-burnt 10-in. bricks, whole ones only being used for the cylindrical part of the wells. Additional stability is obtained by the presence of twelve vertical iron tie-rods inserted equidistantly in the masonry, and running up from the curb, to which they are clamped, being connected at every 16 ft. in height by bottle-nuts 6 in. long. The spaces between the wells are filled with concrete for 5 ft. below low water. The stratum consists of sand entirely for the first seven piers, starting from the Adamwahan side, for the next three piers averaging two-thirds sand and one clay, while the last seven piers are, or were, fully two-thirds of their length in clay soil. The protection between each abutment pier and the one next to it consists of a pear-shaped mass of from 3½ to 4 lakhs of cubic feet of stone, designed to prevent any undercutting by the river. The centre-line of this mass is occupied by a curtain of block-wells, 9 ft. square and 30 ft. deep. The river-piers are protected by masses of stone round them varying from ¾ lakh to 1½ lakh, the larger quantities having been used wherever the river attacked the wells before their completion. The top of this protection has in no place sunk, as yet, lower than 25 ft. below low-water level, although between some piers where the bed is clay the river has scoured down to 56 ft. The beds of both spans at which this depth was attained are floored with brick cubes for a thickness of from 5 ft. to 10 ft., to admit of the girders being erected on stages over the deep stream. The piers are finished with a corbelled and weathered cornice, open on the sides between the corbels to admit air and light to the bearing gear of the girders. The iron superstructure, which was sent out from England, complete for erection, was executed by Messrs. Westwood, Baillie, & Co., and Messrs. Head, Wrightson, & Co., and credit is said to be due to both these firms not only for the workmanship displayed, but equally for the care taken, which landed at Adamwahan this huge mass, about 6,500 tons, complete and ready to erect without so much as one nut or one screw wanting. The bridge was wholly designed by Mr. Molesworth, C.E., the details being worked out by Mr. Randell, C.E., and may be generally described as a species of lattice-girder bridge.

The mean rail-level is about 60 ft. above low-water level. Owing to the badness of the rails sent out from England, the permanent way with expansion joints has not been laid, and the road is temporarily laid on longitudinal sleepers and uniformly secured by coach-screws. The river is at present virtually confined to two spans of the bridge at its south end, but in 1876 the stream cut its channel laterally southward and ran for half a mile along the east side of the south approach embankment (which was only saved from being undercut by heavy stone protection) and raised a sand-bank nearly as high as an average flood. A breakwater is now in progress from the left bank, which is faced for two miles with 13 in. side brick cubes to the amount of from 200 to 500 cubic feet per foot run, according to the depth of water in front. Its head is protected heavily with stone, and the entire bund will be 4 ft. higher than any known flood, and furnished with a line of rail to enable additional protection to be promptly launched if ever found necessary. Two canals, each 150 ft. wide, cut across the south bank, will draw off surplus flood-water and relieve the pressure on the bund. The stations on the new line have, at the upper end, been constructed with domed roofs to the rooms, which, though not unsightly, have not, we understand, proved a success; the domes do not produce the coolness anticipated, and they are too heavy for the kucha-pucca masonry of the walls; Shujabad station-house fell bodily down from the floods last year, and is being rebuilt with a flat roof.

At the opening in June last, Sir Andrew Clarke read a gracious telegraphic message received from her Majesty the Queen, in which she thanked the Government of India for their congratulations to her on the completion of so grand a work, and signified her wish that the bridge should be named "The Empress." Sir Andrew afterwards made an address, in the course of which he said,—"Great and interesting as have been the difficulties which have been overcome by the attention and care of Mr. Rayne, Mr. Galwey, Mr. Heenan, who fell on the field of his work, Mr. Graham, and others who have been employed here, if I do not note them all, let them not fancy their names or labours are forgotten. These things are known to most of us here present to-day, and have been described to our visitors; I mean the difficulties in constructing the foundations of this bridge, and in raising the superstructure; perhaps even still more interesting, and certainly no less perplexing, was the task of training and curbing the river itself, so as to induce it to abandon its vagaries and wanderings and keep in the way it should go. Without doubt one of the most remarkable features of the fabric itself has been the sinking and founding of the wells. To us engineers here in India, this system of founding the buttresses or piers over which the roadway is to pass, is well known, and it is commonly said that we have learned the practice in this country, having adapted and adopted it from the native engineers of India. I am myself under the impression that it has been stated under competent authority that this system of dropping hollow cylinders into the heart of treacherous soil owes its birth to an inventive genius of a date long anterior to any application of it in this country, and hence that it cannot be said to be of pure Indian origin. Be this as it may, however, it must be admitted that whatever was its source, it is in India that we have learnt the value of the principle, that our application of it has met with marked success so far, and that one of the novel and remarkable features of this fabric, I repeat, is the great depth to which in the bed of the Sutlej the engineers have had to sink their piers. If I remember right, all are down some 100 ft. below the natural, or what should be the natural, bed of this wandering river, and I cannot leave this part of my theme without mentioning with honour the name of one of ourselves, a French engineer, who has been associated with us in this particular work, and to whose skill and inventive genius it is due that we have been able to accomplish the sinking of the wells with less difficulty, and with much economy of time and money. For though our roving, never-stay-at-home river,—a very Bohemian in his nature, and a second Ariel in his eccentricities,—loves softlying, still his bed is in places hard, and was intractable to deal with, until Mr. Gatmell invented a machine which I commend to the attention of those who have not seen it, which is as simple as it is original, and which has removed the hard and gnarled lumps that have been met with in the mattress of the Sutlej. Another feature in the practical erection of this bridge, and one which furnishes, I suspect, exceptional experience, is the rapidity with which the iron superstructure has been put in place. To have lifted on to the piers these girders, weighing tons upon tons, and clinched with thousands of rivets, would be in itself a feat of which any man who had organised the arrangements might justly be proud. But when you view the site on which he had to work, and call to mind that, at the very moment of Mr. Bell's supreme agony, when the last of his water-spans was being lifted into place, our Ariel river suddenly took it into its eccentric head or bosom, or what you will, to do what it had never done before in the memory of the oldest inhabitant,—if an old inhabitant ever survives in Adamwahan,—and at that very particular time of year came down in flood, and threatened the whole of the staging and appliances by which the girders were being adjusted. When you remember all this, you will, I am sure, agree with me in attributing the success with which the river was defeated to the pluck, skill, and energy of Mr. Bell and his assistants, and to the men, both European and native, who, confiding in their leader, worked with willing hearts and hands to beat the enemy."

Mr. Rayne, replying for the staff, said:—"I have mentioned the name of Mr. Baxter amongst Mr. Bell's small staff of Assistant Engineers. Mr. Baxter was always called upon when a more than usually difficult piece of work had to be undertaken, especially if it required tact and good judgment in dealing with native contractors or work-people. Modest and diffident of his own powers, his usual reply when thus called upon was to the effect that he did not think 'he could do it'; urged further, he would say he 'would try'; and when Mr. Baxter said he would try, no more was needed; it was sure to be done and done well. To Mr. Baxter fell the construction of the great spur on the other flank and the temporary pile bridges which, thanks to the floods, he had to rebuild three times this season. Messrs. Tait & Moyle are two other valuable young officers who have rendered Mr. Bell excellent help. They were in charge of the well-sinking till it was finished, and since then between them, they have had the putting up of the whole of the girders. These young officers do great credit to the Royal Engineering College, where they were trained. I have been surprised and delighted at the facility with which they have fallen into the ways of working here, in India, with the natives, and the practical, thorough, and devoted way in which they have buckled to their work. Mr. MacMerny, sub-engineer, put in the piled stages across the deep river in 55 ft. of rapid water, and put up all the other timber stages throughout the bridge, in addition to his other duties as foreman of the saw-mills and carpenters' and carriage-building shops. Mr. Winmill, sub-engineer, had charge of the machine-shops and of all the steam-

engines and locomotives, but was always ready, as he was often, like the others, called upon to undertake any other duty in times of emergency. Mr. Macpherson, sub-engineer, had charge of all the riveting work of the girders, and how well the work was done is proved by the excellent results yielded under the official inspection tests. Mr. Bewell, supervisor, and Mr. Da Silva and Mr. Rex, well-sinker and girder erector, did excellent service, as did many more, both native and European, foremen belonging to the works establishment. Nor will I fail to mention how well and satisfactorily on the whole the skilled native workmen have done their duty. The handling, erecting, and riveting of the large masses of iron in these girders is no light work; nor could many of the men have had to deal with anything of the same magnitude before, but that they had latterly become wonderfully proficient at it may be judged from the fact that the last of the spans, a mass of ironwork weighing nearly 400 tons, was put together and bolted up in its place on the piers in forty-five working-hours. One hears complaints of native workpeople, of their slowness, idleness, pusillanimity, &c., but I have not found them particularly amenable to these charges, and certainly not when properly led and managed, nor, I think, has Mr. Bell. Certainly, the workmen who have put up the 6,400 tons of iron composing the Empress Bridge girders cannot be very conspicuous for these failings. As regards the last, indeed, their reckless bravery, sometimes amounting to fool-hardiness, and perhaps arising from ignorance of danger, that would be apparent to most European workmen, has led to several unfortunate accidents during the progress of the works, and has always been a source of some disquietude to Mr. Bell and myself. I must not omit to mention on this occasion the services of some of Mr. Bell's predecessors in charge of the Empress Bridge who, to my regret, are not here to-day, Mr. Graham, to whom fell the duty of laying the first foundations and starting the well-sinking, and Mr. Galwey, who, ably assisted by Mr. Monk, carried on the latter work till it was more than half completed. Altogether the Empress Bridge has been fortunate—certainly it has been so latterly—in the staff appointed for its actual construction; few large works can have been more fortunate. On behalf of that staff I again thank you, Sir Andrew Clarke, for so kindly proposing, and the company for so cordially receiving, the toast of our healths."

BERKSHIRE ARCHÆOLOGISTS IN LONDON.

ON Thursday in last week, as already briefly mentioned, a large party of the members of the Berkshire Archæological and Architectural Society visited London. Leaving Reading by the 9 a.m. train on the Great Western Railway, they proceeded to Westbourne Park Station, where they changed carriages for the District Railway and went on to Westminster Bridge Station. Among the members and friends present were Col. Loyd-Lindsay, V.C., M.P.; Mr. G. Shaw-Lefevre, M.P.; Mr. Geo. Palmer, M.P.; the Mayor of Reading (Mr. J. Silver); Mr. Charles Smith, F.R.I.B.A. (vice-president); Mr. E. J. Shrewsbury, Mr. J. Morris, and others. Proceeding to Westminster Abbey, they assembled in the Chapter-house, where they were received by Dean Stanley, who made a few prefatory remarks, in the course of which he described the Chapter-house as it was and as it is. He observed that the building was of especial interest, inasmuch as it was the cradle of all constitutional assemblies, our House of Commons, which was 600 years old as an institution, having met for the first 300 years in that building. Referring to the interesting wall paintings which were brought to light during the restoration of the building, he pointed out the one (to the left of the door on entering) representing the Apocalypse. This was painted by Abbot John of Northampton, *temp.* Edward IV. The Dean observed that the Dean and Chapter had no jurisdiction in the building, which was the property of the Office of Works, who would, he hoped, before very long, fulfil their promise to provide stained-glass windows for the building, which was formerly the church of the House of Lords.

Proceeding to the Abbey, the visitors were conducted by the Dean to Henry VII.'s Chapel, the tomb of Edward the Confessor, and other notable parts of the fabric, but no connected remarks were made, the Dean's explanations being as to points already familiar to most people.

Proceeding to St. Margaret's Church, the visitors were received by the rector, the Rev. Canon Farrar, who gave an interesting account, chiefly historical, of the building, lately re-opened after restoration. Most of the points referred to by the Canon will be found in the paper read by Mr. G. H. Birch a few weeks ago at the London and Middlesex Archæological Society, of which we gave a tolerably full report at the time.

The visitors next proceeded to the crypt of St. Stephen's Chapel (the chapel of the Houses of Parliament), where the hon. sec., Mr. F. W. Albury, read a short paper, in the course of which he said that this was almost the only portion remaining of the old Palace of Westminster, and it formed the basement story of St. Stephen's Chapel. After many years of desecration (it was once used as the dining-room of "the Speaker"), it has been restored as it now is, in accordance with the original design of the late Sir Charles Barry, by his son, Mr. Edward M. Barry. The length is 90 ft.; the width, 28 ft.; and the height, 20 ft. The entrance at the north-west corner is a private entrance from the palace. The seven stained-glass windows represent the ministry and martyrdom of St. Stephen. The wall lining below the windows is of alabaster and inlaid marble. The bosses are the old ones, which have been carefully preserved; they are beautifully executed, and represent the martyrdom of St. Stephen, St. John, St. Catherine, and St. Lawrence, and one of them St. George and the Dragon. The nine panels in the east wall represent the cross in the centre; the others being St. Peter, St. Stephen, St. Oswald, St. Etheldreda, St. Edward the Confessor, St. Margaret of Scotland, and St. Edmund the Martyr.

Having lunched at the Westminster Palace Hotel, the visitors proceeded to the Chapel Royal, Whitehall (the banqueting-house,—and the only portion executed,—of the new royal palace designed by Inigo Jones). Here they were received by the Rev. Canon Knollys and the Bishop of London, who both complained (and with good reason) of the dirty state of the place, the cloth-hangings being thickly covered with dust. Canon Knollys stated that he believed that Her Majesty's Board of Works were prepared to spend 5,000*l.* in alterations and renovation, and the sooner the work was done the better. He suggested that when the work was done some attention should be paid to the celebrated paintings by Rubens which adorn the ceiling, and which show signs of "sagging" in certain places, owing, it is believed, to being badly fastened up, or to the fastenings having given way. Reference was made to the disputed question as to which was the window through which King Charles I. passed out to his execution, Canon Knollys expressing the opinion that it was by the one immediately to the rear of the royal pew. The rich altar-plate was inspected, and was much admired.

Having thanked Canon Knollys and the Bishop of London for permitting them to visit the building, the visitors returned to Reading.

BOLSOVER CHURCH.

THE parish church of Bolsover was reopened on Tuesday, July 16th. This church was in a very deplorable state, its roofs decayed and affording easy access for the rain and snow, its windows denuded of their tracery, the seating and fittings (to quote the words of Bishop Trollope) "sadly requiring revolutionary treatment to make them worthy of the fine old structure they now encumber"; the tower arch blocked up by a brick wall, and huge galleries disfiguring the aisle and western end, to accommodate the bearing timbers of which the capitals of the piers were nearly half-cut through. The chancel arch,—a modern semicircular one,—was achieving a slow but steady victory over the ancient piers, the spire damaged by lightning, and the whole demanded a substantial and thorough repair. Thanks to the energetic and self-sacrificing spirit with which the vicar took up the work, this has now been accomplished. His Grace the Duke of Portland has not only restored the chancel and its fittings, but has provided the principal part of the cost of the remainder. His Grace the Duke of Devonshire, with his characteristic liberality, nobly responded to the vicar's appeal. The Rev. Mr. Hallowes and Mrs. Hamilton Gray rendered material help, and many others whom space prevents our mentioning aided the work. The lectern and fald-stool were presented by the Misses Stillwell.

The church, which is dedicated to St. Mary, is one possessing much historical interest, the Norman portion of it being probably erected by the natural son of the Conqueror (William Peverel), and founder of the castle, who died in 1112. Of this building there probably only remains the semicircular arch over the chancel doorway, which contains a representation of the Crucifixion carved in low relief, and the font, which is clearly Norman, although altered by Late Fifteenth Century masons, by cutting rude tracery upon it. The earliest remains after this belong to the Transitional Norman period, and consist of the piers of the chancel-arch and several of the arch-stones themselves, which were found imbedded in the walls of the later builders. Several capitals of the same period were also recovered, and have been walled in as corbels in the south aisle. A very charming one, happily so cased in the heart of the wall as to have sustained little injury, has been built into the chancel-wall. The tower and spire are Early English, the latter being of the stumpy character not unusual in the locality. The south aisle is of the Decorated period; its windows were completely wrecked, and have had to be renewed, the west window being perpendicular. In this aisle is a monumental recess, in which has been placed a very interesting bas-relief representing the Nativity. This was discovered in 1704 at the north door of the church, where, turned face downwards by some iconoclast, it had long served as a step. It shows considerable traces of colour, and is of fourteenth-century work, as a careful examination of the censer borne by one of the angels and other details clearly show, although it has been frequently assigned to a much earlier date. A series of interesting tombstones having floriated crosses, swords, and other emblems incised upon them, had been used for the same purpose, and are now laid in the chancel and other pavements. The east window of the chancel is the only other relic of the Decorated period. At the eastern end of the south aisle is the Portland chapel, erected in 1618 by the Cavendish family, and bearing their arms and crest. In the vault beneath rest the remains of many of the family, including those of the late Duke of Portland. Two fine monuments adorn the interior,—one of alabaster, erected in 1617 to Sir Charles Cavendish, by his wife, Catherine Baroness Ogle, and their recumbent effigies are good examples of the art of that period. The inscription is worthy of note.

The opposite monument is of Italian design, having Corinthian columns with a finely profiled sarcophagus between them. The entablature and pediment are richly carved, and the whole was executed and erected at a great cost by Italian workmen. It was erected by Henrietta Cavendish Holles, wife of the second Earl of Oxford, to the memory of Henry, second Duke of Newcastle, and other members of the family. In the chancel are memorials of several of the ancestors of the Rev. Mr. Hallowes, of Glapwell, also of Lady Barker. Here also lies the architect whose fertile pencil designed the alterations of the castle keep, and built the stately suite of rooms (now dismantled) for the reception of Queen Henrietta and Charles I.

The additions now made consist of a large north aisle (giving many additional seats) and arcade, new roof throughout (the architect was anxious to preserve the low fifteenth century roof over the nave, but it was found to be in such a state of decay that it was impossible to do so), rebuilding the chancel arch, adding an organ-chapel, and the complete renovation of the chancel, which is fitted with oak stalls, stone credence-table and sedilia, and a reredos of Bath stone, with crocketed canopies. The floor is laid with tiles of simple design. The whole of the seats are of deal stained. The roof is covered with red Staffordshire tiling. The work has been well carried out by Messrs. Shillitoe & Morgan, of Campsall, near Doncaster, under the superintendence of the architect, Mr. J. D. Mitchell-Withers, of Sheffield. The warming has been arranged by Messrs. Stuart & Smith, and the gas-lighting by Messrs. Hydes & Wigfull, both of Sheffield. The bells have been re-cast and added to by Messrs. Taylor, of Loughborough. A clock has been manufactured

by Mr. Smith, of Derby, and the organ enlarged by Messrs. Foster & Andrews, of Hull, the choir generously defraying the cost of an additional stop. The total cost is expected to be about 6,000*l.*

EXTENSION OF UNIVERSITY COLLEGE, LONDON.

From the official statement of the position of the above college, published on the occasion of the festival of the fiftieth anniversary of the opening of the Institution, when Earl Granville laid the foundation-stone of an extension of the college buildings, we learn that it is the intention of the authorities to make certain additions in the way of appliances for technical instruction, which, we think, cannot fail to be of interest to architects, engineers, and allied professions.

Between the years 1868 and 1876 the south wing of the college was erected at a cost of 25,700*l.*, and is now entirely occupied by the school classes. It is now proposed (1) to extend the north wing as far as will balance the present south wing; and (2) at some subsequent period to complete the T-shaped terminations of the southern and northern wings respectively. The foundation-stone laid on Tuesday was in connexion with the first part of the project,—the extension of the north wing. The cost of carrying out this portion of the plan is estimated at 50,000*l.*, of which 22,000*l.* would be for the building proper, while it is proposed to spend 3,000*l.* on erecting a chemical laboratory, and no less than 10,000*l.* on the other annexes and alterations, including a very interesting novelty, we mean the erection of an engineering laboratory. The remaining 15,000*l.* are assigned to fittings and other expenses.

As regards the engineering laboratory, we are told that the Council and Senate are desirous of making University College one of the chief places of scientific education for the engineer. "The proposal has been laid before and approved by more than fifty of the chief engineers of the country." The college has already made a start in providing the necessary appliances, having appropriated a sum of money from its present resources for that purpose.

THE WOOD PAVING AT LUDGATE CIRCUS AND THE TRAFFIC.

A DEAD LOCK.

The vehicular traffic of the great thoroughfares which converge at the Ludgate-circus has for the last fortnight been carried on with extreme difficulty, and been brought almost to a dead lock, owing to the wood pavement which is at present being laid down within the Circus. The scene presented from morning until evening is little less than a chaos, and whilst passengers and travellers by vehicular agency must have had their patience sorely tried by the constantly recurring blocks in the several thoroughfares, pedestrians have had to thread their way across streets hemmed in by vehicles on all sides at the risk of broken limbs and the hazard of their lives. The work is being carried out in four sections, the south-west section having just been finished, whilst the north-west section is now in progress. The sections extend to the centre of the roadway at the bottom of Fleet-street and the foot of Ludgate-hill: one half of the thoroughfare at these points is thus entirely closed for traffic, and hence the accumulation of vehicles, and blocks and stoppages, which, it would appear, cannot be avoided. From about the middle of the forenoon until six or seven o'clock the police,—largely reinforced for the occasion,—have an arduous duty in directing and marshalling the traffic through the labyrinth of vehicles which arrive in succession at the Circus from east, west, north, and south. Fleet-street, New Bridge-street, and Ludgate-hill are almost constantly blocked, and the traffic entirely stopped for as much as five and ten minutes at a time. A day or two ago,—and the same occurs daily,—New Bridge-street was studded with wagons, omnibuses, and other conveyances three abreast, which extended from the Circus to near Blackfriars Bridge, whilst about the same time there was such an accumulation of vehicles locked in between the bottom of Fleet-street and Fetter-lane, that one might have almost walked on their roofs between the two points. It will be another fortnight, at least, before the paving of the Circus can be entirely completed, the whole of the east side having yet to be executed, and in the meantime the present blocking of the adjacent thoroughfares must continue.

FOOTWAY IMPROVEMENTS IN TOTTENHAM.

The Tottenham Local Board are about to expend a large sum in the improvement of the public footpaths in their parish. At their last meeting they had before them a report of the surveyor, in which he recommended that in a parish such as Tottenham concrete kerb was preferable to granite, and in this the General Purposes Committee agreed with him, and recommended that the Board make an application to the Local Government Board for permission to borrow the sum of 9,271*l.* to tar pave and curb with concrete the footways of the roads in the parish, which roads were set out in the report. It appears that the proposed improvements in the roads set out would cost 10,000*l.*, but there are other roads in which similar improvements would follow. Some members of the Board expressed an opinion to the effect that builders should be called upon to provide the roads for the houses they erected, but the Chairman explained that these roads were not private roads, but the whole of them public roads, and the Board had no power to call upon the builders to make the roads. The roads were ancient roads. The motion was carried, and the surveyor was instructed to prepare the plans and specifications for the works.

SALE OF THE NEW STEAM FERRY.

The new Steam Ferry at the East End, upon which such a large outlay has been incurred in the erection of warehouses and other works, and which was only opened in May last, does not appear to be a very promising speculation, liquidators having been appointed to wind up its affairs, whilst the whole of the property of the company is announced for public sale. As is known, the Ferry was established for the conveyance of horses and heavy goods across the Thames between Wapping and Rotherhithe, in order to avoid the long and circuitous route by way of London Bridge. The sale, as announced, is by order of the mortgagees, and includes all the buildings and other works, on which the company have laid out such large sums of money, together with the steamers *Jessie May* and *Pearl*, which were built expressly for the company's service. On the warehouses at Wapping alone an outlay of 30,000*l.* is said to have been incurred. These are three in number, two of them containing six floors, and and one four floors, with an aggregate floor-space of 53,570 ft. In addition to the warehouses there is an engine and boiler house, as well as an accumulator-house, which have been provided for raising and lowering the pontoons of the ferry. Likewise a jetty and pontoons, 170 ft. in length, have been constructed under a licence from the Thames Conservancy Board. These works are all on the Wapping or Middlesex side of the river. On the Surrey side, at Rotherhithe, an engine and boiler-house, and an accumulator-house, with engines and machinery, have likewise been erected for lowering and raising the pontoons, as at Wapping, together with a jetty extending 70 ft. into the river. The land on the Wapping side is held from the Bridewell Hospital Estate, for ninety years, at a rental of 57*l.* per annum. It is stated that upwards of 5,000 horses, in addition to wagons and lorries with heavy goods, have been conveyed across the ferry since its opening in May. It took nearly three years to execute the works in connexion with this undertaking, which has now prematurely come to grief.

Cutting the Obelisk. The obelisk has now been got fairly on to the Embankment; and last week was begun the operation of dressing square the butt end of the obelisk, in order to render it stable by means of the four bronze crabs. By thus squaring it, as determined on by Mr. John Dixon and Professor Erasmus Wilson, with the sanction of the consulting engineers, Messrs. B. Baker and H. Palfrey Stephenson, it is expected to withstand a pressure of 90 lb. to the square foot. At present its stability is computed at 45 lb. to the foot. The force of the most violent hurricanes seldom exceeds 25 lb. to the foot.

OBITUARY.

Mr. J. T. Robinson.—A few days ago Mr. Jethro T. Robinson, the architect to the Lord Chamberlain, expired very suddenly, at his residence, Bloomsbury-square. The deceased gentleman, who appeared to be in robust health, got up and dressed as usual, and whilst engaged in conversation with Mrs. Robinson at the breakfast-table, suddenly fell down, and died immediately before medical assistance could be obtained. The family doctor was sent for, who attended at once, but only to find that life was extinct. It is supposed that the death was from heart disease. Deceased was the architect of the Grecian, City-road; the Victoria; and the Alexandra theatres; Sanger's Royal Amphitheatre; Hengler's Cirque, Liverpool; and theatres at Hull and other large provincial towns; several of which have been illustrated in our pages. The suddenness of his death is shown by the circumstance that our present issue contains a list of tenders delivered to him for certain works about to be done under his direction.

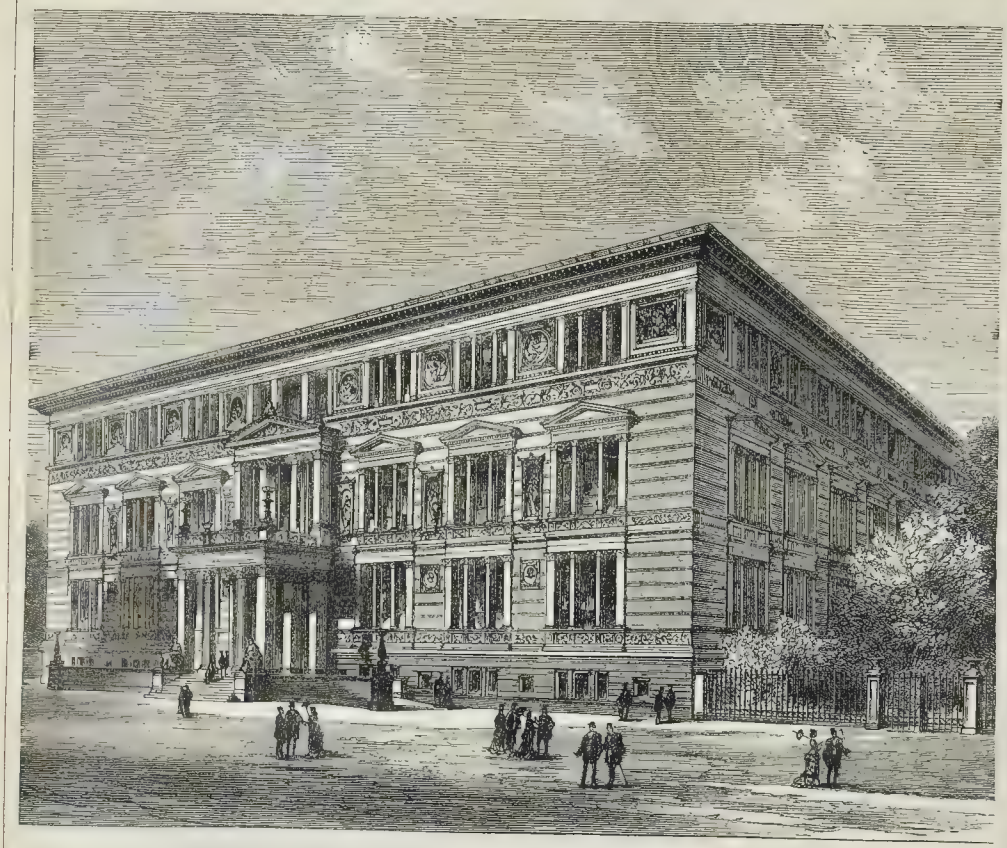
WELLAND VIADUCT.

Lieut.-Col. Tryon, of Bulwick Hall, keyed the last arch of this structure on Friday, 5th inst. Welland Viaduct is on the Midland Railway branch from Kettering to Manton; it crosses the Welland Valley from Harringworth to Seaton, in the counties of Northampton and Rutland, and is one of the longest structures of this kind in England, being three-quarters of a mile in length. It has eighty-two arches of 40 ft. span, some of them 70 ft. in height. The foundations of the piers and abutments are of concrete,—some of them are of a considerable depth. The whole of the structure is erected with bricks manufactured on the ground, with Derbyshire gritstone springers, string-course, and coping; the arches and spandrels are all covered with two coats of asphalte. The first brick was laid in March, 1876; and the first arch was commenced in June, 1877. It has been pushed on with such vigour that the arches were finished in the first week in July, 1878. The whole of the brick and stone work will be completed by the end of this year, or early in the next. The work contains 30,000,000 bricks, 20,000 cubic yards of concrete, and 19,000 cubic feet of stone. Barrow lime is used in the concrete and mortar throughout the whole work, supplied by Ellis & Sons, Mount Sorrel Junction, Leicester. Messrs. Barlow, Son, & Baker, London, are the engineers for the line, and their inspector of the works is Mr. G. W. Smith; the contractors for the whole of the works are Messrs. Lucas & Aird, London; their agent on the works is Mr. Stannard. Mr. W. H. Lorden is the sub-contractor for the brickwork, and Mr. R. Holmes is the brickmaker.

NEW ENGINE WORKS, AT LEICESTER.

Extensive engineering works have recently been erected by Messrs. Simson & Company, in Vulcan-street, Leicester. The works cover an area of three acres and a half, and embrace all the usual branches of a general establishment, having distinct buildings for boiler-making and wrought girders, for smiths, for fitting-shops, for pattern-making, and for moulding and casting, thus drawing together the work which had previously been carried on by the firm at three separate places. The buildings are arranged round a large central yard, and are connected by a siding with the main line of the Midland Railway, which forms one boundary of the property. The front part comprises offices, stores, and show-rooms, and also the shops required for the manufacture of boot, shoe, and hosiery-making machines, which are distinct branches of the business. These buildings have been erected from the designs of Mr. J. B. Everard, of Leicester, but the remainder of the works have been designed by members of the firm.

Artisans to the Paris Exhibition.—The following contributions have been made by some of the City Guilds to the fund now being collected by the Society of Arts for the purpose of sending Artisan Reporters to the Paris Exhibition:—The Clothworkers' Company, 100*l.*; the Drapers' Company, 50 guineas; the Mercers' Company, 50 guineas; the Fishmongers' Company, 25 guineas; the Cordwainers' Company, 25 guineas; the Salters' Company, 10 guineas; the Carpenters' Company, 10 guineas.



THE NEW INDUSTRIAL MUSEUM, BERLIN.—PROFESSOR GROPIUS, ARCHITECT.

THE NEW INDUSTRIAL MUSEUM, BERLIN.

THE International Exhibition at Paris in 1867 opened the eyes of the Germans to the fact that in several branches of industry in which art and skill play a considerable part, they were falling in the rear of the French and some other European nations. Following the example of our own country, therefore, which had been enlightened in 1851 as to its own deficiencies in artistic industry, and which had accordingly founded the splendid museum at South Kensington with a view to remedy those deficiencies, the Germans, rather more than ten years ago, began to take steps for establishing a great school and museum of objects of art-industry. The movement was set on foot by private persons, and met with general approval and support in the Fatherland, while the Government, on its part, assisted the project by an annual grant of 15,000 thalers (2,250*l.*). The Crown Prince and Crown Princess of Germany warmly entered into the idea, the former becoming a patron of the institution. So energetically did the promoters go to work, that it was not long after the close of the last Paris Exhibition when the museum first opened its doors to the public. A considerable collection of objects and models had already been made, and these were temporarily housed in a building hired for the purpose where drawing and modelling classes, together with lectures on art-industry, were likewise commenced without delay.

After the Franco-German war of 1870-1871, when, owing to the huge indemnity, money was plentiful and new, and vast projects, more especially in building speculations, were every day starting into life, the new museum shared in the general prosperity, to such purpose that the Prussian Parliament readily granted a sum of 800,000 marks (40,000*l.* sterling), for the purpose of providing the new institution with a fitting home. Professor Gropius, an eminent Berlin architect, was commissioned to prepare plans and drawings of an edifice worthy of the new museum, and was likewise charged with the duty of superintending its construction.

A suitable site was chosen for the building in the gardens of the War Office, and behind the temporary Houses of the German Imperial Parliament. Here work was commenced on the foundations in the spring of 1877, within a year of which time the walls had been carried nearly up to the roof; but it is not expected that the building will be entirely completed within and without before the summer of 1880. The new museum has its front to the north, and covers an area of 70 mètres long by 70 mètres broad, the walls up to the roof measuring 27 mètres in height. The materials used in its construction are sandstone and light red ornamental bricks. The basement, which is almost on a level with the surrounding gardens, is laid out in a number of rooms, chiefly intended for modelling-classes and work-rooms connected with the plastic and other arts. Over this come the ground-floor and two stories, which will accommodate the various collections of objects of art and industry belonging to the museum; the windows of the ground and first floors are each divided into three parts by two artistic pillars, and crowned with pediments. The portico at the chief entrance, springing out from the centre of the principal front, and comprising two Corinthian columns and two pillars, is approached by a gentle flight of steps, which are flanked by pedestals, intended to be surmounted by statues of Holbein and of Paul Vischer, in a sitting position, while the window above the portico, on the first floor, is finished to correspond, projecting beyond and being larger than the others. The façade will be ornamented with a frieze above the windows of the first floor, and with statues between them, with escutcheons, medallions, and especially with Venetian glass mosaics between the windows of the uppermost story, representing various epochs of civilisation.

Entering by the principal door, we are conducted by a flight of stone steps to the vestibule, a very interesting feature of the edifice, being surrounded by galleries, above which the topmost story is broken through, so that the light comes down from the roof. Behind the vestibule we come to the great inner court, 40 mètres long by 22 mètres broad, which is covered by a glass roof, and is surrounded by arcades (of flat arches) of 5 mètres in breadth, supported by syenite columns in both stories. In this portion of the building it is intended to exhibit plastic works of large size. In the main axis of the building, next to this court, comes the principal staircase, richly decorated with wall paintings. Other staircases lead from the east and west sides of the court. In the north front, on the ground-floor, are the rooms for the officials of the museums, for the library and reading-rooms, while the rooms above, on the first and second floors, are to be used as *ateliers*. Around the inner court, on the ground and first floors, will be the rooms of the museum proper, while in the topmost floor will be the rooms set apart for classes of instruction. On the south side of the ground-floor will be the large lecture-hall, capable of seating 500 hearers. All the apart-



BUILDINGS AT THE PARIS EXHIBITION: THE BELGIAN FAÇADE.—M. ÉMILE JAULET, ARCHITECT.

ments of the building are constructed so as to be fireproof. Such are the chief features in the edifice, which will not only be an ornament to the German capital as a piece of architecture, but which will have an important influence on the art industry of Germany in the future. The new institution is further interesting as another proof of the thoroughness with which the Germans enter into all business connected with the questions of skilled industry, art-manufactures, and technical education.

PORCH AND BELFRY OF THE BELGIAN FAÇADE: PARIS EXHIBITION.

THE Belgian façade in the Rue des Nations has probably elicited more praise than any of the other buildings there. With the aid of marble, brick, and stone, an imposing structure has been erected, resembling somewhat an Hôtel de Ville. The architect, M. Emile Jaulet, has adopted the style of the Renaissance (beginning of the seventeenth century), his aim evidently having been to make an interesting exhibition of the products of his country. The details are most carefully executed, and, regarded as a reproduction, the building is certainly entitled to much praise. Want of repose is the objection that may be most strongly urged against it.

LONDON STREET ARCHITECTURE: MESSRS. MARSHALL & SNELGROVE'S PREMISES, OXFORD-STREET.

THESE extensive buildings (having a frontage of 160 ft. in. Oxford-street, and one of 90 ft. in Vere-street), of which we give an illustration, have recently been erected by Messrs. Marshall & Snelgrove, the well-known silk mercers. The leases of this portion of their premises having mostly expired, his Grace the Duke of Portland granted new building leases, desiring that the façade should be of some architectural importance, a condition which has been carried out in a commendable spirit.

In excavating for the foundations, the workmen came across a portion of an old road, some 12 ft. below the present level of Oxford-street, and running parallel to it, probably the Roman military way which ran from north to south from Verulam, and at Tyburn turned east to London.

The basement, 12 ft. high, extends under the pavement, and is lighted from below the stall-plates, and by Hayward's patent "Prismatic pavement lights," throwing daylight back 30 ft., thus enabling the space to be used for counting-house and other general requirements. The ground-floor is devoted to retail trading business, whilst the first floor is arranged for warehouse and wholesale business, and the other three stories provide sitting and bed rooms, which are situated on each side of a central corridor, giving accommodation for some 250 of the *employés* of the firm. Each room is ventilated by an up-shaft as well as open fireplace; over each gas-burner is a bronze tube connected with an up-flue, and a swing glazed flap over each door into the corridors, aids in obtaining a continuous current of air.

There are two fireproof floors, consisting of riveted wrought-iron girders, and rolled-iron joists, carried on cast-iron columns; these and the floors are encased with concrete composed of Portland cement and burnt ballast.

The façade in both streets is carried out in yellow malms and Corsham Down stone, all the cornices, string-courses, and weatherings being in Portland stone. The lower portion is divided into bays by pilasters of Portland stone, below which are Shap (Westmoreland) granite pillars on grey Aberdeen moulded bases, the Shap and Portland being finished at their junctions with ornamental bronze bands. The upper portions of pilasters have bronze ornaments in panels harmonising in colour with the stall-plates and sash-bars.

From pavement to underside of shop-cornice the height is 17 ft., giving an unusual quantity of light to the counters.



LONDON STREET ARCHITECTURE: MESSRS. MARSHALL & SNELGROVE'S PREMISES, OXFORD STREET.—MR. OCTAVIUS HANSARD, ARCHITECT.

The upper portion of the building is divided into three stories, the whole being surmounted by a balustrade, broken at intervals by dormers, terminating with high mansard slated roofs, with ornamental iron railings. There is a central tower, and lateral towers, which are entirely of stone, with pilasters and cornices, the friezes of window-heads on first floor being carved with flowers emblematical of countries, cities, and fabrics connected with trade.

In such a large establishment it was necessary to give more than ordinary consideration to the gas supply, and consequently unusually large meters have been fixed and means adopted to reduce the consumption by the use of "wet governors," through which the gas passes before leaving the meter-houses, by which the pressure is considerably reduced below that in the street-mains, and this gas is distributed to the building during the daytime at 5-10ths, and in the evening at 7-10ths pressure. When it is remembered that the pressure in the street-mains varies between 3·5 and 4·0, the value of governors in conjunction with supply-pipes of ample size will be readily appreciated.

The building has been erected by Messrs. Lawrence & Sons, of Waterloo Bridge, Mr. James Stapleton being their foreman of works. The masonry and carving have been well executed by Mr. J. W. Seale, of Walworth. The gas arrangements and fittings were entrusted to Mr. James Slater, of High Holborn; and the whole has been carried out from the designs and under the superintendence of Mr. Octavius Hansard, F.R.I.B.A., of Argyll-place, Regent-st.

THE NEW EDDYSTONE LIGHTHOUSE.

IT is announced that the Trinity Board, after six weeks' consideration, have decided to build the new Eddystone Lighthouse themselves, and not under contract. The estimate of the Board's engineer was 90,000*l*. There were three tenders, the lowest, that of Mr. Pethick, of Plymouth, being 105,000*l*.

The *Western Morning News* gives the following description of the proposed new structure:—The first point which offered itself for consideration was obviously that of the precise site for the new work. Smeaton's tower (the present building) was, of course, erected on the very site of its predecessors,—the wooden, or mostly wooden, structure of Rudyerd, which was completely destroyed by fire; and the fantastic building, also of wood, put up by Winstanley, as the first occupant of the rock, and which, together with its author, was utterly annihilated in the great storm of the 26th of November, 1703, after a brief but useful existence of three years. The "House Rock," as it is called, upon which the present tower is built, stands not alone, but is only one and the highest of a group of rocks and reefs, projecting their jagged summits in the range of tide between low and high water. These comprise the House rock and reef, the South rock and reef, the South-east reef, the East rock, and a detached spit, the North-east rock. The position selected for the new tower is on the South Reef, about 100 ft. away from the existing lighthouse, across the gut or channel, and in a south-easterly direction. It has the advantage of partial protection, towards the west and south-west, by the House Rock and reef, but the disadvantage of being considerably lower in elevation. No portion of the site rises above the half-tide level, and the lowest parts, where the foundation courses of the new structure are to be laid, lie 4 ft. below the low-water level of an ordinary spring tide; whereas the rock whereon Winstanley, Rudyerd, and Smeaton carried on their operations, so far as relates to the immediate site of their labours, was entirely above the half-tide level, and its summit at the present landing-place is not covered at high water of ordinary spring tides. It will readily be understood that this constitutes a material aggravation of the difficulties and hazards, already great, of this new and arduous enterprise. For not only is the exposure to the action of surf and ground-swell more than proportionately increased, but the duration of the already too limited time within which it is possible to carry on work "in the dry" is most seriously shortened; and no inconsiderable portion of the basement must be executed entirely under water. The retention of the old tower during the construction of its successor is a *sine quâ non*. The lower level of the foundation for the new work has also exercised an influence on the form, proportions, and dimensions of Mr. J. N. Douglass's design, which is not only very much larger than that of Smeaton, but varies considerably therefrom. Fundamentally the same general form is to be adopted; and, technically speaking, the shaft of the tower is a concave elliptic frustrum,—realised in Smeaton's original conception as the bole of an oak,—but, in order to give weight and solidity to the substructure, with corresponding power of resistance to the violence of the waters, the lower courses of masonry, up to and inclusive of the twelfth, are to be perfectly cylindrical in form up to the level of about 3 ft. above the high-water level of ordinary spring tides. At this point there is a diminution of more than 8 ft. in the diameter, forming a commodious landing platform, whence springs the shaft proper of the tower. The diameter assigned to this cylindrical base is 44 ft., and that of the tower at its springing is between 35 ft. and 36 ft., at a height of a little over 22 ft. above the foundations. The circular shaft attains its smallest dimensions (18 ft. 6 in. diameter) at a height of about 134 ft. above the rocky bed of its foundation; swelling out, with a bold and graceful cavetto, to an enlarged diameter of 23 ft., maintained up to the level of the gallery-course or lantern floor, at a total height of 142 ft. above the base of the light-house, and 122 ft. 6 in. above the level of high water of ordinary spring tides. The magnitude of this noble light-tower will be at once apparent by comparison with the similar dimensions of its existing predecessor. Smeaton's shaft diminishes from a diameter of 34 ft. at the foundation-course to 26 ft. at the level of high water ordinary spring tides; and thence to 20 ft. at the entrance door, and 15 ft. at the top, the gallery-course being but 61 ft. above high-water mark, and the lantern-floor about 7 ft. higher. Thus the new light will be displayed at an elevation 55 ft. greater than that of the old one, and its range of visibility and efficiency will be proportionately extended. It would be superfluous, in regard to an as yet unexecuted work, to describe minutely all the proposed details of its construction; but some few of the general features of the design may be glanced at with interest. The structure is to be built entirely of granite, and to be entirely solid (except a small water-tank) up to the level of the entrance-floor, at about 22 ft. above the landing-platform; the access from low-water mark being by an outside step-ladder, formed of gun-metal cleats, recessed in the granite below the platform, and projecting from the surface of the tower above that level. The foundation is to be formed by cutting away the rock in benchings or steps, for the first four courses, all the stones which bed on the rock being secured thereto by metal bolts. Throughout the entire structure every individual stone will be closely united, or bonded in to those surrounding it, by solid dovetail projections, fitting into corresponding recesses; and each course of stones is similarly to be connected with those above and below it; so that in this manner, when set in Portland cement, the entire mass will acquire almost the homogeneity and strength of the solid granite rocks from which its component elements were quarried, as has been amply demonstrated by experience. The hollow upper portion of the tower will be similarly built, the rings being formed of single stones running through from the inside to the outside of the shaft. The internal diameter, as proposed, varies from 11 ft. 6 in. to 14 ft., and the thickness of the ring from 8 ft. 6 in. to 2 ft. 3 in. This part is to be divided by arched granite floors into nine stories, apportioned as stores, coal, oil, crane, living, bed, and service rooms. The door and window openings will be provided with gun-metal doors, sashes, and shutters; and the general fittings of the tower are proposed to be of the same first-class, solid, and expensive character,—therein lying true economy, from the very situation, nature, and purpose of the lighthouse. Summing up the total quantity of the granite in the proposed new tower, it is approximately something less than 69,500 cubic feet, giving to the mass a total weight of about 5,150 tons of masonry. The metal-work in cast, malleable, and wrought iron, in gun-metal, Muntz-metal bolts, copper, and brass and other materials will make up a gross total of about 50 tons more, or 5,200 tons in the whole. This great mass will have to be wrought, set up, and fitted together on shore, taken down, loaded in vessels, transported by sea to the Eddystone rocks,—a distance of fourteen miles from Plymouth,—and there unloaded, hoisted, and built into position, at a mean height of 43 ft. above the level of low water of an ordinary spring tide. The time allowed for the completion of the work is five years, giving an average of 1,030 tons to be erected in each year, practically limited to the summer season, so far, at least, as the actual work at the rock is concerned, inasmuch as during the winter half of the year it is impossible to carry on operations of this kind at all; and it may be added, indeed, that the work can only be executed intermittently even during the summer months.

THE DOME OF THE ROCK.

SIR,—Mr. Fergusson having done me the honour to notice my remarks on the architecture of the Dome of the Rock, I would beg leave to invite him in your columns to criticise further than he has done the statements in question. I do not presume to offer an opinion as an architect on such questions, and the strength of Mr. Fergusson's case must always lie in his undisputed reputation for architectural learning. I merely wish to call attention to facts which must strike the eye of any one visiting the Dome of the Rock.

Mr. Fergusson has replied at length on the subject of the arches, and the gist of his remarks appears to be that he supposes the arches under the Dome to have been struck from three centres, while the reviewer makes them to have been struck from two. The actual form is accurately shown in Lieut. Kitchener's photograph. Also he notices that round arches occur both in the Mosque of 'Amru and on the exterior of the Dome of the Rock.

Mr. Fergusson does not state his reason for ascribing the pointed arches in the Aksah and 'Amru mosques to 'Abd el Melek rather than to the later restorations, nor does he notice that the arches in the Dome of the Chain, which is generally supposed to be 'Abd el Melek's work, are semicircular. Round arches are thus apparently not distinctive of Byzantine work.

I should be glad if Mr. Fergusson would also treat at length the question of the pillars. To an outsider like myself it appears to be an indication of primary importance that these pillars are so different one from another, and it is the more important to call attention to this, because in his earliest work on the question Mr. Fergusson speaks of the "order" of the Dome of the Rock.

Every one acquainted with Jerusalem will know the extreme difficulty of taking measurements in the interior of the Dome of the Rock. I have myself been cursed and hustled while drawing details; but I succeeded in taking sketches of the twelve capitals under the Dome, which have been recently published in my book, "Tent Work in Palestine" (vol. i., page 323). I believe I shall not be mistaken in asserting that it is most unusual, in Early Byzantine buildings, to find the great difference of design here found in capitals belonging to one set of pillars, and certainly it must be unusual to find differences of diameter and of length in the shafts,—differences which are sufficient to be visible to the eye. In Constantine's Basilica at Bethlehem the capitals are of one design, and the diameter and height of the shafts are uniform. In the Aksah Mosque, in that of Amru, and in the fine Mosque of Jezzar Pacha at Acre, the same peculiarity is remarkable,—pillars, apparently torn from some older building, have been used up, and in many cases the capitals do not appear to be those originally intended for the shafts.

The character of these pillars in the Dome of the Rock is unmistakeable, for architects agree that they cannot have been Arab work. But it is not a little important for Mr. Fergusson's theory, that he should be able to show that they were originally designed for their present position, which is certainly not the impression that would be naturally produced by their appearance.

The architectural argument is far the strongest part of Mr. Fergusson's case. With regard to history and topography, he cannot claim to hold a position of superior knowledge; but he might fairly accuse me of shifting ground,—because unable to answer his reply,—were I to insist on the strong objections which may be urged against his theory on these grounds.

There is, however, an architectural question, to which I would call attention, about which it seems to me Mr. Fergusson is bound to furnish a satisfactory answer.

Eusebius describes the Basilica erected by Constantine, and the hemisphere on the west, which was the crowning part of the work. Theodorus, in 530 A.D., speaks of the same building ("in the middle of the city," I may remark in passing), and states that the Mount of Calvary, to which there was an ascent by steps, was fifteen paces away, and under one roof with the sepulchre.

When, however, we come to the eighth century, we find the description different: we have a round church (which Mr. Fergusson identifies with the octagonal Dome of the Rock), a separate chapel of Calvary, and other separate buildings. The rough plan of Arculphus shows these in positions which give a general result strongly resembling the plan of the present Church of the Holy Sepulchre. It is this plan which Mr. Fergusson professes to follow, though it may be remarked that the known levels of the rock have obliged him to place one of the buildings (representing the original Basilica) in a position quite different to that in which it is shown by Arculphus, while his Calvary is actually on a lower instead of a higher level than his supposed Holy Sepulchre.

Now, if we accept the evidence of the contemporary history of the Pascal chronicle, the Basilica of Constantine was destroyed in 614 A.D., and the change of plan is accounted for by the fact that Modestus replaced the great building "under one roof" by the small chapels. But this history Mr. Fergusson refuses to credit; thus we are reduced to the apparent paradox that Mr. Fergusson supposes the seventh-century chapels to be represented by the Dome of the Rock and by other buildings, of which not even the foundations are visible, though the rock is on the surface where they should be; yet these separate chapels he ascribes to the time of Constantine, at which period the "Round Church" of Arculphus is entirely unnoticed,—the "hemisphairon" of Eusebius having apparently occupied the same site.

Mr. Fergusson tells us that on seeing the imperfect drawings of Mr. Arundale, he at once "jumped to the conclusion that the Mosque of Omar (*i. e.*, the Dome of the Rock) and the Aksah were Christian buildings." Against this assumption we have to balance,

1. The Cufic and Arabic inscriptions on the buildings, giving the dates of the various parts.

2. The account given by Arabic historians of the building of the Dome of the Rock by 'Abd el Melek, and of his restorations in the Aksah Mosque.

3. The descriptions by Christian writers from the fourth to the eight centuries of the position of Constantine's Basilica north of Sion, in the middle of the city.

Mr. Fergusson is obliged to add to his hypothesis of the transference of site for the Holy Sepulchre four other transferences of site; first, that of the Sakhrah, or Holy Rock, from some other position occupied in Omar's time (and, according to his view, from a place where no rock exists) to the present site; secondly, the transference of the *traditional* site of the temple from some other site to that recognised in the twelfth century (*i.e.*, the Sakhrah); thirdly, the transference of the site of Zion; fourthly, transference of the traditional site of the Prætorium.

Architectural criticism needs to be of a very convincing character which can demolish such a mass of evidence, and the opinion of a distinguished architect, who has done more than any one else to throw light on the date of styles in Syria, is, unfortunately, quite opposite to that of Mr. Fergusson.

CLAUDE R. CONDER, Lieut. R.E.

Growth of Bedford.—Mr. F. T. Mercer, surveyor, has just completed a survey and map of the borough of Bedford. As illustrative of the growth of the town, he says:—"The area upon which Bedford now stands appears to be more than twice as large as that of the last map, published thirty-seven years ago. In that map there are no railways, nor any buildings beyond Priory-street, Water-lane, or River-street, up to Union-street, on the west. The district of New Town was only laid out as far as Albert-street, and continuing the north side of the town to Kimbolton-road we find nothing much beyond the entrance to that road. On the east side of the town there appears nothing beyond St. Cuthbert-street, whilst even in Gadsby, Duke, and Mill streets considerable areas of vacant ground are shown."

OUR FOOTPATHS.

SIR,—No more opportune season will probably suggest itself to write about footpaths than the present, as the subject is of interest to all those who are now revelling amidst rural scenes or at seaside resorts.

Our footpaths open up the more beautiful scenes in nature; they follow the course of the winding river, and penetrate the umbrageous forest. In this respect they are superior to turnpike roads, which latter are not merely dusty, but in many cases wend their serpentine lengths through the least interesting parts of the country. The country is now in its noon-tide attire. Nature is voluptuous in her display of all that is lovely and enchanting to the genuine lover of natural beauties. What wondrous treasures are now open to holiday-making botanists and naturalists! What rich scenes of undulating corn-fields, verdant valleys, and sylvan glades delight the gaze of the enthusiastic artist! Were it not for the footpaths, which form a perfect network over the country, many of the loveliest spots in England would be unseen but by the favoured few. To see the country to perfection we must leave the dusty roads and wander across the footpaths through "green daisied fields" and shady woods. Who but the weary and "worked to death" denizens of our large towns can express the ecstatic delight which they experience when strolling along well-beaten footpaths, and the balmy air, cooling and invigorating, animating them with new hopes, strengthening their weak and half-formed resolutions, and giving them a new lease of life wherewith to renew the stern battle for existence? The beauties of nature, and the moral and physical benefits derived from their contemplation have been favourite themes with the poets of all ages, and that which has excited the tenderest sympathies, awakened the warmest emotions of the heart, and inspired with sublime conceptions the best of mortals, must be in itself good, and its acquisition desirable.

As our towns enlarge, and the population increases, occasional glimpses of the country will become more than ever a *sine quâ non* of our existence. What is life, I would ask, surrounded by a polluted atmosphere, smoke-begrimed houses, an incessant flare of gas, lumbering vehicles, and screeching locomotives? It is with a desire to see the people retain this privilege of penetrating far and wide into the country, and drinking freely and copiously of its charms, that I have ventured to draw the attention of your readers to the too glaring fact that within the last few years hundreds of public footpaths have been closed without comment, and the public deprived of the use of that to which in many cases they had a legal right. That a deep interest is taken in these footpaths is evident from the fact that, in those districts where encroachments are attempted, the inhabitants of the various localities are always ready to provide the sinews of war,—as far as their means will permit,—to oppose any endeavours that may be made to deprive them of their rights. In two or three instances local societies have been established for the purpose of preserving the footpaths within their several districts.

I have no doubt architectural students, antiquaries, and others will find when visiting favourite scenes during their holiday tours that many old and familiar haunts have within the last twelve months been closed against them, thus depriving them of much innocent pleasure and desirable recreation.

As some little consolation to such, I would call their attention to the existence of an association which has recently been formed, called the "Footpaths Defence Association." The objects of this Association are clearly set forth in the prospectus, which can be had on application at the offices, No. 28, Essex-street, Strand.

Any information which tourists and others may be able to obtain respecting enclosures of public footpaths and rights of way, &c., will have due consideration, if forwarded to the secretary.

Such a society as the above, which seeks by reasonable and legitimate means to obtain for and preserve to the people access by footpaths to those sylvan scenes for which our native land has ever been famous, should meet with the hearty support and co-operation of the general public.

The destruction of natural beauties is no recent innovation, although, probably, a more frequent occurrence during the past few years than at any previous period. Whilst asking the aid of a generous public to stay these wholesale spoliations, and hoping a more enlightened and less selfish view will be taken in the future by landowners and others who attempt these depredations, we can but lament with the poet, who in 1634 called attention to

> "—— the havoc and the spoyle,
> Which, even within the compass of my dayes,
> Is made through every quarter of this isle
> In woods and groves, which were the kingdom's praise."

The interest which the *Builder* has invariably evinced in all matters bearing upon public health must plead my excuse for thus trespassing upon your space, as I feel that in the free use of footpaths the people have within their reach the means for the attainment of health, strength, and consequent happiness.

JAMES GEO. BUCKLE.

THE VICTORIA DOCK EXTENSION.

ON Tuesday last the Society of Engineers visited the works of the Victoria Dock Extension, extending from Silvertown to Beckton, opposite Woolwich. The works (of which Mr. A. M. Rendel is engineer-in-chief, and Mr. A. C. Andros, resident engineer) were so fully described by us a year ago (vol. xxxv., p. 727), on the occasion of the society's visit at that time, that we have only now to report the progress that has been made during the past twelve months. The double tunnel and bell-mouths, through which the Woolwich branch of the Great Eastern Railway is to be diverted, are practically completed, and it is expected that they will be opened for traffic in the course of the next two months. These tunnels and bell-mouths are constructed in white gault bricks, supplied by the Aylesford Pottery Company, and set in Portland cement. The new entrance-lock has also made great progress, and is a very fine work, probably the largest in the world, being 800 ft. long over all. The lock-walls are of concrete, varying in thickness at different points, and faced with hard Staffordshire blue bricks, supplied by Mr. Joseph Hamblet, of West Bromwich. An immense quantity of excavation on the site of the new dock has been done during the past year, principally by means of the "steam-navvy" and the steam "dredger" for land excavation. Both these ingenious and labour-saving machines were described in our former account of the works. They have been almost indispensable to the execution of the work, seeing that the quantity of excavation required to be done was about three million cubic yards. The walls of the great ninety-acre dock are entirely of concrete, and have an aggregate length of upwards of three miles. The north wall is very far advanced towards completion, and the south wall is making good progress, although it has been much more recently decided upon. It was at first intended to leave the south side of the dock with a sloping bank of earth lined with puddle, but this intention has been abandoned in favour of a wall, so that the dock will have quayage on each side. These concrete walls are the great speciality of the works, and should be seen by all interested in concrete work. They are about 38 ft. 6 in. high from foundation to top of coping, 18 ft. thick at the base, and 7 ft. thick at the top, supported at intervals of 50 ft. by huge counterforts of the same material. The coping is also of concrete. Two large graving docks, capable of receiving the largest vessels entering the docks, are being constructed at the east end, the walls being of concrete. It is expected that the works will be completed, and the new dock (which will, we believe, be the largest in England) opened at the latter end of next year. The satisfactory character of the materials, and the good workmanship, were spoken of with great approbation by the visitors. Messrs. Lucas & Aird are the contractors, their representative on the works being Mr. W. Colson.

Bridging the Forth.—Mr. Bouch, C.E., Edinburgh, has received instructions to prepare working drawings for the proposed bridge across the Forth at Queensferry. The span height will be 135 ft. (instead of 150 ft. as at first suggested), provided the Government consent. The bridge will be on the suspension principle, having two lattice-girder spans, each about 1,100 ft. in length, which will be supported midway on the island of Inchgarvie. The promoters have obtained power from Parliament to guarantee to the undertaking a revenue of 75,000*l*. It is expected the works will shortly be commenced.

BRIDGE ACCIDENT ON THE LONDON AND NORTH WESTERN RAILWAY.

AN accident of a frightful, and at the same time of a remarkable character, has just occurred on the London and North-Western Railway, in the neighbourhood of Winsford, Cheshire. A double line of rails is now in course of construction between Crewe and Warrington, and whilst a large gang of men was engaged in taking down a bridge known as Moulton Hall Bridge, in order to make room for the double line, one of the men said he would not work there any longer, as he was afraid of the bridge giving way. Some of the other men laughed at him, but he had barely left the bridge when the whole structure crashed in, carrying with it three or four of his fellow workmen, and one of them, on being extracted from the rubbish, was found to be seriously injured. Assistance was telegraphed for, and a special train was sent down from the railway company's hospital at Crewe. The man, on being examined at the hospital, was found to have sustained frightful injuries, his left thigh being badly broken, a number of ribs staved in, and his spine also injured. He has since died.

WORCESTER DIOCESAN ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE first excursion of this society for the present season took place on the 10th inst., when a large party proceeded in carriages to Alcester. On the side of the Alcester-road several sequestered churches are situated, and one of these, Flyford-Flavel, the party stopped at to examine in detail. They first passed Grafton-Flyford. The church at Flyford-Flavel is a plain structure, consisting of nave and chancel, with a square tower at the west end. The exterior has a neglected aspect, nettles abounding around it, and a great elder-bush covers one side of the timber porch. The interior presents a similarly miserable condition, and Mr. Noake, who gave an account of the architectural features, said that it was the worst specimen of church neglect in the diocese. He said that the society had before remarked upon its wretched state, and he thought if the bishop could but see it, probably the patron of the living, at his request, might be induced to do something to amend its disgraceful state. A beggarly wooden gallery exists at the west end, and under the tower is a heap of rubbish. As to the architectural points of the church, Mr. Noake stated that the Perpendicular style was chiefly apparent, but there was also Early English work, and an old circular-headed doorway. The chancel has been rebuilt in modern times, but in a debased manner. There is a screen of old woodwork below the chancel arch, and in the south chancel wall is a curious wide recess, for which no use can be assigned. An opening to the stairs of the rood-loft is still perceptible. An octangular font may be noticed, and under the tower is a massive wooden chest, once the bole of an old tree, and 10 ft. in length, but with its lid open as if to receive chaff or any other ingredient, instead of parish records. As if in solemn mockery, a notice is affixed to the external wall of the structure declaring that "Whoever damages this church, or commits any depredation," &c., "will be prosecuted." The party drove on many miles further, passing from Worcestershire into Warwickshire, and next made a pause at Exhall. Here was a pleasing rest from the toils of research, for the Rev. J. E. Cole, the incumbent of Exhall, invited the excursionists to luncheon. The church is a small building recently restored.

Leaving Exhall, the party drove rapidly to Wixford Church, the place recalling Shakspeare's appellation of "Papist-Wixford." The structure presents a curious appearance, showing a high roof, with a much lower projecting chancel, and a low square wooden turret at the west end. This aspect is occasioned by two structures being now connected together, as explained in a paper read by Mr. W. J. Hopkins. The original structure was called St. Milburgh's Chapel, and Mr. Hopkins in afterwards going round this part of the building pointed out its most remarkable features. He particularly noticed the lancet windows on the south side of the chancel. The walls of the church are whitewashed, the west end being completely blocked up. There is a wooden porch and plain Norman doorway. Passing into what was formerly a chantry chapel dedicated to St. John the Baptist, a large altar-tomb of Purbeck marble commanded attention, there being upon it the full length effigies in brass of Thomas de Crewe and his wife, with their armorial bearings, the date of sepulture being 1400 and 1419. On either side of the figures at their base a naked foot is represented within a circular scroll. It was stated that the Crewe family was collaterally connected with the noble family of the Beauchamps of Powick. Seated around this sepulchral memorial, the company listened attentively to a paper by the Rev. T. P. Wadley on the heraldry displayed on the Crewe tomb, and pictured formerly and still partially in the windows. Returning to Alcester, the excursionists wound up the day by dining at the "Swan" Hotel.

SHROPSHIRE ARCHÆOLOGICAL SOCIETY.

THE Shropshire Archæological and Natural History Society held its annual excursion on the 8th inst. Proceeding by train to Shifnal, the members took carriages to Tong Castle and Church. At the latter building, the "Great Bell of Tong" was inspected. It is in the tower, and those who made the ascent had their attention arrested by the following lines painted on a board at the bottom of the belfry stairs:—

> "If that to ring you doe come here
> You must ring well with hand and care,
> Keep stroak of time and goe not out
> Or else you forfeit out of doubt.
> Our law is so concluded here
> For every fault a jugg of beere—
> If that you ring with spurr or hat
> A jugg of beer must pay for that,
> If that you take a rope in hand
> These forfeits you must not withstand;
> Or if that you a Bell ov'r throw
> It must cost sixpence ere you goe.
> If in this place you sweare or curse,
> Sixpence to pay, pull out your purse,
> Come pay the clerk his fee;
> For one (that swears) shall not go free.
> These laws are old and are not new,
> Therefore the clerk must have his due.
> GEORGE HARISON, 1694."

Although this seemed to infer that the belfry was rather dangerous ground to explore, many ventured up the dark staircase, and had a sight of the great bell, which weighs 2 tons 8 cwt. Unfortunately it was cracked in 1849, when ringing for divine service. It is stated that nine persons may comfortably stand underneath it. It was first given to the church in 1518 by Sir Henry Vernon, knight. It was broken by the Parliamentary forces in the time of King Charles I., and was recast at the expense of the parish in 1720. In the rear of the church are the remains of an ancient priory. Donnington Church was the next place visited. The church is being restored, under the direction of Mr. Martin, architect, who pointed out the fine workmanship of the hammerbeam roof, which was erected, as a tablet let into the woodwork informs us, at a previous restoration of the building. The tablet has the inscription,—"Thomas Twigg, carpenter, 1635," and the initials of the same artificer are on every beam. Mr. Martin remarked that Mr. Twigg's principle of roof construction was bad, as, there being no tie-beams, there was nothing to check an outward thrust, and consequently the walls were liable to be thrust out of the perpendicular, and this was actually the case in places. The building at present consists of only a chancel and nave, but Mr. Martin was strongly of opinion that at some period there was a south aisle. The building was refaced in 1784, and was also partially restored. It should also be stated that the Twigg roof was 3 ft. higher than the original roof of the building. After a short stay the party were called to their carriages, and they then proceeded to White Ladies. The ruins of this convent of Cistercian, or White Nuns, so called to distinguish it from a nunnery of Black Ladies, about a mile on the other side of Boscobel, is situated some distance off the road in the middle of a meadow. The party alighted, and passing through Spring Coppice, inspected the exterior of the ruins of the monastery. These are not very imposing, owing to modern masonry, which has been introduced to fill up the apertures in the Norman walls, and thus secure a certain amount of privacy for the ground enclosed. Boscobel House was next visited. It is celebrated in history as having formed a temporary refuge for King Charles II. after the battle of Worcester, and is supposed to have been erected by Mr. Giffard, of Chillington, in the time of Queen Elizabeth. What is believed to be the veritable oak tree in which the king took refuge was visited. It measures 19 ft. 5½ in. in circumference at the base, and is 12 ft. 3 in. in girth, at a height of 4 ft. Some controversy has taken place as to the identity of the tree with that in which the king took refuge, it being contended by some inquirers that it is only an offshoot of the historical tree.

Weston Park having been visited, the party took carriages to Shifnal, where the annual dinner was held.

PARLIAMENTARY.

Rivers Pollution Prevention Act.—In the House of Commons last week, Mr. Sclater-Booth, in reply to Sir U. Kay-Shuttleworth, said the Rivers Pollution Prevention Act, 1876, had come into operation just about as it was expected it would do. A number of cases had arisen and been dealt with, and others were still under consideration.

The Artisans' Dwellings Act.—In answer to Sir U. Kay-Shuttleworth, Mr. Lowther said that this Act had been put in operation by three towns in Ireland, nine in England, and one in Scotland. As there were only five towns in Ireland which could come under it, whilst there were 71 in England and six in Scotland which could take advantage of its provisions, it would be seen that Ireland had been, out of all proportion, the most willing to adopt it. Mr. Cross added that he thought the time had arrived when an inquiry should be made why, in cases where official reports had been received, the local authorities had not taken advantage of the Act.

Metropolitan Gas and Water.—Mr. Cross, in answer to Sir U. Kay-Shuttleworth, stated that it was not the intention of the Government to propose any measure on this subject this session, and it was rather too early to give any promise for next session.

MONUMENTAL.

Leopold I., King of the Belgians.—The monument which is to be erected in memory of the first King of the Belgians will be of a character akin to our own Albert Memorial, and, like that monument, will be the work of several artists. M. de Curte has produced the general design, in which a statue of the late King, to be executed by M. Guillaume Geefs, will be placed under a Gothic baldacchino or canopy, the summit of which will be about 130 ft. in height, and will be surmounted by a figure representing the genius of Belgium. Statues of the nine provinces of the kingdom will be placed round this Gothic tower.

Statue of Burns for Kilmarnock.—Mr. C. W. G. Stevenson, sculptor, Edinburgh, has just completed the full-sized model of his statue of Burns, which has been commissioned for the town of Kilmarnock. In this figure is reproduced, on the scale of over 8 ft., the design embodied in the small model which was selected in competition. The poet is represented in standing posture, as if he had paused in the course of a rural walk to record some flitting fancy. In the features, as well as in the costume, the well-known Nasmyth portrait has been closely followed. The committee have authorised the artist to proceed at once with the execution of the work in marble.

Sulphuric Acid Gas in the Atmosphere. Some statistics of the amount of sulphuric acid gases evolved by the consumption of coal in London were given in a paper read by Mr. James Mactear before the Society of Arts. It was estimated that the coal annually consumed in London is over 8,000,000 tons, equal at one per cent. of sulphur to 80,000 tons, or as oil of vitriol to 245,000 tons. This is more than five times the amount given off from all the sulphuric acid works in the country. For the whole of the United Kingdom the figures are:—Coals consumed, 114,043,940 tons, which at one per cent. will give as sulphur 1,140,439 tons, or, in round numbers, as oil of vitriol, 3,500,000 tons. Mr. Mactear also gave some interesting details of the method adopted (invented by himself) for the recovery of sulphur from the chimneys of alkali works, as in Glasgow, where some 30,000 gallons a day soak away in the form of a yellow liquid from vast heaps of alkali waste, and run beneath the city through a sewer into the Clyde.

COMPETITIONS.

Yarmouth Town-hall.—The *Norfolk Chronicle* understands that Mr. Boardman, architect, of Norwich, has been asked to assist the new Town-hall committee in the choice of a plan and design for the proposed building. In our last we gave a notice of the numerous sets of plans sent in.

The Rowland Hill Memorial.—The committee entrusted by the Kidderminster Town Council to select a sculptor for the statue to Sir Rowland Hill, have chosen Mr. T. Brock (formerly of Worcester), out of seven competitors. The cost of the statue will be 1,300*l.*, and it is to be of Sicilian marble, resting on a pedestal of Cornish granite. Signor Fontana's design, holding the second place in the opinion of the committee, receives a premium of 25*l.*; and No. 6 (Mr. Williamson's) a premium of 15*l.* It was resolved to invite Mr. Brock to inspect the suggested sites for the statue, with the view of reporting upon them.

BROMPTON ORATORY COMPETITION

SIR,—What the Fathers mean to do with regard to the actual building of this church remains to be seen; perhaps they will endeavour to soothe the outraged feelings of some architect who, in the unadorned simplicity of his exterior, considered that he had faithfully adhered to the expressed wishes of the Fathers in this respect, as also in denying himself the luxury of a dome.

But is it not highly absurd that there should ever be two aims for competing architects? Why should not the premium be given to him who had succeeded so well in interpreting the necessities of the case as to have produced the most suitable building? As it is, one architect gets the premium, another the job. Cannot there be one recognised system in all competitions, at once removing all chance both of unfairness and perplexity? Thus, that the referee, in his decision, bear in mind not only the architectural merits, but also the suitability of the designs to the necessities of the case; that the carrying out of the building be entrusted to him who gains the premium; and that the decision of the referee be absolutely binding. F. B.

NORWOOD SCHOOLS COMPETITION.

SIR,—In last week's *Builder* the Guardians for the Parish of Lambeth advertise for plans for the extension of schools at Norwood, and in the same paper is the account of a meeting of the Board of Guardians, from which it appears Mr. Foulsham has already prepared plans. I think, before any one prepares drawings in competition, the Guardians should engage not to allow Mr. Foulsham to compete, as he has already the advantage of knowing exactly what the Guardians want, and evidently has friends on the Board who are trying to have his plans carried out. As the affair looks so suspicious, an architect of standing ought to be called in, whose award the Guardians should bind themselves to adhere to, and to publish for the satisfaction of competitors. ARCHITECT.

SANITARY MATTERS AT DERBY.

SIR,—With a sanitary rate of 3*s.* in the pound during a year, one would think that sanitary work should and would be well done. Not the least thing objected to is the way that house refuse is collected. This is emptied into the gutter in front of the several houses, and shovelled and broomed up by the scavengers, and that in a very imperfect way. Now, some time since the Sanitary Authority issued notices to householders that the refuse was to be brought to the pavement in boxes; but the scavengers are too lazy to lift the boxes to the cart, so they tip them in the street, and then shovel and broom the filth in the usual way. A more unbecoming, filthy, and annoying process than this gathering of refuse cannot be conceived. Heaps of ashes, dust, pea-pods, paper, and the general miscellanea of household and culinary operations are left in the hot sun and blown hither and thither by the winds. The exposure for hours, waiting the irregular calls of the scavenger, is a great nuisance; and the shuffling imperfect way it is collected, leaves the nuisance over Sunday; and, in fact, all the week through, for much that is scattered by the wind is never again collected.

Another matter is the work of the sanitary inspector. I do not know who he is, or how his duties are assigned him, or what those duties are; but such a thing as domiciliary inspection is, I believe, a thing unknown. At least I speak from my own knowledge and that of my friends. Construction of sewers, their proper working and ventilation, and the proper cleansing of back places, have not ever come under my notice, except a complaint is made, which is rare, or a *death* occurs, when, of course, a little is attempted. Certainly Derby is far from being perfect in sanitary matters. More money expended on these, or *better* expended, would improve the health and save the pockets.

SANITAS.

RAINFALL AND SEWAGE IRRIGATION.

SIR,—The effect of the rainfall in connexion with the question of sewage irrigation has not received the attention it deserves. The following observations are submitted for consideration, in the hope that a correct view of the subject may be arrived at.

Space or area being a most important factor in its consideration, a convenient and useful scale of measure is suggested for the purpose: it is a square sub-divided into sixty-four parts, each representing ten acres, being a total of 640 acres, or a square mile. An example will show its application to the purpose:—A district of 200 acres would be represented by twenty of the sub-divisions. On it is a population of 2,000, at an average rate of ten on an acre,—certainly not a dense population. The district is provided with water-closets, sewers, ventilating-shafts, gullies, water supply, and with the means of conveying into the sewers the rain which falls on the district. Further, there is land conveniently situate for irrigation, which can be obtained, and it is advised that twenty acres will be sufficient, being at the rate of an acre for 100 persons, such area being represented by two squares. Thus are presented at one view the comparative areas of supply of sewage and rain from 200 acres and their destination, twenty acres; and the proportions are commonly considered to be quite practicable.

The sewage alone from such population would amount to about 267 tons daily; but this is more than the average daily rainfall. It is of the utmost importance to bear in mind that the land does not possess unlimited power of absorption of moisture, whether rain or sewage. It cannot absorb the rain alone which falls direct on it. The contour of the surface, the hills, valleys, brooks, rivers, all facilitate the effluence or drainage of the unabsorbable excess, which, under certain circumstances, is a very large proportion of the whole. It is quite the natural consequence, and it is not to be wondered at if failures occur in attempting to carry out plans contrary to obvious natural laws.

The effect of a rainfall of ·25 in. in such a district shall now be considered. In quantity it amounts to 25 tons per acre, or 5,000 tons on 200 acres. As it falls (possibly in a very short time, an hour or less) it flows into the sewers, which at the same time are receiving the ordinary daily flow of sewage of 267 tons. Onward the mixture flows, diluting, augmenting its bulk, till the fall of rain ceases. The manure by that time is diluted almost infinitesimally, and the water is spoilt. It flows on to its destined area, 20 acres, which is thereby reduced to a complete swamp, the quantity being equal to a rainfall of 2·63 in. on an acre, and then it flows on to pollute the water into which it is discharged, and, being further diluted, it is probably reported to be "not so bad." HENRY PHILLIPS.

Glass-cloth.—*Gastach*, or glass-cloth, is a name given by Dr. Hirzel, of Leipsic, to a gas and water-tight stuff, which he has recently patented. This is produced by placing a large smooth piece of so-called gutta-percha paper between two pieces of some not too coarse and dense material—*e.g.*, shirting (undressed),—and then passing the arrangement between heated rollers. The outer pieces of the shirting combine in the most intimate way with the enclosed gutta-percha to form a material which is impenetrable by gas and water. It may be made still denser and more resistant by being coated on both sides with, *e.g.*, copal lac. The material is said to be well adapted to form gas-tight membranes for regulators of pressure of compressed gas-bags, or sacks for dry gas-meters, as also dry gas-reservoirs.

RE "THE FORTUNE" THEATRE, AND MOORFIELDS AND ENVIRONS.

IN the article in your last issue respecting the above theatre, a certain Dr. Lambe (who met his death at the hands of the City apprentices) and the district of Moorfields came in for incidental mention. In the portion of the letter of Sir Francis Nethersole quoted, the doctor's death is thus remarked upon:—"A prodigious discredit, for which the mayor and sheriffs have been sharpely reprehended, and the Citty may chance be fined; but that will not bring the man to life againe." Sir Francis was right in his conjectures as to the City being likely to be mulcted in a fine, for the City records supply us with the evidence that the fine was subsequently inflicted. Without referring to the original records themselves, we have before us as we write a little, and, it would appear now a rather scarce, volume, entitled "A List of the By-Laws of the City of London Unrepealed, &c. Printed by Henry Kent, Printer to the Honourable City of London. 1769,"—in which we find, among several other interesting entries, the following, under the date of 17th Jan., 8 Car. I., JOS. Rainton, No. 30, fol. 50:—"*Murthers.*—A Fine of 1,000*l.*, imposed by King's Bench, for not securing the Murtherers of Lamb, to be raised on the Companies." As all the guilds or City companies most likely contributed their quota of the fine, the one thousand pounds was not long in being paid. This was in the year 1632, and during a reign in which the Corporation and Companies both willingly and unwillingly advanced large sums to the king, and for other public and interested projects.

Respecting Moorfields, we find the following entries in the little volume above alluded to:—7th August, 1606. "Moorfields, 200*l.* ordered to be paid out of the Chamber for finishing works in Moorfields, or such other sums as shall be necessary." "Rails belonging to Companies to be applied to raising Moorfields"; and in the following year, "400*l.* granted by the Lord Mayor and Court of Aldermen to be applied towards finishing Moorfields." The last entry we find anent Moorfields is under the date of 5th December, 18 Jac., 1620:—"400 marks given to bevel Moorfields." At first sight the word bevel would appear to be a misprint for level, but we may suppose the bevelling of Moorfields consisted in giving an incline to the swampy ground for drainage purposes, or otherwise slanting or bevelling the surrounding ditch, fosse, or other raised works inclosing the fields. The City sewers and ditches appear to have been in a bad state during the above-mentioned years, for we find that in 1606 the Corporation granted "two-fifteenths for cleansing the ditches," including, we suppose, those at Moorfields; and in 1632 "two-fifteenths for cleansing City's ditch." The localities of Hounds-ditch, Shore-ditch, Fleet-ditch, and Moor-ditch were not very salubrious throughout portions of the seventeenth and eighteenth centuries, whatever they might have been at an earlier date. Holy-well-mount, Shoreditch, near to the new Great Eastern-street, it is well known, was used in 1665, the year of the great plague, as a regular charnel-pit for the interment of the dead, who were buried in hundreds there at night time by the light of torches. But we are digressing: the founder of the Fortune Theatre, the Alms-houses of St. Luke's, and Dulwich College, was a noble player, and died ennobled by his great gift; but the nineteenth-century governors of the College not only ignore the rights of the poor in St. Luke's, but the respect that is due to the memory of Edward Alleyn at Dulwich and elsewhere. H.

SIR GILBERT SCOTT.

SIR,—A paragraph appeared in one of your contemporaries that Mr. William Hague, of Dublin, had been appointed architect for the works to be done at Dunsany Castle, county Meath, in the place of the late Sir Gilbert Scott.

I, as executor of the late Sir G. Scott's will, wrote to Lord Dunsany, inquiring whether this statement was accurate, and I have received a most kind letter from him in reply, authorising me to say that the statement is quite erroneous, and that should he proceed with the works his first step would be to communicate with the sons of the late Sir G. Scott.

May I ask the favour of your inserting this letter?

19, *Coleman-street.* J. H. SCOTT.

Scarborough.—The Town Council has sanctioned plans by Mr. Hawkins, C.E., for the enlargement of the harbour, &c., at a cost of 13,000*l.*

THE NORTH COAST OF KENT.

SIR,—By your favour, I have, from time to time, been enabled to call the attention of those who may be deemed to be "authorities" in this matter to the inevitable and destructive inroads of the sea in this part, and also of the total want of prevision and thought exercised in the question.

I presume the Government may possibly feel that the securing of the coast line of the Isle of Sheppey may even be deemed a national affair, and in some way, at all events, worthy of their attention.

The construction of a sea-wall from Sheerness to Margate cannot be long delayed. This should be a concrete sea-wall, and would, by its reclamation of land, be a fair investment.

Some fifteen hundred years ago the Reculver Church is credibly affirmed at four miles from the sea, *temp.* Eliz. one mile, now only protected by an apron, and the whole foreshore between this and Herne Bay is rapidly crumbling into the sea. F. R. I. B. A.

Q. E. D.—In certain portions of our coasts the destruction is rapid,—washed into the sea; in certain other portions ground is being gained by the receding of the sea: 10 ft. per annum in 100 years, 1,000 ft.; in 1,500 years, = about 3 miles.

THE PROFESSIONAL DECORATOR.

SIR,—I have been waiting almost impatiently in hope that some able pen would take up the discussion raised upon Mr. Armitage's paper on mural decoration, and to claim for the decorative artist some share of consideration for his work and influence upon architecture.

At the conference of architects it was lavishly bestowed upon the picture painter, whose share in mural decoration is small as compared with that of the decorator, yet the last named was left out in the cold.

It is for this reason I request the indulgence of a small space. We have only to ask what a painter can do with a building. Without a knowledge of architecture, he very likely will apparently change the character of the mouldings by colour wrongly applied, the apparent size of windows will be disproportionately increased by the addition of borders, and the walls cut up into spaces in keeping with the above, and these he fills with ornament of a nondescript or medley character. An architect who knew this part of his profession would say "The building is murdered by colour; I will have none of that. Let wall, roof, and member take its proper place,—that which I assigned it; but emphasise and make it beautiful. According to the key and gradation of the mass so let the members be."

I think I have said enough to show that the decorative artist has quite as much to do with the successful finishing of a building as an artist who merely paints figures.

I know there are a few both architects and decorators who do not neglect the important part to them of the other's profession, but until this point is more fully recognised, we shall be afflicted with many abortions such as one meets with about the country called decorations.

I must say, in conclusion, that some wandering decorators look out for any word of assistance such as often occurs in your valuable journal.

BENJAMIN ARNSBY.

The Royal Dramatic College.—The necessary amount of public support not having been accorded to the Royal Dramatic College, near Woking, of late years (and we can scarcely wonder), the trustees, Mr. Benjamin Webster, Lord William Lennox, and Mr. J. W. Anson, applied to the Charity Commissioners for power to sell the property and to devise a scheme for the investment of the proceeds. By direction of the Commissioners, the property was, on the 11th inst., offered for sale at the Mart, Token-house-yard, by Messrs. Farebrother, Lye, & Palmer, the arrangement being that the proceeds of the sale should be invested by the trustees, and the interest divided amongst the present inmates as out-pensioners. No bids being forthcoming, the auctioneer had to declare the property withdrawn and open for sale by private bargain. Could not some business-like committee be formed to take the matter in hand and secure the building for the dramatic profession? Vast sums of money have been spent over it.

THE END OF "JERRY" BUILDING (PERHAPS).

SIR,—As the time is an opportune one, you will allow me, through the *Builder*, to make a few remarks on the Building Act Amendment Bill which has just passed, and awaits, as I write, the Royal Assent. The first Act promoted by the Metropolitan Board of Works, and which was lost, was more extensive in its range, and consequently met a vigorous opposition on the part of those who mostly profited by speculative building abuses. The present short Bill amends the Building Act, but to a far shorter extent than the first Amending Bill promoted by the Metropolitan Board of Works, and it deals chiefly with building materials. If the provisions of the present Act are rigidly enforced, there is not the least doubt that the evils of Jerry building will be considerably minimised within the London metropolitan circuit, and this partial reform in itself will be a matter of extreme gratification to all sanitary pioneers and reformers, and I think to none more than to yourself and the *Builder*, who, for half a lifetime, have persistently and consistently advocated and aided every well-devoted effort in the direction of building and sanitary and social reform. Before, however, speculative building scandals are stamped out, other reforms will have to be accomplished, and the duties of district surveyors, local board surveyors, medical officers of health, and sanitary officers will need to be better defined. As matters stand at present in the metropolis, there is a division of sanitary duties, and of course of responsibilities, between the district surveyor and the local board surveyor; that of building construction devolving upon the former, and that of drainage on the latter, and unfortunately bad drainage, or make-believe drainage, has been productive of more evils than even bad house construction and the use of vile materials. The position and remuneration of district surveyors need a revision too, and if their efforts again are not well supported by the board they serve, and by the police magistrates, speculative building abuses must continue. A large percentage of the jerry-building element, and those who otherwise profit by building abuses, is to be found in our local boards, and all know the latter are the feeders to the Metropolitan Board, so there is always a danger of reform being injured by duties being perfunctorily performed. If a governing board will not perform its duty by prosecuting evil-doers, the arms of officials are henceforth weakened, for they cannot successfully act without the support of the bodies they serve. There are also several anomalies connected with the local government of the metropolis, which go far to neutralise the efforts of sanitary and social reformers. The parish of Hackney may be cited as one of the worst instances of those anomalies, for its affairs are administered under what is termed the "tripartite" system of local rule, the duties being divided between three boards, one a life and self-elected one (the trustee board), a vestry and a district board of works constituting the other two. Here are three boards leading to plurality in appointments and other evils, not speaking of swollen expenses which could be avoided under one distinct local board. A sanitary or building abuse prosecution, possible under a local board in Edmonton, is not possible under the local board in Hackney, nearer the City. Bad building culminated recently in Hackney in houses falling, a death, a coroner's verdict of manslaughter, a subsequent prosecution, and an acquittal of the indicted. Though the District Surveyor publicly gave evidence on the inquest that he warned the builder, and drew his attention to the bad materials he was using, yet, despite of the evidence adduced and the verdict of the coroner's jury, the Metropolitan Board of Works would not prosecute. They contented themselves with reprimanding their District Surveyor, and then relegating the duty of prosecution to the Coroner's officer. The result might have been anticipated, for somebody must have been responsible for the bad work and material, if not the builder, certainly the sub-contractor or his representatives. I fear very much, sir, that in matters of drainage and foundations, much "scamping" is still likely to take place, both in the suburbs of London, and in the provinces. I have myself been witness to abominable building malpractices around London, but particularly in the East End; and as a voluntary worker, I have devoted much valuable time morning and evening for several years past to detect and expose these flagrant abuses. Even on Crown lands, sir, during the last five or six years, I have seen practices on the part of speculative builders permitted that were a crying scandal. On the borders of some of our Royal parks, ground let to speculative builders was not very long since excavated in every direction, series of pits being dug before, under, and in the rear of the houses being built, the sand dug out to depths ranging from 10 ft. to 16 ft. and upwards, and its place filled up with the most offensive and disgusting rubbish. At some personal risk, loss of time, and annoyance, I put a stop a few times to these abuses on Crown lands, and other border lands in the vicinity, by threatening to bring the matter before the attention of Parliament. I often doubted whether the attention of the Woods and Forests Commissioners or her Majesty's Board of Works was drawn to these abuses. It is possible that those officials who were responsible were badly served by their agents or subalterns. It is not many weeks since I once more witnessed building abuses on Crown lands, but I succeeded, at the risk of an assault and very foul language, in putting a stop to the sand digging and selling, and the rubbish shooting, &c.

I might write a volume on speculative building abuses and kindred evils, but I will conclude by expressing the pleasure I feel in seeing at last a direct blow aimed at the vampire "Jerry" system. One who has laboured and suffered in common with others (and against personal interest in favour of public ones) is entitled, at least for the nonce, to a public hearing upon his subject, and gives his sign manual in the most fitting columns of the *Builder*.

C. CLINTON HOEY.

LANDLORD AND TENANT.

KINO *v.* ENGLISH.

THIS was a motion, in the Chancery Division, before the Master of the Rolls, for an injunction to restrain the defendant from altering the shop and premises, 173, Fenchurch-street, and generally from "committing waste." The lease, which was granted for twenty-one years from August, 1873, contained a covenant that the lessee would not alter the present building either externally or internally.

Having become bankrupt, the lessee, Ballantine, was now represented by his trustee, English, who had sold the bankrupt's interest to one Fisher, who was now removing partitions, throwing the rooms into each other, putting in a new front and entrance, and otherwise altering the premises, in alleged breach of the covenant against waste. On behalf of the defendant it was urged that the alterations were for the benefit of the landlord, as the premises would thereby be greatly improved, and their value enhanced. The removal of a few partitions of decayed match-board could not be called "waste," and the action was really prompted by trade jealousy, the defendants being about to open a tailor's business on the premises of which Mr. Kino, who was himself a tailor, had become possessed of the reversion in the lease.

His lordship was of opinion that the acts complained of did not amount to waste, and the Courts were not anxious to assist landlords in taking any unfair advantage of their tenants. It was not a case for injunction, and therefore no order would be made on the motion, the costs to be costs in the action.

AN ARCHITECT'S CLAIM.

JAMESON *v.* THE BRICK AND STONE COMPANY (LIMITED).

THIS was a case tried at the Northumberland Summer Assizes, Newcastle-on-Tyne, the other day. The action was brought for an account for services rendered.

Mr. Cave, Q.C., in opening the case, said the plaintiff, Mr. Jameson, was an architect living in Newcastle. He sued the defendants, the Brick and Stone Company (Limited), for work done for them, and the answer they brought to the action was a most extraordinary one. Mr. Jameson, in 1873, entered into the service of Messrs. Herdman & France, under a contract, by which he bound himself to serve them for a certain time. In September, 1876, it was agreed that that arrangement should be put an end to, and that Mr. Jameson should be at liberty to start business on his own account as an architect and surveyor. At that time there was a company in existence called the Property and Building Company, and it was suggested, at a meeting of that company and Mr. Jameson, that they should have a certain proportion of the profit of Mr. Jameson's business,—that they should, in fact, become partners,—they finding, he presumed, the capital for his use; but although negotiations took place nothing came of it. There was also a suggestion made that Mr. Herdman, jun., who was only about eighteen or nineteen years of age, should become a partner with Mr. Jameson, for which his father was to contribute 500*l.* to the partnership. This was discussed, but it also fell through. No money was ever advanced by Mr. Herdman, senior, and thereupon Mr. Jameson commenced business alone under the style of Jameson & Co. Mr. Jameson had never been assisted by Mr. Herdman, junior: in fact, when, a little subsequently, Messrs. Herdman & France found it convenient to turn themselves into a limited company—the Brick and Stone Company,—Mr. Herdman, junior, was transferred from the employ of Messrs. Herdman & France into that

of the company where he had been and was still a clerk. In the year 1877, Mr. Jameson was called upon to do a considerable amount of work for the Brick and Stone Company, and on the 1st of December of that year, he sent in his account, being 498*l.*, after giving credit for 87*l.* The Brick and Stone Company had several directors, many of whom had nothing to do with this matter, but there were three who had,—Mr. Herdman, who was chairman, Mr. France, and Mr. Moatt, who acted as secretary,—and these apparently set themselves to see how they could meet Mr. Jameson. First, they wrote a letter to Mr. Jameson in which they suggested that he had better call a meeting of the company (Messrs. Jameson & Co.) together to see if they would concur with the account, suggesting that the Property and Building Company and Mr. Herdman, jun., formed the company with Mr. Jameson. Mr. Jameson wrote back saying that he was capable of conducting his own business, that this was his own business, and that he wished they would pay what was properly due to him. The next step they took was one of the most extraordinary character. Mr Jameson brought this action on the 15th of January, and on the 22nd there was a meeting got up, consisting of Mr. Herdman, sen., Mr. France, Mr. Moatt, and young Mr. Herdman, who even now was only twenty years of age. At this meeting they proposed to make a settlement of the account, and to do this they treated Mr. Herdman, jun., who was the son of the chairman, and a clerk in the employ of the company, as a partner in Jameson & Co., and got him to sign a document, by which, in consideration of the sum of 80*l.* odd, he was to release the Brick and Stone Company from this account of 498*l.* This was substantially their defence that day, but he would call some of the directors of the company themselves, and they would tell them that they knew nothing about this pretended settlement, and that for their part they were willing to pay what was due to Mr. Jameson.

Witnesses having been called on both sides, the judge pointed out that the case had occupied the court two days, and seeing how the evidence had gone, he suggested that the defendants should agree to a verdict for the plaintiff, subject to a reference. After a short consultation, the defendants agreed to this, and the jury, under the direction of his Lordship, returned a verdict for 498*l.* 7*s.* 6*d.*, subject to reference.

BRIDGES.

Musselburgh.—The wooden railway bridge which spanned the river Esk a short distance from Musselburgh station having become insecure, plans were prepared by Messrs. Bell, the engineers of the North British Railway Company, for the erection of a new bridge, and in the course of last summer operations were commenced immediately to the south of the existing structure. The work has now been completed. Resting on substantial piers of masonry, the structure consists of two spans of malleable iron, 97 ft. and 75 ft. respectively in width, being 12 ft. wider than the six spans of the old structure, while it is also 4 ft. higher from the bed of the river. The cost of the bridge has been from 2,000*l.* to 3,000*l.*

East London.—Steps have been taken for the removal of the Old Hermitage Bridge, which formed the junction between Lower East Smithfield and Wapping, and which was erected at the time of the construction of the London Docks, for a single vehicle passage only. A temporary crossing has been erected on the north side, and a much wider new bridge will be erected on the site of the old one, wide enough to allow of three vehicles to pass at the same time. Although the old piles had been submerged and driven into the London clay for fifty years, they are stated to be in an excellent state of preservation.

Dunoon.—An iron bridge over the river Echaig, on the route between Dunoon and Inveraray, was opened on the 6th inst. Mr. Archibald Gilchrist, Dunoon Castle, chairman of the District Road Trust, performed the ceremony. The engineers were Messrs. Bell & Miller, Glasgow.

NEW PUBLIC HALLS.

Bedford.—At the Bedfordshire Midsummer Quarter Sessions, the magistrates resolved to erect a new Shire-hall, from plans prepared by Mr. A. Waterhouse, A.R.A., in conjunction with Mr. Watson, the county surveyor. The cost will be about 20,000*l.* Part of the old buildings is to be retained. Referring to the decision, which was not unanimous, the *Bedfordshire Times* says that the plan adopted by the magistrates "is a compromise between an entirely new building and the patching-up of the present hall. As the proposed expenditure is little short of the estimated cost of a new building, and will leave the front untouched, there will be many who will be dissatisfied with this half-hearted policy, while the cost will still be large enough to trouble the farmers. It is noticeable that the dissentient was Mr. Bassett, who has, through Mr. Waterhouse, given to Leighton what is undoubtedly the finest business front in this county. If, for a matter of 5,000*l.* (two or three beyond the amount proposed to be voted), the county are to miss having a fine hall, with a convenient as well as a commanding façade and entry, it can only be said that the judgment of the justices compares ill with that of the notedly careful bankers of Leighton."

Whitby.—On the 24th ult. a new Foresters' Hall was opened at Whitby. It is situated in Church-street, and has been adapted to its present purpose at a cost of about 1,000*l.*

Luton.—A company, named the "Luton Alliance Hall Company, Limited," was formed in February last for the purpose of building a hall which might be used by the Alliance Band, and also for entertainments, gymnastics, &c. The cost is estimated at 1,000*l.* Arrangements have been made with Messrs. Pearson & Sons, architects, Luton, to prepare plans, &c.

Fulham.—The Fulham Vestry has deputed the Works Committee to seek for a site on which to erect a vestry-hall and new offices.

Inverness.—A dispute having arisen as to the alleged encroachment of the new Town-hall on the Exchange, the matter was referred to Mr. David Rhind, architect, who has made a report, in which he suggests a way by which the front of the Town-hall could be put back 2 ft. or 3 ft., but for the rest advises the Council to adhere to the original plan. The depth of the Exchange was formerly 38 ft. on one side, and 28 ft. on the other. Mr. Lawrie's plan reduced it to a uniform pavement of 21 ft.; and now, by Mr. Rhind's proposal, the space may be widened to 23 ft. or 24 ft. This, says the *Inverness Courier*, seems likely to be the outcome of the controversy. Another suggestion put forward is to purchase the property in the rear, and so widen the Exchange to about 50 ft. The proprietor asks 3,100*l.* for the property, and it is doubtful whether the Council could vote this money, or whether the Exchange Association could guarantee the amount of money that would be required.

NEW MARKETS.

Upton-on-Severn.—A new cattle-market has been completed and opened at Upton-on-Severn, adjoining the White Lion Hotel, from plans prepared by Mr. Price, the cost being 1,000*l.* The work was entrusted to the following local contractors:—Messrs. Parsons, builders; Mr. Crump, mason; Mr. Liddiard, ironmonger; and Mr. White, painter. The yard is computed to hold 600 sheep and 200 cattle, and land is secured for further extension of the market, if it should be found necessary.

Crewe.—The proposed purchase of a large open space of land behind Crewe Market Hall, for the future extension of the market, has been agreed to by the Crewe Town Council, a committee having already arranged a purchase from Alderman Heath, the owner, for 5,000*l.* conditionally upon the railway siding accommodation being unrestricted.

Newcastle-on-Tyne.—At a meeting of the Town Council of Newcastle-on-Tyne on the 3rd inst., the finance committee submitted plans and estimates of the cost for the erection of a fish-market, in conjunction with the fish-jetty recently constructed at the Swing Bridge, in the Close. The proposed building provides for a market 140 ft. in length by 80 ft. in width, with an entrance 40 ft. wide by 36 ft. long. There will also be market-keeper's, weighman's, and other offices; and compartments for carrying on the business of a large fish-market. Provision is also made for six shops fronting the Close, each shop having a frontage of 16 ft. 6 in. The estimated cost is 15,730*l.* for the whole building.

London.—At a recent meeting of the Court of Common Council, Mr. Deputy Walter asked the chairman of the Markets Committee (Mr. Rudkin) what progress was being made in regard to the construction of a new fruit and vegetable market in Farringdon-road,—whether, in fact, there was to be a new market at all? Mr. Rudkin, in reply, stated that for some considerable time past the committee had had before them the plans, &c., for the reconstruction of the market, the consideration of which had been adjourned until a definite settlement had been come to with the London, Chatham, and Dover Railway Company on a question relating to the rise of the substructure of the market. The heads of an agreement had been prepared, and had been approved by the officers on each side, and was now waiting for the approval of the directors of the railway company. Mr Deputy Fry asked what the committee had done up to the present time, and how much money had been expended. Mr. Rudkin replied that the committee had prepared plans and a model, and a very considerable sum of money had been expended in the excavations, in some portion of the foundations, and in underpinning some of the arches that were constructed in connexion with the Holborn Valley Improvements. These were not works, however, which would affect the question as to whether a new market should be constructed or not, but would have been necessary even had the Corporation not wanted the site for the present purpose.

GASWORKS.

Maidstone.—We have some particulars as to the extension of the Maidstone Gasworks, the consumption of gas in the town having doubled within the last twelve years. The works are being carried out under the direction of Mr. J. West, the company's engineer. The *Maidstone Journal* says the land adjoining the existing works having been obtained, the first step was to extend the river-wall a distance of some 300 ft. This wall is built with large blocks of Kentish rag stone, supplied by Mr. W. Bensted, and Portland cement, the concrete foundations being very wide and of considerable depth. The shell of the new retort-house, which has been built by Messrs. Punnett & Son, of Tonbridge, is a large and substantial erection of red brick, with stone facings. It is 150 ft. long, 68 ft. wide, and the elevation at the apex of the roof is upwards of 50 ft. The foundations are of concrete. The iron roof has been erected by Messrs. Samuel Cutler & Sons, of London. All the retorts, settings, and interior work will be done by the Company's men. A new process of drawing and charging the retorts by machinery, invented by Mr. West, will be employed. Preparations are also being made for new condensers, exhausters, scrubbers, and station meters. At a short distance from the new retort-house a large tank for ammoniacal liquor will be placed, the excavation for its reception being well nigh completed, and above this will be put four large purifiers, 24 ft. square by 5 ft. 6 in. deep. Messrs. Cutler & Sons have obtained the contract for the purifiers.

Thrapston.—The old gasworks here have been demolished, and new works are in course of erection. Mr. W. Horn, the contractor, expects to have the new buildings, comprising a large retort-house, purifying-shed, &c., finished by the latter end of August or commencement of September. The tender of Messrs. Porter & Co., of Lincoln, has been accepted for the ironwork, which comprises large hydraulic main and ascension pipes, three large purifyers, in place of the two small and old ones now in use; a Korting's patent steam jet exhauster, and other improved apparatus, in order to improve the quality as well as increase the quantity of the gas. The whole of the buildings will be elevated and the yard correspondingly filled up to a height which will effectually prevent in future the disasters which have occurred from the irruption of floods. Mr. John Eunson, C.E., of Northampton, is the engineer in charge of the reconstruction.

Plymouth.—The annual report of the Plymouth and Stonehouse Gaslight and Coke Company shows that the affairs of the company are in a very satisfactory state. The price of gas to private consumers has been reduced to 2*s.* 3*d.* per 1,000 ft., and to the public lamps to 2*l.* 14*s.* per annum, from Lady-day last; and a considerable increase in the consumption of gas has taken place during the past year. The directors, with the view of meeting the increasing demand for gas, have made contracts for the erection of a new retort-house. Larger pipes have also been ordered, to replace the present main from the Crescent to Durnford-street, which will afford a better supply to the consumers of Stonehouse generally. Mr. George Henderson, who has filled the office of secretary from the formation of the company, retired at Lady-day last, after a service of thirty-four years, and the directors have agreed that an annuity of 400*l.* be granted to him.

Wirksworth. Messrs. Camm, Brothers, of Birmingham, have executed two windows, which have been placed by the late Mrs. Gell, of Stanton-on-Peak, in the Gell Chapel, Wirksworth. The north window represents Our Lord Teaching Humility by setting a little child in the midst of his disciples; and the Raising of Jairus's daughter. The east window has for its subjects the Resurrection and the Agony in the Garden.

CLOCKS AND BELLS.

Burnham.—The new tower and clock provided as a memorial of the late Mr. Laban Sweeting, have been "inaugurated." The tower, which is Gothic in style, is octagonal in form, and attached to the front of the Charity Schools. It is a somewhat massive structure of red brick, relieved by black dressings, with mouldings, battlements, pinnacles, &c., of cement, and at the top is an open belfry surmounted by an octagonal cupola, with a vane at the apex. On the first floor of the tower an enlargement of the school committee-room has been effected, and a spacious and convenient apartment is now available for parochial purposes. Over this is the cloak-room, in which is the clock, which has been manufactured by Messrs. Gillett & Bland, Croydon. It is constructed to strike the hours upon a bell of 2 cwt., and the four quarters on two other bells, weighing about 4 cwt. altogether. The bells were also cast and tuned in Messrs. Gillett & Bland's own bell-foundry.

Cowesby.—On the 4th inst. a new peal of bells, provided for Cowesby Church, near Thirsk, at a cost of between 500*l.* and 600*l.* by Mrs. Lloyd, of Cowesby Hall, were used for the first time. The peal has been cast by Messrs. Warner, of London, and hung by Mr. T. Mallaby, of Masham, the tenor weighing 9 cwt., and they are set in B flat.

Brailes.—A few months ago the bells of Brailes parish church were in a sad state of neglect and decay. The third and the tenor bells had been badly cracked for many years. This state of things might have long continued had not a liberal offer been made by one of the landowners of the parish to undertake the expense of re-casting the two cracked bells on condition that the rehanging of the entire peal should be effected in connexion with the general restoration of the church. The cracked bells were entrusted to the care of Messrs. Blews & Son, founders, of Birmingham, by whom they have been re-cast. The re-hanging has been carried out by Messrs. Hooper & Stokes, of Exeter.

CHURCH-BUILDING NEWS.

Walton-on-the-Hill.—The new Church of St. John the Evangelist, Walton-on-the-Hill, Liverpool, has been consecrated. The style is an adaptation of Early French Gothic. The interior is of bold proportions, the nave being 33 ft. 6 in. wide. In its present incomplete state the church consists of chancel, two transepts, and three bays of the nave, and accommodates about 600 people; and when completed according to the plans, two more bays will be added to the nave, a lofty tower and spire at the west end, and two vestries for the clergy and choir on the south side, the accommodation to be provided being for upwards of 1,000 persons. Among the donations is the costly marble reredos, the gift of Mrs. Gerard Lee, of Luton Hoo. The figure-subjects of this work, which represents the Crucifixion, were executed by Mr. T. Woolner, R.A., and the moulded and carved work is principally of red marble, relieved with gold mosaic, executed by Messrs. Earp & Co., the design of the whole having been superintended by Mr. G. E. Street, R.A. The woodwork generally was executed by Messrs. Cain & Crennell, of Mulbery-street, and the decorated panels by the architects. The figure-subjects in the pulpit, representing the four Evangelists, are being executed in sgraffito work by Messrs. Trollope & Sons. Two of the windows are filled with stained glass, one by Messrs. Forrest & Sons, of Liverpool, representing "The Blessing of the Children by Our Lord"; and the other, the work of Mr. Holt, of Warwick, has two subjects, "The Journey to the Cross" and "The Ascension," is given by Mr. James Glover. A third window, from the studio of Mr. Holiday, of London, is approaching completion. The contract for the whole of the constructional part of the church has been carried out by Mr. Hugh Yates, of Liverpool; and the architects are Messrs. Aldridge & Deacon, of Liverpool.

Maghull.—The foundation-stone of the new church of St. Andrew, Maghull, has been laid. The site of the new church is to the east of the old structure, which was originally built as a chapel-of-ease. The new building is being erected in the Early English style, and its total length will be 127 ft. by 51 ft. wide, not including the porch. The total height of the nave is 45 ft. to the ridge of the roof. The church is divided into nave, chancel, and north and south aisles, the first of which is 69 ft. long by 24 ft. 6 in. wide; the chancel is 27 ft. by 20 ft. 6 in., and the aisles 69 ft. by 10 ft. There is also an organ-chamber and chapel, each 15 ft. by 14 ft., and a vestry 13 ft. square. The tower is situated at the west end, and is 21 ft. square at the base. The church is being built with Yorkshire shoddy walling and Stourton stone dressings, the inside of the chancel being lined entirely with white stone. The whole of the woodwork will be of pitch pine. The building when finished will be capable of accommodating 574 worshippers. Mr. J. F. Doyle is the architect, and Mr. S. Gunning (both of Liverpool) the clerk of works, Mr. James Leslie, of Miller's Bridge, Bootle, being the contractor.

Heswall.—The parish church of Heswall, Cheshire, having been for some time in a very dilapidated condition, and the accommodation being inadequate for the requirements of the increasing population, it has been determined to restore the tower, and to rebuild and extend the church to the north-east. The additions have been designed by Mr. James F. Doyle, architect, Liverpool, under whose superintendence the works are being carried out. The work has so far progressed that on the 29th ult. the ceremony of laying the foundation-stone, or rather of placing a record of the proceeding in one of the stones of the church, took place, the laying of the stone and placing the record therein being performed by the Rev. Mark Coxon, the venerable rector of the parish. The works are being carried out by Mr. Hugh Yates, builder, Liverpool. The church, when completed, will accommodate about 500 worshippers.

Glencarse.—A new Episcopal church has been opened at Glencarse. The building is Gothic in style. The font, of Peterhead granite, was executed by Messrs. Cramb & Beveridge, Perth, and is the gift of Mrs. Greig, of Glencarse. The plans of the church were prepared by Mr. D. Stewart, Rossie Priory. The contractors were Mr. Thomas Taylor, mason, Inchture; Mr. John Gregory, joiner, Dundee; Mr. John Mackay, plasterer, Perth; Messrs. D. & W. Crabb, slaters, Dundee; and Mr. G. H. Nicoll, Dundee (who supplied the heating apparatus). The cost has been about 1,100*l.*

Madley.—The parish church of Madley, near Hereford, was recently reopened, after restoration under the direction of Mr. F. R. Kempson, architect, Hereford. The new pulpit and reading-desk are the work of Mr. Merrick, of Hereford (from designs by Mr. Lewis Powell), the pulpit being partially made up of the materials of the older rostrum; the floor has been laid with Godwin's (Lugwardine) encaustic tiles; the general contractor being Mr. Collins, of Tewkesbury. The chancel has been restored at the cost of the Dean and Chapter of Hereford, under the superintendence of Mr. Chick.

Reddall Hill.—Mr. John Cotton, architect, Birmingham, has prepared plans for the restoration of Reddall Hill Church, Old Hill. The estimated cost is 800*l.*

Aghade.—The parish church of Aghade, Ireland, has been restored, after restoration and enlargement under the direction of Mr. J. Rawson Carroll, architect, Dublin. The enlargement chiefly consists in the erection of a chancel, three of the windows of which have been filled with stained glass by Messrs. Heaton, Butler, & Bayne. The contractors were Messrs. Morrison, Brothers, of Bagnalstown.

West Bromwich.—The new church of St. John the Evangelist, West Bromwich, was opened a few weeks ago. It is situated in the south of The Lyng, near the Oldbury-road, and is built in the Early English style. It consists of nave, south aisle, and apsidal chancel, the north aisle, tower, and spire having been omitted for the present. The material is brick, with stone dressings, the interior being lined with white bricks, relieved with terra-cotta, the roof-principals and woodwork generally being of red fir, stained. The edifice has been erected by Mr. Sheasby, builder, of Leamington, from the designs of Mr. Ettwell, architect, West Bromwich, the contract sum being 4,500*l.*

Walpole.—Walpole Church, near Halesworth, has been reopened, after restoration, at a cost of about 1,100*l.* The church, which was rebuilt some 150 years ago, in what is described as "a kind of castellated style," has now been in great part again rebuilt, Mr. Eyton, being the architect, and Mr. Grimwood, of Weybread, the contractor. Gedney's hot-air apparatus has been adopted for warming purposes.

Huntspill.—St. Peter's Church, Huntspill, Somerset, has recently been reopened after restoration, at a cost of 1,200*l.*, under the direction of Messrs. Hans, Price, & Wooler, architects, Weston-super-Mare, the contractors being Mr. Thomas Searle, of Bridgewater. The peal of bells has been remodelled by Messrs. Taylor, of Loughborough.

Woolwich.—The chancel of the new church of SS. Michael and All Angels, situated near the Dockyard Station, has just been consecrated by the Bishop of St. Alban's. The edifice, which is exceedingly lofty, is in the Early English style. The nave is at present only a temporary one in iron, but when the building is all completed, it will be undoubtedly the most imposing church in the neighbourhood. Built in the main of brick, the dressings are in Bath stone, and the steep-pitched roof is covered with red tiles and crease. On plan the present works embrace a chancel, south chancel aisle, north-east vestry, and base of tower adjoining, the lower part of which, opening into the chancel, forms the organ-chamber. The building is strengthened by buttresses, and the doors, of oak, have their ironwork painted chocolate, helped by marginal lines of gold. The interior of the chancel is very imposing. Carried by long vaulting shafts, the roofs are stone-groined, filled in with brick, and the clearstory is arcaded, and is pierced by five lights. There is a triple-light east window, and the chancel aisle is divided from the chancel itself by an arcade of two bays. These are carried by large circular columns surmounted by carved capitals. There is a dwarf wall dividing the chancel from the nave; the former is reached by a rise of three steps, whilst there is a further elevation of six more ere the level of the altar is gained. The chancel-aisle floor-level, however, remains the same as the nave, and it is divided from the chancel proper by a low screen. The gas-fittings generally, which are good, are also by Messrs. Hart, Son, & Peard. The stalls, altar, and oak-work generally, as well as the reredos &c., are by Mr. Harry Hems, of Exeter, and the contract for the building has been carried out under the supervision of the architect, by Messrs. Kirk & Randall, builders, of Woolwich. The architect is Mr. J. W. Walter, of London.

Havant.—The nave of the parish church of St. Faith, Havant, was re-opened on the 25th ult., after restoration. It was originally built in 1831, and its restoration has been a part of an almost entire re-construction of the building, at a total cost of 1,500*l.*, the work having been performed under the superintendence of Mr. Abley, the agent of the contractors, Messrs. Hale & Son, builders, of Salisbury. The nave affords sitting accommodation for 270.

Twyford.—The new Church of St. Mary the Virgin, Twyford, Hants, was dedicated on the 27th ult. The old church dated from the Carolean epoch, and had long been found inadequate to meet the growing needs of the place. The new church has been erected from plans prepared by, and under the superintendence of, Mr. A. Waterhouse, A.R.A. It is constructed in flint, Bath stone, and brick, with Broseley tiles for the roofs, and encaustic tiles for the floors. The architect has conserved the ancient portions of the edifice. Four capitals of the Norman Church of St. Benedict form sedilia for the ringers in the belfry, and in the nave, the piers, caps, and bases of the transition and Edwardian Churches, and also the windows, have been used again. The building includes a nave, and two aisles, and a chancel, with south chapel, and an organ-chamber, clergy, and choir vestries. The length of the church from east to west is 120 ft., and the breadth 50 ft., whilst the tower and spire are, together, 110 ft. high. The church will seat over 500 persons. The work has been carried out by Messrs. J. H. & E. Dyer, of Alton, builders, some of the fittings being done by Mr. Heath, of Twyford.

Sevenoaks.—A new aisle has been added to St. John's Church, Sevenoaks. It is on the north side of the church, and provides 200 additional sittings. It has just been erected by Messrs. Punnett, builders, of Tunbridge, at a cost of about 1,300*l.*, Mr. Ewan Christian, of Whitehall-place, London, being the architect. It is lighted by six windows on the north side, all of which are single lights, five being of grisaille glass, while the sixth is the gift of Major German, in memory of two of his daughters, who died in infancy. There is also a window, a two-light one, in the north-west corner, the design being the presentation of children to Christ, with the words, "Suffer the little children to come unto me and forbid them not." This is the gift of Mr. Thomas Lockwood, of the Beacon, in memory of his wife.

DISSENTING CHURCH-BUILDING NEWS.

Salisbury.—Mr. Samuel Morley, M.P., laid the foundation stone of a new Congregational chapel at Salisbury on the 26th ult. The building (which is to be erected by Mrs. Hale & Sons, of Salisbury) is from a design by Messrs. Tarring & Wilkinson, of London, and will consist of an apse and two vestries, a nave, and east and west aisles, with a tower and spire, the materials to be used being Swanage stone with Bath stone dressings. The site is in Fisherton-street, exactly opposite the Salisbury Infirmary. The chapel is intended to hold from 600 to 700 persons, and will cost nearly 8,000*l.*

Goudhurst.—The memorial-stone of the new Baptist chapel, Curtiaden-green, was laid on the 25th ult. The buildings consist of a chapel, with external porch, vestries, school, &c. The style is Gothic, the buildings being faced externally with local clamp bricks of a dark colour, the bays and buttresses being executed in red brick, and the copings, arches, strings, cills, and plinths being in plain and moulded white bricks; stone being sparingly used. The chapel will have an open-timbered roof, pierced for ventilation. The builder is Mr. Miles Tully, of Tudely, Tonbridge, and the architect, Mr. Wm. Theobalds.

Wroughton.—The foundation-stone of a new Wesleyan chapel at Wroughton, Wilts, was laid on the 26th ult. The building is designed in the Gothic style, and is constructed with red bricks of the neighbourhood, relieved with horizontal bands of white and black bricks, and Bath-stone dressings. Accommodation is provided for seating 240 persons, including the gallery. The architect is Mr. Orlando Baker, of New Swindon; and the contract for the whole of the works has been taken by Mr. George Wiltshire, of Swindon, at the sum of 700*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Burton-on-Trent.—The foundation-stone of a new Roman Catholic Church at Burton-on-Trent has been laid. The building is intended to accommodate about 400 worshippers. It will be of Gothic architecture, and built of brick with stone facings. Mr. Morley is the architect, and the work has been let to Messrs. Lowe & Sons, builders.

St. Alban's.—Cardinal Manning has opened the new Roman Catholic Church of St. Alban and St. Stephen, built in London-road, St. Alban's. It is the first Roman Catholic Church either built or used in the town since the Reformation. Only a portion of the building has been completed. To carry out the complete design for the church will involve an expenditure of 13,000*l.* Mr. Nicholl is the architect, and the style is Gothic.

Aiskew.—The new Roman Catholic Church of St. Mary and St. Joseph, Aiskew, near Bedale, was opened on the 4th inst. The total cost of the church will be about 2,000*l.*, most of the money being a gift by the will of Catherine, Lady Throckmorton, and the site, together with the presbytery, is the gift of Lord Beaumont. The character of the building is that of a small country church of the thirteenth century.

SCHOOL BUILDING NEWS.

Shelf.—A new school building is being erected in connexion with Whitefield Wesleyan Chapel, Shelf, near Halifax. It is Italian in style, with open-timbered roof, and comprises a room 80 ft. by 24 ft. for boys and girls, with two classrooms to each department. The architects are Messrs. Milnes & France, of Bradford; and the contractors Messrs. Firth & Son, masons, Queensbury; John Patchett, joiner, Clayton Heights; Elijah Briggs, painter; and H. Crowther, slater and plasterer, Shelf. The cost is estimated at about 1,200*l.*, but the new school is only a portion of a larger scheme which is in contemplation.

Sheffield.—The new Roman Catholic Boys' Schools, intended to take the place of the old and inadequate school building in Surrey-street, were opened on the 26th ult. The schools are practically the gift of the Duke of Norfolk, who gave the site, and expressed his willingness to defray the whole of the expenses incurred in their erection, after the sum of 1,000*l.* had been raised by the congregation of St. Marie's. The schools, which are in the neighbourhood of Leadmill-road, are designed to accommodate 400 boys. There are spacious class-rooms and teachers' rooms, a residence for a caretaker, a large covered playground in the basement, and an open arcade towards the yard. The buildings are of brick, with stone dressings, the roofs being covered with Broseley tiles. The schoolrooms are warmed and ventilated by Haden's apparatus. The architects are Messrs. M. E. Hadfield & Son, the style being described as "Tudor."

Lincoln.—The new boys' school of St. Peter's-at-Gowts, Lincoln, has been opened. The architects are Messrs. Goddard & Son, Lincoln, and the style adopted is "Queen Anne." The materials used are red brick, with deeper coloured red brick dressings, the roof being covered with red Staffordshire tiles. The builders were Messrs. Cowen & Thompson. The lighting and heating have been executed by Mr. J. Elliott, Lincoln, who has fitted up the windows with Clarke's patent lever cranks. The school will accommodate more than 300 boys.

Queensbury.—New Wesleyan Schools at Clayton, Queensbury, near Halifax, have been opened. The new buildings have cost, exclusive of the site, about 2,600*l.* They are erected on the opposite side of the road to the chapel, and are Gothic in style. The principal school-room is 50 ft. by 34 ft., with a corridor at each end dividing it at one end from an infants' room, communicating with a class-room, and at the other from three class-rooms for the mixed department. Three other class-rooms are also obtained in the basement. The premises have been erected from the designs of Mr. John Drake, architect.

SCHOOL-BOARD SCHOOLS.

Sturton-by-Stow.—New Boord Schools are in course of erection here for the united district of Stow, Sturton, Bransby, and Coates. Messrs. Crosby & Sons, of Lincoln, have taken the contract for the buildings at the sum of 1,525*l.*, and the total cost will be about 1,900*l.*

Dunse, N.B.—New Board schools are about to be erected in Dunse, from plans prepared by Messrs. Herbertson & Son, Galashiels. The buildings will cost upwards of 4,000*l.*

DISASTERS.

HENRY WILLIAMS, employed at Lichfield Cathedral as assistant carver, was at work at one of the buttresses on the north side of the edifice, when, his foot slipping, he fell to the ground. He was removed to his residence, and surgical aid was procured, but he died within an hour of the accident.

Two men, named Dogherty and Mullens, met with their death at the Hanley sewerage works. One of them, while descending a shaft, fell, and was drowned in some water at the bottom. The other went to look for him, and met with a similar fate. It is supposed they were overcome by some foul air which had accumulated in the shaft.

At the village of Henley, Hants, a father and son, named Moore, were engaged in cleaning a well 70 ft. deep, when they were overcome by the noxious gas, and made signs to be pulled up. Two other sons immediately went down, but they also succumbed, and died shortly afterwards. Very little precaution would have prevented this fatality.

On the 12th inst. the Old Manchester Free Library, Campfield, which has long been considered as insecure, fell to the ground. Three men, who were engaged at work upon it, were buried in the ruins, and were fearfully injured. Their names are Thomas Quin, Nathan Macknallan, and George M'Clellan. They were removed to the Infirmary.

Michele & Carrington's Testing Machines for Cement.—The testing-machine patented by Mr. Michele, who is of the firm of Francis & Co., cement-makers, Vauxhall, was used by the jury in judging the quality of the various cement exhibits in the Paris Exhibition, in which that exhibited by Messrs. Francis & Co., of Vauxhall, stood the highest test, viz., 1,300 lb. on the 2¼ in. section. This cement-tester is now very largely used, and has been employed by H.M. Government on nearly all the depôt barracks they have erected throughout the country. The wire-tester and paper-tester, on the same principle, are also being largely used; though, owing to their later introduction, their adoption is not, as yet, so extended.

DECORATION OF ST. PAUL'S CATHEDRAL.

THE Committee have fallen back on a model of the dome decorated by the late Alfred Stevens, and have published a long report, to which we shall refer before long.

"All that the sub-Committee ask the Executive Committee at present to sanction is that they be allowed—first, to enter into a contract with Mr. Leighton for the preparation of a cartoon for one of the large circles, at an expense of 600*l.*, with the understanding that if the work is proceeded with he is to be employed, if he wishes it, for the other seven great circles on similar terms. Second, in like manner, to contract with Mr. Poynter for all the figure subjects on two of the ribs, and all the others in the intermediate space, at a price not to exceed 1,550*l.*, with a like understanding as to the remainder. Third, to employ Mr. Stannus to prepare the full-sized cartoon as above described; and, fourth, to engage the services of Mr. Penrose till at least this cartoon is fixed *in situ* on the dome, by which several proceedings, with their incidental minor expenses, a total liability will be incurred of from 3,500*l.* to 4,000*l.* It is calculated it will require at least one year from the time of giving the orders to complete these preliminary works, before which time it will not be necessary to ask a sanction for any further expenditure that may be determined upon."

To this the Dean and Chapter have assented.

VARIORUM.

WE understand that Capt. Calver is preparing a rejoinder to Sir Joseph Bazalgette's reply to his October report upon sewage disposal. A little detention will occur in its appearance, as the writer is adding to certain observations upon the currents of the Thames.——Mr. R. Norman Shaw, R.A., is the author of a Book of Designs for Cottage and Villa Architecture in Concrete, which is on the eve of publication. The drawings of the entire work are by Mr. Maurice B. Adams, A.R.I.B.A., and these have been reproduced by photo-lithography. The plates are about thirty in number, and include some of the buildings erected at the Paris Exhibition and elsewhere not before published.—"The Report of the Highway and Sanitary and Public Health Joint-Committees of the Paddington Vestry on Wood and other Pavements," just now published by order of the Vestry, contains a considerable amount of information useful to those who are inquiring as to pavements.——The July Number of the *Victoria Magazine*, conducted by Miss Faithfull, includes a photograph of Mrs. Brassey. This magazine has lately made a start upwards.

Miscellanea.

Continuous Footboards on Railway Carriages.—Colonel Yolland's report on a fatal accident which occurred on the 3rd ult. to a female passenger, at the Bishopsgate-street Station of the Great Eastern Railway, has been issued. The carriages were not fitted with a continuous footboard, but had iron steps outside each door. Colonel Yolland says that if the carriage had been fitted with a continuous footboard it is highly probable that, although the woman might have been injured from her own imprudence in getting out of the train after it had started, she would not have lost her life. Colonel Yolland adds:—

"The Great Eastern Railway Company have, I understand, fitted somewhat more than two-thirds of the carriages which run in their suburban trains with continuous footboards, having arrived at the conclusion that these continuous footboards, if placed at a proper distance from the edges and above the surface of the platforms, will materially tend to diminish the number of this class of accident. But I do not learn that this company have as yet recognised the necessity for substituting continuous footboards for these iron doorsteps on all the carriages that run on all their lines. It may be that a greater portion of the accidents of this class occur on the suburban traffic of the principal railways which have termini in London; but there is no doubt whatever that they do occur elsewhere; and I am not aware of any reason why these continuous footboards should not be affixed to all passenger carriages, and extend from the outer ends of the buffer castings at the end of each carriage so as to get rid of the open space between adjacent carriages fitted with long buffer-rods."

The Wilberforce Memorial Church, Southampton.—The Prince of Wales has fixed August 13th for laying the dedication stone of the new parish church of St. Mary, Southampton, which is to be rebuilt as a memorial of the late Bishop Wilberforce, whose son, the Rev. Basil Wilberforce, is rector of the parish.

The Artists' Benevolent Fund.—We hear, with much pleasure, that the Royal Academy have voted 100*l.* to the Artists' Benevolent Fund. A few day sago, too, the treasurer of this fund received a legacy of 107*l.* from Mr. J. J. Stainton. This will prove encouraging to its officers.

Experiments with Dynamite at Portland.—A series of experiments with dynamite were made a few days ago in Messrs. Mitchell & Co.'s quarries at Portland in the top and bottom "capstone." Two sections of rock were operated on simultaneously,—a section of capstone next the Portland bed, into which were bored the holes in line 9 ft. apart, and each 3 ft. deep, well planned to cut and to work to each other. The other part operated on was a section of top cap overlying the bottom capstone, but a step back, and into which four bore-holes had been made 3 ft. deep each and 9 ft. apart, in line with each other. The seven holes in the two sections were charged with 10 lb. of dynamite, and electric fuses inserted, coupled up together in circuit by small copper connecting wire, insulated with gutta-percha. The holes were then filled up with water in lieu of tamping or stemming, and the end wires connected to the two cables leading to the electric machine a safe distance away. The quarry was then cleared of men, and the signal "all clear" having been given, the electric machine was unlocked, the cables attached to the terminals, and by turning the handle of the machine a few revolutions, a current of high tension electricity was sent along the cables through the fuses, exploding the seven charges simultaneously. On examination, it was found that the three charges in the bottom capstone had removed a section of rock 42 ft. 6 in. long by 7 ft. 6 in. wide, by 5 ft. deep to the bed below, equal to 59 cubic yards,—equal to 132 tons 15 cwt. The four charges in the top cap had removed a section of rock 42 ft. long by 5 ft. 3 in. wide, by 7 ft. deep to the bed of lower capstone, equal to 57 cubic yards,—equal to 128 tons 10 cwt. The rock was broken up into blocks from five to fifteen tons each, so effectually that the whole lot operated upon,—261 tons 5 cwt.,—was removed clean away by quarrymen in two or three days. On a subsequent day another lot was operated on with equal effect. The experiments were conducted under the superintendence of Mr. Read, the local dynamite agent, by Mr. John Harris, travelling instructor to Nobel's Explosive Company, Glasgow.

Farming in Zanzibar and Freed Slave Labour.—Actual experience of this has been had by the Universities Mission at Zanzibar during the last three years. The chief establishment is at Mbweni, four miles from the town itself, where there is about 150 acres of land under cultivation. Effective communication with the town has been a great difficulty, but has at length been established by means of bullock-carts, for which a road had first to be made. These were constructed on the spot, the work of the carpentering and smiths' department of the school and industrial establishment at Kunigani. Great as has been the difficulty of starting all this, the difficulty of maintaining it seems even greater, as the bullocks are found to die in large numbers. As a last resource it has been determined to introduce into Zanzibar a traction-engine of special construction, which will be used as a locomotive, and also stationary to drive a saw and turning lathe. The sum required for this is not less than 500*l.*, and it is earnestly hoped that many who see this will be induced to contribute towards it. No profit can ever be expected to accrue to any one from the work. Further information may be had from the Rev. S. Randolph Dunnington, York, and subscriptions will be gladly received by Messrs. Hoare & Co., Fleet-street.

The Metropolitan Fire Brigade have just added to the plant of the new chief station in the Southwark Bridge-road two light draught steam fire-engines, specially suited for rapid transmission to a fire. These engines were delivered on Thursday, the 11th inst., having been previously tested on the premises of the makers, Messrs. Shand, Mason, & Co., in the presence of Captain Shaw and his officers. Various improvements have been introduced; by means of those in the boiler, steam was raised from cold water to 100 lb. on the square inch in six minutes and a half, this being an acceleration of time by about three minutes or four minutes, as compared with the engines previously in use. The increasing height to which warehouses and public buildings are now carried in London rendering it necessary for increased pressure on the water-jet, this requirement has been met in these engines by giving an increased area of steam cylinder as compared to the water cylinder.

Should Horses be Shod?—This question has lately given rise to a very interesting discussion, having an important bearing on the question of street pavements. Mr. George Ransom has written to the *Times* to advocate using horses without shoes. He says that since 1862 he has constantly done so, though he has owned over 200 horses at one time, and used them for all kinds of purposes over rough roads. Their hoofs required paring sometimes, but they grew so tough that they could not be cut with an ordinary drawing-knife, but they required steel nippers. He argues that though horses used to being shod would wear their hoofs out quickly if used immediately after having their shoes taken off, the same result would not follow if they were brought gradually to regular work, thus giving time for the soles of the hoofs to acquire the necessary hardness and toughness. On the London asphalte Mr. Ransom thinks horses would go much better and more safely unshod. Commenting on the discussion, the *Lancet* says,—"The proposition will crop up at intervals until a rational view of the subject comes to be taken. As a matter of physiological fitness, nothing more indefensible than the use of shoes can be imagined. Not only is the mode of attaching them by nails injurious to the hoof: it is the probable, if not the evident, cause of many affections of the foot and leg which impair the usefulness, and must affect the comfort of the animal. Whether horses could work on our roads without some protection is another question. We think it would be found that the natural structure would adapt itself to any ordinary requirement. There is, however, a wide difference of opinion upon this point among authorities on horse management, and the problem is not likely to be faithfully solved until the experiment has been tried . . . . . It should, however, be understood that the experiment must be tried with colts that have never been shod. This is an essential condition of the test."

Architects and the "Athenæum."—For a long time past some foolish and malignant person has been allowed by the proprietors of the *Athenæum* to damage their property, and has succeeded to a larger extent than probably they imagine. We would point to his last achievement in that direction. An attempt is being made to collect funds for works stated to be needful for the preservation of the fine church of St. Peter Mancroft, Norwich. The vicar and churchwardens appeal for aid in their work, and here is what this *gentleman* of the press has been permitted to say of the whole architectural profession:—

"While we advocate maintenance of this fine architectural and historical building, of which the vicar and his colleagues are the trustees for posterity, it is necessary to protest against the employment of an architect in this as in similar cases, because an architect's professional instincts, not less than his personal interests, may,—at least so long as the 'five per cent.' practice obtains,—lead him to do that which cannot by any possibility be done without destruction of all that is valuable to the future,—all that Norwich men ought to preserve and venerate in St Peter's. If preservation and due maintenance of what time has honoured, if to retain all that history prizes in Mancroft Church, be really the desire of the vicar and churchwardens, let them employ an engineer, who can do all that is wanted, and probably at one quarter of the cost of what an architect would charge."

The slander of this precious paragraph, which is on a par with the ignorance it exhibits, has been expressed on many previous occasions in the same pages.

Hereford Middle Class College.—The works of the new Middle Class College at Hereford are being rapidly proceeded with. The contract was taken by Mr. James Bowers, of Hereford, and since operations have commenced the work (under Mr. Hobson, the foreman) has been carried on with great expedition. The building will be in the Early Gothic style, and Mr. Kempson is the architect. It is not intended at present to complete the whole of the buildings, the contract for the whole erection being 12,729*l.* The complete plan of the building comprises a central block, surmounted by a clock-tower, with two wings. At present, however, it is only intended to complete the centre and the west wing, so that the clock-tower will form the eastern end. The contract for the present work is 9,529*l.* The building will be erected of red brick, manufactured by the contractor at his brick-yard, which is situated a short distance only from the site; the dressings will be of Bath stone, relieved by terra-cotta bricks and black bricks. The roof will be covered with patent Broseley tiles of different colours. The college will be built with a view of accommodating 100 boarders besides day-boys.

TENDERS

For works of sewage utilisation at Burslem, Staffordshire, for the Burslem Local Board. Mr. E. Richards, engineer.

Contract A.—Engine-house, boiler-house, and coal depot:—

Mackay	£1,728 0 0
Drewitt & Pickering	1,714 0 0
Barlow	1,640 0 0
Matthews	1,490 0 0
Bowden	1,479 0 0
H. & R. Inskip (accepted)	1,382 0 0

Contract C.—Making and delivering cast-iron pipes, 12 in., 18 in., and 21 in. diameter:—

Spittle	£4,656 14 0
Cochrane & Co.	4,405 13 7
Oakes & Co.	4,364 8 0
Sylvester	4,059 15 4
S. & J. Roberts	4,042 13 7
Stacey, Davis, & Co.	3,912 7 1
Firmstone (accepted)	3,834 1 8
Brymbo Company	1,367 0 0

Contract D.—Laying and jointing the rising main, constructing intercepting sewers, straining-chambers, suction-well, and tank:—

	Pipe-laying and Sewers, &c.	Covered Tank only.
Walker	£3,841 8 3	£2,647 18 11
Mackay*	3,139 0 0	2,201 0 0
Drewitt & Pickering†	2,509 0 0	2,833 0 0
H. & R. Inskip	—	1,937 0 0

In one amount.

Smith	£4,123 0 0
Macguire	7,200 0 0

* Accepted for pipe-laying only. † Withdrawn.

Contract E, for open tank, to hold 500,000 gallons:—

Walker	£1,199 7 0
Drewitt & Pickering (accepted)	1,143 11 8

For foundations, &c., for a warehouse, Friday-street and Watling-street. Messrs. Ford & Hesketh, architects:—

Shaw & Co.	£3,621 0 0
Conder	3,490 0 0
McLachlan & Sons	3,350 0 0
Peto, Bros.	3,238 5 6
Browne & Robinson	3,235 4 6
Adamson & Sons	3,145 17 8
Scrivener & Co.	2,953 10 8
Ashby & Horner	2,932 0 0
Lawrence	2,860 0 0
Ashby, Bros.	2,777 0 0

For the erection of a detached villa residence, Baldslow-road, Hastings, for Mr. J. Reeves. Messrs. Cross & Wells, architects:—

Wood	£2,221 0 0
Womersley	2,204 0 0
Rodda	2,183 0 0
Eldridge	2,167 0 0
H. & C. Harman	2,165 0 0
Geary	2,118 0 0
Buller	2,041 0 0
Vidler	2,038 0 0
Ditch (accepted)	1,950 10 0

For alterations and additions to premises, George-street, Hastings, for Mr. J. H. Pearch. Messrs. Cross & Wells, architects:—

Womersley	£1,683 0 0
Crattenden	1,665 10 0
Eldridge	1,655 0 0
Ditch	1,642 10 0
Vidler (accepted)	1,599 0 0

For the erection of a detached villa residence, Clive Vale Estate, Hastings, for Mr. C. Davenport Jones. Messrs. Cross & Wells, architects:—

King	£1,300 0 0

For Gospel-hall and new premises, Hoxton, for the Rev. A. T. Edwards, M.A. Messrs. Waring & Nicholson, architects. Quantities supplied:—

Howard	£3,370 0 0
Staines & Son (too late)	3,284 0 0
Hammond	3,270 0 0
Lapthorne (accepted)	3,089 0 0
Jarvis & Son (withdrawn)	2,836 16 0

For the second enlargement of Congregational Church, Carlisle. Mr. Ralph Nicholson, architect. Quantities supplied:—

Laing (accepted)	£1,413 0 0

For the erection of cowsheds and piggeries at Mitcham Schools, for the Guardians of the Poor of the Holborn Union. Mr. H. Saxon Snell, architect:—

Bamford	£440 0 0
Sabey & Son	393 0 0
Patten	333 0 0

For works in strengthening throughout the roof of Bouverie-road Chapel, Stoke Newington. Mr. George McDonell, architect:—

Catlin (accepted).

For repairs, painting, &c., to Warehousemen and Clerks' Schools, Russell-hill, West Croydon. Messrs. Burney & Monday, architects:—

Baker	£572 0 0
Larnca	526 10 0
Joselyne	465 0 0
Smith	450 0 0
Mines (accepted)	321 0 0

For alterations, &c., No. 18, Hatton-garden, for Messrs. Booth & Fox. Messrs. Clarkson, architects:—

Mody	£249 0 0
Ward	247 16 0
Somerville & Hill	237 0 0
Mills	229 0 0
Smith	187 10 0
Cox	175 10 0
Vincent	175 0 0
Cook & Co.	170 0 0
Ranson	160 0 0
Heather	153 10 0
Eady (accepted)	102 0 0

For erecting four premises in Watling-street and Bread-street, City, upon the former site of All Hallows Church. Mr. Alexander Peebles, architect. Quantities supplied by Mr. W. E. Stoner:—

Scrivener & Co (accepted).

For farmhouse and buildings at Greasehays Farm, Stockland, Devon. Mr. Herbert J. Jones, architect:—

Clarke & Turner	£879 11 0
Mims	830 0 0
Trott	755 0 0

For alterations and repewing the Wesleyan Methodist Chapel at Redwick, near Bristol. Mr. Herbert J. Jones, architect:—

	Pitch Pine.	Yellow Pine.
Stephens & Bastow	£520 0 0	£393 10 0
Cowley	480 0 0	470 0 0
Gay	410 0 0	375 0 0
Humphreys	395 0 0	371 0 0
Wilkins & Hill	365 0 0	350 0 0
Lewis & Edbrooke	355 0 0	330 0 0

For seven houses in Maygrove-road, Kilburn. Mr. W. Smith, architect:—

Johnson	£4,457 0 0
Mansbridge	4,405 0 0
Beach	4,383 0 0
Martin	4,275 0 0
Somerville & Hill	4,252 10 0
Temple & Foster	4,245 0 0
Wicks	3,783 10 0
Prout	3,350 0 0
Taylor	3,325 0 0

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Erratum.—In paragraph headed, "Tunnel Accident in Germany," p. 732, line 10 from top, should read "limestone of the *firmest* description," not "finest."

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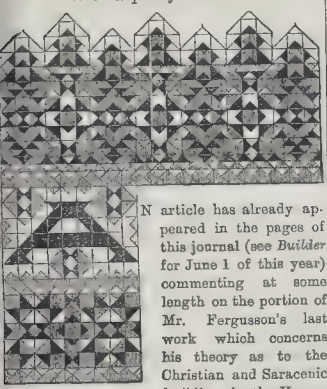
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The Temples of the Jews.



AN article has already appeared in the pages of this journal (see *Builder* for June 1 of this year) commenting at some length on the portion of Mr. Fergusson's last work which concerns his theory as to the Christian and Saracenic buildings in the Haram area at Jerusalem, and which has given rise to some correspondence in our columns between the author of the book and some of those who regard his views on this subject with decided scepticism. But upon another portion of his book, and that which, in fact, gives to the volume its distinguishing title, "The Temples of the Jews," little or nothing has been said in our pages as yet, and it is due to the author that his elaborate effort (the first, so far as we know, that has been systematically made) to trace out the successive plans of the Jewish temples, and to arrive also at some conclusion in regard to the architectural style of the latest and most sumptuous Temple erected by Herod, should receive some special attention from us; so that we shall not be thought to be repeating ourselves in returning again to his book from another point of view.

We must premise, however, that an exhaustive critical examination into Mr. Fergusson's theories on this subject, as stated in his work, is what we are hardly attempting here. Such an examination could hardly be made within the compass of a review even of greater length than articles in our pages usually run to, nor without wearying our readers with *pros* and *cons.* as to the interpretation and collation of more or less obscure passages of description from the Biblical books, Josephus and other sources, the deductions from which could not be made intelligible without an extent of illustration which would almost amount to reproducing the book in our pages, and the original meanings of which are in many cases all but unintelligible from the very same cause,—the absence of any illustration; architectural plans being, above all things, the most difficult to realise from words only, and the most capable of almost endless latitude of interpretation. It must be observed also that while the subject of the Dome of the Rock, to which we devoted considerable space, deals with existing architectural remains, and with ascertainable facts in regard to architectural history and style, the portion of the book devoted to the subject of the Jewish temples is concerned almost entirely with buildings of which only a few of the most fragmentary vestiges, at best, remain, and is for the most part matter of pure theory, in regard to which one can come to no nearer conclusion than that one is more or less probable than another. But it will be useful here to give a sketch in brief of the course of reasoning pursued in Mr. Fergusson's pages, together with some critical estimate as to the bearing of his conclusions on some at present obscure passages in the history of architecture.

Mr. Fergusson's method of procedure has been to commence by restoring the first form of the Temple, the Tabernacle erected in the desert, and from this as a basis to endeavour to realise in turn the plans of the several temples of which we have record, down to that of Herod; and in doing this to collate the measurements and descriptions of the Bible, Josephus, and the Talmud, so as to make them, as far as may be, check and correct each other.

In considering the value of such evidence, he also lays, and rightly, a good deal of stress on considerations of architectural propriety and probability. When anything which to the architect is manifestly absurd occurs in a description, he must be allowed to reject, if he cannot explain it. "When, for instance, the text of Ezekiel, as it now stands, represents the cells surrounding the Temple as so constructed that neither light nor air could ever reach them, it may safely be concluded that this was not so, and that the text is either corrupt or, at present, unintelligible. In the same manner, when Josephus says these same cells were only five cubits square on plan, but twenty cubits in height, we may reject the statement as certainly erroneous." And no architectural critic, we imagine, will find fault with such a use of what may be called architectural common-sense as this.

The power of thinking-out and realising the actual practical conditions of a problem in building, which the author has frequently used with so much effect in his reconstructions of buildings which have been wholly or partially destroyed, is conspicuous in regard to his main point of difference from the popular idea of the Jewish tabernacle or movable temple which was the precursor of the building, as it has been accepted for the last 200 years, and duly added to the large pictorial Bibles which used to be among the necessary complement of a family library, especially in country houses. "According to their scheme, the tabernacle was a wooden box, 30 cubits long, by 10 cubits wide, and 10 cubits in height, open at one end, and roofed by curtains thrown across it like a pall over an open coffin. Yet such a restoration seems impossible: in the first place, because it does not accord with the description in the Book of Exodus, but more so because it is absolutely opposed to common sense. If any one will try, or even think, he will find that it is impossible to stretch a linen curtain across such an open space of 15 ft., without it sagging in the centre, so that every drop of rain that fell upon it must fall through, and heaping rams' skins and badger skins upon it (Exodus xx. 14) would only make it worse. Their weight, especially when wet, would only make it sag more, and they would act as sponges to retain any drops that might otherwise in a tempest be blown away and escape." Mr. Fergusson accordingly assumes as matter of course that the Tabernacle, being, in fact, simply a tent, must have had a ridge and sloping sides, according to the received way of contriving tents in almost all ages and countries. This is unquestionably the most probable supposition in itself; but the author admits a difficulty, viz.: that a ridge of 40 ft. in length must have had a ridge-pole to prevent it from sagging to an inconvenient and unsightly extent, and that a ridge-pole of such a length again absolutely presupposes at least two intermediate posts or props from the floor, of which no mention is made in the Biblical specification, though it appears intended to be as full as possible. This however, Mr. Fergusson regards as "one of the cases in which the constructive necessities of the building must be considered as supplying what the written authorities have omitted to mention"; and he adduces as a parallel case that of the Temple, which must have had pillars on its floor, since the roof could not be supported without them, though no distinct mention is made of them: "the writers seem to have taken for granted that every one knew that these supports were and must have been there, and as mere mechanical pieces of construction, they did not deem it necessary to include them in their description of the glories of the buildings." Now, we make no objection to this method of reasoning in itself; it is more probable, perhaps, that supports should be omitted in the description than that the structures should have been put up in an inherently defective manner of building: but we do feel inclined to warn Mr. Fergusson against a habit which he not unfrequently falls into, of arguing completely in a circle. He here says that the omission to mention the "story-posts" in the tabernacle is of no consequence, or is the less remarkable, because the temple building must equally have had supports internally, which also are not mentioned. But a few pages further on we find "None of those who have hitherto attempted to restore the temple have ventured to place pillars on its floor to support the roof. It is true they are not directly mentioned in any of the descriptions we generally refer to, but neither are the central pillars in the tabernacle, which must have been employed to support the ridge-pole of the structure."

Now, this really will not do: it is the most obvious arguing in a circle, and it is an oversight into which Mr. Fergusson has a great tendency to fall; after having propounded a theory as probable or even possible, he assumes it as proved, and then uses it to prove the very premisses upon which he built it. We have come across at least two instances of the same fallacy of argument in this book, of still more pronounced character; and though we admit it is an exceedingly common failing with archæologists, who have a habit of building up theories in a most wonderful way by arguments which are entirely inter-dependent, we are surprised to find a writer of so much common sense, and capable often of such close and logical reasoning, falling into this curious habit of manipulating theories to prove each other. Mr. Fergusson would do wisely to be more cautious in this respect, because one such lapse of logic, if it happens to come prominently forward, is often enough to prejudice a reader against the whole conclusions of a book, or, at least, very much to strengthen any scepticism which he may have had at the outset.

Apart from the question of the roofing, the description of the Tabernacle is remarkably plain and comprehensible; and, as Mr. Fergusson says, when that is obtained, it is not difficult to follow out the planning and arrangement of Solomon's Temple, which was manifestly based on the Tabernacle in its main points, only with its dimensions increased each way. The Holy of Holies in the Tabernacle was a cube of 10 cubits, and in the Temple became a cube of 20 cubits; the holy place (answering to the nave in a Christian church) was 20 cubits long by 10 wide in the Tabernacle, and double these dimensions in the Temple. "The total measurements are not, however, 40 by 80 cubits, as might at first sight be expected from this system [the totals of the Tabernacle being 20 by 40], but, in consequence of the necessary thickness of the walls in stone construction, 45 by 90 cubits." Something like this obviously would be the case; but the last-named measurements are not given or hinted in the account in the Book of Kings, from which the other measurements are given; and the passage forms an instance of the frequently-recurring habit of our author of mixing up facts and dimensions which are the result of his own conjecture, with those which are given from authentic sources, without any hint to the reader that they do not all stand on the same authority. In the present case it is of little consequence, as the thickness of the walls must obviously be taken into account; but we find the same method of writing in other passages in which it is really deceptive, so that the reader hardly knows, till he has made a separate investigation for himself, which are the facts given by the cited authorities and which are Mr. Fergusson's conjectural (occasionally *very* conjectural) deductions from them; and this we object to as not a fair way of writing.* To continue,—the position occupied by the verandah which surrounded the Tabernacle, Mr. Fergusson considers was occupied in the Temple by the small chambers (described 1 Kings vi. 5, 6), which he regards as in three stories surrounding the Temple, or what in a modern church would be the north, south, and east sides, and together equal to the whole height of the chancel ("Holy of Holies"), but overtopped by the nave, which rose above them, and had a "clearstory" above the roof of the upper range of chambers. The description of the chambers in the passage in the Book of Kings, cited just now, seems almost incapable of any other interpretation:—

> Ver. 5.—"And against the wall of the house he built chambers round about, *against* the walls of the house round about, *both* of the temple and of the oracle: and he made chambers round about.
>
> Ver. 6.—The nethermost chamber *was* five cubits broad, and the middle *was* six cubits broad, and the third *was* seven cubits broad: for without *in the wall* of the house he made narrowed rests round about, that *the beams* should not be fastened in the walls of the house."

In other words, the wall was set back each story to afford a bearing for the floor timbers of the cells or chambers. Even allowing for the words not found in the terse sentences of the Hebrew, and supplied in italics by our translators, the meaning of the description seems quite clear, and Mr. Fergusson's plan and section at least the most probable that could be given. The "clearstory" above the third tier of chambers he gets from the fourth verse of the same chapter, "and for the house he made windows with narrow lights," and as the expression translated "house" seems to be always applied to the nave, and there was a porch across the whole front, as well as the three tiers of chambers round the sides, it is difficult to see where these "lights" could come except as what we should now call a clearstory. The introduction of two rows of pillars or rather story-posts, to assist in carrying the roof, seems also consonant with the probability of the case. No direct description of such a feature is given, certainly; but it is unquestionable that cedar beams of 30 ft. bearing would be likely to require supports to prevent them from sagging; and the conclusion is ingenious which the author draws from the description of the temple-furniture, ten tables and ten candlesticks, five for one side of the house, and five for the other; certainly an indication that there were so many spaces or "bays." Mr. Fergusson also quotes in favour of this view the statement (1 Kings x. 12) that Solomon made pillars of almug trees for the house of the Lord; but here again we have to complain of the author's tendency to cite passages in such a manner as to suit his own argument; for this fact is not mentioned in connexion with the first description of the building of the temple at all, but in a later portion of the history where it is said (after the mention of the visit of the Queen of Sheba) that the navy of Hiram brought there trees from Ophir, and that of some of them Solomon made "pillars" for the house of the Lord; the marginal note of our translators suggesting "props" as another reading. The inference from this would be rather that they were subsequent additions. However, we think the pillars highly probable. But Mr. Fergusson's façade, with a staircase tower on either side of the "narthex," appears to be purely imaginative, and to have no real reason except that he thinks it would be better so, and that the façade must otherwise have wanted width and dignity, in which we quite agree. He considers the stairs were necessary to get to the upper chambers and to an upper room above the temple; but his stairs and turrets are far too important in size and position, and directly contradictory of the statement about the staircase (1 Kings vi. 8)—"The door for the middle chamber was in the right side" (marginal reading, "shoulder") "of the house: and they went up with winding stairs into the middle chamber, and out of the middle into the third." This indicates the stair as a subordinate feature on one side of the building, about as clearly as anything could do; and it is, to say the least, rather singular that the author entirely passes over this verse, so very explicitly expressed, but which would interfere very much with his arrangement of the stair-turrets in the main front. In short, all that we believe can be said about his idea of the façade is that it might have been something like what he shows, and might have had towers, but that there is not a shadow of evidence for them, and the indications of the narrative, so far as it bears upon the point at all, seem opposed to the idea. We should take it that the Temple was a building of which the architectural display was essentially internal rather than external,—a common characteristic of Eastern architecture; and that very probably the external front in Solomon's Temple (which, it must be remembered, was, as Mr. Fergusson himself points out, only an amplification of the original Tabernacle) had no very marked architectural character or dignity, the effect being concentrated on the interior.

It is unnecessary here to touch upon the intermediate stages of the Temple as rebuilt after the Jewish captivity, or the vision of Ezekiel in which what may be called a model specification for a temple is given in the language of prophetic mysticism. The latter is a purely imaginary ideal, and of the former Mr. Fergusson admits that we can know little or nothing. What has been said in regard to the Tabernacle and Solomon's Temple affords a sufficient preface for a few words in regard to the restoration of Herod's Temple, which forms the main object of this part of the book, and which is illustrated not only in this volume but in a drawing which has been hanging for the last three months in the architectural room of the Royal Academy.

It would hardly interest our readers if we were to attempt to go through all the various various arguments as to the precise size and situation of Herod's Temple in regard to plan; nor, indeed, could the multiplicity of views on the subject be properly sifted, or even adequately represented, consistently with our necessary limitations as to space. We may say that the main difference between Mr. Fergusson's view and most others that have been propounded as to the extent of the Temple site, is that he concentrates it within a smaller area than most other restorers, on a space nearly square, and about 600 ft. each way, in the south-west angle of the Haram area. His reasons for assuming this extent and position for the plan appear to us very strong, not to say almost conclusive. The south-west angle of the Haram area may almost be considered a fixed and admitted point as identical with the south-west angle of the Temple, since it is the only angle of the enclosure that is a right angle, and immediately adjoining it is the commencement of the ancient viaduct across the valley connecting the Temple with the upper city, and marked by the springer of the arch known as "Robinson's arch." As far as this point goes, most archæologists are agreed. Working from this point, Mr. Fergusson continues:—"If this is so, it follows that the western wall of the Haram, as far north at least as the Jews' Wailing-place, is part of the west wall of the Temple; and in like manner the south wall of the Haram, as far at least as the double gateway, is identical with the south wall of the Temple, as rebuilt by Herod. Assuming this to be so, we further find, at the distance of exactly 600 ft. from the southern wall, and perfectly parallel with it, a terrace wall now supporting the building of the Dome of the Rock, and above that the bare rocky summit of the hill, rising now, as it always did, 20 ft. or 21 ft. above the lower platform.

"In like manner, when we measure eastward from the western face of the Haram, at a distance a little less than 600 ft., the ground sinks suddenly, at the Triple Gateway, to a platform 40 ft., as before mentioned, below the level of the general surface of the intervening area. Between these two points we have a perfectly level area, measuring about 600 ft. each way; perfectly solid throughout, except where pierced by two tunnel gateways, the presence of which we are led to expect, and where it is hollowed out into cisterns, which we also know did exist under the arch of the Temple." Josephus describes the total area of the temple buildings as a square of 600 ft. each way, which is not very far from the size of this platform: and the extension of the Temple further eastward seems, at all events, out of the question, since the ground is only made up even to its present level at the south-eastern part of the Haram artificially, by vaults, which appear to be of later date, and which, in any case, are not spaced or built so as to support the piers of a great building over them.* That the building was, at all events, approximately a square can hardly be questioned, even if Josephus's precise measurements are regarded as the result of a love of round numbers and symmetrical ratios; and its obvious limitation in the eastern direction, counting from the angle by Robinson's arch, seems therefore to infer a corresponding limitation in the northerly direction. This question of the site and extent of the Temple, it may be here mentioned, has an important bearing upon the question of the origin of the Dome of the Rock to which so much reference has been made in the *Builder* lately; because the supposition of those who deny Mr. Fergusson's views as to the origin of that building is, that the Sakrah, the sacred rock over which it is built, was originally invested with importance in the eyes of the Mahommedans as being the site of the altar of the one true God under the Jewish dispensation, and therefore naturally an object of reverence to those who were opposing Monotheism to

* We could give a number of examples of this; one other will suffice: we have an engraving (p. 163) with the title, "Portion of the Lid of Herod's Sarcophagus (from a drawing by De Saulcy). "Any one reading the title would, of course, suppose that this was an object which by general consent was recognised as what it is here described to be; but he will find that De Saulcy, from whom the drawing is taken, "strangely mistook" it for that of one of the early kings of Judah; and even the author himself can only say that "if the theory is correct" that the tomb from which it was taken was the Herodian family sepulchre, then it "hardly admits of doubt" that this was the lid of a sarcophagus fashioned by Herod to contain his own remains So that there are two conjectural stages to be passed in arriving at the assumed conclusion as to its being Herod's sarcophagus; and as the ornament on this lid is one of the chief authorities for the restoration of the detail of Herod's temple, we begin to think there should be a little more certainty before it is engraved and labelled in this way.

* See Mr. Fergusson's diagram and note on page 75, which, assuming that the facts are correctly represented, appear conclusive as against Mr. Warren's theory of the position of the Stoa Basilica over these vaults.

Christianity. Now, if the south wall of the Haram area is recognised as identical with the south wall of the Temple, as, according to Mr. Fergusson's theory, it must be, no theory of the plan and extent of the Temple at all consistent with existing accounts can extend it so far north as to take in the Sakrah in its present position as the site of the altar. That part of the controversy must now be left to those who have taken it up by expressing their personal views in our columns; we merely notice here the bearing of the one part of the subject upon the other. Of Mr. Fergusson's plan of the Temple in detail, we will only say here that it seems in the main to fulfil, in a degree unusual in such restorations, the combined conditions of architectural effectiveness with probability in regard to the relation of its parts to each other and to the peculiarities of the site: nearer than mere probability it is utterly impossible for any one to arrive, in spite of the author's very confident observations in the conclusion (p. 105) of his chapter on the plan, in regard to a building which was utterly destroyed centuries ago. But in regard to its general style architecturally, something more definite may, perhaps, be said by the help of comparison with existing remains of Eastern architecture.

The plan of the actual Temple of Herod,—the Temple proper,—considered apart from the surrounding courtyards and apartments, as given by Mr. Fergusson, is very nearly the same with that which he gives of Solomon's Temple, only on a larger scale, and with somewhat more elaborate architectural ordinance; *e.g.*, an open colonnade running in front of the rows of chambers on each story. The most important difference is that the entrance façade, with its flanking towers, is spread much further beyond the width of the main building, which, in the perspective view (*Frontispiece*), seems quite subordinate to the front, and produces rather the effect of a modern railway-station building with a hotel in front. The expression quoted from the Middoth (p. 131), "that the sanctuary was narrow behind and broad in front, like a lion" (a singular but very suggestive simile), conveys the idea, however, that the proportion between front and rear was something like this. As to the architectural restoration of the exterior generally, we, for our part, can only regard it as for the most part pure conjecture, with more or less probability in regard to some of the details. The author admits that in regard to the height, so contradictory and improbable are many of the statements, that "any one might feel justified in rejecting them altogether, and assuming that a restoration is impossible from existing data. . . . Still, I believe that the general dimensions and appearance of this celebrated building can be made out with fairly approximate certainty. At all events, it is well worth trying to do so; for its interest is unsurpassed by that of any building in the world; and if it can be done, a restoration of it settles many curious problems which have occupied inquirers for a long time past."

As to the interest of the inquiry in itself, there can hardly be two opinions; but really, as to the idea of even "approximate certainty" being attained, or of architectural problems being settled, by a process built upon such conflicting and imperfect testimony, we must remain sceptical. It would be possible, we must think, to make a drawing which would come as near to satisfy all the positive indications of the architecture of Herod's Temple which can be collected, as this one of Mr. Fergusson's, and which would have so different an effect that no one would ever suspect it was meant for the same thing. The author admits that the result has been a surprise to himself, and we imagine it has been equally so to a good many of his readers, for it is certainly not a very beautiful structure; nor can we see anything very satisfactory in this process of evolving lost buildings from the inner consciousness of even the most learned architectural critic. It is quite a different thing from restoring buildings of which the ruins remain in sufficient preservation to give a clue to plan and detail. There is, however, some interest and suggestiveness in the consideration of the reasons which have led to some of the details adopted in this restoration.

The elevation and perspective view on the frontispiece and plate III. show a building of what may be described as most resembling a rather impure and florid Italian Renaissance style, with pilasters on two stories and columns (with angle pilasters) on the third; over this last story rise low square towers with pyramidal roofs at the angles, which serve to stop the ridge and high-pitched roof running across the central portion of the façade. The upper (columnar) story between the towers is an open loggia, for the existence of which a reason is given, founded on the description of the last retreat of the priests to the upper part of the building, where they held out for some days, while the Roman soldiers had already got possession of the sanctuary. The description of Josephus as to their place of retreat might undoubtedly mean such a loggia as this, and might also be susceptible of half a dozen different interpretations.* A much better ground for the loggia, and even for the general shape of the façade, seems to be furnished by the engraving given (p. 139) from De Vogüé, of a typical form of church existing in Syria, which, indeed, seems to us to have been at the root of a good deal of Mr. Fergusson's restoration of Herod's façade; and it may be taken for granted that his building, however exceptionally rich and costly, would not have stood alone in its general design, but would have had, like all other specimens of ancient architecture, its close relations with existing models in the same country, of which this church at Tourmanim seems to be a reminiscence. The reason given for the high-pitched roof is a curious and surely quite insufficient one. It is founded on the statement of Josephus that spikes were placed on the roof of the temple to prevent birds from settling on it, and the author urges that it would be impossible to spike a flat roof so as to attain this object, and that the roofs must have been made steep enough to prevent birds from settling on the slope, and then have been spiked at the ridge and parapet with the object named. The roofs would have to be steeper than they are shown to attain this object; and it certainly appears a very small basis on which to erect a high-pitched roof in the absence of any direct testimony as to such a roof; though we admit that some colour is given to the theory by the shape of the rock-cut "Tomb of Zacharias" given on page 142,—a cubical design with an Ionic order, and a square pyramid for a finish above the cornice. The pilasters and panels of the Temple are shown profusely decorated with carved foliage, intended as ornament derived from the vine. And here we come upon a really interesting point; for the existence of a style of architectural ornament at this period in which the vine was predominant seems unquestionable, and is entirely in keeping with what we know of the sanctity and symbolical meaning attached to the vine by the Jews. The interesting relic called by Mr. Fergusson the "lid of Herod's sarcophagus" (before alluded to), though we objected to the reader being asked to accept that title for it *sans phrase*, must be recognised as of about the date of the Temple (owing to the character of the tomb in which it was found), and is a most probable representation of the style of ornament which may be supposed to have been carried out in the Temple. The existing remains of the carved ceiling of the Huldah gateway, also adduced by Mr. Fergusson in evidence, form a corroborative testimony in favour of the style of detail suggested. The author also lays some stress on the style of the remains of synagogues in the Tiberiad, discovered of late by the Palestine Exploration Society, one of which was illustrated in the *Builder* for May 18 of this year; though, of course, the evidence of these remains is only reflex, in so far as they may be supposed to have been reminiscences of the Temple, as they are of later date than that of its destruction; nor, indeed, can we see that any application of their characteristic detail is made in the author's Temple façade. An illustration much more directly to the point is furnished by the remains of the temple at Baalzamin, some details of which are given (on page 141) from De Vogüé's "Syrie Centrale," and which is of the same date as the Jerusalem Temple (the name of Herod being mentioned in the inscriptions), and entirely confirms the evidence of the sarcophagus-lid before named in regard to the nature and style of the ornament. From this building the author also obtains a hint for the bases of the columns, which nearly resemble inverted Classic capitals.†

But the most noteworthy and interesting feature in the detail of Mr. Fergusson's façade is his interpretation of the vine-bearing gate of the Temple, and the manner in which he connects it on the one hand with the erection placed by Solomon before his Temple, and described in the Bible as two pillars, which he called Jachin and Boaz, and on the other hand with features in religious architecture so far remote as Japan and India. No student of architectural history who has realised how frequently the traces of a common origin are to be found in architectural remains far remote from each other (more especially in that which is concerned with religious symbolism) will be in any way startled at such a suggestion. Mr. Fergusson first suggests, in speaking of Solomon's Temple, that the description of the two pillars with their enormous and elaborate capitals ("chapiters" as the English version has it), upon which it seems impossible to crowd all the detail that is described if we imagined them as capitals of columns in the ordinary acceptation of the term, would involve an absurdity if we tried to design them in literal accordance with the description; nor is there anything in religious architecture quite analogous to these two supposed pillars of bronze with such extravagant capitals. But Mr. Fergusson finds something analogous in the *Toran* which stands in front of Japanese temples, and consists of cross-beams supported by two pillars of granite, beneath which the worshipper must pass in entering if he wishes his prayers to be heard; and in the gates of the Indian topes, consisting of several cross-beams, carried by two pillars or uprights. Taking this hint, he represents the Jachin and Boaz of Solomon's Temple as supporting two cross-pieces or open-work beams on which would be arranged the various ornaments described in the account in 1 Kings vii., the "nets of checker-work and wreaths of chain-work" with which the chapiters were adorned. "Any one," adds the author, "who has been in the East, and knows how frequent these torans are in front of the doorways of temples from India to Japan, would rather look for, and expect to find, something of the sort at Jerusalem." When we come to Herod's Temple, it seems that the description in the Talmud actually gives the number and measurements of certain beams over the entrance,—"The gates of the propylon were 40 cubits in height and 20 cubits broad, and above these were five richly-carved beams of ash or oak. The lowest of these extended one cubit either way beyond the pillars of the doorway, while the one next above this was one cubit longer either way than that below it, so that the upper beam of all extended to 30 cubits." The description adds, "Between each beam there was a row or course of stones," but the beams as here described could hardly have been built into the wall: Mr. Fergusson apparently takes the stones as supports at intervals between the beams, in the form of transverse beams tying the larger ones into the wall. Over this framework of timber the branches and fruits of the sacred vine are trained. The restoration of this feature, given, in accordance with the above hypothesis, on p. 155, seems to us the best and most consistent bit of restoration in the book, and the one most decidedly consonant to probability and architectural fitness. One other interesting suggestion we must notice: the erection over the entrance of the Sanchi Tope, which is engraved as the parallel of the feature in the Jerusalem Temple, is, from its carvings, obviously devoted to, or symbolical of, tree-worship; "whether this has or has not any affinity with the honour paid to the vine at Jerusalem is a question others must determine."

We have given but a very condensed indication of the gist of the treatise under notice, which is one full of interest, whether the reader be inclined to accept or to demur to the conclusions of its author.

* The expression of Josephus is merely that the priests took refuge "on the wall" (*ἐπὶ τὸν τοῖχον*), which he describes as eight cubits broad. So vague an expression may mean almost anything.

† Some of our readers may remember that this peculiar form of base was used in the carefully-studied architecture of Mr. Rivière's picture of "Lazarus at the Rich Man's Gate," in the Royal Academy exhibition of last year.

Monument to John Mackenzie. — The movement originated by the *Celtic Magazine* to erect a public monument to John Mackenzie, compiler and editor of the "Beauties of Gaelic Poetry," has so succeeded that the monument is about to be erected in Gairloch. The monument is in the form of an obelisk of Aberdeen granite, 13 ft. 6 in. high, and the site chosen for it is a projecting rock outside the churchyard and overlooking the grave. It bears both Gaelic and English inscriptions. The monument has been executed by Messrs. Robertson & Law, Inverness.

EXCAVATIONS AND PUBLICATIONS.

ENGLISH AND FRENCH.

THE first issue of text and plates is now before us, towards what promises to be a work of equal interest and importance,—"Miletus and the Latmian Gulf," by MM. Olivier Rayet and Albert Thomas. The Latmian Gulf itself is a thing of the past, and has shared the fate which was already proverbial in antiquity respecting the city of Miletus, mother of so many and such important colonies for which it once provided a port. "Miletus had a vogue in days gone by," —was the purport of the sarcastic iambic line. In those days the gulf deeply indented the western coast of Asia Minor, immediately to the south of the mountainous promontory that curved northwards to embrace the wider bay of Ephesus. What the Cayster has done for Ephesus on its site, the Mæander winding its way through a vast plain with steep and friable land around it, has done far more liberally,—more severely, —for Priene and Miletus that once faced each other as maritime cities at its northern and southern margins, for Heraclea and Myous at its nearer and more remote recesses. The extremity of the gulf where it narrowed southwards is now cut off as a lake; and the Mæander, with windings still more exaggerated than those which the ancient cities on its banks symbolised on their coins, now finds its way to the sea at a distance of several miles from what was its embouchure in the days of Herodotus. Ports and roadsteads are gone, small islands show as moderate hills in a flat district of which only a part is cultivated, part is a marsh always, and part invariably flooded during winter months. Herodotus was well aware of what was going on and had been, and he illustrated the formation of the Egyptian delta for his countrymen, as well by the accumulations of the Scamander, which had increased the distance of Troy from the coast, as by those which had extended the plain of the Mæander. So the traveller must now go inland if he would study the geographical conditions of the battle of Mycale on the coast by Priene, that decided the political relations of Europe and Asia at a most important epoch; and he must take time into his account as well as space when he collates the descriptions and enumerations of towns and localities by Strabo, Pliny, and Pausanias.

The excavations and archæological inquiries which led to this publication were originated, and the cost of them defrayed, by the Barons G. and E. de Rothschild,—a worthy example it might be said, if justice to some predecessors who were also at work concurrently did not require us rather to say in most praiseworthy emulation of a worthy example. The publication of results is under the auspices, which presumably implies at the charge, of the Ministry "de l'Instruction Publique et des Beaux-Arts." What more this implies than the subscription by the State, in itself most liberal for fifty copies of an expensive work (200 francs the copy), we are not aware. When the text which appears in quarto form is complete, an account is promised, in two volumes, of nearly all that is known, and of most that is likely to be, of Miletus in the first place, and then of Priene, Tralles, Magnesia on the Mæander, Myous, and Heraclea; the agora of Heraclea is especially indicated as sharing with the enormous temple of Didymean Apollo at Miletus in artistic and archæological interest and importance.

The first part of the first volume, now delivered, gives a general study of the river Mæander and its environs, and then a detailed history of Tralles in both Greek and Roman times; so detailed, indeed, that unless the anticipated limits of the work prove elastic, some more important cities will be cut down, we cannot but fear, to disproportionate brevity. Besides the description of the present state of ruins,—of works of excavation,—of elaborate restorations, among them, may it not be too daringly precise,—that of the Didymæan Temple, which has already obtained the medal of the *salon*,—we are promised more than 150 new inscriptions, and a wealth of numismatic reproductions, with descriptive catalogue. The sculpture which was discovered by the expedition has been presented by MM. de Rothschild to France, and is now to be seen at the Louvre by those who are unexhausted by other demands upon the energy and time of the studious of exhibitions.

The atlas at present delivered,—the first of eight *livraisons*,—contains ten plates, including two maps of the Latmian Gulf and parts adjacent, ancient,—with successive variations of coast line marked,—and modern. The magnificent archaic bronze of Didymean Apollo in the Louvre is represented in heliography, and another plate reproduces a marble lion found at the Necropolis of Miletus, which compares with that in our Museum from Cnidus. This pair, it must be said, considered along with what remains of the Lion of Cbæronea, goes far to prove that the Greeks,—as masterly as are many of the lion-heads which they have left us,—never attained,—it may be from a lack of models,—to a true feeling for the general "points" of the king of beasts.

The other plates, we confess, take us a little by surprise, as they are without reference to the text along with which they are put before the world. They are views, plans and sections, and restorations of the Temple of Athene Polias at Priene. The title-page bears the note, "All rights reserved"; and our first movement is one of regret that it was not supplemented by another, "All rights respected." However, the case is one, perhaps, that may better be made one for amusement or indulgence than for indignation, as long as its true bearings are not mistaken. The advertisement of the work contains the intimation that "the attention of MM. Rayet and Thomas was particularly attracted by the admirable Temple of Priene, uncovered eight years ago by Mr. Pullan, and on the subject of which that able investigator has not produced any publication." This is probably an example of a class of cases in which it would not be for the interest of the world that "architectural copyright" should be too strictly insisted on. Many more than eight years ago the French themselves undertook, at State expense, the excavation of the temple at Magnesia, on the Mæander, —a work which cost the life of, at least, one of the conductors of the expedition; but no publication of results has followed to this day, and some inquiry at several times has failed to elicit information as to what became of the drawings. If some later independent adventurers had bestowed labour upon the site already cleared to their hands, and even been in a hurry to publish what they found, the world would have been richer by knowledge which it may now be too late to recover. As regards Priene, however, Mr. Pullan's drawings have been not only in safe-keeping, but in steady if leisurely advance to publication. Otherwise than leisurely they scarcely could be. The expedition to Priene was only one of several, to carry through which the Society of Dilettanti made considerable efforts on the distinct anticipation of the progressive destruction which Greek remains in Asia Minor were being subjected to, and also of the uncertainty, from the precarious state of Turkish politics, how long firmans might be obtainable or excavations be possible at all, either with firmans or without. It seemed desirable to secure the drawings and measurements at all costs first, and then in due time publish. Publications that are to follow worthily Mr. Penrose's classical work on the Parthenon, promoted by the same society, are not affairs of brief gestation by private societies. However, it is but courtesy to assume that the artists commissioned by MM. de Rothschild, were not aware how far advanced are the plates of the English society, and that it is due to the accident of these particular plates of their own being the first finished, and to no thought of forestalling in interest those to whom they were indebted for their opportunities, that they appear in anticipation of their own illustrating text.

As regards the plates themselves, they leave nothing to desire in elegance and finish; as regards their scientific value,—and this is a point of view which, from the advance which has been made in the recovery of the theory of the best Greek architects, is all important,—not quite so much can be said. The dimensions are not inserted in the plates of details, but have to be recovered by application of compasses to scales,—*periculosæ plenum opus aleæ*. Where such exactness is in question as is demanded in the determination of the proportions of first-class Greek work, there is no safety but in the recorded measurements being provided to check the vagaries and lapses of the engraver, as well as the variable expansion of paper in the processes of printing. The plate, again, which exhibits professedly the actual state of the ruined plan, would indicate that various interesting dimensions were obtainable, which are not supplied, and it leaves us to obtain some others by additions or subtractions that always involve liability, or what is almost as troublesome, apprehension of error through unaccounted fractions. We plead then now, as always, for the insertion of as many original measurements of the actual remains as possible, and for the warning correction of extensive through-measurements and joint measurements, the true security against those errors which will creep into measurements of dislocated and disturbed remains: the security which we thus gain is a satisfactory limit of the errors that can be allowed for intermediately.

Our last words cannot be other than those of hopefulness, nay of congratulation, at the prospect of the completed work being a valuable addition to that library of classical architecture and archæology which is preserving for posterity the best records that can be recovered of the great, —must we still, and always add,—unfortunate people, to whom the world owes its start and its standard in the noble pursuit of refined and embellished—in fact, of civilised life.

PICTURES AND FRAMES.

THE TURNER DRAWINGS.

IT would be difficult to find in the world of fine art an institution of more import than the National Gallery of Pictures. It is a something that in great measure stands quite apart, and shows evidence of work in a way peculiar to itself. Much as has been written and thought out on the subject of art, and on methods of work, there yet remains a good deal more to be said, and, what is more, a good deal more to be yet thought out and analysed. This National collection of paintings has been got together, as all know, more by lucky accident than through any deep thinking about it, or with any design of forming a history of painting as a fine art, or of showing successive methods and ways of work. This is, perhaps, but a poor account to give of it, but, looking at the things about us, there is much to be thankful for, and to be proud of, and certainly much to be learnt from what there actually is before us in Trafalgar-square. Broadly and generally stated, it is a vast collection of the artistic individualities of the several authors of the works on its walls,—of their individual powers of *hand* and *mind*, through the media of brush and colours,—a wonder to each artist himself, and each work a wonder to those who intelligently look at them. How must the great Titian have wondered at his own power over the colours he used, the very same that others about him had!

How strange a sight it would be, in these correct days, to see one of the old painters, as Veronese, at work,—to see the roughness of his matter-of-fact surroundings, the comparative coarseness of his materials, and, more than all else, perhaps at the simple state of mind in which he went to his work. There could have been no science present, in our advanced acceptation of the word, no grand "principles" to go by, and certainly, in the majority of cases, no "precedent" to guide. Each man must have looked solely to himself, and may be not a little puzzled to find his way, or to see, however dimly, what there was before him. Most o the mighty masters of drawing and painting, in whatever age or country they lived, got all their materials from the things and life about them. Whatever the subject may have been which they were "illustrating," to use a common and accepted modern phrase, they but looked to and at the life and ways of life, and to the things about them, for the material objects from and out of which to compose their pictures; and it was done, as we may in our Gallery see, in a plain and matter-of-fact way, which would hardly pass muster, it is to be feared, in these academical days, so simple were the painters in their way of work. We might find a something, too, in the sight of their colours, brushes, paint-boxes, and at the painters' gear generally; just, indeed, as we may find a special interest in Turner's "colour-box" and palette, now exhibiting in Bond-street with so many of his best works.

Our more immediate object in now calling a moment's attention to the National Gallery collection of paintings, and to the pictures and drawings of Turner, which Mr. Ruskin has put for a time within public view, is the singularly uncomfortable way in which the pictures are hung, and the small and inconvenient rooms in which they are exhibited. In the very small room in Bond-street, all so crowded up in the centre with screens, and even a huge iron safe, it is all but impossible to get sight of the pictures at all. It is, indeed, a pity that it should

be so, for almost any popular exhibition of mere toys would meet with better treatment. All pictures need not only their necessary space on the wall, but a certain ground-floor space in front of them, so that they may be seen at some convenient distance from the eye,—at least, at first,—the spectator after a while getting closer to the picture for details and more minute examination. In the small Turner Room this is impossible; and in the National Gallery itself it is with the large pictures but little better. It is a something to get a picture at all; but when got it is surely worth its mere wall and its floor space! We can hardly imagine anything more instructive to the art student than this series of Turner drawings and paintings, showing as they do to great extent his way of work, and his progress from beginning to final completion. They should, then, be so exhibited as to be fairly and comfortably seen.

Again, if we dared regard it but for a moment in this light, and look on these paintings as things quite *per se*, we might feel a little surprised at the way in which each picture is considered and exhibited as a "piece of furniture," surrounded, as so very many of them are, by huge vulgar gilt frames, covered with unmeaning ornament and putty enrichments. So *wide* in the National Gallery are some of these attractive frames that they all but eclipse the very pictures they enclose, and it would almost seem that the frame being made first, the picture was ordered to be painted afterwards for the mere purpose of filling up the vacant space in it. We could value some of these pictures with a quite insignificant number of superficial square inches when compared with the space taken up by the gorgeous gilt frames surrounding them. Would it not be easy to remedy this, and thus to look at the picture first, and the frame afterwards, or not at all? Indeed, may we not say that the smaller paintings and drawings are killed all but outright by their wide heavy frames? Nay, the gilding alone, with bright lights on it, puts out in some cases the artist's work altogether.

There is another matter worth considering. We refer to the colouring of the walls of the rooms or galleries. The main object of a gallery specially built to contain and exhibit pictures or paintings is surely and simply to leave the picture or painting, and allow it to tell its own tale, and to make its own simple, sole, and real impression on the mind of the observer and student. The more simple and unobtrusive the room, the better for the painting and the painter, and there can, we think, be no doubt,—and certainly no artist will dispute it,—that the colour of the wall on which the painting is seen should be such as not in any way to obtrude itself on the eye, and take its attention in the smallest degree from the painted canvas before it. A very simple and easy experiment will soon convince any one of the difference produced by a change in the colour of the background in and against which a picture is seen.

By the way of special example, and to realise our position to the artist reader, for it is to such here, in the first place, we would chiefly address ourselves,—we would point to the world-famous National Gallery picture the "Consecration of St. Nicholas," by Paul Veronese. We need not attempt any description of it, well known as it is, or ought to be, but will only say that it fully illustrates what we desire to here enforce—the self-sufficiency of the picture as *painting*, and as an idea to tell the mind's eye; and that while the mental impression of such work lasts, nothing ought to come in its way, or to mar it, whether it be an over-impressive and ponderous frame, or the "walling,"—to use a general but descriptive word,—of the room in which it is hung up. This fine work of Paul Veronese needs most surely no accessories to engage the thoughts and interest of the student. It is enough, and more than enough in itself, and the first lesson to learn in the Gallery is to see this, and to wish for nought else. Nothing can well surpass the magnificence of the mere *painting*, the work of the brush, here; and well might old Venice be proud of her painters, when but one of them could do such work as this. We once saw this very picture out of its awkward frame, and on a rough wooden stand in the middle of the room for the purpose of being the better copied by some ambitious student; and it is the keen remembrance of it, as we then saw it, which makes us the more regret its present surroundings.

We call attention to this important matter of picture displays, from the very fact of their growing importance, as evidenced by the interest taken in the Turner collection in the Bond-street-rooms. As a guide and inspiration to the student, this historical series, as collected and arranged by Mr. Ruskin, is hardly to be sufficiently estimated. It shows the artist when he begins his work and when he is at his best and highest, and it shows, too, what it is to interpret nature, and how much is lost and gained in the process. We cannot but think that no more useful and instructive introduction, if we may use the phrase, to the study of the landscape painting in the National Gallery, by its different masters, could be, than a visit and a long visit, to this open book of Turner's. We would begin with the pencil outlines and the few plates,—too few, perhaps,—from the "Liber Studiorum," awkwardly placed, as they are all but on the very floor of the narrow room, and then go finally to the more completely-developed, though not better, examples and proofs of the great landscape-painter's powers of mind, and eye, and hand. It is really a most wonderful and mighty show of high-art power, and should be carefully and thoughtfully read through and through, again and again, by the student who is thoroughly in earnest, and means real work.

THE STORY OF AN OLD BRIDGE.

FRANKFORT-ON-THE-MAINE.

THE Old Bridge over the Maine at Frankfort is one of the most curiously interesting structures of its kind in Germany, and though not the oldest of its class, nor so rich in statues as the famous one over the Moldau at Prague, its known history, together with that of its predecessors on the same spot, takes us back to the days of Charlemagne. In general appearance it is not so antiquated as it really is, and many of its old and distinguishing characteristics have long since disappeared. The watch-towers which formerly stood at either end, with their frescoes and images of the Madonna, have long been forgotten; the houses and chapels which may be seen on the oldest pictures of the bridge disappeared with the so-called Dark Ages. The mills that are beneath it may trace their origin far back; but they have been renovated to such an extent that their antiquarian interest is lost. Yet there is much left of ancient date to interest us. There are curious and rude sculptures over the doorways leading down to the mills; and on the opposite side, a crucifix surmounted by a gilded rooster, whose joint history leads us back some 500 years, and about which legend delightfully clings. Then there is the red sandstone monument of Charlemagne, looking Rhinewards, holding in one hand the imperial apple, and in the other the imperial sword; a recent creation, —indeed, erected in the year 1843, in commemoration of the thousand years' existence of the German empire. Goethe called this bridge the only ancient structure of importance in Frankfort.

It is a bridge to which historical events cling, and events connected with the lives of some of Germany's great men. It is also a pleasant bridge to stand on. Beneath us the waters of the Maine rush on as if in haste to greet the nobler flood of the Rhine, bearing the slender woodrafts from the Spessart, and the shallow boats laden with wood and fruit and produce of Bavaria to the busy city of bankers. On one side of the river is the quaint old suburb of Sachsenhausen, backed in spring-time with its rare fringe of apple blossoms. On its course the waters wash the foot of an ancient wall which historians tell us bounded the garden where Charlemagne loved to sit and quaff beer or meth, or whatever the Germans imbibed in those days. Schiller once stood on this old bridge in a gloomy state of mind, and perhaps contemplated suicide by casting himself into the flood, for he asked in his despair as he gazed in silence on the river, "Which is the deeper; that water or my suffering?" The young poet was then fleeing from his Stuttgart and Mannheim difficulties.

Of Goethe also arise, as we stand on the bridge, pleasant memories, of which he tells us in "Truth and Fiction," and which Bettina does not forget to gossip to us about. "Das Kind" writes to Goethe: "This and the following story (told me by the Frau Rath) made the most lively impression upon me. I see you before me in the full splendour of your youth. On a bright winter's day, when your mother had company, you proposed to her a drive with the strangers along the Maine. "I put on my scarlet fur cloak (your mother said), to which was a long train, and fastened down the front with gold clasps. My son was shooting like an arrow between the other skaters: the air had made his cheeks glow, and the powder had flown out of his hair. As soon as he saw the scarlet cloak he came up to the coach and smiled quite kindly at me. 'Now what do you want?' I said. 'Come, mother, you are not cold in the carriage, give me your velvet cloak.' 'Why you won't put it on.' 'But I will, though.' I pulled off my beautiful warm cloak; he put it on, swung the train over his arm, and he sailed away like the son of a divinity along the ice. Had you but seen him, Bettina! Anything so beautiful is not to be seen again! I always have him before my eyes, how he glided out of one arch and under another, and how the wind filled out the long train behind him."

The bridge has many legendary memories. The gilded rooster on the crucifix could tell us much of history if so it chose: of wars and pilgrimages, of floods and tournaments, of ice festivals and persecutions of the Jews. For five hundred years has this gilded rooster, or its predecessors in office, occupied tutelar honours on the bridge. It has seen the brilliant retinues and *cortèges* pass over on the way to the imperial coronation; it has seen the long cavalcades of soldiers pass and repass; it has seen the convoys of merchants coming in to the great semi-annual fairs; seen Germans, Swedes, Austrians, and French struggle for mastery beneath it, and is silent of all. Indeed, it is rather a mysterious bird. The boatmen think it was placed there to point out the deep current for their vessels, but the antiquary thinks it was perched there on purpose to defy him in his researches as to its why and wherefore. But legend has given the bird immortality, and a certain importance in the history of the bridge which we cannot overlook.

The story goes that the contractor found that he was unable to complete the structure within the specified time, and, fearing the consequences, he prayed to the Devil for aid in his emergency; for in the good old times of which we speak, Satanus was a personage of authority, and much sought after in times of need. The Devil, as we know, seldom leaves his friends in the lurch, and he promised to help the bridgemaker out of his difficulties on one condition. He would aid in finishing the bridge by the appointed time, and as his reward he simply claimed that the first living creature which should pass over the completed structure should belong to him. The Devil drew up the contract, and the contractor signed it with his own blood, as was customary in such contracts. On the appointed day the bridge was completed, and the Devil wanted his pay. But this time the "old familiar gentleman" found that the contractor had proved too many for him, for, instead of permitting any good Frankfort citizen to first pass over the bridge and lose his life and soul, he caused to be driven over before him a live rooster, and thus cheated the Devil out of his pay. The Devil was, of course, very angry at having made a contract so indistinctly worded,—so angry, indeed, that after tearing the innocent bird to shreds, he partly destroyed the completed work, shaking the central arch till it gave way; and it is just possible he would have destroyed the bridge entirely had not the clergy taken the precaution to institute a solemn procession, and consecrate the structure on the following day. Thus Satan was deprived of all further power over the bridge. Legend has here simply woven together a number of historical incidents connected with the bridge in her own quaint manner, mixing up truth and fiction, conjecture and traditions.

The present bridge dates only so far back as the year 1342, although it had predecessors of stone and wood dating some centuries earlier. Batton says that Charlemagne built a wooden bridge here. Historical mention of a bridge, however, is first met with in 1035, and again in 1192; then it was of wood; it was rebuilt in stone in 1276. This lasted until 1306, when, together with the towers, it was almost completely destroyed during a violent flood. It was then rebuilt stronger, the money for the purpose being collected from the sale of certain indulgences by the Church. The building of bridges was considered to be in those days a religious work, like the building of churches, because they aided the spreading of the gospel, and enabled the pilgrims to Rome and Jerusalem to perform their journeys with greater ease. In 1342 a violent flood tore down the tower on the Sachsenhausen side, and nearly destroyed

the bridge. The present structure dates from this period, though it was not finished until the year 1419. In the middle there were two places left unarched, and simply covered up with boards that could be easily removed in case of hostile approach. The two places were only walled over in 1840. Thus the Devil's wrath turns out to be after all simply human strategy.

The bridge was an interesting structure in those days. Besides the towers at either end, on which were on the one a crucifix and an insulting fresco directed against the Jews, and on the other an image of the Madonna and a box for the reception of donations towards keeping the bridge in repair, there were two mills, built about 1410, which may be seen to this day in newer shape. There were also a small chapel or sanctuary, and a little structure styled the Rat-house; and somewhere there were two secret chambers,—the one for men, the other for women,—probably condemned criminals who were here cast into the Maine; and, finally, there was, and is still, the crucifix with the gilded rooster. The passers-by were warned by an inscription, and a rude carving representing a hand hewn through by a hatchet, that the bridge was sacred in character,—"*Wer dieser Brücken Freiheit bricht, Dem wird sein frevelnd Hand gericht*,—"Whoever abuses the freedom of this bridge shall forfeit his hand as a punishment." No beating was permitted on the bridge. In case of a *mêlée*, and the beating caused bleeding, the aggressor should lose his hand,—a common mode of punishment in those times. The Jews were, in all probability, the greatest gainers by this "freedom," though they were subjected to deep insult every time they gazed on a wretched fresco on the Sachsenhausen Tower, a drawing of which may be found in the "Antiquarian des Mainstromes." The little chapel on the bridge was dedicated to St. Catherine. Sometimes, during excessively rainy seasons, the citizens feared greatly for their bridge. In January of the year 1374 the city fathers promised to pay for forty masses if the bridge were spared. This method proved successful, and was again resorted to in the following year. The Rat-house on the bridge was used for a very curious purpose. It was built in 1498, and in it from this year to 1557 every afternoon a converted Jew stood and doled out a heller (farthing) for every dead rat brought to him by the city youth. After cutting off the tails, to keep as a voucher for the money entrusted to him, he cast the bodies into the river. In the year 1498 1,080 rats were thus disposed of. The money employed in this warfare against the rats was taken out of the fines paid by the Jews. In 1569 the Rat-house was transformed into a place for the storing of powder.

The story of the gilded rooster which surmounts the crucifix is of some cultural interest. Historically, the bird is a well-authenticated landmark. The Frankfort city archives contain an official document of the year 1405, in which is seen a picture of the bridge, showing already the crucifix and the rooster, and after that time the city chroniclers frequently made mention of both. In the autumn of the year 1434 we are told how both were blown down during a violent storm and sank in the river, but were fished up again; and after being repainted and gilded by Sebald Fyol at a cost to the city of six gold guilders, replaced more firmly than before. The crucifix had been somewhat damaged by the fall, but remained afterwards for a long period unharmed. During the beleaguring of the city of Frankfort in the year 1552, we are told in an old song how the venerable bird was wounded,—

> "Oh, have ye then all heard the news?
> A leg from the rooster was shot;
> So that he must now limp about,—
> And you can believe me or not."

The crucifix and the rooster were witnesses of many bloody encounters. In the year 1635, during the Thirty Years' War, a battle raged between the Swedes on the one side of the bridge, and the Imperialists and Frankforters on the other, for several days. During the *mêlée* a bullet struck the rooster and knocked it from its perch into the Maine, whence it was never recovered. Another Swedish bullet struck the thigh of the Saviour on the crucifix, and the indentation may be seen to this day. With this incident tradition has been at work. A Swedish soldier, a zealous Protestant, disgusted with the symbol of the Papacy, had taken aim at the crucifix. He hit the mark, but the bullet rebounded and killed the shooter on the spot. The city councillors did not allow the bridge to be deprived long of its tutelar bird, for we are informed that on the 11th of January, 1636, a new rooster was constructed and placed on the old spot. A poem was written for the occasion by a Frankfort poet laureate, Johann Flittner, the author of several German and Latin poems. One hundred years later, on the evening of the 16th of December, 1739, a fresh misfortune befel both crucifix and rooster, the central arch of the bridge gave way, taking with it the two landmarks. It required eight years to repair the bridge, and further two before the crucifix and the rooster were replaced. The latter was made of beaten copper, heavily gilded, for which a sum of 200 florins was paid. A lengthy poem was composed for the occasion of the inauguration by a member of the city council, Von Lersner. Thenceforward the rooster perched on unharmed amid the Napoleonic wars of the commencement of the present century, the struggles of the Revolutionary era, and the Prusso-Austrian combat.

Such is the outer history of the rooster, as it were; but, together with the crucifix to which he is attached, he bears a greater inner significance. We have already mentioned the earlier presence of two secret chambers for the purpose of holding criminals. The crucifix and the rooster were erected on the bridge at a time when the most inhuman punishments were inflicted on criminals. False play, the wanton cutting of forest trees, the smallest offences, could be punished with death. Tortures of all kinds were in vogue,—piercing with red-hot iron, cutting off the ears, burning, drowning, and boiling in oil. Merian tells us that in the sixteenth century 131 persons were hanged, 53 beheaded, 41 drowned, 16 torn on the wheel, 7 burnt, and 1 buried alive,—altogether, over 200 persons in Frankfort alone, which city was a model of moderation. Dr. Kriegh is of the opinion that the crucifix and the rooster stand on the spot where the execution by drowning took place on the bridge; for, under this arch, the river was originally strongest and deepest. Here, too, the bodies of suicides were cast into the river.

But it is with the executions by drowning that we must explain the existence of the crucifix and the rooster. It was customary during the Middle Ages to erect a chapel or a crucifix near the place of execution, as was the case at Frankfort at places where executions of other kinds took place; and the crucifix and rooster were, doubtless, placed here, the former to call to mind the Redeemer, the latter to recall the denial and penitence of the Apostle Peter. To us now the rooster serves to attach these gloomy memories of old. The last execution by drowning in the Maine took place in the year 1613. These occasions were celebrated by the city guilds with great festivities. Possibly animals suffered at Frankfort as well as at other places. In an age when the authorities sent out cryers to warn the May-chafers to get out of the land, and grasshoppers were threatened with ecclesiastical excommunication if they did not stay their ravages, it was not unusual to hear of animals being sentenced to death for their transgressions. To animals, birds, and insects were attributed a high degree of intelligence, which may account for the tradition that this rooster had formerly the faculty of distinguishing whenever a Jew passed over the bridge, when he was supposed to crow in mockery. People of the city have an old saying that every time this remarkable bird hears the clock of the cathedral church strike twelve, it crows three times. All we can say is that the rooster, besides reminding us of ancient barbarism, brings up in the legend connected with it relics of heathen worship. When the primitive faith was abolished, the Devil had to fill out in his one person the places previously occupied by Odin, or Thor, or Loki, and to perform the labours which the giants had been accustomed to perform in the mythological era. The Devil cast blocks of stone at the Christian churches like the giants did at cities. Like the giants, the Devil appears as a master-builder. As the former are betrayed by gods and heroes in the building of Walhalla, so is the Devil befooled by men in the building of the Frankfort Bridge.

What else shall we record about this curious bridge? Children born in the mills beneath it are called Gickelburgers, or *protégés* of the rooster, since they are neither Frankforters nor Sachsenhausers. To do justice to Charlemagne would require more space than we can spare; but we would record the Sachsenhausen tradition that Charlemagne is the author of a discovery which has proved of incalculable benefit to mankind. The story goes that a worthy citizen of Sachsenhausen was once crossing the bridge with his little boy, and the latter, being of an inquisitive turn of mind, after gazing at the statue for some time, exclaimed, "Father, why does he hold that apple in his hand?" referring to the imperial apple which the ancient ruler holds. "Oh, my son," replied the father, "that is Charlemagne; he it was who first invented apple-wine (cider)." There is still another story of an Anglo-Saxon tourist, who, wandering on the bridge, asked a resident Anglican the name of the dignitary represented by the statue on the bridge. "Charlemagne," was the reply, pronounced like Charley Maine! "Oh!" responded the other, "and so the river perhaps takes its name from him!" Across the river is the village or suburb of Sachsenhausen, famous for its dirty streets and its uncouth rude inhabitants. It has, nevertheless, produced a local poet, Ferdinand Stolze, whose works were once very popular in Frankfort. His poems are written in the Frankfort dialect. A German guide-book maker, floundering in the English language, says of Sachsenhausen,—"Charles the Great, the founder of the place, sent hither the unruliest of the vanquished Saxons, and the descendants of these noble Saxons are mostly gardeners, vine-dressers, cartmen, porters, or bleachers. Even nowadays they are possessed of their ancestors' character; they are even celebrated for a sound and witty stoutness. [The writer attempts to translate the German expression *Witzige Derbheit*, which simply means an ignorant bluntness.] Strangers who like undaunted frankness and an excellent cider, which Sachsenhausen is famous for, a very simple but unmingled wine, must go and look for a pine crown or a branch over the door." But this "natural man" we prefer to see at a respectful distance, and admire him in pictures, as the artist sees him, imbibing his apple-wine. We can, nevertheless, afford to admire his apple-orchards, especially when the trees are in bloom in the spring-time.

THE IRISH BOARD OF WORKS.

IT is not open to doubt that a department which is either overworked, or within the range of whose duty so large a number of subjects are contained that it is impossible they should be properly performed, is clearly an inefficient department. For there is a wide difference between a department itself having the control of a large number of subjects, and a non-departmentally educated head having the supervision of a department. In the latter case a fresh intellect trained to manage and understand business matters makes a better chief than one versed to the lips in departmental mysteries. But this does not apply to the other officers of a department who, if they have too many subjects upon which their attention is concentrated, must inevitably fail to perform properly and thoroughly the work of a department. And this, it is evident, is clearly the cause of many of the shortcomings of the Irish Board of Works, as set forth in the Report and Evidence of the Departmental Committee which has been investigating this important matter.

The Board of Works in Ireland was created in the year 1831, under the Act 1 & 2 William IV., c. 33, and it then consisted of three commissioners and a subordinate staff. At the present time, for it is not necessary to go through the changes which have occurred since its creation, it consists of two paid members, an honorary and non-effective member, an assistant-commissioner, and a small staff. We say a small staff, because, compared to the work which has to be done, it is clearly decidedly small, for it consists of no more than sixty-two persons, exclusive of the Land Improvement Commissioners. Let us see next what is the outline of the duties which it is necessary that these sixty-two persons and the commissioners should undertake. And it must further be borne in mind that we have included in this number all the *employés* of the department, both small and great. We will give as an example the largest branch, that of the architect. There is, first of all, the architect himself, with the not very large salary of 800*l.* per annum, and a travelling allowance of 39*l.*, a somewhat singular amount. Beneath him is, next, the Assistant-Architect, with half the above salary, and three surveyors of buildings, who also each receive 400*l.* a year. Then come seven district surveyors, and the remainder consist of drawing

clerks, a draughtsman, copyists, and so on to the number of eleven persons. This is only one portion of the department, and, of course, the heads of it have to exercise control over other parts quite different in character, such as the land improvement and the account branch. For when the Board first commenced operations, it had to execute the duties performed by the Exchequer Loan Commissioners in Ireland, by the directors of Inland Navigation, and many other variously differing duties. At the present time the following may be considered a more or less accurate summary of their multifarious work:—1. Construction and maintenance of all public buildings. 2. Land. 3. Arterial drainage. 4. Inland navigation. 5. Royal harbours. 6. Commercial harbours. 7. Post-roads. 8. Railway and tramway inspection. 9. Certain piers and harbours. 10. Sea-coast fisheries. 11. Management of loans for labouring classes' lodging-houses and dwellings for sanitary purposes, under the Public Health Act of 1874, and for railways. Here, of course, are a multitude of duties, requiring every one of them accurate attention and great knowledge of details, but each of so large a character that it would be absolutely certain that much delay would necessarily occur in the transaction of the work by the responsible chiefs. And many things, also, must be left to subordinate officials which should be transacted by the higher personages of the department. It is not, therefore, very much to be wondered at that a good deal of dissatisfaction has for a long time existed in Ireland at the manner in which the business of the Board of Works has been carried on, and that the Committee of Inquiry have found much to reprobate. "On the whole," they say (Report, p. lxi.), "though it has been our pleasure to note proof of intelligence, industry, and general good intentions in the Board of Works, we consider that the facts elicited by our inquiry are sufficient to account for that feeling of uneasiness and dissatisfaction towards the Board which has for so long past found expression outside as well as inside Parliament." That is to say, putting the same sentiment in less Parliamentary language, the charges brought against the Irish Board of Works have in the main been proved, and its past administration is condemned. The real recommendation of the committee is simply that the Board of Works should be strengthened from top to bottom; when once that recommendation is made it is plain proof that the department has hitherto been overworked, and that its strength has not been equal to the duties which it has to perform. That is really the best excuse which the Board can have for its many shortcomings in the past. You may regard a man as negligent and worthy of blame who does not perform thoroughly the duties with which he is intrusted; but if you find that he has to do work which could only be reasonably expected to be performed by two persons, it is not the man but the system which is really to blame.

Let us, then, briefly note some of these recommendations. It is proposed that the Board should, in future, consist of a chief and two other commissioners; that a secretary with definite duties should be called into existence; that the commissioners should distribute the business among themselves, and that no new measure should be taken and no fresh expense incurred which has not previously received the sanction of the Board in its collective capacity, the personal responsibility of individual members being confined to carrying into due execution arrangements which have already been determined upon by the Board. There is also to be noticed a suggestion rather than a recommendation of the highest importance. It is that the Board should be represented in Parliament by a responsible Minister, and that for this purpose the chairmanship of the Board might be combined with the presidency of the Local Government Board, and thus the Treasury and the chief secretary for Ireland would be relieved of some of their duties, and the work to be done by the Board of Works would be directly within the influence of the British Parliament. "The administration," say the Commissioners of the Board of Works, "has no doubt much influence on the progress and prosperity of Ireland, and, therefore, should be quickly amenable to public opinion." Such a change as here proposed would, there can be no doubt, be most valuable; but whether it would be feasible for the chairman of the Board adequately to fulfil his present duties and also those of a Parliamentary nature, is more than doubtful, and any such scheme would appear to necessitate the appointment of a fourth commissioner,—a result, however, which would be by no means to be deplored in the interests of Ireland. Consider, for example, that the Board have under their control the buildings of between 1,100 and 1,200 national schools, and it at once becomes apparent how necessary it is that there should be some means by which public opinion may fairly criticise the way in which these duties are performed, and by which the Board may openly and fairly defend their management. The health of hundreds of the rising generation may depend upon the proper fulfilment of these duties, and the House of Commons is the proper arena both for public criticism and official defence.

So much for the top. As to the bottom, the changes recommended are to the same effect: one department will be a sufficient example. We have already given the staff of the architect's branch; we will now mention the tonics recommended in that portion of the Board. Two more district clerks of works should be added; also another furniture clerk and lower division clerk; and the two temporary draughtsmen should become permanent,—making three in all. And this is by no means more than the work of this office demands; for it consists in the general control and supervision of all buildings under the Board's charge; the preparation of designs for new buildings; the examination and revision of plans submitted by local bodies and private individuals who obtain advances from the Board, and the inspection of works for which such advances have been made whilst in progress. As a matter of fact, therefore, it would seem to be the higher parts of this branch which most require strengthening, because the main work is of a responsible and important character. Indeed, we can hardly conceive duties more closely connected with the comfort and material progress of the Irish people, and the improvement of Irish towns, than those which fall to the lot of the architect of the Irish Board of Works. In fact, it is not going too far to say that the architect of the Board may do much to make or mar the architectural beauty of the Irish towns; because, by having public buildings handsome in appearance and useful in construction, not only is Ireland, as a country, actually improved, but a great impetus must necessarily, though indirectly, be given to the general improvement of buildings which do not fall within the supervision of the Board. Moreover, it seems pretty clear from the report that the actual materials and work done by contract under the superintendence of this department have not given satisfaction to capable and independent persons, such as the officers of the Royal Engineers connected with the Ordnance Survey, in regard to buildings for this branch of the service. We refrain from going further into details, and only touch upon this point here to show how necessary it is that from every point of view the architect's department should be efficiently officered and manned, and should also be under careful and capable supervision. We have here only in the most brief manner pointed to the outline of the duties of the Irish Board of Works, and to the manner in which the shortcomings of the past are proposed to be remedied in the future. At another time we may recur to some other aspects of the question.

THE FUNCTIONS OF AN ACADEMY AS AN EXHIBITING BODY.

PROBABLY more hard things have been said of the present exhibition at the Royal Academy than of any preceding one. It would, however, be very difficult to say with real accuracy whether, taken as a whole, the exhibition of 1878 is worse than its predecessors; but whether it be of the low character which is usually assumed is really no kind of blame to the Academy itself, unless there rests upon this body a duty to keep up its exhibition to a certain standard. In fact, as many loose things are said about the duty of the Academy as of the character of the pictures which hang round the walls of Burlington House. It becomes, therefore, in every sense advisable to consider what are the duties as regards the exhibition of pictures of a National Academy, for we may assume without more ado that the Royal Academy must be considered as the representative and governing body in English art; not, perhaps, in fact as regards the performances of its individual members, but looked at under all surrounding circumstances, and having regard to the semi-official position which even its most modest supporters must allow that it holds.

The first part of the duty of an academy in the exhibition of pictures is to take care that such an exhibition should fairly represent the general condition of the national art of the time. There should be no desire to favour one school more than another, nor to place one class of subjects over another. Every school and every kind of subject should have the opportunity of being fairly represented, fairly criticised, and fairly judged. Some kind of subject may not meet with general approval, but, nevertheless, those who hold that such is worthy of admiration are entitled, so to say, to be heard in defence of it, and such defence is only possible by the fair exhibition of it. Moreover, a young school of artists may justly look for a fair field and no favour at the hands of our national academy; and, paradoxical as it may seem, such a body in their exhibitions should be as far from being academical as possible. And just as a veteran statesman desires to bring forward rising talent, so should an academy do all in its power to bring into notice any distinct school, however small, that it may properly gain adherents, or, on the other hand, sink into the obscurity which it justly merits.

Next, as a corollary to this first proposition, comes the second, that whilst every school and every class of subject should be represented, the best works only of such school and class should be admitted to the academic exhibitions. There should be a strenuous endeavour to raise the national taste by the exhibition of good works before all things, and to give to those artists who are enabled to exhibit pictures at this exhibition a reputation from having done so which is fairly and justly earned. There is no possible object gained by exhibiting a mass of works of a similar character and of small merit: it causes the deserving works to be lost in a crowd of rubbish; it lowers the public taste; and it takes away the reputation which should be attained by a place in the Academy. Moreover, it has this further drawback, that it necessarily so crowds the exhibition-rooms that many works cannot be fairly judged, so that works which deserve accurate notice are often really thrown away. And it must be borne in mind that so great is now the opportunity of exhibition in the galleries of picture-dealers and private societies, that it is almost wholly impossible for any painter of any merit not to take his proper place among contemporary artists, even if by some oversight his productions are overlooked by the committee who select the pictures which are to be exhibited in the rooms of the Academy. But there is, as it seems to us, one exception to this rule, that only the best pictures of every school, and dealing with every class of subject, should be admitted, and that is when the subject of the picture is in itself of such intrinsic interest that even though the execution is not of the highest kind, yet the nature of the subject should cause it to be admitted. Of course, if a picture is irretrievably bad, no amount of interest in the subject matter should override this inferiority of art; but if a picture falls somewhat in technical execution below the average, yet is of a subject of high interest, then it should be admitted. And this rule applies with most force to portraiture, where the representations of some well-known man deserve admittance, even though as we have said, they are not quite up to the average. This rule, too, would have this effect in regard to other classes of subjects than portraits, that it would be an incentive to the choice of good subjects; it would give scope to the imagination, and to the mind of the painter, as well as to his technical powers.

We have said that by permitting large numbers of every class of subject to be exhibited the really good works are lost, like needles in a bundle of hay; and we hold further that an academy sins by overcrowding its rooms, because it is one of the duties of such a body to give every opportunity to the public for the intelligent appreciation of art. The *salon* should not be a great auction-mart, or a merely popular rendezvous, but it should be [a place where the productions of contemporary art should be spread out pleasantly before the observer, and where he may observe and meditate over the condition of the national art. Moreover, in every such exhibition there should be some attempt, at any rate, made to classify the exhibited works: exigencies of space must from time

to time cause any general rule of this kind to be impossible of application, but that does not prevent its being applied where possible. Because, if, to take portraiture again as an example, one portrait is in one room, another in another, one set between two landscapes, and another between two social scenes, it is well nigh impossible to compare one work fairly with another, a great deal of time is necessarily lost, and the whole character of the exhibition is consequently lowered.

Moreover, in regard to the representation of every school and class of subject, it seems necessary to point out this, that those schools or subjects which are of a high or interesting kind deserve a larger representation than those which do not possess this merit. For so long as each school is fairly represented, a national academy, in the exercise of its duties as guardian and educator of the public taste, should endeavour to set before the public view as large a number of works of art of a high class of subject as possible. By this means, again, it may by degrees do something not only to elevate but to keep on a higher level public taste, and thus increase the general appreciation for art.

These are the main positive duties which belong to an academy as an exhibiting body, and consequently other negative ones flow from them. One of the chief of these is to give no greater advantages to those exhibitors who may be members of the Academy itself than to those who are not within its pale, to consider the members of the Academy and the non-members as equal in the exhibition-room, and to be as fair and without favour in judging of an Academician's work as in considering that of the greatest tyro in art. Another is to remember that possibly by the endeavour to raise and keep art in a high position, a large measure of unpopularity among artists may arise; but an academy should be as regardless of ephemeral pleasures of popularity as the judge on the bench. The one is the guardian of national justice, the other of national art. Another, to bear in mind that to fill the academic coffers is the least of the results of an exhibition which should be aimed at, and consequently not to desire, above all, that flocks of ignorant persons should crowd its portals, not for the purpose of studying art or of intelligent pleasure, but to go through a certain form which has become a kind of social duty; for when once this latter notion becomes an ordinary impression in society, it is pretty evident that the exhibition is not based on right principles.

It is not necessary now to consider to what extent the Royal Academy acts up to these general principles; for any person who has thought over them in relation to the several exhibitions at Burlington House which he may have seen, can judge for himself how far the Royal Academy follows them out. And it must be remembered that whilst speaking of pictures, these principles are applicable equally to sculpture and to architectural drawings, possibly even more so to this latter branch of art in some respects than to any other; for the architect has fewer opportunities than the painter of showing the results of his education and thought to the general public, except in his completed and actual buildings. We will, then, not now apply the test of these principles to the Royal Academy, but we may point out that if a national academy, or an academy which holds this place, does not act up to them, it must ultimately either lose its place as the representative body of the national art, or such drastic reform will take place in regard to it as will cause it to fulfil those duties which before this it had neglected. One of these things is certain to happen sooner or later to any body of this kind not acting up to these principles; and in the interest of art in such cases the sooner the last of them happens the better. R.

The Portsmouth Master Builders' Association a few days ago had their sixth annual excursion, Eastleigh being the *locale*. The party, numbering 140, arrived at the Bishopstoke station by special train, and, headed by the marine band from Gosport, proceeded at once to the grounds of the Mount, by permission of the owner, Captain Hargreaves, where dinner was provided. Mr. H. Evans, chairman of the Association, occupied the chair, and Mr. C. Light the vice-chair. Mr. Drew Bear gave "The Portsmouth Master Builders' Association," which was responded to by Mr. C. Light.

THE PARIS EXHIBITION.

SOCIAL AND SANITARY.

THE corner of the Champs de Mars, stretching within the angle which has the Porte de la Seine for its apex, the Pont d'Jena and the Porte Rapp for its extremities, embraces many annexes of considerable interest. On crossing the river, and leaving behind us the Trocadéro gardens, which we described in our last, we have a full view of what has been nicknamed *La Plage*. This broad open place, or walk, studded with chairs and benches, and a large number of the high seats with sheltering backs generally used at the seaside, presents the appearance of an esplanade at some fashionable watering-place. The Exhibition building, in the background, might be mistaken for a huge casino, while the occasional glimpse of the water of the Seine, the few masts of model yachts, &c., tapering upwards over outhouses that contain apparatus for saving life at sea, and small boats moored on land, all tend to nurture the illusion which has won for this portion of the Exhibition grounds the name of *the beach*. Down on the banks of the river, which can only be reached by descending a long flight of steps, are the exhibits of the ports of France, of all matters relating to navigation, and of fire-engines. Above are some handsome fountains, and the horticultural show. Passing by these attractions, we turn into the garden, glancing on our road at the air-meters, &c., from the observatory of Montsouris, used for testing the velocity of the wind, and calculating the amount of the rainfall. The air-meter seemed rather heavy, and suited only for rough work and approximate calculations. It could not be compared, for delicacy, with several English air-meters we have examined, notably the air-meter manufactured by J. H. Steward, of London, which has the further advantage of being comprised in a box of about 6 in. square. While touching on this subject, we should urge the more frequent use of these instruments. They are most useful in calculating, and especially in comparing, the efficacy of various means of ventilation. If we are doubtful as to the value of sundry windows, ventilators, and other openings, the air-meter will chronicle the amount of air that has passed through them in a given time, and enable us to judge with comparative accuracy their respective value; at least, if we are careful in taking into account the direction and force of the wind, the possibility of a return current, the difference of temperature when the different experiments are made, and the size of the openings in question. By these means we have often discovered that the windows, &c., which were considered very efficacious, proved to be of little or no use, while other apertures really supplied the larger volume of air, though these were sometimes not included in the scheme of ventilation.

Immediately beyond these scientific instruments will be found the exhibit of the National Tobacco manufactures, a monopoly which is not without its use if viewed with respect to the health of the smoker. In France, at least, we know that we can obtain in all parts of the country, and for precisely the same price, the same cigar, cigarette, or tobacco; we know that these have been manufactured under Government control, after Government analysis, and that it will not be to the benefit of any individual to adulterate these products. In France, no one need smoke in ignorance of what he is imbibing, but can obtain the most precise information respecting the tobacco he is consuming, its value, where it is grown, and the proportion of nicotine it contains. At the Exhibition he may watch how the tobacco is prepared, and how it is analysed. Papers, books on Paris, and official documents will complete the history of every French cigar. Would that we were as well acquainted with the origin, the chemical properties, and mode of manufacture of those habanas supplied to the English market, whose name is legion, and whose birthplace is hidden within the German lodging-house walls of Whitechapel!

M. O. André's model house is wood and iron; the large building devoted to the exhibits of the Creusot, a smaller structure for samples of coal, and another devoted to the Compagnies de Gaz, are the principal structures forming the group of buildings immediately behind the French restaurant and the French tobacco manufactories. We will not insist on the marvels of ironwork that were produced under the guidance of M. Schneider, nor dwell on the model schools and cottages built for his numerous colony of workmen. Creusot was described at length in an article published in a recent issue, and specially devoted to this subject. Another building, equally large, and containing the exhibits of the Ministry of Public Works, is close at hand. Here we were at once agreeably impressed by the freshness of the air, and, at the same time, by the absence of draughts. The fact is that this structure is ventilated by Messrs. Geneste & Hercher's system. Outside, at the back, their suction-wheel may be seen at full work, and in stooping over it the strong rush of air extracted from this building is sufficient to blow away the hat of an imprudent investigator. The purity of the atmosphere is consequently due to a powerful engine, and Messrs. Geneste & Hercher have felt that, in dealing with public structures, mechanical means of ventilation were indispensable. The pavilion, where this interesting experiment may be daily watched, and which we must explain in detail on a future occasion, contains many objects which cannot fail to attract the attention of our readers. There are models of bridges, aqueducts, lighthouses, dredgers, diving apparatus, &c. We have also a rich collection of large albums containing the most graphic and elaborate photographs of the great public works undertaken in France by the State. Among the maps that cover the walls we notice a chart of all the lighthouses of France, and of all the mineral products of the country. Samples of these latter are fastened to the part of the map representing the department where they abound. There is also a valuable library relating to public works, and many other matters demanding careful study and examination.

The annexe devoted to methods of lighting and warming houses comes next, as we pursue our windings towards the Porte Rapp. This is Class XXVII., and apparently there was not room for all appertaining to this subject within the main building, and hence the necessity of this annexe. This class recalls, to some extent, the exhibitions of domestic and sanitary appliances which are sometimes held in England simultaneously with the Social Science Congress or other gatherings of this description. First of all, we come upon M. Giroud's gas-regulators and rheometers. This patentee professes to have solved one of the chief causes of ill-health and extravagance, by ensuring the more complete consumption of the gas used for lighting rooms, &c. This patent is based on the three following principles:—First, a regulator should be composed entirely of metals not subject to oxidation. Secondly, the pressure from the gas-works must be annulled so as to render the supply independent of external influence. Thirdly, the apparatus should contain no levers, pulleys, or other contrivances likely to cause impediment through friction. To carry out these principles, the gas is received in a red copper cylinder, and here a special mechanism pumps it into the house at a given rate and quantity which cannot vary. This, together with a special gas-burner, called a *rhéomètre*, ensures the complete consumption of the gas, a result equivalent to an economy varying from 15 to 30 per cent., and preserves the atmosphere and furniture from all the injurious and destructive influence of unconsumed gas.

Unfortunately the very next exhibitor proposes a system of lighting which would entirely destroy the advantages to be derived from this check placed on the supply of gas from the outside. M. Emile Lavril would do away altogether with pipes and canalisation, and gasworks. He suggests that each householder should make his own gas. What bickering and quarrelling in municipal and vestry politics such a solution would avoid! This hydrocarbon gas is obtained from rectified mineral oils, which need only the same precautions in their use as usually employed for alcohol or petroleum. The cost, per hour, for one light of this new gas, amounts, it is stated, to 0·037f. or 0·031f., while the ordinary gas, at 30 centimes the cubic mètre, amounts to 0·045f., and at 45 centimes the cubic mètre, to 0·067f.

M. A. Bengel has a patent for warming apartments with gas and air mixed together, obtaining the maximum of heat from the minimum consumption of gas, and this without allowing any escape of carbonic acid, smoke, or odour. The interior of the stove is cylindrical, its exterior triangular. There are four cylinders, the centre being a sort of boiler, which gives out great heat; the triangular shape of the stove

facilitates the admission of air from the room which travels round the seat of combustion without mixing with the fumes or gases escaping therefrom. An escape of steam is so contrived that it occasionally moistens the hotter parts of the stove, adding by its oxygen and hydrogen an element that may be burnt, or may add to the vitality of the air by the proportion of oxygen contained in the water, and which escapes consumption. The other details of this stove are complicated, and cannot be easily understood without a model. The practical conclusion is that this stove, we are assured, will warm a room measuring 150 cubic mètres by the consumption of 240 litres of gas per hour; while a larger stove, burning 300 litres of gas per hour, will warm 250 cubic mètres of space. Unfortunately the degree of heat thus imparted is not fully explained. We should have liked to know what consumption of gas is necessary to raise the temperature in a room of a given size from, let us say, 50° to 60° Fahr.

Messrs. Gaillard, Haillot, & Co. have also a remarkable stove in hollowed bricks, so as to avoid the oxide of carbon that escapes from stoves in metal. The ordinary stoves, it is urged, do not cause much ventilation; the movement of air hardly exceeds the 15 to 16 cubic mètres required for the consumption of each kilogramme of coals burnt. The old-fashioned stove, in a word, draws enough air for its own wants, but leaves the room and its inhabitants to take care of themselves. An extra chimney or a ventilating shaft, with a gas-burner or small fire within to create a current, is therefore necessary; and this is generally considered too expensive and troublesome. Messrs. Gaillard & Co. profess to obviate these difficulties. The vitiated air gathered by tubes from all parts of the room enters at the basement of the stove at the back; the pure air enters the basement at the front; both travel along parallel channels, the one to be ultimately expelled by the chimney, the other, warmed by its proximity to the smoke and hot-air flues, is thrown into the room from the top of the stove. In summer-time, by the opening of certain traps, the air can be drawn into the room from the outside when the stove is not lighted. It is, therefore, a ventilator for both summer and winter.

M. F. V. Grossot, another exhibitor, makes extensive use in his ovens and stoves of Gurney's batteries, an effective, though certainly not novel means of economising heat. His *helicoïde* column is, we believe, more novel. This is a spiral division, placed within the flue of a stove, so that the smoke and hot air must travel round and round before it leaves the room, and enters the chimney; thus the heat has time to warm the flue and spread itself over the room. We did not notice anything very new from the celebrated house known as "A la Ménagère"; this is a firm which devotes its energies to selling the inventions of others. Messrs. Cuan Aîné & Co. have here a fire with a screw in the chimney, which revolves under the influence of the heat immediately below, and by its revolutions greatly increases the up-draught, thus causing the fire to burn with more vigour, and also ventilating the room. In the main building this firm have other objects of interest; and it was their stove which, during the fearful winter of 1871-72, warmed the northern portion of the Palais de l'Industrie, imparting a temperature of 20° centigrade, while outside the thermometer had fallen to 19° below zero. The system adopted seems to recall Gurney's batteries, modified to a triangular shape.

In the Annexe des Machines we found apparatus for making Seltzer and other effervescing drinks, and regret to note that but little supervision is exercised as to the nature of the water employed. One important firm confessed to us that they used Seine water, though so much money has been spent to provide Paris with water from the pure sources of the Vanne and the Dhuis. In front of the annexe devoted to French machinery, we found a pavilion where all the mineral waters of France were exhibited, and a great number of them can be tested at the trivial cost of 15 centimes a glass, including a pleasant admixture of syrup. The thirsty visitor should, however, be careful which water he selects, as some produce powerful effects. And now, we have at last completed our journey round the outside of the main building. We entered by the Porte Rapp and turned to our left, and worked round till we have returned to our starting-point, including the Trocadéro gardens in our long journey. When we consider that notwithstanding our efforts to condense our materials, we have not yet mentioned the contents of the main building itself, some idea may be formed of the immensity of the Exhibition. At the same time, the result of great efforts, in which all nations have participated, cannot be dismissed in a few paragraphs, and we are glad to offer our meed of praise to these useful endeavours.

THE NEW INTERNATIONAL POSTAL TREATY.

THE stipulations of the new international postal treaty which was signed at Paris in June have been published, and it is now possible to furnish exact particulars of the nature of its most essential conditions, and the changes effected in the old regulations.

The new treaty, in its main points, is based on the approved principles of the Bern Convention. It may be looked upon as adding strength to the provisions of the latter compact, which has now, in a sense, been superseded by the new treaty. By this instrument the Postal Union has been considerably enlarged, including within its scope almost all civilised countries of the globe, and especially subjecting to its regulations the numerous and important mail steamer lines. It provides further facilities for international postal intercourse, and carries out more stringently the principle of uniformity of rates than was possible in its initiation in 1874, when various provisions of an exceptional and transitional nature could not well be avoided.

At the Postal Congress which met recently at Paris, all the countries belonging to the Postal Union were represented by delegates, with the sole exception of Persia, the representative of which was prevented by illness from attending. Delegates also were present from Canada, Chili, Hawai, Hayti, Liberia, Mexico, Peru, Salvador, Uruguay, and Venezuela. Those from Canada, Mexico, Peru, and Salvador have signed the new convention, by which their respective countries have become members of the union. The representatives of the remaining countries above mentioned have declared the accession of their countries to be impending. The Postal Convention of Bern was signed by twenty-two, the Postal Treaty of Paris bears the signature of thirty-two contracting parties. At the time of the foundation of the Postal Union in 1874, the twenty-two countries included populations of 345 millions; by the Paris Treaty, 750 millions of inhabitants of thirty-two countries are benefited. Outside the union are only several English colonies, a few republics of South and Central America, and China. In the case of China, however, it must be taken into account that there exist in the most important seaport towns of that country both English and French post-offices, which belong to the union, and that, besides, Russia maintains, for the expedition of letters, a land-post as far as Pekin, charging only union postal rates. China must therefore be considered to all intents and purposes as already belonging to the Postal Union. Having regard to the altered conditions, the name of "General Postal Union" is changed to "International Postal Union." The new convention is to take effect on April 1, 1879. According to it, the postage for a letter has been generally fixed at 25 centimes = 2½d. Besides this general rate, a second postage of 5d. has been introduced for trans-oceanic countries, which have entered the Postal Union in 1876 and 1877, on account of the expense of sea and land transit. The various Governments may retain this rate of postage in future, but they are not bound to do so, complete liberty of action being reserved to them. Having regard to this, and the postage for land transit, for which formerly two rates of 1s. 8d. and 3s. 4d. per kilogramme of letters existed, being in the new convention universally reduced to 1s. 8d., and the compensation for sea transport for long distances from 1*l.* to 12s. 6d. per kilogramme of letters, it will in future be possible to adopt one uniform rate of postage of 2½d. per letter. Before the foundation of the union the various rates of postage to countries now belonging to it were very numerous, and the number of rates charged for the mutual interchange of letters in the thirty-two countries that have given in their adhesion to the Bern Treaty was over 1,200.

For postcards, a uniform rate of 1½d., instead of 1½d. and 2½d., will be introduced.

It is the same with respect to the rates for printed matter and samples. In the case of the latter, the various differences have been removed; the present minimum postage of 1½d. will be accepted for the whole extent of the union. For samples of a weight up to fifty grammes, hitherto subjected to a postage of ½d., an increase of the tax was necessary. This could not well be avoided, as, on the one hand, the present differences have been removed, and, on the other, the great majority of the Governments represented at the Congress were of opinion that the minimum rate of postage of 1½d., existing in Germany, was to be looked upon as an adequate compensation for the work imposed upon the post-office in receiving, despatching, and delivering such parcels, the number of which is not considerable.

A proposal made by Germany, of admitting in the International Postal Union not only samples, but also small parcels up to a weight of three kilogrammes, was discussed at the congress. But difficulties were raised from various and influential quarters, especially by countries not possessing a carriage-post. It was resolved for the present to refer the proposal to the International Bureau of the International Postal Union in Bern for consideration.

For letters and parcels not sufficiently franked, relief has been found, the additional tax to be levied in future being no longer assessed in accordance with the postage for unfranked letters. In close relation with this regulation, it has been found possible to abolish the provision of the Bern Convention, according to which insufficiently-franked newspapers were excluded from transit within the Postal Union.

Already, at the Postal Congress held at Bern in 1874, it was proposed to admit for transmission within the General Postal Union, besides ordinary correspondence, also letters containing valuables and money orders. At that time considerable difficulties, of a nature not then easily to be overcome, opposed themselves to carrying out the scheme. The Postal Congress of Paris in 1878 has succeeded in framing two agreements, of which the one, respecting the transmission of letters with valuables, has been signed by eighteen; the second, concerning the issue of money orders, by sixteen, contracting parties. Further adhesions are expected.

The new Postal Treaty may be pointed out as another progressive step in opening up the friendly intercourse of nations. It weaves a visible bond of union round almost all civilised peoples, reminds them of its benefits, and forms a powerful impetus for similar efforts in related branches. We now count by millions those who experience daily its relieving and facilitating effects on the intercourse and the exchange of ideas in the various material and intellectual spheres of human activity.

FAMAGOUSTA.

THIS town, situated on the eastern side of the Island of Cyprus, and thirty miles north-east of Larnaka, with which it might be connected by a narrow-gauge railway, offers, it is said, greater facilities for the construction of a harbour,—and no harbour exists on the Island at present,—than any other. A plan has been prepared, by which an area of about 300 acres could be converted, with a certain amount of dredging, into a harbour, with a minimum depth of 27 ft., where vessels could be afloat at all times under shelter. It is proposed to construct a breakwater, to run in a N.N.E. direction, about three-quarters of a mile in length, along the ledge of rocks, which at present affords a certain amount of shelter to vessels, and would form a natural foundation upon which to construct the work. These rocks in places rise so high out of the water as to leave comparatively little artificial work to be performed to complete the structure. This isolated breakwater would shelter the proposed harbour from easterly and southern gales, while the trend of the coast on the north and east would protect shipping from storms coming from the northerly and north-easterly quarters. The estimate of the probable cost of the works as made by the engineer, Mr. Hamilton Fulton, amounts to 500,000*l.*

The National Portrait Gallery. — Earl Stanhope has presented a marble bust of his father, the late Earl, to the National Portrait Gallery. The bust is copied by H. H. Armstead, A.R.A., from the original at Chevening, which was executed at Rome in 1854 by Lawrence Macdonald.

THE LATEST STAGE IN THE DECORATION-SCHEME FOR ST. PAUL'S.

WE adverted last week to the fact that a new report had been published by the Committee for the Decoration of St. Paul's Cathedral, and gave a short extract embodying the statement as to what the Committee had actually up to this moment undertaken to do. The report has been so generally published in the daily papers that it is hardly necessary for us to republish it here: it has probably been seen by every one who is interested in seeing it. But the occasion of publishing it is one which marks a new stage in the proceedings of no little importance, and which cannot but be satisfactory to us, in so far as it is a move in the direction which we must regard as, comparatively speaking at least, the right one; at all events, it is a move away from what we have before thought it necessary to condemn as totally unsuitable, both from an artistic and an intellectual point of view.

To speak more plainly (since in regard to a matter of such public interest it is necessary to speak plainly), it seems pretty obvious that the proposal to cover Wren's building with designs in a semi-Gothic, semi-Byzantine manner, and inspired by a religious or ecclesiastical feeling totally at variance with that which prevailed when St. Paul's Cathedral was built, is finally disposed of by the discovery of the design sketched on a large model by the sculptor of the Wellington Monument, and to which the committee seem now almost entirely to have transferred their allegiance. Those who remember in how enthusiastic a spirit Mr. Burges's Byzantine designs were commended to public admiration may think that to find a similar enthusiasm now transferred to a design so utterly at variance with it as that of Stevens, does not say very much for the calmness of judgment of a committee who seem prepared to admire such opposite things* with equal zeal. However, we, who objected from the first to the whole spirit and style of the former design, may, at least, be glad to see attention drawn towards one which is broad and grand in style, and is in keeping with the architectural feeling of the building. Stevens, in fact, worked by choice in the style which Wren himself would have approved, and whatever there may be to criticise in his design in detail, its very faults are in harmony with the architectural detail by which it would be surrounded. Whether on that account such faults (for faults there certainly are) should be retained, or whether we should not endeavour to design in harmony with Wren's building while avoiding the defects inseparable from the architectural style of his day, is of course a point deserving careful consideration.

The design by Stevens, which the committee have acquired, is now in the chapter-room at St. Paul's, where we had an opportunity of examining it. It is a model of half the dome and the drum, taking the section on the diameter of the dome so as to show the interior face; the model, which stands several feet in height, takes in also the heads of the arches carrying the dome. It is, however, incorrect architecturally in detail, as the pilasters beneath the dome do not lean inward, as in the building, and are besides too short in proportion, and the section of the dome is rather too flat. It is, however, quite sufficiently correct for the purposes of a sketch, which is all that it can be said to be. Upon the concave surface of the model dome the design is drawn, in a style entirely suggestive of and based upon that of Michelangelo, so far as the figures are concerned; the architectural detail is more that of Wren. The portions which in the report of the committee are spoken of as the "ribs," and which are coincident with the main lines of buttressing of the dome, are treated in a semi-architectural manner, and consist of a composition extending in a narrow strip from the springing to the apex of the dome, made up of a rather heterogeneous collection of florid architectural details and figures mingled together, or piled on one another, the whole standing on the shoulders of groups of stooping figures, who perform the part of Atlas to the structure over them. Between these ribs the wider spaces contain a considerable field of plain gold surface, with a large circle in the centre of each space in which the principal pictorial design is to be introduced, and a smaller circle similarly used in the narrower part of the space near the apex; these circles are slightly connected with the design of the ribs by horizontal bands connecting their borders with the borders of small panels in the rib designs. The large circles contain important subjects from the Old Testament, the smaller ones subsidiary subjects from the same; and beneath each of the large circles also is a more conventionally treated prophetic figure in an architectural frame forming a kind of niche. The drum of the dome, beneath the order of pilasters, is covered with a conventional ornamental design, so roughly sketched, however, that it is not easy to make out the precise intention.

The figures in the dome design are sketched with the same power of conception and freedom of design which characterise so remarkably the sculptured works of Stevens, and there is a general impress of genius about the whole which asserts itself at once, in spite of the roughness of execution. At the same time it must be said that the design as a whole is essentially a painter's and not an architect's design; and when we regard it from an architect's point of view it is evident that it has some shortcomings in regard to the scheme as a whole. The introduction of the "rib" composition at the points of buttressing is a recognition of the architectural construction, but in this respect it goes either too far or not far enough: there is not the slightest hint of structural stability in the oddly built-up collection of details forming these ribs, which, while they give (and are intended to give) a sort of quasi-architectural appearance to the whole, are disjointed in composition and ragged in outline. Thus they break up the design into vertical strips, but not in a sufficiently conventional or architectural manner: the composition is either too artificial, or not artificial enough. Two systems might equally be adopted in decorating a space like the dome; either the points of construction and the architectural expression might be ignored, and the whole treated simply as a pictorial design on a concave surface; or the whole might be divided into sections by a symmetrical architectural design forming the framework of the pictorial designs; but in that case the architectural framing should be carried out on true architectural principles and methods. This is not done in Stevens's sketch, so that it seems to be neither the one thing nor the other. There is also an obvious mistake (easily rectified) in showing the designs in the large circles with precisely the same gilt ground as on the spaces outside the circles; the pictures should certainly have a different ground, either in colour or in texture, from that of the intermediate spaces, otherwise the circles which frame the pictures would appear merely as *applied* to the surface of the dome, instead of being the confining limit of a pictorial design enclosed within the circle.

In the same room is a model prepared under the direction of Mr. Penrose, giving the correct section of the dome, and having sketched out on its inner surface a modification of Stevens's design, leaving the larger circles empty for whatever may be suggested as the most appropriate subjects, and modifying the design of the ribs so as in some degree to remedy the defect we have spoken of, by giving them a more connected architectural design. This latter modification, however, if made at all, requires carrying further than is done here; the ribs are a little more symmetrical in appearance, but they are still unarchitectural. If this alteration is what was complained of in Mr. Clayton's letter in the *Times* of the 23rd, we hardly think his complaint called for; the original design as it stands is not faultless, and the modification, so far as the "ribs" are concerned, is undoubtedly an improvement. If, however, the committee intend, in addition to these alterations, to substitute entirely different designs from the Apocalypse for Stevens's Old Testament designs,* it is obvious that there will not in that case be much of Stevens left;—not that we regard the committee as in any way pledged to carry out Stevens's design because they have bought the model; but there is certainly a claim to be made that the sketch of a great artist, if used, should be used with respect, and not merely pulled in pieces to be made use of in putting together a new design; and, at all events, we hope that Mr. Oldfield by this time regrets the ill-judged remark into which he was betrayed in his letter in answer to Mr. Clayton, that the committee, having bought the model, "had a right to burn it if they chose": an expression, to say the least, in very bad taste.

In the same number of the *Times* in which that letter was printed (24th ult.) appeared one from Mr. Cockerell, drawing attention to a point of great importance,—the effect of the proposed decoration on the aërial perspective of the interior. The committee had urged that the employment of the gold grounds and light colours used in Stevens's design would go far to relieve and remove the darkness of the dome. Mr. Cockerell says, in reference to this,—"May not a too-thorough remedy of this assumed defect produce another defect of a much more radical and destructive kind? We are so accustomed to abuse the atmosphere of London, that we have come to overlook the cardinal merit which it possesses of lending by its haze an artificial distance, and thereby conferring upon such a building as St. Paul's an apparent size which it does not in reality possess, and which an outlay many times greater than that now to be made would not, under other conditions of climate, have procured. Those who have long frequented and loved St. Paul's will painfully remember the disastrous sensation of loss of space which they experienced on first seeing the restored paintings of Sir James Thornhill some twenty-five years ago. If even a monochrome (perhaps a little hot in tone) produced such an effect, what may be expected of the 'bright colours' which by piercing the friendly haze will rob the dome of half its space? It is worth considering whether a sufficiently decorative effect may not be obtained without loss of scale by the use of aërial tints, even of a monochrome, for which the gray-blue treatment of the Limoges enamels (with perhaps an increased proportion of gold) might offer valuable suggestions."

That this criticism is not made without reason we are convinced; and, while very glad that anything so much more in keeping with the building than some former designs could be said to be, seems to be finding favour, we cannot but recur to an old fear on our own part, that it is hardly wise to spend so much on decoration of a high-class where it will be so little seen, and where, if it should turn out a mistake, the mistake would be so very serious. Immediately after studying Stevens's sketch, we walked from it into the cathedral, and, standing under the dome, endeavoured to realise how it would appear if executed. The result to the mind's eye was not satisfactory. It appears to us that if the important pictorial subjects contemplated are carried out with such force and brilliancy of execution and material as to be effective from below, the architectural effect and the scale must infallibly be lessened; and we doubt very much whether even under these circumstances what was lost in the architecture would be gained in the pictures. Our impression is, that pictures on ceilings are generally a mistake, and more particularly so in very lofty buildings; that they can never be properly seen, and that they and the architecture mutually injure each other. Before any of the great expense contemplated is incurred, we should strongly suggest for consideration whether the dome may not be more effectively and suitably decorated with some more conventional or architectural decoration, not destitute of meaning, but such as would give sufficient colour and brilliancy of effect without involving the execution of elaborate and most expensive works of high-class pictorial art in a situation where they must be all but thrown away.

* From the names appended to the recent report, the constitution of the Decoration Committee seems to have changed negatively by the retirement of some who were formerly members; but all who are now on it were, we believe, members from the first.

* We have received a pamphlet from Mr. Oldfield, entering into new suggestions for the subjects for the principal pictures, to be taken mainly from the Apocalypse. This part of the question involves, of course, other considerations besides those pertaining to art, and we cannot go into it just now; but it is one of great importance, on which we may have something to say on another occasion.

Liverpool Art Club.—The committee of this club propose to open an exhibition of the works of Josiah Wedgwood during the next session. It is proposed, in order to make this exhibition a useful representation of Wedgwood's productions, to exhibit the specimens, so far as it is possible, in the order in which they are described by Wedgwood himself in the various editions of his catalogue. A committee, consisting of Messrs. William Bartlett, A. H. Brodrick, Charles T. Gatty, and T. Shadford Walker, has been appointed to carry out this plan, and they are asking possessors of old Wedgwood ware to give them some general description of the works they possess, and which they would be willing to exhibit.



REREDOS: HOLY TRINITY, COVENTRY.

REREDOS: HOLY TRINITY, COVENTRY.

THE reredos in the church of the Holy Trinity, Coventry, and of which we give a sketch, was executed in Caen stone, by Messrs. Farmer & Brindley, from the design of the late Sir G. G. Scott, R.A. It was given to the church as a memorial of the late Mr. Bill by his widow. The subjects of the panels are the Crucifixion in the centre, and the Nativity and Ascension on either side. The canopy is perforated.

THE LEGAL POSITION OF SECRETARIES TO BUILDING SOCIETIES.

IT is a somewhat unpleasant feature of modern commercial life which has been, more or less, created by the use of joint-stock companies, that the management of companies falls into the hands of a certain class who give up their life to the working of these associations, and we do not refer to managers, strictly so-called, but to that numerous class who are shareholders, and have the direction of several undertakings. This arises to some extent from the fact that the ordinary shareholder does not trouble himself with anything to do with the management of the concerns in which he has placed his property, and the management of companies thus becomes the work of a certain number of people, who do pretty much what they please with other persons' property. It is undoubtedly a bad feature, for it produces speculations, rivalries, and often a heedlessness which would not otherwise arise.

Building societies resemble other companies in this matter, but it is rather from necessity than from choice, and the influential person in the case of these associations is rather the secretary and manager than the directors. The points, therefore, connected with the legal position of the secretaries of building societies cannot be too often placed before the public, in order that those who are in any way connected with these associations may have as much light thrown in their path as possible.

The Legislature has, indeed, always given an exceptional security of some sort or other to building societies against their acting officials, which, whilst it is, no doubt, to some extent a safeguard, has still a tendency to throw more than ever into the hands of a secretary the responsible work of the society, and to induce some carelessness in regard to the supervision of affairs. Thus, under the last Act of Parliament relating to building societies (37 & 38 Vict., c. 42, s. 23), every officer having the receipt or charge of any money must become bound with at least one sufficient security, or give some other security for the payment of all sums of money due from him to the society. But as regards societies registered under the previous Acts, there is a still further provision which deserves some notice. By 4 & 5 William IV., c. 40, s. 12, executors are directed to pay out of the estates, assets, or effects of secretaries and managers, all sums of money remaining due which they may have received during the time that they held office before any other debts. It happened quite recently that the Master of the Rolls was asked to put this particular Act into force (*Re* Marriott, 47 *Law Journal* Reports, 331), in the case of a secretary who had received certain moneys of a society, who had died bankrupt, and without accounting for the funds which he had received. But there the important question arose whether, since the defalcations of this official might have been detected long before by a proper diligence in the examination of his accounts, the society in consequence would cease to have a prior claim to the other creditors. We are inclined to think that it would have been for the general benefit of other societies which still exist under the old statute that this contention should have been upheld. But the Master of the Rolls thought

differently, and considered that the society had still the first claim upon the assets of its secretary. We think this decision of doubtful benefit, because it puts almost a premium on carelessness by the directors and responsible shareholders in these societies, and is quite different from upholding the claims of a society which, though it may have been defrauded, is still free from any carelessness which has tended to produce the loss. But having given the latest decision upon this point, the present state of the law upon it is plain, and we can state it clearly, even though we may not think it wholly beneficial in its probable consequences.

But yet, whilst there are these defences against errors or faults on the part of secretaries of building societies, it is obvious that they have a remarkably wide scope for their energies. For when the secretary, as he generally is, is also the manager of the society, it will be bound by his acts. This position involves, of course, the general rules relating to principals and agents; but it is well to point out that the society will in many cases be liable for his acts, although they may not be ratified in a strictly formal manner. Some years ago this proposition was made clear by a case decided in the Court of Common Pleas, Allard *v.* Bourne and Others, 15 Common Bench Reports (New Series), p. 468. In this instance the secretary had given orders for certain repairs, which were duly executed, but he had no direct authority to give this order, nor was a meeting of the directors called to sanction it, nor was it entered in the minute-book of the building society. Still the Court decided that the directors were liable. It is true that two of them were aware that the work in question was in process of execution, but that makes little difference to the general proposition, because the work had never been formally ratified by the directors as a body; indeed, the cause of this action was their repudiation of it. Nor, again, is it very material that the society had, so to say, taken the benefit of the work, because if the Court had not considered that such unauthorised orders were within the scope of employment of the secretary, the question of the benefit to the society would have mattered very little. What is of importance is to observe that this case does give a large scope to the authority of the secretary, who has also a manager's functions, and shows that no objections consequent on a breach of the society's rules will lessen the liability of the society, if the acts which produce it can be brought within the scope of the secretary's employment. Again, another but somewhat different example of the scope of the secretary's powers is shown by another decision. In this case, the subscription of a member had been received by the secretary, but the society was wound up before the date at which, in the ordinary state of things, it would have ceased to exist. It was then found that the secretary had never paid over the subscriptions which he had received to the society, and accordingly the payer of them brought his action against the secretary to recover the amount which he had paid to him. But the Court were of opinion that he could not recover these sums, because they had been received by an authorised official of the society, acting within the scope of his employment, and if any one could recover the money it was the society which had been defrauded of its funds.

These examples may be supplemented by another which shows that, on the other hand, the mere use of the word "secretary" will not always prevent a personal liability on the part of this official. In the case in question (Bottomley *v.* Fisher, 31 *Law Journal* Reports, Exchequer, p. 417), the defendant was the secretary of a building society, who had signed his name to a promissory note, merely adding to it the single word "secretary." The note was also signed by two others, who specified that they were directors of a certain building society. The plaintiff, it should also be pointed out, was not a member of the society of which Fisher was the secretary. The question then arose, was the latter personally liable on this instrument, since he affirmed that the money in respect of which it had been given was lent not to himself, but to the society. But the Court, without hesitation, considered that the defendant was personally liable, because the word "secretary" was merely descriptive of his position, and was not any limitation of his liability. He did not sign for or on behalf of a society, but in his own name, merely adding to it the word "secretary." This is an instance which should be carefully noted by these officials, because it is pretty clear that many a man may legitimately enough fancy that when the money is lent to his society, and he signs himself with the simple word "secretary," he is secure against being held personally liable. No branch of law has given rise to more litigation than that connected with the personal liability of agents, and the means of preventing it. Anyone, therefore, who occupies the responsible position of a secretary of a Building Society, should bear in mind that, largely as the judges are in the habit of construing the scope of his employment, yet that when he puts his name to written documents of a character other than merely ministerial, he should be careful to limit his personal liability, since the scope of employment cannot enlarge, or rather, in this case, limit, the effect of a signature.

Whilst, therefore, it is obvious, from the preceding observations, that, in spite of the protection afforded by the Legislature to Building Societies in regard to the acts of their secretaries, care must be taken by those having authority in these societies not to omit careful supervision of the secretary's duties, it is of equal importance for secretaries themselves to be prudent in the way in which they put their names to documents and papers not of a strictly ministerial nature.

OUR FLOATING WEALTH.

THE annual statement of the Navigation and Shipping of the United Kingdom embodies, in a large Blue Book of 300 and 400 pages, a mass of fact in regard to our floating wealth, and the trade it enables us to perform. In addition to the tables of the number and tonnage of vessels entered and cleared from and to foreign countries, the men employed in the service, and the vessels built, it gives us the details of the trades at the various chief ports, the extent to which at each the boats are employed in deep-sea fishing, the number of persons finding employment in securing the harvest of the sea, and other allied facts in regard to the means and ends of our navigation. It appears that during last year 308,665 British vessels entered at ports in the United Kingdom,—192,003 being sailing vessels, and the remainder steamers, but in tonnage two-thirds of the whole was under steam. The foreign vessels entering were 31,653,—only 5,059 being steam-vessels, but fully a third of the tonnage was of this class. Out of this total trade first given, about an eighth part was done to and from foreign countries and British possessions. On the registers of ports in the United Kingdom there are now registered 15,090 vessels, four-fifths of which are still sailing, the total tonnage of which is over six million tons; whilst our colonies add to this 13,158 vessels, of over 1,797,477 tons.

Looking now at some of the mass of tables, we find that into the ports of the United Kingdom in the year there entered from France 10,922 vessels; from Russia, 4,980; from the United States, 4,496; and from other ports in lesser proportions. Without, however, analysing these tables, we may turn to the abstracts of the principal ports, and find that Bristol had in a year 968 vessels entering with cargoes from foreign countries; Cardiff, 1,650; Goole, 804; Grimsby, 1,219; Hartlepool, 1,314; Hull, 3,258; Liverpool, 4,184; London, 9,233; Middlesbrough, 420; Newcastle, 2,196; Newport, 1,142; North Shields, 167; South Shields, 217; Southampton, 2,187; Sunderland, 749; Swansea, 847; Dundee, 449; Glasgow, 668; Grangemouth, 727; Greenock, 396; Leith, 1,681; Belfast, 418; Cork, 312; and Dublin, 648. The growing extent of the trade by steamers makes a table devoted to that trade interesting; and it may be stated, as indicating that growth, that out of the entrances of vessels at Bristol, above given, 244 were those of steamers; at Cardiff, 444 were steamers; at Goole, 697; at Grimsby, 523; at Hartlepool, 221; at Hull, 1,689; at Liverpool, 2,080; at London, 5,350; and at other ports, in somewhat similar proportions. As to the nations from which vessels entered, we may cite London as an example. In a year there entered, with cargoes or in ballast, into the metropolitan port, 8,066 vessels from British ports; 167 from Russian; 418 from Swedish; 1,107 from Norwegian; 437 Danish; 936 German; 411 Dutch; 89 Belgian; 128 French; 117 Spanish; 6 Portuguese; 49 Austrian; 10 Greek; 94 United States; and 4 from other countries.

Classed according to tonnage in the most recent year, and taking the vessels employed in the home trade to illustrate the whole, it may be said that out of 11,662 vessels in that trade, 5,379 were under 50 tons; 4,075 were between that tonnage and 100 tons; of 100 and under 200 there were 1,612; between 200 and 300, 252; 119 were between 300 and 400 tons; 128 between 400 and 500 tons; 58 between 500 and 600 tons; 31 between 600 and 700 tons; and 8 above 700 tons. In the foreign trade the proportion of the higher tonnages was larger; and, as may be expected, if the vessels be divided into sailing and steam, the latter give a great preponderance to the vessels of greater burden. In the larger ports, also, the proportion of vessels of small tonnage is limited, and it is in the smaller ports that the bulk of the vessels of limited burthen are employed. Passing on to the boats registered under the Sea Fisheries Act of 1868, we find that they are divided into three classes,—the first, boats of 15 tons and upwards; the second, boats of less than 15 tons "navigated otherwise than by oars only"; and the third, boats navigated by oars only. Of the first class there are registered as owned at seventy-eight English ports, 3,425 boats,—the aggregate tonnage of which is 137,768; at twenty-five Scotch ports 2,940 boats of 51,039 tons; and at nineteen Irish ports 405 boats of 9,861 tons; in addition to which there are between two and three hundred vessels registered at the Channel Islands. Of the second class, in the English ports, there are 7,130, of about 34,000 tons burthen; in the Scottish ports 8,309; and in the Irish ports 2,817. And of the third class, there are registered at the English ports 1,912; at the Scottish ports, 1,105; and at the Irish ports, 3,002. There are employed in the working of these fishing-boats 59,382 men and boys regularly, and in addition 54,236 occasionally.

As to the additions to our floating wealth, we have the figures for seventy-three English ports, at which in the year 571 sailing-vessels, of 114,515 tons, were built, the bulk of which were wood, and 262 steamers, all of which, except thirty-one, were built of iron. In Scotland, 119 sailing-vessels, of 88,963 tons, were built at fifteen ports, as well as 125 steamers, of 51,561 tons. Ireland built at seven ports seventeen sailing and two steam vessels. These numbers are in each case exclusive of vessels built for foreigners; and at ten English and Scottish ports there were fifty-six vessels built,—all steamers with three exceptions. In these facts, then, we have an approach to a statistical compendium of our navigation and shipping, of our floating wealth, as well as some indication of the results of the trade these figures portray. There has of late been considerable discussion as to whether our industrial supremacy is being successfully assailed. Into that question it is not now desirable to enter; but the figures which we have compressed so greatly point out that, whether Britain continues to be the manufactory of the world to the extent that it now is or not, we may fairly come to the conclusion that it remains as fully as of yore the sea-carrier of the world. We are still also very largely shipbuilders for other nations; not only by the small number of vessels built for foreigners directly, but also by the large number built for English owners, and afterwards sold to foreigners. It is, therefore, a conclusion to which the facts fairly point that, whether or not in other directions Great Britain is retrograding, in this she holds her own, and she still as largely as before, in Whittier's words, "helps to spread the silken chain of commerce round the world."

Paper.—An International Exhibition of all kinds of paper and pasteboard has been opened at Berlin, and will remain so till September 1st. The exhibition promises to promote effectually the manufacture of the important articles to which it is devoted. Five hundred and thirty-one firms, including most of the leading houses in Germany, Austria, England, France, Belgium, Holland, Denmark, Sweden, Russia, Italy, Switzerland, and the United States, have contributed towards the Exhibition. Besides every variety of writing and printing paper, there are special departments for paperhangings, paper blinds, and paper for building purposes, the general applicability of the article being demonstrated by a paper house erected in the courtyard, with tables, chairs, chandeliers, and stoves of the same vegetable material. Machinery employed in the production of paper is also shown.



BUILDINGS AT THE PARIS EXHIBITION: GREECE, DENMARK, AND CENTRAL SOUTH AMERICA.

THE BUILDINGS FOR GREECE, DENMARK, AND SOUTH AMERICA, AT THE PARIS EXHIBITION.

NOTWITHSTANDING the critical period through which Greece, during the progress of the Exhibition, was passing, she did not hesitate to take part in it, and nothing has been neglected, as far as time would permit, to make her exhibition as complete as possible. It is to be regretted, however, that events in the East have prevented the large ironfounders from being represented; and tanning, so important an element in Grecian industry, is but imperfect. "Under these conditions," to quote from M. Mausolas's admirable preface to the Grecian catalogue, "Greece presents herself to the world as an humble disciple of progress, in order to prove that nothing has been neglected by her for the development of the elements of civilisation, and that her tendencies and aspirations towards the principles of progress are inherent to her existence."

Visitors to the Paris International Exhibition would do well to make a careful inspection of this section, and obtain the catalogue, which is full of instructive matter. Preceding the list of exhibitors, there is a brief interesting geographical sketch by M. L. Lambros, while the geology and climate of Greece are treated of by MM. A. Cordella and E. Dragoumio. A few statistics are added, which prove the advancement Greece has made since she threw off the Ottoman yoke. In a separate catalogue will be found a list of the famous mineral waters of the country. The façade of the Greek section, pure and simple in style, is due to M. Benar.

Denmark, the birthplace of Thorwaldsen, has chosen for its façade a study from the Exchange at Copenhagen, and entrusted its execution to M. Duhleanp. In architecture, Denmark followed the general impulsion of Europe, but in a manner that national motives, above all those of the Danish Renaissance, have been made to predominate in monumental architecture and in industrial art, which is cultivated with much zeal in that country. M. Alfred Vaudoyer is the architect of the façade which distinguishes Central and South America.

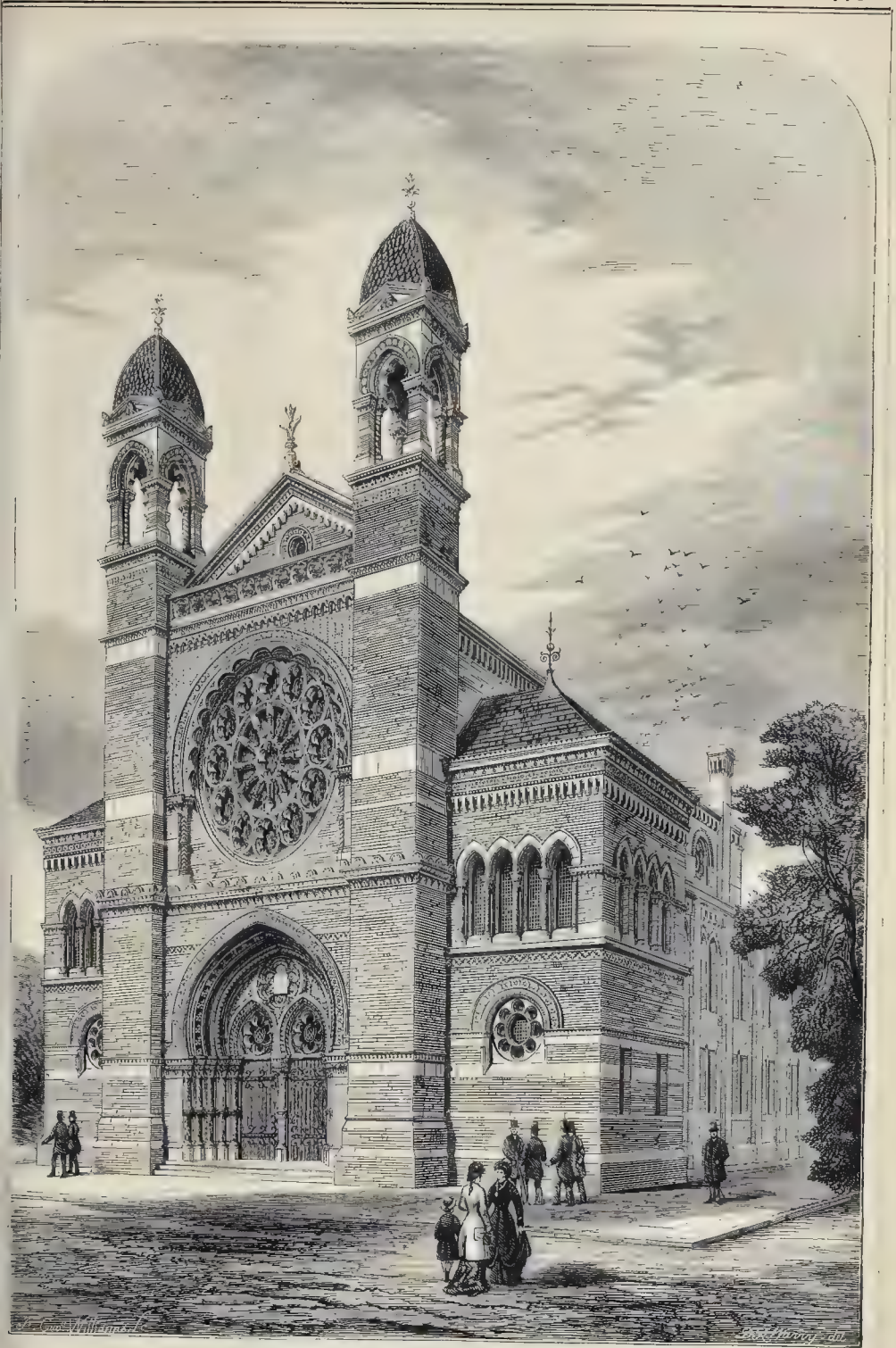
NEW SYNAGOGUE, PETERSBURG-PLACE, BAYSWATER.

WE give herewith a perspective view of the exterior of this building, which is now in course of erection. The synagogue has a frontage of about 71 ft. to Petersburg-place, and a depth of about 100 ft., and is well lighted on all four sides. The main entrance is by a recessed porch, in the centre of the west frontage, flanked by two turrets which terminate with minarets. There are, in addition, two subsidiary entrances at the north-east and south-east corners. There are four staircases leading to the galleries. The dimensions of the building on the ground floor are 65 ft. by 61 ft., and on the gallery level, 83 ft. by 61 ft., and it is calculated that the entire building will accommodate about 900 worshippers, although seating for a much smaller number is provided in the first instance. The style is Byzantine. The internal arrangements differ somewhat from those which usually obtain in the orthodox London synagogues, the ark being intended to be in the nature of a shrine placed in an apse or vaulted recess. The choristers will be placed in a gallery behind the ark, and nearly level with the ladies' galleries. In this position they will be well heard, without being seen by the worshippers. The ark and almemmar will be of marble. The exterior of the building is of red brick, with dressings of red Mansfield stone. Mr. N. S. Joseph, of Coleman-street, and Messrs. Audsley, of Liverpool, are the joint architects. The works of the substructure have been carried out by Messrs. Adamson & Son, of Turnham-green, and those of the superstructure by Mr. George Shaw. It is expected that the building will be open for service at the end of the year.

THE CAREER, IN GREAT BRITAIN, OF REVIVED GOTHIC.

THE Gothic style of architecture was a result of the overthrow of the Roman Empire by the Teutonic tribes from the North of Europe. But for this great event there would, we may presume, have been no such style; but, instead of it, a Romanesque something between our present Anglo-Classic and Gothic, which latter could only have arisen in the hands of nations who were regardless of antiquity, reverence for which would always probably have confined the Mediterranean and Celtic races to a more or less pure Romanesque style, as it did in South Italy and in the South of France, where Classic or Celtic races remained. While, on the other hand, there would have been no introduction of pure Classic or Roman to this side of the Alps, had there been any revival of it in Italy. Christianity alone would not have created Gothic, for it existed for ages after its emergence from the Catacombs without doing so. But while content in the hands of the Romans and Classic races with a pure Classic Romanesque or Byzantine style, in the hands of the Teutonic tribes it sought to give utterance in architecture to the new ideas and hopes which it inspired, and to reflect therein the new conceptions of the Deity and the high destiny of the soul, and so originated the Gothic system.

It was natural for the descendants of these Northern tribes to attempt the revival of their architecture a generation or two ago; a momentous event, if we consider its upstirring and awakening effect on the worlds of art and literature,—its relation to the new science of archæology and historic criticism, to ritualism, &c. All we have to regret is, that it was not taken up in a more enlightened spirit; that its revivers did not more carefully forecast their enterprise, so as to commence from the truest or best starting-point, and in the right direction. At first sight it might seem most natural to have begun where the Mediævalists left off in the



NEW SYNAGOGUE, PETERSBURG PLACE, BAYSWATER.—MR. N. S. JOSEPH AND MESSRS. AUDSLEY, ARCHITECTS.

sixteenth century; but as the stream had grown corrupted, and the later phases of it were not the best, the perfect Gothic of the Decorated period presents itself as the fittest nucleus, round which every beautiful element in other periods that would harmonise with it might grow, till nothing was lost. The most important point of all would have been to make the revived style reflect every modern circumstance that could or ought to influence it; and the changes in the general condition of society since the period of its discontinuance, brought about by the mighty events in the political, religious, and scientific worlds; which have impelled thought and enlarged the boundaries of the intellectual and moral worlds, with which the fairy-realm of the imagination, peopled by the deathless progeny of the poet, has kept pace. Nothing needed to be lost, for all the periods of Gothic present elements too valuable to be abandoned to oblivion; and the course here indicated would bear some analogy to that of the Bolognese School of the Caracci in painting, which aimed at uniting the perfections and charms of all the other schools,—the grace and sweetness of Correggio to the drawing of the Roman School and the colouring of the Venetian. It would be gathering from every period the scattered rays of truth and beauty, and making of all periods one copious treasury or fountain of elements, to be artistically and harmoniously recombined, as we combine words in literature, according to the laws of grammar, logic, rhetoric, &c.; so copious as to enable the architect to go "from grave to gay, from lively to severe," and embody every variety of character.*

This is truly using ancient architectural examples,—resolving them into their original elements, and re-using those elements as a language, —a sort of hieroglyphic language,—between which and literary language there is undeniable analogy: the latter has its more important words,—its roots, which are said to be the verbs, action being the primitive idea of each; and so has the architectural in its piers and arches, columns, &c. The architectural differs from the literary in being a natural language, while verbal language is an artificial or conventional one. It more resembles that primitive and untaught language of human beings by which they endeavour to express emotions or desires, and which consists of the action of the limbs, gestures of the body, and play of the features. It differs also from the literary language in this: its elements are more or less susceptive of the further impress of mind upon them; and in the process of being re-used or applied to a new purpose by a true artist, they cannot escape the influence of his judgment and taste, feeling and fancy, which go to give the work into the constitution of which they enter a claim to originality,—a quality that follows naturally upon the exercise of artistic mind.

Some few elements of this great treasury would be unimprovable, and to touch them with an eye to refinement would be like gilding fine gold, but most of them would be susceptive of the artistic stamp. Some could be pointed to which should be looked upon as well-nigh obsolete. Such, for example, is the Lancet window, the step from which to the Decorated is one which no artist should dream of retracing; which is as if a painter went back to the primitive monochromic method of his art. It is employed, I believe, for its simplicity and cheapness; but a church may be very simple and inexpensive with some of the graces of the Decorated window, without which Gothic is but faintly Gothic. Salisbury Cathedral is, I own, a building of great beauty; but it owes it not to the Lancet window, and would have been a finer building had it been as uniformly built after the Lancet window was superseded. The latter, however picturesquely grouped or originally treated, bears no comparison to the broad-mullioned, tracery-fraught window,—the glory of the Gothic style,—which is the most favourable to the highest qualities of architecture, and the introduction of which should have sealed the fate of the Lancet window for ever. For a very humble village church a Lancet window may be fitting enough, but surely it was a mistake of some architects awhile ago to introduce it into the designs for a cathedral.

The style could scarcely progress in the present day so steadily and uniformly as in the Middle Ages; individual mannerism would here and there betray itself. It must characterise the modern age. One artist, I suspect, would have a peculiar feeling for this feature, another for that. But the style would advance and modernise itself, nevertheless. The conduct of art is different from that of science: in our inquiries into the laws of the universe, it is important, following the precept of Lord Bacon, sternly to destroy all idols of the intellect; in the pursuit of art idols of the intellect and the imagination may and must be utilised. That the style in question can modernise and adapt itself in the way I am endeavouring to indicate is proved to me by the fact that I have, more than once, come upon a modern Gothic church that has charmed me like a Mediæval example. Exhibiting the impress of modern mind on Mediæval materials already consecrated by lofty and endearing associations, it has been like the first glance and tone of love,

> "New, as if brought from other spheres,
> Yet welcome as if loved for years."

One of the most notable effects of this truthful treatment of the revived style would be the disappearance of the warlike character which, to the last, was worn by the Mediæval Gothic, rendering churches and cathedrals semi-castles; and the reflection of the more peaceful character of the modern age, as well as the true genius of Christianity. To this nothing would more contribute than the suppression of embattled parapets, and introduction of those aspiring features the most contradictory of earthly strife and ambition, and symbols of piety—pinnacles and spires, which point as with silent fingers to the sky and stars, and sometimes, as Wordsworth remarks, when they reflect the brazen light of a rich sunset, appear like pyramids of flame turned heavenwards.

Another result of truthful treatment of the style would be the exhibition of the utmost refinement consistent with correct expression of character, which should be sought in a vertical style as well as in a horizontal one. Northern Gothic, as well known, owes much to the works of the Saracens in Syria and Egypt, through the Crusaders; and probably to the Italian Gothic of such edifices as the cathedrals of Orvieto and Sienna, as well as to the beautiful offspring of Saracenic and Byzantine,—the Venetian Gothic. I believe Northern Gothic might be still more indebted to them for delicacy and beauty, and would be if architects generally imbued their minds with those southern and Oriental styles to the extent which they deserve.

But it is the Classic which most imperatively demands its part in the modern Gothic, it being amongst us and about us. Styles can no more escape each other's influence than human beings; and the two styles in question are prone, not only to influence each other, but to mingle, as they did in the Elizabethan. I think that mutual influence, at least, should be encouraged, which it can only be to good purpose through the uniform, impartial culture of architects, which is in itself desirable. The Gothic practitioner of the present day will be an imperfect architect if he turn his back on the style in which alone purity and grace in detail was carried to perfection by the Greeks, as will the Classicist who slights the style (Gothic) in which picturesqueness of outline and composition completed its climax; and whose monuments amongst us should render our Classic more picturesque than it would otherwise be. A Gothic practitioner should acquire such knowledge of and feeling for the Classic that it would become, not merely the furniture of his mind, but a part of his mind itself. It is essential to his education as an architect, as well as to his duly proving the capabilities of the Gothic style, which I hold may unite all the grace of the South to the vigour of the North. I am persuaded the utmost Doric delicacy, including the application of diminution and entasis to piers, would long ago have been introduced, but for undue influence of precedent, and forgetfulness of the paramount claims of beauty in art, which, as the symbol and shadow of God, should be secured in His temple, as well as expression of religious ideas.

A third result of the course here indicated would be the exhibition of a truer appreciation of sculpture, which, in more directly appealing to human feeling and intellect than architecture, is an inlet into it of higher qualities. There are some practices of the Mediævalists, in their application of sculpture, which should be looked upon with caution; for instance, they were not careful to introduce their statues so as to relieve the rectilinear forms of the architecture, and increase the variety and harmony by their diagonal and curved lines. While, on the other hand, they sacrificed sculptural beauty to the conveniences of the architecture, as when they bent the human figure round archivolts, or placed it radiating, as in the entrance to the nave from the cloisters of Norwich Cathedral. Sculpture deserves better treatment than this. It deserves ample spaces, wide-enough niches, where its beauty and capability could be fully developed, and which there is nothing in the nature of the style to forbid. If it demand drapery, so much the better for the statues, for draped figures always look more dignified than naked ones, and certainly more proper. Nude statues were in harmony with the naked spectacles which, at the Olympic games, corrupted the manners of the Greeks, and, as noticed by Gibbon, banished from the stadium the virgins and matrons, but not with Christian manners or morals. Besides which, statues may be so draped as to lose little of their beauty of form, which is highly important. Sculpture having but one power, the power of pure form, with which to captivate, that power should not be sacrificed, as it was in the Mediæval sculpture, to expression. Expression, which is beauty in action and passion, is important in Gothic sculpture; but the artist should bear in mind the grand law of the art, which requires the infusion into his statues of the greatest amount of life and thought with the least deviation from beauty. In great buildings where means are sufficient for the employment of the highest minds upon it, the embellishment may include the divine in human form, even ideal beauty; for I hold that, as in the Greek, the sculpture introduced into Gothic may be of the very highest kind.

As sculpture can breathe in other materials than stone, I cannot see why statues might not be of a different material from the building, as bronze; nor do I see why they cannot, while adorning architecture, be often made to snatch from oblivion the lineaments of real demigods and heroes, benefactors of their race, as portraits.

Another result of truthful treatment in the revived style would be the exhibition in it of more refined and higher religious feeling on many points than that shown by the Mediævalists. It has, I am aware, been usual to speak despairingly of religion having any influence at all on architecture now. But as religion exists still, I cannot see why it should not be the muse of the modern architect as it was of the Mediæval, and of the pre-Raffaellite painters of Italy of the fourteenth and fifteenth centuries, if it is not to be with us a mere theological notion or name, but a vivid mental image, living in the imagination and swaying the heart. True religion links man to the divine nature, and, as nothing takes so firm a hold on the imagination as the superhuman, nothing should be so vividly reflected in works of the imagination, or have a more hallowing influence on them, especially on those dedicated to the Deity, whose presence therein, bodily or spiritual, the Christian architect must believe in.

Gothic architecture cannot dispense with an inspiration to which she almost owes her existence, and of which her great works seem the organic creatures; works which alone are sufficient to inspire the modern architect with something like the Mediæval enthusiasm. So much art and science were never before blended with poetry as in these creations, which are emblems of man's relation to the Infinite, and embodiments of Biblical poetry of superhuman grandeur. Our religion should not only inspire as lofty an ideal in architecture, and every possible excellence and glory of art, but it ought to secure its purification from everything gross that inferior manners and morals may have communicated, such as forms taken from the old Pagan mythology of the Northmen, and whims and jests of carvers and workmen. If it again animate the workman, and there is no reason why it should not, the better for the architect, the architecture, and himself.

Had such as I have faintly sketched been the career of Gothic architecture, to which I think a sufficient portion of the art spirit or genius, which, as fabled of the universal menstruum searched for by the old alchymists,

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* In an early paper, entitled "The Nature and Extent of Originality in Architecture" (*Builder*, vol. viii., p. 356), I endeavoured, at considerable length, to show the fallacy of those who would cut every sympathetic link that binds us to ancient and foreign art, and make us, spider-like, evolve all from our own minds. The value of the architect, as of every other votary of art or science, consists in rightly using the materials prepared for him by former men. The attempt to make a style that could take any hold on the human heart or fancy out of nothing, reminds of nothing so much as the project in "Gulliver's Travels," of extracting sunbeams out of cucumbers.—S. H.

can blend and harmonise the most discordant elements, would not have been wanting, every church erected by the humblest practitioner would of necessity have been in the style of the day, with some leaven of the nineteenth century in it; and we should not be every now and then hearing the strange anomalous announcement, in the public papers, of a church being just opened built in the style that prevailed in some quarter of some long-past century; showing that the style, instead of holding an onward course, was jumping about, maniac-like, backwards and forwards, to the dismay of its true and enlightened friends, and exciting regret that the different periods had ever been discriminated. Why, I would ask, is architecture alone of all fine arts or liberal sciences thus insulted? Why is not the sermon, for instance, preached on such occasion in the vein of St. Anselm or Thomas Aquinas, or in the language of Chaucer? This is not a development, but a perversion of the system, which should be neither Early English, nor Decorated, nor Plantaganet, but Neo-Gothic, as leavened by the art-feeling and judgment of the architects. If a new church is nothing more than an imitation of a certain phase of Mediæval architecture,—if the chief thing sought to be embodied in it has not been fitness or artistic beauty, but truth to a period, it should be announced that Messieurs Lancet and Perpendicular were the *archæologists* employed, not the architects. It might, I think, be laid down as an architectural axiom that any past-century architecture has no right to be erected in this.*

But archæology, the handmaid of history, has beguiled the noble art of architecture; seduced her into undue attention to her history, and the periods and changes of her styles, which have been a stumbling-block to the architect, causing him to lose sight of the end in the means, and aim at producing archæological specimens of styles rather than true individual works; the fruit in some measure, I think, of an over-reverence for ancient examples as something inapproachable by the intellect of our time, which paralyses invention, chills artistic feeling, and leads many who could achieve originality to mere timid imitation and copying, which is the bane of art. A youthful and ill-fated poet of the last century incurred almost universal obloquy for offering a new work to the world as an old one; yet it is greater treason against the cause of progress to pass off an old one as new.

This is bad enough, but worse remains to be deplored: the churches produced or reproduced within the range of the Pointed Gothic are embodiments of fitness itself compared with what has been done in emulation of the Norman, which is the great-grandfather at least of the last Gothic; the style that grew into the Lancet, which grew into the Geometrical, which changed into the Perpendicular. In going back to this patriarchal style, all fitness and duty to the present day is out of the question, as much as it would be in going down to the style or styles of the 20th degree of latitude. Yet churches in the Norman style are still constructed.

There is a large and well-built church I visited lately, in a remote part of England, erected but a year or two ago, wherein, owing to the smallness and fewness of the windows, the congregation worship in a sort of twilight; and, from the presence of a double row of thick-set piers of the proportions of barrels, more than a third of them are unable to see the officiating clergymen; while for want of modern folding doors, that can be readily opened and closed, they are during some portion of the service, exposed to cold; simply because the necessities of the times and infancy of constructive skill led the Normans 800 years ago to build the kind of structure of which this is a reproduction. It is exactly suited to a state of society the very reverse of that for which it was built,—to a period of lawless violence, in the iron age of feudalism and chivalry, the time of the curfew, and trial by wager of battle, when every part of England was studded with strongly-garrisoned castles, and, owing to foreign invasion and intestine war, the whole of the country, from the Humber to the Tyne, was one wide waste. It has not one feature in recognition of the spirit or requirements of the present day, or its own special purpose, which were not allowed to have the slightest influence on its plan, details, or furniture. The congregation was a company of refined English people, accustomed in their homes to all the conveniencies, comforts, and decorations of the day, but the church has coarse sandstone walls, bare oak-benches, and rude broad oaken doors, all of a piece, and too unwieldy to open and shut as weather might require. Its purpose,—Protestant worship,—required abundance of light to enable the congregation to read their small-type hymn-books and prayer-books and pocket Bibles on the cloudiest winter day; but it was adapted to Catholicism of the eleventh century, when much light was not needful, as nobody but the priests could read, and when large windows might be dangerous. The latter, in consequence, being reduced to well-splayed loop-holes cautiously widening a little in the clearstory, the congregation seemed as if expecting an attack of bowmen. They were, of course, not really afraid of such attack; but as the Norman or Norman and Saxon congregation 800 years ago were probably afraid, in order that the church may be a correct specimen of the eleventh-century style, they must *appear* to be afraid.

Seriously, here is an example of art-perversion one would scarcely expect to find so late as 1878, or after so much experience and criticism. Probably nobody sees this more clearly than the architect who was employed upon it. But he has weakly followed the public or perhaps clerical taste instead of guiding it. Such a church has no more business in any British city of the present day than a model of the ancient trireme, or of Noah's Ark would have in the English Channel instead of an ironclad. If a living dog is better than a dead lion, the humblest cottage or grocer's shop adapted to its purpose is a more respectable object than this nineteenth-century church built in a style that the thirteenth century justly abandoned as unfitting and semi-barbarous, and never for a moment looked back to. Fancy the Athenians building their temple to Minerva, on the close of the Persian war, in the style of their Pelasgian ancestors before the Dorian invasion of the Peloponnesus, or the Romans rearing their Pantheon or Colosseum in that of the Etruscans, and you have an idea or image not much more anomalous. The authors of this church ignored the true artistic use of the Norman works, which, imperfect as they are, throw light on the conditions of architectural energy and grandeur, and they forgot the true nature of style,—that the course of architecture is to create style, not to conform to or copy it. A chart of the glorious past of architecture would present the architectural styles of the world, all changing character with their position as they range geographically from West to East, or descend chronologically from the night of antiquity to the present time, and each reflecting the race, religion, time, place, and climate to which it belongs; and passing into another style in the course of ages by the acquisition of new features or elements, not unlike what is predicated of plant and animal species in the Darwinian theory; which shows at a glance that style is the offspring of circumstances, and not a cause, but an effect. Such a chart would exhibit the Early English flowing out of the Anglo-Norman, as the French Pointed rose out of the Frankish, and the German Pointed out of the Round Gothic. The Normans altered their style to follow the slightest change in the manners and state of society. They altered it till it became what is called Semi-Norman, or Transitional. Why, after nearly a millennium of growing advance upon everything else in their time, should any educated people be found so inferior in taste and knowledge to them as to tempt architects to such acts? But why cannot architects be as faithful to their intuitions, as independent and as free from the influence of precedent and patronage, as artists ever were in any period of the world? If patrons solicit them to such folly, on the one hand, nature and their own genius solicit them on the other. Nature's perpetual admonition to them is, "The world is new and untried, do not be satisfied with the past; I give you the universe a virgin to-day."

To work truly and hold a real relation to architecture is worthy the highest ambition, since every new and truthful design contributes to the stream of its progress, and sheds a ray of lustre on its already illustrious career. Let English architects remember they are collectively writing a chapter honourable or dishonourable in the history of architecture. The advancement of our nature both in ourselves individually and as regards the human family, is scarcely more a sacred duty than aiming at real progress in an art so potent as architecture for good or ill on the public mind. The career of architecture should exhibit throughout analogy to the course of human history or nature in history, which, it is well said, has a higher end in the production of new individuals than security, viz., ascension, or the passage of the soul into higher forms. So did ascend the soul of architecture from the archaic piles of Karnac and Luxor, through the Temple of Corinth, till it reached its highest manifestation witnessed by the ancient world in the Parthenon. Let the soul of architecture experience a similar ascent in the revived Gothic of Great Britain.

All architects, I am aware, cannot have any great degree of inventive power, or wield the mighty imagination which, with the epic muse of poetry, can call new worlds into existence. But all may cultivate earnestness of thought, and love for the beautiful and true, which are the objects of their art; and there is a power residing in these alone the force of which is incalculable. Human love has been the muse and inspiration of the greatest poets, as a higher and diviner passion has been the one animating principle of the lives of eminent saints, breathing through their every look and gesture; and led to sentiments and deeds that seem superhuman. The principle is the same, only qualified by its object. The one in question is surely not an unworthy one while pursued in its right place. The enthusiasm for it is increased by the force of example. Architects and artists of all branches, and, I may add, votaries of literature and philosophy, may catch fire from each other's eyes, which is the chief use, as it gives the chief value, to artistic and learned societies: to breathe an atmosphere of enthusiasm among their members, who inspire, rather than teach, each other. This enthusiasm, with ordinary faculties—memory, taste, and judgment, may do much in architecture.

Since penning the foregoing, a recent article in the *Builder*, entitled "Popular Criticism as applied to the Architectural Profession," which I had not before observed, has suggested an additional remark or two. I think popular criticism on architecture is of little value to the profession; for I hold firmly that none can criticise architecture but architects, or such real amateurs as have taken up the subject in the love of it, and given long years to its study. Those who have not, however otherwise eminent, are liable to the most egregious errors, as witness those of Addison, Pope, and Swift, on the works of Vanbrugh, which should be a warning to non-professional men how they attempt to arraign the architect, or guide the current of architecture.

But I believe that a profound ignorance prevails of architecture among the public to a degree that ought not to exist on an art the creations of which are so poetic and romantic—so calculated to elevate and refine the public mind, though many fancy themselves wise on it. Almost every man that has been to Italy becomes a Sir Oracle in styles and orders, when, perhaps, he only proves,—

> "How much a dunce that has been sent to roam
> Excels a dunce that has been kept at home."

The greatest difficulty of the non-professional man when he attempts with only a *cramming* preparation to write or lecture upon the subject, must be to disguise his profound ignorance of it.

As to the unfavourable tenour of recent criticism, I believe that despite all shortcomings, there is a vast amount of industry, talent, and enthusiasm in the architectural profession—and that a great proportion of it are accomplished men, who are proud of their vocation, and doing their best to honour it. I judge by experience and observation chiefly provincial. Degradation there is, and in high places of it; but I for one see no good reason for mourning in sackcloth and ashes, as has been suggested, over the general career and state of architecture. For grief so extravagant I think a more just public cause could be found.

Sir Edmund Beckett would probably have spoken more respectfully of architects in his "Book on Building" if he had known the greatness of their art. The charge of unconscientious conduct can no more justly apply to the architectural than to any other profession, and should not be levelled against any entire profession. It is opposed to the highest Christian precept and example. Ten righteous persons, had they been

* It is some relief to find that Italy, "the hot-bed of art," is not going on in a much more enlightened spirit, if we may judge by the published illustration of the new church at Lonigo, Venetia, a very graceful composition in itself, but obviously too much of a re-production of certain celebrated Middle-age examples to satisfy a travelled Italian, to whom it must be a very familiar form. How are the mighty fallen!—S. H.

found in Sodom, would have saved the city. It will be best met, however, by each member taking more heed to his ways, and walking with increased circumspection. Let him,—

"Still achieving, still pursuing,
Learn to labour and to wait,"

and out of evil will come forth good.

SAMUEL HUGGINS.

THE POTTER'S ART.

MANY readers of the *Builder* must have been interested in the recent notice of the manufacture of pottery-ware in Japan, and a few days since of the process in use at Lambeth. The contrast is great, but not greater than that between a choice specimen of Japanese ware, and a stoneware socket-pipe of Lambeth, turned out of a machine at the rate of fifty per minute.

Full of interest is a contemplation of the various methods adopted in the construction of pottery. Recently entering the Royal Academy, my attention was arrested in the first room by the picture, No. 53, "Women moulding Water Jars, Algeria," by Mr. Edgar Barclay. Having regarded the picture for some time, I could not refrain from doing so still more closely, from an exceptional, *i.e.* technical point of view. I thus noted that the Algerian potters are women. I was aware that women were the potters of Central Africa; there, however, a wholly different process is followed. No wheel is used, nor, apparently, any rotary motion, neither that adopted elsewhere in Africa, nor that used in forming the Indian ghoora, or water-bottle. Notwithstanding, the vessels appear perfectly symmetrical. The process appears to be one of building up the sides or walls of the vessel. The sides are remarkably thin, relatively to the size of the vessel and the mode of construction, which demonstrates the extreme plasticity or toughness of the clay, and the great skill of the potter.

The very early specimens of vessels built up by hand, and which are found in numerous grave mounds in this country, are mostly unsymmetrical, very thick, and very clumsy. Nor did that clever rogue "Flint Jack" succeed in his pottery amongst the cliffs at Whitby in greatly improving upon them, nor, in fact, even rivalling them. Neither does the Stornaway pottery ware, constructed by hand without any rotary action, greatly excel Flint Jack's productions, and though still in common use in the Hebrides, is most uncouth and rude in form and workmanship, and cannot in any way compare with this Algerian pottery.

Desiring further information, I ventured to write to Mr. Barclay respecting the subject of his picture. He has most courteously replied to my inquiries. Mr. Barclay writes,—"The pottery represented is made only by the Kabyles or mountain tribes, who were never subjugated by the Arabs, and, until conquered by France had been free from time immemorial.

It is made exclusively by the women, and chiefly in the summer time. After the corn and fig harvest the heat is intense, and there being little labour in the fields, the women are thus occupied at home. A certain amount of pottery is, however, made in some villages all the year through. The subject of my picture was taken near Fort National in the spring time, but other tribes further removed, from French settlements are more noted for this pottery.

I have also visited these tribes, and the mode of manufacture is the same everywhere. The cleaning and preparing of the clay I did not see; all I know is, that it is very roughly prepared. A store of clay was kept in a cool, shady place in a house, and a young woman on beginning to model the vases chose a smooth convenient spot for the purpose out in the sunshine, and had the clay handed to her in small quantities as required, so that it was always of the same consistence. She kept a basin of water by her side, into which she dipped her hands, but had no tools whatever. She commenced by making a rough saucer as a sort of stand, and then built a solid pedestal of clay in the centre of it, the lower point of the future amphora-shaped vase, which now very quickly began to rise as she kept moving slowly round and round, skilfully adding clay and smoothing it into shape with her hands, and keeping the rising vase remarkably true in shape. Each new piece of clay when added she supported in position with her left hand as she smoothed it round into shape with her right. Having started one pot, she forthwith commenced another, and then another, keeping four going at the same time by turns. When the modelling of all four vases was completed she sat down and began modelling on the handles. These amphora-shaped water-vases are carried on the back, and the object of the point is to fix it in the girdle, and thus steady the vase when being carried. The day's work of this young woman was the making of four of the large vases, and she had plenty of time to chat with her neighbours, who, occupied in various ways, came and sat down round about her. The vases were very truly and neatly made; they looked to me too big, but I suppose they would shrink considerably in the drying and baking. In the evening they were all carried in the saucers into the courtyard of the adjoining house for protection, and were left to dry.

I saw various such vases with a waxy and polished surface lying in the sun, and was told that the next process the vases I had seen made would undergo would be the waxing of their exteriors. After that they were painted. I saw a woman thus engaged sitting on the floor of her house,—a good subject for a picture: she covered portions of the vase with a thick red paint,—some earth mixed simply with water; I did not understand what earth it was, and do not think she knew herself, for all I could get out of her was that she had bought it. To finish, a quantity of ornamentation, in a rich black colour, is added, drawn on with a rude brush with considerable precision, all the patterns being geometric in character, or obtained by combinations of straight lines. The brush was without a handle, simply a sort of pointed whisk of hairs bound together at one end. This last colour is, I fancy, the same as Arab ink, a rich brown black, somewhat glutinous in character, and prepared somehow from burning the refuse and fatty parts of skins. The pottery is lastly baked in the rudest way possible. A fire being lighted in a round shallow hole made in the earth and the pottery placed on the top. I once saw this performance going on, and felt surprised that the whole of the pottery did not come to grief; it does not, however, but being imperfectly baked it is very brittle. This I learnt to my cost, for I had some packed, being anxious to bring specimens home with me, but three-quarters of them were smashed on arrival in London. The only good collection of Kabyle pottery that I have seen is a museum at Algiers; it shows a great deal of invention in patterns, and a very remarkable variety of design in the way of quaint shapes and combination of form.

The lamps are among the most curious of these productions, consisting of rows of little cups, in tiers one above another, each little cup being filled with olive oil, and pointed to receive a wick, all being curiously joined together, and supported on a single stand, with a handle at the back to carry it. In their houses the Kabyles build up immense jars of clay over 6 ft. high, and rudely ornamented, the object being to secure their stores of grain and figs from vermin. I was one day occupied in sketching the pottery in the museum mentioned, when two American gentlemen entered, and one of them exclaimed, with much astonishment, 'I have seen vases exactly like some of these among the Indians of Brazil.' Some pieces of ancient American pottery exhibited in the British Museum might very well have been made by Kabyles, so great is the similarity of character. I have also seen very ancient Phœnician pottery and vases dug up at Cyprus and other places remarkably like. Such resemblances in primitive manufactures in various parts of the world, having no possible communication with one another, seems to me full of interest. To conclude, I will quote a passage that struck me in Commander Cameron's book, "Across Africa," where he describes a woman near Tanganyika Lake, making pots, and says that they make them of an amphora shape, such as I have represented in my Academy pictures.

I was much interested at Kisungi by watching a potter at her work. She first pounded with a pestle, such as they use in beating corn, enough earth and water for making one pot until it formed a perfectly homogeneous mass. Then putting it on a flat stone she gave it a blow with her fist to form a hollow in the middle, and worked it roughly into a shape with her hands, keeping them constantly wet. She then smoothed out the finger mark with a corn cob, and polished the pot with pieces of gourd and wood, the gourd giving it the proper curves, finally ornamenting it with a sharp-pointed stick. I went to examine this work, wondering how it would be taken off the stone, and the bottom shaped; and found that no bottom had yet been formed. But after the vessel had been drying four or five hours in a shady place, it was sufficiently stiff to be handled carefully, and a bottom was then worked in. From beginning to pound the clay till the pot, holding about three gallons, was put aside to dry, occupied thirty-five minutes, and providing it with a bottom might take ten minutes more. The shapes are very graceful and wonderfully truly formed, many being like the Amphora in the Diomed at Pompeii."

There *may* be readers of the *Builder* who know of other localities where the apparently natural order of Pottery is reversed, the clay being immovable, and the potter working round it.

FELDSPAR.

A VAST BUSINESS AND ITS NEW HOME.

LONDON abounds in great extensions and developments of commercial and manufacturing concerns, and of institutions of divers other kinds. One of the narrowest and most unpretending frontages in Ludgate-hill,—the entrance to the offices of the Prudential Assurance Company,—suggests an illustration of the truth of the remark. The magnitude of the business of this company, as regards the number of policies it has issued, and the rapidity with which the business has been created, are, we believe, without parallel in the history of life assurance. Originally the front block of building sufficed for the accommodation of the company's staff and the transaction of its business, which increased, however, so rapidly that more room soon became a necessity.

The long-galleried court-yard of the celebrated coaching inn, La Belle Sauvage, where "Tom Brown" was put down on his way to Rugby, was, many years before the "Tabard" in Southwark, and other hostelries of the same kind, adapted to modern uses. Messrs. Cassell, Petter, & Galpin, printers and publishers, occupied at first part of one side of the yard, and eventually nearly the whole of the lofty buildings on both sides; but their business outgrew their accommodation, and they erected to the rear of La Belle Sauvage-yard a large new printing establishment, round a glass-roofed quadrangle, an establishment that is quite unique, and one of the most perfect of its kind probably in existence. Messrs. Cassell & Co. retain one side of the yard for warehousing and other uses; but their new premises enabled them to vacate the buildings on the opposite side, of which the Prudential company gladly entered into possession, and made the necessary communications with their front building. Their premises now extend from the front in Ludgate-hill to a point well back in La Belle Sauvage yard. Large though the premises be, and great the amount of floor area, they are again inadequate for the accommodation of the business, and of the crowd of *employés* that make the place as busy as an ant-hill, as may be easily believed when it is stated that the officers, clerks, book-keepers, messengers, &c., in occupation of the premises number fully 500 persons in all, including about 150 lady-clerks, by whom congenial and suitable duties are, as a rule, effectively discharged. The company would have preferred to remain in the situation they now occupy; but such a fabulous price was asked for adjoining property they wished to acquire, that they were under the necessity of looking elsewhere for the accommodation they needed, and hence their purchase of the large plot of ground at the junction of Brooke-street with Holborn, and the erection of a large, lofty, and stately pile of building, upon the occupation of which, as offices, they are to enter soon. The extent of the accommodation in the new offices is very much larger than the company could have hoped to acquire at Ludgate-hill, and this at a considerably lower cost.

The new building is by Mr. Waterhouse, A.R.A., and affords a good example of the capabilities of terra-cotta in ornamental façades. The Holborn elevation is about 80 ft. wide, and the side elevation to Brooke-street about 180 ft. long. The greater portion of the buildings have six floors, including the basement and the uppermost floor, which is lighted by dormers. The fronts are relieved by oriels and gables. Two ventilating-shafts break the sky-line; the high-pitched roofs, surmounted by ornamental ridges, are also carried to different heights. Once into their new home, the Prudential will for years to come have "ample scope and verge enough"

for the efficient and convenient transaction of its immense business, and will not have, for some time to come, occasion for enlargement or another house.

The marvellous success of this company is probably attributable to several causes: (1) enlarged experience, and the acquisition of exact data whereon to base life assurance business; (2) energy, enterprise, perseverance, and skill in management; (3) employment of suitable means for pressing home the claims of life assurance upon different classes; and (4) especially the facilities afforded to persons of limited means to avail themselves of its advantages.

The history and experience of the Prudential contrasts curiously with those of some of its elder brethren. The only office in existence at the beginning of the last century that granted assurances on single lives, did so for a uniform premium of 5*l.* for every 100*l.* assured, on all lives under forty-five years of age! Experience has enabled the Prudential to take the risks at equitable graduated amounts, ranging from 1*l.* 11*s.* 1*d.* per annum for an assurance on a life at sixteen, to 3*l.* 8*s.* 11*d.* for an assurer aged forty-five, with a different amount for every intervening year. These rates are without profits. Again, another highly respectable office, that commenced business about the middle of last century, opened with four policies; at the end of the century it had 5,124 policies in force. The first policies of the Prudential were issued in 1852; its business is divided into two branches,—the "Ordinary" and the "Industrial." At the end of 1877, that is after twenty-five years' work, it had 17,751 policies in force in the "Ordinary" Branch, assuring 2,555,091*l.*; and in the "Industrial" Branch, 2,643,665 (now 3¼ millions) policies assuring 22,303,959*l.* The annual premiums on the two classes of business were 93,352*l.* and 1,227,803*l.*,—together 1,321,155*l.* The number of policy-holders is increasing at the rate of 30,000 per week. The company has agents in all parts, England and Wales, Scotland, and Ireland, among whom business is interchangeable. Some active agents collect the premiums weekly upon as many as 10,000 policies.

The Prudential Company seem, from the facts as regards the number of their policy-holders, to be justified in pronouncing it "the largest Life Assurance Institution in the world."

OPTICS AND GEOMETRY OF ARCHITECTURE.

SIR,—One or two points occur on the perusal of the excellent articles on "Geometry and Optics of Ancient Architecture" (pp. 685 and 739 of the *Builder*), the discussion of which may add to the value of articles of great research. The first of these, and the only one in which the writer of the article will find occasion to reconsider a statement which, while *per se* not to be contradicted, is rather hasty, is about the Egyptian canon of proportion. A single example, it is true, may not indicate the existence of a canon. But we are not confined to single examples. Lepsius states that three distinct canons of proportion were successively adopted by the artists of Egypt. Prisse d'Avennes, in the magnificent work on Egypt, which was aided by the subvention of the French Government, reproduces several examples of the rectilinear mapping out of a wall in equal-sized parallelograms, with a view of exactly producing the human proportions adopted as normal. He classes them in two groups,—those of the old canon, obtaining from the time of the fourth dynasty to that of Psamtek I.,—a period of more than 3,000 years,—and those of the new canon, which were used for a period of about one-fourth of that duration, down to the time of Caracalla.

In the old canon, the height of the figure is divided into nineteen parts, and the surface of the wall on which the representation is made is ruled into equal squares. The head occupies three of these divisions. There is no visible neck. The body, from the chin downwards, is divided equally between trunk and legs; the latter, however, being proportionately longer in women. The length of the foot, which is always drawn in profile, is equal to the height of the head. Thus, if either the head or the foot be taken as a modulus, the whole figure, measured by such modulus, is as 19 to 3.

In the new canon, the total height is divided into 22 parts, 4 of which are equal to the length of the foot. The head measures about 3¼ parts, or between 3 and 4. Thus the proportion has been changed from 19-3rds to 22-4ths. In the figures of this period there is a visible throat. For gods and royal personages lofty head-dresses are added, which reach to the top of the 26th square, giving almost an additional head of height to the figure at the first glance. The height of a seated figure on this system is 18⅛ squares.

It appears from the study of Egyptian sculpture, and of that koilanaglyphic work, as it is called, or heightening of low relief by strong colour, which is so prevalent an enrichment of the walls of Egyptian temples or tombs, that certain conventional modes of expressing personal qualities were universally adopted. The figures, indeed, may be regarded as hieroglyphics. They are rather diagrams than pictures. Thus, the width of the shoulder—always represented in front,—and the length of the foot —always given in profile, denote strength. Grace was sought by reducing the size of the waist, and by lengthening the legs at the expense of the trunk. Majesty is added by a towering head-dress. In the old canon the shoulders are six squares wide, or $\frac{6}{19}$ of the height: in the new they are $\frac{6}{22}$. The knee is at the fifth square, counting from the ground, in the old canon; at the sixth in the new. The end of the trunk is at the eighth square in the former; at the tenth for men, and the eleventh for women, in the latter. The width of the waist is always less than the length of the foot. On the tomb of Rameses III., a king of the twentieth dynasty, at Medinet Habou, are to be found colossal figures of the nature of caryatides. Strength is the idea here sought to be indicated; and the length of the feet is actually as much as two-ninths of the entire height. Between these colossi are children, with feet of the proportions usual according to the second canon.

The other point as to which attention is called is with reference to the point of sight. It does not fully appear how Mr. Pennethorne considered that this was determined. Without having access to his work, it is not certain whether the omission is his fault, or whether I fail to follow the argument correctly. He speaks of an angle of 45° being subtended. Is this intended to apply both to vertical and to horizontal range? In either case it appears to me to be far too open an angle. For vertical proportion, for example, an angle of 45° places the spectator at a distance from a building of its own height. Surely this cannot be regarded as that distance at which the proportions of the edifice will produce the finest effect on the imagination! In his treatise on linear perspective, Leonardo da Vinci says,—"You must be distant from your picture twice the size of it"; and it is clear from his reasoning that he is here giving a minimum distance. This rule will give an angle of 33° instead of one of 45°, and the further increase of the distance to three times the height of the object, and to an angle (in rough figures) of 20°, will be found, I submit, generally speaking, far more suitable for the spectator than a standpoint giving an angle of a more obtuse nature. Again, the rule of Leonardo, that the point of sight ought to be on a level with the eyes of an ordinary-sized man, is entirely inconsistent with the idea of looking at an architectural elevation, of which the sight, measured on a vertical plane, would subtend an angle of 45° at the eye of the spectator.

With reference to the horizontal angle, the subject has been very little studied. From personal observation of an unusual kind, I can state with certitude that the angle of convenient horizontal vision differs with different observers. It is probably purely dependent on the distance between the pupils of the eyes. I believe, though I cannot assert it as a fact, that vertical lines, when at a certain distance on either side of the central line of sight, assumes a curved form on the retina. Whether it be from habit or from any other cause, the eye can more readily detect any departure from the perpendicular,—when an object is in the centre of the field of view,—than from the horizontal. The workman looks *along* the surface which he planes, in order to be sure that it is out of winding. He looks *at* the quoin of his building, and rarely requires to get it out of winding with a plumb-line.

There is one experiment, which may be readily made, by any one who is on the seashore by moonlight, which throws much light on the question of the capacity of the eye to estimate the accuracy of a vertical line, as compared with that accuracy when applied to a horizontal line. The shimmering sea horizon appears level. At least, it does so to the great majority of persons. Now, let the spectator lay his head on a table, so that the line of the horizon becomes vertical, or, at all events, is at right angles to the line joining the axes of the eyes. The curved form of the earth will be immediately visible. The experiment is as beautiful as it is simple. How much of the results may be due to habit may be questioned. But it is not probable that habit has much to do with it, for this reason. Persons who look on the sea for the first time do not observe it to be curved. The universal impression produced is that it is flat. We have to educate the eye, by the phenomena of ships or other moving bodies, and to convince ourselves, in spite of the first impression on our vision, that the sea *must* be curved. "Parallax" even now is loud in his assertion that it is not.

The cause of this phenomenon I hold to be, that the vertical range and play of the combined vision of the two eyes is greater, or more easy, than the horizontal range or play of the double vision. If a suspicion strikes us that a portion of the side of the field of view is "out of drawing," we directly turn the central line of vision upon it: we lose the sideway effect, nor does it seem possible to arrest it. For vertical range, on the other hand, it is extremely probable that the sense of weight, and the unconscious effort of the human figure to maintain its own perpendicular, have much to do with our instinctive perception of a vertical line. And yet, if we take the mode in which the tapestry decorations of churches are now so often suspended by devout female hands, it is by no means sure that this instinctive perception of the vertical is universal.

The little table given (p. 740, 2nd col.) is unanswerable. But it would add to the value of the article for a little information to be added, as to the distance of the point of view drawn by Mr. Pennethorne, and the distance of the point of view that would be chosen by an intelligent student, after exhaustive study of the subject.

F. R. C.

ADDITIONAL WORKS SELECTED BY THE PRIZEHOLDERS OF THE ART-UNION OF LONDON.*

From the Royal Academy.—"Richard Savage," Wm. Holyoake, 200*l.*; "Llanberis Pass, North Wales," S. R. Percy, 150*l.*; "Through the Village," F. E. Bodkin, 60*l.*; "The Glen—October Morning," T. B. W. Forster, 50*l.*; "Old and Young," J. White, 35*l.*; "Sunken Road, Brittany," W. Bolton Jones, 40*l.*; "Gleaflas—October," J. H. Oswald, 40*l.*; "A Gray Evening,—Cornish Coast," C. Smith, 40*l.*; "Whitley, Surrey," J. E. Grace, 35*l.*; "An Old Farmhouse," N. O. Lupton, 35*l.*; "The Hiding-place," H. H. La Thangue, 30*l.*; "Dort, Holland," C. Thornely, 30*l.*; "Autumn," J. Fulleylove, 25*l.*; "Autumn by the River Dane," R. Nortbrs, 25*l.*; "The Irish pool," J. L. Pickering, 25*l.*; "View of Fontainebleau," J. Thorn, 20*l.*; "Monastery Stairs, Munich," W. Blackman, 20*l.*; "Antwerp by Moonlight," A. Bellin, 20*l.*; "A Salmon-pool on the Aune," G. Harvey, 20*l.*; "Harvest Weather," H. Hume, 20*l.*; "The Point of Attack," R. S. James, 20*l.*; "Witness my Hand and Seal," E. B. Leighton, 20*l.*; "The Shores of the Hebrides," J. O. Long, 20*l.*

From the Society of British Artists.—"Windsor Castle, —Morning," Geo. Cole, 100*l.*; "From the Sunny South," J. C. Waite, 75*l.*; "A Trout Stream, North Wales," A. Glendening, 60*l.*; "An Old Mill, Castleton, Braemar," A. Panton, 30*l.*; "He's Gone!" J. R. Ashton, 25*l.*; "A Scene in Berkshire," C. L. Coppard, 20*l.*; "Autumn," W. S. Jay, 20*l.*; "Harvest-time," A. Verey, 20*l.*

From the Crystal Palace Picture Gallery.—"In Surrey," J. Peel, 75*l.*; "A Dealer in Ancient Furniture at Antwerp," H. Schafels, 70*l.*; "Autumn Evening," H. Deiters, 60*l.*; "Fog Lifting, Coast of North Devon," J. G. Naish, 60*l.*; "A Peep at the Trent, near Ingleby," G. Turner, 55*l.*; "Rovil Roses," J. C. Waite, 53*l.*; "Autumn," G. Ceder, 45*l.*; "My Model's Opinion," Miss E. Conolly, 36*l.* 15*s.*; "At Coutances," A. Montague, 35*l.*; "A Country Road," G. Ceder, 35*l.*; "A Juvenile Cricket-match," D. Payne, 35*l.*; "The Path to Seale Force, Cumberland," W. Williams, 35*l.*; "A Sussex Woodland," J. Godet, 30*l.*; "Tide on the Turn," S. Walters, 30*l.*; "Dawn of Day, Isle of Man," T. S. Crexford, 25*l.*; "The Matterhorn, near Zermatt," S. Hodges, 25*l.*; "Stonor-hill, Hampshire," M. Snape, 25*l.*; "The Old Bridge at Capel Curig," G. Wells, 25*l.*; "What is she going to do?" C. J. Gripps, 20*l.*; "Newhaven Harbour, Sussex," R. H. Nibbs, 20*l.*; "Washing-day," B. Nordenberg, 20*l.*

From the Institute of Painters in Water-Colours.—"Lichfield Cathedral, from the Minster Pool," J. Chase, 45*l.*; "Sands of Lamentation, near Aber, North Wales," J. W. Whymper, 35*l.*

Brickmaking in the Isle of Wight.—Mr. Alfred Prangnell, of Elmsworth Brickyard, near Newtown, recently achieved the feat of making 2,012 best white bricks in twelve hours and a half. He has (according to the *Hampshire Independent*) done other remarkable things in the same line.

* See p. 694, *ante*.

THE DOME OF THE ROCK.

SIR,—Officers of the Royal Engineers seem o have a peculiar mode of conducting contro-ersies on archæological subjects, which renders t extremely difficult to arrive at any satisfac-ory results. Capt. Warren, for instance, chal-enged me, in the columns of the *Athenæum*, to how, if I could, that his arrangement of the illars of the Stoa Basilica was not correct. his I did easily in the following week's number June 26, 1875). He replied in the next issue of hat journal, neither admitting nor contesting ny statements, but taking up entirely new round; and when driven from this position ook up a third; and when that was also found ntenable, resorted to personalities, and so closed he correspondence. Fearing recourse to similar actics in noticing Lieut. Conder's letter, which ppeared in your issue of the 29th ultimo, I arefully avoided all speculative subjects, but elected one to which I thought a simple yes or o answer could be given, which was, whether he arches of the Dome of the Rock were pointed r not. It was also, it appeared to me, an rchitectural fact interesting to the public, and ts discussion singularly suited to the columns f the *Builder*. As I knew he had been in the nosque and drawn a good deal when it was full f scaffolding, all I asked for was a drawing of ne of these pointed arches, that the public night judge of their form.

The result is not satisfactory, as his answer n your last issue leaves it doubtful whether he dheres to his own statement or withdraws it. He refers to Lieut. Kitchener's photograph of he interior which is engraved as the frontis-iece of his book,—"Tent Work in Palestine,"—nd which proves beyond all dispute that the ntermediate range of arches is circular; nor loes he dispute the correctness of M. Comte's drawing of the exterior, where all the arches re circular, and the masonry and the orna-nents of a style,—so far as I know,—never ound in Saracenic buildings. The question is herefore narrowed, as I said before, to the ixteen arches supporting the drum of the Dome. Lieut. Kitchener's photograph is at too harp an angle to settle this certainly, and, besides, a beam interferes just where the centre of the arch comes: hence the necessity of a drawing. As an excuse for not producing this, Lieut Conder states that he was frequently "cursed and hustled" in drawing in these buildings. He was enabled, nevertheless, to make correct drawings to scale of all the twelve Corinthian capitals which support these arches, and has published them in his "Tent-work in Palestine" (p. 223). As they are all different,—except three,—it must have been a work of considerable labour and skill to obtain them; and as he measured also the pillars and their bases, it is to be regretted that he did not also measure one of the arches,—they are all alike,—which rest on these capi-tals. It would seem to have been a much simpler and easier operation; but as it was not done then, we must wait until some one under-takes it now; and, after all, *I* do not think it of much importance (for reasons given in my last), nor, indeed, of any, except for the argument he proposes to base upon it. It is curious, however, as an architectural fact, and one would like to know how it is.

Instead, therefore, of a plain answer to a plain question, Lieutenant Conder invites me to dis-cuss with him, in your columns, the text of Eusebius, Theodorus, Arculfus, and the "Pascal Chronicle," the interpretation of Arabic and Cufic inscriptions, and the history and architec-ture of the Aksah, the Dome of the Chain, and the Dome of the Rock, the site of Zion, &c. Many of these subjects, as he well knows, would take chapters to discuss properly, and others could not be rendered intelligible without more illustrations than could be afforded, and hardly one is suited for the columns of a weekly journal. I have no idea of embarking on such "a sea of troubles,"—especially when on the point of leaving London for the season. Indeed, I now sincerely regret my imprudence in asking a question about the pointed arches; but it seemed so simple, and only to require so simple an answer. Were I, however, to answer one of Lieutenant Conder's questions, I must answer all, or submit to being told that I do not answer any particular one, because I cannot, while the chances of any hit being scored in my favour seem very small. Besides, all of them, with many others far more important, and having more direct bearing on the main argument, have already been discussed to such an extent as I think necessary for eluci-dating the subject in hand in my various publi-cations, especially the last on "The Temples of the Jews and other Buildings on the Haram Area." In his work, "Tent-work in Palestine," Lieut. Conder simply ignores the whole of these; but if he sees so clearly how erroneous my theories are, nothing can be easier than to refute them. I have always stated my views with the most perfect openness, and given my authorities for every statement I have made. There has been no reserve and no mystery, and any one, consequently, who knows better, can without any difficulty point out my errors, and convince the public that I am wrong, especially as ninety-nine men out of a hundred are offended by their novelty, and would be only too glad to see the pestilent heresy extirpated. But the case must be taken as a whole. Nibbling at the de-tails of the argument in weekly letters to periodicals will never, I believe, suffice to enable the public to estimate the true bearings of the questions at issue.

I have not the smallest possible pretention to infallibility. As I said in the last paragraph of the preface to my work on the "Temples of the Jews,"—"All I mean to assert is that, as the evidence at present stands and is known to me, I can draw no other conclusions from it than I have done." I feel, and always have felt, that some new fact or some new excavation may any day alter the whole complexion of the case; but, meanwhile, I do not think Lieut. Conder can employ his leisure better than in exposing the errors of my logic, which he seems so confident he can do. If he does show me the error of my ways, I believe I shall be the first to confess it, but, whether I do or not, if it is done with the fulness of quotation and illustration that I have employed, the public will not be long in deciding between us; and, if the decision is against me, my works on the Holy Sepulchre must be rele-gated to that shelf of a library appropriated to curiosities of literature. I cannot say I have much fear of this result. JAS. FERGUSSON.

THE GILBERT SCOTT MEMORIAL.

SUBSCRIPTIONS are dropping in, but scarcely to the extent anticipated. The arrangement come to does not seem to be fully understood. It has been decided to place a Brass over the grave as the personal share of the memorial, and the design for this is being made. The remainder of the fund will go towards the founding of a teachership for art-workmen at the Architectural Museum, where there are plenty of students with lack of means to supply thoroughly the practical teaching they really require. At present there is an art-master from South Kensington in connexion with the Science and Art Department; but it is pretty well known how far short these masters are of a due knowledge of building construction, to say nothing of architecture proper. All who desire to give some further help in the matter of technical education for art workmen should help this fund. Mr. Maurice B. Adams, at the Museum, will afford any information that may be required.

A Mountain of Tin.—Tasmania is (accord-ing to an Australian paper) rapidly becoming a second Cornwall in the quality and extent of its tin supplies. Four years ago the value of tin and tin-ore exported from the colony was barely 7,000*l.*, while in 1877 the value of the metal sent out of the country was nearly 270,000*l.*, and the industry has received a fresh impetus in the discovery of a new lode-bearing district. Until very lately the principal portion of the tin produced in Tasmania was obtained by the ancient process of "streaming," or washing the sand and earth in water, and allowing the heavier metallic parts to subside; but by the discovery of the lodes at Mount Bischoff the colonial miner was able to compete on equal terms with his fellow-craftsman in Cornwall, and as the tin-mines of the old country have fallen off in productiveness, those at the anti-podes have been able to make up for their failure. The mining district of Mount Bischoff has now found a rival in the discovery of a tin mountain at Mount Heemskirk, on the West Coast. The "wash-dirt" is some 20 ft. thick, and produces about 25 per cent. of tin; but the existence of solid seams of metal, traversing the mountains in veins several feet in depth and width, has thrown even these productive work-ings into the shade.

THE PROGRESS OF MUSIC IN ENGLAND.

SOME earnest steps have again been taken to bring about the union of the Royal Academy of Music and the National Training School of Music, and a desire that this should be effected has been expressed on both sides. Beyond this, however, it has been resolved by an influential meeting, held at the National Training School, that it is desirable to establish "A Royal and National College of Music," on a more per-manent and extended basis than that of any existing institution. The course of instruction would consist of a complete course of training, extending over several years, and scholarships would be obtainable by open competition. Honorary fellowships would be bestowed. The Union of the Royal Academy of Music and the National Training School of Music is depended on for the constitution of the college, but other musical societies throughout the kingdom are to be looked to for co-opera-tion. The proposition at present is not quite clear. We should be disposed to regard the scheme as one for the founding of a University of Music for the giving of degrees, the Academy, the Training School, and various other societies being affiliated, and taking the place of colleges. If the scheme be carried out, large accommodation for examinations would be needed, and the Albert Hall would come in for legitimate use. There seems reason to believe that the 1851 Commissioners are well disposed towards the scheme, inasmuch as Earl Spencer is one of the chief movers in it, and the fact that H.R.H. the Prince of Wales is named for the presidency shows that the project is not mere talk, but will in one shape or another be carried out.

ST. JOHN'S HOSPITAL, BATH.

ST. JOHN'S HOSPITAL, or Blue Alms, Bath, has been reopened, after considerable restoration and improvement. The Hospital of St. John the Baptist was founded (according to an address read by Mr. E. Turner Payne) in the year 1180, by Reginald Fitz-Jocelyne, second bishop of Bath and Wells, for the benefit of sick and aged poor. It was early attached to the Monastery of Bath, and remained part of its possessions until the Dissolution, when it passed to the Crown. Shortly after this event, it was annexed to the parish church of St. Michael within the walls, a building of which every trace has disappeared. St. Michael's-place alone recalls the name and indicates the site, which was closely contiguous to the ground now covered by Mr. Palmer's Cabinet Manufactory. Under the management of the rectors of St. Michael's *intra muros*, otherwise St. Michael by the Bath, within the city of Bath, the brethren were abridged of their rights, and the building became so dilapidated that early in the reign of Queen Elizabeth the establishment was nearly destroyed. Elizabeth, however, in 1573, granted a brief to be in force for seven years to raise money for the purpose of repairing the Abbey Church and rebuilding the "ruinated" Hospital of St. John. Warner states that the edifice of the hospital, as then rebuilt, was a low building of one story, extending 90 ft. in front by 26 ft. 6 in. in depth, and consisted of six rooms next the east front, and six next the west front, with a colonnade before the latter of 6 ft. broad, in-cluding the thickness of the columns, and three passages through the building from east to west, into each of which passages four of the rooms were made to open. Queen Elizabeth vested the patronage of the hospital in the mayor and chief citizens of Bath, subject nevertheless to the rules and orders on which it had been originally founded by Reginald Fitz-Jocelyne; but, says Warner, "the value of property in the city and neighbourhood of Bath has considerably increased, and the integrity of those entrusted with the patronage was not proof." In 1616 the Corporation made an order that the Mayor of Bath for the time being should be master of the hospital. This being carried into effect for nearly half a century, the income of the charity went into the chest of the Corporation, or was divided amongst its members, the poor brethren were discharged, the buildings neglected, the chapel was desecrated and converted into an alehouse or post-office. At last the peculators omitted to present, and the patronage lapsed to the Crown shortly after the Restoration. Charles II. there-upon presented his chaplain, John Rustat, to the mastership. The patronage, however, remained vested in the Mayor and Corporation of Bath,

who in 1683 presented one William Clement, and in 1711 one John Chapman, under whose mastership an information was filed by the then Attorney-General, which resulted in what is well known in the history of the hospital as Sir John Trevor's award, dated the 13th February, 1716. The findings in this suit, as set forth in the appendix to Warner's history, No. 76, disclosed a long series of misappropriation of the hospital property. Happily for the charity, the last improvident case was set aside, and by the award, leases for three lives were granted to the actual tenants of the lands and possessions of the hospital, at rents amounting together to 163*l.* 15s. 2d. The value of the hospital property was, however, found by the award to be 1,200*l.* per annum. By this award, Sir John Trevor established the scheme under which, till within the last fifteen years, the hospital property has been managed. In process of time, as the value of property has increased, the system has been found intolerable and wasteful of the funds of the charity, but it is interesting to reflect upon its influence upon the fortunes of the city of Bath. A large area on the west and south-west of the old city wall belongs to the Hospital. Had it not been for the greater security of tenure given by the award, this large space would probably have remained unbuilt upon. It would have been beneficial, no doubt (says Mr. Payne), in a sanitary point of view, to have a large open space near the centre of the city, but in what other direction would Bath have expanded? Where would be our Alsatia? Would the grave lines of Bathwick, or the square, crescent, and circus, designed and partly executed by Wood, have been possible? The history of the Hospital for the next 150 years seems to have been uneventful. Its possessions in and about Bath were much built over, and a great increase of annual value resulted. In 1820 the Commissioners for inquiring into charities reported that the value of the property was then upwards of 11,000*l.* per annum. Parts of the property are of now much less value, but others have probably improved. I think, therefore, that the present value may be safely estimated to exceed 10,000*l.* per annum,—a noble endowment for any charity. In the year 1851 the Hospital was decreed by the late Lord Chancellor Truro to be a municipal charity, and the patronage was accordingly vested by an order of the Court of Chancery, dated in 1853, in the Trustees of the Municipal Charities of Bath. In the legal proceedings, the late Mr. Thomas Fisher took a warm and intelligent interest, and his exertions and professional skill largely conduced to the preservation of the Hospital as a public institution, instead of its being sold for private purposes, as proposed by the Town Council of the day. Immediately upon their appointment, the Trustees proceeded to prepare a scheme for the management of the Charity and its property, and the administration of its revenue. Grave difficulties, however, presented themselves, especially those resulting from the system of leases for lives which for 150 years had prevailed, and upon the faith of the continuance of which a large expenditure had been incurred by the lessees. Eventually, after several years of correspondence with the Charity Commissioners, the Trustees consented to the institution of proceedings, and the Commissioners certified the case to the Attorney-General of the day, who, on August 11th, 1864, filed an information against the master, co-brethren, and sisters, for the establishment of a better scheme of management and administration. In May, 1865, on the death of a person upon whose life with those of others, numerous and valuable leases of the Hospital property had been granted, it became known that these leases would be renewed upon the old system. The Attorney-General thereupon filed a supplemental information to restrain the proposed renewals. The order was refused on a hearing, but the Attorney-General immediately appealed to a Superior Court, and obtained the order, since which no such grant has been possible. On the 18th of June, 1877, the new Board was first called together by the Attorney-General's solicitor, as directed by the new scheme, and the Trustees have since vigorously proceeded with the execution of the duties entrusted to them. They at once took the needful steps to survey the buildings of the Hospital itself, and obtain a report upon them, and in consequence directed the preparation of a specification, on which, with the assent of the Charity Commissioners, they entered into a contract with Mr. Ambrose Ambrose, who has carried out the work of restoration, under the superintendence of their surveyor, Mr. Henry Spackman. At an expenditure of about 1,100*l.* the building has been completely renovated.

FALL OF TREES IN WINDSOR PARK.

A REMARKABLE and rather alarming occurrence took place in the Long Walk at Windsor on Sunday afternoon, by which three young men very narrowly escaped with their lives. As is well known, in addition to the central drive in the Long Walk, there are avenues on the east and west sides, overshadowed with full-grown trees, which are favourite walks for pedestrians. About three o'clock in the afternoon of Sunday, a large number of persons who were taking exercise in the Walk were alarmed on suddenly hearing a loud crash proceeding from the avenue on the east side of the central walk, a short distance beyond the entrance to Frogmore Lodge, which was immediately followed by the falling of two ponderous branches of one of the trees, from an altitude of upwards of 40 ft. The branches were about 15 ft. in length, and measured 3 ft. in circumference, and were consequently of considerable weight. Three young men at the moment were sitting on a seat immediately under the tree, and fortunately had the presence of mind to rush to the main trunk, and thus escaped injury, the branches, however, falling within about a yard of the spot where they had sat. What may be added as a singular coincidence is that shortly before the above-named occurrence took place, a similar casualty happened in the same avenue a little further on, near to the lodge entrance of the Great Park, when a large branch fell from one of the trees at this spot. Within the last few weeks several of the large trees in the Walk, which had suffered much through being struck by lightning, have been cut down.

SCHOOL BOARDS AND THEIR ARCHITECTS.

AT a recent meeting of the Norwich School Board, Mr. White moved "That the preparation of the plans of the Crook's-place School, and schools hereafter to be erected, be thrown open to public competition. He contended that, during Mr. Brown's appointment, public competition had been superseded; and he was anxious that this state of things should be put an end to. By adopting this resolution they would be placing themselves in a fair position; and although he did not doubt for a moment that Mr. Brown supplied good plans, he would certainly supply them none the worse by going into competition with other architects.

The Mayor seconded the motion. He said he thought they had not acted fairly towards the ratepayers by pursuing the existing system of giving their own architect alone the preparation of plans for their schools. He understood that when Mr. Brown was first engaged it was simply to advise the Board; from that it came about that he made plans, and then they felt that they could not but employ him, so that he had actually got the whole thing in his hands, and those in Norwich who might have desired to compete for the preparation of plans had been completely shut out. He felt that Mr. Brown had given every satisfaction in preparing plans and superintending the building of schools; but for all that the system was unfair, and this motion was intended to bring about a better state of things.

Dr. Duckett said no doubt their object was to get the best architect they could; but he doubted whether competition was the surest way of obtaining that, especially when they had such a tried man as Mr. Brown, who, he believed, had obtained his present position by public competition. He, therefore, had demonstrated his ability to hold such a position. The London School Board's architect was permanently engaged for a special purpose, and the plans were not put out to competition. He moved as an amendment, "That it be referred to the general purposes committee to consider the propriety of putting out the plans of the Crook's-place School, and any schools hereafter to be erected, to public competition, and also the propriety of appointing a permanent architect."

Mr. White accepted the motion of Dr. Duckett.

Canon Copeman concurred with the course taken by Mr. White. His impressions with regard to the history of this matter did not agree with those of the Mayor. In the first instance, Mr. Brown undoubtedly obtained his position by public competition, honourably and fairly, and when they came to have to build schools, they were so indebted to Mr. Brown for unpaid services, for advice and assistance, that they felt they ought to employ him. They went on employing him until they felt that they were placing themselves in a false position, and it was suggested that they should give Mr. Brown the definite position of architectural adviser to the Board at a salary of 40*l.* a year. Accordingly Mr. Brown had gone on giving them advice and assistance, but such was the nature of his services, that it was perfectly ridiculous to suppose that 40*l.* a year was an adequate salary.

Mr. Cooper objected to such a low salary being given to a gentleman so that this was made a reason why the building of schools should be put into his hands and withdrawn from public competition. They could not put one wrong right by perpetrating another; and if Mr. Brown were not sufficiently remunerated, that was no reason why the public should be shut out from competition in the building of the schools. They wanted the best ability, and he thought they were not less likely to obtain that if there was competition among architects. As to the architect to the London School Board, he believed that official received 2,000*l.* a year as a salary, but he did not receive the usual fees, which would amount to an enormous sum, considering the number and extent of the schools erected in the metropolis. His was a permanent office, and he did not object to discussing the expediency of such an appointment at Norwich. He hoped the office would be wholly abolished, or else that the gentleman elected would be adequately remunerated for the duties attaching to the office.

The motion was then agreed to.

LONDON WATER-SUPPLY.

THE object of the audacious policy of some of the water companies, in increasing enormously their charges against consumers, may be to raise their property to a fictitious value in anticipation of its being taken over by the Metropolitan Board of Works; its justification is not certainly to be found in the improved quality of the supply. In his report for June, Professor Frankland states that,—"The Thames and the Lea have been much swollen by heavy rains, and the water drawn from these rivers by seven out of eight companies supplying London, was so much polluted by organic matter as to be unfit for dietetic purposes. Such intense pollution rarely occurs in summer, and the Southwark, Grand Junction, East London, and New River Companies seem to have been unprepared for it, as they have failed to filter the water effectively before delivery." "Moving organisms were found in the Southwark and Grand Junction Companies' waters," which were "turbid and brownish yellow." Colonel Frank Bolton reports of these two companies that they have not "storage capacity and impounding reservoirs" sufficient "to avoid taking in water when floods prevail." Colonel Bolton also reports that the companies have now an aggregate of 713 miles of mains constantly charged, and upon which hydrants could at once be fixed. The total number of hydrants at present erected is 4,626, of which 2,827 are for private purposes, 545 for street watering, 779 for public use, and 475 for Government establishments. The companies that are moving actively in giving constant supply, under the provisions of the Metropolis Water Act, 1871, in a portion of their districts, are the Kent, New River, Chelsea, Lambeth, and East London.

Bradford Theatre destroyed by Fire.—Fire broke out last week at midnight at the Prince's Theatre, Bradford, and in a short time the building was completely gutted and totally destroyed. The theatre was erected about two years since by a limited company, at a cost of 26,000*l.*, and has since been in the lesseeship of Mr. W. Morgan, whose time would expire on the 1st of August. Mr. C. Rice, of the Theatre Royal, Bradford, had engaged to take the premises, including the Star Music-hall, built underneath the theatre, which is not much damaged. The fire was discovered shortly after the theatre closed. Its origin is a mystery.

WHITLEY CONVALESCENT HOME.

ON Monday, July 15th, the annual meeting f the subscribers to the Prudhoe Memorial onvalescent Home, Whitley, Northumberland, as held at the institution, under the presidency f Earl Percy, M.P. Additional interest was nt to the proceedings by the inauguration of ormitories which had been added since the last eeting. Nineteen years have elapsed since he Convalescent Home was first established Marsden, and eleven years ago, the foun- ation stone of the new Home at Whitley as laid by Earl Percy, the building being ected as a memorial to Algernon, Duke of orthumberland. Nine years ago the building as formally opened by the Duchess Eleanor of orthumberland for the reception of patients; nd since that time the demand for admission as been beyond the accommodation the build- g would afford. The Home was originally lanned to accommodate about seventy patients; ut the architect (Mr. Thomas Oliver, New- astle) made provision in the administrative epartment for the effective working of the stitution should more accommodation at any me be added. Additions have been made to he building, by which accommodation is pro- ided for nearly fifty patients, and now about 20 patients can be admitted. The new build- gs consist principally in extensions to the en's side of the Home, and comprise two acious additional dormitories, placed at right ngles to the existing north wing, and two day nd reading rooms on the west front, together ith smoking-rooms, store-room, &c. The works ave been carried out in stone throughout, and armonise with the existing buildings. The hole cost has been about 3,000*l*. Further orks, involving an outlay of about 3,500*l*., are ontemplated as soon as funds will permit.

FISHING FOR NOTICES.

A FRENCH publisher, seeking to push what eems likely to be a very questionable French ovel, sends us a cut-and-dried notice of it, with n intimation that, on receipt of the *Builder* ontaining the notice, a copy of the book will be ent in exchange. Clever, certainly, though not lever enough this time. But we can match it t home. Here is a note just now received:— The secretary of" So-and-So's "Water Meter ompany presents his compliments to the ditor, and begs the favour of the insertion of he accompanying paragraph. *Doubtless* an dvertisement will follow." Careful secretary! ot to commit his directors to payment for the nfounded praise. America sends us something lmost as 'cute by the same post. The writer ays he is about to establish a newspaper to efend the interests of British subjects in the nited States and elsewhere; and that, as he ntends to forward us a copy of the paper, he equests us "immediately on the receipt of this etter," not only to send him our last issue, but ermanently place him on our list of exchanges. ld-fashioned people would have sent a copy of he new paper first.

"SHOULD HORSES BE SHOD?"

THIS is the heading of a paragraph in last veek's *Builder*. I am very glad at last to see hat public attention is drawn to this very im- ortant question, and one that requires imme- diate attention, for the benefit of poor horses, which in numerous places in the City are unable to keep their feet when drawing heavy loads. The stamping and straining to keep their feet must be very injurious, and amount simply to cruelty. Those who profess to stand up as pre- ventors of cruelty to animals should come forward, or some capitalist, and give the horses the benefit of their pity in a substantial manner. Horses put to heavy work could never do with- out shoes, as suggested; and, on the other hand, nailing shoes on their feet, all will admit, is very injurious. If one or more of your nume- rous readers would find a little capital to fit up one or two teams that are constantly carrying heavy loads in the City, they would set a prac- tical and humane example, which others would soon follow.

I would propose to have shoes made various sizes to fit on to the horses' feet, about 1½ in. up the hoof, to clip over, and to continue the width of an ordinary shoe underneath the foot, made with holes in such a manner that steel studs, partly sharpened, about ¼ in. to ⅜ in. long, could be fixed in them, and replaced with others when worn out. This would give the horses a firm and sure footing wherever they went. The hoofs would want paring sometimes to fit nicely, the same as a man's corns when they are trouble- some. A simple arrangement to fix the shoes when on would be essential to give them a firm hold. Two horses would do the work of three with greater ease, and far less injury to the horses. Owners would save a great deal in horseflesh by adopting this suggestion. No doubt other propositions will be forthcoming, and if better than this I should be pleased to see them brought into use. They could be taken off at night, and put on again when the horse is wanted.

If once this great and humane boon to horses were forthcoming, we should soon see factories established, and shops for horses' shoes, where they could be fitted from a stock in a few minutes, and sent about their work again. An immense amount of time would be saved to those having a large number of horses, and also in winter, when they required sharpening; they would also be a protection to their feet. Why not have horse- shoe shops as well as men's shoe-shops?

J. B.

BRITISH AND FOREIGN COMPETITION.

IN the Engineering Trades' Report, just now issued by Messrs. Matheson & Grant, we find the following observations:—

"Apart altogether from the present depres- sion of trade, the great Labour question presses on manufacturers as the difficulty for the future. Although trade-unions have been quiescent lately, workmen have shown little inclination to assist the masters in meeting adverse circumstauces. In the engineering trades, the struggle is not so much about wages —for the various crafts are such as will gene- rally allow liberal rates,—but about hours of labour, vexatious restrictions, and the apparently capricious interference which hinder the profit- able working of a factory. English makers find it hard to believe that their foreign rivals are similarly troubled; and it is difficulties of this kind, rather than any within their own control, which make them fear foreign competition. An agitation for reciprocity, or some other modification of Free Trade, still continues, and is chiefly upheld by those who would set the supposed interests of a trade above those of the community. There is no doubt that individual trades will be closely pressed by foreign com- petition, and if with a fair field the English makers allow themselves to be beaten, it is for the general good of the country at large that it should be so, and that prices unnecessarily high should not be paid. But though American tools, German hardware, or Belgian joist-iron of doubtful quality may be sold at low prices in England and in the Colonies, such isolated instances afford no real criterion for estimating the staple manufactures of the country; and though England will not again enjoy a monopoly of the engineering trades, the resources and ability available are far too great to justify any anxiety that the extension of trade will cease. Nowhere is capital so abundant and powerful, coal and iron so plentiful or so well placed, and facilities for shipment so great, as in England; and if the cost of labour be measured by value of products, and not by the mere rates of wages, the English workman still distances all com- petitors."

BUILDING IMPROVEMENTS AND EXTENSIONS IN WINDSOR.

VERY considerable operations in building are at present going forward in Windsor and the neighbouring parish of Clewer, which has now for some time past been included within the Parliamentary area of the royal borough.

Restorations have likewise for some time been in progress at different points around the Castle, and at the present time works are being carried out at St. George's Chapel. The south- west elevation is to a great extent being re- faced, including the pinnacles and turrets, which are now in course of restoration, and it is understood that the intention is to restore and reface, in a similar manner, the buttresses and the flying-buttresses above, both of which appear to be in a rather dilapidated condition. Amongst the new buildings in the town of Windsor which have just been completed are new offices for the Windsor Gas Company, which are situated on the south-east side of the town, a short distance from the lower part of High-street, and near to the open space known as Bachelors' Acre, where the bachelors of Windsor erected the Jubilee Obelisk to King George III. The building is in white Suffolk brick, with Portland-stone dressings, and polished granite columns for ornamentation. In the immediate neighbourhood, and also towards the west, in which direction the town is extending into the locality of Clewer, a large number of villa residences have recently been erected, whilst several others are at present in progress. Similar improvements in cottage- building are likewise going forward in several parts of the town. In this class of buildings Mr. Richardson Gardner, the member for the borough, is taking a deep interest. He has just purchased a whole street of old cottage-buildings a little to the west of the Great Western Rail- way Station. These buildings, which stood at a very low level, and were damp and unhealthy, have been entirely cleared away, and the site having been raised about 4 ft., and filled in with concrete to the ground floor, a set of new cottage buildings have been erected, which have a neat and comfortable appearance. They are formed of stock brick, with red brick dressings and ornamental bands, the elevation in the centre and at each end of the block being surmounted by gables. The different tenements are ap- proached at each end by flights of steps leading on to a terrace in front of the buildings. They are called Victoria Cottages, and an inscription in stone in the centre of the block indicates their re-erection.

Mr. Gardner has likewise just erected a large block of similar cottages on a portion of the Clewer Estate, upwards of fifty acres in extent, and which is now being laid out for building purposes. The tenements which have been so built are called Gardner Cottages, and are 100 in number. The land around which the cottages have been erected occupies an area of upwards of six acres, the buildings forming the four sides of a square, with elevations east, west, north, and south, to streets around the site. The buildings forming the square enclose a large recreation space, together with gardens attached to each tenement, for the use and recreation of the tenants. On other portions of the Clewer Estate, residences of a high class, as well as cottage-buildings for the industrial classes, are rapidly springing up, and in a short time the neighbourhood of Clewer is likely to add very materially to the general population of Windsor.

PARLIAMENTARY.

Charges of Metropolitan Water Companies.—In the House of Commons, on the 18th inst., Colonel North asked the Chancellor of the Exchequer if his attention had been called to the enormously increased charges of the metro- politan water companies under certain alleged legal rights in their Acts of Parliament con- sequent on the re-assessment of property, and whether the Government contemplated any commission of inquiry on the subject with the view of protecting the public against such charges and making the supply of water, and not rateable value, the basis of payment. The Chancellor of the Exchequer, in reply, said the attention of the Government had been directed to the matter. He did not know that it would be the best course to appoint any commission of inquiry, but undoubtedly the whole matter was one that demanded inquiry and consideration.

Arklow Harbour.—In answer to Mr. Parnell, Sir H. Selwin-Ibbetson said that, owing to the refusal two years ago, by the persons interested, of the Government offer to provide half of the cost of improving Arklow Harbour, and to advance the other half by way of loan, the improvement scheme had fallen through, but he understood that the Wicklow Copper Mining Company had now applied for a loan of 12,000*l*. or 13,000*l*. for the purpose of improving the harbour.

The Incorporated Church Building Society held its last meeting for the present session on the 15th inst. During the session just concluded the sum voted by the Society in aid of the various works brought before them has been 12,471*l*., whilst the amount of receipts in the same time falls considerably short of that sum, and it is stated that unless greater sup- port is given to the Society there must be a reduction in the scale of grants.

OBITUARY.

Mr. H. F. Lockwood.—Mr. Henry Francis Lockwood, head of the firm of Lockwood & Mawson, architects, Bradford and London, died at his residence, Heron Court, Richmond, Surrey, on Sunday last. "Mr. Lockwood," says the *Bradford Observer*, "came to our town at the time when it was at the point of its most notable development, and gave to its architectural history a distinctly marked character. He was brought up in the Classical rather than in the Mediæval school." His health has been failing for some time past. Mr. Lockwood was born at Doncaster, and was, it was stated, in his sixty-seventh year. He was articled to the late Mr. Peter Robinson, of London, for whom, on the completion of his articles, he superintended the works at the rebuilding of York Castle. He commenced practice in Hull at the age of twenty-three, and from that time to the present he had been actively engaged in many large and important undertakings. In 1849 he removed from Hull to Bradford. In conjunction with his partners, Messrs. William and Richard Mawson, he has erected many of the public buildings of Bradford, including the Townhall, the markets, St. George's Hall, the Exchange, and Airedale College, and he was employed by Government in the erection of the Rifle Factory at Enfield Lock. He was appointed one of the competing architects for the New Law Courts, and in the year 1874 he removed to London, where he has since resided, and where he has been engaged upon many extensive works, such as the City Temple, the Inns of Court Hotel, the premises for the late Mr. Charles Mecking on the Holborn Viaduct; also for the Fore-street Warehouse Company, the Merchant Taylors' Company, and the Civil Service Association. During the course of the improvements in the streets and buildings in Bradford, Mr. Lockwood was retained throughout by the Bradford Corporation as their arbitrator. He was architect to the late Sir Titus Salt, not only in the works and town of Saltaire, but in numerous public and private works with which Sir Titus was associated.

RIGHTS OF THE OWNERS OF LAND ADJOINING RAILWAYS.

NORTON *v.* THE LONDON AND NORTH-WESTERN RAILWAY COMPANY.

THIS case, tried in the Chancery Division, before Vice-Chancellor Sir R. Malins, is so important that we have delayed referring to it until we could find space to give the whole of the judgment.

His Lordship said this case involved a question of considerable importance to the public, for if the contention raised on behalf of the defendants could be maintained, it would place the country generally in the most unfortunate position with regard to land adjoining railways. The plaintiff, who had died since the commencement of these proceedings, had taken a lease for 99 years of some land next against the line of the London and North-Western Railway, at Saltley, near Birmingham. The land on both sides of the railway at this place belonged to Sir Charles Adderley. The plaintiff's house was built in the year 1861, and it was opened as an inn, and was called the Station Hotel. The front of the house opened upon the road, but the back part looked over the line of railway, and the seven windows at the back derived their light and air from over the railway. Mr. Norton had full enjoyment of his house, unquestioned by the railway company, till the year 1874, when the company erected a signal-box, which was used for the purpose of working the line of rails. The railway was in a cutting, so that the signal-box was somewhat lower than the windows of plaintiff's house, and the smoke from the chimney belonging to the signal-box was very frequently blown into the plaintiff's windows, and he alleged that the nuisance was so serious that it prevented his customers from frequenting his inn, and his trade was thereby injured. The plaintiff made a complaint to the authorities of the railway company respecting this nuisance, and subsequently the signal-box was removed from where it at first stood and was placed in another position. This removal, however, did not appear to have been effected for the purpose of preventing the nuisance of the smoke, but to suit the convenience of the defendants, and a gas-stove had since then been used instead of a coal fire. It seemed that this complaint which had been made by the plaintiff was very annoying to the officials of the company, and they claimed an indemnity from Mr. Norton, in the shape of a rent, for the privilege of uninterrupted light and air across their railway. This claim was refused, and thereupon the company thought fit to erect a large hoarding directly in front of the plaintiff's house, and within 1 ft. of his windows, whereby the light and air were almost entirely excluded. Having done this, the company persisted in retaining the hoarding for a period of six months, until (in December, 1876) it was accidentally blown down by the wind. The company still claimed the right to shut out the light from the plaintiff's windows, and this very expensive litigation had been caused owing to the claims set up by the company; and, if it succeeded, the effect would be that any person erecting a house close to a railway might be entirely prevented from having any windows in the house which should look over the line. A question very similar to this was raised in the case of The United Land Company *v.* The Great Eastern Railway Company (Law Rep., 17, Eq., 158), which was confirmed by the Court of Appeal, and it was there held that the rights of a landowner on the line of a railway ought to be in no way prejudiced except so far as was required for the actual construction of the railway. The landowner was to have as much enjoyment and as free use of his land after the railway was constructed as he had before, so far as the execution of those rights did not interfere with the rights of the railway company and the rights of the public in running over the lands upon the railway. His Lordship was, therefore, of opinion that the rights of the plaintiff, as the owner of adjoining land, were precisely the same as he would have had if no railway had been made, and one of those rights was that of erecting a house, and he was fully entitled to use all the rights appertaining to the erection of a house so long as he did not interfere with the rights of the public in running over the land upon the railway. No man could possibly say that the plaintiff's windows in any manner interfered with the rights of the railway company in using their line for the purposes for which it was intended. The company were not to take away from the owner of the adjoining land anything that was not absolutely wanted for the purpose of the railway. Then the company, feeling as they must have done that they had no right whatever to prevent the plaintiff from using his windows, and that they had only power to prevent the erection of such works as might be an injury to their line, set up this defence,—that possibly at some future time they might require this land for the purpose of erecting a station. This contention he believed to have been a mere afterthought. There was no evidence whatever to show that the company were likely to require a station at this point, and if they did erect one they had no land upon which they could make approaches to such a station. They would in that case have to purchase the requisite land. The suggestion was nothing more than a pretence, and had no foundation whatever. The plaintiff had a right to the enjoyment of light and air to his house, and to have as many windows as he pleased, and these proceedings to prevent him were wholly unjustifiable. A question had been raised as to damages occasioned to the plaintiff by the smoke from the signal-box and the damage caused by the erection of the hoarding. His lordship was of opinion that the plaintiff was entitled to compensation in damages in respect of both the smoke and the hoarding, and an inquiry must be directed as to the amount of damage sustained by him. Then there was another question raised —whether the company were entitled to the land to the extent of 4 ft. 6 in., which adjoined the quick fence along their line at this particular point. Taking into consideration all the evidence which had been produced, he was of opinion that there never had been any ditch as alleged by the company outside their quick fence; and that the fence was always intended by the company to be the boundary of their property. The result was that a perpetual injunction must be ordered, restraining the defendants from re-erecting any hoarding so as to interfere with the access of light and air to the plaintiff's premises, and there must be an inquiry as to damages for the injury caused to the plaintiff by the issuing of smoke and by the erection of the hoarding, and the company must pay the costs of the action."

ACTION AGAINST CONTRACTORS FOR INJURY TO A WORKMAN.

CLUTTERBUCK *v.* COMMISSIONERS OF SEWERS; SAME *v.* TRUSTEES OF THE CITY TEMPLE; SAME *v.* MYERS AND OTHERS.

IN this case, heard in the Bloomsbury County Court, on the 22nd inst., the plaintiff, a gasfitter, sought to recover the sum of 30*l.* damages for injuries received by falling through a broken paving-stone on the premises of the City Temple.

Mr. Woolfe, who appeared for the plaintiff, stated that the action had been originally brought against the trustees of the City Temple alone, but that under the new Judicature Act, the three defendants were joined in the present action.

The plaintiff deposed that on the 11th of September, 1875, when in front of the City Temple, proceeding with his work, the flag-stone on which he was standing gave way, and he was severely injured in the chest and spine. He was at the time of the accident earning 2*l.* 10*s.* a week, but since then he had only been able to earn half that sum per week. He had had to pay a doctor's bill, amounting to 18*l.*, and claimed compensation for the suffering he had endured.

Mr. F. G. Norton, inspector of pavements for the Commissioners of Sewers, called, said he saw the stone in question about a week after it was broken. It had not a proper foundation, nor was it supported in the centre. He considered that Messrs. Myers, the contractors, were wholly to blame as to the cause of the accident.

Colonel W. Haywood said he was engineer to the Commissioners of Sewers. He constructed the viaduct, but could not say who laid the stone in question: it was not done by the direction of the Commissioners of Sewers.

At this stage of the case the Judge remarked that there was no evidence to go to the jury on the fact that the stone in question was laid by the Commissioners of Sewers, or by their authority, and as there was no negligence shown, plaintiff should be nonsuited so far as the Commissioners of Sewers were concerned.

The case against the trustees of the City Temple was then gone into, when Mr. Lockwood, jun., was called, who said his father, who died only on the previous day, was the architect of the City Temple. Messrs. Myers & Son, the contractors, were bound by their contract, in one clause of it, "to relay and make good" any paving-stones injured in the operation of their work.

A labourer was called and said he was employed by the contractors, and had cracked the stone in question by letting an iron girder fall upon it.

The Judge hereupon said he would take the opinion of the jury as to who was liable, and who had been guilty of negligence.

The jury, after a brief deliberation, said they considered there was no case against the trustees of the City Temple, and held that there had been negligence on the part of the contractors, and gave damages in favour of the plaintiff for 30*l.*

His Honour said that finding would be judgment in favour of the trustees of the City Temple, and against the contractors, who would have to pay all the costs.

PATHS.

SIR,—I am very much troubled with weeds growing through my new roads and footpaths, and shall be obliged if, through your valuable paper, I can hear of something that will destroy them without breaking the surface.—H. T.

CASES UNDER THE METROPOLITAN BUILDING ACT.

WOODEN BUILDINGS.

ON the 2nd inst. Mr. C. King, of Ashchurch-terrace, Shepherd's Bush, appeared before Mr. Paget, at the Hammersmith Police-court, in answer to a summons which had been taken out by Mr. T. E. Knightley, district surveyor for Hammersmith, charging him with having done work without giving notice, as required by the Act.

The District Surveyor stated that defendant had erected in his garden what he should call a greenhouse, sashes and other woodwork being placed on brickwork 4½ in. thick. He gave an approximate size, which he said was all he could do, having been refused admittance to the premises. All he asked was compliance with the Act, which required the brickwork beneath sashes to be increased to 9 in. in thickness, with two courses of footings. He did not press for a penalty, although in order to be regular he had taken the initial proceeding under a penal section of the Act.

Defendant called the building a "summer-house," and asked the magistrate whether such an erection came within the meaning of the Act. He had removed an unsightly dustbin, and utilised the old bricks in the lower portion.

Mr. Paget, replying to defendant, said he had no doubt this summer-house was a "building," if constructed in the manner described by the district surveyor and himself. He asked what alteration would bring it within the requirement of the Act, and upon being informed upon this point adjourned the summons for a fortnight, expressing the hope that defendant would no longer go on cutting off his nose to spite his face, but would meet Mr. Knightley properly in the matter, and do the work.

Mr. Pott was recently summoned by Mr. T. E. Knightley, district surveyor for Hammersmith, before Mr. Paget, at the Hammersmith Police-court, for having erected a wooden building at No. 30, Stowe-road, Shepherd's Bush, without giving notice as required by the Building Act.

The District Surveyor explained that the building was approximately 11 ft. long, 5 ft. deep, and 7 ft. high: it was enclosed with wooden boarding instead of brick walls, and was therefore an illegal building. He had used every endeavour to persuade Mr. Pott to make the necessary alteration, but without effect. The defence was that this was not a building within the meaning of the Act; Mr. Knightley, however, read over some decided cases on the subject, and the magistrate coincided in the view taken. Addressing defendant, he said:—"My opinion, according to your own description, is that this is a 'building.' It is useless to kick against the pricks by flying in the face of public officers. I would recommend you to do as Mr. Knightley has suggested, he having met you very properly in the matter." The defendant protested he would pull it down altogether, whereupon Mr. Paget said he would adjourn the summons for a fortnight, to enable him to do so, as the surveyor did not press for a penalty.

FRITH HILL, GODALMING, AND FARNCOMBE WATERWORKS.

THE pretty district of Godalming, which, since the removal thither of the Charterhouse, has been steadily increasing in importance, will soon have the benefit of a good supply of water by a company with local gentlemen of influence as directors having been formed and a Board of Trade order obtained. Mr. Jabez Church, C.E., who has been appointed by the company to design and carry out the works, has proved by trial borings in the green sand that an unlimited quantity of water is to be relied upon, and of the quality of which Dr. Frankland and other eminent chemists report most favourably. The works were commenced on Monday under the inspection of the engineer; and the necessary buildings and water tower to supply a portion of the district will be designed to harmonise with the beautiful locality by Mr. C. F. Hayward, F.S.A., architect.

THE PARIS INTERNATIONAL CONGRESS OF ARCHITECTS.

THE work of this Congress, of which we have already spoken, will commence on Monday next, the 29th inst., and will be carried on until Saturday, the 3rd of August. It will include a visit to the city of Reims (on the 1st of August), and end with a confraternal dinner. Some interesting questions are proposed for discussion.

THE GROSVENOR GALLERY.

As many applicants for Sunday admission tickets to the Grosvenor Gallery are under the impression that it will be opened next Sunday, may I ask you to allow me to state that the Gallery will not be opened on July 28; but that free tickets for Sunday, August 4, may be obtained from the office of the Sunday Society. All applications for tickets must be by letter, enclosing stamped and addressed envelope.

Visitors should be reminded that catalogues cannot be obtained on the day.

M. H. J.

YARMOUTH MUNICIPAL BUILDINGS COMPETITION.

At a meeting of the Mayor, Aldermen, and urgesses of the borough of Great Yarmouth, 1 Monday, the 22nd inst., the following report ' the New Public Offices Committee was con-rmed :—

"The committee having carefully considered the designs nt in by the forty-one competitors, with respect to the robable cost, the light given to the courts, rooms, and rridors, the width of the corridors and passages, the nitary arrangements, and the architectural merits of each the several designs, and with the assistance of Mr. dward Boardman, architect, of Norwich, whom the com ittee had called in, and who stated that he was entirely norant of the names of the authors of any of the designs, solved unanimously to recommend the Council to ward the first premium to the design bearing the motto 'Beacon Blue,' as fulfilling the requirements of the ouncil more than any other design sent in, and for similar asons to award the second and third prizes to the designs aring respectively the mottoes 'Saxon' and 'Bona ides.'

The Committee feel assured that the design of 'Beacon lue,' when carried out, will not only answer the purpose r which it is intended, but also add to the architectural nbellishment of the town. The specification sent in with e design stated that the author was confident that the ilding, as designed, could be carried out for the sum med in the Instructions to architects."

The Mayor subsequently opened the sealed tters which accompanied the three designs nt in, to which prizes had been awarded, and appeared that the design sent in with the otto "Beacon Blue" was submitted by Mr. hn B. Pearce, 'architect, of Norwich; the esign sent in under the motto "Saxon" was bmitted by Messrs. George Nattress & George edger, architects, of 31, Great James-street, edford-row, London; and the design sent in nder the motto "Bona Fides" was submitted y Mr. Brightwen Binyon, architect, of Ipswich.

BROMPTON ORATORY COMPETITION.

SIR,—With all deference due to Mr. Willey, ay I observe that my letter was not addressed o him, and he seems to have misunderstood the urport of it? I particularly wrote to the athers, in the vain hope that they would have he civility to reply, as it is for them to say hether they will allow Mr. Waterhouse's eport to be made public. If they still remain lent, and refuse to grant this favour, I shall onsider, in conjunction with other architects, heir silence as a proof that their decision ntirely disagrees with Mr. Waterhouse's pinions.

I am exceedingly surprised at the course they ave taken in the matter, as it is so derogatory o men in their position to call in the assistance f an "eminent architect," and to advertise the act as an inducement to architects to compete, nd lead them to suppose they would be dealt ith justly; which has not been the case. There ould have been a small excuse for them had hey been unadvised as to the professional sages in such a case; but I see no excuse what-ver for them when they had Mr. Waterhouse o tell them of their unfair behaviour towards number of honourable men, such as those who ave been innocent enough to send in designs nder such circumstances. AN OUTSIDER.

PORTLAND CEMENT TESTING-ROOM.

SIR,—Having seen in your valuable journal a otice of a testing-room and laboratory for ortland cement, established for the satisfactory uarantee of a good quality of the same, I feel ure that it will supply a want that has long een felt.

A difficulty, however, appears to remain here the Portland cement is delivered on works aving no clerk of works; or where there is a rge supply of Portland cement, then whether he whole quantity is equal to the sample ested can scarcely be known.

Of course it is to the manufacturer's interest o see that every bushel is of the quality speci-ied, and it remains to be seen whether any heck can be put on the builder after the cement as left the manufacturer's hands, and he has one all in his power to ensure a good result.

W.

The Land Titles and Transfers Act.—he Select Committee of the House of Com-ons on the Land Titles and Transfer question ave terminated their sittings for the present ession, and have reported the evidence taken efore them to the House, with the recommen-ation that the committee be reappointed next ession.

A NUISANCE AT BRIXTON.

SIR,—The neighbourhood of Loughborough Park,—one of the pleasantest parts of Brixton,—has for the last few evenings been afflicted with a serious nuisance, in the shape of a disgusting effluvium, given off, it is believed, from a newly-established soap-boiler's, tallow-melter's, blood or bone boiler's, or some kindred business, carried on, so far as can yet be made out, in some of the arches of the London, Chatham, and Dover Railway, about midway between Loughborough Junction and Brixton Stations. The nuisance can only be compared to that which has existed for so many years in the neighbourhood of Friar-street, Blackfriars-road. Such a nuisance, in this hot weather, is likely to be fraught with serious effects on the health of the inhabitants, to say nothing of the deterioration in the value of property which must ensue. The Lambeth Vestry and the Metropolitan Board of Works have been communicated with, as have also the railway company, the latter, I believe, disclaiming any knowledge of any such noxious business being carried on in any of their arches in the neighbourhood. Pray, Sir, allow me, through the medium of your journal, to urge the inhabitants and property-owners of the neighbourhood to take prompt and determined measures to put down so intolerable a nuisance.

BRIXTONIENSIS.

STAINED GLASS.

Wistanstow.—A new stained-glass window has been placed in the parish church of Wistanstow, in memory of the sister of the rector, the Rev. J. Swainson. The window has three lights. In the first opening is a figure of Miriam with a cymbal. The centre light is devoted to a representation of "Hannah" in a devotional attitude; whilst in the third opening is "Rachel," bearing a shepherd's crook. The whole rests upon an ornamental base, and is surmounted with a rich canopy, the tracery consisting of illuminated designs. The window is the work of Mr. Davies, of Shrewsbury.

Great Berkhampstead.—A stained glass window has been placed in the parish church of St. Peter, in memory of the late Mr. Longman. It is on the north-eastern side, and faces the Grammar School. The window has been executed by Messrs. Heaton, Butler, & Bayne.

Folkestone.—On St. Peter's Day three new stained-glass windows were unveiled in the south wall of the nave of St. Peter's Church. They have been executed by Messrs Clayton & Bell, at the cost of a gentleman who is a frequent visitor to Folkestone. The subjects of the designs are events in the life of the Apostle Peter. The one nearest the pulpit represents the delivery of Peter from prison; the centre window represents the healing of the sick at the Beautiful Gate of the Temple; and the third, the miraculous draught of fishes.

CHURCH-BUILDING NEWS.

Chelmsford.—The entirely rebuilt church of St. Lawrence, Chelmsford, has been opened. The former structure had fallen into great dilapidation. The ancient chancel, having entirely disappeared, was replaced some few years since by an ugly brick excrescence. The new church is erected upon the old lines, in the Perpendicular style, similar to the old building. The plan consists of nave, 45 ft. by 21 ft., chancel, 21 ft. by 17 ft., vestry, and north porch. The material used externally in the construction of the building is Kentish rag stone, in random courses, and all windows, doorways, weatherings of buttresses, and dressings generally, are in Bath stone. As much of the ancient stone and other material as it was possible to work in again has been re-used. The roofs are covered with old tiles crested with an ornamental tile ridge. The nave roof is surmounted by an oak octagonal turret, the spire of which, rising to a height of 60 ft., is covered with shingle. The church is warmed by one of Rimington's hot-air stoves. Mr. Robert Wheeler, of Tunbridge Wells, is the architect, and Mr. W. Stammers, of Southminster, the builder.

Ashe.—A new church erected at Ashe, near Basingstoke, has been consecrated. The architect is Mr. G. G. Scott, and the builder was Mr. Samuel Elliott, of Newbury.

Ashton-under-Lyne.—The Bishop of Manchester has consecrated the new Church of the Holy Trinity, Ashton-under-Lyne. The church was founded by the late Mr. Heginbottom, of Ashton. The style of the building is Early Pointed. Internally, the walls are of red brick below, and red and white in patterns above. Externally they are of red brick, with bands and patterns in blue brick. Sitting accommodation is provided for 760 worshippers, all the seats being "free and unappropriated for ever." A sum of about 12,000*l.* has been spent upon the building and its surroundings, but there still remains to be erected a parsonage-house. The works have been carried out by Messr. W. Storrs & Co., contractors, Stalybridge, from designs by Messrs. M. & H. Taylor, Manchester. The chancel is paved with tiles supplied by Mr. Godwin, of Lugwardine. The contractor for the heating arrangements, which will be by hot-water pipes, was Mr. John Wilson, of Ashton. All the painted windows are by Messrs. Heaton, Butler, & Bayne. There is but little carving; what there is has been done by Messrs. T. Earp & Sons. The bells are by Messrs. Mears & Co.

Wiltshire.—At the quarterly meeting of the Salisbury Diocesan Church-Building Society, on the 2nd inst., a grant of 125*l.* was voted towards the enlargement and restoration of the parish church of Child Okeford, in the archdeaconry of Dorset, and a similar amount was also provisionally granted to further the rebuilding and restoration of the parish church of Shapwick, in the same archdeaconry. Votes were also made to Codford St. Mary, in the archdeaconry of Sarum, and to Avebury, in the archdeaconry of Wilts, towards the restoration of the parish churches in those parishes.

Brereton.—St. Michael's Church, Brereton, near Rugeley, has been reopened, after enlargement and restoration. The church, which was originally a cruciform building, opened in 1837, has been enlarged by the addition of north and south aisles, designed by the late Sir Gilbert Scott, who closely adhered to the style of the existing structure,—late Early English verging on Early Decorated; and it will now accommodate about 400 worshippers. Externally the only striking feature of the new work are the corbels, from which spring the moulded labels of the east windows, those on the south aisle representing her Majesty the Queen and the late Bishop Selwyn, and those on the north aisle the apostles St. Peter and St. Paul. The new work is of local stone, the royalty and cartage of which was given by the late Earl of Shrewsbury. The total cost of the works has been about 3,000*l.*

Minster-in-Sheppey.—Mr. Ewan Christian, the architect to the Ecclesiastical Commissioners, has visited the Abbey Church, Minster-in-Sheppey, which is about to be restored. The cost of the restoration will probably be about 3,000*l.*

Bardney.—The church of St. Lawrence, Bardney, has been reopened, after restoration. The walls and arches have been cleared of the plaster which covered them, the false roof taken away, and the old oak roof displayed. The west end of the north aisle is formed into a baptistery. The windows have been restored, and filled with cathedral glass, and floors laid throughout with encaustic tiles. All the old pews have been swept away, and replaced by chairs. The whole of the works have been carried out by Messrs. Walter & Hensman, of Horncastle, under the direction of Mr. James Fowler, architect, Louth. The whole of the funds, 2,500*l.*, required for a perfect restoration, have not yet been raised; the tower and porches are left for future restoration.

Sutcombe.—The Parish Church, dedicated to St. Andrew, and built in the local Perpendicular style, has been in part restored, and further renovations are in contemplation. The parish is a remote one, some six miles from Holsworthy. The restoration has been carried out at the expense of the rector, the Rev. A. E. Clementi Smith. The architects engaged are Messrs. Bodley & Garner, of London. The church consists of a western tower, nave, north aisle, chancel, and south chancel, or Thuborough aisle. The building is interesting as possessing a wealth of old carved woodwork, the ancient bench-ends, and the lower part of what was once a rood-screen still remaining, sadly mutilated. The present works embrace the restoration of the chancel-roof and renovation of the chancel generally; new stalls have been made, with richly-carved ends, the late type of ornament general in the church being strictly adhered to in the new work. Many of the old carved benches in the nave have also been restored. These works and the new carved work have been carried out by Mr. Harry Hems, of Exeter. The roof of the chancel has been decorated in colour by Mr. Carter, of London. The general works are by Mr. Allin, of Sutcombe.

Tarporley.—The tower of Tarporley Church, Cheshire, has been recently inspected by Mr. Crowther, the architect for the work. In his report he gives a satisfactory account of the manner in which the builder, Mr. James Fleet, has executed his task. The cost of rebuilding it amounted to 2,348*l.* 11s. 8d.

DISSENTING CHURCH-BUILDING NEWS.

Kirkcaldy.—The memorial stone of the new Free Church, Kirkcaldy, was laid on the 15th inst. by Provost Swan. The church is to be built in the Gothic style with a tower and spire attaining a height of 250 ft. Sittings are to be provided for 1,150 persons. Adjoining are to be Sabbath school and young men's halls, the former to hold 300 and the latter 150. The architects are Messrs. Mathews, Aberdeen. The contractors are:—Mackenzie, mason work; Little & Sons, joiners; and plumbers, Wood,—all of Kirkcaldy. The cost, exclusive of site, which was the gift of Provost Swan, is estimated at 16,000*l.*

Seacombe.—A new Welsh Presbyterian chapel has been opened at Seacombe. The chapel occupies a site in Liscard-road, near its junction with Victoria-road. The building is cruciform in plan, consisting of nave and transepts, with vestry and necessary lavatories and cloak-rooms, &c., at back. The whole of the external masonry consists of limestone, that for the dressed portion being obtained from the Penmon quarries, near Beaumaris, Anglesey, and the shoddies or ashlars from Craig, Denbigh. The chapel will be heated with hot-water apparatus supplied by Messrs. Bennett, Brothers, Liverpool, who also provided the lightning conductor and finials, and fixed all the gas-piping, &c.; the gas pendants and iron hinges, &c., being supplied by Messrs. Jones & Willis, of Birmingham, from special designs supplied by the architect. The latches and general internal work were supplied by Mr. Doodson, of Manchester. Messrs. Hart, Son, Peard, & Co., of London, supplied the entrance-gates and railings. The whole of the pewing, which is pitch-pine, was entrusted to Messrs. Roberts, Williams, & Co., Liverpool. Mr. Sipping was the plasterer; the carved work being executed by Mr. J. Griffiths and Signor M. Geflowski. Messrs. Forrest & Son, of Lime-street, Liverpool, supplied the glazing, which is of rolled cathedral glass, fixed in lead lights. The clerk of works was Mr. J. Jones, of Egremont; and the whole of the work was carried out under the superintendence of the architect, Mr. R. G. Thomas.

Hastings.—The memorial-stone of a new Congregational church for Hastings has been laid. The site of the church is in the centre of an entirely new district, which is being rapidly built upon. The church is in the Early English style. A tower and spire occupy the south-east corner. Red brick with buff terra-cotta dressings are the materials used. Some land has been secured on the north side of the church for the erection of a school. The architect is Mr. T. Elworthy, of St. Leonard's, and the builders Messrs. C. & E. Harman. The cost of the whole structure will be 5,000*l.*

Buckley.—The foundation-stone of a new Welsh Calvinistic Methodist chapel at Buckley has been laid. The new building will be situate on the road leading from Mold to Buckley, and will be Romanesque in style, carried out in red brick with Ruabon dressed stone facings. Sitting room will be provided for 260 persons. The architect is Mr. Richard Owen, Liverpool, and the contract has been let to Mr. John Williams, of Buckley, for 1,025*l.*

Llanidloes.—The memorial-stones of a new chapel for the service of the Welsh Congregationalists of this town have been laid. The style is Grecian. The contract is for 1,550*l.*, with the materials of the old building. The architect is Mr. J. Humphreys, Swansea; and the builder, Mr. J. Hope Owen, Llanidloes.

Leith.—A new United Presbyterian Church is to be built at Leith. The site is at the corner of Summerside-street and Summerside-place, Bonnington, the front elevation being to the former street. It is designed in the Gothic style. The main building measures 80 ft. by 55 ft., the pointed roof rising to the height of 56 ft., and being surmounted with neat ridge-tiles. A vestry, session-house, and other necessary offices have been provided for. The church will be seated for 700 persons. The estimated cost is 7,000*l.* Mr. Starforth, of Edinburgh, is the architect, and Mr. W. Baxter, of Leith, is the contractor.

Tunstall.—In consequence of the present building belonging to the Congregational body being too small and inconvenient to meet the requirements of the congregation, a new erection has been decided upon. The site will be at the front of the present school chapel in High-street, and the new building will be constructed to seat 450. The cost is estimated at 1,300*l.* The church is to be erected from the designs of Mr. A. R. Wood, architect, Tunstall, the builder being Mr. J. York.

Benfieldside.—The foundation-stone of a new Presbyterian Church and Schools has been laid at Blackhill. The new building is being erected upon a site facing Durham-road, and is to be entirely of stone, faced with fell blockers in thin courses, with a chisel draught at angles instead of quoins. The entrance-porch is to be carried up as a tower, with slated spire, to the height of 70 ft. The side walls have been designed exceptionally low, and in order to break the monotony of the large span roof, a continuous clearstory, with stained glass, is to be formed on the timbers of the roof. The church is to be seated to hold a congregation of 350. Mr. G. Westgarth is the contractor, and the estimated cost is a little over 2,036*l.* The architect is Mr. W. Lister Newcombe.

Milton-next-Sittingbourne.—The new Primitive Methodist Chapel in Church-road, Milton, has been opened. It has been built from the designs of Messrs. Kerridge & Sons, of Wisbeach, by Messrs. Rands & Sons, of the same place. The total cost will probably be about 800*l.*, and the chapel will accommodate 200 persons.

Maidstone.—King-street Congregational Church, Maidstone, has been re-opened, after renovation and decoration under the superintendence of Mr. E. W. Stephens, architect.

SCHOOL BOARD SCHOOLS.

Islington.—New Board-schools have been opened by the School Board for London in Caledonian-road, Islington. The building is in the main road, close to the Cattle-market, and will accommodate 1,150 children. The total cost of the site amounts to 3,534*l.*, and that of the building to 11,010*l.* Mr. E. R. Robson was the architect.

Hemington.—New schools for the Lockington and Hemington School Board have been opened at the latter place. The style is Elizabethan, the architects being Messrs. Giles & Brookhouse, of Derby, and the contract amounted to 1,200*l.* The buildings consist of large school-room, class-rooms, teachers' residence, and out-buildings, with a good play-ground, surrounded by a wall. The schools accommodate ninety children. The late Mr. F. Hood, of Castle Donington, was the builder.

Marylebone.—New Board schools, in Henrietta-street, Marylebone, were opened by Sir Charles Reed on the 15th inst. The following are some statistics as to the buildings:—Area of site, 13,340 square feet; cost of site, 16,184*l.* 16s. 1d.; legal expenses, 517*l.* 11s. 9d.; total, 16,702*l.* 7s. 10d.; cost of building, exclusive of extras, which have to be reported, 8,370*l.*; clerk of works' salary, 104*l.* 10s. 2d.; extras, so far as reported, 1*l.* 10s.; total, 8,491*l.* 0s. 2d.; total cost of site, 16,702*l.* 7s. 10d., and of building, 8,491*l.* 0s. 2d.; making a total of 25,193*l.* 8s. The total cost of site per head is 29*l.* 2s. 11d., and of the building per head, 14*l.* 16s. 4d. The accommodation is,—boys, 181; girls, 188; infants, 204. Mr. E. R. Robson is the architect.

SCHOOL BUILDING NEWS.

Irlams-o'-th'-Height.—The memorial stones have been laid of new Wesleyan schools at Irlams-o'-th'-Height, Pendleton. The architect of the building is Mr. John Cheetham, of Moorside, Swinton, and the contract for the work is let to Mr. Samuel Cheetham, of The Heights, for a sum of 860*l.*

Gainsborough.—It is stated that the managers of the Gainsborough Church schools have under consideration the desirability of re-organising their present buildings, and of adding two new schools to them. For Trinity parish a new school for 200 girls is to be added to the present block, and the infants will take possession of the rooms now tenanted by the girls. The plans of the building have been drawn by Mr. E. Wright, who estimates the cost at about 900*l.*

Water.—The guardians of the poor of the parish of St. Matthew, Bethnal-green, have it in contemplation to improve the water-supply to their workhouse establishment by sinking an artesian well into the chalk basin. Mr. Peggs, C.E., of Westminster, who has carried out the improved water-supply at Shoreditch workhouse, will also carry out the necessary works here.

BUILDING OPERATIONS IN THE FAR NORTH: WICK AND THURSO.

THE *John O'Groat Journal* says that during the past few months a considerable amount of building has been going on in the Wick district, chiefly on the Pulteneytown side of the river. After the completion of the new bridge, and the extensive additions which were made to the manse, the first work was that of a large new workshop, at Janetstown, for Mr. George Forbes, millwright and engineer. Messrs. Reid & Tait were the contractors.

Adjoining the "Wick Agricultural Iron Works" is another house in course of erection, on what is termed the model cottage system, belonging to Mr. Daniel Henry, joiner. In it there will be virtually four houses, two entering from the front, on the ground flat, and two from the back, by an outside stair. It is stated to be the first of the kind which has been erected in Caithness, and follows the model of hundreds of houses put up by the Edinburgh Co-operative Building Society, and also in Prince Albert Buildings, Edinburgh. Mr. D. Miller is the builder.

Mr. Mitchell's new residence, "Gowrie Cottage," is being erected from plans by Mr. Donald Dunbar, architect, Wick. The contractors were Mr. D. Miller, builder; Mr. D. Henry, joiner; Mr. W. Smith, plasterer; and Mr. B. Dunbar, plumber.

St. John's parsonage has been pushed forward by the contractors. It is situated in Moray-street, and is adjoining the chapel. Mr. Donald Dunbar, Wick, is the architect; and Mr. D. Miller, Pulteneytown, the builder; Mr. John Bain, Pulteneytown, joiner; while Mr. B. Dunbar is plumber.

At the Harbour Brae, adjoining the coffee-house, workmen have begun clearing away for the foundation of a building to be erected by Mr. Charles Dunnet, Wick. Mr. Dunnet has also erected extensive stabling from Union-street to River-street.

In connexion with the Hempriggs estate, there has been good work done. A new commodious farmsteading, gamekeeper's house, with kennels attached, has been erected at the Mains, Ackergill. There have also been cottages erected at Reiss, Barnyards, and East Banks.

In Thurso, a new mansion is being erected for Mrs. Smith, of Olrig. It is in the Elizabethan style, the central portion being flanked by side wings. It is stated that the designs were prepared by Major Smith, of Olrig. Contractors,—Mr. Thomas Ross, mason, Castletown; Mr. George Hill, joiner, Castletown; Messrs. Ryrie & Oag, plasterers, Thurso; Messrs. Reid, slaters, Thurso; Mr. Cramond, painter, Thurso; and Mr. Dunbar, plumber, Wick.

Immediately adjoining, and on the face of the same hill as Mrs. Smith's mansion, is Ormlie Lodge, the property of Mr. John Henderson. Ormlie Lodge is built in the Gothic style. The material used is bluestone, faced with Morayshire freestone. The cost will be upwards of 5,000*l.* Mr. James Edgar, late manager of the Forss quarries, and now of Glasgow, was the architect. Contractors,—Mr. George Manson, mason, Murkle; Mr. George Durran, joiner, Thurso; Mr. D. Ross, slater, Thurso; Mr. Scott, painter, Thurso; Mr. James Mercer, plumber, Thurso; and Messrs. Oag & Ryrie, plasterers, Thurso.

Mina Villa, the residence of Mr. W. Reid Tait, is situated on the right hand coming from the station. It consists of sixteen apartments. The style of architecture is pure Gothic. We believe Mr. Ross, of Inverness, was the architect. Contractors,—Mr. John Gunn, mason, Halkirk; Mr. Geo. Durran, joiner, Thurso; Mr. Donald Ross, slater, Thurso; Messrs. Oag & Ryrie, plasterers, Thurso. We believe the contractor for painting and the plumber work were from Inverness, but we did not learn their names.

The new house, erected by Mr. James Brims, is a Gothic erection. The architect is Mr. David Smith, Thurso. Contractors,—Mr. William Munro, mason and slater; Mr. B. Alexander, Thurso, joiner and painter work; Mr. B. Dunbar, Wick, plumber; and Mr. Jas. Smith, Thurso, plasterer.

Mr. Lewis Dunbar has erected a commodious house in Janet-street. It is in the Gothic style. The architect is Mr. Ross, Inverness. Contractors,—Mr. George Manson, mason; Mr. George Durran, joiner; Mr. Donald Doull, plumber; Messrs. Reid, slaters; Mr. Noble, painter; and Messrs. Ryrie and Oag, plasterers,—all of Thurso.

Captain M'Kidd's new house is in the same

…eet. It is in the Elizabethan style. The …one used is Brora freestone and polished …shlar work. Mr. D. Smith is the architect. …ontractors,— Mr. G. Manson, mason; Mr. …urran, joiner and plaster work; and Messrs. …eid, slaters.

…Thurso East Castle occupies a prominent …osition in the landscape. What was the old …d original building has been completely re-…oved, and the new structure erected on its …te. The original castle was built in the six-…enth century by George, Earl of Caithness, …d the sea wing was afterwards added by …e late Sir John Sinclair in the year 1833. …r. David Smith, architect, Thurso, prepared …e designs for the modern building. The sea-…ard foundations had to be dug out to a depth …f 20 ft., while the portion of the site to the …uth was founded on the solid rock near the …rface. Thurso East Castle has been six years …building. The height of the main tower is …7 ft. from the basement, while the main body …the castle is five stories in height, and sur-…unded by towers and embattlements, from …hich magnificent views of the surrounding …untry and to seaward are to be obtained. …r. Alex. Swanson, contractor and builder, …urso, carried out all the arrangements in …onnexion with the various sections of the …ork, including the mason, joiner, slater, and …umber contracts.

THE NORTH LONDON COLLEGIATE SCHOOL AND CAMDEN SCHOOL FOR GIRLS.

On Tuesday, the 23rd, two memorial stones …ere laid, one on each side of the new entrance …f the extensive building now in course of …ection at Sandall-road, Camden Town, for the …orth London Collegiate School for Girls.

This school was founded by Miss Buss a …uarter of a century ago, and, together with the …amden School in the Prince of Wales's-road, …ntish Town, is still under her management; …though both are now carried on under the …spices of trustees appointed under the scheme …the Endowed School Commissioners for the …plication of certain trust funds in the hands …the Brewers' Company, amounting to some …,000*l.* In furtherance of the same object, the …othworkers' Company have given 2,500*l.* …wards the cost of the examination-hall,—to …called the "Clothworkers' Hall."

Mrs. Buxton, assisted by Mr. E. N. Buxton, …st-master of the Brewers' Company, laid one …ne, and Mr. Charles Reynolds, master of the …thworkers' Company, laid the other,—the …chitect, Mr. E. C. Robins, F.S.A., presenting …silver trowel to each, with suitable inscriptions …graved upon them.

The old school-house, in Sandall-road, will …partially taken down, and an additional story …d a new front will be added to the remainder, …ile the vacant ground around will be occupied …the new buildings, giving accommodation for …0 pupils. The principle adopted in the classi-…ation of the pupils is that of fourteen separate …asses, of thirty pupils in each class, with …e teacher and assistant to each class. Five …these class-rooms open into the great hall on …e ground-floor level, and five on the gallery …el.

The hall, 80 ft. by 40 ft., is not only to be …ed for collective purposes, and for one or both …hools on prize-days, &c., but affords space for …e withdrawal of pupils from the class-rooms …r special teaching as occasion may require. …ere is a deep gallery at one end of the hall, …d a shallow gallery on one side, which also …ms the means of access to the second-class …oms on the first-floor level.

Three more class-rooms and the drawing-…hool are on the second floor of the new build-…g, flanking the hall, but not communicating …th it. Single Swedish desks will be used …roughout.

The dining-hall, kitchen, and cooking-school, …d other domestic offices, are in the base-…ent, as also a spacious cloak-room and con-…niences.

Over the Board-room in the old building is the …nce lecture-room, while the teachers' and …sic rooms, and servants' dormitories, occupy …e remaining upper part of the right wing or …ned portion of the present building. The …mnasium, 60 ft. by 25 ft., is situated in the …den in the rear, and is already completed. …e warming and ventilation have received …ention.

On the completion of the ceremonies, the company adjourned to the Camden School, in Kentish-town, which has been completed and in use for several months, and formally opened that building, which was designed by the same architect.

BUILDERS' BENEVOLENT INSTITUTION.

The thirty-first annual meeting of this Institution was held on Thursday, at Willis's Rooms, St. James's, Mr. Dines in the chair, in the absence of Mr. William Higgs, the president. The annual report (read by the secretary, Major Brutton) congratulated the subscribers to the Institution on the fact that, although the past year had been one of almost general adversity in trade, the income of the Institution had not been diminished. This was especially gratifying in view of the recent increase in the amount of the annuities to pensioners. Six pensioners had been elected during the past year, and, by the new rule, one widow of a pensioner had been placed on the list of annuitants without election. It was a source of much gratification to the committee that they were enabled to recommend that all the candidates (three) presenting themselves in May last should be placed on the funds of the Institution without the trouble and expense of canvassing. The Institution was very much indebted to its president during the past year (Mr. William Higgs). The balance-sheet showed that the total receipts for the year were 2,445*l.* 2s. 2d., and the expenditure (including the purchase of 209*l.* Three per Cent. Consols) 1,773*l.* 7s. 11d., leaving a balance of 671*l.* 14s. 3d. in the hands of the bankers. The report and balance-sheet having been adopted, votes of thanks were accorded to the president, treasurer, trustees, committee, and other officers of the Institution. Mr. Plucknett was re-elected treasurer; Mr. Keeble was asked, and consented, to undertake the duties of honorary secretary to the annual ball; and Mr. Edward Conder was unanimously elected president for the ensuing year. It was announced that the annual dinner had been fixed for Thursday, November 7th next, at the Freemasons' Tavern.

ST. AUGUSTINE'S, SOUTH BERMONDSEY.

On Saturday last the Bishop of Rochester consecrated the chancel and two bays of the nave of St. Augustine's Church, Lynton-road, Bermondsey.*

The portion now completed covers an area of about 80 ft. long by 60 ft. wide. It consists of a chancel of three bays, and two bays of the nave, with north and south aisles. The chancel, in addition to wide aisles on north and south sides, has an ambulatory at the eastern end. The style is Thirteenth-century Gothic of English character, the chancel having a square termination with three arches opening into the ambulatory, and three windows above; that in the centre being of three lights and the sides of two lights.

Owing to the ground on which the church is built being considerably below the level of the road along the north side, and the soil being peat for some depth, it was thought desirable to form a crypt under the whole of the building. A groined ceiling has been constructed of cement concrete at a height of 14 ft. above the crypt, which supports the floor of the church. The chancel is 40 ft. deep and 27 ft. wide; it is vaulted with red brick to a height of 46 ft.; the portions adjoining the western bays of the chancel on the north and south sides are 13 ft. wide, in which seats are placed. The organ, built by Messrs. Bevington, is on the north side, under the tower. The organist's seat is a balcony under the arch opening into the chancel.

The vestries, which are not yet built, will be on the north side of the chancel; that for the clergy will adjoin the chancel aisle; that for the choir will be in the crypt below, reached by the turret-stair, which has concrete steps.

The nave will be 77 ft. long in five bays, 35 ft. high to the wall-plate, with a narthex of 17 ft. wide, and a large porch facing the road. The font, which is of red Dumfries stone, will stand in an octagonal baptistery at the south side of the narthex. The walls are faced with red bricks, with masonry of Bath stone, and red Dumfries stone piers. The nave is the same height and width as the chancel, with aisles, 13 ft. wide and 13 ft. high to the wall-plate. The benches at present accommodating 460 persons are of deal stained black. The church, when finished, will seat 1,000 persons, and all the sittings will be free.

Messrs. Henry Jarvis & Son, of Trinity-square, Southwark, are the architects.

* A view of the Interior of the Church appeared in the *Builder*, on the 1st of January, 1876.

A PERSONAL QUESTION.

At the meeting of the Metropolitan Board of Works, to be held this Friday, the 26th inst., the following report from the Works Committee is to be considered:—

"That, from the facts and circumstances which have come to the knowledge of the committee relative to the past and present interested connexion of Mr. Joseph Storey, the representative at this Board of the parish of St. Luke, with property in that parish required for the Board's Improvement Scheme in Whitecross-street under the Artisans' Dwellings Act, and for the local improvement in Golden-lane, now being carried out by the same Vestry, and to the cost of which the Board have agreed to contribute a moiety; and from the fact that a claim is now before the committee, signed by Mr. Storey and his co-adventurers, demanding a sum of no less than 47,052*l.*, in respect of property in which he is largely interested, the committee are of opinion that Mr. Storey's duties, as a member of the Metropolitan Board of Works, are in complete conflict with the private interests of himself and of his co-adventurers, and that his conduct in relation to the properties in question is calculated to reflect discredit upon local self-government."

THE WORCESTER ARCHÆOLOGICAL SOCIETY AND THE GRAVEYARDS.

Sir,—Reading in the *Builder* the account of the Society's trip to Grafton Flyford, and Flyford Flavel, reminds me of what I saw there and in the neighbourhood last autumn, the primary cause of the wretched state of the graveyard at Flyford Flavel being that there are public paths through it, used by the children going to the National Schools, who soon learn to make use of an open space to play their gambols in. I felt it a pity that such could be the case, and wondered why the parish authorities could not divert the footpaths to either the north or south side of the yard by setting off a width of a couple of yards and placing a wire fence. The same remark as to the thoroughfare applies to Grafton Flyford, where the school-house adjoins the churchyard, and cannot be diverted so well as at Flyford Flavel, but it is in a much better condition. If the society had turned off from here to Huddington, Mr. Noake and his friends would have met a donkey or two, with an alarming appendage, in the churchyard. This is the worst kept one I have ever seen; there are no fences to it, they having been grubbed up by the pigs, as also have been the graves. On the north side I saw a solitary mound; this was thickly studded over with blackberry briars to prevent the pigs poking their noses through.

The church is an interesting old one of various dates, with a chapel on the south side, belonging formerly to the Hall; the north side has a timber porch of Decorated date, the lower part in a ruinous condition, the sides having been rooted up by the pigs. There is no public thoroughfare through it. The cause of this disgraceful state of things is that most of the parishioners are Dissenters. This church is within eight miles of Worcester Cathedral, where so many thousands of pounds have been laid out within the last twenty years. Adjoining the north side of the churchyard are the remains of the Hall,—a beautiful specimen of the Elizabethan style of a half-timbered mansion; the greater part of it has been pulled down, including a chapel. At the back is a magnificent massive chimney-shaft, with various patterns wrought upon it; it is now occupied as a farmhouse. The place has an interest in its having been the residence of Sir Richard Winter, one of the Guy Fawkes conspirators, who was hanged, and possibly from that cause the place became dismantled. A mile farther on is Himbleton, the village of which is an unusually interesting one, consisting of lofty blocks of half-timbered cottages. The church is a good old one. In the yard were some turkeys sitting on their eggs, an unusual thing late in the autumn season. I hope some of your Worcester readers may be induced to have a tramp out about their neighbourhood, and give you an account of their rambles among the churchyards in that county, which, in my own experience, have been the least cared for of any diocese in England.

J. B. Watts.

VARIORUM.

"Posts and Telegraphs, with an Account of the Telephone and Phonograph," by William Tegg (Tegg & Co.), is a pleasant, chatty piece of bookmaking, but contains nothing new.——We have received the first volume of *Brief*, a weekly epitome of the Press. Bound thus it becomes a volume to retain and dip into. The Index is full, and presents some original features. The proprietors claim with justice that *Brief* is the only paper in which the news of the week is edited, epitomised, and classified under separate headings.——*Design and Work* improves. It is very cheap, and includes much useful reading for the workshops.——Any one wishing to have a compact account of the proceedings at the late General Conference of Architects, 1878, will find it under the head Sessional Papers 1877-8 (Royal Institute of British Architects), Nos. 14, 15, 16, 17. It is obtainable for a few shillings.

Miscellanea.

The Supervision of the Houses of Parliament.—The *Morning Advertiser*, after denying the truth of some rumours as to the instability of the tower, says:—"Nevertheless, it cannot be denied that in other far lighter and less prominent parts of the buildings, important cracks have appeared, and are still appearing. In what is called the officers' court, there was one most serious fissure and settlement of the stones, which extended through the wing and seemed to make risky the carved archway which gave access from it to the river front. Now this ugly seam has been closed with cement, and we are told that no further movement is to be apprehended. It may be so, but a very recent inspection has shown that two other cracks are developing themselves,—and pretty plainly too,—lower down, and on either side of the great crack which has been stopped above. The key-stones of the arched doorways, too, here and there, show by their gaps that they are loosening in a way which, if not actually threatening, certainly suggests the necessity for careful and skilful watching; and the same may be said of many of the small windows on the ground-floor, which are not of much consequence in themselves beyond that they serve to show what is going on beneath them. Recently a rather serious crack has occurred under the windows of Colonel Carrington's quarters, where the pressure of the stones together has been sufficiently severe to nip the edges off from one, and the pieces now lie on the grass. Yet the river wall, either from its parapet or foundation, shows not the slightest signs of yielding, and while this is so the building which it confines cannot have moved much except towards Westminster. It is a singular fact, however, that where the cracks we have mentioned have occurred, they precisely face the spot on the river terrace where the piles in front of it were drawn out instead of being sawn off, and all would have been treated in the same manner but for the timely and energetic remonstrances of our contemporary the *Builder*. Still, the building just now requires some careful supervision, and this can only be got by the appointment of a competent architect to take charge of it, and see to its wants at regular intervals. There was some such official before Mr. Ayrton came into office as First Commissioner of Works, but he effected a reduction by abolishing the post, and that was sufficient as an economy. Time will show."

The Blackpool Winter Gardens.—These gardens were opened on the 11th of the present month by the Lord Mayor and Sheriffs of London in state. The buildings, of which we have already given a description, are principally of glass, iron, and brick. The glazing is done on the principle patented by Mr. W. E. Rendle, of Westminster, whose glazing may now be found on almost every new building of the kind. The dome of the Winter Gardens is about 120 ft. in height, and has a very light and graceful appearance, and can be seen a long distance out to sea. The principal structure is a glass corridor, extending round the whole of the building, this being also glazed on Rendle's patent system.

Oxhill.—The old Wesleyan chapel at Oxhill, near Banbury, is being enlarged. It will seat 300 persons when finished, and the cost of the alterations will be 400*l*. The contract has been undertaken by Mr. Kingerlee, of Banbury.

A Russian Observatory.—A new magnetic observatory has been opened at Pavlovsk, to serve as an annexe to the Central Physical Observatory of St. Petersburg. The new observatory covers about eight hectares of surface, and the situation is in all respects favourable for the work for which it is intended. The establishment comprises three principal scientific buildings,—the principal building being of stone and surrounded by a terrace for meteorological observations; a double-arched structure in stone covered with earth for observations in magnetic variation; and a wooden pavilion, without a particle of iron, for absolute magnetic measurements and for determinations of time. Besides these three buildings, devoted to the purely scientific work of the observatory, there are four wooden houses for lodging the staff, servants, and other purposes. All these structures are roofed with bitumenized paper, and the scientific buildings are at a sufficient distance from the other buildings to prevent the scientific observations being affected by their neighbourhood. As we have said, the pavilion for absolute magnetic measurements is without a particle of iron; all the metallic parts, locks, and padlocks, keys, doors, and chimneys of stoves, &c., are of copper or brass, and each of these objects has been tested by a particularly sensible magnetometer. The same test has been applied to the limestones of the foundation, the bricks of the stoves, and the chimneys, the granite supports of the instruments, &c. In short, every precaution has been taken, both during the building and after its completion, to prevent a trace of iron getting near it.

City Carlton Club.—The Duke of Richmond, president of the club, has laid the foundation-stone of the new club-house, which is to supersede the present premises in King William-street. After much effort, and fruitless negotiations in other quarters, the committee have succeeded in procuring from the Grocers' Company an eighty years' building lease of a portion of their property, comprising an area of 5,150 ft., situated between St. Swithin's and Sherborne-lanes, close to the present premises. Owing to the leases of the tenants of houses on the property not expiring till 1881, a large sum had to be paid to the occupiers by the committee in the way of compensation, and in order to obtain immediate possession. A contract for the club-house, as designed by Mr. R. Roberts, architect, was entered into by Messrs. Perry & Co., of Bow, the amount for the building being 27,000*l*. The new structure, which will be of stone, is calculated to accommodate nearly 1,200 members. It will contain a spacious coffee-room, 70 ft. long by 26 ft. wide, reading-rooms, two billiard-rooms, a smoking, card, and private dining room. The kitchens will be on the top of the house. There will also be sleeping accommodation for upwards of thirty servants. The sum required for building the club, for compensating the outgoing tenants, and for furnishing, is being raised amongst the members of the club by debentures bearing 5 per cent. interest, and which are the first and only charge upon the property of the club.

Wood-Peeling in Perthshire.—The wood-peeling season in Perthshire has now come to a close. Since the beginning of May the number of persons employed at the stripping of oak and larch bark numbered about 2,000, and consisted of men, women, and children, chiefly Irish. The wages paid to the men ranged from 3*s.* 6*d.* to 4*s.* per day, to women from 2*s.* to 2*s.* 6*d.*, to boys and girls from 1*s.* to 1*s.* 6*d.* The wages of wood-peelers have within the last few years been more than doubled, but, on the other hand, the price of bark has lately fallen from 20 to 25 per cent., owing to importations.

Closing of Footpaths.—*Apropos* of Mr. Buckle's letter in our last, we see it stated in the Wiltshire papers that access to "Oliver's Camp," on Roundway Down, near Devizes,—a spot which had been open to the public from time immemorial,—is now sought to be inclosed, iron railings, 4 ft. or 5 ft. high, having been erected round the camp and down the slope of the hill.

Coatham Convalescent Home.—The completed portion of the new Children's Hospital in connexion with the Coatham Convalescent Home has been opened. The plans were prepared by Mr. R. Moore, architect, Coatham, from a design by Mr. Norman Shaw, and the contractor was Mr. J. H. Burton, builder, Coatham. The cost has been 3,000*l*.

The Railway Passenger Duty.—Mr. Rodwell has presented to the House of Commons a petition from seventeen railway companies which pay no dividend to ordinary shareholders, praying: 1. That no duty shall be levied on any fare not exceeding 1d. per mile. 2. That every railway which in any one year pays no dividend to its ordinary shareholders shall be exempted from passenger duty for that year. The petitioners stated that in the year 1876 there were forty companies which paid no dividend on their ordinary shares, and yet during the same year the same companies were obliged to pay in passenger duty 41,574*l*., and in local rates 54,455*l*.

Boulogne Harbour.—The Board of Trade have received, through the Secretary of State for Foreign Affairs, a copy of a recent French law authorising the making of a deep-water harbour at Boulogne. The proposed works are to be undertaken at the public expense. The estimated cost is 17,000,000 francs, towards which the Chamber of Commerce at Boulogne is to contribute annually the sum of 100,000 francs for fifteen years.

Public Parks for the Provinces.—The Corporation of Winchester have received permission to borrow 1,250*l*., to purchase and fence the ground on St. Giles's Hill for a public park.——The Mayor of Derby has received a communication from the Duke of Devonshire, in which he requests that his name may be added to the list of contributors, for 500*l*., to the fund for the purchase of the Derwent Bank Estate.

Offensive Businesses.—The *London Gazette* has published an order made by the Metropolitan Board of Works, under the provision of the Slaughter-houses, &c. (Metropolis), Act, 1874, confirmed by the Local Government Board, declaring the business of a fat-melter or fat-extractor, "that is to say, any business in which fat is melted, rendered, extracted from any material, or remelted," to be an offensive business.

An ancient British Sepulchral or Cinerary Urn, containing burnt bones and wood, has just been dug up in the churchyard of Shaw-cum-Donnington, near Newbury; but, unfortunately, it was much broken in removal. As near as can be ascertained, it was fully 18 in. high. It is ornamented with the usual herring-bone or zigzag lines, and has a central band formed by impressed thumb-marks.

Home for Little Boys Farningham-road, Kent.—A block of buildings for stores, workshop, reading-rooms, &c., was opened on Saturday, 6th instant, by the Countess of Zetland, and the foundation-stone of an additional house was laid by Mrs. Horniman on behalf of the donor. Messrs. Spalding & Evans are the architects, and the contractors W. Downs & Co., of Southwark.

TENDERS

For north block of building for the Governors of the Leys Schools, Cambridge. Mr. Robt. Curwen, architect. Quantities supplied by Mr. J. S. Alder:

Stephens & Bastow	£9,699 0 0
L. H. & R. Roberts	9,558 0 0
Brass	9,480 0 0
Dove, Bros.	9,350 0 0
S. & W. Pattinson (accepted)	9,200 0 0

For alterations and additions at warehouses, Satchwell-street, Bethnal-green, for Mr. James Hately:—

Barrow (accepted)	£850 0 0

For detached house at Grove Park, for Mr. C. N. M[illard]. Mr. G. Sherrin, architect:—

Staines & Son (accepted)	£1,650 0 0

For alterations and additions to Grove Chapel, Camberwell. Mr. Alfred R. Pite, architect:—

Allen & Son	£1,690 0 0
Turner & Son	1,500 0 0
Smith	1,396 0 0
Falkner (accepted)	1,285 0 0

For billiard-room for Mr. J. MacAndrew, Mill-hill. Mr. Alfred R. Pite, architect:—

Boden (accepted)	£488 0 0

For new chancel aisle, vestry, and other alterations to east end of Upton Church, Essex. Mr. George McDo[nald], architect:—

Gibbons (accepted)	£1,040 0 0

For alterations and bar-fittings to "The Bell," Bell-hall-street, for Mr. Lawrence. Mr. Henry R. Cox, architect:—

Anley	£795 0 0
Toms (accepted)	779 0 0

The Builder.

Vol., XXXVI. No. 1852. Saturday, August 3, 1878.

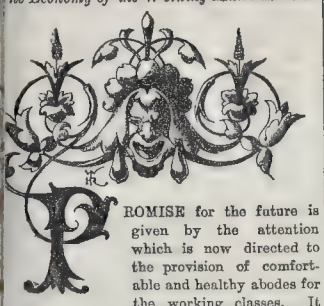
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The Economy of the Working Man's Abode.



PROMISE for the future is given by the attention which is now directed to the provision of comfortable and healthy abodes for the working classes. It will be of interest for those concerned in this important subject in England to glance at what is the state of the same question on the Continent. A Sicilian engineer, Signor Pietri Bonaccorsi, has communicated papers on economical houses for working men to two recent numbers of the Milanese architectural and industrial journal, *Il Politechnico*, from which we propose to take such items of information as are but little known in this country, while omitting such references to English practice as may naturally be more familiar to our own readers than they appear to have been to Signor Bonaccorsi.

The Parliament of Belgium is said to have been the first that occupied itself in any serious attempt to improve the condition of the dwellings of the workmen. In 1838 that assembly appointed a commission for the investigation of the subject; and in 1845 it allotted a credit of 30,000*l.* for the purposes of improvements in buildings of this nature.

Italy was not long in attempting to follow the examples set by Belgium and Great Britain. Florence was the first of the hundred cities of Italy to comprehend the importance of the subject. In 1848 a company was formed by philanthropical citizens of Florence, to which many members of the nobility subscribed. The municipality offered an ample area of land on very moderate terms; and a large building, covering 3,406 square mètres of ground, was erected by the company.

In 1860, the citizens of Milan, in emulation of those of Florence, instituted a building company, to which, in the following year, the communal Council granted gratuitously a free area of from 7,800 to 8,000 square mètres, for the purpose of constructing large houses for workpeople. Later, in other cities, such as Naples, Turin, Genoa, &c., efforts of the same nature have been commenced by private individuals, and more or less liberally aided by the Municipal authorities.

In France, in 1849, on the initiation of the President of the Republic, the first *Cité ouvrière Napoléon* was commenced. In 1852 the Government gave the sum of 400,000*l.*, as a subvention to a company formed for the construction of a new workman's quarter in Paris; and in the following year building societies were formed at Marseilles, Mulhouse, Lille, and Rouen, as well as other companies at Paris, all of which received the support of the Government.

It is unnecessary for us to enter into any detail of the sanitary questions involved in the housing of the workman. In England the subject is, fortunately, not new. In France and Italy, on the contrary, the idea of the advantage to human life and health, secured by properly ventilated sleeping apartments, is a subject that has come before the public attention with almost the novelty of a revelation. The scope, the Italian Building Societies have to insist, of their operations, is solely the welfare of the workpeople, in procuring for them cheap, commodious, and healthy abodes.

Domestic life in Italy is conducted on lines very different from those with which we are familiar in this country. From the Alps to the Ionian Sea stretches a country which is the very cradle of architecture—at all events, of domestic architecture. Stone admirably adapted for building purposes is in most regions accessible. Limestones of every quality, suitable either for ordinary or for hydraulic mortar, abound. The form of bricks, which is unchanged from the times of the Roman Empire, or even of the Roman Republic, and which is between that of an English brick and an English tile (as may be seen at St. Albans), is well adapted to make the most enduring work, when laid in the unexceptionally excellent mortar which is made in every part of the Italian peninsula. The type of the workman's home in Italy is thus not the hut, but the garret, cellar, or other small apartment of a palace.

Thus it was laid down in the first instance as the rule for the new working-men's houses that they must offer, at a low cost, well-constructed, ventilated, lighted, airy apartments, with doors and windows that properly close, with good kitchens, fitted with the convenient stoves, which are common where charcoal is the fuel mainly in use, with chimneys (a convenience frequently wanting in Italian houses, as, for example, in the Royal Palace at Naples, where iron tubes often make their appearance in the winter), sinks, drains, lavatories, wells, fountains, great courts, sometimes enclosing trees,—in fact, with all that is needful for healthy life, and for that degree of personal comfort which is desired even by the poorest. We have, in England, yet to be educated to a considerable extent in order to find the command of a shady court, furnished with a fountain, or at all events with a deep well of ice-cold water, needful for the poorest. But in Italy we tread everywhere on the traces of an ancient and most elaborate civilisation, and of a state of society in which, while the basis was slavery, or a state of ascription to the soil little differing from slavery, there was an inordinate wealth and command of the luxuries of life possessed by the great, which was directed, in a great measure, to the provision for their dependents of things which to us seem stately luxuries, but which the heat of the Italian summer leads men to regard almost as necessities. While in northern climates shelter from rain and snow is the first demand of the workman, in Italy he requires breathing-room, and shade from the rays of the sun.

In addition to a view of the requisites for the health and comfort of a workman's home which is so much higher (at all events on paper) than any framed in Great Britain, a great principle of social economy has been contemplated by the founders of the Italian building societies,—a principle, we may add, which is receiving very full illustration in certain admirable institutions amongst ourselves. The Building Company, or Society, of Mulhouse, was one of the first which attempted, in France, to secure to the working man, in a short time, and at cost price, a habitation which should be his own property, and to do that without inflicting any loss on those who came forward to aid him.

In Italy the effort has a scope and a meaning which will not be grasped by many English readers without explanation. Perhaps the most firmly based of Italian Institutions is the lottery. Its advertisements are in every publication, in every street. Its drawings are weekly. Its subscriptions may be as low as five *grani*, or about twopence of our money. Week after week the workman lays his subscription on the counter of the lottery office. And if any dream that can in any way receive a numerical interpretation have visited him, he will leave there every coin he can collect. We call this mode of investing his savings gambling, pure and simple. The Italian philanthropist, while admitting the demoralising effect of the institution, calls it a sacrifice made by the working man in the hope of bettering his afflicted condition. Call it what we like, we must all agree that if the weekly dole were invested in a building society, instead of in the lottery, it would be an improvement of very great importance. And there is this to be said in favour of the Italian building societies. There is a reality and visibility about their operations which appeals with much more force to the confidence of the timid and suspicious peasant than any savings-bank or similar institution can hope to do. The house is even more tangible than the lottery. What to an English workman would be the chief advantage of the building society, the certitude of its outcome, would not, in all probability, prove so attractive to the Italian as a brilliant chance. He would prefer raffling for a house, for instance, 250 times, to making an equal number of equal payments, at the termination of which the house would be his. At the same time, it is indisputable that there is here to be found an element of success and of popularity for the building societies of Italy.

Economical abodes for the working classes must satisfy three indispensable requisites. These are, solidity, salubrity, and economy. Solidity is attained by the preparation of good natural or artificial foundations, by the use of the best materials, and by the adoption of modes of construction regulated by the teaching of

science and the light of experience. Salubrity requires a good situation, fresh pure air, ample light, and (happy Italian workman!) a pleasant view, with a judicious distribution of all the portions and details of the building. Economy requires the absence of mere ornament, the choice of a site at a moderate price, in the neighbourhood of good building materials, and the employment of skilful and honest workmen. It will be seen how far less complicated is the question of site in the vicinity of most of the Italian cities, than is the case with regard to our own metropolis, or great centres of industrial life. The Italian writer admits that economy, as regulated by the price of site, and central position, are irreconcileable. The finger is here put on a difficulty which is very formidable in Great Britain.

In applying the principles thus laid down to the special case of the city of Catania, Signor Bonaccorsi first considers the four quarters, or *Frozioni*, into which that area is divided by the two main cross-roads called the Strada Stesicoro-Etnea and the Strada Lincoln; and then enters on a survey of the available sites to be found in each district, paying particular attention to the prevalence of the three dominant winds, the Maestro, the Levante, and the Ponente, and their respective qualities. We may take this as a hint to ourselves, to avoid an exposure to the north and east alone, where choice of outlook is allowed to the architect.

The various systems of workmen's houses constructed in the various parts of Europe may be grouped in three classes. These are (1) isolated houses; (2) grouped houses; (3) houses including many residences. Those of the first and second groups readily satisfy the requirements of health and those of convenience; but they can only be economically constructed where land, as well as labour and materials, is cheap. Favourable examples of this arrangement may be cited at Birmingham, where the hundreds of acres of small, mean, brick houses, stretching in intersecting lines beneath a canopy of smoke, would, however, form a very appropriate representation of the *Inferno* to an Italian workman, or even to a Neapolitan lazzarone. The second system is said to have answered well at Mulhouse, Marseilles, Lille, Rouen, Kuchen in the kingdom of Wurtemburg, and other towns, where immense quarters have been constructed, covered with a network of streets, terraces, gardens, and courts, and enriched with baths, lavatories, infant asylums, schools, reading rooms, and churches.

In Italy, in Paris, and in Berlin, where land, labour, and materials are all dear, the compound house, or building including many residences, has been adopted. It did not need the dictum of the architect Cantalupi to show that edifices composed of many separate parts, of small proportions, are always more costly than those in which the different parts are so grouped together that the entire structure may be carried to a great height. But this economical perception may be held to underlie the general architectural design of most of the buildings of Italy.

We are thus prepared to find that the type selected by Signor Bonaccorsi is purely Italian, with such modifications as may be suggested by the peculiar conditions of Catania, as regards the climate, the position, and the habits of the locality. But little attention has been given to certain accessories of less importance, on the ground that the workman, accustomed to toil, does not require the same accommodation as the rich citizen or the noble. At the same time it must be admitted that the designs recommended insure the desired requisities of solidity, salubrity, and economy. From an English point of view, they do more. The principal and the lateral elevations figured, though of extreme simplicity, are not devoid of a certain architectural dignity. This is attained by simple features, not attended with extraordinary expense in a country where stone is so accessible as in Italy, but the absence of which condemns a huge building to present a mean and poverty-stricken appearance. Even in brick buildings, the main lines of shadow may be produced, by due care, by oversetting. The elevation consists of four principal stories, with an attic range. A projecting cornice or fascia runs at the top of each story; that immediately below the attic windows being twice as bold as the lower members. The windows come down to the line of string course, and their height is three-fourths of that of the story to which they admit light. Their width is the half of the height of the lower windows; and the aperture of each is defined by plain jambs and architraves with a width of about one-sixth part of that of the aperture, the thickness being such as to throw a definite shade line. The general elevation is divided into three blocks, of which the centre is about six-sevenths of the width of each of the two externals; and the quoins of the outer blocks are defined by projecting pilasters, which are rusticated on the ground story. The pitch of the roof is low, and the projection of the eaves above the attic story is the same as that of each of the three fascias below the upper cornice. Cantilevers are shown on the fascias below the jamb of each window; and on the central block they are also interspaced along the whole line of string-course. A light railing, bounded by piers supporting lamps, reaches on either side the entrance to the side block. The effect of these simple architectural provisions, which break up the general mass into harmonious and well-proportioned parts, is admirable. The cost can be but small.

The above is a broad description of the elevation. Signor Bonaccorsi says that the design presents the aspect of a civil house of the third order. The form of the plan is a rectangle, isolated from the street, of which the lower side measures 44·30 mètres, and the smaller 27·80 mètres; thus the area inclosed is equal to 1231·54 square mètres, or 1,474 square yards. A large central court opens on the street on the principal side, and gives light to all the interior rooms. The total height, from the level of the street to the little cornice of the attic plane, is 17·50 mètres, divided into five planes or stories, of the several heights of 4·50, 4·00, 3·80, 3·00, and 2·20 mètres. (There can be no doubt that much of the good effect of the elevation depends on this just gradation.) The pitch of the roof allows a mean height of 3 mètres, and a maximum height of 3·70 mètres to the attic story.

The system of construction is that which is ordinarily adopted in houses of good quality, and the material used the best afforded by the vicinity. The external walls, on the ground line, have a thickness of 0·80 mètres, and the internal walls a thickness of 0·50 mètres. This diminishes story by story, the external arches being reduced, in the attic plane, to 0·50 mètre, and the internal to 0·25 mètre. All the walls of less thickness than 0·40 mètres are of brickwork, set in mortar; and the small subdivisions are of brickwork, set, in the Sicilian fashion, in cement. The doors, balconies, and windows have their jambs and architraves wrought in calcareous stone. The same material is used for the cornice, the fascias, the pilasters, the corbels, the window-cills, the projecting floors of the balconies, and the cills of the doors. A stylobate of lava forms the base of the edifice, and the sills of the doors on the ground-floor are of the same material. The corbels and frames of the windows in the court-yard are of lava, covered with stucco. (It should be remembered that stucco in Sicily has only a very distant relationship to what goes by the same name in England.)

The steps of the staircase (again we say, enviable working-men of Sicily!) a mètre in length, are of white marble.

Light iron rails protect the stairs and the balconies. An iron grille with a gate closes the principal entrance to the building. The roof is framed in wood, and covered with common tiles. The ground floor and three succeeding stories are covered with arches in pumice stone and *gesso*; and the attic has a ceiling under the tiles. The floors of the rooms are of flooring tiles; the shops on the ground floors are paved; the court-yard is paved with lava. The doors and windows are such as are commonly used in Catania.

For the internal arrangement the rooms are placed in double rows, each being directly illuminated. Entrance is given by a balcony, or landing, reached by staircases from the court. There are fifteen residences on each floor, composed, some of two, others of three rooms. The larger rooms are five mètres by four; the smaller, four mètres square. The internal rooms all average the same size. The air contained in each room is sufficient (Signor Bonaccorsi thinks) to supply the respiration of eight persons for an entire night of ten hours, and in the larger rooms twelve persons might sleep for that time without any fear of suffocation, there being two ventilators to each room. This opinion can have a shadow of correctness only on the supposition that the ventilators are large and always left open,—as they would not be in England. The same number of fifteen residences is arranged on each story; the attic rooms being reduced in order to allow a narrow internal passage to replace the open balcony which gives access to the first, second, and third floors. The entrance to the inner room or rooms is in each case through the accompanying outer room.

Each residence is provided with a water-closet, in the English fashion, with a marble seat, and with drains. There is a provision of a fire-place with a chimney on the Harel system, and also a small lavatory for washing, and a small cistern. Potable water is supplied by leaden pipes on every story, allowing a sufficient quantity for the consumption of ten persons to each residence. When the geological conditions admit there will be at least one well in the court-yard. The rain will be conducted so as to aid in cleansing the drains.

As the lowest mean monthly temperature of Catania does not fall below 51° Fahr., it is unnecessary to provide for warming. In case of need, use may be made of the chimneys provided for cooking. The external decoration, as before intimated, is of the simplest kind, but yet not devoid of architectural propriety.

The building taken as an example thus contains seventy-five apartments, and is capable of accommodating about 600 inhabitants. The cost of construction, exclusive of land, comes in round figures to 5,920*l.*, which allows of a moderate price for each of the seventy-five apartments. As these vary in size and in convenience, the price will vary accordingly. On the ground floor, a residence of two chambers, anteroom, and kitchen, will cost in round numbers 92*l.*; while the smallest residence, comprising one room and a kitchen, will cost only 52*l.* According to the number, size, and position of the apartments, the prices may be taken to range, on the first floor, from 50*l.* to 82*l.*; on the second, from 49*l.* to 80*l.*; on the third, from 47*l.* to 76*l.*; and on the fourth from 35*l.* to 52*l.*

The arrangement made by the muncipality is to receive payment in fifteen years, with interest at the rate of five per cent. per annum. Thus for the first year one-fifteenth part of the cost has to be paid, with interest on the remainder. In the case of a 50*l.* room the annual cost would thus amount to 5*l.* 15*s.* for the first year, to 5*l.* 10*s.* 6*d.* for the second, and so on, diminishing each year till the end of the term, when the apartment will become the property of the tenant. Thus a payment of less than 8*s.* a month will ensure the possession, at the end of fifteen years, of a freehold tenement, forming a solid, commodious, and healthy abode. The cost of the attic apartments comes to the extremely moderate rate of 23½ centimes, or less than 2*d.* per day.

It will be observed that no allowance is included for repairs. It would have added to the confidence with which the enterprise may be regarded had a special provision been added for that purpose. But the absolute solidity of the Italian houses, which are built so as to resist any but very serious earthquakes, must be remembered. A very small sum will be sufficient for repair. If a small additional payment were added to cover, not only this item, but the daily cleansing of the stairs and balconies, and the removal of dust and rubbish, the economical nature of the investment would not be seriously interfered with, and more reliance might be placed on its sanitary regulation.

It must be remembered that not only is the cost estimated for a building of magnitude, such as that in question, too low to be taken as applicable in England, but that nothing was paid for land. The addition to the cost of the house of the price of 1,474 square yards of land will be an item of which the magnitude will depend on position. Five-and-twenty or thirty per cent. at least, must be added to the cost for land in a central position, if this has to be purchased.

We should like to see an estimate of a compound residence on the plan so fully illustrated by Signor Bonaccorsi for London, Manchester, or some great English town. We must omit the luxury of a marble staircase; but we should like to see some attention paid, as before described, to the main lines of architectural definition. The sense of self-respect of the tenants would be raised by the mere fact of having their abode in a structure of architectural dignity, however severe in its simplicity, instead of having merely to look at a wall with so many glazed holes in it. A normal estimate, laid down on such lines as we have indicated, might lead to the devotion of a sufficient sum of money to the experiment in unexpected quarters.

THE THEATRE ARCHITECTURALLY CONSIDERED.

A GREAT deal has been said, and is continually being said, as to the need of improved arrangements for convenience and safety in the plan and the access to theatres; not a word too much, since it requires the most persistent repetition of advice and caution on the part of public journals, and threats of penalties from more official quarters, to induce managers to adopt even the most obvious and necessary precautions to guard such buildings from danger by fire, and to render egress from them, if the danger really exhibits itself, possible for a large audience within a reasonable space of time. In fact, the persistency of lessees or managers in ignoring such precautions as far as they can venture to do so is not more remarkable than the easy-going spirit of the public which will see itself brought into needless risk with entire indifference, except just during the period of a panic supervening upon some unexpected conflagration or crush.* One can hardly mention theatres at all without giving one more jog to this subject in regard to London theatres, especially as the only chance of getting attention paid to it at all seems to lie in never letting it rest. But there are some other points in regard to theatre-building which, though not in one sense so absolutely and practically important as safety of construction and facility of egress, cannot but suggest themselves in regarding the theatre from the point of view of an architect, and to which it is worth while to call attention every now and then, though all the immediate effect that we can hope to produce by our reflections is, perhaps, to suggest to an influential leader here and there a wholesome discontent with things as they are, and an ambition to have them improved, such as may gradually spread itself and mature into a public taste which will exercise its influence on future structures, or on the rebuilding or redecorating of the old ones.

Considering how numerous theatres are in London, and how important a part they play in the public life of the day in most large towns, it is really remarkable how little they contribute to the architectural adornment of our streets and public places. In a large proportion of cases in London, the theatre, so far as its externals go, is simply a large entrance-door, with more or less gew-gaw decoration about it, and enlivened at night by various tawdry devices of illumination inferior in taste and design to what a tailor or purveyor "to the Royal Family" will put up over his shop on a gala night. The reason for the retiring nature of theatrical property in regard to its frontages is, of course, obvious. Being almost always to be used by artificial light, or (in exceptional cases of day-light use) being a class of building which can easily be lighted from the roof, it is a natural result of economical giving and taking that the expense of new frontages should be spared, and that the theatre should in a large number of instances be entirely regarded as an interior, not in, as may be most conveniently and inexpensively managed, amid existing house property, which can be left untouched, and in most cases undepreciated, or even raised in value, by the proximity of the place of amusement. Where this can be done, it would, of course, be out of the question to expect that money should be expended on an effective exterior, unless those who supplied the capital saw very clearly that the expenditure on appearance would eventually tend to repay itself by its attractiveness; and in most cases, perhaps, it would be chimerical to expect this. Even, however, when nothing can be seen of the theatre but its entrance to the stalls in one street, and the pit entrance up a side street, which the *gamin* is so eager to point out to every one who can be supposed to be looking for it, there is surely room for some improvement on the merely gin-palace style of lighting up and decorating which distinguishes almost all these entries, and gives on the very threshold the first impression of cawdriness and false glitter which runs through the whole idea of our theatrical decoration. And the odd thing is, that this catchpenny style of painting and illuminating is applied just where one would think it was least wanted, —at the entries leading to the best seats, the filling of which depends on the public repute of the performance as gathered from report and from press criticism, and not upon any momentary enticement of the idle and unwary. There might seem more reason in applying this kind of gaudy show to the pit and gallery entrances, since the audience which enters here does partly consist of those who may be attracted to enter without having previously intended to do so, which can scarcely be the case with that part of the house for which the seats may be secured a month in advance.

However, this is a minor and not strictly an architectural point, except that one may wonder why the entrance to a place of entertainment, which is supposed to be for the best class of society, should be decorated in no better and less vulgar manner than is in vogue for a public-house. But in the more exceptional instances in which a theatre is built standing free, or partly so, and is externally as well as internally a new and separate building, the common-place character of the architecture, and the want of coherence between the nature of the building and its architectural treatment, is in almost every instance conspicuous; and seems the more so because the building is one which gives so much suggestion for original and emphatic treatment. The contrast between the requirements of the auditorium and the stage, the necessity for spacious lobbies and staircases to the former part of the building in any house on a large scale, the curved line almost invariably given to the auditorium, are all so many suggestions (which one would suppose could hardly be ignored) for a special treatment of the building, so that there could be no doubt for what purpose it was intended. There is hardly any precedent in modern architecture, it must be admitted, for doing this. The large theatre in London which has longest escaped the fate of theatres, and has lasted since its famous conflagration *Consule Planco* to the present day, is simply a cubical block with a cement front, which might be a riding-school, a Dissenters' meeting-house, or anything else. The only thing that can be said for Drury Lane externally is, that at any rate it is not tawdry, and so far escapes one source of vulgarity. Its sister house has been rebuilt in recent days, with much cost and considerable ingenuity of construction; but it may be said that the same drawback, want of definite character, is even more conspicuous it its case, because it is not absolutely destitute of architectural pretension, but has a front with a certain stateliness. The general design, however, is only the Drury Lane cubical box, with some architectural dressings. Of the once projected opera-house on the Embankment, much need not be said; there was more intention of distinguishing between the two portions of the building in the design, in a manner borrowed from the Paris Opera-house; how it would have looked in execution, one can only guess. What is obvious, however, is, that the detail and style would have been very common-place and very much beneath the demands and capabilities of its splendid site.

The short-coming of large modern theatres architecturally seems to consist, first, in the absence of any attempt to utilise the real forms of the plan, and the requirements of the different portions of the building, as the basis of the general grouping of the design; and, secondly, in the employment of a conventionally florid and even tawdry decoration, which seems to be accepted as the right thing for a theatre, which is, in fact, so decidedly accepted, that when we do meet with the same class of decoration in other positions we stigmatise it as "theatrical," and in so speaking convey the most marked condemnation of the taste of the designer. Taking the latter portion of the iniquity first, it is surely time that we should endeavour to impart a better class of design, a purer and more refined architectural treatment, to such a building as a theatre. Unless we except a church, there is no kind of building in which the æsthetic part of architecture may rightly be so prominent, in comparison with the practical, as a theatre. It is essentially a building for artistic purposes, often for the combination, one may say, of two or three arts. Yet in general it may certainly be said that there is hardly any class of building in which architectural refinement of style and detail is less considered. When money is expended on architectural embellishment, the great object seems to be to make the theatre as showy as possible. The famous building at Paris is the culmination of this meretricious taste, indulged under peculiar advantages for carrying it to its utmost extent, and carried out with the admixture of much sculpture and other detail which is really brilliant and fine in an artistic point of view, but still, with a total effect which is undeniably, from the highest artistic or architectural standpoint, vicious and vulgar. The influence which probably leads to this proverbially theatrical style may be considered when we come to speak of the interior of the theatre, which, we need hardly say, is in this respect generally even more marked in character than the exterior. The other fault which is to be found in the external treatment of the theatre generally is the want of a breadth and simplicity of architectural treatment, expressing frankly and characteristically the real constructive ordinance of the building. The auditorium is always, according to present ideas as to seating an audience for seeing and hearing, arranged on a curvilinear plan, which is almost invariably ignored in the architectural design, although a curved bounding line, on a large scale, is so universally effective in architecture, that it has not unfrequently been invented for the sake of effect when there was no practical call for it. But the modern theatre-architect almost invariably conceals this true source of architectural effect behind a facing or façade of square design, which may just as well belong to a concert-room, a ball-room, or any other place for large public gatherings. The stage portion is almost necessarily a square block of buildings, and by absolute requirement it must rise pretty high above the auditorium ceiling, so as to allow space for the vertical hoisting of scenery. There is a real suggestion here for an unusual and powerful architectural contrast; but, instead of working this out into something striking, the theatre-architect, in almost every case we can call to mind, contents himself with a big, ugly pile of roof, and hoping that no one will notice it much. It is certain the thing may be very much better done than this, and that an opportunity has been presented by the modern theatre which the modern architect has generally failed to make the most of.

When we come to the interior of the house, everybody must admit that the case for the prosecution is even stronger than in regard to the exterior. It may be true that theatre decoration has advanced with the advance in taste of late years, but relatively it is in much the same position as it has been for long past. What would be vulgar and showy in a private house is the best that can be got in a theatre. When we hear that the —— theatre has been newly decorated during the recess, we know that we shall find the proscenium a mass of coarse gilding, with commonplace emblems or monograms here and there; and that the ceiling and other places susceptible of decoration will be in keeping, the gilding being mostly laid on a quantity of raised pie-crust detail executed in *papier-mâché*. The pie-crust is not quite so rampant as it used to be, but there is still a formidable amount of it to be met with. The object seems to be that every thing should conduce to a general effect of glare and glitter. This would be considered bad taste in a drawing-room in howsoever rich a mansion, and would be hardly likely to be admitted to the same extent in a concert-room: then why in a theatre? As far as we can see, it merely arises from some vague tradition that theatres, as places of recreation and relaxation for the evening, are expected to be gorgeous and brilliant in effect. But the fact is, that the theatre is exactly the place where this ought not be. In the first place, it is emphatically an artistic entertainment, or, at least, should be, and therefore, of all places, should show artistic refinement and taste in its embellishment; and secondly, because to over-decorate the auditorium in this manner is really in antagonism with the object of the interior, which should be to concentrate the chief attention on the stage and its scenery and figures, and not to attract the eye by a profusion of comparatively coarse and *prononcé* decoration close to the spectators and interposed between them and the scene. Such a display of gaudiness is not only in bad taste in itself, but often positively injurious, rendering the scenic effect weaker and less real by contrast, and giving an additionally cold and colourless effect to the costume of modern comedy, when that is the object.* In fact, the usual type of theatre

* Only a few days since, a complaint appeared in the *Times* that on a particular evening the access to the stalls in the Covent-garden Opera-house was entirely blocked with chairs—contrary to the express orders of the Lord Chamberlain, as we need not observe.

* We remember one instance in which, on reopening a theatre after decoration, it was thought necessary to abandon, almost at the last moment, a comedy of modern life which had been in preparation, and substitute one in

decoration makes an excellent framework for an extravaganza or ballet with brilliant costumes and accompaniments; but it is much in the way of any entertainment in which acting is of more account than costume. The house is meant to look from, not to look at; and the eye should not be attracted by anything too strong or prominent on the spectator's side of the proscenium. The proscenium arch itself is capable of, and offers a natural opportunity for, a great deal of delicate and suggestive treatment in design—it is the frame through which the living picture is seen; but then its character as a frame must be preserved, nor must it be such as to divert the eye from its true object, the scenery and acting on the stage.

In endeavouring to realise a higher class of architectural treatment in the interior of theatres, there is, of course, the difficulty to contend with, that the materials to be used must be such as will be acoustically good, and that the materials most satisfactory in this respect are not those which are calculated to realise the best architectural effect. It may be urged, in fact, that plaster, the very material which has been so grossly misused in the theatre, offers about the best means of combining an incombustible character with acoustic suitability (fibrous plaster, at least, offers this combination). If we accept this, plaster may at least be treated with more reserve and refinement in regard to design than it usually has been in theatres, and be made to appear more obviously what it is, a mere application, instead of mimicking construction or carving. But, in fact, as it is utterly impossible to make a theatre of fire-resisting materials compatibly with acoustic excellence, it does not seem of very much consequence whether a material, more or less inflammable, be employed; the object in regard to this part of the problem must be to keep fire away from the auditorium, and to provide ample egress by fireproof corridors and staircases in case of accident. With this reservation, there seems no reason why wood should not be employed, both as a lining (than which hardly anything could be better for acoustic effect) and as the ground-work for ornamental treatment. Whether this be adopted or not, what is certainly desirable is that gew-gaw finery, in whatever material, should be turned out, and that it should be recognised that an unobtrusive, quiet, and tasteful system of decoration is as desirable in a theatre as in a drawing-room, and may just as well be realised there, when once people are got out of the habit of expecting to find their theatrical entertainments placed in a setting of gilt gingerbread. A similar criticism may apply to that unsatisfactory and often ludicrous affair, the act-drop; sometimes a "gorjus" curtain, with painted folds and festoons, such as we know it never could naturally fall into; sometimes an improbable landscape, with impossible figures, the absurdity of which strikes one the more forcibly after seeing the same curtain, as one frequently does, for many seasons. We recall one which used to provoke the satirical spirit within us, where a man is continually whirling round in the air a damsel whom he has lifted from her feet in the excitement of a dance; another with a mermaid continually and perseveringly swimming across an open piece of water, with wonderful rocks in the distance; our readers can most of them add to the list without difficulty. If instead of these trashy productions, a drop-curtain were treated as a field for good decorative design, with perhaps figures blended with the design, it might be made the opportunity for the display of some artistic work of a really high class, and in the most suitable manner.

The shape of the auditorium is usually regarded as a matter pretty well fixed in regard to general principle and arrangement, and only differing in detail. It might, however, be worth while to consider whether the usual horseshoe form is necessarily the best for every case. In Wagner's Theatre, at Bayreuth, as we recorded at the time of its construction, a wide stage and a correspondingly wide auditorium were used, the audience sitting facing the stage in parallel rows. This is, perhaps, an arrangement only suitable when a large and wide stage is required by the nature of the performance; but the plan, or some modification of it, has its recommendations. It does not compel the spectators at the extreme points to look so far into the wings and thereby lose the illusion; nor does it (as carried out at least in the Bayreuth Theatre) compel a large number of them to sit under the ceiling of a gallery or upper story and have the annoyance of columns before them. These thin iron columns in any case are a great element in the destruction of architectural effect and expression, and it would be a great gain if, when it is necessary to seat an audience partially in stages one over another, these could be contrived on the cantilever principle, and the columns dispensed with. The attainment of a monumental simplicity in design and decoration, with the greatest convenience and satisfactory acoustic result, is the problem yet to be solved in the modern theatre.

After all, as in most matters connected with architectural style, the architectural defects of the modern theatre are the reflection of other more deep-seated defects in the theatrical and social system. The theatre at present is so much a matter of individual speculation on the one hand, and of ephemeral taste or fashion on the other,—it is so devoid of national character and of serious aims, either artistic or moral, that it is not suprising that the building should partake of the same ephemeral and superficial character. To this may be added the conviction (not unreasonable) that it is the lot of every theatre to be burned after no very long period of existence, as another motive which may stand in the way of the expenditure of capital on a building of nobler style and enduring construction. In fact, however, this objection is one which answers itself, since the building of theatres with more care and of more enduring materials and construction, would tend to lessen, the danger from fire, and prove in the long run the best economy. But the motive which would most surely operate in evolving a more noble and dignified theatrical architecture would be the raising of the drama to the *status* of dignity and importance, as an object of national interest, which it still partly occupies in France, and which it once occupied, in fact, though not quite so ostensibly in theory, in this country. We held a far higher position in this respect when the present Drury Lane was built than we do now; and, to some extent, the building itself indicates this. Plain and almost grim as it is externally, it was intended at the time as a worthy and permanent home of English drama (not of Italian opera) and the spacious and, according to the architectural lights of that day, stately character of the staircase* and entrance lobbies sufficiently indicates this. Its erection was a matter of public interest, as is evident from the literature of the day, far more than the erection of a new theatre would be at present; far more than was excited by the rebuilding of Covent Garden, the nearest parallel case to the present day. There is, at present, no motive for the erection of a fine class of buildings for the drama, because it has ceased to be, either in theory or fact, a matter of national interest or of the expression of national character. If we could revive the drama in England from a system of *rifacciments* of unhealthy compositions "adapted from the French," to be once more a noble, national, and intellectual recreation, our theatres would probably ere long shed their tawdriness and adopt a garb more worthy of the occasion, and our new buildings of the same class would realise the dignified and permanent architectural character which would then be in accordance with the object for which they were erected.

which brilliant costumes could be introduced, to prevent the actors being "killed" by the new decorations. This was certainly placing the accidental before the essential.

* It is obvious from its illustration in engravings of the day that the main staircase was then considered an achievement of some importance in architectural design. In the present day, a staircase of the same relative importance and pretension would be much more probably attached to a railway hotel than to a theatre.

St. Luke's Artisans' Dwellings Scheme Last week, at the invitation of Mr. W. Hurran, guardian, a meeting of ratepayers was held at 250, Whitecross-street, to take into consideration the advisability of adopting measures to provide accommodation for those persons compelled to remove by the wholesale pulling down of houses now going on in various parts of London by the Metropolitan Board of Works and railway companies. It was argued that the ratepayers suffered considerably by the change, in consequence of the land lying so long vacant, and that trade was driven from the district. It was resolved that an association be formed to meet the exigencies of the case, to be called "The St. Luke's Artisans' Dwellings Scheme Association," to facilitate the building of dwellings for the labouring classes, thereby lessening the rates, and retaining trade.

IS THE THROWING OF THE CRUDE SEWAGE OF LONDON INTO THE THAMES A NUISANCE?—IS IT PREVENTIBLE?

Observations made in our pages recently under the heading, "Is the Health of East London Worth Attention?" have excited, as might have been expected, considerable interest in some quarters. In the course of those remarks,* we cited, from the accordant enactments of more than half a dozen Acts of Parliament, distinct proof that it had at no time been the intention of the Legislature either to allow any part of London to be exposed to the pollution of the waters of the Thames within its limits, or to allow the Thames itself to be a permanent exception to the law regulating pollution of rivers. To many persons, indeed, it may appear to be a work of supererogation to attempt to make more plain such self-evident truths. But it becomes necessary to assert them, in consequence of the contradiction, both practical and formal, to which they are exposed by the operations and by the publications of the Metropolitan Board of Works. "There is no evidence whatever," reports Sir J. Bazalgette to his Board on the 15th of April, 1878,—"which suggests the statement that the sewage works its way up the river, and that statement is contrary to the fact." It is remarkable to contrast this statement with one produced by the same engineer to the Institution of Civil Engineers on March 14th, 1865, which was as follows:—"The wind and other causes would vary the result, but it may be roughly assumed that a substance in suspension works up the river about one mile a day at each high water as the tides strengthen, and down the river two miles a day as they fall off." In the same report the author claimed credit for the fact that "the sewage is delivered into reservoirs situate on the banks of the Thames, and placed at such a level as will enable them to discharge into the river at about the time of high water. By this arrangement, the sewage is not only at once diluted by the large volume of the Thames at high water, but is carried by the ebb tide to a point in the river twenty-six miles below London Bridge, and its return by the following flood tide, within the metropolitan area, is effectually prevented."

The first outcome of this statement is,—that the Metropolitan area is to be held to terminate seven miles west of Barking Creek, or half a mile west of Greenwich. To that point, according to the authority cited, matter put in suspension at Barking at high water neap tide will ascend by high water at the following spring. That is the evidence on which the whole project of getting rid of the sewage is based. At certain springs, indeed (as was the case in July, 1851), the working up the river occurs not only for seven miles, but for nine miles. Of the two experiments relied on, one gave the higher, and one the lower figure. Eight miles will be, therefore, a mean, and nine miles will be within the limit of occasional occurrence.

But this view of the case omits a very essential element. The Thames at Barking is 7-16th of a mile wide. Soundings give a depth, in the middle of the channel, varying from 15 ft. to 19 ft. At a rough estimate the low-water volume at that spot will be about 2,500 metric tons per foot run of the river, while the tide flow will more than double that volume, raising it at high water to 7,000 metric tons per foot. In 1834 Rennie estimated the flow of water over Teddington weir at 1,337 cubic feet per second. Thus, for 55,660 cubic feet of water, or 2,500 metric tons, to pass the weir would occupy forty-nine seconds. The mean velocity of the river was taken by the same engineer at two miles per hour, or 176 ft. per minute, which is rather less than 3 ft. per second. It will appear from these data how slow must be the seaward movement of the bulk of the water of the Thames at Barking. Into this quantity of water running at such rates of speed, the discharge from the northern outfall is poured for three hours and forty minutes per tide. The pumping power at Abbey Mills was calculated to provide for lifting 15,000 cubic feet per minute, that at Crossness for a mean duty of 10,000 cubic feet per minute. Dividing, in that ratio, the 120,000,000 gallons discharged into the Thames in twenty-four hours, we find that 36,000,000 gallons per tide, or 163,636 gallons per minute, is poured in in 220 minutes each tide. This gives a dilution, compared to the steady outflow of the river,

* See p. 741, *ante*.

ot quite four equivalents of water to one of ewage, the river outflow for the minute being 00,582 gallons, and the sewage outflow for the ame time being 163,636 gallons. We have seen hat the quantity of tidal water is to that of the iver in the reach about as thirty-five to twenty- ve. Regarded as a bulk of water, the volume ontained in the reach at any moment presents large proportion to the influx of sewage. But ve must regard the rate of movement of the vater as compared with that of the influx of the ewage, as well as their respective bulks. We ave, then, to bear in mind the fact of the travel- ng backwards and forwards, as shown by Sir . Bazalgette, of the water contained in any ection of the Thames. During a half-lunar eriod there will be a given influx of tide, and an qual efflux. This will remove, tide by tide, a ertain quantity of sewage, that quantity entirely epending on the degree of admixture between ne sewage stream and the general volume of ne water, both fresh and tidal. But during the me that the springs are making, all that can e reckoned on as carrying sewage out of the each of regurgitation is the flow of the river self. And it will not be the flow for twelve ours, but the flow for three hours and forty inutes, per tide, that has to be regarded as in he first place to be mingled with 163,636 gal- ns of sewage per minute at Barking, and, wenty-five minutes later, to be mingled with a rther quantity of 123,077 gallons per minute t Crossness; making a total of 286,713 gallons f sewage to every 500,582 gallons of fresh ver water.

As these figures give a result widely different rom that indicated by the Metropolitan Board Works, it will be well to verify them. The ily outflow of the Thames, according to ennie, is 3,223,125 tons of water. Of this the uantity flowing out in the seven hours and venty minutes of the escape of the sewage ill be 992,799 tons. Into this volume, during he time of its overflow, are poured 545,545 tons the effluent matter from the London sewers the two points of discharge. A mixture of ss than two parts of water to one of sewage the result. This mixture undergoes two rther steps of dilution,—one due to the fact at the volume of water at Barking is so much excess of the volume where the Thames was auged (a dilution which, however, is to a great xtent counteracted by the slower movement of he current where the cross section of the river larger), and the second due to the incoming de, which in volume is more than double the olume of the river, but which is subject to an lternating movement up and down the channel f the stream.

The only point which remains undetermined within the limits, as mentioned by Sir J. Bazal- ette, of variation of wind and tides), is the istance travelled by the sewage during the hree hours and forty minutes for which it nters the river at Barking. As to this we shall uide ourselves, as hitherto, by the statements nade by Sir J. Bazalgette in 1865. He said hen,—"As regards the time of discharge, it is emonstrated by the same series of experiments hat the delivery of the sewage at high water nto the river at any point is equivalent to its ischarge at low water at a point twelve miles ower down the river. The mean time of the all of tide may be taken to occupy seven hours wenty minutes. If a distance of twelve miles s passed in that time, half that distance will be nade in the three hours and forty minutes of he sewage escape. Thus, to the eight or nine niles above Barking to which, according to Sir . Bazalgette's data, the sewage thrown into he Thames will work back from neaps to prings, must be added six miles of daily regur- itation, due to the period for which the sewage o flows after high water. This gives a point ourteen or fifteen miles above Barking inlet, or rom 3½ to 4½ miles above London Bridge, to vhich, on a full spring tide, the polluted water vill, with as much certitude as is due to the bservations of the data on which these very imple calculations are based, inevitably ascend.

We are anxious that the matter should be ully understood; and that the more so, because, s has before been remarked in our columns, he Metropolitan Board of Works has chosen to ake the tone of being within its Parliamentary ights, and of being thus in a position to defy ot only the Thames Conservancy Board, but all he world. Our argument is twofold. First, ve have to contend that the Parliamentary ights, if any such exist, of the Metropolitan Board to pollute the Thames are not absolute, but conditional and temporary. As to that, we really think that, after the facts we have before cited, there can be but one candid opinion. Still, as the Board seem disposed to despise opinion, and to lean on the exact letter of the existing law, denying, even to Parliament, the right to explain its own intentions, it is essential to look at the matter in the light of the pound of flesh. As to this, we contend that the Board has not done that which it was appointed to do. It has made an oversight; a rather curious oversight. It has omitted to make any allowance for the time which it must take to run 120,000,000 gallons of sewage out of its reservoirs, though it performs this conservative function without being in any way impeded by the application of any process for the previous disinfection of the effluent water. "We are authorised," the Board may be thought to say, "by our Amendment Act of 1858, to carry on and complete according to such plan as may to us seem proper, the necessary sewers and works for the improvement of the main drainage of the metropolis. We have done so. We were authorised by our first Act, to sell our sewage; but no purchaser is in the market. We were not bound to disinfect it, and we have no intention of doing anything of the kind. We are not a board of health. We do not care for health or for doctors. We had a great work to do. We have done it. We deserve public gratitude. And we ask Parliament to show its appreciation of our high capacity for administration by making over to us the power of the water companies and of the City Bridge Committee, and by allowing us to set the conservators of the Thames at defiance." That is, in fact, if not in literal expression, the contention of the Metropolitan Board of Works. Therefore, it is needful for us to take up the second point of contention, and to show that the Metropolitan Board is not within the protective limits of its Acts of Parliament.

By the Metropolis Management Act of 1855 (18 & 19 Victoria, cap. 120), the powers and rights vested in the Metropolitan Board of Works are stated to be given "for preventing all or any part of the sewage within the metropolis from flowing or passing into the river Thames in or near the metropolis." Further, "they may cause the sewage or refuse from the sewers to be sold or disposed of as they may see fit; but not so as to create a nuisance." And the amended Act also is stated to be for the purpose of preventing, as far as may be practicable, the sewage of the metropolis from passing into the river Thames within the metropolis.

But on certain days in every month,—according to the data furnished by the engineer of the Metropolitan Board,—a considerable portion of the sewage of the metropolis does, by the action of the Board, pass into the river Thames within the metropolis. Measures have not been taken for preventing this as far as may be practicable. The sewage is disposed of so as to create a nuisance. As to that, the law, as cited by Mr. Higgs (Treatise on the Law relating to the Pollution and Obstruction of Water Courses, p. 119), is clear and unmistakable:—

"Nuisances to water may be either of a public or a private nature. A public nuisance is an injury to the property of all persons who come within its influence, while a private nuisance is an injury to the property of an individual. Nuisances to water may be restrained by injunction. If the nuisance be public, by information at the suit of the Attorney General; if private, at the suit of the persons suffering special injury. The fouling of a public river so as to render it unfit for the use of man is also an indictable offence."

That the turning of raw sewage into a river is a legal nuisance there can thus be no doubt. The cases in which this has been decided are conclusive. And further, "It is no answer to an information for the purpose of restraining the pollution of the river by the sewage of a town that the river was foul before receiving the sewage, or that it would remain so if such pollution were to cease, for two reasons: 1. The addition of the sewage aggravates the evil. 2. The former nuisance might terminate, and it is not right that when one nuisance terminates there should be another brought into existence (Att.-Gen. *v.* Leeds Corporation).

"The creation of a public nuisance cannot be justified by the provisions of an Act of Parliament." "Thus, the authority over sewers, and the drainage powers given by Parliament to local boards, do not authorise the committal of a nuisance by the Boards in the exercise of such power." "The right of drainage into the sea and public rivers (conferred by the Towns Improvement Clauses Act, 1847), is subject to the condition that no nuisance be created." The dictum of the Master of the Rolls deserves to be made known, not only with regard to the Thames, but whenever a river is in danger of pollution.

Referring to the Local Government Amendment Act, which enables local boards to execute works without their district, subject to a proviso which must be taken as explanatory of what a nuisance on water is, Sir G. Jessel said,—"I think the meaning is pretty plain, and it means this. You shall not send your sewage-water into a natural stream until you have made it wholesome water,—until you have got rid of all the noxious matter in it. The next point is, which water is it that is not to be affected or deteriorated? You are not to affect or deteriorate the water in the river—what portion of the water? I cannot accede to the argument of the defendants that it merely means you must not poison the whole river; for a river may be hundreds of miles long. I think it must mean that you are not to affect or deteriorate the water in the river at the point where the outfall is, and that if you at that point pollute the water, you shall not enjoy the privilege given you by this Act of Parliament of making an outfall outside your district." In the same way Vice-Chancellor Wood held that the Council of the Borough of Birmingham, although bound by a local Act of Parliament incorporating the Towns Improvement Clauses Act, were not justified in so carrying on their operations for this purpose as to drive away fish, and prevent cattle from drinking the water of a river at a part even miles below the town, where it belonged to the plaintiff.

We have thus plainly stated the case. The Metropolitan Board of Works could not, according to legal ruling, be authorised by any Act of Parliament to pollute the Thames. But in the Acts on which they rely, they are specially prohibited from so executing their works as to cause nuisance, or to allow sewage to pass into the river within the metropolis. That they do the latter we have shown on the evidence of their own engineer. That they do the former we have shown on the authority of the Master of the Rolls, and of Vice-Chancellor Wood. The only possible reply that we can anticipate is, that such *laches* and acquiescence has been shown as to enable them to defy all comers. As to that it is observed, "The mere fact of a person bearing for a certain time an evil would not alone prevent the Court from saying that the evil may be arrested, and this still more where the evil is a continually increasing one. Therefore, when sewers constructed under Parliamentary powers had been completed, at a cost of 207,355*l.*, and had been in operation sixteen years before proceedings were undertaken, the court will interfere."

It seems, therefore, to us, that in their communication to the Metropolitan Board of Works of the report of Capt. Calver, under date of October 15th, 1877, the Conservators of the Thames have been, to a certain extent, in error. They have acted as if the rights and duties of an important public body would be so far acknowledged by another public body that measures of public welfare could be discussed between the two. If any such expectation was entertained, it must have been rudely dissipated by the publication of Sir. J. Bazalgette's report. That document, so far from acknowledging that the prevention of the pollution of the Thames is a statutory duty imposed on the conservators, and that the representation of that highly respectable authority are entitled, at all events, to respectful attention, actually proceeds to school, rebuke, and attack the conservators for the discharge of their own functions. Not only does Sir J. Bazalgette assert that there is no documentary evidence,—the adjective deserves note,—to prove that foul and offensive accretions have recently formed within the channel of the Thames, but he goes on to remark that "the unprotected state of the banks, which in many places are being rapidly washed away," "are,"—we are not responsible for the grammar,—"the result of a neglect of the duty which legislation has cast upon the Thames Conservators." It is to be hoped that the Lord Mayor, the two aldermen, the four common councillors, the deputy master of the Trinity House, and the other members of the Thames Conservancy Board, may be edified by this lecture on their duties!

Thus the Board of Works has thrown down

the gauntlet. Being asked to consider certain statements, it begins by denying their accuracy, and concludes by throwing a stigma upon the party making the representation. We shall not anticipate the reply which may be given to the counter-charge, because it is a matter with which the Metropolitan Board of Works have no concern whatever, supposing it to be true. We will only note, for the benefit of those whom it may concern, that there exists a very accurate survey of the Thames, made in the year 1832 by Admiral Bullock, R.N., and that we can say from personal inspection that the details of this chart are such as very seriously to invalidate the data relied on by the Metropolitan Engineer as to that waste of the banks of the river with which, as before said, his Board has no concern.

But the Board of Works goes further. First, it says (in spite of the neglect of the Conservators) the channel of the Thames is improving. For this, the inference is, we are to be thankful to the drainage outfall. Then it is "contrary to the fact," to state that the sewage works its way up the river. The reason for carrying the main outfall eleven miles down was stated, in 1865, by the Engineer, to be the fact that the sewage worked its way nine miles up. We have here not only contradiction, but self-contradiction. In fact, the report simply says "Do your worst."

What that worst may be, the Board of Works do not seem to have counted. We recommend them to make inquiry at Birmingham, at Leeds, at Cockermouth, and at other places where local bodies, relying on local Acts of Parliament, have poured sewage into rivers. We recommend them to read their own Acts of Parliament, which bind them to dispose of the sewage so as not to create a nuisance, and so as not to pass into the Thames within the metropolis. We recommend them to read Sir Joseph Bazalgette's report as to the movement of the river, and the ascent of the sewage-laden water. We recommend them to turn to any recent Act of Parliament, or recently reported case as to pollution, in order to understand what a nuisance on water is. When they have done this, they will, perhaps, come to the conclusion that they have reckoned without their host.

On the other hand, we can hardly imagine any sound reason which should prevent the conservators of the Thames from taking the summary mode of proceeding which has been, we believe, invariably successful in similar cases,—when properly advised. It is no question of a few feet of mud here and there,—of the analysis of the water in one place, and of the mud in another. The daily discharge of the sewage of some four millions of people into the Thames at two points, without any attempt to take the best practical means of defecating it, is a fact impossible to deny, and, at all events, easy to prove. The Conservators of the Thames have no need to attempt to trace the course of the foul stream after its entrance into the channel. The one fact constitutes their case. The fact is not only uncontroverted, but unexcused by the Metropolitan Acts of Parliament. It was not an anticipated procedure,—it is true,—but still the Acts have been made tight enough not to be vitiated by the insertion of provisions tending to justify a nuisance. "The drainage powers given by Parliament to Local Boards do not justify the committal of a nuisance by the Board in the exercise of such powers" (Attorney-General *v.* Proprietors of Bradford Canal). The whole case lies in this nutshell. It is a hard one for the teeth of those who claim a statutory right to destroy our noblest waterway. It is one which the metropolis and the country will expect to see made matter of information at the suit of the Attorney-General on the motion of the Conservancy of the Thames. And as it is the fashion nowadays to sneer at applications for legal or equitable redress, we conclude with one more quotation,—"On proof of a wilful contempt of an injunction to abate a nuisance, a writ of sequestration will be issued."

We hope, then, that those of our readers who have given attention to this and our previous articles on the subject will come with us to the following conclusions.

The health of the riparian inhabitants of London, and especially of East London, deserves consideration. The pouring into the Thames, during two periods of three hours and forty minutes each in the twenty-four hours, of 120 millions of gallons of crude sewage, is not only a technical legal nuisance, but a serious sanitary danger. Its continuance is not authorised by the Metropolitan Act, and is in entire opposition to all legislation, and to all judicial decisions, for the last quarter of a century. It is a nuisance which it is the statutory duty of the Conservators of the Thames to take measures to abate. It is one as to which the law is on their side, and for which the tribunals will grant redress. We, therefore, hold that it should only be a question of time how long it is to be allowed to continue.

IN THE ENGLISH SECTION OF THE PARIS EXHIBITION.

In describing the various pavilions, annexe buildings, cottages, &c., of the Champs de Mars and Trocadéro Gardens, we have found so little to say about England, that we may be excused if, in turning our attention to the main exhibition building, we begin with the English section. Fortunately its whereabouts need not be described. After the exhibits of France, which occupy the whole half of the building, the English section is undoubtedly the greatest attraction, and the greatest success. It is not only the largest foreign section, but it is that which bears the most distinct marks of progress when compared to what has been done at previous exhibitions. Our glass, our pottery and hardware, have elicited the reluctant praise of our rivals; our paintings in the fine-art galleries have won two gold medals out of the four medals accorded to foreign artists, and our furniture, though certainly not equal to that of France for its artistic excellence, gives good promise. All these steps in the road of national progress are very emphatically demonstrated at the Paris Exhibition, and it was not without a certain sense of pride and satisfaction that we visited the section devoted to the arts and industries of England. But, to turn from these considerations of general interest, we quitted the more attractive galleries to examine the classes devoted to matters of technical importance, and at once found ourselves confronting the stand of the now well-known Silicate Paint Company. Here the jury were gathered in force, and were enduring patiently a powerful exposition of the incalculable benefits to be derived from Griffiths's Zinc White. It is true we had no business to listen to this important discussion, so at once plead guilty of journalistic indiscretion. This preparation is not yet perhaps as well known as the silicate paints; and has, in any case, a very practical bearing on the health of both those who build our houses and those who live in them. It has for basis the white sulphide of zinc; but this is so combined with other ingredients that it acquires greater covering power than lead paint, though possessing none of the poisonous qualities of the latter. All who have read Mr. Redgrave's report on the inspection of factories, and have studied statistics of illness and deaths among workmen, will at once appreciate the great benefits to be derived from the use of a paint free from lead; and, as on the French side of the channel, the statistics of the Paris hospitals show that more than a third,—indeed, nearly half,—of the persons treated for lead poisoning are house-painters, we need no longer insist on the necessity of abandoning the use of lead paints. But will Griffiths's zinc white supply an efficient substitute? That is what the jury and the sanitarians who are coming in shoals to Paris will attempt to decide. For our part, we imagine the verdict will be highly favourable. Already the prefect of police has issued orders, dated but a few weeks back, that henceforth the closets of all lodging-houses in Paris must be painted with zinc colours, it being so clearly proved that lead cannot protect the walls against noxious gases. We watched the application of sulphuretted hydrogen to test the zinc-white, and as this pigment certainly does not contain any lead, it did not of course change its colour. In common with the silicate paints, the zinc-white manufactured by the same firm does not produce any chemical action on metals, and it can resist any degree of heat. All these features are carefully shown at the Exhibition, with specimens that have been exposed to every test. Among other things of this description, there is an iron can which has contained salt and water for more than a year, and yet the silicate paint has effectively protected the metal from the corroding influence of the salt. This is attracting the attention of a great many persons, and the paint is being extensively canvassed as the best means of protecting the iron coating of modern ships from the action of the salt sea-water. Certainly, as compared with the paints shown by other nations, this is one of the novelties, and promises to be one of the most useful inventions exhibited.

Around these paints are the exhibits of some of our leading chemical manufacturers. There stands, for instance, an enormous block of alum, 8 ft. or 10 ft. high,—to cure English sore throats, the French visitors remark in passing! Then there are patent soaps, which wash and disinfect simultaneously, with more or less—particularly less—efficacy than usual; and we have also the now celebrated gold palm-leaf stand of Price's Patent Candle Company. This is a particularly elegant exhibit, and the photographs of stearine crystals give an insight of the science,—the chemical knowledge,—required for the successful manufacture of candles. It is, perhaps, strange in these days, when mineral oils abound, when gas burns in nearly every town, that the manufacture of candles should not only prosper, but actually increase. There must be many more persons than generally imagined who consider candles at once more pleasant and more wholesome. They do not produce, in any case, so much heat for the same volume of light as either mineral oils or gas; and this is no small advantage in these hot evenings. They are also unattended by the disagreeable smell which accompanies the not unfrequent escape of unconsumed gas. On the other hand, in the English, as in the French section, there are several patents which profess to remove all these inconveniences. Tice's Improved Dry Gas Regulator is one in point. The gas is admitted into a chamber, and pressed out of it by weights attached to a flexible diaphragm; thus, as in the French patent we described in our last article, the pressure of the house supply can be regulated precisely according to requirements and independently of the outside supply. By this means the escape of gas due to its passing too rapidly through the burners is avoided together with the consequent "bad light, offensive smell, smoky ceilings, and heavy gas bills." Again, for places where there is no gas supply we have the "Sun" auto-pneumatic gas machine which is a simple machine, occupying but little space, producing a gas that burns evenly, and does not contain the sulphur compounds so fatal to animal and vegetable life. This firm also exhibit Hearson's patent automatic gas-lamp for illuminating streets at the reputed cost of one farthing per hour. A reservoir is placed over this lamp, and does not, as is usually the case, shade the light. It contains antoline, or benzoline free from oil, and the system can be fitted to an ordinary street-lamp. Such inventions are worthy of note, and it is particularly interesting to watch how closely the French and the English patents follow each other. The difficulty nowadays is not the lighting of a room, building, or street, but the selection of the one out of the rival systems which presents the most advantages, or, perhaps, we should say, occasions the least inconvenience and disappointment.

NEW PANTECHNICON BUILDINGS IN SOUTH LONDON.

On a vacant plot of ground, nearly half an acre in extent, in Station-road, Camberwell, almost immediately opposite the Camberwell New-road Station, a large new building is about to be erected, to be called the South London Pantechnicon, which will be of a similar character to the well-known establishment in Motcombe-street, Belgravia, which, it will be remembered, was burnt down a few years ago. The new building will cover a ground area of about 13,000 superficial feet, and will have a frontage to Station-road of 120 ft. in length, whilst it will extend upwards of 100 ft. in depth. It will be carried to a great height, having several floors and galleries, with a spacious area in the centre, and will contain lifts and other appliances for the storage of every description of property, including furniture, luggage, plate, musical instruments, carriages, pictures, and other valuables. The works in connexion with the building have just been commenced.

Ringstead.—The Wesleyan chapel at Ringstead has been re-opened, after repair and enlargement. The work has been carried out by Messrs. William Smith & Son, of Raunds. The total cost has been 330*l.*

GOVERNMENT LOANS FOR LABOURERS' DWELLINGS IN IRISH URBAN DISTRICTS.

There are several Acts of Parliament which deal with the dwellings of the lower classes in Ireland. There is the statute, 23 Vict., c. 19, which is concerned with country districts, and connected in practice with the Land Improvements Acts. Then there is the Artisans' Dwellings Improvement Act of 1875, which has apparently been so short a time in existence that its operation in Ireland has been inappreciable, though, considering that it is now three years since it became law, we are surprised to find, from the authority of the report of the Committee to investigate the management of the Irish Board of Works, that such is the case. For looking at things in the ordinary way, we should have assumed that the greatest activity shown under it would have been in its earliest years, when there was an ample field for its operation. We cannot help fearing, therefore, that if it has not hitherto been employed in Ireland, it may become altogether a dead letter. Then there is, finally, the Act of 1866 (29 & 30 Vict., c. 24), which is confined to urban districts. This Act, we may briefly recall to our readers' memory, empowers the Commissioners of Public Works to make loans to be repaid within forty years at a rate of interest not less than four per cent. to town councils, railway companies, dock or harbour commissioners, trading or other companies, and owners of land in fee, or for terms not less than eighty unexpired years for purchasing sites, and for erecting or adapting dwellings for the labouring classes. Moreover, the loan is not to exceed one-half the value of the property in which the money is to be expended, but if collateral security be given, the full amount of the estimated outlay may be lent. These are the main provisions and the fundamental aim and object of this statute. The Act has now been in operation for twelve years, and the Committee are perfectly justified in saying that since the procedure is neither complicated nor expensive, and the facilities given by it are unquestionably great, and considering also how apparent throughout Ireland has been the want which this Act was intended to supply, it might have been expected that it would have been considerably acted upon. But when we come to figures, we find that unfortunately such is not the case, for during these twelve years only eighty applications have been made,—that is, rather less than seven every year. But this small application is not to be wondered at, when we come to compare the amount of grants in Ireland with those in England made under a similar Act (the Labouring Classes' Dwelling-houses Act), passed also in the same year. In Ireland, one-half only of the loans applied for were granted; in England, five-sixths of the amount have been granted. The reason for this nonfulfilment of natural expectations can be given in a very few words from the report in question,—"We have no hesitation," say the committee (p. xii.), "in saying that we think the Board did not, until lately, place a sufficiently liberal construction on the Act." The subject is one of such great importance and interest that it will not be out of place to consider some of the facts on which this opinion is based.

It is true, no doubt, that of late, as the committee say, the loans have been more liberally granted; but when once the idea was propagated that the Board of Works were very chary in granting loans for the purposes of labourers' dwellings, there can be no doubt that persons would cease to make what they considered useless applications. For instance, the Board for some time refused to grant money for buildings partly completed, on the ground that such loans were contrary to the spirit of the Act, in the face of the fact that by the eighth section money is to be granted and applied "towards the purchase of land or buildings, and the erection, alteration, and adaptation of buildings to be used as dwellings for the labouring classes." When a loan is required for the purposes of completing a half-finished building, it is clearly needed for the purposes of erection. Thus one Mr. Thomson, of Belfast, applied for a loan for twenty-two buildings, estimated value, 1,560*l.*, fee simple title; amount asked for, 1,000*l.* But all that Mr. Thomson got by this application was an answer from the Board that it was "contrary to the Act to grant loans for houses already built or nearly completed." There was no ground for saying that these structures were not intended as dwellings for artisans; the sole basis for refusal was the fact that they were nearly completed, and this was done, as we have said, in the face of a section of a statute which speaks not only of erection, thereby pointing to new buildings not completed or begun, but of alteration and adaptation, which distinctly point to buildings already erected. There can, therefore, be no cause for surprise that the Act in question has not yet fulfilled the expectations of its promoters when it has been practically nullified and strangled by those who should have been the first to encourage persons to take advantage of its provisions. Moreover, it is not very encouraging for the future success of this or any other work entrusted to the Board, to consider the way in which the Board altered their practice in this respect, for they either adopted the first view without proper consideration, and without taking sound legal advice as to the construction of the Act, or they changed their opinions in the most heedless manner. For this is the explanation of the chairman of the Board:—(921.) "And is the granting of a loan in such a case (*i.e.*, of unfinished buildings) contrary to the Act or the rules?—It is contrary to the spirit of the Act, contrary to its intentions." And then, after some intermediate questions, come the following:—(924.) "Then you have changed your practice, in fact?—Yes, we enlarged our area, so to speak." (925.) "And if those people had made their application a little later, they would have got the advance?—I suppose so." A very comforting remark for the persons who applied before these liberal and proper notions reigned in the Board of Works, but one which is a strong condemnation out of the mouth of their chairman of the Board, so far as regards the execution of this Act. It is none too strong, therefore, to say, as the committee do, that "it must be remembered that the effect of withholding from the public the advantage of a statute cannot be measured by the refusal of this or that application. There has to be taken into consideration the deterrent effect that a refusal here and a refusal there has upon intending applicants, more especially in the case of an Act like this, which was in its infancy, and so required to be construed even more liberally than if it had been in full working order."

But a thought of a somewhat legal character thereupon naturally suggests itself, and it is this,—if in this instance and in others the Board have been found to fail palpably rather in mind than execution, what security is there that, as at present constituted, it can be relied on to perform its duties effectually. The instance we have cited was a clear one of an error of judgment, and no amount of extra assistance can cure this defect, and this view of the Act is curiously in contrast with what may be termed the philanthropic one which suddenly overpowered the judgment of the Board, for they decided to refuse applications for loans when they inferred from their knowledge of the applicant that he was merely induced by the easy terms offered by the Act for borrowing money, to come to the Board of Works for speculative reasons, and not from any motive for benefiting the poorer classes. Such a reason is absolutely grotesque,—the main object of the Act was, of course, to give the poorer classes as good homes as possible, and whether the builder was a philanthropist or a speculator was wholly immaterial. Indeed, the Board might fairly have brought their theory to a *reductio ad absurdum* by inquiring whether the philanthropy was genuine or fictitious. Again, a case occurred in which the loan was refused on the ground that building societies and other private persons were erecting buildings near the same place for labourers, and if the applicant's wish were granted, that he would be in a more favourable pecuniary position than his neighbours. This, as it seems to us, was an equally unsound ground with the last, because if the dwellings were *bonâ-fide* intended for working men, and if the security was sufficient, the Board should at once have granted the loan. It should have made no difference to them whether other persons were or were not building similar dwellings near at hand, because the main question in regard to the Act is the purpose of the building, and the propriety of the security offered. As the committee justly observes, "the Act was passed with a view to attract capital to a field of enterprise, irrespective of the motives of the applicants. . . . . The business of the Board lay in seeing that the security offered by the borrower was sound, and that the plans gave good promise that the buildings would be suited to the requirements of the poor, with a due regard to their comfort, convenience, and health."

We have said, therefore, enough to show that the Labouring Classes' Dwellings Act has failed from no inherent weakness in itself, but from a want of judgment in the method of its application by the Irish Board of Works. Much harm has, of course, now been done, which it will take some years, at any rate, to repair. And a period of commercial prosperity has also gone by in which the Act was more likely to be utilised than at a time when times are bad and business men have few profits to invest for the benefit of the working classes. But it is much to be hoped that the publicity given to this matter by the investigations of the committee will cause the fact that more liberal opinions now prevail, and will prevail in the future, to become known in Ireland, and that during the next ten years the Act will have a vigorous operation. Nevertheless, as we said before, the manner in which the Board of Works have fulfilled the duties cast upon them by this statute must make us hesitate to be too sanguine as to the judgment and the vigour with which they will fulfil them in the future unless public criticism be vigilant and strong.

MEDALS TO ENGLISH ARCHITECTS.

PARIS INTERNATIONAL EXHIBITION.

The Jury of Class 4, Architectural Drawings and Models, have brought their labours to a close. For *all* works of all nations sent in, thirty-seven medals were allotted; of these nearly half, or eighteen, were agreed to be given to the French exposants, who were twice as numerous as the foreign exhibitors. To the foreign architects the awards are as follows:—

	Medals.	Hon. Mention.	Rappel.
England	7	1	1
Austria	6	2	1
Italy	2	1	—
Holland	1	1	—
Belgium	1	—	—
Switzerland	1	—	—
Hungary	1	1	—
	19	6	2

The "Rappels de Médaille" refer to those who have already received rewards or medals in former Expositions in France, as in 1867. This was the case with Mr. Waterhouse in 1867 for the Manchester town-hall, and he sent his best drawing this time of that building, and in such cases as this a diploma will be given, ranking equal to First Medals.

The English list, unanimously adopted, is as follows:—

1 "Grande Médaille"	Mr. E. M. Barry.
1 First Medal	Mr. G. E. Street.
1 Ditto	Mr. Pearson.
1 Second Medal	Mr. Norman Shaw.
1 Ditto	Mr. T. H. Wyatt.
1 Third Medal	Mr. Horace Jones.
1 Ditto	Mr. J. P. Seddon.
1 Honourable mention	Mr. Jackson.
8	
1 Rappel	Mr. A. Waterhouse.
9 Total.	

A question arose as to members of the jury,—whether they should be competitors for the fine arts section? This was permitted by the regulations; but we need scarcely say that *all* the English members, whether as painters, sculptors, or architects, at once declared they could not act as judges and also be competitors. In the Architectural Section the following took this course at the outset:—

Herr Ferstel	Austria.
Commander Basile	Italy.
C. Barry	England.
De Suers	Holland.

The jury had ten members in addition to the above. There were five Frenchmen and Marietta Bey, Egypt. These did not declare themselves *hors de concours*; but Marietta Bey and M. Lefnel were not exhibitors, so four Frenchmen remained. As a matter of fact, we believe, none of these four received medals; but as we have not yet received the full report, we are not quite certain of this.

Under the presidency of Herr Ferstel, all acted together most harmoniously.

It is obvious that the English exhibitors owe

much to Mr. Charles Barry, who looked very vigorously after their interests and position, and succeeded in getting for them the highest number of medals that any foreign nation receives.

TRAMWAY INVESTMENT.

Subscriptions are invited for a first issue of 25,000*l.*, in 5*l.* shares, by a company styling itself "The Tramways Corporations, Limited," the total capital of which is to be 250,000*l.* The undertaking has been formed for the purpose of constructing tramways in different places, apparently with a view to sale. We are unacquainted with the status of this corporation, but commend to public attention, subject to a careful verification of the competence and reliability of the projectors of any new undertakings, any effort to employ English money in improving English ground. We observe, in reference to this project, and also recalling attention to our own remarks (pp. 633 and 681, *ante*) on Roadways, Railways, and Waterways, and on Mr. D. K. Clark's little volume on Tramways, that the Edinburgh Tramway Company, in the report for the last half-year, propose to pay a dividend at the rate of 8½ per cent., and the Hull Tramway Company a dividend at the rate of 9 per cent. per annum.

On the Edinburgh tramways the half-year's revenue is 32,917*l.*, and the expenditure, 25,578*l.* The capital expenditure on this line of tramway, to the close of 1876, was 220,762*l.* for 13·29 miles, or 16,600*l.* per mile; of which the way and equipments amounted to 10,256*l.* per mile. A net income of 830*l.* per mile is thus required to pay 5 per cent. on the capital. The receipts in 1876 were 62,111*l.*, or 4,673*l.* per mile, out of which the expenditure comes to 72·52 per cent. For the last half-year the working expenditure appears to have mounted to 77·7 per cent. of the income. It is to this gradual swelling of the per-centage of working expenses that the attention of shareholders and intending shareholders ought especially to be directed. 16,000*l.* per mile is a respectable capital outlay, and it is only by very careful economy that dividends can be maintained when the rate of expenditure absorbs more than half the gross revenue. In Edinburgh the cost of working is augmented by the steepness of the gradients. This is a matter of the utmost importance on any way worked by animal power. The actual cost of gradient may be matter of calculation, as far as foot-pounds or any units of force are concerned; but when muscles and lungs are in question, the condition and maintenance of the stock have to be taken into account. The number of miles run per horse in Edinburgh is low; it amounts to only 5·80 miles per day of 313 days in the year. The gradients of Leith-walk average 1 in 32, and the maximum gradient is 1 in 14. To surmount this latter pitch a force of 160 lb. per ton, plus the running friction, must be exerted. The saving of friction on a good railway, as compared to an ordinary road, is about 40 lb. per ton, and by the use of oil instead of grease for the axles a further saving can be effected; but at an incline of 1 in 56 the resistance of gravity amounts to 40 lb. per ton, and the commercial value of the saving of running friction diminishes in proportion. If this gradient is exceeded, the economical value of a tramway will be very low, unless the traffic be so great as to insure that only a small comparative amount of dead weight shall be carried. As to the other element of cost in depreciation of stock, namely, the pull required for starting the train, we have already pointed out that the introduction of the principle of the accumulator may be looked forward to as a safeguard. Our readers will see that money is to be made out of tramways, so that they be ably and honestly managed, laid over tolerably level ground, and commanding ample traffic. In the absence of either of these requisites they are best avoided.

University College, London.—Mr. Samuel Sharpe has promised to give 5,000*l.* towards the building of the North Wing of University College, London, so soon as the Council are prepared to begin the work. It is expected that this liberal donation, together with others which have been received, will enable the building to be very shortly commenced. A sum of 50,000*l.* in all will, however, be required to complete the extensions which are immediately contemplated.

AN IMPROVEMENT IN ORGAN MECHANISM.

Messrs. Bishop & Son, the present representatives of the late eminent organ-builder of the same name, have just erected at their factory, in Marylebone-road, a small organ intended to afford a practical illustration of a system of mechanism patented by them, and likely to be of great use in the case of large organs, more especially when it is necessary or desirable that the key-board should be at some distance from the instrument.

The invention consists in a new method of applying wind-pressure to convey the action of the player on the key to the pallet which admits the wind to the pipe. As many of our readers know, the old method of connexion between the key and the pallet was by a direct pull on a long thin slip of wood called a "tracker," with special appliances for taking the pull round angles (on the principle of the bell-crank), so that in the simplest form of the movement there was usually a vertical pull from the end of the key, giving a horizontal pull to the tracker, which in turn gave a vertical pull on the "pull-down" which opened the pallet. When the distance between the key-board and the sound-board was considerable, there was, even in small organs, a considerable *vis inertiæ* to overcome, and the tendency of the tracker to lengthen or shorten under changes of temperature has always been a difficulty, though it may be much decreased by varnishing the mechanism. But when organs began to be so much increased in size as they have been in recent times in this country, the increased scale of the sound-boards and pallets rendered the resistance to the touch of the player a serious matter, and it was to remedy this that the beautiful invention of the pneumatic touch was made by Mr. Willis. The object of the pneumatic lever was not to change the mode of connexion, but to make the wind-pressure do part of the work for the player, by assisting and accelerating the action as soon as the key was partly pressed down. The system patented by Messrs. Bishop consists in making the wind the actual means of communicating the motion of the key to the pallet, in a manner which has the same merit of relieving the player's fingers of the heavy work, and rendering the touch as light and even as that of a piano, and is (within reasonable limits) independent of the distance between the player and the instrument. The first object is equally obtained by the pneumatic lever, which, however, involves rather complicated and delicate mechanism. The present invention is remarkable for its simplicity. Each key communicates with a short "back-fall" and tracker action, on the usual principle, but involving a vertical tracker of only a few inches in length, so that this part of the mechanism (the most subject to derangement) is concentrated close to the keyboard, and easily accessible for adjustment or repair. When the key is struck, the movement opens a valve which admits wind under heavy pressure from a special bellows (and called the "driving-wind") into a pipe of ordinary gas-pipe tubing of small bore, which is carried to the sound-board of the organ, and which terminates in a very small narrow bellows (one for each tube), immediately under the pallet which admits the wind to the pipes corresponding to the key that has been struck. As soon, therefore, as the valve at the key-board end of the pipe is opened by the player pressing the key, the air in the tube is strongly compressed by the pressure of the driving wind, and instantly inflates the small bellows at the other end of the tube. The lower jaw of the little bellows descends, pulling down with it, by a short vertical tracker, the pallet over it, and admitting the wind to the pipes. As long as the key is held down, this position of things is maintained by the pressure of the driving wind; as soon as the key rises, the driving wind is cut off again from the tube, and the pallet is closed in the usual way by a spring, drawing the bellows up again. At the same moment the surplus compressed air in the tube escapes back again through an exhaust-valve at the key-board end; the exhaust having been closed by the action of striking the key, but allowed to open again the moment the key is released. The process sounds complicated in description, but in working it is most simple and instantaneous in its action, and seems very little likely to get out of order when properly made. The action of the draw-stops is conveyed to the slides in the same manner, through tubes of rather larger scale. The system gives great facility for placing the pla at a distance from the instrument, without any way interfering with the rapidity of t action: for so long as the tube is air-tight, compression instantly operates in a tube considerable length. In the only large organ which the system has yet been applied, that Great Yarmouth Church, the action is conve through tubes 50 ft. in length, and the orga is seated among the singers, while the or (divided into two halves) stands at some dista in the middle of the adjoining broad aisles.

When we say that the driving wind is plied by a special bellows, it must not be und stood that there is another bellows to be work to furnish the ordinary supply of wind to pipes. The heavy pressure bellows furnis the whole wind to the organ; but for the pi the pressure is diluted, as one may say, thro a second bellows into which the wind pas before entering the pipes, the pressure of w being automatically reduced in passing from bellows to the other, by a special process, nature of which the inventors do not wish make public at present.

There is good precedent for expecting t Messrs. Bishop's invention will be largely adop and become recognised as a useful one, for original founder of the factory was the inve of two of the most useful and almost uni sally adopted improvements which were m in English organ-building, the "concus bellows" (for equalising the distribution of between the larger and smaller pipes in cas a sudden large demand from the former), the "composition pedals," for throwing out stops in groups without compelling the pl to withdraw his hand from the keys: the la being, perhaps, the most important mechan assistance to the player that has been inve in this country, and which has been for a time applied to organs so much as a matt course that its origin and the name of inventor are forgotten by many. The inven we have described will, we hope, prove equ to the credit of the present representativ the house, who keep up the repute which factory of Bishop has always deservedly ha fine tone and first-class materials and work ship.

FREE LIBRARIES AND THE WORKI CLASSES.

It is by no means creditable to London provincial towns should avail themselve much more readily of the Free Libraries than the metropolis. The Londoner looks the provincial as rather a person to be pi but when we contrast the manner in which inhabitants of provincial towns establish an free libraries,* patronise tramways, and tak management of the water supply into their hands, it becomes evident that there is more energy and public spirit in the provinces th London. It was but a short time since inhabitants of Kensington were invited t the Free Libraries Act into operation in large and wealthy parish, but alarmed by bugbear of "more taxation," the proposa negatived, although it was conclusively sh that by the limitation of rating powers i Act the amount required would have been small. That, however, is not the subject which we wish to make a few remarks r what we think should be considered by all may have to make up their minds on this m is the value to the working classes of free l ries. And of the term "working classes would not confine ourselves to mere m labourers; for by this expression must be u stood,—here at any rate,—workmen, &c they are generally called, small artisans, indeed, all who do not come within the pr sional classes, such as lawyers, merchants so forth.

It is evident, then, that the value of libraries is twofold. In the first place, afford the means of passing leisure hours, work is done, healthily, pleasantly, or ins tively; and in the second, they also afford means for the working-man to improve hi individually in his work, and consequently improve the quality of the whole class of which is performed. But even the first

* We give by way of illustration the statistics of the Public Library in Birkenhead,—a town the large m of the inhabitants in which are shipbuilders, oper and small tradesmen,—for the week ending July this year. Reference Library: works issued (exclusive), 418; average per day, 69. Lending Lib works issued, 1,148; average per day, 191.

sequence may be said indirectly to be of actual professional value to the working-man. If an artisan lives in a 20*l.* rental house, and there is a rate for the free library of 1d. in the pound, he will have to contribute in the course of the year the sum of 1s. 8d. We will assume that he is a man of some intelligence, and buys, from time to time, as many workmen do, an illustrated paper and a cheap book or pamphlet now and again. The free library being in existence, he may, if he please, though we should not advise it, save this money so spent by obtaining the papers and books from the library in addition to many others which hitherto, from their price, he has considered wholly out of his reach. Again we venture to think that workmen, if they can obtain books in the evening, will often spend a quiet evening at home instead of going to the public-house by way of passing the time. We do not say that at the public-house they get drunk. We need not go so far as that. But at the public house it is quite certain that some money will be unnecessarily spent; for it may be laid down as a true proposition that drink without food is, in nine cases out of ten, wholly unnecessary, and often, indeed, positively harmful.

With his book at home, the workman will find himself in the morning not only fitter for his work, but 6d. or 8d. richer than he would have been had he passed the evening in front of the bar of a public house. We do not, let it be understood, wish to see workmen abjure the companionship of their fellows: workmen's clubs, and any meetings of workmen or others from time to time for social or professional purposes, are distinctly good; but what we condemn is what may be seen in any town to such a large extent in these days, what is best described in a somewhat American fashion as "loafing" at public-houses and in tap-rooms. When we consider the value of money to all men who earn their living by their hands or in daily work, and also the value of health, it is quite obvious that if free libraries become in time largely established and largely used, the workmen will benefit both in their pockets and in their bodies. We have said nothing about the obvious benefits which a man receives from wholesome and pleasant amusement, such as reading undoubtedly is,—indeed, it is too plain to require us to point it out more fully here.

But when we come to the second point, it is evident that the proper use of free libraries should benefit the workman directly in his professional career. At the present moment the workman has no means of consulting and reading works which bear directly or indirectly upon his own trade. Except by means of the fragmentary information to be gleaned from a penny paper, he has scarcely any opportunity of becoming acquainted with the way in which his trade is being carried on in a foreign country. Certain class papers, such as the *Industrial Review*,—we say nothing of our own,—deal with this kind of matters; but, on the other hand, the information contained in their columns must necessarily be often very brief, and in many cases they are not free from partisan bias.

Take, for example, ordinary plumbers or stoneworkers. If a free library is at hand, they can consult the latest works on their trade; they can from various books obtain considerable intelligence in regard to the substances and the matter of their work, and they can become, instead of mere automatic workers, who are commanded to do this and forthwith do it, intelligent workmen, understanding the mode and character of their work. We have taken an ordinary plumber as being one of the first examples that occurred to us; but it suggests this consideration, that comparatively few workmen understand the reasons for certain kinds of household arrangements and sanitary measures. How often must any householder have seen a workman who has gained the knowledge of his trade purely by a long apprenticeship at actual labour be utterly at fault when he has had to make up his mind upon some hindrance which a slight theoretical or systematic knowledge of his subject, such as could be gleaned from books dealing with sanitary, drainage, or other matters, in a plain form, and dealing with principles, would have enabled him to overcome at once. If a little consideration be given to this part of the subject, many illustrations of a more forcible kind than that which we have here put forward will occur to any intelligent reader. Take china or glass workers, and consider for a moment how, by the opportunity of studying or reading up the subject of china and glass, the mere mechanical details might have floods of light thrown upon them, and how a mere labour might become positively interesting; for we will venture to say that there are dozens of workmen engaged in these or similar trades who would be only too glad to have information thrown on the general theory and history of their trade if they only had the means of obtaining it in a definite, and clear, and accessible form. Take watchmakers again. What does the ordinary English watchmaker know of his brethren of the Black Forest, of the rise of that picturesque portion of the clock-making trade which has its head-quarters in the town of Tryberg, or in the neat village of Fürtwangen, amidst the bracing and pine-clad hills of Baden.

And that leads to the further consideration that when free libraries are accessible to the workmen of factories or other establishments for a particular object, those in authority at such places should take the trouble to compile from time to time lists of works dealing with the subjects of their trade which might be consulted by workmen desirous of knowing what are the authorities which throw most light upon the subjects of their daily labour. By thus enabling the workman to study his trade apart from its performance as a mere daily toil, we can scarcely doubt that in process of time the intelligence and the general intellectual condition of large numbers of working people would be improved and increased, and that by the agency of free libraries. We do not suppose for an instant that as soon as a free library is established in a town forthwith the whole class of workmen will be improved. But we do assert that in the long run a manifest improvement must by these means be brought about in the working classes, and that, at any rate, large numbers of industrial workers will be directly and indirectly benefited; and even if only this latter result were brought about it is a distinct argument in favour of free libraries, in which the cardinal principle should be, not to have a large collection of various kinds of books, but to have large numbers of books of actually the same kind; because the same books are almost certain to be required, since the same classes are the general readers. But we have no intention here of saying more on the management of free libraries. What we have been desirous of pointing out is the value which they can certainly be to working men, masons, or any other kind of artisans.

SALTBURN-BY-THE-SEA.

"Give me the luxuries of life," says one of Holmes's paradoxes, "and I will dispense with the necessities." In somewhat of unison with this, modern society grows more and more to demand that it shall be provided with the means of enjoyment in its annual holiday, and in comparison with its care for this it is to an extent careless about its dwelling-place in the longer and busy time of life. And where there are growing populations or centres of industry, one of the earliest requisites is some retreat from the din and the turmoil of toil, and thus we have our growing bathing-places and health-resorts. There has been during about thirty years a very great development of industrial life, and a consequential growth of population, in the Cleveland district; and it was inevitable that with this there should be an enlargement of the facilities of enjoyment for the populace. Saltburn is the chief of the new watering-places which have been constructed with this view, and its promoters were unquestionably wise in their choice of site. From a breezy cliff-top, on which it stands, the eye falls down the bushy and wooded slopes of a little ravine, through whose depths a stream warbles, and beyond the cluster of dull cottages, with once-ruddy roofs, and the conical eminence through whose herbage the red soil penetrates, there is southward a rising ground, of shades of glowing green, of rich fallow fields, and of a few clumps of green trees. Looking to the east, in the distance, the ranges of terraces of one of the mining villages breaks in upon the emerald, and the tipping cradles and tall chimney at the mouth of the mine are marked upon the slope of the hill, whilst, as the eye follows on, it takes in a streak of agricultural land, and then the lattice work of the iron bridge that crosses the glen conducts us back to the town. Ranging east, we notice the black huts of the coastguard, and the red cliff, which juts out a bold precipice into the sea. A great sweep of blue ocean stretches out from the mass of sea-weed and mussel which darkens the foot of Huntcliff, and which retreats from the sands that stretch in yellow firmness along by the ancient village of Marske to Redcar. Ranging due east from Huntcliff is the great treasure-trove of Cleveland, whence is drawn wealth that in part sustains the watering-places of the north-country coast, and which has been peopled and developed to an extent certainly unsurpassed in industrial annals In consonance with the rapidity has been that of the growth of Saltburn. Almost hidden from view from the top of the cliff, behind the eminence called Cat Nab, are half a dozen quaint old cottages fronting the sands, and ever in the sound of the monotonous song of the waves which, at high water, beat up close to their foundations. These cottages form "Old Saltburn,"—once a renowned little smuggling village, where many and many a cargo has been "run." But fifty years ago the star of the illicit trade set, and Saltburn sank into obscurity, from which it did not emerge till fifteen or sixteen years ago. A company was formed to improve the natural beauties of the place, and to provide some of those accessories which, in watering-places of this generation, have become necessary. There on the cliff,—an eminence of some 160 ft. in height,—in 1861, the late Earl of Zetland laid the foundation of one of the chief architectural attractions of the place, —the hotel, —taking its title from the nobleman named. Its proportions and its architectural beauties entitle it to no mean place amongst those caravansaries of travellers in which Shenstone found the "warmest welcome." Its main front is five stories high, and nearly 200 ft. long, broad terraces running along front and side; whilst there has been not only the provision of architectural beauty and the choice of a site commanding natural beauty of no mean order, but also those requisites which modern taste make requisite for comfort and convenience. Next the promoters of the place seized upon the little ravine which runs down to the coast immediately below the hotel, and transformed it into pleasure-gardens, the terraces being laid out with great taste, and the background being a dense mass of foliage, struggling up the steep sides of the dell, whilst temples, summer-houses and seats, fount and rosaries, add to and emphasise its natural beauty. The valley widens, and grows more picturesque, reaching, a mile or so from the sea, the once hidden, but now well-known, sylvan beauties of Marske Mill.

To this seaside retreat the terminus of the railway was extended, and soon crescents and terraces began to arise; a pier was planned and executed, and the nucleus of a town speedily grew by the side of the railway, — a town designed for a health resort, built with that view, and hence in appearance the streets, even the humblest, have some pretensions to neatness, whilst in all cases sanitary needs seem to have been studied. A curious taste has given to the streets on the north of the railway the names of precious stones, and thus Garnet, Ruby, and others slope down from the line to the sea-banks, whilst a little more to the west, a small dell, called Hazeldean, shuts off the town from the agricultural country to the west. Near this, private munificence has erected a convalescen home,—a retreat for those recovering from illness, which is stately in appearance in its creamy front and stony-grey tiles, and which has also all provision for the needs of those recovering from illness. Early, the munificence of a few Episcopalians gave to the little town the benefit of a place of meeting for those o their faith, and it is almost needless to say tha Dissent in some of its most prominent phases was speedily represented by local habitations as well as names. School accommodation has been provided, the gas consumption is large and is fully met, whilst from the moors an abundant supply of pure water has been drawn. And, looking alike to ample provision for the needs of residents as well as for those of visitors, it may be said that this community has acquired practical completeness, but there cannot be a doubt that in the future there will be an enlargement of its boundaries.

Unquestionably, Saltburn derives its chief attractions from its situation, though there has been a judicious improvement of some of its advantages. From the highest point of the town, a a glance shows the advantageous situation; the position high up amongst the breezes that blow from the moors; the long, firm sands that

stretch from Huntcliff towards Teesmouth; the magnificent prospect on every hand, taking in the commencement of the new land "whose stones are iron," the pleasant villages that impinge on the coast, and the iron-making district, cloud-compelling, beyond the mouth of the Tees, as well as that which Ulysses saw when it was his purpose to sail "beyond the sunset, and the baths of all the" eastern stars. With the varying of the seasons—in the shelter it has in winter, its coolness in spring, its languor in summer, and its grateful wave-lessened saltiness in autumn—there are variations in its attractions, just as over its seaward prospect there sweep the changes of clouds and mists, of sunbeams that dance on the empurpled waves, and of boisterous gales that sweep into great breakers of the ocean, and drive to northern or southern havens the fishing fleets; but in all there are the beauty and the variations which ocean changes give to what would otherwise be monotonous.

THE OBELISK.

The preparations for raising the obelisk are proceeding apace. The four main uprights of the staging, each consisting, as we have already stated, of six sticks of timber, each 1 ft. square, are in position, and the iron jacket, consisting of plates and girders, is being fixed round the central portion of the obelisk. The iron "strap" which will pass under the butt end of the obelisk from two opposite sides of this jacket (in order to prevent the monolith from slipping out) is of ¾-in. metal, and 24 in. broad. We have already so fully described the mode to be pursued in raising the obelisk (see p. 679, *ante*), that we need not say more at this time than that the apex of the stone, when erected, will be about 30 ft. higher than the upright main timbers of the scaffolding. Instead of raising the obelisk in a horizontal position for the entire height necessary to allow it to turn on the trunnions of the iron jacket to a vertical position, the expediency of allowing the butt-end to trail the ground, or rather a platform to be erected for the purpose, is being discussed. By this means its perpendicularity would gradually increase with the height to which the girders supporting the trunnions were raised, until, when they had reached the maximum altitude required, the monolith would have acquired a perpendicular position by the mere force of gravity,—the iron jacket encompassing the central portion of the obelisk being, of course, so placed as to allow of the preponderating weight of the butt-end of the obelisk asserting itself. This modification of the plan has been suggested by those who entertain doubts as to the capability of the scaffolding to sustain the operation of turning the entire mass on the pivots or trunnions at a considerable height. These doubts are not entertained by Mr. Dixon, the engineer directing the works; and if the proposed deviation of plan is made, it will only be with the view of making assurance doubly sure. The full-sized cast which is being taken for the South Kensington Museum is making good progress. A portion of the pyramidion has been washed and coated with a solution composed, it is stated, of beeswax dissolved in spirits of wine. Whatever the solution may have been [we could get no exact information as to this on the works], its application has had the effect of showing the colour of the granite, and the tone of the small portion of the obelisk so treated is in pleasing contrast with the dirty aspect of the monolith generally,—the result of its voyage.

We may add that the height of the pedestal will be about the same as that of the top of the ornamental lamps which stand on the Embankment wall. The inscription to be placed on the pedestal is, we believe, not yet fully determined upon. The Metropolitan Board of Works, at its last meeting, passed the following resolution:—

"That, previously to any inscription being placed on the pedestal of the Obelisk (Cleopatra's Needle), such inscription be first submitted to this Board for its consideration and approval."

We understand that the power of the Board to interfere in this matter will be disputed.

Buckland St. Mary.—A new stained-glass window has recently been erected in the north aisle of Buckland St. Mary Church, at the expense of Mr. Davis, builder, of Taunton, who restored and enlarged the church some years ago. The window has for its subject the building of Solomon's Temple.

STANCHIONS AND COLUMNS.

On looking over my old notes when I was a student, I came across the following remarks on the comparative strength of iron columns and stanchions, which, if correct, may be of service to others, and if incorrect, possibly one of your more scientific readers will point out the faults.

According to Rankine's formulæ for wrought iron, and Gordon's for cast-iron:—

$$W = \frac{C\ S}{1 + \frac{L^2}{cD^2}}$$ crushing weight in tons.

Where C = 36 for cast, and 16 for wrought iron; and c = 3,000 for wrought columns, or 400 for cast columns.

$$= 1{,}000 \text{ for wrought stanchions or } \frac{400}{3}$$

for cast stanchions.

S = sectional area of metal.

L = length of upright in inches.

D = diameter of column (or breadth of stanchion in above formula).

B = breadth of stanchion (in following formula).

t = thickness of metal in stanchion (in following formula).

If the same quantity of metal be used in the stancheon as in the column, then the strength of column is to the strength of stanchion as

$$\frac{cB^2D^2 + 3L^2D^2}{cB^2D^2 + L^2B^2}$$

For—

$$W = \frac{C\ S}{1 + \frac{L^2}{cD^2}}$$ = breaking weight of column.

$$W = \frac{C\ S}{1 + \frac{3L^2}{cB^2}}$$ " " stanchion.

$$\text{and } \frac{\text{breaking weight of column}}{\text{ditto stanchion}} = \frac{\frac{C\ S}{1 + \frac{L^2}{cD^2}}}{\frac{C\ S}{1 + \frac{3L^2}{cB^2}}} = \frac{1 + \frac{3L^2}{cB^2}}{1 + \frac{L^2}{cD^2}}$$

$$i.e., = \frac{cB^2D^2 + 3L^2D^2}{cB^2D^2 + L^2B^2}$$

Now we want to know when to use the column and when the stanchion; in other words, when there is an advantage in the use of the column over the stanchion, or *vice versâ*. At some point, if any, the column and stanchion will be of equal strength or bearing power, if any point, it will be when—

$$\frac{cB^2D^2 + 3L^2D^2}{cB^2D^2 \times L^2B^2} = 1$$

i.e., when $3L^2D^2 = L^2B^2$

or when $B = D \times \sqrt{3} = 1{\cdot}732$ times D.

Since the sectional areas are equal, therefore

$$\frac{\pi}{4}(D^2 - d^2) = 2Bt - t^2 *$$

and $B = \sqrt{3}\,D$; therefore

$$t^2 - 2\sqrt{3}\,Dt = -\frac{11}{14}(D^2 - d^2)$$

$$t^2 - 2\sqrt{3}\,Dt + 3D^2 = \frac{31}{14}D^2 + \frac{11}{14}d^2$$

$$t = \sqrt{3}\,D \pm \sqrt{\frac{31}{14}D^2 + \frac{11}{14}d^2}$$

For example, if the diameter of a hollow column be 10 in., and the thickness of the metal be 1½ in.,

then $B = 17\frac{1}{3}$ in.,

$$\text{and } t = 17\tfrac{1}{3} \pm \sqrt{\frac{3100}{14} + \frac{539}{14}}$$

$$= 17\tfrac{1}{3} \pm \sqrt{\frac{3639}{14}}$$

$$= 17\tfrac{1}{3} - 16\tfrac{1}{9}$$

$$= 1\tfrac{2}{9}$$

That is to say, that a stanchion 17⅓ in. wide, and 1⅔ metal will be of the same weight-bearing power as a hollow column 10 in. diameter and 1½ in. metal. In an 18-in. wall the stanchion would bond in well of the abo scantling, whereas with a 9-in. wall it wo be awkward. Tables of strength of columns given in Hurst and other handbooks; by above formula, having found the required sect of column, it is easy to transpose it into proper section for a stanchion. L. S.

* The section of stanchion is assumed to be +. If I section then the short arm is assumed equal to $\frac{B+t}{2}$

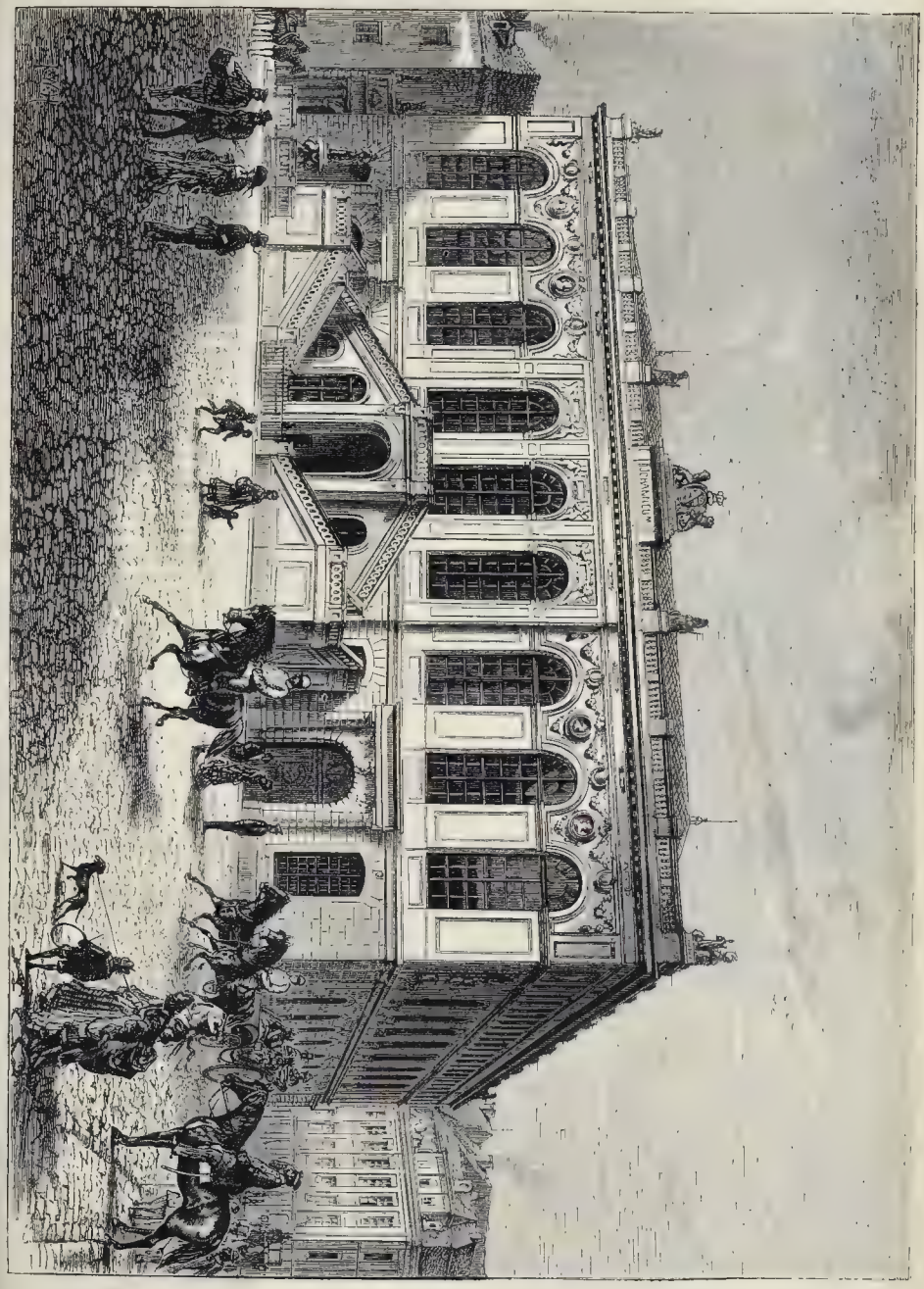
THE HISTORICAL MUSEUM, DRESDEN

Already at the beginning of last centu the museums of Dresden have ranked with long-renowned collections of Italian cities formerly alone the high-schools for artists a connoisseurs—and have ever since continued enjoy the recognition and admiration of lov of art. After the various royal art-collectio in the course of years, had been considera augmented, and arranged in such a manner to satisfy all reasonable wishes, the task s remained to the General Direction of the Roy Collections of Art and Sciences of rendering t treasures they contained more accessible to t public, and of advancing the real object of t collections, which consists in supplying examp upon which to work. By this arrangeme students are now enabled to become bet acquainted with the existing treasures of art former centuries; they are able to collect use suggestions for original work; and they rece stimulation for developing good taste. At t same time, works were published which fai fully represented to the eye the creations former periods of art; and thus a rich collect of photographs of the principal objects Dresden museums has been gradually accum lated, which now furnish the artist and artis alike with the desired guidance for study.

Quite recently, two of the most import collections of Dresden, the Historical Muse and the Porcelain Collection, have experienc an essential change by their removal to Museum Johanneum. The buildings of Zwingergebäude and the Japanische Palais wo very badly adapted for receiving objects of description they contained, more especially account of their dampness. The latter gave rise great difficulties in the way of their preservati causing such anxiety to the General Direct as at last to decide it, after transferring paintings to the New Museum, to utilise vacated space by building a second story the reception of the two collections; tastefu decorated rooms were created, which made suitable display of both collections possib The Historical Museum received a most rema able decoration in the shape of the cartoo illustrative of the history of Charles the Gre Friedrich Barbarossa, and Rudolf of Habsbu which were drawn by Julius Schnorr Carolsfeld for the frescoes now gracing walls of the Royal Castle at Munich. Museum was fortunate enough to get possess of them, and still more fortunate in providi the great wall-spaces necessary for their pro exhibition, which was obtained by utilising their display the full height of both stories the rooms bordering on the staircase.

The Historical Museum occupies now, co pared with its former arrangement, a mu better position, due regard having been paid the relationship of the respective arms and their chronological display. In the interest the craftsman, the artistic work of the armou of the sixteenth century has been grouped tasteful cases in such a manner, according their handiwork, as to afford a consecutive vi from the engraved and damascened arms iron to those worked and etched in silver; elegant sword-hilts, valuable shields, helm &c., have been placed so close to the behol as to give the fullest satisfaction to the lover art.

The General Direction, in rearranging museum, has not lost sight of the events modern times. It applied to the Saxon W Office for a grant of arms captured in the Franco-German War. The arms supplied fr the Dresden Arsenal in consequence of t request have been used in erecting a war tro in honour of the German armies. There is a complete collection of small-arms as now u by the European armies, a collection which i intended to supplement by the latest inventi as they are introduced. The Turkish tent c tured at the relief of Vienna in 1683 has b restored to its original form, the impress caused by this rich piece of Eastern ornamen tion being thereby greatly enhanced.



THE HISTORICAL MUSEUM, DRESDEN.

The Collection of Porcelain and Vases has also gained considerably by its present rearrangement, the greater portion of space at disposal having permitted a chronological and systematic display.

THE INTERNATIONAL CONGRESS OF ARCHITECTS.

We have the utmost pleasure in announcing the brilliant success of the Congress of Architects which has been opened at the Palace of the Trocadéro this week, as one of the many and eminently practical and useful attractions of the Paris Exhibition. The organisers of this somewhat vast and ambitious undertaking were at first rather doubtful as to its success. In 1867, during the Exhibition held that year, a small congress had been organised at a moment's notice, and some of the more notable foreigners who were then visiting Paris were persuaded to attend. But this was a haphazard gathering when compared to the great concourse which we have just witnessed. The present Congress was opened on the afternoon of Monday, the 29th ult., in one of the four large lecture-rooms of the Palace of the Trocadéro. The programme was rigorously executed. M. Lefuel, Member of the Institute, and President of the Organising Committee, occupied the chair, as announced, and delivered the opening address. At his side, and acting as vice-chairmen, we noted M. Charles Blanc, of the Academy of Fine Arts; M. De Laborde, Permanent Secretary of the Academy of Fine Arts; M. Strohm, of St. Petersburg, Councillor of State, &c.; M. Boëswillwald, Inspector-General of Historical Monuments. The secretaries were M. Charles Lucas, M. Cernesson, and M. Raulin. Thus, in the space of a few feet from each other, we found grouped together representative men, whose names are known in various parts of Europe. The audience was very numerous; the majority of the adherents, who now number about 500, were present, for the room, which was quite full, must have held some 400 persons. Among these many foreigners of distinction were noted. We recognised, for instance, Señor Villajos and Señor Belmas, of Madrid; Señor Salas, of Tarragona; M. Ropett, of St. Petersburg; M. Langlet, of Stockholm; M. Dietrichsen, of Christiania; Señor Da Silva, of Lisbon; M. Warocqué, the Belgian Royal Commissioner; M. Massarani, President of the Fine Arts group; Mr. R. Phené Spiers, and many others.

When the President had concluded his opening address, M. Charles Lucas gave a lucid and effective summary of his secretaryship; and, finally, M. Achille Herman, architect of the Tower of Paris and the Nanterre House of Correction, read a brilliant paper on "Æsthetics for the Million," which was loudly applauded, and helped to stimulate the flagging energies of the members, who, in many cases, were weary, after long journeys from the provinces and abroad.

It was only on the second day that the business of the Congress began in real earnest. The morning sitting, held at the Tuileries, was most animated, and some very notable speeches were delivered on Question No. 3, which relates to the position of the architect as a professional man. Messrs. Couran and Dumont were the first speakers, and insisted on the importance of compelling architects to earn and obtain a diploma before they are allowed to practise in their calling. M. Langlet then rose, declaring that practice had proved in Denmark that diplomas were not of much use; and M. Strohm, though not so emphatic, admitted that in Russia they had not been of much greater service; but the speech which created the greatest impression was delivered by Mr. R. Phené Spiers. It was M. César Daly, editor of the *Revue Générale de l'Architecture et des Travaux Publics*, who suggested that Mr. Spiers should be called upon to explain the position of English architects and English architecture, on the ground that he had enjoyed the benefits of education both in England and in France, and could therefore compare the two systems.

In order to account for the development of English architecture, and show how slight influences change our system, Mr. Spiers said that there was no real school of architecture in England. There was no foundation for studies that might serve as a basis on which to build a new system. The schools at South Kensington only aimed at instructing masters who go to the provinces to teach in the provincial schools, and this did not amount to anything more than mere drawing from casts. In England, a youth, on leaving school, enters an office, pays a premium, and is then informed by the principal that he must not expect any lessons, but must simply content himself by watching the work that goes through the hands of his employer. The youth, therefore, only acquires the knowledge of routine daily business; nor do more than twenty or thirty per cent. of the students avail themselves of the evening classes to complete their architectural education. The Architectural Association, Mr. Spiers also pointed out, was a peculiar society, framed, formed, and carried on to correct the defects of English architecture, and probably in no other profession, and certainly in no other country, could such an institution be found. A certain number of students also joined the Royal Academy Schools, which Mr. Spiers himself has directed during the last seven years; and he begged the audience to believe that here, at least, the designs given to the students do not consist of the traditional subjects, such as a house for four brothers, a casino in a park, and the other unpractical structures which find so much favour in the eyes of French examiners. The entire absence of system in England had not, however, interfered with the production of such men as Sir Charles Barry, Cockerell, Sir Gilbert Scott, and others. Mr. Spiers then launched forth into a more speculative, and at the same time, more interesting phase of his subject. He dwelt on the enormous influence literature had exercised on architecture. The works of Stuart and Revett, Pugin, Ruskin, and Sir Walter Scott, and the recent great religious movements, had all helped to create schools. Then there had ensued the anti-Gothic reaction, and the introduction of what is called Queen Anne style, but which it would be more correct to define as the architecture of the Stuart period. This, and the great influence of brick decoration on design and modern work, were also explained; and, finally, the speaker concluded by expressing his conviction that a purer style will soon find favour, and we shall probably take the works of Duc, Duban, Labrouste, and Vaudoyer as our models.

Practically speaking, all the discussion has led to was the adoption of a somewhat colourless resolution, which was solemnly carried, with only one opposing vote, at the afternoon sitting. It is urged that the societies of architecture of France shall place themselves in communication with foreign and provincial architectural societies, and study and decide the question relating to the giving of diplomas to architects.

The Congress has many other grave matters to discuss before it can conclude its labours; and if it continues as successfully as it has begun, this great meeting will be a success.

INTERNATIONAL CONGRESS OF SURVEYORS.

In Paris, on July 18th, 19th, and 20th, an International Congress of Surveyors, convened by the Central Committee of the Surveyors of France, was held, forming one of the series of congresses held at the Palais du Trocadéro, by authorisation of the Minister of Agriculture and Commerce.

Representatives from England, Italy, Germany, Belgium, Spain, and Switzerland took part in the proceedings. In response to an invitation from the president of the Société des Géomètres of France the Institution of Surveyors of London sent three delegates, viz., Mr. E. Ryde (vice-president), Mr. Charles J. Shoppee (member of council), Mr. J. W. Penfold (honorary secretary), together with Mr. J. C. Rogers (acting secretary).

At the first day's sitting the congress was constituted, under the presidency of M. Lefèvre de Lucy, president of the Central Committee of the Surveyors of France. An executive committee was next appointed, composed of vice-presidents, one nominated by each nationality, Mr. Ryde being the English representative. M. Lefèvre was then chosen, by acclamation, president of an international committee for the permanent supervision of the objects of the congress.

The second and third days were occupied in considering the various questions proposed for discussion by the French committee. These related:—1st. To the adoption of some guarantee of professional competency; 2nd, to the comparative merits of the cadastral surveys of the various countries represented at the congress; to the improvement of the methods of property registration, as practised on the Con nent, and to the best form for the public ma plans, descriptions, and valuations of t various kinds of landed and house property a basis for the equalisation of taxation.

The English Delegation laid before the c gress a statement descriptive of the position a functions of the various branches of the p fession in England.

In the course of the discussion the Ordnar Survey of England was described, as also t English system of valuation for the purposes local and Imperial taxation. English Ordnar maps on the various scales were presented the French Central Committee, together w copies of the published volumes of the Tra actions of the Institution of Surveyors.

The articles of discussion prepared by t French committee were (with certain modifi tions) accepted in the form of resolutions. T establishment of a permanent Internatio Congress, with the following representatives: a provisional committee, with power to add their number, was agreed to:—President: Lefèvre de Lucy, France. Vice-Presiden MM. Bucaille, Havre, France; Edward Ry England; Dr. W. Jordan, Carlsruhe, German Paul de Jaer, Brussels, Belgium; Dioni Casanal, Saragossa, Spain; Raphael Tarante Teramo, Italy; and Redard, Fribourg, Switz land; and MM. Pottier, Villers Cotterets, Ais and Hatchet, St. Quentin, Aisne (secretaries and Derivry, Noyon, Oise (treasurer and edi of the *Journal des Géomètres*).

The proceedings of the congress terminat with a vote of thanks to M. Lefèvre de Lu (the president), proposed by Mr. Ryde s carried by acclamation.

After the conclusion of the business the fore delegates were entertained by the French co mittee at a "*Banquet confraternel*" at French Restaurant in the grounds of the Ex bition, and about 150 members assembled. English deputation were placed on the rig the Italian on the left, of the president. Af dinner, M. Lefèvre was presented by the s veyors of France with a gold commemorati medal. The utmost cordiality marked the wh proceedings, and the objects with which t interesting congress took place were in ev respect achieved.

On the Monday the various representati attended at the Tuileries to confirm and s the minutes of the congress.

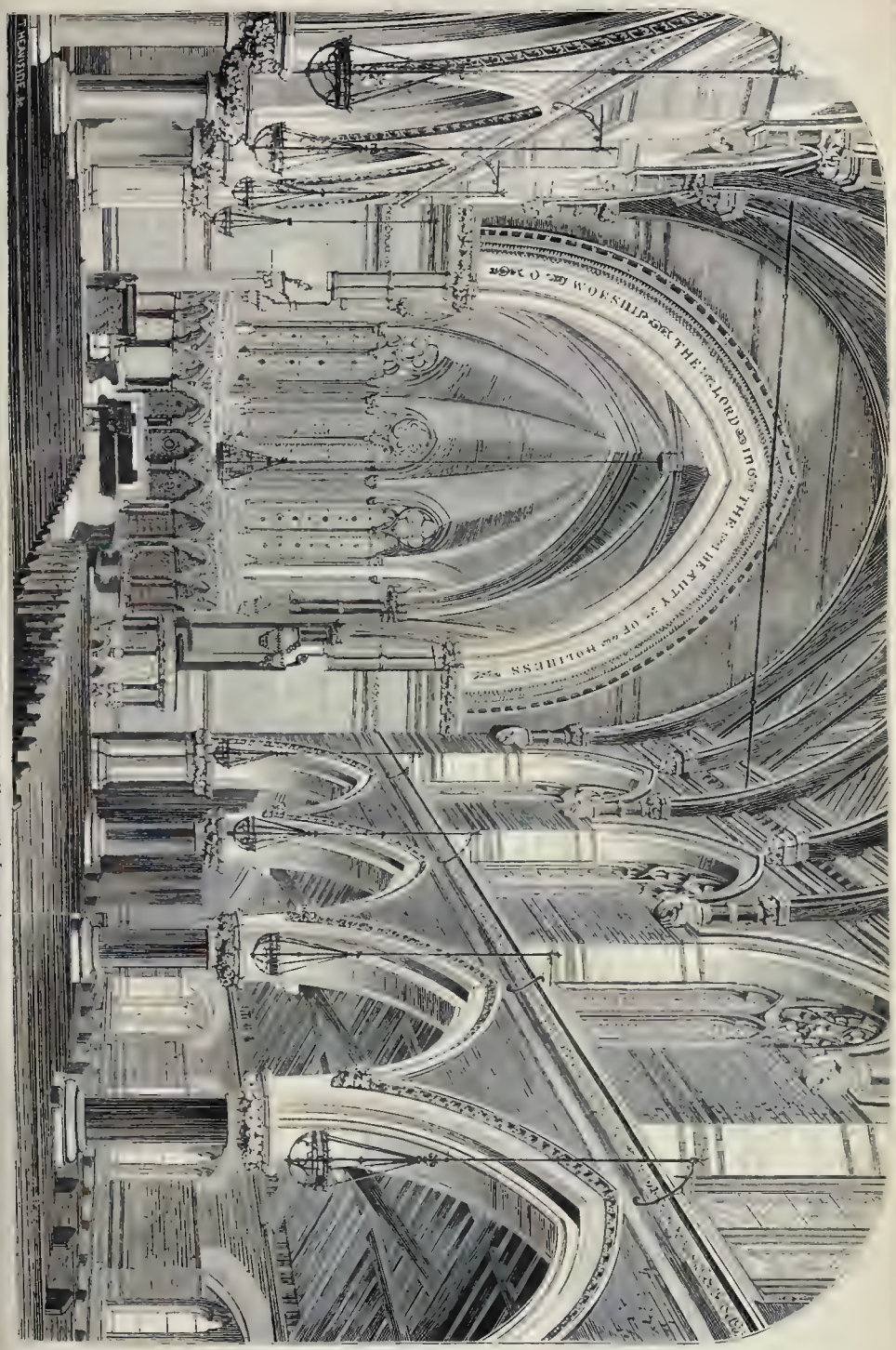
THE RUDOLF FOUNTAIN, INNSBRUCK.

The monumental fountain of which we g an illustration has been erected at Innsbru in commemoration of the union of the Ty with Austria. On September 29th, 1363, M garetha, called "die Maultasch" (literally "(pocket-mouth," on account of the abnorm size of her mouth), renounced her claim to t duchy of Tyrol, depositing the government of t country into the hands of Duke Rudolf IV., Austria, of the house of Habsburg. F hundred years later, on September 29th, 18 on the occasion of the solemn celebration of f fifth centenary of the union of the Tyrol w the Austrian monarchy, the erection of a co memorative monument was resolved upon. unveiling of the monumental fountain, which placed in the Margarethenplatz at Innsbru did not take place until September 29th of l year. Plan and design were prepared by Hi Friedrich Schmidt, Cathedral Architect, Vien The statue of Rudolf, about 9 ft. high, and t other metal figures and ornaments, were cast the Imperial Art Foundry, Vienna. The sculpt Grissemann, a Tyrolese, supplied the design the statue of Rudolf, from a portrait on t sepulchral monument in St. Stefan's Cathedr Vienna. The stonework, of Lofer marble, h been executed by the sculptor Hohenauer, Innsbruck.

Communication in Kensington.—At t meeting of the Kensington Vestry on the 25 ult., a memorial was read from the inhabitan of Brompton-road, Brompton-square, and t neighbourhood, complaining that there is communication between them and Rutlan gate, Ennismore-gardens, &c. The only way present was a footpath through Brompt Churchyard, or a circuitous route through Mor pelier-square, and so on to the Exhibition-ro The memorial was referred to the Works Co mittee. The want has been long felt, and oft urged.



THE RUDOLF FOUNTAIN, INNSBRUCK.—Dombaumeister Friedrich Schmidt, Architect.



TRINITY CHURCH, SOUTH HAMPSTEAD.—Mr. Henry S. Legg, Architect.

TRINITY CHURCH, SOUTH HAMPSTEAD.

The church, of which we present an interior view, is erected in the parish of South Hampstead, upon part of the estate of Sir Spencer Wilson, bart., adjoining St. John's Wood.

It has been substituted for a small timber temporary church, erected some thirty years ago at the lower end of the fields so well known as "the Conduit-fields" leading to Hampstead, and which erection has served the purpose of a temporary church to three congregations, each now duly supplied with permanent buildings, but which has just been swept away for the large and (possibly in the future) noble avenue, 70 ft. wide, called Fitz-John's Avenue, connecting Hampstead with London.

The Rev. Henry Sharpe having attracted a small congregation in the temporary church; and this congregation being desirous of continuing his ministration, applied for a site for a permanent church to the late Sir Thos. Maryon Wilson, bart., who, in conjunction with his son, the present Sir Spencer Wilson, readily granted it free of all cost. A district being assigned out of the parish of Hampstead, with the sanction and approval of the late vicar, the first stone of this structure was laid by the Earl of Shaftesbury.

Externally, the church is not at present specially attractive, on account of the want of the tower and spire, which it is hoped will be shortly erected. The interior, however, has been studied, more particularly with reference to the great desideratum of accommodating a large congregation with comfort as regards space, seeing, and hearing, ventilation, warming, easy ingress and egress, &c. To effect this, the nave has been designed sufficiently wide to accommodate the greater part of the congregation under its roof. The pillars carrying the nave walls or clearstory are of red polished granite, in order to admit of their being of as small a diameter as possible, so as not to intercept the view of those sitting in the aisles, and at the same time to be sufficiently strong to carry the clearstory walls over, which are lofty, and 2 ft. 6 in. in thickness.

The church will accommodate 1,000 people, all on the ground floor. The length is 128 ft. from east to west, including the chancel, which is 36 ft. long. The width from north to south, including the aisles, is 65 ft. The height of the nave from the floor to the apex of the roof is 70 ft. There is at the west end a narthex or porch, 34 ft. long by 9 ft. wide, and a north porch besides; also another entrance under the tower, on the south side. At the eastern end there is a chancel-aisle, an organ-chamber, and a vestry.

The style adopted is the Transitional from Early English to Decorated. All the tracery work, mullions, arches, capitals and corbels, are of stone. The walls internally are of brickwork, a great portion, especially of the nave, being in Pether's patent bricks, pressed with a pattern or design upon each, combined with bands of bricks of a purple colour running throughout. The roofs of the nave and aisles are of fir, boarded. The chancel, however, is vaulted, having moulded stone ribs, and the spaces filled in with brick; the thrust being amply provided for by projecting buttresses around the apse.

The exterior is of Kentish rag and Caen stone. The warming is a combination of hot air and hot water, the apparatus being a chamber forming the foundation for the tower.

The total cost up to the present time is about 13,000*l*. The chancel, together with chancel aisle, organ-chamber, and vestry, it may be stated, was a gift of one lady, the separate cost being about 3,500*l*. The pulpit, which is of stone, with polished marble shafts both below and above, is the gift of Mr. Robert Woodd, in memory of his father. It has around it six panels, carefully carved, illustrating events in the life of St. Paul. The font also, which is elegant and simple, is the gift of Mr. Ewan Christian.

The builders were Messrs. Dove, of Islington; and the architect was Mr. Henry S. Legg, of Christ's Hospital, London.

Kirbymoorside, near York.—A vicarage house is in course of erection for this benefice, at a cost of 2,000*l*. The architect is Mr. J. Mitchell Bottomley, of the firm of Messrs. Armfield & Bottomley, of Middlesbrough-on-Tees. The contractor is Mr. Thomas Wood, of Pickering.

TOWN SANITATION AND MORTALITY: LIVERPOOL.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

The fifth annual meeting of this association was held on the 25th ult., in the Council Chamber of the Town-hall, Liverpool. Some routine business having been transacted,

The president (Mr. Deacon, borough engineer of Liverpool) delivered his inaugural address, of which the following are passages:—

In assuming, for the first time, the chair to which you have done me the honour to elect me, I wish to welcome you heartily to the second city in the kingdom, and to express the hope that you will not fail to find in Liverpool some works worthy of your thoughts, and to acquire some new and useful information such as I have invariably gathered in the different towns which, on similar occasions, we have previously visited. The first Public Health Act was passed in the year 1848, and by this Act, and the Towns Improvement Act of 1847, the appointment of surveyors was authorised in the towns and districts to which those Acts were applied, for the distinct purpose of carrying out the practical work involved in the improvement of the sanitary condition of the country. As a class of engineers and surveyors, therefore, our existence dates back for only thirty years; and it appears to me that no small credit was due to the municipal government of Liverpool when, six years earlier, they obtained a local sanitary Act, the provisions of which were so well considered by the Council of the day that many of them have not been improved upon, and are to be found in the most recent sanitary legislation. Under this Act I believe the first borough engineer was appointed. No class of men know better than do we ourselves that the choice of candidates to perform the duties of our office has at all times been the happiest, and that in many instances the standard of professional knowledge which sanitary authorities have succeeded in securing has been far too low. It may be that the standard has generally been as high as the remuneration could reasonably be expected to command, but if that standard were raised, the remuneration would inevitably rise also, for in the long run there is little to be feared from the competition of those whose practice is obsolete among professional engineers. The members of this association (and I am happy to say that we include the engineers and surveyors to nearly all the principal urban and sanitary authorities in the kingdom) meet together, from time to time, to widen our knowledge by visiting each other's districts and works, by examining the causes of increased efficiency or diminished cost, and by thus adding the experience of our neighbours to that which is gained in the comparatively limited sphere in which our individual duties lie. You have each received a printed account of some of the various works which I shall ask you to inspect. From that account you will be enabled to gather information not only concerning the existing state of sanitary engineering in Liverpool, but also concerning the changes which have been effected within the last few years. Before asking you to consider the works, I will endeavour to show you that, judged by the mortality of Liverpool, the existing state of sanitary engineering is satisfactory, and that, judged by the decrease which has recently taken place in that mortality in relation to other places, there is the best reason to conclude that the changes described in the paper before you have given most important and satisfactory results. Excepting the soil upon which Liverpool is built, there is not, I believe, in the physical geography of the district anything calculated to produce an abnormal death-rate, but the soil is for the most part unfavourable. The rock is everything that can be desired; but over this rock (the new red sandstone) lies in most parts a thick bed of the absorbent but nearly impermeable boulder clay of the glacial period. Before the borough was almost entirely covered with buildings and pavements, a large portion of the 30 in. of rainfall absorbed into the boulder-clay by capillary action, rather than by percolation, was slowly restored to the air when rain had ceased, and produced an abnormally damp climate. But there is a social, and perhaps more important, element which should be taken into account in considering the death-rate. We have among us a large and ever-changing population of seafaring men, and we have in addition a proportionally large migratory population. Consider for a moment the effect of a multitude of persons moving continuously through the town, to many of them the first dry land for weeks past, to many others the last dry land for weeks to come. Obviously the number of invalids left behind at different times, and enumerated by the census on a single night, is higher than the actual average number of invalids corresponding to the number of emigrants in the town on any one night. The number of deaths resulting from those invalids must, therefore, be also higher than the mean death-rate of the population producing them. There are also many other circumstances connected with a migratory and, in great part, very poor population, which are inimical to the health of residents themselves. But there is a third and still more important cause tending to increase the death-rate in Liverpool. I refer to the very small area within the municipal boundary in relation to the population. The population of the borough of Liverpool is about 532,885, the area only 5,210 acres, giving a mean density of 102·3 persons per acre. If we take the seventeen other large English towns which are the subject of the Registrar-General's special reports, and with the death-rate of which that of Liverpool is compared, we find that the total average density of population in them is only 33·6 persons per acre, or less than one-third of the density in Liverpool,—a density, be it remembered, arising in a great measure from the fact that the borough of Liverpool is only the nucleus of a very large dependent population, which in most towns is included within the municipal boundary. If, notwithstanding this unfavourable mode of comparison and the other adverse circumstances to which I have adverted, it can be shown that the total death-rate from all causes is not exceptional, and that the deaths from those diseases which are generally regarded as dependent upon sanitary measures are actually less than in most other towns, there will, I think, be an additional reason for believing that the municipal engineering work of Liverpool is worthy of your consideration. In an address which, as it appears to me, is among the ablest to be found in the archives of any association, Mr. Hawksley, as president of the Health Section of the Social Science Congress in 1876, compared the total mortality of Liverpool with that of the other large cities most nearly approaching to it in magnitude, namely, Manchester and Glasgow, and from the year 1869 to 1875 inclusive, he found from the Registrar-General's official returns that the mean annual death-rates of the three cities were almost exactly alike. Liverpool gave 30·1 deaths to each 1,000 persons living; Manchester, 30·1 per 1,000; Glasgow, 30·5 per 1,000, or 30·1 deaths in Liverpool, as compared with a mean of 30·3 deaths in Manchester and Glasgow. Since the date of Mr. Hawksley's address, two more years have passed, and the death-rate of Liverpool still bears the comparison satisfactorily. I will now give you the mean annual death-rates from 1869 to 1877 inclusive:—Liverpool gives 29·4 deaths to each 1,000 persons living; Manchester, 29·7 per 1,000; Glasgow, 29·3 per 1,000; or 29·4 deaths in Liverpool, as compared with a mean of 29·5 in Manchester and Glasgow. Even from this comparison it is evident that Liverpool is not, when compared with other similar places, the abnormally unhealthy city which people are in the habit of supposing it to be. But, as an Association of Sanitary Engineers, it appears to me that we may more usefully investigate the mortality from certain zymotic diseases which are generally believed to be affected by such surrounding conditions as a sanitary authority can control. Now, if we comtrast the mean death-rate of Liverpool for the years 1875-6-7, and the first quarter of 1878, from scarlet fever, diphtheria, fever, and diarrhœa, with the corresponding death-rate in the 17 towns already referred to, we find that in only seven of those towns is the death-rate lower than in Liverpool, though the mean density of population in Liverpool is three times as great. It is clear, therefore, that in contrast with other towns Liverpool is not in an unsatisfactory sanitary condition. If we compare the mean death-rate in Liverpool, above referred to, with the corresponding death-rate for the five previous years,—viz., 1870-71-72-73-74,—we find a diminution of 46 per cent.; while in the corresponding periods the mean diminution in the other seventeen towns is only 23 per cent. For so exceptional a change in Liverpool we naturally seek for a visible cause. I am aware that the periods

compared are shorter than they ought to be for purposes of the kind; but, if I go back ten years from 1874, instead of five, I find the comparison still more favourable to the more recent period. Now, the division of the two periods of which I have compared the mortality from certain zymotic diseases was a time when many important sanitary works were in progress, or about to be commenced. I will enumerate a few of these:—81 miles of sewers in the heart of the town have been thoroughly ventilated; 44 miles have been thoroughly cleansed; a large proportion of the whole have been renovated and rendered self-cleansing, as explained in the paper before you; and others have been provided with flushing-tanks, and are now systematically flushed; 300,000 square yards of pavement, formerly pervious to moisture, have been reconstructed, and rendered impervious. The connexions between 1851 drains in the cellars of court-houses (the traps of which were often defective) and the sewers have been cut off, and pneumatic separation between drains within and without dwellings of all classes is now common, though far from universal, as it ought to be. Under the medical officer's advice, large numbers of insanitary cellars have been closed; and during the last eighteen months, 2,178 of the remaining privies have been converted into water-closets. I will not ask you to believe that the whole of the greatly reduced mortality from zymotic diseases is due to the sanitary changes I have enumerated, though I think you will agree with me that the coincidence indicates a very important connexion between them. I will only say, in conclusion, that, although much good work has already been done, much still remains to be done. There are defects in the sanitary works of the best of our towns, to which the eyes of our legislators and the public must be more fully opened before the remedy will be found. We are still very far from the Hygeia which has been pictured by Dr. Richardson in such glowing colours; but, however sceptical we may be of the immunity from certain diseases promised there, and of the greatly extended life of man under such conditions, we cannot, as municipal engineers and surveyors, do better than conceive for ourselves a city in which all public works, and I am bound to add certain private works, have been executed in the most perfect manner, and to raise to that standard, so far as possible, the centres of population, in connexion with which each of us holds so important a trust.

Mr. Charles Jones (Ealing), the hon. sec., regretted that the president's address precluded any discussion: it was a fixed rule of the association's throughout the country not to allow discussion on the president's opening address. During the reading of the paper they had learned more about Liverpool than they ever knew before. He moved a vote of thanks to the president for his able address.

Mr. Ashmead (Bristol) seconded the motion, which was carried unanimously.

Discussion was then invited upon a communication by Mr. Deacon with reference to the works of Liverpool. The paper was read by the secretary, and the president answered a large number of questions on the following subjects:—Portland cement for carriage-way foundations; bituminous concrete for carriage-way foundations; sett pavements, with asphalte joints; artificial asphalte pavements; the Liverpool tramways; sewerage construction; improvement of old sewers; sewer ventilation; influence of form on strength of cement; the general utility of the test for strength; difficulty of testing on small works; simple modes of testing; Portland cement setting; the Bootle Waterworks; the waterworks appliances at the Hotham-street depôt; meters for measuring trade supply of water, &c.

A vote of thanks was passed to the president for his valuable communication and the questions which he had so kindly answered.

In the evening the members dined at the Alexandra Pavilion, Eberle-street, Mr. Deacon presiding. After the loyal and patriotic toasts, Mr. Pritchard (Warwick), district secretary for the Midland Counties, proposed "The Past Presidents," coupling with it the name of Mr. Ashmead (Bristol), the immediate past president.

The President next proposed "The Municipal Institutions of the Country." He explained that his Worship the Mayor of Liverpool, who intended to respond to this toast, had been unexpectedly prevented from attending the banquet. He would therefore call upon Dr. Gill to reply to it.

In the course of his remarks, Dr. Gill said there were a great number of dwellings in Liverpool which were not fit for the habitation of beasts. These were occupied by the lowest order of the people, and they ought to be removed. It was a pity the corporation could not afford to raze them without delay; he hoped they would be able to do so before long. In conclusion he proposed the "Worthy Secretary," coupling with it the name of Mr. Jones, who, in responding, hoped that before long the Association would have amongst its members all the principal engineers and surveyors in the north, south, east, and west of England, so that its powers might be proportionately increased.

The Chairman gave "The Representative Body of the Association," coupling with it the name of Mr. Lyster, the engineer to the Dock Board, who, in replying, inviting the members of the Association to visit any of the works over which he had charge in the Dock Estate.

Amongst the other toasts was that of the "Medical Officers of Health," to which Dr. Taylor responded.

The concluding toast was "The President," which was proposed by Mr. Lyster.

THE GEOLOGY OF LIVERPOOL IN RELATION TO ENGINEERING WORK.

ASSOCIATION OF MUNICIPAL ENGINEERS.

At a meeting of this society last week, Mr. T. Mellard Reade, C.E., read a paper on the above subject, in which he classified the various strata, commencing with the post-glacial strata. In the course of it he said, speaking of the

Boulder-clay and Drift-sand,

The thickness of these drift deposits varies from nothing to about 140 ft., the deepest I know being in the old bed of the river Mersey, under the town of Widnes. Near the north docks the stony clay appears to graduate into gravel, which fills up deep gullies cut into the sandstone rock. This bed of gravel has been quite a godsend for the formation of concrete for the dock works, of which a large quantity has been used for backing for the walls. The neighbourhood is deficient in a natural supply of shingle, most of that used in Liverpool coming from abroad as ballast. The bulk of the clay is of a more plastic character than the foregoing, and is often separated from the lower beds by a line of denudation and a thin seam of stratified sand; but it is very difficult to lay down any general rule for the geological interpretation of the deposits.

It is very singular in excavating in the town of Liverpool to come upon these relics of a period of floating ice. This I exhibit is a chipping from a glaciated erratic of porphyritic felstone, which was found in the excavation at the corner of Victoria-street, where it had lain embedded at the base of the clay under the cellars of some very old property. Another and larger erratic was found in the same place, half embedded in the red sand which often lies on the top of a red rock, between it and the boulder clay above. A still larger greenstone boulder was found in an excavation in Hackinshey, and they are, in fact, common under the foundations of Liverpool.

Triassic Rocks.

These rocks, when reached, of course, in all cases terminate our digging for foundations. A word as to their economical aspect. They constitute the whole of the local stone, and many of the beds form very good building stone; but, in consequence of its porosity, which makes the rock such a good water-bearing stratum, it is apt to convey the damp into a house; in fact, it should never be used unless backed up with brickwork. The white stone of which Compton House is built is from the Stourton quarries, in Cheshire; and some of the old Liverpool buildings are of similar stone, from equivalent but harder beds in Liverpool, from quarries now closed, and, indeed, built over. The stone generally used now from the neighbourhood is that of the pebble beds of the Bunter. Messrs. Wells & Sons' quarry at Bootle supplies a great deal of this rock for the north end dockworks. There is also a fine red stone from the Runcorn quarries, which can be obtained in very large blocks, and is free from pebbles. It belongs to the Keuper division.

I have refrained from saying anything on that vexed question—the water supply from the new red sandstone—as my views will be published in the forthcoming report of the British Assoc tion. In conclusion, I would commend the stu of geology to engineers and architects.

After a short discussion, in which Mr. Isd Roberts (Liverpool), Mr. Morant (Leeds), E. Pritchard (Warwick), Mr. White (Oxfor and Mr. Lemon (Southampton) took part, thar were voted to Mr. Reade, and a strong wish w expressed that some steps should be taken reproduce the drawings by which it was illi trated for the benefit of the Association. Reade stating his readiness to place them at disposal of the Association with that view.

The meeting then adjourned.

In the afternoon the members of the assoc tion paid a visit to the Bootle pumping-stati where they were met by Mr. Councillor J. Wilson, chairman of the water committee; Alderman Rigby, deputy chairman; Councill Roydon, Graves, and Barkley Smith; Mr. Duncanson, C.E., deputy water-engineer; Joseph Parry, C.E., assistant water-engineer, A heading or underground reservoir, the lowe floor of which is 105 ft. below the surface, a the length of which is 440 ft., the breadth 18 f and the height 26 ft., was brilliantly lighted by means of the electric light, and the membe of the association having descended into it means of a series of steep ladders, were co ducted through it by their president, Mr. Deac who explained the mode in which the wat enters the heading, and the method of gaugi the flow from the different parts. There a several boreholes in the heading, the deepest which is about 630 ft. from the surface. T process of sinking the 1,000 ft. borehole was al exhibited and explained. The borehole is 26 in diameter, and has already been sunk to depth of 960 ft. The apparatus used in borir is a modern application of the old Chinese rop boring machine. The machinery is designed b Messrs. Mather & Platt, of Salford, the co tractors for the work, and is very ingenious After leaving the waterworks the party pr ceeded, in the omnibuses which had taken the thither, to the North-end Docks, in course construction. Mr. Lyster, the dock enginee received them and explained to them the plan of the works, and afterwards conducted the through the culverts and sluices. The visito inspected this portion of the works with gre interest, and one and all appeared to be muc struck with the massive,—the Titanic,—cha racter of the masonry and the completeness an perfection of the sluicing arrangements.

THE RECENT TRIAL OF COWLS AT KEW

The recent report, published under th auspices of the Sanitary Institute of Gree Britain, upon certain exhaust cowls] or vent lators, which were exhibited at the Leamingto Congress, in connexion with that society, ha necessarily led to criticism. The Sanitar Engineering and Ventilation Company, in som remarks made by them, say:—"The gentlemen who conducted the trial found, as the result o their experiments, that the exhaust-cowls did not give so good a result as a plain or ope pipe, and it is not at all surprising that suc should have been the case under the circum stances. There was a building standing alon in an open space, with nothing to interrupt th free course of the wind currents, and it is wel known to those who have studied the questio that under those conditions, viz., with a curren of air blowing horizontally across the top of a open pipe, an open pipe gives the best result This was pointed out by Dr. Parkes years ago and has been repeated by others since,—th little toy, known as the 'Spray Producer' being a practical illustration of the principle involved —but these are not the conditions under whic nine out of every ten exhaust-cowls are placed —at any rate in towns, because of some highe adjacent building, or a wing of the building, o a chimney stack, against which the wind strikes and which produces reflex action; the air being deflected at various angles by these and similar obstructions, and which is the chief cause o down-blow in certain chimneys. Now, exhaus cowls, or ventilators, which are dependent upon the wind currents for their use, have been designed with the view of getting the best possible upcast or pumping action, and at the same time providing against down-blow, the arrangement being such that at whatever angle the wind strikes them, it should not be able to blow down the vertical pipe or tube to which they are attached, as it would frequently do in

he case of an open pipe. This being so, it eems an extraordinary statement to issue from he Sanitary Institute, that the only object hese exhaust-cowls appear to serve is to pre-ent the admission of rain, which, they say, ould be accomplished in a much less expensive nd simpler manner. To those who understand he subject, it seems unnecessary to point out a act so evident as that we have named, but for he non-professional public who have been per-uaded to go to some expense in fixing these xhaust-cowls on their dwellings, it may be as ell to state the fact with the same publicity hich has been given to the result of the Kew rial. We had not the opportunity of witnessing he trials, but, if we are correctly informed, here were other reasons why the open pipe at Kew gave a better result than the exhaust-owls, chiefly the arrangement for the influx of ir to the shed, on the top of which the cowls ere placed; and we believe that a gentle-nan who carefully inspected the arrangements, nd took some readings there on his own account, ntends publishing in the technical papers some igures which he thinks will conclusively prove he fallacy of the verdict pronounced by the ub-committee of the Sanitary Institute of Great Britain."

THE ST. GOTTHARD RAILWAY.

The question which is at present uppermost n the public mind of Switzerland, and which is lso of the greatest interest to foreign countries, s the supplemental subvention which the in-rease in the expenses of the St. Gotthard Rail-vay has made necessary. Our readers need erhaps reminding that, in consequence of the nexpected difficulties in the construction of the St. Gotthard tunnel, the original estimates have een considerably exceeded. The Governments f the countries most interested in the works, Germany and Italy, are quite willing to furnish heir quota of the necessary additional funds. Strangely enough, the country which will ulti-nately profit most by the completion of the rail-vay has, up to the present time, refused to urnish its share. The sum required of Switzer-and is only eight million francs, no very great urden for the country, notwithstanding that it as already supplied twenty millions towards he works. The Federal Council thought of vercoming the old jealousies between the East nd West of Switzerland by giving the cantons ost nearly concerned the opportunity of raising hemselves the supplementary funds. This ndeavour has been completely wrecked. The wo railways most interested, the Central Rail-vay of Switzerland and the North-East Railway, were quite ready to accept the additional burden, notwithstanding that they have been passing through heavy crises; all they asked was that the Federal Government should find them the money until they were able to repay it. The only difficulty rested with a dozen or so of cantons, who could not be induced to subscribe their quota, even after, at a last conference, the Federal Government had offered to take a few millions on its own account. It is this spirit of public niggardliness which lies at the bottom of much of the procrastination and delay already experienced in the completion of the St. Gotthard Railway. It is a strange phenomenon that the cantons farthest away from that line (Solothurn, Baselstadt, Basselland, Aargan, Schaffhausen, and Thurgau) have been all along most ready to help in the common work; the resistance comes from those nearest to it. At the head of the opposition is the most ancient of the oldest cantons, the canton of Uri, within whose circumscribed limits the chain of the St. Gotthard rears its icy pinnacles. All possible interests, both ideal and material, ought to have induced that canton to make a last sacrifice. But, no; the majority of the Landsgemeinde at Altdorf,—that Altdorf which was, if tradition is to be relied on, the cradle of Swiss independence,—have resolved not to give another franc. The same is reported from Nidwalden, in whose mountains was born the man who knew how to "make a way for liberty." Schwyz and Obwalden distinguished themselves, however, by voting in favour of the subvention. Another category of cantons shielded its parsimony behind a feeling of displeasure, either natural or assumed, at the limitation of the proposed network of lines feeding the principal railway, although common-sense ought to tell them that all the branch lines will be built as soon as the trunk line is completed. The cantons loudest in this strain were Tessin and Luzern, Zug and Bern joining in. But there is every reason to believe that the second category might have been gained over if the Federal Government had taken over a considerable portion of the supplementary convention, and thus morally compelled them to agree to it. It was then that happened what no one had expected. Zürich, the second largest and the richest canton, the canton considered the most educated and most liberal, the canton most interested in the St. Gotthard Railway, rejected the supplementary convention by popular vote, even after its Cantonal Council had recommended its acceptance almost unanimously. The secession of Zürich overthrew all former combinations. It might have been possible to again appeal to the people, but time pressed, more especially as the German and Italian Parliaments had voted the supplementary amounts demanded of the two countries. The Swiss Federal Council resolved to do without cantonal help, and to assume the responsibility of finding the funds itself. No doubt is expressed as to the action of the Federal Council being ultimately approved. All the chances are in its favour. The cantons which were willing to contribute directly, as well as most of those which objected to this course, will probably not find fault with the whole Republic accepting the responsibility of supplying the money. Should there still be any cantons refusing to sanction even this course, they will find themselves in a miserable minority.

ENGLISH LANDSCAPE ART IN THE YEAR 1878.

For the third time, Mr. Alfred Dawson publishes his notes under the above heading,* slashing right and left, sometimes with and sometimes without reason. We quote his opening observations:—

In reviewing the position of landscape art this year, there is no new feature to remark particularly; though by careful inspection it will appear that some small changes have taken place, and these changes, on still closer scrutiny, will bear out the statement that they are of an improving kind. For a long time we have had to record, along with the better report, one of another kind,—a report of treachery to art, and falsehood to nature. The wilful defection of a man from canons of truth which can have no other interpretation than that for which his fellows and himself have laboured to approach, is a sin and an evil done to the fair name of art: not that a man ought to be in any way pedantic or conventional, but that he should not be the cowardly, false being that alone would be able to do such a thing, as when he goes and represents nature diametrically opposite to her real character and appearance. Except one at the Grosvenor Gallery, there does not appear, at the present time, any conspicuous case of this sort; and this one we have, let us hope, learned to tolerate at least, as we do some poor deformed and demented creature who needs the pity and charity of other people to keep him, though not to necessarily lodge him in a palace and feed him on the best of everything, and make the largest show possible of his hideous presence, as if he were a noble type of humanity.

The perpetual hankering after this kind of trash appears to be subsiding and making way to a good deal of real painting from nature on the spot, which is a far better thing. It is infinitely better to make a bad picture painted on the spot than a worse one painted on the smudge.

There is, however, large room for complaint on that most important point, dignity of subject. This appears to be now quite forgotten; the meanness of many of the landscape subjects is indeed something for condemnation. See if there is one fine distance in the whole Academy, or one splendid tree, or one noble sunset, or, indeed, daylight sky. The only approach we have to dignity is in the few Alpine pictures, not the best that we have seen, though good, and a couple of Venetian subjects hung badly. If one were inclined to be ironical, it would be quite appropriate to recommend some splendid dog-kennel or dust-hole well worth a large canvas and a month's work. Now, while this is so, it is all very fine for the art critics to talk their smoky learning about Mr. Millais's little rivulet or Mr. Aumonier's big foregrounds, but it cannot make dry bones live, and no amount of flattery can convert a sketch into a picture; the flatterer will disappear, the artist will follow, and the picture will remain a wretched, unprotected failure, which the far-scattered few who might say a word for it will certainly never care to defend for an instant. Now this is, of course, doubtless, very nice for men who only have the one idea of getting money out of the pockets of the public. Such men, whether artists or dealers, or the still more delicately suspended "gentleman dealer," need no hard-and-fast criterion, and sublime excellence they do not care much for, but their desire is a name that is capable of any amount of inflation with a proportionate supply to meet the demand which they whip up; a very sorry kind of thing for benefiting art and artists.

Now for all this, speaking to artists, there is but one remedy: be free from the charge yourself, and refuse to do anything with those who desire to so treat you. Never mind specious promises or any other adventitious aid to profit, but paint the best picture you can. Get for it the best price you can, and put by all the pictures you can against the time when you may be glad to have them. The desire to sell out can only mean that you have no faith in your own productions, so you get to regard them as a tradesman regards damaged goods. Men who paint rubbish must be ashamed to meet their own pictures again, but men who paint good pictures are always glad to see them again. That there is a canon of excellence and value, and a clear line of truth in art, if a few men would but follow it closely and insist on its right to be respected, there cannot be a shade of doubt. And just as last year, in this pamphlet, a few points were taken up bearing on this part of the subject, so now it will be somewhat further elucidated.

As it is easy to criticise a result placed before one, but hard to create the object, it is no ungraceful duty in the same way for any one who undertakes technical criticism, as far as possible to give some guiding clue as to certain principles of subject or aspect which are needful to produce good pictures. There are also conditions of working and practice which it would be well to observe as being incompatible with a real genuine producing genius.

Now many painters seem to lack and others to have most fully developed the important idea that there must be in every picture some one pronounced aim or object, whether grand or mean, complex or simple, but, whichever it is, there is no harm done by allowing it a dominating place. At the same time, it is a matter of absolute choice whether some one aim or two or three should obtain in the same picture. It neither disqualifies nor makes a picture, whether this is carried out in one form or the other. But there is a great exception to be taken from this point, namely, that when a picture has several aims or objects, it is harder, very much harder, to do than when it has only one. The very lowest form of value or attraction in any picture is that where the subject and the working are reduced to a minimum, while some cant phrase in the title of the picture is set to do all the work that the artist left undone. Of such as this are Mr. Watts's dove subjects, Mr. Whistler's Nocturnes, and a few other solidified vacuities which turn up from time to time. The next class above this, and not much above it, is that in which there is almost as little subject, but the cant title is omitted, a locality is suggested, and some pronounced aspect of nature is at best represented, yet the sky is *nil*; the rest of the picture is little enough, and we are asked to praise it greatly. Of such are various Daubignys, Corots, and sundry other late evening effects, or effects of fog or moonlight, which the reader may discover for himself. Next above this class, we place those pictures in which some one aspect of nature is really well done, being copied on the spot from nature. This is not a very high class, because there are technical reasons why certain great qualities should not be obtainable, except by a carefully-cultivated power to express them independently of their presence. The only things that can be got well by copying are such things as do not change,—rocks, trees, and material generally, always under some effect that can be seen any time. Thus Mr. Brett likes clear sunshine because it can be easily referred to, and it must be equal and universal for the same reason; and other painters from nature go in for flat, clouded shade, for the same reason. These are low art; they are simply copying nature when pinned out and pasted down flat, so that she cannot give their fancy any trouble,

* Deighton & Dunthorne.

but can be copied as a Kensington student copies a scroll or a conventionalised botanical design. This is all a poor form of art, that is, it is not high; perhaps, putting it fairly, it is about halfway between the top and the bottom,—whether in art an inch at the top is worth two at the bottom shall be left to the reader to judge.

THE HYGIENE OF EDUCATION.

Sir,—In these days, when events move so rapidly, and when the elaboration of ideas still remains a comparatively slow process, I should be glad if you would favour me by giving publicity to the following principles, which are the substance of an attempt to place the science of education on a more exact basis than has hitherto been done.

Regarding the human system as a divine mechanism, I have long thought that it would tend to promote a truer comprehension of the science of education if we were to study the subject from a more mechanical point of view,—if we were to consider every thought and every act as the equivalent of a certain amount of vital force expended,—and the due share of power to be utilised by the brain as a limited quantity, capable of being either monopolised or proportionately distributed amongst all faculties. That the brain power in every individual is limited is no mere assumption, for we all know that there is a point at which it begins to flag, a second where it begins to show marked signs of distress, and a third where it exhibits all the signs of total exhaustion. Our mental as well as our physical power is limited. There is a supreme effort, beyond which we can no further go. Let us then, first of all, regard the total vital force in each individual, from the cradle to the grave, as a fixed quantity, and the use and distribution of this sum total as a force which is capable of either an economical or of an extravagant expenditure. In considering the human system as a mechanism, however, we must not forget that it is a sub-system,—that it is a portion of a more colossal system,—of the solar system. Let us, therefore, turn our eyes towards, and contemplate the celestial mechanics, to see whether there be not some correlation between the laws which regulate the expenditure of power in the Cosmos, and in the Microcosmos? The recognition of such a correlation is inevitable, after the most cursory glance, and forcibly impresses us with the simplicity, the unity of nature.

Now, what is that great principle which strikes us in a general survey of astronomical science, from the movements of the planets to the fluctuation of the tides? Is it not this: that the total power of the solar system is a fixed quantity, and that all cosmical phenomena fluctuates within definite limits, and that whatever fluctuations take place in that system in excess of a certain mid, mean, or average range, must be *compensated* at some time or other by irregularities as much in defect? That is to say, if any unusual manifestation of power be made in some special portion of the system, that can only take place by a deprivation of force somewhere else in that system. It is by this method of *compensation*, this great restorative of hygienic principle, if I may so express it, of the solar system that the stability of the mean amongst all the aberrations and fluctuations of that system is preserved, and that astronomers are enabled to calculate events that have happened, and events that are to come. For, if the sum total of the power of the solar system were not conserved,—if there were any appreciable and marked abatement in this quantity,—there would be no precise recurrences, no precise periodic times, and the prediction of solar events, with anything like accuracy, would be impossible. No excessive manifestation of force, therefore, can take place in any special direction in the solar system without that being accompanied or succeeded by an equal degree of abatement or deprivation of force in some other and opposite direction. Any planetary aberration in *excess* of its *mean* orbit must be compensated at some time or other by one as much in *defect*.

In the human system, as in the solar, excessive action in one direction is followed by exhaustion or defect in another; excessive elevation of spirits by depression; excessive attention on the part of one sense by inattention or obliviousness in others; an excessive absorption upon one object by indifference or neglect of others. And do we not, on the certainty of the principle of re-action or of compensation, predict that when we see a man running to one extreme at one time, we shall see him coursing to the very opposite at another? In fact, you shall find that nature in her organic systems cannot exceed everywhere at once; but only somewhere and some when, at the expense of some other where and of some other when. Through all her vicissitudes she must be reinstated and her equilibrium in the aggregate restored by that principle of compensation we have indicated. The well-being, both of the solar and of the human systems, consists, not in a series of irregular and extreme changes, but in the preservation of an even tenor of moderate variation. The preservation of this compass would appear to be the goal of "progress" of the Cosmos.

Having shown that the expenditure of power both in the solar and the human systems obeys similar laws, let us proceed to roughly enunciate those laws.

Of the Solar System.

1. The total force in the solar system is a constant quantity.

2. There cannot be an excessive demonstration of force in every part of the system at once. The total force must either be proportionately or disproportionately distributed. An excessive demonstration of force in any special direction in that system disturbs its even tenor and perfect well-being.

3. The *mean* activity of every faculty of the system would, according to the laws of probability, be the best. Experience confirms this view, and shows that the normal *mean* of any fluctuating faculty of the solar system cannot either be exceeded or fallen short of but by the disturbance of the *mean* state of some one or more faculties of that system.

Of the Human System.

1. The total life force of a human being is a fixed quantity. This force may be utilised either by fast, moderate, or slow degrees. By moderate degrees is, by the law of probability and the testimony of experience, the best.

2. Any daily consumption of the total vital force beyond this moderate degree, beyond nature's just dole, would be at the expense of the future; any slower expenditure would tend to conserve energy.

3. Every thought and every act is an equivalent of a certain amount of force expended.

4. Any excessive expenditure of vitality by the body leaves less available for intellectual purposes. Any excessive expenditure of energy by the brain leaves less available for the purposes of the physique. Any attempt at a simultaneous and excessive use of both would be destructive.

5. One portion of the system may be stimulated to excess by suppressing the vitality of another. The intellect by the abatement of the physique, the physique by the abatement of the intellect. That is to say, power may be abstracted from one portion of the system to aggrandise another. A man may transfer his vital power, if not wholly, in greater part either to the intellectual, physical, or sensual side of his nature. But should he attempt to exceed in all at once, his fund of vitality would soon be used up. A pyre lighted in several places at once is soon consumed.

6. Health, then, mainly depends upon the fair distribution of vital energy between the intellect and physique.

7. Any excessive consumption of vital energy by a faculty, or a set of faculties, must be compensated by a period of inactivity or rest in that faculty or set of faculties.

8. The great question of educational economy, then, is the greatest amount of health to the greatest number of faculties; or, in respect to educational training, the greatest development to the greatest number of faculties. Now this greatest development to the greatest number can only be attained by the due, the right, or the moral use of each; in other words, by a fair distribution of vital energy amongst the whole. For any one faculty being stimulated to consume more than its due share would do so at the expense of the rest,—a procedure which would be injurious both to that stimulated to exceed, and to those deprived. A due distribution of vital energy amongst all the faculties is that which the law of probability and the testimony of experience indicate as the best.

The discussion of these principles of the hygiene of education may be left till another opportunity. We may note, however, that the last, which gives the best general statement of the great principle of educational economy correlated with the main principle of another economy,—political economy; for what is held or perfectness to the greatest number of faculties but a slight modification of Bentham's axiom, of "the greatest happiness to the greatest number"?

W. Cave Thomas

THE NEW ELEPHANT AND CASTLE THEATRE.

The Elephant and Castle Theatre in the New Kent-road, Newington, which was recently completely destroyed by fire, the bare walls excepted, is to be rebuilt upon a plan which is thought to be an improvement upon that of the old structure, and the works have been in progress about a fortnight. The designs for the new building were prepared by Mr. Robinson, whose very sudden death has been recorded in the *Builder*. The plans have been approved by the Lord Chamberlain and the Metropolitan Board of Works, and in the erection of the building Mr. Robinson's designs will be strictly adhered to. The building is intended to be carried to a greater height than the old theatre, and will also be of much greater strength, with numerous spacious entrances and exits to and from all parts of the house. In the erection of the new house the main walls are to a great extent being entirely reconstructed. The boundary-wall at the rear of the stage has been altogether taken down and is now being re-erected in a much more substantial manner than was that of the old building. It is being built on a foundation of concrete, and footings 4 ft. in width, and 11 ft. in depth below the ground line, the wall itself being 18 in. in thickness. In addition, the side walls are for the most part being rebuilt, even the part where they were at all scorched by the fire being restored and made good, and this involves almost the entire rebuilding of the upper part of the walls, which was condemned by the architect. These walls will be carried several feet higher than those of the old house. The tie-beams, roof-principals, main rafters, and collar-beams are 12 in. by 8 in., and 12 in. by 6 in., and the other timbers in proportion. The timbers and iron columns and girders supporting the various portions of the auditorium portion are likewise intended to be made equally strong, whilst the whole of the floors of every part of the house will be of fire-proof construction.

From both sides of the pit there are exits direct into the street, 5 ft. 6 in. in width, in addition to which there are three ground-floor entrances and exits, common to dress-circle, pit, and gallery, when necessary, these several exits being each 7 ft. wide. From the gallery there are four distinct and separate entrances each 4 ft. wide, in addition to passages under the gallery communicating with the main exits, and it is calculated that in case of fire the theatre, if full, could be entirely cleared in five minutes.

The contractors for the building are Messrs. W. Bracher & Son, of Great Ormond-street, who have undertaken to complete the works in time for the opening of the theatre early in November. Mr. J. H. Watson, who has superintended the erection of several theatres designed by the late Mr. Robinson, is clerk of the works. The interior fittings and decorations will be executed by Messrs. Pashley, Newton, & Young, of Red Lion-square.

Whitechapel Churchyard.—In the Consistory Court, on the 29th ult., before Dr. Tristram, the Chancellor of the Diocese of London, an application was made on behalf of the rector and churchwardens of St. Mary, Whitechapel, for a faculty to take a part of the churchyard to widen Whitechapel-road and Church-lane as a public improvement. A sum of 2,000*l.* would be required, and the Metropolitan Board would provide one-half. It was also proposed to lay out the remainder of the churchyard as a "ornamental garden," after the tombstones and human remains were removed to another part of the churchyard from the portion no required. The Chancellor directed the faculty to be issued within three weeks.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

The third annual meeting of this Society commenced on Tuesday, in Bristol. The general meeting of the members and associates was held at half-past twelve, in the Guildhall, the chair being taken by Sir William V. Guise, bart., the president of the Council.

Alderman Jones, on behalf of the Mayor and Corporation, welcomed the society to the good old city of Bristol.

The general secretary (Mr. Palmer Hallett) then read the third annual report, which contains the following passages:—

"The council of the Bristol and Gloucestershire Archæological Society may continue to congratulate the Society on its satisfactory condition. The Society, at its very successful inaugural meeting in this city, in 1875, reached the number of 400 honorary and subscribing members. It now counts 512, including 500 subscribers, and these numbers, if not showing an increase since the last annual meeting, fill up losses and maintain the substantial position then attained. The finances, too, are sound. . . . . Among the personal losses which the Society has this year suffered, is that of its president (the late Earl Bathurst). . . . . Among other losses the council have to deplore are those of the Rev. W. H. Bathurst, of Lydney Park; Mr. Richard Mullings, of Cirencester; and the Rev. J. G. Joyce, of Strathfieldsaye rectory, Hants. . . . . For a report of the work accomplished during the year, the council would refer to the volume of Transactions, the first part of which will shortly be published. The Cirencester meeting introduced the Society for the first time to the great evidences of the Roman occupation of the Cotswold hills, and especially manifested the striking frequency of early Norman work in these higher regions of our district. At the beginning of the year a winter meeting was held at Gloucester, where a temporary museum was formed, and some very valuable papers were read. Full reports of these meetings and papers will be contained in the volume. . . . . The council hold the annual volumes to be among the best evidences of the Society's efficiency and utility. The monographs they contain will constitute a valuable portion of the work which the Society originally put before it as one of its chief aims, viz., 'the collection of materials for an improved county history,' and towards such an aim as large an expenditure as possible will prove the best economy. The last volume was brought out chiefly under the direction of the Gloucester local committee, and to Mr. John Bellows many acknowledgments are due both for the good workmanship it displays and for other special services rendered in its preparation. This year they have asked Sir John Maclean, F.S.A., to undertake the editorship of the volume, and they believe that the work, when it appears, will justify them in the satisfaction they feel in his acceptance of this post. In the furtherance, also, of the above-mentioned object, namely, the collection of materials for an improved county history, the council have printed and circulated a scheme of archæological inquiry, consisting of questions calculated to bring out the various antiquities existing in the different parishes of the county."

The report having been adopted,

Sir Wm. Guise introduced Mr. Christopher J. Thomas, who had been elected by the Council as Earl Bathurst's successor in the presidency of the Society.

Mr. C. J. Thomas then proceeded to deliver the following address:—Archæology, which had until comparatively recent times been the study of but a few, and was mainly confined to an acquaintance with the antiquities of Egypt, of the Greeks, and of the Romans, has in later years become the interesting and fascinating pursuit of an ever-widening circle of votaries, many of them men of learning and erudition, zealously occupying themselves with this branch of science, not only in Europe, but wherever civilisation has extended. As the knowledge of the structure of the globe on which we are placed and its varied conditions in ages, or, may I not say, in æons long past, has been obtained by the researches of geologists among the strata of which its surface is composed, so the archæologist, when he has discovered the works or the remains of ancient man which by good fortune have not been destroyed or disturbed, accumulates the facts of such discoveries, and deduces from these facts a far wider and more accurate knowledge of the early condition of humanity than was previously possessed,—a knowledge stretching back far behind the age of letters or of the most primitive records. As instances of the value of recent archæological research and its results, allow me to mention the discoveries of Dr. Schliemann in Greece and of Mr. Wood at Ephesus. By means of discoveries such as these, and others of still earlier periods, we are enabled to trace back the progress of humanity, which from its beginnings is shown to be of low type and of great rudeness, and we can compare those times with those our later days, days in which sciences and arts have tended in their development to a vast improvement in the moral, the mental, and the material condition of mankind. I must confess that the views which I thus briefly allude to are those which for me constitute the chief interest of archæology; but the programme laid out for the present session of your society is mainly of a modern date. We are about to visit some of the Mediæval buildings of Bristol and its vicinity. I am far from saying that any of these should stand injuriously in the way of modern comfort and convenience, or be hindrances to the requirements of the present and the future; but as far as possible these memorials should be preserved with loving care. We are in old Bristol and in old Britain. Our inheritance from the past is a rich inheritance. If our ancestors had, as men, their faults and their failings, let us not dwell upon these needlessly, let us rather sustain the fine buildings and the worthy institutions they have left us; let us keep alive the munificent charities, not in a literal spirit, but maintaining them as we believe our forefathers would have carried them on in the lights of a later age. And not only in Bristol, but in the wider extent of the fine old shire of Gloucester, which is the sphere of our Society, may the veneration of the past lead us so to act that the future may have reason to look back with complacency on our deeds and monuments. If we act in such a spirit our Society will have a life of usefulness, and render itself worthy of present and of future success.

The members then left the Guildhall, and at two o'clock they proceeded to view Canynge's house, in Redcliff-street.

At half-past two the party repaired to the Redcliff Infant Schoolroom, where luncheon was provided by the Mayor.

The visitors then proceeded to St. Mary Redcliff Church, where the Rev. Canon Norris read a paper descriptive of the church. He first described the tower, which, with its steeple, was 300 ft. in height. It ranked with England's stateliest towers, and was a complete work of art, separate from the church. It belonged to the very purest epoch of English architecture. One of the puzzles of the church was whether there ever had been a complete spire. He thought it was clear,—for evidence existed in the Bodleian Library,—that a spire was originally attached to the tower, but was destroyed in 1445. Architecturally and historically there was undoubted evidence of the fact. He then proceeded to give a sketch of the church in historical order. He gave a slight reference to the connexion of the unhappy poet Chatterton with the parish. He said that thirty years ago the church was in a ruinous condition, but it had been restored under the superintendence of Mr. G. Godwin, the carving having been entrusted to Mr. Rice, a master mason worthy of the name. An Early English porch had been discovered, and that must have led into an Early English church; but there was no record of that church, and there was no account of it in the archives of the parish. There were traces of this thirteenth-century church, however,—not the church of the Canynges, but of the Berkeleys,—the number one church, as Mr. John Taylor rightly called it. In the Mayor's Calendar, dated 1376, there was a record that William Canynge built the body of the present church from the transept downward. He was the grandfather of the more famous Canynge. That was the church number two, and traces of that church existed in the south part of the transept and nave. Why was the second church so soon replaced by the present church, which was in the Perpendicular style? The answer was forced on them that some catastrophe happened in the interval, and they had a record of a tremendous thunderstorm that threw down the tower, and wrecked the work that was being done to the old church. He then described the present edifice, mainly built in the fifteenth century. It exhibited traces of genius in its erection, and the richness and picturesqueness of its parts and the depth of its shadows might well be envied.

The next place visited was St. John's Hospital and Hermitage, of which Mr. John Taylor gave a description; and

At Temple Church the party were given a brief description of the fine old edifice by the Rev. W. Hazledine, the vicar.

The last place visited was the crypt of St. Nicholas, of which church Mr. J. F. Nicholls gave a short description.

The annual dinner of the Association was held in the evening at the Queen's Hotel, Queen's-road, the President in the chair.

An evening meeting for the reading of papers was held in the lecture-theatre of the Museum and Library.

Papers were read by Sir J. Maclean, F.S.A., on "Elmore and the Guise Family"; and by Mr. Thomas Kerslake on "The Historical First Cause of St. Werburgh's Church." The writer remarked that, having sometimes said that the date of the original foundation of the lately-demolished church of St. Werburgh was the year 741, and that a building so called had from that early date always stood on the spot, he had been asked how he knew it. He had answered, by the same evidence as the most important events of our national history were known, viz., by necessary inference from the very scanty records of those times, confirmed by such topical monumental evidence as might have survived. This fact was in itself of considerable importance to local history, because if it should be realised it would be the very earliest solid date that had yet been attached to the place we now called Bristol. Having dealt at some length with the early history of Bristol and its neighbourhood, the writer went on to state that there were still known in England thirteen dedications of churches or chapels in the name of St. Werburgh, although, perhaps, not more than half of them were any longer above ground. Seven of the thirteen were within the counties of Stafford, Chester, Shropshire, and Derbyshire; that was, they were within the original kingdom of Mercia; but the other six were extraneous, and three of them great stragglers. These must have owed their origin to political and military extensions of the influence of that kingdom, and they were found in places where Æthelbald, one of the three Mercian aspirants for the English empire, had made good a conquest, and might therefore, he believed, have been his usual method of making his mark of possession. Indeed, there could be little doubt that most of the seven that were found at home, within Mercia, were also of Æthelbald's foundation; probably all except the present Chester Cathedral, which arose out of the translation of her relics to that place nearly 200 years later.

Dr. Beddoe, F.R.S., next read a paper on "The Craniology of the Interments at St. Werburgh's Church."

On Wednesday the Society visited Westbury, Henbury, Blaize Castle, and Almondsbury.

LEICESTERSHIRE ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

The summer meeting of this Society has just been held at Cambridge. The whole arrangements of the proceedings were undertaken and admirably carried out by the Rev. S. S. Lewis, F.S.A., honorary secretary of the Cambridge Antiquarian Society.

The members and friends of the Society assembled at the University Arms Hotel, and first visited the various collections of pictures, statuary, and engravings, Mediæval illuminations, Greek coins, and local Romano-British antiquities in the Fitzwilliam Museum, throughout which they were conducted by the director, Professor Colvin.

After luncheon they were escorted by the Rev. the Master through the chapel, hall, library, &c., of Peterhouse, where the stained glass of the sixteenth-century east window commanded general attention, as did likewise the painted windows recently added from the designs of Professor Ainmüller, of Munich. At the adjacent church of St. Mary-the-Less, the vicar, Dr. Guillemard, was in readiness, and pointed out the gallery connecting church and college, and other interesting architectural features. The next point made was Queen's, the college of Erasmus, where Mr. Clarke and the Rev. A. Wright guided through the gardens, chapel-hall, and library of their Old House. In the library, amongst other treasures, there were shown a noble folio manuscript of St. Augustine, and a very interesting transitional Prayer-Book issued in the reign of Henry VIII. Thence passing through the quadrangle of St. Catharine's College, the visitors entered the library of Corpus Christi College, and inspected amongst the manuscripts the copy of the Gospels which St. Austin of Canterbury is said to have used, the original draft of xlii. Articles (1562), Bishop Clifford's Pontifical and the original Saxon Chronicle. Hence they passed through the ninth-century tower and restored church of St. Benedict, and attended the choral evening service in the chapel of Henry VI.'s "Royal and Religious" foundation, and afterwards inspected the curious passage between the ceiling and the roof.

The next day began with a visit to Gonville and Caius College, where Mr. Bensly, Fellow and Librarian, commented upon the portraits and

other treasures of the hall, combination-room, and library. Similar attention was received from the Rev. G. Atkinson at Trinity Hall, where the original method of securing books to the library-desks was shown and explained. After a few minutes under Dr. Luard's guidance in Great St. Mary's Church, Mr. Bradshaw (University librarian), exhibited and commented upon some of the most notable manuscripts and early printed books in the University library; and after a short visit to the Senate House, the party proceeded to Trinity College, where they were received by Mr. Cobb, Senior Fellow, and the Rev. R. Sinker, librarian of the college. The Rev. Professor Mayor and Professor C. C. Babington gave a lucid history of the architecture of St. John's College in its various stages, and especially of the new chapel by Sir Gilbert Scott, and of its predecessor. Early college plate, interesting manuscripts, and service-books were also shown.

After luncheon, Mr. Pattrick (Fellow of Magdalene College) exhibited and explained the most notable books and engravings in the Pepysian Library; whence, after viewing some traces of old Camboritum and the later fortifications of Castle-hill, the visitors inspected the very Early Norman Church of St. Peter, and its modern neighbour, that of St. Giles.

SUGGESTED GALLERY OF CASTS.

In the House of Lords on Monday evening, Earl Cowper asked whether, considering the admitted importance of establishing an historical gallery of casts from the antique according to the plan proposed by Mr. Walter Perry, the First Lord of the Treasury would take immediate steps to have a report prepared which could be laid before Parliament on the scope and limits of the collection, how it could be obtained, and the probable cost. The matter was one of the desirability of which there could be no question, and he was encouraged to make the application, which was simply for a preliminary inquiry, by two memorials in favour of the proposal. The cost of the establishment of such a gallery had been estimated at about 10,000*l.*, and South Kensington had been suggested as the most suitable site. The commissioners of 1851, and the authorities of South Kensington, were favourable to this, and the authorities of museums both in this country and on the Continent had expressed themselves willing to render assistance.

Earl Granville expressed the hope that the Government would entertain the subject.

The Earl of Beaconsfield said,—It is unnecessary for the noble earl to press upon her Majesty's Government the interest and importance of the object he has in view. There never has been any hesitation on the part of the Government on that head, nor do I think that there has been any difficulty on the question of expense. I do not wish to pledge myself as to detailed expenses, but I cannot imagine any difficulty on that account. The difficulty arose in this way. There are at this moment many collections and museums urging their claims upon the Government either for legitimate pecuniary assistance or for sites, and both these are difficult subjects to deal with. The expenditure for an object such as that brought forward by the noble earl may not be excessive, but it would form a precedent. There is another cause of delay, and I can say little more than I said at the end of March last, when I undertook the management of the business. Nothing of any importance has been done. Although several gentlemen have been applied to to form a treasury committee, nothing has been brought to a head, and the position of the question is much the same as at the end of March. It is an object the importance of which we quite appreciate, and I hope during the recess it will be brought to a satisfactory issue.

Dr. Chalmers.—On the 27th ult. a bronze statue of the late Dr. Chalmers was unveiled in Edinburgh. The idea of erecting the statue originated with the late Dean Ramsay, so long ago as 1869. The execution of the work was put into the hands of Sir John Steel, R.S.A. The statue, which is 12 ft. high, represents the doctor standing in a quiescent attitude, attired in the dress of a moderator of Assembly. The left hand supports an open quarto Bible, and the right is brought round over the top of it. The statue stands on a pedestal of granite 15 ft. high, the total height of the monument being 27 ft.

THE ASSOCIATION EXCURSION.

We give below the recently-issued detailed programme of this year's excursion of the Architectural Association to Hull and its neighbourhood. This will be the ninth of those excursions which the late Mr. Edmund Sharpe taught the members of the Association to manage and make good use of. It was one of Mr. Sharpe's many incompleted projects to make South-east Yorkshire the scene of such an excursion; he had indeed sketched out a provisional list of places to be visited. The Choir of Howden supplies matter for six plates; and the Choir of Selby,—the most complete of the Yorkshire abbeys,—for eight plates, in his "Parallels" (1848).

Monday, August 12, by carriages from Hull (Royal Station Hotel), to Preston, Burton Pidsea, Humbleton, Aldborough (lunch), Skirlaugh, Swine, Hull.

Tuesday, August 13, by rail from Hull (breakfast at 8.0), to Cottingham, Beverley, Hull.

At Beverley St. Mary's Church will be visited immediately on arrival. Luncheon at the Beverley Arms Hotel, at 2.0; and at 3.0 members will meet at the Minster (North Porch).

Wednesday, August 14, by carriages from Hull (breakfast at 7.45), to Hedon, Burstwick, Keyingham, Otteringham, Patrington (lunch), Hull.

Thursday, August 15, by rail from Hull (breakfast at 8.0), to Selby, Howden, Hull.

At Selby the Abbey Church will be visited immediately on arrival. Luncheon at the Londesborough Arms Hotel, at 1.0.

Friday, August 16, by carriages, rail, and boat, from Hull (breakfast at 8.0), to Barton-upon-Humber, Thornton Curtis, Thornton Abbey (lunch), Hull.

Saturday, August 17, Hull (breakfast at 8.30). Members will meet at Holy Trinity Church at 9.30, and at St. Mary's Church at 12.10. The remainder of the day may be spent in further examining the churches and other buildings of interest in the town. Luncheon at the Royal Station Hotel at 1.30.

The excursion party will set out from Hull at 9.30 a.m. on Monday, which will call for arrival on the 10th. Mr. C. R. Pink, of 22, Great George-street, S.W., is the honorary secretary for the excursion; and Mr. James Fowler, F.R.I.B.A., of Louth, will be the conductor. The president (Mr. H. L. Florence), the officers of the Architectural Association, the Scottish and Irish contingents, and a proper mixture of new men, will take part in this pleasant outing, to which, as of old, we wish all success.

A FRENCH "SCHOOL OF INDUSTRY."

The *Bradford Observer* publishes the report of a visit recently paid by a weaving overlooker from Bradford, Mr. Mitchell Stead, to the Municipal School at Rheims. The report was one of those submitted to the last meeting of the Bradford Chamber of Commerce, and contains some interesting matter. The School of Industry was the first one of its kind to begin at Rheims, and after it had been at work for some years, the promoters conceived the idea of giving technical instruction to boys, as well as youths and men, and from that idea sprang the Municipal School.

"This school is entirely under the management of the municipal body of Rheims. It is a much larger building than the other school, and more perfect in its internal arrangements. They admit boys from other schools at the age of twelve to fifteen years, and they have accommodation for 300 boys,—100 in each course of instruction. The boys' stay should be limited to three years, but as the school has only been established upwards of two years, I fancy these arrangements have not been strictly adhered to, particularly with regard to the age of the boys when admitted. The studies are carried on in a number of class-rooms and lecture-rooms, which open into one long corridor. Some of the class-rooms are set apart for the private studies of the boys, so that they can spend their time here if they chose, instead of in play.

A portion of the building is devoted to the study of chemistry, and in the teaching of this science they have one of the cleverest masters in France. He has a large lecture-room fitted up in the same manner as the other lecture-rooms; but it is also furnished with a large laboratory, so that he can give experimental lessons in chemistry, and arrangements are made, by means of a flue, to carry off all noxious gases. He gives lectures on the analysation of wool; and shows the boys how to extract the natural grease, and then to reduce the grease to a solid substance, or otherwise as desired. He also teaches how to wash wool, and the ingredients to be used in order to cleanse it best, and at the same time not injure the fibre or interfere with the lustre. This is taught so that wool may be washed to the best advantage, and in order that each boy may learn what materials to use. In order to arrive at the best result he also teach dyeing, and he commences first with the prisma colours. His lecture-room is so arranged th when he wishes he can throw it into comple darkness by means of close-fitting shutte which, when put up, exclude all the light. opening a small orifice in one of the shutters can admit a ray of light which falls upon table, and directly in front of the pupils up this table he places a glass prism, and the r of light falling upon it, throws off all the colou of the rainbow, commencing with the lig shades close to the prism, and gradually deepe ing in colour until it verges into a black shado While this is visible to the pupils the master structs them in the best means of producin those colours on cloth. Afterwards there is series of lectures on the making of colours, t chemicals to be used, and the application of t dyes to the cloth. Adjoining this lecture-roo is one solely used by the master, which contai all kinds of chemical apparatus, and a fi assortment of scales used in weighing th smallest possible substance or liquid. Ne to this is a room devoted to the use of the boy Each boy has a separate portion allotted to hi which consists of a marble stand about 6 ft. h 4 ft., a furnace, water-tap, and a space beneat into which he can put the different things he using. This arrangement is made so that eac boy can follow out his studies without any the others interfering with him. In this roo the boys must analyse wool, or other material, the manner they have been taught; they mu extract the natural grease and solidify it, an then they must wash the wool according to th principle they have been taught; then the must make their own colours from gas-tar coal-tar. They have a large collection of colour in a glass-case, each colour being kept in air tight glass-jars. The master told us all thes had been made by the boys themselves. The the boys have given them a bundle of rag which they must dye according to the colour shown them by the prism. I saw a bundle these rags dyed by a boy of fifteen, whic showed a most beautiful gradation of colou the light shades being in the middle, an gradually deepening to the edges of the bundle The arrangement of colour in this case was pre cisely the same as we often met with in th French section of the Exhibition.

In connexion with this department, the master also gives evening lectures free to all the re sidents of Rheims. They have also a depart ment devoted to instruction in weaving and th other branches of manufacturing fabrics. Here they have a large number of hand-looms, mos of them being small ones, and consequently better adapted for the boys to work. Some o them are furnished with harness and some with heald machines, and nearly all of them have sliding boxes, so that they can weave differen colours of weft into one cloth; they have also four power-looms. None of these have been run as yet, but the boys were fitting up the shafting and pulleys, in order to have them running as soon as possible. This departmen is most perfect in its arrangement, and offers every facility for the boys to learn how to dress the warps and twist them into the healds. It i also furnished with a machine for reading the cards and stamping them, the same as in the other school, all the boys having to make their own designs.

We were also shown into the workshops, and here we received the greatest proof of the usefulness of this school. The first shop was one where joinery and woodwork generally were taught. Some of the boys were engaged in making rifle-stands, and we saw one that was finished. It was made entirely of oak, of very beautiful design, having a hollow place at the bottom for each rifle-stock to rest on; and a niche at the top for the barrel, the whole being inclosed in a very handsome frame, the workmanship being very good indeed. They are taught the use of the rifle, and they were making these stands for their own use. All the boys in this room were engaged in some kind of work some were planing, some joining, some sawing and others were turning at lathes,—all of them being under the superintendence of one master. I saw him speak to one of the boys, and the humble manner in which he handed him his plane to inspect was something very refreshing to see.

We then went into a room where practical mechanics are taught. It is fitted up much the same as an ordinary mechanics' shop, having

ools of nearly every description. Some of the oys were engaged in making bench-plates, ome were planing them in a machine, and thers were filing the surfaces perfectly smooth nd true. Any one who understands mechanics ill know how difficult it is to make an article f this kind. They were making one for each ench, so that they could at any time test the orrectness of any surface they wished to file erfectly evel. At the end of this workshop ere two smiths' fires. A boy was working at ne of them, making some small articles of on; and at the other two boys were working, he smith being apparently between fifteen and ixteen years of age, and the striker about four- een. They were forging a steel screw-key, and laced before them on a bench was a most laborate full-sized drawing of the key, showing ll the angles and curves. This was a most omplete work, and the boys had made it them- elves before commencing to forge the key. Just ehind the forges was a portable engine and oiler, and a youth was keeping up the fires and ttending to the engine as well. This engine upplied power to all the workshops, and had een lent to them, as they were showing the one hey had made themselves at the Exhibition. n commencing these workshops the authorities ust bought as many tools as would make a tool, nd then the boys had to make the others them- elves as they found the want of them. They how a large number of things made at this chool in the Exhibition, the most conspicuous bject being the steam-engine before men- ioned; they also show a number of models in ood and iron. All these show great skill in onstruction and workmanship. They also how a number of freehand and mechanical rawings, which display great taste and orrectness. They also teach the science of otany, and in order to encourage the boys in this direction, they have a large piece of ground planted with trees, herbs, and flowers, and all these seem to be very well attended to by the pupils. We were kindly presented by the director with a programme of the education given at this school; and according to it, they teach many more things than I have mentioned. In conclu- sion, I must say that had it not been for the kindness of Mr. Holden, who acted both as guide and interpreter, we could not have seen these schools to the same advantage that we did. He takes a very active part both in the management and support of these schools, and seems quite familiar with their working. The director of the latter school seemed particularly anxious to show us everything of interest in the place, and courteously answered us every question through the medium of Mr. Holden. I forgot to say that in this latter school they have a staff of six professors, and a teacher in each of the work- shops."

ST. PAUL'S: ANOTHER VIEW.

Sir,—I have just returned from an inspection of Stevens's design for the decoration of the dome of St. Paul's. I cannot say that I was disappointed, for I did not expect to see more than what I found. Had I expected to see greater things I should have exclaimed, "Can this design be by the man who has recently been bracketed in genius with Michelangelo?" and I should have continued the soliloquy by saying, "If so, this design is quite sufficient to show that he has not the slightest claim to such a position," for its conception is weak in the extreme. The talent that Stevens did possess was that of a certain degree of cleverness in what, I believe, the Italians term *pasticcio* com- position. He never struck out an original thought in his life. This design for the dome is no exception. It is a congeries of Michel- angelesque bits. It is a design *appliqué*, showing no fundamental mastery in decoration, no con- nexion with the general design of the building. It is *put on*, and that is all. The same weak- ness shows itself in the Wellington Monument, in which the canopy is altogether too thin in its quantities, and in which the figures are not a part of the general design, but also *appliqué*. But not only is the design for the dome weak in general conception, but in its subdivisions. The repetition of the circles is puerile in the extreme, and would be fatal to the grandeur of the dome. Sir James Thornhill's design, as a scheme of decoration, is far superior to anything which has recently been put forward. It is simple, and architecturally unites itself with the edifice. Thornhill's arrangement only requires that better pictures should be substituted for those within the arches. These pictures might be executed by Mr. Leighton, and the entire decoration executed in mosaic. Here is a design ready to our hand, and time-honoured,—a design with which no constructive fault can be found. To preserve its main features offers a wise and safe course between "the ills we have and those we wot not of." Let any one conversant with the greatest decorative works stand under the dome and imagine designs by Leighton, *in colour*, substituted for the monochrome figure subjects of Thornhill, and gold grounds, within the arches of the composition, and he will be able to realise the splendour of the effect.

Sir Christopher Wren's own notion of deco- rating the dome of St. Paul's with mosaics must have been very limited, indeed. It was confined to some arabesques on the ribs which divided the *panelling* of the dome. This panelling will, in all probability, be found filled up, when Thornhill's work is erased. At least, this is the conclusion to which one must come after closely inspecting Emmet's engraving. In this engrav- ing, executed during Wren's lifetime, figure- decorations are exhibited in the spandrels under the whispering gallery; but the figures are not designed, some sideways and some fore-front, a decorative incongruity reserved for more modern illustration in the two mosaics already fixed.

We do not want more light or more aërial tints; more light would destroy the dim religious light and mystery of the dome, and aërial tints would destroy its ponderosity and render it too light in appearance for the structure. A deco- ration should, in some degree, mask the struc- ture, and lead the imagination away from the bald reality. The height and degree of light will mellow true colouring to its proper aërial gradation.

The decoration of St. Paul's has, nevertheless been materially advanced by the summoning of Messrs. Leighton and Poynter to the work.

Meter.

STEVENS'S DESIGN FOR THE DECORATION OF ST. PAUL'S.

Sir,—Mr. Oldfield, in replying to Mr. Clay- ton's letter in the *Times* of the 23rd inst., in reference to the alterations proposed to be effected in executing the design by the late Alfred Stevens for the decorations of St. Paul's, makes very startling demands for property- rights in works of art.

Mr. Clayton claimed in his letter that Stevens's design, if used at all, should be adopted in its integrity, and not under some altered shape and motive by which the work would be no longer his.

Mr. Oldfield contends that the design in ques- tion was bought unconditionally, and that there- fore the right of purchase confers upon the Dean and Chapter rights to alter or even burn as they please. This claim of Mr. Oldfield's is only extraor- dinary because he ventures to make it. That it would hold good in law there is no doubt, but Mr. Oldfield cannot be unaware that he advocates a right which is honoured in the breach and scorned in the observance.

By such right a Greek statue, say the Venus de Milo, could be pulverised, the Transfigura- tion scraped to the canvas, and Tintern Abbey blown into the air. The deep sorrow in Europe, —one may say the world,—over the loss of the Peter Martyr in Venice gives us a measure of the execration which would have followed upon the exercise of such rights as Mr. Oldfield claims, had the loss of this picture followed therefrom. As regards the right to alter an art- work, most artists would elect for the alterna- tive right to destroy as the kinder of the two; and, did Mr. Oldfield's views prevail on the subject, artists would anticipate the course he would defend by commissioning their executors to anticipate the right to alter, by taking into their own hands the right to destroy.

Justitia.

The New Gloucester Gate Bridge.—The Duke of Cambridge, as ranger of the Regent's Park, has undertaken to perform the ceremony of opening the New Gloucester Gate Bridge and approaches, which has been carried out by the Vestry of St. Pancras, from designs by Mr. W. Booth Scott, C.E., their chief surveyor. It is understood that his Royal Highness has fixed this Saturday, the 3rd of August, for the ceremony.

ENLARGEMENT OF THE MIDDLESEX SESSIONS HOUSE.

For nearly twelve months past the Middlesex Sessions House, Clerkenwell, has been in the hands of the builders, during which time the building has been very considerably enlarged, by the erection of an additional block on the south side, facing the new thoroughfare called Clerkenwell-road, which has recently been opened as a portion of the new street now in course of construction between Oxford-street and Shoreditch. Whilst the enlargement has been in progress, the existing building has like- wise been undergoing extensive internal altera- tions, the sessions being held at the West- minster Sessions-house until the works are completed, which it is expected will be effected about the commencement of October. The new buildings are 25 ft. in depth, with a frontage to Clerkenwell-road 70 ft. in length, and are upwards of 50 ft. in height. They are built of Portland stone, and in general design are uniform with the old building, the ex- ception being that, instead of a second story, the elevation terminates with cornice and balustrade, carried to a height of about 4 ft. above the heads of the first-floor win- dows. About one-half of the elevation,—the south-east portion—is octagonal in form, and there is also a return frontage to the east in extension of the east frontage of the existing building, which contains the principal entrance. At the south-west side there is a gateway, enclosed by walls in Portland stone, 12 ft. in height, through which gateway prisoners will be taken to and from the cells, without being exposed to the view of the general public, as has hitherto been the case. The basement portion of the new extension building contains nine cells and the record room. The ground floor contains a committee-room, 24 ft. by 20 ft., together with a number of additional rooms for the clerk of the peace for the county, and his subordinate clerks. The upper floor contains another committee-room, uniform with that below, and also a spacious luncheon-room, the private rooms of the chairmen of the courts, magistrates' retiring-rooms, lavatories, &c.

The courts in the old building are being en- tirely re-arranged internally, so as to secure increased accommodation and convenience, and the whole of the interior of the building is being thoroughly renovated and re-decorated.

The new buildings have been erected from the designs of Mr. Frederick Henry Pownall, architect to the county; and the works are being carried out under his superintendence. Messrs. Higgs & Hill are the contractors for the new buildings; and Messrs. Patman & Fother- ingham are executing all the decorations and other work in the old structure. Mr. Lawrence is the general clerk of works. The entire cost of the works, when completed, will be about 12,000*l*.

STONE BREAKING.

The Savile-street Foundry and Engineering Co., of Sheffield, make a speciality to a great extent of machinery for crushing and pulverising stones, ores, and such like. One of these machines is a novel combination of Hall's "Multiple Action" Machine and Engine, mounted upon a timber frame, on four flanged railway-wheels, and made self-propelling upon the rails, and so constructed as to become, in the hands of a railway contractor, a very useful implement. It will not only move itself at the rate of three to four miles per hour, but will draw a respectable load after it, thus conveying either broken or unbroken stone, ballast, &c., to the place where it will be finally used.

The engine and boiler being distinct from the stone-breaker, and provided with a fly-wheel and additional driving-pulley when necessary, it can be used for driving a mortar-mill, saw- bench, hoisting-gear, or, indeed, any other machinery, and will move itself to any destination.

Before describing the essential difference which characterises this machine from others, we will point out the conditions under which railway lines, turnpike roads, reservoirs, docks, piers, or large sewage outfalls, and, in fact, in all cases where large masses of concrete work are used, are constructed. It not unfrequently happens that large masses of rubble stone or solid rock are met with at various places in the cuttings as the work proceeds, which it is intended to use either as a foundation, ballast, or concrete.

This material must be removed or deposited along the sides of the intended line, where it has hitherto been broken mostly by hand, as it would scarcely pay to fix a machine unless a very large accumulation of stone can be brought together which, after being broken, is deposited along the line. This involves the haulage of all the stone used, amounting to many thousands of tons, both to and from the machine, whereas by this improved method the stone gathered out is broken by the machine and deposited in the centre of the road ready for spreading, saving a great amount of haulage over a large contract, besides which the machine can be used as a locomotive for hauling heavy loads when not otherwise employed.

The stone-breaker is mounted at one end of a timber frame, with at the other a boiler and engine, and arranged with a view to the ends to be obtained, a reversing link motion is attached, with a highly sensitive governor acting on the throttle-valve, and regulating the engine to a uniform speed of 125 revolutions per minute. The self-moving gear consists of a chain pinion running loosely on the crank shaft, with a clutch at the back, operated by a lever from the foot-plate; a steel chain and wheel on a second motion shaft works a pinion, which gears into a spur-wheel on the driving-axle. A sheet-iron awning is placed over the man who fires from between the boiler and stone-breaker.

The machine to which we refer has been invented and patented by Mr. Hall. Instead of one moving face, two are employed, and thus a perfect balance of parts is secured. One half the strain is taken off the machine because only one-half of the crushing area is at work at any one time, as it will be seen that whilst the one jaw retires the other jaw advances, and it is claimed that there is a saving of fully 25 per cent. in the power required to work the machine.

THE STUDY OF ANCIENT ART.

The following memorial has been addressed to the Earl of Beaconsfield:—

"We, the undersigned, being professionally interested in the promotion of higher education in London and its vicinity, beg to represent to your lordship our strong conviction of the importance of giving increased prominence to the study of ancient art as a branch of classical training. As we believe that a museum of casts from the antique would be of very great service for this purpose, especially if provision were made for the delivery of lectures upon the history of Greek sculpture, to be illustrated from the casts and from the collections in the British Museum, we earnestly hope that your lordship may see fit to give your assent to some such scheme as that which we understand has been submitted to you by Mr. Walter Perry and others for the formation of a museum of this nature."

It is signed by twenty-four head-masters, principals, and professors of the colleges and chief schools in London.

CYPRUS AND ITS TIMBER.

Between the two mountain ranges of the Messaria lies a broad tract or plain, extending quite across the island, from the Bay of Famagosta to that of Morphu on the west, through a length of nearly sixty miles, with a breadth varying from ten to twenty miles. The greater part of this plain is open and uncultivated, and presents nothing but barren downs. In antiquity Cyprus was celebrated for its forests, which not only clothed the whole of its mountain ranges, but covered the entire central plain with a dense mass, so that it was with difficulty that the land could be cleared for cultivation. The *Timber Trades Journal* says,—At the present day the whole plain of the Messaria is utterly bare and treeless, and it is only the loftiest and central summits of Mount Olympus that still retain their covering of pine woods. The disappearance of the forests has naturally affected the rivers, which are mostly mere torrents, dry in summer. The ancient forests long supplied the Greek monarchs of Egypt with timber for their fleets. It was the value attached to these forests which, upon the death of Alexander, made Cyprus become an object of contention among his successors. Under Turkish rule, as might be expected, the state of things described above has found no remedy, nor have we any accurate account of the capabilities of the island to produce other wood than that which is indigenous. This, it is to be hoped, will soon be settled, and for the sake of the prosperity of a colony which even in temporary occupation demands the remedy of such an evil, it is to be trusted that the restoration of the forests will be at once commenced. Quick-growing trees should be first planted, and no doubt the eucalyptus will be freely used. In remarking on the wastefulness which has brought about this state of things, one is reminded of what Michelet says of his countrymen, that they were in the habit of cutting down two firs to make a single pair of wooden shoes; and of the time described by St. Pierre, in whose time the planks brought to St. Petersburg were not sawn, but hewn with the axe, and a tree furnished but a single plank. The loss of the forests had reduced the watercourses of Cyprus to mere trickling brooks, often dried up altogether, and this is in obedience to known laws. In America it is always observed that clearing the ground causes running springs to disappear. Lake Valencia, in Venezuela, shrivelled up to an enormous extent, according to Humboldt, from the same cause. Switzerland has sustained a depression of level in her lakes from the too free use of the axe; and Hummel records an instance where, when the annual cuttings reach a certain point, the springs yield less water, and some dry up altogether. Bryant, the American poet, says of the drying up of streams that the cause is the destruction of the forests; "they are drying up," he says, "and from the same cause our summers are growing drier and our winters colder." But space would not suffice to bring forward the array of authorities which might be quoted. Let us hope that the new occupiers of Cyprus will not think the matter too trivial for notice.

PAVING WORKS IN WANDSWORTH-ROAD.

The traffic in Wandsworth-road, from the Vauxhall Railway Station to a little beyond Nine Elms-lane, a distance of about a quarter of a mile in length, is at present almost entirely stopped, owing to the heavy paving works which have for some time been in progress there. The consequence is that the South-Western Railway Company's goods lorries and vans have to approach the company's goods-yard by a very circuitous route, whilst the general traffic is likewise similarly diverted. The whole of the roadway between the points named is being taken up to a considerable depth, and the material carted away, and as the works proceed the foundation of the road-way is formed of a concrete bed, 6 in. in thickness, upon which are laid blocks of granite, 9 in in depth. The works will take some weeks to complete. Messrs. Mowlem & Co. are the contractors.

OBITUARY.

Mr. W. Wyke Smith, solicitor to the Metropolitan Board of Works, died on the 22nd ult., after a few hours' illness, in his seventieth year. During the time when Mr. Woolrych, now one of the metropolitan police magistrates, was clerk to the Commissioners of Sewers and afterwards to the Metropolitan Board of Works, and in his capacity as a barrister acted as legal adviser to those bodies, it was only necessary to refer to Mr. Smith matters which were purely within the province of a solicitor. At the beginning of 1861, however, Mr. Woolrych, who had about fifteen months before resigned the office of clerk to the Metropolitan Board to become its standing counsel, received an appointment as police magistrate, and left the Board without a permanent legal adviser. It was then thought desirable to appoint Mr. Smith as the official solicitor to the Board.

Mr. Alexander Doull, C.E.—Scotch papers announce the death, in his eighty-third year, of Mr. Alexander Doull, C.E., who, while serving with the Royal Engineers, took part in the Survey of Ireland, and after terminating his career in the army, was engaged in engineering works in America, Russia, and other foreign countries.

New Mission-hall, Northampton.—The memorial-stone of a new mission-hall, on the site of the circus in Abington-square, Northampton, has been laid. The architect is Mr. H. H. Dyer. The building will cost 750*l.*, and will accommodate 1,000 persons. Mr. William Poole is the builder.

COPYHOLDS.

DUKE OF RUTLAND *v.* TUTIN.

This action was brought in the Chance Division, before Vice-Chancellor Sir Richa Malins, by the Duke of Rutland, against Messr Tutin & Co., who had purchased a piece of la containing about two acres, forming part of th manor of Ilkeston, in the county of Derby, fro a Mr. Hewitt, for an injunction to restrain th defendants from working or interfering wi any clay under such piece of land, and th plaintiff claimed to be entitled to all profi gained by the defendants in consequence of the having worked and sold such clay. The defen ants contended that they were entitled, und the custom of the manor, to work the clay an to dispose of the same; and they also contend that they had that right under a deed of e franchisement, dated in 1873.

The Vice-Chancellor said it appeared that M Hewitt, from whom Messrs. Tutin had purchased this lan was one of the copyhold tenants of the manor of Ilkesto of which the Duke of Rutland was lord of the manor. It w well known that there were many things which a lord of manor could do and which the tenant of a manor could not which were at variance with the ordinary rights of a fre holder. This was acknowledged to be so very inconvenie that in the year 1852 an Act was passed to give the tena of a manor a compulsory power to enfranchise his cop hold; but in the case of a compulsory enfranchisement th 48th section of the Act provided that no enfranchiseme under the Act should extend to or affect the estate rights of any lord or tenant in or to any mines, mineral limestone, lime, clay, stone, gravel-pits, or quarri within or under the lands enfranchised, or any rights e entry, or other easements of any lord or tenant over th lands, or any powers in respect of property in the so which might, but for such enfranchisement, have bee exercised for the purpose of enabling the lord or tena more effectually to search for such minerals, &c. In t year 1873 Mr. Hewitt desired to enfranchise his tene ment, and applied to the steward of the manor for thi purpose, and the steward agreed that he should be a liberty to enfranchise upon payment of 110*l.* What wa the position of Mr. Hewitt? If he had simply been tenant coming under the Act of 1852 for a compulsor enfranchisement, then, by the 48th section of the Act, a the minerals, including clay, would have been reserve as a matter of course. It was said that there was custom of the manor under which all the tenants of th manor had a right to dig for clay. There certainly wa some evidence which went to show that the tenants ha occasionally dug for clay; but there was no evidence t show that the acts were known to the lord of the mano or to his steward. It was possible that, in some cases, th digging for clay by the tenants was of so trifling a natur that it was not thought worth while to interfere; but then was no evidence, in his lordship's opinion, of any such custom, and he was satisfied that the Duke of Rutland ha never waived his right, which every lord of the manor has to the minerals within the land. When Mr. Hewitt applie to be allowed to enfranchise his tenement, there was deed of enfranchisement executed, by which the propert was conveyed to William Hewitt, his heirs and assigns, fo ever, to be held as freehold and discharged from all fines quit-rents, and all other incidents whatsoever of copyhol or customary tenure. If the deed had stopped there William Hewitt would have had all the rights of a free holder, and would have had power to work mines; but there was a proviso in the deed that nothing therein con tained should prejudice or affect the rights or remedies o the duke or of the lord of the manor for the time being, i respect of any land held of the said manor other than thos intended to be thereby appointed and enfranchised, no any of the rights, privileges, &c., reserved by the 48t section of the Copyhold Enfranchisement Act of 1852. The consequence was that Hewitt agreed that the lord's rights should be preserved exactly in the same manner a if there had been a compulsory enfranchisement of the land, and Hewitt had bound himself to treat the lord o the manor as the owner of the minerals, including the clay. On both these grounds, therefore, both on the evidence as to custom and on the terms of the deed, h was of opinion that there must be an injunction as prayed by the plaintiff, and an inquiry as to the profits made by the defendants, and the defendants must pay the costs o the action.

THE ALLEGED "JOBBING" IN LAND REQUIRED FOR METROPOLITAN IMPROVEMENTS.

The report of the Works Committee of the Metropolitan Board of Works, relating to the connexion of Mr. Joseph Storey (the representative of the parish of St. Luke at the Board) with certain transactions in land required by the Board for metropolitan improvements, was unanimously adopted at the meeting of the Board on the 26th ult. We printed the substance of the report in our last (p. 791). Mr. Storey entered into a long explanation of his action in regard to the purchase and sale of the properties to which the report of the committee chiefly related, and said he challenged the most thorough and complete inquiry into every matter with reference to which his conduct, so far as it was known, was not considered satisfactory. He contended that all his dealings in regard to property in St. Luke's were perfectly legitimate, and without any ulterior motive; that they were carried out in a perfectly open manner, in his own name. He was not afraid of submitting his case to any court in the country; on the contrary, he would gladly welcome the most searching inquiry into his

nsactions, and was satisfied that the result uld be to vindicate his conduct most roughly and entirely. He defied the Board take legal or other measures to oust him m his position, and contended that, so long he did not vote or act in any proceedings of e Board relating to property in which he was erested, his conduct was not open to question, her legally or morally. Because he happened have property which was required for public provements by the Board, he was not going "give it" to the public. He asked whether ier members of the Board who had had pro- rty required for the public had sacrified their ivate interests for the good of the rate- yers? He contended that the prices asked the property in the claim sent in to the ard were fair, and was willing to submit the estion to arbitration.

BROMPTON ORATORY COMPETITION.

SIR,—I am not surprised that the result of is competition has elicited some corre- ondence.

It is, of course, no business of the public or e profession how the Fathers spend their oney. They are perfectly at liberty either to ke advantage of so rare an opportunity and ish princely funds to erect a building which all be emphatically *usui civium decori urbis*,— mething on the lines of the Early Renaissance, nd recalling the hopes of its vigorous dawn, ss our own Gothic revival, to be so soon and sadly dashed; or they may, if they prefer, ect a building with all the coarseness and ulgarity of St. Peter's or St. Paul's carefully opied, and all their redeeming merits carefully iminated. True artists may weep,—as they eep over the Albert Memorial, the new Foreign ffice, or the New Law Courts,—at magnificent pportunities frittered away on gilding and nsel, on vulgarity and deformity, or mere asquerading. They may weep, but they must eep in silence. The Fathers spend their own oney as they like.

But, sir, the public, and the profession espe- ally, have a right to complain, and are entitled consider themselves grievously imposed upon hen the Fathers advertise for designs, put ome thirty members of the profession to an xpense of many hundred pounds, and then ive the first premium to a design which they ave had before them for years, which was pub- shed in a journal three years ago, and which I ill venture to say they dare not for their own akes carry out, and which was clearly not suit- ble to their views, because, having had it efore them for three years, they tried to get omething more suitable by competition.

If it was adapted to their purpose, why put he profession to such needless expense? They re very hard worked, and very poorly paid, without being the victims of so hollow an invi- ation as this.

I say, sir, the competitors have a right to omplain of a very gross breach of faith,—a reach of faith we expect from town councils nd parish vestries, and committees of men rained behind the counter, and growing grey n nepotism and corruption; but such a breach f faith as this we do not expect from the Fathers of the Oratory, who, those who differ most from them in points of faith will cheerfully admit, are men of refined taste and polished gentlemen.

A COMPETITOR.

BOARD SCHOOL COMPETITION, ASHFORD.

IN reply to the advertisement in our pages, the Board received twenty-nine designs from various architects in competition. The designs were exhibited to the public at the Assembly Rooms, Ashford, on the 10th ult. The Board had several meetings to consider the designs, and at their last meeting, on the 22nd ult., they decided that the designs bearing the motto "Abécédaire" should be selected for the premium of 20*l*., and also as the designs for the new schools; and that the author of them, whose name and address appeared, on opening the sealed paper, to be Mr. J. T. Hanson, architect, of York-buildings, Adelphi, London, and of Dover, should be appointed the architect to carry out the designs. The Board also selected the designs bearing the motto "Tuition" for the premium of 10*l*. On opening the sealed paper it appeared the author's name and address were Mr. W. R. King, architect, of Ashford.

THE EPPING FOREST PRESERVATION BILL.

SIR,—The Parliamentary session of 1878 is now approaching its close, having been an important and eventful one, chiefly owing to the complications upon the Eastern question.

Among the minor events is one the possibility of the consequences of which our legislators have yet to learn. On the 4th of July, the Epping Forest Preservation Bill was passed in the House of Commons, which declared that all inclosures made upon it since the 21st of August, 1851, were illegal, and as such liable to be thrown open. As this Act becomes law and is put into force upon all sides of England will arise the same question, as to whether the inclosures that have been made from the roadsides and commons since 1851 are not also illegal; meetings will be held, and bodies of men organised for the purpose of discussing the new Act, and, after giving notice to the owners of the illegal inclosures, will proceed to pull down the fences and re-open the waste lands. When it is considered that since 1851 every county in England has had considerable strips of waste lands taken from the roadsides and added to the local landowners' properties, when the peasantry begin to follow up the Epping Forest Preservation Bill, it will be found in equity that no imprisonment can ensue upon such acts, the precedent of the House of Commons effectually upsetting the laws that have previously guided our judges, as no law can be allowed to exist in one district and not in another. I hope myself, in the interest of order and of reason, the House of Lords will see the necessity of not passing the Act in its entirety, but introduce such amendments concerning inclosures made since 1851 as will prevent the possibility of the Disenclosure Act spreading throughout the whole country; and considering that the majority of our peers and county families have vastly profited by inclosures of land since 1851, calling their attention to the consequences of this Act of the House of Commons may be a means of preventing riotous proceedings, which, if the Bill becomes law, will sooner or later take place.

J. B. WATTS.

PUBLIC-HOUSE COMPENSATION CASE.

STEPHENS *v.* METROPOLITAN BOARD OF WORKS.

THIS was heard at the Sheriffs' Court, Red Lion-square, on Saturday, before Mr. Burchell, under-sheriff, and a special jury.

The claim was in respect of the value of the Geneva Arms, Hayes-court, Soho, which was required by the Metropolitan Board of Works, in connexion with the Piccadilly-circus to Oxford-street improvement. The claimants were Messrs. G. W. & F. R. Stephens, who represented every interest. The claim comprised three principal ingredients,—the value of the property as a freehold, the value of the leasehold interest which Messrs. Stephens had the power to grant, and the value of the fixtures. Finally, there was the usual claim of 10 per cent. upon compulsory purchase. On the part of the claimants, Mr. E. Bailey Haynes, surveyor, said he had surveyed the house, and considered it was worth 80*l*. a year, and that it would fetch that amount of rent upon a thirty-one years' lease. The reversionary interest was worth an extra 500*l*. He estimated the present value of the fixtures at 204*l*. 15s. 8d., making the total value of the property 3,645*l*. He knew that about 800*l*. had been recently laid out upon the premises. He seriously said that the reversion at the end of a thirty-one years' lease was worth 500*l*. He considered the premises in excellent repair. Within a radius of say 100 yards there are ten, or perhaps a dozen, other public-houses. His valuation of the fixtures was a sound one. His valuations had never yet been upset. He adhered to his opinion that at 80*l*. a year rent the house would fetch a premium of 1,000*l*., and he had been actually offered more than 1,000*l*. if he could obtain the premises at a rental of 80*l*.

Mr. Philbrick addressed the jury for the Metropolitan Board of Works, contending that the claim was excessive.

Mr. William Lovejoy, called as a witness, said he did not think the claimants were entitled to any premium, because he did not believe the house, being surrounded by other licensed houses, was worth a premium. If the licence could be transferred to other premises it would be of some value; but he felt sure the magistrates would not allow the removal of a licence in a district where there were so many public-houses. He considered the rental value, including the licence, to be 60*l*. a-year, to capitalise which at twenty years' purchase would be 1,200*l*. He would add 10 per cent. upon the compulsory purchase, and 100*l*. for fixtures. He had seen the inventory of fixtures prepared by Mr. Haynes, and considered some of them, such as the plate-glass windows, belonged to the freehold, and were not tenants' fixtures at all. He put on 10*l*. a year to the rent as the value of the licence. If the licence could be removed, it would be worth about 500*l*., but he felt certain that power to remove could not be obtained.

The verdict was 1,900*l*. in full of all claims.

VERITY'S AIR-PROPELLER.

IT is quite beyond doubt that there are many times when if a constant supply of fresh air be necessary it must be pumped in,—it will not come in of itself,—and there are places where it can never be obtained without some artificial action. Messrs. Verity Brothers have patented an arrangement to effect this, which is simple and effective. It somewhat resembles in appearance an ordinary gas-meter, and occupies but small space. A cistern placed in the highest available position in the building in which the apparatus is to be used, and a ¾-in. lead pipe conveying the water to the machine, are all that is required. The internal mechanism consists of a drum, with a set of fans worked by a fly-wheel placed in the centre and on the same axis as the fans, which revolves on jewelled centres. Two mere pin-hole jets of water directed on to the fly-wheel put these fans in rapid motion. A current of air may be passed through the machine at the rate of 1,000 ft. per minute and upwards, according to the size of the apparatus; reducing the supply of water by turning the tap, the revolutions may be brought down to three or four per minute, so that the current of air may be regulated to the nicest degree. A couple of machines, placed in proper position and nicely regulated, secure the result of an incoming current of the exact force required and no more, and an extracting power equal to, or greater, than the inlet supply. The water, after working the machine, passes down through minute orifices across the inlet tube, and thus washes the incoming air. The invention is applicable to many wants, and ought at once to come largely into use.

MASTERS AND MEN.

Bristol.—A strike of plasterers commenced in Bristol on Monday. Some time ago they demanded a rise of ½d. per hour. Some of the employers have conceded the advance, but most of the masters refuse to give it, and declare that if the men strike they shall not come in again except at a reduction of ½d. an hour. Thirty men have left the city for other work. The remainder will receive strike pay from the National Association of Plasterers.

Edinburgh.—At an aggregate meeting of the Edinburgh joiners, to consider the bye-laws as recently received from the masters, the following motion was adopted:—"That having heard the code of bye-laws forwarded by the employers for adoption, the meeting regret their inability to accept the same, as they fail to embody any of the recommendations mutually agreed upon at the conference of employers and workmen, and they resolve to adhere to the code adopted at a former meeting of the trade, embodying the recommendations referred to."

Barrhead.—The joiners of Barrhead and neighbourhood received notice from their employers of a reduction of ½d. an hour, to come into effect on the 1st August, making the wages 7½d. an hour.

Proposed Vestry-hall for Bermondsey.—At the last meeting of the Bermondsey Vestry, a report was read from the Vestry-hall Committee stating that it was desirable, in the interest of the proper conduct of parish business, that a Vestry-hall with offices should be provided. The committee pointed out that at present the accommodation for the deposit of parish documents rendered it necessary that they should be placed in different establishments. Mr. Prater moved the reception and adoption of the report, which was carried. It was afterwards resolved that the whole question should be considered at a meeting of the Vestry specially convened for the purpose.

THE BOWER TRAP.

We have seen at Messrs. Smeaton & Sons' the Bower Patent Sewer-Gas Trap in action, and feel justified in recommending it for sinks, lavatories, baths, the overflow of water-closets, and such like. A section of it may have been seen in our advertising columns. A small india-rubber ball, which is floated up to the underside of the inlet-pipe, forms the trap, and as the cup in which it floats is of glass, its satisfactory action can be seen. For some cases, however, it should be said, the cup is made of lead. One very important fact is made clear in watching the specimen set up by Messrs. Smeaton, and that is, the completeness with which the water in an ordinary syphon-trap is drawn out by the action of the water in any other pipe communicating with it. The ordinary trap, as usually put in, will lose nearly all its water-seal by siphonage every time a basin, bath, or water-closet is emptied, and this not only occurs to the trap through which the water has passed, but to all traps on the line of waste-pipe. The form of the Bower Trap is such that it cannot be siphoned enough to break the seal, sufficient water always remaining to float the valve firmly to its seat.

A PROTECTIVE COATING FOR WALLS.

According to the *Thonindustric-Zeitung*, a Herr W. Reissig has made application for an imperial patent for a new coating of walls, which is affirmed to protect them against penetration by injurious liquids and exhalations, to prevent the formation of fungus, and even to permit the walls to be washed with boiling water. This coating is a spirituous solution of stearate of soda, prepared in the proportion of 50 grammes of stearate of soda dissolved in 1,000 grammes of spirits of wine of a strength of 66 per cent. Besides this preparation, other solutions of soap in spirits of wine of more or less strength may be used; but stearate of soda is to be preferred in cases where expense is no consideration, because it forms a very hard and firm layer, which may be cleaned in the dry way. For stables, spirituous solutions of common brown soap or soft soap suffice; but the stronger the spirits the better. Spirituous solutions penetrate much deeper into the walls than those prepared with water, on account of the little decomposition to which the soap is subjected. The solution may be coloured by direct mixing with dragon's blood, aniline colours, or by direct mixing with a colour producing no decomposition, such as yellow ochre, ultramarine, &c. These coloured coatings are said to look very brilliant. For hospitals, disinfecting substances may be added in solution, which is also important for stables in certain circumstances. The coating will not adhere on oil materials, but it takes well on wood, lime, gypsum, and cement. Size colours are suitably fixed beforehand, a solution, 5 per cent. strong, of chromate of alum especially recommending itself, besides other well-known means. Walls of limestone or other rocks containing lime are hardened beforehand with baryta-water or soluble glass.

The germ of this *invention* our readers have often heard of before.

SHARP PRACTICE.

The Southport Corporation have just advertised in your and several other London professional newspapers for an "Assistant in the Borough Surveyor's Office, who must be an experienced surveyor, leveller, and draughtsman, at a salary of 120*l.* per annum"; but in consequence of the very large number of applicants for this situation they have actually re-advertised the place at 40*s.* per week.

This is quite a novel and new fashion of taking advantage of these hard times; and, I must add, not creditable to the town, exhibited in all the principal railway stations in the kingdom as the Montpellier of the North.

One Who Unfortunately Applied.

The Artisans' Dwellings Act.—Dr. Dixon, Medical Officer of Health for Bermondsey, has made an official representation, under the Artisans' Dwellings Act, 1875, "that Foxlove-street, Matilda-place, and adjoining houses, courts, and alleys in the neighbourhood, constitute an unhealthy area under the provisions of that Act." The report was received.

CHURCH-BUILDING NEWS.

Bury St. Edmund's.—The decoration of the chancel of St. James's Church, Bury St. Edmund's, has been completed. The work has been executed by Mr. E. Frampton, of London. The space beneath the string-course of the north and south walls is divided into two sections, the lower part forming a dado, which is painted a deep maroon, relieved with diaper work. Above this is a band adorned with holly leaves and berries, the upper edge of which represents a billet moulding. This forms the base of a series of thirty-five canopied panels, each about 5½ ft. high, and these are occupied from the chancel arch to the steps of the sacrarium with representations of the grape, the passion-flower, and the lily; from the sacrarium steps to the east wall the panels are filled with figures of angels, bearing various instruments of music, and representing the heavenly choir.

Alphington. — The parish church of St. Michael's and All Angels, Alphington, was re-opened by the Bishop of Exeter on the 25th ult., after restoration under the direction of Messrs. Hayward & Son, architects, by Messrs. Stephens & Son, builders, Exeter. The walls of the south aisle have been almost entirely rebuilt, the chancel has been lengthened, the piers and arches have been restored to the perpendicular. The roofs of the church are entirely new, the old floor has been taken up, the vaults filled in, and a bed of concrete laid under the new floor to prevent the rise of exhalations from the human remains beneath. The old gallery, which extended across the whole width of the church has been removed, and the tower-arch opened to view. The only other alteration made in the church is the erection of a vestry on the south side, with a loft over it for a large organ. The work of restoration has been carried out in a conservative spirit, every bit of original work that could be preserved having been used again, sometimes at a greater cost than that of substituting new work. The steps in the sacrarium are of Devonshire marble, the floor laid with Godwin's tiles, and the east window is filled with stained glass by Ballantine & Son, of Edinburgh, the gift of Mrs. Hart. The centre light represents the Crucifixion, with an almost opaque background. A single light window, by Mr. Drake, of Exeter, containing the figure of St. Michael, the patron saint, and presented by the architect, is on the north side of the chancel. The two western windows are embellished with stained glass, executed by Ward & Hughes, the gift of the Rev. H. T. Ellacombe. Another stained-glass window, by Beer & Driffield, is in the north aisle. The old-fashioned pews, nearly 5 ft. in height, have been replaced with open seats of pitch-pine, those in the chancel being of black walnut and oak. The upper part of the porch had to be rebuilt, and as there were evident traces of the existence of a former niche, it was determined to build a new one, which has been filled by a statue of the patron saint, executed by Mr. Harry Hems, at the expense and from the design of Lord Devon. The whole of the wood and stone carving, except the statue of St. Michael, has been done by Mr. Sendell, of Exeter. The total cost of the restoration, including the windows and other liberal gifts, will not be less than 4,500*l.*

Melverley.—The ancient parish church of Melverley, on the banks of the Severn, has been re-opened, after restoration. The church is, in plan, similar to a college chapel, and consists of ante-chapel, nave, and chancel, the triple division being formed by two constructional high screens. The porch is on the south side. The quaint open benches, which were almost concealed by modern pews, have been provided with sloping backs, and the simple font, of probably earlier date than the church, is preserved. The nave and chancel have new quarry floors, and the sanctuary is laid with Maw's figured tiles. The chancel is provided with new oak stalls, altar, and altar-rail; and the east wall, under the window, is enriched with a dossal. The sanctuary is raised three steps. The old oak pulpit, which stood on a rubble wall, has been repaired, and fixed on a base formed of carved work found in the church; it now stands on the south side. The gallery over the ante-chapel has been retained, and fitted up with chairs. The restoration has been carried out by Mr. R. Price, of Coleham, under the direction of Mr. Haycock, architect, Shrewsbury, at a cost of a little over 700*l.* The glazing, oiling, and painting were entrusted to Mr. W. Done.

Miscellanea.

Preservation of National Monumen in Ireland.—The Commissioners of Pub Works in Ireland, in their annual report, sta that the Church Temporalities Commissione in 1874 vested in that Board fourteen churche ecclesiastical buildings, and other structures, f future preservation and maintenance, and order to meet the cost of placing these ruins, far as possible, in a state of security again further dilapidation, and to supply a fund f their subsequent preservation, these Commi sioners transferred to the credit of the Boa 22,554*l.* During the past year, after caref inquiry, they made choice of 105 addition structures, which, out of a multitude of case appeared to be the most deserving of beir preserved as monuments of national or histor value and importance, and vested them in t Board for future maintenance. They also tran ferred to the credit of the Board 27,446 making in all 50,000*l.* to be applied in repai ing and maintaining the 119 churches, eccl siastical buildings, and other ancient structur selected for preservation. Up to the press the works have been completed at the Rock Cashel; seven churches: Glendalough, Ardmor Ardfert, Monasterboice, Devenish Island, S Columb's House (Kells), and Donaghmor Works are now in progress at Movilla, Ardtok St. John's Point, Loughin's Island, Magher Kilmacduagh, and Howth Abbey.

New Nisi Prius Court at Chester.—O the 25th ult. a new law-court was opened Chester by Lord Justice Coleridge. For man years the inconvenience and bad ventilation the old court have been very much felt by who had business there. As no cure for the defects was to be had, the magistrates of t county decided to provide better quarter They called in the services of Mr. T. M. Loc wood, architect, Chester, who prepared t plans for the new court. The arrangement the court itself is on a plan very much like th of the courts in Strangeways, Manchester. Th order adopted is the Doric; pilasters of th order divide the walls into compartment Along the top of the pillars runs an entablatur above which are a series of semicircular arch forming recessed panels in the wall, and fro above these the roof is carried. The de framing of the roof leaves, by sub-divisio eight octagon glass panels, tinted and filled wit the arms of Hugh Lupus, first Earl of Chester in the same style as the glass ceiling of t House of Commons. All the fittings of t court are of carved and polished oak. Th builder is Mr. Samuel Warburton, of Manchester The cost has been about 12,000*l.* The buildin is situated in the Castle-yard.

Memorial Fountain at Hurstpierpoin The little market-town of Hurstpierpoin Sussex, has just been favoured with a gift in th shape of a fountain, designed to perpetuate th memory of Mr. H. Holman, who died last yea The fountain, which has been set up by the son of the deceased on the church green, has a height of 17 ft. 3 in., and it is built of Cornis granite, finely picked. The width at the bas is 7 ft. 8 in. by 2 ft., there being a cattle trough 6 ft. 8 in. by 3 ft. 4 in., and 2 ft. 6 i high, which alone weighs 2 tons, the weight the whole fountain being 12 tons. The whole the granite was brought by ship into South wick, and thence conveyed to Hurst. The foun tain is surmounted by a cross of granite. O the south-west side is the fountain, the wate issuing from a lion's mouth, and the waste goe into a dog-trough at the base. It is supplie by the Metropolitan Drinking Fountain an Cattle Trough Association, and the whole of th work has been carried out under the superin tendence of their foreman, Mr. R. D. Gibbs.

Newport Pagnell.—In consequence of the increasing consumption of gas in the town, the Newport Pagnell Gas Company decided t erect, at their works in Caldecote-street, a large holder capable of containing about 18,000 ft. o gas, in addition to the two at present in use The tank for this holder, which was commenced in April last, having been completed, all the men engaged in the work were lately invited by the manager of the company's works, Mr. James Whitmee, to a capital spread. The tables were laid in the tank, which, although a somewhat novel supper-room, was most suitable and con venient, the weather fortunately being fine.

Artisan-Reporters on the Paris Exhibition.—The joint committee of her Majesty's Commissioners and of the Society of Arts for promoting visits of selected artisan-reporters to the Paris Exhibition have now completed the arrangements under which artisans will be sent to Paris. Each artisan is expected to devote from eight to fourteen days to the visit. He will be paid 8*l.*, out of which he must pay all charges connected with his trip. Free admission to the Exhibition will be granted. Arrangements have been made with the South-Eastern and London, Chatham, and Dover Railway Companies for the purchase of a return ticket to Paris and back, available for fourteen days, at the price of 20*s.* Lodgings have been provided at a reduced scale, and arrangements have been made for obtaining meals also at reduced charges. Besides the artisans selected by the joint committee, artisans may be sent at the expense of their employers or local committee. Such artisans will be supplied with the necessary cards and certificates to enable them to take advantage of arrangements and facilities afforded by the joint committee. Employers or local committees subscribing to the fund may select or send out artisans in number to the extent of one for each 10*l.* subscribed, or subscribers to the fund may nominate for consideration and selection by the joint committee such artisans as they may think suitable to represent the special trade or trades of the district or party subscribing. Subscriptions are sought from local committees, individual firms, or employers to enable the joint committee to carry out the undertaking on a complete and successful scale.

Birmingham Sewage.—At the last meeting of the Solihull Sanitary Authority, the inspector of nuisances drew attention to "an abominable nuisance" caused by the Corporation of Birmingham at the wharf near Henwood Mill, in the parish of Solihull, by the deposit of night-soil and other offensive matter. Many thousands of tons of night-soil were, he said, deposited on the land. The pan manure, or clear excreta, was brought up in boats, and the liquid matter was allowed to run into the mill-dam or river Blythe. The smell was most offensive, and the river, which formed part of the Birmingham water supply, was to a great extent polluted. A fatal case of typhoid fever had occurred at the mill. The clerk read a report which he had received from Dr. Wilson, the Medical Officer of Health, on the same subject. After a careful investigation he was convinced that there had been a serious pollution of the neighbouring stream by leakage from the manure heaps, and that such pollution would in all likelihood recur after heavy falls of rain, and that the abominable stench from the excremental matter contained in the heaps, and which was in a semi-fluid condition when deposited, constituted a nuisance highly dangerous to health. There was every reason to believe that the nuisance had been the cause of grave and repeated illnesses, one of which had terminated fatally. Mr. Lewall, resident engineer on the Solihull Sewerage Works, also made a report on the subject, in which he stated the quantity to amount to 5,000 tons, and that the smell was most offensive, and could be perceived at a distance of a quarter of a mile. The Board instructed the clerk to write to the Corporation of Birmingham, calling upon them to abate the nuisance forthwith.

The Liverpool School Board have accepted the tender of Messrs. Brown & Backhouse for the erection of schools for 1,060 children in Clintsad. The schools are from the designs of the Architect to the Board, Mr. T. Mellard Reade. They consist of four departments; the infants and mixed juniors being on the ground floor, and the senior boys and senior girls on the first floor. The principal façade is to the north, the plan being of a ⊥ form. A plunge-bath is provided in the basement. The playgrounds are spacious, being the largest of any of the Liverpool Board schools. Ten feet and a half superficial per child is allowed for floor space. The contract amounts to 9,090*l.*, or 8*l.* 11*s.* 6*d.* per head.

Hints as to Colour in Schoolrooms.—Dr. Gillard, of the Chicago High School, declares that schoolroom walls, for the sake of the pupils, should be tinted with a pinkish, greenish, or brownish tinge, and that the "blackboards" should be green, brownish, or drab in colour. He adds that it is a mistake to think that the board must be black to make the chalk-mark distinct.

The Proposed Bradford Art-Gallery and Museum.—On the 24th ult. a meeting of the Free Library and Art-Gallery Sub-Committee was held in the Mayor's Parlour, at the Bradford Town-hall, for the purpose of meeting Sir Herbert B. Sandford, assistant director of the Science and Art Department, South Kensington, who visited the town for the purpose of making inquiries with reference to the proposed Art-Gallery and Museum. After explanations had been given as to what was proposed, the meeting adjourned to the large room over the Free Library in Darley-street, where it is intended to place the Art Gallery. Sir Herbert Sandford closely examined the room and its approaches, and will report upon it to the South Kensington Museum authorities. In order to enable him the better to do so, Mr. Virgo, the librarian, furnished him with the architect's plans.

Bucks Archæological Society. — The members of this society had their annual excursion on the 22nd ult. Leaving Aylesbury shortly after nine o'clock, they proceeded to Bourne End, receiving additions to their number at the different stations on the way. On arrival carriages were there waiting to take the party to Hedsor, Cliveden, Burnham Abbey Church and Beeches: Dropmore Church, through Dropmore Park to Woburn, where the party partook of the hospitality of Mr. A. Gilbey. After proceeding to Bourne End, a lengthened halt was made at the residence of Lord Boston, where the chief historical objects and architectural features of the mansion were inspected, Burnham, Hedsor, and the beauties of Cliveden also receiving particular attention; and at Woburn a paper was read on the antiquity of the church, the first records dating from the year 1300.

Ayr.—A new wet dock has been opened at Ayr. The contract price of the dock, the construction of which was commenced about four years ago, was 132,000*l.* The extent of water is in all about seven acres and a quarter, the range of tide, 10 ft.; depth of water, 22 ft.; length of dock, 650 ft.; average breadth, 450 ft. One of the principal features of the work has been the reclamation of land from the sea. Thirty acres were reclaimed, and a site thus provided for the dock, quays, sheds, &c.

Thames Valley Sewerage.—Mr. Buchanan' C.E., has been appointed to provide the members of the Lower Thames Valley Main Sewerage Board with a complete analysis of the various schemes sent it for dealing with the sewerage of the united district, but he is to refrain from giving any opinion as to the merits or demerits of the respective plans. His remuneration for the work is not to exceed 100 guineas.

Business Premises, Banbury.—The new building in the High-street, Banbury, on the site of the old "Star," is approaching completion. It is faced with Pether's patent bricks. The whole of the work has been carried out by Mr. A. Kimberley. A new house and shop have been erected for Mr. Merry in Calthorpe-street. Mr. A. Kimberley is also the builder engaged in this work. Mr. W. E. Mills designed both buildings.

The late Joiners' Strike in Manchester.—At the Manchester Assizes last week, before Lord Chief Justice Cockburn, the case of Last *v.* Goodwin and others was settled. The plaintiff sued the defendants, as trustees of the Joiners' Union, for damages, on the ground that he had been wrongfully dismissed from his post as secretary of the union during the strike. The jury, by direction, returned a verdict for the the plaintiff, with 100*l.* damages.

The Institute of Painters in Water Colours.—A great move will shortly be made here. It is proposed to erect a new building for the purposes of the Society, with greatly increased means of accommodation, and a plot of land in Piccadilly, opposite the end of Sackville-street, is already secured. The project will probably be carried out by means of a small company.

The Designs submitted by Messrs. O. Edwards and W. Owen, of Manchester and Rhyl, have been selected in limited competition for a new Baptist chapel and schools, to be erected at Bowden, Cheshire. The chapel is to seat 500 persons, and to cost about 2,000*l.*, and will be built in the Italian style of architecture.

TENDERS

For the formation of sewer, and carriage and footways in connexion therewith, in the line of the Bethnal Green Improvement, new street between High-street, Shoreditch, and Gibraltar-gardens, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

Ward & King	£25,000	0	0
Cook & Co.	21,763	6	0
Stevens & Co.	21,300	0	0
Webster	19,970	0	0
Crockett	19,900	0	0
Mewlem & Co.	19,500	0	0
Nowell & Robson (accepted)	19,490	0	0
Cardos	18,839	0	6

For providing additional pumps at the Crossness and the Effra and Falcon Brook storm outlets, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

Eastons & Anderson (accepted)	7,700	0	0

For Contract No. 1,—the erection of proposed new soap factory, at North Woolwich, for Messrs. John Knight & Sons, consisting of stabling for forty horses, foremen's cottages, fat and packing houses, chimney-shafts, roads, paving, and concrete foundations. Messrs. Tunley & Boyle, architects. Quantities supplied:—

Cooke & Co.	£22,537	13	8
Sabey & Son	20,584	0	0
Cullum	19,995	0	0
Merritt & Ashby	19,333	0	0
Baker & Son	19,331	0	0
Sawyer	18,900	0	0
Hook & Oldrey	18,350	0	0
Crockett	18,317	0	0
Aitchison & Walker	18,256	0	0
Brass	18,244	0	0
Kirk & Randall	17,693	0	0
Dickinson	17,583	0	0
Cowland Bros.	17,486	0	0
Martin	17,480	0	0
French	17,450	0	0
Sheffield & Prebble	16,873	0	0
Prout	16,516	0	0
Perry & Co.	16,409	0	0
Vernon & Ewens	16,272	0	0
Brealy (withdrawn)	16,200	0	0

For works, cleaning, &c., at Marylebone Infirmary:—

Hill	£315	0	0
Taylor & Capel	117	16	9
Britten	95	10	0
Lemon	95	0	0
Sherman (accepted)	92	0	0

For additions and repairs to parish church, Colford St. Mary, Wiltshire:—

Hopkins & Sons	£1,123	10	0
Giles	1,119	0	0
Coleman Bros.	1,077	0	0
Stephens & Bastow	1,075	0	0
Burgess	1,013	11	0
Gaisford	989	13	0
Harris	988	0	0
Balcombe (accepted)	973	13	0

For alterations to Baptist chapel, Ripley, Derbyshire Mr. R. Argile, architect. Quantities supplied:—

Fletcher	£970	0	0
Clark (accepted)	662	10	0

For house and buildings, on the Northern Sewage Farm, Ripley, Derbyshire, for the Ripley Local Board. Mr. R. Argile, architect. Quantities supplied:—

Oldersham	£630	0	0
Warren	470	0	0
Fletcher	450	0	0
Wetton	440	10	0
Clower	413	0	0
Jackson	400	0	0
Wyld (accepted)	385	2	0

For the erection of engine, meter, and boiler houses, smith's shop, chimney-shaft, &c., for the Lea-bridge District Gas Company. Mr. E. H. Thorman, engineer:—

Bangs	£1,987	0	0
F. F. & J. Wood	1,883	0	0
Reed	1,928	0	0
Falkner	1,837	0	0
Crabb (accepted)	1,750	0	0

For cleaning and painting works at Christ's Hospital, Newgate-street. Mr. H. S. Legg, architect:—

Harrisson & Wood	£973	0	0
Patman & Fotheringham	823	0	0
Pitman & Cuthbertson	720	0	0
Morby & Company	687	0	0
Hayward & Son (accepted)	670	0	0

For carcassing presbytery, adjoining the Church of St. Patrick-in-the-East, for the Rev. Angelo Lucas. Mr. F. W. Tasker, architect. Quantities by Messrs. Batterbury & Huxley:—

Bangs	£1,230	0	0
Patman & Fotheringham	1,150	0	0
Aviss	1,140	0	0
Vulbey	1,100	0	0
Nightingale	1,097	0	0
Linzell & Son	1,000	0	0

For three houses at Bishopwood-road, Highgate, for Mr. W. Piper. Messrs. Batterbury & Huxley, architects:—

	For three houses.			For one house only.		
Conder	£9,627	0	0	£3,297	0	0
Greenwood (too late)	9,500	0	0	3,337	0	0
Nightingale	9,398	0	0	3,288	0	0
Lathey Bros.	9,253	0	0	3,231	0	0
Gould & Brand	9,200	0	0	3,193	0	0
Linzell & Son	9,000	0	0	3,330	0	0
Sharman	8,800	0	0	2,990	0	0
Wise (withdrawn)	8,490	0	0	2,900	0	0

For erecting first portion of the Church of St. Patrick-in-the-East, Wapping, for Cardinal Manning. Mr. F. W. Tasker, architect. Quantities by Messrs. Batterbury & Huxley:—

Patman & Fotheringham	£4,450	0	0
Aviss	4,447	0	0
Nightingale	4,332	0	0
Linzell & Son	4,289	0	0
Bange	4,289	0	0
Vulbey	4,148	0	0

For pulling down and rebuilding Wycliffe Chapel Schools, Philpot-street, Commercial-road, E. Mr. J. Hudson, architect. Quantities supplied by Mr. Stanger:—

Read & Son	£3,620 0 0
Moyle & Son	3,512 0 0
Jacobs	3,480 0 0
Ashby & Horner	3,476 0 0
Little	3,289 0 0
Hearle & Son	3,282 0 0

For resesting St. James's Church, Hampstead-road. Mr. Rogers, architect:—

Ball & Wicks	£197 0 0
Titmas	180 17 6
Wagner	168 0 0
Blandford	163 0 0
Somerville & Hill (accepted)	154 0 0

For painting and other repairs at the Homerton Small-Pox Hospital, for the Managers of the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects. No quantities:—

F. G. & R. Vigor	£1,237 0 0!
Bishop	1,250 0 0
Wythe (accepted)	870 0 0
Cook & Co.	663 0 0!

For a house and offices at Farley-hill, Swallowfield, Berks, for Mr. William Simonds. Mr. W. Ravenscroft, architect. Quantities by Messrs. Cooper & Son:—

	Brown Portland Stone, extra.		Part deal in Joinery, less.	
Wheeler Bros.	£8,724 0	...	—	—
Higgs	8,686 0	...	£405 0	... £498 10
Rider & Son*	8,578 0	...	580 0	... 1,000 0
Woodroffe	8,558 0	...	480 0	... 576 3
Filwood	8,390 0	...	395 0	... 737 0

* Accepted, using part deal instead of oak in joinery, and with Bath stone dressings.

For alterations and additions to the Golden Lion, Copenhagen-street, Islington, for Mr. Ridler. Mr. Miller, architect:—

Adams	£1,174 0 0
Beale	980 0 0
Anley	890 0 0
Lamble (accepted)	879 0 0

For building a lodge at Hayling Park, Croydon, for Mr. James Watney. Mr. H. J. Newton, architect:—

Dove Bros.	£1,455 0 0
Goden	1,439 0 0
Lamble (accepted)	1,277 0 0

For new Baptist chapel, North-end, Finchley. Mr Morton M. Glover, architect:—

Staines & Son (accepted)	£3,587 13 0

Accepted for restoration of Great Salkeld Church, Cumberland. Messrs. Hetherington & Oliver, architects:—
Hindson & Graham (masons).
Court Bros. (joiners).
Porter & Dixon (plumbers, painters, glaziers, &c.).

For new Centenary Congregational Church, Lancaster. Messrs. Hetherington & Oliver, architects. Quantities by Mr. G. Connell:—

Briggs & Lancaster (mason)	£2,310 0 0
Wright (joiner)	1,193 6 0
Hartley (slater and plasterer)	215 13 0
Calvert & Heald (plumbers, &c.)	267 4 0
Meadowcroft (painter)	120 11 0
Trustees of the late Edmund Sharpe (smith and ironfounder)	140 0 0

For new schools for 800 children, at Edinburgh-road, Notting-hill, for the London School Board. Mr. Robson, architect:—

Shepherd	£9,450 0 0
Adamson & Son	9,279 0 0
Thomas	8,820 0 0
Higgs & Hill	8,734 0 0
Grover	8,622 0 0
Scrivener & Co.	8,568 0 0
Hobson	8,557 0 0
Wall Bros.	8,451 0 0
Tongue	8,444 0 0
Rankin	8,430 0 0
Hook & Oldrey	8,395 0 0
Stimpson & Co.	8,150 0 0

For additions to Epperstone Avenue-road, Leamington, for Dr. Otho Wyer. Mr. George Hart, architect:—

Sheasby	£269 0 0
Rolf	205 0 0
Bird (accepted)	205 0 0

For additional buildings to Belvedere Works, John-street, Pentonville, for Messrs. Symmons & Sons:—

Beaves (accepted)	£2,575 0 0

For alterations and additions to the Bedford Head, Tottenham-court-road, for Mr. Wood. Quantities supplied by Mr. H. Pollard:—

Scrivener & Co.	£4,984 0 0
Goodman	4,897 0 0
Patrick & Son	4,260 0 0
Lawrence	3,980 0 0
Clemence	3,867 0 0

For erecting two villa residences on the Woodcote Estate, Wallington, Surrey, for Messrs. Parker and the Freeholders. Mr. E. P. Loftus Brock, architect:—

Julian & Co.	£3,650 0 0
Brass	3,500 0 0
Potterton	3,390 0 0
Lose	3,320 0 0
Jarrett	3,050 0 0
Mattock, Bros.	2,993 0 0
Bish	2,800 0 0
Howe & White	2,350 0 0

For the erection of pantechnicon and two houses, in the Station-road, Camberwell, for Mr. W. Harriss. Mr. John Farrer, architect:—

Julian & Co.	£4,400 0 0
W. & E. Nottle	4,400 0 0
Taylor	4,393 0 0
Thompson	4,334 0 0
Conder	4,297 0 0
Holliday	4,265 0 0

For erection of a mixed school and mistress's house, at Horley, Essex, for the Horley and Lyston School Board. Mr. Samuel Knight, architect:—

Grimwood & Sons (accepted)	£795 0 0

For erection of three model cottages at Roshampton, Surrey, for Mr. E. A. Hambro, built of cement concrete, faced with red Broomhall tiles. Mr. Samuel Knight, architect:—

Sutton (accepted)	£1,000 0 0

For erection of new premises, 112, Fleet-street, for Messrs. Brentini. Mr. Samuel Knight, architect. Quantities by Mr. G. Fleetwood:—

Colls & Son	£3,470 0 0
Patman & Fotheringham	3,190 0 0
Nightingale	3,177 0 0
Shepherd	3,175 0 0
Downs & Co.	3,140 0 0
Roberts & Co. (accepted)	2,979 0 0

For the erection of St. Peter's Church, Upper Holloway. Mr. C. L. Luck, architect. Quantities supplied by Messrs. Northcroft, Son, & Neighbour:—

Adamson	£8,140 0 0
Harris & Co.	7,994 0 0
Boyce	7,728 0 0
Hill & Higgs	7,560 0 0
Stevenson	7,539 0 0
Lawrence	7,438 0 0
Wall Bros.	7,415 0 0
Scrivener & Co.	5,675 0 0
Clemence	5,590 0 0
Wheeler	5,415 0 0

For the erection of a villa residence at Epping, Essex, for the Misses Symondson. Mr. John Hudson, architect. Bricks provided:—

Field & Son	£1,400 0 0
Reed	934 0 0
Bentley	888 0 0

For repairs and alterations at Nos. 29 and 30, King-street, Tower-hill. Mr. John Hudson, architect:—

Outhwaite & Son	£212 0 0
Sparks	193 0 0

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J. J. W. *Antwerp* (next week. Send photograph, &c.).—Sanitary inquirer (animal charcoal is desirable).—P. (If you have not confidence in your architect get another. We, certainly, will not assist you in trying to trip him up).—W. C. T.—D. B.—E. W.—M. M.—S.—B.—J. C. R.—H. B. G.—S. G.—G. S. & Co.—M. & Son.—J. R. C.—A. & B.—T. C. N.—J. B. W.—W. W.—R. A. Jun.—C. H.—W. R.—D.—J. H.—B. M.—H. Bros.—J. E. C.—E. L. B.—G. F. D.—T. W. B.—J. F.—G. J. S.—T. M. R.—E. & O.—S. & Co.

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

The Builder.

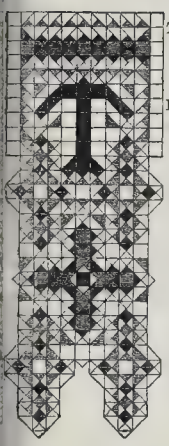
VOL. XXXVI. No. 1853. SATURDAY, AUGUST 10, 1878.

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The Development of the Modern Town-hall.

THE Town-hall, as the centre of the social and political machinery of a free city, has played a considerable part in architectural history. The Hôtels de Ville of the corporations of German burghers in the Middle Ages, and extending into the commencement of the Renaissance period, are only second in interest and grandeur to the cathedrals which preceded them for a century or two (or sometimes longer) in architectural lineage. As the power of the church decreased and that of the merchant and artificer increased, the town-hall, in which the business of the community was transacted, gradually occupied almost the central and leading position in interest and importance; and in the periods when architecture counted for something in national life, the size and importance of the Town-hall or "Hôtel de Ville" may almost be taken as the measure of the prosperity and independence of the municipal bodies, whether subject to a monarchy or not. In this country the local municipalities did not gain sufficient independence and importance to leave their mark in this way on the architecture of their day, until the period when architectural display was almost entirely in abeyance; and, in any case, it is hardly likely that municipal independence would have taken this form of illustration until quite recent times, because our local corporations, whatever privileges might be granted to them in a political sense, had not, for the most part, acquired that privilege of possessing wealth which is the necessary prelude to architectural display. The large fortunes were then still in the hands of noble houses, which had not yet dissipated them, and the chance for the architect lay more in building sumptuous mansions for them than in enabling the various cities to emulate each other in the magnificence of their town-halls. But the wealth and political importance of our leading towns has been immensely increasing during the present century, and it is not surprising that the revival of architectural interest during the last thirty or forty years should have been directed, among other objects, to the rebuilding of town-halls on a larger scale and with more costly and elaborate embellishment than had ever before been thought of in this country.

Previously to the architectural revival, the majority of the town-halls of the modern period were of the most formal type of symmetrical Classic designs: square blocks, with a rusticated base and pilasters over, with perhaps a columned portico on one front, and a door in the centre of each face. Even very small and straggling country towns prided themselves on having a town-hall of this description,—sometimes ludicrously small and slight in construction, but still rejoicing in a Classic uniformity which, at a glance, distinguishes them from the rest of the local architecture, and points out the little square prim building at once as the town-hall. In some larger towns, this exceedingly formal type assumed a more important aspect, and occasionally developed into a building possessed (in spite of the *fade* nature of the detail) of much elegance and completeness as an architectural design. The celebrated "Wood, of Bath," was a noted fabricator of this class of town-hall; and Bristol and Liverpool still attest his capability in this respect;* the latter town especially, by a building which, in spite of its simplicity and formality, is still one of the most suitable and tasteful of town-hall exteriors in its way, though very unambitious in comparison with many recent structures.

Before the Classic period, also, English county towns could show town-halls, small, certainly, but of much interest and picturesqueness of character; so much so, that it is matter for regret that so many of them have necessarily been rebuilt, or so much altered and added to as to have lost their original character. Some of those which still remain, or did remain within a recent period, we have occasionally illustrated. Among the ancient timber town-halls those of Leominster, Kington, and Brecon are noticeable; and Norwich has a specimen of a small but interesting building of more solid character, which has been added to without the destruction of its original features. But, unfortunately, the deficiency in accommodation of many of these interesting buildings has led to the necessity for supplanting them in modern times, and the same necessity has been felt in regard to some of the larger and more modern buildings of the Classic epoch, not always on account of absolute want of space only, but owing to the almost entire disregard of convenience of planning and lighting in many of these latter buildings; in which, so long as the exterior displayed the desired symmetry and orthodox repetition of parts on each façade, the internal planning might take care of itself.

It was this need of practical improvement which led in the first instance to the taste for building new town-halls which has become so much developed of late. We had the curiosity to trace the subject back through its records in our own columns, and find that almost the first allusion to the subject appears in the shape of a letter complaining of the want of accommodation in the Bristol Guildhall, which was said to be a "Guildhall without a Hall." The bad state of the courts throughout the country (which are generally connected with, or forming part of the town-hall building), was the subject of comment on our own part in connexion with this correspondence, and we then predicted the necessity for the rebuilding, which has been so largely carried out since. Almost at the same time we find reference to the redecoration of the Liverpool Town-hall, the first hint of a subject on which there is something special to be said, which we pass over for the moment. Much congratulation appears to have been indulged in the local papers of the day in regard to the decoration of the Liverpool building, the beautiful and soft effect of the ground glass in the dome, and the imitation marble pilasters, which it was really impossible to discriminate from real marble, &c.; and Birmingham Town-hall underwent about the same time a process of glorification of the same description, including blue pipes with gilt powdering for the organ. The kind of decoration described would, at all events, hardly provoke the same congratulations, even from "local papers," at present. It is interesting to find, also, that the system of taking in confiding architects in the matter of Town-hall competitions had its origin in an early stage of the movement, as might be expected from the perfection to which it has since been brought; the usual and leading features of the competition swindle appearing in a complete and concentrated form in the correspondence in regard to a small Town-hall competition of the date to which we are alluding.

Reference to the halls at Liverpool and Birmingham reminds us that the idea as to what a town-hall is, and what it shall include, has varied very much, though at present it seems to have settled pretty well into a generally accepted programme. But there are three elements in the Town Hall, which are sometimes found in combination and sometimes alone. Properly speaking, the Town Hall, or Town House (Hôtel de Ville) is the centre of municipal business, and the official home of the municipal staff. It has, however, frequently included a large public room, a "hall" in a more generally accepted sense, for great public meetings of either a political or a recreative character; and, thirdly it may and sometimes does include the borough courts of law. The majority of the older town-halls included the first two elements; the courts have often been a separate affair. But the relative prominence given to the public hall, or the business offices, has a great effect on the

* The Bristol building is really the Exchange; but it belongs to the class of structure we are speaking of.

character of the building and the manner in which it would be classified. Birmingham Town-hall is an almost exceptional specimen. The existence of one great room is the emphatic feature of the building, which, as every one remembers, is externally a sort of Classic temple, on an elevated basement, in which the business requirements may find space how they can: the hall is the *raison d'être* of the building. This can hardly, from any point of view, be called a model for a town-hall, which should always appear at least as much a place of business as of festivity; but the Birmingham building serves as an extreme illustration of the prominence of the public-hall element, and at the same time of the fact that as a general rule, in proportion to the prominence of this element will be the symmetrical, classic, and "state" character of the plan and design. Where the main purpose of a building is one large room for special and easily-defined uses, it will naturally assume an expression of unity and simplicity of plan. Where the combination of various business offices is regarded as the predominant object, there is more suggestion for a plan less uniform, less stately, and more decidedly practical in scheme, though the public hall and its architectural expression may still form the dominating or central feature, not overpowering or excluding the rest. Not infrequently, however, the building called the town-hall, or (indifferently) the public hall, is made a separate affair, entirely for purposes of celebration, and the business offices are collected in a building called by the comparatively modern names of "municipal offices." There is in this case the disadvantage that the chief magistrate, whose official connexion with the offices is a matter of course, is placed out of connexion with the public room in which the hospitalities of the municipality would naturally be exercised under his superintendence: and even if, in exceptional cases, a State suite of rooms be provided for him independently, the opportunity of connecting these with the public hall *par excellence* is lost. It was to obviate this drawback that Mr. Lynn, in his splendid plan for the Birmingham Municipal Offices, which we published (see *Builder* for 1871, p. 688), suggested the bold idea, unfortunately not adopted, of connecting the Mayor's suite in the new buildings with the great room of the town-hall, by means of a corridor carried on a bridge from one to the other. The provision of a State suite for the Mayor becomes, in large town-halls, a nearly separate element, though it should always be connected, if possible, with the public room; and in town-halls of moderate size the latter would, in most cases, form the Mayor's reception-room, with perhaps an ante-room or smaller room adjoining. Liverpool, the most extensively provided in the way of public rooms of our provincial towns, has almost a complete building for each department. The town-hall is occupied in the main by a spacious suite of reception-rooms, the scale of which says a great deal for the spirit and foresight of those who built it at an early period of the century. The municipal offices, which formerly found an inconvenient lodgment partly in the town-hall and partly in the Custom-house building, are now concentrated in a very large and costly "Municipal Buildings" structure, and the public hall of the town for great entertainments is combined with the Law Courts in Elmes's celebrated building. This latter combination is not altogether a happy one, possibly. The Law Courts have a closer connexion in nature and scope with the municipal public buildings than with the public hall for entertainments, and the latter during assizes becomes a mere *salle de pas perdus* for lawyers and clients, an object which might be as well served by a smaller hall, while the interference with the use of the hall for public entertainments is very serious. It is worth while to bear in mind, in reference to this, how much the value of even the most spacious public buildings may be interfered with and rendered nugatory by mistaken grouping and connexion. Manchester has, in a more practical spirit, concentrated her municipal offices and municipal entertaining-rooms under one roof or collection of roofs, giving the largest example of the comparatively new form of the town-hall on what may be called the multifarious principle. As the predominance of the entertainment-hall gives the cue for a Classic treatment on plan, so the adoption of the multifarious town-hall, combining everything in one building, suggests a greater variety and departure from unity and symmetry,—a principle which, in regard to architectural expression, is perhaps more suitable on a large scale than on a small one. When a small town-hall, consisting only of offices, is planned with too little regard to symmetry, it assumes too much the appearance of a mere private house, which should always be avoided. The town-hall should declare itself, if not by its size and importance, then by its central situation and a certain formality which cannot be mistaken for that of a private residence. This was the good point of many of the old smaller town-halls, in spite of their prim artificial look and inconsiderate planning; you can at least always pitch upon the town-hall at a glance from among the buildings which adjoin it.

Looking back again to our notes of progress in this branch of architecture, we observe that our first illustration of a town-hall of any importance was that proposed for Sheffield in 1847. This was a design in a grandiose Classical style, with a heavy rusticated basement, such as may be considered the precursor of the manner of building town-halls of which Leeds furnishes the most prominent and important example. In the succeeding year St. George's Hall, Liverpool, which, as incorporating the law-courts, may be considered of the nature of municipal buildings, was approaching completion. In 1850 we notice the enlargement of Southampton Town-hall, and in the next year the new town-hall of Worksop is alluded to. In the following year we illustrated a building which was the precursor of a series of buildings of the same class,—this was the town-hall, so-called, of Bethnal-green, but which was really a building of the class subsequently distinguished as vestry-halls, which, as we need not observe, have become quite a feature of London districts. It is recorded in our columns as the first building of the kind erected for the express purpose of rendering it unnecessary to hold meetings in the church, a fact which is significant also in regard to the altered views as to the fitness of using the church building for secular objects which were then gaining ground. This was a Gothic structure; but Swansea comes forward in the same year with a town-hall in the most ultra-Classic, square-cut style, a regular box, such as we have before referred to as characteristic of a former period. In the same year appears the "New Vestry-hall for Islington," showing how rapid the progress has been in this class of building, for already this "new hall" is voted to be antiquated, and we reviewed not long since a set of eighty designs submitted for another new one to supplant it. In 1853 the competition for the new town-hall for Leeds resulted in the selection of the design of Mr. Brodrick, then quite a young man, and whose design was very worthily and rightly chosen by the standard of judgment of that day. The enthusiasm with which it was spoken of at the time, and the congratulations of the Leeds folk over the glory to accrue to their town from it, are rather curious to read now that the building has at all events ceased to be a subject of excitement. Not that Leeds Town-hall has not stood the test of changing fashions in architecture as well as most large buildings of the last quarter of a century; it will always be a good building externally, at any rate; but it is rather a warning in regard to the attempt to bring a number of departments of different character and requirements into a perfectly and rigidly symmetrical plan and design. The large hall, in fact, governs the design; but the subordinate departments are too multifarious and important to be governed in this way; in consequence, there are dark corners and "passages that lead to nothing," and a want of clearness in the arrangement and subordination of the various departments. Still, the building marks an epoch in town-hall architecture, and in many points not unworthily. The smaller town-halls now began to show, however, a decidedly Gothic tendency; we illustrated Banbury as a specimen in the next year (1854); and in the same year was the competition for the then proposed Preston Town-hall, in which a first premium was duly awarded and (we hope) paid, but of which nothing more was heard for some time after. In 1855 the architect who ultimately built the new town-hall at that place distinguished himself by gaining against competitors from all countries the competition for the new Hôtel de Ville for Hamburg,—an incident which the nationality of the architect brings within the scope of our subject. After that there is nothing of note for a little while; there is mention of town-halls at Barnsley and Newcastle, and we illustrated specially the principal entrance of the Leeds Town-hall, and its ornamental detail. In 1860 the Halifax Town-hall, from the designs of Sir C. Barry, is a real step in the architectural history of the subject: it is the first instance, on a large scale at least, of the application of Classic architecture in a stately and palatial style to a town-hall, without fettering the requirements of the plan by a rigid and conventional symmetry; and the spire almost the first really successful application of this feature to Classic architecture, has been quite a landmark in modern architectural design, and been often, though hardly successfully, imitated. In the same year we note the small town-hall of Bishop Auckland as a more pure specimen than had previously appeared of the employment of Gothic of the really quiet and subdued Old English type to this class of building; and in the same year also the account of a strong protest made against the destruction of the Hereford Town-hall, and our illustration of it in order the better to enforce the protest, call for a word of remark in connexion with the next town-hall we were called upon to illustrate. This was, in 1862, the important work of Sir G. Scott at Preston,—important, not so much from its size as from the novelty and effectiveness of its treatment, and from its obvious relation in idea to the old Hereford Town-hall just mentioned, both partially standing on piers, with a vaulted open arcade, though the Hereford building only did in timber what the Preston building translated into stone. The same year we had another vestry-hall to illustrate,—that of Mile-end,—a terrible production in the style of exceedingly heavy and coarse modification of Italian, which seems to have come to be considered as almost proper in a special degree to a vestry-hall, so many and so heavy are the examples in a cognate manner.

Congleton Town-hall, in 1864, was the first specimen in another style, carried out subsequently with more elaboration, at Northampton. This was the first instalment of what afterwards became so common a development in English practice with a certain set of architects; a Gothic founded on French types, and which had the good luck to be introduced just in time to become popular as people were looking for some new variety in Gothic. In the same year Mr. Brodrick appears with a good town-hall for Hull, a Classic building treated with considerable richness and some originality, especially in the design of the cupola, which forms the central feature. Tiverton built during the year a small town-hall, which may be convenient enough internally, but externally illustrates our remark as to the necessity of some sort of state and dignity in a municipal building: it appears merely like a good-sized dwelling-house.

In 1865, we see that "Town-halls and Exchanges" became a special heading in the index of this paper, the principal examples mentioned that year being Chester, Hartlepool, and Gateshead. In the same year, the foundation-stone of the Hull New Exchange was laid, and the New Liverpool Exchange, the large and important work of Mr. T. H. Wyatt,—was in a forward state, and was illustrated as complete the year following. In that year town-halls came in a batch; Farnham, Guiseley, Ledbury (a case of restoration), Ipswich, &c., and we also illustrated some charming old buildings of the same class in Franconia, curious contrasts to the tameness and formality of some of the English examples of about the same size. In the same year (1866) we had the pleasure of illustrating one by Mr. Crossland (Rochdale), which might stand comparison with the Mediæval examples with better chance; this was a fine building in full Late English Gothic style, irregular in composition, and with a fine and effective angle tower. In this year came off also the competition for the Manchester Town-hall, and that for the Law Courts for London, so that it was an eventful year in competitions for the buildings of the class, in which the Law Courts may be included, so far as to be noticed at all events, though in detail of course its objects are different.

The year 1868 was a great one for town-hall designs, not all executed. We gave illustrations of three of the Manchester designs, those of Messrs. Waterhouse, Speakman & Charlesworth, and J. O. Scott. Of the one carried out we have spoken in detail in different stages of its progress. Pendleton, a suburb of Manchester, built a local town-hall in rather a vestry-hall style, and Middlesbrough produced a new one

Classic design with angle pavilions and a pola in the centre of the front; a design which ay be classed among those inspired by Leeds wn-hall. We also illustrated for the first time Australian town-hall, that of Melbourne, ain of a very Leeds type, only with the ding feature (it can hardly be called a wer) placed at the angle instead of the centre. t perhaps the finest work of the kind which had occasion to illustrate in that same year as the Berlin Town-hall, by Herr Waesemann. is was in its way a really remarkable building. le floor in it was almost entirely given up to re architectural effect in the way of halls, rridors, and colonnades: a treatment justi- ble in a great central city like Berlin, where chitectural grandeur and stateliness in official ildings are called for. The design is a square mmetrical block, yet much more Mediæval an Classical in general feeling; and the tower a really remarkable piece of design for the most grim power and force of treatment which displays. It may be questioned if any one of r similar town-halls, fine as some of them are, n equal this Berlin building, unless it were in finement of detail, in which English architects, a rule, would have no difficulty in surpassing ost of their German brethren.

In 1869 we have the completion, or at least rward state, of the Chester Town-hall, a build- g of some importance and success, an example the pronounced taste for foreign Gothic, and far out of keeping with the old city in which is built; but a praiseworthy building in itself. areham is on the list of the same year; and in e following year we illustrated the Belfast wn-hall of Mr. A. T. Jackson, a successful and itable building, conspicuous among modern wn-halls by the absence of a tower,—a deficiency hich is, however, on the whole, a drawback. wers have sometimes been put up, certainly, thout much reason, in town-halls as in other uctures; but on the whole it seems to us that less funds are very short, a tower which marks e position of the municipal centre of the town om a distance is so suitable an appanage of gnity to a city that it may very well be erected r that motive only.

In 1871 we illustrated no English town-halls, but had to take note of Brighton, Macclesfield, urso, Winkworth, Wolverhampton, and others; d Carlisle wrote asking advice as to the cessity or advisibility of a new town-hall, hich is generally a step towards building one. 1872 we had the pleasure of illustrating the e Gothic Town-hall of Bradford (Messrs. ockwood & Mawson), interesting as showing e development of what may be called romantic chitecture in a town of very unromantic anufacturing associations, and also as an ample of the attempt to employ sculpture stematically in historic illustration of the untry or county in which the building was ected. Lewes, St. Helen's, Welshpool, and Win- hester figure among town-hall records in 1873, d also a larger building than any of these, Bolton, hich we illustrated. Bolton is a town of some- hat the same style and association as Bradford, ut took a very different turn in the style of the wn-hall, which is a rather cold and tame lassic building, with uninteresting detail; ough an object of great interest to the in- abitants. In the next we have a batch of naller examples,—Heywood, Maidenhead, Rhyl, underland, Woolwich; of which we illustrated hyl. But a much more important building, or least design, illustrated by us in the same ear, was the Proposed Chicago Town-hall, a ally unusual and fine building. The plan was hat its architect described as a compound reek cross, unusual in arrangement and ffering scope for a great deal of internal effect; nd the design a free treatment of Classic of no ttle originality and picturesque character. It ould be worth while for any one intending to arry out a building of this plan to glance at his design (on p. 629 of our volume for 1874). n 1875, the Hampstead Vestry-hall, another ery ponderous structure, was commenced, and he Hastings and Nottingham Town-hall pro- osed; and in the same year the vestry-halls of it. Clement Danes and St. Pancras; and we ave notes of Salford, Stafford, and Treganon own-halls, and an illustration and description f Todmorden Town-hall, built by Mr. John ibson, in a quiet solid style, resembling that f the banks of which he has designed so many; nother example (unusual) of the town-hall with- ut a tower. We had occasion, however, to llustrate a very large and very pretentious esign for the city-hall of San Francisco, a building certainly of sufficiently "go-ahead" character for its locality; and in this year occurred also the important competition for the Leicester municipal buildings, resulting in the selection of the first revived Queen Anne design for a town-hall. Yarmouth, the competition designs for which we have just noticed, came on the *tapis* in 1876, as also Rugeley and Staines, and we gave an illustration of St. Helen's, and of the new Erfurt Town-hall, by Herr Sommer, a very cleverly-designed and effective Gothic building. Vienna followed in 1877; her specimen is, however, a poor and tame production. During the present year we have published illustrations of the Birmingham Municipal Buildings, now completed, a sufficiently suitable Classic "pile," and the new Municipal Buildings at Cardiff, which show a great deal of originality in grouping and detail; rather wanting, perhaps, a tower or other leading object to give them more importance, for the whole building has a trifle too much the look of a collegiate school.

As we have noticed in running through some of the town-hall work that has been done, there have been various ways and principles of applying architecture to the expression of buildings of this class; which, however, may be broadly divided into the classical and romantic, or the symmetrical and the picturesque, methods of treatment. In cases where everything connected with the municipal business and administration is collected in one great building, it may be said that the picturesque is, unless in very exceptional cases, not only the most suitable treatment, but the one which is almost demanded by the nature of the problem. It is next to impossible to bring together a grand hall, a set of gas-offices, a town-clerk's and surveyor's rooms, treasury offices, police-courts, &c., in one building, and to arrange and design that building symmetrically and upon the Classic plan, without contradicting the real working qualities of the plan and making it inconsistent with itself; giving too much prominence and importance to one portion and too little to another. Manchester is the largest and most typical example of the town-hall as a combination of every department of business, so far; and the Manchester town-hall, as a plan, must be considered, on the whole, a decided success. The exceptional case would be that of a great capital city, where the largest amount of expenditure might be justified, and the grandest architectural display on a great scale would be reasonably expected. In such a case the combination of everything in one building would probably hardly be looked for; but if it were, there would be sufficient reason, then, for subordinating or keeping out of the way the minor offices and giving prominence to the state portion of the building at their expense. As to the general style of a town-hall in relation to the town in which it is built, our feeling is that a small town which is essentially picturesque, and which means to remain in the same *status*, should build a town-hall in keeping; but a town which is essentially in a state of progress should build in advance of itself, and let the town-hall be the centre up to which the rest of the surrounding architecture is to aspire. Under such a view of the subject the architect of the town-hall undoubtedly has a great architectural mission, and cannot well give too much thought and consideration to his building, which might have, if worthily carried out, almost the architectural importance of a cathedral, and be a kind of school of architecture for the neighbourhood.

There is also another point in regard to which the possibilities of the modern town-hall as an artistic influence have been greatly, indeed almost entirely neglected. Were the same spirit prevalent now which was prevalent when "the Signory" employed the Bellini and Titian and their compeers to decorate the walls of the Great Council Chamber with the noblest procurable painting of the day, we should have our town-halls and council-rooms also decorated with the best art of the day, so as to be practically schools for awakening in the people a love and appreciation for art, and at the same time adding a high interest to the buildings themselves in the historic records which might thus be blazoned upon their walls in better colours than those of heraldry. One or two efforts have been made in this direction; the Liverpool Council chamber has been decorated with paintings by an artist of genius, or is in course of being so, and a similar intention is prevalent in regard to the Manchester Town-hall, though we believe the details of the scheme are hardly settled yet. But these are exceptional instances. How much more opportunity there will be for making the most of Town-halls built on a large scale we cannot say; many of the principal towns have already rebuilt theirs, and the opportunities are just at present fewer than they were some years ago. But others will turn up as towns increase, and buildings become old or proportionately insufficient: and in such cases we will hope that in future the building will be made a worthy centre externally for the architecture of the town to be improved up to, and internally will be made an opportunity for the exercise of mural painting in its highest form. This latter end may still be realised in some of those town-halls which are already complete architecturally, but whose walls still show bare and silent spaces which might be eloquent with the beauty and poetry of art.

THE RELATION OF ARCHITECTURE TO THE LAWS OF HUMAN VISION.

The inquiry into the optical correctness practicable, or practised, in architecture, will receive much light from an examination of the optical powers of man. By this we do not intend the power of the eye as an instrument of vision. This has been illustrated by surgical writers. The geometric representation of spaces and distances on the retina forms the basis of the study of perspective. But there is another mode in which the optical action of the human vision may be regarded, which, so far as we are aware, is hitherto virgin ground.

We are unaware of the link that binds together the image presented to the sensorium, or what we say we see, with the complex machinery of the lenses of the eyes, the retina, the optic nerves, and the sensory optic ganglia at the base of the brain. But we understand something of the action of the eyes themselves as lenses, and of the difference between their use singly or in combination. We know that for certain purposes, such as verifying a straight line, experts are for the most part in the habit of using one eye alone. In almost all works on perspective, the subject is discussed from the hypothesis of a single point of vision, or as if the field were looked at with one eye. The lines of perspective, thus regarded, are all clearly derivable from the fundamental principles of geometry. Linear perspective may be called a corollary of the elements of Euclid. Its geometric laws were within the range of the thought and practice of the architects of Greece, in the time of the highest architectural splendour. But the earliest regular treatise on the subject now in our hands dates in about the beginning of the sixteenth century, or some 375 years ago. In his treatise on Perspective, Leonardo da Vinci wrote,—"Those parts of objects which are of less magnitude will first vanish from sight. This happens, because the shape of small objects at an equal distance comes to the eye under a more acute angle than the large ones, and the perception is less in proportion as they are less in magnitude." Defective as this definition is in philosophical perspicacity, it yet goes to the root of the matter. But although Leonardo da Vinci has treated perspective rather experimentally than geometrically, he has indicated the existence of a branch of the study which has only received close attention within comparatively recent times. We refer to the compound perspective of the two eyes. There are several instruments made for drawing in perspective. Such are Bevis's perspective instrument, which is a rectangular board with a hinged movable frame, carrying two adjustible strings; and Ronald's perspective machine, patented in England, in which a bead is made to traverse the plane of delineation; and an instrument invented by Sir Christopher Wren is described in the "Abridgment of Philosophical Transactions." But in all these cases a single eye-piece is used. It is to Wheatstone that we are indebted for the investigation of that double and combined perspective of the two eyes, which led him first to represent solid forms by lines of brilliant light, and which finally has led to the construction of the stereoscope. The mode in which Leonardo da Vinci regarded this part of optical study took the form of an explanation "why objects in painting can never detach as natural objects do." It is impossible, he says, that objects in painting should appear with the same relief as those in the looking-glass, unless we look at them with only one eye.

The stereoscope is, in point of fact, an artificial means of fixing the direction of the eyes on a

given point, or on given points. But the eyes themselves may be compared to two telescopes which are carried by the same axis, with a free vertical movement, at the same time that they are capable of a much smaller movement in azimuth, as regards their lines of collimation. If a theodolite were fitted with two telescopes, 2½ in. apart, on the same axis, which was capable of movement, by a set screw or other means, from a parallel position to a more or less converged position, we should have an instrument somewhat on the principle of the human eye. The play of the vertical axis is much more ample than that of the horizontal adjustment. This adjustment allows of a lateral play of the adjusted lenses, from the parallel position to an angle of 86° 30′ or less. And there is, of course, the lateral movement of the whole plane of the theodolite, represented by the movement of the head on the neck. We have only to add that the lenses themselves differ not only in different instruments, but in the same instrument from time to time. From birth to extreme old age the curvature of the lenses of the eyes, as a rule, slowly diminishes. But what, generally about the forty-ninth year of life, begins to cause pain in the eye, and ultimately leads to the adoption of spectacles, is the loss of the instinctive power of the eye itself to adjust its focus, and to assume a sharper or flatter curvature, according to the proximity of the object which it regards. In good eyes, in youth, a microscopic or a telescopic power can be assumed, at will, by the same organ.

Continuing, for the sake of perspicacity, the analogy of a binocular theodolite, we find that in a man of 6 ft., or 1·824 mètre high, the level of the line of collimation is 67½ in., or 1·71 mètre, from the ground. The width between the lines of collimation, when parallel, is from 2·2 in. to 2·8 in., or from 1-24th to 1-30th part of the height of the plane of vision from the ground. The convergence of the lines of collimation may be taken as equal to about 7 deg. for the vertical angle. Convergence to a closer point approaches what is called a squint; and divergence beyond the parallel is subject to the same depreciating term. But the curvature of the line of the eye allows of a certain radiation of the visual ray beyond the parallel lines, which differs in different persons, but of which little use is made for the purpose of attentive vision.

Taking the height above given, and considering, with Leonardo da Vinci, that a level line from the eye is the upward boundary of the best kind of normal vision, we find that the limit of perfect sight is defined by the curvature of the surface of the earth. A tangent to the surface of the earth drawn through a point at a distance of from 14,000 to 15,000 mètres, or from 8⅔ to 9⅓ miles, from the observer, would coincide with the centre line of the pupils of the eyes of a person of ordinary height. However excellent the lens, the entire object would, on the surface of the sea or of a level plane begin to disappear at this distance; which, therefore, of definite grounds, may be taken as the limit on physical vision.

If we consider the vertical play of the eyes from the ground to the level, which is, except when objects are very close, both free and unconscious, to correspond with the lateral range of vision when the eyes are bent on a distant object, we obtain, as before said, a proportion of from 24 to 1 to that of from 30 to 1. But we have to allow for the lenticular radiation before mentioned, or for the angle of unconscious vision without the parallel lines of collimation. If we suppose the lenticular radiation to be equal to the power of adjustment, we shall have a range of horizontal vision, without turning the head, or sensibly turning the eyes, of three times the proportion before determined, or of from 1-8th to 1-10th of the height. And here we at once arrive at the columnar proportions of the more elegant Greek orders; the height of the Ionic column being from 8½ to 10 diameters, that of the Corinthian from 9¼ to 9¾ diameters.

That some analogy was traceable between the columnar proportions of the Greek orders and those of the human figure, from the squat infantile dimensions of the Doric to the maiden graces of the Corinthian, has long been faintly indicated. There is nothing in the present view inconsistent with that portion of the poetry of architecture. On the contrary, the observation that the play and fixature of the human eyes are such as to allow them most readily to comprehend and to present to the imagination the erect human figure, is fully in accordance with that sense of fitness which underlies the idea of the beautiful.

We must remember that the single picture which appears to our contemplation in the sensorium is not a superposition of the separate picture seen by each eye. In colour it is possible so to superpose the tints of the spectrum as to form white or any tint of light. But if an object,—say at 50 yards' distance,—be alternately regarded by each eye, the other being closed, and the head being unmoved, it will seem to leap from side to side. Let us take the instance of a brickwork pier, looked at at that distance. If a rule or other object be held so that one quoin of the pier coincides with one mark when seen by the right eye, and with another when seen with the left, these marks will be found to be separated by about the distance of the pupils of the eyes. If we suppose the head to be fixed in this position, and a perspective drawing to be made from the point of vision of each eye, we cannot obtain the effect of solidity by superposing these drawings (supposing the upper one, or both, to be made on perfectly transparent paper or glass. We should only have a blurr, not a compound image. There is an unconscious and ill-understood action by which the two eyes combine their respective images. It is so unconscious, that we cannot tell, in all cases, whether we are looking at a solid object or not, so long as the head is unmoved. Thus in the case of a room like the Roman lecture-theatre, to which we some time ago directed attention (see *Builder* for May 5, 1877), where landscapes were so framed as to appear like actual scenery looked at through windows, the deception may be so complete that the observer cannot decide whether he looks on nature or on the counterfeit, without moving his head. In this case there is no superposition of images. Two images are formed, one by each eye, but they are identical, or rather exact duplicates; subject only to the small difference in size and in brightness of hue which usually occurs between the vision of the two eyes of the same individual. The landscape represented must be so distant that the slight parallax between the two eyes is unapparent. In that case, as before said, the deception may be absolute, until the head is moved. The eye has so long a visual memory to bear, in order to aid it in its grasp of fact. By that memory it arrives at the measure of parallax, and the moment that is done, the objects regarded will, to use Leonardo da Vinci's expression, detach themselves from one another if real, and fail to detach themselves if only portraits presented on the same plane.

Let a student pay a visit to a wide and far-reaching landscape, or approach a noble pile of building, while reflecting on these considerations. Let him not only look at the face of nature, but analyse his own consciousness as he looks at it. He will be surprised to find,—at least, if we may argue from the experience of the few to the experience of the many,—at how small a portion of the landscape, or how distinct a feature of the building, he looks at one time when the first impression has been received. On attaining a lofty standpoint, from which a noble range of landscape can be seen, the first impression, no doubt, is that of range. The eye revels in the view of the wide expanse. But it proceeds to take in the amphitheatre in detail. At first, instinctively no doubt, the spectator moves his eyes, and even his head, probably very rapidly, so as to catch the idea of unbounded expansion. He glances around the horizon, and conveys to his mind the impression of an amphitheatrical range. But as soon as he begins to take note of the principal objects, he regards them one by one. Then he will find how very small a portion of the landscape he comprehends at any moment, in azimuth, in distinct vision. It is probable that a very marked difference in this respect exists in different persons, depending, not only on the telescopic power of the eyes, and on the habit of observation, but on the actual distance apart of pupil and pupil. We have here a physical explanation of those observations which have connected the appreciation of size and of form with the distance between the eyes. The greater this distance, the wider is the base of the triangle of which the apex is fixed on any distant object. The greater must be the power of the pair of eyes, as an optical instrument, to appreciate form and size. But apart from any such difference as constitutes a sort of personal equation of the observer, it will be found that the limit of distinct vision, horizontally regarded, is that of th parallel rays of the eyes. Thus, a face, at fou or five yards' distance, a figure at forty or fift yards, a tree, or a tower, at five hundred yard can be looked at with content. It fills the eye The moment general roving vision is exchange for fixed attentive vision, this limitation of th range of regard becomes sensible. And it wi be found that the range is far smaller, hor zontally regarded, than vertically. The paralle play of the binocular lenses on their commo axis is much more free and unconscious tha their convergent or divergent movement. Thu in fact, the aspect of a graceful female form, a beautiful column, is taken in as a whole. would be unsatisfactory were this not the ca If our range of attentive vision were as grea horizontally as vertically, square or globula figures would be most pleasing to us,—or woul at all events, most completely fill the eye. Hol far the vision of quadrupeds, in which fr quently each eye has a semi-independent, an even a reversive action, coincides in this cond tion with our own, it would be instructive learn. As far as observation yet extends, th vision of each genus of animal is in some wa or other remarkably adapted to the specia habits and modes of life of the creature.

It is no objection to this view to say that th eye may be attracted by an object, or a motio occurring in a plane almost at right angles the line of vision. We see the most remarkab instance of that in the eye of the horse,—whic sweeps a backward glance with hardly any motio of the head. If we instance, as far as humi vision is concerned, the case of a flash lightning, occurring on the right hand or on t left, the example may be thought inconclusiv as we cannot determine how far the ligh radiating from the flash may affect the enti field of vision. But we may take many i stances, such as the appearance of a balloon of a large bird in the air, or the falling of stone, to the right hand or to the left hand the spectator, which he sees, as it were, witho looking at it.

This, we conclude, is due to the sphericity the eye itself, which receives much more lig than that which is utilised for what we call atte tive vision. A movement so much out of t field of observation as to have only that indire relation to the eye is yet quite enough to attra the attention; and unless this be concentrate on some other object (in which case the le direct appeal to the senses will be altogeth disregarded), the effect of the impinging ray r ferred to will be to direct the vision towards t spot. When the glance thus given is rapid, t change in the direction of sight will be very pr bably quite unconsciously made.

From these considerations it will appear wi tolerable clearness that the idea of a conve tionalisation of architectural forms in order bring them into a certain relation, when see from a certain standpoint, is one that will n bear investigation. The wonderful accuracy the Grecian artists, in the era of Phidias an Praxiteles, in the dimensions of the huma figure, has only recently been investigated. exact does it prove to be, in all the certai examples of the antique, that the age of a wor may be to some extent determined by the degre of exactitude in the vertical proportions, or the girths of the several parts. The foot wa the modulus of girth; and a modulus of whic equal multiples or aliquot parts were alwa applied to the trunk and limbs. In the sam way, while taking the diameter of a column t the modulus, we find exact numeric proportio to obtain in the different members of a Grecia building. Nothing is haphazard, guess-wor there or thereabouts. But the adoption of d finite dimensions, in numeric or harmonic pro portion is one thing, and the foreshortening of building artificially is another. If it were po sible to arrange that a temple or tower shou be viewed from one point alone, as for examp through a certain window, such modification o its proportions might be admissible; as then would be a definite reason for it, and very likel it might be carried into effect.

But in a large and graceful building the archo tectural effect has to be regarded, not fro one, but from many, points of view. The spe tator would stand at one place to grasp the ide of the edifice; at others, in order to regard it several parts. He would look at the portico fro one distance; at the graceful lines and deeply cut capitals of an individual column, fro another. In the same way, a certain standpoi would be selected for looking at the façade of

athedral, while the spectator would have to go o twice or three times the distance if he wished o appreciate the effect of the spire as contrasted with the mass of the church.

In cases where the position of the spectator s necessarily restricted,—a circumstance which ill not unfrequently occur in street architecure,—of course it may be desirable for the rchitect to exaggerate certain features of his ork at the expense of others. It may be oubted how far this was ever the case in reece. In Rome, it would not be difficult to nd examples. One will occur to some of our eaders, of a debased and objectionable kind, n the attempt to increase the apparent length f an architectural vista by an actual converence of lines supposed to be parallel. The eye ay be thus deceived, but outraged truth nally avenges herself. For example, a false erspective has the opposite effect from that esigned, when it is viewed from the narrowed xtremity.

A most unfortunate example of the miserable esult of restricting the range of the observer as o position, is now palpable in St. Paul's Cathedral. We have visited the Wellington Chapel, ith every disposition to admire what is adirable in the work of such an artist as the amented sculptor of the Memorial. That there s much there to admire we have already said. he groups in bronze at the end of the Catalque, when exhibited in the true sculptural ght attained under the lantern of the Gallery f the Royal Academy, were massive, imposing, nd effective. Of the heads of the cherubs we ad heard so much, when they were seen in the tudio, that we hoped that they might have roved no unworthy companions to the exuisite boy-angels of Grinling Gibbons. The ecumbent figure of the great soldier of duty has n unquestionable grandeur, as well as truth. ut, crammed into the nook which the monuent fills, we defy any one to see it. It is imossible to form any just idea of what it really s. A glare of white light from the window,—he great fault and blemish of the whole cathedral, — cuts across the composition of the culptor. There is no point from which the monument can be seen as a whole; there is one from which any detail can be seen in such light as to do justice to its features. A more horough failure can hardly be conceived. Excellences there are which are rendered invisible. Faults there are, as to which we hesitate to speak, from the reflection that, if the idea of the whole composition could be grasped by the spectator, they might be counterbalanced or explained. A more disastrous example of the evil effects of disregarding the intimate relations that should exist between architecture and sculpture, between design and position, between work in relief and illumination, it would not be easy to point out. We may compare the Wellington Monument, so placed that no one can see it, with the colossal seated figure of Prince Albert in the Memorial, so exposed to view that it must necessarily appear out of proportion from one or other standpoint. We may contrast these latest efforts of art amongst ourselves with the evidence to be found,—not farther off than the British Museum,—of the perfect mastery which the Grecian artists possessed of these two branches of design,—the knowledge of what was required by position, and of what was required for illumination. And, that well pondered over, we shall not be prepared to admit that the proportions of Grecian architecture were so framed as to be harmonious only when viewed from a single standpoint.

An International Exhibition.—*L'Eco del Progresso*, the organ of the International Exhibition to be held at Milan next year, states that the proposed Exhibition is to be the third in size of any that have taken place heretofore, still the space open to exhibitors will be one-fourth larger than at Paris. The main building is to be 812 ft. square, and five stories high. There will be twenty galleries in it, 812 ft. long. The art-galleries are eight in number, and will be ample for the exhibit of the vast number of art-treasures that will be sent by artists and owners of collections. The buildings are to be massive, in the Lombard style of architecture, and will be permanent. Exhibitors can ship their goods from the Paris Exposition, in bond, by the Alta Italia Railroad to the building. The opening will be April 1, 1879. The Director-General of the Exhibition is Mr. Frederick Guscetti, an American of Italian descent.

THE INTERNATIONAL CONGRESS OF ARCHITECTS.

The Congress, which opened in a brilliant and enthusiastic manner, drifted, we regret to say, towards that state of confusion and incoherence which characterises the early efforts of inexperienced bodies. In a word, it would be difficult to state why the Congress met, and what its members desired. Nevertheless, it has been a success. The English members present were at a loss to account for the unpractical character and issue of the debates; but it must be borne in mind that it would not be fair to judge a French meeting from an English standpoint. We have for many years, generations in fact, enjoyed the right of meeting. The police do not interfere with our various technical and trade associations. The force of precedent, and long-established customs, supply any English gathering with ready-made rules which will ensure the easy transaction of business. Further, no large body of men can meet in England without the presence in their midst of some persons who have acquired considerable experience in the management of public demonstrations, who can occupy the chair with tact, who can intuitively guess the sense of the meeting, and formulate a resolution which shall be a brief and practical summary of the views entertained by the majority. All this, which it is so natural for us to expect in England, cannot be found in France, where the people have never been allowed, for more than a few years consecutively, to walk independently of the apron-strings imposed by a paternal Government. Even under the present Republic, a doctor of medicine was forbidden, the other day, from delivering a lecture on poisons, for fear he should allude to social poisons! It was thought he might confuse belladonna with Mariolatry, arsenic with trade-unions, and strychnine with Socialism! Thus, with the exception of M. Charles Lucas, there was no one to work and manage the Congress and prevent the confusion which inevitably must ensue as the consequence of inexperience. We might also venture to add that the English themselves were somewhat to blame in this matter. We certainly might have helped in the organisation of the Congress by attending in greater numbers, by accepting the chair at various sectional meetings, and our assistance and our experience would have received grateful welcome from the French and the foreigners assembled at the Tuileries and the Trocadéro. The English Institute of Surveyors sent some delegates to the Geometrical Congress, and not only paid their expenses, but it was suggested that a further sum should be given, so that the English representatives should entertain the organisers of the Congress at a banquet. The various associations representing the interests of English architecture have not displayed the same public spirit.

To return to the Congress. The questions which proved of the greatest interest, and were discussed somewhat haphazard, and even where they were not inscribed on the programme of the day, related to the remuneration which architects should claim, to the necessity of a qualifying diploma, and to the method of establishing competitions for the design and construction of public buildings. From these various debates it may be clearly gathered that the engineers of France have far more influence than the architects, and that these latter are somewhat imbued with the sense that they occupy an inferior position,—a fact which all must regret; for so noble a profession should be able to hold its own, and need not make it apparent to the world at large that engineers enjoy a higher consideration. The Société Centrale was accused more especially of adopting this unworthy tone; and it is to be hoped that the Congress, if it has not served for any other purpose, will, at least, inspire the architects of France with feelings of greater confidence in themselves. When they consider how easy it is to unite in a strong body,—how readily some foreigners, at least, will lend themselves to strengthen the bonds of such an association,—the French architects must feel that there is great vitality in their profession, and that a little order and method alone is required so as to insure higher places and higher consideration in the State. It is true that, in Governmental quarters, the engineers rather than the architects are in power; that the Minister of Public Works himself is an engineer; but this is only the accident of a moment, and, in any case, architecture is strong and good enough in itself to be independent of any such considerations. M. Trélat made, on this subject, a very good speech. Dealing with the teaching of architecture, he insisted that the three points necessary were, conception, material, and form. The engineers were certain as to the accuracy of their calculations, their schemes were based on abstract formulæ, on definitive and fixed rules. The architect carries his formulæ in his mind; he does not act by rote; his schemes generally prove to be equally correct; but this result is due to his memory, to his intuition, to power of judging from the general aspect presented. It is possible to become an engineer by dint of study, but it is necessary to be born an architect. The value, however, of this artistic and intuitive perception it is extremely difficult to appreciate; and when a dispute is brought before the French tribunals, the architects often get an unfavourable verdict. The judge is often unable to appreciate the value of work where no merchandise has been delivered, no goods were sold or produced, where but a few designs on a piece of paper are the most that can be shown. The judge fails to realise the studies necessary to produce these designs,—the natural gift the architect must possess if these designs are worth anything; he fails also to appreciate all the responsibilities involved. The judge is not sufficiently aware that a trivial mistake may bring about a serious accident,—the fall of a wall or an arch. Some workmen may be killed; the architect himself may even suffer the penalty in prison, and, in any case, would lose much of his reputation, and, consequently, the better part of his income. All these considerations it was the duty of the Congress to bring forward, and they were discussed. But, unfortunately, the echo of the discussion has not as yet travelled far. The papers were not supplied with information in a proper manner. We have not yet received the wording of the two or three resolutions which the Congress adopted. They were not written out, no one took a copy of them when voted, and no one apparently knows very precisely how they were worded. Hopes, however, are entertained that the short-hand reporter in due time,—that is, in the course of a few days, when he has read over his notes,—will be able to give persons interested at least a rough idea of the wording of the resolutions. This will, doubtless, make English readers smile, and we hope that at the next Congress held in France, persons who propose resolutions will at least give sufficient thought and time to the matter to write out carefully what they desire to suggest.

On the necessity of a diploma opinions differed very widely. A diploma might be a good institution in the abstract, and it was very gratifying to those who possessed it and those who employed architects thus qualified. It also might shut out quacks; but, then, what would become of the old architects of established reputation, who are too well known to submit themselves to test-examinations? M. Mayne insisted forcibly on this difficulty. Señor Mariano Belnias, of Madrid, editor of the *Revista de la Arquitectura Nacional y Estrangera*, explained that in Spain all architects were compelled by law to obtain a diploma. They are not all obliged to study at the Architectural School; some may follow the classes of private tutors, but every student must pass the same examination before he receives a diploma. At the School of Architecture the first three years are devoted to general architectural education, followed by an examination. If the student passes successfully, he is then required to study for four years more subjects of more special and practical importance. This example was not, however, considered to apply to France, as it had not been recently introduced, and it is not likely that anything very decisive will be done in this matter.

Public contracts and architects' fees were the subjects of several most animated discussions. On the latter point a vote was carried in favour of claiming more than five per cent. for works under 400*l*. On the other hand, it was urged that the fixed sum of five per cent. had the advantage of preventing many disputes, and that, notwithstanding the example of Belgium, Germany, and Marseilles, the traditional and immemorial custom should be maintained. The vote, though carried, was weakly supported and might have been revised, as proposed, at a more important afternoon meeting, had there been time to reopen the discussion.

For competitions for public buildings, M. Davioud proposed that the examination should be at two degrees. The first should consist of

simple sketches. The four best would then be selected, and their four authors invited to make a full, elaborate plan, for which an indemnity should be paid to each. The best plan might then be selected. This solution of the difficulty was strenuously opposed by some members of the Congress, but was carried when put to the vote. M. Achille Hermant urged that the good ideas of the four competitors would be pirated, as their drawings must of necessity be exposed, so that public opinion might, as customary, exercise some control. M. Strohm, the Russian delegate, here proposed that the merits of the various schemes should be discussed by their authors in the presence of the jury, a suggestion which was much applauded; but the president, nevertheless, did not put it to the vote. It was further argued that the jury should, on their side, be remunerated, and selected from the most competent connoisseurs.

Such, in a few words, are the principal subjects that were discussed; but there are other matters with regard to the Congress, and notably the interesting excursion to Reims, which still remain for us to describe.

EXCURSION OF THE INTERNATIONAL CONGRESS OF ARCHITECTS TO REIMS.

Imbued with the example set by the organisers of English congresses, the French architects were determined that they also would enjoy a day's holiday, to be devoted to the inspection of objects of special interest to the profession. The difficulty of selecting a suitable spot for the excursion must have been great, but the problem was most happily solved, for it would have been impossible to see objects of greater interest in so short a time than were then examined. The excursionists, to the number of 130, met at the Great Northern Railway-station, at half-past eight in the morning, much to the surprise of the ordinary travellers. Indeed, the confusion was so great that the tickets could not be delivered with sufficient promptitude. The usual red-tapeism of French officials rendered it useless to suggest that a second ticket-office should be opened, to meet the emergency; the functionaries preferred incurring the risk of an accident, by keeping the train nearly half an hour behind its time, to departing from their ordinary custom. Arrangements had been made to deliver tickets at half-price to all the members of the Congress, and thus the long journey was accomplished for but a small outlay. The journey, which lasted a little more than three hours, was most agreeably spent by all present, notwithstanding the heat and dust. It was an excellent opportunity for making new acquaintances; the occupants of each carriage had not travelled many miles before they became firm friends. The foreign delegates were treated with especial cordiality. With the refined delicacy which distinguishes French gentlemen, all the honours were reserved for the strangers who had paid France the compliment of crossing her frontiers and assisting her efforts. In the most trivial, as in the more important details, the foreign delegates had every cause to congratulate themselves for the trouble they had taken. It would have been impossible to find more agreeable hosts.

On arriving at Reims, the members of the Congress were met at the platform by the Mayor, the Prefect of Police, the Architect of the Town, and other local notabilities. The Mayor delivered, of course, a few words of welcome; regretting, at the same time, that, as Reims had secured so large a number of distinguished guests, more time could not be found to display in detail the architectural and archæological curiosities of the town. With these few words the Mayor suggested that, under the circumstances, speeches must be brief, and hurried the company off to lunch. This was admirably served in a garden, and the toasts were drunk with the champagne made in the district. But these were necessarily short, and the Congress started at about two o'clock to visit the Gallo-Roman mosaic which was discovered about ten years ago in the centre of a large *boulevart* that skirts the town near the Port de Mars. At present this remarkable relic is only protected by a rough hoarding which conceals it from view of the persons passing by. On being admitted within the hoarding, it proved a little difficult to see the mosaic, on account of the number of persons standing upon it. Nevertheless, a glance sufficed to show its antiquity and its wonderful state of preservation. Expressions of interest and of satisfaction were heard on all sides; and, carried away by the enthusiasm of the moment, M. Charles Lucas proposed the immediate opening of a subscription for the preservation of the mosaic, the construction of an awning, and the opening on the spot of a small museum. An excited debate ensued, and many persons forgot to examine the mosaic so as to join in the discussion as to whether or not it would be dignified to send a hat round for money! Finally it was decided that matters should be managed in a more formal manner. The Central Society of Architects would write an official letter to the mayor of the town, calling his attention to the value and magnificence of the mosaic, urging that it should be carefully preserved, and that it had been greatly admired by upwards of a hundred architects and connoisseurs coming from all parts of the world, and in congress assembled. The Mayor very adroitly replied that such a letter would be considered as a title of nobility conferred on the mosaic, and that under such circumstances the town of Reims would not begrudge the necessary expenditure for its most effective preservation.

After this incident, the members of the Congress next examined the Roman arch, without, however, expressing any opinion as to its size, though it is considered larger than any Roman arch remaining within Rome itself. After the invasion of the barbarians, this old arch was used as one of the gates of the city, and close at hand there is an old Roman street, now called the Rue des Tambours, where there are several houses dating from the twelfth and thirteenth centuries. Unfortunately, we passed so rapidly in front of all these curiosities that it was impossible to give more than a casual glance at each house. We had started after two o'clock, and the train returned to Paris at a quarter past six. To economise our time, therefore, we merely paused for a moment in front of the majestic Hôtel de Ville, and the remarkable fifteenth-century wood carving that ornaments the Maison Mouloton on the Place du Marché. Then, passing by Pigale's Louis XV., we at last came to the magnificent cathedral for which Reims will ever be renowned. The admirable crest, the marvellous harmony of the small with the larger arcades were pronounced by many admirers to be finer than anything similar to be found in Lombardy, and no one ventured to dispute how admirably the proportions had been kept. Within the cathedral considerable attention was bestowed on the chapel which M. Viollet-le-Duc has recently restored; and some time was also spent in examining the treasures and the vestments. These included the chasuble which served for the coronation ceremony of Louis XIV. and the gold chalice first used by St. Clovis, and afterwards by the other kings of France. There was a relic-case which had belonged to Henry II., and another relic-case which had been more or less battered and broken during the revolution, and is stated to contain not, this time, the inevitable piece of the cross, but a thorn from the crown of thorns. The courteous and agreeable ecclesiastic who accompanied us on this visit, having to deal with an intelligent body of men, did not express any very profound reverence for the authenticity of the relic.

The sculpture, that is to say, the statues which ornament the cathedral, are most interesting, and, we regret to say, somewhat neglected. The grant that has been allowed for the restoration of the cathedral does not include any sum for the preservation of the statues. Yet it would seem a great misfortune to remove the scaffolds raised round the cathedral without having first seen to the statues. These are not only precious from an artistic point of view, but are valuable as historical evidence. Notre Dame de Reims, often called Notre Dame de France, has fourteen kings with sword, sceptre, and the traditional long cloak sheltered in by the buttresses of the transepts. The drapery of these statues, the rich sculpture of the crowns, the leaves representing sometimes human features, the artistic clustering of the long hair, and the noble expression of the kings, all commend them to preservation. Fifty-six other kings, not so well sculptured, are placed round the towers and the grand entrance, and form part of "The Baptism of Clovis." Among these statues there are two of genuine historical importance. They prove that the kings who ornament the exterior of th cathedral are certainly kings of France, an not, as it has been stated, kings Judah. They represent Pépin-le-Bref and Charl magne. The identity of the latter was recog nised, with the assistance of the scaffold, fro the fact that he alone wears the Imperial crow which always distinguishes Charlemagne. Pépi le-Bref is represented as much smaller than th other kings. He is standing on a lion, and h been mistaken for David, who is also at time accompanied with a lion. According to ol chroniclers, and, notably, the Monk of St. Gal Pépin-le-Bref was insulted by his retainers i consequence of his short stature. On one occasio when assisting at a bull and lion fight, he defie his courtiers to separate the animals. As the all hesitated, Pépin sprang into the arena, e claiming that David, though little, killed Goliath and that Alexander was smaller than his mo illustrious generals. In a few moments the kin had slain both bull and lion, and it is this ep sode which the statue at the cathedral seeks t recall. The king is not represented, as usua in an attitude of majestic repose; on the co trary, his cloak is thrown aside, his robe girdled tightly round his waist, and what remain of his arm is upraised as if to strike. The lio also seems infuriated by the strife. Thus it w be seen that these statues are extremely interes ing, though the peculiarities we have mention had almost entirely escaped notice, and the value was only discovered when the scaffol raised to restore the cathedral, facilitated closer inspection.

From the cathedral the members of the Co gress naturally proceeded to examine the apar ments where the king dines and resides durin the coronation ceremonies, and then visited th old church of St. Rémi. The architecture this church bears the stamp of three distinc epochs. There is the Romanesque architectur of 847, the ogival school of 1149, and th further additions of 1172. It is curious to not the efforts to harmonise the Gothic with th Romanesque, and all these points were admira bly explained by M. Leblou, who has done muc to preserve this edifice.

Time, however, stole rapidly on the excu sionists, and they were compelled to hurry awa to reach the celebrated cellars of the Pomme champagne. These were illuminated with in numerable candles, and presented a fantast aspect. We walked for more than a mile unde ground among thousands of casks and millio of bottles of the clear dry champagne, whic constitutes the glory, the renown, and th fortune of Madame Pommery; and then omn buses drove the members off to the new theatre the model technical school, and back to th railway station, thus completing an afternoo of unequalled sightseeing, enhanced and en livened by the exquisite champagne offered t the delegates, at Madame Pommery's specia command. As the engine whistled, and the trai tore along the dusty line to Paris, Spaniards an English, French and Austrians, and othe nationalities, mingled in the utmost confusion cheered to the success of architecture, to th international character of all works of all art and sciences, which tend to refine the tastes an improve the material comforts of humanity.

JOHN SHUTE, 1563.

Having, after a period of over thirty years seen for the first time, and become possessed of a copy of "*The First and Chief Groundes of Architecture*, used in all the auncient and famous monymentes: with a farther and more ample discourse upon the same, than hitherto hath been set out by any other," permit me to con tribute to your journal a description of the volume for those of your readers who may have also been desirous of knowing its contents,—a volume which to so many has been entirely un known except by its lengthy title, referred t in Walpole's "Anecdotes of Painting." Th work is not considered to be a rare one by booksellers, yet it is seldom met with; and I d not remember that my learned friend, the late Mr. Arthur Ashpitel, F.S.A., had ever seen a copy of it. Lowndes mentions three editions in 1563, 1579, and 1584. Neither in the Britis Museum, nor in Sir John Soane's Museum, nor the Cambridge University Library, is the work to be found; but a copy of 1563 is in the Bodleian Library at Oxford. "The Universa Catalogue of Books on Art" states that the editions of 1563 and 1584 are in the Bodleian

the former only has been seen by a friend, Mr. E. G. Bruton, who kindly compared a description of my copy of 1563 with the one there, which he states contains the bookplate of 'Mr. Horatio Walpole." The work is in the catalogue of the "Douce Collection" at Oxford. Many years since Mr. J. J. Scoles told me he had seen a copy for sale in a catalogue, and, from information, he thought the late Professor Willis had bought it, and I remember that on one occasion he said he had a copy. Are any others known?

The book is a small folio, in size 11¾ in. by 7¾ in., and consists of only twenty-six leaves, including the plates; and is printed with italic type. The title-page is bordered by four wood blocks of Italian ornament, of very good detail; in the lower one is the monogram, the top stroke of which is not quite clearly defined as belonging to it, or to the ornament, and a little below, is another letter *A*. A monogram omitting the C is attributed to Andrea Gessner, editor and publisher, of Zurich, about 1599. Within this border occurs the title above printed, followed by "Published by Jhon Shute, Paynter and Archytecte. Imprinted at London, in Fletestrete, nere to Sainct Dunstan's churche, by Thomas Marshe. 1563." The back of it contains "The Contents" and three errata. The next page, with the signature A ij, contains the dedication to the "Princes Elizabeth," queen of England, &c., in which is stated nearly all, if not all, that is known of this author, and therefore I extract it for its quaintness, simplicity, and information, with its spelling carefully followed.



"It is both rightly and excellently affermed of Marcus Tullius Cicero, in his first booke de officiis (right Excellent Princes and my moste gratious souerayne Lady) that no man is borne into this world for his priuat and singuler weale, because our Countrie chieflie, partely our parents, and partly our kinsfolke do require as it were a duety of vs, and recompence for that the whiche we haue received. And like as the members of mans body be diuers in number, and haue according to their diuersitie diuers and peculiar properties so is it in a good and well-setteled comen weale: in whiche ther is no office so base, or handie worke so simple, whiche is not necessary and profitable for the same. And as the members of the body doing without impedimentes their naturall dueties, ye whole body is in an helthful hermonye, and able to performe all that belongeth to the same. So is it in a publike weale whe all men in their calling, do labour not onely for their owne gayne, but also for the profit and comoditie of their Countrie, which thinges when I according to my small Capacitie did waye with myselfe, I was as it were stirred forward to do my duetie vnto this my Countrie wherein I live and am a member. And so much the rather, for that being seruant vnto the Right honorable Duke of Northuberlad, 1550. It pleased his grace for my forther knowledg to maitaine me in Italie ther to cofer w^t the doiges of ye skilful maisters in architectur, and also to view such anciet Monumentes hereof as are yet extant, whervpon at my retourne, presenting his grace with the fruites of my trauailes, it pleased the same to shewe them vnto that noble king Edward the VI., your maiesties most deare brother of famous memorie, whose delectation and pleasure was to se it, and suche like. And hauing the sayde trikes and deuises aswell of sculture and painting as also of Architecture, yet in my keping, I thought it good at this time to set fourth some part of the same for the profit of others, especially touching Architecture: wherein I do follow not onelye the writinges of learned men, but also do ground myselfe on my owne experience and practise, gathered by the sight of ye Monumentes in Italie. And because all the members of the body hane cheflye and principally a duetie to the head, as gouernour of the whole, and without which al the other cannot liue. So my duety inforseth me, most soueraigne lady (the perfect and natural head next vnto God of this our common weale), to shew a token of the same vnto your highnes, in presenting these my poore and simple laboures whervnto I am the rather boldned, considering your highnes delight in all kynd of good learning, and parfect skill in the tonges and sciences. Most humble besecking your royall maiestie to vouchsafe to let this my small trauaile and woorke passe under your noble protection and defence: and I according to my bound and duety shall pray to God for your long life and prosperous Raygne, with peace and tranquilitie to his honour and glorie. Amen.

Your Maiesties most humble and obedient subiecte, JOHN SHUTE."

At the back of the leaf commences the Preface, in which occurs the passage in reference to studies, none "deserveth greater prayse, than that whiche is of the grekes, named 'Architectonica,' and of the latines, 'Architectura' [I thinke not altogither vnfite nor vnaptlie by me termed in Englishe, the arte and trade to rayse vp and make excellent edifices and buildinges]." Shute then notices his travels and readings; and that "intending to write of Architecture or buildinges," says,—"I have taken my first enteraunce into the writing of this arte, at the fine antique pillers or Columnes, comonly named of the places and persones partely where and of whom they were inuented, and partely of their vertues and properties of those that they wer likned vnto," and explains that their proportions must be understood "before any one can attain to any estimable part of the reste of this science." He takes "Vitruuius," corrected by "(Sebastianus Serlins, a merueious conning artificer in our time)", to which he "ioyned the minde and iudgement of one Gulielmus Philander," and mentions the annotations on Vitruvius by him, published 1546.

The signature B i commences "The Discourse from time to time hovve this Science of Architecture increased." After a perusal of this part I was disappointed, for I had always hoped to find some short notice of the state of building in England, perhaps followed by the names and works of the practitioners of his days, and thus at last to arrive at the knowledge of "who was John of Padua," and of some others of that date. This chapter is followed by "What the Office and Duetie is of him that wyll be a Perfecte Architecte or Mayster of buyldings," which is founded upon the well-known chapter in Vitruvius. Towards the end, he writes,—"But I may pray as Vitruuius doth, saying, I pray O Cæsar, and all other that rede this my writinges, if ther be any thing disagreing to any of these sciences beare with me for I cofesse of myselfe (saith he) not to be parfaict.—But I, the setter forth of this treatise in Englishe, acknolage myself not to be a parfaict Architecte, (as he saith), nor yet Gramaria, and though I hane put myselfe in prease, it is not through the depe knowlaige aboue rehersed, but I do it for to put in vre an entrance or beginning to them which be therin ignoraunt, and desyre further knowledge in these thinges, as hereafter appereth by the declaracion hereof." This finishes the page, and then follows a folding copper-plate engraving of the Tuscan column, showing the Order complete made "upon the Simetrie of a strong man"; with its measures and the method, in outline, of producing the entasis; and a third illustration of the said "strong man" habited in warlike attire resting on a mace well designed in this early Italian ornamentation. Four pages of description of its parts follow; and then a similarly-arranged plate of the Doric column, with a partly-naked figure of Hercules, with his club as its counterpart. Again, four pages of description, succeeded by a plate of the "Ionics," represented by a female figure, which may be taken for Juno, as a peacock stands on the same pedestal with herself; and after its five pages of description, comes the plate of "Corynthia," "the pillor that was founde in Corinthia, by Callimachius, the excellent Architect of Corinthe." A female figure in a tunic and cloak is engraved; this is followed by its five pages of description; and then succeeded by a wood engraving of the same size as the other plates, of the "Composita or Italica the triumphant pillor," represented by a female figure in a very placid attitude. Three pages of description of it are followed by one "of another avtentike piller and a necessarie Companion to the beforenamed pillers made by the Atheniens to his perfection named Atticurca," having a woodcut. Then come five diagrams with descriptions of the "chaunges" or "standings" of the columns; ending with "There are many edifices of the antiques wherin all the orders of these pillers haue bene sette one uppon another; garnishing them accordinglye as it is yet to be sene in the Amphitiatrum named Collosseum in Rome whose excellent and praiseworthy doing shalbe more plainely sette fourth hereafter." This would seem to imply that a second publication was contemplated. The signature F ij and folio xviii., on the same page, contain the rule how to "diminish the scapus under the capitall by the increasing of his height"; and "Another example to be observed very necessary for the maister builder or Architecte that is for the inlarging of the Epistilium, when the pillor amounteth to certaine heightes." On the reverse of this leaf the work terminates with a regret that the author has no more "figures out of which springeth both desire and also encouragement to the same." The imprint is the same as on the title-page.

The volume I am referring to is clean and in good preservation. To say that the bookseller had the work "bound by Riviere," will be sufficient to show the estimation in which it was held by him. The male and female figures, neatly engraved, vary from 7¼ in. to 8¼ in. in height. Each paragraph has a woodcut initial letter, varying in size, which appear not to have been specially cut for this work. The copy in the Bodleian Library is stated to be coloured, and the plate of the Composite column is partially adhering to a plain plate; it has also a duplicate impression of the Composite column. The precepts contained in this treatise are those of pure Italian architecture, and far in advance of the ideas shown in the volume of drawings by John Thorpe, or carried out in the edifices of that early period.

This book is considered to be the first practical work in English on Architecture. Walpole, in his "Anecdotes of Painting, &c.," quotes "Lomazzo on Painting," 1598, for the remark that "Limnings, much used in former times in church-books, as also in drawing by the life in small models, of late years by some of our countrymen, as Shoote, Betts, &c., but brought to the rare perfection we now see, by —Nicholas Hilliard," &c. This Shoote, Walpole further on supposes to be the above John Shute; and adds that "the cuts and figures in the book are in a better style than ordinary." He also considers him to be the author of another work, published 1562, entitled "Two very notable Commentaries," &c., containing a translation from A. Cambini, and printed by Rowland Hall. As it was dedicated to "Sir Edward Fynes, Lord Clynton and Say," and in it the translator writes, "I am your man, and you my very good lord and master," it is hardly possible that it can be by our John Shute, who acknowledges the Duke of Northumberland as his master in the work referred to by me, and published in the following year. There was another John Shute, who translated Viret's "Christian Instructor" of 1565 in 1573, and other works in 1579 and 1594; to say nothing of "J. S.'s Pious Life and Death," 1643; and "Funeral Sermon," 1645. I also find mention of a Captain John Shute in 1563. The work of 1573 is, curiously enough, dedicated to the celebrated Lord Robert Dudley, Baron of Denbigh, Earl of Leicester (third son of the Earl of Warwick); curious, because the Duke of Northumberland before noticed was his father, John Dudley (born about 1502), Viscount Lisle, Admiral of England, and when Earl of Warwick mounting into eminence on the fall of the Protector Somerset, was created in 1551 Duke of Northumberland, and after the accession of Queen Mary was attainted and beheaded in 1553. Was this duke engaged in building operations of any importance to render it advisable to obtain a correct knowledge of the art of architecture, by sending "his servant" abroad to learn it? Edward Seymour, Duke of Somerset, the "Protector Somerset," it is well known, was building the palace in the Strand at the time of his death, in January, 1551-2. If more could be learnt of Sir John Thynne, John Caius or Keyes, John Thorpe, John of Padua, and this John Shute, all of whom are known at about the same period, we should be able to decide if they were three or five persons, and about this we are at present quite uncertain.

I have lately found another, and, I think, an unknown reference to our John Shute, in the "Account of Architects and Architecture," written by John Evelyn, 1696, who, while noting the use of the words "cornice," "trabeation," and "entablature," observes, "Some writers apply it" [the word "trabeation"] "only to the very cover and utmost top of the orders; but so does not our countryman, John Shute, whose book, being printed Anno 1584 (and one of the first that was published of architecture in the English tongue), keeps rather to the ancient terms than by mixing them with such barbarous ones as were afterwards introduced, indanger the confusion of young students and such as applied themselves to the art." It is not only curious that

Evelyn refers to the last of the three editions of the work; but that in 1679, in a bookseller's list of architectural works, no mention is made of Shute's work, although Serlio, Hans Bloom, Vignola, Scamozzi, Palladio, and Wotton, are referred to as being "in English"; whilst Vitruvius, De l'Orme, Dietterlin, Marolois, and many others, "are difficult to be got."

Shute, "painter stainer," died September 25, 1563, the same year as the publication of his work, and was buried in the Church of St. Edmund, Lombard-street, destroyed in the Fire of 1666. The edition of Stow's "Survey of London," 1722, records the twenty-eight lines of the English epitaph. From the lines,—

> "That ancient practice and profound,
> That hight of Architecture,
> A Knowledge meet for those
> That Lmd lings doe erect,
> As by his Workes, at large set forth,
> Is shewne the full effect,"

it might be inferred either that he had published another volume on the art, or that some edifices had been erected from his designs,—more probably the latter; but I know of none to which his name has been connected.

WYATT PAPWORTH.

ST. ALBANS ABBEY.

THE restoration of the Abbey Church of St. Albans appears likely to afford a fine field for the squabbles of archæologists and archæological critics. A new phase in the fight has just been reached, and the proposal by those concerned in the restoration to place a high-pitched roof (we presume of thirteenth-century type) over the nave has led to an indignant correspondence in the *Times*. First came Lord Carnarvon, as the president of the Society of Antiquaries, who thinks that "the magnificent folio on St. Albans which the Society published from Mr. Carter's drawings in 1813" gives them a right to be heard. Well, the drawings hardly give a very correct idea of the external aspect and structure of the building, but they were good for the time in which they were done, no doubt. Lord Carnarvon expresses himself as quite aware that a high-pitched roof on the nave of St. Alban's would be no novelty; but he urges that the "accidental substitution of flat roofs" (low-pitched roofs, we presume, is meant) has given singular magnificence to the only really fine feature of the exterior, the central tower. This, he thinks, would be greatly impaired by the substitution of a high-pitched roof; "nor can it," he adds, "be said that the proposed changes would improve the effect of the interior, for I assume that no one even in this age of extensive church restoration can contemplate an alteration of the flat ceiling." But the pith of the Earl of Carnarvon's letter really lies in the succeeding sentences:—

"I would also, with all respect, press upon the committee the consideration as to the amount of new work which this proposal must involve, together with the obvious risk of the new work not being in harmony with the old. The western gable, with the parapets on either side, will all have to be new or altered, a change involving not only considerable cost, but doubtful, perhaps, in effect when the change is completed. The features which have been introduced into the building since the high roof was lowered have rendered such a roof incongruous. The *consensus partium* cannot be restored.

I have thought it was only respectful to the committee to adduce some special considerations which seem to me adverse to their scheme; but on more general grounds I would venture to urge, on behalf of the society, a very earnest consideration of the further question, how far a measure which is incontestably destructive of the architectural history of a great building is justified by any architectural gain to be obtained—even assuming that there is such—by the substitution of a high-pitched roof.

As a work of art, the exterior of St. Albans can never be made beautiful; but if it is left in its present condition it will continue to be interesting in the highest degree as evidence of successive additions and alterations in successive generations of men and centuries of time."

This was followed by a letter from Earl Cowper, complaining that "we Hertfordshire men" were being put in the absurd position of seeing their beloved abbey injured by injudicious restoration, which was paid for out of their own pockets:—

"We were told that the tower and the south nave were actually falling down, and that a great part of the remainder, if not looked to, would be in the same condition; and we subscribed in order to preserve the ancient building as it was, not to transform it into what certain architects consider that it ought to be."

This was capped on the same day by a letter from Mr. Morris, the sensitive secretary of the sensitive Society for the Protection of Ancient Buildings, stating that Lord Carnarvon's letter expressed the opinion of "men of taste" throughout the country; which it is, of course, well to know, on such good authority. Mr. Beresford-Hope followed with a letter defending the proposed scheme on grounds of architectural design; that the abbey had been intended to have a high-pitched roof; that the weather-mould of the original roof was shown in Mr. Neale's volume on St. Albans; and that the architectural advantage of such a roof was self-evident, from the at present abnormal length and consequent proportionate lowness of the nave. He also, however, has a profound respect for the old painted ceiling, "a relic of old art which it would be sacrilegious to disturb."

To those who have seen with their own eyes what these gentlemen have only written about, the correspondence is, at all events, rather amusing. It may be worth while, however, to tell the correspondents and their readers a little more about the building than they appear to know.

In the first place, then, a new roof for the nave is an absolute and imperative necessity *at once*, almost as much so as the strengthening of the tower and the setting straight of the south wall. Concerning these latter, by the way, and the remark of Earl Cowper that "we were told" they were in danger of falling, we may just observe that if that nobleman had paid the attention to the proceedings at the Abbey which his professed interest in the building would have led one to expect, he certainly ought to have known that the statements as to the critical condition of the tower and south wall were not one iota exaggerated, and that nothing but what was absolutely necessary has been done to put them in a secure state. The case is no less critical with the roof. The existing roof of the nave, as we suppose most of those who have taken any interest in the building are aware, is not a Gothic one at all,—not even late Gothic; it is an ordinary tie-beam roof of oak put up within the modern or post-Gothic period.* Of the ceiling a word just now. The roof for some reason has suffered from worm-eating and decay to a degree that is quite unusual in timber of the very moderate age of this. Its present state, as seen on entering with a light between the roof and ceiling, is extraordinary, and renders it astonishing that it has not fallen into the church some time since. Scarcely a single tie-beam has any bearing on the walls whatever; the wood is rotted into mere touchwood, and iron flitches have been bolted on each side of them to hold on the walls. But even thus there is in some cases nothing to depend on, for the wood has rotted so far back that only the last bolt of the flitches has anything to hold by. Between the iron flitches you find a hole like a rabbit burrow, into which you can put your arm and pull out handfuls of dust and mould. The king-posts have been tenoned into the tie-beams without bolts or straps, and though we may suppose they have been wedged or keyed up originally, the shrinkage of the wood has left the tie-beams to part company from them, and they are held up by iron straps put on subsequently through staples fixed into the wood, and the ends slightly turned. The purlins have been very weak in scantling from the first, and in places where they have sagged, instead of any attempt being made to strengthen them, the rafters have actually been packed up with pieces inserted between them and the purlins, so as to keep the outer line of roof straight, which seems to have been thought all that was necessary. Horizontal bearers have been placed from tie-beam to tie-beam to spike the ceiling joists to; but as the tie-beams have sagged, they have been cut away round the ends of these bearers to prevent their carrying down the bearers, and buckling the ceiling so much as might otherwise have been the case, and so effectually has this been done, that the bearers meant to carry or stiffen the ceiling joists are in some instances actually lying upon the ceiling, and only supported by it. In short, the general conclusion suggested is that the roof has been unscientifically designed and put together from the first; that at an early period it began to decay and to give at all points; and that then the greatest bunglers among the village joiners were let loose to do what they liked with it. The principals are at present propped from the internal scaffolding at several points, without which they could hardly be considered safe for a day; in fact, only a few days back one of the tie-beams suddenly cracked with a loud report, and now presents a serpentine curve, picturesque, but not practical in appearance.

It is, therefore, perfectly impossible that the present roof can remain, or that any good whatever can be done with it, unless the sentimental gentlemen of the Society for the Protection of Ancient Buildings can persuade the committee to leave the timbers to rot on the top of the props, adding more props as the decay proceeds, which, we believe, is the method they advocate. The only question is on what principle the renewal of the roof should be carried out; whether it should be an attempt to design and construct such a roof as may probably have stood upon the thirteenth-century clearstory, or whether it should merely be the replacing of the present roof with a similar sound and good one, with merely the utilitarian object of preserving the building. And we must say that we are so far with the opposition, that our strong impression is in favour of the latter proceeding. It is of course, perfectly true that originally the building had high-pitched roofs, and the indication of the junction of these roofs with the tower is visible; though, if Mr. Beresford Hope had looked at the building before writing his letter to the *Times*, instead of trusting to Mr. Neale's drawings, he would have seen that there is not any actual weathermould on the west face of the tower; if there was one, it has been cut away. But we may say that the one really good point in the correspondence we have alluded to is the Earl of Carnarvon's remark that the change would involve the re-designing and re-building of the west front, or its upper portion at least, and the addition of a similar high-pitched roof to each transept. This it unquestionably would; and such a degree of alteration of the building, destroying all its well-known and characteristic outline and associations, we conceive would be an error and a disadvantage not to be compensated for by the erection of any modern imitation of a thirteenth-century roof, however able and perhaps beautiful in itself. What we should recommend would be simply to remove the present tumble-down roof, and substitute a new one on the same lines, of the most solid and enduring material and construction. And what about the ceiling? Thereby hangs a tale. There seems to be a most curious misapprehension about that same ceiling. One of the great arguments against the proposed high-pitched roof is either that it would involve the removal of the ceiling, or that half the value of the open roof would be lost by the fact that it would be hidden by the ceiling internally. That any one should dream of touching the ceiling seems to be regarded as an enormity not to be mentioned. Even Mr. Beresford Hope, who writes on the side of the Restoration Committee, regards it as a precious relic of old art which it would be a sacrilege to touch. The fact is, that although the small portion of ceiling over the choir is a Gothic design, renewed or restored, the ceiling of the nave is merely an exceedingly coarse and clumsy imitation of the general style of the original choir ceiling, and was made at a comparatively modern date, and after the Gothic style which it simulates had in reality died out. Impressing this fact (which seems to be strangely overlooked) upon our readers, we hope they will be the less startled to hear that the ceiling must inevitably go in any case, quite apart from the question of the high roof. A new roof, as we have shown, is absolutely necessary, and the ceiling, which consists of band-box planks about ¼ in. thick, is so rotten that the pieces which were necessarily taken off preparatory to the recent operations on the south wall in many cases came in pieces in the process; the edges in most cases are rotted away and ragged, and the ceiling, once taken down, would not be fit to put up again, except so piecemeal as to necessitate at least half of it being new. Any one who is incredulous has nothing to do but go up and examine it, or even an examination of the pieces which were taken off and are now

* Some pieces from a Late Gothic roof are, however, worked up in the rafters and ceiling joists.

stacked in the nave would be a nearly sufficient indication of the true state of the case. As to the ceiling being artistically valuable, it is not so; it looks pretty well from below, but it is itself an imitation,—and a very bad and coarse one, and of no historic or archæological value whatever. But its appearance has long been associated with the interior of the Abbey; and what we should do, if the matter lay with us, would be to construct a new low-pitched tie-beam roof as before, and then to fix up such portions of the ceiling as were in good condition, if sufficient were found to make it worth while, and make it up with new pieces continuing the same design; or, if none of the existing ceiling were fit to be used again, then to place a new ceiling under the new roof and paint it, not in imitation of the imitation, but of the original, viz., the portion of the choir ceiling which has been preserved and restored. A fresh imitation of it would have just as much title to respect as the existing imitation, and would be sure to be a much better one and better carried out.

Such are the plain facts about the present stage in the restoration of St. Albans, concerning which such a needless outcry has been made by persons who have taken no trouble to learn the real truth,—a matter, indeed, about which the "Protection" Society do not seem to trouble themselves much, as it might often be exceedingly in their way. It is a pity that noblemen and gentlemen will write so positively in the papers upon subjects of which they have no practical knowledge. The only way to get ground for a satisfactory judgment in such a matter is for people to go up ladders and scaffolds, poke into roofs, and see things for themselves.

It is satisfactory to find that the displacement of the inner face of the clearstory masonry during the forcing over of the south wall has been rectified without any difficulty or any injury to the work, the facing stones have been taken out and reset; and the wall now presents a perfectly good appearance internally. Externally the clearstory is in a sad state of dilapidation, and a great deal of renewal is necessary. Here, again, it is urged by the extreme conservatives that the work should be left in its present decayed condition rather than have new stones introduced; and there would be something to be said for this, no doubt, if it were a mere matter of sentiment and appearance. But the fact is that many of the stones in the window archivolts, &c., are actually split in pieces, and ready to fall out, and a large proportion of them are destitute of proper bond into the body of the wall; their renewal is necessary, practically; and we presume the most bigoted anti-restorer, if he could be caught in one of his lucid intervals, must admit that in such a case it is as well to replace the excised stone by one cut to the design of the old one which it replaces. The fact is, the Mediæval builders, though such great building artists and such bold constructors in regard to the main design of their buildings, were often bad and careless constructors in regard to such details as bond, and consequently a retributive justice comes upon them, and their work has to be removed and replaced when, if properly put together, it might have remained intact.

The shores against the exterior of the south walls have been for some time struck, and brick flying buttresses in cement now take their place, and there seems no danger of any renewed settlement of the wall, unstable as its construction is. The modern wall which externally concealed the porch at the end of the north aisle has been taken down, and the porch thrown open. Built up in this wall were found a great number of fragments of architectural detail, mostly of the Perpendicular period, some of them very beautiful, and which had been kept in a remarkable state of preservation in the wall. The fragments of this nature form an interesting collection.

New Wet Dock at Greenock.—The ceremony of cutting the first sod of the new wet dock at Garvel Park, Greenock, was performed on the 1st inst. by the Provost and Mrs. Lyle. The dock, which has been named the "James Watt" Dock, in honour of the celebrated engineer, will be 2,000 ft. in length, and 300 ft. in breadth, and will afford 7,200 ft. of quayage. The cost of the work, including upwards of 80,000*l.* for the site, is estimated at about 420,000*l.*

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

Some account of the first day's proceedings of the third annual meeting of this Society appeared in our last (p. 813, *ante*). On the second day of the meeting (Wednesday in last week), the party proceeded in carriages to Westbury, and proceeded to the church, where Mr. John Taylor read a paper on Westbury College and Church. The visitors, after examining the church, betook themselves to the carriages, and were driven to Henbury. Some time was spent in the grounds surrounding Blaize Castle, the difficulties and troubles of ascent being compensated for by the beauty of the scenery. Bishop Clifford gave an address on the Roman remains at Blaize Castle. The party then proceeded to Henbury Church (recently restored), which was described by the Rev. W. Way, who was thanked for his kindness. Luncheon was served in an adjoining schoolroom. Compton Greenfield (where the church was inspected) was next visited. Mr. Sholto Vere Hare hospitably entertained the Society at Knole Park, and threw open his art-treasures for inspection. At Almondsbury Church Mr. Reynolds drew attention to the thirteenth-century chancel, showing well the ornament of the period. The monuments and epitaphs having been examined, the travellers started back to Bristol through Southfield, halting at Redland Manor House, the residence of Mr. Reynolds, to inspect some rich examples of domestic architecture. In the evening a *conversazione* was held in the lecture-theatre of the Museum, Queen's-road. Mr. C. J. Thomas presided, and there was a good attendance. Mr. Alderman Fox (Master of the Merchant Venturers) read an interesting paper on "The Ancient Guilds of Bristol," for which he received the thanks of the meeting, and which he was asked to have printed in the proceedings of the Society. The remaining papers were "The Ancient Privileges of the Bristol Freemen," by Mr. J. F. Nicholls; "The Manor of Clifton," read by Mr. Jacques on behalf of Mr. A. S. Ellis; "The Roman Remains at Berkeley," read by Mr. J. F. Nicholls on behalf of Mr. Irvine; "The History of the Bristol Portrait of Sebastian Cabot," by Mr. George.

Thursday, August 1st, the third day of the meeting, was spent in Bristol. The Society met at the Mayor's Chapel, when a paper on the building was read by Mr. J. Taylor. The party was conducted over the chapel, and various points of interest examined, and Mr. Taylor was warmly thanked for his paper. They next repaired to the cathedral, in whose inspection a considerable time was spent. Mr. R. J. King read a paper on the architectural and other features of the building. He remarked that there was nothing quite like this cathedral, either in England or on the Continent. It stood, in many respects, alone, and a minute acquaintance with other great English churches of the same period enabled even an unprofessional student like himself to recognise and appreciate its remarkable peculiarities. The beauty of the edifice had not always been recognised. The great originality of the design seemed to him to have resulted in nothing but what was admirable. The nave, so long wanting, had been added to the choir and transepts, and how far the cathedral in its renewed condition can be pronounced unpleasing, might, he thought, safely be left to the judgment of all who were visiting it that day. The great distinguishing features were the lofty main arcade, with triforium or clearstory, the aisles of equal height with the nave and choir, and consequently admitting of those lofty and magnificent windows which quite compensated for the absence of the usual stages above the arcade; the roofing, or rather the vaulting, of the aisles, and the disposition and design of the sepulchral recesses. After the paper, the members went round the cathedral, and various details were examined and described. Mr. King was cordially thanked for his paper. After leaving the cathedral, the visitors proceeded to All Saints' Church, which was examined; and afterwards the Corporation records and insignia were inspected at the Council-house. Some explanatory and descriptive remarks were made by Mr. J. F. Nicholls. The Red Book, Book of Wales, and other interesting volumes, came under notice. The members and their friends were received in the Council Chamber by the Mayor, the Treasurer (Mr. Harford), the Town Clerk, and the Deputy Town Clerk. In accordance with previous arrangement, the company next visited the Merchants' Hall, in Prince-street, where luncheon had been provided by the Master of the Merchant Venturers. In consequence of the large number of guests it was found necessary to occupy two rooms. The Mayor (Mr. G. W. Edwards) was present, as also the Master of the Society, the President of the Association (Mr. C. J. Thomas), Mr. T. T. Taylor, Mr. F. Lucas, Mr. M. King, several gentlemen connected with the city, and a full attendance of the members of the society and their friends who had invitations. After the luncheon some complimentary toasts were proproposed. Mrs. Hallett, responding for "The Ladies," expressed satisfaction that at the meetings of this society the ladies had their rights as well as their privileges. From the Merchants' Hall the members and friends proceeded by King-street and Bristol Bridge to St. Philip's Church. The architecture and peculiar features were described by Mr. J. Taylor and Mr. J. F. Nicholls. On returning into the city, several houses in Castle-street and near the Castle were visited, by permission of the tenants. An interesting paper was read by Mr. J. F. Nicholls on the Castle as it was, and what portions of it remained. The party then repaired to the Black-friars, where a paper was read by Mr. J. Taylor, on "The Dominicans in Bristol." St. James's Church was the last place visited for the day. The members were received by the vicar (the Rev. T. Graham). Mr. J. Reynolds made some explanatory remarks. In the evening the Mayor of Bristol entertained a very numerous party of the members of the society and other gentlemen to a dinner at the Mansion House.

The concluding meeting of the members of this society was held on the morning of Friday, the 2nd inst., at the Museum and Library. Mr. C. J. Thomas presided, and in opening the proceedings said he thought the society might congratulate themselves upon the very favourable weather they had had, and also upon the zeal that had been displayed in promoting the success of the meeting. Several resolutions, conveying votes of thanks to the Mayor and Dean of Bristol, and to all others who had promoted the success of the meeting were agreed to by acclamation, and it was resolved that Cheltenham be the place of next year's meeting, and that the choice of a president be left to the decision of the council.

After the meeting a number of the party started for Hannam, and thence proceeded to Bitton, where luncheon was provided in the school-room. They left Bitton for Siston Church and Court, and proceeded to Pucklechurch, whence they returned to Bristol, where the party dissolved.

ROYAL ARCHÆOLOGICAL INSTITUTE AT NORTHAMPTON.

The thirty-fifth annual congress of the Royal Archæological Institute of Great Britain and Ireland was commenced in Northampton on Tuesday in last week. The members and friends gathered in strong force in the Assembly-room of the new Town-hall, to be present at the official reception by the Mayor and Corporation. The Town Clerk read an address, which was certainly a model of brevity as compared with other addresses of the kind we have listened to.

Lord Talbot de Malahide, president of the Institute, thanked the citizens for their words of welcome, and said it would be cheering to the members of the Institute to remember, in the course of their proceedings, that the Corporation took an interest in their pursuits, which he was satisfied would have a tendency to preserve the ancient monuments of our country. He feared that it was not every corporation that was equally deserving of praise. Northamptonshire was comparatively a new country to the members of the Institute, and the antiquities of Northampton would be barely touched upon by what they proposed to do. There were many historical associations connected with this county, some of great importance in relation to the history of the country at large, and to the constitutional history of this country. He missed the presence of one old friend in particular who was intimately connected with the county, and whose *spécialité* it was to describe from time to time the different historical events that had taken place in the localities where the Institute held their meetings, and who would, no doubt, had he been living, have favoured them with an account of Northampton, and of the battles

which took place here in the neighbourhood, and had such a powerful influence on the future of this country. He need only mention the name of the Rev. C. H. Hartshorne to awaken the feeling that in the death of him they had sustained a very great loss. While it was a pleasure for one to attend those meetings, and to meet with those amongst whom friendships had been formed, yet there was also a painful feeling attached to that when one came to think of the deaths that were constantly occurring. Here he might mention that when he first joined the society a good many years ago, and for some time afterwards, it had had the advantage of being presided over by a nobleman who was highly accomplished in every branch of science and of art, and who did much to promote the prosperity of the society. A great many would remember the old Marquis of Northampton (the father of the present Marquis). There was, perhaps, no one in such a high position who took such a lively interest in literature, science, and art as that nobleman did, having been president of the Royal Society, for many years president of the Geographical Society, and of many other learned societies, his scholarship being one of the brightest jewels in his coronet.

The Archdeacon of Northampton then stepped forward, and presented addresses of welcome, firstly, from the clergy of Northampton and the neighbourhood, and secondly, from the Architectural Society of the Archdeaconries of Northampton and Oakham. The address presented by the last-mentioned body concluded as follows :—

"The restoration of our ancient and beautiful churches has, with the willing consent of the clergy and churchwardens, occupied very much of our attention during the past few years, and whatever criticism in this direction your more practised skill may prompt can be usefully adapted and applied to the churches that are yet unrestored. It is our earnest desire and our confident hope that occasions like the present may be the means of cultivating among all educated men a higher appreciation of the noble and cultivated art, in the name of which we welcome you to Northampton; and that while you are the trusty and trusted investigators of the illustrious past in the architecture of the nation at large, we may be the pioneers in our own county of good taste, sound judgment, and gracious design in the buildings of the present and of future generations."

Lord Talbot de Malahide briefly responded, and then vacated the chair in favour of the Rev. Lord Alwyne Compton, the president of the meeting, who then read his inaugural address in which he said : —

My subject is long enough to occupy any length of time, only I fear, on the one hand, I may find it difficult to interest those amongst you who for the first time, have joined the ranks of the Archæological Institute; and, on the other hand, that whatever I say may be a twice-told tale to my fellow-members of longer standing. Do not then suppose, ladies and gentlemen, that because archæology must be my theme, I intend to begin, as used to be the rule,—and perhaps still is with our brother antiquaries of Italy,—at the creation of the world. The study of primæval antiquities is, indeed, most fascinating; and it is of no small importance, connecting itself, as it does, with the whole history of man. No doubt some of you have read that remarkable paper by Mr. Wallace, in which he shows how little historical foundation there is for the theory of the gradual development of man's civilisation from the ignorance which he is supposed to have shared with his supposed ancestors, the anthropoid apes. On the contrary, the earliest traces of man, whether in his bones or in his works, show a very high order of intelligence; and, at any rate, in a large part of the globe, barbarism has followed, not preceded, civilisation. But of this primæval archæology we have not, perhaps, the most important monuments in our country,—or, at any rate, in Northamptonshire; and while we hope for interesting papers upon all antiquarian subjects from our friends assembled here, we know that of course the local subjects must in a great measure predominate. Nor shall I attempt to describe the rich feast of antiquities that our guests will find in and around Northampton. Briton, Roman, Anglo-Saxon, Dane, Norman,—all have been here, and have left the marks of their presence. Our churches, if not of the great size of those in some parts of the kingdom, are numerous, and contain examples of every style, from the earliest Saxon of Brixworth, as Mr. Parker has supposed, and the Danish of Earl's Barton, to the Late Perpendicular of Whiston; and our domestic architecture ranges from the Edwardian towers of Rockingham to the Elizabethan towers of Castle Ashby. But of all this you will hear from others; all this you will, I hope, see for yourselves. I think I can more profitably occupy your time now with a few remarks on a question that is of passing interest to the antiquary, and is now pressed upon us from a new and unexpected quarter,—the question of the restoration of ancient buildings. I need not tell any one here present, whether he be a dweller in Northamptonshire or one of our guests from some other county, that the restoration of our ancient buildings has for many years employed our architects, giving a practical interest to one part at least of the studies of our archæologists. Through the length and breadth of our country, from the grand cathedral to the humblest parish church, this work has been going on at a cost of many thousands of pounds. I believe that in some counties scarcely a church remains unrestored; in others,—here, for example,—the work is in full swing. But nothing passes unquestioned now-a-days, and we have of late been assured that all this work is mischievous,—in fact, little else than destruction,—and a society has been formed, called, I believe, the Society for the Preservation of Ancient Monuments, but which devotes much of its energies rather to preventing restoration than to meeting decay. I do not think that any antiquary will deny that under the name of restoration much destruction has actually, in many cases, taken place. Workmen, in all ages, perhaps,—certainly workmen in the present day,—like a good job, well-finished and complete work. Old untidinesses are a pain to them. They prefer spic-and-span novelty to the crumbling stones in which lichens and artists delight, and thus, even with the best restoration, rich mouldings are sometimes simplified by being scraped down; and, even where the old work is most accurately copied, much of its beauty will be gone, much of its spirit be missing. A workman who tries to copy is not likely to produce an effect equal to that of the man who was, to a greater or less degree, original in his work. Thus it comes to the archæological student an unrestored church is a special delight; but when the conclusion is drawn that, therefore, no church should be restored,—that no improvements must be attempted,—that we must neither, like the men of old, boldly put our own work in the place of that of our predecessors, nor yet, as we have lately been doing, lovingly try to reinstate what they did, but must retain all as we find it,—we feel there must surely be some mistake; that surely this new zeal for the preservation of ancient monuments outruns discretion. And that it does so seems quite certain, when we find it gravely argued that if a church is too small, or in any way inconvenient for its main purpose,—the public worship of God,—we must carefully preserve it as it is, putting, if need be, iron bands to keep its stones together, for they respect the stones far too much to replace one of them, and build by the side of it a new church for use. This suggestion is so preposterous that it is really difficult to argue against it. Of course, it might be possible to adopt it in the case of a very few buildings of very great interest. But the difficulty that has been found in providing, even by legislation, for the preservation of some of the most ancient remains in this country,—a preservation involving no expense, but simply the loss, from cultivation, of a few acres of ground, shows how impracticable it would be to raise the necessary funds. We find it hard enough work to get all we need for restoration on the present system, when we are pressed on the one hand by the religious, and on the other by the æsthetic, feeling. But to build a new church, in order to keep the old one intact, would appeal to the feelings and to the pockets only of the small band of the Society for the Preservation of Ancient Monuments, or, as it has sometimes been called, "Ruinistic Society." And what would be the final result? Suppose such a scheme had been adopted two centuries ago, how many of our ancient churches should we now have to study from? Would not the certain result after a few years be the neglect of the disused building, and its consequent decay and ruin? I have been tempted to speak on this subject to-day, because we have here for the study of our friends two very remarkable examples of restoration which go far to vindicate the system, when duly carried out, from the recent attacks upon it. St. Sepulchre's is one of the few churches built in England in a circular form after the model of the Church of the Holy Sepulchre in Jerusalem. It has been restored. What is the result? It is that the antiquary will find it more worthy of his study than it was before. It was restored by Sir Gilbert,—then Mr.,—Scott, working with some of the members of the Architectural Society of this county, as well as with the local authorities of the parish. No attempt was made to carry out the impossible task of replacing the exact circular Church of Simon de St. Liz, but many features of the old work, which were before concealed, are now visible, and being still a church, there is every probability that it will remain for the study of future antiquaries for generations to come. The other example I would refer to is, in some respects, more remarkable and more to my purpose. It is the Queen's Cross. I need not tell you that the march of improvement, or the progress of decay, I know not which, has deprived us of several of those beautiful monuments of the love of Edward I. How is it that our example remains? It is owing to the hand of the restorer. In the year 1713 it was nearly falling into ruin by reason of age. A hundred and sixty years more of neglect would probably have left nothing but a ruin for us to study. But it was restored by the Honourable Assembly of Magistrates of the county of Northampton, as appears by a notice placed upon it at that time. A second restoration took place in 1762; a third, at a comparatively recent period, was carried out by Mr. Blore, the architect; and I can hardly imagine a more crucial example of the good or the evil, whichever it may be, of restoration, than this thrice-restored cross. The dates are enough to frighten the antiquary. Queen Anne's time, whatever it may have been in respect to household furniture, which we now delight to copy, was certainly not a very Gothic period; 1762 was a period of taste we have not yet reached; and Blore's work does not always commend itself to our judgment. Yet when Mr. Law, an architect, and a member of our local society, stirred up by the bitter words of a paper read at the Archæological Association, which met here sixteen years ago, examined minutely and carefully this Cross, he found the restorations throughout had been so carefully executed that, but for the use of different stone, he could not have distinguished the new work from the old, and that all the most singular features of the design, which had been attributed to Mr. Blore, existed in the original stonework. Thus we find that, thanks to this one of several generations of restorers, we have Queen's Cross still to admire and to study, such as it was when first erected, nothing being wanting except the termination, which, in a true spirit of conservative restoration, was left imperfect by Blore, though it is almost certain that a cross originally stood on the summit. I think these two cases of restoration—and there are many others equally carefully carried out in this county — are a fair answer to the attacks made upon restorers generally. Still, as I have already said, there have been many cases, and there might be some more, where persons engaged in this very necessary work, either from ignorance or carelessness, have done as much mischief to an ancient monument as time itself was doing; and the only safeguard against this is to be found, first, in the more correct taste, and the more reverent esteem for old work diffused by this Institute and its many smaller sister societies; and, secondly, by the preservation of records of what existed before such restoration began, and what was done in each case; which records form, or should form, part of our stated work. Looking at the great need for such records, and the great mass of them that should be accumulated, I think it is much to be wished that all antiquaries should, if possible, work together. And I hope I shall not be considered by the more energetic workers of the Institute to be stepping beyond my province as president of this meeting, if I express my earnest wish that the two long-divided bodies of the Institute and the Association could once more coalesce into one. I do not for a moment suppose it would be an easy work to carry this out; each has, no doubt, to a great extent, now an established individuality, and, though we often see two individuals joined together happily as heads of a new household, marriages of whole societies are not so common. Still, I cannot but think one peripatetic society of antiquaries for the British Isles would be quite enough combined with the local societies, which are so general; and, though I have my own opinion on the original split,—an opinion sufficiently indicated by my having always been a member of this body and never of the other,—I cannot help feeling that old

feuds are best forgotten, and that each society would be strengthened and invigorated by their union. And then the Archæological Institute and Association,—for such I suppose would be its style and title,—might further connect itself with all the local societies. Many of them have already joined to the extent of publishing their transactions in one common volume; thus, at a very moderate increase of expense, securing a much wider circulation for the papers contributed by their various members. But I think if the Institute and Association would take a central position with respect to them all, and would prepare annually for them all an index, or *catalogue raisonné*, of their several contributions to antiquarian knowledge, we should be able to do a great deal more, and avert the risk which now exists of the same work being done twice over in different places. This work of union might, perhaps, tend still farther; though it might, perhaps, be too much to look forward to really united action with such important independent bodies as the Society of Antiquaries, the Institute of British Architects, and others. But still it is well to bear in mind that union is strength, and that, whether for the study or for the preservation of our ancient monuments, we shall be more powerful, in proportion as we can bring to united action the whole of those who take an interest in these subjects.

Lord Talbot de Malahide, in moving a vote of thanks to the president of the meeting for his address, said that although he belonged to the Society for the Preservation of Ancient Buildings, he did not go the same length that some people did in holding that in no case was restoration necessary, but he was not quite sure whether, looking at the extent to which restoration was carried on now, it did not mean the complete destruction of the ancient character of many of our most valued buildings.

Lord Alwyne Compton, in replying, said he was not aware that Lord Talbot belonged to the Society to which he (Lord Alwyne) had referred, but he had not the slightest doubt that if he were living in the same parish as Lord Talbot, and the church had to be restored, they would agree upon every detail; for, although not a member of the Society for the Preservation of Ancient Buildings, he (Lord Alwyne) would stand up for conservative restoration. He would not destroy anything ancient if it could possibly be preserved. He hoped the Society to which the Lord President of the Institute belonged would do some good, only he feared that it might do some harm in preventing desirable restoration, and being an excuse for people keeping their money in their pockets when it would be much better taken out.

Mr. J. H. Parker followed by expressing his surprise to see a letter from the secretary of the Society just alluded to, calling upon him (the speaker) to attack Mr. Jones for the restoration he had effected at Bradford-on-Avon. But the truth was that, having acquired bit by bit the property which originally belonged to the church, formed a committee, and engaged Mr. Irvine, one of the best Scottish clerks of works, he had carried out a most desirable work, and it was outrageous he should be attacked for it. At the same time, it was perfectly true, as the late Sir Gilbert Scott pointed out, that a great deal of mischief was done by so-called restoration, which was nothing less than the demolition of old buildings, and the replacing of them by new ones.

Lord Alwyne caused some laughter by saying that the last thing was that the Society, it was said, had forwarded an address to Sir Garnet Wolseley, begging that there might not be too much restoration in the island of Cyprus.

The members and visitors then proceeded to the Gold-street Lecture-hall, where they were entertained at luncheon by the Mayor and Corporation. They afterwards proceeded to

St. Peter's Church, and in the course of his description Mr. J. H. Parker said this was a very curious and interesting old building, and one of the best examples in England of the rich Norman style. At first sight, it appeared to be a very easy church to describe, as it was apparently all of one period. But, on examining it, they found that was by no means the case. There were certainly the six arches of the original nave, and the walls and buttresses throughout the church were of the Norman period. The east and west ends, it was curious to note, however, were subsequently erected, the last-mentioned being of the time of Henry VIII. Unfortunately, there was no history of the church. Tradition said it was connected with the Castle, but that was all the information possessed on the point. They had, therefore, only to go upon the principle of comparison. The details are exquisitely wrought, and having been cleared from the plaster and whitewash which formerly concealed their beauty, they now exhibit some of the finest models in the Norman style of architecture. Some attention was devoted to the font, which is very similar in design to the Queen's cross. On the north side of the crypt (whose architectural features are similar to those of the church) there is a doorway which is said to be the entrance to a subterranean passage to the chancel; and on the north side of the sanctuary is a credence-table supported by a Norman pillar with polished granite shaft. The church is 90 ft. in length, including the chancel, and 34 ft. in breadth. The exterior of the church was viewed from the north-west side of the grave-yard, and found to be equally interesting with the interior. The arcades were pronounced by Mr. Parker to be very rich; and he also commented admiringly on the west Norman arch, which he did not think was on its original site. St. Peter's Church was thoroughly restored in 1850-2 at a cost of 2,060*l.*, under the superintendence of Sir Gilbert Scott. It was then that the east wall was thrown down and the chancel thrown out about 15 ft. upon the old foundation.

The Castle Remains were next examined with considerable interest, and general regret was expressed that the authorities of the town had not obtained the site for a recreation ground, for which it is admirably adapted. In a few short months the works of the London and North-Western Railway will occupy the spot on which the ruins now stand. The Castle, it is generally believed, was erected by Simon de St. Liz, soon after the Norman conquest. Some antiquaries have supposed that it was erected on the site of a more ancient structure, whether of British, Roman, Saxon, or Danish origin is a matter of conjecture. As there is no mention of the castle in Domesday Book it could not have been completed until after that survey was taken. The recorded history of the castle is of the most entertaining character.

The company next proceeded in carriages to the so-called—

"*Danes' Camp*," *Huntsbury Hill*.—This work is situated to the south-west of Northampton, and affords an extensive view of the surrounding country. The other military works in the neighbourhood—the entrenchments at Rothersthorpe and Clifford-hill on the west and east, and the Borough-hill and Guilsborough to the north-west and north—can be seen in the distance. Although hitherto known as Danes' Camp, Mr. Bloxam pronounced it to be British. He pointed out that it was formed according to the natural configuration of the ground; and was certainly not Danish, because the Danes were destroyers rather than constructors.

Queen Eleanor's Cross was lastly examined. It was erected in memory of the Queen of Edward I.; and of some ten to fifteen built at the same period, only two others, Waltham and Geddington, survive the rude hand of time. The company were much entertained with the general description by Mr. E. F. Law, of Northampton.

On the return journey to Northampton, the old hospital of St. John was examined. This building was founded in 1137; but the present building belongs to the Decorated period.

In the evening the members met at the Town-hall, when Dr. Evans, F.R.S., president of the Section of Antiquities, gave an exhaustive *resumé* of the history of the county. He passed rapidly in review the leading points so admirably summarised by the late Rev. Thos. James, of Sibbertoft, and then proceeded to trace the palæolithic and neolithic remains found in the county, as well as the relics of the pre-Norman period.

The Rev. R. S. Baker read a paper, which was listened to with much interest, and has attracted some attention from a new and ably-argued theory it promulgated, as to the origin of the name of Northampton. The title of the paper was, "The Nene Valley as a Roman Frontier." It was argued by Mr. Baker that the Roman camps still existing on the right bank of the Nene, at intervals of about seven miles from Chesterton, near Peterborough, to Clifford Hill, near Northampton, are part of the chain of forts mentioned by Tacitus, in his "Annals" (book xii., section 31), as erected by Ostorius, in the reign of Claudius, about the year 48, or fifteen years after the Crucifixion. This view had been expressed by Camden and successive writers, but the novel part of Mr. Baker's argument was, that the name Tacitus gives for the Nene, Antona, is simply correct, and requires no fresh reading; that the Nene, or at least the upper portion of it, was called Anton in British times, and gave its name to Northampton, which in Domesday is written Northantone. He cited the case of Southampton, which was shown to be a remarkable parallel to that of Northampton, and to be certainly of Celtic origin, and derived from the ancient name of the river Test, which was in Roman times Anton,—a name still retained by the natives in its upper branches about Andover, &c. Mr. Baker gave an instance of traces of the same name still clinging about the Nene. The latter name is derived from the Celtic Nant, a valley, and Anton signifies in the same language "end water," or "boundary water." The paper was followed by a lively discussion, originated by Lord Talbot de Malahide, and carried on by Mr. Evans, Mr. Barber, and several other gentlemen, who, as a rule, seemed to regard Mr. Baker's theory as a reasonable one.

On Wednesday some sixty members and friends of the Institute assembled at 9.45 a.m. and went in carriages to the following places:—

Harlestone Church.—This church, dedicated to St. Andrew, is ancient, and consists of nave, side aisles, chancel, and south porch, and a tower containing a peal of six bells. The rector (the Rev. D. Morton) stated that the tower was in existence in 1294, and that the chancel was rebuilt in 1320, according to MSS. in the British Museum. These statements were confirmed by the inscription on Richard de Hette's monumental slab:—"Orate pro anima Ricardi de Hette qui fecit cancellum, cujus auxilio fuit ecclesia facta anno Domini 1325." The MSS. stated that by way of donation to the work different people respectively found the ironwork and glazing, stone and wood, and carpentry. The porch is later than the body of the church, and the clearstories Late Perpendicular. With respect to the narrow windows in the chancel, Mr. Parker termed them leper windows, by which the sacrament was administered to persons suffering from contagious diseases; but Mr. Bloxam considered they were for utter confession. The former gentleman said it was possible they were used for both purposes.

Althorp Park.—A pleasant drive through the handsome avenue brought the party to Earl Spencer's spacious mansion. The house is now closed for alterations, and, in the absence of its noble owner, the Rev. F. J. Ponsonby, formerly rector of Brington,—a gentleman thoroughly acquainted with the lore of the locality,—received the company. The splendid library numbers about 33,000 volumes. Mr. Ponsonby greatly interested the visitors by showing some of the choicest and most ancient specimens of typography, general admiration being expressed at the beauty of the work. Much attention was also devoted to the picture-gallery, which measures 115 ft. by 20 ft., and contains a fine collection of portraits.

Brington Church was the next halting-place, and here Mr. Ponsonby again acted as cicerone. The principal interest did not so much centre in the church itself as in the monuments found therein. The tombs and effigies of the Spencers from 1522 to 1636 are exceedingly striking, their fine and genuine condition, the display of heraldry, and the interesting costume exhibited, giving them a high value as memorials of an ancient and illustrious family. Brington is notoriously a special pilgrimage of the Americans; for the last English ancestors of George Washington lived in the parish many years, and are buried in the chancel under slabs bearing the arms: two bars in chief, three mullets, which, if not the origin of the stars and stripes, is at least, as Mr. Ponsonby observed, a most remarkable coincidence. The nave and aisles of the church were generally considered to date from the latter end of the thirteenth or the beginning of the fourteenth century. Points in the architecture of the church particularly noted were the fluted pillars, the poppyheads, and the buttresses on the south-west side. A quiet ride by East Haddon Church, which has recently been restored, brought the company to

Holdenby, where Mr. G. Nicholls had provided luncheon, which was partaken of by about 100 ladies and gentlemen. Subsequently Holdenby House and its interesting surroundings were examined, the Rev. F. C. Alderson conducting

the party, and explaining the history and characteristics of the place. The mansion was erected by Sir Christopher Hatton in 1570, and is especially memorable as the place of confinement of King Charles I. Holdenby Church is Late Decorated, and the chancel was rebuilt in 1848, from the designs of Sir Henry Dryden, bart. The whole church was restored in 1866 by Sir G. G. Scott. In the chancel particular attention was directed to a piece of very ancient glass representing the coronation of the Virgin, which the rector has had appropriately placed in one of the windows. The elegantly-carved oak screen is also very curious, having been originally brought, it is believed, from a private residence.

Spratton Church was first examined from the outside, Mr. Parker expressing agreement with Mr. Freeman that this was by far the best way to understand a church. He directed especial attention to the late Norman tower with Decorated spire — one of the finest features of the church; and in going over the less important details, showed how, as in many other parishes, old doorways and old windows were used in the later work for the sake of economy. The vicar (the Rev. J. Ll. Roberts) delivered a short address of welcome to the members of the Institute. He then indicated as an object worthy of inspection the beautiful alabaster figure of a knight in armour of the time of Edward III. with the arms of Arden. The vicar likewise mentioned the fact that there had been in the church three altars, in addition to a fourth, which he presumed stood in the chantry. The register dated from 1538; and the communion-plate was of the very best time of Queen Anne. Sir Gilbert Scott superintended the restoration of the church in 1847.

Brixworth Church.—The members had reserved their greatest treat until last. This church is one of the most remarkable and interesting in the kingdom; and the time of its erection is a point of considerable controversy. Viewing the church from the outside, Mr. Parker said the building was very difficult to explain, because it belonged to so many different periods. That there were remains of Roman work was evident, but how far they extended was a matter for consideration. The editor of Murray's Handbook spoke only of Roman materials, but he thought the arches were so well built that they must have been erected by the Romans themselves.

The Vicar (the Rev. H. E. Gedge) explained to the company,—which, having gradually increased, nearly filled the body of the church,—that the theory of Brixworthians was that the church had been a Roman basilica of the third or fourth century. He remarked upon the architectural formation of the place as favouring the idea, and said it was of the exact symmetrical proportions of the buildings in question. It was also remarkable that, taking a cubit to be 18 in., it was of the exact size of Solomon's Temple. In conclusion, the Vicar remarked on the fact of a Roman eagle having been found some fifteen or sixteen years ago, which could be inspected by the members of the Institute.

Mr. Bloxam had known the church fifty years, and, although Roman materials were used in its construction, was not disposed to place it earlier than the eighth century.

A member asked whether there was any proof of a Roman town having been in the neighbourhood.

Mr. Gedge said that was where they were beaten back. But, on the other hand, it had been said to be in their favour, for if the building had been in a large town it would not have been considered good enough, and consequently its most valued features would have been destroyed. As favouring the local contention he cited the situation of Brixworth between the Wash and the Severn, the discovering of Roman coins around, and its impregnable position,—the Romans having an eye for a good position.

Mr. G. T. Clark, of Dowlais, argued in favour of the building being Norman, stating, among other things, that it was too long for a Roman basilica.

The members of the Institute then examined the various points of interest in the church, notably a small fourteenth-century shrine, containing a relic and the Roman eagle, albeit some were sceptical as to the age of the last-mentioned.

A *conversazione* was held in the evening.

In the course of the proceedings, Mr. E. F. Law, architect, read a paper on Queen Eleanor's Cross. At the outset he alluded to the loving feeling exercised in the erection of the cross, which he held to be one of the most elaborate yet chaste and graceful, and withal appropriate, memorials to be found in the United Kingdom, or in any other part of the world. He then went on to state, as the result of most careful examination, that the several restorations of the Cross had interfered but little with the general character of the structure. Indeed, so carefully, and upon the whole so faithfully, had the restorations been executed, that had it not been for the varieties of the stone used in the several restorations, it would have been difficult to ascertain where some of them had been effected. It had been said, "Fancy the outcry that would be made if our favourite Titians, Raffaelles, Hogarths, and Turners were to have each a few square feet cut out, and replaced with new canvas with copies of the original." But he asked the objectors that if they possessed a real Titian, Raffaelle, Hogarth, or Turner, and by accident, or by the operations of time, some damage occurred to the picture, whether they would not hail with delight and satisfaction the artist who, by great skill and judgment, should thoroughly restore the defect, while leaving the other parts of the original untouched and uninjured in all its original purity and beauty? He was proud of many ancient works in every department of art, and was prepared to venerate them; but he freely confessed that he was not so antiquated in his pride and veneration as to allow them to become defunct, rather than lend a helping hand towards their proper and legitimate preservation. Mr. Law then dealt with the restorations of 1713, 1762, and 1836, giving from personal knowledge a very comprehensive account of the latter, which, he assured the visitors, was carried out with the most judicious and sacred care. He mentioned, in conclusion, that a desire had often been expressed to see the summit completed, but until something more definite could be discovered as to its original termination, he quite agreed with the late Mr. Hartshorne, and many others, that it would be well to leave it as at present.

On Thursday morning the annual meeting was held, the business occupying but a short time. At a quarter to ten a.m. the members and their friends left the Bridge-street Railway-station, for Wellingborough, where carriages were in waiting to convey them to Irchester. The name is derived, like the names of all places with a similar termination, from *castra*, and it is said that there was one of the fourteen forts of Ostorius, the Roman general, who subdued the British prince, Caractacus, A.D. 50, or thereabouts. In this county of "'squires and spires" the steeple at Irchester is conspicuous in a group of the latter, but, says Mr. H. Hartshorne, there is nothing very striking otherwise about the church. There are inside some excellent Perpendicular screens, and the pulpit is a good example of Cinque-cento work. Leaving for Rushden the party examined the church there. It is, says the same gentleman from whom we are quoting, "a highly beautiful building, with a magnificent Late Decorated steeple, finer even than that at Higham Ferrers." There is architectural evidence that the whole circuit of the walls is of the very end of the thirteenth century. The nave arcades are Early Perpendicular,—those of the chancel are later,—and the alterations subsequently tell their own story. "Within, the lofty transepts, the rich strainer arch, the fine roofs, the parcloses, and the Early English sedilia and piscina help to make up an interior which is not only exceedingly interesting, but very striking indeed." Driving next to Higham Ferrers, the grand collegiate church, which Mr. Hartshorne considers "the finest in a district remarkable for the splendour of its ecclesiastical buildings, its historical associations, and the numerous monuments of Mediæval piety with which it is surrounded," some time is spent here. Speaking generally, the Early English and Decorated styles prevail. To the former belong the tower, with its sumptuous double entrance, and the south arcade; to the latter, the lady-chapel, the double north arcade, and the roofs of the nave and north aisle. The interior is rich in brasses, heraldry, stalls, parcloses, and tile pavements, some of the enrichments being due probably to Archbishop Chichele, a native of the place, to whose munificence is owing the school-house, the bede-house, and college.

After luncheon at the Green Dragon, the party divided, those forming No. 1 proceeding in the direction of Raunds, and those forming No. 2 to the railway station for Thrapston. The former saw, at Raunds, a fine and massive Early English tower, with a singular pedimental set-off. The chancel, with its fine east window and aisle, are of the same period; but the north and south aisles are Decorated, with certain later features introduced. Near the church is a large barn, perhaps as early as the thirteenth century. Stanwick, which was next visited, has a church with a unique Early English octagonal lantern, with a fourteenth-century spire. The body of the church is of the same date as the tower, but both this and the south aisle have been greatly altered in Perpendicular times. Irthlingborough Church, whither the party drove next, has a curious and interesting character, its peculiarities arising mainly from the use made of the Norman foundations for the thirteenth-century church, from the enlarged building that was required when the college was founded, in the time of Edward III., by John Pyel, and from the domestic buildings then added, which do not exactly tell their own story. The most remarkable feature is the ponderous tower, with its lofty lantern. This is attached to the main body of the church by the western porch, and has vaulted chambers and other domestic features connected with it. They were probably offices of the college. The interior of the church, which is not so impressive as the outside, contains the effigies of Pyel and his wife, shockingly mutilated, and a good canopied tomb, in Purbeck marble, late fifteenth century. Proceeding next to Finedon, a church of great size and beauty was seen. The whole building, except tower and spire, which are rich Perpendicular, is Early Decorated work. The details throughout are of the best, the interior being as fine as the exterior. The chancel screen is of stone. A fine strainer arch takes the thrust of the western walls of the transept. The ancient practice of separating the men from the women prevails here. In the room over the porch is a curious collection of Divinity and valuable editions of the Fathers. During the stay at Finedon, the hospitality of the Rev. G. W. Paul, who provided tea for his visitors in the vicarage garden, was gratefully accepted. The party afterwards left for Higham Ferrers station, where they were rejoined by party No. 2, who were also proceeding homewards, having spent a most delightful afternoon in the neighbourhood of Thrapston. Islip, with its well-proportioned Decorated church and Perpendicular tower and spire, was first visited; then Lowick, where there is a beautiful tower and octagonal lantern, with flying buttresses. The style that prevails is Early Perpendicular, with painted glass of Decorated character in the windows of the north aisle. The effigies of Ralph Green and his wife (1419) are the work of Thomas Prentys and Robert Sutton, "kervers," of Chellaston, in Derbyshire, and were erected, according to an indenture still existing, in 1420, at a cost of 40*l*. The tomb and effigy of Edward Stafford, Earl of Wiltshire, are among the finest works of this period; the heraldic and other details being delicately and faithfully executed, and the sculpture of the whole as fine as it can be. "The dignity and solemnity of this fine church," says Mr. Hartshorne, "leaves an impression upon the mind not easily effaced." A pleasant drive brought the party to Drayton House, which stands in the midst of a park full of fine avenues of wych-elms and limes. Sir Simon de Drayton had licence in the 5th of Edward III. to crenellate or embattle the mansion and to impark thirty acres. The house, like the ownership, was subject to many changes. Henry Greene rebuilt a part of Drayton; it was much altered by the Mordaunts in the time of Elizabeth, and considerably renovated under William III., all these changes giving great character to the house. Tudor towers are crowned by William III. cupolas, and a vast hall has been interpolated within the old quadrangle, the approach to which is through a screen of the time of Simon de Drayton. The house retains its spangled beds, a quantity of old china, and a large number of portraits. The gardens were restored to their ancient formality of the late Mr. Stopford Sackville. There are large pieces of still water, in which the house is reflected, with lime-trees of great size sweeping the banks and walks of turf between them. The old hedges of hornbeam and beech might be the very same introduced from Holland by Sir John Germaine, who, according to Walpole, was so ignorant that he turned the pillars of his new colonnade with the capitals downwards, supposing them to be pedestals. After going over the house and

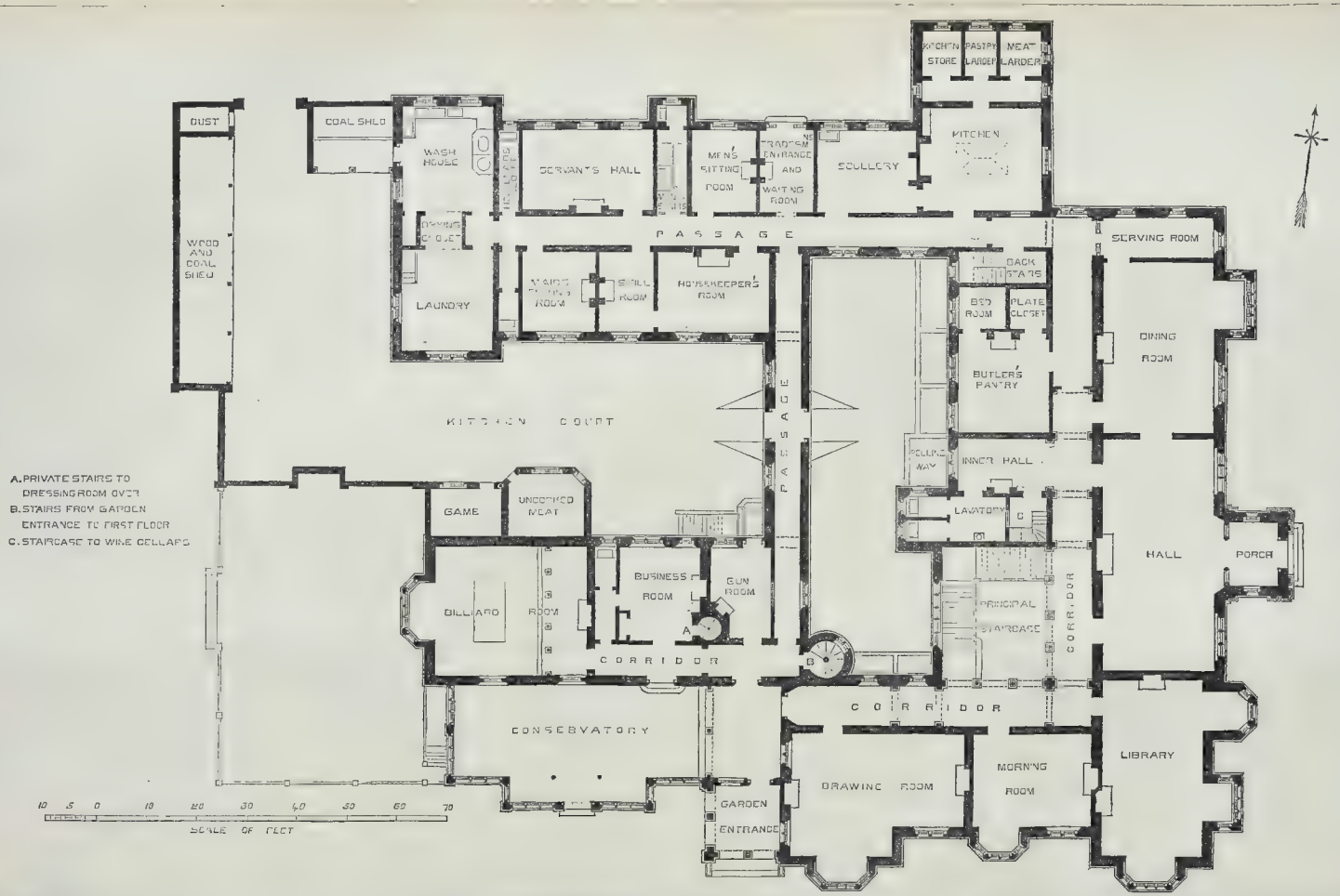


SIDBURY MANOR HOUSE, DE



David Brandon, F.S.A., Architect.





SIDBURY MANOR HOUSE, DEVON.—*Plan.*

north-western tower (which, by the way, appeared to be of later date, possibly as late as the end of the fourteenth century) would be noticed three figures of elegant proportions and in the original stone, they happily having been safe beyond the reach of the pikes of Cromwell's soldiers or of the Roman cement. Tradition informed them that in the niche immediately over the western window, where now they saw a bow-legged figure of Charles II. (erected in honour of him as the reigning sovereign at the time, and on account of his contribution towards the repairs of the cathedral after the disastrous civil wars, and in which good work Bishop Hackett took so conspicuous a part), there was originally a figure of our Saviour in glory, probably surrounded by the Heavenly Host, and which he (the dean) hoped in due time to see reproduced. The remaining niches now vacant were filled with Patriarchs, Prophets, and Judges, and probably some of the leading personages, both civil and ecclesiastical, of the Mercian dynasty. The lower stage of niches was occupied by figures of the Apostles. He (the dean) had already hinted that the upper stage of the north-western tower was erected at a considerably later date than east of the building. A careful examination of the structure showed this. It showed marks of an imitation of an earlier period which was not quite true to the Early period itself. It was quite possible the upper stage of the tower was erected about the end of the fourteenth century, and it was also possible the figures were of the same date. His reason for thinking so was because the series of figures of the kings on the north side of St. Chad ended with Richard II., who died in 1399. The party then re-entered the cathedral, the leading features of which were pointed out in succession by the Dean, who also indicated the position of the little vestries or mortuary chapels on the south side of the lady-chapel, which will be completely restored in honour of the lamented Bishop Selwyn, and in one of which his effigy will be placed. The Dean also drew attention to some other works of restoration which he himself had instituted.

The party then attended the afternoon service, and subsequently assembled at the entrance to the lady-chapel for the purpose of hearing some remarks by Bishop Abraham on "The Shrine of St. Chad." On the exact site of the shrine stood a chair, whereon was placed the Gospels of St. Chad, a bulky manuscript volume, which excited great interest. Taking up a position by the side of the chair, Bishop Abraham said that St. Chad's body was buried there for many years. There were but few traces of the shrine of St. Chad, and they were, primarily, those gospels,—St. Chad's Gospels, as they were now called, because they had been in that cathedral for many years. The librarian at Cambridge paid a visit to Lichfield to look at the book, and he was able to decipher on the first page the name of a Bishop of Lichfield, who received it from Llandaff Cathedral. The name was Kinsy or Winsey, who lived about the year 940, and from that time to the present, with the exception of a short period during the Parliamentary wars, the book had been in the possession of the cathedral authorities. It was one of the most remarkable manuscripts in existence, and many of the readings were unique; but he had not time to dwell upon these more than to say the book had been in the possession of the authorities of that cathedral since 940, and that on one of the pages were some writings which gave an account of how it came into the possession of the authorities of Llandaff Cathedral. Any stories they might hear about St. Chad himself, when he was consecrated, being sent on horseback from Winchester to this part of the country to convert the Mercians, and of his exchanging his horse for a copy of the Gospels, on which he was enabled to continue his ride, might be dismissed as mythical. The real genuine story of his coming there was recorded in Latin, and was to be found in the book before them. From some of the writings in the manuscript, it was probable that it belonged to the eighth century; it was one of the oldest manuscripts they possessed, and it might interest them to hear what an influence those sort of ancient books exerted. One Whit Monday he was showing the book at a meeting in the Black Country, when a pitman, on hearing that it was a thousand years old, stepped back and brought forward his daughter, telling her to put her hand on that blessed book, for she might never have another chance of touching a book a thousand years old. Such an incident showed the spirit of reverence in all classes of society for antiquity. Well, the volume was called St. Chad's Gospels, not because the saint possessed it, but because it had been in that cathedral probably for 900 years or more. That was one of the chief remains of the shrine of St. Chad. The next trace was "The Minstrelsy," which had been pointed out to them by the Dean. This Minstrelsy was so very rich and valuable that it was necessary always to have a priest living in the cathedral; and just under the minstrelsy was a sort of sacristy, called "The Monks' Larder," but no doubt Mr. Cox would be able to tell them more about that. In the late excavations in the minstrelsy, a former clerk of the works found the head of a doorway level with the floor, so that apparently the resident priest had a communication with the college of priests across the road. He (Bishop Abraham) thought that probably this doorway was another connexion with St. Chad's shrine. Thirdly, the College Council paid to the town a small sum of about 10*l.* a year for the pathway and right of road with the town across the Minster Pool into the cathedral, so that all pilgrims coming to that wealthy shrine might be able to have access to it; and if the Chapter at any time had shut them out, it would have seriously injured the trade of the town. That was another trace, and a record, he might say, of the value and richness of St. Chad's shrine.

Mr. J. C. Cox, of Belper, then read a paper on "The Mortuary Chapels of the Cathedral," which are to be restored in memory of Bishop Selwyn.

The Dean moved a vote of thanks to Mr. Cox, who subsequently mentioned that a small flue or concealed shaft had been discovered in the Consistory Court. He was at a loss to know what this could mean, and the only solution he could think of was that it was intended to carry off the fumes from incense censers or from lamps which could be placed on a small ledge or shelf underneath. He should be glad to learn if such an arrangement existed elsewhere. The Dean said he thought St. Nicholas could claim a right to the corner indicated as being the probable site of the chapel dedicated to St. Chad. The position of the shrine of St. Chad would lead to the belief that the lady-chapel comprised the whole space eastwards to the high altar, and that originally there was a screen running across.

KENT ARCHÆOLOGICAL SOCIETY.

The annual meeting of the Kent Archæological Society was held at Bromley and neighbourhood on Wednesday and Thursday in last week. The opening meeting was held at the offices of the Bromley Local Board, Earl Amherst, president of the Society, in the chair.

The Rev. W. A. Scott-Robertson (hon. secretary) read the twenty-first annual report, which stated that during the past twelve months fifty-one new members had joined the Society, and fifteen candidates (among whom was the Bishop of Rochester) awaited election. The receipts from subscriptions amounted to 280*l.* 19s. 6d., and arrears to the extent of 89*l.* 17s. 6d. had come in. At the bank the balance was 270*l.*, which, however, would be exhausted in defraying the expenses of the forthcoming volume of the "Archæologia Cantiana." The Society had commissioned an eminent artist to execute facsimiles of the unique mural paintings which adorned the walls and the vaulted roof of the apse of St. Gabriel's Chapel in the crypt of Canterbury Cathedral. The deficiency of light and ventilation rendered the copying of these works of art a difficult and expensive process. During the year the following interesting objects had been brought to light:—Two Roman coffins of lead, one found beneath the highway at Crayford, and the other at Chatham; a magnificent gold torque or amilla of five coils, found at Dover; a remarkable shaft, lined with bricks, and descending 146 ft. into the earth, opened at Eltham Park,* and a similar shaft during some excavations at Cæsar's Camp, Folkestone.

The report was adopted, and the members, to the number of about 200, repaired outside, and took carriages to Chislehurst, where they inspected the parish church. The Rev. J. B. Parker, the curate, read a few notes, which had been prepared for the occasion by the Rev. F. H. Murray (the rector), who was unavoidably absent. From the information so supplied, it appeared that there was evidently a church on the spot previously to the rebuilding of the greater portion of the present edifice, between 1442 and 1462; but the only remains of these are the font, a rude bracket at the north-east of the Scadbury Chantry, and the north wall of the north aisle. The date given to the font is about 1267, before which date the church was likely to have been very small, apparently only occupying the site of the present north aisle. The church of the date of 1440 and 1462 consisted of the tower, the north aisle, the nave, and the chancel, the pillars on the north side and the windows being of that date. In 1849, when the edifice was restored, the pews were of every form, height, and size; there were two galleries at the west end, the tower was blocked off with woodwork, there being a gallery across the east front of it. Other particulars were given as to the state of the church at the time. Attention was called to a monument to Sir Edmund Walsingham, and another in memory of Mr. Selwyn, grandfather of the late Bishop of Lichfield. A fire occurred in March, 1857, destroying everything in the tower and spire. The Rev. Mr. Robertson pointed out several mouldings, in the pattern of a rose, which had been placed there evidently in connexion with the severe contest between the Lancastrians and the Yorkists, in which the party emblems were red and white roses.

The carriages were once more taken to, and the visitors drove to Frognal, the seat of Earl Sydney (Lord-Lieutenant of the county), his lordship having given a cordial invitation to the Society. The whole of the interior of the ancient mansion,—at which Queen Elizabeth visited Walsingham, her Secretary of State,—and the spacious and beautiful grounds were thrown open unreservedly for inspection.

The next place visited was Eltham Palace, which was more interesting in an archæological sense than the previous objects of inspection. All that is left of the once stately palace, where the English sovereigns down to the time of Oliver Cromwell often dwelt, is a ruin.

On returning to Bromley, the visitors dined in the Drill-hall.

A meeting was held in the evening in the temporary museum attached to the Drill-hall, when papers were read by Mr. Flinders Petrie (on Kentish earthworks), Mr. Norman, Mr. Spurrell, Dr. Beeby, Mr. Latter, and others.

On Thursday a circuit south of Bromley was taken, and visits were paid to Orpington Priory and Church, Cudham Church, High Elms (the seat of Sir John Lubbock, M.P.), the earthworks at Holwood (the seat of Mr. R. Alexander, C.B.), Wickham Court (the seat of Col. Farnaby Lennard), and the church close by. The weather was all that could be desired. Soon after ten o'clock about 200 members of the society and their friends were conveyed in carriages from Bromley to the picturesque priory at Orpington, where Dr. Broom accorded them a hearty reception. Having assembled on the lawn, the company listened to some notes which had been prepared by the Rev. Canon Scott Robertson. He stated that the name of the house must have been derived from its connexion with the Priory of Christ Church, Canterbury. In Mediæval times, it was not called Orpington Priory; nor was there any religious house or monastery there. It was the property of the great dignitary who held the rectory of Orpington,—a position of great profit and influence. His rights as "parson" of Orpington extended over the adjacent chapelries of Hayes, St. Mary Cray, Downe, and Keston. He was the patron of the vicarages of those places and of Orpington. The small building of stone before them seemed to have been erected in the reign of Richard II., and appeared to have been complete in itself, consisting of three rooms, one over another. Below the surface of the ground was a vaulted crypt, from which a short staircase of stone passed upwards. At the east end was a fireplace and chimney, of which the projecting masonry could still be seen, and which was flanked by two buttresses, one at each angle of the east wall. These buttresses were placed diagonally, not at right angles to the wall. The architectural features of this small, compact, and complete building led to the supposition that it was built about the time of Richard II. An entry of a peculiar character, in one of the archbishops' registers, gave, it was thought, a clue to the history of this building. The entry recorded the fact that on April 9, 1323, the Archbishop sanctioned, if he did not direct, the erection of a vicarage-house in "Parsony's Garden," and it was

* Described in the *Builder*, p. 196, *ante*.

elieved to be more than probable that the resent building was the identical one erected that date. If so, the fact that that spot was ne parson's or rector's garden, suggested that ne house attached to this sinecure rectory was ery near; yet not quite adjacent to this little ouse, which was erected for the parish priest. r. Broom had shown to him (Mr. Robertson) the southern extremity of the house a cellar-indow of Early English character, now blocked p. The window corroborated the inference hat the ancient parsonage-house, belonging to he rector, who was non-resident, stood near, ut somewhat to the south of this small building the time of Richard II. In Tudor times, no oubt, a larger vicarage-house had already been rovided for the parish priest, and then the ore ancient rectory and the little vicarage ere united by the erection of a very fine Tudor all, open for inspection, and in which was to be en one of the most valuable collections of china the country. The crypt was lighted up for spection. The company were then shown over he Priory, and provided with refreshment, after artaking of which the church at Orpington was isited. From some notes prepared by the Rev. anon Robertson, and which were read to the ompany, it appeared that the church was pro-ably erected late in the reign of Henry II., or that of Richard I.; the western doorway eing enriched with mouldings of transitional r Early English character. There was in the uth wall of the nave, near the chancel arch, n indication of the former existence of a round-eaded window high up in the wall. The tower, hich stood at the north-east corner of the nave, ad Early English windows and arches. When he north chantry chapel was added in the fteenth century the Early English window in he tower's east wall was not destroyed, it still emained *in situ*. In the porch there was a fine anopied tomb of the Edwardian period, the anopy being carved in chalk. The north hantry bore in several places the armorial oat of its founder, one of the Rufford amily. On the south side of the nave ere two arches in the wall, near the chancel rch, and which probably admitted the preacher the pulpit, by means of a staircase in the all. There was a similar pulpit still in exist-nce in Foot's Cray Church. The south door of he chancel was worthy of a glance; it was of arly English character, and the wooden screen-ork in the tower arch was good.

A drive through beautifully-wooded country, splendent in the sunshine, brought the party Cudham. The church here,—one of those ld-fashioned, low, square-towered buildings, eculiar to Kent,—was visited, and the company ere informed that the Early Norman windows the nave, towards its end, showed that the hurch was erected early in the twelfth century. n the north side was an indication of a Norman oorway. The tower-arch, south-east of the ave, and the chancel arch, were of the Early nglish period. At the south-eastern corner of he nave would be observed a peculiar buttress-ike addition to the pier of the chancel-arch.

The next place visited was Sir John Lubbock's esidence, High Elms, where the party were ordially received by Sir John and Lady Lubbock, nd, at their request, proceeded at once to a arge marquee in the grounds, where dinner was erved. After the repast the visitors inspected ir John's museum, and strolled about the rounds.

From High Elms progress was made to Hol-wood. In Mr. Alexander's grounds Mr. Roach mith gave an interesting address upon the ncient earthworks there, consisting of three ramparts or mounds of earth running parallel, nd two corresponding fosses or trenches. Mr. mith denied their alleged Roman origin. He ontended that they were made by the ancient ritish or Celts, as fortifications, and not by the omans, as there was no brickwork or masonry bout them.

The next place visited was Wickham Court, etween which and Holwood the scenery was bsolutely magnificent, particularly on Hayes ommon. Mrs. Farnaby Lennard extended a ordial welcome to her guests, who inspected he lofty chambers of the old mansions and the ell-kept grounds. On the lawn some notes ere read, which stated that in the time of dward the Confessor the place was held by one odric. William the Conqueror gave it to his rother Odo, Bishop of Bayeux. Afterwards it ame into the possession of the eminent family f De Huntingfield in the seventh year of dward I. (1278). In the time of the Romans and earlier, it was a large and important station for which its commanding situation was well adapted. When the house was rebuilt by Sir Henry Haydon, in the reign of Edward IV. times which were very troublous—it was a fortified house; and after the Wars of the Roses it underwent a number of alterations. The church at Wickham having been visited, some of the party took their departure, while the rest had a pleasant drive back to Bromley, where they dispersed.

THE INTERNATIONAL CONGRESS OF HYGIENE.

This concourse of sanitary reformers has been opened with much success and enthusiasm England is not very strongly represented, at least so far as numbers are concerned; but the presence of Mr. Edwin Chadwick, C.B., is as a host in itself. We noted also among the English men who attended Dr. Hardwicke, Dr. Lory Marsh, Dr. E. J. Syson (formerly health officer of the important district of Salford, Manchester), Dr. Rose (of London), Dr. Hinckes Bird, Dr. Faure Miller (of the *Lancet*), and Mr. Adolphe Smith.

The questions discussed as yet relate to infant mortality, to the pollution of water-courses, and the adulteration of food. In next week's issue we hope to give some account of the forthcoming debates on the dwellings of the poor, and on unwholesome industries, such as the manufacture and use of lead in paint, and arsenic in the colouring of paper. Pending these debates, we can, at least, express our congratulations to the organisers of this Congress. Every discussion has proceeded thus far with the utmost order. The programme has been realised in its every detail, and the Congress cannot fail to contribute largely to the spread of knowledge in sanitary matters.

NEW BUILDINGS IN THE STRAND AND THE SAVOY.

THE ART-UNION OF LONDON.

Two handsome blocks of buildings are now in course of erection on land belonging to the Duchy of Lancaster, at the corner of the Strand and Savoy-street, one of the blocks being intended for commercial purposes and professional chambers, whilst the adjoining building on the west, which has its elevation and entrance in the Strand, is being specially erected for the Art-Union of London. The first-named building has three prominent elevations. The Strand frontage is 37 ft. in length and 62 ft. in height, containing, on the ground-floor, two shops, with four floors above, having alternate arched and square three-light windows, with ornamental brick arches and panels. The general face of the elevation is in white Suffolk brick, with Portland stone cornices, terminating with a balustrade, also in Portland stone. The Savoy-street elevation, and that on the south side overlooking the Chapel Royal, Savoy, are the two most prominent features in the structure. The Savoy-street frontage from the Strand to its southern boundary at Church-passage is 68 ft. in length, and is carried to a height of 72 ft., with a central tower rising 14 ft. above the main face of the elevation, making the extreme height of this portion of the elevation 86 ft. above the ground line. The main entrance to the upper floors of the building is in the centre of the ground-floor, and shows polished red and grey granite pilasters, with carved capitals and trusses in Portland stone, and surmounted by a massive arch, also in Portland stone. On each side of this entrance the ground-floor contains shops, the windows of which are arched in Portland stone, uniform with the central entrance. The first-floor windows are in Portland stone, with enriched friezes, and carved capitals, the central window being surmounted by a pediment. On each side of the central window there are two three-light windows, divided by pilasters. The second-floor windows are arched in Allen's white moulded Suffolk bricks. The third-floor windows are mullioned in character, whilst the fourth or upper floor are arched in moulded brick, uniform with those on the second floor. The elevation is surmounted by a balustrade, with a central tower, rising to a height of 14 ft., as already stated. The Church-passage, or south frontage, which overlooks the Chapel Royal and its churchyard, is uniform with the Savoy-street frontage, with the exception of the main entrance. The south frontage has, however, an entrance which leads to the chambers in the upper part of the building by a separate staircase. At the corner of Savoy-street and the Strand, and also at the south boundary at the junction of Savoy-street and Church-passage, there are angular elevations, with bold projecting bay-windows in Portland stone, 24 ft. in height. The staircase leading to the upper part of the building, and approached from the Savoy-street entrance, is 9 ft. in width, and is in moulded Portland stone. On the west side of the building, in close proximity to the boundary-wall of the new Art-Union buildings, there is a well, 12 ft. by 8 ft., for light and ventilation purposes, faced with white glazed bricks. Messrs. A. & C. Harston, of Leadenhall-street, are the architects, and Messrs. Sheffield & Prebble, the builders. Mr. Bennett is clerk of the works. The estimated cost of the buildings is 15,000*l*. They are being erected for Mr. G. Rees, the lessee from the Crown.

The new building adjoining, which is being erected for the Art-Union, from the designs of Mr. Edward Barry, will, when completed, be an ornamental addition to the Strand, to which it will have a frontage of about 30 ft., extending in depth 70 ft., to the boundary of Church-passage, and will contain spacious exhibition-rooms. The Strand frontage is entirely of Portland stone, richly carved and moulded. It has a massive and wide arched entrance, with lofty arched windows. Messrs. Perry, of Bow, are the contractors for the building.

In addition to the above-named buildings, the erection of another large block, intended for offices and residential chambers, has just been commenced on the south side of the churchyard of the Chapel Royal, on a portion of the site on which until recently stood the Lutheran Church. These buildings will have a north frontage of 200 ft. in length, facing the Chapel Royal, the frontage extending from Savoy-street on the east to Savoy-hill on the west. The buildings will extend to about 50 ft. in depth southwards. They are intended to be of an ornamental character. The Chapel Royal will thus very shortly have on its north and south sides high class new buildings with considerable architectural pretensions. The architect for these last-named buildings is Mr. E. Ellis, and the contractors are Messrs. Colls & Sons.

CLOCK-TOWER, DOWNHAM MARKET.

A clock-tower has been erected in the market-place of this town, the gift of Mr. James Scott, of Commerce-hall, Bridge-street. It was opened on Monday, the 29th of July, by Sir William Bagge, bart., M.P., who afterwards presided at a banquet given at the Crown Hotel in honour of the occasion.

The tower is in the Gothic style of architecture. It consists of an octagonal base or plinth, rising from a stone platform, and enriched on each face by panels and mouldings. In the centre of these panels are placed lions' heads and shields alternately, and upon the shields is the inscription:—"Presented to the town by James Scott, 1878." One of the panels is hinged, and fitted with lock and key, to form a door giving access to the interior of the tower. The top of the base terminates in a cornice at the height of 7 ft. Above this rises an octagonal shaft, divided and relieved by mouldings and filled in between each angle with several tiers of panels filled with tracery. Above this shaft the tower assumes a square form, with a a dial on each face. Around the borders of the dials are cable-twisted and zigzag mouldings, and in the angles of each face are panelled Flamboyant perforations filled with ruby-coloured glass, while below and above the dials around each face run similar quatrefoil perforations filled with ruby glass. The corners are relieved by ornamental standards, and the top by a cornice. At the four corners above are placed terminals, and above rises the roof, enriched with tile-like serrations and with open dormers on the four sides, fitted with open tracery and crowned with terminals of the pine-apple type. The whole is surmounted by a weather-vane. The height to the centre of the dials is 21 ft., and the total height 33 ft. The whole of the tower is of cast iron, bronzed and enriched around the dials, terminals, vane, &c., with gold. The work is from the design of Mr. W. Cunliffe, and has been finished under his personal superintendence, as also was the public fountain recently presented to the town of

Liverpool by Colonel Steble. The clock was manufactured by Mr. J. W. Benson, of Ludgate-hill, and is made with all the latest improvements. The wheels are of gun-metal, the teeth being cut by a machine driven by steam-power, and are fixed to their respective pinions (which are of steel, and working in gun-metal bearings) in such a manner that any part may be removed without disturbing the remainder. The striking train is made upon the rack-work principle, and fitted with metal fly-fans for regulating the time of blows given on the bell. The escapement is on the "dead beat" principle, and the pendulum compensated, beating seconds, with a bob of 56 lb. weight. The time is shown upon four illuminated dials of opal glass, covered with plain glass to protect the figures. The hands are of stout copper. The movement is fixed in the base of the column, and the hands are connected by means of iron rods about 14 ft. in length. The bell for striking the hours is placed above the dials, and was supplied by Messrs. Warner & Co., London; and the clock is fitted with an apparatus by means of which gas for illuminating it at night may be turned on or off automatically at any desired time. There is also a maintaining power to keep the clock in motion during winding. The motive power is provided by weights suspended to iron cords, which work the whole depth of the column. The total cost of the clock and tower was about 500*l*. A good deal of the work has been distributed amongst the tradesmen of the town, including Messrs. Trotter & Son, ironmongers; Mr. W. Lawrie, stonemason; and Mr. R. Gage, bricklayer.

THE MASTER OF THE MERCHANT TAYLORS' COMPANY.

It deserves a note in a journal such as ours' representing the interests of architecture and architects, that the gentleman who, as Master of the Merchant Taylors' Company, introduced the plenipotentiaries at the recent Guildhall reception, is Mr. Edwin Nash, a Fellow of the Institute of British Architects. Mr. Nash is an esteemed member of the profession, the architect of a long list of churches and schools, and for many years has been chairman of the Institute Board of Examiners under the Metropolitan Building Act, a position he has just now resigned in consequence of being made Master of the Company in question.

GRANSTON, PEMBROKESHIRE.

On the summit of a rugged cliff, overhanging the broad Atlantic, a few yards from Abermoule, the spot where the submarine cable that unites this country with America quits the British coast, stood till very recently the ruins of the church of the above parish. On the 4th ult., however, it was re-opened after a thorough restoration (which almost amounted to a rebuilding), from the plans and under the superintendence of Mr. E. H. Lingen-Barker, architect.

The wild birds of the sea had long made the sacred fabric their habitation, for the roof-covering, and many of the timbers, had to a large extent disappeared. There were no indications of any other floor having existed than the "bare earth," except in the Squire's high-backed pew, which occupied the whole of the transept, the distinction between rich and poor being also kept up most consistently in the other seats, which were nothing more than a few rickety trestles or forms. The walls being fortunately of very substantial masonry, have, with the exception of those facing north in the nave and south in the chancel, been left standing, but everything else was obliged to be renewed, open timber roofs, tile floors, doors, windows and fittings, the only part of the original work remaining besides walls being the fine old Norman font, which has been carefully cleaned and reset.

The contractors for the work were Messrs. T. & J. Lloyd, of Dark-street, Haverfordwest.

SUCCESSFUL CANDIDATES FOR THE WHITWORTH SCHOLARSHIPS, 1878.

Mather, Thomas (21), Pattern Maker, Preston.
Groves, William (20), Mechanical Engineer, Crewe.
Tozer, William H. (21), Engine Fitter, Exeter.
Kingdon, Zachary H. (21), Mechanical Engineer, Manchester.
Duckworth, Thomas (21), Marine Engineer, Liverpool.
Needham, Joseph E. (21), Pattern Maker, Oldham.

MEDALS TO ENGLISH ARCHITECTS, PARIS UNIVERSAL EXHIBITION.

With reference to our recent notice of the result of the labours of the international jury on fine art at the Paris Exposition in section 4, *i.e.*, architecture, we find it necessary to say that the entire jury on architecture comprised ten members, of whom five were French, and five represented other countries. Of these, the following is a list:—MM. Ballu, Bœswilwald, Duc, Lefuel, Vandremer, France; M. Ferstel, Austria; M. Basile, Italy; Mr. Charles Barry, England; M. De Suers, Holland; Mariette Bey, Egypt.

We are glad to learn that the report drawn up by the jury, and sent in for ratification by the superior authorities, states that *all* the members of the jury who were also exhibitors, desired to declare themselves *hors de concours*, though a "Rappel de Médaille d'Honneur" was attributed to one of its members in spite of his protest to the contrary.

The report has not yet been published in the *Journal Officiel* in Paris, so that it cannot as yet be literally published here.

FORESTS IN EUROPE.

According to the *Deutsche Industrie-Zeitung*, the area still covered by forests in Europe is 739,830,722 acres. This forest-area is distributed as follows over the different countries:—

	Forest Area. Acres.	Per cent of Productive Area.
Russia (in Europe)...	477,192,922	47·44
Austria	44,486,814	31·05
Sweden	43,532,960	75·72
Finnland	35,696,942	79 76
Germany	34,961,274	27·21
Norway	25,424 523	89·93
Spain	21,335,156	26·90
France	20,641,953	15·97
Turkey (in Europe...	13,371,023	19·72
Italy	12,413,956	19·18
Portugal	2,682,176	22·90
Greece	2,235,353	33·99
Switzerland.....	2,032,598	27·55
Great Britain and Ireland.....	1,974,320	3·88
Belgium	1,139,959	17·58
Holland	529,748	8·69
Denmark	456,068	6·38

"ST. PAUL'S: ANOTHER VIEW."

Sir,—It was not that I esteemed Stevens's special talent less, but that I respected the decoration of our Protestant Cathedral more, which induced me to protest in my previous letter under the above heading, against an exaggerated estimate of his merits, an estimate as much in excess of his deserts, as former depreciation was below them. I am afraid, however, that the term "*pasticcio*," which I therein used, was not the word used by the Italians to express that kind of art for which Stevens's had a talent, but I cannot yet recollect the right one. His talent was of that kind of which there have been many instances both in literature and in art,—a talent which can simulate the manner either of great writers, of great painters, or of great sculptors. It is, undoubtedly, a talent of a peculiar kind, but one which has never been esteemed of the highest order, nor ever ranked with genius. This talent of Stevens's, however, was, as in most other instances of the kind, incapable of any extensive and sustained flight. His did very well while it was confined within very narrow limits to small figures, and to small spaces, but it failed in mastery, in generalship, when dealing with large figures, and design upon a large scale. The design for the dome of St. Paul's, for instance, is a mere surface decoration. The designs for the main divisions would do very well for arabesques, but they afford no legitimate standing-room for the large figures which encumber them; and the contorted outlines of these divisions would have a most disagreeable effect against the gold ground. Some of the figures introduced into them, too, repeat too closely the figures in the spandrels beneath. The circular dishes in which it is proposed that Mr. Leighton's designs should be served up, would not give his great talents much scope, and would destroy their fine taste. The figures in these circles would play second to those on the arabesque divisions, and the gold grounds running through from the general surface of the dome into the circles would leave a series of rims, in which Mr. Leighton's work would appear as if it were cut out and pasted on. Stevens's design is deficient in plain spaces, a defect which outrages all true feeling for decorative propriety, for plain spaces, spaces of quiet, spaces of repose, form the necessary reliefs to the *loudness* of colour and ornamentation. In the best Italian examples of decoration this essential feature of decorative design is never lost sight of,—and it is for this feature that Thornhill's scheme so admirably provides. It carries up precisely those features of the construction beneath, which must form the setting of the figure decorations in the lower portion of the edifice. The figure subjects *in colour*, which I propose should be substituted for those in monochrome, by Thornhill, would, with their gold grounds, form an agreeable contrast to the neutral stone tint of the architectural portions of his design; and the gold grounds within the arches would give a solidity to these architectural features, which would be exceedingly impressive.

It is a fashion to depreciate Thornhill, but Thornhill's talent was prodigious for the time in which he lived, and is not to be despised even in our own day. There are extraordinary geniuses who do not hesitate to pronounce even Michelangelo and Raffaelle to have been "muffs." But have the committee at all contemplated the hazard they are running with public opinion in proposing to thoroughly erase Thornhill's work? "What!" said a stranger in a casual conversation on the subject, whilst travelling, "do you mean to say that they are going to utterly destroy Thornhill's work? Why! I always thought it was considered to be a part of St. Paul's." And I myself believe that its total erasure would raise "a cry" only inferior to what would be caused by a wanton destruction of the cathedral itself.

Furthermore, sir, I utterly repudiate the notion that the committee is a competent tribunal to direct such an important professional matter as the decoration of St. Paul's; it would not be tolerated by any other profession. Artists should raise their voice against the inconsistency. It is by such inconsistency that the art resources of the country are misdirected, that money is wasted, and that public art-work so frequently ends in fiasco. England cannot be made to see that art-work should be entrusted to the supervision and direction of artists. If the best artistic talent of the day is not equal to the occasion, much less is non-professional. In all the great art-epochs, the fine arts were directly encouraged by the employment of painters and sculptors on public works, and by leaving the direction of art-affairs to artists themselves.

Meter.

GEOMETRY AND OPTICS OF ANCIENT ARCHITECTURE.

Sir,—I have seen the work on the above subject, recently published by Mr. John Pennethorne, and have read with profit and pleasure the critical considerations thereof which have appeared in your journal.

The work at the first glance gives one that depressing impression which, to the mere practical architect, appears inseparable from scientific publications of so theoretical a character; but I think that even the general reader will find that, when attentively taken up, the many portions of the work which are really of service to the working architect, are far from exercising the influence which I have suggested, and I am led to this conclusion because I have given more attention to those particular parts of the work which you have more minutely criticised, and I have correspondingly derived considerable pleasure therefrom.

You refer to the subject of the modifications required in modern designs in execution, from their original proportions in the geometrical drawing, and it is only necessary to look around to discover the truth of your observation,—to find, visible from the street, just one-half of the windows above the principal cornices; to find in narrow thoroughfares, the whole of the proportions distorted, and nothing so distinct as unstudied soffites; to find mouldings utterly incongruous and meaningless because all is visible except that part to which the architect directed his attention in the geometrical drawing. Then clients wonder why it is that their buildings in execution appear so very different from the delineations which had been so delicately tinted

nd exhibited with so much satisfaction to their dmiring glances before the building commenced, nd if Mr. Pennethorne's book should lead to a roper study of architectural effect from the articular points of vision from which many uildings can only be regarded (such, for instance, s the opposite side of a narrow thoroughfare), is time and study will, to say the least, not ave been thrown away.

I have been much impressed with Mr. Pennehorne's observations on the "first given quanities obtained by proportion," and the "true imensions from calculation," and have also read our criticisms on the result of his calculations nd corrections in the East Portico of the Parhenon—the conclusion you arrive at upon this articular subject being that summed up in your wn words, "he has simply refuted himself by is own figures." The bases of your conclusions are, I gather, that Mr. Pennethorne's table hows that the proportions of the entablature nd pediment are *decreased* in execution instead f being *increased*, in order, as we may suppose, o preserve in perspective their true proporionate relation to the whole height of the order. Now if Mr. Pennethorne has fallen into this rror on a point in his work of the greatest inorest to architects, I should regard with very reat suspicion many or all of his other deducions and conclusions, but I cannot yet bring myself to think that he has so fallen into error.

The drawings given on Plates I. and II. of he work, roughly illustrated in your diagram p. 686) show the point referred to, and we find hat the true dimensions derived from calculaion are of course in excess—as a total,—of hose of the first given quantities by proportion, ut the result of Mr. Pennethorne's calculations hows a *minus* in the cases of entablature and ediment where we should have looked, you onclude, for a *plus*. There can be no doubt hat to support Mr. Pennethorne's theory the reater the distance of any particular member f the entablature from the point of sight, the reater must be the increment to correct the ffect of perspective on the architecture, and conceive that this would be in direct ratio, if he objects viewed were in a *vertical plane* without projection, the cases being altered where here are projections from that plane; and a tudy of the plate shows that although the qual parts into which the height of the order as been divided are simply repeated, or the ection of a sphere of which the point of sight s a centre, the heights of the *projecting* parts re not determined by the cut of the conveying ay on the *vertical plane*, but are determined by he cut of the ray on the vertical line, which is ound by producing a line up from the plan of he projections till it meets the converging ray hich corresponds with the particular division f the architecture required,—thus the last conerging ray but one cuts the extremity of the ascia above the corona of the entablature, *not* on he vertical plane which is cut to determine the eight of the column, &c., but on the plane hich is found by producing the projection rom the plan; and it seems to me that his method is correct, because the nearer he projections approach the point of sight he larger they will appear, and not only o, but wherever a projection occurs, there is ither a soffite or a series of mouldings,—vertical eight is lost, but *girth* is obtained, because we re then viewing the object directly on its diaonal plane; again, suppose that we have a *eceding* member above a projecting cornice,—a locking course, for instance,—the height of that ember would have to be determined in a imilar way by projection from the plan, and ot by a cut of the ray on the same vertical lane which served for the column: it is this aw in perspective which gives such value o Mr. Pennethorne's theory as to the manner n which the Greeks designed their buildings, nd enhances considerably the value of his mple method of corrections.

There is one other consideration which I hould like to note if I am not trespassing on our space. With reference to Mr. Pennethorne's trong point, that the Greek buildings he refers o were designed to be looked at from only one oint, you conclude that if the Greek architects orked on this principle they "wasted their me and science in a very foolish manner." Now, if we refer again to Mr. Pennethorne's alculations of the corrections in the east porco of the Parthenon, we shall find that the esult of the corrections for the total height is nly 51·074 for true dimensions from calculaons as against 50·668 for first given quantities obtained by proportion. I should, therefore, conclude that the general appearance of the building to the uneducated eye from any point had not been so altered that either the science or the refinement were thrown away (more particularly, as it would appear, that the Greeks took so much care to confine the spectator to a limited view); but that for the refined and educated there was one point, and one point only, where the building could be regarded in its perfection. The melody of a musical composition may be very pleasing to the uneducated ear, but a master would seek below the melody for evidence of skill and refinement,—its harmonies could be only thoroughly appreciated by the cultivated, but its general effect would not be materially injured; nor would it be distasteful to the ordinary hearer, because of a slight discord in the lower parts.

WILLIAM WOODWARD.

CHURCH RESTORATION SEVENTY-SIX YEARS AGO.

SIR,—The fact that the parish church of St. Peter, Sheffield, is about to be restored, has brought up a pleasant communication in the local *Independent*, wherein reference is made to a prior restoration in 1802. At that time it appears a new clearstory was built over new arcades, and much other work was done. Here is the agreement:—

"By an indenture of four parts, dated 17th March, 1802: the twelve capital burgesses of the first part; the Rev. George Smith, John Mower, gentleman, Francis Hoole, of Crookesmoor, gentleman, and others, of the second part; Revs. James Wilkinson, George Bayliffe, Edwd. Goodwin, Matthew Preston, Samuel Bates, and Francis Newton (the vicar, three assistant ministers, and the churchwardens), of the third part; John Ash and James Burbeary, gentlemen, of the fourth part; it is set forth that the parish church of Sheffield has become ruinous and in decay in the walls, arches, pews, roofs, and other parts of the fabrick, and needs immediate reparation and amendment. And the same church is in many respects become, not only clumsy and indegant in its appearance, but darkened and incommodious, by reason of the situation, condition, and disproportion of, and want of symmetry and proportion [*sic*] in several of the pillars, arches, windows, and other parts thereof, and requires, in these respects, considerable alterations and improvement. And whereas the said capital burgesses have agreed to defray the costs of such reparation as are to be made according to the plans prepared by Charles Watson, of Wakefield, which have been approved by the parties; and whereas the seats, stalls, pews in the body, and in the lofts, and other parts of the said church are mouldcrous, rotten, and decayed, and are, moreover, extremely irregular and incommodious, and greatly unsuitable to the rank, style, and condition in life of the present owners and occupiers thereof; and the flooring and pavement within the said church are broken, interrupted, and ruinous, and in decay, and require total and entire renovation; and whereas it is agreed that all the said pews, lofts, &c., with the reading-desk, pulpit, parish clerk's pew, font, and organ-loft shall be taken down and renewed, and new seats, font, &c., be erected in lieu of them, and that new flooring and pavement be laid. The new pews to be allotted by the Rev. Christopher Alderson, of Aston; Rev. John Lowe, of Wentworth; and Hugh Parker, of Woodthorpe, esq., commissioners, chosen by the parties to these presents. The owners of pews agree to pay their share of the cost of repairing, as their property will be thereby improved."

Attached to the deeds are some plans showing the alterations, sealed with the seal of the Church Burgesses, and signed by the architect and by the representative of the Archbishop of York.

Plan No. 1 represents "a section of the east end [of the nave], showing the effect of raising the roof of the church 4 ft., and the new side arches."

Plan No. 2 is a section showing the great new west window, with the roof raised 4 ft.

Plan No. 3 is a section through the chancel, showing the effect of the intended screens and organ.

Plan No. 4 is an elevation of the west front, showing the new west window and the centre battlement, adapted to suit the roof when raised. This plan shows that there were no west doors at that time.

Plan No. 5 is a section showing the five intended new arches [of the nave], proportioned and adapted to the present tower and chancel arches, with the roof of the church raised 4 ft.

Plan No. 6 shows "the intended new pewage for the galleries;" and No. 7 that for the ground floor.

On the schedule attached to this deed are appended the names of 194 persons, most of them, though not all, residents in Sheffield.

HARRY HEMS.

South London Free Library and Reading Room.—The rooms and library of the Working Men's College will be opened as a "free public reading-room and library" on October 1st next, and remain open every week-day, during suitable hours, so long as the expenses, estimated at 200*l.* per year, are provided by *local* contributions. The management will be under the control of a local committee, and the funds will be quite distinct from the funds of the college; but there will be no restriction as to age or sex, the rooms and books being freely at the service of any to whom they are useful. Subscriptions are needed.

THE GLOUCESTER GATE BRIDGE, REGENT'S PARK.

THE new bridge over the Regent's Canal at Gloucester-gate, Regent's Park, was opened with considerable *éclat* on Saturday, the 3rd inst., H.R.H. the Duke of Cambridge officiating. The Duke spoke genially at a breakfast which followed the ceremony, praising all concerned.

In March last we gave a view, plan, and section, of the structure, with full particulars.* Briefly, the foundation-stone of the present bridge was laid on the 11th of August last year, by the Right Hon. Gerard James Noel, M.P., First Commissioner of her Majesty's Works and Public Buildings. The new bridge, the builders of which are Messrs. Kirk & Randall, has been constructed by them from designs by Mr. W. Booth-Scott, C.E., chief surveyor of St. Pancras, the contract for the erection of the structure being 13,500*l.* The width between the parapets is 60 ft. in the clear, the carriage-way being 36 ft., and each of the pavements on either side 12 ft. The headway is 16 ft. above the water level of the canal, and the lines of the bridge and the canal intersect at an angle of about 71 degrees. The bridge is mainly constructed of iron, red Mansfield stone, and pressed bricks. The medallions are in red terra-cotta, twenty-three in number. The pedestals at the end of the wing-walls are surmounted by groups in terra-cotta (not determined on when our view was published), one being a representation of "Fisher Maidens," and at the opposite angle "Flower Maidens." Facing the Park-entrance there is on one side a group of soldiers, a Grenadier, a Highlander, and a Life Guard, supplemented at the north-west angle by a group of athletes: these are designed by Signor Fusigna. The superstructure of the bridge consists of ten wrought-iron web-plate girders, each 57 ft. 6 in. long and 3 ft. 6 in. deep. The girders are 6 ft. 5 in. apart from centre to centre, strongly braced together by ten iron diagonal frames. The girders are bedded upon and bolted through Aberdeen granite blocks, 18 in. in thickness. The platform of the bridge is constructed of half-inch wrought-iron curved floor-plates, on which is laid creosoted paving in a bed, averaging 7 in. in depth, of bituminous concrete for the carriage-way, and the footways of Val de Travers asphalte 2 in. thick. The two outer girders which carry the cast-iron parapet are of the same open quatrefoil pattern as that along the parapet of the wing-walls. The lamp-posts and lamps are elaborate and clever works, produced by Messrs. Gardner & Co., of the Strand. The bridge is noticeable for a larger amount of ornamentation than is usually associated with parish works.

ANTWERP PALACE OF THE FINE-ARTS COMPETITION.

A COMPETITION of considerable importance has just now been decided in Antwerp. The subject was the new Palais des Beaux Arts, proposed to be erected in that picturesque city. The jury, named half by the Belgian Government and half by the city of Antwerp, have unanimously awarded the first place to M. Jean Jacques Winders, of Antwerp, the architect of the Hôtel de Ville de Giltry. The second place is given to M. Blomme; third, to M. Van der Hegge, of Brussels; fourth, to M. Jean de Coster; fifth, to M. Joseph Schadde; and the sixth, to M. Ernest Dieltiens,—all of Antwerp. Acting on the report of the jury, which declares that all the selected competitors have, in their designs, exceeded the sum allowed for the erection of the building, the city have called upon them to submit modified designs in a second competition.

LEEK FEVER HOSPITAL COMPETITION.

As it appears that entire confidence is not placed in the Board's officers for the adjudication of the prizes, what guarantee can the competitors generally have that the two designs sent up with the two favourites are really the best suited for the rivalry, or that they may not simply act as foils to the comparative merits of "Epidemiology" and "Cave Pestem"? Such a suspicion can only be entirely removed by allowing the architect of the Local Government Board, or whoever the referee may be, to inspect the whole of the plans sent in in the competition, and make his unbiassed award accordingly.

* See pp. 294, 296, *ante*.

LEICESTER NEW PUBLIC PARK.

Messrs. Barron & Son, landscape gardeners, of Elvaston Nurseries, Barrowash, Derby, have been awarded the first premium of fifty guineas for their design for laying out the new public park at Leicester. The park, which is over sixty acres in extent, is situated by the river Soar, near the old abbey. As the public are already provided with a large recreation and cricket-ground in the immediate vicinity of the proposed new park, the whole of the sixty acres is treated as pleasure-ground. Messrs. Barron & Son's design includes a large piece of ornamental water, with island, rockwork, &c., an American garden, a rose garden, archery ground, lawn tennis and cricket-ground, and bowling-green. They also furnish plans for a pavilion, lodges, entrance-gates, bridges, and band-stands. The Corporation of Leicester offered 100 guineas in premiums, 50 guineas for the best design, 30 for the second best, and 20 for the third best.

There were twenty-two competitors from all parts of the United Kingdom, and one or two from the Continent. Messrs. Barron & Son have been appointed to carry out the work.

SYSTEM OF VENTILATING AND PURIFYING SEWERS.

Mr. Robert Parker, surveyor to the Poplar District Board, has published some evidence in favour of the mode of ventilating sewers lately proposed by him.

The following is a statement of his ways of ventilating and purifying sewers and house-drains and water-closet soil-pipes:—

Main Sewers.—Wherever ventilating shafts and reversible cowls can be fixed so as to force wind into the main sewers, the result will be a public benefit. Those, however, which are frequently surcharged, and in which the fluctuation of sewage is very considerable, must be excepted; for, during the time of the rapid accumulation of the sewage, an upward pressure is produced, which drives the foul air out of the ventilating grates. In such cases as these it would be advisable to construct small shafts at all convenient sites, to convey the foul air to a higher level, which would very much remove the source of complaints as to noxious vapours being discharged from main sewers, so as to be inhaled by passers-by.

Sewers and Drains.—I would suggest that the following method be observed in applying my scheme in the purification of the above. Suppose a street to be 700 ft. in length, and to contain about seventy houses, and each house to have a separate drain into a sewer, such sewer being large enough for a man to walk through it. The rain-water pipes and kitchen sinks should not be connected direct with the house-drains, but their contents should be discharged into the open air, or into trapped sinks placed beneath the kitchen sinks, and the yard sinks used for surface drainage. A ventilating pipe, 2½ in. in diameter, should be connected with the drain at the rear of each house, and continued to the apex of the roof, and the soil-pipes of all water-closets situate above basement floors should be ventilated by inserting a ¾-in. pipe as near to the closet-pan as circumstances will permit, which should be continued to or upon the roof of the premies. Suitable sites should be selected for the erection of two shafts, 9 in. internal diameter, upon each of which a reversible cowl should be placed, to force wind into the sewer and drains, to dilute the foul air previously to its passing through the ventilating pipe. This continuous motion would produce a thorough system of ventilating and purifying sewers and drains. In many cases the rain-water pipes could be used for ventilating pipes. If the sewer in the street be not large enough for a man to pass through it, the same principle as laid down in the previous case would apply.

Combined Drainage.—In the event of houses having been drained by a system of back-drainage of about eight or ten houses in a block, and the main drain passing through about the centre of them, a shaft should be erected at the end of such main drain, to receive a reversible cowl to force wind into the drains and the sewer; and if the sewer be large enough for a man to pass through it, a flap-trap should be fixed at the outlet of the drain, with an aperture in it 3 in. in diameter, for the purpose of regulating the supply of wind,—that is to say, as the wind is being forced into the sewer, a portion of it would pass through the ventilating pipes at the rear of the houses, and the remaining portion through the flap into the sewer, which would escape at the present ventilating grates. Supposing the sewer in the street to be 12 in., 15 in., or 18 in. in diameter, the wind that would be forced into the sewer would escape where it met with the least resistance through the branch sewers, and the ventilating pipes at the rear of the houses; or, should it be necessary, ventilating-shafts could be constructed. On various occasions, during the course of my experiments herein referred to, when the velocity of the wind has been high, I have examined sink-traps in and out of the houses, but have neither seen any motion in the water, nor detected wind escaping therefrom.

AN IRON EXHIBIT, PARIS.

Messrs. Barnard, Bishop, & Barnards, of Norfolk, have published an illustrated description of their exhibits at the Paris International Exhibition, a dainty quarto pamphlet well worth having. This now eminent firm have received our hearty praise for their exhibits on previous occasions, as well for artistic and original design as for great excellence of workmanship, and this praise we are bound to repeat on the present occasion, and willingly do so. Amongst their works now shown are some elaborate wrought-iron entrance-gates, which are made to serve as the entrance to the pavilion of H.R.H. the Prince of Wales, some smaller gates, placed on either side of it, and the fire-basket and andirons used in the entrance-hall of the pavilion,—of which hall, by the way, we intend to give a view speedily. They also send a very remarkable series of works in the shape of an ornamental pavilion in cast and wrought iron, designed by Mr. T. Jeckyll. The railing which surrounds the pavilion, a very striking production, is divided into seventy-two panels, each of which is occupied by a sunflower, 3 ft. 6 in. high, the flower itself being 11 in. in diameter. The workmanship is admirable. Messrs. Barnard, Bishop, & Barnards also exhibit some of their useful slow-combustion stoves, the cast fronts of which are for the most part quite beautiful.

A QUERY FOR MASTERS.

Sir,—Knowing the interest you take in the advancement of the working classes, I would submit to you a most novel innovation about to be introduced by a portion of the *employés* of one of our largest building firms, and would ask whether such a line of policy is likely to conduce to that good feeling that should exist among the whole of the *employés* engaged with a firm. The new idea is, that the heads of the departments, with the office-clerks and foremen, are about starting an annual beanfeast upon their own account, giving the deputy foremen, the setting-out foremen, and leading shop hands the cold shoulder; in fact, it is to be a party of the select few only. I admit that the idea is a novel one, and, to a superficial observer, there may appear nothing un-English about it, though it appears to me essentially so, and likely to lead to a great deal of acrimonious feeling among the different *employés* of a firm; and I would ask the principal men of other firms to reflect before they attempt to introduce such an exclusive line of policy; for it appears to me to be setting up a kind of "caste" among *employés*, the effect of which would be anything but advantageous to the employer, and should be deprecated by all right-thinking men. Vox Populi.

CHURCH-BUILDING NEWS.

Clee.—On the 20th ult. Holy Trinity Church, Clee, was re-opened, after restoration at the cost of Mr. Thorold. The work has been done under the superintendence of Mr. James Fowler, architect, Louth, Mr. Stark, of Louth, being entrusted with the stone work, and Messrs. Hollinworth, of Grimsby, with the joinery. The repairs have been extensive, the transept, porch, buttresses, eastern tower, and a number of the seats being entirely new. In addition, several new pinnacles have been added to the old tower, and a new slated roof over the nave, with many other minor improvements and repairs. The graveyard has been levelled the depth of 2 ft. round the church, and will be asphalted 3 ft. in width. The entire cost will be nearly 2,000*l.* The church is of the Norman period, and is a most interesting structure, both from an architectural and historical point of view. It was consecrated during the reign of Richard I., by St. Hugh, Bishop of Lincoln.

Oxford.—The Rev. Alfred Pearson, who has just succeeded the Right Rev. T. Valpy French, the new Bishop of Lahore, in the Rectory of St. Ebbe's, one of the oldest churches in Oxford, is making an effort to transform its exterior "into something more consistent with the rich luxuriance of architectural beauties of which the University city can boast." So says an Oxford paper. The first structure was erected to the memory of Ebba, or Tibba, daughter of Ethelfrid, King of Northumberland, who became Abbess of Coldingham, and died in 683. The present building is much disfigured by an old rubble-built tower projecting into the body of the church at the north-east corner. It is proposed to remove this, and in its place erect a small belfry over the vestry, at the south-east corner. The proposed alterations include piercing the west wall with a Gothic window, corresponding somewhat in character with that at the east end.

Aldeby.—Proceedings are being taken to obtain funds for restoring the priory and parish church of Aldeby, Norfolk. 500*l.* are required for the work.

Bideford.—A new church is about to be erected at East-the-Water, Bideford, from plans by Mr. Bryden, architect. The cost will be 1,500*l.*

Bourton-on-the-Water.—The parish church of Bourton-on-the-Water is in course of restoration and enlargement under the direction of Mr. T. G. Jackson, architect. The cost will be 3,500*l.*, and a bazaar is about to be held to aid the funds.

Dallington.—Steps are being taken to complete the restoration of Dallington Church, at a cost of 1,000*l.*

DISSENTING CHURCH-BUILDING NEWS.

Denton.—On the 22nd ult. the foundation-stone of a new Baptist chapel was laid at Denton. The building will be of brick, with the gable towards the road of red pressed Harborough bricks, stone dressings, and a plinth of blue bricks. The interior woodwork will be of deal, varnished. The seats will accommodate 150 persons. The plans have been prepared by Mr. J. Ingman, Northampton, and the builders are Messrs. Robinson & White. The total cost will be 400*l.*

Stratford-on-Avon.—A new Congregational chapel is to be erected on a site near the present Independent chapel in the ancient Rother Market. The design, which is in the Gothic style, has been make by Mr. H. J. Paull, architect. Messrs. Roberts & Son, Stratford-upon-Avon, are the builders, the amount of their tender being 2,970*l.*, and 27*l.* in addition for a lecture-room. The work of preparation will be immediately commenced, so that the ground will be in a condition for the ceremony of laying "a corner" or "a foundation stone or stones," early in October. The chapel is intended to accommodate a congregation of about 400 persons.

Acomb.—A new Wesleyan chapel is about to be erected at Acomb, at a cost of 1,600*l.*, on land which has been presented by Mr. J. F. Taylor. The building, which will be in the Gothic style, with front of pressed brick and stone dressings, will provide accommodation for upwards of 300 worshippers. A school-room, with two class-rooms, will be attached. The buildings will be constructed from the designs of Mr. C. Anderson, architect. Messrs. Keswick & Son will do the brick and stone work, and Mr. R. Gray the joinery.

Ottery St. Mary.—The memorial stones of a new Baptist chapel at Ottery St. Mary have been laid. The building is being erected according to designs by Messrs. Packham & Croote, architects, Exeter. The builder is Mr. E. Carnell. The chapel is to be constructed of brick, with Beer stone dressings, and bands of Staffordshire blue brick. The cost will be about 600*l.*

A Powder Magazine Blown up by Lightning.—The *Leeds Mercury* reports that during a thunderstorm which passed over Morley on Tuesday afternoon, the lightning struck a powder-magazine containing one ton of powder, belonging to Messrs. John Haigh & Sons, Victoria Colliery, Bruntcliffe. The magazine was situate in the middle of a field, 400 yards from the colliery. The shock was something terrific, and but for the incessant rain which preceded the explosion, and had the effect of stopping all traffic in the vicinity, many lives, it is thought, must have been lost. A field of oats is completely destroyed, being laid to the ground as well as scorched. At the pit, a man named William Haigh was struck with a brick, and hurled into an adjoining coal-screen.

VARIORUM.

"Pearls Restrung: Stories from the Apocryha," by Mrs. H. S. Mackarness, author of "A rap to Catch a Sunbeam" (J. Masters & Co.), an admirable little book which can scarcely ail to command a lasting demand, and consenently a large circulation. Although addressed atensibly to children, many of larger growth ill find pleasure in the perusal of it. The olume is appropriately inscribed by Mrs. Mackarness to her brother-in-law, the Right lev. the Bishop of Argyll and the Isles.——In he August number of *The Nineteenth Century*, Miss Florence Nightingale makes a strong ppeal in favour of the patient millions of ndia. The money-lender is the chief giant gainst whom she fights.——Cassell's *Household Guide* gives some Hints on Varnishing,—"Before eginning to varnish it is necessary that the urface to which it is to be applied should be erfectly free from all grease and smoke-stains, or it will be found that if this is not attended to he varnish will not dry hard. If the varnish is o be applied to old articles, it is neccssary to ash them very carefully with soap and water efore applying it. When it is wished that the arnish should dry quickly and hard, it is necesary to be careful that the varnish should always e kept as long a time as possible before being sed; and also that too high a temperature has ot been used in manufacturing the varnish emloyed. It is likewise customary, when it can be one, to expose the article to the atmosphere of a eated room. This is called stoving it, and is found o greatly improve the appearance of the work, s well as to cause the varnish to dry quickly. fter the surface is varnished, to remove all the narks left by the brush, it is usually carefully olished with finely powdered pumice-stone and vater. Afterwards, to give the surface the reatest polish it is capable of receiving, it is ubbed over with a clean soft rag, on the surface f which a mixture of very finely-powdered ripoli and oil has been applied. The surface is fterwards cleaned with a soft rag and powdered tarch, and the last polish is given with the palm f the hand. This method is, however, only mployed when those varnishes are used which, when dry, become sufficiently hard to dmit of it. When it is wished to varnish drawings, engravings, or other paper articles, it s usual to previously paint them over with a lear solution of gelatine. This is usually preared from parchment cuttings."——The 25th housand has been published of "Wholesome Houses: being an Exposition of the Banner ystem of Sanitation, by G. E. Banner, C.E." Crosby Lockwood & Co). Those of our readers who desire a full description of the system, which is said to be working well, will find it ere for a shilling.

Miscellanea.

Huddington Churchyard.—The *Worcestershire Chronicle* takes exception, in terms more orcible than polite, to the letter by our correpondent, Mr. J. B. Watts (p. 791, *ante*), relating o the condition of Huddington churchyard, near Vorcester. The *Chronicle* appears to have its power of vision magnified by party prejudice, or it sees enough to excite its wrath in the emark made by our correspondent that the ause of the neglected state of the churchyard is hat "most of the parishioners are Dissenters." The writer imputes to our correspondent liberality of sentiment, and, challenging the orrectness of his statement, vaguely says,—"We have never heard of there being, and we do ot believe there is, a Dissenting place of worship f any kind there." Supposing our correspondent o be correct as to his statements (and for their orrectness or otherwise he must be held responible), there is nothing in his letter to warrant he imputation to him of the statement that the Huddington graves and churchyard are ruthessly trampled under foot "by the unhallowed ettitoes of Dissenting bacons." Our correpondent's meaning obviously was, that as the nhabitants were mostly Dissenters, and not Churchmen, friends did not exist, nor were funds orthcoming, to put the church and churchyard nto a decent condition. Surely thus much may e said or implied without offence. The real oint is, that the churchyard is in a discreditable tate, and the editor of the *Chronicle* will best ischarge his duty as a public writer by assistng in bringing about some improvement.

Improved Industrial Dwellings Company.—The report and statement of accounts of this company, presented at the thirtieth ordinary half-yearly meeting, held at the Mansion House on Tuesday, states that the whole of the capital has been subscribed, viz., 250,000*l.* stock fully paid, and 250,000*l.* in shares of 10*l.* each. The total amount of capital received to 30th June was 312,500*l.*, and in addition 58,160*l.* had been paid in advance of calls. The loans received from the Public Works Loan Commissioners amount to 138,000*l.*, and a further loan of 11,00*l.* is about to be taken up. The directors have applied for additional loans to the amount of 74,000*l.* in respect of the buildings now being erected. The total expenditure on capital account is now 517,974*l.* 19s. 8d. The capital expended on works in progress, and wholly unproductive during the half-year, has amounted to 77,772*l.* 10s. 1d. The Revenue Account shows that the rents, &c., amount to 22,624*l.* 16s. 7d., and dividends on investments, and other items, amounting to 777*l.* 18s. 1d., make the total income for the half-year 23,402*l.* 14s. 8d. The total expenditure has been 13,165*l.* 11s. 1d., leaving a divisible profit of 10,237*l.* 3s. 7d., which, added to the balance 182*l.* 11s. 10d., brought forward from last half-year, gives a total of 10,419*l.* 15s. 5d., available for dividend. The directors recommended the payment of the usual dividend at the rate of 5 per cent. per annum, free of income-tax, which will absorb 7,708*l.* 12s. 8d.; that 2,500*l.* be added to the reserve fund for the equalisation of dividends, which will then amount to 31,500*l.*; and that 211*l.* 2s. 9d. remaining be carried forward to the next half-year's account. The estates are stated to be in a very satisfactory condition, and have been maintained in thorough repair. The directors have acquired two additional freehold estates, one being at Deptford, in the centre of a densely crowded neighbourhood, and the other at Hackney. The directors have also decided on erecting twelve additional blocks at the Bethnal-green estate. The whole of these works will be commenced at once, the plans for building providing for 295 families, or about 1,500 persons. The number of dwellings now in occupation is 2,369, accommodating about 12,000 persons, and the number in course of erection, and for which plans have been approved, is 831, which will provide accommodation for about 4,000 additional persons, or 16,000 in all. In their last report, the directors drew attention to the fact that they had made offers to the Metropolitan Board of Works for certain sites, which, under "The Metropolitan Streets Improvement Act, 1872," had been specially set apart by Parliament for the use of the working classes, who had been evicted from their homes for the purposes of street improvements, and that the Board had not accepted those offers. The directors express their gratification that of the ten sites set apart by the Act, eight have been let, though not to this company, who state that the directors offered for these sites the highest ground-rents that in their judgment could be paid, having regard to the means of the working classes, and they felt it would be unwise to take the sites at the value set upon them by the Metropolitan Board, as that would have necessitated one of two evils, viz., either to charge rents which would be a sore burden to, and promote overcrowding with all its disastrous consequences among, the classes intended to be benefited, or to involve the company in a considerable annual loss. The report was adopted.

Competition is invited for "a prize of 10*l.*," for the best essay in favour (or otherwise) of the First Banking and Reserve Fund Association, Limited,—an amusing mode of puffing, certainly. When it is seen that "essays will not be returned, nor reasons assigned for the judges' award, and that they will become the property of this Association, and that the secretary *pro tem.* reserves the right to publish any or all of them," it will be obvious that the new Association mean to get as much for their money as possible.

Assessing Manchester Town Hall.—At a meeting of the Manchester City Council, the Mayor stated that in April he received a note charging the Corporation with 937*l.* 10s., the rate upon an assessment of 25,000*l.* for the Town-hall for inhabited house duty, or 9d. in the pound. An appeal has been addressed to the Inland Revenue Department setting forth the very limited and occasional use of the Mayor's apartments in the hall as a place of residence, but the reply was unsatisfactory.

New Offices, Holborn District Board of Works.—We learn from the daily papers that the foundation-stone of this building was laid by Sir J. McGarel-Hogg, on Saturday last. We have already given some particulars of the building, but may here say that it will occupy a site at the corner of the now widened Liquorpond-street and Gray's-inn-road, having a frontage to the latter thoroughfare of 100 ft., and a return depth next Liquorpond-street of 124 ft. The ground-floor story will contain a public office for the conduct of the general business of the Board, and offices for the clerk, surveyor, and medical officer of health. In the rear of the site on this floor will be a mortuary, post-mortem room, and disinfecting-room. The Board-room is approached through a doorway and entrance-hall at the corner of the site, leading to the principal staircase. In the rear there will be a stone-yard and depôt. On the first-floor will be the board-room, 90 ft. long, 45 ft. wide, and 30 ft. high, being lighted both on the north and south sides; also a committee-room, 48 ft. long by 30 ft. wide; a sub-committee-room, lavatory, and retiring-rooms. The façade next Gray's-inn-road is carried up one story higher, the rooms being set aside for the use of the housekeeper, whilst in the basement will be strong-rooms for the books, papers, and archives of the Board. The style is Italian, freely treated, a noticeable feature being a clock-tower, 100 ft. high, at the corner of the site. The materials employed in the elevation will be of red brick and Portland stone; the doorway forming the approach to the board-room being composed of polished Aberdeen granite. The works are being carried out from the drawings, and under the superintendence of Messrs. Isaacs & Florence, architects, the contract being let to Messrs. Browne & Robinson, for the sum of 25,987*l.*

Education at the Crystal Palace.—The award of medals and certificates (art), as well as of the free scholarships, in the ladies' division of the Crystal Palace Company's School of Art, Science, and Literature, was completed on Wednesday, last week, with the following result:—Water-colour Painting.—Mr. Goodall's students—silver medal, Miss Eliza K. Hitchcock, South Norwood; certificate, Miss E. M. Jennings, Penge. Water-colour Painting.—Mr. Smallfield's students—silver medal, Miss Maud Robinson, Norwood; certificate, Miss Janet Munro Bethune, Penge. Modelling in Clay.—M. Constant Vincelst's students — certificate, Miss Marion Bedale, Streatham; the scholarship in art, Miss M. Bedale. Judges,—Mr. John B. Burgess, A.R.A., Mr. A. D. Fripp, and Mr. W. F. Woodington, A.R.A. The scholarship in music, Miss H. Blagden, Sydenham. Examiners,—Mr. E. J. Hopkins and Mr. Brinley Richards. The scholarship in modern languages, literature, &c., Miss Jessie Simmonds, South Norwood. Examiners,—Rev. Alfred Ainger, M.A., Rev. Charles Rogers, LL.D., M. Gustave Masson, Professor Albert Hamann, and Professor Cav. G. Volpe.

Metropolitan Monuments.—The new Act conferring powers upon the Metropolitan Board of Works with respect to the obelisk known as Cleopatra's Needle and other monuments has been printed. It recites that it would be of advantage to the metropolis that facility should be afforded for the maintenance of the obelisk upon the Victoria Embankment, and that other powers should be conferred with respect to the preservation of monuments, statues, and other works of art from time to time upon any of the embankments and lands in the metropolis. The obelisk now being erected is placed under the control of the Board, and the Board is to preserve and maintain the same for the benefit of the public, and the Board may erect in connexion therewith "any appropriate works of art." The statute provides for the punishment of any person who injures and disfigures in any way the obelisk or any monument placed under the care of the Board by the Act.

Stonyhurst College.—August 1st was prize day at Stonyhurst College, Lancashire, and additional interest was given to the proceedings by laying the foundation-stone of a new building in course of erection, at a cost of 12,000*l.*, after the designs of Messrs. Dunn & Hansom. The (Roman Catholic) Bishop of Salford performed the ceremony.

Cottage Hospital, Moreton-in-Marsh.—The foundation-stone of the Sands Cox addition to the Moreton Cottage Hospital has been laid. Mr. Calloway is the architect, and Mr. Joseph Gill is the builder.

Leadenhall Market.—It having been proposed (though not by way of official resolution before the Court of Common Council) to remove Leadenhall Market, the tradesmen of the market and its vicinity are and have been for some time making a great stir against the proposal. At a meeting held on Wednesday afternoon it was resolved "That it is most desirable, in the interests of the citizens and of the public generally, that Leadenhall-market should be retained and improved, and this meeting respectfully calls upon the Corporation of the City of London to refer the subject to the City Council for their consideration." Whatever doubts may exist as to the desirability of retaining the market, there can be none as to the advisability of improving it if it be retained, as it at present largely consists of a congeries of narrow allies hemmed in between Gracechurch, Leadenhall, and Lime streets.

The Proposed High-level Bridge Across the Thames.—At the meeting of the Metropolitan Board of Works on the 2nd inst., it was resolved to proceed with the construction of the proposed high-level bridge across the Thames, near the Tower of London, according to the single-span design submitted by Sir Joseph Bazalgette. For the purpose of raising the necessary funds for the work, and for maintaining and rebuilding the other bridges of the metropolis outside of the City area, the Board intends to apply to Parliament for extension of the 9d. coal and wine duty, upon the present basis, up to the month of July, 1900.

Badges.—The civic dignitaries acting on the committee in the ceremony of the presentation of the Freedom of the City of London to Lords Beaconsfield and Salisbury on Saturday last, each wore as an insignia of office a gold badge made by Mr. J. W. Benson, of Old Bond-street and Ludgate-hill. They were in the form of the Maltese Cross, enamelled in the centres; on each side were the crests and coronets of the persons honoured.

The Free Libraries Act.—Sir Julian Goldsmid has offered to give 500 guineas to the city of Rochester towards the foundation of a free library, on condition that the burgesses provide for its maintenance by adopting the Free Libraries Act, which they have hitherto been unwilling to do.

TENDERS

For the erection of new Corn Exchange and out-offices, for the Lincoln Corn Exchange Company. Messrs. Bellamy & Hardy, architects. Quantities supplied:—

Ives & Son	£11,438 0 0
Martin & Sims	7,800 0 0
Sherwin	7,650 0 0
Barnes & Wright	7,620 0 0
Close & Co.	7,458 0 0
Walter & Heasman*	6,660 0 0

* Accepted, subject to a few deductions.

For new front, at 16, Grand Parade, Brighton. Mr. Arthur Loader, architect:—

Barnes	£859 0 0
Newnham	844 0 0
Bruton	835 0 0
Lockyer (accepted)	758 0 0

For erection of warehouses in rear of 55, East-street, Brighton, and alterations at 54, Old Steine, Brighton. Mr. Arthur Loader, architect:—

Bruton	£2,100 0 0
Barnes	1,710 0 0
Newnham	1,686 0 0
Lockyer (accepted)	1,629 0 0

For new shop-fronts, alterations, &c., at 6, Little Newport-street, Soho, for Mr. G. Koen. Mr. A. J. Rouse, architect:—

		Extra for Revolving Shutters.
Steed	£425 0 0	£32 0 0
Gammon	405 0 0	10 0 0
Howard	392 14 0	14 0 0
Hocking	391 10 0	—
Blandford & Co.	391 10 0	10 10 0
Linfield	380 0 0	30 0 0
Garney	378 10 0	48 0 0
Polton	375 0 0	—
Smith	361 14 0	18 16 0
Dunford	350 0 0	15 0 0
Niblett	343 0 0	23 0 0
Webber	326 0 0	25 0 0
Mackness	321 0 0	24 10 0
Vincent	313 0 0	—
Gritton	289 0 0	22 0 0
Cooke & Co.	284 0 0	15 0 0
W. P. Smith	283 0 0	21 0 0
Heather & Davies*	283 10 0	10 5 0
Murphy	230 0 0	13 10 0

* Accepted.

For alterations, &c., to Newhouse Farm, Sevenoaks Weald, for Mr. J. L. Langworthy. Mr. Sextus Dyball, architect. Bricks supplied:—

Wiltshire	£1,421 0 0
Punnett & Sons	1,214 0 0
Willis & Son	1,200 0 0
Manktelow	1,070 0 0

For new warehouse, for Messrs. Wendover & Co., Hanover-street, Portsea. Mr. E. Wendover, architect:—

Burbidge (accepted)	£2,000 0 0

For taking down and rebuilding premises in Bovey Tracey, Devon, for Mr. G. Bond. Mr. John M. Penn, architect. Quantities supplied:—

Collings & Son	£465 0 0
Tapper & Kallaway	450 2 8
Davis Bros.	394 0 0
Easton	353 10 0
Palfrey	342 10 0
Mardon	320 0 0

For the construction of vaults and drainage, Exchange-walk and St. Peter's-gate, Nottingham. Mr. George R. Isborn, architect:—

		Extra for Paving.
Dennett & Co.	£498 5 9	£212 0 0

For bar-fittings to the Angel and Crown, Warwick-street, Golden-square, for Mr. Little. Mr. H. R. Cotton, architect:—

Moreland & Nixon	£435 0 0
Toms (accepted)	430 0 0

For new mortuary at the workhouse, Marloes-road, for the Guardians of the Poor of the parish of St. Mary Abbotts, Kensington. Messrs. A. & C. Harston, architects:—

Wise	£333 0 0 !
Lathey Bros.	315 0 0
Reading	300 0 0
Handy, Davis, & Co.	192 0 0
Cooke & Co.	182 0 0
Hardy (accepted)	165 0 0 !

For additional story on Nos. 11 and 12, Brompton-square, Mr. J. T. Stokes, architect:—

Stimpson & Co.	£433 0 0
Sheldon	420 0 0
Turrell	399 0 0

For additions and alterations in rear of same:—

Sheldon (accepted)	£307 0 0

For a terrace of ten dwelling-houses, at Bemerton, Salisbury, for Mr. J. C. Truckle. Mr. Fred. Bath, architect. Quantities supplied:—

Sawkins	£3,601 0 0
Hopkins & Son	3,436 0 0
Young & Sons	3,270 0 0
Pomroy	3,250 0 0
Hale & Sons	3,217 0 0
Harris	3,190 0 0
Witt	3,185 0 0
Tryhorn	3,160 0 0
Cooper	3,055 10 0
Dolman (accepted)	3,032 0 0

For pulling down, clearing away, and shoring premises adjoining 19 and 21, Ludgate-hill. Messrs. Joseph & Pearson, architects:—

Tatum & Co.	£182 0 0
Spiller Bros.	120 0 0
Harris	115 0 0
Blount	105 0 0
Bird & Co.	105 0 0

For erection of slop-tank, South Wharf-road, Paddington, for the Paddington Vestry:—

Marks	£2,091 0 0 !
Beech	1,520 0 0
Mowlem & Co.	1,500 0 0
Headdy	1,170 0 0
Hook & Oldrey (accepted)	1,090 0 0
Martin	857 0 0 !

For painting Board schools, Camden-street, Camden-town:—

Mark	£472 0 0
Aitchison & Walker	438 0 0
Petchey	430 0 0
Wall Bros.	391 0 0
Hook & Oldrey	327 0 0

For painting Board schools, North Bow:—

E. J. & C. Willmot	£725 5 0
Hobson	574 0 0
Pritchard	539 0 0
Sergeant	467 0 0
Hook & Oldrey	449 0 0
Boyce	443 0 0

For painting Board schools, Tower-street, Seven-dials:—

Petchey	£455 7 0
Warne	411 0 0
Boyce	390 0 0
Hobson	339 0 0
Knight	290 0 0
Hook & Oldrey	264 0 0

For the erection of Sunday School, Denmark-place, Peckham. Mr. Herbert D. Appleton, architect:—

Haydon	£3,087 0 0
Thompson	2,924 0 0
Hansell	2,874 0 0
Downs	2,733 0 0
Tarrant & Son	2,644 0 0
Hawkings	2,560 0 0
Hook & Oldrey	2,495 0 0
Higgs & Hill	2,490 0 0

For erection of corn-store, Frederick-mews, Hyde Park. Mr. E. Vigers, jun., architect:—

Stephenson	£1,189 0 0
Thompson	1,130 0 0
Gerrard & Smith	1,067 0 0
Wells	1,067 0 0
Macey & Sons	1,048 0 0
Temple & Foster	1,042 0 0
Hook & Oldrey	985 0 0

For the erection of a vicarage, for St. John's, Chelsea. Mr. A. Baker, architect. Quantities supplied by Mr. H. P. Foster:—

Bradley	£3,025 0 0
Lascelles	2,597 0 0
Braid & Co.	2,500 0 0
Thorn & Co.	2,384 0 0
Adamson & Son	2,313 0 0
Wall Bros.	2,050 0 0

For the erection of parochial-hall, for St. John's, Chelsea. Mr. A. Baker, architect. Quantities supplied by Mr. H. P. Foster:—

Bradley	£2,380 0 0
Lascelles	2,190 0 0
Thorn & Co.	2,135 0 0
Braid & Co.	2,120 0 0
Adamson & Son	1,976 0 0
Wall Bros.	1,870 0 0

For additional story to the Metropolitan Board of Works offices, Spring-gardens. Mr. George Vulliamy, architect:—

Hook & Oldrey (accepted)	£5,653 0 0

For stabling, warehouse, &c., at High-street, Deptford, for Messrs. Carter, Paterson, & Co. Mr. William Eve, architect:—

Salt	£1,240 0 0
Sheffield & Prebble	1,183 0 0
Hubble & Trott	1,140 0 0
Crabb	1,135 0 0

For stabling at Goswell-road, for Messrs. Carter, Paterson, & Co. Mr. William Eve, architect:—

Heiser	£326 0 0
Salt	287 0 0
Crabb	254 0 0
Sheffield & Prebble (accepted)	247 0 0

For two houses, with shops, at Church-street, Stoke Newington, for Mr. R. C. Halse. Mr. William Eve, architect:—

Woodward	£1,134 0 0
Sheffield & Prebble	1,076 0 0
Salt	1,035 0 0
Crabb (accepted)	910 0 0

For extending warehouse at Milner-street, Chelsea, for Messrs. Carter, Paterson, & Co. Mr. William Eve, architect:—

Salt	£495 0 0
Sheffield & Prebble (accepted)	473 0 0
Crabb*	420 0 0

* Withdrawn in consequence of error.

For entrance-lodge to the Royal Masonic Benevolent Institution, Croydon. Mr. Robert Griggs, architect:—

Hyde	£380 0 0
Waller	368 0 0
Coles	356 0 0
Taylor (accepted)	350 0 0

For new schools, Harrow-road. Messrs. Joseph & Pearson, architects. Quantities not supplied:—

Williams	£2,925 0 0
Browne & Robinson	2,920 0 0
Langmead & Way	2,890 0 0

For the erection of three detached villa residences upon the Butts estate, Brentford. Messrs. Smithies & Gladman, architects:—

Beauchamp	£3,950 0 0
Gibson	3,892 0 0
Falkner	3,875 0 0
Nye	3,690 0 0
Taylor (accepted)	3,460 0 0

For rebuilding No. 115, High-street, Brentford, for Mr. Henry Wood. Messrs. Smithies & Gladman, architects:—

Falkner (accepted)	£720 0 0

For extra story and other works on Nos. 11 and 12, Brompton-square, for Mr. James Davis. Mr. J. T. Stokes, architect:—

Stimpson & Co.	£433 0 0
Sheldon	420 0 0
Turrell	399 0 0
Ditto, revised (accepted)	380 0 0

For a bridge at East Shalford, Surrey. Mr. Lower, architect:—

Horn	£167 0 0
Mitchell Bros.	151 0 0
Crills & Sons	128 0 0
Etherington (accepted)	100 0 0

For rebuilding shops and offices, No. 10, Little Tower-street, City. Messrs. Ford & Hesketh, architects:—

Merritt & Ashby	£5,659 0 0
Scrivener & Co.	5,457 0 0
Mark	5,434 0 0
Ashby Bros.	5,428 0 0
Browne & Robinson	5,342 0 0
Brass	5,283 0 0
Braid & Co.	5,275 0 0
Conder (accepted)	5,218 0 0

For the redecoration of the concert-hall, St. James's Hall. Mr. Walter Emden, architect:—

Sykes	£1,240 0 0
Wright	920 0 0
Lea (accepted)	787 10 0

The designs of the late Mr. Owen Jones will be retained.

For the erection of six 6-roomed cottages at Islington:—

Hillard	£1,743 0 0
Pickering	1,392 0 0
Harbert	1,230 0 0
Gattrell	1,187 0 0
Blandford & Co.	1,000 0 0
Foster (accepted)	950 0 0

TO CORRESPONDENTS.

R. R. C (Moorish).—J. P. A. (we shall be happy to hear from Mr. J. C. B.).—J. J. (the penalty for excess of time is often enforced).—W. & B. (next week).—S. B. (should have sent list of names and amounts).—G. D. (should find for his son a master in whom he has confidence; he may easily waste his money).—J. W. B.—S. G.—Mr. B.—G. M.—W. H. L.—G. B. & Co.—A. L.—O. M.—A. P.—T.—H. H.—A. S.—W. P.—J. W.—J. S.—L.—M. & S.—M. & A.—S. & G.—R. T.—H. & O.—H. B. P.—H. P. F.—W. G. L.—E. C. R.—F. B.—H. F.—R. P.—B. & Co.—E. T.—J. P.—W. T.

Yarmouth Competition.—We are asked to say that the Yarmouth Town Council cannot return the drawings sent in for the recent Municipal Buildings Competition by "East Coast" and "B with an Arrow in a Circle," as the authors have not forwarded their names with the sealed letters that should have accompanied the designs.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

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The International Health Congress.

THIS great concourse is now closed; of its excellent discussions there remain but the stenographic reports to revive the memory of those who were present, and to instruct those who were absent. An undying impression has, however, been produced, and cordial relations were established, which the most disastrous political differences will not be able to efface. Throughout all the meetings a strong spirit of internationalism was manifest. Every one felt that in France we had found the connecting link between nations; that science was above political prejudices; that the love of humanity could not recognise any limits, would not be restricted by any frontiers. These sentiments, expressed in words of poetic eloquence, were uttered by Frenchmen and Englishmen, by Dr. Richardson, delegate from America; by Baron Maydell, from Russia; by Dr. de Grosz, from Hungary; by Dr. Michaelis, from Austria; by Dr. Taderkolm, from Sweden; by Dr. Bambas, from Greece; by Senator Crocq, from Belgium; by Cobicci Pacha, from Egypt; by Mr. Jäyer, from Holland; by Dr. Felix, from Roumania; by Dr. Velasca, from Spain; by the delegate from Denmark; by Dr. Günter, from Berlin; and by Masaux Maéda, from Japan! So many men of eminence, and so much knowledge from diverse sources, but all bearing on the one subject, have rarely been gathered together; and, if the resolutions carried by such an assembly fail to produce any legislative results, we must for ever despair of governments.

Among the various discussions of special interest to us we noted a paper by Dr. Balbirnie, of Sheffield, read at an early morning sitting, and relating to the ventilation of schools, barracks, and hospitals. Dr. Balbirnie advocated a central system of warming and ventilating groups or series of rooms without being obliged to place the intake and outlet of air at the exterior of the building. This suggestion was opposed, on the ground that foul air had a tendency to accumulate in the angles of a room, and Dr. Balbirnie had proposed to place the inlet of air midway in the wall between the corners. The discussion then drifting to the general question of unwholesome dwellings, M. Belval, of Brussels, explained that in his town builders were obliged to devote at least a fifth of the site for supplying back-yards to the houses they constructed. On the strength of this principle, Dr. Perrin rose to protest that in Paris many yards were not big enough for the efficient ventilation of the houses, and expressed a hope that henceforth buildings would not be sanctioned unless a more liberal allowance of space and air was obtained. Discussions also arose in several sections relating to the lighting of schools. This question has been brought forward recently by the energetic action, the pamphlets, and eloquent speeches of M. Emile Trélat. The eminent architect argues that the eyesight of the pupils is spoilt by the confusion of light thrown into the school-room. He would apply to light the same rules as we apply to sound, and so build the school-room that the light should travel across the class without collision with rival rays, which must produce a confusing effect. If we seek to educate the ear we should not play two different tunes at once; nor ought the eye to be wearied by a conflicting method of illumination. M. Trélat, it will be seen, is seeking to introduce fixed principles for guidance in the discussion of this important subject, and we hope on some future occasion to deal more amply with his theories.

In the first section Mr. Edwin Chadwick was able to raise an interesting discussion by reading a paper on "The Necessity of Creating in each Country a Ministry of Public Health." We have ministers of agriculture, ministers of commerce, ministers of justice,—that is to say, ministers for the suppression of crime,—why should we not have a minister for the suppression of preventible disease? M. Felix, of Bucharest, suggested that such a ministry should not be subjected to political fluctuations, as it would not be practicable to change the nature of its work at every change of government. Dr. Gibert, of Havre, complained that in France there were no means of resisting an epidemic; but Dr. Pietra Santa, in a fluent speech, protested that the sanitary laws and organisations of France were so admirable that they might serve as models to all Europe. To many of his audience, however, Dr. Pietra Santa only made matters appear worse; for, by proving that the law sanctioned almost all that is necessary for the perfect sanitary government of the country, the present unsatisfactory state of affairs is still more inexcusable. Thus the assembly remained steadfast in its approval of Mr. Chadwick's proposal, and by ventilating this matter in the presence of delegates from all parts of the world, much good has been accomplished. We will give some quotations from his paper in our next.

We now turn from morning meetings of the sections to the general meetings held in the afternoon, where the six questions of the programme were discussed. Of these, there are two that specially interest us. The first, relating to unwholesome dwellings, and the second to unwholesome industries. The first discussion was opened by Professor Gubler, the president, who related that on the previous day the members of the Congress had visited the peninsula of Gennevilliers, where the soil is irrigated with some of the sewer water from Paris. They were now able to state that this gave rise to no unpleasant smell, and that the water, when once it had filtered through the earth, became quite drinkable, and was good enough to sustain a very excellent crop of watercresses, which, it is known, will not grow anywhere but in the purest water. The Congress then proceeded to discuss the Report, of which M. Emile Trélat, the architect, and Dr. Du Mesnil, member of the Government Committee on Unwholesome Dwellings, are the authors. In the first part of the report, M. Trélat discusses the respective advantages of co-operative building societies and the efforts made by large employers of labour to supply wholesome and cheap dwellings to their workmen, concluding that the latter have been most successful. Then, again, M. Trélat compares the *Cité ouvrières*, or *Cité casernes*, as they are sometimes called, where a number of workmen live together in one block of buildings, and which we generally call artisans' dwellings and Peabody Buildings, with the *Société Mulhousienne des Cités Ouvrières*, where the workmen live in separate or in semi-detached cottages, as at Shaftesbury Park Estate, Wandsworth, concluding that the latter are infinitely the best, and that the *Cité casernes* are decidedly unhealthy. These opinions, it is true, are justified if based only on French experience; but Mrs. Bovett Sturge most fortunately rose to describe what had been done in London. The mortality in the artisans' dwellings of our metropolis amounted, the lady said, only to 17 per 1,000 per annum, while that of London equalled 21 per 1,000. Further, deaths from infectious diseases were one-third less numerous in these buildings than among the other inhabitants of the metropolis. One company had lodgings for 12,000 persons, and the Peabody buildings could contain 10,000 inhabitants. To have omitted, therefore, to mention the result of experiments carried out on so large a scale, was undoubtedly a serious fault committed by the author of the report. This, however, afforded M. Trélat an excellent opportunity of rendering due homage to our countrywoman. He did not regret his omissions, since they had been so ably compensated by the facts Mrs. Sturge had brought forward, and could only congratulate himself on the happy circumstance by which the Congress had secured the co-operation of this able and gifted lady. Nor can we refrain from expressing our own sense of gratification. Mrs. Bovett Sturge, now practising in London, has taken her degree as doctor of medicine at the Paris University; and, with the exception of Mr. Adolphe Smith, was the only English person at the Congress who spoke fluently in French. We are, however, indebted not merely to her knowledge of the language, but to her eloquent speeches, to the elegance of her diction, and to the force of her arguments, for the vindication, before the delegates of all nations, of English sanitary science and sanitary reform. No one, we should add, received from all sides more homage and attention than our English lady-doctor, who, in the acquisition of her scientific knowledge, has known how to retain the modesty, the tact, and delicacy, which distinguish our best women.

The second portion of the report, by Dr.

Du Mesnil, related to unwholesome dwellings generally, and protested against the lack of light, the overcrowding, the bad and dangerous wall-papers, the dirty staircases, the leaking roofs, the damp cellars often inhabited by poor people, and notorious increase of mortality wherever we find any overcrowding. Even the improvements, the new boulevards, had been attended with some evils; as, in opening out bad quarters for the creation of rich streets, the overcrowding in the poor quarters that still remained was considerably aggravated. Finally, M. Du Mesnil suggests that a law should be enacted to the effect that the letting of furnished lodgings should not be sanctioned without previous inspection by the sanitary authorities. These latter should insist on a plentiful supply of water, on 14 cubic mètres space for each bed, on the constant washing of the walls, and on the use of paint instead of paper. This brought up Mr. Griffiths, of Liverpool, who, in a speech read for him in French, proposed that the petrifying liquid of the Silicate Paint Company should be employed, so as to keep the homes of the poor free from damp, to facilitate the washing of the walls, and avoid the dangerous use of paper. The latter not only harboured dirt, but, if it was not carefully removed each time the room was repapered, the accumulation of paste would occasion putrefaction dangerous to health. He cited a case of typhoid traced to the presence of twenty-five layers of paper left on where they occasioned an unpleasant smell, and the poisoning of the blood demonstrated by the fever. The value of the petrifying liquids was, however, criticised by Dr. Felix, of Bucharest, and M. Emile Trélat, both maintaining that silicate had often been used, and it was found that it did not last, but dropped off the walls. These assertions were, in their turn, disposed of by an official letter written to the president. The silicate to which both Dr. Felix and M. Trélat alluded, was artificial silicate of potassa, or of soda, and this certainly is defective. But the petrifying liquid in question is made from a natural silica found in Wales, resulting from a volcanic eruption. It is unlike anything else known to exist, and cannot possibly be removed when once applied to a porous wall, such as a wall of brick or of stone. The Congress then discussed the lack of water-supply, and the bad drainage of workmen's houses. M. Durand Claye remarked that the manure taken from workmen's houses in Paris contained from 7 to 8 kilogrammes of nitrogen per cubic mètre, while the manure from rich quarters contained only 40 to 60 grammes in the same volume. Many proprietors did not wish their houses to have a water-supply, as that would dilute and reduce the value of the manure produced by the inhabitants. There is already, it is true, a supply of 150 litres of water per head in Paris, but this is employed for fountains and the washing of the streets, while the drainsare neglected. It further came out, in the course of the discussion, that a block building in Paris containing 1,800 working-class inhabitants, did not possess any water-supply at all. These disclosures constituted a discreditable contrast to the facts related by the foreign delegates. Senator Crocq, for instance, explained that in Belgium the Communal authorities can take what measures they consider necessary to render a house wholesome; and if its proprietor resists, the house is closed by the police. With the assistance of these rigorous measures, true typhus has been banished from Belgium. Mr. Edwin Chadwick, by the intermediary of Professor Gubler, related that in London there were houses where the inhabitants had never been free from typhus fever, but we have now enforced our sanitary laws, and have completely driven all typhus away. Mr. Adolphe Smith, in his turn, described the nature of the English Sanitary Act in relation to unwholesome dwellings, and caused no little surprise among the French and some foreign delegates by explaining that a landlord might be fined 20*l.* for letting a room in which there had been fever, unless it was properly disinfected. Finally the Congress voted resolutions to the effect, firstly, that the suggestions thrown out by French committees of hygiene should be enforced by law, and no longer avoided by the pretexts that a proprietor was not responsible for his lodger, or the lodger liable to the cost of improving the proprietor's property. Secondly, that the municipality of Paris must convey an abundant water supply to all the dwellings in the towns, particularly those situated in the working-class quarters and in furnished lodgings.

Finally, and before we eave the question of water supply, we must announce that, in accordance with a proposition brought forward by Mr. Jäger, of Amsterdam, an international association has been formed, with Mr. Edwin Chadwick, C.B., as its honorary president, for the purpose of urging the Government of each country to bring pressure to bear on all local administrations, and compel them to supply the inhabitants of their respective districts with pure drinking-water. The greater part of the foreign delegates present at the Congress, have joined this new association.

The discussion on unwholesome industries, or, at any rate, the report on this subject, issued by Drs. Gubler and Napias, is of special interest to the members of the building trade, for the chief victims are, undoubtedly the house-painters, the makers of paint, of looking-glasses, and those employed in the decoration of houses. The report describes a great number of masks and other contrivances suggested and applied to prevent workmen inhaling the lead or copper dust; but these are declared of little avail. During the course of the discussion, several speakers exhibited masks of this description. In one case the air was supplied by means of a gutta-percha tube, which communicated with the outside of the workshop, a process of breathing which must be very fatiguing to the lungs. Another speaker appeared with a huge gutta-percha bag on his back. From one tube he drew the air out of the bag, and sent it back into the bag by another tube, so that he was breathing his own breath over and over again, and the air supply must have become more and more foul. Evidently this was but a sorry contrivance; the difficulties of its application very numerous. The workmen would assuredly neglect to replenish the bag with fresh air as frequently as necessary. Thus the discussion did not alter the conclusion of the report, namely, that no satisfactory masks had yet been invented. Professor Lutschaunig's speech was consequently considered very appropriate. He argued that, so long as lead was employed, there would be cases of lead poisoning; but as paint, which is the most frequent cause of poisoning, could be made better without lead, more than half these disasters would be avoided. Professor Gubler and Dr. Napias had complained that "incurable routine is opposed to the generalisation of a process free from danger," and that, therefore, zinc white was not successful. If, however, zinc whites were made not from oxide of zinc, which has only half the covering power of lead, but, according to Griffiths's patent, from sulphide of zinc combined with other ingredients, which, while in no wise modifying the hygienic, the non-poisonous qualities of the zinc lend to this metal a body and whiteness that lead paint itself does not possess; then there would no longer be the same objections against the use of zinc. Mr. Lutschaunig insisted that he cared but little which manufacturer succeeds in gaining favour for his paint, so long as his paint cannot poison those who use it. If he alluded to Griffiths's white, it was because he was well acquainted with its innocuous qualities, and that, as there would soon be seventy-five tons of this paint produced per week, he thought the sale of so large a quantity would contribute greatly to reduce the number of cases of lead poisoning. The authors of the report have stated that "it is desirable that manufacturers should participate in the labours of the Congress of Hygiene, and explain the new methods they have invented or applied." Mr. Lutschaunig's speech was the most effective answer to this invitation, for he proposed, in the use of this discovery, a remedy which "can satisfy at once the tradesman and the sanitary reformer. In lauding this product," he continued, "we support a means of avoiding all the horrors of lead-poisoning, which is in harmony with the principles of science and the exigencies of commerce." We have, for our part, described this invention in these columns, and are glad to note that its sanitary qualities were ably brought before the notice of the Congress. Mr. Kingsett's "Sanitas" disinfectant and M. Toblet's pavilion or cottage hospitals were among the other arrangements which were discussed and approved. But the time was now at hand when business had to be laid aside and the concluding speeches pronounced.

Dr. Gubler wished the members of the Congress good speed in an eloquent outburst of feeling. Baron Maydell thanked the organisers in the name of all the foreign delegates for their admirable management and hospitality. Finally Dr. Picciotti invited the members of the Congress to meet again two years hence at Turin, and read a telegram from the municipality of that town, promising the warmest reception. This proposition was received with acclamation, and thus it was decided that the third great international congress should be held in Italy. England, therefore, can only hope to come fourth on the list.

In concluding this notice we must confess to omitting mention of the most agreeable, if not, strictly speaking, the most useful features of the Congress. We allude to the three days devoted to excursions, and to the banquets and official receptions which enlivened the proceedings. On these occasions so many good things were said that we may try hereafter to give some short account of the sanitary reformers at play.

SCULPTURE AND THE STUDY OF IT.

The subject of the suggested Gallery of Casts, to which attention was called in our last number, is one that deserves more than cursory mention. It may at once be admitted that the formation of galleries and museums, illustrative of art in its several branches, is an object that has long obtained our hearty support. It must be remembered, on the other hand, that any application for aid from the public funds for a purpose that is not manifestly deserving of national subvention, is in itself something of an injury to the worthy actual recipients of that kind of support. The aid of the tax-payer in such cases is limited, and the question of a wise distribution of such sums as can properly be borne by the budget is complicated by every appeal that is made on any but the most undeniable grounds. It thus becomes of great importance to inquire what is the basis of any claim on national support for a new gallery for the collection of casts from the antique.

It will be remembered that South Kensington has been indicated as the site for the proposed gallery, and that the sum of 10,000*l.* has been mentioned as necessary for the establishment. The figure suggested leads to the conclusion that no new building is in contemplation; but that some of the existing and unoccupied space that was provided for the proposed Perpetual International Exhibition is intended to be utilised for the new gallery. If this be so, we must remark that the first requirement of a sculpture gallery is special sculptural illumination. As a rule, the illumination of sculpture is a subject grossly neglected in England. We can only call to mind one public apartment where a proper light is obtained. That is the central hall, or lantern, of the exhibition-room at Burlington House. A piece of sculpture which has the good fortune to find a place under that downpour of light is seen under circumstances of such advantage, that a clay model placed in that apartment has a finer sculptural effect than a marble statue in a less appropriately illuminated situation. We may contrast with some figures exhibited at Burlington House since its opening the fine portrait busts belonging to the National Portrait Gallery, which, as a rule, are now deprived of their full merit and interest by being injudiciously placed on brackets in a room lighted for pictures. The shadows are thus blurred, or even reversed, and works of art of much value are made to look like cheap and trumpery ornaments of an ordinary apartment. It is impossible to insist too strongly on a point as to which we have not only the authority of the great artists of the past, but that of common sense. The experiment can be made. A head, or a whole figure, may be seen casually lighted, and afterwards lighted in a mode adapted to its design. We may instance the lovely bronze female masque,—a Medusa or a Hypnos,—acquired by the British Museum a few years ago. When first placed in the cases of the bronze-room, it required the eye of an expert to detect its great beauty. It has been subsequently placed in a central position, under a vertical illumination; and its wonderful life and force arrest the admiration of the most casual visitor. We are of opinion that the arrangement of specimens of sculpture in rooms or galleries not especially constructed for the purpose of their display, under the direction of a sculptor or of an expert in sculpture, would do more harm than good. This is only a matter of detail, but it is a detail of the utmost moment. The relations of the sculptor and of the architect cannot be ignored, without injury to the works of the latter, and destruction to the value of those of the former.

Two points require establishment, in order to upport any such demand as is now made for ublic money. One is the desirability of the new llection in itself. The other is the question of te. The two are, indeed, intimately connected. the first position be established, viz., that it of public importance to have the new gallery, e second question will, sooner or later, have settle itself. But we have to ask how such institution is supposed to be calculated to rry out the professed objects of the twenty- ur gentlemen who have lately addressed a emorial to Lord Beaconsfield praying for overnment aid in the establishment of an his- rical gallery of casts from the antique?

These gentlemen are, first the head masters of ton and Harrow; then those of the City of ondon School, Merchant Taylors, Christ's ospital, Dulwich College, St. Paul's School, and Vestminster; and thirdly, professors and mas- rs of University and King's Colleges, London. he first question is, How is a new London allery to be made available, not only for udents within the metropolis, but for those of ich outlying schools as Eton and Harrow? ext, we must inquire in what manner is it tended to make the new gallery at South ensington serviceable to the purely London tablishments?

We are wholly in accord with the prayer of he memorial in considering that it would be of ry great service to the rising generation, and o the country at large, "if provision were made r the delivery of lectures upon the history of reek sculpture." That these lectures may be, o some extent, illustrated by casts, is no doubt ie case. That they may be with much more rce and good effect illustrated "from the col- ction in the British Museum," we hold to be ndeniable. But how, let us ask the memorialists, the provision of lectures, or their illustration om the priceless fragments of the noblest reek art now to be seen at Bloomsbury, to be rwarded by the establishment of a separate allery of casts, nowhere in the vicinity of the lgin marbles? There is a want of connexion ere which looks as if the learned men who emorialised the Prime Minister had been more ady to sign than to reflect on the purport of eir memorial.

Far be it, however, from us to suggest any- ing more than a momentary want of consider- tion. We are only too happy to see such names s those of Dr. Hornby, Dr. Montague Butler, r. Abbott, Dr. Baker, Dr. Barry, Dr. Scott, and Ir. Walker, pledged to the opinion that the igher education of classical scholars will be romoted by the establishment of a lectureship n Greek sculpture to assist at anything which ay tend to promote so desirable an end. Our nly wish is, that that end, now admitted to be esirable, should not be lost sight of for a ioment until it is fully attained. And there- ore we must be pardoned for the suggestion hat it may be attained more rapidly, certainly, nd effectively, by a very small degree of con- ord between the eminent memorialists them- elves, than by any application to the Prime linister. The pithy lesson of the fable of the ark and her young ones should here be remem- ered. When the head masters set themselves o the task of looking for a fit lecturer on sculp- ure, the lectures will be readily forthcoming.

We speak with the more earnestness on this ubject from the fact that such an idea has long een more or less distinctly intimated in our own olumns. We have lamented that England has ot of late encouraged any one to attempt for culpture what Sir Joshua Reynolds, to some xtent, effected, for painting. We say to some xtent, for, though the lectures of this eminent nan still remain without being displaced by a fuller and more systematic treatment of the sub- ject, their inadequacy to form an introduction o the present study of art is unquestionable. We have recently referred to a much earlier example of an attempt to produce a systematic introduction to graphic art in the treatise of Leonardo da Vinci on painting. Perhaps the subject of aërial perspective has never received more proper consideration than by this great artist. But the geometry of his linear per- spective is confused, when it ought to be simple. The lectures of Flaxman may be remembered. But Flaxman so far failed to breathe the vitality of nature into his reproductions of Classical types that in the handbook of his journey through Italy we cannot find a single instance of a sculptor's model drawn from life. Yet the Greek type is still to be found in many parts of Italy, and sculptural models, of pose as well as figure, are readily to be seen bathing in the summer waves of the bays of Naples, of Salerno, and Otranto. When we look further, as to the bibliography of art, we find that not only do we borrow most of our light, but that we only borrow that which we can obtain at a low price. We look in vain, in the art catalogue, for a translation of the "Laocoon" of Lessing; of the Polyclète, or other works of Schadow; of the "Proportions du Corps Humain" of Audran; of the "Bücher von Menschlicher Proportion" of Albert Dürer; of the "Œuvres complètes de Michel-Ange"; of the "Tabula Anatomica" of Leonardo da Vinci; of the "Monumenti Antichi inediti" of Winkelmann. There is an English translation, as well as French and Italian versions, of the "Geschichte der Kunst des Alterthums" of the latter writer, of whose writing there exist forty volumes in German, French, and Italian, to three in English. Of Flaxman's lectures on sculpture a third edition was published in 1849. Westmacott's "Handbook of Sculpture" is "adopted from an essay contributed to the 'Encyclopædia Britannica,'" and was published in 1864. One lecture was delivered by this artist before the Cambridge School of Art in 1863. Lubke's "History of Sculpture" has found a translator and a publisher, thanks to the facilities afforded by electrotype for the reproduction of the drawings of German artists. M. Taines's five works on the philosophy of art have found a translator, not in London, but at New York. The works of La Croix, Viardot, and others are rather fitted to adorn the library or the drawing-room than to aid the lecturer. The more one seeks for English works on the theory, history, and practice of sculpture, the more do we see the need of a composition of a standard work, fitted for the guidance of the student, and written with an express view to illustration by visits to our existing collections of sculpture.

It has not been without a view to the supply of this great gap that we have ourselves from time to time called the attention of our readers to certain main principles underlying the study and practice of art, whether graphic, chromatic, or glyptic. We may cite articles on Ornamentation (March 11, 1871); on the Antique: its study or restoration (Feb. 3, 1871); on Grandeur in the antique (March 30 and May 25, 1872); on Scale (June 29, 1872); Motion (Sept. 28, 1872); Shadow (Oct. 12 and 19); on Sculpture, Criticism, and Record (Dec. 28, 1872); on the Real, the Conventional, and the Ideal (March 8, 1873); on Colour (April 19, 1873); Form (Aug. 9, 1873); Proportion and Symmetry (March 7, 1874); Grace (July 6); early Art-work in Gold (Aug. 8); in Copper (Sept. 19); systematic Education in Art (Oct 31, 1874); and Beauty (April 22, 1876); as forming, among many papers of more special character, a sort of thread of reflections such as must be presented by any lecturer who would bring a clear view of the art of the past before the attention of the student of to-day. While art in general has been the theme, there are some of the above articles, such as those relating to shadow, to form, and to grandeur, which are more specially devoted to the rudiments of the art literature of the sculptor.

In another direction we may cite an article on the "Canon of Beauty in Greek Art," which appeared in No. 285 of the *Edinburgh Review*, and which gave some account of the bibliography of the important subject of human proportion. The latest admeasurements of the growing child, in Germany, were here compared with data taken from the finest Greek statues. And a modulus, or automatic scale, was then suggested, by use of which the comparison of proportions was reduced to the utmost simplicity; and painful specialisation, such as that of Audran, is replaced by direct reference to the canon followed by Phidias and his contemporaries. In any new lectures on sculpture it will be necessary to give a full account of an investigation which throws so much light on the traditional, exact, and unwritten rules of Grecian art.

Even the past few months have witnessed discoveries which fill up an enormous, and heretofore unbridged gap in the history of sculpture. In our notice of the discoveries of Dr. Schliemann at Mycenæ (15th of December, 1877), we pointed out how this gap was once filled. A few years ago Greek sculpture, for all that could be positively stated to the contrary, sprang perfect from the soil of Athens, in the time of Phidias, as the olive and the horse were said to have sprung up at the voice of Athene and of Poseidon. It was only deductive reasoning, or sculptural instinct, that led to the idea which we have ventured to express, that what the sculptor's art owed to Phidias was not so much a new touch as a new material. For bronze, silver, gold, and ivory he substituted the rougher, but more enduring, material of marble. The Apollo Belvidere is one of those figures of antiquity which suggested the former existence of a lost branch of sculpture with great force. There is no doubt that that noble work is but a Roman copy of a Greek original. The want of exactitude in the dimensions of the legs, compared with each other, alone is a proof of this. It is also tolerably clear that the marble suffered much from the sacrilegious chisel,—or, far worse, file, of Bernini, when it passed into his hands. Its first discovery was made by Raffaelle, who immediately started for Rome to inform Pope Julius II. of the good fortune that had led to its unearthing at Ostia. So eager was the Pontiff to behold the statue, that, although on the point of retiring to bed when the painter sought an audience, his Holiness gave immediate orders for a journey to Ostia, and saw the statue for the first time by torchlight. The left ankle, which bears much of the weight of the figure, is an inch larger in girth than the right. When this fact is compared with the peculiar extension of the arm, with the arrangement of the chlamys, and with the accentuation of the trunk of the figure, we see every reason to conclude that the original was in bronze; and that such departures from the precision of the canon of Polycletus as were thought necessary, mark a change in material as well as a later period of art.

That the original of the Apollo Belvidere was a bronze or a silver statue was thus an opinion very explanatory of difficulties otherwise hard to read; and that, not with reference to that individual statue alone. If Greek artists, down to the time of Phidias, wrought in metal, it is easy to understand the absence of specimens which marked and dated the progress of the sculptor's art. Bronze is highly perishable under circumstances which hardly affect marble. Silver, gold, or metal with silver or gold fittings, of course presented a tempting bait to the greed of the barbarian. Greek coinage is traced as far as the eighth century before Christ. There are electrum coins, evincing no small command of the art of the die-sinker, of the sixth century. But the discovery at Mycenæ of the golden masks which were interred with the important personages whose remains were discovered by Dr. Schliemann furnishes a positive proof of the use of metal eiconography at a date far earlier than the apogee of Greek sculpture.

It is thus certain that we are now in a position to take a more intelligent view of the history of sculpture than was competent to Flaxman, or to any one of those Italian, German, or French sculptors or critics to whom we have hastily referred. We therefore hold, not only that gratitude is due to those promoters of high education, who have pointed out the propriety of connecting the study of Greek and Latin authors with the study of Greek and Latin art, but that the time has come for a more exhaustive dealing with the subject than has yet been attempted. It should be grasped in its entirety. The bibliography of sculpture must be summarised; the history of sculpture must be traced; and the learning and the practice of the subject must be illustrated by reference to those objects of ancient art in which England is unusually rich.

But what the public seems to forget is, that our sculptural wealth is not confined to the priceless relics of the Elgin and Phygaleian marbles, and other treasures of the British Museum. We have at this moment, within a few miles of London, a collection of casts from the antique, on which no cost was spared, and which, at all events, when new, was unique. Most unfortunately, the whole stock of the Handbooks to the Sculpture Gallery of the Crystal Palace perished in the great fire. They have not been reprinted, and copies are not easily to be found. But the casts themselves exist, arranged, many of them at least, in chronological sequence, and illustrated by architectural reproductions. Unless more damage has been done than we are at all prepared to admit, we have under our hands, at the Crystal Palace, precisely such a collection of casts from the antique as it is now proposed to form *de novo*. Why not make adequate use of what we really have?

And this leads to another reflection as to museums, both special and general. We very much fear that their true educational value has

been of late much misunderstood. Teaching by the eye is of the highest value, provided it be teaching; but a museum no more teaches of its own accord than does a dictionary. In fact, a good museum is a dictionary,—not of words, but of objects. For illustration, explanation, verification, its use is essential; but it wants the living voice. A collection is not of itself fully a teacher. It is the apparatus of the teacher. In nine cases out of ten more information will be derived from a teacher without specimens, than from the specimens without a teacher. We look from the side of a vessel, it may be, with half-intelligent gaze, on shore, and wood, and river. Scene succeeds scene; and if we rush through a country like our typical Western neighbour in his frantic haste to "do the Continent," what are we the better for our tour? But when the voice whispers in our ear, and the finger points in illustration of the quotation,—

> "Hac ibat Simois; hic est Sigeia tellus
> Hic steterat Priami regia celsa senis,"

with what new glory is the scene illumined? The admirable scene in the "Taming of the Shrew" may be taken as illustrative of the function of the teacher, and of the quaint discords to be drawn by his perverted ingenuity from books or from objects of art. "*Hac ibat Simois*,—'I know you not.' *Hic est Sigeia tellus*,—'I trust you not.'" The one comment which fell on the ear of the present writer on one of the first days of the admission of the general public to the Great Exhibition of 1851 referred to a statue of Pan, and it was in these words, "Look at that 'ere covey with a tail!"

It is not to be understood that we are arguing against the establishment of a museum of casts. The idea is very attractive, and such an institution would be very useful in many respects. We have ourselves sketched out the lines on which it should be founded. All we now say is, that the proposal should first have full consideration and discussion.

Experience of the British Museum and of the South Kensington Museum has shown one thing with unexpected force. That is, that the effort to combine teaching and amusement is likely to result in failure. The more thoroughly a gallery is arranged as a self-teaching exhibition, the less does it attract interest as a sight. Nor is this the case with the ignorant alone. It is the case, to a great extent, with the cultivated man,—even with the specialist. Thus, a man who has taken a warm interest in classificatory natural history, devoted years to the study, and eagerly sought all sources of information, finds his courage flag on a visit to the Zoological galleries of the British Museum. There he will find, in their proper places, objects which, singly, he would have travelled miles to see. But the dead, sombre, mechanical effect of the lines of bird or beast mummy have a disenchanting, paralysing effect on the eye. The long rows look like the columns of a dictionary. There is not even the excitement of turning the leaves. There is the absence of that interest in the hunt which seems to be needful, in order to fix details, one by one, in the memory, and which is certainly necessary to the enjoyment, and perhaps to the utility, of study.

We hope that this idea of a course of lectures on Greek sculpture will not be allowed to drop. Its importance has now been formally acknowledged by the principals of our most famous public schools. For the illustration of such a course we possess specimens of the highest value, casts of an exhaustive variety, and photographs which complete the catalogue. The sculpture of the world is represented in England; but English literature is silent as to its history, its grandeur, and its teaching. It is time that the reproach of silence should be removed. For our own part we can only say, that if the headmasters and professors who have borne testimony to the need of lectures of this kind have the consistency due to their expression of opinion, their wishes may be at once carried into effect. Let scholastic institutions offer that degree of support which can not, in the present state of education, be expected from the public, and the completion of a series of lectures worthy to serve as an introduction to the study of antique art, illustrated by reference to our own treasures, and to representations and *fac-similes* of those of Italy, Greece, France, and Germany, may be counted on with prompt certainty. We shall be glad to receive any communications on the subject.

OBSERVATIONS ON THE PROGRESS OF MODERN GREECE.

The enthusiasm which the very name of Greece roused among Englishmen some fifty years ago is now a thing of the past, but yet there can be very little doubt that though we now regard Greece in a calmer spirit, there is still a great deal of real interest felt in the future of that country. The history of the last two years has once more turned the eyes of Europe to the East, and necessarily, therefore, Greece and her people have again attracted the attention of the world. But there is a current fallacy in regard to this question which has been caused to a great extrent by the settlement of 1830. People have become so accustomed to the present territorial extent of the kingdom that they are inclined to regard the acquisition of Thessaly, Epirus, and Crete as almost showing a lust of conquest in a young and struggling nation, whereas these three places really form part and parcel of modern Greece; their inhabitants were the first to rise in rebellion against the Ottoman rule, and it was only by the accident of diplomacy that when Greece, as it now exists, became independent, these, the best parts of the land, were excluded from the independence which they deserved, and have consequently remained, and will remain, a perpetual source of bloodshed and rebellion until they receive the freedom and the self-government to which they look forward as an integral part of the kingdom of Greece. In all notices, therefore, on the state of modern Greece, it must be well remembered that the kingdom is not yet by any means possessed of those lands and peoples who are the most necessary for her full and complete development. But the progress, under all its difficulties, of modern Greece shows plainly how earnestly all politicians should strive to give to the present kingdom those other portions which are needed to make a prosperous and happy nation out of rebellious vassals and a struggling principality.

There are many phases of this development which would not come within the scope of subjects treated of in our pages, but, on the other hand, considering the renewed interest with which the Hellenes and their land are now watched, it will not be out of place to devote a short space to some points which fall within the range of matters to which we are in the habit of drawing our readers' attention.

Greece is eminently a maritime country; she is, in fact, almost an island, even without taking into account those "Isles of Greece," whose glowing beauty has formed no unworthy subject for the poet. It is essentially, therefore, one of the first duties of such a kingdom as Greece to develope the capacities of her ports, and if she has done this, it is certain that she is making a decided, though it may not be a rapid progress towards a greater state of prosperity. Under the dominion of the Turks decay and desolation flourished, and it is one of the strongest arguments in favour of the emancipation of those Grecian provinces still beneath the Ottoman rule if it can be shown that the progress of free Greece has been reasonably rapid, taking into account the overwhelming difficulties from poverty, and from the troubles of the surrounding lands, against which she has had to struggle.

Let us take first the historical Piræus, the port from which the triremes of ancient Hellas went forth to conquer or to civilise the barbarians of the surrounding lands. In 1830 it was full of mud and sand, and hardly accessible even by the fishermen's boats; to-day it is an admirable port, deep and large, and alive with vessels of commerce, and contains war-ships of all nations. Another remarkable instance is found in the harbour of Chalcis, which forms the chief town and port of the fertile island of Eubœa, and of the eastern parts of Attica and Bœotia. For years the harbour could not be crossed by vessels which drew more than about 10 ft.* on account of the channel which divides the island from the mainland being choked with *débris*, but now its enlargement has been undertaken to the extent of twenty-one yards and a half and to the depth of six yards, and a movable bridge has been stretched across, so that constant communication can be kept up between Bœotia and Eubœa, and vessels which have to go through the channel can now do so instead of sailing the whole way round the long island of Eubœa. The expense of the work in question has been 952,000 drachmas (850,000 francs), which may be roughly set down at 34,000*l*. Here is an excellent example of the effect of the struggling civilisation of Greece, as compared with the lethargic barbarism of the Turks. The Ottoman Government had years during which this most necessary piece of work might have been done, it was never undertaken, and never would have been performed; but no sooner are the poverty-stricken Greeks free, than with their commercial instinct they at once set to work to remedy the existing state of things, and thereby benefit themselves and all other nations of the world. The same thing will be witnessed in Cyprus where the ports are in the same condition as were those of Greece when she became independent; and every single piece of increase in material prosperity which the islands of the Mediterranean and the lands of the East witness done by the hand of the stranger or the freedman adds another indictment against the Ottoman rule, and is another step towards its inevitable disappearance. We might mention yet other instances, such as the construction of a mole 300 yards long at Patras, of a breakwater at New Corinth, and many works of a similar kind. But another matter of a like kind forms a pregnant example of what Greece has done for commerce in the East. In 1847, M. Leconte, the well-known writer and traveller in Greece, wrote thus:—"A single lighthouse has just been constructed on an island close to Syra, but navigators say that it is absolutely necessary that they should be built on four other spots." But at the present day the Government have placed lights of different degrees of strength not only on four other places, but on forty-six points, visible from thirty down to five miles in distance.

And if we turn to the towns, the same progress is visible. Look on this picture of the Piræus, as described in the earlier years of this century, before the independence of Greece by Count Pecchio and M. Lebrun, in 1825. "I awoke," says the former, "under the pleasant sky of Attica, and my eager glances sought the Piræus,—the celebrated Piræus,—but, to my great distress, I saw only an insecure port, and some ruins scattered along the seashore." "And," says the latter, "the Piræus is nothing more now than a deserted bank, of most miserable aspect." Now look on the Piræus of 1878,—"solid and useful quays, markets regularly built of stone, squares, places, and fountains are everywhere visible, looked after with the greatest care." Take even Athens itself; it is now a town of 70,000 inhabitants. It contains 5,000 houses. The mere enumeration of the new buildings shows how things have changed: a royal palace was built by King Otho; a University has also been erected, a large building, with several wings and a graceful and simple façade. It contains two side courts, paved with marble. Externally, and close to the façade, there are two marble statues, one of the Patriarch Gregory proclaiming the independence of the Greeks, the other of the poet martyr Rhigas Férées, who was executed in 1798, and whose patriotic songs are still fresh in the memory of the Greeks. Another statue placed in front of the university buildings does honour to the memory of Coray. Each of these works was executed by the hands of modern Greek sculptors, and shows at once that the men of to-day seek to do honour to the patriots who have gone before them, and who have lost their lives in the wars for independence, and also to show that they themselves desire to excel in the arts of peace. Close to the University is the Academy, a building of marble, in the Grecian style: the gift to Greece of one of her sons, who lives habitually, like so many more in foreign lands, not in his own country, viz., Baron Sina, of Vienna. Then there is the School of Art covered with marble work; the Chamber of Legislature, opened in the course of 1876; the offices of the various ministers; the fine Museum (the gift of M. Bernardaki); and the Observatory, founded and endowed by the generosity of Baron Sina. It would not be difficult to go through various new towns, or old ones rebuilt, there. On the site of ancient Sparta a new and modern Sparta is growing up with regular streets, a prefecture, and various departmental offices. But it is sufficient to say that forty-eight new towns have been built according to modern plans, and numerous others repaired and renovated in various ways. Greece may be far from that state of security and prosperity to which she might

* We take the statistics and information contained in this paper from a recent voluminous and compendious work of the Blue Book character, "La Grèce telle qu'elle est. Par Pierre A. Moraitinis, Ancien Conseil de Grèce. Athens Libraire, Karl Wilberg; Paris, Firmin Didot et Cie. 1877."

ultimately attain, but looking to the ruins from which she has raised herself, and to the towns rising up on her surface, the words of Horace are not a little applicable,—

"Merses profundo, pulchrior evenit."

Finally, we may turn from towns and harbours, and note briefly some points connected with the School of Art. Passing over the years from 1837, when the School of Art, under the title "Polytechnique School," was founded at Athens, to the year 1867, we may pass to the present time, when this institution is housed in a fine building recently completed, which the country owes to the generosity of MM. Stourdari, Michael and Hélène Tossitza, and Averoff. Indeed, no feature of the Greece of to-day is more noticeable than the way in which private individuals, who are frequently residing for a large portion of their lives in foreign countries, where their energies have a larger scope, have employed their wealth in the erection of new buildings of a handsome and durable character in their own land. It shows plainly enough that as soon as the country is secure in the hands of its own people, and free from the domination of the stranger, the Greeks of to-day are only too willing to lavish on it their riches, as their fathers did their blood. But to return to the School of Art. It is attended by 300 pupils, who are presided over by a director, a secretary, eighteen professors, a director of the mechanical workshop, a mechanician, and six other employés. The instruction itself is divided into the following sections: Painting, sculpture, xylography, chalcography, ornamentation, mechanics, architecture, and geometry. It also possesses a library, a museum of sculpture, a picture-gallery, and a mechanical workshop for the practical teaching of the pupils. The objects of its existence are, in fact, twofold,—the instruction of artists in the highest kinds of art, and the teaching of various artistic theories which will benefit the artist and the workman. There is clearly, therefore, an endeavour always continuing to improve the character of the Greek people as artists and as workmen; and we must again repeat that the larger the kingdom becomes, and the more fertile land there is added to the present territory, the greater will be the possibility of an increase in its material prosperity; for, whilst the neighbouring provinces of Epirus and Thessaly are in constant rebellion, it is absolutely hopeless to expect that the arts of peace will thoroughly flourish in a kingdom in which every man feels himself almost a brother of the Epirotes and Thessalians across the border.

It is scarcely necessary to say anything as to such things as the two large machine manufactories established in 1860 and 1871, nor yet as to the improved state of the roads of Greece, which is another piece of evidence of the manner in which civilisation progresses in this little kingdom. The Government have done much in this direction, though much more yet remains to be performed.

But what has been said here will show plainly that Greece, since the proclamation of its independence, has been steadily increasing in prosperity, and that it possesses an organisation and institutions which are well fitted for a larger kingdom. This is not the place to go into the question of politics or finance. What we have been desirous of directing attention to is the manner in which handsome buildings have sprung up, towns have been rebuilt, harbours deepened, and a school of art which has already produced several able artists, such as Drossi, the sculptor, and Volonakis and Prassalentis the painters, has been founded. We quite admit that various evils still exist in great strength, officialism is rife, brigandage is not wholly suppressed, though it is greatly lessened; but it must be borne in mind that this kingdom has had much to contend with, and whilst shaken by every trouble in the East, has yet, as we have seen, had time to improve its material character, and to set up institutions which are calculated to revive the arts and establish trades and handicrafts, which will, it is to be hoped, at no distant date, give back some of its ancient prosperity to this country. Constantinople for the Greeks is the dream of mere enthusiasts, but the creation of a compact and prosperous Hellenic kingdom is not only a possibility, but in a certain number of years a certainty.

Barnard Castle.—The operative masons of Barnard Castle have resisted the proposition of the masters for a reduction in the men's wages equivalent to 1s. 8d. per week.

BABYLONIAN LAND LAWS.

When men began to abandon the nomadic mode of life and became settlers and agriculturists, there very soon grew up the want of some communal laws as regards the rights and responsibilities of landowners. It became necessary to find some means by which to fix the boundaries of the property of each individual, and to regulate and govern the system of land transfer.

Herodotus informs us that the ancient Egyptians had at an early period invented a system of geometry or land-measuring, and he gives us a very lucid reason in support of this statement. The annual inundation of Lower Egypt by the periodical rise of the Nile, and the frequent obliteration of all landmarks by which every man's property was known, rendered it necessary to have some means by which to ascertain the boundaries of the lands belonging to each person. In addition to this, the Egyptian system of land grants by which all land was state property, and the revenues being furnished by taxes in proportion to the amount of land held, all necessitated a strict system of land surveying. The existence of carefully-drawn surveys of the royal tombs, and of the gardens attached to houses, as well as a map of the mines in the Peninsula of Sinai, all show that such a system of land mensuration was in vogue in the Nile regions. The simple problems solved in the geometrical papyrus in the British Museum show that such surveys were carried out according to scientific principles. Herodotus informs us that Sesostris, by whom probably is meant one of the Rameses, sent proper persons to survey and measure land which had been submerged and lost by the rivers rising, in order to adjust the taxes with equitable proportion to the amount of land held.

The reasons advanced by the father of history are equally applicable to the domains of many other lands, especially to such as have a periodical inundation by their great rivers,—as, for example, the far Eastern cradle of Turanian civilisation on the banks of the Hohang-ho and the Yang-tze-Kiang, or the land of Babylonia, the twin-sister civilisation to Egypt, where the annual rise of its dual streams of the Tigris and the Euphrates furnished life and nourishment to the lands on their banks.

Considering the very early period at which the land of Babylonia was occupied by an agricultural and land-holding population, we may certainly expect to find some traces of laws and regulations relating to the rights and duties of these early landlords.

An examination of the cuneiform inscriptions shows us that at a very remote period, more than 2,000 B.C., the laws relating to property had been tabulated and recognised, and were rigidly enforced. By the law tablet (Wa. I. II. 10) one of the most valuable inscriptions in the British Museum, we learn that the rights of possession extended over lands, houses, slaves, male and female, and even embraced the private sanctuaries or shrines of the household gods. A man could leave property to his son or brother, but had not the right to compel him to reside upon that estate, and the presence of a man's landmark or boundary-stone was a proof of possession, and formed the title-deed to the land in question; and married women were entitled to hold land and estates in their own right. Considering that such laws were in existence, we may naturally expect to find some rules and regulations as to trade in land. In this we are not disappointed. In the second volume of the "Cuneiform Inscriptions of Western Asia," pl. xiii., we learn that an estate consisted of the house, the field, and the plantation or grove, and that the system of mortgage by real security was in vogue at a very early period. In lines 27-29 of this tablet we read, "In regard to the interest on his silver [money], his house, his field, and his plantation, as security he has placed." The grove or plantation, which was frequently mentioned as part of the estate, was the palm-grove, which formed an adjunct to every house. In the mythological texts we find one of the most frequent similes for extreme prosperity was, "Thou shalt flourish as the trees beside the door." It is curious to notice that the Babylonian name of the date-palm was *suluyû*, a name which is preserved to this day in the Arabic *salaf*. From the fruit of these trees the tax of first-fruits was collected. The act of pledging or raising money by mortgages on the estate is frequently mentioned in the early commercial documents of Babylonia. In the text quoted above we read "His house for silver he has laid a burden on" (*i. e.* pledged), and even slaves, male or female, and in some cases the man's own person, could be pledged to raise money. An example of such a transaction as raising money by personal security is found in an inscription, where we read,—"For his liberation silver he has weighed." The money mostly being in silver, the term "silver" may frequently be taken in such a sense as money in the present time. The written terra-cotta tablet which formed the memorandum of such transactions was called *sipartu*, or "written deed," and was drawn up with great care, and most carefully attested and sealed.

In no museum in the world, excepting the unopened treasure-heaps of buried Babylon, is there so fine or so regular a collection of commercial documents as in the British Museum. From the eighteenth century before the Christian era, until less than a century before that epoch, there are in this collection documents recording transactions which have taken place in the marts of Nineveh or Babylon.

Space will not permit me to mention more than one or two of the finest of these documents which enrich our national Museum. Among the early tablets are several written in the Accadian or old Turanian idiom of the early Babylonians. These documents are dated in the reign of King Khammvragas, who was one of the most energetic and warlike of the early Babylonian kings. It is important to notice that in many of these documents, one at least of the contracting parties bears a Semitic name, showing that even at that early period the Semites were the chief traders. One important document of this early series is written entirely in Semitic, showing that the language was held in sufficient importance to be used in commercial transactions. About a year ago I discovered a long bilingual inscription of this monarch recording various great events in his reign, which shows that the Semites were so important an element in the population of Babylonia as to require a royal proclamation to be a bilingual.

One of the largest and finest of these documents relating to gifts or sales of land is the boundary-stone bearing an inscription of Merodach-baladan I., B.C. 1200, which was presented to the trustees of the British Museum by the proprietors of the *Daily Telegraph*. This stone was placed at the corner of a plot of land presented by the king to a person named *Merodach sum-izakir* as a reward for his services to the state. In this document, although the dimensions are not given, the greatest possible care is taken to give all the adjacent and bounding properties, and the deed is attested by numerous witnesses. To the document is appended a long list of pains, penalties, and curses which will be visited upon the head of the unfortunate individual who injures the landmark of the royal donor (Deut. xix. 14; xxviii. 17).

Two very interesting documents in the collection are two conical black stones from Babylon which record sales of land in the reign of *Merodach-iddin akhi*, a king of Babylonia (B.C. 1150), a contemporary with the great Assyrian king, Tiglath-pileser I.

One of these is of great interest on account of the price of the field having been paid in kind, in lieu of the 616 *mana* of silver, and an inventory of the objects given, with a valuation of each, is given in the document.

Among the items, we may notice "One chariot with its harness for 100 (pieces) of silver." Six riding-horses, equal to 300 (pieces) of silver. "A cow in calf, some asses and mules, as well as numerous pieces of cloth." These, we are told in the inscription, "are in lieu of 616 pieces of silver." This document furnishes us with the name of the surveyor who values the land, — his name is "Sapiku," the son of Merodach-baladhu, — and he is termed the *Masakku*, or the measurer of the field. Appended to this document are numerous curses on the mover of the land-mark.

During the period of the Assyrian empire, commerce flourished to a considerable extent at Nineveh, and its land transactions may best be illustrated by the following translation of a tablet relating to the sale of a house at Nineveh in the year B.C. 640:—

1. The House with its woodwork and doors
2. Of Idpaic, in the midst of Nineveh,
3. Adjacent to the house of Rubu-Nabu,
4. Adjacent to the house of Dabir-Istar,
5. Adjacent to the house of Shamas-irba,
6. Adjacent to the established street.

7. The house which is in the midst of Nineveh
8. is built by KULLALAI.
9. From PAKANA-ARBA-IL for Sar-Istar,
10. For the sum of half a MANA of silver he has taken.
11. The full price is given, this house.
12. The lease is taken.
13. The deed is drawn.
14. It is done, there is no withdrawal.
15. Whosoever at a future day or at any time
16. Shall violate this contract, or this property,
17. Whether it be PAKANA-ARBAIL,
18. Whether it be his sons, or his sons' sons,
19. Who from KULLALAI,
20. his sons or his sons' sons,
21. This confirmed deed shall violate,
22. 5 MANAS of silver he shall give.
23. Witness in the presence of Isid-Nabu, the chief of plantation.
24. Witness in the presence of Kal-zir-Dabu Assur, the chief of plantation.
25. Witness in the presence of Tirya, the chief of plantation.
26. Witness in the presence of Khirurya.
27. Month Iyar (II.) 10th day in the Eponym of ASSUR-LADANI,
28. In the presence of Nabu-akhi-iddina, the Judge.

Here we have the deed of the sale of a house which took place in the eponyeme year of a person named ASSUR-LADANI. By the occurrence of this name and the assistance of the canon of these archons or eponyms we are enabled to fix the date of this document. There are a great number of documents of this class in the national collection which relate to commercial transactions in lands, houses, fields, and slaves, which took place in the great marts of Nineveh or Kalakh. But the number of Assyrian commercial documents in the British Museum is very small compared with that of the Babylonian, of which more than half the collection consists.

In the year 1875, the trustees of the British Museum obtained by purchase, from a dealer in Baghdad, a collection of more than 2,000 inscribed cuneiform tablets, of varying sizes, from ½ in. by ¾ in. to 8 in. by 12 in. These documents, on their arrival in England, I found to belong to the class known as contract-tablets, from their contents relating to commercial transactions and contracts. These tablets were found in one of the mounds on the site of ancient Babylon, but in which I have as yet not been able to ascertain. They were found deposited in a series of earthen jars, the tops of which were covered by a plain tile sealed to the jar by bitumen. Immediately on their arrival in England I commenced an examination of these important records of the past, and soon found them to be of the greatest value. My first researches were directed to the dates attached to these documents, which were of the greatest possible value for the settlement of the much-vexed questions of later Babylonian and Persian chronology. The result of this examination I have published in a paper in the Journal of the Society of Biblical Archæology, vol. vi. Some idea of the complete sequence of the series of dates formed from these tablets may be obtained when it is mentioned that, from the first year of Nebuchadnezzar, B.C. 605, until the last year of Darius Hystaspis, B.C. 486, there is hardly one year unrepresented by dated documents. In addition, many of the most difficult points in Biblical and Oriental chronology have been settled by the examination of these documents.

A very slight examination of these tablets sufficed to show that there was not only a regular sequence in the chronological order, but that they all were derived from one and the same source. They were, in fact, the commercial documents and papers of a great Babylonian firm of bankers and State land-agents, trading in the name of EGIBI & SONS. Among these tablets are found terra-cotta memoranda, representing every kind of commercial and fiscal [transaction, land sales and leases, loans and mortgages, loans of money, sales of slaves and property of every description. In the State portion we find lists of temple offerings, receipts for taxes, lists of unpaid dues and claims, law cases, letters, and arbitrations. In documents relating to land transactions this firm is extremely rich, and a most important document in this section which I have discovered I now lay, at the request of the editor, before the readers of this journal.

In examining the land-agency section of the papers of this firm, I discovered a tablet in dark terra-cotta, on which was neatly drawn the plan which accompanies this article, and which was evidently appended to a lease or sale of the estate it represents. I have not as yet been able to discover the actual deed relating to this land, but I hope to do so at some future time; however, the plan itself is of great interest and value.

It represents a plot of land of about 8¼ acres in area, which was situated, like all Babylonian estates, on the banks of a river or canal. The inscription at the head of the plan informs us that it is the plan of "a field in the high road on the banks of the river or canal Nahr Banituv. Although in the plan the name of the river is lost, I am fortunately able, from another tablet relating to the adjacent property, to supply this important item.

The estate is divided into three pairs of parallelograms, which I have called B^1-B^2, C^1-C^2, D^1-D^2, to which are added two more similar-shaped plots, A and E, and an irregular trapezoidal piece, F. The dimensions are all given in cubits, or fractions of cubits, and are most carefully figured on the drawing.

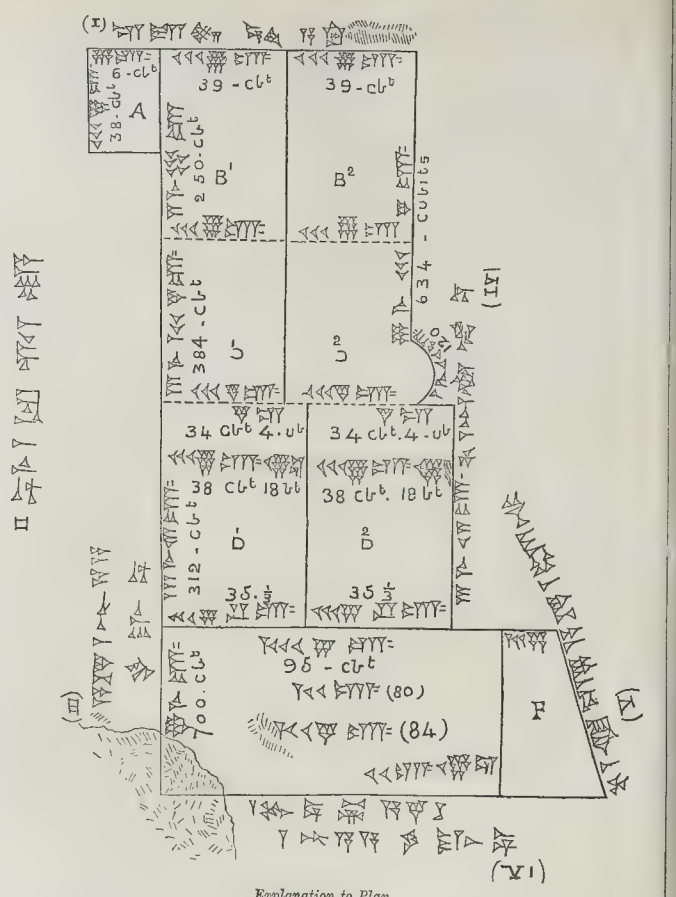
The length of the Assyrian cubit has been established by means of the comparison of the measurement in cubits of the circumference of the palace of Khorsabad, as given by Sargon, king of Assyria, in his inscription, and the measurement in mètres, as obtained by M. Flaudin, the French architect, employed on the explorations on that site.

The inscriptions state that the cubit circumference of the palace walls was 16,280 cubits, and the measurement of M. Flaudin gave 8,547 mètres, which gives a value of 0·525 m. as the length of a cubit.

Representing the French mètre as 39 English inches, we obtain for the cubit the value of 20·475 English inches. Those who are anxious to gain further information as to the linear measures of Assyria and Babylonia, will do well to consult the excellent work of the learned German Egyptologist, Dr. Lepsius, entitled "Die Assyrishen Langen masse, 1877."

The greatest length of this estate is from north to south, being 1,646 cubits, or 936 yds. 0 ft. 5 in. in English measurement. The width on the northern border, on the edge of the highway, is 84 cubits, or 140 ft. The dimensions on the southern portion being much obliterated, it is difficult to arrive at any conclusion as to the length of the base line.

The arc-shaped curve on the east side is most carefully measured, its circumference being 120 cubits, or 200 ft. It is unfortunate that the



Explanation to Plan.

I. "Field on the road which is on the bank of the river [Banituv]."
II. "The enclosure of Ipriya."
III. "[Land] of Buruga, son of Tariya, son of the chief builder."
IV. "Land of Nabu-sar-ibni."
V. "Land of Kisya, son of [Dibzir, son of Pitu-sa-babi."
VI. "Land of Buruga, son of Tariya, son of the chief builder."

The dimensions are in cubits:—Babylonian cubit = 20·475 English inches, and uban = $\frac{1}{30}$ of a cubit.

The original plan bears no indication of being drawn to scale. The block here given is almost the exact size of the original.

mall dimension in the interior of the arc is obliterated, as it evidently represented the radius of the curve.

In the names of the owners of the adjacent properties we have most important matter, for by these I have been enabled to fix the date of the plan and the name of the owner of the land, both details of great importance.

The northern boundary is the highway, another document calls it the royal-highway, on the bank of the river Banituv. The greater portion of the western side adjoins the land or enclosure of a person named Ipriya, and the remainder of that side, and the southern boundary is formed by the land of Buruga, the son of Caria, the son of the chief builder. The eastern side, the whole of the upper portion, that is, plots B^2, C^2, D^2, are adjacent to the land of Nabu-sar-ibni. The portion F adjoins the land of Kasiya, the son of Dibzir, the son of Pitu-ar-babi.

Taking the cubit as 20 English inches, and the gi or *uban*, which is only the 30th part of a cubit, being omitted, I obtain the following table of areas :—

	Ft. in.		Ft. in.	Sq. ft. in.
1. Plot A =	38e × 6e	=	63 3 × 10 0 =	632 6
2. Plot B = 2 (250e × 39e)	=		416 8 × 65 0 =	54,166 8
3. Plot C = 2 (384e × 34e)	=		640 0 × 56 2 =	71,892 16
4. Plot D = 2 (312e × 35e)	=		520 0 × 57 7 =	59,886 8
5. Plot E =	700e × 95e	=	1,166 2 × 158 0 =	184,254 4

Square feet 370,830 42

Square yards 41,203 3 ft. 42 in.

Acres 8. 2483 yds. 3 ft. 42 in.

8 acres 2483 yds. = 8½ acres.

Having thus roughly estimated the area of this estate, as calculated from the plan and figured dimensions drawn more than 2,000 years ago, we will now endeavour to find out some particulars of the mode of land valuation and transfer which were gone through in this case. Among the tablets of this Egibi series is one very finely written and preserved which relates to the sale of a field in which took place in Babylon in the month Tasritov, 14th day in the 3rd year of Nabu-nahid (Nabonidus), king of Babylon. This document is a very fine example of the conveyance series, and will enable us to gain a very full insight into the mode of transfer.

In the accompanying translation some of the technical terms are very difficult on account of their being confined solely to this class of documents.

TRANSLATION.

A.

1. A field (in area) 5 gur, 1 as, 5 ka of corn seed to seed it.
2. The plantations, and wells attached to the field, its borders, and approaches.
3. Upon the river (canal) of Baituv, in the approach to the gate of Zamama, in Babylon.

B.

1. 949 cubits on the upper side towards the west, a boundary is fixed.
2. By (the land of) Nabu-sum-utsir, the giver of the field.
3. 949 cubits on the lower side, towards the east, a boundary is fixed. By (the land of) Nabu-sar-ibni, son of Marduku.
4. 40 cubits, the upper headland towards the north a boundary-line is fixed, by the king's highway, on the bank of the canal of Banituv.
5. 40 cubits, the lower headland towards the south, a boundary-line is fixed by the other portion of the field.
6. A field for this portion, 5 measures of corn seed. A field with the wells attached.
7. And a valuation of 5 ka, 8 measures of corn seed, the area. First measurement.

C.

1. 1,630 cubits, on the upper side towards the west a boundary-line is fixed.
2. By (the land of) Nabu-sum-utsir, the giver of the field.
3. 1,614 cubits, on the lower side towards the east a boundary-line is fixed.
4. By the land of Dib-zir, the son of Bel-sunu, son of the porter at the gate (Pitu-sa-babi).
5. For the junction of the headlands on the north the former measurement suffices.
6. And the extra boundary is fixed by the land of Nabu-sar-ibni, the son of Marduku.
7. On the south a boundary is fixed by the land of Nabu-sum-utsir, the giver of the field.
8. An enclosure of 3 gur, 4 ka, 7 *measures* of corn seed, the field and borders adjacent.
9. And by area measured by the ka. The second measurement.

D.

1. A field of 5 gur, 1 as, 5 ka of corn seed, the measurement of this field.
2. In area 3 gur, 1 pa, 5 ka, 2 *measures* of corn seed, the fences adjacent.
3. That is at 5 measures of corn seed for 1 shekel of silver, 18⅓ mana, 8 shekels of silver its value.
4. And addition 1 pa, 5 ka, 6 *measures* of corn seed for the borders and approaches.
5. That is at ⅓ a measure of corn seed for 1 shekel of silver, ⅔ mana, 9 shekels of silver its price.

E.

1. From Nabu-sum-utsir, son of Nabu-khil-ili, son of the chief builder.
2. Mina-ilav-marduk, son of Nabu-tabni-utsir, son of Egibi.
3. For the price above-named 19 mana, 17⅔ shekels of silver he has obtained.
4. In addition to its full price a 1½ mana of silver as guarantee he has given it.

F.

1. The estate for 20½ mana, 17⅔ shekels of silver by this bond from the hands of Mina-ilav-marduk.
2. Son of Nabu-tabi-utsur, son of Egibi, Nabu-sum-utsir.
3. Son of Nabu-khil-ili, son of the chief builder, for the full price of this field.
4. A purchase he has made—a repudiation he has not.
5. They shall not return to each other, they shall not violate by force.
6. For the future among the brothers, the sons or the family, legitimate or illegitimate.
7. Who is of the sons of the chief builder shall repudiate these fields,
8. Not giving the silver, not reverencing this bond, silver he shall pay.
9. As much as xii full (*mana*) he shall pay.

G.

To the seal attached to this document :—
Witness in the presence of,—

1. Samas-sum-ukin, son of Sula, son of Bartuku.
2. Rimut, son of Zilla, son of the chief builder.
3. Marduk-sum-utsur, son of Musallim-marduk, son of the boatman.
4. Kalba, son of Basa, son of the cup-bearer.
5. Rimut, son of Marduk-ireba, son of the soldier.
6. Marduk-sum-utsur, son of Musallim-marduk, son of the boatman.
7. Kisir, son of Mabu-ukin-napisti, son of the judge.
8. Mina-ili-marduk, the scribe, son of Sukhai.
9. Nabu-sekul-esir, the scribe, son of Nabunnai.

Babylon, month Tasrituv, 14th day, in the iii year of Nabonidus (B.C. 552), king of Babylon.

℄

The nail-mark of Nabu-sum-utsir, the giver of the field, fixed for his seal.

●

Attached to the document are the impressions of the cylinder engraved seal of Mina-ili-marduk, the scribe, who wrote one of the deeds, and the seal of Nabu-sekul-esir, the scribe who wrote the other copy.

The first section of this document contains a species of preamble giving the nature of the transaction,—the land, its situation, and computed area. We find that it is situated on the border of the king's highway, in the approach to one of the great gates of Babylon. The great gate of Zamama was on the southern side of Babylon, so that we may possibly recognise the Nabur Banituv, in Wurdeah Vor, one of the great canals on this side of the city.

In the second section of the deed (B) we have the measurement given of the first parallelogram into which the surveyor has divided the estate, its dimensions being 949 cubits × 40 cubits, or 1,580 ft. × 66 ft. 8 in.

Lines 7 and 8 give a computation of the area of this field, according to a system in vogue in Babylonia, and also among the Jews, by a computation of the amount of corn required to sow it (Leviticus xxvii. 16).

The third paragraph (C) relates the measurement of the second parallelogram. This parallelogram adjoins on to the southern side of the first measured portion, and its area is difficult to compute, on account of the dimensions of the headlands being lost.

A similar calculation of the area by the quality of corn required is appended to this paragraph.

In section D, two corn areas are added together, and a price estimated according to the market price of corn.

We have for the land area, the price of ⅓ shekel for each measure of corn, *i.e.*, 18⅓ mana 8 shekels.

For the fences, approaches, &c., a higher quotation of ⅓ a shekel per measure, giving us a value of ⅔ mana, 9 shekels.

Section E computes these two values, and gives us a price 19 mana, ⅔ shekels of silver as the full price.

	Mana.	Shekels.
1. To the computed value of ground ...	18⅓	8
2. To the computed value of fences, &c.	⅔	9
	19	17
Represented in the deed as	19	17⅔
To this is added a guarantee, for faith of	1½	
Which, to balance the previous slight deduction is represented as	20½	17⅔

The section F relates to the ratifications of the deed and the penalties of refutation on non-fulfilment of any of the clauses. Here we notice that in the enumeration of the descendants the brothers take precedence of the sons, an evident relic of the old Turanian law of heritance which was in use in Babylonia. A similar law of heritance is in vogue in Turkey at the present day.

To the document are attached the impressions of the cylinder seals of the scribes who made the two copies of the document for the vendor of the field, Nabu-sum-utsir, and the purchaser, Mina-ili-marduk.

The first of these scribes is Mina-ili-marduk, the son of Sukhai, and his seal is a figure of a priest, in robes of his office, standing in the attitude of adoration before an altar. On the altar are several sacred emblems, a cross, a staff surmounted by a solar disc, and a serpent. The legend on the cylinder has been written in archaic, or black letter type; the inscription, "The seal of Mina-ili-marduk, the scribe." The word for seal is literally "writing-stone." The seal of Nabu-sekul-esir is a figure of a eunuch in act of adoration, and bears the inscription, "The seal of Nabu-sekul-esir, the scribe."

There still remains one very important point to be examined respecting this deed, and that is the enumeration of the adjacent properties; for by these we shall be able to solve the two most difficult points respecting the plan I have described.

We find the adjacent lands to the one sold in this deed are given as—

1. On the west the boundary is in the land of Nabu-sum-utsir, the giver of the field. This man is described in the deed as the son of Nabu-khil-ili, the son of the chief builder.
2. The boundary on the east is the land of Nabu-sar-ibni, the son of Marduku. The second parallelogram adjoins the land of Dibzir, the son of Bil-su-nu, the son of the "man, the opener of the gate," *i.e.*, the porter.
3. The northern boundary is the "king's highway," on the bank of the river or canal of Banituv.
4. The southern boundary is the land of Nabu-sum-utsir, the vendor of the field.

Among these adjoining proprietors we recognise many of the names of the persons mentioned in possessing land adjacent to that figured in the plan.

In the plan, we find plots B^2, C^2, D^2, have an eastern frontier on the land of Nabu-sar-ibni of 946 cubits, or three cubits less than that given as the length of the first plot in the tablet translated. The northern boundary is 40 cubits, or one cubit more than width of plots B^2, C^2, and D^2.

The second parallelogram joins on to the land of Dibzir, son of Bil-su-nu, son of the opener of the gate (Pitu-sa-Babi). We find the south-eastern frontier of the land in the plan, that is, the trapezoidal portion F, adjoins the land of Kisiya, son of Dibzir, son of "the opener of the gate" (Pitu-sa-babi).

From these data it is evident that the eastern boundary of the estate of the plan and that mentioned in the tablet are the same, and, in fact, the latter includes a considerable portion of the former. The estate sold by Nabu-sum-utsir to Mina-ili-marduk was a long narrow one, 40 cubits in width, and 949 + 1,630 or 2,579 cubits, in length, with a narrow headland upon the river to afford a means of irrigation of the land.

The whole western side is occupied by the land of Nabu-sum-utsir, a name which does not occur on the plan.

The south and south-western boundary of the plan are the lands of Buruga, son of Tariya, son of the chief builder. Nabu-sum-utsir, the vendor of the land in the tablet, is the son, Nabu-khil-ili, the son of the chief builder, a member of the same family, but not a son of Buruga. In the plan we find the son of Dibzir, whereas Dibzir himself occurs in the tablet; it is therefore evident that the sale of the land drawn in the tablet took place later than the third year of Nabonidus, at a time when the greater portion of this estate was in the hands of Nabu-sum-utsir, who sold plots B^2, C^2, D^2, half of E and F, and a considerable amount south of the base line, to Mina-ili-marduk for the sum of $20\frac{1}{2}$ mana $17\frac{5}{6}$ shekels of silver. Since that sale the lands had in part changed hands, and had become combined in the form of the estate figured on the plan. The probable date of this plan is, therefore, the latter end of the reign of Nabonidus.

Space will not permit me to deal with many of the points of interest which suggest themselves in the examination of these documents. I hope at some future time, when my examination of this interesting branch of cuneiform literature is more advanced, to give to this journal some more extracts from the papers of Egibi & Sons, bankers and financial agents, Babylon.

W. St. C. Boscawen.

BRADFORD.

"We looked mysteriously into a kindred country, where dwelt our fathers; inexpressibly dear to us, but which had seemed for ever hidden from our eyes,"—words of Carlyle, which might fittingly be used by those who know Bradford now, and could have looked upon a faithful portraiture of it as it was when the element of growth began really to manifest itself. To obtain such a portraiture we must look to what Bradford was between forty and fifty years ago. We need not cast back anxious eyes into the past; for, except in the dating back of the old parish church to the reign of Henry VI., there is not much of an antiquarian nature about the town, and what there is is so girt about by the genius of to-day,—the erections, the factories, and the noise,—that it is hidden. The town is in the heart of the manufacturing country; situated at the junctions of what were "three beautiful valleys." With coal and iron abounding near it, and with facilities of shipment by its canals and of despatch by early railways, it necessarily acquired greatness. Let us look at what it was above two score years ago, and we shall speedily see what changes it has known since. It had been, under the great Reform Act, recently created a borough; it was building a large new courthouse, where we were to meet its "court of requests," and that for the "honour of Pontefract"; it had two churches,—St. Peter's and Christ's,—besides half a dozen chapels and places of worship for Dissenters; its markets and fairs were to some extent agricultural; its manufactures were then, firstly, worsted stuffs, then broad and narrow cloths, and "wool cards and combs" were also made. The gentry of that day lived in High-street, Manor-row, Vicar-lane, and Horton-row; four bankers—including firms still trusted—kept the cash of its merchants; there were boat-builders on Canal-side and Windhill; the sole collieries worked near were Bowling, Four Lane End, Wilsey, Calbery, and Eastbrook; shuttle and sizing makers abounded; sixty-eight firms were included in the list of woollen cloth manufacturers, including representatives of the Bradley, Dibbs, Hammond, Hardaker, Lightfoot, Overend, Parker, and the Wall families; whilst the woolstaplers were even more numerous, and the worsted spinners and worsted-stuff manufacturers formed an imposing number. The gasworks in Mill-street were small. A dozen coaches ran to Halifax, Huddersfield, Kendal, Leeds, Manchester, Preston, Skipton, and York; a van to London, whilst the Deacon & Harrisons, the Carvers, Thompsons, Huttons, and Harrisons, formed the chief of the carriers, and Selby Canal and other companies gave "conveyance by water." The post-office was on a small scale—in Kirkgate,—and from Keighley and Haworth it was still by horse-post. Finally, at the first election the candidate at the head of the poll received only 634 votes, although the borough contained even then 43,537 inhabitants.

After the date to which these particulars refer, there was the commencement of an era of growth in the great trades of Bradford, and a necessary growth of the town itself. The position of the town, its full supplies of power, the variety of its trades, and the extent to which there has been a growth in the wants the chief of these supply, are the main causes to which that growth may be ascribed. It has been, on the whole, a steady and sure growth, not so much by leaps and bounds, as has been known in the case of other communities, and possibly for this cause it has not so fully known the eras of special depression that other towns have known. It still has its ironworks, on, perhaps, a scale of increased size; it has stone-works of some note; its collieries have shared in the prosperity and adversity of the coal trade; but still, its chief dependence is on its wool and worsted manufactures, and it may claim to be the principal seat of the stuff and woollen yarn trades; and the growth of these varied trades has been reflected in the population and in all the tokens of an enlarged populace. At the last census the numbers of the people had so risen that from the 43,000 we have noted they had to be set down as 145,830. Its School Board, before it had been many years in existence, had 7,300 children on the registers of its schools, and has largely increased its accommodation since. The number of paupers in the limits of the local Board of Guardians varies between 1,000 and 2,000; in the town the death-rate fluctuates between twenty and thirty, and the number of deaths from sixty to nearly 100 weekly. In the Bradford Infirmary and Dispensary there are usually about 100 in-patients, whilst those treated outside raise the number of the afflicted dealt with by this institution over 1,000 weekly, and other institutions play their part in the removal or the assuaging of the pains and ills the flesh is heir to. There are more pleasant proofs of the great and growing population of Bradford; there are the almost countless churches and chapels which stud the town with edifices of differential beauty; the noble provision that has been made in the handsome parks for the recreation of the populace; and the manner in which some attempt has been made to meet the intellectual needs of the townspeople. Not only so, but in its mechanics' hall, its free library, its temperance-hall, which has been said to be the first of its kind in the world, and one or two of its hospitals, it has buildings with considerable claims to architectural beauty. Its stations are in one or two instances being made more commodious; it boasts of three or four statues, including those of Titus Salt and Oastler; and in other modes it has shown a corporate appreciation of art not universal in English communities. It is true that this taste has been exhibited under considerable difficulties, under the general difficulties which affect such communities in the smoke and the soot of busy manufacturing districts, but that it exists in spite of these is matter for congratulation.

As to the trade of Bradford and the prospects of the town, its predominance in the special industry which has taken such deep root in it is well known; and its market is looked forward to with eagerness wherever men in the wool and worsted trades most do congregate. Its banks are many, and the appreciation by capitalists of the chief of these may be gathered from the fact that the shares sell for three times the amount which has been paid up. Similarly its Exchange and others of its public buildings have their values "above par," and its Corporation and Canal Company have their respective securities also approved by capital. The foundations of its trade are secure, and it is more likely that that trade will be increased by the addition of new branches than that it will be diminished by the falling off in the old. In its position, its old and continued repute, as well as in the largeness of the capital invested in its chief trades, there are very substantial reasons why Bradford may expect to flourish and to increase. It is not the small town it was half a century ago; but it has put forth new roots which seem to have taken enduring hold. Stretching not only out itself, it has put forth offshoots around it which are not the least part of its greatness. In pleasant Airedaile, one of its best known sons planted a vigorous young manufacturing colony which could not find room for its growth in Bradford, and created a model manufacturing village known far and wide. And though Saltaire may be said to be the chief of these offshoots there are others notable in their way around Bradford, whilst all the villages near the town have derived a vast impulse from the growth of that great community, and in most instances that impulse has been of an industrial order. Thus, with its belt of manufacturing towns in embryo, with a district around it studded with great communities, and with ample railway communication with all the great centres of trade and population, Bradford may claim to be one of the most promising commercial towns in Yorkshire. As we have seen, it has within it one or two oases in the midst of a wilderness of brick and mortar, and it has also an outlet by rail to one of the most bracing and invigorating, not to say one of the wildest districts of England. Stretching right out from Bradford, there runs out by Skipton the great extension of the Midland Railway, which in its northern course rushes, careering through a wild land, where mountain ridges and high and bleak moorlands alternate with pretty little dells far below, looking down on which the gazer is reminded of those lotus-eaters who looked down from the heights on the tillers of the soil below. The great seat of the stuff and woollen yarn trades has, then, ample opportunity to seek rest in the breezy uplands far away from its own noise and dense life. It has in the parks that beautify it, and in some of its many public buildings, proofs of the public spirit of its citizens, which will serve it in good stead in the future as in the past. Its trade must know the ebbs and flows in that greater volume of trade of which it forms a part; but unlike stationary communities, it flows with the flow, and it does not feel so fully the ebb as do some, and thus its future is promising as its past has shown fulfilment.

A MIDSUMMER NIGHT'S DREAM IN MARBLE.

The great vase which M. Gustave Doré has executed for the Exhibition of 1878 at Paris, is the most original design which can be found in modern sculpture. We call the object a vase, in default of a better word; but it does not belong to either of the nine principal forms of vase, as they are indicated in the Catalogue of the British Museum. It is neither an amphora, a hydria, a krater, a lebes, a lekythos, an ariballos, a cantharos, nor a kylix. It does not approach the more modern form, dear to the artists of the Renaissance, of the tazza. An Italian would call it bluntly *una bottiglia*. It is a pear-shaped, long-necked vessel, of very elegant proportions and curvatures, standing, with the pedestal, which forms part of the design, 4·50 mètres high. The extreme width is about half the height. The diameter of the narrowest part of the neck is one-fifth of the widest diameter. Over, under, round, and into the mouth of this gigantic vessel, a chorus of some hundred satyrs, nymphs, and *amorini* are conducting a midsummer night's revel. The extraordinary boldness of the work may be estimated, rather than imagined, when we say that the largest figures would stand, if erect, 3 ft. high; and that the whole group consists rather of figures in the round than of what is usually called relief,—even *alto relievo*. The motive of the grouping may be said to be the capturing and binding of the Satyrs by the Nymphs and Loves; but the boldest and most life-like notions startle the observers. One lovely little cherub has twined a vine-stem round the legs of a Satyr, who is struggling with four other Cupids and a nymph, and has fallen backwards with the force of the pull, and rests on the ground only with one knee and one foot,—the little body being at right angles with the vase, and the head actually upside down. The

face of the latter figure has an arch and triumphal smile, while his companion, whose vine-stem has snapped, is falling below him, with a lively expression of terror and wrath at his mishap. On the opposite side of the vase a sort of Cupid's ladder is occupied with girls and Loves climbing to the summit. One little Amorino is squeezing grapes into a cylix held by a nymph, who must be thought,—perhaps alone of all the numerous figures,—to be already somewhat the worse for the vine-juice. Behind him a girl helps herself up by clinging to the ankle of a climbing Cupid.

Yet higher another Love has just got his arm over the lip of the vessel; while a third, perched on the top, holds up his right hand in encouragement. A fat Silenus, to the right of the wine-making Cupid, seems oppressed with heat or with thirst, and is tended and embraced by two boy-angels. Again, looking to the right, we come on a Cupid riding on a lizard, and just unhorsed by the wriggling opposition of his *monture*. The little winged groom, whose duty it is to lead the lizard, is almost entirely detached from the vase. A Satyr, blowing a conch, and holding on with one hand to the vine-tracery, is another figure almost wholly detached from the ground. One seated female figure, with a Cupid seated by her, may be considered, from the comparatively matronly quiet of her attitude, to be Venus, or Titania, or the *chaperon* of the wilder girls. Around the base of the vase are Cupids engaged in more serious business, such as was indicated by the charge of Titania,—

"Come, now a roundel and a fairy song;
Then, for the third part of a minute, hence:
Some, to kill cankers in the musk-rose buds;
Some, war with rear-mice for their leathern wings
To make my small elves coats; and some, keep back
The clamorous owl, that nightly hoots, and wonders
At our quaint spirits."

Spiders, beetles, worms, moths, and flies, instead of bats and owls, are the small deer chased by the elves of Doré, one of whom is engaged in the unprecedented frolic of blowing a snail, as a schoolboy blows an egg, with his lips at the end of the spire of the shell, the mollusc turning round his horned eyes in embarrassment.

As an example of the picturesque in sculpture, and the execution, in solid material, of the lightest and wildest sketches, hitherto confined to the pencil or the etching-needle for their production, M. Doré's vase stands alone.

SOUTH KENSINGTON PRIZE DRAWINGS.

The drawings to which prizes have been awarded in "the National Art Competition of 1878" are on view in Exhibition-road. They are very numerous, about 1,400 in number, and fill two pretty large rooms on walls and screens, and furnish, we may conclude, a good indication of the nature and extent of the work which is being done under the auspices of "the Department." At least, as to the extent of the work done we must form a high estimate, because we learn that these are selected from 138,045 works sent up by 142 schools of art throughout the kingdom. Nevertheless, the impression produced, on a first view at any rate, is that medals are given rather freely, and are not very difficult to earn. If we may conclude that a comparatively sufficient discrimination is exercised in dispensing rewards, we must also conclude that in that case an immense amount of poor work is submitted. Of course, it may be said that this is to be expected when the competition is open to all pupils in a certain grade of the Government schools of art all over the kingdom. There are nine gold medals given, nearly forty silver ditto, between seventy and eighty bronze ditto, and considerably over one hundred book prizes; all alike dignified, we observe, with the title "National,"—"National Gold Medal," "National Bronze Medal," "National Book Prize"; so that we are surprised, in the case of drawings honourably mentioned, not to find them also labelled "National honourable mention." There is a degree of pomposity about this which is unnecessary, and which, in view of the character of some of the works on which these national rewards are bestowed, becomes occasionally rather ludicrous. For example, we observed that a National gold medal for architectural design (the only one awarded) had been gained by a student at Northampton, for a "design for church." This we naturally looked at with some interest; and, having certainly some special right to speak in regard to architectural design, we must plainly say that to give a reward with so high-sounding a title for such a drawing as the one in question is simply absurd. It is a perspective drawing of a Gothic church, without a spark of originality, and so scratchy and defective in drawing in many places that it could hardly have had a chance for a prize even in the *junior* class of design of the Architectural Association. The architectural contingent to the exhibition is not large; there are, in fact, only a very few architectural drawings hung; but, even granting that this were the best of them, to give the producer of this drawing the right to say that he obtained a "National Gold Medal" for architectural design is not a proceeding calculated to raise the Government schools of art in the eyes of architects, to say the least of it. In fact, however, the architectural design by Mr. Marshall (also a Nottingham student), to which the bronze medal has been awarded, has considerably more merit in it than one that gained the "gold," as it shows a certain amount of originality in architectural treatment, which the other certainly does not. Other gold medal designs seem (as we heard remarked in the room) "very easily earned"; one for designs for glass vases, for example, of which the drawings are fairly executed, but the designs contain nothing more than might be picked out of any one of half a dozen shop-windows. In other cases there is a more even balance between the work and the award; Miss Bradley, of Dublin, for example, has gained the gold medal for "a chalk drawing of a head from life" by a drawing showing much feeling and refinement, and not over-finished; and Miss Grace (Brighton) shows a still-life group in oil which quite deserves the honour it has attained,—an honour, however, considerably impaired by the bestowal of a medal of precisely similar importance on works exhibiting very inferior qualities.

We commended one drawing as not being "over-finished," thereby intending to imply our conviction that in certain departments there is a good deal more attention paid to finish of execution than is consistent with the real end of the kind of study pursued. Of course, if people paint flowers, for example, or anything else from life, it is hardly possible to finish too much, because the finish, the realisation of the delicacy of nature, is itself the object, and the work when complete is really a work of art and a thing to derive pleasure from, though ostensibly done as a study. But we can hardly feel the same in regard to the drawings from well-known casts which fill so large a part of the wall-space, and upon which so much time and labour must have been bestowed. A crayon drawing from a cast is a means to an end only,—a process of learning; and, in our opinion, the student who spent a given time in making two or three drawings of the object from different positions, with accuracy but not with much finish, would know much more about it, and have made more progress in drawing within the time than the one who devoted the whole time to a highly-finished stippled-up drawing from one point of view. No one cares for the latter when it is done; and the only aim in this stage of study should be to get as much power of drawing as possible in proportion to the time expended.

Things are not so bad in this way at South Kensington, perhaps, as they once were. We do not now see rows of drawings of a plaster plum or something else equally uninteresting, which have as much relation to real "art" as practising scales has to real music. But the impression produced by the collection is that the hand rather than the head is educated in the Schools of the Department. From a certain point of view it may perhaps be replied that this is all that a school of art can really profess to accomplish, and that the pupils themselves must bring the brains and the feeling to bear upon what they learn, and turn it to its best account. Still, there is a very obviously prosaic tendency pervading the studies. In the oil studies still-life immensely predominates; groups of jars and books and other objects of the kind. Landscape is scarcely represented at all, leaving us to suppose that it is not much encouraged; and what there is of it is mechanical and destitute of feeling. On the whole the decorative design seems to us the most successful department, though here we quite fail in some instances to understand the judgment which has regulated the distribution of rewards. The occasional specimens in which originality and artistic power rather than mere finish, are exhibited, serve to render the mechanical nature of the mass of the work more prominent; but these do not seem to have found the favour they might have reasonably expected. Miss West's very clever little sketch of two mice attacking a piece of cheese, which gets a bronze medal only, shows much more real artistic insight and observation than some things which have received medals in more precious metals. There are one or two figure studies from the life from Lambeth, drawings and models, which have far more of life in them than those which have received prizes over their heads. In short, the impression produced is that the prizes are given more for manipulation than for any higher quality; and we cannot consider this a good or desirable tendency in a school of art.

INTERNATIONAL CONGRESS ON CIVIL ENGINEERING.

The programme of the International Congress on Civil Engineering at Paris, in 1878, is of importance not only as a guide to inquiry and discussion, but as a synoptic view of that branch of practical science as regarded in France. It consists of nine sections, which are as follow:—

Section I.—Mines and Metallurgy.

1. *Steel.*—New modes of making steel; its economical future; its various applications. 2. *Explosions of Firedamp.*—Explosions; causes to which they may be attributed, and more particularly their relation to the varieties of atmospheric pressure; influence of ventilation; preservative methods. 3. *Transport in Working Mines.*—Interior transport; elevation to daylight; horizontal and inclined traction by chains; discharge; embarcation. 4. *Mechanical Working of Coal.*—Procedures proposed; air and water employed as means of transmitting power; attempts at application; future reserved for the subject. 5. *Processes of Sinking.*—Means employed; present state of the machinery; dimensions of the largest bore-holes; boreing for mineral research; extraction of specimens; sounding with reference to springs of water; latest works on artesian wells.

Section 2.—Agriculture and Rural Engineering.

1. *Steam Culture.*—Present state of the question; machinery; means to be employed in order to hasten the development. 2. *Utilising Hydraulic Resources.*—Present state of irrigation; study of the means of increasing its extent; natural irrigation; machinery to employ; reservoirs; dams. 3. *Reclamation of Land fit for Cultivation.*—Drainage; embankments; polders; encouragement of enterprise. 4. *Machines serviceable for Harvesting.*—Mowing-machines; reaping-machines; haymaking-machines, and rakes; their application in France; conditions which they must fulfil; their present state. 5. *Economical Transport in Farms.*—Traction-engines; conditions of their employment; results obtained in England; agricultural railways; material for transport.

Section 3.—Machines.

1. *Steam-power.*—Its valuation by land and by sea; indicated horse-power, nominal and effective; specification of the power of boilers; unification of steam horse-power. 2. *Accumulators.*—Extension of the employment of accumulators, and of machines of hydraulic pressure; motor machinery; hydraulic presses; hydraulic tools; transmitters of power. 3. *Associations for Supervision of Steam-Engines.*—Their development; statistics of accidents; influence of the associations on the prevention of accidents; on the economy of fuel; their importance with reference to the observation of rules; testing of iron plates. 4. *Unification of the Dimensions of the Parts of Machines.*—Pitches and diameters of screws and bolts; state of the question in France, in England, and in Germany; commercial importance of unification; system to adopt. 5. *Choice of the Fittest Metals to adopt for the different Parts of Machines.*—Properties of mild steels, and of hard steels; properties of cemented iron; properties of malleable cast-iron; conditions of employment; boilers on steel plates; shipbuilding in steel.

Section 4.—Roads, Rivers, and Canals.

1. *Inundations: Means of Checking them.*—Natural basins,—basins of retention; embankments; plantations; methodical study of floods; their prevision; probable indication of their height. 2. *New Descriptions of Metal Bridges.*—The new methods compared to the old; tempo-

rary bridges; modes of support and of movement; description of the best examples. 3. *Utilisation of Roads and Banks for the Establishment of Railways.*—Edge rails; flanged rails; influence of the form of rail on the kind of way; augmentation of adhesion; diminution of traction. 4. *Comparison of the Different Modes of Paving Towns.*—Pavements; macadam; wood; flags; bitumen; examination of the different systems with reference to cleanliness, cost of maintenance, and traction; inquiry made in England. 5. *Dams for Rivers.*—Different systems of movable dams; their mode of construction; their cost; their efficiency; description of the latest examples.

Section 5.—Railways.

1. *Economical Railways.*—Gauges, gradients, curves; junctions, change of vehicles; results obtained. 2. *Motor Machines for Tramways.*—Motors by steam, hot water, and compressed air; automotor machines, towing machines; coefficients of traction. 3. *Material Improvements to Introduce into the Passenger Service.*—Carriages; warming them; sleeping-cars; communication between the vehicles; goods traffic. 4. *Perfecting the Way.* Substitution of steel for iron rails; metallic sleepers; changes of way. 5. *Employment of Steep Gradients.*—Central rail; fixed engines; funicular systems; principal results obtained; steam brake.

Section 6.—Navigation, Fluvial and Maritime.

1. *Compound Engines in Marine Navigation.*—Their advantages; their systems of distribution; consequence of their employment; surface condensers; deteriorations resulting from the employment of the water of condensation. 2. *Resistance of Hulls.*—Successive changes of sections; recent observations; rules deducible; limits of recoil. 3. *Haulage of Boats.*—Direct towing; submerged chains; towing from banks, by cattle or by locomotive engines; resistance to traction, according to speed, and according to the sections of canals. *Life-boats.*—Conditions to fulfil; latest improvement; development and organisation of humane societies; porte-cords and other means of communication. 5. *Rolling and Pitching.*—Apparatus of observation and registration; experiments on rolling and pitching; relation between the form of hull and different conditions of the sea; means proposed to check rolling.

Section 7.—Public and Private Constructions.

1. *Supply and Distribution of Water in Towns.*—Quantity of water necessary; its choice; river water; filtration; establishment of hydraulic apparatus; spring water; aqueducts and reservoirs; their construction; conduits of distribution. 2. *Drains.*—Their use; their modes of construction; their cleansing; employment of water from drains in agriculture. 3. *Ventilation of Edifices.*—Different conditions of the problem; ventilation by pressure or by exhaustion; by chimneys or by machines; quantity of air necessary; connexion between warming and ventilation; examples of recent apparatus. 4. *Mechanical Perforation of Galleries and Tunnels.*—Percussion perforators; results obtained; rotary perforators; examples of their application; utilisation of natural forces; cost per mètre forward. 5. *Foundations of Great Works.*—Foundations in rivers and in the sea; employment of compressed air; influence of pressure on the health of workmen; means to obviate evil results.

Section 8.—Industrial Physics and Chemistry.

1. *Utilisation of Artificial Cold.*—Industrial production of cold; its distribution by liquids or by gas; different methods in use; principal application; cold in chemical industries; preservation and management of food. 2. *Lighting large Workshops.*—Industrial production of electric light; work involved; utilisation for the lighting great vessels; economical results in workshops; divisibility of electric light. 3. *Pneumatic Telegraphs.*—Particular conditions under which they are applicable; description of apparatus; examples taken from great organised systems. 4. *Industrial Employment of Explosive Substances.*—Dynamite compared to other explosives; precautions necessary to take in the manufacture; transport and storing of explosives; their application to the execution of great public works; economic results. 5. *Gas Stoves.*—Principles of their mode of action; their application in metallurgy; in gas making; in glass and pottery furnaces; in the production of steam; analysis of combustible gas; established economical results.

Section 9.—Different Industries.

1. *Machines for Domestic Use.*—Sewing-machines; their influence on the clothing industry; their economic results; motors applicable to sewing-machines; knitting-machines; embroidery-machines. 2. *Fabrication of Paper, from the point of view of the Paucity of Rags.*—Straw and wood; increasing proportions of their introduction; different substitutes for rags; manufacture of pulp; transport of pulp; present condition of the manufacture of paper. 3. *Recent Progress of Spinning and Weaving.*—Different trades concerned in spinning; development of this industry in the United States; factories for mechanical weaving; automatic stopping of the machines in case of the rupture or tangle of a thread. 4. *Cements, their Manufacture and Use.*—Portland cement compared to other products of new kinds; resistance of cements in hydraulic constructions; blocks of cement for use in the sea; comparative trials of cements; present state of the industry. 5. *Character of Textile Fabrics.*—Conditions which new textile matters must fulfil to be applicable to the manufacture of tissues; jute; *formium tenax*; properties of their fibres; increasing importance of their use; character of the tissues which they form; relation between this problem and that of the materials requisite for making paper.

CRYSTAL PALACE ENGINEERING SCHOOL.

This useful institution, which opened in January, 1873, with nine students, continues its successful and prosperous career. The seventeenth term of the school came to a close on Saturday last, by an inspection of the work of the students in the drawing-office, the pattern-shop, the smiths' shop, the fitting-shop, and in the workshop of the Colonial Section, all situated in, or at the base of, the south tower of the Palace; also a bridge erected by the "Coloniala" across an arm of the lake at the lowest part of the grounds, between the shore and the Tertiary Island, upon which the students have been camping out for several weeks past. The certificates awarded to the successful students were afterwards presented to them by General Henry Hyde, R.E., of the India Office, Assoc. of Council In.C.E.

Mr. H. S. Bicknell, deputy-chairman of the Crystal Palace Company, introduced General Hyde in a few appropriate remarks, in which, in the name of the directors, he had to express to the most eminent members of the engineering profession, Royal, Civil, and Mechanical, their most earnest thanks for the countenance and assistance that these gentlemen had given so readily, at a considerable expenditure of time and convenience, to the interests of their engineering school.

General Hyde, before presenting the certificates, stated that an engineering experience in India, extending over many years, and a wide range, and a narrow examination of the work that had been done by the students in all the sections, enabled him to say that they had in this school an institution much needed, and of peculiar value. Young men who intended to follow the engineering profession in India, in the colonies, or anywhere abroad, had here the means of acquiring theoretical knowledge, but especially practical, handicraft capability, that they would not find abroad. They must go from home trained, and capable from their training to utilise their resources, under new conditions, and hitherto untried difficulties. The General gave the students some valuable practical advice, and pronounced the school the supply of a great necessity, and for them a field of opporounity that they could not overappreciate.

The examiners were Mr. Ernest Benedict, M.I.C.E., and Mr. J. W. Grover, M.I.C.E., whose report was read by Mr. F. K. J. Shenton, secretary. Sixty certificates were awarded, but twelve of the students took two each, one for lecture examination, and another in some other section, making forty-eight students, out of the total of sixty-three, certificated. The lectures for the term were on "Railways: their Construction and Appliances." The result of the examination was less satisfactory under this head than it has been at the close of former terms, possibly from the number of marks attainable,—242,—having been raised. In December, 1877, there were eighteen certificates awarded for lecture examination: on Saturday the case stood thus,—students who had attended the lectures, thirty-five; eligible for examination, twenty-seven; passed satisfactorily, twelve. Mr. P. J. Ogle was first with 228 marks, Mr. R. L. McLaren second, and Mr. F. Mackinlay third. Each of these three students had also certificates for work in the fitting-shop. Twelve certificates were awarded for work in the drawing-office,—Messrs. A. T. Anderson, first; E. Allen and G. N. Taylor, equal seconds; and T. Cargill, third. In the pattern-shop twelve students were certificated,—Messrs. A. C. Pickthall, first; W. Halfhide and W. N. Woods, equal seconds; and A. A. Barnes, third. In the fitting-shop ten certificates were awarded,—Messrs. M. F. Wilson and H. Denny first and second respectively. For the first term in the civil engineering section,—general surveying and preparation of plans, sections, and estimates for Parliament,—seven certificates were awarded,—first, Mr. F. J. Scott; second, Mr. W. Hewitt; third, Mr. B. B. Bridges. Second term,—calculation of strains, and preparation of general and working plans, specifications, and estimates of a railway and dock,—five certificates, Messrs. W. A. Fenton, first; E. Hott and C. W. Moore, equal seconds. Two students in a third term of the civil engineering section, Mr. G. S. Aitken and Mr. D. Gibson were first and second respectively.

Mr. Benedict, apologising for the unavoidable absence of his colleague, Mr. Grover, said that in their *viva voce* examinations they had endeavoured not only to get correct answers, but to find out whether the students thoroughly understood what they were talking about. After twenty-five years' experience in India and in England as a working civil engineer, he was prepared to say that no man who made a toil of his daily work could possibly get on. A man to make his mark in any profession must love his work for its own sake; this applied, indeed, not only to professions but to handicrafts, and if we heard a little less about a "fair day's wage for a fair day's work," and a little more about the quality or value of the work done or turned out, we should have less difficulty, he felt sure, in keeping our place at the head of nations. With the present open competition in England, which was close run by foreign engineers, it was now more than ever necessary for Englishmen to strain every nerve to keep their ground, and every young man who did not feel his heart and soul in his work should give it up at once, and turn his attention to something else: he would certainly do little good as an engineer. In this school a young man had exceptional advantages for preparing himself for an after-career, and it would be his own fault if he did not take advantage of them. He could here learn in a few months, with little trouble, what in practice it might take him years to pick up. He would impress upon young engineers that theirs is an honourable profession and not a trade, and, that like Cæsar's wife, they should be "above suspicion," so that they may be as much trusted by their employers as by those they employ, as lawyers, doctors, and clergymen.

The examiners in their joint report state that although the standard of examination is very high, the results of the lecture examination have been most satisfactory, and that the notebooks of the students show how highly they value the instruction imparted to them.

Mr. Wilson, the principal, in reply to a vote of thanks, delivered briefly an address, touching upon the honourable positions that had already been achieved by former students in the school. He spoke in terms of high commendation of the conduct of their last *primus*, Mr. F. J. Scott, who was now leaving them to enter upon a good appointment. He was first, in his time, for lecture examination, had done equally well in every section, and now left them first in the Civil Engineering section in which he had been studying during the last term.

Arbitrator under Dwellings Improvement Act.—At a meeting of the Metropolitan Board of Works last week, a letter was received from the Home Office, stating that the Home Secretary has appointed Sir Henry Hunt, C.B., to act as arbitrator in the matters of the schemes under the Artisans', &c., Dwellings Improvement Act, 1875, for the improvement of certain areas within the Westminster District and the parish of St. Giles-in-the-Fields.

NEW SUBWAY AT VICTORIA STATION, PIMLICO.

We last week had an opportunity of inspecting the new subway opened at Victoria Station on Monday. The subway, as we have already mentioned, connects the Victoria Station of the Metropolitan District (Underground) Railway with the Victoria termini of the London, Brighton, and South Coast, and the London, Chatham, and Dover Railways, and will thus facilitate the transit of passengers between those stations. Hitherto passengers from either of the termini mentioned have had to incur the danger and inconvenience of crossing the station-yard, which is generally very crowded with vehicular traffic, and is, moreover, very dirtily kept. Hence the new subway will be a great boon. The subway consists of a main passage running in a straight line for a length of 300 ft., 10 ft. 6 in. wide, and 9 ft. 6 in. high to the crown of the arch, which has a versed sine of 2 ft. This passage has its sides and roof faced with white glazed or enamelled bricks, supplied by Mr. Barfield, the London agent of the Farnley Iron Company. The floor is paved with Val de Travers asphalte, 1 in. thick, laid on a bed of concrete, 2 ft. thick. Channels are formed at each side to carry off any water that may enter. The whole of the brickwork is set in Portland cement. The arch is four rings of brick in thickness, the side walls being 3 ft. thick, and carried down to a depth of 20 ft., and supported on concrete foundations. The subway is constructed through what was once part of the Grosvenor canal dock or basin, and a number of old piles were met with. The subway is lighted and ventilated at about the centre of the 300 ft. length referred to by means of a sort of lantern light opening into the centre of the station-yard, and forming a crossing "refuge" for foot-passengers, much in the same style as the subway leading from the Westminster Station to the House of Commons is lighted and ventilated. An iron framework, 9 ft. long and 6 ft. wide, fitted with Hayward's patent semi-prismatic lights, is supported on iron joists to form the footpath of the "refuge" in question, and at this point in the subway the side walls are carried upwards with a raking batter, terminating in a semicircular opening on each side. These openings are faced with white bricks, and are surrounded with a cast-iron railing through which air enters the subway, being glazed on top with thick rough plate glass. Having now described the main portion of the subway, it only remains to state the mode in which it is connected with the various stations. At the District Railway end, the subway widens out into a sort of bellmouth, whence proceed, right and left, passages leading respectively to the up and down platforms of the District Railway, that leading to the up-platform being continued across the line by one of the pre-existing bridges. The construction of these passages is substantially the same as that of the main subway. In addition to these side-passages leading to and from the up and down platforms of the District Railway, there is a third entrance in the centre, at the end of the main subway, this entrance leading directly into the booking-office of the District line, which is only three or four steps above the level of the subway. At the other end of the main trunk of the subway, going from the District station, are the communications with the London, Brighton, and South Coast and the London, Chatham, and Dover Railway. The approach to the Brighton Company's station is up a flight of Portland stone steps on the right-hand, running at right angles to the subway, and giving access to the exterior of the booking-offices of the Brighton line, though under the projecting glazed carriage shelter. The approach to the London, Chatham, and Dover Railway Company's terminus is by a passage 33 ft. in length running diagonally from the left-hand side of the main subway, opposite to the stairs giving access to the Brighton line. At the end of this short passage is a flight of Portland stone steps, giving access direct into the interior of the Chatham and Dover Company's terminus, just by the Customs' shed. This short arm or passage was constructed at the sole expense of the London, Chatham, and Dover Company, under whose premises it is carried; but the other portions of the subway were constructed at the joint expense of the three companies. The total cost of the works (which have involved the diversion of two sewers) is between 4,000*l.* and 5,000*l.* The whole of the works have been carried out for the companies by Mr. Charles Dickinson, contractor, under the superintendence of and from plans prepared by Mr. Henry Wallis, C.E., of Westminster. The iron railings surrounding the steps leading to the Brighton Station, the gates shutting off communication between the subway and the various stations when traffic has ceased (or to prevent undue crushing and crowding), have been provided by Messrs. Young, of Pimlico; the gasfittings by Mr. Z. D. Berry, of Westminster; and the prismatic lights by Messrs. Hayward Brothers. Mr. Swaker has been the contractor's foreman in charge of the works. Altogether, the work is very creditable to all concerned, and the only wonder is that so necessary an improvement was not effected years ago. The railway companies are sure to reap their reward, for passengers will now be able to pass safely and speedily, and without being bespattered with mud, from the low-level lines running east and west to the high-level lines running south of the metropolis.

COMPLETION OF THE METROPOLITAN MEAT AND POULTRY MARKET.

With the erection of that portion of the Poultry Market on the south-west side, bounded by the Metropolitan Railway and King-street, Snow-hill, the Metropolitan Meat and Poultry Market may now be said to be completed. This section of the market is now finished, and will be occupied and thrown open to the public in a few days, as soon as the paving of the King-street, Snow-hill approach, now in progress, is completed. By the taking down of several houses on the north-west side of King-street in order to give a spacious carriage access to the market at this point, a considerable additional street area has been gained, the width of the thoroughfare in front of the market, at the angle of Snow-hill and King-street, being about 80 ft., and forming a sort of open square. By this approach the market will now be easily reached from the neighbourhood of Newgate-street and other main thoroughfares on the south side, as well as from Charterhouse-street on the north side. The section just finished has two spacious entrances, and includes the whole of the south-east elevation of the Poultry Market, with the exception of the tower at the east angle. The tower just completed at the extreme south-west angle of the building is uniform with that at the east, just named. The two markets, with the thoroughfares intersecting them, cover an aggregate ground area of nearly six acres. The extreme length is about 1,000 ft., and the width upwards of 200 ft.

NEW BUILDINGS, BERLIN.

THE OFFICE OF THE INSPECTOR-GENERAL OF ENGINEERS AND FORTIFICATIONS.

We have been enabled on frequent occasions to refer to the progress of architecture in Berlin, and to the perseverance displayed and attention bestowed, both by public and private enterprise, in beautifying the aspect of the city on the Spree.* In this number we present our readers with the illustration of another of the fine buildings of which the capital of the Hohenzollerns can boast.

A handsome quarter, the West End of Berlin, has been rising during the last ten years in a locality formerly known as "Schafgraben" (Sheep's Ditch), on the road leading at the southern side of the Thiergarten, past the Zoological Gardens, to Charlottenburg. It is an ever-changing scene, as we pass along, of villas embowered in pretty gardens alternating with mansion-like structures. Both the "speculating builder,"—if the term may be employed in this particular instance,—and owners of property have done their duty. It almost seems as if they had struggled in earnest in a competition in which good taste and elegance were to carry off the prize. The façades of the new buildings have been adorned most lavishly, so that this part of Berlin may now indeed be looked upon as the handsomest quarter of the city, completely overshadowing, by the beauty of its architecture, the older streets of the whilom Prussian capital.

The building illustrated rises in the centre of this aristocratic and, architecturally speaking, fastidious neighbourhood, its style and high cupola creating an effect far and wide; the emblems and decorations placed over the windows and the portal indicating the purpose to which it is devoted.

The front of the building serving as offices for the Inspector-General of Engineers and Fortifications is placed on the north side of the Kurfürstenstrasse. Its style reminds us of the architecture of the times of Frederick the Great; but we find also in its minor features imitations of the decorations of the Berlin Arsenal, making its architecture a near approach to the rococo style, without, however, the degeneracy and fantastical bizarreness of the French treatment. The façade is richly membered; the centre part, surmounted by an elliptic cupola, jutting out powerfully into the foreground. The corner pavilions also are somewhat advanced, and provided with steep mansard roofs and small turrets.

The ground-story is rusticated, faced with yellow cement. Over the windows we discover, cast in gypsum, the celebrated masks of dying warriors by Schlüter in the court of the Berlin Arsenal. Corinthian pilasters of yellow cement support a richly-membered entablature; the walls between the pilasters are of red brick. The centre pavilion is characterised by two large caryatides, old Tentonic warriors, of light sandstone, which support the balcony of the principal story. Corresponding with the decorations of the centre pavilion, trophies composed of classic and modern arms and standards are placed over the entablature of the corner pavilions. Semi-circular, tower-like staircases, ending in pointed turrets, have been built on the sides of the pavilions.

The grounds round the building have been prettily laid out, and are surrounded by a railing of stone pillars and wrought iron in keeping with the character of the whole structure.

* See *Builder* of Sept. 8, Sept. 15, Oct. 27, and Nov. 3, 1877, &c.

THE PAVILION OF H.R.H. THE PRINCE OF WALES, PARIS EXHIBITION.

THE HALL.

Coming through the wrought-iron gates which form the main entrance to the Pavilion, one enters the hall, of which we give an illustration representing the right-hand view, with the staircase leading to the jurors' rooms on the first floor, connected across the hall by a gallery running from right to left.

The space to be disposed of was very small; everything has been designed to give the idea of what might be done on a much larger scale.

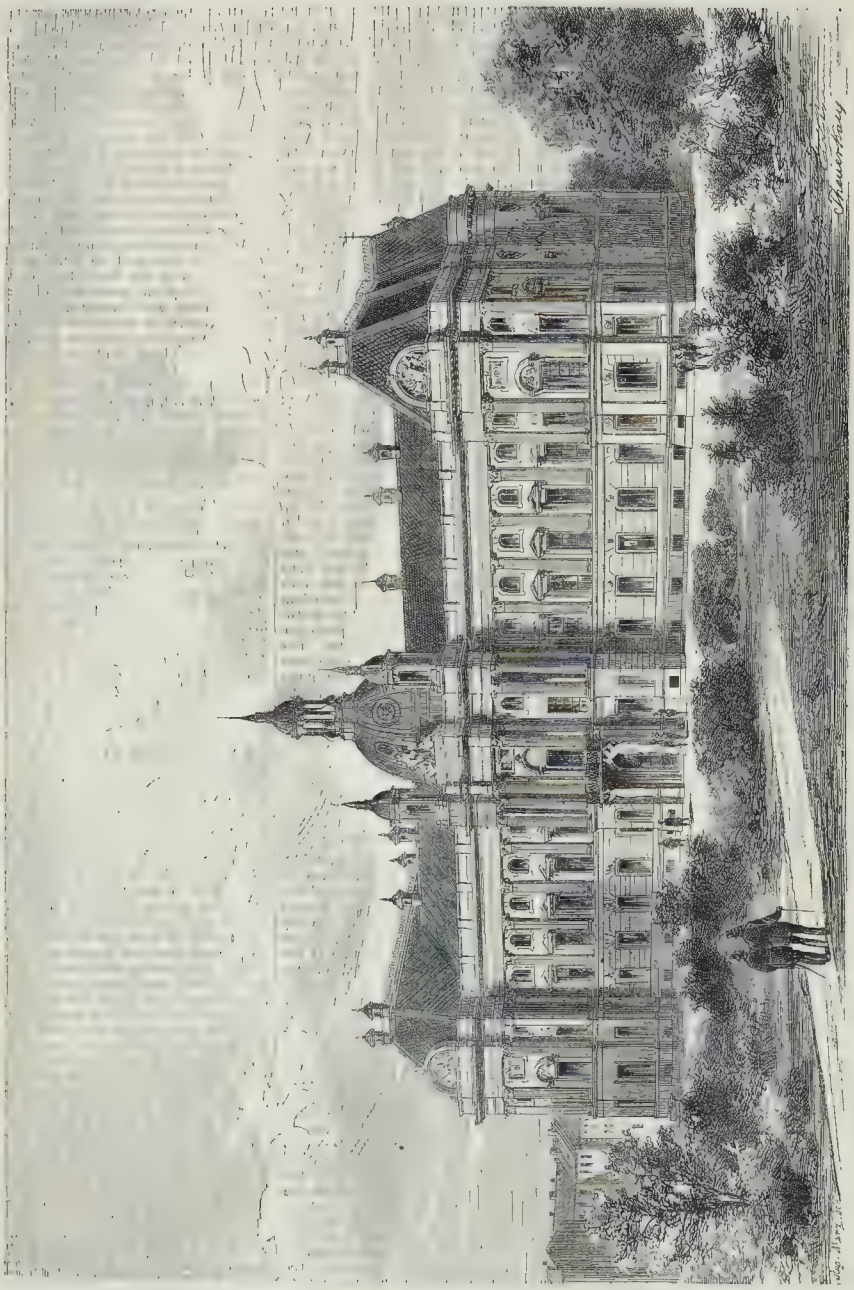
The general style is what is usually called "Queen Anne," but partaking much more of a Jacobean character. The square columns supporting the gallery over the stairs are strongly suggestive of the gallery at Hatfield. The colour of the woodwork is a soft green, relieved with dark yellow backgrounds in the panels, where pomegranates and apples form the chief ornament in relief. There are also some conventional panels in the frieze at the top of the hall.

The ceiling is in plaster relief, with an entwined design in the feeling of the period.

The floor is laid with a flowing pattern in mosaic by Messrs. Minton Hollins, of Conduit-street.

There are on each side of the front entrance two carved American walnut cabinets, in which are exhibited various specimens of English china and pottery ware, and some silver *repoussé* tankards and cups. On the side opposite are placed two box seats, very much after the style of the old chests which were once so plentiful in Lancashire and the Midland Counties, but having the addition of a back covered with embossed stuff, and these serve as a store for rugs as well as seats. Over these are hung trophies of armour mostly copied from old examples by Messrs. Elkington, which come out in mild contrast with the quiet green of the walls. Over the entrance-gates, made by Barnard, Bishop, & Barnards, there is a large window in stained glass representing the "four seasons" and "the signs of the Zodiac," executed in very rich colours by Messrs. Powell, of Whitefriars. The curtains forming *portières* to the two openings are made in heavy velvet materials of a rather Persian design, where dark-blue, green, and yellow are the predominating colours.

The large opening facing the gates leads into the dining-room, which is the principal apartment in the pavilion; and the quiet colour of the hall enhances the effect of the Windsor tapestries which decorate this room. Large vases in blue and white china, filled with palms, give an air of comfort and finish to the apartment. The hall was designed by Mr. H. Henry, and executed by Messrs. Gillow & Co.

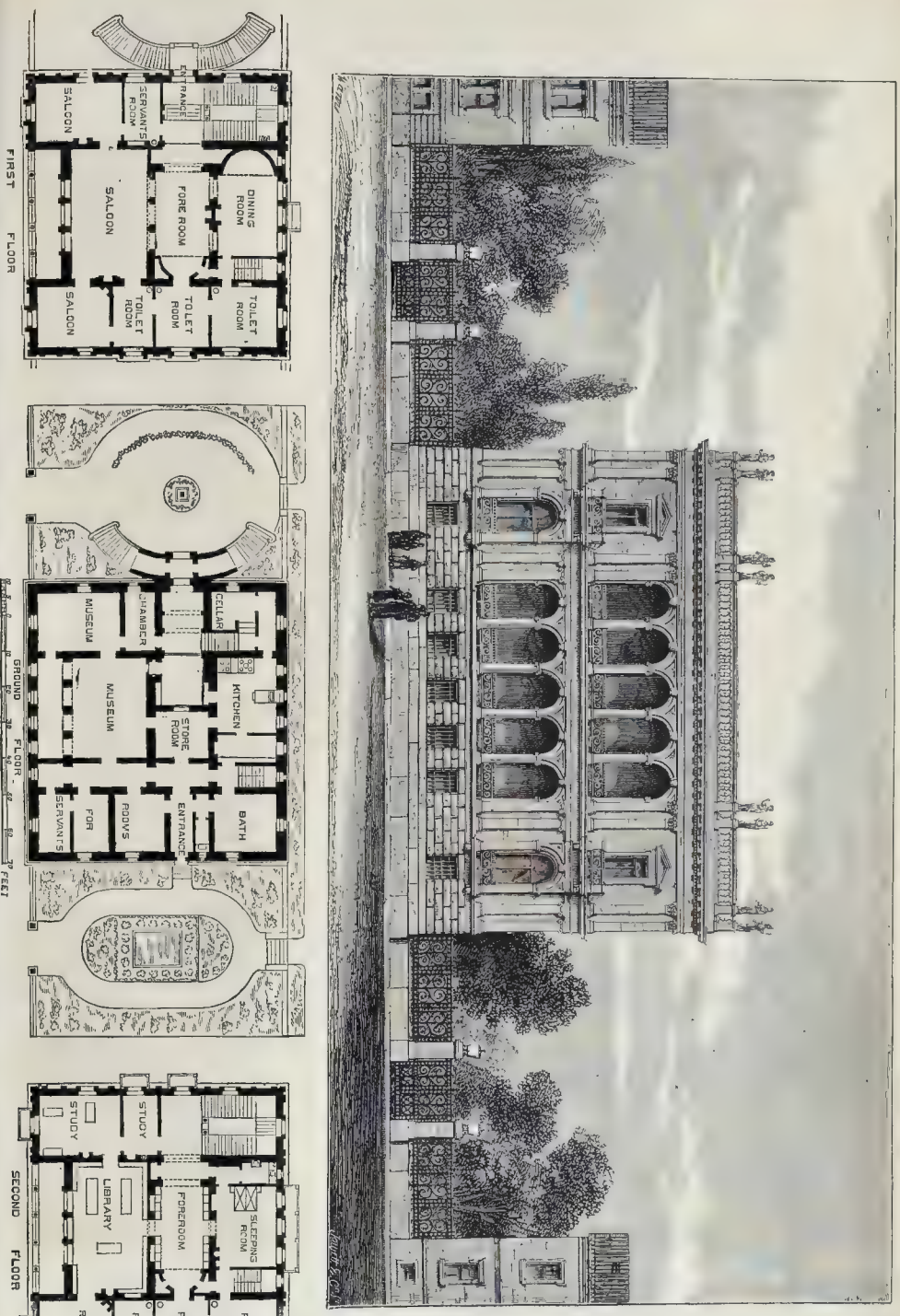


THE OFFICE OF THE INSPECTOR-GENERAL OF ENGINEERS AND FORTIFICATIONS, BERLIN.



THE PAVILION OF H.R.H. THE PRINCE OF WALES, AT THE PARIS EXHIBITION: THE HALL.

Designed by Mr. H. Henry, and executed by Messrs. Gillow & Co.



DR. HENRY SCHLIEMANN'S HOUSE, IN ATHENS.—Professor Ernest Ziller, Architect.

DR. HENRY SCHLIEMANN'S DWELLING-HOUSE IN ATHENS.

On one of the most beautiful sites in University-street (*Λεωφόρος Πανεπιστημίου*), close to the Royal Palace, is being built Dr. Schliemann's stately mansion according to the plans of Professor Ernest Ziller. It is three stories in height, and on three sides surrounded by a garden of orange-trees. The apartments on the ground-floor contain, next the front, the collections of antiquities, whilst those on the garden-side serve for the household. On the first floor are the reception-rooms on the front, and the dining-hall and visitors' room on the garden-side. On the second floor are Dr. Schliemann's study and the library on the front, and the sleeping-rooms of the family on the garden-side. All the dwelling-rooms are on the sunside: and this is an important object at Athens, because the Athenian proverb says:—"Where the sun makes no visits the physician is a frequent guest." The whole building, up to the first floor, is of grey marble; the cornices, window-cases, columns, balconies, &c., are of white Pentelic marble.

There could be no doubt regarding the style of architecture that would be chosen. The proprietor wished to have, instead of a roof, a terrace which does not exist yet in modern Athens, but which was in general use here in Classical times, and undoubtedly it is very congenial to the climate. But it was particularly to be considered that the proprietor is an antiquary, and that all his feelings and thoughts are concentrated in the ancient world. From this reason the rich finds in the excavations at Troy and Mycenæ will furnish the motives for the paintings in the porticos on the façade of the mansion.

All the floors of the house are being made of strong vaults, with iron traverses, and covered with mosaic concrete as in the Italian *palazzi*; with the exception of the doors and windows, no wood enters into the construction.*

SETTING A BIG CHIMNEY UPRIGHT.

During the last two years, upon the premises of Messrs. Storey Brothers & Co., at White Cross Mills, Lancaster, a huge chimney, which will form a conspicuous object for miles around, has been in progress. The dimensions are given below; and we understand that when completed it will be the largest chimney-shaft in North Lancashire. During the last few weeks a very interesting operation has been going on for the plumbing, or bringing to the perpendicular, this chimney-shaft, which we shall presently describe.

Some particulars with regard to the object with which the chimney is being erected, and details of its construction, may not be uninteresting. In the processes connected with the works at White Cross, vapours are unavoidably given off, which, although considered to be by no means insalubrious, have at times a flavour which requires a highly-educated nasal organisation thoroughly to appreciate. In fact, the Messrs. Storey have been led to believe that to some of their neighbours this odour is absolutely distasteful, and they, in consequence, determined to incur the enormous expense of erecting this tall and handsome shaft in the hope and expectation that any vapour which may be discharged from it will be carried away clear of the town, and dispersed and diffused without causing the slightest offence.

The chimney, when completed, will be about 250 ft. in height above the ground. It stands upon a base of concrete 28 ft. square and 5 ft. thick. In plan, the shaft itself is a regular octagon, circumscribing at the outside of its base a circle 25 ft. in diameter. It is a double chimney, that is to say, there is in the interior a cylindrical shaft 8 ft. in diameter, formed of brickwork varying in thickness from 18 in. at the bottom to 9 in. at the top. This is surrounded by a space or cavity, 2 ft. 6 in. wide, enclosed by the outer shell, which is brickwork, 4 ft. 6 in. thick where it rests on the base, and 14 in. at the top, the batter or inclination of the sides being ¾ in. to a yard.

The internal shaft is intended to carry off the smoke from the steam boilers, and the vapours from the stoves, &c., are to be passed off through the 2 ft. 6 in. space betwixt the inner and outer walls. This space is divided into three distinct flues by vertical diaphragms of brick-work, which latter also act beneficially in tying or binding the whole structure together. Above the chimney as it now stands it is intended to carry up the work, principally in stone, for a further height of 30 ft., the cap of the column, which is of a light and elegant character, having been designed by Messrs. Paley & Austin.

The smoke will be delivered from the top, and the vapours from side openings communicating only with the external cavity.

The number of bricks used in the chimney has been 750,000; concrete about 41 cubic yards; and there will be used in the completion of the top 650 cubic feet of stone. The total weight upon the foundation is about 3,300 tons. The bricks used have been the "shale" bricks, supplied by the Catou Brick and Tube Company. As these bricks absorb less moisture than the ordinary brick, they were found most suitable for this work. Mr. C. Baynes was the contractor for the undertaking, Mr. Cornthwaite being the sub-contractor for the brick work. Mr. W. Gunson, the draughtsman at White Cross Mills, acted as clerk of the works.

During the erection of this chimney, or rather after it had attained a considerable elevation, it gave signs of diverging somewhat from the perpendicular, and this divergence ultimately amounted to 3 ft. 10¼ in. at the top. The inclination was towards the south, and it is to be accounted for partly because during the two years occupied in its erection very frequent rains kept the mortar soft on the weather side. The result of this was that the joints on that side were squeezed rather closer than those on the other, and the chimney heaved or bent over accordingly. The principal reason, however, must have been that the foundation was a little weak on the south side, and thus yielded to the pressure, the weight on that side being slightly increased, no doubt, by the deflection of the chimney. As it stood, even with a cast of nearly 4 ft. from the plumb, the chimney was perfectly safe, and to many observers the divergence from the perpendicular was not perceptible. To the Messrs. Storey, and especially to the designer of the shaft, Mr. Edward Storey, this was, however, a defect and an eyesore which could not be tolerated, and consequently steps were taken to bring this tall and unwieldy mass back into its proper position.

The work was entrusted to the practised hand of Mr. J. W. Cronshaw, the well-known "chimney doctor," of Blackburn, and it has been most expeditiously and successfully completed. The operation consisted in cutting out courses of bricks in five different places near the base on the north side of the chimney, and rather more than half-way across. These courses, which had originally been practically parallel-sided,—that is, of equal thickness throughout,—were replaced by courses of bricks of gradually diminishing thickness from the end of the cuts on the south, towards the north. Of course, the difference in thickness at the south and north end of the cuts, was, in each case, very slight; but the aggregate diminution of thickness in the five courses shortened the north side of the chimney sufficiently to bring the axis into a truly vertical position. As will readily be understood the cuts were not made right through at once, without some provision being made for taking the bearing of the weight. A width of about 18 in. was first cut right through the 4 ft. 6 in. of brickwork of the outer shell on the extreme north side, a course of bricks being then withdrawn, and the top and bottom joints being thoroughly cleaned off. Into this space, 18 in. wide and rather over 3 in. deep, good hard bricks were then closely packed, these bricks being, as has been explained, with the joint material thinner than those they were replacing. At the outer end good oak wedges were inserted; then similar cuts were made right and left of the first, and similarly treated with bricks and wedges, the work always going on regularly on each side, east and west, from the north towards the south. As this was done the wedges were gradually withdrawn and the chimney quietly settled over towards the north, until when all the five cuts were completed it had come back to the perpendicular. The lowest cut was close to the ground, and the highest about 30 ft. above. Two of the cuts were continued into the internal shaft.

Proposed Vestry Hall, Fulham.—The Fulham District Board of Works has appointed a committee to consider this project.

BRICKS, FROM AN HISTORICAL POINT OF VIEW.*

The science of agriculture no doubt afforded the earliest scope for the exercise of human skill and industry. The Biblical narrative speaks of Abel as a "keeper of sheep," and of Cain as a "tiller of the ground." An application to the mechanical industries allied with arts of construction must, however, have been very early forced upon man, in order to supply implements of husbandry and to provide places of habitation. We read in the fourth chapter of Genesis that Tubal-cain was "an instructor of every artificer in brass and iron," or, according to Gessenius, "a sharpener of every kind of brazen and iron instrument"; a reference clearly pointing to the manufacture of tools required for the purposes of the husbandman and probably of others used in connexion with constructive art, then in its rudest infancy.

There is little doubt that clay, in combination with such materials as would bind it together in a compact mass, was employed in the structure of the primitive human dwelling. In course of time this method of construction was superseded by the use of the same plastic substance, moulded, either with or without other ingredients, into suitable forms, which were afterwards dried or burned, the result being the production of the article now known as "brick." The descendants of Noah are described in Genesis xi. 3 (2247 B.C.) as making bricks and burning them thoroughly, afterwards laying them with "slime,"—or, as some translators read, "bitumen,"—in the place of the mortar now employed for the same purpose. With the bricks thus made they built the tower of Babel "on a plain in the land of Shinar." Some of the best authorities agree in regarding the ruins still standing at Birs-Nimrud, to the south-west of Hillah, near the Euphrates, as being the remains of this tower; and it is a remarkable fact that, after the lapse of ages, the bricks of which it is constructed are so firmly embedded in the bitumen used as mortar that it is no easy task to detach or extract one. The circumference of the tower measures 762 yards, and a conical elevation on the western side rises to the height of 198 ft. The various stages of brickwork are of different colours,—a result which must have been attained by some special process, the ordinary Mesopotamian brick being of a pale yellow or whitish colour. The late Mr. George Smith, the indefatigable Assyrian explorer, deciphered among the tablets in the British Museum a history of the building of this tower, which will be found in his "Chaldean Account of Genesis."

The mounds of Assyria and Babylonia abound with bricks, sun-dried and burnt, Rawlinson, Layard, Mignan, Rennel, and other travellers having found them in incalculable quantity. Modern research has also confirmed the statement of Herodotus, that from the clay thrown out of the trench surrounding the ancient Babylon, bricks were made and burnt, which were used in building the massive walls of the city. The buried palace of Nebuchadnezzar on the Euphrates is said to have furnished bricks for the erection of all the buildings in its neighbourhood for many years past; and we are told that "there is scarcely a house in Hillah which is not almost entirely built with them." Müller, in his "Science of Language," says that the ancient materials from the colossal palaces erected by the great ruler of Babylon were carried away for building new cities, and that Sir Henry Rawlinson discovered numbers of the bricks in the walls of the modern Bagdad on the borders of the Tigris. No doubt can exist as to their identity, owing to the custom which prevailed in Assyria and Babylonia of marking each brick with the name and title of the king in whose reign it was made, and also, in many instances, with the name of the place in the construction of which the brick was to be used. These inscriptions are in cuneiform characters, and were impressed upon the brick in a sunken rectangular panel, closely resembling that in which the name and trade-mark of modern manufacturers of moulded bricks now appears. From the presence of these inscriptions Sir Henry Rawlinson has been able to ascribe the manufacture of some of the bricks found by him

* From Bricks and Brickmaking: an Historical, Technical, and Descriptive Sketch (Hall & English, No. 71, High-street, Birmingham); a pamphlet issued by Messrs. Wood & Ivery, of the Albion Blue Brick and Tile Works, West Bromwich. The strength of the blue bricks produced by this firm is well known; and they are now making steps, copings, and architectural decorations in the same ware, which well deserve the attention of architects and constructors.

* The elevation is drawn to a scale of about 20 ft. to an inch.

to the period of the older kings of Babylon, who reigned about 2000 B.C. In form, the ancient Assyrian bricks closely resemble thick tiles, being generally from 12½ in. to 14½ in. square, and about 4 in. in thickness. They were almost universally shaped in a mould, some being rounded at the corners for quoins or special work. Generally speaking, they were of a pale yellow or red colour. At Kouyunjik, Nimroud, and other places, however, bricks have been found glazed with a thick coating of different colours, some having subjects traced in outline upon them. The walls of the city of Nineveh are said to have been built with glazed bricks of this description, and those of the Median Ecbatana were constructed of coloured bricks. Enamelled bricks, brightly coloured, have also been found in abundance in the mound of the Mujellibeh in Mesopotamia, the principal tints being a very brilliant blue, a deep yellow, red, white, and black.

In Egypt, bricks were used at a very early date, some of the most ancient Pyramids, built at least 2,000 B.C., being constructed of brickwork. The mud of the Nile has always been the sole material employed in the manufacture of Egyptian bricks, and the process at the present day is almost identical with that adopted in the time of Thothmes III., the prince who is believed to have occupied the Egyptian throne at the period of the exodus of the Hebrews, about 1430 B.C. Brickmaking, there is reason to believe, was a royal monopoly in Egypt, and the bricks which have been found bearing the stamp of Thothmes III. are more numerous than those of any other monarch. Nearly all Egyptian bricks, both ancient and modern, are *adobe*, or sun-dried. A few burnt bricks have been found in river walls or hydraulic works, but their use was evidently very limited. Owing to the rich alluvial character of the mud of which the bricks are made, chopped straw or reeds, pieces of pottery, and other materials, are almost invariably used for the purpose of binding the clay together. The modern process is to form a trough or bed, into which mud and water are thrown, together with large quantities of cut straw. The mixture is tramped into a mortar, taken out in lumps, and then shaped, either by hand or in moulds, into the required forms. A painting discovered upon the walls of one of the tombs at Thebes, in which the processes employed in manufacturing bricks are represented with striking minuteness of detail, shows how closely these resemble the method still adopted in Egypt. Some of the workers are depicted as engaged in digging the mud, and mixing it in heaps with sand, while others carry the material thus prepared in baskets to the brickmaker, who is seen shaping it in the mould. Others, again, are employed either in laying out the bricks thus formed upon the ground to dry in the sun, or in bringing from the river, in jars upon their shoulders, the water required for tempering purposes. Labourers, too, are busily engaged in removing the dried bricks upon flat boards, two of these being slung by ropes attached to each end of a yoke placed across the shoulders. Taskmasters are also shown, watching over and directing the operations, stick in hand, ready to inflict summary punishment on the idle or the refractory. Brickmaking, it must be remembered, was regarded in Egypt as a degrading task, and was usually assigned to slaves. It formed the principal occupation of the Israelites during their bondage in Egypt, after the death of Joseph, and the grievous addition to their toil necessitated by the obligation to provide their own straw may be readily estimated from what has been already said as to the process of manufacture. The bricks made by them during their captivity were probably used in the erection of the great treasure-cities of Pithom and Rameses. At a later date, we read of the erection of Egypt of a brick pyramid by Asychis, the monarch whose reign immediately preceded that of Sethos, the contemporary of Sennacherib and Tirbakah, about 700 B.C. This would probably be one of the four brick pyramids still remaining in Lower Egypt in addition to those at Thebes. Two of these are close to the ancient Memphis and the modern Dashour, and the others are situate at the mouth of the Fyoom. They are built of sun-dried bricks, the chambers having arched ceilings. Brick arches are to be found, however, in buildings at Thebes of a much earlier date, the arch having been invented and used in Upper Egypt centuries before the reign of Asychis. The ordinary Egyptian brick approached somewhat to the modern type, being generally from 14½ in. to 16 in. wide, and of a thickness varying from 5 in. to 7 in. In the older pyramids they were of an exceptional size, measuring in some cases 20 in. in length, and about 8 in. in width. The bricks of Egypt, like those of Assyria, bore the names of the kings in whose reign they were manufactured, but, in place of being inscribed, they were stamped, the hieroglyphs being in relief.

In Palestine, in the time of the prophet Isaiah, it is clear that bricks were used in the construction of private dwellings (Isaiah ix. 10), and one of the offences laid to the charge of the people of Israel by the prophet was that of using brick in place of stone, for the construction of their altars (Isaiah lxv. 3).

Amongst the ancient Greeks, who devoted special attention to every branch of constructive art, the manufacture of bricks was placed under legal supervision and brought to a very high perfection. Pliny mentions three distinct varieties as being in general use, and alludes to the circumstance that the walls of the city of Athens, on the side towards Mount Hymettus, were built of brick. Many of the principal public edifices in the leading cities of Greece were also of brickwork,—perpendicular walls of this construction being considered by the Greek architects more durable than those of stone.

Brickmaking was a flourishing industry in the Roman Empire, both sun-dried bricks (*laterœ crudi*) and kiln-burt bricks (*laterœ cocti*) being extensively used in public buildings. All the great existing ruins of ancient Rome are of brick, and there is scarcely a province of the once mighty empire which does not still exhibit striking proofs of the durability of the bricks manufactured, and the skill of the artificers who laid them, in the days when Rome was mistress of the world. In the erection of the Coliseum, 80,000 captive Jews were employed, who probably helped to make the bricks of which the noble structure was built, as well as to lay them. The use of bricks in the construction of the public edifices of Rome was indeed so general as to afford occasion for the remark of the Emperor Augustus, with reference to the numerous and extensive architectural improvements he had carried out, that "having found the city brick, he had left it marble." To enumerate all the great public buildings which thus bear witness to the excellence attained by the Romans in the art of brickmaking would be tedious. Among the most notable, as illustrating the progress made at different stages of the history of the empire, are the Pillar of Trajan, the Bath of Titus (A.D. 70), and the Bath of Caracalla (A.D. 212). Notwithstanding this very general employment of bricks in the construction of public edifices, it may be inferred, from the observations of Pliny, that they were not commonly used in private houses, in the building of which wood was probably the chief material; a view which would seem to be, to some extent, confirmed by the extent and destructiveness of the fires which occurred in ancient Rome. Pliny, after referring to the common use of bricks by the Greeks, condemns them as wholly unsuited for Roman dwellings, in which party walls were not allowed to exceed 18 in. in thickness, and that thickness, he declares, "would not support more than a single story." At this period, the Roman bricks varied considerably in size, but were chiefly of three classes. The largest, known as the Lydian, were 1 ft. 6 in. in length by 1 ft. in breadth, and the others, which were respectively four and five palms in length, took their titles from their admeasurement. They were all very much thinner than the modern brick, more especially those employed as a bond in Roman rubble-constructions, which, in this respect, bore a close resemblance to the wall-tiles of the present day. The kiln-burnt bricks in the Greek building at Treves called the Palace of Constantine, are all "of a square form, 3 in. in diameter, and 1½ in. thick." The custom of marking each brick, which has been alluded to as prevailing amongst the Assyrians and Egyptians, was maintained by the Romans, the various brickmakers having each their distinguishing mark. Every brick was stamped with the figure of some god, plant, or other symbol, encircled with the name of the maker, the consulate, and the legion by which it was used. The Twenty-second Legion has been traced through Germany by bricks which bear its name, and at Caer-leon, in England, Roman bricks have been discovered with the inscription "Leg. II. Aug.," while others found at York attest the presence there of the Sixth and Ninth Legions. Some of these bricks were scratched on the surface, while others had lumps raised on them, or were deeply notched, with the view of making the mortar adhere more firmly. The Romans preferred, for brickmaking purposes, a clay which was either of a whitish hue or decidedly red. They considered Spring the best time for carrying on the process of manufacture, and it was the general custom to keep bricks two years in stock before laying them.

With the decadence of the Roman Empire the art of brickmaking declined and fell into disuse, but, after a few centuries, experienced a complete revival, the Italian ecclesiastical and palatial architecture of the Middle Ages being distinguished by remarkably fine examples of brickwork and ornamental work in terra-cotta. Towards the close of the seventeenth century, an Italian, named M. Fabbroni, rediscovered an ancient invention, which had been completely lost for many generations, namely, the manufacture of bricks sufficiently light to float in water. Strabo speaks of these bricks as having been made with an earth found at Pisane, in the Troad, and Poseidonius mentions others of a like character as having been made in Spain "of an argillaceous earth, wherewith vessels of silver are cleansed" (probably rottenstone). M. Fabbroni succeeded in producing these floating bricks from "fossil meal," an infusible earth found in abundance over a considerable area of certain districts in Italy. They were only one-sixth the weight of an ordinary clay brick, and on this account were highly esteemed for vaulting church roofs and similar architectural work. The earth of which they were composed consisted, according to Ehrenberg, the German microscopist, almost entirely of the siliceous skeletons of minute water-plants. The bricks with which the arching of the floor in the Berlin Museum is built were made from this material, in combination with a certain proportion of clay "slip."

Among many of the Asiatic nations, bricks of excellent quality have been made from a very remote period, and are to be found in buildings erected centuries ago. A very full account of the history of brick-making in India will be found in the "Professional Papers on Indian Engineering," of Major Falconnet, R.E., published in May, 1874.

In China, bricks are faced with porcelain, and in Nepaul they are richly ornamented by the encaustic process and in relief.

Brick-making was found by the conquerors of Peru to be a flourishing industry in the ancient empire of the Incas, and we have the testimony of Spanish historians, as well as that of Humboldt, Prescott, Stephens, and Squier, that both in Peru and in the more northerly regions of Yucatan and Mexico, there are still extant fine structures in brick, as well as in porphyry and granite, the work of races which have long since passed away.

The scarcity of stone in Holland and the Netherlands naturally led the inhabitants, at a very early period, to seek some other durable material for building purposes, and brick has been almost exclusively employed in the construction not only of private dwellings and commercial establishments, but of ecclesiastical structures and other public edifices. Very fine examples of brickwork in two colours abound, the most notable, perhaps, being at Leeuwardein, in Friesland. The material used in Dutch bricks is chiefly the slime deposited in the numerous rivers and arms of the sea. This is collected by men in boats, who use long poles, furnished at the end with a cutting circle of iron, and a bag-net with which the slime is brought to the surface. Bricks of exceptional hardness are made with a mixture of this slime and sand from the banks of the river Maas. Ordinary house bricks and tiles are chiefly made at Utrecht, from brick-earth found in the vicinity. For the production of the special make of bricks known as "Flemish bricks," which are manufactured in France, Flanders, and the corresponding Belgian frontier, sand from the Scheldt is principally used. At Ghent, as well as at other points lower down the river, the supply of this material constitutes an important branch of the trade of the district. In preparing brick-earth, the slime and sand are well mixed, and then kneaded together with the feet, special care being taken with this operation, so that a perfectly homogeneous mass may be the result. The mixture is then deposited in heaps, and is moulded and dried in the same way as in this country. The kilns used for

burning vary in size, some being large enough to contain as many as 1,200,000 bricks. Peat is the fuel ordinarily used for firing.

England seems to owe the introduction of the art of brickmaking to the Romans. Some specimens of their work which have been discovered date back as far as A.D. 44. The bricks in these early examples are nearly all of the wall-tile form, the use of which, as a bond in rubble constructions, has been already adverted to. These large thin bricks continued in use, under the same conditions, until about the time of the Norman Conquest, when regular masonry gradually superseded rubble-work. A casual reference in the Saxon chronicles shows that bricks were made under the direction of Alfred the Great, but these were probably the bonding bricks just mentioned. The earliest instance of the use of bricks of the modern or Flemish type is said to be afforded in the work at Little Wenham Hall, Norfolk (A.D. 1260). These bricks are of a deeper red than those generally used in Suffolk and the adjacent counties, but paler in tint than the common red brick. The use of brick in England as an ordinary building material, even for important structures, does not seem to have become at all general until the reign of Henry VIII., although there are some few brick buildings of the two previous reigns. Herstmonceaux Castle, Sussex, and the Gate of the Rye House, in Hertfordshire, were built in the early part of the reign of Henry VI., and the following are among the best examples of erections in brick from this date to the close of the reign of Henry VIII.:—Tattershall Castle, Lincolnshire, A.D. 1440; Lollards' Tower, Lambeth Palace, A.D. 1454; Oxborough Hall, Norfolk, A.D. 1482 (about); Gateway of Hadleigh Rectory, Suffolk, close of fifteenth century; the older portions of Hampton Court Palace, A.D. 1514; and Hengrave Hall, Suffolk, A.D. 1538 (completed). Thorpland Hall and the Manor House at East Barsham, both in Norfolk, were built during the reign of Henry VII., and the Parsonage at Great Snoring, in the same county, during that of his successor. The remains of these buildings exhibit some of the finest specimens of ornamental brickwork to be found in this country. Throughout the reign of Elizabeth, the employment of brick would seem to have been reserved for the construction of mansions and other extensive works. In common buildings, the method ordinarily adopted was that of filling in a framework of timber with lath and plaster; and, even when the use of bricks became general, they were only introduced in panels between a framework of timber. In the first year of the reign of Charles I. (1625) the size of bricks was regulated by a special order, and from about this period their use seems gradually to have become more general in shops and private houses, for, on the rebuilding of that portion of London which was destroyed by the Great Fire in 1666, the new erections were all of brickwork. So rapidly did the use of the material spread that the 19th Car. II., cap. 11, fixes "the number of the bricks in the thickness of the walls" of the several rates of dwelling-houses of the period. The records of the Corporation of the City of London also furnish evidence of the favour with which brick had come to be regarded as a constructive material, for about this time a resolution was passed in the following terms: "That they (the City surveyors) do encourage and give directions to all builders, for ornament sake, that the ornaments and projections of the front buildings, be of rubbed bricks; and that all the naked parts of the walls may be done of rough bricks, neatly wrought, or all rubbed, at the discretion of the builder." A special feature of brickwork, at the close of the seventeenth and commencement of the eighteenth century was the enrichment of house-fronts by the introduction of ornaments carved with a chisel. Mr. Dobson's treatise on "Brick and Tile Making," published in Weale's Rudimentary Series, contains a sketch of a house in St. Martin's-lane, built by a person named May, about 1739, which is a fine example of this species of work in red brick. Two fluted Doric pilasters support an entablature, the mouldings, flutings, and ornaments of the metopes, having been carved with a chisel after the erection of the walls.

In the year 1784 a duty of half-a-crown per thousand was imposed on bricks of all kinds (24 Geo. III., cap. 24), the tax being raised ten years after to 4s. per thousand (34 Geo. III., cap. 15). In 1803 a classified schedule of duties on bricks and tiles of different qualities and sizes was substituted for the uniform duty hitherto imposed. Thirty years after (by the 3rd Wm. IV., cap. 11), the duty on bricks was again raised, the common sorts being subjected to an impost of 5s. 10d. per thousand, while tiles were wholly relieved from taxation. These duties were the subject of a Commission of Inquiry in 1836, and in 1839 the 2nd and 3rd Vic., cap. 24, relieved the trade of the vexatious restrictions imposed by the schedule of duties hitherto in force, and re-established a uniform duty of 5s. 10d. per thousand on all bricks "of which the cubical contents do not exceed 150 cubic inches," without regard to their form or quality. In 1850, bricks ceased to be the subject of taxation, the duty being wholly repealed (13 Vic., cap. 9). The development of the brickmaking industry during the first half of the nineteenth century may be estimated from the following statement, in round numbers, of the total make of bricks upon which duty was paid at the close of each decade from 1820 until the repeal of the tax:—1820, 914 millions; 1830, 1,100 millions; 1840, 1,400 millions; 1850, 1,700 millions. Four years later, it was estimated that the total number was considerably in excess of 2,000 millions, the capital employed in this branch of industrial enterprise at that period exceeding 2,000,000*l.*

The employment of machinery in the manufacture of bricks appears to have had its origin either in this country or in the United States. Some of the earliest American patents were taken out in 1792, 1793, 1800, 1802, 1806, and 1807. The records containing the specifications of these inventions were unfortunately burnt in 1836. Prior to June of that year, 122 patents for brick and tile machines had been granted in the United States, and upwards of 500 have since been taken out. In England, as early as the year 1619, we find, among the Specifications of Letters Patent, that the eleventh granted was for the protection of the "Arte of making a certain engine to make and cast clay, &c." This first idea of a machine for making bricks consisted of a large pan or table, containing moulds, which were filled with brick earth and a heavy roller passed over them to force the earth into the moulds. The surplus clay was then scraped off the top, and the bricks were ready for ejection from the moulds. This was, no doubt, a somewhat crude arrangement, but it approaches closely, in principle, the most approved machines of the present day. We do not, however, meet with any record of the introduction of brick-making machines the operations of which were regarded as a practical success prior to the year 1839, when Messrs. Cooke & Cuningham patented one, which was capable of turning out 18,000 bricks in ten hours. In November, 1859, Mr. J. E. Clift, of Birmingham, at a meeting of the Institution of Mechanical Engineers, read a paper describing Oates's brick-making machines, which were then in use at Oldbury. The crushing strength of the bricks made by these machines was said to be 8,024 lb. per square inch as compared with 4,203 lb. in bricks made by hand from the same material. The cost of Oates's machine was from 150*l.* to 200*l.*, exclusive of the engine for driving it, and its turn-out averaged 12,000 bricks per day, or about twenty per minute. In 1861, Messrs. Dixon & Corbett had a machine in work in the neighbourhood of Newcastle-on-Tyne which was driven by steam power, and turned out 1,500 bricks per hour. The years 1861 and 1862 were marked by special activity in the production of these machines, the patents granted during this period embracing the following:—Wimball's, Morrell & Charnley's, Green & Wright's, Basford's, Effertz's, Grimshaw's, Morris & Radford's, Poole's, Newton's, Sharp & Balmer's, Platt & Richardson's, Foster's, and Smith's. Up to the year 1868, forty-seven patents relating to bricks and their manufacture had been granted. During the last twenty years many new machines have been invented, and important improvements introduced, and probably over 200 patents for machines connected with the manufacture of bricks and tiles are at present on record.

Harborne and Edgbaston Institute.—On Monday last Mr. Henry Irving laid the foundation-stone of the Harborne and Edgbaston Institute at Harborne, a suburb of Birmingham. After the ceremony he was entertained at luncheon at the Masonic Hall, Birmingham, and made an interesting address.

ROYAL ARCHÆOLOGICAL INSTITUTE AT NORTHAMPTON.*

We continue our notes of the Archæological Institute's proceedings in Northampton and neighbourhood.

On Friday, the 2nd inst., meetings of sections were held in the town-hall, under the presidency of Dr. Evans. Mr. Bloxam read a paper on "The Sepulchral Effigies, both Sculptured and of Brass Incised, of Northamptonshire." He remarked, at the commencement, that Northamptonshire contained as large and varied a series of monuments, sculptured effigies, and incised brasses as any English county, and they have been well and admirably illustrated by a few praiseworthy individuals. Particular mention was made of the labours of Mr. W. H. Hyett, Mr. T. O. Gery (whose collection of rubbings is now in Mr. Bloxam's possession), Mr. Frank Hudson, and Mr. Albert Hartshorne, the latter's valuable work on "The Recumbent Monumental Effigies in Northamptonshire from 128 scale drawings," being spoken of as one of the most important illustrative works in existence belonging to a single county. One desideratum, Mr. Bloxam said, is still left, viz., complete representations of the architectural features which enrich the monuments, exclusive of the sculptured effigies or incised brasses—features which, in fact, are simply characteristic of the monuments themselves. Confining himself to sepulchral effigies, both sculptured and incised in brass, Mr. Bloxam selected out of some 200 or thereabouts, a few which he considered of the greatest interest, dividing these again into classes—ecclesiastics, judges, knights, or those represented in armour, laymen in civil costume, and ladies. Under the first-mentioned head was noticed the grey marble effigy in Peterborough Cathedral of Abbot Benedict, who died in 1193. There had been monuments in the same place of the last abbot and first bishop, John Chambers, who died in 1556; and Bishop Dove, who held the see from 1601 to 1630, but both are now destroyed. Indeed, we have in the county at the present, not a single sepulchral effigy of a bishop. At Towcester Church there is an interesting effigy of Archdeacon Sponne; and sculptured ecclesiastical dignitaries are also to be found at Aston-le-Walls and Yelvertoft. Incised brasses representing priests may be noted as existing at Newton Bromshold, Woodford, Higham Ferrers, Chipping Warden, Sudborough, Ashby St. Ledgers, Castle Ashby, Rothwell, and Cotterstock. Of legal dignitaries there are within the county no less than five judges, one of incised brass at Wappenham, and four sculptured at Deene, Weekley, and Easton Maudit (two), whilst at Steane there is a white marble effigy of a sergeant-at-law. Of effigies in armour there is a large and wonderful variety, from that in Castle Ashby Church of Sir David de Esseby, who died previously to 1268, to that in Lowick Church of Sir John Germaine, bart., who died in 1718. Mr. Bloxam gave a very interesting delineation of the characteristics of the costume; effigies at Dodford, Hinton, Paulerspury, Warkworth, Ashby St. Ledgers, and Great Brington being particularly cited. He further informed the company that there are in Northamptonshire no fewer than ten sepulchral effigies carved in wood, of which three are ladies and seven knights. They all appear to have been executed in the first half of the fourteenth century,—indeed, it is rare to meet with wooden effigies of a period later than that century. These curious figures are to be found at Woodford, Paulerspury, Dodford, Gayton, Ashton, Alderton, Cold Higham, and Braybrooke. Of effigies in lay costume there is a very rare fourteenth-century sculpture of a forester at Glinton Church. Similar examples exist at Wadworth (Yorks) and Newland, but there are very few in the country. Great Brington, Cottesbrooke, and Maidwell comprise the principal churches in which sculptured effigies in civilian costume are to be seen; the brass effigies of the sixteenth and seventeenth centuries are more numerous, including interesting specimens at Hemington, Ashton, Chipping Warden, Aston-le-Walls, the Church of the Holy Sepulchre (Northampton), Church Brampton, Burton Latimer, Chacombe, and Flore. Of sculptured effigies of ladies, there is a capital series from the latter part of the thirteenth century to an early period of the eighteenth century. In his remarks, under this head, Mr.

* See p. 829, *ante*.

Bloxam mentioned the chaste and beautiful arrangement of drapery in the figure of Scholastica de Drayton,—perhaps the first in chronological order,—and said it must be admitted that in the latter part of the thirteenth and early part of the fourteenth century, the school of sculpture in this country surpassed generally subsequent ages in the pose, freedom, and beauty of design. Barnack, Woodford, Paulerspury, Lowick, Brington, Horton, Charwelton, Edgcott, Norton, Easton Maudit, Weekley, Stowe, Carlton, were all alluded to as furnishing conceits worthy of examination, and the progress in costume was admirably traced.

Mr. Samuel Sharp next read an exhaustive and able paper on "The Bones in Rothwell Crypt," reproducing in the main the arguments advanced by him some years ago at a meeting of the Northamptonshire Architectural Society's Committee for local antiquities.

While these papers were being read, a large number of the visitors were examining the following churches in the town: viz., the Church of the Holy Sepulchre, St. Giles's Church, and All Saints' Church. The recent restoration of St. Giles's was generally commended by the members of the Institute. There are indications of Norman work in the tower; and the western doorway is of that period. The chancel is Early English, and the rest of the church generally Perpendicular. All Saints' Church was rebuilt soon after the fire of 1675, and along the front runs the inscription, "This statue was erected in memory of King Charles II., who gave a thousand tun of timber towards the rebuilding of this church and to this town." The "merrie monarch" also remitted "chimney money" for seven years. The exterior of the edifice presents a strange mixture of architectural styles, retaining still the old Decorated embattled tower (which escaped destruction at the time of the fire), with a modern Italian body and an Ionic portico forming the façade of the west front: yet taking each portion separately archæologists never fail to find subjects for admiration. It consists of nave and chancel, with north and south aisles. The nave is 73 ft. 6 in. by 74 ft., and the chancel 34 ft. 6 in. by 24 ft. The walls of the church are lined with oak, and on each side of the east window are paintings of Moses and Aaron, said to be the work of Sir Godfrey Kneller. The handsome pulpit is formed of Norwegian oak, and the organ, originally erected in 1700, is one of the finest in the kingdom. The register of the church dates from the year 1560.

In the afternoon a large company took carriage tickets for the excursion. The route was by the Wellingborough-road, passing on the way Weston Favel, famous by its associations as the burial-place of James Hervey, to

Earls Barton Church, where Mr. Parker acted as *cicerone* to the party. He remarked that Earls Barton is one of the most remarkable churches in the country, the Anglo-Saxon tower being especially noteworthy. The chancel is also very peculiar, and displays Norman workmanship. A considerable part of the church is Decorated, of the fourteenth-century style, and the woodwork is fifteenth-century, and very good of its kind. The sedilia are very interesting, and the locker in the east wall is very unusual. There is also a low-side window, about which discussion had taken place,—the leper's window. The chancel arch is Decorated of the fourteenth-century, but with Norman springings.

At Castle Ashby the visitors were received at the princely mansion of the Marquis of Northampton by Lord and Lady Alwyne Compton. The castle is built of Weldon stone, in the form of a quadrangle, with two lofty octagonal towers at the north-east and south-west angles, a fine avenue of trees extending from the south front to the deer park. In the large room Mr. R. G. Scriven read a paper on the alterations that have been made at various times in the building; and the Ven. Lord Alwyne Compton, to the gratification of the company, added a few words. Most of the visitors then accompanied Lord Alwyne to the church, chiefly in the Perpendicular style, with some Decorated and Norman work, and consisting of nave, north and south aisles, and porches, chancel, and a small embattled tower, in which are five bells. Among the monuments is a colossal figure of the Angel of Resurrection, by Tenerani.

Whiston Church, which stands on an eminence known as Combe Hill, was the next haltingplace, but only for a few moments. The Hon. and Rev. L. C. R. Irby, the rector, produced an old manuscript, which his grandfather received from a Mr. Langley in the year 1800, and which purported to be a history of the church, culled from Bridge's history of that date, with additional notes. This at the commencement gave an account of the village, and the way in which the Catesbys became possessed of the manor. It then went on to record the building of the church in 1534, by Anthony Catesby, the stone having been brought from Ketton and Weldon. Catesby died in 1553, and his monument, of which the villagers are very proud, is displayed in the church.

Cogenhoe Church was the last on the round. The Rector (the Rev. C. H. Burnham) said the church was one of no common interest. They would find the tomb of the founder, Sir Nicholas de Cugenho, in the south aisle, and his coat of arms upon the capitals. Nicholas died in 1280, and, therefore, the church must have been erected before that date. The chancel the visitors could not fail to admire as a fine specimen of Early English work. He (the Rector) had been led to understand that it dated back to 1150, and that it was the then modern part of an earlier church, which Sir Nicholas replaced by the present one.

Mr. Parker, at the invitation of Mr. Burnham, also made a few remarks. He said the church was certainly a remarkable one, and he thought the rector had well supplied the time of its erection. It must have been a few years before the death of its founder.

A *conversazione* was held in the evening at the Town-hall, when a paper, on "The History of the County of Northampton," was read by the Rev. W. Monk, M.A., late hon. sec. to the Society of Antiquaries for the County of Northampton.

On Saturday, the 3rd, there was an excursion to Kettering.

At Kettering Church, the attention of the visitors was attracted by the fine Early Perpendicular tower and spire, which can be seen for several miles around. The nave and aisles are also Perpendicular, and the chancel is Decorated.

Rothwell, with its church and market-house and crypt, was also visited. A drive through a pleasant country lane brought the party to

Rushton Hall, which is built round three sides of a quadrangle, the fourth side being closed by a Doric screen. The house was begun by Sir Thomas Tresham about 1595; continued by the Cockaynes, and finished in 1630.

Geddington Cross was the next place on the list.

Kirby Hall having been reached, the excursionists took luncheon. The hall stands in the midst of woods and avenues near the extremity of Deene Park, and was originally built for Humphrey Stafford by John Thorp in the year 1572. In 1638—1640 Inigo Jones altered the screen which encloses the quadrangle, and built the stately entrance-front, and the walls and gateways of the outer court.

Rockingham Castle was arrived at somewhat late, to the general regret, as a desire had been expressed to make a full and complete examination of Mr. G. L. Watson's noble residence, which stands on the finest site in Northamptonshire. However, under the care of Mr. G. T. Clark, whose loving zeal in connexion with buildings of this description is notorious, the party made the most of their opportunities.

In the evening, Mr. S. Tucker (Rouge Croix) read a paper at the Town-hall on "The Descent and Varying Armorials of the Spencers of Wormleighton and Althorp."

On Sunday, the 4th, the Rev. Canon Pownall, F.S.A., preached in the Church of the Holy Sepulchre, making special reference to the proceedings of the Congress.

On Monday, the 5th, a large company went by rail to Oundle, and thence in carriages to Cotterstock Church, the characteristics and history of which from its foundation in 1337 by John Giffard, canon of York, to its recent restoration by Mr. Street, were described by the Rev. A. J. Abbey. Tansor Church and Fotheringhay Castle were also visited.

A meeting was held at the town-hall in the evening, under the presidency of Lord Alwyne Compton, Sir Henry Dryden, bart., being among the company. Mr. J. Tom Burgess first gave an address on "The Opening of the Clarence Vault at Tewkesbury," and urged the Institute to utter a protest against the mercenary exhibition of the relics found therein.

The Rev. A. Foster, of Farndish, read a very interesting paper on "Eastern Maudit."

The general concluding meeting of the Institute was held on Tuesday, the 6th inst., after which there was an excursion to Canons Ashby, the seat of Sir Henry Dryden.

During the meeting of the Congress, a loan museum of local and general antiquities was opened under the management of Mr. R. Ready, of the British Museum, the hon. curators being the Rev. H. J. Bigg, F.S.A., the Rev. F. C. Alderson, and Mr. J. B. Hensman.*

THE DECORATION OF ST. PAUL'S.

SIR,—Many suggestions have been made by competent advisers as to the best course to be adopted in embellishing our metropolitan cathedral, yet after all, there is the common-sense view, as well as the transcendental, to be taken of a proposed scheme of decoration.

A terrible fuss is being made about the proposal to *redecorate* the dome; but I venture to think that it would be better for art, the cathedral, and the public, if our decorators would restrain their lofty flights and aspiring conceptions and commence operations a little nearer *terra firma*. It is annoying to the public when pictures are hung too high at the Academy exhibition, and this annoyance cannot but be aggravated when paintings of more than ordinary merit are elevated 100 ft. above the heads of the spectators. Thornhill's design may be very fair, and possibly many persons consider it bold, lofty, aspiring, &c.; but *common sense* deprecates the idea of contemplating it with your head thrown back and neck twisted until you are blue in the face. I have never known any one to stand and gaze for five minutes at the dome of St. Paul's without being more impressed by pains in the neck than with the beauty of Thornhill's painting. I would suggest that if the dome *is* to be painted, visitors should be provided with lounges, so that they may lie upon their backs, and contemplate the "mysteriousness" of the dome with less discomfort than at present is absolutely necessary. "Meter," in the *Builder* for August 3, says that Sir James Thornhill's design "is simple, and architecturally unites itself with the edifice," and he suggests that designs in colour should be substituted for the present monochrome figure-subjects, leaving it to the reader to imagine what would be the "splendour" of the result. Exception must be taken to these statements, not, however, in a captious spirit, but merely with a view to ascertain what is legitimate and truthful in art. In the first place, the architectural divisions of Thornhill's design are its chief artistic fault. Under ordinary circumstances, their introduction into a picture would not excite adverse criticism, as no doubt would exist as to their being anything but pictorial representations, but their present introduction is not in accordance with the true principles of design, as they are but sham painted architecture. An endeavour is made to give reality to the pilasters by giving them relief with shade, and showing the soffits of the arches. This apparent reality is emphasised by the pilasters of the decoration continuing the structural lines of the pilasters round the drum of the dome. Practically, it would be absurd to see stone piers or pilasters accommodating themselves to the concave surface of the dome; and for the purpose of pictorial division painted ribs would be less unsatisfactory. If divisions are desirable, they should,—unless executed without relief,—be architecturally real and structural. The panelling supposed by "Meter" to exist under the surface of the present painting would be far preferable to the sham architectural divisions of Thornhill. It cannot be denied that there is a striking boldness displayed in Thornhill's composition. The faults lie not so much in the design as in its position. Again, it is a question worthy of consideration whether, in the event of there being no structural divisions upon the surface of the dome, it is desirable to describe false ones? Personally, I could conceive it possible to treat the decorative subjects with more dignity, regarding the dome as a broad endless frieze, than by dividing into sections, either by circles or other means.

Some persons have expressed a fear that painting in colour will rob the dome of its "aërial mysteriousness." Nothing will tend more to such a consummation than the introduction of figure-subjects. The human figure constitutes to the eye a perpetual standard of measurement. We judge of the heights and dimensions of

* The local newspapers, the *Herald* and *Mercury*, have contained very full reports, and to these we have been indebted.

buildings by comparison with the individuals in or around them.*

Figure-subjects, if executed life-size, would scarcely be perceptible at such a height, and if designed upon a colossal scale would naturally dwarf everything in juxtaposition to them. It has been the fashion to paint figure-subjects upon ceilings,—and a dome is but a concave ceiling,—ever since Michelangelo and Raffaelle essayed to decorate the Sistine Chapel and St. Peter's. Great masters, however, are not equally great in all things, and whilst lavish in our commendation of their unequalled skill as painters, we are bound to admit that as *decorators* the greatest painters have perpetrated shams that cannot, upon any theory of art, be excused. They obtained fictitious relief by means of painted architecture, thereby clearly showing how easily it is for even genius to fail when employed out of its legitimate sphere. A dome, vault, or ceiling is simply a covering, and as such should be treated. A *picture* upon a flat ceiling is bad, but upon a concave one it is worse. A ceiling should be so decorated as to be equally effective from any point of view, and this is impossible with figure-subjects. Saints upon their backs, and apostles standing on their heads, may be edifying to some people, but a circus clown would be more sublime than a patriarch painted up-side-down for a thousand guineas. The common-sense procedure is that laid down in the *Builder* for June 15, as follows:—"That where it is intended that a building should be ultimately decorated with mural painting, the whole scheme should be conceived from the first, and the architectural details should harmonise with and, where possible, be suggestive of, the pictorial subjects which are to form the crown of the whole. And it appears to us that it is directly the province of the architect rather than of the painter to conceive or invent the idea of the whole result, though he cannot carry it out himself."

The above suggestion cannot be carried out in its entirety, as the building is already erected; but the next best thing could be done. An architect could be employed to prepare a general outline for a scheme of decoration for the entire building, suggesting the nature of the different subjects and their styles, but leave the painters so far without restriction that they may impress their own individuality upon their conceptions. The piecemeal method now being adopted can never lead to satisfactory results. The decorative scheme should be carried out upon some definite and comprehensive method, so that the present generation who have subscribed may have the gratification of seeing the results of their munificence. Upon entering the cathedral we are conscious of something lacking. The bare stones are cold and uninviting. If other evidence were wanting that Wren intended the interior of his *chef d'œuvre* to be decorated, it is to be found in the preponderance of bare wall surface unrelieved by ornamentation of any description whatever. Another matter not to be lost sight of in preparing a comprehensive system of decoration is to endeavour, as far as practicable, to render the height of various portions of the interior more consonant. The height of the dome is so excessive compared with the nave and transept that these latter appear ill-proportioned and low. A system of decoration must, therefore, be improvised that shall tend to give greater apparent height to the arms of the cross without altering the normal appearance, as regards height, of the dome itself. In other words, the nave and transepts must be made to suit the proportions of the dome, and not the latter reduced in apparent altitude to suit the other internal portions of the structure. I know not what the members of the "committee" may think, but the majority of common-sense people must admit that if a building like St. Paul's is to be decorated in *patches*, having no regard to a scheme in its entirety, the better plan would be to commence at the bottom rather than at the top of the building, for by this means alone can success be guaranteed with any approach to certainty. If St. Paul's is to be decorated by the finest display of talent which the country can command, and at an expenditure of thousands of pounds, it is but reasonable to expect that the paintings will be placed so as to be seen with *ease, pleasure, and advantage*.

Let the shade of Thornhill remain undisturbed awhile, until the other portions of the cathedral have been decorated, and another generation shall arise wiser than the present.

Bad art has already desecrated the interior in that the most sacred part of the edifice. The intermediate surface of the chancel vaulting between the ribs is in reality plain, but an attempt at relief has been obtained by painting sham caissons.

There is an effective bit of ceiling decoration to the cove over the communion-table in the chapel on the north side of the nave. Here the colour is merely applied to the structural relief. If an artistic lie is already perpetrated in the first *patch* of decoration, what may be anticipated by the time the whole is completed? Surely if, under any circumstances, the introduction of unreal and fictitious art is to be deplored, it is when applied to such an edifice as St. Paul's Cathedral. The very nature of the building calls for the highest excellence, unsullied by aught that is meretricious or untruthful. The committee would do well to call to mind the observation of Ruskin, and act upon it, "that modern architects decorate the tops of their buildings, whilst Mediæval architects decorate the bottoms of their buildings. That makes all the difference between your seeing the ornament, and not seeing it. You increase the cost of your buildings by one-half, in order to mince their decorations into invisibility."

JAMES GEO. BUCKLE.

P.S. Since writing the above, I have again visited the cathedral. The manner in which the caissons, or octagonal panels, are painted between the crown of Thornhill's arches and the eye of the dome, is a successful attempt at decorative deception. The introduction of coloured pictures between Thornhill's painted architecture would only tend to make the deception I have alluded to all the more realistic. It is only the monochrome treatment which prevents it being a painted imposition.

* It is a favourite trick with architectural draughtsmen to make their figures in perspective drawings disproportionately small, thus giving a fictitious importance to the building.

IS THE BLACKNESS OF ST. PAUL'S MERELY THE EFFECT OF SMOKE?

SIR,—In connexion with the above subject, Professor Paley appears to have lost sight of wind and weather. Now, it is a well-known fact that, in London, the prevailing winds are from the south and west, principally south-west; also, that they bring much rain; and my opinion is, that the appearance of the stone on the north side of St. Paul's, and to a great extent on the south-east side and east end, is the result of smoke and dirt. Also, that the appearance on the south-west side is the result of bleaching from exposure to wind and weather. If proof of this be required, examine a portion of the stone which, although on the south-west side, is by its position protected from wind and wet: it will be found nearly as dirty as any on the north side. But, take a large surface of the stonework,—say, from the south-west angle of the south transept to the south-west angle of the clock-tower,—then draw a horizontal line from the cathedral to the top of the warehouses opposite, and mark the effect of the wind and wet according as such surface is or is not protected by the warehouses,—it is all bleached; but that above the level of the tops of the warehouses, in a far greater degree than that below. I could give many such examples of bleaching on the same kind of stone from the south-west, whilst the protected sides are dirty and begrimed. One only: the south-west side of the pillars of the Royal Exchange portico.

C. M. G.

SIR,—The very interesting notice in the current number of the *Builder*, respecting the blackness of the outside of St. Paul's Cathedral, calls to mind a remark in one of the letters forming the published well-known correspondence between Mrs. Carter and Miss Talbot. It is dated from the St. Paul's Deanery, March 14th, 1752, and is as follows:—"We are still extremely well pleased with our situation, the air (the smoke, I should say; for there is a sugar-baker just by that is candying us all over as fast as he can), the exercise, the way of life, agrees with us all very well." The letter which contains the above is one written by Miss Talbot.

CIVIS.

Salkeld.—Plans have been approved for the restoration of Great Salkeld Church, Cumberland, prepared by Messrs. Hetherington & Oliver, of Carlisle, and the works are now in progress under their direction.

A CURIOUS COLLECTION.

Two generations have been sedulously storing up a wealth of art-work, various and almost innumerable in detail, but now to be distributed amongst the connoisseurs of all art-loving nations. In a narrow street near to Bedford-row, many a passer-by who, in his youth, had a "stool" in one of the legal firms in the neighbourhood, has observed an old-fashioned shop with many choice engravings in the window, and has longed for the time—"looming in the future"—when his improved position in the office should enable him to enter the dingy portals,—always closed, its owner being absent for the past twelve years,—and make himself famous in the eyes of collectors by becoming the possessor of some of the rare things therein. But the youth has arrived at maturity, has become possessor of the means to purchase, yet his efforts to do so have been fruitless: the same choice prints have remained in the window. As an answer was required for repeated inquiries, all were told,—"Nothing will be sold until the owner returns." Two collectors of prints, whose homes are on the other side of the Atlantic, finding that there were in this collection prints they coveted, took the long journey across, in the hope of acquiring them, but without success. The same answer met their inquiries. A wealthy man in London sent 10,000*l.* for two paintings in the collection. That was refused. Other pictures equally valuable are there,—rare works,—whose pedigrees are well known, and whose qualities are not questioned. The owner has not come back. He has gone, it is to be hoped, where he will find beauty in perfection, not in the abstract, as in his possessions here. The gems of art that he has so strangely accumulated will be reset. They are somewhat tarnished, and many will enjoy what only one hitherto has possessed. Their late owner was one who seemed to have a mania for the acquisition of such things, inherited from a parent equally peculiar. The desire was to possess them, rather than to deal in them. If a fine picture were included in an auction-sale anywhere in the country, his practice was to go thither at once, and keep as near as possible to the coveted work until he became its possessor, and then to hurry away and bury it in seclusion.

It is believed that, after the labour of cataloguing the property has been accomplished, it will be placed, about January next, before the public in the Rooms through which it seems the fate of most works of art to pass at some period or other.

DEFECTIVE COUNTY COURT ACCOMMODATION AT HASTINGS.

SEVERAL buildings of a public character have recently been erected in Hastings, but, according to the following statement of the Hastings County Court judge, made this week, the local authorities would do well at once to employ an architect and a builder in the erection of a new County Court. It appears that the judge has caused some offence by his late attendances, and, referring to the matter on opening his Court in the Market-hall, on Monday, he made certain remarks which had at least the merit of being plain and outspoken. Whatever blame there might be in the case, he said, the censure lay at the door of the Corporation, and not on his shoulders, inasmuch as, owing to the lack of accommodation, he was compelled to wait while the undisputed plaints were being disposed of by the registrar. To obtain access to the court he had to enter a public-house, and the only available private room was in a public-house. He had to attend between thirty and forty courts in the Sussex district, and he did not hesitate to say that that of Hastings was the worst of all. It was a disgrace to the town, and both the inhabitants and the Corporation ought to be ashamed of it.

Public Works Department, India.—The Government of India have passed a resolution convening a conference of the representatives of Indian Railways in Calcutta next November, to discuss various points of railway administration. We willingly mention that the Secretary to the Government of India in the Public Works Department will be glad to receive papers or communications from any one interested in the subject.

PROGRESS OF BUILDING ON THE HATCHAM MANOR ESTATE.

The large estate at New Cross, known as the Hatcham Manor, which was some time ago purchased by the Haberdashers' Company, and by them laid out for building purposes, is rapidly being covered with semi-detached residences, upwards of 100 houses of this class having already been erected, whilst several others are in progress. Under the stipulations laid down by the Haberdashers' Company, there is to be strict uniformity in their architectural features and appearance (why?) with the exception of those to be erected on the high ground, near what is known as Telegraph-hill, which, we understand, are to be of larger dimensions than the rest, and will stand within more spacious grounds. Several of this last-named class of residences are now in progress. On the south-east side of the estate the level of the land is much higher as it rises to Telegraph-hill, than that of the new road which has been made through the estate, and which gradually ascends until it attains an elevation which commands a panoramic view around the south-eastern portion of the metropolis. The high ground to the south-east side of this road is about to be reduced to the road's level, and this will involve the removal of several thousand cubic feet of earth. A bed of clay has been found to lie under the surface, and bricks are about to be made on the spot previously to levelling the ground and building upon it.

The Haberdashers' Company have undertaken to build a church on the estate, and the works have just been commenced. The site of the church is at the summit of the hill, immediately opposite to the new Haberdashers' schools which the company recently built on the estate. We believe that the designs have been prepared by the company's architect, and that the builder is Mr. Snellgrove, of Gloucester.

SHEFFIELD.

The Jessop Hospital for Women has just been opened. It has been erected at a cost of something over 30,000*l.*, at the sole expense of Mr. Thomas Jessop, a wealthy merchant, and at one time mayor of Sheffield. The style of building is freely-treated Elizabethan, and it has been designed by Mr. J. D. Webster, architect, of Sheffield, under whose supervision it has been built. Although somewhat cramped up, it stands in a good part of the town. It has three frontages, facing respectively towards Leavy Greave, Gell-street, and Victoria-street. The main point is towards the first-named thoroughfare, and from the central part of this, over the principal entrance, rises a lofty tower. The structure is built of red brick, with dressings of Hollington stone; the gables are numerous, and well broken up; the chimneys are tall and of moulded and cut brick; and the steep-pitched roofs are covered in by grey Welsh slates. The parapets are of worked and pierced stone. The building is surrounded by a dwarf stone wall, surmounted by wrought-iron rails. The internal arrangements show a well-chosen plan, and the comfort and health of future patients has evidently been carefully thought out. Upon the ground floor the apartments are devoted to board, waiting, and governor's rooms, and to the dispensary; and upon the three upper floors are the various wards. These latter are reached by an imposing staircase, whose windows contain excellent stained glass, by Messrs. Powell, of Leeds. The long broad corridors, that cut the building from end to end, are laid with encaustic tiles, by Messrs. Maw, of Broseley, and the whole of the carved work is by Mr. Harry Hems. The general contractors were Messrs. Chambers & Sons, of Sheffield. The warming and ventilating are by Mr. Phipson; and the plumbing by Mr. Corrie, of Sheffield. Mr. Kenyon was the slater and Mr. W. Robinson the painter, both of Sheffield. The clerk of works was Mr. Payne.

THE PORTLAND ESTATE.

Mr. Charles Fowler, of Upper Woburn-place, has been appointed by the Duke of Portland as surveyor to his Grace's Marylebone estates, in the room of the late Mr. Henry Baker, of Gower-street. Mr. Fowler's friends, and they are numerous, will hear of this announcement with much satisfaction.

ODOURS FROM CYPRUS.

Leave Mr. Eugene Rimmel alone to make the most of every passing event. While others are sending capital to Cyprus, he gets a capital scent out of it, and calls it "Extract of Cyprus Flowers, culled in Paphian Bowers." Whether by any other name it would not smell as sweet, we need not inquire; he has, wonderful to say, sent us a bottle of it, and we certainly smell sweeter since we used it, and feel more respectable. Some perfumes have unquestionably an elevating sort of tendency; they send one involuntarily to "Araby the bless'd," and the Oriental poets. It was a matter of course that we should soon get a scent from the love-worshipping island, for in the earliest times the fragrance of its flowers gave it a name, which translated, means "The Plaything of the Goddess of Love."

This passion, by the way, has always played such a part there that it was anciently said the exuberance of Nature in Cyprus served to stifle every higher feeling in sensual enjoyment. Yet what a wonderful story the island has, ranging from prehistoric times till now. Any distinguished conversationalist who has looked this up, and wants a cue for its delivery, need only touch his handkerchief with the "Extract of Cyprus Flowers," and there he has it at any moment that may seem fitting. After he has alluded to the Phœnicians, described the Temple of Aphrodite, to which no women were admitted; and sketched the connexion of the island with Egypt and Rome, he must not forget that our own Richard of the Lion Heart had hold of it once, and gave it to the Templars; and our *raconteur*, after a brief allusion to *Othello*, probably quoting something about frighting the Isle from her propriety, may wind up wittily with the expression of a modest hope, that English poets will now improve since we possess in Cyprus a Mount Olympus of our own. After this ingenious commendation of the new scent, if the inventor of it does not send us a box of gloves, we shall say there is no gratitude in Man or Rimmel.

THE PLASTERERS' COMPANY'S PRIZES.

The following is the result of the seventeenth annual competition for prizes offered by this Company in connexion with the Science and Art Department, South Kensington:—

For an original design in monochrome, for a ceiling of a room, with centre for chandelier.—*First Prize*, C. E. Wilson, of the Sheffield School of Art; *Second Prize*, J. M. Benson, of the National Art Training School, South Kensington.

Second: For an original design, modelled in plaster, for a portion of a ceiling centre.—*First Prize*, H. Harvey, of the National Art Training Schools, South Kensington. *Second Prize*, W. Wallen, of the Westminster Royal Architectural Museum School of Art.

The competition drawings and models are now on view at the Annual Exhibition of National Art Students' Works, South Kensington.

WEST LEAKE, NOTTS.

The parish church, dedicated to St. Helena, has been re-opened, after restoration. It is in the Decorated style, and consists, in the main, of nave, south aisle, south-west porch, north transept, and chancel. The south aisle and the clearstory have been rebuilt, and the nave and aisle covered in by new open-timbered roofs. These are of pitch pine. There is an open turret for two bells over the western end,—it is a unique feature. The roofs are of steep pitch, covered by warm red tiles. The ivy upon the east end has been left growing as heretofore. The apex of each gable is surmounted by a foliated cross in worked stone. The roofs are carried by massive stone corbels; the aisle-roof is a lean-to one. The seating in the body of the church is of pitch pine. The pulpit, the reading-desk, and the chancel-stalls are of well-seasoned oak. They are massive in construction, well moulded, and carved. The chancel is approached from the nave by a rise of two steps, and two other steps, further eastward, give the line of the altar. The pulpit stands upon a stone base outside the chancel, upon the north side, but is approached by four steps from within. The doors throughout the building are of oak, upon framings of pitch pine, and the chancel floor and the avenues in the body of the church are laid with encaustic tiles. The glazing is in the cathedral tinted glass. In the east end a stained-glass window has been put in. The subject is the Resurrection, and is the work of Messrs. Heaton, Butler, & Bayne, of London. The altar-rail is of oak, with wrought-iron standards. The reredos is of Caen stone, and consists of an arcade of eight bays. The columns are of serpentine, and the recesses are filled in with polished alabaster. The central panel has a plain Latin cross thereon, of pure statuary marble. The upper part of this reredos and the capitals in its arcade are ornately carved. The church contains several highly interesting tombs, and other curious architectural remains. The restoration has been carried out by Mr. Henry Black, of Barrow-on-Soar, near Loughborough, from the designs and under the immediate superintendence of Mr. Henry Hall, architect, London. The stone and wood carving is by Mr. Harry Hems. The cost of the renovation has been liberally defrayed by Lord Belper, whose seat at Kingston is in the immediate neighbourhood.

ST. ALBAN'S ABBEY CHURCH.

A meeting of subscribers of 100*l.* each was held in the town-hall, St. Albans, on Saturday last, to consider the question which has arisen as to the renewal or otherwise of the roof, the chair being occupied by the Bishop of St. Albans. Communications on the subject from members of the Society of Antiquaries, of the Society for the Preservation of Ancient Monuments, and from individuals, were first read.

Sir E. Beckett submitted the following resolution:—"That the roof of the nave having become ruinous, it is desirable to restore it to the original pitch indicated on the tower, keeping as much of the pointed and panelled ceiling as may be in a sound condition, restoring the rest in similar style."

Mr. W. Jones Loyd seconded the motion.

Mr. Evans proposed the following amendment:—"That this meeting recognises the propriety of the late Sir Gilbert Scott's desire to preserve the old roof of the nave as an interesting portion of the Abbey, and inasmuch as it appears from the architect's report that this roof can be rendered perfectly good and serviceable, recommends that it be repaired accordingly."

The Earl of Verulam seconded it.

Mr. Scott said that his father had never discussed the question with him; but he had no doubt his opinion would have been in favour of a high-pitch roof if the matter had been brought definitely before him, seeing that he had put a high-pitch over a low-pitch roof at Selby, and desired to do the same at Rochester. He did not think the present roof was past repair, but it would cost 3,000*l.* to make a complete job. He endorsed for a new roof the use of Memel timber, but preferred lead to slates as more dignified in appearance.

Archdeacon Grant then spoke at some length, arguing strongly in favour of the retention of the old roof by adequate repairs.

Several other gentlemen took part in the debate, and finally the original motion was carried by fifteen to five.

PORTLAND CEMENT TESTING-ROOM.

Sir,—My absence from town prevented me until now replying to your correspondent, "W.," respecting the above, in your issue of the 27th ult.

I have no desire to fill your pages with a wordy correspondence respecting the utility of testing cement, or the value of an independent testing-room; but as the question of your correspondent has been put to me many times by others situated as he seems to be, I may perhaps so far trespass on your space as to state that if users of cement would specify that from all deliveries of cement a sample would be taken indiscriminately from several sacks (or barrels, as the case may be) and tested, the difficulty of your correspondent would be overcome. Of course, if the manufacturer is to send the sample for testing, he might, if so disposed, deliver a different quality of cement to that sample; but if the samples for testing are taken from the cement already delivered on to the works, the manufacturer would be obliged to deliver such cement as would stand the required test, or he would risk having the whole delivery returned on his hands. H. Faija.

ARCHITECTURAL COMPETITION ILLUSTRATED.

RHYME AND REASON.

Twelve architects once, so runs the tradition,
Sent in their designs for a spacious town-hall:
There was, to be sure, a fierce competition;
Eleven were worsted, and went to the wall.
And hear it, ye "sold," the architect chosen
Was told beforehand he would be the man.
Entre nous, said the Board, designs near a dozen
Will help our elect to improve on his plan.—H.

THE COST OF BUYING UP THE WATER COMPANIES.

Sir,—Will you allow me to correct an error in the press in the recently published official account of the National Water Supply Congress, which is calculated to perplex those readers who take an interest in the London water supply? I am there reported to have said, speaking of the New River Company, "in the Government returns the capital was put at thirteen millions." I said, not thirteen, but three. The only figure returned under the head of that Company's capital expenditure, to December 31st, 1876, in the "Statement of Accounts of the Metropolitan Water Companies" for that year, is 2,892,802*l.*, although it is stated that the conditions of the property are peculiar. According to an article in the *Pall Mall Gazette* of May 18th, 1878, the least value at which the property could be estimated for compulsory purchase is 11,377,000*l.* But this is allowing only twenty-five per cent. above market value. The award in the case of the Stockton and Middlesbrough Water Company, which is relied on by the advocates for the acquisition of the existing water properties "as a settled leading precedent," gave twenty-five years' purchase of statutory dividends, to which 45½ per cent. was added, by Mr. Higgins's award, for compulsory purchase, besides a sum equal to rather more than half that compensation for "statutory and other debts." Thus for purchasing a property which the Mayor of Middlesbrough stated might have been obtained by negotiation for 550,000*l.*, the award came to 789,977*l.*; and the total cost, including that of arbitration, will come to at least 850,000*l.*

I find that the sum set down (in Mr. Chadwick's estimate of twenty-six millions sterling for all the water works) for the compulsory expropriation of the New River Company was 7,434,157*l.*, instead of 11,377,000*l.* At the rate of the Middlesbrough award the sum required for the purchase of the eight London water properties would be 31,001,500*l.*

Francis R. Conder.

A GALLERY OF AUTOTYPES FOR THE ILLUSTRATION OF HISTORY, AND OF THE PROGRESS OF ART.

Sir,—I have proposed that a Gallery of Autotypes, instead of a Gallery of Casts, should be formed for the more comprehensive purposes set forth in the "heading" to this letter, not only for illustrating the history of Grecian sculpture, as suggested by the memorialists for a Gallery of Casts, but the entire history of art—pictorial, sculptural, and architectural; and this, too, at a comparatively trifling cost of money and of space. Plaster casts are doubtless necessary evils, but they are subject to discoloration, to distortion in piece-moulding, and to deterioration from repeated coats of paint. If not painted, they become begrimed with dust, and unsightly. A Museum of Casts, too, would necessarily be laden with specimens of early Grecian sculpture, which would be by no means calculated to improve public taste. The end proposed by the advocates of a Gallery of Casts is, that lectures should be given to students of the Classics, on the history of Grecian sculpture. Surely autotypes would equally well answer the purpose. A gallery, too, in which autotypes were hung, could, from time to time, be utilised for other purposes. But what, I would ask, does this constant lecturing on the history of art come to? Simply this, that art was in all the great epochs gradually developed, *pari passu*, with civilisation,—from crude beginnings to the fulness and completeness of maturity. And this in every case by the employment of artists on great public works. Surely men's brains must have been reduced to a very pulpy state to require thousands of pounds to be spent on either a Gallery of Casts or of Autotypes, to teach them this. For the illustration of Grecian and of Italian history, photographs would certainly answer the purpose. If, however, it is considered to be absolutely necessary that Grecian sculpture should be presented bodily to the eyes of the student, that want is sufficiently met by the collections in the British Museum, and by something better than mere plaster casts,—the marbles themselves, with the touch of Phidias, in some cases, fresh upon them. And for the intimate and profitable study of Grecian art as a training for taste,—if taste can be instilled by such means,—nothing could possibly surpass the collection in the British Museum, were the new one even ten times as extensive. We have possessed this unique collection for more than half a century, and few but students of the fine arts ever study it. A professor has never even yet been appointed to direct the studies of the art-students. And the possession of these treasures for so long a period has never made any marked impression on British taste. Gothic has been rampant ever since. This leaning, too, has been fostered by Churchmen, who are the greatest sticklers for Classical study. Consistent country!

W. Cave Thomas.

OPEN-MOUTHED PIPES *v.* VENTILATORS.

Sir,—As the result of the experiments made at Kew, by the judges of the Sanitary Institute, with ventilators, as against plain pipes, is still commanding considerable attention, will you permit me to publish the following results showing the effect the shape of the outlet has upon the speed of the up-current.

I have recently put up at my house a 4-in. pipe about 13 ft. in height, and whose top stands about 2 ft. above the ridge. At eight p.m. last night (Aug. 9), I tried the up-current, first with the plain pipe, then I put an expanding or trumpet-mouthed outlet perpendicularly upon the top of the pipe. This being tried was taken off, and a Boyle's 10-in. soil-pipe ventilater, with 3-in. pipe attached, put on; this being also tried, was taken off in turn, and a 3-in. Banner's cowl was then tried, and the following are the results, showing the number of feet per minute which each gave of up-current:—

Plain open pipe.	Pipe with trumpet-mouth.	Boyle's.	Banner's.
200	400	300	200
200	300	200	170
200	300	200	160

In this case, the plain upright pipe with expanding outlet gave much the best results; and when at four p.m. to-day I repeated the experiments the trumpet outlet gave much the quickest up-current. The plain pipe again gave 200. The open joint where cowls turn helps to hurt their effect. I tried a drain at Dr. Cassell's house, Newton-terrace, Glasgow, which has the soil-pipe going up the centre of the house, to act as its ventilating shaft, and which soil-pipe carries off the rain-water from the centre gutter: the anemometer showed an in-current of fresh air into the drain through the ventilating-trap of 300 ft. per minute; but after running hot water down the soil-pipe the in-current rose to 500 ft. per minute.

W. P. Buchan, Sanitary Engineer.

THE NON-SOCIETY MAN'S COMPLAINT.

Sir,—You are probably aware that, at the time the masons' strike was settled, the masters' central committee sent a circular round warning the masters against any devices that might be tried, either by foremen or others, who might be favourable to the society men to the prejudice of the non-society men, giving as their reason for such a course what was only right, namely, that as the men had helped them in their struggle with the society they should defend them after they had gained the day; so that in the event of any future struggle, they, by this display of good faith, might count on the assistance of the same or similar men again. Now, sir, I wish to relate my experience of how this provision is carried out in one of the largest yards in town. I may begin by saying that I do not blame the employers in question, unless it is for not looking closely enough into the doings of the foremen in regard to the matter in question. I went there and got employment from the managing foreman, and came next day to start work, when I was told by the shop-foreman that he knew nothing about me and would give me no work. Well, I had no resource but to go back to the manager, who told me that he would make it all right, and I was to come to work at one o'clock. I did so, and was then told by the shop-foreman, with an oath, that I would have to do a great quantity of work to be worth 9d. per hour there. I make no comment upon his behaviour. I leave the facts to speak for themselves. Well, I very naturally asked him how much he considered a day's work for a man at that price; but he could not or would not tell. Well, I was sent into a shop along with some more non-society men, where, I am safe to say that, every man worked to the best of his ability for his employer's advantage; and, from what I afterwards saw, I know that we were turning out at least one-half more work per man in this shop than they were doing in the society shop. But yet we were led to understand by the foreman that we were not worth the money. Well, after being some days there, I was sent into the society shop. Now, mark the difference here, instead of the men being closely engaged at their work, as they were paid to be, they were engaged in all sorts of horseplay, as throwing bags at each other, and occasionally varying the amusements by making a war of abuse on me and other non-society men. Some were standing drunk at the banker, and the foreman would now and again present himself, and, asking if there was anything left in the bottle, take his drink, and depart again. Yet these men, in spite of all this, or, rather, I may say, in consequence of it, seeing that the foreman was a participator in it all, were all counted worthy of the full wage, while the men that attended to their work would have been all reduced, if Mr. Henshaw had not got notice of the intended reduction from one of the men, and interested himself to have it prevented. I may mention that another of the amusements the men have in this yard is the singing of some doggerel lines that some of their number have composed, about the dire vengeance they intend to take on Mr. Henshaw and some others for the share they took in having masons brought to London while the strike was on. And, in conclusion, I may say that I hope you will see your way clear to the publication of the above, as it is for the interest of the masters themselves to know how their orders are really carried out; and I am quite prepared to substantiate all I have said if called upon.

One Who Knows.

GLOUCESTER GATE BRIDGE.

Sir,—Permit me to draw your attention to the very flat roadway of the above bridge. In wet weather it will be one mass of mud, there being no curve for drainage. The parapet, I fear, is too low, and hence dangerous to those who may be tempted to take a leap, or to children who cannot resist the temptation of climbing up.

Please also notice the elaborate inscription under the solemn-looking soldiers at the park entrance recording the opening of the bridge, in deeply cut letters, displayed, and gilt, which contains the following:—

"This bridge and approach road
was
opened for public traffic," &c.,

by the Duke of Cambridge, twelve lines being devoted to the titles of his Royal Highness.

As a vestryman once said to me "they don't want no gentlemen" at the Vestry, perhaps the same idea prevails as to grammar, though the School Board expenses are somewhat heavy on

A Ratepayer.

Another correspondent inquires why we have not spoken of the new drinking-fountain put up at one end of the bridge. Our reply is that, speaking of it as it appeared on the opening day, we could have said nothing satisfactory concerning it. Since then, however, we are glad to find the whole thing has been taken down and is to be re-arranged: so we may have a better tale to tell presently. To join on satisfactorily a figure like Durham's "Sunshine" to a huge mass of natural boulders requires artistic skill.

ST. HELEN'S, BISHOPSGATE.

The following, from Messrs. Wadmore & Baker, reached us last week too late for insertion:—

"Some time since you were kind enough to insert a communication we made through your columns of the discovery of the old west-end doorway, leading to the nuns' choir, in St. Helen's Church, which, after having been concealed with bricks and cement for upwards of 130 years, had again been brought to light. You will regret to hear that there is some danger of its being closed up again, unless some substantial interest is taken in its preservation. The churchwardens, the vestry, and parish are most anxious to restore in a substantial and suitable manner the whole of the external work, and in times when church restoration is much questioned, an examination of what has already been done will attest that it has been carried out in a careful and discriminating manner; but the necessary and substantial repair is so great that a special appeal only remains to be made to those interested in ecclesiology for the preservation of the above."

Hammersmith Mall.—The question of the embankment of Hammersmith Mall, from plans prepared by Mr. Bean, surveyor to the Fulham Board of Works, has been adjourned for a year.

A ROUND OF VISITS.

THE SOCIETY OF ENGINEERS.

On Wednesday last about fifty of the members of the Society of Engineers visited the works in progress at the New Law Courts, where they were received and conducted by Mr. Bartholomew, chief of the contractors' drawing-office. Of this visit we need not say more than that the works have made marked progress since the termination of the masons' strike. The enclosure eastward of the block of offices facing Bell-yard is now railed in, and the carriage-road and footways paved.

From the Law Courts the visitors proceeded to the extensive and old-established engineering works of Messrs. Pontifex & Wood, Shoe-lane, where they were received by Mr. Chadwick and shown over the premises. Messrs. Pontifex & Wood manufacture a great many large copper vessels, refrigerators, &c., for use in breweries and sugar refineries, and they manufacture a great variety of smaller articles in copper and brass. They also make large numbers of steam and water valves and cocks, water-closets, bath-fittings, and plumbers' requisites in general. The visitors witnessed the milling or rolling of some sheet lead, and the more interesting operation of lead-pipe making, the heated metal being forced through a matrix of the required diameter by means of hydraulic pressure, and somewhat cooled ere its exit upwards from the cylinder, whence it is wound, while still warm, direct on to a drum, till a coil of the required length or weight is obtained. It issues from the cylinder at the rate of two or three yards a minute.

Leaving Messrs. Pontifex's premises, the visitors proceeded to the works of the well-known firm of Messrs. S. Owens & Co. (formerly Clinton & Owens), of Whitefriars-street, where they were received by Mr. Clement Owens, and Mr. Coley, the manager. This firm enjoys a well-merited repute for all kinds of hydraulic and pumping machinery. Among the specialities shown to the visitors were Blake's well-known patent direct-acting steam pump, of which Messrs. Owens are the sole licensees and manufacturers for Great Britain, and of which more than 10,000 are said to be in use. It is claimed for this pump, which was first introduced in America in 1864, that its simplicity of construction, positive action under any pressure, and the perfect arrangement of all its parts, enable it to run at any speed with certainty, delivering more water, with a less expenditure of steam, than any other direct-acting steam pump. An important feature is the mechanical connexion between the movable seat (which in certain cases becomes the main valve) and the main piston. It permits the pump to run at very high speed without danger of striking the heads. The piston cannot reach the end of the cylinder, as the mechanical connexion referred to gives a lead as certain as can be obtained with an eccentric. The pump is constructed without a cylindrical valve; it has two valves, viz., main and auxiliary, both of which are plain flat-slide valves, the same as used in the ordinary steam-engine. The ports of these slide-valves are all cut out to gauge by a very compact and ingenious piece of machinery, called the "Brainard Milling Machine." The pump works well at extreme ranges of speed. A 5-in. pump, with an 8-in. steam cylinder having a 12-in. stroke, was started to work at 155 single strokes a minute, and the speed was varied down to 25 strokes. It was then run up again to a high speed, and suddenly set to an extremely slow speed. With the delivery throttled to represent a head pressure of water of 230 ft., and with an average steam pressure of 40 lb., the pump almost imperceptibly moved at the rate of 1 stroke in 12 minutes, or 5 strokes per hour, delivering water throughout. This shows the capability of the pump either for quick or slow working. Among other specialities shown to the visitors were Mann & Owens' patent gas-valves, some of which, as large as 48 in. diameter, are being made for the gas-works at Beckton.

A number of the visitors afterwards dined together.

The Tower of London.—A new guard-house has just been completed at the western end of the Tower Walk, for the use of the troops in garrison. It has been built by the Government contractor, of block granite with Bath stone facings.

WOOD PAVEMENT AT THE WEST END.

Wood pavement on a large scale is now being laid in several of the leading thoroughfares at the West End. The Marylebone Vestry have just commenced the paving of Oxford-street, between Tottenham-court-road and Regent's-circus with wood. The vestry have decided to have it done by workmen in their own employ. It is to be laid on a concrete foundation, and grouted with Portland cement, and after being completed is to be covered with tar and sand. The tender of Messrs. Waterman & Co., of Gracechurch-street, for supplying the wood in blocks, has been accepted. The Paddington Vestry are about to lay down wood pavement in several thoroughfares within their district, including Westbourne-grove, for the paving of which the tender of the Improved Wood Company has been accepted; also the tender of the London Wood Paving Company for laying down similar pavement in Radnor-place and Somer's-place; and that of the Asphaltic Wood Company for paving Southwick-street.

NEW MORTISING MACHINE.

Messrs. F. W. Reynolds & Co., have lately introduced a new mortising-machine, called the "London." The advantages claimed for this machine are:—1. Its strength combined with lightness, rendering it at once a durable tool and one easily transported from place to place. This lightness is due to an ingenious arrangement of the levers by which the fulcrum whence the power is developed is placed at the base of the machine instead of on the standard, as is usually the case. 2. Only one fixing of the wood is necessary both for mortising and core-driving, and, in the case of hard wood, for boring the holes at the end of the mortises. This is effected by means of two plungers side by side, one for the mortising chisel and the other for the core-driver and the boring apparatus, both of which tools fit into the same socket. The boring-bit is worked by a cranked handle on the right side of the machine, through a pair of mitre wheels, which are fixed. When the plunger is used for core-driving the bit is removed and a suitable tool inserted in the socket. By previous arrangements it was necessary to first fix and mortise the wood and place it on one side for core-driving, and afterwards refix and drive out the core, thus necessitating twice handling and fixing, besides requiring, in the case of large quantities, considerable space to stack the wood half done. These disadvantages are all obviated by the "London," as the wood, once fixed, is mortised, cleared of core, and taken straight to the joiner,—saving time and room.

THE PRETTY STATE OF THE LAW.

Sir,—You kindly permitted me last year to air a grievance affecting equally builder and baronet, painter and peer, labourer and lord.* May I ask the extra kindness of being allowed to say that since writing the inquiry "What is law?" I have struggled ineffectually to obtain an unanswerable answer to the question. Thousands and thousands are being spent yearly upon old and new courts, judges, their belongings and followings. Complaints are periodically made as to the "block in the law (?) courts," when, upon examination, three-fourths of each session are found to be occupied in trying to undo and in undoing the several decisions of previous sessions supposed to be legal. Three learned judges will give a unanimous opinion, or, as some would say, expound the law, upon a case. And a week after three equally learned judges, upon the very same case, will give a unanimous opinion quite the reverse. Again, one judge will issue his mandate to forbid another judge to carry out his legal decision previously come to. Is not this an expensive sort of game; and does it not greatly confirm what I have said, that there is no law, but opinion only, which could be obtained with much less expense, time, and trouble, compared with the present system? "My word is law," saith a certain quotation. But where upon earth is there a man, learned or otherwise, who can say, "My word is law," although the country is highly taxed to pay many to do so?

Let me instance a recent case interesting to the public, where a widow is supposed to have had awarded her by law a certain amount of damages for the loss of her husband. After having had her feelings harassed for five years with repeated investigations, all the amount awarded her has been sucked away by the "mistletoe-boughs" who flourish upon the trunks of those forced into our so-called law.

With regard to what is called the "Law of Bankruptcy," it has become a well-known fact, more particularly to your readers, that it is made (query intentionally) for the benefit and encouragement of dishonest debtors.

Away with all such deception. Let all future Acts of Parliament be so framed that disputes may be settled at once and for ever.

The much-prized right of appeal is a delusion and a snare, giving the verdict to the suitor with the longest purse,—to him who can carry the case farthest and take the chance of an opinion his way. Y.

* See vol. xxxv., p. 374.

CLERKS OF WORKS AND ENGINEERS.

Last year the Littlehampton Local Board of Health entered into a contract to have a well sunk to supply the town with deep spring water, under the directions of Mr. Grantham, C.E., of London. The Board of Health lately ordered the clerk of works to report to them weekly on the progress of the works, which the clerk of works declined to do without the sanction of his chief, Mr. Grantham; and Mr. Grantham declines to allow the clerk of works to report to the Board, but offers to report weekly himself. Thereupon the Chairman, at the last meeting of the Board, proposed that the clerk of works be dismissed with a week's notice. What is the usual practice with engineers and architects with regard to the reporting of clerks of works? Ought the clerk of works to report to the engineer, or to the Board, or to both? It is said that, "No man can serve two masters without hating the one," &c. Is it desirable that a clerk of works should be put in the position of hating one party? A Visitor.

Books Received.

Art Foliage, for Sculpture and Decoration; with an Analysis of Geometrical Form. Second Edition. By Jas. K. Colling, F.R.I.B.A. London: 150, Hampstead-road; and B. T. Batsford. 1878.

We give a warm welcome to the second edition, which has just now appeared, of Mr. J. K. Colling's "Art Foliage." The work as first issued some dozen years ago, has done good service, and has been out of print some time. In the new edition the author has omitted twelve plates of natural foliage, which were in the original book, as he is about to publish a separate work on that part of the subject, and in their place has given an Appendix consisting of three chapters of letterpress, "Inlay," "Stone Carving," and "Wood Carving," and twenty additional plates of original designs. It is an excellent book of its kind, and will be found valuable by a large number of persons, and we cordially recommend it.

A Handbook on Home Life and Elementary Instruction. London: Chapman & Hall.

Many persons who recognise the value of domestic economy, and would aid the Congress founded to promote the study of it, are yet heard to ask, "But how can it be taught?" The pleasantly-written little book before us gives a fair answer to this inquiry or doubt, and sketches schemes of instruction which, if carried out earnestly, would not fail to produce good results. The Education Department should send it about.

VARIORUM.

The veteran, Mr. William Bardwell, sends us a brief historical narrative of the Royal Church and Parish of St. Margaret the Martyr, Westminster (Bardwell, Great Queen-street),—a pamphlet of 20 pages. It has no date, and may have been written some time ago. Be this as it may, however, it contains a considerable amount of interesting information compiled from the Churchwardens' Accounts, "assisted by the gleanings of others," and includes two illustrations.——*The Theatre*, which was making its mark as a weekly paper, has now taken the shape of "a monthly review and magazine," and begins well in that shape. A national subsidised theatre is advocated with discretion. The number contains two excellent photograph portraits, one of Miss Helen Terry, the other of Mr. Henry Irving, of themselves worth the whole cost of the review.

The Director of Ordnance Survey.—Col. A. C. Cooke, C.B., has been appointed Director of Ordnance Survey.

Miscellanea.

The Value of Land in Fulham.—The case of "Lord Beaumont *v.* The Metropolitan District Railway Company" has been heard at the Sheriffs' Court, before Mr. Under-Sheriff Burchell and a special jury. This was a compensation claim by Lord Beaumont for 20,000*l.* for some property at North-end, Fulham, near the West Kensington Station, and it was stated that land in the locality had wonderfully increased in value. The notice to treat was given in August, 1874, four days after Lord Beaumont had completed the purchase from Colonel Gunter. His lordship held other land in the neighbourhood, and had intended to erect a convalescent Home for the Knights of the Red Cross. The Solicitor-General, Mr. Morgan Howard, Q.C., Mr. Poland, and Mr. Eyre Lloyd, were for the claimant; Mr. Bidder, Q.C., and Mr. Pollard for the company. The evidence adduced on both sides was remarkable. Land at Kensington was at 30*l.* an acre ninety years ago, but within the last ten years there had been a great increase in its value, and it was now worth from 4,000*l.* and upwards an acre, and was becoming still more valuable. The land required by the railway was 1 a. 20 p., and the valuation was to be taken from 1874, when the notice to treat was served. The surveyors for Lord Beaumont differed, their estimates ranging from 8,000*l.* to 18,000*l.*, while the surveyors for the company were all under 3,000*l.* Lord Beaumont had, it appeared, purchased largely in the locality, and one of the points was that the railway had improved the property in the neighbourhood. Mr. Under-Sheriff Burchell ruled that Lord Beaumont was entitled to compensation for the value of the land at the time of the notice, irrespective of what he had given for it. Mr. Bidder submitted that 3,000*l.* for the land, the old materials, and the making of roads would be ample compensation to Lord Beaumont, and he invited the jury to consider that the making of the railway had increased the value of the property in the neighbourhood. The Solicitor-General claimed a full, fair compensation for the property taken by the railway according to the evidence of the value given by the surveyors he had called. Mr. Under-Sheriff Burchell put it to the jury to decide between the conflicting evidence as to the value of the property in August, 1874, when the notice to treat was given. The jury gave a verdict for 7,250*l.*—*Times*.

Southampton Board Schools.—At a special meeting of the St. Mary-Extra School Board, Southampton, on the 8th inst., the committee appointed to examine the plans (ten in number) sent in in competition for the new schools presented a report, which (according to the *Hampshire Advertiser*) commented on the plans examined,—"Pax," "Excelsior," "Clausentum," and "Exits and Entrances,"—and in conclusion stated that a selection was made between "Clausentum" and "Entrances and Exits," and after careful consideration the committee recommended the Board to accept the drawings marked "Clausentum," subject to the approval of the Educational Department. Mr. Rosoman, in seconding the adoption of the report, said there were three plans not selected by the committee, — "Thorough," "Spes," and "Keystone,"—which he thought were admirable, and deserving of mention. The report was adopted, and the envelope accompanying the plans of "Clausentum" was opened, and the chairman announced the author to be Mr. W. H. Mitchell, Southampton.

A New Lock.—We have received from Mr. Hill, of Upper Thames-street,—who for some years has made a speciality of locks and door furniture,—specimens of a new rim-lock, recently registered, which we think deserves some notice. The design is good, and quite unique, and well adapted for prevalent styles of architecture. There are no rough or sharp angles, so objectionable in ordinary rim-locks; and the mode of fixture to the door (through the flange) is preferable to the usual long screws passing through the body of the lock. The general finish is very good, and the prices seem moderate. The War Department has not been slow to appreciate these merits, as we understand Mr. Hill has orders to supply this lock for the officers' new quarters at Cyprus. The War Department are using the same article for the new military offices at York (now erecting under the supervision of Major Malcolm, R.E.), and for several large barracks throughout the kingdom.

Mr. Ruskin and the "Guild of St. George."—The *Leeds Mercury* states that an application on behalf of Mr. Ruskin, to be made forthwith to the Board of Trade for a licence directing an association to be formed, under the name of the Guild of St. George, to be registered with limited liability, without the addition of the word "limited" to its name. The objects of the association are specified thus:—1. To determine and institute in practice the wholesome laws of labour, and especially agricultural life and economy; to instruct first the agricultural, and then, as opportunity may serve, other labourers and craftsmen, in such science, art, and literature as are conducive to, or connected with, good husbandry and craftsmanship. 2. The acquisition, by gift, purchase, and otherwise, of land in any part of the country. 3. The acquisition, erection, &c., of museums and schools. 4. The acquisition of pictures, books, sculptures, and works of art and natural history. 5. The erection of dwelling-houses for agricultural labourers. 6. The holding, tilling, and cultivating, leaving uncultivated, turning into waste or common land, all or any part of the property acquired. 7. Granting loans or gifts with or without interest. 8. The doing of all things lawful and incidental to such objects.

The Turners' Company's Prizes.—The Company of Turners propose to give this year their silver medal, the Freedom of the Company, and other prizes, to any workman, whether master, journeyman, or apprentice in the trade in England, who may send in the best specimen of hand-turning in wood, diamond-cutting and polishing, and throwing and turning in pottery. The competition in wood includes turning in both hard and soft wood. The work must be all hand-turning, produced in the lathe "without special rest or tool apparatus," and the carving must be the work of the exhibitor. The competition in pottery includes terra-cotta, stonework, earthenware, and porcelain. In the diamond-cutting and polishing competition, the Baroness Burdett-Contts, who is a member of the Company, has placed at the disposal of the Court the sum of 20*l.*, to be distributed in this class among the competitors. Past-Master C. Christopherson has placed at the disposal of the Company a sum of 10*l.* to be awarded as a prize for the best specimen of amateur work in ornamental turning, in either ivory or hard wood, executed during the period of competition. Any lathe apparatus may be used.

The New Opera House.—In the House of Commons, Mr. Whitwell asked the Chairman of the Metropolitan Board of Works whether the hoarding connected with the apparently discontinued New Opera-house on the Embankment would soon be removed, as it had for a long time been an obstruction to the footpath. Sir James M'Garel-Hogg replied that the time fixed for the final completion of the New Opera-house was the 29th of September next. Of course it was hopeless to expect that it would be finished by then; but until that date it did not seem expedient to the Metropolitan Board of Works to take any steps with regard to it. He would take care that the attention of the Board was directed to the matter, and he had already caused notice to be given to Mr. Mapleson of the hon. gentleman's question.

Death-rate.—The annual rate of mortality per 1,000 in the week ending July 20th, in the twenty English towns, ranged in order from the lowest, was as follows:—Bristol 18, Wolverhampton 20, Brighton 21, Nottingham 22, Portsmouth 23, Norwich 23, Oldham 24, Birmingham 25, London 26, Plymouth 26, Newcastle 26, Sunderland 26, Bradford 28, Leicester 30, Manchester 32, Sheffield 33, Salford 36, Leeds 37, Liverpool 38, and the highest rate 44 in Hull. The annual death-rate from the seven principal zymotic diseases averaged 9·7 per 1,000 in the twenty towns, and ranged from 3·5 and 3·6 in Plymouth and Portsmouth, to 17·1 and 20·8 in Leeds and Hull. Scarlet fever showed fatal prevalence in Birmingham, and whooping-cough and measles in Sunderland. Small-pox caused 11 deaths in London, but not one in any of the nineteen large provincial towns.

The late Mr. P. Wykeham Martin.—It has been decided by the citizens of Rochester to place in the Guildhall of the city a full-length portrait of the late Mr. P. Wykeham Martin, who represented the city in Parliament for more than twenty years, and whose sudden death in the House of Commons a short time ago cast a gloom over that assembly.

Wolverhampton Theatre.—The Theatre Royal, Wolverhampton, has been re-opened, after redecoration. A prologue, written for the occasion, congratulated the auditors on the rescue of the theatre from its supposed intended conversion into a galvanising works, a supposition founded on the fact that when the house was in the market, and no one else would buy it, Alderman J. Jones, of the Corrugated Iron Company, negotiated for its purchase; but the members of the Free Library Company have reason to know (says the *Staffordshire Advertiser*) that if the sellers had not "backed out," the theatre would now have been, not a galvanising works, but a museum for the town. When next the worthy alderman is bent on such a generous deed, may he not be disappointed. The theatre is saved to the drama; but it is to be hoped that a museum is not lost to the town.

York Buildings Water-gate.—At a meeting of the Board of Works last week, Mr. Leslie moved "That, in the opinion of this Board, it is desirable to make an additional entrance into the Board's beautiful garden east of Villiers-street by raising the York buildings water-gate to the level of Buckingham-street, and so utilising that ancient work, provided that the whole expenditure does not exceed 500*l.*" He said that the appearance of the Embankment was somewhat depreciated by the subsidence of this gate. Mr. Selway observed that the subject was worthy of attention, but objected to the adoption of the resolution, as it was against precedent. He moved that the matter be referred to the Works, &c., Committee for consideration. Mr. Leslie accepted the amendment, which was then adopted.

Izaak Walton.—A bust of Izaak Walton, executed by Mr. Bell, was unveiled in the Church of St. Mary, Stafford, by the Earl of Lichfield. The Dean of Lichfield in his address gave a sketch of Walton's life and literary labours, dwelling particularly upon his intimacy with the best and choicest spirits of the Church of England of his day as an evidence of his own intrinsic excellence of character, and upon his "Complete Angler" as the work upon which his literary fame most rested. Expert as he was as an angler, he was no less skilful as a "fisher of men," winning "the hearts of all that he did angle for."

Chester Castle.—A fire broke out at Chester Castle on Monday evening, beneath the new Nisi Prius Court, which has recently been erected at a cost of 10,000*l.* The scene was exciting, for on one side the county prisoners were incarcerated, and on the other, in immediate proximity to Cæsar's Tower, separated only from the burning building by a guard's box, a quantity of ammunition was stored. To prevent the fire from extending to this tower, therefore, was the chief object of the firemen, as an explosion would have inevitably been terribly destructive to life and property. In a short time, however, the flames were mastered.

Drainage at Bombay.—The Army Sanitary Commission have (according to the *Bombay Gazette*) issued a memorandum upon the report of the Bombay municipality for 1876, and the Secretary of State, in considering it, has desired the Bombay Government to urge upon the municipality the necessity of carrying out speedily a system of drainage that will reduce the serious elements of disease and death now prevailing in Bombay.

New Method of Lighting Street Lamps at Sheffield.—Last week some experiments under the electric and pneumatic processes introduced by Mr. Weston for lighting and extinguishing street-lamps were made at Sheffield. For the purpose of testing the pneumatic process, Mr. Weston had fitted several street-lamps with his patent burner and the necessary tubular connexion. The experiments are stated to have been successful.

Trade Unions Congress.—The eleventh annual Trade Unions Congress is to be held in the Athenæum, Bristol, on Monday, September 9th, and following days. The programme of business includes, besides Parliamentary subjects, co-operation and its relation to trade-unionism, representation of labour in Parliament, overtime, and apprenticeships.

The Exhibition of Sanitary Appliances and Articles of Domestic Use and Economy, held in connexion with the Autumn Congress of the Sanitary Institute of Great Britain, will take place at Stafford, from the 2nd to the 19th of October next.

Old Paris.—One of the oldest monuments in Paris, the Duke of Burgundy's Tower, in the Rue aux Ours, in Paris, now forms part of a group of schools created by the city of Paris. It is a square edifice, with embattled parapets. During a long time it was divided into small lodgings; in the great hall two stories had been constructed, and the guard-room was turned into a storehouse for ironmongery. The staircase of this tower is of particular interest to artists and archæologists. The stone column around which the steps wind is terminated in a capital, from which issues a representation of an oak-tree, the branches of which, covered with leaves very delicately carved, constitute the vaulted roof.

The Broseley Tileries.—Instead of saying in our description of Sidbury Manor House, "the roofs will be covered with Broseley tiles, from Staffordshire, manufactured by the Broseley Tile Company," we ought to have said *Shropshire*. What gives the preference to Broseley tiles in the market is their colour and quality, arising from the value of the clays peculiar to this district.

Court of Common Council.—At the last meeting, at the instance of the City Lands Committee, it was resolved to expend 200*l.* in providing improved ventilation for the Council Chamber, and 205*l.* in supplying each member of the Court with a medallion of Temple Bar, formed from the lead of the roof of the structure.

Art-Union of London Exhibition.—As we have already given a list of the principal pictures purchased by the prizeholders, it will suffice to say that the exhibition is now open in the Gallery of the Institute of Water-colour Artists, Pall-Mall, and includes a number of excellent paintings and other works of art.

Borough of Southport.—In answer to advertisements, the council had sixty-seven applications for two vacant situations,—assistants in the surveyor's office. They have appointed Messrs. William Gordon, of St. Helen's, and John Boothby, of Oldham.

The Post-office.—The site of the old Probate Registry in Queen Victoria-street, upon which the new Post-office Savings-bank Office will be erected, is to be purchased of the Commissioners of Works for 70,000*l.*, and charged to the Post-office vote.—*City Press.*

TENDERS

For the erection of a new wing to Springfield House, Muswell-hill, for Mr. L. H. Hicks. Mr. W. P. Griffith, architect:—

Grover	£1,632 0 0
Pocock	1,430 0 0

For new laundry, additions, and alterations to No. 7, Parsons-green, Fulham, for the London Female Reformatory Institution. Mr. W. P. Griffith, architect:—

Swan (accepted)	£400 0 0

For addition and repairs to No. 9, Wine Office-court, Fleet-street, for Messrs. R. K. Burt & Co. Mr. W. P. Griffith, architect:—

Ody (accepted)	£150 0 0

Accepted for a block of shops and offices, at Altrincham, Cheshire. Mr. George Truefitt, architect:—

Southern (joiner)	£1,800 0 0
Hamilton (bricklayer)	970 0 0
Watton (plumber)	732 0 0
Patterson (mason)	670 0 0
Hood (plasterer)	315 0 0
Ashcroft (slater)	133 6 0

For five dwelling-houses and shops, with stabling and warehouse in rear of Wandsworth-road. Messrs. Hill, Grylls, & Wilcocks, architects. Quantities supplied:—

Stephenson	£4,884 0 0
Cocks	4,738 0 0
Scrivener & Co.	4,325 0 0
Hunt (accepted)	4,117 0 0

Accepted for fireproof floors and roofing, for Mr. H. Hansom. Messrs. Hill, Grylls, & Wilcocks, architects:—

The Patent Concrete Building Apparatus Company	£200 0 0

For the making of a new road, and the lowering of a portion of the High-street, for the Harrow Local Board:—

Cowdery & Sons	£3,000 0 0
Blackmore	2,949 0 0
Metcalf	2,516 10 0
Thompson & Sons	2,500 0 0
M'Kenzie	2,210 0 0
Dover, Brothers	2,145 0 0
Rendall	1,920 0 0
Young & Nicholson	1,904 0 0
Rowland, Brothers (accepted)	1,795 0 0

For alterations at the Red Lion and Still Tavern, Drury-lane, for Mr. F. Hurdle. Mr. A. E. King, architect. Quantities supplied:—

Rogers	£325 0 0
Ladstone & Son	320 0 0
Tape	249 0 0
Millson	246 0 0
Cocks & Co.	244 0 0

For the construction of a 15-in. pipe sewer, for the Harrow Local Board:—

Thompson & Sons	£1,150 0 0!
Cowdery & Sons	1,124 0 0
Metcalf	1,095 0 0
M'Kenzie	1,060 0 0
Blackmore	995 0 0
Strachan	976 0 0
Rendall	858 0 0
Rowland, Brothers	845 0 0
Taylor	767 0 0
Young & Nicholson (accepted)	615 0 0!

For the erection of farm buildings, at Fetcham Park, Leatherhead, for Mr. J. Barnard Hankey. Mr. F. J. Dibble, architect:—

Hamblin, Brothers	£2,320 0 0!
Heselgrave	1,987 0 0
Brown	1,716 0 0
Edser	1,638 0 0
Walker	1,271 0 0!

For building a house and shop, stables, &c., at Dorking, for Mr. William Beall. Mr. F. J. Dibble, architect:—

Nightingale, Brothers	£1,954 0 0
Hamblin, Brothers	1,580 0 0
Heselgrave	1,236 0 0
English	1,235 0 0
Pledges	1,160 10 0

For alterations to house, Ewell-road, Epsom, for Mr. A. J. Ede. Mr. F. J. Dibble, architect:—

Page	£155 10 0
Chuter, Brothers	151 10 0

For foundations to warehouses, Farringdon-street, for Messrs. Pirie & Sons. Mr. G. Vickery, architect:—

Morter	£2,375 0 0
Scrivener	2,242 0 0
Dove, Brothers	2,125 0 0
Lawrence	2,104 0 0
Browne & Robinson	2,070 0 0
Hart	1,884 0 0
Crabbe	1,828 0 0

For pulling down old premises, and building two houses, with workshops, in Maroon-street, Limehouse, for Mr. Hugh Cotter. Mr. W. C. Livermore, architect:—

Poulsell	£949 0 0
Gooding	925 0 0
Harbert (accepted)	775 0 0
Palmer	765 0 0

For St. Andrew's Mission-room, Kensal Town. Mr. E. Vigers, jun., architect:—

Temple & Foster	£1,013 0 0
Wells	915 0 0
Hook & Oldrey	870 0 0
Thomas & Butland	845 0 0
Fairchild	810 0 0
Lamble	795 17 0

For sewer, at Kensal-green, for the General Cemetery Company. Mr. Henry Dawson, architect:—

Neave & Son	£685 0 0
Mowlem, Burt, & Freeman	576 0 0
Hook & Oldrey	565 0 0

For the erection of a pair of semi-detached residences, at Southall, Middlesex, for Mr. William Savage. Mr. Thomas Newell, architect. Bricks supplied by Mr. Savage:—

Kearley	£1,148 0 0
Hardy	935 0 0
Atkinson	775 0 0
Collins & Co. (accepted)	725 0 0

For forming length of sewer, road, and footpath, on the Castle-hill estate, near Ealing, for Mr. C. P. Millard. Messrs. Walter Graves & Huibert, surveyors:—

Killingbeck	£610 0 0
Adamson & Sons	430 0 0

TO CORRESPONDENTS.

H. H.—J. M.—S. M. H.—E. S.—H.—J. B.—H. & O.—W. B.—B. B. & R.—W. T.—U. & Co.—W. G. & H.—W. B.—C J P.—D. & W.—F. N. C.—W. W.—W. C.—H. H.—E. C. R.—H. F. J.—G. H. W. (possibility of redress would depend on some minute particulars Take personal advice).—G. B. I. (under our mark)—M. (ditto).—W. H. D. (too late for this week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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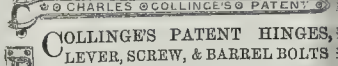
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Art and Mathematics.

SELDOM has there been an opening address at a British Association meeting conceived in a broader and more truly philosophical spirit than that delivered by Mr. Spottiswoode at the Dublin meeting. It merited the term "philosophical" in the best sense, as being really an attempt to bring out the bearing of a special study upon human life and work in general, the wisdom to be educed from its consideration, rather than the mere advance made in technical points. It has been assumed very often that the business of the president on these occasions is to give a review of the state of scientific progress during the year which has elapsed since the last meeting; but it is at least tacitly felt now that modern science has become too great and complicated a web for its windings and involutions, even during one year, to be disentangled in a single speech or address. Several presidents of the British Association have under this conviction taken the opposite course, and confined themselves to a technical disquisition on the subject which was their speciality, and on the last steps taken in its investigation; and no doubt addresses of great value have been given on these lines, but hardly such as we look to from the president on such an occasion. It certainly is the part of a presidential address to generalise, not merely to contribute one more to a collection of technical papers. Mr. Spottiswoode hit the mean in a singularly happy manner. Not forsaking his own special science, —mathematics,—he gave an address which, while just touching sufficiently on the most recent developments of the science to give to general hearers an idea of their scope and direction, had for its main object to show the connexion of the study with the great objects of human life which are of universal interest whether to scientific or to non-scientific minds. Like all his predecessors in the presidential chair, he observed, he was constrained to regard himself as in "a position of exceptional and unusual difficulty,"—the normal position of a British Association president; and his own peculiar difficulty lay in the fact that the science which he represented, when regarded from the mathematician's own point of view, presented so few points of contact with the ordinary experiences of life and modes of thought, that any account of its actual progress which he had attempted must have failed in the first requisite of an address,—that of being intelligible. "Now, if this esoteric view had been the only aspect of the subject which he could present to his hearers, he might well have given up the attempt in despair. But although in its technical character mathematical science suffers the inconveniences, while it enjoys the dignity, of its Olympian position; still in a less formal garb, or in disguise if you are pleased so to call it, it is found present at many an unexpected turn: and although some of us may never have learned its special language, not a few have, all through our scientific life, and even in almost every accurate utterance, like Molière's well-known character, been talking mathematics without knowing it." From this general observation we come nearer to our aspect of the subject in the quotation which Mr. Spottiswoode gives from Newton's "Principia," and nearer still in the application which he himself makes of Newton's view of mathematics, as necessarily affecting even works of art:—

"In his preface to the 'Principia' Newton gives expression to some general ideas which may well serve as the keynote to all future utterances on the relation of mathematics to natural, including also therein what are commonly called artificial, phenomena. 'The ancients divided mechanics into two parts,—rational and practical; and since artisans often work inaccurately, it came to pass that mechanics and geometry were distinguished in this way,—that everything accurate was referred to geometry, and everything inaccurate to mechanics. But the inaccuracies appertain to the artisan and not to the art, and geometry itself has its foundation in mechanical practice, and is, in fact, nothing else than that part of the universal mechanics which accurately lays down and demonstrates the art of measuring.' He next explains that rational mechanics is the science of motion resulting from forces, and adds, 'The whole difficulty of philosophy seems to me to lie in investigating the forces of nature from the phenomena of motion, and in demonstrating that from these forces other phenomena will ensue.' Then, after stating the problems of which he has treated in the work itself, he says, 'I would that all other natural phenomena might similarly be deduced from mechanical principles. For many things move me to suspect that everything depends upon certain forces in virtue of which the particles of bodies, through forces not yet understood, are either impelled together, so as to cohere in regular figures, or are repelled and recede from one another.' Newton's views, then, are clear. He regards mathematics, not as a method independent of, though applicable to, various subjects, but as itself the higher side or aspect of the subjects themselves; and it would be little more than a translation of his notions into other language, little more than a paraphrase of his own words, if we were to describe the mathematical as one aspect of the material world itself, apart from which all other aspects are but incomplete sketches, and, however accurate after their own kind, are still liable to the imperfections of the inaccurate artificer. . . . If, turning from this aspect of the subject, it were my purpose to enumerate how the same tendency has evinced itself in the arts, unconsciously it may be to the artists themselves, I might call as witnesses each one in turn with full reliance on the testimony which they would bear. And, having more special reference to mathematics, I might confidently point to the accuracy of measurement, to the truth of curve, which, according to modern investigation, is the key to the perfection of Classic art. I might triumphantly cite not only the architects of all ages, whose art so manifestly rests upon mathematical principles, but I might cite also the literary as well as the artistic remains of the great artists of Cinquecento, both painters and sculptors, in evidence of the geometry and the mechanics which, having been laid at the foundation, appear to have found their way upwards through the superstructure of their works. And in a less ambitious sphere, but nearer to ourselves in both time and place, I might point with satisfaction to the great school of English constructors of the eighteenth century of the domestic arts, and remind you that not only the engineer and the architect, but even the cabinetmakers, devoted half the space of their books to perspective and to the principles whereby solid figures may be delineated on paper, or what is now termed descriptive geometry. Nor perhaps would the sciences which concern themselves with reasoning and speech, nor the kindred art of music, nor even literature itself, if thoroughly probed, offer fewer points of dependence upon the science of which I am speaking. What, in fact, is logic but that part of universal reasoning; grammar but that part of universal speech; harmony and counterpoint but that part of universal music, 'which accurately lays down,' and demonstrates (so far as demonstration is possible) precise methods appertaining to each of these arts? And I might even appeal to the common consent which speaks of the mathematical as the pattern form of reasoning and model of a precise style."

The reference to the connexion of the cabinet-maker's art with mathematics was suggested, as we find from a foot-note to the published report of the address, by Chippendale's and Sheraton's books. Mr. Spottiswoode's appeal to the architects as witnesses in his favour struck us as coming very *apropos* to some recent articles and correspondence in our own columns. How far the appeal to the architects of all ages would need modification may be a question, unless the application of mathematics is understood in so general a sense as to include the mere process of striking an arch from a centre and measuring the angles for the joints of the voussoirs. We imagine, however, that a little more than this was intended, and that the assumption was that all architecture has been more or less proportioned on a mathematical basis. Of many structures, ancient and modern, this (as we had recently occasion to observe) could only be said in regard to that observance of proportion which naturally results from the employment of a standard measure of fixed length, and the consequently probable result that any room or building laid out by its assistance will have commensurate ratios,—30 ft. one way, 50 ft. the other way, and so on. There is no doubt, however, that the connexion between architecture and mathematics has been very close; and the closer, the more architecture has risen above building necessities into the region of pure art: the more it has been made matter of intellectual study and enjoyment for its own sake, the more stress has been laid on mathematically just proportions and curves. In the details of Greek ornament, too, the wand of the mathematician rules, and the curves and thicknesses of the different parts of the anthemion ornament, for instance, are probably capable of precise mathematical expression. But in speaking of art more generally, as allied with mathematics, the President of the Association seems to overshoot the mark a little. It is true that he cites Leonardo's "Trattato della Pittura" as indicating how with the great painters mechanics "found their way upwards through the superstructure of their works" (a very happy way of expressing it): but Leonardo must probably be taken *cum grano* on such a point; with all his power of artistic production and invention, he was also a good deal of a schemer and a theorist, bent on formulating an ideally-perfect method; a temperament which often leads to the invention of theories which are beautifully symmetrical in themselves, but have not a very real or practical bearing on the art they are intended to illustrate. In one sense it is true that mathematics have a very direct relation both to painting (or at least to *colour*) and to music, inasmuch as what are called indifferently the "harmonies" of both sound and colour depend upon the ratio of vibrations in a given time, and are demonstrable by calculation on paper as well as by experience of the eye or the ear. But it is difficult at first to see how we can trace any similar connexion in regard to natural form, as exhibited, for instance, in the sculptured figures of those same Greek artists who attached

so much importance to mathematics in their architecture. We seem to be driven, then, to Bacon's criticism, that though a painter may make a more beautiful face than ever was seen in reality, yet it must be "by a kind of inspiration, and not by rule." There may, however, be a reply possible to this from the mathematician's point of view. It may be said that the beauty of contour in the face or the figure is as much the result of mathematically-perfect ratios in the contour lines as in the case of those more artificial classes of design (such as the anthemion or the entasis of a column) in which the elements of the curves are capable of ready demonstration: only that in nature and in works of art founded directly upon nature, the curves are so much more delicate and their combinations so much more complex that our powers of analysis cannot grasp them; that if we could so grasp them, we could produce a beautiful face not by "a kind of inspiration" (or a happy accident, which is really what the phrase comes to), but in accordance with an intention clearly apprehended beforehand by the intellect, with the certain knowledge of the result of expression which each curve and each combination would produce; and that a face or a figure which we now merely feel to be ugly without being able to say why, would be capable of an analysis shewing precisely where the false relation of curve comes in and produces a discord of line, a falsity of geometrical progression. That we cannot do this, and do not think of it in designing the figure, is no proof that beauty of this kind is not, in fact, capable of reduction to mathematical expression; because we work with colour in the same way, by the eye, and by a natural or acquired perception of harmony of tones, though we know intellectually that the reasons why certain tones harmonise, and others are felt as harsh in combination, can be shown mathematically by the ratios of their vibrations, though the machinery and calculation necessary for the investigation and proof of this are too delicate and abstruse to be of practical use to the painter. The fact would seem to be, when we come to look upon it broadly, that we can formulate a mathematical expression for the entasis of a column or the curve of a scroll, because their elements are sufficiently simple to enable us to grasp them: we cannot formulate one for the contours of a face or of a hand, because the problem is so infinitely more complex and more minute that our finite faculties of sense and appreciation do not enable us to grasp it. There is something very interesting and suggestive in this view of the case (which was hardly hinted at by Mr. Spottiswoode, but is our corollary from some of his remarks), because it gives a new idea of the relation of such arts as architecture to nature; suggesting that architecture is not opposed to nature in following a definite and even mathematical rule of design, but is merely doing in a simple form, such as we are able to grasp, what nature is doing in an infinitely more complex and complete manner; that we need not, therefore, regard symmetrically-designed architecture as an artificial thing opposed to and at war with the simplicity of nature; that, contrariwise, nature is a thousand times more artful than art,—so artful, that our faculties cannot follow her in her infinite subtleties; and that, as Mr. Spottiswoode said in the comprehensive and thoughtful sentence which suggested these reflections, "The truth is, that the simplicity of nature which we at present grasp is really the result of infinite complexity; and that below the uniformity there underlies a diversity, the depths of which we have not yet probed, and the secret places of which are still beyond our reach." And so while we look on the refinements of natural form with that feeling of reverence expressed by Browning:—

> "'As like as a Hand to another Hand!'
> Who said that, never took his stand,
> Found and follow'd, like me, an hour,
> The beauty in this—how free, how fine
> To fear, almost—of the limit-line!"

We may believe that the requisite refinement of that "limit-line" has its mathematical equivalent, if we could only find it, because it is the result of that harmony of proportion and ratio of which mathematics furnish a kind of literary expression: just as, in looking at a grotesque face, we may conclude that if we could analyse its constituent lines and proportions we should find the grotesque element really due to an unexpected and abnormal contradiction of symmetrical mathematical ratios.

This very subject of the grotesque is touched upon in another portion of the address we are considering, in rather an original manner, and in reference to a mathematical subject about which it is worth while to say a word in passing on its own account. Those who are not in the habit of hearing much about recent progress in the theory of the higher mathematics would be rather startled at the manner in which some of the most time-honoured axioms and formulæ have recently been shaken in their seats. They would be shocked to hear, probably, that though it is still a fact that parallel lines, if produced by any practical process, do not meet, yet theoretically they are now regarded as meeting. Or if they were told (the instance which Mr. Spottiswoode adduces) that all circles pass through the same two imaginary points at an infinite distance, they would probably be inclined, as he suggests, to "whisper, with a smile or a sigh, that they hoped it was not true; but that in any case it is a long way off, and perhaps after all it does not much signify." It is perhaps needless to add that these and other such definitions of the new mathematics are, so far, ideal or imaginary, and that their real use lies in the assistance they lend to certain forms of calculation. But Mr. Spottiswoode's exemplification of the kind of mathematical reasoning upon which such theorems are based, the kind of part they play in the science, is so admirably clear as a typical example for general readers, that we shall be doing good and assisting slightly the general comprehension of the position of modern mathematical reasoning if we quote it, though taking us for a moment aside from our special subject. After observing that, although these imaginary formulæ seem incapable of interpretation at present, it does not follow that they may be so upon a more enlarged basis of interpretation,—that there must be some more comprehensive statement of the problem that will include cases impossible in the more limited, but possible in the wider view of the subject,—he continues:—

"A very simple instance will illustrate the matter. If from a point outside a circle we draw a straight line to touch the curve, the distance between the starting-point and the point of contact has certain geometrical properties. If the starting-point be shifted nearer and nearer to the circle, the distance in question becomes shorter, and ultimately vanishes. But as soon as the point passes to the interior of the circle the notion of a tangent and distance to the point of contact ceases to have any meaning; and the same anomalous condition of things prevails as long as the point remains in the interior. But if the point be shifted still further until it emerges on the other side, the tangent and its properties resume their reality, and are as intelligible as before. Now, the process whereby we have passed from the possible to the impossible, and again repassed to the possible (namely, the shifting of the starting-point), is a perfectly continuous one, while the conditions of the problem, as stated above, have been abruptly changed. If, however, we replace the idea of a line touching by that of a line cutting the circle, and the distance of the point of contact by the distances at which the line is intercepted by the curve, it will easily be seen that the latter includes the former as a limiting case, when the cutting line is turned about the starting-point until it coincides with the tangent itself; and, further, that the two intercepts have a perfectly distinct and intelligible meaning whether the point be outside or inside the area. The only difference is that, in the first case, the intercepts are measured in the same direction; in the latter, in opposite directions. The foregoing instance has shown one purpose which these imaginaries may serve,—viz., as marks indicating a limit to a particular condition of things, to the application of a particular law, or pointing out a stage where a more comprehensive law is required. To attain to such a law we must, as in the instance of the circle and tangent, reconsider our statement of the problem; we must go back to the principle from which we set out, and ascertain whether it may not be modified or enlarged. And even if, in any particular investigation wherein imaginaries have occurred, the most comprehensive statement of the problem of which we are at present capable fails to give an actual representation of these quantities; if they must for the present be relegated to the category of imaginaries, it still does not follow that we may not, at some future time, find a law which will endow them with reality, nor that, in the meantime, we need hesitate to employ them, in accordance with the great principle of continuity, for bringing out correct results."

The remarks following this explanation bring us back to our own side of the subject; for, in further defence of these "imaginaries," Mr. Spottiswoode points out what he considers to be analogous aberrations from realism in art, in which forms unknown to biology, situations incompatible with gravitation, &c., are made use of to express certain states of artistic feeling and taste:—

"Who that has ever revelled in the ornamentation of the Renaissance, in the extraordinary transitions from the animal to the vegetable, from faunic to floral forms, and from those again to almost purely geometric curves,—who has not felt that those imaginaries have a claim to recognition very similar to that of their congeners in mathematics? How is it that the grotesque paintings of the Middle Ages, the fantastic sculpture of remote nations, and even the rude art of the prehistoric past, still impress us, and have an interest over and above their antiquarian value, unless it be that they are symbols which, although hard of interpretation when taken alone, are yet capable, from a more comprehensive point of view, of leading us mentally to something beyond themselves, and to truths which, although reached through them, have a reality scarcely to be attributed to their outward forms?"

The illustration, we must be allowed to say, is a trifle far-fetched—the two classes of facts are hardly analogous even in their metaphysical relations; but certainly the comparison is very fanciful and pretty, even poetic; and the mere fact of bringing in an illustration from art in connexion with such a subject is pleasantly significant of the breadth and extent of the writer's sympathies. On the other hand, as Mr. Spottiswoode suggests that there is a good deal of mathematics in art, so he comes round in a later paragraph of his address to the idea that there is something pictorial in mathematical formulæ; they have, like a drawing, the faculty of presenting at a glance what could only be expressed in words of considerable length, and with much complexity. "In algebraical formulæ combinations of the quantities entering therein occur and recur; and by a suitable choice of their quantities the various combinations may be rendered symmetrical, and reduced to a few well-known types. . . . . Instead of wading laboriously through a series of expressions which, although successively dependent, bear no outward resemblance to one another, we may read off symmetrical formulæ of almost any length at a glance. A page of such formulæ becomes a picture; known forms are seen in definite groupings; their relative positions, or perspective, as it may be called, their very light and shadow convey their meaning almost as much through the artistic faculty as through any conscious ratiocinative process."* Thus, while many of us have been talking mathematics without knowing it, it would seem that the mathematicians have been in a sense artists without knowing it.

In the concluding portion of his address, too, the President offered what ought to be consolation and hope to those who think we are in danger of being overrun by science, and who regard the annual meetings of the British Association somewhat in the light of the clanking of the chains forged for the æsthetic side of our nature. Recurring to the mathematical precision aimed at in the Cinque-cento art, and to the development of Greek art together and in harmony with geometry, he hoped, if his views were considered somewhat novel, or even if they were only what is from habit or inclination usually kept out of sight, their expression on this occasion might act as a kind of solvent to that rigid aversion which both literature and art are too often inclined to entertain towards science of all kinds, and which is fostered by the severance maintained in education, and in our early years, between literature and science. But "things which now look weird and fantastic may in fuller light prove to be familiar and useful. The outcomings of science which at one time have been deemed to be but stumbling-blocks scattered in the way, may prove stepping-stones which have been carefully laid to form a pathway over difficult places for the children of 'sweetness and light.'" This was the idea suggested by Buckle in his "History of Civilisation": an age of scientific research was paving the way for a new art. The way is in that case getting very thoroughly paved at present, though we doubt if many of the paviors regard their work with the modesty and the breadth of view in regard to future results which characterises their foreman in this year's gang. But it is something to find a president of the British Association taking so broad and humanising a view of the relation of science to life and art, and we must thank Mr. Spottiswoode for an appeal to sympathies so far beyond the narrow and materialising tendency which is too characteristic of contemporary science just now, but which (with him) we believe will be shaken off as soon as its work of preparation is accomplished.

Drinking Fountains.—In accordance with a bequest by the late Alderman Besley, the typefounder, two drinking-fountains, according to the *Printing Times*, have been erected,—one on each side of Aldersgate-street, at the union with the Goswell-road, and in addition to their ordinary useful purpose they serve to mark the City boundary. Each fountain bears an inscription commemorative of the late alderman.

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* The same may be said of the notes and signs which form written music. To the initiated, a page of musical type conveys the outline and colour of the composition almost pictorially, and without any intermediate process of reasoning from the aspect of the signs to their meaning.

IMPROVEMENT IN COVENT GARDEN.

It may be presumed, without much presumption, that when Englishmen are half through the positive Age—an age that must follow at no distant period the present age of revival and sham—they will tell funny stories of the way in which house-building was generally conducted during the latter years of Victoria; of the many important functionaries that had a finger or a hand in the design of the said house; of the preliminaries that were necessary, and often conducted with a solemnity of mystery, if not secrecy, for the acquisition of the borrowed land which was to bear the said house; of that marvellous leasehold system under which middle-class Englishmen consented, at slight profit to themselves, to put sterling coin into the coffers of the great landed family, and thereby inevitably double a princely income after intervals of years during which the noble recipient and his heir silently legislated for their countrymen, or reposed on those national laurels which the cadets only of their family were clever enough to cull.

And things prospered,—more, they steadily improved. Take, for instance, the Covent-garden that, since the old wooden house of the Bedfords, facing the Strand, was pulled down to make way eventually for Southampton-street, has seen such striking changes. Once the abode of wealth and fashion, then of third-rate vice, then the resort for travellers, and a great hotel centre, now a market more famous than any other in England, and impassable to all carriages except those that pay toll to the noble landowner, a market that has trebled and quadrupled in the course of this century,—that has doubled within a lifetime. Well, of course, Covent-garden is to be inclosed with brand new houses. The time has at length arrived for rebuilding the square. The first thing, therefore, to do was to make it half as big again, to allow not only space for the transaction of that business which brings an enormous income to the Duke of Bedford, but to make the thoroughfares round the market-buildings eligible for public use. In any other country but England, and in far less important cities than London, a municipality would have taken care to see that such a square as Covent-garden was enlarged when the time came for rebuilding the houses enclosing it. But here in England nothing of the kind interferes with the rights that grow out of possession. Every house in Covent-garden may before long be rebuilt, but not a square inch will be added to the width of the roadway, or even to that of the pavement. True, for a short time we imagined that the southern side was being enlarged, and that some dozen feet were likely to be added to the width of the roadway parallel with the Strand and next Southampton-street, where we risk a smash every day of our lives. But such a hope is destroyed by the fact that the alignment of Henrietta-street is being maintained by a stone coping, which has just been placed in front of the new Covent-garden Hotel, the first new building yet finished in the square; while on the other side exactly the same bit of an arcade that before existed is being rebuilt, as if the famous square belonged to two landowners, one of whom employed an architect who fashioned houses *à la mode de* Turin and the Rue de Rivoli, in defiance of the other's professional adviser, who believed that a London sun was to be courted, not barricaded off. Suffice it that Covent-garden is being rebuilt, and that for the next hundred years at least the almost perpetual block of market-carts across the northern thoroughfare can neither be remedied nor reduced, except by an unlikely diminution in the market-trade.

The houses, some recently erected, and others in course of erection, upon this part of the Duke's land, constitute a vast improvement over the sort of tenement that for so many years was thought worthy of the Bedford Estate. Less than twenty years ago if a leaseholder wished to obtain a renewal, for a short period, of his lease, it was necessary for him to smother the good brickwork of his old house with the dingiest cement,—of a hue even more dirty than the bricks it covered. Then came a period of brick and cement dressings, followed by a few variegated fronts of red and yellow. At present, building on the Bedford estate is, in architectural parlance, "Henri deux," approaching "Henri quatre"; and this is how the consummation is reached. First take the bit of land and then prepare to build upon it. You, the lessee, have your own agent, an architect, and he proceeds to do his duty. He applies to the Duke's agent for an elevation of the building his client (the lessee) desires to erect. It may be a shop, a dry-goods warehouse, a school, an hotel, a public-house, or a chapel. An elevation is supplied by the Duke's architect (Mr. Henry Clutton) to the lessee's architect, and then the latter begins to make his plans. The plans made and accepted by the lessee are sent to the Duke's surveyor (Mr. Cross), who in the interest of his employer has been known to keep such plans much more than three months, during which time ground-rent has to be paid, and the surveyor reports thereon to the Duke's agent. There is a building in progress in Hart-street, Bloomsbury, the plans of which occupied the surveyor nearly half a year before permission was given to begin, and the ground-rent during that period was not by any means declined. In short, in new Covent-garden, the exterior is settled beforehand; the interior is made to fit the external wall; and we are bound to say that though, in one or two cases, such a course may terminate successfully, it is not a wise or logical mode of building houses which are to stand in their places at least for a century. Nothing, however, can be said against the two façades of the Covent-garden Hotel, at the corner of Southampton-street, except, perhaps, that the dormer windows are too big and overpowering. Whether the façades now rising on the opposite side of the square will be equally successful remains to be seen. Such façades are only tolerable when they are known to be the genuine work of the seventeenth century, and are, necessarily, crowned by the lofty roof of steep pitch. The block of buildings on the site of Clunn's Hotel, next to "Evans's," while it will resemble the massive houses erected in France during the reign of "Henri quatre," will have no tall roof to sustain, and, indeed, relieve the clumsy character of its general appearance. We are, however, quite disposed to wait till the exterior is finished before criticising its ugliness, and content ourselves with commending the arrangement and construction of the interior, believing as we do that the building will be a starting-point for another and a better mode of planning houses in the heart of London.

The building to which we refer occupies the corner of James-street, and contains all that part of the northern arcade between James-street and "Evans's." Though really one building, it is divided, and properly divided, to contain occupants of every description. The corner forms an hotel of the second class, and one part of this hotel is so arranged on every story as to admit of being let as a family residence or a large set of rooms. Next this hotel is the entrance archway, or *porte cochère*, leading into a spacious courtyard, just like a Paris block of buildings, with the exception that it is covered with glass at the level of the first-floor. This courtyard, some 40 ft. by 30 ft. in size, affords light to the shops which are entered from under the arcades, and access to a block of warehouses, proposed to be let by floors. The entrance to the hotel is under the arcades, and further on, next "Evans's," is another entrance, leading to a staircase and several superposed residences. Throughout this building the traditional London notion of a house with two or three rooms over two or three rooms, divided horizontally by 9 in. of deal and plaster, is ignored. The shops are complete in themselves, each one with its mezzanine and its cellars. The warehouses or stores are complete in themselves, one on each story. The residences can be made complete in themselves, one on each story, the slight vertical subdivisions being easily supported upon the iron and concrete floors which form a horizontal partition, or party-floor, between each story. In fine, the roof is to be of iron.

We are so well satisfied with the manner in which the lower stories of this block of buildings are planned and constructed, that we may be led to praise the superstructure without just cause. Having seen the lower floors, we know how easily the upper portions can be arranged to suit the mode of occupation prevalent in the heart of London. We hope, however, to be able to give our readers a plan as well as a description of this new block which Messrs. William Cubitt & Co. are erecting from a design made by themselves, and made to fit the elevations imposed upon all who take a lease of land in and around Covent-garden. Obviously, we maintain our views, long held, concerning the shortsighted policy that is habitual to hereditary holders of the London soil, but we are willing to admit that the Messrs. Cubitt have surprised us into admiration,—if only for the courtyard where wagons will unload, and so no longer cumber the public way,—a surprise all the more natural when it is remembered that such a block of buildings, composed of brick and stone walls extraordinarily thick and solid, of iron stanchions embedded in the brickwork, of floors of concrete largely composed of broken brick, of iron and concrete stairs, of thin brick partitions supported upon the solid floors, of strong deeply-moulded balconies, of casements opening upon them, will be likely to endure a hundred years after the lease has run out,—when the owner of the soil will take possession of all that is immovable upon it. And this he will do, and will enjoy, unless fire, siege, or civil war intervene to prevent him. Finally, all professional men whose business is house-planning should go and see the leasehold investment that a great building firm have the wisdom and courage to make in Covent-garden.

PROPOSED FUSION OF LONDON GAS COMPANIES.

Considerations such as those which we laid before our readers on the 11th August, 1877, have so far proved to have weight with the managers of some of the principal London Gas Companies that a scheme for a partial fusion is now announced to be, not only in contemplation, but in course of arrangement. The companies about to fuse are the Gas Light and Coke Company, which is the chief northern company, and the Phœnix, which is the most important gas company south of the Thames. As the united capital of the two companies would amount to eight and a half out of the eleven millions of which we described the distribution on the occasion before referred to, it is tolerably clear that the proposed amalgamation, if carried out, will be a step to the general fusion of all the companies now supplying London with gas. That certain advantages are thus to be commanded under existing circumstances, our readers are aware. What remains to be seen is how far the best is to be made of the opportunity for securing such advantages. In that we have to bear in mind the interests of the producers, and of the consumers, of gas; not as opposed, but as essentially harmonious, and involved with one another. Saving may be effected. How is the best use to be made of the money saved?

There are several features in the proposed amalgamation of considerable promise. In the first place, the parties proposing the fusion are practically at home on the subject. They know the facts of the case. It is not like a speculation, or a wild-goose scheme, which proposes to acquire existing rights at an impossible price, in order to reap imaginary advantages. If the two largest existing gas companies come to the conclusion that they had better make a common purse, there is not only a theoretic argument on their side, but positive experience is called to council. This must be borne in mind as an essential requisite of any sound scheme of unification.

It remains to be seen how far public interest needs an advocate on the occasion. It is said that no Act of Parliament will be required. If so, all that can be done is to watch with care that actual rights are fully maintained. The union of all the gas companies of London will involve the bringing all under inspection as to the quality of gas supplied. It will also lead, sooner or later, to equality of price. And that can only be effected by reducing the general price to the lowest rate now paid. It would be unfair to raise the price in the cheapest district, as an element of fusion. On the other hand, though there is no absolute necessity for change of rate following change of proprietorship, public opinion would be sure, sooner or later, to demand unification of price. It is said that on a former occasion, when the company which has already swallowed several of its neighbours, took in the "Imperial" district, the effect was the improvement of the illuminating power of the gas supplied in that district by as much as two candles per burner. The public, and its advisers, will have to see that any further levelling is up in quality and down in price.

That there are indications to be drawn from a comparative analysis of the accounts of the various companies of large economies to be effected, by the application in every case of the best features of the management of each, we showed very plainly in our article on the subject last year. Thus, in the item of leakage alone, some four per cent. saving was possible, if all the pipes and communications were as carefully

watched as are those of the least leaking apparatus. In the sale of coke, we showed that tens of thousands of pounds might be lost or saved every month by the mere fact of briskness of sale. In the manufacture of gas from a given quantity of coal, another five per cent. saving appears to be possible in certain works. On the whole, although we are not willing to take the responsibility of asserting that a saving of two millions of money is possible by adopting all the best measures, yet such a saving is not inconceivable. Even if we only look to half that advantage, it is a figure deserving anxious care to attain it. But, be the saving small or great, the question is,—what to do with it when obtained.

The first aim of the existing legislation on the subject is to divide saving between producer and consumer. This is not only equitable, but admirable, in as much as it tends to establish a common interest between the parties. A check is thus imposed on waste; and it is not impossible that the leakage before referred to would be found seriously to diminish under such a system. But as to the portion of benefit which goes to the companies, what we are anxious to suggest is, that it should be applied so as permanently to benefit the proprietors, not by an immediate rise of dividend, but by extinction of statutory and other debts, and by a final reduction of the capital. Not only is this good economy, but it is an economy which may hereafter prove of the utmost value. We have no warrant as to the question how long London will be lighted by gas. The introduction of a cheaper and better mode of illumination would leave the existing companies with a large and useless set of pipes, and other works, in their hands, and little or nothing besides. A company has a claim for full and fair compensation if its works are expropriated by law. But it has no claim on any one if they simply become useless by virtue of some new discovery. That this may prove to be the case as to gas is quite within the limit of possibility. For many purposes the electric light is already far more available than the light of gas. The great objection to the former has arisen first from the irregularity, and secondly from the cost, of its production. The first of these is disappearing before the prolonged attention that has been given to the construction of regulators or electric lamps, especially in France. As to the second, by the mechanical production of electricity, the cost has already been reduced, it is said, to something close upon the price of gas. And we may suggest that it is quite within the limits of possibility that the ample force which is now left to waste its energy in the tidal rise of the Thames might be readily applied to the mechanical production of electric light. This is not, it is true, quite the same thing as setting the Thames on fire, but it is a step in that direction. At all events he would be a bold man who was content to risk a large sum on the contingency that London would be lighted with coal-gas a quarter of a century hence.

We trust that this consideration will receive the same careful attention that appears to have been given to other hints that we have ventured to offer on the subject. The contraction of the capital of the gas companies would tell on the consumers in the most effective manner. It would allow of a certain lowering of the rates of charge within a definite future, and it would do so without injury to the proprietors of the existing works. In fact, it would be a mutual insurance of buyer and seller against future loss, either in annual payment or in principal. Under any circumstances, such a step would be wise; but under the extreme uncertainty of what we may call the scientific contingency affecting the gas trade, to neglect it would be more than blindness.

Demolition of another old City Church. Under the operation of the Act of Parliament legalising the taking down of several of the old City churches, another of these venerable structures will, in a few days, disappear. Messrs. Fuller, Horsey, & Co. have sold the materials of the Church of St. Dionis Backchurch, in Lime-street, close to Fenchurch-street, and with an entrance from that thoroughfare. The whole of the interior fittings had been previously sold, and the fabric only now remains. It occupies a ground area of more than 20,000 superficial feet. A range of houses and shops immediately adjoining the church, and having their frontage to Fenchurch-street, are about to be taken down simultaneously with its demolition.

THE ENGLISH SECTION OF THE PARIS EXHIBITION.

GAS LIGHTING AND COOKING.

As the weeks and months pass by, there is less wandering about on the part of the visitors, the attractions of the Exhibition have become more familiar, each person has a more defined idea of the section he desires to examine, and experience has taught the necessity of a systematic method of investigation. In spite of this more ordered state of things, or perhaps we should say, as a natural consequence, the influx of visitors to the English section is still considerable, and expressions of admiration mingled with surprise are constantly arising from the crowd. Some of our more practical inventions still fail, however, to attract all the attention they deserve. It is a difficult matter to persuade the public to take interest in a patent for excluding draughts or sewer-gas, or for preventing the explosion of the kitchen boiler, or for insuring the complete combustion of gas in the lighting of houses; the visitor pauses, in preference, to contemplate jewelry,—a vanity as old almost as the world, and which does not present any sensible improvement on what was done centuries ago, and is, indeed, in its artistic qualities, too often vastly inferior to the jewels our ancestors wore. The furniture, the glass, patent sofas that can be converted into beds or arm-chairs, or lounges, or rolled up and carried away altogether, are also palpable and, perhaps, more modern attractions; and, with all these things, which, as the French idiom graphically puts it, "leap to the eye," it is with difficulty that the ordinary visitor can be persuaded to look at the more prosaic exhibits, though they may be interesting, but in any case not attractive to the sight. Nevertheless, there is one exhibitor in particular who has known how to make his mark. He has won a character for originality among our neighbours, and this is an excellent passport. He is entirely absorbed in the manufacture of gas, in the economy of fuel, in the production of intense heat from the smallest volume of combustible matter; and he has had the tact to utilise the results attained in an eminently popular manner. He exhibits his stove most efficiently by cooking the dinners of the neighbouring attendants who watch the various exhibits. Considering the cost of food at the Exhibition, it is no small advantage for those whose means are necessarily limited, to bring their own meat in, and have it cooked gratuitously by an enthusiastic stove-maker. Thus Wright's patent has become a sort of household god in the English section; and the visitor, while looking at cottons, calicoes, chemicals, or wandering through some other totally different section, will probably be told by a grateful attendant, who for once, and with Mr. Wright's assistance, has dined well, that there is a very wonderful stove which should not be missed. This, at least, is the way we happened to discover the cooking apparatus in question, and on the day of our visit we found Mr. Wright ablaze with the heat of a great triumph, for he had just cooked dinner for 120 persons at an outlay of 1s. 4d. in fuel!

This patent consists of producing gas by passing ordinary air through cotton and charcoal saturated with gasoline. The air thus becomes carbonised and highly inflammable. The difference between this and other similar systems is due to the fact that the air passes only through the vapour of the spirit instead of being forced through the spirit itself. The latter and old system naturally causes a bubbling of the spirit, and the evaporation thus occasioned reduces the temperature, and consequently prevents the air mixing with a sufficient quantity of spirit. In Wright's system the air does not pass through a liquid mass of spirit, but only through saturated pistons. The gas thus procured can be adapted for every conceivable purpose, — for lighting houses, theatres, railway and other carriages,—as the gas-producing cylinder takes but little space, and contains a supply that will last several weeks. Nor need there be any fear of explosions, for it is not necessary to store the gas, but usual to make it as fast as it is consumed. By the skilful utilisation of this gas we have Wright's patent portable soldering apparatus, a portable melting-pan, a bench melting-pan, and a tinman's stove. The soldering can be done without any blowing, and at an outlay of about 3d. for a whole day's work; while for burning, for instance, old paint off a wall with spirit, it would cost about 6s. When applied to a kitchen-stove, Wright's pate atmospheric gas will, it is stated, cook a din for forty persons at an expenditure of ab 3d. in gas! and it was this which dr most attention at the Exhibition. Fren visitors were never tired of contemplating t large joints of beef baking or roasting in t presence of this new gas; and the strange, u known, inexplicable and undefined substan on which the gravy fell, and that bore the o name of Yorkshire-pudding. But the acme wonder was reached when Mr. Wright produc from one of his pans a boiled haddock, and pr sented it to a policeman, with a view of co ciliating the authorities. This was, indeed, moment of wonderment, for, strange to say, pr served haddocks are totally unknown in Franc

If Mr. Wright's patent has thus been adroit "pushed" during the Exhibition, he is, neve theless, a comparatively new comer, and the is this weak point in his stove,—the econom realised is considerably impaired by the cost installation. Many persons will still pref utilising the gas already laid on in their hous to the employment of unfamiliar contrivanc for the manufacture of a new gas. In this cas the exhibits of Messrs. S. Léoni & Co. wi amply satisfy all their desires. Nor is the co sumption of ordinary gas considerable; ina much as, according to prospectus affirmation five pennyworth of gas is sufficient to coo a hundred-weight of meat. There is, again another and very important saving effected b the fact that the juices and fat, instead of bein separated, as is the case with the ordinary pro cess of cooking, are, to a great extent, preserved and thus the meat retains its weight and nutri tive properties. The secretary of the Londo Hospital states that, after experiments prolonge for six months, the waste of meat in cookin for the hospital was reduced from 33½ per cent. to 14½ per cent.; while the daily average co sumption of gas fell from 610 to 250 cubic feet This latter economy is insured by burners on the Bunsen principle, and by the admixture o 40 per cent. of ordinary air with the gas; this produces a non-luminous but an intensely hot flame, and, as all the gas is consumed, there can be no smoke or carbon remaining. Instead of using reflectors, these ovens are lined with tiles, which absorb, preserve, and become themselves heat-producing; they also insure the more even distribution of heat over the whole oven.

Again, if there are any persons who still object to the use of gas for cooking, who are indifferent to the rival claims of home-made gas, and of the gas supplied by the companies, they will find in the "Eagle" range an improvement worthy of their attention. The first and most noticeable difference in this kitchener is the fact that the fire-bars are placed vertically, which prevents the cinders falling out with the provoking facility that generally characterises an ordinary fire, and compromises so often the quality of the gravy. The bottom of the grate can be moved up and down, so that the fire need not be larger than required. Flues are so contrived that the heat and flames may be conveyed round one or both of the ovens that are on either side. Particular care is taken with regard to the ventilation of the ovens, and the general appearance is plain and practical.

From this we were naturally attracted to Rosser & Russell's patent safeguard against the explosion of boilers in kitchens. A little pipe with a small chamber is riveted on the top of any ordinary boiler, just above an opening made on purpose. Across this chamber there is a metallic diaphragm plate, made at various degrees of strengths, which are proved by actual tests. Should the pressure of steam exceed the ordinary working pressure, the diaphragm will burst, and thus permit an escape up the pipe, and prevent the explosion of the boiler, or the damage resulting from over-straining. This safeguard itself only costs 12s., and the diaphragm can be replaced for a very trivial outlay.

Among other attractions still relating to the cooking of food, we should mention the great variety of cooking utensils in wrought-iron and enamel, of Messrs. T. & S. Clark & Co., which are guaranteed free from arsenic and lead. This is particularly interesting to the French, as it is customary to use a great number of enamelled cooking-utensils in France, and the Government blue books, compiled from the reports of the Sanitary Committee, disclose several cases of poisoning from the oxide of lead extracted from a badly-enamelled vessel when full, or an acid substance was allowed to remain in it for some time.

Returning to inventions relating to gas, these are so numerous that we despair of being able to mention them all; yet the certificates given to the Improved Air-Gas Company are so emphatic that we must devote a few words to this matter. A thousand cubic feet of this air-gas are obtained from three gallons and a half of gasoline, which costs 2s. per gallon retail, giving light of illuminating power equal to twenty-two sperm candles. The coal-gas costs 4s. 6d. to 7s. per 1,000 feet in provincial towns, and gives a light equal to only fourteen sperm candles, so that the air-gas is as cheap; but it is not supposed to compete with the coal-gas of large towns. It is simply purer, safer, can be used in hospitals,—as it does not produce sulphurous or nitrous acids,—and can be readily introduced in country houses and other places where coal-gas cannot be obtained.

IN SOME PORTLAND CEMENT WORKS.

MANY who not only use Portland cement largely, but understand its properties and peculiarities very well, have possibly not seen its constituents in the process of becoming Portland cement; and the idea of cement works is connected with notions of dirt and dust which are not attractive to the mind, and would not in general suggest a visit to such works as a desirable half-holiday. It may be admitted that there is nothing either very beautiful or very intricate in the operations gone through; but it is not uninteresting to see "how it is done," and to notice that, like most other manufactures for which there is an increasing demand, Portland cement-making is in a state of progress, and that some new ideas have been developed lately in the way of shortening labour and economising material.

To any intending explorer, it may be suggested, in the first place, that the notion of the untidiness of the manufacture which naturally presents itself to the mind is pretty well realised by the facts; and, in short, that you had better not visit cement works in kid gloves and patent leather boots, nor indulge in any very *recherché* apparel of other descriptions, unless you wish to have its lustre considerably tarnished before the visit is ended. Nor, in general, is cement to be sought for amid very entrancing scenery. Cement is made most economically where there is much mud (mud, that is to say, of a clayey or aluminous description) in convenient contiguity with much carbonate of lime in one shape or another; the most convenient shape for immediate utilisation being chalk, which is, fortunately, the most common also in this country. As the materials are found in juxtaposition in considerable quantities in several localities, it is needless to say that it is in such localities only that the manufacture can be profitably carried on, as any manufacturer who was weighted with cost of carriage of the materials to any appreciable extent would soon find himself out of the running. The favour with which the Medway was regarded as a site for cement manufacture at an early period arose not so much from the superiority of its clay to all other clays, as because there was so much of it and so easily got at.

The place of our visitation, however, is not on the Medway, but in a low marshy district adjoining a larger and more famous river. Having donned "our meanest garments" (to use the expression which so offended the prince in "Cymbeline"), and driven the requisite distance from the railway, we eventually pull up beside what looks like a horse-pond, now dry, with a good deal of caked and cracked greyish-white mud on the bottom of it,—the first sign that we have arrived at the works. We are in a kind of amphitheatre, left by cutting away a high chalk bank, the scarped side of which forms the background of the picture. Engine-sheds, kilns, and drying-sheds stand somewhat irregularly about the open space, and a general chalkiness pervades everything. Our host on this particular occasion acted on the principle expounded by the ruler of the feast at Cana, and showed us first the best and most improved method of operation, and afterwards that which was worse; but it may be more convenient to mention the latter first. In this older portion of the works the materials were mixed by the wet process, in which a large proportion of water is added to the materials while in process of mixing, the liquid cement when just mixed containing about 400 per cent. of water. The main stages of the process are mixing, drying, burning, and grinding, and the difference between the old and new methods in this case lies in the first two stages only. The mixing takes place in round brick vats or pits, built in cement and sunk below the surface of the ground for most of their depth. In these pits, in a considerable quantity of water (as before observed), are placed the ingredients in the rough state,—chalk and river-clay, namely, in lumps of a few inches square, in proportions of about one of clay to three of chalk. In this pit revolves rapidly a horizontal churning-wheel, with vertical rakes depending from the spokes, and sweeping the lower portion of the pit, keeping the whole contents in violent agitation. The solid materials get broken up and reduced to powder, and finally held in complete suspension by the water, and the whole, when reduced to a sufficiently fluid state, escapes through fine sieves in the upper portion of the pit walls into the reservoirs called "the backs," whence it is drawn off and deposited in the drying-pit, one of the large shallow ponds we noticed on first entering the works. Here the solid material gradually sinks to the bottom, and stands till the water has dried off its surface, when the residuum is taken up in barrows and wheeled to the drying-sheds. Here it is spread on a fire-brick or fire-tile floor, with coke furnaces under, forming a large hot-hearth, the heat of which drives out the water remaining in the mixture, which is put down at first as a very liquid paste, and immediately begins to rise in bubbles in a manner curiously reminding one of the look of the moon's surface as seen through a telescope (suggesting that we have here very much the same sort of action on a small scale), and eventually assumes the appearance of hard dry lumps, separated by the cracks which take place by the shrinkage of the stuff as the water is driven off. It is then ready to go into the kiln; and as beyond this point the process does not vary, we will now look at the improved method of mixing and drying.

The first obvious difference between the improved mixing-pit and the old one is this, that instead of the horizontal mixing-wheel turning within the pit, the rim of the wheel coincides with the circumference of the pit wall, and revolves upon it; or, perhaps, the appearance of the thing may be better conveyed by saying that the upper portion of the pit wall, above the trench which surrounds it, is movable, and is itself the rim of the wheel, the spokes to which the rakes are attached being fixed into this outer rim, and the whole revolving together. There are no "backs" and no gratings for the escape of the mixed material, which finds its way out through the narrow joint between the fixed wall of the pit and the revolving rim, impelled partly by the centrifugal force imparted by the revolution of the wheel and its rakes, and partly by the friction of the revolving rim upon its bed. Thus, the stuff, as soon as it gets to the requisite consistency, finds its way through, and is seen at the outside of the pit continually oozing out beneath the revolving rim and falling into a narrow trough (5 in. or 6 in. wide), which runs nearly round the outside of the pit, but with a break at one point. As fast as the mixture oozes into this trough it is collected and swept along by metal scoops revolving with the rim, till it reaches the break in the trough, where it falls into a kind of well, corresponding to the "backs" of the old pit. The advantage so far is that the mixing can be carried on with a much smaller proportion of water; the large quantity of water used in mixing by the old method being required because the stuff would not percolate through the sieves into the backs without a considerable proportion of water to carry it through; in other respects the superfluity of water is a disadvantage in mixing, on account of the different specific gravity of the two classes of materials to be mixed. By the new method the stuff can find its way through the joint under the revolving rim in a much thicker and less watery state,—it, in fact, contains only about 50 per cent. of water, and the difference is at once perceptible in the appearance of the stuff in the mixing-pit, where it looks like very thick cream instead of the watery mixture that is churned in the old pits. But the important gain is after the material has come out of the mixing-pit; for instead of lying in a drying-pit till the surplus water is got rid of, it holds such a comparatively moderate amount of water that it can be removed straight to the drying-hearths, while it is still sufficiently near a liquid state to be driven there by a force-pump. As soon, therefore, as the mixture is swept out of the trough into the well adjoining the mixing pit, it is taken up by a suction-pump and driven through an iron pipe to the hearths. Thus, both the time expended in drying off the surplus water, and the labour of removing the residuum in barrows to the drying hearths, are saved, and the process from the time when the rough material is put into the mixing-pit till it flows from the pipe in the form of a creamy paste into the drying-hearth, is entirely automatic.* The mixing-pit, it should have been observed, is fed through two shoots leading into the pit beneath the revolving-wheel, the one for clay, the other for carbonate of lime (in whatever form); the regulation of the proportions of the two materials depending on the attention of the workman charged with this office.

The drying-hearths have assumed a different form of late, and may now rather be described as drying-ovens. They consist of circular brick ovens, in this case about 50 ft. in length, and about 6 ft. or 7 ft. in diameter, with a furnace at one end, the heat from which draws through the oven, and the wet cement is spread about 1 ft. thick on the invert of the oven. This was the first form of the drying-oven, but in those which we saw a further economising had been effected by constructing the oven with as thin a roof as possible,† and spreading another but thinner layer on the top of the arch, which is dried by the transmitted heat; the thickness of the cement inside and outside respectively being regulated by experience, so that each should occupy the same time in drying. The action of the heat in expanding the brickwork was curiously shown in one of these ovens, where the roof, originally finished flush with the end wall, had gradually protruded nearly half a brick length; the expansion being partly assisted by the cement on the top falling into the joints and preventing their closing up. The cement paste pumped up through the pipe, as before described, falls on the roofs of the ovens, and is then thrown down by hand into them and distributed there and on the roof in the proper thicknesses.

The whole of the water having been dried out in these ovens, the cement, now in the form of hard dry lumps, into which it has split and contracted of its own accord in the process of drying, goes to the kilns to get rid of its carbonic acid. The kilns are filled in layers of cement and coke alternately, with a good supply of coke and dry wood on fire-bars at the bottom for giving the first lighting; and the whole is burnt till the cement is reduced to the state of vitrified clinkers, which have a hard metallic ring. When the kiln has cooled, the clinkers are removed in tram-waggons or in barrows to a Blake's crusher, where, being reduced to sufficiently small gauge, they are carried up automatically by feeders on an endless band and delivered on to the floor over the grinding-room, where the material is shovelled by hand into hoppers, and finds its way into the grindstones beneath, and is reduced to its final state of a brownish powder. The men employed in loading and unloading the clinkers for the crusher have to wear masks over their eyes to protect them from the effect of the lime dust. In general one has an impression that the manufacture is not a pleasant or healthy one for those continually engaged in it practically. The last stage of the operations is the packing of the cement powder in bags or barrels, ready for transportation by rail or sea to where it is required.

Oil v. Gas.—On Wednesday the Romford Board of Health discussed the respective merits of gas and oil for lighting the public lamps of the town. Both systems have been tried. It was generally admitted that gas gave the most satisfactory and least troublesome light, but it was stated by several members that the Board would save 200*l.* per annum upon the tender of the gas company by continuing to use oil. The number of lamps is 110. Last year the saving through using oil was 125*l.*, but this year less will be required for plant, &c., and oil is 2*d.* per gallon cheaper. It was agreed to continue lighting with oil, and the tender of the gas company was rejected.

* The improved mixing-pit as here described is, it may be mentioned, the patent of Messrs. Francis & Co., and due, we believe, to the ability of Mr. V. De Michele, one of the partners. The Portland cement testing-machine patented by Messrs. Michele & Carrington, and which is in use at these works, has already received mention in our columns.

† First, 4½-in. brick was tried, but the heat disturbed the bricks so much as to make it difficult to maintain the arch for any length of time, so that 9-in. work has now been adopted.

AN IDLER IN PARIS, AND ITS SHOW.

The interesting articles you publish, Mr. Editor, from your correspondents here leave little to be said about the Exhibition; but, perhaps, a few words of lighter matter and a look-back may not be without interest to the many who are unable to be present at the great "show," and have not participated in the whirl and excitement of the last three months; or even to those thousands who will avail themselves of their autumn holiday to take a rapid glance at it whilst rushing through this brilliant capital on their way to cooler regions; and this centre of Republican France, this Paris of to-day, which is rising more gorgeous than ever from its communistic ashes, is well worth the time so given to it.

It was with mingled feelings of pleasure and pain, after an absence of eight years, that on our arrival here in the month of May we heard once more the clatter and patter of the French tongue; drove past the familiar sign of the "Bon Diable" towards the cooler quarter of the Champs Élysées,—those truly "Elysian fields," with their myriad lamps, cool, green arcades of trees, and innumerable *cafés chantants* spread before us; whilst in the distance the Arc de Triomphe was thrown into grand distinctness by the softly brilliant but somewhat ghostly electric light, now so much employed to illuminate the public buildings in Paris. The vast moving crowd, the almost impassable throng of carriages, the Babel of tongues, the faces from all lands and climes, made Paris, in the months of May and June especially, a scene unique and unparalleled. The people seemed to have given themselves up to the enjoyment of the hour, and the Parisians, with a good humour that does them the highest honour, saw their places filled up in the *cafés*, and had to walk weary and footsore to their various destinations, whilst the English, the American, the Spaniard, the Chinese, the Turk, drove comfortably by in the usurped Victoria, or surveyed Paris from the top of the comfortable tram. "Yes," as *Figaro* quaintly says, "we bear all this cheerfully; for, is it not the highest compliment paid to France to be thus amicably invaded?" Minister vied with Minister in the number and brilliancy of their receptions, and one could hardly praise too much the generous hospitality of the various gentlemen at the head of affairs. Notably amongst them may be cited M. De Freycinet, the Minister of Public Works, whose lovely gardens afforded him the opportunity of offering his guests an entertainment that not only recalled the best days of the Empire, but had in it something very original for the Parisians,—as Ministerial balls are generally given only in the winter. The trees were lighted up to the topmost boughs with coloured lamps, which also twinkled in thousands amidst the grass and ferns. The electric light was thrown on the various statues, so that even when the crimson and green Bengal fires were lighted the figures shone through these coloured veils as if bathed in moonbeams; and as we descended from the ball-rooms, through the palms and lovely tropical plants of the conservatory into the garden, the lime-light falling on the various fair faces and jewelled forms made them look like denizens of Fairyland. An excellent supper, though partaken of in somewhat pic-nic fashion, was an agreeable *accessit* to the pleasures of the evening, and as we drove home through the cool morning air, and saw the quaint old women *balayeuses* (or street-sweepers) already at their work, it seemed as if all had been but the phantasmagoria of a dream.

The Prefect's ball at the Palace of the Luxembourg was interesting, as it brought us into close contact with the "powers that be." Madame Ferdinand Duval did the honours of her *salon* with grace and tact. The Duchess of Magenta's manner is quietness itself, and she fills her high position with a simplicity and good breeding that do the greatest credit to her head and heart. The Marshal President has the honest soldier-like look of a man more fitted for the camp than the court. Amidst the delegates from all lands, the evident pleasure the Chinese Ambassador and suite took in the gay scene amused us. The "feature" of the evening was the very beautiful arrangement of the conservatory, with the huge palms and exotics lent by the Municipality (as they belong to the town), and the quaint music. But one more word about balls,—the English Charity Ball, at which the Prince of Wales was present,—and enough on this subject. It was given at the "Hôtel Continental," which, though hardly completed, is certainly one of the sights of Paris. Its windows overlook the gardens of the Tuileries. The coffee-room is in the Henry II. style; the dining-room, which can accommodate 350 guests, is in that of Louis XIII.; the conversation-room of the Louis XVI. period. The Winter Garden is a charming spot; the style is that of the Moorish Alhambra, matting on the floor, and large plants rendering it a cool and pleasant retreat. But decidedly the marvel of the edifice is the ball-room. Take its description from *Galignani*:—"It is in the style of Louis XIV.; the roof is supported by seven columns on each side, between which open sixteen bays, with doors on one side and windows on the other. At one end is a colossal chimneypiece supported by two allegorical bronze figures, one holding a mask, the other a tambourine. The paintings on the ceilings and the various medallions are by M. Laugée. The one in the central oval (not placed when this was written) is to represent the 'Triumph of Aurora'; the other two in the ceiling, the 'Dawn of Day' and 'Night.' Above the cornice, at the sides, the four Seasons are admirably represented. An adjoining concert-room, in the style of Louis XIV., has been decorated by M. Besson, the subject chosen being 'Hymen.'"

So many events, amusing and interesting, took place during this month that I should be trespassing too much on your valuable space did I do more than slightly sketch them. The return from the French Derby, the "Grand Prix," on a Sunday afternoon, is a startling contrast to our quiet Sabbath. Towards six o'clock on the 16th of June, the Champs Élysées presented a scene of bustling gaiety. The Marshal President, with the Shah by his side, seated in an open carriage, called a Daumont, with six horses to conduct it, and driven by three postillions in the well-known quaint dress and the traditional pig-tail, drives past amidst the acclamations of the crowd. Then follow all that Paris holds of the great leaders of fashion, respectable and otherwise. Here we see a carriage filled with pretty smiling faces, shaded by mantillas; there a grave and bronzed Arab, who passes impassively majestic through this glittering throng, seeming to bear about him something of the freedom and calm of the desert; though even with them times are changing, and they are beginning to learn foreign languages and accomplishments. What a contrast two days after, on the 18th, did those same Champs Élysées present. A vast crowd lining the pathways, but quiet and still; every sound hushed; nothing to be heard but the muffled "tread of the soldiers," the sad yet grand strains of the military music, as the splendid funereal car, containing the remains of the blind, dethroned, but much beloved King of Hanover passed by, followed on foot by the Prince of Wales, Ernest of Hanover, the ex-king of Spain, and all the notabilities in Paris. It was, indeed, a picture to look on in contrast to the other. Never was more forcibly brought home to one the lesson,—"*Sic transit gloria mundi.*" And even a brilliant military spectacle such as that of the grand review, two days afterwards, failed to efface the impression.

About the fête of the 30th so much has been said, and it has been so well depicted in the illustrated papers, that it were but a twice-told tale to revert to it. But what made it so far different from the other fêtes here was, that, beautiful as Paris looked, the Bois de Boulogne was this time the central point of attraction, for all that the imagination could devise to make it seem like a scene in Elfin-land had been brought into play, and it was no longer an actual every-day event, but a chapter out of the Arabian Nights. And M. Alphand, the engineer to the City, and the principal director of all this, may be well content with his share in its success. What was especially deserving of praise were the good temper, good conduct, and sobriety of the vast crowd; it seemed as if Republican France was on its mettle to prove what it could be. Thus June melted into July, whose entry was inaugurated by a very interesting circumstance not without future interest and importance to the world, if it succeeds; and that was the baptism at Havre of a little steam-vessel, once called the *Pandora*, and destined to essay again the passage of the North Pole. The *Pandora*, or *Jeannette*, as it is now called, is of English build, and has already brushed against the ice of the Arctic zone, as it served as courier (in the last expedition) to Captain Nares. It has been bought and equipped at a cost of 40,000*l.*, by Mr. James Gordon Bennett, of the *New York Herald*, who makes a present of it to the United States, and undertakes all expenses for two years, and who only asks them to make choice of the crew destined to man it. The captain, M. De Long, is hardly thirty years of age. His ancestors left Bordeaux at the Revocation of the Edict of Nantes. The idea he starts with is success or death. For there are two ways of reaching the North Pole: one coming from the Atlantic Ocean; the other, in going up the Pacific. Up to the present moment all the expeditions, and which have failed, took the Atlantic route, and when they reached the regions of ice they found themselves forced to contend with a current that comes evidently from the side of the Pacific. The new idea is, to come through the Pacific to the Straits of Behring, and there, as there is a current, instead of having it against them, they will have it with them. We shall try, they say, to get out on the side of the Atlantic Ocean; and they add calmly, "this route has one advantage,—once the *Jeannette* gets into this current, we *must* find our way out, or perish." Mr. Gordon Bennett, Mr. Stanley, the African explorer; Mr. Gudin, the celebrated marine painter; Mr. Ryan, of the *New York Herald*; M. De Hæstyne; M. Périvier, of the *Figaro* (to whom I am indebted for details); and Capt. De Long, after a lunch, at which a graceful allusion was made to Millais's fine picture of the old sailor with his finger on the map of the north-east passage, proceeded to perform the baptism of the *Pandora*, with all good wishes for its success.

Then, like a thunderclap on the political horizon, the news rang through Paris that Cyprus was ours. It was spoken of at the moment by some with mixed feelings of regret and envy, by others with resigned good nature. But for a time it was evident that the occupation of the Island of Venus, once the cherished possession of France, by the British, caused a slight feeling of vexation.

A visit to the Italian Opera at the end of the season does not give one a chance of seeing it at its very best. But to leave Paris without going to the *Grand* Opera would be a great mistake. It is certainly the most sumptuous building of its kind in Europe. It was constructed, as all the world knows, with some modifications, from the designs of M. Charles Garnier. Begun in 1861, it was discontinued during the Franco-Prussian war, and completed in 1874, when it was opened to the public after the burning of the old house in the Rue Lepelletier. Though it covers an area of three acres, it yet contains fewer seats than the Scala at Milan, or the San Carlo at Naples. The cost of the building itself was 1,424,000*l.*, and certainly, after gazing at the façade, with its wealth of embellishment, its group of Music by Millet, and Dance by Carpeaux, ere passing on to the splendours of the inside, one ceases to wonder at the cost. Great difficulties were, moreover, encountered by the builders in laying the foundation of the edifice. A little below the surface they met with a stream of water, in the removal of which eight steam pumps were employed day and night for seven months, and they had to penetrate a depth of 50 ft. below the stream before reaching solid rock. Some of the columns outside are of the same marble as those of St. Peter's at Rome, and were the last obtained from the now exhausted quarries of Sienna. But, indeed, so many countries have contributed to the embellishment of this building, it is difficult to enumerate them. The Vosges Mountains have yielded granite, and grey and yellowish marbles. Then there are the variegated marbles of the Jura, the Breccia of Aleppo, "Sarrancolin" from the Pyrenees, onyx from Algeria, black marble from Dinant, granite from Aberdeen, green marble from Jœnkœping in Sweden, red marble from Finland, white from Carrara, yellow from Sienna, green from Genoa, and Breccia again from Sicily.

The Communists used the building as a gunpowder magazine in May, 1871.

One is almost "overpowered" by the gorgeousness of the interior. The grand staircase, which affords room for fifty people abreast, is a sight in itself; and what with the paintings, the statuary, the glitter, the gold, the superb scenery of the "King of Lahore," it was with a feeling of positive relief that between the acts we passed through the "crush" room or *foyer*, remarkable for the paintings by Baudry, which cover an area of about 800 square yards, and form the most extensive works of the kind

which have been executed since the days of Raffaelle and Michelangelo (they are placed too high, however, to be seen to perfect advantage), along the marble mosaic corridors to the balconies that overlook, or rather look down, the vista of electric lights that adorn the new Boulevard de l'Opéra, and, whilst breathing the soft summer air, to look at the moon rising over this brilliantly-animated scene was to see a sight never to be forgotten.

One of the pleasures of this month was reading the charmingly witty, energetic, and eloquent articles of M. De St. Genest, of the *Figaro*, who pleaded with such success the cause of a most interesting institution, called the Orphanage of Auteuil, founded by a most excellent man, on his own means only,—a modern St. Vincent de Paul, the Abbé Roussel, —who had taken in first one little homeless, parentless wanderer, then such numbers, bringing them up in all useful trades, that at last his means utterly failed. M. De St. Genest's articles so touched the hearts of his readers that in an incredibly short space of time he received, not only subscriptions to the amount of 6,000*l.*, but also yearly donations, that will enable the good abbé to realise the dream of his life, and see his orphanage become a permanent institution. (It reminded me, sir, of the use your journal had been in rewarding the brave Belgian workman, Caris.)

The English Choral Society gave three concerts in the Trocadéro, under the direction of Mr. Leslie and Mr. Sullivan. The latter played the accompaniment to his lovely song of the "Lost Chord"; and on the last day, on which the Prince of Wales was also present, it was at his special request repeated; and it was with a glow of delight that, as "God save the Queen" burst on the ear, we saw the whole audience rise, though I confess it was rather comical to see them all to a man calmly turn their backs to the stage and confront the Royal Box, which was on what we call the pit tier. It was meant, undoubtedly, as a mark of respect, and as such, I presume, the Prince accepted it. I am happy to say that the society took back to England a prize in the shape of a work of art. The Orpheonists won the prize of honour, but nothing in a musical point of view,—fine as the instrumental concerts of La Scala and Turin were,—excited so much delight and actual pleasure as the performance of the young students from Upsala singing of "The Norway Mountains." "The Farewell at the Boat," was simply delicious. The proceeds of the concert were dedicated to the building of a Scandinavian church here.

But there was,—there is,—so much to see and hear, one might go on *ad infinitum*. Still it is impossible, ere giving oneself up to the great show, not to make a rush through Paris and get a glimpse once more, or for the first time, at its various objects of interest,—the beautiful churches; and its handsome law-courts and "Galerie de St. Louis," in the "Palais de Justice." A day in the Louvre, with its art treasures, the various museums and institutions; a saunter through the palace and picture-galleries of the Luxembourg; then an hour idled away in its lovely gardens, near the beautiful "Fontaine de Médicis," whose erection must have counted as one good deed, at all events (in an artistic point of view), in the life of Catherine (de Médicis); a drive home by the various boulevards, all the world abroad apparently on pleasure bent,—must follow. Up some morning with the lark, and off to the great "Halles Centrales," or vegetable market, by six o'clock. There you see life in a different form, but with the bustle, the hubbub,—the movement to be expected from a spot where these modern Madame Angots reign paramount. Off again for a few moments to that cool little Eden in the heart of this brilliant city, the Parc de Monceau; a drive through the heart of Red Republican France with a vengeance, a quarter called Belleville, up to the heights of the "Buttes de Chaumont"; there flower and shrub adorn a spot that was once the refuge of the *desperado*,—the haunt of the worst part of the population of Paris. The quarries have been transformed into a rocky wilderness, surrounded by a small lake, whilst cascades, grottoes, and temples add to the picturesqueness of the scene. To M. Alphand, the architect, and M. Barillet, the head gardener of Paris, the skilful laying out of this spot is due. In 1871 the Buttes de Chaumont and Père La Chaise were the last positions held by the insurgents; from them they threw shells filled with petroleum into the city; but, in their turn, they were exposed to an incessant cannonade from Montmartre, and ultimately retreated to the lower part of Belleville, and were almost all shot down.

One day more we give to a look at the relics of St. Louis and the brave murdered archbishop; then clamber up into the romantic towers of Notre Dame, where, perched up in mid-air, amidst the quaint carved stone gurgoyles and monsters, one sees far beneath the gilt dome of the Invalides, the towers of St. Denis, the ruins of the Tuileries (where I last beheld the fair Empress in all her pride of pomp and power). When rebuilt, the Tuileries is to be used as a French South Kensington Museum. The old familiar column of Vendôme once more rears itself upwards, but minus the familiar cocked hat of the *Petit Caporal gris*, whom I much preferred in the well-known dress than as a Roman Emperor. By the bye, it may interest you to hear that the cocked hat the Emperor is supposed to have worn during his Russian campaign, and which he gave after 1812 to his valet, Everard, as a *souvenir* for his services, and the authenticity of which is supposed to be proved, was sold the other day (to M. Armand Dumarez, a well-known painter, whose brush has depicted many of the great feats of the first Empire) at the Hôtel Drouot, for 7*l.*

The monster captive balloon of M. Giffard, even when at rest, attracts the eye by its enormous proportions. Then from it the gaze wanders beyond the grand Arc de Triomphe to the cool glades of the Bois, away to the dim heights of Valérien. All is so calm, so quiet up here, only a butterfly skimming across the sky in the soft summer air seems to invite us to follow his course, and float down the picturesque Seine to St. Cloud, or wander farther off still to the glorious old woods of Fontainebleau.

My visits to the Exhibition have been but few and far between. Still, several hours each time spent in a minute inspection of its marvels have given me some slight insight into the various departments; though, idler like, roaming about with no settled plan in view as to taking sections or countries categorically. On our first visit we careered rapidly down the *Galerie du Travail*, which you enter by the Porte Militaire, that human hive where on all sides they are hard at work improving each "shining hour" in the fabrication of every known or imaginable thing in common use. At this counter prettily-tinted pearl beads are receiving the "last touch." We turn from them to where ribbon is being woven. There purses are being put together; though, after a few hours spent in this enticing building, one has not much money left to put into them. Lace-work, embroidery on satin, imitation jewelry, enamel flowers, miracles are being performed out of mother-of-pearl shells; some weary-looking Indians are weaving priceless cashmere shawls; farther away various Algerian knick-knacks, that we always fondly and firmly believed to have come straight from the "Dark Continent," are taking shape and form (though, of course, there are real Algerian manufactures here). Before us stands the diamond-cutting establishment of Mr. Roullina (and also others from Amsterdam); and not far from it big and little folks flock to look at the celebrated automatic swimming-dolls of M. Martin, who seems to have a fine sense of humour; for we see the Parisian belle, a bald-headed old gentleman, &c., and a party with horns whom we sometimes speak of as "Old Boots," in the elaborate bathing costume of the day, all disporting themselves amicably in the tank. This gallery deserves an entire day to be devoted to it. And resolving on a longer visit another time, after one backward glance, which takes in the huge Indo-Dutch trophy at the extremity of the gallery, composed of sugar-canes, skins of animals, fishing, shooting, and boating implements of all kinds, rare birds, &c., and crowned by two pyramids of liqueur-bottles, we wended our way down the quaint "Street of Nations," taking a glance *en passant* at the façades which represent the different styles of architecture peculiar to all lands and times, many of which you have already illustrated. Here the Netherlands have an erection that reminds one of the Palaces of Haarlem, Leyden, and Rotterdam. Next we stand entranced before the porch of the exquisite Gothic cloister of Bethlehem, which is situated not far from Lisbon, on the banks of the Tagus. Its very perfect reproduction here, on a reduced scale, is due to M. Pascal, architect to the National Library. The statues of saints have been replaced by Portuguese Grand Inquisitors and admirals. But the very perfect wood engraving of this in your journal has already made it familiar to your readers. Denmark has a cheery-looking building, and ambitious little Greece gives us a rather brilliantly decorative house, which also has been illustrated by you. Some minor States give us a sketch, as it were, of what they can do. The Belgian construction of marble and stone, in the style of the Renaissance, looks somewhat sombre and heavy, but is very handsome. Switzerland has contented herself with a countrified habitation of the seventeenth century, but such as you even yet meet with in the Canton of Argovia. Russia, faithful to her worship of Peter the Great, gives us the wooden *fac-simile* of the house in which he was born near Moscow; Austro-Hungary, a doorway surmounted by statues; Spain, a souvenir of the Alhambra at Grenada. Through the door of the Palace of Pekin, we can enter into "China." Clever Japan has only the entry to a country-house. Italy shows the façade of a Milanese palace. We pass two little Norwegian and Swedish châlets; pass also a useful-looking building erected by the United States; rush in for a moment to the Prince of Wales's house, delighted to see a fresh art movement set on foot in the shape of the Windsor tapestries; give one more glance at the other English edifices, notably the one in the style of the reign of Queen Anne, the other that of William III.; and turn into the *Vestibule d'Honneur* (or D'Jena), where, after a look at the monster clock exhibited by the Maison Farcot, ornamented by four statues, representing the four elements, and having a pendulum independent of it, twenty-four yards in length, attached to the summit of the cupola by a system based on the experiments of Foucault, and a series of spheres to form the balance, we turn to the left, and flutter, like the moth to the star, to look at the Crown jewels. They were luckily sent, during the time of the Commune, to Brest; and the public seem to greet with great delight their recovered treasures,—crowns of pearls, of diamonds, necklaces. One said, "I have clasped the fair neck of Mary of Scotland"; and there are stomachers, zones, &c., whose priceless value is eclipsed by their historic interest. There also glitters the famous "Regent," —a very perfect jewel, weighing 139 carats, supposed to have been bought by Pitt of a native prince, trafficked with by Law, and sold to the Duke of Orleans for 160,000*l.* In 1792 it was stolen from the Garde Meuble, and buried in the Allée de Veuves; pledged at one time by the First Consul to the Batavian Government. It forms once more, after various vicissitudes, one of the most brilliant ornaments in the regalia of France. At night the pedestal and glass case which contain these jewels sink by some mechanical contrivance into the ground, and strong iron plates are placed over the spot. We reserve for another day a more elaborate study of the Sèvres china and Gobelins tapestry, and pay a visit to the Prince's Indian collection. The diadem with eighty-six brilliants, and the Koh-i-nor, or Mountain of Light (?), which once belonged to the King of Lahore, and valued at 124,000*l.*, gathers a crowd round it. A second diadem has the Kanderassy in it, which is worth 120,000*l.*, and would be worth double except for a slight defect. We determine for to-day to stick to the jewels, so go off to the French section,—or rather Golconda it should have been called. And the tale of "Sindbad the Sailor and the Valley of Diamonds" seems here realised. Diamonds, — diamonds everywhere, of all sizes and of matchless purity. MM. Rouvenat & Lourdel exhibit a brooch composed of one immense sapphire surrounded by diamonds, with a pendant of the same. And when we see the fabulous price which a little leather plaque announces, — 2,500,000 francs (100,000*l.*),—we fully agree that the smallest parcel often contains the dearest things. A very elegant suite of the same stones at M. Boucheron's, purchased by Mrs. Mackay at a very much smaller sum, are more to my taste. Bapst, the Court jeweller, has also sapphires and emeralds of a size only fit to be worn on the neck of a "daughter of the gods." Under M. Fontenay's glass case are an immense shell, with two large pearls incrusted in it, a little diamond bird perched on the border, and a scimitar studded with the same large precious stones (24,000*l.*),—the great Ackbar alone could have dreamed of possessing such a weapon. Our attention is next caught by a wonderfully carved set of turquoise. M. Bourdier exhibits a collar of diamonds worked in a lace pattern;

next a spray of maiden-hair fern; a head-dress of fern-leaves, with the dew-drops still sparkling on them, all in these precious stones. It is no longer jewelry we are looking at, but poetry and painting embodied.

We must not omit to mention in the exhibits of M. Jules Parges a diamond encased in iron metal, which was found like this, and is the only specimen of the sort extant in the world. Marvin & Mellerin display objects of great beauty, and M. Talife some enamel *cloisonné* articles made by him alone.

Wearied for the moment of all this dazzling display, we wander away for a rest to look at Erard's grand piano (2,000*l.* will buy it); and after examining the beautiful paintings in the Louis XV. style on it, have the pleasure of hearing from it some beautiful music. Where could an Idler better stop?

EXCURSIONS FROM HULL.

ARCHITECTURAL ASSOCIATION.

Hull,—to most people who know it well, and to plenty of others,—would seem an odd place to select for spending a week of holidays. The combination of north of the Isle of Dogs and Rotherhithe with a touch of Whitechapel, its characteristics translated into Londonisms,—do not tempt many of those, who are fated to do good work, and earn good money there, to house themselves very near to the ancient seaport. Tram-cars and railways help active-minded troops of people to residences in the outskirts, to the new quarter round the Pearson Park at the north-west, to Beverley, to Hornsea, and to Withernsea, and to rural homes,—to Holderness, and the Garden of Yorkshire, Ferriby and the Ellas. But the wants of daily life, and of the young men of the Association on their outing, differ not a little; and Hull is clearly not without its good points. Its trade compelled railway engineers to make it a centre. Five railways,—counting in the Lincolnshire course by New Holland,—converge at Hull. The Royal Station Hotel can hold a large party, put them in large rooms, and the proprietor can care intelligently for their necessities and comforts; and the town is the home of well-appointed wagonettes. Brought to actual test,—in the pleasant week which ended last Saturday,—the preponderance of merits, recognised in spite of prepossessions, must entitle the grimy port, seated on the Hull, and skirting the Humber,—to rank with Angoulême and Winchester,—the best of excursion head-quarters heretofore. Of Mediæval and early Kingstown-upon-Hull, prosperity has made a pretty clean sweep within the area of the foot,—feminine Chinese in shape, albeit hardly in dimensions.* The heel of the foot is between the Prince's and Queen's Docks, and the ankle at the ferry-boat pier. The shipping in the Hull,—the natural dock on the east,—has been impelled energetically for five centuries and more over the ends of the earth. Within this little area, once the walled town, the buildings of any age can be counted on the fingers. The two churches should come first: The Grammar School on South Church side, dated 1583,—a plain and much suffering building of red brick, with brick mullions and transoms, seems to live a threatened life,—being shut up, and likely to be sold, and thereafter most probably destroyed. In High-street, the King's Head Inn, formerly a principal inn in Hull, is of half-timbering and picturesque form, and has been devoted to marine stores; a timber house at the end of George-yard has good carved wooden brackets. The Dog and Duck Inn, opposite the end of Blackfriar-gate, has front projections, carved wooden figures, and late sixteenth-century wooden cornice. The White Hart Inn,—up an alley out of Bow Valley-lane,—has a fine Jacobean panelled chamber, with a good fireplace,—a little meagre in pilaster and cornice projections, but with careful drawings. It has also another room of the later half of the seventeenth century, a notable piece of panelling. Old staircases, Wilberforce House (seventeenth century), and a few scraps of doorways, &c., bring the short list to an end. Modern Hull,—beyond the old town to the west and north, and over the Hull river to the east,—with its town-hall, institutions, banks, chambers, new post-office (a clever large doorway), dock offices, warehouses, hotels, stations, churches, and chapels *(ehau!)*, would require, and possibly deserve, a goodly mass of description, but is a little out of our way at present. Dock extensions and miles of new streets built and formed, and numberless neat (also other gaudy) villa residences, things very impressive in their way, must need be merely mentioned before turning to the consideration of the works of earlier days, which the excursionists came from many parts of the three kingdoms to see. Between twenty and thirty churches were visited. Holy Trinity, Hull, is one of the largest parochial churches in England, 272 ft. long within the walls, and 72 ft. wide. This, and Beverley (St. Mary), Cottingham, Hedon, and Patrington are all well-developed cruciform churches. Beverley Minster,—some eight miles north of Hull,—and Selby Abbey, and Howden Church, both on the line for Leeds to the west, may be named among churches of the first rank. The rest of the buildings do not claim notice on the ground of size.

Mention of the peculiarities in the transepts at Beverley Minster might appropriately introduce notes as to special features in other plans, such as that Selby has nave and choir about equal length, and of very similar form,—the choir roof now higher than the nave. Skirlaugh, a chapel founded by the Bishop of Durham, a very interesting and complete work of the earliest years of the fifteenth century, is 22 ft. in width throughout; length, 80 ft. inside. Swine has no chancel arch, and the aisles are of the same length as the nave. At Patrington the transepts have east and west aisles, and the eastern aisle is continued between the crossing covered by the tower and the chancel. This church has also a charming apsidal chapel on the east of the south transept, and there is no west door, an omission rare in such a church, perhaps explained by the fact that the Bishop's Close on the west came within a few feet of the west wall. Burton Pidsea, not otherwise of interest, furnishes a somewhat similar example. The tower is built within the church, occupying a part of the nave previously constructed. The street of the village skirts the churchyard near the old west wall.

Of the towers which rise above the crossings of the larger churches, Hull (Holy Trinity) is no doubt the largest, and, barring the fearful finials, a work of great dignity, asserting itself strongly over the great Hull of to-day. From the Humber itself, and from the Lincolnshire side, the tower is the most distinctive feature of the whole town; it is now surrounded with scaffolding for restoration. The tower at Howden is a very tall lantern, now a ringing-chamber, with two immense three-light windows on each side, and a shorter story above; the whole in good proportion to the church beneath it, and a notable example of the simple means by which distinctive character was obtained in Mediæval towers. The distinct ideas, worked out in tower design, would be worth tabulating. Hedon tells well, from near and far, between Hull and Patrington,—clear in outline, and judiciously divided in solids and voids,—two lights of each three-light window are pierced, and the angles thus left solid in effect. Among large cross churches Cottingham claims regard on account of its broad and vigorous central tower,—one story only above the high-pitched roofs of nave and transepts,—but that story very majestic.

These heavy central towers have conveyed practical lessons of a constructional kind. The great tower of Hull (Holy Trinity) has sunk bodily (without any considerable disturbance of the abutting walls) at least 2 ft. The foundation, of trees interlaced, was found strangely bent downwards, and the outer ends upwards, when the walls were bared below the soil. Cottingham tower, about 30 ft. square outside, and massive in proportion, seemed likely to imperil the church. Arches were built under the older arches, and the bulk of the piers added to considerably. Hedon tower called for a similar operation. Perpendicular casings hide now the earlier and smaller piers, no doubt existing within them.

Among the smaller towers, Barton-upon-Humber (St. Peter's), having a date of about 1,000, long and short work, baluster shafts, and other signs of early work,—would be looked to specially for its age; and Preston for its talent. This tower forces itself peculiarly on the eye and memory. The lower stages are almost blank, and the upper stage consists of two large three-light windows on flush face. Spires were not the fashion in the district; Patrington, however, is a splendid exception. Its well-known, most original, corona,—hung on the tower round the base of the spire,—gives the whole mass, in the far and nearer distance, the expression of Salisbury,—though with only 170 ft. of height it cannot, of course, compete with the great Wiltshire landmark. Keyingham has an octagon stone spire, the joints wholly treated similarly to the water-tables of buttresses,—the whole spire without piercing or projection,—rare, if not unique, and a pretty object seen among the trees, which hang round it. Otteringham has a broach spire, with pinnacles on the broaches,—the pinnacles now truncated and a parapet run round the base of the spire,—with unhappy effects.

Following a system of "parallels,"—a good series of main arcades, or bits of arcades, could be obtained,—mixing small work with great:—*Norman*,—the nave of Selby. *Transition*,—Barton (St. Mary's), the very latest Transitional on the south side, and earlier on the north of the nave; the nave of Selby also furnishes examples. *Early English*,—Beverley Minster should have precedence by all good rights. *Decorated*,—Howden, Patrington, Selby, Hull (Holy Trinity,—the chancel) would form a good series; and *Perpendicular* could be represented by the nave of Holy Trinity, one of the loftiest and most graceful arcades in the country,—early in the style. In the way of smaller and later work the eastern bays of Hull (St. Mary's) could play a good part. However tempting it might be to pursue such a system of comparisons, through many details, fellow-feeling for the human nature of the gentle reader would forbid one to pour forth on him the whole contents of well-filled note-books. Only one or two further notes shall be displayed. In windows, probably the very earliest use of the reversed curves in tracing may be found in the west front of Howden,—the first use of an ogee curve,—afterwards so common, and used with such effect in perfect work at Patrington and Beverley (St. Mary's,—north aisle of chancel), &c. Porches and portals (a little gem at Thornton Curtis, and a splendid north porch at Selby). Roofs,—(Patrington, nave and transepts); Keyingham (nave—good bosses). Vaultings,—(wood on stone springers in Selby choir,—Decorated), notable interlacing character north of chancel of Beverley (St. Mary's); other late groining of high merit at Thornton Abbey (1380-90). Mouldings,—stone and wood carvings, materials, puzzles, furniture (font-cover, Selby), pulpits, seats, brasses, monuments, fonts: all these would call for a little volume in themselves. For, to start with,—is there not the Percy shrine at Beverley? Is there not, for example, a monument to William Skinner (father of Syriack Skinner, the friend of Milton) at Thornton Curtis? Are there not the Henton tombs at Swine, and the De Meaux effigies at Aldborough? At Cottingham is one of the finest monumental brasses in the county,—to Nicholas de Luda (Louth), died 1383,—who built the chancel of the church. The font at Patrington is one of the richest and best to be seen anywhere; and that at Thornton Curtis,—the bowl composed of a large block of black marble,—resembles somewhat the Winchester and other similar fonts of very early date. Fragments of good old glass are worked up in the east window of Beverley Minster.

Thornton Abbey (Augustinian Canons), some five miles south of the Humber on the Lincolnshire side, is not only a very splendid work of architecture,—one of the most magnificent of monastic gateways (date 1380-90); it is also surrounded by old trees, and makes pictures full of rare colours from the west approach, and from the greensward on the east, and furnished a suggestive background for a photographic group of architects in search of beauty. The abbey church, about 282 ft. long, represented at present by some foundations of piers and a piece of the wall of the south transept, is carefully preserved by the Yarborough family. The remains of the chapter-house are of Early Decorated date, and of rare beauty. It is not proposed to bring back these buildings,—destroyed almost utterly by their being used as the stone quarry of the neighbourhood,—to their original form. That proposition is, however, strongly made for the choir of Howden,—now roofless, and going year by year into more hopeless ruin,—a proposition which should be well fought over by opposing sects. Are all the materials for a complete restoration of the choir and chapter-house to their condition in the fifteenth century to be found on the spot? If so, should money be got together and the work be done? And what extent of restoration by the help of conjecture might be allowed?

* Old Hull (the foot above mentioned) was about 900 yards from north to south, and 900 yards from east to west. Modern Hull,—population 130,000,—is at least two miles north to south, and two miles and a quarter east to west.

How much superficial area in each square? How many features per cent.? Both parties have reason to be grateful that, whereas the contest usually goes off on such side issues as utility or expense, the case of Howden is as near the "friendly suit to try a principle" as can well be imagined. Restorers, in this district as elsewhere, have been doing good work and bad. Saving the south aisle of the nave of Selby from absolute ruin; pushing it up to the perpendicular when it leaned 2 ft. over to the south; bringing Hull (Holy Trinity) to its present comeliness from the laughable distortion of years ago; bringing St. Mary's, Beverley, safely through its troubles, are not likely to excite other sentiments than gratitude to Sir G. G. Scott. It would be unreasoning to praise him equally for copying the debased work, and the bungles of the debased work, of the old south aisle, for the new aisle of Hull (St. Mary's); and perhaps it would be equally unreasoning to praise all the work done under other architects at Hedon, Swine, Patrington (chancel,—the rare Easter Sepulchre not improved), Aldborough, &c. Barstwick,—not a church of much interest otherwise,—should be seen as a good example of the true unrestored ordinary parish church, with square pews of varied linings, a kind of lamp-shop in the north aisle, ed curtains, tinsel, and litter. The nave and transepts at Patrington remain as yet uncleared, affording an example of a higher type of structure, cumbered throughout all the most elegant architecture with "parts of the history of the country"; high pews, and a western gallery. Let no one suppose, however, that the pulpit, dated 1612, and some carved seats of the same kind of work, are discreditable parts of history. Barton (St. Mary's) is doomed to destruction,—of the pewing, which prevents the columns of the nave arcade from being seen,—there is a rather rare arrangement of a stone bench round those on the south side. As Mr. James Fowler, of Louth, the leader of the excursion, has this work in hand, it is appropriate to congratulate him generally in respect of his clever selection of the best examples in the district, and to add a word of congratulation also on his clear and concise descriptions of them, and on his good generalship throughout the excursion.

Thanks and good wishes were to the fore at the last dinner on the 16th; the President (Mr. H. L. Florence) expressing generally obligations to Mr. Fowler; and Mr. Drew, of Dublin, according to the Excursion Secretary, Mr. C. R. Pink, with the assent of everybody, praises,—well deserved.

On the 17th the party dispersed, Wells being suggested for next year's headquarters.

ADMINISTRATIVE CHANGES FOR IMPROVEMENT OF THE PUBLIC HEALTH.

INTERNATIONAL CONGRESS ON HYGIENE.

The discourse by Mr. Edwin Chadwick, read in French at the recent Health Congress, and already referred to in our pages, was on the "Administrative Changes needed in Central and Local Organisation for the Improvement of the Public Health." In it he set forth the need of the appointment of a Minister of Public Health, as a member of the Cabinet of every Government, and he defined the principles of central action for the direction of local effort.

The following are the statements given as to the cost of disease and the importance of the functions of a Health Minister, as compared with those of the War Minister, and other members of administrations.

Extent of Preventible Deaths to be provided against.

The sanitary condition of the population of Great Britain, taken as a whole, is less depressed than that of the chief Continental States, as denoted by their death-rates; yet with us the deaths from causes clearly ascertained to be preventible, cannot be less in the United Kingdom than one hundred and twenty thousand annually, and the serious cases of preventible sickness as more than tenfold that number. It may at the same time be taken, indeed, as proved, by evidences too long for detailed recital, that by rudimentary sanitary measures of a public character, the deaths preventible by improved water supplies, and by improved town sewerage and house drainage, reduced common death-rates in a number of urban districts are fully one-third of the existing rates. We can now, in such districts, by public measures, augment the insurable duration of life of every individual by about one-third. Setting aside, as the surgeon must do, mental pains, the oppressive sense of short and miserable existences, dark fears and forlorn hopes, and confining attention to the narrow economical view, and regarding men merely as investments of capital in working stock, or productive force, what amount of money is it worth while to expend to stay money waste?

Extent of Pecuniary Loss to be averted.

In an address I gave, as President of the Economic Section of the Social Science Association, some years ago, at its meeting at Cambridge, I endeavoured to show how advantageous it would be for States if men were regarded and treated, and if they also regard and treat themselves, as investments of capital. I estimated that, at the adult stage, each of the wage classes might be regarded as an investment of 200*l.* of capital. At forty years it would be double that sum. Dr. Farr has recently revised that economical view, and in the last report of the Registrar-General it is set forth that the "minimum value of the population of the United Kingdom—men, women, and children -is upon an average not less than some 159*l.* a head. That is the inherent value in them as a productive money-earning race." Speaking of emigrants, it is stated:—"The emigrants are chiefly adults—married and unmarried; the men greatly exceeding the women in number; a few infants accompanying their parents. Valuing the emigrants as agricultural labourers have been valued at home, taking age and service into account, the value of emigrants in that year was 175*l.* per head." I accept this estimate as, in my view, a minimum estimate, which covers the exceptional cases in our country, of the bodily and mentally disabled. The first estimate for the general population of men, women, and children may be presented as an approximate estimate of the loss occasioned by the destruction of 120,000 lives by insanitary conditions, and the temporary disablement by sickness of a tenfold number. The loss to the mother country from the departure of emigrants is countervailed by a return of custom and of good will, and by various social as well as economical advantages. But the premature departures of the dead are a total loss, leaving heavy burdens of dependent orphanage and widowhood.

Dr. Farr has realised another view, which I some years ago expressed, of the importance of getting out tables of vitality, or of the ages of the living, to estimate the vital force of communities, and the gains of sanitation by comparison with the tables of mortality. From these new and important tables of vitality, it appears that there are in the healthiest districts sixty persons in every thousand of the population of the mature age of forty, whilst in the least healthy districts there are only forty persons of that age. As a rule, these tables show that in the least healthy districts the living force is one-third lower than in the more healthy districts; or, as I might express it economically, that the capitalised value of the effective living force is one-third higher amongst the same number of the population of the more healthy districts than it is in the least healthy districts. I have endeavoured to illustrate the economical effect of bad sanitary conditions in some districts where there is a heavy infantile mortality thus,—that it is as if, in order to obtain one working horse, two colts had to be reared, and the working horse did not last above two-thirds of the time that he would have yielded due productive force under good sanitary conditions.

An example of the economy of force by sanitation is now being displayed in our West Indian colonies, where coolies, labourers from the East Indies, are being imported to supersede the negro labour, which at one time was considered to be the only labour possible under the insanitary conditions prevalent there. The coolies are now imported under sanitary superintendence as to habitual food, labour, and remuneration agreed upon for a term of years; and, under sanitary rule, the death-rates are on the average scarcely above one-half the death-rates amongst the free-squatting negroes. The cost of the coolie to the planter is stated to be about 30*l.* per head "delivered." Sanitation gives a double value to the coolie as an investment against the negro, with whom the planters would now dispense as an inferior investment. These economic factors of sanitation are submitted to the members of Congress for application to their respective populations, and they may doubtless amply vindicate the statement, the superior Governmental position, as a means of economy, which I contend should be accorded to a health administration.

From data I got out in 1851, I estimated the cost of preventible sickness and mortality, chiefly amongst the wage-classes of England and Wales, at about fifteen millions per annum. It might, with the present population, be estimated at one-fourth more. On Dr. Farr's estimate of the value of life lost of men, women, and children, the total loss would exceed nineteen millions sterling annually. Viewed, then, solely in the financial aspect, we may ask what ought to be the position of the Governmental organisation to stay such waste?

Position claimed for a Minister of Health.

Bentham drew up a model constitutional code for all nations, in which was provided, as a Cabinet Minister, a Health Minister; and some early elementary writings of my own on sanitary subjects led him to confide to me the task of filling up the details of the functions of that minister, and of the organisation of a special sanitary service. But early engagements in some large commissions of inquiry and in executive offices prevented me from acquitting myself of that task, for which, indeed, the materials were but scant, whereas now they will be found to be abundant. Our present Prime Minister has made a declaration, which has been hailed throughout the country: "That the health of the people is really the foundation upon which all their happiness, and all their power as a State, depend. It is quite possible for a kingdom to be inhabited by an able and an active population; you may have skilful manufacturers, and you may have a productive agriculture; the arts may flourish; architecture may cover your lands with temples and palaces; you may even have material power to defend and support all these acquisitions; you may have arms of precision, fleets of fish torpedoes; but if the population of that country is stationary, or yearly diminishes in stature and strength, that country is ultimately doomed." "The health of the people is, in my opinion, therefore, the first duty of a statesman." The stupendous pre-occupations in political contests, to which he has been visibly subjected, will have hitherto obstructed the due action on the conviction thus expressed. I have stated proximately the positive amount of money interest which a Health Department has to sustain; but I would beg to submit that some of the evidences as to relative position which may be claimed for the Health Minister, as compared with the interests confided to other Ministers, from a Prime Minister, who is free to arrange the distribution of places in his Cabinet, a place may be claimed for the Health Minister, and for this reason:—The fighting-time for which a War Minister and his organisation has to prepare, is for short periods at intervals of years—it is to be hoped at lengthened intervals of years. The fighting-time for which the Health Minister and his organisation has to prepare is daily and continuously. It is with him as if an invading enemy were constantly to be met, and every year a great battle were fought and won by that enemy against the people which causes such slaughter and devastation as I have stated. Twelve years of preparation, for only a month, or, probably, at most, about half a year of fighting time of the War Minister, will have cost the nation the greater part of two hundred millions sterling (for the army and the navy), the greater part of unproductive expenditure really weakening economic force, with the results of great destruction and aggravated loss in large part to ourselves. The expenditure required by a well-appointed Health Department, represented by a competent Health Minister during its constant fighting-time, would, to our utmost present imaginations, be vastly less, and largely augment national economic force and productive power. The War Minister himself, however, needs the aid of the Health Minister, and of his organisation, for the practical applications of sanitary science; for, with us in war hitherto, whilst the loss of military force in battle has been as one, the loss from insanitary conditions and by disease has been as two. Our first army in the Crimea was lost by insanitary conditions. The Minister of War acknowledged, in his place in Parliament, that our second army was saved by the application of sanitary science, and

returned home in a better state of health than it had ever been in barracks at home—saved, it must be said, by the practical application of science, acquired by acting as sanitary officers who had their training under our first general Board of Health. The aid of the Health Minister, and of his organisation, is needed not only by the War Minister, but by the Colonial Minister, for the advancement of settlement and colonisation. The power of an army is in the health of the soldier; the progress of a colony will be in the health of the emigrant colonisers. I got an important lesson, given by French sanitation, examined for instruction. In a place, held for strategical purposes, three sets of troops had been decimated, and three sets of colonists swept away by disease; but by well-conducted sanitary works, the conditions were altered, and a seat of health was established in that settlement, so that the birth-rate, which had been below the death-rate, was got above it, and as robust, healthy children were reared as any at home, whilst the death-rate in the military force was made as good as in France, and the loss of military force for occupation was reduced. It is to be noted, as an example of the cold shade of obstruction with which sanitation has to contend, that this achievement was passed over without notice or reward of any sort; and it was so with us. Those whose nonfeasance had really lost the first army in the Crimea, and who ought to have been tried and cashiered for it, received decorations and distinctions; whilst those whose science and labour had saved it, received none, and, it must be added, expected none, and applied for none. It is to be presumed that had there been a fitting Health Minister present in the French Cabinet, our Crimean example would not have been passed over and lost, but would have been studied and extended for the advantage of France and of civilisation, as it was studied and applied in the Northern army during the recent American Civil War.

To continue the illustration of the application of sanitary power to colonisation, in respect to our new Eastern possession which has fallen to the charge of our Government—a former seat of high culture, and of a large, thriving population—now a scant population, eaten up by sloth, and depressed by extensive marsh miasma, where seats of high culture are made seats of pestilence. In the common course of temporary military occupation, such places may be held merely as military possessions, and large expenditure be incurred for fortifications and military works, and the country might continue much as it is found. Hospitals might, in pity, be erected by voluntary subscriptions, and relief be doled out for the cure of marsh diseases, without any effort being made for the drainage of the marshes whence the diseases arise. But if sanitary science and economical science be duly consulted and efficiently applied, the pestilential marshes of Cyprus will be drained, pure water will be collected and stored for distribution, and droughts averted, the interior country opened up by roads, wholesome culture stimulated, free trade protected and encouraged, and the best military defences will then be obtained, in a thriving and contented population, under remunerative rule. Of such successful sanitary and economical rule we have had some good instances in India. It was the observation of one of our sanitary staff, a competent observer, who went to the relief of our army in the Crimea, that if the money expended by the Russian Government in massive fortifications and in the maintenance of excessive military establishments had been expended upon good roads throughout the empire and in opening up the country to trade and commerce, fitting it for healthful settlement, a strong population might have been in existence, such as would have withstood our allied armies. To advert to our home service, however, it has been found that the chief seats of the foul-air diseases in our cities, against which a Health Minister may direct the most efficient means of prevention, are also the chief seats of drunkenness, vice, crime, and disorder, against which the Home Minister (our Justice Minister) has his chief occupation in directing only partially effective measures of repression. The service of the Health Minister must come in aid of the service of the Education Minister, and be applied to schools, as they now are centres of children's epidemics; much injury is now done to the physical conditions of the population, and to their industrial aptitudes and productive force, by over-sedentary work, and consequent unproductive occupation of time. The presence of a competent Health Minister may also serve to the better information of the Finance Minister, by preventing his being, as he now frequently is, the economiser (by inadequate allowances) of the means of economy on the largest scale in promoting health, which constitutes the strength and the wealth of the population. On a correct comparative examination of the services of the Ministers of the several departments of the Government, our case will be found, by an enlightened public, to be made good, on the whole, for a higher and more effective state of sanitary administration than now exists.

Reactionary Interests against the First Central Organisation.

Our progress has been beset with powerful reactionary influences, the operation of which I may not stay to describe, and it may be stated as a progress at a rate of three steps forward and two steps backward. In answer to my repinings, a late chief, Earl Russell, was wont to say that it required a quarter of a century to get the idea of a simple principle implanted in the minds of our people,—that is to say, as they are represented in Parliament. They have to learn to solve the problem of conciliating interest with duty in local administration. They have yet to understand the economy of one properly-qualified officer, whose time is devoted to his duty in prevention, as against two officers' half time, or three officers' third time only given to it, the rest of the time and interest given to private curative practice. The local reports now given under these conditions are for the most part of a perfunctory character. They consist merely of barren statistics of deaths, founded on a registration of the causes of death, which is recognised as extremely defective. Routine statistical returns of the fact of death, and even of the classes of diseases of which the patients died, without reference to the preventible causes, and the action which ought to be taken for their removal, are positively pernicious, as tending to extend a fatalist impression, that such deaths and diseases are the results of inscrutable causes, that the best that can be done by the local administration has been done, and that there is nothing left for it but patient resignation. The death-rate of one city, which has really an excess by one-third of preventible deaths, is frequently held out to the people as satisfactory as compared with that of another city, where the death-rate, including larger proportions of preventible deaths, is higher. London, which has an excess of 20,000 preventible deaths annually, is held forth as the healthiest city in the world, because its death-rate is not so high, if not of Paris, as that of Berlin and of Rome. It is customary in these reports to give solely the mean of the death-rate of an entire city, which comprises the mean of populations in extremely opposite civic conditions. A mean between the conditions of Dives and Lazarus tends to make it apparent that, after all, Lazarus has not so very much to complain of. In some of our cities the mean is as great as between twelve and fifty or sixty. The defects of urban conditions are mitigated in appearance by presenting the death-rates of suburban and of rural districts in one general average. . . . .

Conclusions as to the Reciprocal Action needed between the Central and Local Sanitary Authorities.

From the indications I have given, I submit as conclusions for an efficient administrative organisation of the public health, that,—

(*a*) A distinct central authority, under a Minister of Health as President of a permanent Board, which shall have executive attributions as above specified, is of absolute necessity.

(*b*) That the efficient action of the central authority is dependent on the completeness and efficiency of special local organisations, comprising well-trained and well-appointed local officers of health, endowed with independent, yet responsible, executive attributions, acting under the supervisory authority of local representative bodies.

(*c*) That the efficiency of the action of the local officers and of the local authorities is dependent on the constitution and efficient action of the central executive as an instructional and aiding authority, between which and the local authority there must be mutual dependence and harmonious reciprocal action.

General Definition of the Primary Functions needed from a Central Authority.

To vary the definition as to the central authority. The principles of the attributions of the central authority, as originally proposed, as comprehending originally the connected branch of the administration of the funds for the relief of the destitution, were,—

Firstly, as an agency for collecting and communicating to each local authority, for its guidance, the facts and the conclusions deduced from the experience of all other places from which information might be obtained.

Secondly, as an agency for the removal of those local evils, in the removal of which the public at large have an interest, but for which the people of the locality are helpless or incompetent.

Thirdly, as an authority of appeal between conflicting local authorities or interests.

Fourthly, as an authority for settling the proper amount, and the correct distribution of local charges, and for the protection of minorities and absentees against wasteful outlays and undue charges.

Examples of the Need of Central Action to prevent Local Oppression.

The importance of a distinct, competent, and impartial authority, for the exercise of these last-recited functions, for the removal of obstructions to local improvement, arising from jobbing and ignorant waste, and also for the protection of individuals, minorities, and absentees, and often of majorities against oppressive local charges, was extensively displayed in the parochial administration of England. When townspeople were in the majority, they imposed extra charges upon farmers or upon the land. When the farmers were uppermost, they threw extra charges upon the townspeople and upon manufacturers. As a rule, given a local tax, and a local power of shifting it upon the shoulders of the weaker was to be found an undue share of the common burden. Then it was a common and almost a general practice of the parishes to try to cheat the other parishes by undue valuations of lands and houses, by which the rate of contribution to a common stock was to be regulated. The undue local burdens to be guarded against, now common in districts under unaided local administration, are badly constructed, misfitting, and ineffective sanitary works. The new central authority, aided by an independent auditor, served to correct these abuses, and to protect the people against gross local misgovernment.

Conclusions.

In counteraction, to some extent, of the deplorably ignorant relapses in principle, in legislation, and in administration which we have sustained, there have been steady advances in public opinion, by which, in time, those relapses will be retrieved. Voluntary associations are rising in different parts of the kingdom to investigate and promote the spread of knowledge on the subject. I have the honour to be appointed as a delegate to this Congress by three of them. Able champions in the press and in special publications in support of sanitary measures are multiplying. The declaration of our Premier that "the health of the people is the first study of a statesman," will need outside support for its advancement, and to enable members of the Legislature to see their way in it. The most important advance, in my view, has been made by the development of clear and distinct normas, demonstrative of the extent of the power of sanitation. The most direct recent practical legislative measure in sanitation has been one to encourage the construction of improved dwellings for the wage classes, a measure which is very good as far as it goes, but it has only gone, and is only likely to go, to a percentage of the conditions requiring removal. One quarter of a year's deaths preventible by improved water-supplies and the complete drainage of houses and cleansing, would, I believe, fill all the model dwellings built in London during a quarter of a century. They are mostly improvable in economy and efficiency of construction; nevertheless they will form useful examples of improvement, which may be brought forward for examination by the great prize offered by the King of Belgium for the best instance of the greatest reduction of a death-rate by them at the lowest cost.

Of the great extent of the evils to be dealt with, and of the administrative agency required to deal with them, and of the economy of an efficient agency, we have the task before us of convincing others as well as ourselves. I beg to submit to the consideration of the Congress,

as *vera*, founded upon the separate experiences of Great Britain.

1. That the magnitude of the preventible evils to be dealt with for the protection of the health of populations requires the organisation of a distinct central department of the public health, with the special attributions hereinbefore set forth, presided over by a Minister of State of co-ordinate position with other Ministers, members of the supreme government.

2. That such Minister should be endowed with supervisory and consultative functions as President of a Central Board composed of specialists of independent responsibility, for the exercise of executive attributions for the protection of the public health.

3. That in connexion with such central authority, local representative bodies should be appointed, with supervisory and consultative functions over local officers of health, with securities for special aptitudes, giving their whole time to the responsible performance of their duties, under general rules and orders set by the central authority with the sanction of the Legislature.

Finally, I have to submit to the Congress, as the results of our experiences, that, however well the principles of sanitary science may be developed, they will make only inconsiderable progress under disconnected and weak local administrations. But whenever the established normas are applied and made general, as they may be by a completely-organised administration, they will effect such improvement in the health and strength and well-being of populations as in no age has been witnessed or imagined.

INTERNATIONAL PAPER EXHIBITION, BERLIN.

The exhibition of paper and the paper industry, opened under distinguished patronage the other day at Berlin, may in reality lay claim to being an international display, for, by the side of a goodly number of German paper-makers, about fifty representatives of the paper trades of France, England, Austria, and the United States, have participated. It has been arranged, both as regards its *ensemble* and its details, after the style of the leather exhibition held last year in the German capital, and the Caxton Exhibition in London, only on a far more complete scale; affording a clear and comprehensive view of the various manipulations of the raw materials used in papermaking; the different machines and machine-tools, all in operation; finally, the various descriptions of the manufactured article in its raw and finished state, all arranged in tasteful collections.

The participation in the exhibition is very large, notwithstanding the counter-attraction at Paris; the number of exhibitors being over 500. The quality of the various papers shown is naturally mostly of a superior description. It is quite beyond our scope to go into details, or to accord special praise to particular makers, but this much may be stated,—that, especially in the production of finer and fancy paper, besides the United States and Germany, England occupies an honourable place.

It seems to us, also, of some importance to note the great consumption of cellulose for paper-making, as represented at the Berlin exhibition. Readers of the *Builder* will remember that we drew attention to this subject some time ago.* The great number of German exhibitors of this raw material proves that the employment of wood for paper-making has assumed large proportions in that country, and that the much dearer rags have been supplanted, as far as possible, by a much cheaper raw material. In England, as is well known, papermakers have turned their attention especially to a vegetable fibre, esparto, and have been very successful in this direction. Although various substitutes have been found in different countries for rags, which have risen enormously in price, the latter are in as much request as ever for the manufacture of finer papers; and we need not wonder if protectionists call out for protective (which they term "rational") duties on that important raw material.

An especial feature of the Berlin Paper Exhibition is a pyramid of paper, illustrating the proportions of production and consumption of that material in the various countries represented at the Exhibition. The foundation, if we may be permitted to use that expression, of the pyramid is formed by the United States (where about 30 lb. of paper is consumed per head); Germany, England, France, Austria, &c., follow. The production of these countries is in about the same proportion. Curiously enough, the quantitative difference in the production of the different countries corresponds to the various qualities of the paper made. The United States are undoubtedly first in the manufacture of paper, if we have especial regard to the extensive use to which paper is put in that country. There almost anything is made of that material. At the Exhibition in Berlin may be seen whole houses of pasteboard, paper barrels, curtains, pails, napkins, excellent carpets, an article wonderfully like oilcloth, paper petticoats, and many other articles.

The number of machines exhibited is very large, and the way in which they illustrate the various processes of papermaking is of a very complete nature. It was owing to the late arrival of the greater part of them that the opening of the Exhibition had to be postponed until the 20th ult.

* See vol. xxxv., p. 31.

THE UTILISATION OF RIVERS AND STREAMS.

At the recent congress of the British Association, Mr. Edward Easton, as president of the Mechanical section, read the opening address. Mr. Easton said,—"At the commencement of each annual report, it is stated that one of the objects of the British Association is 'to give a stronger impulse and a more systematic direction to scientific inquiry, and its division into sections was made with the view of concentrating such inquiry upon the several departments of science.' I propose to endeavour to further that object by making the address, which I have the honour to deliver as president of Section G, a preface, as it were, to the fuller consideration of a subject of the highest interest to all the inhabitants of the United Kingdom, and not least to those who have so freely extended their hospitality to us on this occasion. That subject is the conservancy of rivers and streams, in the widest sense of the term. By the conservancy of rivers and streams, I mean the treatment and regulation of all the water that falls on these islands, from its first arrival in the shape of rain and dew, to its final disappearance in the ocean. I had at first, in my ignorance, contemplated treating the subject in a still wider manner by referring to the rivers and streams of other countries; but I soon found that, without going beyond our own, the vast extent of the field to be traversed would make it extremely unlikely that I could, with any satisfactory result, attempt the more restricted task which I have now before me. Indeed, without the promised aid which I have referred to, I should have shrunk from attempting it at all. The question of the conservancy of rivers and streams involves the consideration of their regulation for the following principal purposes:—1. For the supply of pure and wholesome water for the domestic and sanitary wants of the population. 2. For the supply of water of proper quality and sufficient quantity for industrial purposes. 3. For the proper development of water-power. 4. For the drainage and irrigation of land. 5. For navigation and commerce. 6. For the preservation of fish."

After an interesting sketch of what had been done in early times and various countries, Mr. Easton proceeded to say,—

"A great number of Royal Commissions and Select Committees have conducted inquiries, and made reports upon most of the various branches of the subject,—*e.g.*, the pollution of rivers, the water supply, arterial drainage, navigation, fisheries, &c.; but, until the appointment last year of the Select Committee presided over by the Duke of Richmond, no attempt, as far as I am aware, has been made to grapple with the question as a whole, and the report made by them to the House of Lords omitted to deal with, at least, two of the objects I have indicated as being necessary to the proper consideration of the subject. The recommendations made in the Report of that Committee were most important, and they will, if carried out, remove many of the difficulties which stand in the way of a complete system of conservancy of our rivers. So much has been written on the engineering details of this subject, by men far better qualified than I am to deal with them, that I shall confine myself to the simple statement of the principles which have been recognised by the chief authorities as essential, and to a few suggestions which my own experience leads me to think may be of some value. Almost all the great engineers of former generations who have paid attention to this question, Smeaton, Telford, Rennie, Golborne, Mylne, Walker, Rendel, Stephenson, Jessop, Chapman, Beardmore, and, without mentioning names, many of the most eminent now living, have agreed to the following general propositions:—That the freer the admission of the tidal water, the better adapted is the river for all purposes, whether of navigation, drainage, or fisheries; that its sectional area and inclination should be made to suit the required carrying power of the river throughout its entire length, both for the ordinary flow of the water and for floods; that the downward flow of the upland water should be equalised as much as possible throughout the entire year; and that all abnormal contaminations should be removed from the streams. In carrying out these principles, it is, perhaps, superfluous to say that modifications must be introduced to suit the particular phenomena of each river. In some watershed areas it would be easy to construct reservoirs which would to a great extent equalise the flow and reduce floods. In others it might be better to control the floods by means of embankments; in others, to have weirs and sluices, delivering into side channels, parallel to the main stream, with the same object. Sometimes reservoirs, or receptacles, must be made for catching the *débris* brought down by the streams. In fact, every river must be treated as a separate entity. It is, therefore, necessary that a systematic collection of data relating to rainfall, the geological character of the gathering ground, and the volume of each separate stream, should be made for each watershed area; and this should be carried on for a sufficient length of time to enable a fairly correct estimate to be formed of the behaviour of the river both in time of flood and in time of drought. The establishment of self-acting tide-registering gauges at several points of every outfall should be insisted on. By these means the whole of the phenomena of a watershed area could be ascertained and recorded, and safe and trustworthy knowledge could be obtained, which would contribute towards the determination, not only of the works which ought to be executed, but of the incidence of the taxation by which the necessary funds should be raised. Let me say here that I am more and more convinced that the necessity for providing two kinds of water for the supply of large towns,—the one for drinking and cooking, from springs and wells beyond all suspicion of contamination, the other sufficiently clean and soft for general purposes,—will be gradually forced upon us as population increases. I also wish to remark that artificial compensating reservoirs may be much more frequently made use of than is generally supposed to be possible, when it is considered that, so long as the dams are constructed in situations where there is no danger of their giving way, it is by no means necessary that they should be water-tight, and that, therefore, they can be constructed at a very much smaller outlay. In fact, the purpose would be answered by a series of open weirs, which would collect the water in times of flood, and discharge it gradually down the stream. The example of our French neighbours in the more general use they make of movable weirs—*barrages*—of various construction could, I am satisfied, be followed by us with very great advantage in many cases. The question of water power is one which I think deserves more consideration than it has lately received. It has been the fashion to consider that small water-mills are of little or no value, and, in the present state of most rivers and streams, this is to a very great extent true, but only because the supply of water to work them is so variable and uncertain. Sufficient attention has never yet been given to the subject of the amount of compensation water which should be given for the use of riparian proprietors when the watershed areas are dealt with for purposes of water-supply. There is a kind of empirical rule acknowledged by most of the eminent water engineers, that one-third of the average flow of three consecutive dry years is a fair equivalent for the abstraction of the water falling on a gathering-ground. I am strongly of opinion that, looking to imperial interests, advantage should be taken of every opportunity of dealing with a gathering-ground to provide for a much larger proportion of its available water being sent down the streams, so

that the natural water-power of the country may be properly developed. The extra cost of the necessary works must, as a matter of course, be borne ratably by the interests benefited. It is certain that with the progress of invention many more ways of utilising this power will be discovered. At present, through the medium of compressed air, of hydraulic pressure, and of electro-motors, the great disadvantage of its being only available at the spot where the water runs is overcome, and the power can be transmitted to any distance, and used wherever it may be most conveniently applied. Sir Robert Kane, in his most valuable and exhaustive work on the 'Industrial Resources of Ireland,' has given an estimate of the value of the power allowed to escape every year in the shape of floods, and the same calculation might be applied to the sister kingdom. It is probably no exaggeration to say that where running streams exist the power required for estate purposes, on the majority of properties in the United Kingdom, might be obtained by a proper conservation of the natural water resources of those streams. The consideration I have been able to give to this subject has helped to convince me that, although a vast amount of labour and research has been devoted to it, it is, nevertheless, one in which 'a more systematic direction to scientific inquiry' is urgently needed. I believe that the first step ought to be the establishment of a distinct Water Department, which should at once address itself to the remedying of the evils which are found to be most pressing. The time has long since arrived when the present neglected state of many of our most important streams should be dealt with, and that this was also the conviction of Parliament and of the Government is evident from the appointment of so influential a committee as that presided over by the Duke of Richmond last session. Even the imperfect sketch which I have been able to place before you will have made manifest, I think, the enormous importance of the subject and of the interests involved,—interests subject to periodical losses arising from the present imperfect organisation, or, I may say, the present entire want of organisation,—losses which are not only monetary, and, therefore, to a certain extent capable of being estimated, but which affect health and imperil life, and on that account, as is the unhappy experience of the highest as well as the lowest of the community, utterly incapable of appreciation. How, for instance, can we estimate the loss sustained by the country at large by the premature death of that noble-minded and accomplished gentleman the Prince Consort, whose life and energies were devoted to the encouragement of all the objects which this association is established to foster and promote, and who showed his strong sense of its usefulness by presiding at one of its most brilliant meetings? When it is considered that many lives are annually sacrificed, either directly by the action of floods, or by the indirect but no less fatal influence of imperfect drainage; when it is remembered that a heavy flood, such as that of last year, or that of the summer of 1875, entailed a monetary loss of several millions sterling in the three kingdoms—that during every year a quantity of water flows to waste representing an available motive power worth certainly not less than some hundreds of thousands of pounds; that there is a constant annual expenditure of enormous amount for removing *débris* from navigable channels, the accumulation of which could be mainly, if not entirely, prevented; that the supply of food to our rapidly-growing population, dependent, as it is at present, upon sources outside the country, would be enormously increased by an adequate protection of the fisheries; that the same supply would be further greatly increased by the extra production of the land when increased facilities for drainage are afforded; that, above all, the problem of our national water-supply, to which public attention has of late been drawn by his Royal Highness the Prince of Wales, requires for its solution investigations of the widest possible nature,—I believe it will be allowed that the question, as a whole, of the management of rivers is of sufficient importance to make it worthy of being dealt with by new laws to be framed in its exclusive behalf. A new department should be created, one not only endowed with powers analogous to those of the Local Government Board, but charged with the duty of collecting and digesting for use all the facts and knowledge necessary for the due comprehension and satisfactory dealing with every river-basin or watershed area in the United Kingdom,—a department which should be presided over, if not by a Cabinet Minister, at all events by a member of the Government who can be appealed to in Parliament. It is my firm belief that an intelligent management of watershed areas would be compatible with an absolute profit to every interest affected; that we have here no question of give and take, but that in this, as in every other case, the laws of Nature, under proper and scientific regulation, can be made subservient to the needs of the highest civilisation."

A PRESERVATIVE FOR THE SIDES OF BOILERS.

At present, as far as we are aware, no really effective means for preventing incrustation of boilers has come into general use, notwithstanding that in many large works the removal of the incrustation, after boilers have been in use a certain time, is a great inconvenience. In many cases the hammering necessary in loosening the fur is facilitated by coating the boiler up to water-level with tar; the scales fall off then more easily, but the fur often adheres very firmly in places, so that the operation of hammering becomes very tedious and expensive. In other instances, pulverised talc has been added to the water of the boiler, one part of talc being mixed with ten or twelve times its weight of water. Talc has been used especially for the locomotives of the Paris and Lyons Railway, and it is said that its employment has entirely stopped incrustation. According to a communication from Herr Franz Büttgenbach, in the *Deutsche Allgemeine Polytechnische Zeitung*, the evil of spending much time and money in loosening fur may be entirely avoided by the following proceeding.

A coarse-grained mixture of

25 parts, by weight, of colophony,
2½ " " graphite,
2½ " " blacking,

is made, and 5 lb. of it dissolved gradually in about 40 lb. of boiling gas-tar, stirring continually, and adding then about 1 lb. of tallow. This solution, when still warm, is diluted with 50 per cent. of petroleum. The liquid is applied as warm as possible to the sides of the boiler as far as water-level. When the boiler has to be cleaned after the usual working time, on hammering its sides the crust falls off in large pieces, often several square feet wide, and the boiler-plate beneath appears almost like new. The coating must then be renewed. A large boiler the cleaning of which usually takes days, and then does not get properly clean along the seams and rivets, only occupies as many hours.

The method has been tried by the inventor for the last ten years, and offers great advantages, especially in large works. Care is to be taken, however, to lay the coating on well. On account of the strong smell of the mixture, it is better to put on several workmen at once for laying it on; protected lights must also be used. The boiler has to be left to dry for several hours before filling again.

HINTS FOR LIVERPOOL.

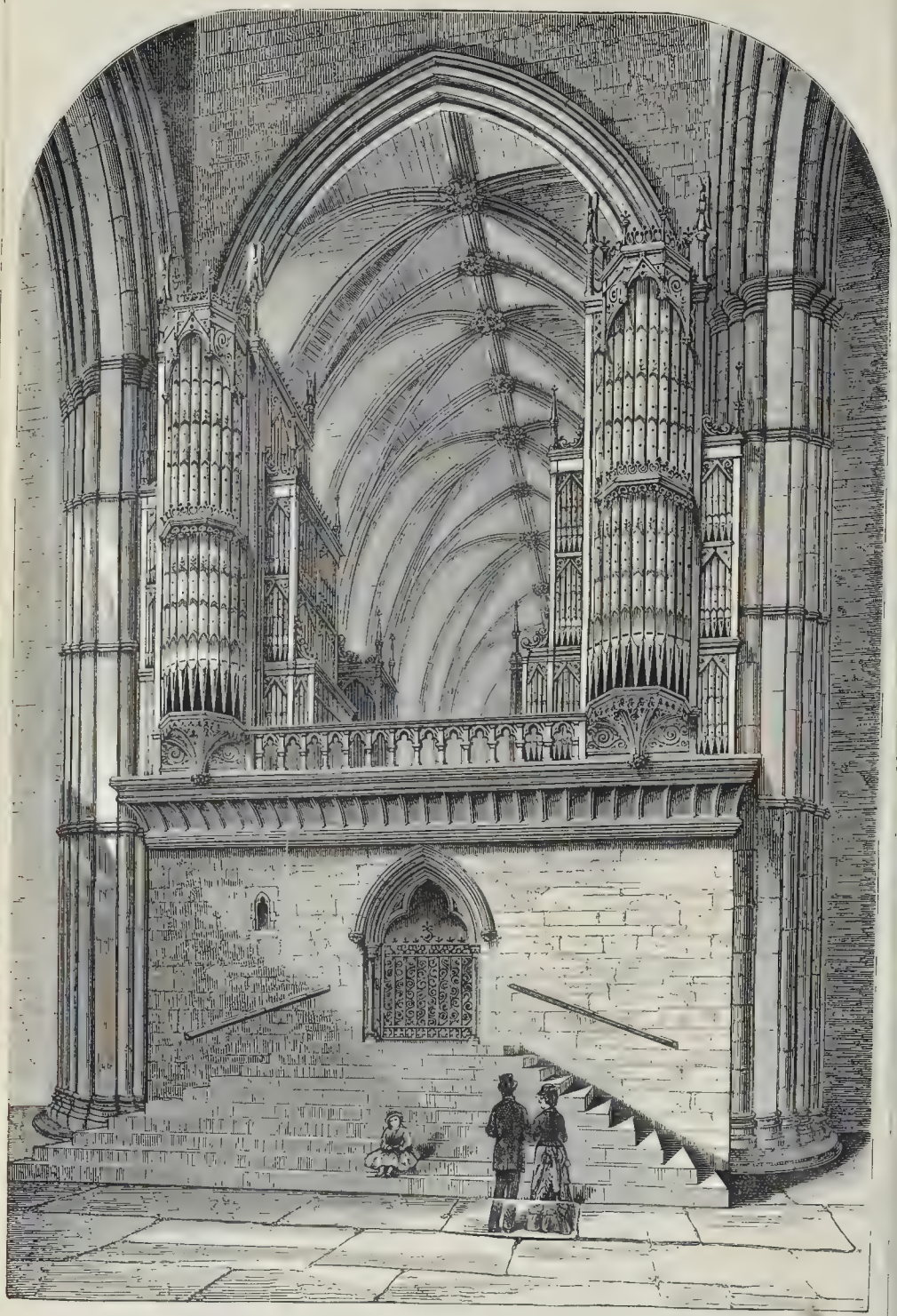
Liverpool, in St. George's Hall and the comparatively new buildings which surround it, possesses undoubtedly one of the most striking architectural views in Europe. Facing the principal front of the hall is the fine and simple front of the London and North Western Station; on the north side of the hall are the Walker Art Gallery, the Picton Reading-room, and the Brown Free Library and Museum, which look over, to a great extent, the space at the back of the hall, which stretches along its whole length until it reaches the street and small houses on the south side of the hill. In the middle of this space stands St. John's Church, and the space itself consists of a hideous and disused graveyard. Across one corner runs a public footpath; but the whole is an absolute desert of sand, relieved with some tufts of weeds and grass, with a few crooked tombstones and black iron railings to relieve the monotony of the surface. It is surrounded on the south and west by a brick wall, and on the north, facing the museum, by a wall adorned with pilasters. There can be no doubt that this is and will be a continuous drawback to this fine site; whereas if the walls were taken down, and a light railing put in their place, or possibly no railing at all, and the graveyard were laid out with shrubs and flower-beds, and, if possible, with grass, this dreary desert would become a fair sight, and would add vastly to the general attractions of the whole neighbourhood. We can scarcely imagine that it needs more than for us to point out the advantages of such a step to induce efforts, at any rate, to be made to bring it about.

There is also another curious piece of mismanagement in connexion with one of Liverpool's finest and most unique works,—the landing stage. The stage and the large shelters which stand on it are absolutely bare of seats, and at any time of the day tired passengers may be seen seated on their boxes, or resting like flamingoes wearily on one leg. Such small things are of infinite importance to the comfort of the public.

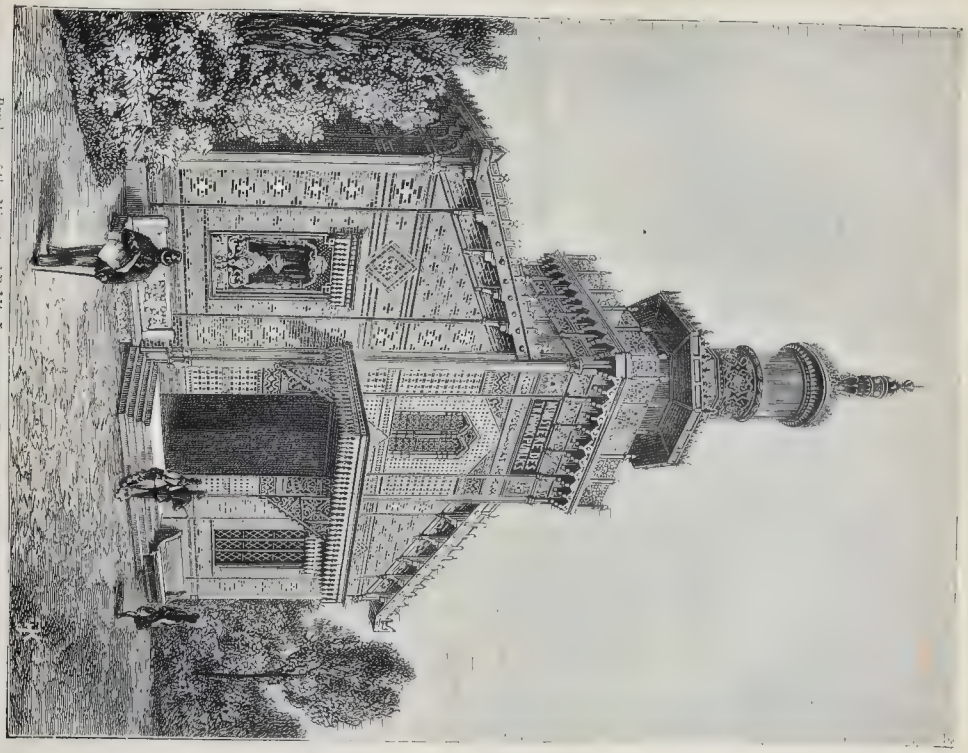
ORGAN-CASE, ROCHESTER CATHEDRAL.

We give an engraving of the organ-case at Rochester Cathedral as designed by the late Sir G. G. Scott, under whose direction the more recent restoration of the eastern portion of this beautiful and interesting cathedral was carried out. As many of our readers are aware, Rochester has undergone two restorations within the modern period; one under Mr. Cottingham in 1825-30, just at the commencement of the Gothic revival, when, as it is scarcely necessary to observe, the real character of Gothic detail was not in the least understood, even by those who were, according to their light, enthusiastic revivalists of Mediæval architecture. How far Cottingham's zeal was destitute of knowledge is sadly shown by the central tower, which he completed, and which presents such a purely "joiner's Gothic" appearance as to interfere with and spoil to a great extent the whole character of the ancient city, when the tower is seen on entering it as the most conspicuous object next to the old castle: the very idea of the place being a cathedral city is almost removed by this weak-looking erection in the middle of it. There is some talk, we believe, of rebuilding the tower, in a manner more consonant with what is now known of the true spirit of Mediæval work, when funds shall be forthcoming for the purpose. In the interior of the choir, Cottingham's work seems to have been confined more to conservation; at all events, the Cottingham handling is pretty well obliterated by that of the later restorer, and the refinement and beauty of William de Hoo's architecture of pure Early English type (1227) is well brought out. The coloured decoration on the lower part of the choir-walls is a restoration from traces found, a portion of the original being preserved in the south-east transept; it is divided or jointed into oblong spaces with a gold heraldic lion on a red ground in each space, forming a kind of diaper or powdering on a large scale. The general effect is good; but as a piece of the original design is preserved, we somewhat question the judgment of reproducing afresh all over the wall this very primitive and rather absurd-looking conventional lion, which certainly has no beauty in itself. The chancel is laid with glazed tiling in the manner considered almost a necessary part of restoration work now, and of which we have said in other cases that it very much militates against repose of effect, and gives an undesirable "church furniture" element to the whole: we should be glad to see this particular method of finish give way to the employment of some method of flooring less showy and glittering in effect. The new reredos stands in a rather singular manner in the centre of the chancel floor, on a block of plain masonry with free passage all round it; the upper portion of the reredos, containing a bas-relief, corbelling out at each end over the substructure in a manner unusual and not altogether satisfactory in effect.

The treatment of the organ and the design of the organ-case are, however, very satisfactory indeed; and it is only fair to say that the engraving we publish, and in regard to which we have been disappointed, does not fully illustrate the detail of the organ-case, which is both original and artistic in effect. The view, however, serves the purpose of a diagram to show the manner in which the organ-case is divided so as to keep the vista into the choir. This is very successfully done in regard to appearance, and is also achieved without the disadvantage of breaking up the instrument and taking parts of it into holes and corners of the building, which has been done too often of late.



ORGAN CASE: ROCHESTER CATHEDRAL.—The late Sir G. G. Scott, Architect.



Pavilion of the Minister of Public Improvements, France.—M. De Dartein, *Architect.*



The Algerian Palace.—M. C. Wable, *Architect.*

BUILDINGS AT THE PARIS EXHIBITION.

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The *Algerian* exhibits are various, including woods, wines, oils, cork, alfa (a kind of long tough grass), cotton, grain (including that of the famous *eucalyptus*), marble, mats, and even wigs; there are also some very fine photographs by Cairol, of Oran; a few excellent garments, manufactured in the Mussulman workshop founded by Madame Luce; and an assortment of educational works.

The plan of the Algerian palace in the grounds of the Trocadéro is due to M. C. Wable; the architectural details and ornamentation are borrowed from the most remarkable monuments of Algeria, and from the mosques of Tlemsen, which dates as far back as the thirteenth and fourteenth centuries, an epoch when the artists of that capital rivalled in taste and talent those of Andalusia.

The palace occupies a space of 35 mètres in length and 50 mètres in depth; the galleries and periatyle cover a surface of 1,200 square mètres; the tower facing the east is 35 mètres in height. The principal entrance to the palace is, as near as possible, a faithful reproduction of the entrance to the celebrated mosque of Sidi-Boumedine at Tlemsen, with its frame of *faïence* and arabesques; all the details of the exterior decorations and *faïence* were executed by M. Léon Parvillié, from designs furnished by M. Wable, as also were the decorative paintings on the ceilings and walls, the escutcheons, &c. In this he was ably seconded by M. Marquette. A charming *salon de repos* is established in the centre of the farthermost gallery; the Arabic inscriptions round the arcade which forms the entrance to the saloon of rest were designed by M. C. H. Gabeau, principal military interpreter. Outside the palace kiosques have been erected by Algerian merchants, who exhibit Oriental stuffs, jewelry, and fancy articles; these are sold at prices which would even astonish the Arab tradesman in the Rue de Rivoli.

The Pavilion of the Minister of Public Improvements is furnished with maps, plans, charts, designs, and models of lighthouses, bridges, viaducts, everything, in fact, connected with building and civil engineering. As at Vienna and Philadelphia, a special building in plain and glazed brickwork has been erected for this exhibit; the iron framework sent to America two years since for the same purpose has been utilised. The building, artistic decorations, the grouping of the models, the arrangement of the maps, &c., are the sole work of M. De Dartein, engineer, professor of architecture at the Polytechnic and Civil Engineering Schools. This gentleman received admirable aid in his task from M. Boulard, superintendent of the draughtsmen's department in the School of Civil Engineering, also from M. de Vesly, recently attached to the staff.*

* Our illustrations were prepared from excellent photographs by M. Neurdein, of Paris.

THE CONDITION OF TENBY.

The *Builder* having long been famed as the pioneer and propagator of sanitary reform in England, I wish to call public attention, through its medium, to the very unsatisfactory sanitary state of Tenby, in South Wales. Tenby is a seaport town of 4,000 inhabitants, in Pembrokeshire, situated on the west side of Caermarthen Bay, on the north-east margin of a rocky peninsula, and the greater part of the town stands on a considerable elevation above the sea, and consequently possesses great facilities for thorough drainage.

Tenby is famed for its fine white sands, beautiful scenery, and bracing healthy climate; it has great natural advantages for being made one of the most beautiful and healthy wateringplaces in the kingdom. Unfortunately, not only for Tenby, but for every one who wishes to enjoy healthy seaside air combined with fine scenery, the affairs of the town are ruled by certain authorities who, either from ignorance or obstinacy, will not perform their plain duty of adopting proper sanitary measures to make their district as healthy as it ought to be. In looking over the last quarterly return issued by the authority of the Registrar-General, I find that the death-rate of Tenby is at the rate of 26·8 per 1,000 per annum; whereas, if it were in a proper sanitary condition, the death-rate ought not to exceed 10 per 1,000. In the same returns, I find the death-rate of Herne Bay only 8·5; Worthing, 12·3; Lowestoft, 12·5; Weymouth, 12·9; Margate, 14·0; Dover, 14·1; Littlehampton, a town of the same population as Tenby, and imperfectly drained, has a mortality of only 14·6 per 1,000. Why is it that Tenby, which is blessed above the majority of towns with every natural condition that could be desired for placing it at the very top of the hygienic scale, still remains in the unenviable position of occupying the very bottom of the scale? The cause of the deplorable unsanitary condition of Tenby is not far to seek; it can only be attributed to thorough bad management.

The drainage of the town is very defective; such sewers and drains as do exist are without proper ventilation; in many quarters of the town there are no drains, and foul cesspools still exist. The flood-tides act as a force-pump in forcing the sewer vapours and foul gases back into the town, and in some places these foul gases escape direct into yards and houses. The water-supply is also very defective. The town is supplied from two open reservoirs,—the old and the new. The old reservoir is situated in a hollow, surrounded on three sides by rising hilly pasture-land; whenever there is a heavy fall of rain, especially a thunderstorm, the water runs rapidly down the steep slopes, and washes the excrement of the cattle into the reservoir, that in a short time breed innumerable animalculæ, which find their way direct into the water-mains. Four years ago a plan was prepared for supplying the town with pure water from certain springs to be collected by underground deep drains into a covered reservoir, by which means, if the plan had been properly carried out, the town could at all times have been supplied with an abundance of pure spring-water never exceeding 59° Fah.; but to save the expense of a properly-covered reservoir and sufficiently deep drains, the authorities in their wisdom elected to have an open basin in a hole, at an angle formed by two cross-roads, where the surface of the water in the basin stands considerably below the level of the adjoining highways, and the consequence is, the dust and dry animal droppings are blown with every wind that blows into the water that supplies the town. Under such conditions can we be surprised at the *excessive mortality* of the town, when, instead of the town getting the benefit of pure cold water direct from the springs, the visitors are treated to water heated by the sun, and seasoned with road-dust, sweepings, animal matter, live animalculæ, and the *spawn of water tritons?* The town council were duly warned, if they persisted in making an open service reservoir in such a visibly bad position, they would have cause to regret it when it was too late.

The great mortality of the town has proved that the warning was not uncalled for. I would advise all weakly persons who are in search of health at the sea-side to *avoid Tenby* as they would poison; and as for those healthy people in search of recreation and pleasure, and who wish to visit Tenby for the sake of its fine scenery, they should insist on all their drinking-water being boiled. My advice to the Tenby town council is, if they wish to answer the above indictment they should set about the reform in earnest, and show a reduced mortality bill; no other answer than a reduced death-rate can prove of any avail.

Wm. Burns, Sanitary Engineer.

TOWN COUNCILS AND ARCHITECTS.

NORTHERN ARCHITECTURAL ASSOCIATION.

A special meeting of the Northern Architectural Association was held on the 13th inst. in the Old Castle, Newcastle, to take into consideration the question of the employment of the officers in the borough engineer's department by the several standing committees of the council in the designing and carrying out of the projected public architectural works in Newcastle.

Mr. T. Oliver, president of the Association, in opening the meeting, said the committee of the Association, who had consulted their hon. solicitor, considered the members had a strong case against what was an unparalleled grievance. Personally, he believed the council were not aware of the injustice they were doing to the architectural profession, but thought they were acting for the best interests of the town. In his opinion and experience, the course adopted was not only unusual but unfair; and so far from being economical was the most expensive course that could be adopted. The public architectural works of a great town like Newcastle should afford employment for its most gifted sons, whether they be young or old, and the only way to test their merits was for the corporation to submit their public buildings to competition. Sir G. G. Scott, Sir Charles Barry, and Mr. Waterhouse were instances of unknown men rising to eminence entirely by their competitive productions. All other corporations adopted the principle of competition, and he contended they were justified in asking the corporation of Newcastle to do the same.

Mr. W. L. Newcombe moved the following resolution:—

"That inasmuch as the corporation of Newcastle have not appointed an architect for the borough, the Northern Architectural Association views with great dissatisfaction and regret the employment of the engineering staff to design and carry out the projected public architectural buildings in Newcastle, if only to the evident disadvantage of the present practising architects, but to the detriment of art and architecture for years to come. The Northern Architectural Association would most respectfully suggest that the council put all public architectural works to competition, as is customary in other large towns and cities throughout the kingdom. That a memorial be forwarded to the council embodying the foregoing resolution, and that a deputation attend at the next meeting and present the same."

Mr. T. Reay seconded the resolution. He thought they were fully warranted in calling attention to the matter. Remarks had been made for years past of the engineers' department of Newcastle having to do with architectural work. It would be for the interests of the town, as well as for the profession, should the memorial of the council be complied with.

Mr. Edward Shewbrooks supported the resolution as one which to his mind was of very grave importance. It affected not only the present but the future position of their town, architecturally considered. They knew and valued the remains of ancient cities in proportion to the beauty of their architecture, and they judged of their modern cities and towns by the beauty of their streets and public buildings. They should always remember this, that they built, or rather should build, as much for their descendants as for themselves, and if they erected a public or even a private edifice, which was devoid of grace or beauty, they did as much harm as if they enacted a bad or immoral law. He supposed it would hardly be denied that an architect required a special training as much as a lawyer or a doctor. As they would not think of entrusting their law-work to a quack, or their personal health to a charlatan, why did they find that there were those who fancied any one could be trusted to act as an architect?

Mr. W. H. Dunn (hon. secretary) said he thought they had only to mention the matter, and they would receive attention at the hands of the town council. He considered it was not a question of cheapness, but of producing buildings worthy of the town. Any one with any artistic taste, when he looked at the buildings in Newcastle, would not ask who was the architect, but who was the engineer, for the mouldings of them showed that an engineer had his hand in them. When their chief engineer was appointed, there was a discussion as to the position he should take in regard to buildings, and several members of the council thought that an engineer could not be an architect. At the present moment they had works about to be introduced by the council which would involve a cost of 200,000*l.*, such as the fish-market, the free library, the public park buildings, &c., to be put in the hands of men who had not qualified themselves as architects. The art of Newcastle would be degraded.

The motion was passed unanimously. It was announced by the chairman that their annual excursion would be made on Thursday to Ushaw College, which they would be allowed to visit, through the kindness of the Bishop of Hexham and Newcastle.

A Revival at Cyfarthfa Ironworks.—The *Cambrian* says that there is some prospect of an early revival of work at Cyfarthfa. "All the necessary arrangements are being made to light up two blast furnaces, and the pig produced will be worked up into merchant bar. Many of the old hands have been looked up, and have undertaken to respond to the call to work at any moment, and their names have been entered at the office. When the fires are once more blazing away at Cyfarthfa there will be an outburst of rejoicing at Merthyr such as we have not had for a long period. The scale of operations even at the start will be such as to afford employment to several hundred men."

ST. ALBAN'S ROOF COMPETITION.

Sir,—As everything relating to competitions for important works becomes known in building circles, and as I find that I am considered by many people responsible for most of what is done at St. Alban's Abbey now, I beg to disclaim all responsibility for the last act of the committee, five of whom (making an accidental majority) have resolved to invite a new competition for the new roof from the same builders who tendered before for the restoration now going on, although Messrs. Longmire & Burge are bound by their present contract to do all further work that may be ordered, according to the schedule of prices on which their former tender was based, which was much the lowest of all; and although the architect had sent in their tender for it accordingly, approved by himself, for a new high roof of various kinds, and it was published and founded on by speakers at the late public meeting; and although the nave is now full of their scaffolding, put up for the purpose of repairing the roof, and of their timber, stones, and men, and must remain so for months for finishing their present work; and although they have been kept waiting for months on account of the various investigations and discussions; and although they have done, to the admiration of everybody, the setting up of the nave wall, which turned out far worse than was expected, with great improvements of their own upon the specification which they contracted on; and although Mr. Longmire saved us from drifting into the tremendous blunder of beginning to cobble up this rotten roof, which would have cost far more than the new one, and have been a bad job after all.

If we were a Town Council building a hall, our votes would be published with the act of the majority, but here it is not so, and those who are ashamed of such a proceeding must disavow it as they can. And though I do not suppose that any of the respectable builders who have been invited to underbid a published tender, based on a competition schedule of prices, will condescend to such a transaction, even if they think they can afford it, it is right that they and others with whom we may have to deal, and our own subscribers too, should know that this is only the act of a casual majority, of whom it is charitable to believe that they did not all understand the nature of it, though it was evident to me in two minutes that some of them came determined to do it at all hazards, for reasons not difficult to guess.

Edm. Beckett.

THE ROOF AT ST. ALBAN'S.

Sir,—I have not the honour of claiming for my profession that of an architect, but I have just read with horror of a meeting at St. Alban's, whereat a proposal was carried to place a high-pitch roof of *slate* on St. Albans Abbey, and I implore you, Mr. Editor, to raise your powerful voice against anything so dreadful. The nave walls, we know, are of immense length in proportion to their height, but are relieved by elegant lancet windows; but, picture that length of dull, cheerless slate, nor brevity anything, and the increased height of the roof would not only necessitate the rebuilding of the west front, but would also destroy the ancient and unique appearance of the Abbey, and utterly dwarf the proportion of its grand tower. Pray, Mr. Editor, use your voice against this destruction (sanctioned by a few clericals in power, and other tasteless persons) of one of our grandest ancient edifices.

Music.

*** If "Music" had read his *Builder* he would have seen that we had already advocated another course.

GALILEE: ITS ANTIQUITIES AND TOPOGRAPHY.

In the Geographical Section of the British Association for the Advancement of Science, which held its annual congress at Dublin last week, Lieutenant H. H. Kitchener, R.E., read a paper entitled "A Survey of Galilee." He said: The great work on which the Palestine Exploration Fund has been occupied for the last six years is a map of Palestine on the model of the Ordnance Survey of England and Ireland. The map of Palestine, from Dan to Beersheba, on the 1-in. scale, has now been completed. Lieut. Conder's health not allowing him to return to the country after 1874, I was entrusted with the command of an expedition to finish the survey of Galilee. My party consisted of three non-commissioned officers of the Royal Engineers, appointed from the Ordnance Survey. I left in January, 1877, and by the end of February my men had joined me at Haifa, and everything was ready for an active campaign.... On the 27th of February work was commenced. From the top of Mount Tabor I examined three chapels recently unearthed by the Roman Catholic monks; they date from Crusading times, when this was supposed to be the Mount of the Transfiguration, and the three chapels are mentioned in old chronicles of that time. The massive fortifications on the top of the mount enclosing these later remains were probably those erected here by Josephus in order to resist the Roman armies under Vespasian; they consist of a solid wall built of large drafted stones, flanked at intervals by square towers enclosing a large rectangular space that occupied the whole of the top of the hill. During our triangulation we found some little difficulty from the natives, who thought we were magicians with power to find hidden treasure under the ground, and that our cairns were marks to remember the places. It was an unfortunate idea, as the result was that in the night-time our cairns often disappeared, and the natives groped through any earth to the rock below, hoping to forestall us. After making the offenders rebuild the cairns on one or two occasions, these annoyances ceased. On the completion of the triangulation, the levelling had to be taken up from the last point on the line. The bench-mark was found without difficulty. It was most fatiguing work dragging the levelling-staves and heavy instruments over the rough country, and when the descent below the sea-level, in a steep narrow gorge, was attained, it was extremely trying. However, in seven days' work, 16¼ miles were accomplished, and the seashore was reached, giving a depression of 682 ft. 6 in. below the Mediterranean. Practically, almost every place of importance was fixed by us. One of the great values of the map is the great number of unknown names it has made public. Thus on this survey 2,770 names were collected, only about 450 of which were to be found on the best existing map of the country. Another is the accuracy of these names, taken down from natives in a manner never attempted before, and the result has been to throw a vast light on the ancient nomenclature of the country, and of the origin of the races that inhabit it. The survey of the detail took five more days, and on the 27th of March we were able to move camp to Tiberias. .... The scenery of the lake is decidedly monotonous, but there is a charm in that dry and thirsty land in having a vast expanse of fresh water spread out before the eyes, and at night the effect of the moon, in Eastern brightness shining on the calm lake, was exceedingly beautiful. During the survey of the shores, we made one considerable discovery,—the site of Senabris, mentioned by Josephus as the place where Vespasian pitched his camp when marching on the insurgents of Tiberias. The name, Sinn en Nabra, still exists, and is well known to the natives. It applies to a ruin situated on a spur from the hills that close the southern end of the Sea of Galilee; it formed, therefore, the defence against an invader from the Jordan plain, and blocked the great main road in the valley. Close beside it there is a large artificially-formed plateau, defended by a water-ditch on the south, communicating with Jordan, and by the Sea of Galilee on the north. This is called Kh. el Kerak, and is, I have not the slightest doubt, the remains of Vespasian's camp described by Josephus. It is just like another Roman camp found near Jenin, where an army was encamped. The next point of interest on the shore is the hot springs of the Hammam; three copious springs burst out of the rock, with a temperature of 140 degrees, and containing a considerable quantity of sulphur. Baths have been built, and they have been famous for ages for the cures of rheumatism and other disorders. They are constantly used by the natives, who often come from long distances to benefit by them. The ruins of ancient Tiberias, with its sea-walls and scattered columns, extend nearly as far south as these springs, and it may be fairly supposed that the modern site of the town is situated to the north of the ancient place. Beyond Mejdel, on the plain of Gennesaret, and round the northern shores of the lake, are the most interesting sites of all,—Capernaum, Chorazin, and Bethsaida. The country here has been so carefully examined by Major Wilson, that the survey was not able to throw much new light on the question of these sites, the solution of which must be sought underground. I am sorry I cannot agree with Major Wilson in the position of Capernaum at Tell Hum, but would rather place it at Kh. Minia, on the plain, believing the fine remains of Tell Hum to be the relics of the known grandeur of the ancient Bethsaida. The clearing up of this intensely interesting question by means of excavation is one of the objects to be attained by the future expedition that the Palestine Exploration Fund intends sending out at the end of the present year, if sufficient funds are available. On the 4th of April our camp was moved to Khan Jubb Yuseff, situated on the great Damascus road, and some distance from any inhabited village. The country round is occupied by wandering tribes of Bedouin Arabs with their goat flocks; to the east it is a mass of basalt, which has flowed over the country and down to the shores of the lake; to the west we had the limestone hills of Safed. I visited the extensive ruins of Kerazeh, the ancient Chorazin, and was struck with the precision and minuteness of the ornamentation of the niches of the ruined synagogue cut out of the hardest basalt, and remaining as fresh and sharp as they were when new. On the 10th we marched to Safed. . . . . I visited a Mahommedan sacred place in the town, called the Mukâm Benât Yakûb, or the sacred place of the daughters of Jacob. Many legends were attached to the place. I was shown without difficulty into the little mosque, and then into a large square cave, which had originally been a tomb of some importance. Two rows of recesses for sarcophagi lined the walls. Here tradition relates that Jacob and his children lived, and that when he was old and blind they brought him Joseph's coat, and the smell of it at once cured him. On regaining the outer mosque I saw a small door with a green curtain hanging over it and incense burning in front. This I was told was the tomb of the seven daughters of Jacob. There they were said to be all as in life, their beauty unimpaired, but it was too sacred to be approached by any but a true believer. I insisted, and was then told that these beautiful and holy maids were very quick to take offence, and devoured any one who came too near their place of rest. However, after a little persuasion I pushed the sheikh aside and squeezed through the hole, being nearly stifled with the bad incense. After a drop of some feet I found myself on the floor of a cave that opened into another. I explored the caves, one of which had been a tomb; the roof had fallen in, probably in the earthquake of 1838. No recumbent Semitic beauties awaited me, and I was very glad to get out into the fresh air again. The village of Keiron is a famous Jewish place of pilgrimage, for here Rabbi Shamai and Hillel and the great Simeon Ben Jochai lie buried. The principal results of the survey of this district were the discovery of three dolmens. During the course of the survey eight dolmens were discoverd, and as these are the first that have been noted in Palestine, it adds a new district to those already known to possess these rude stone monuments, and may be a connecting link between the ancient inhabitants of Europe and India. The remains of two synagogues, unobserved hitherto, were discovered, one at Sufsaf and the other at el Jish. These add considerably to our knowledge of these interesting buildings, and the discovery of the Roman eagle engraved in relief in the synagogue of el Jish adds new proof that these buildings are due to Roman influence over a subjugated people. The eleven specimens that remain to us of these buildings were carefully examined and planned during the course of the survey where it was possible to trace the original work. On the 3rd of May I moved camp to Dibl, a Christian village. . . . . There are a good many Christian villages in this part of the country, quite distinct from the Moslems. A Christian village can be known from a distance by the greenness of its vineyards and fields, in striking contrast to the barren desolation surrounding most Moslem villages. The terrible fatalism of their religion destroys the country. "If God wills that fruit-trees and vineyards should grow, they will grow," says the Moslem, as he sits and smokes. . . . On the 2nd of June the camp was moved to Banias, the ancient Cæsarea Philippi of the New Testament, and the Panium of Josephus. The Hasbamy has a less flow of water than either of the other two streams, and joins them after their junction, when they form a mighty stream. How, then, can it be followed as a source of the Jordan? When the other two divide into almost equal streams, the longest course leads to this fountain of Banias, the true source of the Jordan. This leads us to a consideration of the most interesting geographical feature in Palestine, the great depression of the Jordan Valley, which is merely a continuation of the

great valley extending through Syria, dividing the Lebanon from the Anti-Lebanon, and down which, as pointed out by Canon Tristram before this Association, the Leontes and Jordan rivers flow. I approach this portion of my subject with considerable diffidence, as advancing what, as far as I know, is a new theory for the solution of the physical geography of that region. Should it receive the support of geographical scholars it will be an additional scientific result attained by the survey of Galilee. There is little doubt that the great depression of the valley was caused by a fault and the sliding down of the strata, and that it was once an immense lake. This is proved by the ancient shore-lines found at different elevations along its course. The general supposition is, that it has been a continuation of the Gulf of Akaba, and that the gentle rising of 130 miles has cut off the Dead Sea from the ocean. It is curious that, on this raised land, there is still a well-defined valley, having a fall and showing the channel of a watercourse, as far as we know, the whole way, the evidence of considerable action. In the north we have volcanos, and a volcanic action, we found, was exactly situated in the bed of the valley of the Leontes, at the bend of the river. It has been mentioned previously by Canon Tristram, who noted the way the basalt had flowed down the western side of the Hasbamy. We know that these volcanic outbreaks belong to a late period of geological time. What, then, would have been the effect before this outbreak in the bed of the river? The Leontes, instead of being forcibly turned off at right angles to its course in that most extraordinary bend, which makes it cleave through the rock to the sea, would have flowed into the mighty lake which then covered the plain, and over the southern boundary along the Arraba, which still shows signs of its presence, to the Gulf of Akaba. The only supposition required in this theory is a more abundant supply of water, and of that the country gives striking proof. The extraordinary evidences of the action of glaciers on the rocks, the deep watercourses cut through hundreds of feet of solid limestone, now dry, speak of a former age of rushing torrents. Thus this volcanic outbreak in the Merj Ayun is the key to the present formation of the valley. A very slight cutting through it would again turn the Leontes into its former course, down the Jordan valley, and into the Dead Sea. The saltness of the Dead Sea may be accounted for by the great natural cliffs of rock-salt found at its southern extremity, and by the many salt-springs that are found in that region continually pouring brine into its waters. These cliffs of rock-salt at the Khashm Usdun are a natural crystalline formation, and cannot therefore have been deposited by an evaporating sea. The formation of the lakes is accounted for by the silting up of the plain by *débris* brought down from the hills in the winter torrents. The great river, the Yarmuk, which drains the whole of the Hauran, joins the Jordan immediately south of the Sea of Galilee, and formed the southern shore of that sea by the *débris* it brought down. There is a succession of streams south of this, bringing down *débris* from both sides of the valley, some large as the Zerka and the Farah, and thus a continuous plain was formed down to the Dead Sea; but along the shores of the Sea of Galilee there are no water-courses of importance, except where the Hamam and Rubadiyeh streams form the plain of Gennesaret. The northern shore of the sea is formed by a volcanic outbreak, which nearly blocks the valley. This is the only part in the course of the Jordan where it is shut in between rocky banks. To the north of this another broad plain is formed by the *débris* washed down in the great valleys from the west, driving the little lake of the Huleh into the north-east corner, where no streams, except those from the north, can reach it. Thus protected, the marsh and the lake of the Huleh is only being filled up from the north by the *débris* brought down by the Jordan itself, which is gradually forming a plain out of these beds of papyrus. On the 11th July we arrived at Haiffa once more, safe and well, after completing the survey of 1,000 square miles of country. The whole expenditure was 900*l.*, and taking 100*l.* as the cost of the fair drawing, we may claim to have produced a 1-in. survey at the cost of 1*l.* a square mile. After four weeks' rest in the Lebanon, the field was taken again on the 23rd of August with a reduced party, as my sergeant had been obliged to return to England on account of ill-health. A long march led to the south country, and we surveyed 340 square miles in the desert round Beersheba. This completed the survey of Palestine, but the early portion required revision, and from the 10th of October to the 22nd November we revised 1,700 square miles. The party, having completed all it was sent to perform, then returned to England. I have now told you what has been done. Let me say a very few words on what it is proposed to do next. At the end of this year, if funds are available, an expedition will start to explore the sites of the most sacred scenes of the New Testament history,—the northern shores of the Sea of Galilee, where undoubtedly Capernaum, our Lord's own city, Chorazin, and Bethsaida still exist. In addition to this the expedition will make a thorough survey of the unknown country forming the eastern shores of that sea, on the same scale and with the same accuracy as the present survey. Let me add one more result we hope to attain. We hope to rescue from the hands of that ruthless destroyer, the uneducated Arab, one of the most interesting ruins in Palestine, built on ground hallowed by the footprints of our Lord,—I allude to the Synagogue of Capernaum, which is rapidly disappearing, owing to the stones being burnt for lime.

VERY BAD AIR.

At a recent meeting of the Association of Municipal and Sanitary Engineers and Surveyors, held in Liverpool, Mr. E. B. Ellice-Clark, C.E., read a paper on "The Ventilation of Sewers." In the course of it he said,—

The air of every city is peculiar to itself,—every house, every room of a house, has its own climate; every sewer, every section of a sewer, has its own climate; not only in the nature of the gases and the humidity of the air, but in the temperature and the currents,—the contributing circumstances being such as to cause manifold changes being set up every hour, and perhaps more frequently. It is not surprising to find almost a complete *carte blanche* in reply to queries put to engineers on the composition of sewer-air. Only the most delicate instruments and searching analysis enable the chemist to determine when air contaminated with carbonic acid is injurious to health. To simply determine quantities of whole numbers per cent. is of no value,—the inquiry must be much more minute. Carbonic acid is the principal gas inimical to health found in fairly constructed sewers. The smallest quantity in pure air is 332 parts in 1,000,000. Dr. Miller gives the mean of his analyses in a ventilated sewer at 1,060 parts in 1,000,000, rising to 1,320 parts when the ventilators had been filled with charcoal; but as much as 23,000 parts in 1,000,000 has been found in an unventilated sewer. The difference between this and 1,060 parts is startling, and shows the extent of the contamination in broad relief, and the more so when we learn that the senses observe so small a difference as 34 parts above 369, that an excess of 200 parts is unpleasant, and that 1,000 is injurious to human life. In estimating the danger of air in sewers by the excess of carbonic acid, we must always bear in mind that it is difficult to obtain an atmosphere containing anything like this excess without organic matter existing, and it is probable in a sewer the two increase in a direct ratio. The amount of carbonic acid present in an ordinary house was found to be 540, in a bedroom at night 2,300, in the pit of a theatre 2,730, in a mill 3,000, per 1,000,000,—all of which places were unpleasant, if not unhealthy, and containing a greater excess than a ventilated sewer.

To have a pure and wholesome air we must have it with less than 700 in 1,000,000, and we can come to no other conclusion than that if sewer-air containing 23,000 parts finds its way into a house, accompanied by the smallest quantity of sulphuretted hydrogen, and other gases of putrefaction in whatever small quantities, the danger is so great as to be positively alarming.

The other noticeable difference between sewer and atmospheric air is the great diminution of oxygen, which has partly become carbonic acid and partly unknown, and probably still more deleterious, gases. In an unventilated sewer the oxygen has diminished from 209,900 per 1,000,000 parts to 179,300 (in a mine it has been as low as 182,700, but found to be unbearable). In a ventilated sewer it was found to be 207,100—the average in the Metropolitan Railway was 207,000. This is a difference of 30,000 parts in 1,000,000, and if the figures do not appeal sufficiently strong to our understandings, we must inquire further what it does mean. The average quantity near a Lancashire midden and about the backs of houses was 207,000; in a cow-house the same; in a theatre with the temperature at 78° Fahr., 206,300—this is assured to be a change from bad to very bad air and dangerous to live in—in a law court the oxygen had fallen as low as 204,900, an atmosphere difficult to continue in long; indeed, when oxygen is deficient to the extent of 900 in 1,000,000 the air is impure; all gradations higher than this show the danger to human life until the quantity is 170,000, when, in all probability, it would prove fatal; it has been ascertained that something like 174,500 was unbearable. Take this diminution of oxygen and the excess of carbonic acid, and we have sufficient to prove that, putting aside the organic substances floating in an unventilated sewer accompanying the gases, air is so changed as to be the source of great danger, and means must be provided to prevent such changes.

HOW TO MEET THE REQUIREMENTS OF POPULATION DISPLACED BY THE ARTISANS' DWELLINGS ACT.

This was the title of a paper read by Sir James Watson at the British Association Congress. He remarked that as demolitions and removals are most required in densely-populated places, where ground is valuable, it is likely to happen that, instead of building the same description as the old, new and elegant structures would be erected, unfit for the former occupants. Besides, there is a legislative enactment by which not more than 500 persons can be displaced until a certificate is procured from the sheriff that suitable house accommodation has been provided. With every local authority proposing to put the Act in force, the question will then be, "How are we to provide for our population displaced by the pulling down of such dwellings?" A sufficient answer has, I think, said the speaker, been given to this question by the proceedings which occurred at Glasgow, where the corporation obtained an Act in 1866 for the same purpose as that for which the Artisans' Dwellings Act was many years afterwards passed. This Act led to large purchases of property by the Corporation under the name of City Improvement Trustees. As soon as it became known that these large purchases of blocks of houses had been made for the purpose of clearing them away, and that there would consequently be a great demand for house accommodation, builders immediately commenced the erection of workmen's houses, and to such an extent has this been carried that, at December last, while no fewer than 31,057 persons had been displaced by the removal of old buildings during the ten years the Improvement Trust has been in operation, houses have been erected not only sufficient to accommodate those displaced, but greatly beyond it. The corporation of Glasgow have also erected model lodging-houses for such as are unable to maintain a proper house with its attendant expenses. The houses have been found invaluable. For some years there have been in operation two houses for men of 300 beds each, and one for women of ninety-six beds. A third for men will be ready in September, and three more are in progress. The charge is 3½d. and 4½d. a night. Games of various kinds are allowed in the evening. There are newspapers and a library. A chaplain is attached to each house, and Divine worship is performed every Sabbath. A police-constable is in attendance, who excludes persons of bad character or "gaol birds." The houses are filled to overflowing. Persons residing in them can either purchase from the store or shop attached to the house such articles as they require, and cook them in the large cooking-hall of the lodging-house, or can take their meals at any of the cooking depôts throughout the city, where food is supplied at a very low rate. The workmen can easily cook their own breakfasts in the morning, as it usually consists of porridge. The success which has attended the houses already opened is very gratifying, for although they have been erected at a time when ground and building were at an inflated price, and when time was required to make them known so as to procure adequate numbers, they have yielded a fair return upon the money spent upon them,—viz., 5¼ per cent. per annum.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT WISBECH.

The thirty-fifth annual Congress of the British Archæological Association commenced on Monday at Wisbech. Soon after two o'clock the president of the congress, the Earl of Hardwicke, and the members and their friends attending the congress, were formally received and welcomed by the Mayor, who assured the visitors that, in spite of the unattractive appearance of the Fen country, they would not be disappointed in the antiquities which it contained.

The Earl of Hardwicke then delivered his inaugural address, in the course of which he gave a long account of the Fen country in prehistoric times, and also within the era of history, showing how in distant ages the Isle of Ely and the surrounding district was a waste and boggy swamp, and how it was reclaimed by pious men and women, such as St. Guthlac and St. Etheldreda, and by those whom they had civilised; how in the Saxon and Norman times it had been the home of saints and of men of science; how the latter had gradually finished the work which the Romans had commenced, of draining off the waters; and how in later times these advantages had been lost by trying to make the natural subservient to the artificial drainage; and then how, lastly, Lord Bedford and other resident noblemen of this and neighbouring counties had charged themselves with the work of reclaiming the "Level,"—a work which they had done with such success that over what was once a howling wilderness the harvest smiles, and the Fens are now one of the best corn-growing districts in England. His lordship then spoke in terms of admiration of the noble parish churches which studded the Fens, in which he felt sure that the visitors would find ample materials for study and research. He also mentioned in terms of high praise a work on the churches of the Fens and marsh lands, illustrated by photographs, and published by Messrs. Leach, of Wisbech. His lordship added that the Prince of Wales had felt great pleasure in ordering his house at Sandringham to be thrown open to the Association; and concluded by observing that in his opinion archæology ought not to be regarded as the handmaid, but as the twin sister, of history, and that few persons deserved more highly the thanks and esteem of their fellows than those who devoted their days and nights to the study of the past, as the best means of discovering and testing truth, and so contributing to our stores of knowledge.

A vote of thanks to the Earl of Hardwicke and to the Mayor of Wisbech was moved by Mr. Thomas Morgan, and seconded by Mr. George Wright, F.S.A., on whom the management of the details of the congress has mainly fallen, and who announced a few changes in the programme for the week.

The public reception concluded, the president and the members of the Association and the visitors of the congress proceeded to the parish church of Wisbech. Here the vicar, the Rev. Canon Scott (a brother of the late Sir Gilbert Scott), read a paper containing notes of the history of the venerable edifice, prepared by Sir Gilbert Scott himself, adding orally some description of its chief structural peculiarities, its monuments, and other relics of antiquity, drawing attention to the flat roof which covered both of its twin naves, and which he had little doubt was pre-Reformation and original work. Mr. Loftus Brock and Mr. Bloxam spoke briefly on the same subject, the former also drawing attention to the unique instance of an old Roman Catholic altar-stone being still used in the chancel of this church as the top of the Communion-table. The Communion-table which was set up in the nave of this church at the Reformation, and which now is kept as in dock in the vestry, was shown and commented on, and the visitors were much interested in the fine brass of Sir Thomas Bauustone, constable of Wisbech Castle, which lies on the floor in the centre of the chancel. The beautiful Perpendicular tower also came in for its share of admiration. There could be little doubt (it was agreed on all hands) that it was the work of Dr. Moreton, Bishop of Ely, and afterwards Archbishop of Canterbury.

Having finished their survey of Wisbech Church, the party went off in carriages and omnibuses to Leverington, where they examined some Early English barrows that had been opened for their inspection, and also a portion of the Roman fosse and agger still remaining. They also paid a visit to Leverington Church, which has a Perpendicular nave and open timber roof, an Early English chancel and sedilia, and a large Decorated eastern window. The font, of rich Perpendicular work, with figures under canopies in the upper part and also on the stem, and the southern porch, with its "parvise" and ogee arch and its fine Early English tower, were much admired.

In the evening the members of the congress were hospitably entertained at dinner by the Mayor and corporation in the Town-hall.

On Tuesday a large party went by special train to Ely, where they were received by the cathedral dignitaries. Taking up his position beneath the lantern-tower, Mr. E. Loftus Brock, F.S.A., told the story of the building, and pointed out its architectural features. The early history of Ely, he said, had been commenced by Venerable Bede, and its later history was continued by the Monk of Ely. From these they could gather that at a very early period a church existed on the isle, about a mile from the present cathedral. It was, perhaps, the knowledge of this early Christian church which led the queenly Etheldreda to quit her Royal Northumbrian home and matrimonial honours to devote herself to God in the isle in the watery waste. As the earlier church was one of those which owed their existence to Ethelbert, it was probably of stone; but whatever it was, every trace of it, and the succeeding edifice, which was destroyed by the Northmen about 870, has disappeared. At this period, and for a century later, monks, with their wives and families, dwelt here. Then the rule of St. Benedict was introduced, and after the efforts of the English, under Hereward, to preserve their independence had proved futile, the monastery came under Norman rule, and Abbot Simeon began the present edifice. Part of his work could still be traced in the transepts. Simeon died in 1093. The work, however, went on, and Hervey, the first Bishop of Ely, continued it in spite of fire and accident. To Bishop Ridel the magnificent western front and transepts must be ascribed. Bishop Eustace built the Galilee porch, 1197-98. The magnificent eastern façade and its six bays of glorious stonework, its columns of Purbeck marble, its recessed and exquisite mouldings, constitute it a gem of this great period of Gothic architecture. In the third decade of the fourteenth century the lady-chapel was begun, in the newer style which we call Decorated. The central tower, which had fallen, was replaced by the present lantern, and the three bays eastward, which had been ruined by the fall of the tower, were reconstructed in all their present grace and beauty on Norman proportions. The carved stalls with their bas-reliefs were also the work of Alan de Walsingham. The chapels of Bishops Alcock and West were late but very rich examples of perpendicular work, the latter showing some of the earliest examples of arabesque foliage of the Italian school.

Mr. M. H. Bloxam related the story of the monuments, particularly pointing out the tall tomb of Tiptoft, Earl of Worcester, and Bishop Heton, who died in 1609, who, though a Protestant bishop, is sculptured in a richly figured cope, skull cap, short ruff, cassock, and rochet.

After luncheon at the Lamb Hotel, a visit was made to the remains of the infirmary, the Monk's Kitchen, and Prior Crauden's Chapel, which, up to a late period, had been a laundry. After luncheon, the Bishop, in response to his health, which was proposed by Lord Hardwicke, said that he thought societies like the British Archæological Association did much good, for they brought the people to look to the past as well as to the future, and showed that there was much to conserve as well as to create.

Returning to Wisbech, the visitors had time before dinner to view the remains of the castle and the museum, under the guidance of Mr. William Smith, Mr. Dawbarn, the Messrs. Peckover, &c. In the evening, the mayor took the chair in the council-chamber, and the hon. treasurer, Mr. Thomas Morgan, F.S.A., read his paper "On the Roman Roads of Cambridgeshire." This subject was very exhaustively treated, and led afterwards to a lively discussion between Messrs. Picton, Lambert, and others as to the exact meaning of a camp and a station This paper was followed by an equally interesting one, read by Mr. Alexander Peckover, "On the Tumuli of the District," with especial references to the two barrows which had been opened expressly for the congress at Leverington, but which, unfortunately, had produced no decided results, although it was the opinion of the reader, as well as of those joined with him as a committee of investigation, that they had been used for purposes of sepulture in very early times. Mr. Richard B. Dawbarn then read the last paper, "On the Ancient Castle of Wisbech," and produced an enlarged drawing of the seal of the castle, which gave rise to a long discussion as to the date of the architecture of the castle thereon depicted, some considering it a Lancastrian castle instead of a Norman building, as the lecturer sought to prove it. After remarks on this subject by Messrs. W. De Gray Birch, Picton, Brock, and J. Tom Burgess, the proceedings were brought to a close.

On Wednesday morning, the visitors proceeded in carriages to see some of the most notable of the marshland churches in the neighbourhood of Wisbech and Lynn, including Walpole St. Peter's. Leaving Lynn by train, a visit was paid to Swaffham and Castle Acre. Mr. Loftus Brock gave a sketch of Castle Acre Priory and the order of Cluniacs, and entered into details which threw much light on this order and the arrangements of their buildings, which in this instance were interesting examples of the twelfth-century style of architecture, known to us as Early English. Mr. Brock gave a brief description of the shell keep and outer wards. The great rectangular enclosure he assumed to be Roman, and was inclined to consider that the mounds outside the fortifications were the work of the Saxons, and he quoted the testimony of Mr. G. T. Clark in the *Builder* in support of his theory.

This outline of the first three days' proceedings of the congress we shall supplement next week by giving details of the subsequent proceedings, together with some of the papers read.

A PROFESSIONAL DINNER IN DUBLIN.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

An interesting interchange of good wishes and good will has just taken place in the capital of the sister isle, between the chief representatives of the Irish architects and the President of the chartered Society in London. It is, perhaps, not generally known that recent changes, —reforms, they have been justly called,—in the Royal Institute of British Architects were not received in Dublin with the acquiescence that welcomed them in Glasgow, Manchester, and other large English cities. It was argued that the four hours of salt-water between Holyhead and Kingstown placed Dublin in a very different category to Glasgow, or even Edinburgh, quite apart from the fact that the first-named is *the* metropolis of an entire island. The Dublin members of the central professional body objected to the equalisation of subscriptions which formed part of the recent reforms; they objected to pay the same sum annually that their colleagues at head-quarters paid; and consequently a few tendered their resignations. These resignations were alluded to in the report of the Council last May, and the statement then made that nine Fellows and four Associates had resigned referred to the objection raised by non-metropolitan members to pay the same amount of annual subscription as that paid by the London members; and it was well known that other Irish members intended to send in their resignations. It was also known that the Royal Institute of the Architects of Ireland,—a body organised on the principles of the English model, —was under the throes of alteration and amelioration. Nothing, therefore, could be more opportune than the visit that Mr. Charles Barry has just made to Dublin, a visit whereby the leading Irish architects have been brought into personal intercourse with the President of the Royal Institute of British Architects.

On Tuesday evening last the Irish architects entertained Mr. Barry at Maple's hotel, Kildare-street. Mr. Owen, the Crown architect, presided, and the company included Mr. Drew, Mr. Deane, Mr. Lanyon, Mr. Rawson Carroll, Mr. Wilkinson, Mr. Henderson, Mr. Carson, Mr. Murray, Mr. Mitchell, Mr. Ashton, and Mr. William H. White, the secretary of the Royal Institute of British Architects, together with several others, including Mr. Robson, the architect of the London School Board, who happened to be staying in Dublin at the time. The health of the Queen having been received with due honour, Mr. Owen proposed the toast of the evening, that of prosperity to the Royal Institute of British Architects, and the health of the

president, their guest. Mr. Barry's reply, which touched in the most practical way possible upon the motives that inspired the dinner, was both effectually done and cordially received. The president argued that not only in the United Kingdom but throughout the Empire there was only one incorporated society of architects,—only one, in fact, with an organisation and a polity, and that was the Institute founded in London less than forty years ago. He urged that membership of it should be looked on in the light of an insurance for professional aims, objects, advancement, and, if need be, defence,—not alone as a medium for study, information, and exchange of ideas. He further pointed out that the single city of Glasgow sent more members to the central body than all Ireland put together, and regretted that a metropolis like Dublin was not, by the force of representation in London, in the foremost rank of British architects. He wished that the Council of the Institute as the deliberative voice of the whole profession should be enabled to speak to boards, to the public, to Parliament, and to the Government with the authority that a general and a comparatively equal representation from all parts of the United Kingdom and of the Empire could alone give it.

A very interesting debate followed, in which one gentleman suggested, with marks of approval, the merging of subscriptions to the local institute in those of the Royal Institute of British Architects,—a course that would inevitably be accompanied by the incorporation of the Dublin society of architects with the central body in London. Two speakers supported Mr. Barry in his view of the position, and Mr. Drew pointed out very properly the financial difficulty of supporting a society in Dublin, and at the same time subscribing to another in London. The practical outcome of the discussion was the promise that a formal proposition would be made from Dublin to the Royal Institute of British Architects,—a proposition which Mr. Barry, in the name of the Council, had previously offered to receive with all the attention so important a communication naturally deserved.

Whatever may result from the negotiations which have taken place, we are assured that the cordiality with which the Dublin architects received the President and their other guests, was of a character too spontaneously genuine to admit of any mistake or misunderstanding.

THE CAPTIVE BALLOON, PARIS EXHIBITION.

A CORRESPONDENT writes from Paris:—If one looks down the Champs Élysées on a morning, an immense round cupola, with a small lappet on its top, towers above the Tuileries. This is the upper half of the Ballon Captif of Henry Giffard. M. Giffard is the well-known inventor of the injector for boilers. Originally a railway engineer, he has always shown a preference for ballooning, and a large fortune, the result principally of the above-mentioned invention, permits him now to follow his favourite occupation with success. Already in 1852 he tried to steer balloons, by giving them an elliptical form, and fixing a small steam-engine, driving a screw propeller, in the car. At the Exhibition of 1867 he constructed his first captive balloon, of a cubic contents of 177,000 ft., and capable of lifting twelve persons a height of 820 ft. The year following he erected a second, larger, balloon in London (Cremorne Gardens), which, however, one day broke from its moorings, yet landed itself safely, or at least comparatively uninjured, at a distance of forty miles from London, in Buckinghamshire. Now M. Giffard has chained up in the Court of the Tuileries a new balloon, perhaps the largest he ever built. It is capable of receiving 883,000 cubic feet of gas, weighs 30,865 lb. (nearly 14 tons), and has a carrying power of 24,250 lb. (over 10 tons), of which, after deducting for ballast, &c., about 11,000 lb. (nearly 5 tons) are made available for ascending. The rope to which the balloon is fastened permits a rise of nearly 2,000 ft.; the long-like car has room for thirty to forty persons; a steam-engine of 300 horse-power fetches the captive back from his aerial flight, when he has got to the end of his tether, and regulates his rising by means of an ingeniously constructed air-break.

From the Place du Carousel the whole form of the balloon is seen as a large ball, with a light tapering point in the form of a pear. Its length, with the car, is 180 ft., at present the highest (?) object in the neighbourhood, higher even than the Arc de l'Étoile. The fenced-off space whence the ascents are made is continually besieged by a curious crowd, both ladies and gentlemen waiting within the enclosure for the start. The steam-engine is close to the entrance; it drives a drum 5 ft. 6 in. in diameter and 33 ft. long. Round the drum runs a rope 2·7 in. thick, which is conducted to underneath the balloon through a tunnel. At the end of the tunnel is a cone-like depression; at its bottom is a heavy iron roller that may be turned in any direction; round this the rope is wound, and then fastened by a massive iron hook to the balloon. The latter, as usual, hangs in a network of small ropes, which combine gradually to thicker ones, finally assuming the dimension of an arm, and thus permit of the fastening of the car as well as the great cable.

While waiting for the time of the ascent, one of the aëronauts explains to the assembled intending excursionists the difficulties and obstacles that had to be met and overcome in completing the gigantic work. First of all, a material had to be found which would remain air-tight for months in all sorts of weather, tight especially against hydrogen, the gas most difficult to imprison. M. Giffard, after repeated experiments, composed the material of his balloon of seven layers: inside muslin, then india-rubber, linen, again india-rubber and linen, then a layer of vulcanised india-rubber, and finally outside muslin coated with varnish and zinc-white paint. The coating of varnish alone weighs over 600 lb., that of zinc-white over 800 lb.

The network surrounding the balloon has 52,000 meshes. Those meshes are not formed by knots, but by interweaving the threads forming the ropes; the manufacture of the network made the establishment of a special rope-yard necessary. In order to prevent perforation of the balloon by the friction of the meshes, each of the 52,000 crossing-places was neatly surrounded by a piece of kid leather, so that now, smooth and soft, they give way when the balloon distends itself or shrinks. After the material and the ropes were completed, the work of sewing began, and it may be mentioned that forty sewing-machines used up together 55,000 yards of thread. First the lower, then the upper, hemisphere was sewn, both laid together, and joined by sewing up the equator. The air-valves were put in, and finally the filling began, for which only pure hydrogen was employed. For more than a year, hundreds of people have found employment in various operations necessary for the construction of the balloon. The reader may perhaps conceive from the above data, not very often thought of when ballooning is mentioned, that the simple construction of this large balloon, with all its apparatus, was a very important performance of the art of modern engineering, a much more difficult task, indeed, than, for instance, the building of a moderate-sized river bridge, as every operation had to be performed by means of newly-invented machines and by novel methods.

The voyage upwards is highly interesting, and as perfectly free from danger as any journey possibly can be. In case the rope should ever break, necessary precautions are adopted. Two experienced aëronauts by profession take part in the trip, the brothers Godard and Dartois, sometimes also M. Tissandier. But their office will probably for ever remain a sinecure; for the ascending force of the balloon is about 5,000 lb.; the pressure of the wind may add, under the most unfavourable conditions, another 10,000 lb. (if the wind is at all strong, no passengers are taken); the mooring of the balloon being tested in all its parts to 50,000 lb.

The car is entered, like a ship, over a gangway; a slight jerk downwards loosens the cables, the attendants lift the anchors, a musical band enhances the enjoyment of the supreme moment by means of a valse, a slight moving of the floor,—and noiselessly the enormous sphere, with all it contains, mounts upward. The buildings which on the ground confined the view suddenly sink down like the drop-scenes of a theatre, behind them rises the horizon, what was near sinks more and more below, distance seems to move towards us, and soon we float hundreds of feet above, enjoying a most splendid range of view. This drop-scene-like sinking of the ground is the most peculiar sensation of the whole trip. The balloon rises so rapidly and with such perfect steadiness that the traveller soon loses the consciousness of being himself in motion while the earth below him remains stationary. He feels as if he were resting still, and sees the parts of the earth at first most near to him glide away, downwards, while the far perspective grows towards him. And this can only be experienced in a balloon.

The view is simply magnificent. In the pure height in which we float, we have Paris below us like a chessboard; the green lawn of the Champs Élysées, the greyish green ribbon of the Seine, the sharp waves of the sea of houses, the Bois de Boulogne, and the whole pleasant-looking surrounding of the capital, all this lies at our feet like a kaleidoscope; the blue hills of Normandy shortly rise on the western horizon, while towards the east and west Champagne and Beauce border the picture with less prominent lines. Soon we have no scale for the height at which we are; whatever adheres to the ground becomes smaller and smaller. The basins of the Tuileries Gardens seem Liliputian saucers; the houses shrink almost into nothingness; men appear only as so many tiny, crawling spots. We no longer know whether we rise, halt, or fall; and when a passenger asks the captain whether we have begun to sink again, and at what rate, the latter replies,—"We are still ascending 200 ft. per minute." Only if we look down along the rope, we gain a perception of the giddy height at which we seem to hang. At last our manometers indicate an elevation of 1,800 ft., and the conductor waves a flag. Below sets an attendant, who—in a looking-glass, so as not to dislocate his neck—carefully follows the movements of the balloon, takes up the signal, and passes it on to the engine-man. Without any jerk, our aërial vessel stops for a last look round, and then it glides down, imperceptibly as in ascending, towards the earth. The houses grow larger, men may be distinguished, soon the dull noise of the streets and the muffled sound of music reaches our ears, already we hear the labouring of the engine—all at once the horizon vanishes, the Tuileries shoot up by the side of us, as they before sank down below us; then an oscillation, and we are back on *terra firma*, richer by an interesting experience and a large commemorative medal, of which the accompanying *brochure* kindly assures us that it is an object of art, and that it is a kind of diploma which entitles us to consider ourselves in future aëronauts.

THE PANAMA CANAL.

THE project of cutting through the American isthmus for the purpose of establishing a communication between the Atlantic Ocean and the Pacific has entered upon a new stage. A convention has been concluded between the United States and Colombia, represented by their Secretary for Foreign Affairs, Señor Eustorgio Salgar on the one part, and Mr. Luciano N. B. Wyse, the chief of the scientific expedition for exploring the isthmus in 1876, 1877, 1878, and member and delegate of the International Company for an Interoceanic Canal, on the other part, by which the privilege of constructing a canal from the Atlantic to the Pacific is accorded to the above company. The vast expense attending such an undertaking has hitherto principally delayed the commencement of the works, for there has been no scarcity of projects. Two plans especially were prominently brought forward. One included the section of the isthmus in Nicaragua, making use of the great inland lake of that country; the other confined itself to the cutting the isthmus of Panama in the direction of Aspinwall to Panama. The latter project seems now finally to have been adopted, notwithstanding the most eminent engineers of the United States of America have always preferred the Nicaragua route, basing their prediction on personal inspection of the country. M. Ferdinand de Lesseps, the constructor of the Suez Canal, also gave his opinion in favour of the Nicaragua Canal. In a letter addressed conjointly to the Minister of Nicaragua in London and the Consul-General of that country for France, he describes the project of the Nicaragua Canal as that "which offers the greatest facilities of execution, and the greatest security for carrying it out."

The Tay Bridge.—Mr. Bouch, C.E., has been presented with the freedom of the burgh of Dundee, in recognition of his services as the engineer of the Tay Bridge. Mr. Bouch, in acknowledging the gift, said the idea was mooted for throwing a double line across the Tay, and that from the experience gained in the construction and working of that bridge, the Forth Bridge would be a double line.

SUSSEX ARCHÆOLOGICAL SOCIETY.

On the 15th inst. the members and friends of this Society proceeded in carriages from Hastings to Brede-place. Passing through Ore and Guestling, they arrived at Icklesham, where a halt was made to inspect the church, the Rev. W. Powell (the hon. secretary of the Society) pointing out a few of its interesting features. He explained that from the writings of the late Mr. Petit, who had also furnished two views—one of the interior and the other of the exterior—it appeared that he was of opinion that the tower was of the Norman period, whilst the chancel showed marks of Transition. The church was restored about twenty-five years ago. Leaving Icklesham, the party drove through Winchelsea Marsh, at the end of which many of the gentlemen mounted the steep hill to Udimore. Before visiting the church, the party were much interested in looking at the Court Lodge, near the church, which is now subdivided into seven dwellings for cottagers. The church, which is small and curiously built, contained an old register-book, the entries commencing in the year 1559, and along the aisle were two or three tombs recording the death of the Treebody family. Another pretty ride brought the party to Brede Church, the bells of which set up a merry peal. Mr. Slade Butler, who chaperoned the visitors, said that the church, which is situated on an eminence, was anciently connected with Steyning, and both were part of the possession of the Norman Abbey of Ficamp. It was dedicated to St. George, and had a chancel, nave, and aisles. There is some ancient painted glass, including the arms of Echingham, the family having formerly been influential in Brede. There is the tomb of Sir Goddard Oxenbridge, who for the first time called Brede-place Forde-place. It is believed he built the family mansion. The directions contained in his will were faithfully executed, and against the south wall of the chancel of Forde-place, in St. George's Church, is his raised altar-tomb in stone, the figure being recumbent, the head resting on a helmet, his hands clasped over his breast, and a lion at his feet. He is supposed to have been the "Grim Ogre old Oxenbridge," who devoured young children for his daily dinner, and was cut asunder by his neighbours with a wooden saw. It must have been derived from some forgotten legend of great antiquity. After listening to this statement, the visitors walked through the fields to Brede-place, which, by the kind permission of Mr. Edward Frewen, was thrown open for the occasion. As soon as the party entered the hall Mr. Slade Butler remarked that many of the mansions in Sussex were reduced to mere farm-houses, and others were occupied only by farm labourers, and what with the corroding hand of time and the devastation of restoration and modern improvements, they had but little left of the residences of "belted knights or barons bold, or men of high degree." That day they were fortunate in giving their attention to Forde or Brede place, the ancient seat of the Oxenbridges,—a semi-fortified mediæval residence of the latter part of Henry VII.'s reign. The old part is of stone, with good foliated windows, and two fine chimneys. The Elizabethan part is of brick, with stone dressings; the whole is very picturesque. There is no hall, and the windows seem to show that there never was one. The porch leads into the great room, 40 ft. by 28 ft., and 38 ft. high. This room, which had windows on the east and west sides, completely divides the house into two parts. Immediately south of the large room was an apartment of 28 ft. by 18 ft.; the entire east end was occupied by a window of eight lights, with a pier in the centre; the west end by a window of six lights. An excellent dinner was served up in the dining-hall of the old mansion, Mr. Edward Frewen in the chair. After the repast, the company left the hall, and stayed a short time in looking over parts of the house. Returning through the fields to the vehicles on the high road, they took their seats and were driven back to the Hastings Station, *viâ* Silverhill and Bohemia.

ECCLESIASTICAL ART EXHIBITION.

Sir,—It may interest your readers to know that an Ecclesiastical Art Exhibition will be held at Sheffield during the meeting of the Church Congress, and one room in the Loan Collection Department will be set apart for the display of architects' drawings. Every care will be taken for their proper display and safe custody, and carriage will be paid to and from the Exhibition, if desired, on those that *are exhibited*. John Bray, Manager.

THE ELECTRIC LIGHT.

The Vestry of Chelsea sent their surveyor, Mr. G. H. Stayton, C.E., to Paris to examine into the question of using the electric light. Mr. Stayton has done so, and his report is now published. He arrives at the following conclusions:—

"That the present arrangements for electric lighting are unsuitable for long distances (in this I am supported by the City Engineer of Paris), especially in London, where the lamps are so much further apart than in Paris. The close proximity of the electric stations is a great drawback to the system, and their establishment in business streets would be a matter of considerable difficulty. These are the disadvantages of the system. The following are the advantages:—

About 1½ hour's daily consumption is saved in consequence of instantaneous lighting and extinguishing; the light is vastly superior to gas, and is not injurious; there is an absence of noxious smells, both in the production and combustion; the heat in a room, so often unbearable in the case of gas, is scarcely felt; the most delicate colours are preserved; air is not consumed as in the case of gas; there is no chance whatever of explosion, and although the light is so powerful in the streets, no accidents to horses have occurred.

If the cost of producing the 'Gramme' machine (10,000*l.*) could be reduced, or a less expensive one be adopted; if hydraulic, or some other less expensive power, such as a petroleum engine, could be utilised, as the motor in lieu of steam, or even a smaller amount of power than one-horse per lamp be rendered sufficient; if the distance between the electric stations could be greatly increased; the arrangements made capable of minute sub-division, and by some simple method the current could be branched off for household or other requirements, I feel sure that the public would gladly welcome such a change, and it would compete with gas under highly advantageous conditions. . . . .

After a careful consideration of the whole question, I am of opinion that at present the electric light is not suitable for street-lighting in the metropolis; that it is suitable and can be utilised with splendid effect in large squares and places, such as Trafalgar-square or Parliament-square; but although in each of these places at the present time the lamps are numerous, the cost would be greater than gas. I am also of opinion that, so soon as the modifications alluded to can be effected (particularly as to the electric current being carried to a much greater distance, thereby reducing the cost), the electric light will very soon supersede gas to a considerable extent, the attendant advantages being so great."

REBUILDING THE FORESTERS' HALL.

The Foresters' Hall, in Wilderness-row, a building of very considerable dimensions, which was erected only a few years ago, is now being very much enlarged, and when the works in progress are finished the building will be more than double its original size. The undertaking involves almost the entire rebuilding of the structure. The Wilderness-row frontage of the former hall consisted only of the ground-floor, first floor, and dormers. This elevation has all been taken down to the level of the first floor, and is now in course of re-erection on a greatly extended scale, consisting of the ground-floor and three lofty stories, the height of the elevation to the eaves being 60 ft., and 80 ft. to the apex of a high-pitched roof, which terminates with an ornamental iron cresting. The main face of the elevation is in stock brick, the windows of the ground-floor, and the first and second stories, having Gothic arches in red moulded bricks, the general window and other dressings being in Bath stone. The third story has a range of three double Gothic windows divided by iron columns and capitals. The cornice surmounting the elevations is 2 ft. in depth, and is in ornamental terra-cotta work. The high-pitched roof is covered in with pea-green slates, and the iron cresting encloses an open area. The elevation has a frontage to Wilderness-row, 36 ft. in length. The east elevation in Foresters'-hall-place is 94 ft. in depth, extending in a southerly direction, close to the Charterhouse boundary. The architectural features of this elevation, each story of which contains a range of eight windows, are generally uniform with the Wilderness-row frontage, the variation being that between the two upper stories there are ornamental pilasters with capitals, and the third story has open casement windows.

The enlarged building on the ground-floor will contain two spacious additional committee-rooms, each 35 ft. by 20 ft., together with a corridor 9 ft. in width, and of entirely fire-proof construction. The great hall, on the first floor, is approached by three separate staircases, each 6 ft. in width. Two of these staircases are reached by the principal entrance in Wilderness-row, the other staircase being approached from Foresters' Hall-place. The hall is of unusually large dimensions, containing a floor space of 64 ft. in length, by 53 ft. in width, in addition to a spacious gallery at the north end, supported by strong wrought-iron girders, and carried entirely across the hall. The internal elevation of the hall may be described as occupying almost the entire area of the structure, with the exception of the ground-floor. It is carried to a height of 40 ft., and is lighted on each side by the windows in the several stories forming portions of the external features of the edifice. The internal walls are intended to be elaborately decorated with pilasters and capitals, and a coved and panelled ceiling will be uniform in design and execution. It may be added that in addition to the great hall there will also be another large public room of large dimensions in the basement.

Mr. J. Collier is the architect, and Mr. G. Wall, of Chelsea, the contractor. Mr. King is clerk of the works. The cost of the additions will be about 9,000*l.*

ARCHITECTURE AND OPTICS.

Sir,—It would be lamentable if the attention now being shown in your pages to the subject of architecture, and the laws of human vision, should be permitted to drift into the fields of speculation and of fancy; but a perusal of the article in your last week's issue, headed "The Relation of Architecture to the Laws of human Vision," appears to me to point to a substitution of the imaginary for the practical.

That article is evidently the result of much study, and at the moment of the appearance of Mr. Pennethorne's work on the "Geometry and Optics of Ancient Architecture," is likely to considerably aid us in the study of that work; but it is, I think, subject of regret that an exceedingly exhaustive discourse on the powers of human vision should conclude with the following opinion, viz.:—"From these considerations it will appear, with tolerable clearness, that the idea of a conventionalisation of architectural forms in order to bring them into a certain relation, when seen from a certain standpoint, is one that will not bear investigation." This conclusion, strictly read, upsets the whole theory of the manner in which the Greeks designed their buildings. Working on an exaggerated basis, the author of the article arrives at an opinion which might have been anticipated.

It cannot be too strongly urged that the whole subject of Mr. Pennethorne's views on this point is of the most practical kind, supported by actual facts. There is little to thoroughly comprehend in this—that first of all the Greek architects designed their buildings in the then acknowledged correct proportions, and afterwards altered and modified them, so that, regarded from a particular point of sight, they should appear to the spectator absolutely in accordance with these first-settled proportions, and not as they would otherwise appear if the proportions and quantities had not been so modified. This is what one would expect from refined study; but it would be altogether erroneous, I think, to suppose that the Greeks, or that any architect who knew his business, would attempt to so modify their proportions that except from one point they would be altogether inharmonious; that is carrying the point too far. The modifications made, as shown by Mr. Pennethorne's tables of calculations, are not nearly so great as to involve an eyesore regarded from any point of sight.

Of course the portico of a temple could still be regarded from another point, as the author of the article suggests; and even then the modifications made would apply equally well; but an angular view of a Greek temple is the point which any architect would select for a proper view,—it is the palpable point of view for perfection, and Mr. Pennethorne has found that it is the point which the Greeks distinctly led up to by the arrangement of the approaches. The "graceful lines and deeply-cut capitals of an individual column" would not in any way suffer from the corrections which Mr. Pennethorne has suggested. Again, if the Greeks had designed a "cathedral," we may conclude, without hesitation, that the "effect of the spire as contrasted with the mass of the church" would have been well looked after, and the point of view altered accordingly. Nor need "certain features be exaggerated at the expense of others." No architect would sympathise with or sanction such methods; still less the "attempt to increase the apparent length of an architectural vista by an actual convergence of lines supposed to be parallel" that is condemned by your writer; and one has only to look at Mr. Street's church of SS. Philip and James, at Oxford, to find an example which deserves the utmost censure.

In conclusion, I can gather nothing from the article which would prove or show that architecture would in any way suffer if modern architects adopted the system which Mr. Pennethorne suggests that the Greeks adopted, which was practically to design their buildings so as to be seen in perfection from one point of view, but so, nevertheless, that the detail in no way was marred; and that the mass, with its light and shade, its graceful outline, its symmetry, and its proportion, still contributed to the general beauty to which the Greeks attained, and which has served, and will serve, as a model for all that is glorious in architecture.

WM. WOODWARD.

THE DECORATION OF ST. PAUL'S.

SIR,—Mr. Buckle takes exception to some of the opinions put forward in the *Builder* on this subject; not, as he states, with any captious spirit, but merely with a view to ascertain what is legitimate and truthful in art. His manner and his intention are to be commended. But, notwithstanding his good intentions, he runs his argument on the quicksand of "shams." We had really begun to hope that this notion respecting shams was on the wane, and that people, especially writers upon art, were beginning to see that art, for the most part, consists in "shamming" nature: in the skill with which it "shams" on canvas, within well-recognised limits, landscape, figure, &c.; with which it "shams" flesh, in clay, marble, and bronze; with which it "shams" human character, on the stage, in speech, action, and gesture. Architecture itself is an entire "make up," an artificial thing, like nothing in nature but the visions of the architect. It is a piling together of stones to thwart the laws of gravity,—a turning of arches, and of domes of stone, to sham the vaulting of ethereal space, with one of the heaviest of materials. Wren was quite conscious of this, and did not hesitate to make the dome of St. Paul's a "sham" of a "sham," for we all know that the visible is not the actual, but a false dome. The fact is, we may do anything in art to produce a satisfactory effect to the eye, if we do not shock the understanding to too great an extent. There is no greater impropriety in the curving and converging columns of Thornhill's design, than in the institution of the arch and the dome, which tempt and defy the laws of gravitation in stone construction. The architectural portion of Thornhill's design would, upon similar principles of construction, defy the force of gravity, were it in stone, and interest by its constructive daring. As to its being a "sham" because it is painted, why, so would be all the other decorations which your correspondent proposes. Mr. Buckle has yet to learn that fine art essentially consists in "shamming" wisely, but not too well.

At all events, Thornhill's designs have stood the test of a century without being regarded as outraging common sense. Nay, considerable expense was incurred to preserve them, and I, with some modifications already described, would preserve them still.

METER.

THE BLACKNESS OF ST PAUL'S.

SIR,—The suggestion of Professor Paley that the coating of jet-black substance which adheres to the surface of our buildings is the growth of a lower species of lichen, and not the accumulation of sooty particles created by the smoke attending the burning of coal in lieu of wood, is interesting. But that the said supposed lichen feeds only upon calcareous stones such as the Bath and Portland oolites, and that it does not grow in sunlight and warmth, but prefers the shadow side, are not invariable. The action of the sun, wind, and rain upon St. Paul's has been to scathe the weather side of that building, and to disintegrate the stone, and to cause it to decay. But it is not so obvious, and certainly not so well known, that the sooty coating of the rest has been a preservative to the stone, and that, instead of feeding upon it as a lichen, and thereby decreasing its durability, it acts as a covering, and aids in weathering the stone, the arrises of which are often as sharp as when first cut, except where defective stones exist, which, of course, decay in whatever aspect they are placed. Perhaps one of the blackest buildings of the metropolis, prior to its restoration by me, was the façade of Hanover Chapel, Regent-street, which has an eastern aspect; and yet this building, faced with Bath stone, was for the most part coated with oil when first erected, and where blackest was least affected by the weather, and certainly gave no nourishment to any growth upon its surface. When heated with the "steam-jet," which I first introduced into this country from France, and applied to cleaning this building, the leathery substance peeled off like a skin, but had no apparent sustenance from the stone. It did not occur to me to analyse it.

EDWD. C. ROBINS.

DRY EARTH VASES FOR EXCRETA.

SIR,—I beg to communicate to you the latest invention for sanitary purposes. These vases will be made of earth of just sufficient tenacity to hold together for the purpose proposed in the heading to this letter. They will have dry-earth stoppers. They will be easily removed, and their places supplied by fresh ones. When filled, they will be conveyed to the land to be tilled, and there placed at regular intervals to be either broken up or crushed.

These dry-earth vases are proposed as a cleanly mode of dealing with excreta in cottages, farms, &c. The mode of using and of transporting them for tillage need not here be more minutely detailed.

SANITAS.

MASTERS AND MEN.

Newcastle-on-Tyne.—A meeting of the joiners of Newcastle and Gateshead was held on the 15th inst., to consider the notice which has been given by the employers that on September 2nd the wages would be reduced from 8½d. to 7½d. per hour. A motion was carried declaring that the reduction was unwarranted, and should be resisted. An amendment to accept a compromise of 8d. was rejected by 250 to 3.

The Nail Trade.—It is stated that the employers in the nail trade, on the 16th inst., issued a list, which shows an advance ranging from 10 to 20 per cent. upon the list recently issued, but the latter advance will only apply to a few kinds of nails. This advance the majority of the operatives consider inadequate, and state that they will not adopt the list unless it is further amended. In many of the districts the operatives state that they shall go harvesting. In the Sedgley district many of the nailers are stated to be in great distress.

WATER SUPPLY.

Hexham.—A special meeting of the members of the Hexham Urban Sanitary Authority was held on the 14th inst., for the purpose of taking such steps as might be necessary in view of the inquiry appointed to be held on the 26th inst., by Mr. J. Thornhill Harrison, C.E., Inspector to the Local Government Board, in reference to the Sanitary Authority's application for the Local Government Board's sanction to borrow 3,500*l.* for works of water supply. It was resolved that the Works Committee be authorised to procure all such evidence—scientific and otherwise—as to them might seem proper for the purpose of the inquiry to be held by Mr. Harrison on the 26th inst.

Dunfermline.—At a meeting of the Dunfermline Town Council on the 12th inst., it was reported that deputations from Inverkeithing and Aberdour had waited upon the Waterworks Committee of the Council, with the view of discussing the terms upon which a supply of water could be obtained for the districts they represented, and that it was agreed on the part of the Council that negotiations should proceed on the footing—(1) That the Corporation shall deliver the water at Milesmark by meter, and that the pipes and other works requisite for conveying the water to Inverkeithing and Aberdour, and distributing the same, should be laid by the authorities of these places; and (2) that the rate to be charged should be 3d. per 1,000 gallons delivered at Milesmark. Since the conference referred to, a report had been prepared by Messrs. J. & A. Leslie, C.E., Edinburgh, setting forth that, assuming the total quantity of water that may be required ultimately to be 180,000 gallons per day, the cost of the necessary works might be estimated at 6,600*l.*, while the cost of distribution throughout the towns would be about 1,300*l.* for Charlestown and Limekilns, and 1,000*l.* each for Inverkeithing and Aberdour, exclusive of the distributive cost in rural districts.

Bradford-on-Avon.—The Local Government Board have approved of the necessary loan being made by the Public Works Loan Commissioners for carrying out the scheme for the water supply of Bradford-on-Avon, prepared by Mr. Henry Robinson, C.E.

Crummock.—The first sod of the Crummock Waterworks, which are intended for the supply of Cockermouth, Workington, &c., has been cut by the High Sheriff of the county of Cumberland, Mr. F. J. Reed. Lake Crummock is the second Cumberland lake which has been tapped for the water supply of towns. The cost of the works is estimated at 25,500*l.* for main pipes, and 7,152*l.* for branch pipes. Messrs. Pickering & Crompton, of Whitehaven, are the engineers.

NEW MUNICIPAL BUILDINGS IN SCOTLAND.

Helensburgh.—On the 15th inst. the foundation stone of the new municipal buildings at Helensburgh was laid with full Masonic honours by Mr. Alex. Smollett. The building is being erected on the stance of the old Town-hall, at the corner of Princes-street and Sinclair-street, and when completed will cost about 6,000*l.* The style of architecture is that known as the Scottish Baronial, the plans having been executed by Mr. Honeyman, Glasgow. The frontage to Princes-street will be 50 ft. 6 in., and towards Sinclair-street, 80 ft. On the ground-floor will be the council-chamber, the police-office and cells, five in number, the offices of the burgh, collector, and water department, and adjoining the police portion is the superintendent's room. There is also a heating apparatus here, which will supply the whole building. On the upper flat are the council-chambers, town clerk's office, police-court, witnesses' room, and an apartment for the use of the magistrates. The plan is arranged to admit of the addition of a large hall for public meetings. The following are the contractors for prosecuting the work:—Mason work, Mr. David Miller; joiner, Mr. William Jack; plumber, Mr. J. Horn; slater, Mr. D. Dempster; plasterer, Mr. A. Arnott, all of Helensburgh.

Inverness. The foundation-stone of the new Town-hall for Inverness was laid on the 14th inst. by Provost Simpson. Mr. Lawrie is the architect, Messrs. Thomson & Macgregor are the contractors, and Mr. Good is the clerk of works.

HOSPITALS AND DISPENSARIES.

THE writer of a paper in the *Charity Organisation Reporter*, makes the following important statement. We fully agree with the general purport of it:—"The class of general and special hospitals spends 543,000*l.* a year. Their management is open to great objection, especially as regards their out-patient departments. Most of them admit without inquiry, and some on governors' letters used at random, and patients are admitted to their close crowded waiting-rooms in such numbers that proper attention cannot be given to their cases. There is no co-operation, and they have no investigating officers. They have greatly assisted to destroy thrift and independence among the people, and although the boards of guardians have thirty-eight free dispensaries at which all are relieved who are unable to pay even the trifling monthly sum required at provident dispensaries, and also excellent infirmaries for paupers distributed all over London, besides the hospitals for infectious cases maintained by the Metropolitan Asylums Board, no account is taken of all this, and provident institutions are directly discouraged. A small payment from out-patients at hospitals would promote independence and help to pay the cost, as in the case of the Lock Hospital, which collects a large sum of money in that way. The same may be said of the free or "improvident" dispensaries, of which thirty-three receive nearly 26,842*l.* a year, and five for surgical appliances, receiving 9,157*l.* a year, although all poor persons requiring surgical appliances can be supplied free at the Poor Law Medical Institutions. Of this class of charities, spending altogether 96,783*l.* a year, the thirteen provident dispensaries, spending 8,638*l.*, and the thirty-three convalescent institutions 40,265*l.*, and the thirteen nursing institutions, spending 9,181*l.*, seem to be eminently deserving of support. Provident dispensaries, however, should not require external aid after the first two or three years, and convalescent and nursing institutions should be adjuncts to a well-managed general hospital system.

It is said that in London, Birmingham, Bristol, and other large towns, every fourth person is in receipt of gratuitous medical attendance, and by this misapplication of funds the provident system is well nigh impossible."

MONUMENT OF LATE LORD LYTTELTON.

After the death of this lamented nobleman, a number of his Worcestershire friends, by whom he was much esteemed, having resolved to give expression to their regard by the erection of some appropriate memorial, a committee was formed, headed by the Earl of Dudley, Lord Hampton, Sir Edmund Lechmere, M.P., and others, Canon Melville acting as honorary secretary, and liberal subscriptions were obtained. The committee determined upon the erection of a monument in Worcester Cathedral. The late Sir Gilbert Scott, R.A., prepared a design, which was approved of, and has now been carried out. The design is an altar tomb, in the manner of late thirteenth-century work, on which reposes a recumbent statue of the deceased, draped in the robes of a peer. The statue is distinguished by perfect repose, as if asleep. The head inclines slightly to the left side, the left arm resting full length by the side, the right hand resting upon the breast, holding a scroll or parchment, with seal attached, in token of his office of Custos Rotulorum of Worcestershire. The likeness is excellent. The figure, with the four kneeling angels which flank the four corners, are executed in pure white marble,—at present rather too white. The tomb, which is executed in alabaster and different coloured marbles, is enriched with a series of arcbheaded panels, supported by marble columns and carved capitals. These panels are filled with shields, on which are marshalled armorial bearings, illustrating the pedigree of the Lyttelton family, specially arranged by Mr. Tucker, the energetic *Rouge Croix* of the Heralds' College. In addition to the heraldic panels, there are two large circular cusped panels, one in the centre of each side, deeply moulded and filled with bas-reliefs, illustrating, respectively, the Entombment and Resurrection. The cornice and base mouldings are executed in a beautiful bronze-coloured marble, from the quarries of the Earl of Bradford in Shropshire. On the cornice there is a brass bearing the following inscription in raised letters:—

"Hoc · monumentum · in · memoriam · Georgii · Gulielmi · Baronis · Lyttelton · per xxxvi. · annos · hujusce · Comitatus · sub · Victoria · Regina · præsulis · amicii · quidam · lugentes · posuerunt · ex · iis · inter · quos · ut · Dei · Gloriæ · hominumque · saluti · inserviret · operose · laborabat · natus · Martii xxii. A.D. M.DCCCXVII. obiit · Aprilis xix · A.D. MDCCCLXXVI."

The dimensions of the monument are 9 ft. long, 4 ft. wide, and 6 ft. high. It rests upon a step of black Irish marble. The materials have been selected to harmonise with the beautiful pulpit in the nave given by the Earl of Dudley, which was produced by the same sculptor who has executed this handsome and costly Monument of which we are speaking, Mr. J. Forsyth, Baker-street, London. It will be set up in the cathedral next week. It is one of the most successful works of its kind that we know of.

OPEN-MOUTHED PIPES *v.* VENTILATORS.

Sir,—As you have, at the request of Mr. Buchan, published what he calls "results showing the effect the shape of the outlet has upon the speed of the up-current," I hope you will not object, as he has referred prejudicially to my cowl, to give the enclosed (being results obtained by the Metropolitan Board of Works) a place in your journal also.

Plain open and trumpet-mouthed pipes have been tried so long and so often, and have been found so inefficient for the practical purposes of proper ventilation, that for that object they will still probably be generally considered as out of court.

I think it is hardly right that Mr. Buchan should have published his results without informing us of the "conditions,"—the *chief* "conditions,"—under which he carried out his experiments at Glasgow, which, from the results obtained, seem to have been the duplicate of those at Kew, to which he refers. By the only two ventilators which he tested, a Boyle 10-in. soil-pipe (fixed) ventilator was pitted against a 3-in. Banner cowl; the area for exit of air in the Boyle 10-in. ventilator, "with 3-in. pipe attached put on," is as nine to six, as compared with a 3-in. Banner cowl, the latter really being (in proportion) not more than 2¼ in. for exit of air, and as sixteen to six as compared with the plain 4-in. pipe; while, further, according to Mr. Buchan's diagram, the "trumpet-mouthed" and "Boyle" were placed higher above the ridge than the Banner cowl was.

It has further to be noted as somewhat extraordinary, that at *every one* of the wind tests made by Mr. Buchan with the plain open pipe, the trumpet-mouthed pipe, and the Boyle 10-in. (fixed) ventilator, the results obtained gave, in every case, *exactly* so many *hundreds* of feet per minute, while the heavily-handicapped little 3-in. (so-called) Banner cowl had its results given in *tens* of feet.

Ed. Gregson Banner.

Results attained by the Metropolitan Board of Works.

May 18, 1876.—At Greenwich, through a drain of 100 ft. in length, of 4-in. stoneware pipes placed round the yard, and led into a brick shaft 14 in. by 9 in., on the top of which the cowls were fixed:—

	Temperature. In Yard.	In Sewer.
Wind was east, light and variable	55	52

	Feet per Minute.
1st test. The Banner cowl gave a constant up-current of	400
2nd ,, Ditto ditto ditto	600
Total	1,000

	Currents. Up.	Down.	Total Up.
1st test. The open pipe in shaft gave	57	25	32
2nd ,, Not made.			
1st test. The lobster-back cowl gave	150	5	145
2nd ,, The current intermittent—result	—	—	200
			345

June 15, 1876.—At Rotherhithe:—

	Temperature. In Sewer.	In Open
Wind S.W. Velocity 10 miles	64	70

Readings of five minutes each.

		Currents. Up.	Down.	Total Up.
1st test.	Open pipe gave	520	450	470
2nd ,,	Ditto	470		
1st test.	Lobster back cowl gave	350	230	120
2nd ,,	Not made.			
1st test.	The Banner cowl gave	550	720	1,270
2nd ,,	Ditto	720		

Dec. 7, 1877.—At Rotherhithe:—Time of test, 10.40 to 12 noon.

Wind S.W. Velocity at 10.40; feet per minute, 528; at noon, 792.

Temperatures, 54 in sewer, 48 in yard.

No. of Minutes of Test.	Open Pipe, no Cowl.	Weaver's Cowl.	Scott's Cowl.	Down-draught into Sewer.
1	nil	nil	nil	
5	nil	nil	30	100
10	nil	nil	100	
1	nil	nil	29	
5	nil	nil	30	210
10	8	8	60	

Experiments with anemometer, showing currents of air passing up 6-in. shafts.

March 8, 1878.—At Ravensbourne-street, Greenwich. Wind N.W. Speed of Wind, 1,160 feet per minute. Temperature in sewer, 56; in open air, 55.

Time of Observation. A.M.	Time Observing. Minutes.	No Cowl on.	Banner Cowl on.	Scott Cowl on.	Weaver Cowl on.
10.20	1	242	540	500	260
to 1 15 P.M.	5	1,640	2,140	1,800	1,200

Showing a difference, in twenty-four hours,

	In feet.
Between the open pipe and Banner cowl	144,000
,, Scott cowl and Banner cowl	97,920
,, Weaver cowl and Banner cowl	270,720

To state that the Banner cowl has but little exhaust force is to certify that the Giffard Injector and treble-nozzle tuyere are shams.

THE CATHEDRAL ORGAN, SALISBURY.

It is with much regret (says the *Salisbury and Winchester Journal*) that every admirer of Salisbury Cathedral and lover of archæology sees what is now taking place in Salisbury Cathedral for the purpose of blowing the monster organ erected in that edifice. The north transept of this beautiful cathedral is literally turned into an engine-shed, containing the apparatus for supplying wind to the organ. When the instrument was placed in the cathedral it was originally proposed to use water power for the purpose of blowing; but that idea having been abandoned, from causes well known to the public, it was resolved by the Dean and Chapter to erect a gas-engine. Mr. Crossley, of Manchester, a manufacturer of gas-engines, was therefore applied to, and he offered to supply an engine to be erected on the exterior, but connected with the bellows in the interior by a shaft which would give the power necessary for supplying wind to the organ. Accordingly an order was given to Mr. Crossley, and the work was being proceeded with. On Mr. Willis, the maker of the organ, becoming acquainted with what had been done, he refused to have anything more to do with the instrument unless the Dean and Chapter consented to allow him to erect a blowing-engine according to his own plans. The authorities being powerless in the matter—as the tuning of the organ could only be done by the maker or his assistants—they consented to Mr. Willis's wishes, and permission was given to him to carry out his proposals. A fresh order was then given to Mr. Crossley for a gas-engine, which has been placed on the exterior of the east side of the north transept, between two of the buttresses, and it will be enclosed in a stone building with two sliding doors for entrance. This engine is connected by a shaft with an air-pumping engine erected by Mr. Willis, inside the transept, which will supply the amount of wind to the bellows required for playing on the entire organ. It is needless to add that the bellows and the box containing the pumping-engine present a most unsightly appearance in the transept, already disfigured by the erection of huge pedal-pipes, which completely block up one of the windows.

THE ESTATE OF THE HABERDASHERS' COMPANY, NEW CROSS.

Sir,—I have read a short description in your last week's number of the estate at New Cross, belonging to the Haberdashers' Company, with remarks as to the building operations now in progress, and contemplated thereon. My long connexion with the Haberdashers' Company (now for more than thirty years) will, I am sure, plead my apology for saying that your account, although not incorrect throughout, yet contains one or two inaccuracies. There exist no "stipulations," as stated therein, that there should be "strict uniformity in the architectural features" of the buildings erected on the estate, for the advertisement of the ground to be let invites intending builders to "submit their own designs"; but, of course, the Company reserve to themselves the right to accept, alter, or modify them, as they may consider desirable, and I need hardly say that a slavish adherence to "strict uniformity" would not be a course at all advisable to adopt; but while stipulating for a general harmony of design, the Company would certainly allow discretion on the part of those submitting plans, as to details of arrangements and "architectural features," which designs, having been hitherto prepared by men of competence, have not required any alteration or supervision by me, otherwise than that appertaining to my position and duties as surveyor to the freeholders.

The works to the proposed new church have been commenced, as you state, but your correspondent has fallen into an error as to the builder, who is not Mr. Snelgrove, of Gloucester; but Mr. Thomas Collins, of Tewkesbury, who is well known as a church builder, having been extensively employed under the late Sir Gilbert Scott, and also by Messrs. Street, Blomfield, and other eminent ecclesiastical architects. He is also now engaged on the erection of some important additions to a large establishment at Monmouth, belonging to the Haberdashers' Company, the designs for which, together with those of the church above referred to, have been prepared by, and are being erected under my superintendence.

The Architect to the Haberdashers' Company.

VARIORUM.

"Hydrosthetics" is the title of Mr. Thos. Morris's little contribution to the pure water question (Simpkin, Marshall, & Co.). It treats briefly of the Cistern, Drain, and Sewer.——The current number of "L'Art" is a rich one. It includes three plates independently of the text, and a number of engravings on wood and other illustrations.——Guide to Tintern Abbey, by Thos. Blashill, F.R.I.B.A. By adopting a paper on Tintern Abbey, written, after personal examination, by Mr. Blashill for the Woolhope Naturalists, an interesting and reliable guide for 6d. has been obtained for visitors to the ruins of Tintern. It includes a plan and two small views.——"The Advantages of Glengariff as a Winter Health Resort" (R. J. Bush) is the title of a book composed of extracts from known authors and current periodicals in praise of this part of Ireland, including, of course, Killarney. We endorse all that is said about its beauties, they justify any amount of admiration.

Miscellanea.

Another Dig at the Dustbins. — Dr. Whitmore, of Marylebone, says in his last monthly report:—"The most prevalent and objectionable nuisance in the parish at the present time, for the existence of which no shadow of excuse can be offered, is the foul and offensive condition of the dust-bins. In this respect I am compelled to state it as my opinion that the poor are by no means the greatest delinquents. In their dust-bins, undoubtedly, is thrown a deal of decaying vegetable refuse; but in the dust-bins of the wealthy and well-to-do there is added the further and greater abomination of putrefying animal matter. Any person passing through the most aristocratic streets in the parish on a hot, close summer's evening, will constantly have his sense of smell offended by foul emanations arising from the areas of many of the largest mansions, and which, on investigation, would be found to proceed from dust-bins reeking with both animal and vegetable matter in a state of putrefactive fermentation. I need hardly say that this is a nuisance injurious to health, to which the provisions of the Nuisance Removal Acts will apply; but which, I fear, will never be effectually abated until some few of those who are responsible for the evil are convicted and punished."

New Assize Courts wanted for Exeter.—At the last meeting of the Exeter Town Council, the question of the suitability of the ancient Guildhall for the purposes of an assize court,—on which the judges seem to be generally against the citizens,—again came forward. The Mayor (Mr. H. D. Thomas) reminded the Council that at the Spring Assize Sir Fitzjames Stephen consented, on the urgent representations of himself and the Sheriff, to hold his court for the city in the Guildhall, though he had at first intended to try the prisoners at the Castle. When the judges arrived for the Summer Assize he learnt that it was Mr. Justice Denman's intention also to try the city prisoners at the Castle. The Mayor said it was evident the judges had taken a prejudice against Exeter Guildhall, and that they influenced one another. Something should be done to preserve the privileges of the city, and he moved that the letter of the Sheriff be referred to the Guildhall committee. The Mayor stated that there were resolutions on the books empowering the committee to consider the desirability of erecting a new suite of municipal buildings. The motion referring the matter to the committee was carried unanimously.

The Corps of Commissionnaires.—The annual circular of the corps just now published shows that its affairs are in a very satisfactory condition. The number of men on the rolls, about 750, appears to be larger than it ever has been. The committee again record their sense of the indefatigable zeal of Captain Walter, to whom the success of the corps is due. It should be remembered by those needing such assistance as the men can render, that the corps guarantees the honesty and sobriety of all its members, that in case of the illness of a commissionnaire his place is provided for without any cost to them, and that in the event of his death (owing to the provision made for his family) there is no prospect of any claim being made upon them for the support of those left behind. Speaking from long personal intercourse with the men of this corps at banks, the theatres, and other large establishments, we can speak with certainty of their invariable civility and clear-headedness.

Bells for St. Paul's.—The first of a new peal of bells to be erected at St. Paul's Cathedral has arrived. The new peal will consist, when complete, of twelve bells, in all weighing about eleven tons, cast by Messrs. Taylor & Co., of Loughborough, Leicestershire. Each bell bears on one side the emblematic device of the cathedral, and on the other side the armorial bearings of the company presenting it, with the company's motto and the name of the master at the time of the vote. The bells are to be fixed in the north-west tower of the sacred edifice, and in preparation for their lodgment a good deal of interior structural alteration has had to be carried out. Messrs. Shaw, of King Edward-street, under the superintendence of the cathedral architect, Mr. Penrose, have executed the necessary alterations and fittings. The work of preparation has entailed an outlay of about 1,000*l*. We admire bells, but are glad, nevertheless, that we do not reside in St. Paul's churchyard.

Newcastle Industrial Dwellings Company.—The eighth annual report of the directors of the Newcastle-on-Tyne Industrial Dwellings Company recommends a dividend of 5 per cent. per annum. The land for the proposed extensions has been purchased, and the contracts for the buildings let. Two of the blocks are approaching completion, and will in a few weeks be ready for occupation; the remaining two are progressing satisfactorily. Advantage has been taken of our past experience to introduce improvements into the buildings, so as to add to the health and comfort of the occupants. The extensions involve an outlay of about 11,000*l*., and negotiations are pending with the Public Works Loan Commissioners for a loan under the Labouring Classes Dwelling Houses Act, 1866, upon the same. The agent (Mr. John Price (reports that there has been a good and continuous demand for the rooms throughout the year, and all are at present occupied. When the new extensions are finished there will be a total accommodation for 110 families, or about 450 persons, as well as a large room, to be devoted in various ways to the mental instruction and recreation of the tenants. The report was adopted at the annual meeting on Monday last.

International Trades Congress, Paris.—On the 15th inst. the delegates of the London Trades Council held a meeting, Mr. W. Caiger in the chair. The secretary, Mr. George Shipton, read the report of the Executive Committee on the International Labour Congress, to be held in Paris on the 2nd proximo and twelve following days. The report stated that it had been arranged to send a deputation to meet the delegates of trade societies from different nations who would be present at the Labour Congress in Paris, which was for the purpose of "propagating trade-union principles and friendly relations among the working men of France and other countries." The report was adopted. Messrs. George Shipton, Caiger, King, Thompson, and Bray are to go to Paris as the Council's delegates. The report that the French Government had prohibited the holding of the Congress was denied. Among the subjects included in the programme are the wage system; condition of the agricultural workpeople, and the means for their amelioration; taxes and their modifications; education for both sexes; peace and international arbitration; trades organisations and their federation.

Helliwell's Patent System of Glazing.—We should be very much inclined to try this system if we had to put up a greenhouse. It is applicable to covering roofs, suitable for railway stations, mills, factories, weaving-sheds, dye-houses, and workshops, but is specially applicable to conservatories, plant-houses, and orchard-houses. The glass is held on to wood or metal bars by metal clips ingeniously arranged, and there is a saving in cost of the woodwork required for greenhouse and other works. No putty is needed in glazing, and the squares can easily be taken out and repaired by an inexperienced workman. The result of the arrangement is that the whole of the woodwork is covered by glass, and no perishable material is exposed, consequently no outside painting is required. It is necessary that the clips should be of brass or copper, so as not to corrode, and the glass ought to be pretty flat. It seems equally applicable to roofs covered with slate or zinc, and in each case there is a considerable saving of cost in the first instance. It is certainly worth looking to.

Antiquarian Discovery.—Whilst making some additions to Newbattle Abbey, the workmen recently came upon what has proved to be the foundation and base of a chapel in good preservation. The basement of the building is 260 ft. long and about 67 ft. broad, and there are numerous pillars, which are believed to have supported a groined arched roof similar to that of the crypt at present in course of restoration in the Abbey, and which is supposed to have been built about the year 1140. Many elaborately carved stones have been found, and these, with the beautiful moulded work to be seen on fragments of the groined arches and pillars, proved that the mason work must have been of a very superior nature, and in style akin to that of Melrose and Kelso Abbeys. Remnants of the tiled floor, which had been laid in diamond form, are also to be seen. According to the *Scotsman*, the walls were discovered at an average depth of from 2 ft. to 3 ft. from the surface, and over a part of the north wall are spread the roots of a gigantic tree.

Vagrant Wards on the Cellular System, Grimsby.—The new vagrant wards at Grimsby are now complete, and are constructed on the cellular system. The attendants occupy the central part of the building, on one side of which is the men's ward, consisting of six cells, and on the other side is the women's ward, with two cells for women and children, each having a separate entrance. Ventilation is obtained by means of louvres above the roofs of the wards, which are themselves ventilated by means of air-gratings in the outer walls. High and spacious corridors are placed between each set of cells. A bath-room is placed between, and communicating with each ward, and fitted with hot and cold water supply, as is also a lavatory. The buildings are warmed by means of Messrs. Longbottom & Co.'s superheated water system. In the heating-room is placed an apparatus for disinfecting linen. At the rear of the buildings separate yards are provided for the house and the use of the vagrants. The architect was Mr. F. Lowry, and the builder Mr. George Onn.

Tapping the Greensand. —The lower greensand has just been penetrated at her Majesty's Dockyard at Chatham, by a boring conducted by Messrs. Docwra & Son. The stratum was reached at a depth of 903 feet from the surface, and the water has risen so high as to overflow the top of the well. A year ago the boring had been carried down to a considerable depth in the chalk, when the character of the water was unsatisfactory, being brackish. Some years ago Messrs. Docwra & Son tapped the lower greensand at Caterham, but as the boring was very small it became choked with sand. The lower greensand has also been found, somewhat recently at Loughton, in the district of Epping Forest, about four miles south-east of Waltham, an ample supply of water being obtained from this stratum (according to the *Standard*) at a depth of 1,092 ft.

Bideford Fine Art and Industrial Exhibition.—On the 14th the Bideford Fine Art and Industrial Exhibition was opened at the Music Hall by Sir George Stucley, who met the Mayor and Corporation at the foot of the stairs of the Hall, and declared the Exhibition open. For the articles sent in for competition the committee have awarded ten silver and twenty bronze medals, besides 26*l*. in money prizes. In oil paintings, the silver medal is awarded to Mr. G. R. Cooke for a painting of Clovelly Harbour, and the bronze goes to Mrs. B. Davie, of Bideford, for her "Killarney," with certificates of merit to Mr. Sheat, of Exeter, on a picture of Darkham, on the Torridge, and to Alice Horton for her "Fisherman's Daughter." In water-colours the silver medal has been awarded to Mr. H. R. Babb. The architectural bronze medal goes to Mr. R. Bryden.

The Edinburgh Aquarium was opened last week. The building has been erected from designs by Mr. T. B. M'Fadzen, architect. Following the curve of the west end of the Waverley-market, the Aquarium is about 200 ft. long. This area has been screened off from the market by means of an ornamental wooden partition. The promenade is about 12 ft. wide, while the eastern partition wall has been relieved by a collection of paintings illustrative of the ocean and the harvest of the sea. Mr. J. Ciceri has arranged a series of mirrors at the cornice and surrounding the pillars. On the west side of the promenade are the aquarium tanks, which are twelve in number, the majority of them being 16 ft. long by 6 ft. in depth, and the same in width. Next the partition walls are a series of octagon and table tanks.

Social Science Congress.—The arrangements for the Cheltenham Congress are now complete as regards the filling up of the various presidencies of departments. Mr. A. E. Miller, Q.C., one of the railway commissioners, has undertaken to preside over the Jurisprudence Department; the Hon. George Brodrick, that of Education; Mr. W. H. Michael, Q.C., F.C.S., will take the Health; Mr. Bonamy Price, professor of political economy at Oxford, the Economy and Trade; Mr. T. Gambier Parry, that of Art; and the whole will be presided over by Lord Norton. The addresses of the presidents will be delivered one on each day of the Congress.

Recent Developments in Acoustical Science.—Under this heading, a very valuable article, four columns in length, will be found in the *Times* of the 19th inst. It gives a very clear account of all the recent inventions.

Chronological, not Architectural.—A current newspaper paragraph says that the adoption of the New Style is to be discussed at an impending congress of *savants* at St. Petersburg.

TENDERS

For Contract No. 1, Wool Exchange extension, Coleman-street. Mr. F. T. Millar, architect:—

Higgs & Hill	£1,744 0 0
Perry & Co.	1,725 0 0
Langmead & Way	1,600 0 0
Higgs	1,473 0 0
Joselyn	1,433 0 0

For new shop-front, alterations, &c., at 64, Fisherton-street, Salisbury, for Mr. John Evans. Mr. Fred. Bath, architect:—

Pellott, Brothers	£228 0 0
Sawkins	202 16 0
Witt (accepted)	195 0 0

For fitting up offices in Bridge-street, Salisbury. Mr. Fred. Bath, architect:—

Tryhorn	£289 0 0
Pellett, Brothers	238 0 0
Sawkins	230 7 0
Harris (accepted)	195 0 0

Accepted for additions to the Priory House, Salisbury, for Mr. William Hicks. Mr. Fred. Bath, architect:—

Young (excavator, bricklayer, mason, &c.)	£213 0 0
Thornton & Conduit (carpenters and joiners)	167 0 0

For Board Schools at Crew's Hole, for the St. George's Board, Bristol. Mr. Stuart Colman, architect. Quantities by Mr. Deane:—

Walters	£998 10 0
	968 0 0
Wilkins & Hill	910 0 0
Price	895 0 0
Wilkins & Sons	884 0 0
Banner	877 0 0
Crick	868 0 0
Hatherley	850 0 0
Cowlin & Son	827 0 0
Forse & Ashley	729 0 0
Veals (accepted)	

For additional accommodation for 200 children at Ashton Gate Board Schools, for the Bristol School Board. Mr. Stuart Colman, architect. Quantities by Mr. Deane:—

Veals	£795 0 0
Hatherley	694 0 0
Eastabrook	694 0 0
Wilkins & Sons	658 0 0
Beaven (accepted)	598 0 0

For the erection of three houses at Kingston-on-Thames, for Mr. Holt. Mr. Henry W. Beale, architect:—
Wright, accepted.

For new buildings and alterations to premises, Parliament-street, Nottingham, for the Guild Institute Company (Limited). Mr. S. Dutton Walker, architect:—

Vickers	£824 0 0
Lynam	768 8 0
Fish	765 0 0
Mersam	721 0 0
Underwood	717 0 0
Bell & Son	705 0 0
Jelley	680 0 0
Stevenson	646 0 0
Bailey (accepted)	598 5 0

For the erection of a pair of villa residences, Chestnut-road, Plumstead Park, for Mr. A. M. Job. Mr. W. Seckham Witherington, architect:—

Coombs (accepted)	£620 0 0

For warehouse, Bishop's Court, Old Bailey, for Messrs. C. Hoar & Co. Mr. Seckham Witherington, architect:—

Nightingale	£1,260 0 0
Lascelles	946 0 0
Elkington	932 0 0

For rebuilding No. 314, Holborn, for Mr. Bloom. Messrs. Johnstone & Paine, architects:—

Langmead & Way (revised estimate accepted)	£3,832 0 0

For the erection of ten houses in Bradford-road, Sydenham, for Mr. J. Venables. Mr. J. H. Greene, architect.:—

Brand	£2,778 0 0
Prout	2,750 0 0
Jory (accepted)	2,304 0 0
Edey	2,150 0 0

For an additional end house:—

Edey	£475 6 0
Jory (accepted)	379 0 0

For road-making, sewers, and surface-water drains, for the British Land Company (Limited), on their estate at Hadley, Herts. Mr. Henry B. Michell, surveyor:—

Richardson	£3,100 0 0
Keeble	2,816 0 0
Crockett	2,795 0 0
Harris	2,679 0 0
Killingback	2,675 0 0
Jackson	2,570 0 0
Pizzey (accepted)	2,499 0 0

For road-making and surface-water drains for the British Land Company, on their estate at East Barnet. Mr. Henry B. Michell, surveyor:—

Richardson	£1,400 0 0
Keeble	1,387 0 0
Crockett	1,386 0 0
Harris	1,355 0 0
Killingback	1,270 0 0
Pizzey	1,255 0 0
Jackson (accepted)	1,222 0 0

For road-making and surface-water drains for the British Land Company, on their estate at Woodford. Mr. Henry B. Michell, surveyor:—

Richardson	£195 0 0
Jackson (accepted)	188 0 0

For repairs and painting to[thirteen] houses at [Chalk Farm, for Mr. G. J. Smith:—

White	£475 0 0
Rowe	443 0 0
Toms	269 0 0
Gritten	229 0 0
Winkworth	205 0 0

For painting and decorating offices for Messrs. Peek, Frean, & Co., Drummond-road. Messrs. Snooke & Stock, architects:—

Arrowsmith	£798 10 0
Roman & Son	678 0 0
Pritchard	623 0 0
Heeps	571 0 0
M'Lachlan	535 0 0
Greenwood	488 0 0
Ryder & Sons (accepted)	468 0 0

For additions and alterations to No. 50, Hamilton-terrace, St. John's-wood, for Mr. John Fair. Mr. Thos. Harris, architect:—

Atkins	£1,845 0 0
Densham	1,798 0 0
Aitchison & Walker	1,795 0 0
Barber	1,339 0 0

For works at Stockwell Smallpox Hospital:—

Reading	£4,090 0 0
Davis, Brothers	3,894 0 0
Cooke & Co.	3,794 0 0
Blackburn	3,780 0 0
Sawyer	3,456 0 0
Wheeler	3,054 0 0

For an addition and alterations to a villa residence in Lancaster-road, Notting-hill, for Mr. Joseph Platts. Mr. Recardt, architect:—

Petchy	£568 0 0
Whiteley	340 0 0
Davey	317 10 0
Galton	268 0 0

For decorative work to 14, Cornwall-terrace, Regent's Park, for Mr. John Garford. Messrs. Ebbetts & Cobb, architects:—

Steel, Brothers (accepted)	£175 0 0

For the erection of stores, stabling, and shedding at the Central Depôt, Ford-street, Derby (Contract No. 1), for the Derby Urban Sanitary Authority. Mr. Clement Dunscombe, architect. Quantities supplied:—

Bridgart (accepted)	£5,183 0 0

For the erection of a district police station and inspector's residence, Bloomfield-street, Derby, for the Derby Corporation. Mr. Clement Dunscombe, architect. Quantities supplied:—

Bromage (accepted)	£1,470 0 0

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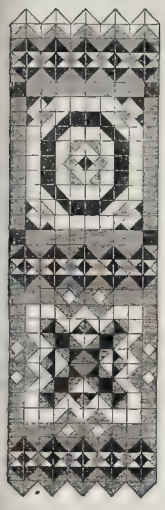
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Notes on Architecture in Palestine.

IF Palestine the building epochs may be enumerated as six in all. First, the Jewish period. Secondly, the Herodian, with which head may be classed the somewhat later Jewish work of the second century A.D. in Galilee. Thirdly, the Early Christian, or Byzantine epoch. Fourthly, the Early Arab. Fifthly, the Crusading. Sixthly, the Saracenic. The modern architecture of the country is scarcely worthy of notice, and nothing has yet been found, in Palestine proper, which can be attributed to the Assyrians, to the Egyptians, or even to the Phœnicians.

1. *The Jewish Period.*

Nothing is more striking than the scarcity of genuine Jewish remains in Palestine, and the almost complete want of Hebrew or Phœnician inscriptions. Not only do no remains exist above the surface, but even by excavation nothing has been recovered except at Jerusalem.

There are, however, no indications in Scripture or in other Jewish writings, to show that the Jews, before the age of Herod, were ever a great building race. The Temple is the only erection specially noticed in the Bible, and even the Temple was built by foreign masons and craftsmen, both in the time of Solomon, and in that of Zerubbabel. The Temple is the only great Jewish building of which any remains have been found, and it is doubtful even in this case whether any of its remaining masonry can be referred back to the time of Solomon.

The various notices connected with buildings in the Bible may also be brought, in almost every case, to show that the buildings were neither magnificent nor very firmly constructed, and the same remark applies to the casual observations found in the Talmud. It seems doubtful, therefore, whether excavation will ever produce very brilliant results in Palestine as far as Jewish architecture is concerned.

The remains found at ancient Jewish sites include caves, cisterns, rock-cut scarps, and rock-cut tombs. It is evident that from an early period the inhabitants of the country were skilled in rock-cutting, and that they lived in caves, as the peasantry still do to a great extent. There are often rude tunnels cut into the hill-side, from which the water of a spring comes forth. The cisterns are generally beehive-shaped, with a man-hole at the top, and from 10 ft. to 15 ft. deep. Rock-cut tanks of great size are also found at some of the old sites.

The most famous example of a rock-scarp is that which formed the foundation of the wall of ancient Jerusalem, at its south-west angle. This was bared to its base in 1874, by Mr. Maudslay, M.I.C.E., and proved to be in one part 50 ft. high. At the corner is a projection 20 ft. square, the base of a tower, with a rock-cut stair from the outer platform of rock; at the east end (as far as excavated), is a second tower and stair. Cisterns are cut in the top of the scarp, and there is, in one part, a ditch in front of it. This solid foundation for the ancient wall reminds us of the solid bases of the great towers, its Hippicus and fellows, mentioned by Josephus. Another rock foundation, 40 ft. high, exists at the north-west corner of the Haram, and this is scarped in the same way with a vertical face, rudely dressed with some kind of pick.

Fortifications of this kind are found in many parts of Palestine. The village of Bittir (Bether), stands on such scarps, partly natural, partly artificial, and the same method of defending a site is noticed by Josephus in describing Samaria.

The rock-cut tombs are, however, of yet greater interest, and a large number were planned throughout Palestine by the survey party. There is no reasonable cause for doubting their great antiquity, for the typical form of these tombs is described in the Talmud, and no examples are known which can well be ascribed to other nations than the Jews. The only Hebrew inscriptions discovered during the survey were found over the doors of these tombs, and in several cases the golden candlestick was represented on the walls. The face of the rock in which the tomb is hewn is generally vertical, but is sometimes cut back to form a square open court in front of the tomb-door. The doorway is very small, 2 ft. 6 in. or even only 2 ft. wide by 3 ft. in height. It is closed in various ways; sometimes by a stone-door, swinging on hinges, and secured by a lock, —hinges and lock having now been removed, being probably of metal;—sometimes by a slab of stone, resting against an inner rim, and secured by a horizontal bar; occasionally by a door which slides up and down; while sometimes the entrance is built up with four or five blocks. The chamber within is four-sided, ranging from 6 ft. to 30 ft. in length, and from 7 ft. to 10 ft. in height. A stone bench, about 2 ft. high and wide, often runs round three sides, and steps lead down from the door to the floor. The roof is generally flat, but sometimes cut to a low arch, or to a triangular cross section. The walls are rudely finished with a pick, or some pointed instrument, and the shape is scarcely ever truly rectangular.

The bodies were deposited in long tunnels, which run in from the walls of the chamber, and they lay with the feet towards the centre, and the head furthest in, at right angles to the wall. These pigeon-hole graves are called *kokim* (plural of *koka*) in the Talmud. They range from 4 ft. or 5 ft. (probably for children) up to 7 ft. in length, and from 2 ft. to 3 ft. in width and in height. The end opening into the chamber was closed by a stone slab, which was plastered over, and in some cases the interior was packed with chips of stone for a distance of 1 ft. or more. The roofs of the *kokim* are sometimes flat, sometimes pointed, and very generally arched out into a semicircular tunnel-vault.

It is interesting to note that in the tombs at Thebes the mummy cases are deposited in the same way as in the *kokim*, in recesses at right angles to the walls of the chamber. Thus the Jewish form of tomb may probably be derived from Egypt. An inner chamber is sometimes reached by crawling through one of the *kokim*. Niches, for lamps, are found in the walls, and sometimes in front of the entrance to the tomb as well.

Several examples were found in the plain of Sharon, in which the chamber was round, and the *kokim* radiated from it. In other cases stone pillows occurred in the *kokim* for raising the head of the corpse by supporting the nape of the neck.

There is no attempt at orientation in these tombs, which depend for direction on the rock only.

By the existence of *kokim* tombs a ruined site is shown to date back to the Jewish period. They occur at nearly all the famous Biblical sites, and their non-existence may be quoted as an objection to any proposed identification.

In the neighbourhood of ancient sites, rock-cut winepresses and rude stone towers are also found, and may probably be of equal antiquity with the tombs. The wine-presses consist of one large shallow trough, with a sloping surface, measuring sometimes 15 ft. side and 1 ft. in depth. A channel leads from this to a deeper and smaller trough, and thence sometimes to a third, 3 ft. or 4 ft. square and 2 ft. deep.

Such wine-presses are found on the hill-side above Jezreel, where perhaps Naboth's vineyard stood.

The rude stone towers appear to have been intended,—like the smaller and less solid ones now built,—to guard the orchards. They are about 15 ft. square, and rather more in height. The corner-stones are sometimes 5 ft. long, and are occasionally dressed, while the rest are quite rude. The lintel-stone of the door is also sometimes well dressed. There is no mortar in the walls, which are very thick. The roof is composed of slabs, 7 ft. or 8 ft. long, resting on the walls, and sometimes on a central pier of similar construction. In one case a semicircular arch of well-dressed stones was thrown from wall to wall to support the slabs. Six or seven of these towers will sometimes occur close together. The great size of their stones indicates their anti-

quity, as the natives never employ such large blocks in building. Such towers are noticed in our Lord's parable of the vineyard (Mark xii. 1).

Ruined oil-presses are also common in Palestine; some are circular, with a stone rolling on end; others have a couple of stone piers, with vertical grooves in them, which seem to have formed guides for a bar descending from the top. No good example has, however, been found to show the precise action of the press. Cylindrical stones also occur in connexion with these grooved piers.

In concluding these remarks as to the more ancient remains in the country, it may be noted that several small but perfect examples of cromlechs were found by Lieut. Kitchener in Galilee, and two more doubtful specimens by Lieut. Conder in Judea.

2. The Herodian Period.

To this period the greater part of the megalithic masonry of the Temple walls is now generally ascribed. It has been found that the curious criss-cross dressing of these stones occurs also on the voussoirs of the Tyropœon Bridge, which does not date earlier than the time of Herod's Temple. An interesting discovery has also been made recently with regard to these walls. In 1873 Lieut. Conder reached the wall at a point previously unexplored near the north-west corner of the Haram, and found the ancient masonry, *in situ*, from the rock to a level higher than that of the inner court. The appearance of the wall is shown in a woodcut in "Tent Work in Palestine" (vol. i., p. 346). At the level of the interior ground it is set back, with a bevelled edge to the stones, and piers are left projecting 1 ft. 6 in. This detail is also observable in the walls of the Hebron Haram, which Mr. Fergusson attributes to the Herodian age. The wall at Jerusalem was also found to have a batter below the level of the bevelled stones, each course being set back 6 in. behind that immediately under it. The horizontal drafts of the stones were in this part 6 in. wide, the vertical ones being 3 in. The object appears to have been to give a more equal effect to the eye. Where the wall is flush, the draft is 3 in. on each of the four edges of the face of the stone.

Scarcely any remains exist of the famous buildings of Herod, at Jericho, Antipatris, Ascalon, Samaria, or Cæsarea. It is very doubtful how much of the work at Masada is really Herodian. The Crusaders have, in the maritime cities, used up the great granite shafts of Herod's colonnades, as through-bonds in their thick walls, or to form jetties to the harbours. The pillars still standing at Samaria have lost their capitals. The shafts are 2 ft. in diameter and 11 ft. high.

Immediately south of Jerusalem, at the conical hill of Herodium, are remains of a large round building with towers, on the hill-top, and of other buildings below, corresponding in position to Herod's palace. The masonry throughout is of moderate size, very well finished, and without any draft. The vaults are semicircular in cross-section, and one small chamber had a well-built dome of fine masonry, resembling the domes of the double gateway on the south wall of the Jerusalem Haram, which Mr. Fergusson attributes to Herod's time.

The tombs of this later period are specially worthy of notice. They are distinguished from the earlier *kokim* tombs, partly by having sarcophagi under arcosolia at the sides of the chambers, instead of *kokim*, partly by the large porches with rock-cut pillars supporting their roofs. The capitals of the pillars have volutes resembling those of the Ionic order, but the attached pilasters at the corners of the porch are generally of the Doric order. The rock inside the porch (which measures 20 ft. to 30 ft. in width, by about 10 ft. in depth) is often cut in imitation of drafted masonry. Sunk places, apparently for metal tablets with inscriptions, such as the Jews employed in the second century B.C., are also found, but only one inscription was recovered, being rudely painted in red, and consisting of the Greek word ΠΑΡΘΕΝΗΣ.

A rock-cut frieze generally occurs above these tombs. The most famous example is that of the tomb of Helena, north of Jerusalem, dating in the first century B.C., according to Mr. Fergusson. In this and in many other examples there are triglyphs with guttæ, and bunches of grapes between. In one case, the doorway had a design of the Greek fret, round the jambs and over the lintel, and a rude representation of grapes and vine-leaves above. In many instances rosettes, wreaths, and geometrical patterns, very well executed, occur between the triglyphs.

New examples of very fine character were found by the Survey party, at Deir ed Derb, in Samaria, and again south of Hebron.

The *loculus* tomb, with a rock-cut sarcophagus under an arch, can now be shown to have been used by the Jews, and to be later than the *kokim* tombs. Numerous transition examples of great interest have been found. In some cases, the outer or older chamber had *kokim*; the inner or newer chamber, *loculi*. The *kokim* were often destroyed in making the *loculi*, and in some cases both *loculi* and *kokim* occurred in one chamber.

The well-known rolling stone, closing the tomb door, is almost always found in connexion with the *loculi*. Only two instances of *kokim* tombs with a rolling stone have been found. This agrees with its use in the Holy Sepulchre, which cannot have been of the class of the *kokim* tombs, as the angels sat at the head and at the foot of the grave. The stone is *in situ* in the tomb of Helena at Jerusalem, standing in the sloping groove in which it rolled. These stones weigh about 6 cwt., and are generally 3 ft. in diameter. They moved like a cheese rolling on its circumference, and had to be pushed uphill to open the door.

To the period immediately succeeding the Herodian age belong also the Galilean synagogues, of which we have now ten well-known examples, without including fragments at *Tairibeh*, and on Carmel, at *Sufsâf*, and possibly the building at *Bekît*.

The oldest appears to be the one at *Irbid* (Arbela), which is stated in Jewish literature to have been built by Rabbi Nitai, who lived 200 B.C. The synagogues of Meirûn, Kefr Birim, and El Jish are said by the same authority to have been built by the famous Rabbi Simeon bar Jochai, the Cabbalist, a member of the Sanhedrim, who lived about 120 A.D. This date agrees with the judgment passed on the architectural style of the buildings by architects, and the fact that they are only found in Galilee agrees also with this view; for at that period the Jewish Sanhedrim sat at various places in Galilee, and Tiberias was the religious centre after the fall of Bether. Rabbi Simeon built twenty-four synagogues, and the similarity of style would render it possible that the synagogues of *Kerâzeh* and *Tell Hûm* may be his work.

The synagogues have lately been noticed in the *Builder*, including that recently found by Lieutenant Kitchener. Their three main peculiarities are: first, the fact that the congregation in entering must have always turned their backs on Jerusalem, as the doors are to the south; secondly, the representation of animals on the lintel-stones, contrary to the second commandment of Moses; thirdly, the use of double columns at the corners of the colonnades.

It is worthy of notice that at Umm el 'Amed the pillars of the synagogue were 160 in. high, their capitals 8 in. high, and the bases 16 in. If the cubit was 16 in. long (as may be deduced from Maimonides), the pillars were thus 10 cubits high, the capitals half a cubit, the bases a cubit.

Among the great public works of the Herodian period may be noted the two fine aqueducts leading to Cæsarea, partly rock-cut and partly of earthen pipes carefully joined, resting on a concrete foundation in a masonry trough, and supported on fine round arches, with a double ring of voussoirs. Where tunnelled through the hill, these aqueducts are reached by winding stairs, cut in the rock, no doubt intended to facilitate the excavation of the tunnel in the first instance, and for drawing water in the second.

To rather a later period the fine Roman roads of the country, with their bridges, guard-houses, and milestones, may be ascribed. They are paved with stone in many parts. The names of the Antonine Emperors are enumerated on one of the milestones, and the lines as now traced are found in many instances on the Peutinger Tables.

3. Byzantine Period.

From the time of Queen Helena's pilgrimage to Jerusalem, and the building of Constantine's basilica in 333 A.D., down to the year 636 A.D., when Palestine fell into the hands of the Caliph Omar, a large Christian population spread over the country, and numerous monasteries and churches were erected, especially in the south, where large Christian villages existed, according to St. Jerome. The architecture of this period is very distinctive in style, and the large majority of the ruins now found belong to this epoch.

We have unfortunately only two dated examples of this period in Palestine itself, though in Northern Syria Du Vogüé has examined many splendid structures of the same style, some of which are dated with exactitude. In Palestine we have Constantine's basilica, built about 333 A.D., at Bethlehem, and the fortress on Gerizim, built by Justinian in 533 A.D., round the octagonal chapel erected by Zeno in 474 A.D. In the first we find columns, with capitals of the Corinthian order, having the cross on each boss between the volutes. These support a very simple cornice, and from above the columns in the central aisle rises a clearstory, once pierced with windows. The capitals are all of one design, and the columns are uniform in dimensions and detail.

In the second example we find the whole of the exterior walls, built of drafted masonry of a peculiar kind, which is found very commonly in the walls of the early chapels and monasteries. The stones are extremely irregular in dimensions, and the courses are not always carried the whole length of the wall at one level. Very narrow courses sometimes occur near the foundations, and high courses above. The stones vary from 2 ft. to 10 ft. in length, and are generally 2 ft. to 2 ft. 6 in. in height. The draft is deeper cut than that of the Herodian masonry at Jerusalem, and is extremely irregular, being sometimes 6 in. wide at one side of the stone, and 3 in. or 4 in. on the other. The boss of the stone is not always of rectangular form. The dressing is rude, and appears to have been executed with a pointed instrument. The boss is always dressed, and projects about 2 in. This masonry was evidently quarried for the buildings in which it is now found, being adapted for its present use, and occurring also in arches and lintel-stones of a size suitable to the width of the entrances beneath.

Another distinctive feature of the style is the character of the vaulting and arches. The stones are smaller than those in the walls. The keystones are very narrow, the haunch stones wide, and the intermediate voussoirs graduate in width from the one to the other.

This peculiarity is found invariably in all buildings of the period. The vaults are semicircular tunnel vaults, and groined roofs never occur, nor are pointed arches ever found.

One of the finest examples yet examined is the monastery of *Deir el Kûlâh*, in Samaria. The cloisters remain almost perfectly preserved, with exception of the roof. The doors have flat lintel-stones over them, upon which the cross is always cut. Sometimes elaborate geometrical designs surround it, and over one door the conventional representation of Calvary occurs beneath it. Over these lintel-stones low relieving arches occur. In one case the stones above were only hollowed out, and no structural arch existed.

The masonry of the interior is not drafted, but the outer walls which rise against the face of the cliff are of large drafted masonry. In the chapel a simple cornice runs round the walls, and above the small window in the apse this cornice is deflected into a semicircular arch. In this building we thus find two of the characteristic features of the architecture of the Golden Gateway reproduced, but, unfortunately, no date has yet been found in connexion with the Samaritan example. The arches and vaults in this building reproduce the peculiarities above enumerated.

The heavy lintel-stones, 10 ft. to 15 ft. long, which were used in the Byzantine monasteries are often the only traces left of the building, the smaller stones having been carried away by the peasantry. In one case a Greek inscription was found on a lintel, which was translated,—"This is the gate of the Lord, the righteous shall enter in."

It may be noted that the vaulting of the Single and Double Gateway passages, and of the Twin Pools, and two others of the Haram vaults, show the peculiarities of the Byzantine arching, above described.

It appears that the form of tomb used at this period was the same as that above described, used in the later Jewish times, but the Christian examples are never found in cemeteries in which *kokim* tombs occur.

At *Belâ*, in Samaria, a tomb of this kind was found with the Greek inscription, ΕΙΣ ΘΕΟΣ ΜΟΝΟΣ, "One God only," and a date which appeared to be probably 332 A.D. In Jerusalem another example was found ornamented with large crosses in red paint, and the letters Α and Ω at the heads of the graves. In the valley south of Jerusalem the same class of tomb is found with Greek inscriptions,—"The monument of certain persons of Holy Sion (a church so-called) from Rome," and again,—"The excellent monument, the tomb of Amarulph of Germany."

The fine tomb, discovered in 1875 in Galilee, the façade of which is given in a former number of the *Builder* (p. 644, *ante*), is also of this period, and with two others is close to a Byzantine church. The façade is covered with a grape-vine, cut in very hard rock, having birds in the branches. On each side of the door is an illegible Greek inscription. The interior has small attached columns, with spiral fluting and rudely-cut Classic capitals. The vine is again cut on the walls, and over each sarcophagus at the back is a boss on which a cross is cut in relief. It is thus clear that the cross is as old as the tomb itself. On the side walls of the open court, before the façade, two lions are rudely represented, and two smaller animals, apparently lambs, with birds and flowers.

Careful plans, sketches, and sections of this curious monument were made by the survey party. A tomb close by has also a cross over the door flanked by two birds in relief. The town where these tombs were found is called Shefa'Amr, and was the ancient Shafram, a place where the Sanhedrim sat in the second century A.D., and which was afterwards considered by the Crusaders to be the home of Zebedee. The ancient Jewish cemetery is at some distance from the church and from the Christian tombs.

To this period also several fine structural tombs throughout Palestine probably belong, having domed roofs springing from pendentives.

The theatre and hippodrome of Beisan are also probably of the Early Christian period, being first mentioned in the time of Julian the Apostate.

4. Early Arab Period.

From the year 636 A.D., when Omar took Jerusalem, until 1099 A.D., when Godfrey recaptured it, few Christian buildings can have been erected.

The wooden building erected by Omar over the Holy Rock in Jerusalem was replaced, according to Mejr ed Din and other Arab historians, by a chapel erected in 688 A.D., by Abd el Melek, on the model of the Chapel of the Chain.

In the eighth century the town of Ramleh was founded by the grandson of the last-mentioned Caliph; but no buildings which can, by inscription or otherwise, be dated as of the period of the original foundation, have yet been discovered at Ramleh.

The early Arabs, as a rule, adapted existing buildings to their own uses (as in the Church of St. John the Baptist, at Damascus), and, with the exception of the buildings at Jerusalem, we hear very little in history of their erections.

5. The Crusading Period.

The most beautiful buildings in Palestine belong to the twelfth and thirteenth centuries. Many of these buildings are dated to a year, and the gradual development of style can be traced in the various example now measured.

The earliest Crusading building was the fortress of Toron, in Galilee (1104 A.D.). The churches in Jerusalem date next with that on Tabor (1110 A.D.), and the fortress of Montreal, east of Jordan (1115 A.D.). The latest work is that at Cæsarea, Acre and 'Athlit, the last strongholds which the Christians held after losing Jerusalem. The walls of Cæsarea and of 'Athlit were built in 1218 A.D. Cæsarea was restored in 1227 A.D., and the history of Crusading architecture closes with the loss of Acre in 1291 A.D.

The earliest examples of Crusading work have much of the heavy character of the earlier Byzantine. The arches are round, and are supported on large columns with capitals of Classic character, the mouldings of the cornices are of the same style, and the masonry is larger than in the later examples.

In the monastery of Ste. Marie la Grande (1140 A.D.) we find this style still in use, but some of the larger arches have a low point.

A magnificent window, photographed by the survey party, exists, close to the belfry. It has a pointed arch, and very boldly-cut dog-tooth mouldings. On the other hand, round arches are found in use even later than 1150 A.D., as, for example, at Samaria.

At Beit Jibrîn a church of St. Gabriel was built about 1134 A.D., and the north aisle still remains. The arches are pointed, but the cornice is still of the heavy Byzantine type, and the columns have capitals of classic design. It is remarkable here, and also at the church in Gaza, that these capitals are in each case of uniform design. The cutting of the leaves and volutes is in low relief, and the work, together with many other examples, seems more probably to have been executed in the twelfth century than stolen from earlier buildings. In this respect these columns contrast with the heterogeneous collection of pilfered capitals, shafts, and bases, which may be found in the Dome of the Rock, and in the Aksah Mosque.

In the later examples the arches are pointed, and ribbed groins occur in the vaulting; the heavy pillars give place to beautiful clustered columns, surrounding solid piers of masonry. The capitals are of most elegant and various design, from the smooth-leaved "crochets" at Samaria, to the deeply serrated leaves at Bîreh (1146 A.D.). The beauty of finish, and the sharpness of outline, in this later stone-work exceeds that of any other period in Palestine.

The masonry used by the Crusaders is very distinct from that of other styles. The stones in the interiors are smoothly dressed, and of small size; those in the exteriors are larger, and have rough rustic bosses. The interior work consists of stones generally 1 ft. 6 in. high, and 1 ft. to 2 ft. in length. The faces have been finished with a toothed chisel, which is often used diagonally, the dressing resembling that of Norman work in England,—a style also remarkable for the small size of the stones.

The diagonal dressing is found (though far more rudely executed) on Saracenic masonry as well as in Crusading work, and the chisel in the last-mentioned style is just as often used horizontally as vertically. A safe distinction is, however, found in the presence of masons' marks, which are peculiar to the Crusading work. Of these great numbers have been collected, including many designs commonly found in English buildings of the same time, and all the letters of the alphabet except D, Q, and X.

The same mark is found in buildings separated by the entire length of Palestine, and in churches built at an interval of fifty or sixty years. In the larger and more important buildings, the variety of marks is much greater. In the church at Bîreh, an arrow-head is the only mark found, and this is repeated all over the walls.

The exteriors of the fortresses have stones 2 ft. to 6 ft. in length, and about 2 ft. high, with a deep draft, and a rustic boss entirely undressed, and sometimes projecting nearly a foot. In two cases (at Sôba and at Kolônia) the draft has a diagonal dressing with a toothed chisel. At 'Athlît (1218 A.D.), the voussoirs of a pointed arch over a postern are of drafted rustic masonry. In the *Kûlât Jalûd*, at Jerusalem, a pointed arch exists in the interior, with drafted stones, having a smooth boss.

From these examples, as well as from many others in Galilee, Syria, and Cyprus, it is clear that the drafted stones were specially quarried by the Crusaders, and were not, as some have supposed, taken from more ancient buildings of Jewish or Phœnician origin.

Some of the ruins of the period may also be recognised by the peculiar character used in the inscriptions, which has been fully described by Du Vogüé. Thus, the fine old monastery of *Kusr Hajlah*, near Jericho, has on its walls frescoes with such inscriptions, by which it is dated as not earlier than 998 A.D.,—a result which agrees with the pointed arches, and which diagonally-dressed masonry found in the ruins.

Many of the Crusading buildings have also *graffiti* in red paint, with dates of the thirteenth and fifteenth centuries.

The thirteenth-century fortresses (as at Cæsarea) are remarkable for the sloping scarps, with very small masonry in extremely hard cement. These sometimes cover the large masonry of the older vertical walls.

The tombs of the Crusading Period are also distinct in character. The rock-cut cemeteries near Crusading sites have shafts sunk in the flat surface, measuring about 6 ft. by 3 ft., and 5 ft. or 6 ft. in depth. On each side of this shaft a recess is cut, under an arch, so that two bodies lay parallel, one on each side of the shaft; a single block of stone covered over the shaft.

These tombs are called *Frank* tombs by the natives, and seem to have been intended for a man and his wife. One example, found at Jerusalem, contained leaden coffins with crosses in relief on the lids. In another case the inscription cut at the back of one of the loculi was as follows:—+ MIMOPIN + ΓΕΩΡΓΙΟ. The crosses showed it to be Christian, and the irregular size of the letters, with the barbarous Greek, seems to date it as belonging to the Crusading period.

6. The Saracenic Period.

The principal Saracenic works are mosques and khans; but the times subsequent to the Crusading were not remarkable for the number of fine buildings erected. At Ramleh the beautiful White Mosque was built in the fourteenth century, and another mosque at Yebnah is dated by its inscriptions about the same time. In Galilee we have some small fortresses of native architecture, and at Acre the mosque of Jezzar Pacha. In Gaza and Hebron there are also mosques built after the expulsion of the Christians, but in the time of Saladin the Christian churches appear to have been used as mosques, and thus the number of original buildings intended for Moslem worship is small.

Saracenic architecture is remarkable for its pointed arches, with voussoirs sometimes of even number, sometimes uneven, the keystone being cut out to form the point. The masonry is less beautifully dressed than that of the Crusaders, and generally of larger stones. Masons' marks never occur. The ornamentation consists of geometrical designs in low relief, and appears very timid in contrast with the fine bold sculpture of the twelfth century.

THE PROGRAMME OF THE STUDIES OF THE ARCHITECT AND OF THE CIVIL ENGINEER.

The programme of the International Congress on Civil Engineering, lately reproduced in our columns, is not one that we can regard with entire satisfaction. As to its merit as a compendious catalogue of the exhibits or contributions of any kind brought before the Congress, we have nothing to say. But we are entitled to expect that a document of this nature should form a sort of skeleton outline of the science of engineering. As such, especially when drawn up with the lucidity of phrase and systematic order which for the most part characterise French scientific works, such a paper might form a contribution of no little value to the science of higher education. As it is, however, the gaps and blanks are almost as conspicuous as the features illustrated. Thus, there is a head, "*Télégraphes pneumatiques*," but not a word as to the electric telegraph, or these wonderful methods now in process of daily improvement, by means of which the electric fluid is employed for the purpose of giving sonorous signals at a distance; or, in the words of Mr. Spottiswoode, electricity is converted into sound. Again, there is a heading "*Inondations: Moyens à leur opposer*," but not a word as to the first essential for carrying out any of these methods, the hydraulic survey of the district liable to the floods. Indeed, the whole question of survey, the very ground-work and basis of civil engineering, is omitted from the French programme.

We hold that a positive injury is inflicted on scientific education by the setting forth of partial details as if they constituted the whole of any branch of study. The tendency of the age is to run into detail. The division of labour is a means of acquiring intellectual, as well as physical, wealth. But the danger of losing sight of the whole in elaborate detail of the parts is great and urgent. Unless the general form of a science or art be kept clearly before the attention of its students, they not only sink into mere specialists, but work in their special branches of study with less advantage than would be the case were their ideas enlarged, so as to appreciate the relation of their particular work to the general advance of the study of which it is an integral part.

We have been very much struck, within the past few weeks, with examples of the mode in which this specialisation of attention appears to have cramped and injured the *coup d'œil* of the architect. It is unnecessary to indicate locali-

ties, further than to say that we speak of a part of the country where pure air, noble prospects, good roads, and comparative sparseness of population are such as to present unusual inducements for the erection of private residences of a high class. Beautiful specimens of old English architecture stud the country, from the cottage and the farm to the baronial or knightly mansion. Men are found to understand these advantages, and to avail themselves of their existence. Money, it is certain, is forthcoming with an unstinted hand. A sort of paradise is open to the architect.

Yet here we find houses rising at costs varying from 1,500*l.* to 15,000*l.* or upwards, the inspection of which, as their plans gradually define themselves in brick, and stone, and mortar, serves to announce the absence of the architect—using the term in its highest sense. It is not that we have to complain of scamping, or of slovenly work. Quite the contrary. The details are often admirable. But the faults that we lament are the want of grasp, of breadth of plan, and of adapting the methods of the builder to the special circumstances of site. Here is a house that we might take as a model in many respects, with the stable-yard crammed —quite unnecessarily—so close to the main entrance as to shut off the garden view, and promise anything but salubrity to the reception-rooms, if the stud be more than a cypher. There we see three or four houses, each, may be, of some pretension to comfort and elegance, stuck so heedlessly in one another's light as to form an ill-adjusted block, where there might have been a picturesque and self-contained group of residences. In another place we see a road so diverted as to cram one house into an ill-shaped triangular garden, commanded by two roads, while the attempt to obliterate the old road by the simple process of planting, without any reference to the rules of landscape or other gardening, has brought a bit of irredeemable Cockneydom into what was a little while since an elegant and picturesque country road. In another place, where at least from 15,000*l.* to 20,000*l.* must be in course of expenditure, where the site commands a magnificent view, and where the preparations for a terraced garden denote a great freedom from any narrow ideas as to cost, we find, rising in the air, instead of a noble mansion, a heterogeneous collection of rooms. A Gothic archway, that might serve for a church, opens into a little insignificant low vestibule, which entirely destroys the *raison d'être* of the gateway. Where a noble oriel window ought to command a broad and diversified view, a chimney is placed, with a small square glazed aperture, called by courtesy a window, on each side. By the doorway, a shapeless window, which looks like that of a buttery, is intended, by some strange caprice, to light a studio or drawing-room. All the details are admirable. No doubt some good examples may be cited for every mullion, every moulding, perhaps every room. But whole there is none,—only a jumble of parts,—and of parts that are petty and inappropriate, when the situation demands the simple and the grand.

Now we cannot doubt that an architect who, at the same time has so much and so little of what is required for excellence in his work as the author of this design, must be a sufferer from a want of that comprehensive, systematic, subordinated programme for his work, the want of which we lament in the Paris programme. Given a site of unusual beauty, and far-reaching view, the first duty of the architect should be so to arrange the chief rooms, and especially the windows, of the house as to take this view as much as possible within,—to make it an unrivalled furniture of the reception apartments. Secondly, we might suggest, the idea of making the edifice a consistent and graceful pile of buildings, as forming part of the view from neighbouring heights, should not have been forgotten. But to make use of such an opportunity for the sole purpose of reproducing Elizabethan mullions, thirteenth-century arch and mouldings, and quaint little windows out of which no one can look, is,—in our view of the case,—not only to waste money, but to sacrifice reputation.

With this view we will attempt to sketch out something of a rough programme of engineering study. Our work must be, necessarily, tentative and provisional. But those who may mend it, not by the criticism or the addition of mere details, but by giving a greater roundness, completeness, and system to the whole, will deserve well of their professional brethren and pupils.

The business of the engineer, then (to return to the Paris programme) contains three main divisions or provinces. These are (1) survey; (2) physical engineering; and (3) mechanical engineering. The head of special or unclassed studies may be added, provisionally, to include those pursuits which are in the course of rapid development, or which have not as yet been sufficiently advanced to be relegated to their appointed stations in the completed system of scientific order.

Survey is the basis of the whole science of engineering. It is either general or special. It ranges from geodesic operations of the first magnitude to the careful exclusion of a bit of sappy timber from a bridge or a door. The antiquity of the work of the surveyor has very recently been illustrated in an unexpected manner. An Assyrian tablet, in baked clay, has just been translated for our pages. It is a deed of sale of a plot of ground, and a plan of the ground in question is attached. This most ancient land survey is more than 2,000 years old. Had the plans of Rome, which were engraved on marble, been copied in terra-cotta, we might at this moment have a more accurate knowledge of the ancient topography of the Eternal City than we have of London in the time of the Conqueror. But it was not till the end of the last century that a trigonometrical survey was generally allowed to be the only accurate basis for mapping a country. General Roy began the trigonometrical survey of Great Britain by measuring his famous base on Hounslow Heath in 1784. In 1802, Major Lambton commenced the mathematical and geographical survey of India by measuring a base-line near Madras. Sir George Everest extended Lambton's "great arc series" across the plain of the Ganges, to the foot of the Himalayas; and when the vast peninsula had been covered with a gridiron of triangles, and a second base was measured in the valley of the Debra Dur, the difference between the computed and the measured length was only 7 in. The height of the loftiest of the Himalayan peaks, named, in fit tribute to the great surveyor, Mount Everest, was determined by measurements of angles by the great theodolite as 29,002 ft. above the sea.

Survey, then, forms the first part of the programme of the study of the engineer. It includes geodesic survey proper, or triangulation, with astronomical determinations of salient points; geographical and topographical delineation; orography, or the contours of the country; geological survey; hydrological survey; and hydrography, or preparation of charts of coasts and estuaries, including soundings and determination of tides and currents. Land survey is an important detail, subordinate to topographical delineation. The shading of hills and delineation of water-sheds, with the preparation of physical maps, ranks under the head of orography. The survey of buildings, and of quarries, mines, forests, and other sources of materials for the engineer and the builder, carries the duties of the surveyor to their limit of detail. We have not spoken of the pioneer surveyor, whose duty, though important, is only provisional.

Each branch of physical engineering is properly based on a branch of survey. The first call upon the engineer is for the establishment of communications. For this purpose, when the first stage of rough work is passed, the orographical and topographical surveys furnish the data. Communications at present are divided into national and international, or exterior and interior; divisions which partly, though not wholly, correspond with that of communication by land or by water. For the former, the engineer has to study the formation of roads, pavements, tramways, and railways; for the latter, he has to provide ports and harbours, to cut canals, and to systematise rivers.

The provision of internal waterways is closely connected with other branches of hydraulic engineering, based on hydraulic survey. Among them are drainage and irrigation,—a study which requires for its completion the survey and regulation of forests and plantations. In the second place ranks the provision for the water-supply of urban districts, and, generally, of the population of the country. Inseparable from the water-supply question is that of sewerage, including the disinfection of its effluent water. Agricultural engineering must be considered in detail under a separate head, but is deeply affected by the system adopted for irrigation and drainage. The details of earthwork, masonry, timber, ironwork, and other element of construction, may be grouped together by the writer or lecturer, but will be studied practically by the pupil as they are carried out on the different public works of which the main characters are above indicated.

Mining, quarrying, coal-mining, well-sinking and boring, form a separate branch of study. It is related, on the one hand, to forestry and woodcutting; and, on the other hand, to metallurgy, smelting, and the making of iron and steel. The civil here comes into immediate contact with the mechanical engineer, whose cradle and school are found in the vast establishments which add forges to furnaces, and not only cast, roll, hammer, and forge, but also, turn, bore, and plane, vast and complex objects of metal.

As the physical engineer gives his hand to the mechanical, so does the latter need much of the knowledge of the chemist. The study of heat has been usually regarded as a part of physics; that is to say, of that *remanet* of natural science which has not yet been portioned out under the name of a special study. But while, on the one hand, the study of heat, as far as its production and its metallurgic effect are concerned, is a part of industrial chemistry, the determination of the relation of heat to motion, which is one of the grandest strides of recent science, renders the study of caloric a distinct part of mechanics. The English thermal unit,—called after the name of its discoverer, Joule's equivalent,—determines the equality of the energy required either to raise 772 lb. for a foot, or to raise the temperature of 1 lb. of water by one degree of Fahrenheit's scale. This elevation of temperature in a pound of water can be produced by the consumption of half a grain of carbon. If water descends freely through a distance of 772 ft., it acquires from gravity a velocity of 223 ft. per second; and if suddenly brought to rest when moving at this velocity, would be violently agitated, and raised one degree Fahrenheit in its temperature. So intimately connected are chemical, thermic, and mechanical phenomena.

The study of mechanical engineering may be described as regarding, in the first instance, the application of natural sources of motion. These are water, wind, and animal power, to which the ingenious labours of Capt. John Ericsson have enabled the engineer to add the radiant heat of the sun.

The readiness with which the force of gravity can be utilised by falling water was perhaps one of the first discoveries in mechanics. The origin of the water-wheel is lost in the remoteness of antiquity. Still more ancient, no doubt, were the simplest contrivances employed, and to this day in use in India, for raising water for the purpose of irrigation. The construction of water-wheels,—over-shot, breast, or under-shot, —of turbines, or of any other apparatus for utilising the mechanical force of a fall or current of water, is falling into neglect in our densely-peopled country. Certainty in command of power is even more essential to the owner of a large mill or factory than economy; and steam is displacing water as a prime motor for that reason. This is not, however, the case in America, in Italy, or in some other localities, where the water-mill is still a very important care of the engineer. In Great Britain, the disuse of water as a prime mover is likely to be fully made up for by its constantly-increasing use as a transmitter of motion. The accumulator principle is one likely to exercise very wide development. Hydraulic rams, presses, gun-carriages, [and second motors of all kinds are daily in course of new application. And the pump, with all its numerous applications, may be studied under this branch of engineering.

The service of wind as a motor power is falling still more rapidly into disuse than that of water. Long lines of windmills may still be seen pumping night and day, whenever there is a breath of wind stirring, to drain our eastern lowlands and fens; but the windmill is becoming more and more rare as a feature of English landscape. That use of the wind which, half a century ago, was one of the proudest peculiarities of the Englishman, whose insular home made him so often a born sailor, has received a last fatal blow from the opening of the Suez Canal. On the China trade, until that great waterway was opened, the sailing clipper ships competed successfully with steamers; the former passage occupying from 90 to 100 days, as against 75 to 80 days for the latter. On this well-known sea-path the course of the winds could be very clearly anticipated. But ships

now run on the Australian line which perform a voyage exceeding 12,000 nautical miles, at an average speed of 11 or 12 knots, and consume only 1,500 or 1,600 tons of coal to drive a weight of 6,000 to 7,000 tons from port to port. Very few sailing vessels of any size are now building; and it is only the yachtsman or the fisherman who is likely long to spread his sails to the wind.

The use of compressed air, as a communicator of motion, however, is advancing together with that of water. The ingenious effort made some thirty-six years ago to avoid the great cost of the self-traction of the locomotive by a pneumatic apparatus, failed, not from mechanical, but from physical causes. As soon as the air in the tube was rarified by the action of the air-pumps, the heat of the earth rushed in, and restored the tension. Thus, the South Devon engines were at work, not only in drawing trains, but in pumping heat out of the earth; and they became almost red-hot in consequence. The use of air as a secondary motor is in its infancy. In some cases, as in mining and tunnelling, highly compressed air performs the double function of moving the perforators, and of ventilating and cooling the works by its escape. It is probable that the employment of compressed air will hereafter receive a great development.

As to the use of animal power, the great object of the engineer at the present day is to dispense with its employment. Among the earliest steps in civilisation may be reckoned the attachment of the bullock to the plough; and, much later, that of the horse, not only to the plough, but to the wagon, the boat, and the coach. The entire period comprised in the history of the application of animal power has witnessed an increase in velocity of work or of transport, from about one mile and a third to sixteen miles per hour. The former is the pace of the bullock in the plough; the latter rate of progress, that of a horse at the fastest trot, was attained by some of the fastest of the English coaches forty years ago. One great disadvantage of animal power is that its cost increases rapidly together with the speed attained. It is not the work done which is the limit of expense; but the wear and tear of the animal tissues. Each creature has its natural pace, or rate of movement; and the most rapidly-moving are also the lightest animals, and those least adapted for performing mechanical work. With machinery the reverse is the case. Speed, in machines, is a great element of cheapness. A machine driven twice as fast as another may do twice as much work in the same time; and although the consumption of fuel is proportioned to the work done, much of the other expense will be proportioned to the time occupied in doing it, so that the financial saving becomes considerable. Indeed, if experiments described in the *American Journal of Sciences and Arts* may be relied on, certain kinds of friction, such as that of journals, decrease with an increase of speed in the revolution of the machinery; a speed of surface revolution of 1 ft. per minute giving 15 as a co-efficient of friction, and a speed of 100 ft. per minute giving a co-efficient of only five. This diminution of cost accompanying increase of speed is an element which tends to the entire displacement of animal by mechanical moving power. It substitutes the steam-engine, or the caloric-engine, for the bullock or the horse, as the slave of man. Little by little it will extinguish the labourer, or the uninstructed man who derives his pay from the sheer exercise of muscular strength. Not a year passes without the substitution of mechanical power for human labour in some new field. The revolution thus in progress is one of more moment than any that the world has yet witnessed. Very long was it stoutly resisted,—and resisted by the very men whose position, it may be hoped, will be elevated by the removal of the burden of toil from their shoulders. This fierce opposition has of late slackened, if not ceased, in this country. It is now rather felt to be the case, very often, that necessary work is shirked, or grudgingly performed, than that the labourer insists on his monopoly of toil. We here touch on a question in which the functions of the engineer bring him into contact with the statistician, with the statesman, and with the philanthropist. But while in newly settled countries, and in sparsely peopled districts, human muscles, and the ready service of the bullock, the horse, the ass, and even the llama, may long retain their present importance as prime movers and sources of power, there seems every reason to anticipate that neither water, wind, nor animal power will be employed as prime movers, except under rare and exceptional cases, in the engineering of the future. To one great exception, however, we have by-and-by to allude.

We cannot do justice to the subject without returning to its discussion. But in closing for the present, we cannot omit to express lively satisfaction at the manner in which the appreciation of the importance of exhaustive and systematic programmes is evinced by the first speaker at the meeting of the British Association. The address of the president is one of which every Englishman may feel proud. Mr. Spottiswoode's tacit protest against a professedly positive, but really negative, attempt to draw a hard-and-fast line to what is to be known, will receive the support of every worker in science, as contrasted with the dreamers in philosophy. Professor Ingram, in his apology for political economy, has taken up our own position,—"That the study of the economic phenomena of society ought to be systematically combined with that of the other aspects of social existence; that the excessive tendency to abstraction and to unreal simplification should be checked; that the *à priori* deductive method should be changed for the historical; and that economic laws and deductions from them should be examined, and expressed in less absolute form. Nor must we omit, in calling attention to the accordance between the views we have long maintained and those now authoritatively put forth at Dublin, to congratulate the president of the Mechanical Sciences Section, Mr. Easton, C.E., on his advocacy of our own proposal, several times urged, for the creation of an administrative department, "charged with the duty of collecting and digesting for use all the facts and knowledge necessary for a due, comprehensive, and satisfactory dealing with every river-basin or water-shed area in the United Kingdom."

THE ST. NICHOLAS ASSOCIATION OF ABERDEEN.

We have received two pamphlets, containing the speeches and resolutions at a meeting held at Aberdeen recently, for the establishment of the Association above-named, and the constitution and rules thereof. As representing a movement which may very well be extended to other towns which are even more in want of it than Aberdeen, the subject has more than a local interest.

The general object of the Association,—called after the "patron saint" of Aberdeen,—is stated in the second clause of the constitution to be "the initiation and encouragement of efforts,—(A) to protect and advance the amenity of the city of Aberdeen and its neighbourhood; (B) to preserve objects of antiquarian, historical, or artistic interest in the city or neighbourhood; (C) to promote the means of open-air recreation for its inhabitants; and (D) to support the magistrates and town council in their endeavours to attain these objects." The rules proceed to give details of the constitution and method of operation of the Association, providing in the usual way for ordinary and special meetings of the council for considering suggestions and special cases that may come within its scope; the extent of the active operation contemplated being mainly indicated in the clause stating that the council will be expected to use its influence with the city authorities, and with proprietors, builders, and others, whose co-operation would be useful in practically carrying out the objects of the Association.

What is the feeling which has prompted the formation of the Association, and in what way its ends are proposed to be accomplished, we learn better from the interesting report of the meeting at which it was constituted, at which the remarks made by some of the speakers showed a great deal of sound sense and judgment, and suggested ideas worthy of consideration by other towns. Mr. John F. White, who presided on the occasion, after observing that the moral and material interests of the town were being well cared for by numerous societies, said that there were still interests that had been overlooked, and a duty to be attended to, that of starting an association which should have for its object to do what is possible to increase the amenity and beauty of the town, and also to provide as far as possible healthy and rational out-door recreation for the inhabitants. The expression "amenity" is rather happily chosen to express the kind of improvement which is desired,—more so even than those who have thus used it seem aware; it is not so much "an old English word" as one speaker said, but an old French word derived from Latin, and subsequently adopted into English, and referring especially, in the first instance, to the pleasantness of places and scenes more particularly. The chairman, in continuing his remarks, said,—

"If we cannot claim such high grounds for public consideration as some of those philanthropic institutions to which I have referred, yet when we consider that our aim is so lofty as to seek that the life of the poorest inhabitant shall be made sweeter and happier, and that our object is also to elevate the tone of the whole community by providing healthy out-door amusements, I do not think it can be said that our object is an unworthy one. We all know how much, as individuals, we are influenced by the circumstances in which we are placed, and how much our happiness is increased if the lines have fallen to us in pleasant places. If this is true of the individual, it is certainly not less true of a community, and so when we turn to our own large cities we cannot fail to be impressed with the depressing and disheartening circumstances and conditions under which the great majority of our fellow townsmen live. It seems to me, then, doubly the duty of every town and community to do its best to provide pleasant surroundings for the benefit of those who are unable to make their homes attractive and cheerful; to let the poorest inhabitant feel that everything that can be done has been done to make his life more tolerable and enjoyable, and to give him interest or proprietorship in every object of beauty the town can supply."

These are very good words; nor do we believe there is any want of goodwill to back them on the part either of the speaker or of others in Aberdeen who are taking up the movement thus initiated. The two questions which seem to have presented themselves most prominently in regard to the working of such a movement at Aberdeen, were the relation of the authors of it to the governing body of the city, and the nature and extent of the natural advantages for carrying out improvements and "amenities." In regard to the first point, there seems to have been a doubtful feeling running through the whole proceedings, as to what the municipal authorities would think of it, -an attitude of compliment to them, as of course enlightened people who would be only too glad to be helped in making improvements of every sort, coupled with an underlying conviction that municipal government was in reality disposed to neglect such matters, and required some spur from without. But the fact is, that official bodies hardly can deal with subjects connected solely with the artistic side of town life. As another speaker, an architect (Mr. Mackenzie), observed, there is not (and we may add there hardly can be in any such case) any power on the part of official authority to condemn, for instance, ugly buildings as such. They can make rules about line of frontage and such matters, and enforce their observance; but to go further than this would be to constitute themselves a committee of taste,—a very uncanny sort of institution under any circumstances; or they may employ a professional man of taste,—in other words, an architect,—and lay down a rule that all designs for new buildings are to be submitted to his approval, in regard to design as well as construction; a still more objectionable state of things, which, if carried out logically, would simply result in all buildings being designed to suit the taste of the town architect, and designs condemned for no other reason than that they were in a style which did not meet his approval. We have known something very like this carried out by a strong-willed architectural official; and how undesirable such a state of things is there is no necessity to point out. This kind of object, the improvement in the outward adorning and artistic treatment of a town, can only be attained by a general and gradual improvement in public taste, leading to a demand for better things, and a less easily satisfied spirit of public criticism; and to this end a non-official society, such as that we are alluding to, may do good work; not by captiously criticising everything that does not suit the taste or theory of its members, but by taking every opportunity to bring before public notice the importance of the beautiful side of things, by calling attention to opportunities overlooked or misused, or protesting against any open and flagrant perpetration of ugliness or disfigurement. Except when the case becomes flagrant,—when something is proposed which in the eye of every educated person is an obvious Vandalism,—it is probable that a society such as this will be more really effective in the end by aiming chiefly at generally educating public taste, than by interfering in detail and in an official manner. It was observed by one speaker at the meeting that Aberdeen had to lament daily "the

fearful atrocities perpetrated in the way of buildings." This is a strong expression, and as far as we remember, Aberdeen has on the whole less to complain of in this way than many towns. But let the architectural "atrocities" be ever so bad in the eyes of competent critics, what individual or what body of men are to take on themselves to draw the line between beauty and ugliness, and to say of a particular design, "This is too ugly,—we cannot allow you to build this; take it back, and make it beautiful?" Such a principle would result at the best in absurdity, at the worst in a kind of petty tyranny. If a man building on a large scale shows a culpable and determined disregard to the appearance of his structures, the Association may, as the phrase is, "make it hot for him," by bringing to bear on him (with more weight and concentration) the same kind of criticism which is generally fired off through the public press; but further than this they could hardly go with effect.

Some of the suggestions for the treatment of Aberdeen and its environs which were made are interesting as bearing on the general question of the relation between art and nature in the laying out or improving of towns. The chairman on the occasion rather dwelt on the desirability of improving the access to places of picturesque character in the outskirts of the town, than of making the picturesque deliberately. Mentioning the various beautiful surroundings of the town, the links, the downs, the splendid stretch of sands, and other places where beauty and healthfulness were provided by nature, he said,—"If we had proper accesses, —avenues, if possible, planted with trees,—leading to these fine surroundings, we should have a result worthy of the town." In regard to one of these "pleasaunces," the sea-beach we remember being struck with the deficiency alluded to here. Few towns can have a finer stretch of sea-shore within easy distance from the streets than that between the months of the Don and the Dee, where the sea comes in gloriously in a high wind; but seldom have we found so much difficulty in getting to the sea when so near it. Sheriff Wilson suggested that the waste and marshy expanse of land between the two rivers should be made into "a great marine park": a very fine and enterprising idea. In a general way, we should be very cautious about attempting to substitute artificial landscape for the wildness and comparative barrenness which is almost characteristic of coast scenery in most places in the higher latitudes; but the particular expanse of land referred to is so utterly without interest or beauty that there can hardly be any question as to its artificial treatment being an improvement. But besides it must be remembered that a modern town is essentially an artificial, not a natural product; and must be more so than ever now that the sanitary arrangement of towns is so much more thought of than it has ever been before, and it is next to impossible that they can be again left to "grow" in any picturesque irregularity which chance may determine. Regarding the matter in this light, we were pleased to notice the phrase made use of by another speaker in the course of the discussion, that he hoped to see "a large work of art" shortly carried out on the banks of the Dee, in the shape of a promenade and carriage drive. The speaker was an architect, and therefore perhaps with an acquired tendency to look at things from an artistic point of view. But there is no question that is the right way to look at it: a town and its environs should constitute "a work of art" on a great scale. And this is the real reply to those people who, allowing a sentiment for the past (a beautiful feeling in itself) to override every other consideration, complain of every improvement which substitutes a straight street for a crooked one, or interferes with the picturesque but often unhealthy tumbledown architecture of old nooks in old towns. Critics of this order would very likely have wanted to stop a town such as Aberdeen in its first great improvement, the making of the long central street (Union-street); they would have protested that it was a spoliation of the old features and character of the town; and so in a sense it was. Aberdeen in its old days was, like most old towns, a work of nature, *i.e.*, of human nature unassisted by science or art; and, from what is left now, we may judge that it was as dirty and unhealthy as such towns usually are. The making of Union-street was the first step towards turning the city into a work of art, and that is the basis on which its further improvements have now to be carried out. The great difficulty and the real success in such a case consists in so blending the artificial outskirts with the natural features of the country that there shall not be any harsh line of demarcation between them; that the town and its environs should appear to arise naturally out of the surrounding landscape; the art in this case being only an application on a larger scale of that which is exemplified in designing a country-house with ornamental grounds.

That such a movement has been set on foot in Aberdeen is matter of congratulation, the more so as it seems to be planned with moderation and common sense. In speaking of the preservation of old buildings, for example, the Chairman pointedly said that no one should allow his own feeling for such monuments to stand in the way of sanitary improvement,—a piece of common-sense which a certain other society would do well to ponder. In connexion with this subject a very valuable suggestion came, it appears, from an able Scottish artist, Mr. G. Reid, R.S.A., who thought the St. Nicholas Association should charge itself with the task of having careful drawings made of old buildings as they exist at the present time, and backed his recommendation by the offer to give his own assistance in doing this very desirable work.

We have given a little space to commenting on the inauguration of this Association for the Promotion of the Æsthetics of Aberdeen, believing that such a movement may not improbably be taken up in other towns, and desiring that it may be, provided always that the line of fair and right interference is not overstepped, and that such associations are not allowed to degenerate (as they sometimes do) into cliques of persons anxious only to recommend or, practically, to force their own views and tastes upon the rest of the community. In Aberdeen there seems to be every wish to avoid this, as it was particularly urged that the association should be made as extended and comprehensive as possible.

It may not be generally known that an association having just the same objects was started a good many years ago in London, but did not remain in operation long.* We want something of the kind sadly now, when these matters are practically in the hands of such a body as the Metropolitan Board of Works. The Institute of Architects is supposed to keep an eye on the doings of that Board in respect of one of their undertakings, but it requires a body embracing wider interests and representing society more comprehensively, to produce much effect.

SANITARY REFORMERS AT PLAY.

We mentioned that three days were devoted by the members of the International Congress on Hygiene, held at the beginning of this month, to excursions in and about Paris, and these were the more pleasurable as they afforded their French hosts an excellent opportunity for displaying their talents as organisers and their virtues of hospitality. The first of these days was spent in a visit to the École Monge in the morning, to the Menilmontant Hospital in the afternoon, and the day was concluded by a grand banquet. The École Monge is, perhaps, the most perfect educational institution for youths in France. The sanitary details are under the management and superintendence of Dr. Passant, and are worthy of the warmest commendation. The dimensions of the class-rooms allow 20 cubic mètres for each pupil. The walls of the dining-room are enamelled, so that they can be washed with a profusion of water. The pupils are constantly drilled into washing their hands and persons. The closets are in a separate block, away from the main building, and a constant draught is created, by means of a shaft and gas-burner, which passes under each pan, and prevents any sewer-gas ascending into the closet and adjacent school. An isolation infirmary has been provided. The dormitories are marvels of cleanliness, and there are adequate provisions for physical exercise in the open air, even when it rains. Finally, the food is plain, ample, and of nutritious quality. The organisation of the school is unfortunately the exception and not the rule, and the foreign delegates will have a very false idea of French sanitation if they imagine that most of the other educational establishments are constructed according to a similar model. The same may be said of the Menilmontant Hospital, which, though open to many criticisms, is, nevertheless, a good institution when compared with a great number of other French hospitals. Indeed, it is questionable whether it was altogether fair to take the foreign delegates solely to these model and totally exceptional institutions. The hospitals of Paris are a disgrace to the nation, and most enlightened French practitioners would have welcomed the moral pressure which the foreign delegates would have brought to bear had they been allowed to visit these seats of infection. The complaints of Frenchmen have been disregarded for many years; but if these social sores were exposed to all Europe, perhaps wounded national pride would awake the administration to a keener sense of its duties. It is incredible that in many hospitals cases of smallpox, scarlet fever, and diphtheria, are not isolated; that in the few places where isolation is practised it is most imperfectly carried out, and that, in many instances, there have been more cases of fever engendered within the hospital,—that is, contracted by patients suffering from some other complaint,—than there were cases brought in from the outside. All these points were, however, kept in the background; and if the delegates are to judge the sanitary condition of France from what they saw during the three days' excursion, they will have a thoroughly false notion of the condition of the country.

These considerations did not prevent the outburst of the most lavish praise during the grand banquet. Some 250 delegates sat down to table, and one and all applauded the greatness of France and the French people. Indeed, it was impossible to resist the eloquent words of welcome pronounced by Professor Gubler, who, as the president of the congress, drank to the foreign delegates:—

"I call you colleagues," he exclaimed, "but I should say brothers, for where can that rare plant, the flower of fraternity, bloom and blossom better if not in our midst, and at a congress of health? Here we have no jealous rivalries, only a generous emulation for the attainment of that which is good. We wage war against all abuses, against all causes that bring about results injurious to our fellows, and with such principles the sentiment of fraternity will naturally dwell in our midst. I drink, therefore, to our foreign colleagues, and specially to the delegates of their governments and learned societies, which are as emanations from other peoples, as the warm sunbeams of their sympathy shining on us. I also ask your permission to drink a personal toast in honour of the Nestor among the hygienists of Great Britain, in honour of Mr. Edwin Chadwick, one of the most illustrious representatives of the science we cultivate."

In returning thanks, Mr. Chadwick spoke of the importance of creating a ministry of public health, and based his arguments on the fact that Lord Beaconsfield had once declared that the preservation of the health of the people should be a prime minister's first duty. The Russian delegate, Baron Maydell, rose as the representative of all the foreign delegates, not to say anything new, "for in Paris it would indeed be difficult to say anything new," but to repeat once more that science could not be restricted by frontiers.

"Science,—that virgin eternally young and chaste, though the mother of thousands of children,—science has equally developed and nurtured us all. It is by the milk drawn from her breast that we have fraternised and acquired strength, and we reject all artificial foods, for they are the true cause of all physical and moral rickets."

Baron Maydell then drank to the health of the nation so "fertile in great geniuses, so amiable in its social intercourse, and which now offers so wide a hospitality: to the health of the great French nation."

The Roumanian delegate thanked the French nation for the many Frenchmen who had helped to civilise his own country, and for the good education many Roumanians had received in France.

The American delegate, Dr. Richardson, of Philadelphia, represented the American Republic in the good wishes she bore to her sister, the Republic of France. As the youngest member of the oldest university of the New World, he thought that this happy combination of the Old and the New uniting together might forecast a good future for hygienic progress.

With such sentiments the magnificent banquet

* The late Mr. William Hickson, of the *Westminster Review*, was the originator, and the conductor of this journal was, at first, the honorary secretary.

concluded, and this brilliant scene, combined with unbounded cordiality, will not readily be forgotten by those who participated in the joyous concourse.

Similar speeches were uttered at the open air lunch given by M. Menier to the members of the Congress who visited his great chocolate factory; inspected his model cottages, rented to his workmen for only 150 fr. per annum, and enjoyed the sight of all the factory children learning in an excellent school built exclusively for their benefit, and where gratuitous but compulsory education is given. The sewers of Paris and the peninsula of Gennevilliers were the points of interest in another excursion, and both proved greatly instructive.

Finally, after the Congress was all over, the foreign delegates gave a breakfast to the president, the secretaries, and the authors of the reports who had organised this sanitary international parliament. This last gathering was a great success, and due in a great measure to the active initiative of Dr. Faure Miller. Professor Gubler was on this occasion equally felicitous. He considered the banquet offered to the French organisers of the Congress as a precious testimony of sympathy, as a feast of the heart, as a family *fête*, but what a large family! We were to constitute a family; there was no superior race; each nation had its qualities. And then, in a magnificent improvisation, he turned to each delegate as the representative, the one of sober Sweden, the other of wise and wealthy England, the other of strong Germany, and finally, after enumerating all the nations, he turned, amidst volleys of applause, to Dr. Pacchiotti, as the poetic representative of regenerate Italy. Such enthusiasm has rarely been witnessed, and something must be accorded to sanitary science, when we think that it has brought German and French to meet fraternally together. Mr. Chadwick's speech we give elsewhere.

Before concluding, we should not omit to mention the official reception of all the members of the Congress at the Ministry of Agriculture and of Commerce, M. Teisserenc de Bort having previously entertained at dinner the presidents and secretaries of the various sections. We hope that, when the International Congress meets in London, one of our Cabinet Ministers will be equally courteous and hospitable. Monsieur Koechlin Schwartz, the wealthy manufacturer, also gave a sumptuous entertainment to the members of the congress, so that their time was fully occupied during the ten days, and every opportunity afforded for the development of those international relations which can but benefit all peoples.

ANOTHER GREAT EXHIBITION.

However indifferent the rest of the world may have grown or learned to feel regarding International Exhibitions, Germany is not yet satisfied with the part she has taken in the great shows of recent years, and she now proposes to hold an Exhibition especially for the manifestation of her own peculiar industries, when we may hope to see that the critics have been unjust in ascribing to the German exhibits at former Exhibitions, the accusation brought against their products, that they are, to use their own expression, "*billig aber schlecht*,"—a phrase of which we are unwilling to give the English equivalent.

It is quite certain that the extraordinarily depressed condition of every branch of industry in Germany at present,—a depression which seems to offer scarcely a gleam of promising improvement, has suggested to the thoughtful manufacturers that a healthy impetus might be given to hope, by the announcement of a great Exhibition to be held in this country within a year or two.

The important industries of the world have had within the last few years four excellent opportunities afforded them of showing themselves in the great international exhibitions which have been held successively in England, France, Austria, and America.

In these exhibitions Germany claims that she has only been suitably represented at Paris in 1867 and at Vienna in 1873. At Philadelphia, proportionately, only a few German firms were represented; of these a great number, and not the most unimportant, had only exhibited because at the last moment they were called upon directly by the Government, so it can with reason be said that the German Exhibition at Philadelphia was only partial, and even as such, was only insufficiently prepared.

Hence it was that the German commissioner believed firmly that he must speak disparagingly from the very first of the German manufacturers, and this fatal cry re-echoed to the furthest limits to which German wares had penetrated.

As is well known, the German Government declined to participate in the Great Exhibition of this year at Paris, and the assent which was given to this conclusion by large numbers of the manufacturing circles showed clearly that International Exhibitions were no longer able to wake the universal sympathy of the world. Indeed, the importance which must be allowed to the Exhibitions of 1851 and 1862 has shown itself more and more wanting in each of the following Exhibitions, notwithstanding their superior pecuniary success. Paris, as a city of pleasure, *par excellence*, was justified in feeling that she might increase her power to avert such difficult financial crises as Austria was obliged to bear in 1873. Many believe that the era of International Exhibitions for the world at large, at least for a time, has passed. Germany, however, who till now has kept aloof, feels the time not far distant when she may be able to hold a successful Exhibition.

The provincial and special Exhibitions which are held from time to time in Germany (such a one as is now open at Hanover) have found more and more favour, and have aroused a wide-spreading and public interest.

To the German mind these circumstances prove that it is by no means the Exhibition in itself, but only as an ostentatious show that in its political aims it has gained discredit in Germany.

The idea of holding in that country a great Exhibition arose, in the first place, from the above-mentioned reasons; but there have been, in addition, very many serious considerations which led to the determination on the part of a large body of the German manufacturers to attempt the carrying out of their plan.

It can scarcely be denied that the insufficient representation of German industry at Philadelphia, stigmatised as it was also by a perhaps unfair condemnation, has caused a bad impression to exist in public opinion abroad, respecting German productions. This misunderstanding cannot fail to have been increased with foreign countries through the non-representation of Germany in the great Paris Exhibition of this year. All these circumstances will be traced back by their foreign competitors to the fact that the five years' crisis has weighed upon no country so severely as on Germany, and the conclusion will hence be drawn that German industry is no longer in a position to compete with the rest of the world.

It might be objected by some as an argument against this view that German exports have within late years greatly increased; but exports, which in many cases can only be sold with loss, point clearly to the conclusion that German goods abroad are beaten out by competition.

All these circumstances united, have seemed to point to the conclusion that a counter-action must be made, and the manufacturers of Rheinland and Westphalia are convinced that an exhibition would serve as a first step in this direction.

Rheinland and Westphalia are the great industrial and producing provinces of Germany. No industry worthy of notice is unrepresented in this extensive district. If Rheinland and Westphalia, or all the western provinces exhibit, then the whole of Germany may be said to exhibit, down to the most important branches, a circumstance which will thus be made known abroad.

The manufacturers of this important, and till within a few years, busily employed district, have met, and in the hopelessness of their serious position, have urged upon their countrymen the plan of an Exhibition, and in a recent meeting have proposed as the most suitable spot in which it might be held, the town of Düsseldorf, the prettiest, the most modern and modernised of the many cities of Rheinland. Düsseldorf has certainly won for itself a world-renown as an art-centre, and it is felt that the connexion of a trade exhibition with an art exhibition, as also the liberal employment of artistic taste in the arrangement and decoration of the Exhibition, will lend an additional charm to the undertaking. Düsseldorf is, thanks to the excellence of its means of communication, easily reached from abroad, more easily perhaps than any other German town, while its situation on the Rhine would involve for most Germans a delightful voyage along that most patriotically beloved and be-legended of rivers.

Though Düsseldorf, undoubtedly, not only as the centre of the chief manufacturing district of Germany, might seem a suitable place for such an undertaking, abounding as it does in urban charms, such as alone are usually found in capital cities, it is more likely, in the event of an Exhibition being held in this country, that Berlin would be chosen as the spot in which German manufacturers could at length have the opportunity, which they say they have so long waited for, of having full power to show the world their industrial strength.

Through the influence of the united European powers, all prospects of war may be considered to have been averted, and a durable peace insured; the German nation, therefore, now looks forward to the near prospect of a rich and rare harvest.

A universal hope is expressed that the difficult burdens which at present oppress the people may be lightened, and a call has been made, not alone on the manufacturers, but on all who are connected with home production, to aid the project of a national Exhibition, and to this end to employ their interest, heart and soul, for the common good of all, so that the country may be enabled to point out what German art and German industry are able to do, and to prove that confidence may be again won, not only at home but abroad, and by this means allow Germany to show that, as she has stood at the head of the world as the most powerful of nations, she is not willing, in the peaceful struggle of arts and industry, to remain behind her competitors and neighbours.

Düsseldorf.

MR. WATERHOUSE ON CURRENT TOPICS.

The following address, by Mr. Alfred Waterhouse, A.R.A., was read at the last general meeting of the Manchester Society of Architects:—

Some of us have recently attended the meetings of the Biennial Architectural Conference held in London, under the auspices of the Institute. These meetings,—whatever may be their direct advantages in the way of increasing our professional knowledge and stimulating our enthusiasm,—have at any rate one great indirect good; they make us better friends, disarm us of jealousies which could not exist if we knew each other better,—make us generously interested in each other's successes, and incline us to work for and trust in one another.

The interest taken in these Conferences outside our profession is also an encouraging sign. The distinguished people who came to our Conference dinner was a proof of this; the half-promise so graciously given by H.R.H. the Prince of Wales to preside at our next dinner was another. It is thought by some,—and I confess I am strongly of their opinion,—that good would result if the Conference did not always meet in London,—that its interest would be increased and the profession generally benefited if a meeting in the provinces alternated with one in the metropolis. I venture to think that a meeting in such towns as Manchester, Liverpool, or Edinburgh would afford abundance of interest to our brethren, and I am sure we should not be slow in offering them a hearty reception should they incline in this way to visit us here.

On looking through the address of the last President, I observed his remarks about the criticism of the Press on ourselves and our doings, which he attributed, in part at any rate, to the hostility of those from whom, as having been of our number, we should have expected a more generous treatment. I entirely agree with him in what he has said on this subject. Yet, on the other hand, may we not be becoming over-sensitive to adverse criticism? Does not the attention bestowed upon our works by some distinguished and cultivated people show a satisfactory interest in modern architecture? and though they may abuse its want of vitality,—sometimes, as we may think, ignorantly,—is it not better for our art that their utterances should be sometimes adverse rather than non-existent? Of all the arts, architecture is the one which most provokes criticism, because it has to do not only with people's æsthetic faculties, but with their comfort and convenience. It does not administer more to the delight of the few than to the well-being of the many. The extreme usefulness of our craft must be a sort of apology for public indignation if the matters of sanitary importance which come

within our consideration are suffered by any chance to miscarry. If we are blamed for what we feel cannot properly be laid at our door, we owe it in great measure to the position of absolute control over our buildings which we have acquired, and which it is certainly for the advantage of our clients that we should in the main exert. But is it not possible that we might do better if, instead of bewailing the injustice of our critics, we compared notes, and by explaining to each other our individual practices we were to endeavour to aim at the best practical solution of those difficult questions which lay us most open to criticism? Take, for instance, the occult art of the drain-layer. Mutual consideration of this problem might convince us of the desirability, in towns, at any rate, of having our drains put in by the local authorities themselves, or by some expert whose credit in the perfection of his work is absolutely at stake; for it cannot be denied that the profession has suffered much from imperfections in work which it is quite impossible for its members to see done in its entirety, and which it often happens that their representatives, the clerks of works, seem hardly alive to the importance of.

But to return to our critics. There are some of them who, though they hit hard, and not always, one is inclined to think, with much taste or discrimination, yet do so openly. They attack us to our face, not behind our backs, and these men, I think, should be held in far different estimation to the anonymous critic. The criticism of the Press must, of course, be to a great extent anonymous, but the editors of our professional papers, at any rate, ought to be able to discriminate between the words of disapproval spoken in the interest of art, and the disappointed utterances of personal animosity and spleen. I think that we have reason to believe that in this respect a better tone has of late years shown itself in our professional papers.

You are aware of the effort of the R.I.B.A. to draw the other cognate societies into closer relations with itself, not with a view of at all destroying their individuality, but in order that the advantages which spring from united action should be more generally felt. I cannot but think that the influence of the R.I.B.A. is powerful and salutary, and that it has a claim upon the support of the country architect as well as upon the metropolitan practitioner.

When the contemplated alterations in the premises are effected, its magnificent library will be still more available than at present, and the rooms in Conduit-street will present many of the advantages of a club to a country member, besides the unique one afforded by the treasures on its bookshelves. The time I trust will not be far distant when every British architect will desire to be admitted a member of the Institute, and then I hope a consistent scale of charges will be maintained, and our practice in this respect somewhat more equalised than at present. I do not only allude to our commission for the ordinary work of an architect, but also to that which is sanctioned in payment of a surveyor in taking out quantities. It is quite true that at present the Institute inclines to close its eyes to this matter. I cannot but think, however, that the time will come, and shortly, when the Institute will feel that its members are as responsible, unless the client himself gives definite instructions in the matter, for the work done by the surveyor and for the charges made by him, as for the excellence of the work done under their own immediate superintendence. The architect, in almost every case, nominates the surveyor, if he is not himself the surveyor, and surely ought to concern himself with the correctness of his surveyor's work and the propriety of his charges; for if the architect do not assume responsibility in this matter, who else is to do it? It is this sense of the duties of our profession towards our clients in this difficult question which has always induced me to believe that the right plan was for the architect to have the quantity-taking of his own works as much as possible under his own control, and when this was impossible, to employ men of the highest integrity and position; and I have sincerely regretted the action of the London Institute in forbidding its members to act in the capacity of surveyors to others of larger practice than their own, for what employment would be more remunerative or instructive to the young architect, with at times little to do on his own account, than, if properly qualified, to take off the quantities of the designs of others; and whom would architects in large practice sooner trust than gentlemen of probity and honour, who were striving to prepare themselves for careers of trust and responsibility? The Institute, I venture to think, will take cognisance of this difficult question, and when once its bearings on the responsibilities of the British architect are seen, such modifications in the bye-laws will be made as will enable it to embrace a much wider circle of practising architects than it can at present.

Manchester being essentially a city of the present,—and let us hope, of the future,—the efforts of its architects have, of course, been directed rather to the development of new works than to the restoration or preservation of old ones, and the somewhat fierce and undiscriminating attack on the restorers made by those who would have everything left as it is, has not, perhaps, much affected many of us personally. It is, however, somewhat interesting to observe that we have, perhaps, about reached the point of time when restoration as it has hitherto been understood and practised may be looked upon as a thing of the past. It has run its course nearly coevally with the career of the great man whose loss we have had recently to deplore, who may be looked upon as the Prince of Restorers, from the enthusiasm, loving care, and immense knowledge and experience of the probabilities of the past with which his operations were pursued, and from the number of the splendid monuments of Mediæval times which were confided to his care. Certainly nothing could have been better than the way in which some of our cathedral and church restoration has been effected. These monuments of the piety of the past have been reclothed in much of their pristine splendour, while the strengthening of their enfeebled parts has not been neglected.

In opposition to the treatment which these structures have received at the hands of Sir Gilbert Scott and his contemporaries and worthy rivals, we now see a determination to keep our ancient buildings as they are,—to reject nothing they contain,—to retain, in the Mediæval church, not only Elizabethan stall-work and Jacobean panelling, but even the pews and galleries which mark the era of our Hanoverian sovereigns, as all forming part of an historic whole, precious to the archæologist of the future. It is impossible to shut our eyes to the reasonableness of this view of the case when not pushed absurdly far. If our ancient structures, while still receiving all reverence at our hands, instead of being made more or less new, within and without, were simply to be kept water-tight, and tied and buttressed as their feebleness might require, they would undoubtedly be more historically valuable, and more picturesque, too, than many of our restored structures. For no doubt there is much to be said in favour of looking at this question from the painter's point of view; the building whose pavement is most worn, whose walls and roof have seen most service, is that which most appeals to our love and our sympathy. Who would not, for instance, have sooner wandered spell-bound over the intricacies of the pavements of St. Mark's before the restorer had begun to replace its stained and broken marbles with perfectly clean and faultless ones? If I am right in thinking that the days of the restorer are nearly over, I think we may be happy in the reflection that the talent which has hitherto been devoted to the endeavour to find out what once was, and to reproduce it, may in process of time find a richer and more profitable field for its display in the production of original work. Most architects, if they be archæological explorers for the greater part of their time, can scarcely be very successful inventors during the remainder: the conservative habit of thought required for their principal occupation has to a certain extent unfitted them for the due performance of their functions as innovating architects. If the purpose and beauty of our buildings were everything to us and ancient precedents nothing, I feel quite persuaded that as artists we should not only succeed in designing satisfactory buildings, but they would have a character of their own quite distinct from anything which has gone before them, and we should at length discover that we had,—without ever intending it or thinking about it,—a new style, a style embracing all the necessities, all the wants and inspirations, of our day, but reflecting no picture of the past. We should have no care about the language of our art, because we should think in it and express ourselves in it quite naturally and without effort, and have all our energies ready to devote to the specialities of each case.

I feel that I may express such opinions as these before Manchester architects with the more confidence, because they have of late years shown themselves freer than most from the trammels of precedent.

Among the many subjects of interest which are engaging the attention of architects is that of *new materials*. And of these I know of none more likely to affect the character of the architecture of the future than Portland cement and terra-cotta. As to the former, we may look to its successful employment in the floors, lintels, and staircases of our buildings, in combination with burnt clay or other incombustible material, with or without an iron core, as giving us a construction not only absolutely fireproof, but of enormous strength and durability. The experiments made by Mr. Hyatt on slabs of concrete, in which wrought iron was embedded, prove that it was of little advantage in such circumstances employing joists of the ordinary H-section; that the upper flange and web could be successfully dispensed with if the concrete properly surrounded the ironwork, the power of the concrete itself above the tie or tension rod (which the equivalent of the lower flange thus became) being sufficient of itself to resist all compression. Mr. Hyatt has also established the important fact that no heat which could be applied to such blocks affect their homogeneity, the wrought iron and concrete contracting and expanding equally and together.

There is no doubt that the great authorities who have spoken and written of brick arching supported on wrought-iron beams as fireproof, even though the upper or lower surface of the beams, or possibly both, were exposed, have, by their teaching somewhat delayed the development of fireproof construction; but now it seems to have been conclusively proved that wrought iron, however dangerous if exposed, yet if completely embedded in a concrete formed of Portland cement and burnt clay, or other incombustible ingredient, is absolutely proof against any ordinary fire.

The other material of the future to which I have adverted is terra-cotta. Our clay is inexhaustible; our quarries, or at any rate some of them, on the other hand, do not appear to be yielding such good stone as formerly; it is increasing alarmingly in price, and the cost of working it, owing to the rise of wages and the trade unions, is no less alarming; while owing to the spead of our large cities, and the deleterious gases which our chimneys are permitted to emit, the power of resistence to atmospheric disintegration, even in the best of stone most carefully selected, seems to be year by year getting less. The most feasible way of meeting this difficulty seems to me to be the improvement of the manufacture of brick and terra-cotta, and the preparation of our designs to meet its special requirements. It is somewhat unfortunate that the South Kensington Buildings, designed by the Royal Engineers, have all been in a style which involves a larger block than terra-cotta can easily be made in to insure accuracy of line, and so even the beauties which the artists of the Department of Science and Art have imparted to the material, has never been able quite to overcome one's regret at the want of truth in the alligument of the terra-cotta work I am alluding to. Of course, there is a difference in the various clays used in the manufacture of this material; but under ordinary circumstances the architect should, I think, endeavour to select a clay which requires no admixture with other clays. From one sort of coal-measure clay he will be able to get terra-cotta of every tint from light saffron or cream colour through every shade of orange-brown, and even purple, according to the action of the fire; from another, every shade of red. It is also easy to obtain other colours (say grey) by amalgamating the staining material (say cobalt) with the clay, running a layer of this coloured clay into the mould first, and then backing up with ordinary clay. Of course, if a block of two or more exposed sides is wanted, it may involve the exclusive use of the coloured clay, and so increase the expense.

For economy's sake, the architect should endeavour to keep his blocks within moderate dimensions (say 15 in. by 9 in. by 4½ in.), though where it is necessary he may use them much larger (say 4 ft. by 1 ft. 4 in. by 10 in.). The clay should be well burnt, even to producing diversity of tint, which is one of the great charms of the material; a wide joint is also of importance, the cement or mortar being well cut back to prevent the edges "flushing." One

of the greatest advantages in the use of the material, however, is the facility with which the blocks can be keyed together. A hundred ways of doing this, to meet his various requirements, will suggest themselves to the ingenuity of the designer.

Though I have now employed this material in preference to stone for some years, and in many cases used thin slabs (1¼ in. in thickness), properly keyed into others surrounding them, 6 in. on bed, as a casing to common brickwork, I have never yet noticed a single case of fracture or decay in any of the blocks.

It is quite true what has been urged against this material, that the ornament, in the general way, must be moulded, and therefore almost of necessity becomes the victim of repetition. The discreet designer will therefore, in all probability, incline to the use of geometric forms for his ornament, which will not suffer from a certain amount of repetition. The omission of forms more or less reproducing nature is the less to be regretted now-a-days, when it is so difficult to get carvers to execute even in stone figures or foliage which can truly be said to marry with the architecture of which they ought to form the chief attractions. I think many will agree with me that our modern architecture is often definitely better without its carving, and so long as this is the case no strong argument can be adduced against terra-cotta on this score. Though if it comes to the highest work of the artist, which it is not desired to repeat in any fashion, no material can be better than terra-cotta. The clay may pass direct from the artist to the kiln, and thence to the building, without a touch from any inferior hand.

It may be as well to add that the ordinary material can be fixed at about 4s. 6d. per cubic foot, and can be easily washed with water, lime stains being removed directly with muriatic acid. The proportion of waste in burning I find to be about 5 per cent.

If I have been somewhat prolix in urging the merits of terra-cotta upon your attention, it is because I have had of late years some experience in its use; and it is perhaps as well, when we address each other, that we should give each other the results of our own experience.

ANCIENT RECLAMATIONS.*

I PRESUME that many visitors to Wisbech on the great occasion of this Congress will, for the first time in their lives, become acquainted with the great English Fenlands, and will, perhaps, at first sight, be little impressed with the scene before them. My object in this monograph, however, is to awaken that just interest which, without doubt, this strange country's story possesses, and if these flat rich pastures, and regions of dykes and dams, may perchance lack some of those stirring tales of chivalry and daring with the recital of which Mr. Motley's pen has consecrated the lowlands of Holland and Zeeland, yet I venture to think that the English fenlands, on their part, have a story of much enterprise to tell. Although happily that enterprise has been more confined to contests with nature than with man, yet even these English Netherlands are sacred to the genius of liberty and freedom, for it was here that the brave Hereward, the "last of the English," as Kingsley calls him, made his stand against the Norman conqueror. That tale had been told so many times, and by such distinguished men, that it will be sufficient to remind you of it. Indeed, I hope that at this Congress, the exploits of Hereward will meet with an abler chronicler than myself. He is a local celebrity, and therefore I must leave him in local hands, that justice may be done him by his countrymen. But, *en passant*, I would draw your attention to a very remarkable common-place form of error, which is that of ascribing all the great and heroic qualities in the world to mountaineers; and forgetting that in the world's story the lowlanders have had an equal, I may say a greater, record of their own to hand up in the Temple of Fame, and have shown quite as great a national life and love of the sacred cause of freedom as their more elevated contemporaries. Thus we see that in the universal desolation which overtook Italy in the destruction of the Roman Empire, a few sand flats in the Adriatic gave a refuge to some bold patriot spirits, where for more than a thousand years Republican Venice defied the despotisms of the world. The struggle of the gallant Dutch Republic in the sixteenth century against the then most powerful empire in Europe is a conspicuous example of the patriotism of the lowlander; but no more striking instances need be sought than those in the story of this English fenland.

In South Lincolnshire there is little doubt but that the three great families of the Hollands, Welles, and Lords of Kyne, made so successful resistance to the Conqueror that an arrangement was made in their favour, so that they might preserve their estates. It was in the fenlands, near Ely, where the great Hereward, five years after the battle of Hastings, established his "Camp of Refuge," and whence he carried on that guerilla warfare which made his name so famous. Later on, in the time of Stephen, we find that Nigel, Bishop of Ely, and Alexander, Bishop of Lincoln, established another camp of refuge on the same Isle of Ely. In the time of John, many partisans of the popular cause fled thither for protection of their life and property; and after the battle of Evesham, in the time of Henry III., the same island became a refuge for the patriot barons, where they were besieged by the King and Prince Edward. Nor did they surrender until, by the "provisions of Oxford," those liberties were secured which were, to use the words of a modern writer, "to prove in no mean degree the foundation of England's greatness."

Thus we see that these lowland plains were consecrated to the genius of freedom; and before I quit this part of the subject, I would draw your attention still further to another remarkable fact,—that just in proportion as we find a country lacking great natural features, so do we find that architecture there develops itself in its most majestic forms; as if the very sameness and monotony of the horizontal landscape induced men to raise lofty piles and spires pointing heavenwards, as thereby seeking to elevate their thoughts above the abject level of the plain. We do not go to Wales or Cornwall or Cumberland to seek our noblest churches, but we find them in flat Lincolnshire, and in the fenlands where we now are. As the plains of Lombardy have developed the fairest of all cathedrals at Milan, so the flat ground by the Ouse at York supports our noble minster. Here, around us, we have Ely, Lincoln, Peterborough, all pointing heavenwards above the lowland plain, as we see abroad the majestic piles of Strasburg, Cologne, Vienna, and Antwerp, rising from similar abject surfaces. The mountaineer's thoughts are carried upwards by the very conformation of the land in which he lives; but the lowlander can alone have his thoughts raised heavenwards by the living labour of his hands, and by his own innate conception of the beautiful, the great, and the good.

Before the drainage of the fenlands was accomplished, the appearance presented by unassisted nature must have been distressing in the extreme. The eye then could have seen nothing but a vast morass, the home of the heron, the wild swan, and the cormorant. A few miserable, half-savage representatives of humanity, perhaps, obtained a precarious subsistence amidst the reeds and rushes of the bogs, and struggled through life amidst frequent attacks of ague and rheumatism. The fens, to those who have not visited them, still possess a bad name; but an inspection of them will dispel the misconception. As the traveller journeys through the district, he will be surprised to find that there is not a more fertile and better cultivated place in the kingdom. On every side he will note rich pastures, abundant corn-fields, and comfortable homesteads, well stocked with healthy cattle. As Cobbett once observed, "Here are the largest beasts and fattest sheep to be found from John O'Groat's to Land's End"; and the general appearance of the population will prove to the observer that this district is now as favoured as any other in these islands. Although he will find the landscape monotonous, the sight of the great artificial canals and drains will in some measure compensate him for the absence of more striking features; and he will be impressed with the evidences of that enterprise and perseverance which has transformed a morass into one of the most smiling and prosperous parts of the kingdom.

My object in this paper is to record as briefly as the limited time allotted to me will permit the various works which have from time to time been executed in this district.

First of all I must explain that the general surface of the fenlands in the neighbourhood of Boston, Spalding, Wisbech, and Lynn, was, near the outfall of the rivers, from 10 ft. to 18 ft. lower than it now is; and it is also supposed, on good authority, that the upper part, even of the great level of the fens was in ancient times at least 5 ft. lower than at present. Hence it follows that the lower part was covered daily by tidal waters, and resembled those salt marshes which are found at this time about these coasts. The upper part, although, as I have said, 5 ft. lower than at present, was sufficiently high to grow forest trees.

The first great engineers who approached the district seem to have been the Romans; to their labours, without question, belong the honour of having erected those stupendous embankments by which this vast tract of country from the sea, and without which neither the towns of Boston, Spalding, nor Wisbech could have been built, as the spring-tides must regularly have covered their sites. It is computed that these immense banks extend for about 150 miles along the old sea border of the fenlands, and a good authority states that at least eleven millions of tons of material must have been used in their construction, or about as much as would on an average be used in making an ordinary English railway of 200 miles long.

It appears, however, that the Romans did not execute the outer bank which bears their name first of all. Other banks in the interior of the district have been attributed to them. The most noteworthy of these, and probably one of the earliest, is that which is called the Raven, sometimes the Roman bank, extending from the Welland, near Cowbit, and running in an easterly direction to the Delph bank, which joins the outer sea-wall. As the Roman occupation extended over some 370 years, it is quite possible that a considerable lapse of time occurred between the construction of the Raven and the outer bank. It is here worth while to note that whereas certain Roman fortresses are said to have been traced at Whaplode Drove, Gedney Hill and Sutton St. Edmund, all just inside the Raven bank, no Roman station has been discovered outside of it in the ground reclaimed by the outer wall. It is necessary to explain here that the formation of great embankments involves considerable difficulties, for although they serve to exclude tidal waters, they on the other hand prevent the escape of the flood waters and natural rainfall of the district, for which some means of escape must be provided. The Romans, with their customary astuteness, seem to have understood this thoroughly, in a way which many great modern engineers have failed to do; and they constructed an immense artificial canal, now known as Car-dyke, which is supposed to have extended at one time all the way from Ramsay to Lincoln. It has been thought that this canal was used by them for purposes of navigation also, from the fact that along it they erected forts at seven places, viz., at Northborough, Braceborough, Billingborough, Garrick, Walcot, Linwood, and Washingborough. But the primary object of the great work was without doubt the interception of the upland interior fresh water and its conveyance to the river.

At the beginning of this century Rennie reverted to the Roman system in draining the east and west fens. The Car-dyke extends for a distance of about forty miles, and it has a width of nearly 60 ft. To show how much the safety of this country depends on these great Roman works, it may be mentioned that in 1810 the sea broke through the sea-wall and inundated the country from Wainfleet to Spalding, causing immense havoc. The town of Boston was flooded, the waters rising as high as the pulpit in the church, and many cattle were drowned, and numbers of corn ricks and hay stacks were swept away.

In considering, however, the permanency of Roman works and their effect upon the modern state of this country, it is important to remember that many of the sites of the ancient Roman cities are now actually occupied by modern towns. Lindum is Lincoln; Causennis, Ancaster; Vainona, Wainfleet; Durobrivus, Castor-on-the-Nene. Cambridge was Camboritum; Durolipons stood probably near Godmanchester; and in Icklingham we have Icano, possibly. Some local authorities seem to make Boston the modern representative of Causennis. The site of the Roman station at Wisbech is in the fork between the ancient beds of the Nene and the Ouze; but the first historical mention of Wisbech appears only in the charter of a grant

* By Mr. J. W. Grover, F.S.A., C.E. Read at the Wisbech Congress of the British Archæological Association.

made in the middle of the seventh century, by Wulfere, king of Mercia (Kemble, Codex Diplom., vol. v., p. 4).

The Romans have left various other traces of their dominions in this country. A village called Colne is supposed to derive its name from a Roman colonia, and lies two miles west of Earith Bulwark, in Hunts., which was a work of the same people. At various other places this encampment has been traced, viz., at Stamford, North Kyme, Horncastle, Burgh, &c. As is usual where there were stations, there were also military roads. The principal ones which have been located hereabouts were:—

1. The Ermine street, which is supposed to have derived its name from Herminius, started from London and passed through Cambridge, Ancaster and Lincoln.

2. The Salt Way branched off from the latter and went to Leicestershire, *vid* Saltley.

3. The Foss Way, which came from Aquæ Solis (Bath) to Newark, and thence to the west side of the Fens, and to Lincoln.

4. A road, name unknown, from Doncaster to the north of Lincoln, thence *vid* Horncastle and Little Steeping to Wainfleet.

5. The Via Devana crossed Ermine-street near Huntingdon and thence to Cambridge.

6. Akeman-street from Cambridge to Ely and Littleport. This road crossed the Little Ouze near Brandon, and passed by Southery and Downham to Lynn.

7. The Icknield way, which was probably a British track, ran south-east to the Fenlands, along a liné from Kentford and Newmarket, thence southwards till it crossed the Devil's ditch.

8. Bullock-road ran from Verulam (St. Alban's) to Chesterton-on-the-Nene; usually considered a British road.

9. The Fen-road commenced in Norfolk, passed on to Swaffham and to Denver, and north of March by Whittlesea to Peterborough.

I give these roads chiefly on the authority of Miller and Skertchley's "Fenlands," page 40.

There is a remarkable statement in Gough's Camden (Introduction, p. 139; 2nd edition, 1806), in which it is said that Sosimus tells us that Probus sent into Britain the Burgundians and Vandals, whom he had conquered, who, settling here, proved of great service to the Romans whenever any disturbance happened. Where they settled I know not, unless it was in Cambridgeshire; for Gervase of Tilbury mentions an ancient camp in that county called Vandalsburg. In another place he says that below Cambridge was a place called Vandalsburg, from the Vandals, who made a camp here, whence they ravaged part of Britain; the plain where they pitched their tents, on the top of a little hill, is trenched round, having only one entrance.

It has been thought by some writers that these Vandals might have been employed in the construction of the Roman reclamation works in the fens. I have been unable to find any good authority, however, for this statement, and the only ground which seems to exist for it is in the fact of the Emperor Probus having been fond of drainage works. Indeed, he lost his life in a meeting of his legions in draining the marshes of Sismisun. Other writers say that the Romans employed a colony of Belgians for the purpose.

I have dwelt thus at length on the works of the Romans, because to them really is due the very existence of dry land at all in the fens. All that has been done since has been to improve and develop only. The stupendous works of these ancient conquerors of the world in excluding the tidal waters by their great sea-walls, rendered subsequent drainage schemes feasible and desirable, and gave the English nation one of its most valuable and fertile provinces. This statement is best proved by the disastrous results which followed a breach in the old Roman dam in 1810, to which I have already alluded.

After the departure of the Romans, when the flood of Teutonic barbarism swept over those islands, the great sea defences were suffered to fall into decay, and the deplorable state of the fens can be gathered from the life of that famous Saxon Saint Guthlac, wherein we hear of "inundations and overflowing of rivers upon the level ground, making deep lakes, rendering all uninhabitable excepting some places which God of purpose raised to be the habitations of His servants who chose to dwell there, for in such places do they (the inmates of Ramsey, Thorney, and Crowland), and many others besides them live, to which there is no access, but by navigable vessels, except unto Ramsey, &c." The story of St. Guthlac is thus given in Dugdale, p. 178, and it is worth quoting, for it gives us some idea of the horrors of the fens in Saxon times:—

"There is in the middle part of Britain (saith the writer of this saint's life) a hideous fen of huge bigness, which, beginning at the banks of the river Grount, not far from the castle bearing that name, extends itself from the south to the north in a very long tract even to the sea; oftimes clouded with mists and dark vapours, having within it divers islands and woods, as also crooked and winding rivers. When, therefore, that man of blessed memory, Guthlac, had found out the desert places of this vast wilderness, and by God's assistance had passed through them, he inquired of the borderers what they knew thereof; who, relating several things of its dreadfulness and solitude, there stood up one amongst them called Tatwine, who affirmed that he knew a certain island in the more remote and secret parts thereof, which many had attempted to inhabit, but they could not for the strange uncouth monster, and several terrors wherewith they were affrighted. Whereupon St. Guthlac earnestly entreated that he would show him that place. Tatwine, therefore, yielding to the request of this holy man, taking a fisher's boat (Christ being his guide through the intricacies of this darksome fen) passed thereunto, and it being called Cruland, and situate in the midst of the lake; but, in respect of its desertness, formerly known to very few; for no countryman before that devout servant of Christ, St. Guthlac, could endure to dwell in it, by reason that such apparitions of devils were so frequently seen there. . . . . Not long after, St. Guthlac, being awake in the night-time, betwixt his hours of prayer, as he was accustomed, of a sudden he discerned all his cell to be full of black troops of unclean spirits, who crept in under the door, as also at the chinks and holes, and, coming in both out of the sky and from the earth, filled the air as it were with dark clouds. In their looks they were cruel and of form terrible, having great heads, long necks, lean faces, pale countenances, ill-favoured beards, rough ears, wrinkled foreheads, fierce eyes, stinking mouths, teeth like horses, spitting fire out of their throats, crooked jaws, broad lips, loud voices, burnt hair, great cheeks, high breasts, rugged thighs, bunched knees, bended legs, swollen ankles, preposterous feet, open mouths and hoarse cries; who with such mighty shrieks were heard to roar that they filled almost the whole distance from heaven with their bellowing noises; and, by-and-by, rushing into the house, first bound the holy man, then threw him out of his cell, and cast him over head and ears into the dirty fen, and having so done, carried him through the most rough and troublesome part thereof, drawing him amongst brambles and briers for the tearing of his limbs."

It seems that some descendants of the ancient Britons inhabited these watery wastes in Saxon times, and were looked upon as even worse neighbours than the fiends themselves; for we read that the saint was disturbed one night by a "horrid howling," whereat he was much terrified, thinking that the howlers might be Britons. Determined, however, to investigate the cause, he bravely turned out of bed, and looked out into the gloomy night air, when he discovered, to his great comfort, that the noises only proceeded from fiends and devils. Finally, however, being provided by St. Bartholomew with a whip, its scourge having three tails, he was able to keep his assailants at a respectful distance. This whip is figured on the Crowland halfpenny, and also on a shield on Knulph's cross.

I give this story to show what an uncomfortable place the fens must have been in Saxon times. To quote the words of an eminent writer:—"We may with great probability look upon the undrained fen as a vast open plain, covered, for the most part, with deep sedge, dotted with thickets of alder and willow, abounding in shallow lakes, temporary and permanent, and overflowed in its lowest parts nearly if not every winter."*

Map of Cyprus.—Mr. Jas. Wyld has issued a new map of Cyprus which will be found a very important contribution to the present knowledge of the island. It includes an agricultural and a geological map.

* The remainder in our next.

LASCELLES'S CEMENT SLAB COTTAGES.

The system of building with cement slabs on a timber or cement framing, patented by Mr. Lascelles, of Bunhill-row, has been before the Institute of Architects more than once, the last occasion being at the discussion on concrete building, at one of the meetings of the Conference of Architects this year. The practical advantages claimed by the patentee for his system are undoubtedly of great importance if realised; though some of them, such as the quality of indestructibility by fire and resistance to damp, are what are common to other forms of building in which cement concrete is used. The specialty of Mr. Lascelles's method is that he gets rid of the necessity for casting walls, as one may say, in a mould, and the consequent difficulty in altering and varying a design with due attention to economy, which is the great drawback to concrete building on the system of packing concrete between boarding. The articles kept in stock for this method of building include "fish-scale tile" slabs, 2 ft. by 3 ft. and 1¼ in. thick; plain slabs of the same size and thickness; lining slabs faced on one side only, and 1 in. thick, the rough side forming a key for plastering; and cement studs with iron in them, 4 in. by 4 in. scantling, for taking the place of timber quartering, and thus rendering the whole house in construction fireproof. The cement studs are not, however, recommended except for very damp situations, or where there is a special reason for rendering a building fireproof; otherwise wood studs are both cheaper and more convenient. The slabs are rebated to keep out wet, and the house may be built either with one thickness of cement slabs outside the framing, or with an inside slab wall also, leaving a space between. With regard to the capability of the single slab wall to keep up the requisite temperature, the author states that he tested one with a thermometer in cold weather, as against a 10-in. thick brick and plastered dwelling close by, and the cement house registered four degrees higher than the brick one. They can be built almost without foundations, at least without deep trench-digging for footings; and Mr. Lascelles has had legal evidence to the effect that they may be regarded as tenants' fixtures (except the foundations), not being built into the ground, and can therefore be removed by the tenant when changing his ground. He adds, not without reason, "that buildings erected to all appearance as solid and substantial as any brick house, and really as waterproof and durable, and which can yet be taken down and carted away when the lease expires, and re-erected in a short time fit for immediate occupation, are absolutely unique."

They certainly are so; and as far as country cottage building is concerned, we expect that this method will be found useful, as it is independent of times and seasons; "the slabs can be kept in stock, so that the building of the house is reduced to the mere screwing together of the materials all dry and fit for use; in fact, the house can be three-parts made in the builder's yard." It seems obvious, however, that such a shell-like method of building as this can only be applied to dwellings on a small scale, and is unfit for towns. It has the advantage, however, over other methods (so far) that it can be made as picturesque as any other method of building a country cottage. The patentee has secured the valuable co-operation of Mr. Norman Shaw to assist him in putting this material into picturesque shape, and publishes a very pretty volume of cottage buildings drawn by Mr. Maurice B. Adams from that gentleman's designs.* Many will, no doubt, be extremely pleased to turn over this book and find that they can have what will be considered to be such picturesque little buildings in a material possessing so many practical advantages, and which has not hitherto received very picturesque development. We cannot but think, however, that even a better result might have been obtained had there been less of archæology and more of architecture in these little buildings. We should never wish to speak otherwise than respectfully of anything produced by Mr. Norman Shaw, but we must confess that we fail to see the reason for thus imitating old rustic buildings in a modern material, unless it be to catch the sympathies of the large class of people who still believe that there is a charm in whatever is old-fashioned in building and something

* Sketches for Cottages: Twenty-eight original Designs. No. 121, Bunhill-row, London.

wrong about whatever is new. Most of these designs, pretty and picturesque as they are, are little more than successful reproductions of various forms of cottages to be found at the roadside in country districts in England, and their merit with many people will be (and we have already heard the remark made) that they look like something old. Our opinion is that here was a real chance for doing something new on the basis of a new material and method, which chance has been deliberately and almost perversely thrown away; for the very surfaces of the cement-slabs are made in what is called by the builder a "fish-scale pattern," to imitate the effect of wall-tiling, and it is promised that the slabs may be stained with an indelible red stain with the same object. All this dressing up of the new material in the old cloak is so much labour thrown away in making a sham. The object should be to find out how to treat the material picturesquely, showing it as what it is. But there is a more serious practical objection to some of these cottage designs, and one which we confess we are really surprised to find in a book put out in the name and under the direction of Mr. Shaw, who in general may claim the unusual merit (with modern architects) of combining with a perception of the picturesque a keen eye to the practical requirements of planning. But here again he seems to have been carried away by his admiration for what is old, even down to nomenclature. He introduces a style of house "common in France and Scotland, but unknown in the neighbourhood of London," in which the beds are placed in recesses in the rooms. There are two rooms, which we must need be asked to call the "But" and "Ben," the old Scotch phrase for the outer and inner rooms so familiar to us in the Waverley novels. Why, in the name of common sense, may we inquire, are we to be asked to talk Scotch in the neighbourhood of London merely to please an architect's archæological fancies, when English has served us all this time? We can only conclude that somewhere between the contractor and his architect the idea of what is really no more than a catch-penny title has got itself in; that the patentee expects that his "but-and-ben" cottages will become a fashion and be in demand. As a matter of worldly wisdom he is very likely right; in London neighbourhoods we fear it may be said that, more than in any other part of the world, it is only necessary to get a good catchword to make a thing go down. The plan of the "but-and-ben" cottage is doubtless economical of space; but we object to it strongly on sanitary grounds. We have constantly had to point out the oversights committed in planning small houses, whereby the inmates are put to sleep all night in the most unventilated corner of the room. But here is absolutely a special provision for the evil in an aggravated form; the beds enclosed in recesses between three walls, and the children's bed actually one-half behind a fourth wall, with only space enough to get in and out: the room being also used all day for a living-room. This is most unhealthy, and a plan which ought not to be adopted in any new cottages. We must be pardoned for saying that when we saw this recommended as a form of cottage in use in Scotland, it immediately reminded us most forcibly of the sluttish northern proverb quoted by Scott in describing Mucklebackit's house in "The Antiquary,"—"The clartier* the cosier," as indicating the Scottish peasant's idea of the perfection of home comfort. The English peasant is quite shy enough of ventilation already, and does not need a house planned especially to foster his tastes in this respect; and we must say we do not wish to see this form of cottage plan become common "in the neighbourhood of London."

Mr. Lascelles has brought out some other building appliances in the way of moulded concrete bricks, &c., which seem likely to be useful, though this will depend a good deal on their cost, of which we have no particulars, nor have these particulars as yet been furnished to the Museum of Building Appliances in Conduit-street, where the materials are to be seen. The moulded bricks for strings appear to be truer in line than hard-burnt bricks or terra-cotta, and harder and more durable than the bricks used for cut ornament; but we must see more of them in use, and have more information as to cost, before positively recommending them.

* *Anglicè*, "dirtier," or, perhaps more literally, "stuffier."

PROPOSED NEW CLUB.

London, although not a geographical centre, is the recognised centre and capital of many important national interests; and naturally so, from its being the seat of the Imperial Government and of the Legislature; the head-quarters of the Army and Navy; the chief emporium and distributor of exports and imports, from its possession of the docks, quays, wharfs, and warehouses of the great "Port of London." It is the capital of many other minor interests, and, *inter alia*, has been the birthplace and cradle of club-life. In establishing clubs of various kinds, for divers purposes, the example of London has, during recent years, been extensively followed in the provinces, every provincial city, or town of considerable population, has now its club, and many of them more than one, but none of these approach the metropolis in the number or variety of such institutions.

The names, presumed objects, and leading characteristics of the most important clubs of Pall Mall and its purlieus,—the club region *par excellence*,—are known, probably, to almost every reader; such, for instance, as the Carlton, the Reform, the Athenæum, the United Service, the Conservative, the Travellers', the Guards', the Royal Artillery, the Army and Navy, the Junior United Service, the Junior Athenæum, &c. The kinds of "birds of a feather" that may be expected to "flock together" in some other clubs are sufficiently indicated by their titles, such as the Alpine, the Arts, the Fine Arts, the Farmers', the Colonial, the Garrick, the Grampian, the Law, the University, the Eton and Harrow, the Oxford and Cambridge Universities, the Volunteer Clubs, the Yacht Clubs, the Coaching, the Four-in-Hand, the City of London, City Commercial, the Oriental, East India, the Athletic, the Skating, the Cricket, the Aëronautical, the Green Room, the Bicycle, with many others, representing political, literary, artistic, scientific, professional, sporting, and other interests. The names of some of the proprietary and other clubs scarcely indicate their objects, such as Boodle's, Brooks's, the Beef-steak, the Cavendish, the Berkeley, the Portland, White's, the Thatched House, Smithfield, the Gresham, and others. If an opinion expressed a few days since at the Guildhall Police-court by the presiding magistrate is correct, it is to be feared that in addition to the advantages that the clubs give to political, scientific, literary, and other interests, they pander to and facilitate the vice of gambling. The opinion he expressed was, that some of these "proprietary clubs" seemed to be little or nothing better than "hells." But there are clubs and clubs, and it may be believed that those in which card-sharpers are tolerated are rare exceptions.

The members of Parliament have their St. Stephen's Club; the Westminster and other engineers, military, civil, and mechanical, have their Whitehall Club; but among all the interests represented, the railway interest is conspicuous by its absence, and it is not to be wondered at that railway officers should be exercised as they are on the subject of founding a club, the advantages likely to result from which should be obvious. "As iron sharpeneth iron, so doth the countenance of a man his friend." It is not intended, we believe, that the projected club should be for chairmen of companies or directors, but for railway officers, who could meet each other in an easy unconstrained way, compare notes on business affairs, and by such interchange of knowledge and experience, strengthen each other and improve all round the capabilities of the members for the discharge of their onerous duties; and, besides, form, probably, many valuable friendships.

In addition to the ordinary advantages offered by clubs, a railway club would be able to extend the special benefit to its members of bringing within their reach the whole of the professional literature of the rail, in periodicals, pamphlets, patents of new inventions, affecting railway working and management, &c. At present, many matters of value and interest, and that would probably greatly increase the efficiency of managers, engineers, superintendents, principal station-masters, and other railway officers, entirely escape their notice, from the impossibility of their commanding, or possessing themselves of the publications or documents in which the information is contained. A well-supplied and ably conducted railway club, library, and reading-room would supply all they need or could desire.

It is true that at the periodical meetings of railway officers, at the railway clearing-house, a species of Railway Parliament is held, at which very important questions affecting railway management and traffic are settled from time to time, but it cannot be too much to say that such decisions would lose nothing in respect of being ripe and well digested, by the free and easy discussion they might receive at the club before being formally tabulated at the Clearing-house, the meetings at which cannot, in the nature of things, serve the same purposes as would be promoted by the designed institution.

Provincial railway officers, we are told, would appreciate such an institution very highly, on account at once of the intercourse and the information it would place within their reach when they come to town.

As regards "ways and means" it would not be necessary to erect a building specially,—that might come afterwards. A good roomy house might be taken in a central situation, and the expenses could be easily met, if the promoters receive the support that they ought to do.

There are fourteen railway companies with London termini, and, adding the clearing-house for fifteen, these might possibly be good for from fifteen to twenty members each. The number of railway officers in the United Kingdom is over 700, a number quite sufficient to provide a proportion of members to make the project a success from the commencement, which it deserves to be. It would be unwise to rely upon the support of honorary members, but there is little doubt that many gentlemen interested in railway property and affairs will be willing to give their support.

CAMBERWELL WORKHOUSE COMPETITION.

In describing the accompanying design, it is needful to say that this competition was a limited one, and that it was decided in the commencement of last year,—for particulars of which the reader is referred to the pages of the *Builder*; he is also referred to some correspondence upon the subject recorded in our pages at the close of the year, and by which it will be seen that this competition must be placed amongst those which have terminated in a manner very unsatisfactory to the competitors generally. It would appear that the design which obtained the second premium, and which is here illustrated, should properly have obtained the first place.

The conditions of the competition required that the workhouse should accommodate 400 able-bodied paupers in equal numbers of each sex, and 100 children, with provision for future extension.

The accompanying plan to scale shows the principal arrangements.

The administrative block shows the disposition of the master's residence, the executive, the kitchen and stores, together with the inmates' dining-halls, corridors, &c.

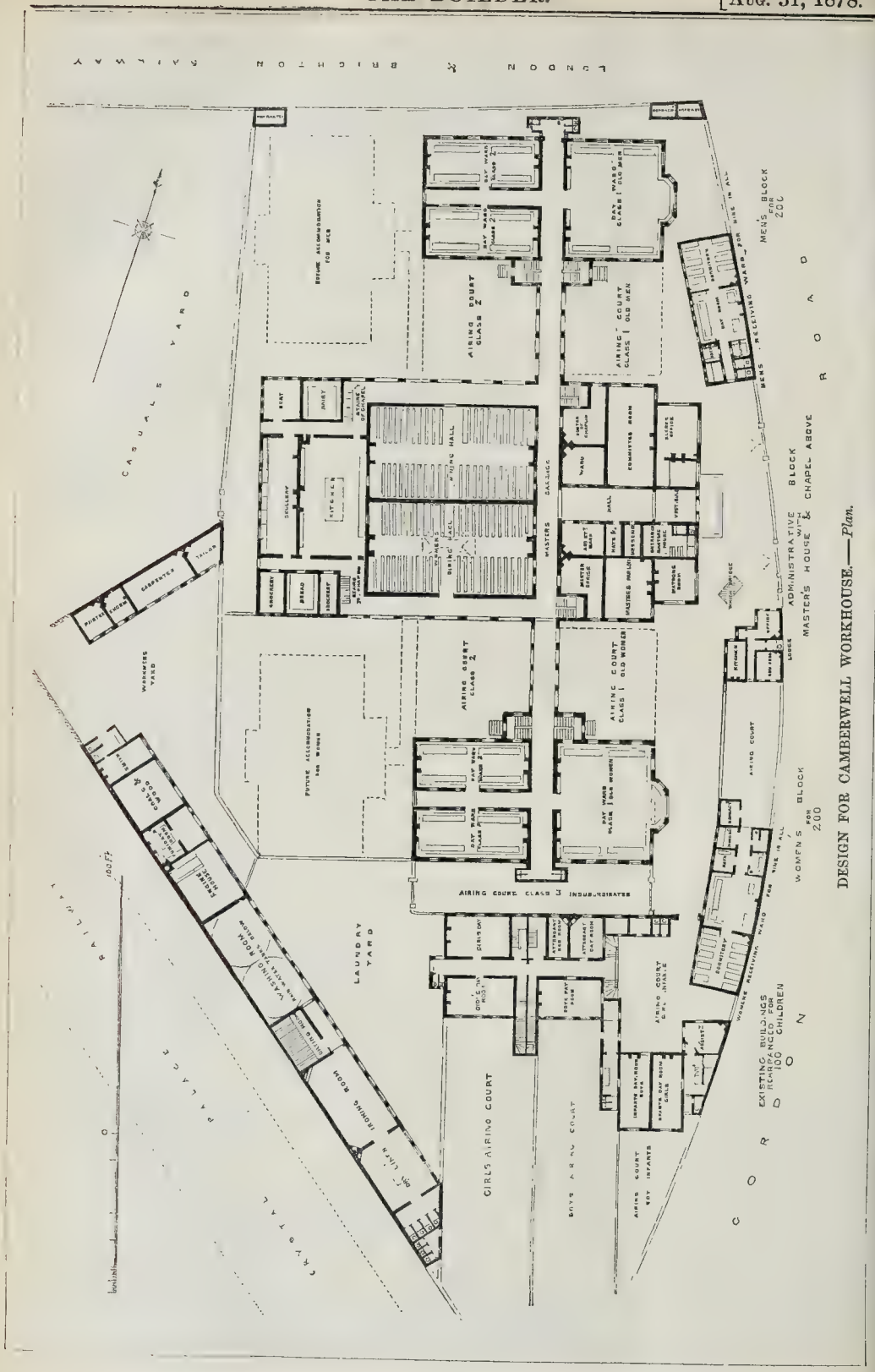
The chief points aimed at in the distribution of the plan are,—the complete separation of the sexes; the subdivision into classes for age and conduct, facility for access, and supervision; continuity of connexion of the inmates' blocks with the administrative, and a covered way throughout; provision against fire, in ample fireproof corridors and staircases; the utilisation of the existing premises, which in this case were to be used for the children, after remodelling the same internally; the provision of as much airing space as possible; and to indicate the maximum for future extension.

The chapel and upper parts of the master's residence would occupy the one-pair floor; and it may be observed that the master's residence is complete and private in itself.

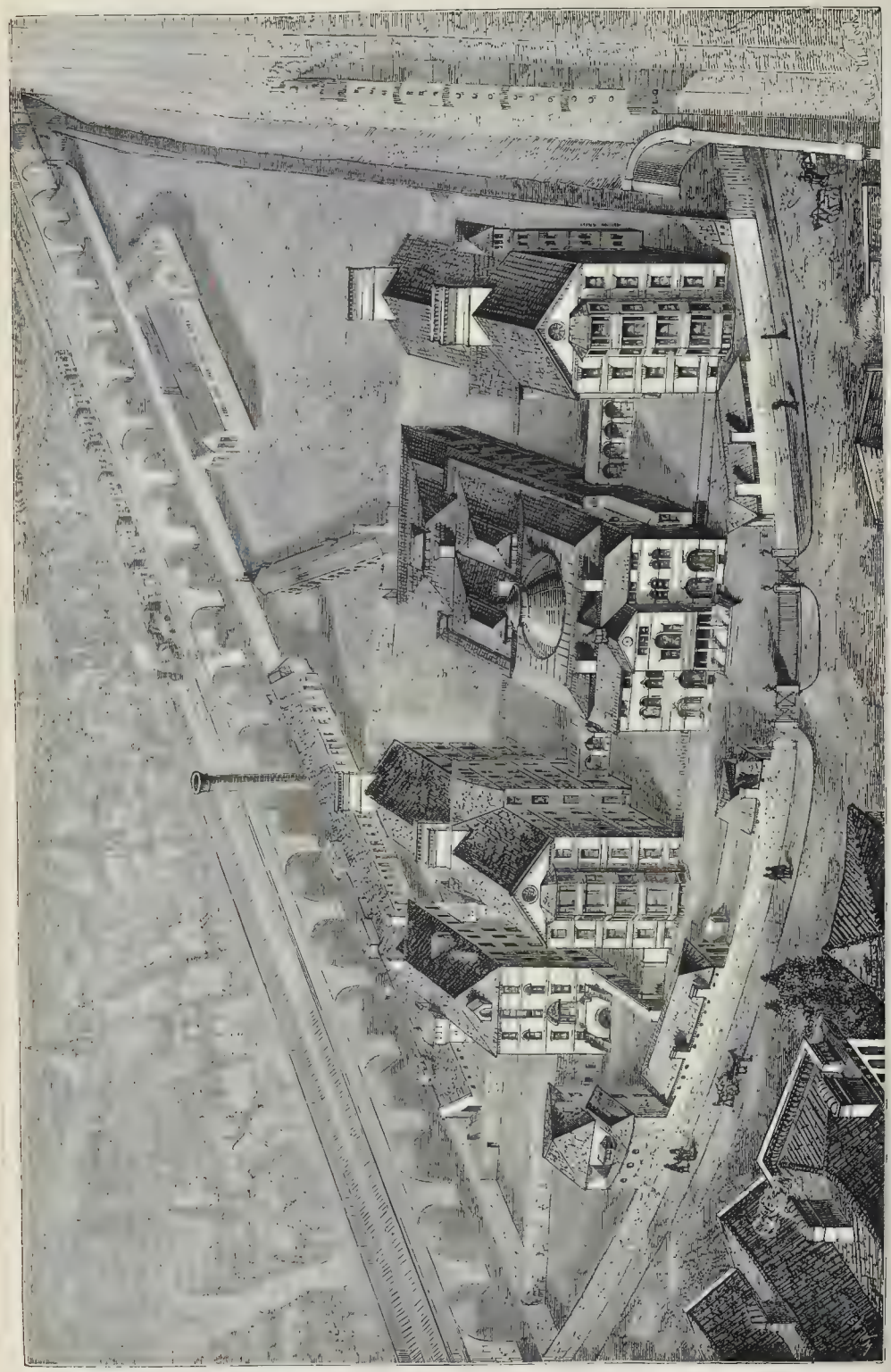
The lavatories and w.cs. to the main blocks are cut off as much as possible from the buildings, and cross ventilated. These also are terminated with ample water-tanks for the supply of them, and for that of the fire hydrants to each floor.

The subsidiary buildings, as the probationary wards, engine-house, laundry, tradesmen's shops, &c., are placed in the most convenient spots that the site would allow, together with a proper drive to connect the whole, and to supply the means of delivery and removal of coals, stores, and other necessaries.

The heating apparatus proposed was the



DESIGN FOR CAMBERWELL WORKHOUSE.—*Plan.*



DESIGN FOR CAMBERWELL WORKHOUSE.—For which the Second Premium was awarded to Mr. R. P. Wheelock.



DESIGN FOR THE UNIVERSITY OF LEYDEN.—For which a Premium was awarded to Messrs. Tarring & Wilkinson.

Gurney stove, with Woodcock's improvements, and so arranged with a system of ducts or fire-proof flues as to supply at pleasure any or all the wards and principal apartments throughout. These ducts were to be formed in the walls as carried up. The whole was so contrived that the apparatus could be cut off entirely from the general traffic. A simple cottage-grate, however, and flue were provided for each ward.

The ventilation was obtained partly by a system of inexpensive sunburners with foul-air extractors, with inlets for fresh air.

Cross ventilation is provided as far as practicable to each ward by means of the ordinary windows.

The elevations are shown grouped in isometrical perspective, to give a better idea of the site, which is peculiar in form and position. The author has chosen for his main front a line nearly parallel to the general chord-line of the curve formed by the roadway. The neighbourhood being a respectable one, and the whole site overlooked by two important railways, he was much influenced by this consideration to render the design as agreeable in appearance as possible, consistent with convenience and strict economy. The style is easy Italian, suited to the nature of the structure.

As to materials, it was proposed to build with good grey stocks, slightly relieved with red stocks to openings, &c., the roofs to be covered with the Broomhall Company's tiles, except where metal was necessary; and internally the construction was to have been Homan & Phillips's fireproof arrangement for floors.

The necessary engineer's works, gas and other fittings throughout, were included in the architect's approximate estimate of 49,000*l.*

The author of this design is Mr. Robt. P. Whellock, A.I.A., of Camberwell.

UNIVERSITY OF LEYDEN.

The architectural taste of the public in Holland has lately been undergoing somewhat of a revival, and although many are opposed to the introduction of novelties, some are energetically endeavouring to promote more artistic views than have for some time obtained, and with this object one or two exhibitions have been instituted.

Last year the Government consented to offer premiums in a competition open to the world for a proposed new university building at Leyden, the professors in that town feeling that the existing buildings were inadequate for their purposes.

As a result, thirty-six sets of designs were sent in from various nations under motto, and the jury appointed proceeded to examine them and reduce their number to eighteen, as being superior to the others, and worthy of a stricter examination. These were reduced to seven, and of these two were afterwards found to be inferior to the remaining five, which were marked as follows, — "Vivat Academia"; "Quis"; "Eigen Kunst is eigen leven"; "Qui hazarde agne"; "Art et Science." Between the authors of these five the amount of the two premiums offered was divided equally. The design named second we illustrate in our present number. It is by Messrs. Tarring & Wilkinson, architects, of Basinghall-street, London.

The plan of the warming and ventilation, to which the instructions called special attention, was arranged by Mr. Wilson W. Phipson.

The total cost of the building was limited between 80,000*l.* and 90,000*l.*, but there is no immediate prospect of the building being carried out.

The design now illustrated endeavours to give a broad and dignified elevation, the details of which, executed in red brick and terra cotta, are freely treated on the basis of some of the old characteristic Dutch architecture.

The plan is carefully arranged to give convenient access to all parts, and freedom of circulation between the various class and lecture rooms and the central students' hall, the ground floor of which is occupied entirely by them as a hall of conversation, having cloak and hat rooms at one end and a buffet at the other. On the first floor of the central hall is the grand picture-hall; and on the first floor of the surrounding ring of buildings are the whole of the examination-halls, and professors', senators', and curators' rooms, as required by the instructions.

The corridors are placed round two large open courts, from which they obtain plenty of light and air, and they give continuous access to all the various rooms and staircases.

A good staircase from the principal entrance is chiefly used by the senate and professors, and for the public on occasions. Four other staircases are more especially used by the students in proceeding from their class-rooms, which are arranged round the outer ring of the building on the ground-floor to their respective examination-halls on the first floor.

The class-rooms, examination-hall, and professors' rooms in each department of law, science, philosophy, medicine, and theology are placed in groups occupying the ground and first floors. A small lecture-room is placed in the centre of the south elevation on the first floor, contiguous to the corridors of approach appertaining to the great hall, having the hall-keepers' and porters' rooms and a public entrance underneath the same, and two students' staircases and entrance, one on each side.

MATTERS OF INTEREST FROM THE DUBLIN CONGRESS.

The Congress of the British Association, held in Dublin within the past few days, has been marked by a larger attendance than that known at any of its previous yearly gatherings. Of the President's remarkably thoughtful address we spoke last week at some length, and we also gave summaries of some of the papers read. We now give abstracts of such other papers read before the various sections as can be considered as coming within the purview of this journal.

Science and the Universities.—The Chemical Section was presided over by Professor Maxwell Simpson, who in his opening address expressed regret that the Universities of Oxford and Cambridge, with their splendid revenues, contributed so little for the advancement of physical science. He hoped that the day was not far distant when the fellowships of a few of them which now went to reward young men for merely passing a good examination should be given without reserve to men who had advanced human knowledge in any department. The Government should take into its own hands the appointments to all scientific chairs in the universities. It had taken primary instruction under its control, and quite recently in Ireland intermediate education to a great extent, and he trusted from that there was a disposition on their part to assume the direction of higher education.

Several papers were then read, including one by Dr. Wallace, who reported as to the best means of developing the light from coal gas.

Changes in Coast-lines.—In the Geographical Section, Dr. Phené read some notes on "Geographical Variations on the Coast of France." He drew attention to a new and important field of research in which French geographers had engaged. M. Ernest Desjardins was foremost in the work, and had published the first tome of a work in which littoral comparisons were given of the forms and dimensions of the coasts from the oldest sources obtainable, frequently going as far back as the first century of our era. The new branch of geography brought to light ports where kings and conquerors had embarked or landed, which were no more, sometimes being entirely washed away, with the former coasts evidenced often by the remains of submerged forests, or, on the other hand, found far inland silted up by the action of the sea. Such examples abounded along our own coasts. Thus, St. Michael's Mount, in Cornwall, was known in the old British language as the "Hoar rock in the wood." Old data fast being obliterated would obtain for such purpose a new interest, and instead of sinking into oblivion, or being classed with the dusty rubbish of an antiquary, would be read with a fresh and lively interest by modern men of science.

Kent's Cavern, Torquay.—In the Geological Section Mr. Pengelly read his annual report "On the Exploration of Kent's Cave," situated in a hill in the neighbourhood of Torbay, in Devonshire. A committee upon which he, with Sir John Lubbock and Mr. Boyd Dawkins, acted, had been appointed to explore it, and he now was prepared with the results. After giving the dimensions of one portion of the cavern, named the Bear's Den, Mr. Pengelly stated that on entering a chamber leading from it, the floor was found to be a complete pavement of blocks of limestone, some of them of considerable size. Their removal disclosed an almost horizontal bed of the typical breccia, the most ancient deposit yet found in the cavern. The chamber measured about 30 ft. from north to south, from 7 ft. to 13 ft. from east to west, and from 8 ft. to 13 ft. from the roof to the bottom of the excavation. The only objects of interest found in the chamber were four pieces of bone. He had in his possession over 7,000 boxes of specimens taken from this cavern. Another part of the cavern, called the Tortuous Gallery, yielded twenty-six teeth of bears, several of them in pieces of jaws; one tooth of the horse; several bones and pieces of bone; three bits of coarse, friable, black pottery, and a piece of black flint, in all probability to strike light. In the part of the cavern called the Undervault, were found forty-seven of the bear, thirty-three of the hyæna, and two of the fox, fragments of bone, and the greater part of a large quartzite pebble. Many of the teeth of both the bear and the hyæna were in jaws or portions of jaws.

Irish Land and Property Laws.—In the section of Economic Science and Statistics, Mr. Murrough O'Brien read a paper "On the Irish Land Act, asserting Mr. Bright's scheme to be the only feasible economic solution of the land question, if accompanied with an easier system of transfer. Mr. Monahan, Q.C., followed with an essay "On the Codification of Law as to Sales of Property." Dr. Hancock mentioned some impediments to the prompt carrying out of some of the principles conceded by the Legislature in the Irish Land Act, and Mr. F. Nolan read an essay "On the Creation of a Public Commission to Purchase Land for Resale to Occupiers in Ireland."

Irish and Cornish Prehistoric Monuments.—In the Anthropological Section, Miss A. W. Buckland read a paper entitled "The Prehistoric Monuments of Cornwall as compared with those in Ireland." She stated that archæologists were of opinion that the prehistoric monuments of Cornwall were the work of the same race as those of Ireland. In both countries the monuments consisted of tumuli (including chambered barrows and giants' graves), monoliths, circles, cromlechs, and holed stones (all probably sepulchral), and hut circles, cliff castles, curious caves, and crosses; whilst in Ireland raths and round towers were to be found. Long barrows were regarded as belonging to the Stone age. As these were found only in the bronze period in England and Scotland, it was inferred that the people of those countries at that time had not inhabited either Ireland or Cornwall. The mode of interment in Cornwall was chiefly by cremation. The late Sir William Wylde believed that the earliest graves in Ireland were gigantic cromlechs covered with earth. Circles in Cornwall were small as compared with Stonehenge, Avebury, and Carnac. Nine existed in the extreme west of Cornwall, but no avennes were traceable in connexion with them, and the same fact had been noted of the Irish circles. The Cornish cliff castles and Irish raths were both ascribed to the Danes, but they essentially differed in construction.

Drainage of Fens.—In Section G, Mr. W. H. Wheeler, of Boston, read a paper on the drainage of the Fen land, considered in relation to the rivers of Great Britain. The subject was treated in the paper under the three heads of Engineering, Administration, and Finance. Under the first head it was sought to be shown that the object of all future legislation should be not drainage only, but the regulation of the water supply. The circumstances of our rivers having been altered by the modern system of drainage, it becomes necessary to adapt their channels to carry a vastly-increasing supply of flood water at uncertain and distant intervals, and during the intervening period to discharge the diminished regular supply in such a way that the channel may not become choked by reeds and shoals, yet be made available for storing a supply of water in lieu of that which formerly percolated slowly through the soil. To effect this, a modification of the plan and waste lands, adopted by the old engineers, is suggested, the river proper being adapted for the ordinary summer and winter flow, and the flood banks to be set back sufficiently distant from the channel to leave a cess or margin to receive the flow of the greatest floods. The space left between the ordinary channel and the banks being only covered by water occasionally, would, like the waste lands, afford valuable pasturage. Each water-shed of a main river should be subject to one Conservancy Board. The whole water-shed being divided into districts, the area of which is to be determined by the water-sheds of tributary streams or other physical channels;

the sub-districts are to be placed under the jurisdiction of commissioners, elected by the occupiers of the land in proportion to their rateable value, and who shall have the charge of all local interests; the general Conservancy Board to be elected from among the members of the district Boards. The means of carrying out improvements required for future administration and maintenance should be raised by a tax on the rateable value of the whole area of land within the watershed, whether rural or urban; as every acre of land receives and contributes its quota of the rainfall, so it should fairly provide its share of the cost of maintaining the channels for carrying this off. The objection that high lands can never be injured, and are so far away from the flooded districts that they do not require any improvement of the river, is met by the answer that it is owing to the drainage carried out on these very lands that water is poured so rapidly into the river as to cause the floods, and they ought, therefore, fairly to contribute towards the remedy, for the evil they have caused.

The Land of Midian.—Captain Burton read a paper on this subject. All who read their Bible, he remarked, are familiar with such phrases as as "vexing the Midianites," and "Midianitish women," but they did not know how hazy on the subject of this grand old land the public of England was before the spring of 1877. About 1249 B.C. the Midianites regained their former power, but after the crushing blow they subsequently sustained, they fade out of Holy Writ, and their land becomes almost unknown. Josephus's nappers recognised two Midians, whereas there has never been more than one. Voltaire made a mistake about Midian, placing it on the eastern half of the Dead Sea, and considering it a little canton of Idumea about eight leagues long. Captain Burton described the exact limits of the country, and then proceeded to narrate his expeditions and discoveries, a detailed account of which he said he would publish about next November. Both expeditions which he had the honour to lead were sent out by the Khedive of Egypt, to whom we are indebted for our present knowledge of a neglected and most mythical country. In 1877 the Khedive placed under his command the first expedition. This preliminary visit lasted little more than a fortnight, but it gave him a fair general view of the country, and he brought back specimens of most of the metals mentioned in the Book of Numbers. In February, 1878, he returned to Cairo, and organised a second expedition on a larger scale. They first explored Northern Midian, and discovered a number of catacombs and many inscriptions very deeply cut, but not easy to decipher. One cutting he found was like St. George and the Dragon, but St. George was without his horse. Photographs of the catacombs and inscriptions were exhibited by Captain Burton. On the Gulf of Akabah the expedition was very nearly wrecked, the wretched boiler of their steamer having struck work, and they were only saved by the exertions of their Scotch engineer, David Dougall, who managed to start the engine again when they were drifting rapidly on to a reef of sharp rocks, and were just fifty yards off. But after this the Khedive was good enough to supply them with a better ship. Their explorations in the interior were at one place interrupted by the hostility of the tribes, who would not permit the expedition to enter their territory without paying a fine equal to about 100*l.* each per diem. On the 25th of February, therefore, they were obliged to retrace their footsteps. Proceeding in another direction they found old smelting-furnaces, and caves which might have been catacombs, and a great aqueduct. They were astonished by traces of immense labour, which yielded not a single line of inscription, nor even a mason's mark, to determine the race of the labourers. He was able to identify some of the places with those mentioned by Ptolemy. Turquoise was a favourite gem among the Bedouins, and judging from a large one he had seen inserted in the stock of a matchlock, which had probably been there for fifty years, they were not liable to change colour. The exploration of South Midian was the most interesting. Photographs were taken of old mining works, and in some of the minerals they found silver visible to the naked eye. Pathetic indeed is the view of the desolation of Midian. Once the Arabia Felix of the ancients, it has now become Arabia Petræa, Arabia Deserta. Under Roman rule it contained 20,000,000 of souls. Now the population was reduced to 2,000,000. He had full and perfect faith that Midian, like many other provinces, would presently awake from her trance,—from her sleep of ages. Midian contained a mining region 300 miles in length, and of equal depth, and he had but little doubt that what the ancients worked so well we moderns could work better still, so that Midian might look forward to the development of her mineral wealth.

Cyprus.—In the Geographical Section, Major Wilson read a paper on Cyprus, in the course of which he dealt with the natural characteristics of the island. Dealing first with harbour accommodation, which he conceived to be a matter of special interest to Great Britain, he said that Cyprus possessed no good natural harbours. The chief places of trade, namely, Larnaca and Limasol, were no better than open roadsteads, whilst Salamis and Famagosta were only artificial harbours, although the last-named was capable of being made into a substantial place of refuge. Famagosta was, he said, considered a good harbour by the ancient Greeks, but we must not forget the difference in the size of the ships used by the ancients and those of the present day. He pointed out that a harbour which was sufficient for Greek galleys would not do for English steamers and men-of-war. Turning to the question of population, he stated that it did not exceed 144,000, of whom 44,000 were Mohammedans. He described the disafforesting of Cyprus, pointing out that the poorer the people became the faster the timber disappeared, until the finishing touch was given by Mahommed Ali, partly for sale and partly for shipbuilding and exportation to Egypt. This destruction of the forests had conduced materially to the unhealthiness of the place; and another cause of unhealthiness was the running to waste of the water at the eastern end of the great plain, where the water collected and formed marshes, producing low fever. The rivers did not always reach the sea, but spread themselves out in marshes, and this gave rise to a certain amount of fever, though not of a very serious type. Major Wilson suggested that one remedy for fever would be to plant the eucalyptus, or Australian gum-tree. Having touched upon the minerals of the island, he finally recommended that the Government should send out, as soon as possible, a scientific expedition to make, first of all, a topographical survey of the country in conjunction with the geological survey, and an examination of the ancient mines, as it was possible that in the limestone districts cave deposits would be discovered similar to those Mr. Adams had found at Malta.

Dr. J. S. Phené, F.S.A., read a paper on the "Courses of Migration and Commerce, traced by Art Relics and Religious Emblems." In this paper references were first made to some remarkable sculptures of the oldest historical notice, existing in the mountains of Asia Minor, particularly the "Niobe" of Homer, on Mount Sipylus, and the Sesostris figure at Nymphio, and subsequently to the various colossal and other rock-hewn sculptures in the Sporades and Cyclades, having affinity, by similarity of style, to those of Asia Minor. It was then mentioned that according to Strabo, tradition showed that the religion of this part of Asia Minor was transferred to the south of Gaul, in the ancient city of Massilia, now Marseilles, and thence consequently it spread over the west of Europe; that this religion brought with it the idea of the colossal in representation, which probably accounts for the ancient colossal figures in Brittany and Britain, and the love for the colossal still found over the whole of that part of France lying between Marseilles and Brittany, the old route of tin traffic between Britain and the Mediterranean. Still-existing Phœnician customs were referred to on the same route, and then references were made to some discoveries on this route, and in the south of Britain and the south of Ireland, which tended to the conclusion that the articles discovered were introduced by Oriental, probably by Phœnician, traders. One of these was a sculptured human head in the exact style of Asayrian art, as found at Nineveh, and which was discovered some slight distance under the surface on the estate of the Earl of Mount Edgcumbe, who had drawn the attention of the author of the paper to it, and furnished him with a photograph. Another was a bronze mask or head found in a bog in the south of Ireland, near the Galtee Mountains; it was the property of Lord James Butler, by whom the particulars and a photograph were furnished to Dr. Phené, with a request that he would give his attention to the matter, and throw what light he was able on the subject. The bronze represented the h of a cow, and had a close resemblance to head found by Dr. Schliemann at Myc which he identified as the head of Hera. head was examined by Dr. Phené at Ath every facility being afforded him by the G Government. The Mycenæ relic was a s head with golden horns, and the head foun Ireland was a bronze one, with the h (missing) made to take on and off, the clearly indicating that they were capabl being taken off for security, and were there no doubt, also golden. Both the heads had sun disc on the forehead; but the bronze which he considered was evidently of Phœni workmanship, had also the emblem of Ast or Ashtoreth, the Sidonean deity, on the head. In the mask found in Ireland the to protruded, indicating sleep or rest, and symbolism was further exemplified by crescent moon being placed beneath the disc, and so indicative of her rest or sle strong similitude when taken in connexion the well-known appeal to the priests of B who must have represented their deitie action or occupation. "Cry aloud, for he god; either he is talking, or he is pursuin sleepeth, and must be awaked." Dr. Ph who had gone over the whole districts refe to in Asia Minor, Greece, the Levant, and complete course in France, found a cow's sculptured in the island of Paros, and anc on part of an ancient temple now forming lintel of a Greek church, near Amyclæ, no from Sparta. Another object of great int was represented, as were all the others, fine photograph representing a bronze figu a deity, shown to be the Tyrian Hercules, f at Vienne, near Besançon, not far from th route referred to, through Gaul. This bore on its head an enormous crown comp of hammers, the number of which agrees the united number of the Kabiri of Samoth and the Cyclopes of Sicily, their occupa being the same, viz. that of metallurgists. attitude of this deity and the vessel he hol his right hand agree with the representati one of the Kabiri on a coin of Pergamus.

Next Year's Meeting-place.—At a meeti the general committee for the purpose of mining the places of meeting in 1879 and and for appointing the officers and counc the ensuing year, invitations were read, from Sheffield, requesting the Associati meet there in 1879, and another from Swe asking the Association to meet there in It was resolved that the next meeting o Association should be held on the 6th of A in Sheffield, and in Swansea in 1880. Pro Huxley moved, and Professor Flowers seco that Mr. George T. Allman, F.R.S., be appo president elect for the meeting at Sheffield

THE CASTLE AT CASTLEACRE.*

The remains of Castleacre Castle hav interest apart from their picturesque be They present features of great value, whic may notice, are of different ages. So ev is this, that many diverse opinions have expressed, and much speculation has beer tured upon, to account for what is, in fac blending of the works of different dates. progress of antiquarian science enables undertake our investigation with more cert of arriving at the truth with respect to th of the various parts. Let us examine brie opinions, first, of our predecessors. Passin the speculations of early describers of C acre, we are indebted to the painstaki searches of Mr. Harrod for an admirable de tion of the remains in a work of no small to Norfolk antiquaries. The nature c earthworks attracted his attention, and h satisfied that the rectangular enclosure outer ballium, enclosing the village, was o different construction to the circular-f earthworks abutting upon the angle fo the castle proper, the inner courts, an raised mound of the keep. Then, again masonry walls built on these inner cour those of the shell-keep itself at once testifie different period for their construction. Th rightly assigned to William de Warenne kept his court here. Recorded history testifies to his having erected a castle Their Norman character testifies readily t

* By Mr. Loftus Brock. Read at the British A ogical Congress, Wisbech.

late, apart from the analogy of the shell-keep before us to similar remains of the same date. Here we may note in passing, how readily in these days research has demonstrated that Norman keeps were not always rectangular, such as Rochester, London, Dover, and many others; but that they were very frequently circular, like Conisborough, and polygonal, like Tickhill, Lincoln, &c., and that the shell-keeps were common enough in buildings of Norman date, as they were in later ones, such as Tretnaton, Restormel, Windsor, &c. The rectangular enclosure of the outer ballium he rightly ascribes to the Romans. This is likely enough, for its rounded angles are analogous to the fortified camps so prevalent in the country, and the formation of the banks and ditch testifies to a regularity of construction not to be found in any but Roman works. In addition, Mr. Harrod discovered Roman pottery in the bank abutting upon the mound of the keep; and it may be noted in support of this Roman origin that the Roman road, the "Pedder Way," leads in a line straight for miles direct from the north gate towards Hunstanton, or rather to the station at Brancaster. These facts may assure us that the banks enclosing the village were the enclosures of a Roman or Romano-British town. Its history is unknown, its name has passed away, and the assurance that here is a Roman site waiting for identification may stimulate local antiquaries to fill up this gap in our knowledge. The circular mounds call for our special attention. Mr. Harrod points out their junction with the rectangular earthwork, and argues that they were in existence prior to the latter, which was therefore modified, and its lines formed up to them, that they might be attached to and form a portion of the stronghold. The effect of this would be to give a British date to them. He says:—"The Roman construction of the site being established, how can the very eccentric form of the works be accounted for? It will be seen that the west bank, of Roman construction, is perfectly straight, the north and south banks do not run at right angles with it, but incline inwards; the northern are bending considerably at its eastern extremity to join the circular work."

Our associate, Mr. Vere Irvine, whose decease was so greatly deplored, and whose acquaintance with ancient earthworks was probably inferior to that of no other investigator, prepared a careful plan of these remains, and has given a lucid description in an early volume of our *Journal*. He points out that the circular works, instead of having caused the modification of the rectangular ones, have, in fact, been formed up against them, thereby proving the prior existence of the latter. He assigned a Saxon date to the mounds.* An examination of his plan, side by side with that of Mr. Harrod, and with the remains, is convincing that the former is the more correct of the two, and that the circular earthworks have been formed against the older rectangular ones, and in part beside them. Are these mounds, therefore, Saxon, or may they not be of the same Norman date as the ivy-clad walls upon them? Here the researches of recent years come to our aid. It enables us to answer Mr. Harrod's inquiry. He asks, "There is no doubt of the castle having been erected by the De Warennes, but did they construct the enormous earthworks of which I have spoken as the south-east angle?" Similar mounds to this are found all over our country, sometimes destitute of all later masonry, sometimes crowned with building of Norman date, as in this case. We also possess a vast number of smaller mounds, probably the remains of dwellings of smaller class. I proceed to show by inference and analogy with some of these examples elsewhere, that these mounds are of Saxon date, and that their formation is altogether irrespective of the late buildings which have been adapted to them. Norwich is known to have had a castle in the seventh century. The present building has no relation to the older plan of the circular earthworks upon which it stands. Lewes Castle, built by Earl Warenne, who erected this, has a similar earlier mound. This castle was the principal stronghold of the Rape of Lewes, one of the primary divisions, the six Rapes of Sussex, each of which had a castle in Saxon times, in each case occupied by the later masonry castle of the Roman possessors. At Chichester the mound remains; at Arundel and Lewes they have the shell keeps of Norman date. In addition to the above, Saxon strongholds are known to have existed at Tamworth, Windsor, Builth, Launceston, Warwick, and a multitude of other instances, and in all these cases the mounds exist with buildings of later date above them. The mounds alone, in a deserted state, and apparently never covered with later masonry, exist at Mexborough, Brenchly, Earls Barton, and many other places.

It is not generally known that there exists at Ely a remarkable earthen mound. It stands due south of the south transept of the cathedral, and in a line east from Ely Porta. It is separated from the buildings of the cathedral by a well-defined valley, crossed by a raised causeway, now the well-known approach to the south side. It is shown in Buck's view, and called "Mill Hill," and most probably a mill stood on it in former times. It is now called "Cherry Hill." Like others of its class, it is circular in form, and a winding path leads around it from its base to its summit, where it presents a level platform, 60 ft. in diameter. Its height and extent forbid us to conclude that it was ever thrown up for the base of a mill, and a short examination of its position suffices to convince that it is the site of an ancient castle, built for the defence of the monastery. This is not the site of the castle built by Bishop Ingellus, 1133, which stood elsewhere. It has no recorded history, but we have these facts to guide us. It stands close to the site chosen in Saxon times for the monastery, and has evidently been placed there for the defence of the latter; it was not used in Norman times. We know that the nunnery had no defence when ravaged by the Danes, and it is reasonable to assume that it was one thrown up to prevent a similar catastrophe on the re-foundation by King Edgar, or one of the fortifications made by Hereward, the last of the English. There exists also a mound very similar to the last, little known, about a mile from Middleton Towers, on the road to King's Lynn. It is larger, loftier, and has a perfectly defined outer rampart and small ditch outside the main ditch, at the base of the circular mound. The path winds around the circular hill quite up to the summit. The height is fully 90 ft., the ditch is fully 40 ft. across, and 15 ft. deep, while the outer ditch is 8 ft. wide and 5 ft. deep. The ascent is very steep, and the fortifications, surrounded with palisades, must have offered a formidable resistance to a foe. At Laughten-in-the-Morthen, the deserted Saxon mound is not unlike that at Tickhill. Both belonged to the same Saxon owner, but only Tickhill became the site of a Norman dwelling. It may be noted that these mounds do not appear in the purely Norman type of castle, such as Rochester, London, Dover, Scarborough, Carlisle, Newcastle, Richmond, Canterbury, &c. These were built mostly on level ground. At Guildford, the Norman keep is only partially built upon an earlier mound. At Porchester, a very small mound is banked against the Norman walls, and at Conisborough and Scarborough the bases of the keeps are sloping in masonry, as if carrying out the tradition of the earlier mounds of earth. The number of these circular mounds and ditches on Saxon sites, indeed, is so great that we cannot close our eyes to the evidence of their almost uniform plan; while the varying form of the Norman keeps is valuable as evidence that the Norman builders, recognising the importance of retaining the strongholds already formed, simply adapted their works in masonry to suit the form of existing mounds. To such an extent was this done, especially with the shell keeps, the form of which more readily accommodated itself to that of the mounds, that it will be difficult to find an example of one apart from the presence of the earlier mound. We may therefore take it for granted that the Saxon stronghold was a mound surrounded with a strong enclosure of wooden palisade, and several ditches of greater or less depth; and that at a later (Norman) date the palisades were removed, and masonry works substituted.

From these remains we may form a graphic idea of a Saxon Thane's mansion; we reconcile the earthen remains to the descriptions of so many early writers who speak of a constant use of timber in such dwellings; and we may realise the view of such a dwelling as is pictured in more than one Saxon MS.*

While we may believe that a Saxon stronghold was almost always of this description, they afford us sufficient reason for not withholding our assent to the dictum that there were no castles in England until the Norman conquest, as has been stated, nor are we without evidence that even walls were occasionally used.†

It is not to be understood that Norman castles and dwellings were never erected on mounds of the same date. Possibly in some cases this was so, but probably so only very early in the Norman occupation. In Normandy we know it was so,‡ and the custom in its general arrangements may have been tolerably universal up to the eleventh century in England and on the Continent as well. Indeed, we may withhold our opinion whether or not the square keeps proper were not originated by the Normans in England rather than by them in Normandy. The sudden increase of wealth consequent upon the conquest gave the Norman settlers here ample means of gratifying their taste for fine buildings, and the constant references to the erection of stone castles by the old chroniclers is amply borne out by the remains still numerous in England. It furnishes us with a sufficient reason for believing that after the first few years at least of the occupation of England, they discarded the plan of construction with mounds, ditches, and mere palisades, common alike in Saxon England and Normandy, for the durable works in stone.

THE TUMULI OF THE FENS.§

Amongst the relics of antiquity remaining in the Fens, few have caused more discussion, or been more fruitful in differences of opinion, than the mounds generally called tumuli. Some have considered them to be beacon hills, others have classed them as sacrificial mounds, as sepulchral monuments, or as places of refuge from the floods, while another idea has been that they are more recent erections for windmills or pleasure-mounds. As, however, their existence has been certified by Dugdale 200 years since, when their origin was as much a mystery as now, the two latter suggestions do not appear probable; although the use of ancient embankments as the site of wind mills is not unfrequent. Two good examples are to be seen on the Lynn-road, erected on the remains of the old sea-bank, one of them the fine mill called the eight-sailed mill. The earliest mention I have discovered of a tumulus in the Fens is in the life of Guthlac, about 700 A.D., who, we are told, found on arriving at Crowland a green mound that had been opened by treasure-seekers. . . . . Another mound close to the Smeeth-road Station, between Lynn and Wisbech, has also a traditional interest. It is called the giant's grave, and the inhabitants relate that there lie the remains of the giant slain by Hickathrift with a cart-wheel and axletree. The mound has not been examined. It lies in the corner of the field, with a slight depression round it, and has now only an elevation of a few feet. A cross was erected upon it, and is to be seen in the neighbouring church-

* The occurrence of Saxon work is pointed out in a series of articles, of no small value to the investigation of this class of monuments, which have appeared in the *Builder* in recent years. Under the signature "G. T. C.," we can recognise the author to be an antiquary whose researches, so ably conducted for many years, have thrown considerable light upon castellated remains. He notices the Roman camps now forming part of the later castles at Brougham and Brough. Others could be readily added. The ancient sites, probably like that at Castleacre, were therefore used by the Romans, adapted by the Saxons, and finally by the Normans. He instances also the mound of the castle of Caerleon, which has been thrown up over earlier work of Roman date.—B.

* The Bayeux tapestry represents one or two fortified places of timber, erected on mounds. One is being attacked, and while the assault is being made on one side, others of the assailants are endeavouring with torches to set fire to the woodwork. We should note that there are some few records of Saxon castles and fortifications being erected of stone. Part of the existing causeway at Tamworth is held to be of Saxon masonry, and the Saxon Chronicle records the surrounding of the burg at Towcester with a stone wall in the time of King Edward the elder.

† "G. T. C.," in his article on Eaton, Scoton, and Huntingdon, in the series already alluded to, notes the following characteristics of the work of this class:—"Not only is there a mound, but the level of the area contained within the inner ditches is generally higher than the land immediately around. This is remarkably so at Builth and Kilpeck among many others, and was apparently intended to give the domestic buildings greater safety, and an advantage when actually attacked. This distinction does not seem to have been pointed out, and it is possible that upon it may turn the identification of many of the earthworks the date of which is unknown."

‡ M. de Caumont, in his "Abecedare," discusses the construction and arrangement of several of the strongholds of some of the chiefs contemporary with William the Conqueror, and those of some who accompanied him to England. They are generally similar to what we should now unhesitatingly call Saxon. One has a close resemblance to the plan of Castleacre; others have so early an appearance as almost to raise the belief that the Normans may have utilised earlier works there as here. M. Viollet-le-Duc instances later works with the earthen banks of the Gallo-Roman period.

§ By Mr. Jonathan Peckover. Read at the Wisbech Congress of the British Archæological Association.

yard of Terrington St. John's, bearing the singular name of "Hickathrift's candlestick." The majority, however, of the Fen tumuli are in the neighbourhood of the Roman Bank. Messrs. Miller and Skertchley, in their recent work on the Fenland, gave a list of twenty-five in the district, twenty of which are within two miles of the ancient sea-bank. They infer accordingly, with some probability, that those who made the sea-walls made the tumuli. Only one mound is mentioned by them in Walsoken, but there is a second not far from the chapel-of-ease in New Walsoken, standing in the midst of the now deserted channel of the Ouse. This has never been examined carefully, and may have stood there in early times as a guard to the entrance of river, or be of more recent construction. . . . . Speaking of Marshland, Skertchley says that their churches are very beautiful, and here are, too, many such of the tumuli." Skertchley also mentions a mound at Elm, near which some Roman coins were found in 1713 of the later empire. The people had strange notions about it, affirming they frequently saw a light upon it in dark winter nights. It was probably situated in the field at the back of the Girls' School, where there are still remains of earthworks. In 1757 several human skeletons were found with the arms of a British warrior, an iron sword, spear, and umbo of a shield, &c., in a kind of tumulus between Chatteris Ferry and Somersham. Between Chatteris and Ely also are three in a triangular form, as stated by Watson in his History of Wisbech. Sir William Dugdale, the author of the History of Embanking, in writing to Sir Wm. Brown, states that while journeying through Marshland (about the middle of the seventeenth century) "he had come across several mounds which he hoped would be explored to ascertain what historic evidences they contain." Two hundred years elapsed, and it was not till 1865 that any antiquarian exploration was made, when the Rev. John Davies, the then rector of Walsoken, superintended the opening of a mound situated to the north of the parish church and by the roadside. He informs us that 2 ft. from the summit sheep-bones were found and several pieces of wood imperfectly charred; 4 ft. lower other bones, and a piece of metal, described by Mr. Davies as the iron handle of a sword, were exhumed. No human remains were discovered. I believe Mr. Davies was inclined to consider the mound to have been used for sacrificial purposes, as the western slope was much more sloped than the eastern. The relics found in the operations are deposited in the Wisbech Museum. No further search was made into the interior of the tumuli until it was suggested by the Rev. Frederick Jackson, of Parson Drove, that the coming of the Congress to Wisbech offered a specially favourable opportunity for further exploration, and a committee was formed to examine the Leverington mounds. Their report gives the more minute details of the work, and although they failed to discover anything which would certainly explain their original purpose of the tumuli, some light has been thrown on the subject. In neither mound have human remains been identified, nor any very ancient pottery, although fragments of vessels glazed and unglazed were not unfrequent. Mr. Sharpe's mound, called "The Rabbit Hill," is 101 ft. in diameter, and 20 ft. high. That in Mr. Webster's field is 10 ft. in diameter and 10 ft. high. The older inhabitants have a belief that the former is sepulchral, and that ghosts haunt it, and the more superstitious dread to pass it at night. It has been constructed carefully with alternate layers of silt and clay, stiffened with water, and the foundation was found 4 ft. below the present surface of the land, standing on a bed of sandy silt, 1 ft. deep. This rested on a thin bed of blue clay, 1 ft. 4 in. in thickness; at the edge of the mound the same stratum was reached, without the superincumbent silt, at a depth of 4 ft. from the land level. In both cases the foundation stood on the bare surface, without trace of herbage. In the centre the "made earth" was distinctly visible, resting on the water-formed beach. The same was found to be the case in Mr. Webster's mound, but there the foundation in the centre was reached 1 ft. below the present land-level, resting on sandy silt of uneven surface, 4 in. or 5 in. deep, beneath which was the layer of blue clay, 1 ft. 4 in. thick. This layer was found on the south-west side, in the field, at the depth of 2 ft. 7 in., and on the east side at the edge, at the depth of 5 ft. 6 in. From this we may gather that a natural rise was chosen for the site of the mound, and that it was erected on unenclosed land washed by the tides. The pottery and bones found in both these tumuli are deposited in the Wisbech Museum. But the difficulties of coming to a conclusion as to the date of erection are much increased by the numerous rabbit-burrows running deep into the interior, many fragments of quite modern china having been found introduced by this means. A mound in Tyd St. Giles parish, in Carrow Field, not far from the site of Dunton Hall, was levelled by the tenant this spring, and a curious specimen of pottery, in good preservation, exhumed. It is in the shape of a jug, round the neck rude frog-like ornaments, and the body of the vessel has a pattern like fishes' scales. This singular relic has been lent to the Museum during the sittings of the congress, for the inspection of the members. These mounds are not unfrequently in pairs. There are two at Walpole and Fishtoft, and there were two at Fleet, in a like position. One of the latter has been demolished, but it bore a considerable resemblance in shape to Mr. Sharpe's mound, while the remaining one, now overgrown with trees, has a similar form to Mr. Webster's. It is very probable that there was a tumulus in Wisbech itself, as an open space on the North Brink is still called the Low. These few notes of our present knowledge of the mysterious Fen tumuli are offered with the hope that they will aid towards the elucidation of the interesting problem of when, why, and by whom they were erected. It will be seen that all these tumuli are not of one class, and I would venture, in concluding, to arrange them as follows:—Firstly,—Burial mounds, such as that described near Chatteris, and possibly the Crowland Hill. Secondly,—Mounds with crosses, as the Giant's Grave in the Smeeth, and probably the Low at Wisbech, the White Cross, the shaft of which is still preserved in Bank House garden, having been erected on its site; and lastly, the mounds connected with the "Roman banks," whose use is at present undetermined.

ST. MARY-LE-BOW, CHEAPSIDE.

A FACULTY has been applied for to effect certain alterations and repairs to this church, and the Bishop of London has intimated his intention of granting such faculty as prayed in a notice affixed to the church-door dated August 16th, 1878, unless some valid reason can be shown to the contrary.

The alterations proposed consist of putting the main fabric of the church in thorough repair, repairing the roof, dormers, ceiling and its timbers; cleaning and repairing the walls externally; rebuilding the parapet wall on the east side of the vestibule, and repointing it; the repair of the tower and lower part of the spire, involving, so far as can be ascertained, the following works, viz., the resetting and fixing of the vases at the angles of the upper stage of the spire, the pointing of the flying buttresses, repair of the flat and trap door at the top of the central staircase, and the covering of the flat with lead; the repair of the balcony in Cheapside and its railing,—this balcony, as we know, had its origin in the old "seldom" or shed in which our kings used to sit to see the jousts and ridings in Cheapside;—the cleaning and repairing of the whole of the stonework generally, and its repointing.

In the interior, the works proposed are the re-arrangement of the east end, and the formation of proper stalls for the clergy and choir; the removal and re-fixing of the pulpit; the removal of the whole of the present seats and the substitution of open benches of oak, or stained deal of suitable design; the remodelling of the reredos, or its removal and replacement by a new reredos of suitable design.

The estimated cost of the works in contemplation is 5,000*l.*, to which the Ecclesiastical Commissioners have agreed to contribute 2,000*l.* out of the proceeds of the sale of the site of Allhallows Church, Bread-street, recently sold under the provisions of the Union of Benefices Act.

The architect is Mr. Arthur Blomfield, M.A.

The Recent Floods.—At Lowestoft much damage has been done by the flooding of houses in the lower part of the town owing to the inadequacy of the sewerage. The Improvement Commissioners intend to construct a larger sewer having an outlet into the harbour.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT WISBECH.

CONTINUING our account* of this, the thirty-fifth Congress of the British Archæological Association, we have to add that, on Thursday in last week the members left Wisbech in large numbers by special train for King's Lynn, where they were met by one of their vice-presidents, Sir Lewis Jarvis, and conducted by him to the Guildhall, where the maces, &c., belonging to the corporation were exhibited, and commented upon by Messrs. Bloxam, Lambert, and others. Mr. W. De Gray Birch gave an interesting account of several of the oldest deeds. The party next crossed over from the Guildhall to the Church of St. Margaret, a fine cruciform building, almost the largest parish church in England. It has two western towers, a central lantern, nave, transepts, and chancel. The earliest work was pointed out in the western towers, where Norman and Early English are strangely commingled. These portions of the edifice are very much out of the perpendicular. The church has some beautiful Early English work, but the greater bulk is of the end of the fifteenth or commencement of the sixteenth centuries, and, large as the present building is, it has suffered a great curtailment. About the middle of the last century the lofty western steeple and the central lantern were destroyed, and afterwards the aisles of the church were rebuilt in a very plain and reduced form. All this and much more Mr. Loftus Brock pointed out; and Mr. M. H. Bloxam called attention to the beautiful and well-known brass, now placed under one of the church towers. The party, on leaving the church, inspected what remains of the monastic buildings on its south side, and, following their guide, passed through the gateway and only existing feature of the Whitefriars, at the end of a long street in which were some interesting specimens of ancient domestic architecture. The visitors then walked along the sites of some of the old fortifications, and came at last to the Red Mount, so called from a singular little octagonal chapel, built of red brick, standing upon it, and having inside, on the topmost floor, a small shrine-like chapel of stone, in the form of a Greek cross, the roof being richly panelled. The peculiarities of the building were pointed out by Mr. Loftus Brock, who said that it is known to have been a Guild Chapel, and dates from the close of the fifteenth century; but the mound on which it stands, probably a tumulus, was called at an earlier period the Lady Mount.

After visiting the Custom-house, the party proceeded to the remains of the Grey Friars' Church, consisting of a Perpendicular tower, hexagonal in form, and standing on four arches of the Decorated period. Here the Rev. Mr. Slight gave some account of the old buildings that once stood on the spot, and the party then made an inspection of the Chapel of St. Nicholas, a building of considerable extent, height, and regularity, of the fifteenth century. After partaking of luncheon at the Globe Hotel, the company, joined by a large addition of visitors from Hunstanton and other places, set off in carriages to Castle Rising, which was fully described by Mr. Brock.

Afterwards the party drove to Sandringham, where, by permission of the Prince of Wales, the party wandered through the grounds and inspected the house, and afterwards returned by special train to Wisbech, where an evening meeting was held in the museum, the following papers being read:—"On Hereward the Saxon," by Mr. S. H. Miller; "On Some Reminiscences of an Old Scholar of King's Lynn Grammar School," by Dr. Phené.

On Friday visits were paid to the ancient Abbeys of Thorney and Crowland. Thorney is remarkable, on many accounts, beyond the monastic remains. The Anglo-Saxon Chronicle tells us it was founded as far back as 662, by Saxulf of Medehamshead, which we know as Peterborough. The Danes ravaged it in 870, and in 972 it became an abbey after the Benedictine type. The first Abbot of Thorney occupies a place in the history of English art as the author of a MS. volume of drawings and tracery known as the "Benedict of Ethelwold," which is preserved at Chatsworth, and the work is thought to have been executed by his chaplain, Goodman, who also was Abbot of Thorney. The abbey thus founded by Ethelwold lasted till

* So p. 892, *ante*.

he Conquest. On November 13th, 1089, the ew edifice was completed, and, according to ngulphus, the historian of Crowland, there ere a great company and many celebrities resent. Ten years later, on St. Luke's Day, he towers and spires on the west front were ompleted. These have long since disappeared; ut one is referred to in a survey of the abbey ade in Queen Elizabeth's reign. Thorney Abbey small in comparison with Crowland, and incom- lete, also, consisting only of an ancient nave, to hich two transepts were added about forty or fty years ago, in what was intended to be the ame style. The village has been almost entirely ebuilt by its owners, the Dukes of Bedford, ithin the present century, and it exhibits all he signs of a model village, having in it neither n hotel nor a beerhouse. The chief features of he church were made the subject of an interest- ng paper by Mr. C. Lynam. Its substance was o the following effect:—At Thorney, the nave f the Norman conventual church has been pre- erved. The west front is a fine specimen of orman architecture, and has a noble Perpen- icular window set between the original square urrets. It is supposed to be of the early part f the twelfth century. The nave arches and riforium are perhaps a century earlier; the learstory, unfortunately, has been destroyed, nd the arches walled up; the aisles also have erished. There are in the windows some few pecimens of German stained glass, and on the orth wall is a tablet to Ezekiel Dance, a native f Compiègne, in France, who acted as pastor of French congregation at Thorney, from their rst settling there in 1652 to his death in 1674. he engineering skill of this little colony from rance is still commemorated in the Fen country y the name of "French Drove."

From Thorney the visitors proceeded to rowland, where the ruined abbey was dis- oursed of by the Rev. Canon Moore, who escribed the means that had been taken to aintain the central west front, with its markable array of statues. This work was arried out under the superintendence of the te Sir Gilbert Scott. The singular triangular ridge at Crowland attracted much attention. ach of its three parts spans a stream at the onfluence of the Nene and its tributaries flow- ng towards Welland and Thorney village. It as erected about the year 1380, and is so arrow that it can have been designed only for edestrians. In the afternoon the visitors pro- eeded on to Spalding, in spite of unfavourable eather. Here Canon Moore described the abbey hurch. The return journey to Wisbech was ade in time for the evening meeting, at which r. E. Ferrey and Mr. Compton read papers on Symbolism in the Early and Mediæval Art" nd on the "History of Great Yarmouth" spectively.

On Saturday visits were paid to the Roman ation at Caistor, near Peterborough (where r. T. Morgan read a paper); the castle at hesterton, and the town of Stamford, where he visitors were shown the old Bede-house and ther antiquities of the town, and were enter- ained at luncheon by the mayor and corpora- on. In the evening a *conversazione* was held Wisbech, Mr. Birch exhibiting and explaining n interesting collection of MSS.

On Monday the visitors proceeded to Cam- ridge. At the Town-hall they inspected the vic regalia, which are very much like those of ynn and Stamford, though larger and not quite ancient. They were shown also some speci- ens of the royal charters granted to the orough from the days of the early Plantagenet ings down to the reign of Philip and Mary. n the Town-hall hangs a portrait of that worthy tizen of Cambridge, Mr. J. Hobson, who is mmortalised by Milton, and who is known to he world by the phrase "Hobson's choice." rriving at King's College, the visitors were ceived by one of the Fellows, the Rev. Mr. hurton, who showed them over the chapel, xplaining the series of painted windows from est to east, the lower windows in their sub- cts corresponding as antitypes to those above. hey also examined the design for a new reredos hich it is proposed to erect behind the Com- union table, and that of the new large western indow by Messrs. Clayton & Bell, which is bout to be put up in the chapel. After uncheon, the visitors went to the Fitzwilliam useum, with the contents of which, as ex- ained to them by Professor Colvin, they were uch interested. A short and hurried visit to ster House and to the Church of St. Mary-the- ess, and other visits at a later hour to Queen's and Corpus Colleges and their libraries, occupied the time till four o'clock.

The proceedings of the meeting were brought to a close on Tuesday, when the visitors pro- ceeded to visit Clare College, Trinity Hall, and Caius College. After inspecting the well-known Gate of Honour, they were shown over Trinity and St. John's Colleges in detail. Of the former, the chapel, the master's lodge, and its grand reception-rooms and royal apartments, the hall, and its noble series of portraits, were hastily surveyed, a visit being then paid to St. John's College, where the new chapel, the work of Sir Gilbert Scott, was inspected. A walk through the gardens by the Cam, in the rear of the colleges, brought the visitors back, through the two quadrangles of Trinity, to the street in which is being erected the new Divinity School, a bequest to the university from the late Professor Selwyn. Thence a short walk brought them to the round church of St. Sepulchre. Between one and two o'clock luncheon was partaken of at Magdalene College. A visit was afterwards paid to the College Library. The rest of the day's programme included a visit to the Castle-hill, the old Fosse of Camboritum, and the Roman Wall hard by, whence the archæologists made their way to the so-called School of Pythagoras and to Merton Hall, and the excursion was wound up by driving to Jesus College to see its new chapel and other interesting features.

We have given but a very brief outline of the proceedings as a whole, electing to give space to the full text of some of the papers read during the proceedings. Papers by Mr. Loftus Brock on "The Castle at Castleacre"; by Mr. Peckover on "The Tumuli of the Fens"; and by Mr. Grover on "Ancient Reclamations," will be found on other pages of this week's *Builder*.

MATHEMATICS AND SCULPTURE.

Sir,—Allow me space for a word or two on your recent article on "Art and Mathematics," with the general tenor of which I very fully agree. Artists, no less than mechanicians, are indebted to Mr. Spottiswoode for the noble contribution which he has made to the general conception of mathematics as an ultimate form of our exact knowledge of nature, no less than for his protest against assigning an arbitrary limit to the range of possible discovery. But the point to which I wish to call attention is your remark "it is difficult at first to see how we can trace any similar connexion in regard to natural form as exhibited in sculptured figures." In one sense, and no doubt in the sense intended by the writer, this is no doubt true. If we were to seek, for example, for a mathematical expression for the series of curves which bound the human figure, within which beauty is found, and beyond which lie the limits of deformity, I think Mr. Spottiswoode would agree that we should entirely transcend the conceivable range of mathematical analysis. The same remark may also, to some extent, apply to the outlines of parts of the figure; though I apprehend that when we come to the several bones and articulations of the skeleton we may come within the province of geometric, or at least analytic determination.

This notwithstanding, personal experience in measuring many of the most important relics of Greek art has led me to the conclusion that, in the time of Phidias and Polycletus, so exact were the rules followed by the sculptor that they properly deserved the name of "canon." The proportions between the vertical dimensions of the best figures are so exact, that from the measurement of one or two of them, (as for example, that from the fontanel to the sternum) it is possible to arrive correctly at the height of the whole figure, if erect. And not only is this the case with the vertical proportions, but the girths are determined, with equal exactitude, by the length of the foot. This is equally the case in the Venus of Milo and in the Venus dei Medici, different as are the ideas of the two figures in many respects. The girth of the waist in each is exactly three times the length of the foot. The girths of the shoulders above the swell of the bosom, and of the bust, under the arms and around the bosom, are, in each case, exactly four times that length. The canonical length of the foot, for a slight graceful figure, is one-seventh of the height. When greater majesty or muscular power is to be indicated, the length of the foot is increased, and with it the whole system of girths. Thus the foot of the Venus dei Medici is 137-960ths of her whole height, if the figure stood erect. That of the Venus of Milo is 149-960ths of the height of the erect figure.

As we depart from the purest age of Greek sculpture this exactitude of proportion disappears. Roman copies of Greek works are mostly there or thereabouts, never accurate.

The study of the Greek canon, which presents so unsuspected an illustration of such language as that of Mr. Spottiswoode, is one that will well repay the attention of the student. It is one that must underlie the competent execution of any such scheme of lectures on the antique as has been recently discussed in our columns. Above all things, it is instructive, as showing the consistence of exact mathematical proportion with the utmost grandeur that has anywhere been attained by human art.

Allow me, while on this subject, to add one line as to the proposal made in the *Builder*, p. 869, *ante*, by Mr. Cave Thomas, to collect, instead of casts, a series of autotypes illustrative of Grecian sculpture. It is not an unnatural suggestion for a painter or draughtsman to make. The wonderful force and beauty of some of the Roman photographs in permanent pigment may well excuse the suggestion. I have but one remark to make on it. Let Mr. Thomas take a pair of callipers, and endeavour, by their aid, to ascertain any sculptural dimension from a photograph. It will need but one or two trials to be convinced that, for sculptural instruction, these fine prints are of little value. Even were they in exact perspective, the attempt would fail. But as it is, to the calculable variation of perspective has to be added the incalculable and often enormous error of the aberrant refraction from the sides of the lens. A foot, or a hand, in the foreground of the print, becomes of disproportionate magnitude. We must have the round, and be able to make the student measure it, in order to give him any acquaintance with the fundamental principles of antique sculpture.

Francis Roubiliac Conder.

PREMIUMS FROM THE INSTITUTION OF CIVIL ENGINEERS.

The originality, labour, and ingenuity displayed by the authors of some of the communications submitted to the Society during the session 1877-78 have led the Council to make the following awards:—

For Papers read at the Ordinary Meetings.

1. Telford Medals, and Telford Premiums, to R. W. H. Paget Higgs, LL.D., and J. R. Brittle, for paper on "Some Recent Improvements in Dynamo-Electric Apparatus."
2. A Watt Medal, and a Telford Premium, to H. Davey, for paper on "Direct-acting or Non-rotative Pumping Engines and Pumps."
3. A Telford Medal, and a Telford Premium, to T. Curtis Clarke, for paper on "The Design generally of Iron Bridges of very large Span for Railway Traffic."
4. A Watt Medal, and a Telford Premium, to Bradford Leslie, for paper on "The Hooghly Floating Bridge."
5. A Telford Premium to J. Atkinson Longridge, for paper on "The Evaporative Power of Locomotive Boilers."
6. A Watt Medal, and a Telford Premium, to Alfred Holt, for "Review of the Progress of Steam Shipping during the last Quarter of a Century."
7. The Manby Premium to E. Bazalgette, for paper on "The Victoria, Albert, and Chelsea Embankments of the River Thames."

Other medals were awarded for papers printed in the proceedings without being discussed, and for papers read at the supplemental meetings of students.

The Electric Light.—Mr. J. Hollingshead writes:—Seeing that Mr. G. H. Stayton's report on the electric light (I presume the "Joblockoff light") of Paris, is going the round of the papers, I have referred its statements to Mr. Mayer and the French scientific gentlemen whom I brought over from Paris to establish and manage the electric light (called the Loutin light), which I am burning every night in the Strand. Their answer, supported by elaborate details, is this: With machinery valued at 3,400*l.* they are prepared to light an area of 1,540 yards long by 44 yards wide, with 36 lamps, exactly similar to those we are now using, having all the admitted advantages of the electric light, and an illuminating power equal to 2,000 of our existing street lamps, at a cost of 10s. 6d. per hour for consumption and superintendence. Thus, in place of 109 gas-lamps, the public would get a lighting power nearly twenty times greater, at a cost of only five times greater than the present outlay. By reducing the number of lamps, and making other alterations, the illuminating power and the cost could be reduced at the same time, until the difference between the cost of gas and electricity would be equalised, still leaving immense advantages on the side of electricity.

A GARDEN OF SANITARIANS.

At the *déjeûner* which was given at the instance of the English delegates at the Paris Congress of Hygiene to a number of the Continental delegates, Mr. Edwin Chadwick, C.B., who presided, said:—This has been the largest Congress on the subject that I have yet known, comprising as it does between six and seven hundred members of different nationalities, amongst whom are delegates from remote countries, where we have never heard before of attention being given to public measures for the prevention of excessive disease and premature mortality. The assemblage is one that gives a light of progress throughout the civilised world. In my position, I feel honoured at the way in which our invitation has been met—when I see by my side M. Guineau de Mussy, the physician to the late royal family of France, whose high accomplishments London society regrets to have lost, but whose science is now being applied to important works for the sanitation of this metropolis. Before me I see M. Pietra Santa, the physician of the late Emperor, of whom whatever else may be said, it cannot be denied that he did much for the sanitation of Paris by removing masses of the "habitations of cruelty," as the psalmist calls them, and opening up new lines of external ventilation, and this he did, though this was but a first and comparatively easy step in sanitation, of which a great amount of more difficult work remains to do, which it is to be hoped the present Government will follow the light of science in doing. I may welcome here Dr. Sapolini, the distinguished physician of the King of Italy. Most welcome is a delegate from Rome—from Rome, whose dominion over the ancient world was marked by great primitive works of sanitation, by grand storage reservoirs and aqueducts for the distribution of pure water, by public baths, and by cloaca for the maintenance of the health of cities. Now that Italy is restored as a kingdom, it is to be hoped that she will be restored to her ancient power by such works, which barbarism has destroyed, and ignorance and sloth have left in ruins! We have had the acknowledgment made by our Premier that the study of the public health is the first duty of a statesman. I can bear witness that Italy's great statesman, Cavour, had an advanced perception of that duty, manifested by immediate action on his appointment as Minister of Public Works, that he came over to England and did me the honour to pay me a visit at the first general Board of Health to learn what we were doing, when I entered into communication with him which unhappily was cut short by his removal by political convulsions and by war. Let us hope that statesmanship in Italy has not died in him, but that peace and unity will allow it to be applied to the revival of her pristine relative condition in the world of health and productive force. I apprehend that an accident has prevented the attendance as our guest of a physician of the Court of Germany, where I know special interest is taken in the subject by the daughter of our Queen; and where in Berlin, great works that I may attest to be sound in sanitary principle are in progress. Spain, too, puts in her appearance by eminent physicians who honour the occasion as our guests. Gentlemen, these collective delegations of physicians of the highest position denote the progress of a great change for the benefit of humanity when we see those distinguished minds which have successfully applied, to the practical application of curative science, the only science they were taught in their colleges, now being turned in all countries to the cultivation and to the promotion of the new science of sanitation; to the new science of prevention, which we are trying to advance by a degree-giving institution. For the future, the prescriptions of the sanitary physician will have to be given not to the *pharmacien*, or the apothecary, but to the builder, the architect, or the engineer. Of the important class of specialists in the new science of sanitation by works, we have present delegations of sanitary engineers, who have made good their pretensions by successful works, which in some important specialities they have come not to learn, but to teach. The service of sanitation in works will have to be achieved by improvements in details; in which the great will often be found in the little, in things for dealing with conditions that are not merely unattractive but repulsive to high-seated ignorance and apathy. I am happy to have near me, as one of our present guests, M. Charles Joly, the author of the most correct and complete treatise I know of on warming and ventilation, and the inventor of what I believe is the best form of domestic open fireplace, which ventilates by warmed air and by the removal of vitiated air. Of our own countrymen we have here a sanitary engineer, Mr. Rogers Field, who, for the sanitation of villages and isolated mansions, has invented a self-acting apparatus, or flushing tank, for the immediate removal of all the putrescible matter before it can enter into noxious stages of decomposition, and its transference through permeable drains beneath the soil for vegetable production. We have here, too, Colonel Waring, the most advanced sanitary engineer I know of in the United States of America, who has successfully applied there Mr. Field's invention, which, in fact, applies to villages and mansions the arterial and venous system, which it has been a great object of mine to promote the application of to cities, of bringing in pure water, and carrying in a constant supply to every house, and of carrying away, by a connected apparatus constantly, and without stagnation and probable decomposition, all fæcal matter by water carriage, and all putrid water, and immediately applying it to the land for agricultural production. We are glad to see here also, a member of our Council, Dr. De Chaumont, the physician of the Netley Hospital, a centre of army sanitation, who has done good work in the specialities of ventilation, and is the worthy successor of the late lamented Dr. Parkes, the author of the first dictionary on the public health. Gentlemen delegates, it is my duty to greet you one and all as our guests. Time does not permit me the gratification I had wished, of calling upon the delegates of each nationality for an expression of their sentiments, but I expect that I may presume upon your sanction in formulating an expression of our thanks to the French Government, and to the French managers of the Congress, for bringing us together, for the way in which we have been received and treated, and for the excellent manner in which they have conducted the business of the Congress.

Warm thanks were given to the Chairman, and expressions of regard to him as the *Doyen* of sanitation.

A MUSEUM OF DECORATIVE ART IN PARIS.

On the 19th of August there was opened, in the Pavilion of Flora, in the Tuileries, "The Museum of Decorative Art." Mr. Cunliffe Owen, C.B., and Sir Richard Wallace are named honorary presidents. The prospectus of the association testifies to the fact that foreign nations, more particularly England, Austria, Belgium, and America, have made extraordinary progress in decorative art, as illustrated by the contributions of these nations to the French Universal Exhibition of 1878. It then proceeds to state that:—

"It is time for us to study with the same ardour as our rivals a vital question which interests the material prosperity of our country. We possess, thanks to our innate taste, a superiority which must insensibly be lost if we fail to occupy ourselves with the development of the favourable circumstances created by art traditions among our artists, manufacturers, and amateurs."

The French presidents of the association are the Duke d'Audiffret-Pasquier, the Marquis de Chennevrières, the Duke Chaulnes, the Viscount de Ganay, the Prefect of the Seine, &c. The subscriptions already obtained towards the objects of the association amount to upwards of 130,000 fr. The opening ceremony was attended by some of the leading notabilities in Paris connected with the useful arts in the character of amateurs and patrons. The Museum is at present in a very incomplete condition; in fact, just now there are only four rooms occupied with pictures of ancient and modern artists. There are, however, cases for the reception of decorative objects of every description. It is the intention of the association to gather together, by purchase and voluntary contribution, objects that may serve as an educating medium for the artisan.

The Nailmakers' Strike.—Failing in an endeavour to compromise the serious disputes between the Staffordshire nailmakers and the 24,000 operatives now on strike, both parties are now acting defiantly, and ignore conciliation. There are symptoms, nevertheless, of the approach of better feelings.

NATIONAL ASSOCIATION OF MASTER BUILDERS.

The half-yearly report of the council of this Association has just been issued. The following is a summary. The report commenced by giving a list of towns the Master Builders' Associations of which had affiliated themselves with the national organisation. They were as follows:—Altrincham, Bradford Builders' and Bradford Stonemasons' Associations, Birmingham, Bolton (Master Joiners' Association), Bristol, Crewe, Cambridge, Chichester, Coventry, Croydon, Dudley, Derby, Doncaster, Eccles, Central Association of Master Builders of London, Lincoln, Leicester, Liverpool, Leeds, Lancaster, Manchester and Salford, Macclesfield, Northampton, Newport (Mon.), Norwich, Nottingham, Nottingham Master Plumbers' Association, Runcorn, Southport, St. Helen's, Warrington, Wolverhampton, Wigan, and Walsall. One of the first efforts of the organisation was to collect statistical returns from various centres of industry as to the rate of wages and the number of hours worked, together with the condition of the labour market. A second return of a similar nature was made in July, and this had proved a great boon to the trade in the settlement of disputes with the operatives. A list of several towns is then given, with particulars of the operatives' demands, and the masters' action in each. The Council then continued by remarking that there were still many towns where local associations already in existence could not see their way up to the present time to affiliate themselves with the national association. The principal of them were Bath, Bursiem, Chester, Cardiff, Hull, Preston, Plymouth, Portsmouth, Sheffield, Stockport, and Sunderland, but they were quite willing to give all information in their power when required by the organisation. Union was very important, and the report urged builders to do what they could to induce unattached societies to give in their allegiance. The association had been the means of forming local associations at Derby, Macclesfield, and Eccles; and there was little doubt it had tended to check the demands of the operatives throughout the kingdom. In Liverpool, where the largest strike in the building trade had occurred this year with the painters, the secretary of the Operative Painters' Alliance Society, sought for a deputation to be received from the operatives to arrange the terms, and put an end to the strike, and he was informed by the chairman that the men could apply for work, and as many as were wanted would be employed. To this he complained that wherever the men had applied for work in other towns, they found that no Liverpool painters were taken on. The men returned to work on the following Monday morning. The National Association had recommended the local associations to petition the House of Commons through the members of Parliament for their respective towns, against a Bill to amend the law relating to the liability of employers for injuries negligently caused to persons in their employ. The treasurer presented his accounts, showing the amount of subscriptions received for the year was 228*l.* 3*s.* 1*d.* Of this, 76*l.* 2*s.* 6*d.* had been expended, and 152*l.* 0*s.* 7*d.* were therefore left in the bank. When the secretary's salary and other disbursements were paid, a net balance of 66*l.* 8*s.* 6*d.* would be left to the credit of the Association.

The plasterers' strike in Bristol still continues, the men having demanded an increase of 1*d.* per hour. The employers, however, are fast filling their shops at the old rate.

CASE UNDER METROPOLITAN BUILDING ACT.

At Marlborough-street, Mr. Paul Vargues, of Leicester-square, hotel keeper, was summoned by Mr. Walker, district surveyor of St. Martin-in-the-Fields, for neglecting to give two days' notice before the commencement of building works.

Mr. Walker said he was compelled to take proceedings in order to remove the prolific source of danger arising from the laxity of builders and owners in neglecting to give notice as required, thus avoiding scientific supervision. He did not want to press heavily against Mr. Vargues, as he believed the neglect was caused by Mr. Vargues's absence from home at the time. The work done was of an important nature, for which the Metropolitan Board of Works had laid down stringent regulations.

Mr. Vargues stated that he had given directions to his builder to open a communication from the rear of his hotel to an adjoining house, but was quite ignorant of the requirements of the Act at the time.

Mr. Mansfield ordered him to pay 20*s.* fine and 12*s.* costs.

THE DECORATION OF ST. PAUL'S.

Sir,—"Meter," in endeavouring to set me right upon the subject of "shams," has himself fallen into a most egregious error. To the main principles laid down in my previous communication I must still adhere, notwithstanding that "Meter" doubts my ability to understand that "fine art is essentially shamming." He says, "*We* had really begun to hope that this notion respecting shams was on the wane, and that people, especially writers on Art, were beginning to see that Art for the most part consists in shamming nature." This is a proposition which I never remember to have seen seriously advanced before. Art in its proper and legitimate sphere is the very antithesis of shamming. Fine art is no more a sham than Nature herself. A sham is essentially a delusion, something "which deceives expectation," and consequently shocks the understanding. A sham pretends to be what it is not, and is perpetrated to deceive. Neither a painting nor a statue can be consistently classed in the category of impositions. The very best compositions in art are always the farthest removed from any attempt to deceive the spectators by an endeavour to ape reality. Art legitimately employed is ever truthful, and the greatest painters have invariably deprecated the idea of shamming nature so as to deceive. The most meretricious works always aim at deception. I have a religious and deep-rooted hatred of "shams," and unlike "Meter," should be truly sorry to see the agitation against them "on the wane." If "Meter" will compare our present art productions in all branches of manufacture with those of previous years, he will have cause to speak well of, and be thankful for, the crusade against shams. To call fine art "shamming" is to libel our greatest intellects. A sham is an endeavour to lie, and the logical conclusion is that, according to "Meter," all painters, sculptors, and modellers are artistic fabricators of falsehoods. James Geo. Buckle.

Sir,—"Meter's" arguments tend to depreciate Stevens's sketch, and are doubtless designed either to wantonly impede its execution, or altogether to prevent it from being carried out. Why should the merits of a deceased artist, or of his works, be called in question? Although not very widely known, Stevens's talents have been recognised, nay highly lauded, by that section of the press which is supposed to favour the aspirations and style of the New School. Is this not enough? How much longer is the commencement of the decoration of St. Paul's to be delayed by factious opposition? If the highest authorities upon mural decoration in this country have been consulted,—I say "if," for I am by no means in the position to say that they have,—why let the demolition of Thornhill's old-fashioned work be proceeded with, and restoration, under Messrs. Leighton & Poynter, commenced forthwith. Does "Meter" desire that the fund subscribed for the work should double itself at compound interest before the work is commenced?

Civis.

CONCRETE HOUSES.

Sir,—I wish to get information in regard to the building of concrete houses. The Duke of Sutherland is desirous of extending his reclamations in the centre of Sutherland, where there is a difficulty of getting skilled labour, and it has been suggested that the houses might be constructed entirely of concrete, including the floors, walls, partitions, and roofs.

I will feel obliged if any of your correspondents can give us any information whether or not this is practicable, or whether it would be more expensive than the ordinary method of erecting houses. There is plenty of clean sand and gravel to be got from the burns in the neighbourhood. G. G.

*** Certainly it is practicable, and would probably be less expensive than the ordinary method. The undertaking would require, however, to be rightly directed.

COMPLAINT AGAINST A BUILDING CONTRACTOR.

Acting on the part of the Working Men's Club and Institute Union, Mr. Edward Hall says he had arranged for a visit to the Natural History Museum, South Kensington, with the concurrence of the architect, the clerk of works, and the contractors' manager, and complains bitterly that, after the bills and cards of admission had been printed, the visit was forbidden, with scant courtesy, by Mr. Markwick, partner in the firm of Messrs. George Baker & Co., the contractors. The act is to be regretted; but whether or not Mr. Markwick has a valid defence of the course he took we are not in a position to say.

OPEN-MOUTHED PIPES *v.* VENTILATORS.

Sir,—At page 896, Mr. Banner states that I ought to have mentioned the conditions under which the experiments were made as described in your previous week's issue, p. 869. With your permission I shall now do so. They were made with a 4-in. pipe carried up from the centre of my house in the upper flat. The entrance-door and all the windows were shut, except that four windows had each an opening in the middle all the way across about 1 in. wide to admit fresh air, and there was only one fire on. These circumstances, and the condition of the atmosphere, caused a natural up-current in the ventilating-pipe all the time I was experimenting. Upon August 22nd, at 8 p.m., the weather changed, and in two minutes the following was the result:—

Plain 4-in. Pipe.	Trumpet Outlet.
75 ft. up.	660 ft. up.
110 ft. down.	15 ft. down.

The anemometer I have used is a new 3-in. one, and the bottom or inlet of the 4-in. pipe was contracted to fit it. The experiments described at p. 869 were made when there was little wind, and it is due to Mr. Banner to publish the following results when the wind blew harder. Each ventilator and the plain pipes got four minutes and the whole amount of up-current of each was as follows, in feet:—

Plain Pipe.	Trumpet Mouth.	Boyle's Ventilator for 3-in. Pipe.	Buchan's 4-in. fixed Ventilator.	Banner's 3-in. Cowl.
800	1,400	1,200	1,980	1,350

In this case, Mr. Banner's cowl acted much better than the plain pipe, as it had the *necessary motive power* in the high wind to make it work, but during a calm this motive power is wanting,* hence its formation and its narrow outlet cause it to give inferior results.

It is somewhat amusing to read the comparison drawn by Mr. Banner, at page 896, between his own 3-inch cowl and Mr. Boyle's fixed ventilator, and in which he takes care to tell us that the outlet area of the latter is much greater than that of the former; but as each is what the patentee sells as his size for a 3-in. pipe, Mr. Banner has himself only to blame if he makes the outlet area of his own cowl too small.

Mr. Banner is also displeased at the results stated in regard to his cowl not being so uniform as the others; but I cannot help the cowl in that respect, for, owing to the way it is balanced, it is somewhat erratic in its action, and thinks nothing of taking a waltz occasionally.

To-day I tried a new and different experiment, viz., to test the value of the ventilators in preventing a blow-down, or suck-down, of air through the ventilating shaft. I only allowed about half the former amount of fresh air to come into the house, and had two fires on, and the following are the results in feet of up-current and down-draught in one minute for each:—

	Plain Pipe.	Trumpet Mouth.	Boyle's Ventilator.	Buchan's Ventilator.	Banner's Cowl.
Up	30	200	160	250	100
Down ...	40	25	10	none	5

The conclusions to be derived from the foregoing experiments I consider are that a plain pipe is much inferior to one with a trumpet-mouthed outlet, while the trumpet-mouth is at least equal to various ventilators, and in some cases is superior,—the situation and purpose having a good deal to do with which would be most suitable. While as to preventing "down-draught" into a house or enclosure with fires on in it, &c., which would tend to draw in a current from the outer air, a plain pipe is far behind a pipe with some suitable appliance surmounting it.

W. P. Buchan.

COWL EXPERIMENTS.

Sir,—Mr. Banner has thought proper in your last issue to submit for publication a tabular statement purporting to be "Results attained by the Metropolitan Board of Works" of certain tests or experiments conducted for gauging the power of various ventilator extracting cowls, and wherein it is made to appear that my Patent Exhaust Ventilator yielded negative results, and that his cowl was the best amongst the appliances tried.

Will you allow me to place on record that the Metropolitan Board of Works are in no way responsible for his statement: it has not emanated from them, and is given without their authority. They repudiate it; and, further, the executive engineer of the Board declares that Mr. Banner's cowl is incapable of performing useful service as an air-extractor, and that it is inferior in its effect to even a common lobster-back cowl.

Mr. Banner has recently applied to the Metropolitan Board of Works for a copy of the tests furnished by the Board's engineer upon the action of his cowls. I am enabled to state for your information that the Board has declined to accede to Mr. Banner's request, the papers in question being confidential; but he was officially supplied by letter, dated the 30th July last, with a copy of the committee's report relative to the subject of experiments.

I have the honour herewith to furnish a copy of the report referred to, which is an extract from the minutes of proceedings of the Metropolitan Board of Works, from which it may be observed that the opinion of the executive is recorded of the little value attached by them to Mr. Banner's appliances.

The tabular statement prepared by Mr. Banner, to which he has unwarrantably attached the Board's name, is deceptive, and garbled in such a way as to entirely mislead the reader. The figures quoted are dressed to show the results of certain fractional periods, and not of the total duration of time of experiments, and are selected for his purpose of snatching an apparent advantage which he does not possess.

For example, in an observation lasting 175 minutes, Mr. Banner selects two periods, each of one minute and of five minutes' duration. It is impossible that the several extractors could be used at the one time upon the same tube and under similar conditions, and it is to be inferred, therefore, from Mr. Banner's tables that he has selected the periods of *maximum force* of the wind to illustrate the action of his cowl, and pitted them against periods of *minimum force* of the wind of my patent exhaust ventilator.

The essentials of a good extracting ventilator to be commended for general service is not speed alone, for that is merely a factor; but power, economy of cost, freedom from down-draught, capacity, permanence, and durability,—features now generally recognised as not possessed by Mr. Banner's appliances. Richard Weaver, C.E.

* Consequently, it is scarcely a proper comparison to class a ventilating cowl and a Giffard injector together, seeing that in the latter case the engineer can apply the steam whenever he pleases.

WILLIS'S ROOMS.

Sir,—Can you tell me what is the peculiar construction of the floor of rooms in King-street, St. James's (Willis's Rooms)? I understand they are the best rooms in London for dancing,—and I have an order to construct a floor precisely similar. If you can let me have any particulars respecting its construction you will greatly oblige, yours faithfully,

H. A. Y.

*** It is a double-framed floor including girders, ceiling-joists and floor-joists, but the proprietors are not aware of any peculiarities in the construction. Originally it was wholly of wood, and there was a row of uprights, disguised as palm-trees, under the centre of it in the room below, which in the times of Almack was called "The Palm-tree Walk," where visitors waited for their carriages. A few years ago iron girders were introduced in lieu of some of the wood girders, and the "palm-trees" were removed. The rooms as originally built were opened in February, 1765. Mr. Robert Mylne was the architect.

PASTE.

Sir,—Response has frequently been given in your pages to the inquiry,—"How to make paste that will keep." Judging from my experience, however, any sufficient answer has yet to be published. I have had additions of each substance that I have seen recommended,—as alum, oil of cloves, &c., but not one of them answers the purpose. Gum is not very suitable for large surfaces; and it gets mouldy in the bottle. The paste that I have found both the least liable to speedy putrescence, and by far the most stickable, and which is brownish in colour, is sold at a certain shop for shoemakers' implements in Rochester-row, where a powder of which it is made could be had when the shopkeeper is in good humour. I believe I have been told that the powder is not dextrine. Paste that is very good, and like what is ordinarily called shoemaker's paste, can be had at a similar shop in Chapel-street, Westminster. It is too thick. It can be diluted; but then I think it acquires the objectionable properties of ordinary paste. What one wants is, with materials at hand, and wherever one is, to be able to make oneself, unputrescible as well as stickable paste, or some sufficient and cheap substitute for it; and if the paste contained an ingredient whereby the pasted papers would be distasteful to mice, there would be some loss of valuable documents prevented for such men as

An Old Literary Man.

BUILDING ACCIDENTS.

Kennington.—On Monday last a shocking accident, resulting in serious injuries to a man named Edward Michael, aged twenty-nine years, residing at 29, Whitloe-street, King's-cross, occurred at Kennington. It appears the man was employed on a scaffold with other men pointing the front of Manor House, Kennington, when a heavy crash was heard, and Michael was discovered lying on the stones with a frightful gash across his left temple, and his upper lip split up to the nasal bone. On his removal to St. Thomas's Hospital he was attended by Mr. Bowen, who found that he was otherwise fearfully injured.

Northumberland-avenue.—On Monday afternoon a serious accident occurred at the works going on in connexion with the hotel which is being built at the Strand corner of Northumberland-avenue. An iron girder was being hoisted, when the guide-rope broke, and one of the workmen lost his hold and fell, sustaining such injuries as to make it necessary that he should be conveyed to Charing-cross Hospital.

Swedish Timber.—We have received a copy of the official "List of Saw Mill Owners and Timber Exporters of Sweden, with their Shipping Marks on Sawn Timber," just issued by the Society of Saw Mill Owners and Timber Exporters at Stockholm. It is sold at the *Timber Trades' Journal* Office. The length of the list would astonish many.

THE BLACKNESS OF ST. PAUL'S.

The criticisms of Professor Paley and Mr. E. C. Robins in reference to the above have opened up a wide field for inquiry and research as to the action of the atmosphere upon the surface of stone-built churches, particularly in our large towns and cities.

I am pleased to be able to endorse Mr. Robins's views when he states in your last week's impression "that the sooty coating on surface has been a preservative to the stone." Being at present engaged on the restoration of the steeple to the parish church of St. John's, Horselydown, Southwark, which is built of Portland stone, I find there are many portions of the facing stone covered with this black sooty-like coating, which certainly appears to have preserved the face of the stone from decay, as is clearly shown by other courses around them when not so covered being considerably disintegrated upon their surfaces, whereas the black-faced stones have not changed or decayed, but their surfaces remain in many cases about ½-in. or more before the face of adjoining stonework. They are not confined to any particular side or aspect, but may be seen on all sides,—north, east, south, and west,—and of the walls of the church generally also.

Upon breaking off small portions of the black-faced stones they appeared to be some degree softer, and not to contain the same quantity of silica as the others, where the face of the stones had been disintegrated or decayed. I would venture to hazard the opinion that it is either a different stone, perhaps Aubigny, or that it is Portland, but not set on its proper bed. Here, then, is offered a chance of easily inspecting the stone to Mr. Robins, or those who may wish to follow up so interesting a subject as the preservation or decay of stonework, or if any geologist or chemist has sufficient interest to do so, he has now an opportunity of studying and analysing it also.

I will just mention that the above church is faced apparently with Portland stone throughout, and was consecrated in the year 1733.

Arthur Billing, Architect.

"CONDITION OF TENBY."

Sir,—In your issue of August 24th there appears a letter from Mr. W. Burns reflecting on the sanitary condition of Tenby. A reply to this will be forwarded to you, but in the meantime it may not be amiss to show the animus in the letter, by stating that Mr. Burns was employed in connexion with the waterworks here; but after his services were dispensed with, he preferred a claim on the Sanitary Authority which was considered unjust and accordingly resisted. Arbitration was agreed upon, and the award has been made these two years, but Mr. Burns has not sufficient confidence in the justice of his cause to take it up.

In connexion with this, some of your readers may possibly remember Mr Burns, about three years since, sending a letter to the editor, making some charges against the corporation. This letter the editor declined to publish, and stated in a paragraph, as well as I can recollect,—"That if the charges were true Mr. Burns had his remedy elsewhere; and if not true, they were better unpublished."

H. T. Morley, Borough Surveyor, Tenby.

FALL OF AN ARCH IN THE CITY.

An inquest was opened on Wednesday before Mr. Payne, at St. Bartholomew's Hospital, on the bodies of Thomas Joseph Higgins, 43, and George Colley, 29, labourers, who were killed by the fall of an archway at Alderman's-walk, Bishopsgate, on Saturday last. From the evidence it appeared that the men were in the employment of Messrs. Brass, builders. On Saturday there was a very heavy thunderstorm, and the deceased men were compelled to seek shelter from the rain more than once. An archway was being constructed, on the top of which was a large quantity of ballast, and this had been added to in weight by the heavy rain which had fallen.

George Kerry, carpenter, gave evidence to the effect that the arch was resting on solid brickwork, and that the ballast was shot on the top of the arch from wheel-barrows. The rain was sufficient to shift the ballast or anything else which was in the way of its progress. He attributed the fall of the work to a sudden shock caused by the vibration arising from a clap of thunder. One of the supporting walls bulged out. He believed that the walls and the arch were properly made, and would have stood firm had it not been for the storm.

George Turner, foreman, considered that the archway fell in consequence of a flash of lightning striking an iron girder opposite, passing through the column supporting it on the wall, and striking the wall, drew it away from the arch.

George Williams, labourer, said he believed the archway would have stood had it not been for the large amount of the ballast. The archway was only supported by temporary rests, and he considered there was not sufficient timber underneath to sustain the heavy weight of the ballast, and the rain which saturated it. The ballast was about eight or nine tons in weight, and it was put on the archway about one hour before it fell. The ballast was placed there for the purpose of concreting.

The inquiry was adjourned.

COMPETITIONS.

Truro Cathedral. — The Executive Committee of the Fund for erecting a cathedral at Truro, after examining the drawings sent in by Messrs. St. Aubyn, Bodley & Garner, Burges, Pearson, Pullan, and J. O. Scott, have selected Mr. Pearson, of London, as the architect. Mr. Bodley was second in the voting.

St. Luke's Church, Southport.—Out of five sets of drawings submitted in competition for the above church, those under motto "Mediæval" were selected, the authors being Messrs. Mellor & Sutton, architects, Southport. The church is to be faced with bricks inside and outside.

WATER SUPPLY.

Glasgow.—At a meeting of the sub-committee, appointed by the Glasgow Water Commissioners on district meters, the engineer (Mr. Gale) submitted the results of the system of night inspection, and of control over the water-supply, as carried out in the six experimental districts of the city. The aggregate population of this area is 60,096, and at the time controlling meters were introduced the average daily supply per head was 53·1 gallons, and the night rate, per 24 hours, 42·2 gallons. The results at the 6th of June last showed that the daily supply per head had been reduced to 33·7 gallons, and the night rate per 24 hours to 19·5 gallons. In one district, where it formerly was 60 gallons per head, the reduction per night was as much as 41 gallons. The average saving over the whole district (population 60,096) was 17·8 gallons per head, or an aggregate of 1,069,709 gallons per 24 hours.

Kilmalcolm.—The new waterworks for the village of Kilmalcolm and its neighbourhood were opened on the 15th of August, by Sir Michael Shaw-Stewart. The supply is drawn from the Blacketty Burn, which is situated on the ducal estate of Sir Michael R. Shaw-Stewart. A reservoir has here been formed by the construction of an embankment, about 400 ft. in length, across the valley. The area of the reservoir is nearly two acres, the depth of water 14 ft., the water surface about 50,000 square feet, and the capacity of the lake a million and a half gallons. This is estimated to give a supply of thirty gallons per day per head over the population in the area of supply. The water is supplied to Kilmalcolm by gravitation, the height of the reservoir above the town being 170 ft., and above the sea-level 465 ft. The cost of the undertaking has been nearly 3,000*l*. Mr. Wilson, C.E., Greenock, has superintended the progress of the works, and the several contractors are:—For the reservoir, filter, and supply-tank, Mr. Matthew Brodie, Gourock; pipe-laying, Mr. Daniel Cunningham, Kilbarchan; cast-iron pipes, Messrs. R. Laidlaw & Sons, Glasgow; valves and hydrants, the Glenfield Company, Kilmarnock.

Books Received.

Three Years in Roumania. By J. W. Ozanne. London: Chapman & Hall. 1878.

Roumania being now a household word, many will be surprised to find that the little book before us is the first about the principality written in English by an Englishman. Mr. Ozanne lived there three years, from 1870, and his object has been to give a general idea of the country and the people without going too much into detail. When he wrote, Bucharest, which name in the native tongue means "the City of Pleasure," had about 200 churches, 25,000 houses, and a population of 244,000. The state of society, as described by the writer, is loose and immoral in the extreme, and does not lead to great expectation of progress, unless a change is being effected in that direction.

Roumania is divided into thirty-three districts and 164 *arrondissements*. Turnu-Severin is the chief town of the Méhédintii district, and is one of the principal Danube ports. It was once upon a time the capital of Little Wallachia, and now possesses a dockyard for the repair of the Danube boats. In this town are to be traced the ruins of a Roman tower and the remains of a Roman bridge. In the district of Argès is the church of Argès, which has attained a European celebrity. Mr. Ozanne says this church was built in 1518, in the Byzantine style, and is of extreme beauty. Its exterior is of marble, carved with remarkable skill, and producing a marvellous *tout ensemble*. The church is built in the form of a square, after the manner of the Greek churches, and has a dome in the centre. There are four little towers of great elegance at the four corners of the monument, and two of them seem about to fall one on the other. The illusion is produced by spiral bands which, encircling them from base to capital, make them look as if they were oblique, although they are in reality quite perpendicular. The walls of the interior are embellished with fresco paintings and gilded carvings. The name of the architect, Manoli, has been preserved in the popular legends, in which the Devil naturally plays a prominent part.

The book will be found very agreeable reading.

Rock-cut Phrygian Inscriptions at Doganlu.

An important paper on this subject, by Mr. Edward Thomas, F.R.S., appears in the current number of the Journal of the Royal Asiatic Society. At the end Mr. Thomas gives "for the exercise of other people's experimental criticism," as good a combined transcript of the inscriptions (reduced into small Greek) as he can obtain from the mechanical eye-copies at present available.

VARIORUM.

The current number of *The Magazine of Art*, includes a thoughtful and eloquent paper by Mr. Wyke Bayliss, F.S.A., named "The Higher Life in Art." Take a specimen,—"Because art cannot do everything it is unreasonable to conclude that it can do nothing. This, at least, it can do. It can so transfigure a little colour that lies inert upon the palette,—a little grey, and brown, and white,—into a living presence, that our hearts shall beat faster only to look upon it. It can so link thought with thought, and put them into grave or sweet words, that we may look through Shakspeare's eyes upon an English garden of 300 years ago,—or hear the storm-shaken pines which make music in the Volkslied,—or see the shadow that lay dark on Dante's life as lies the shadow of the cypresses upon his grave at Ravenna. It can so build stone upon stone, and shape them into beauty, that Richard of Salisbury of the thirteenth century, shall speak to Charles Kingsley of the nineteenth, making him stronger for his duty, and happier in performing it. And the force which can do these things is surely one of which it is well for us to take account. Nor is this all; for, whatever art can or cannot do, it is quite certain that *we* cannot so much as live our lives without it, any more than the bees can build their cells without the fine instinct which controls their labour,—only we sometimes go wrong, while they always go right. It is a question of degree. Whether we build well or ill,—we build. Every picture that the artist paints or the merchant hangs upon his walls, every statue we set up in our midst, every book we read, every song we sing, as surely as every roof-tree that shelters a hearthstone, is a chamber in the great palace of art in which some soul shall for a time dwell. Let us see to it that the chambers are at least clean and full of light. Such chambers have been built by those who came before us. Salisbury Cathedral is one of them. And there has been one also, for centuries, in every village in England where an ivied tower or a simple chancel arch has touched the hearts of priest and squire and people with a sense of beauty even when they least knew it."——Messrs. Bemrose have added to their Railway Panoramic Guides, one for the Glasgow and South-Western line, edited by Mr. R. Kemp Philp. These guides, for a few pence each, give travellers a very good notion of the country they are passing through, with much useful information pleasantly conveyed.

Miscellanea.

Alleged Frauds by a Local Official.—At a special sitting, the Edmonton magistrates have investigated five charges of fraud against Edward Clarke, an ex-member of the board of guardians, and still holding a number of local offices of trust. The prisoner was also charged with forgery. It appeared that Clarke, who was much respected by his fellow guardians, was trusted by them to superintend the building of a temporary small-pox hospital, on the strength of his having formerly been a builder and contractor. The erection was completed in the short space of fourteen days, and shortly afterwards prisoner presented a bill for timber in the name of James Smith, but without an address, for 347*l.* 7*s.* 10*d.* He was also a member of the finance committee, and in that capacity certified to the correctness of the account. A cheque was therefore drawn for the amount, and, at prisoner's solicitation, handed to him, he promising to obtain Mr. Smith's receipt. Eventually he presented a receipt, but in the name of "Joseph," and not James Smith, and his attention being drawn to the difference in names, he said Mr. Smith's son had inadvertently signed for his father, but that he (prisoner) would get a proper receipt. He took the Joseph Smith receipt away, and subsequently brought one in the name of James Smith. An explanation was asked for, and prisoner not being able to give a satisfactory account of the transaction, a searching inquiry was made, which resulted in the discovery that prisoner had only obtained timber to the amount of 243*l.* 10*s.* 11½*d.*, and that he had made out the larger account by increasing the quantities actually supplied. Further investigations brought to light the fact that a similar process had been pursued with respect to drain pipes ordered by prisoner as a member of the Works Committee, and the evidence tended to show that he had committed several other frauds of a similar description. Eventually he was committed for trial on all the charges.

The Ancient Sipontus. — The city of Sipontus was founded in pre-historic times by a colony of Arcadians and Thessalians, who left the shores of the Peloponnesus to settle in Daunia, the third of the Ispigian regions. New Sipontus rose on the seashore, near Mount Garganus, by the two (now dried up) rivers Cerbalus and Daunus, the united waters of which formed the natural and safe harbour. Commander Stanislaus D'Aloe writes to the *Morning Post* claiming the credit of the discovery of the ancient city. He was led to it, it seems, by finding in what was supposed to be the cistern of the present cathedral an epigraph in archaic characters, which he reads thus in English:—"Titus Tremelius Antiochus, Libertus of Titus, undertook at his own expense the erection and dedication of the temple and altar of Diana, built of square stones adorned with plaster, and a statue of Diana. Thus he willingly and worthily fulfilled his vow." From the meaning of this epigraph he concluded that he was in the hall of the ancient temple of Diana Sipontina, and not in the cistern of the modern hermits, and in proceeding to examine it more in detail, found it to be very large, with a conical vault terminating in a round hole to admit the light. He afterwards began to excavate the adjoining ground, and uncovered the capitals of the columns of the portico in two parallel rows to the number of twenty. In the same month of July, continuing the investigations, he discovered at a distance of two kilomètres from the temple of Diana the public Ustrina of Sipontus, surrounded by a wall of reticulated masonry, and near it recognised ruined edifices destined to the use of the public functionaries charged with the cremation of the dead. Returning westward he discovered the quay or mole of the ancient port, now three kilomètres inland from the shore of the Adriatic. All these monuments will be described in the "History of Ancient Sipontus," which will shortly be completed.

Bangor Cathedral. — A pulpit made of Caen stone, erected from a design of the late Sir Gilbert Scott, and executed by Messrs. Cox & Son, Southampton-street, has been placed in Bangor Cathedral. It is intended as a memorial of the late Rev. Morris Williams, rector of Llanrhyddlad, Anglesey, a clergyman well known throughout the Principality. The panels illustrate the preaching of John the Baptist, and other scriptural subjects, and have been executed by Miss Wyndham, a lady amateur.

Huts for Cyprus.—The *Norfolk Chronicle* says that within the last few days Messrs. Lucas Brothers, of Lowestoft, have received orders to prepare with great despatch a number of officers' huts, &c., for Cyprus. The contract was as follows:—Eighteen huts for eight officers and eight men, each separate and private, and yet connected, 60 ft. long, 18 ft. wide, and 9 ft. high; three officers' mess establishments, 116 ft. long, 18 ft. wide, with an ante-room 36 ft. long, 18 ft. wide, averaging 9 ft. high; three guard-houses, 42 ft. long, 17 ft. wide, and 9 ft. high: this building to contain prisoners' room, 16 ft. 6 in. by 15 ft.; a guard-room, 21 ft. by 16 ft. 6 in.; three cells for prisoners, 12 ft. by 6 ft. each, lined with corrugated iron, and planned upon the separate system. The contract was signed on the afternoon of the 3rd of August, and the order was received at Lowestoft on the 5th at midday, and on the 17th the officers' huts were ready, waiting the inspection of the Government inspector. The mess establishments were expected to be finished on Monday night, and the whole affair completed by Thursday at the latest, or in sixteen days from the time the order was first given, Sundays excepted. The whole was completed by machinery, not a tool being employed from the time the timber was landed at the wharf until the huts were ready for delivery, and then they were simply slightly nailed in position. The whole will be shipped and delivered at Woolwich within twenty days from the time the order was received.

Playgrounds and Open Spaces. — Dr. Septimus Gibbon, medical officer of health for the Holborn district, in his annual report to the Holborn Board of Works, states:—Ever since I have been your medical officer of health, I have frequently stated in my reports that one of the most important sanitary wants of the central districts of the metropolis is the provision of playgrounds and recreation grounds where the aged, the invalid, and the young can take air and exercise in safety. For this beneficent purpose I have urged the throwing open of three disused burial-grounds in the district some six acres in extent: they would make admirable gardens or recreation grounds. Many of the churchyards and burial-grounds of the adjoining parishes have been consecrated anew to this divine mission of "healing the sick." I trust, therefore, that your Board, notwithstanding numerous past failures, may be encouraged to make one more effort to have these disgracefully-neglected grounds cleared, beautified, and thrown open to the public as recreation-grounds.

Bye Commissions.—"They manage these things better in France." An important verdict has just been given by the Paris Court of Criminal Appeals concerning the question of commissions given to servants by dealers. The principal accused, Hinze, was a clerk of the Northern Railway Company, and was entrusted with the purchase of certain stores. He was charged with having concerted with certain dealers to procure for them orders, on which they allowed him a bonus of three, four, or five per cent. He thus received a total sum of about 100,000 francs. To obtain for them the preference he dissimulated the lower prices at which the same articles were offered by other firms. Hinze was condemned to three months' imprisonment, and 11 tradesmen were sentenced each to one year's detention.

A New Sailors' Home at Liverpool.—On the 22nd ult. Lord Sandon opened the branch Sailors' Home at North-End, Liverpool. The building (of which we gave a view and plans in our volume for 1876 (pp. 1,242-43), occupies a site in Luton-street, off Great Howard-street, and is advantageously situated for seamen whose vessels may be in the North-end Docks. The style of architecture is Gothic, freely treated to meet the exceptional requirements of the building. The total cost of land and house-property was 10,149*l.* 14*s.* 10*d.*, and the cost of the new home and its fittings about 15,000*l.*, making the total cost about 25,150*l.* The architects were Messrs. Houet & Wise, and the contractors Messrs. Jones & Son.

The Bishop's Throne, Salisbury Cathedral.—The new episcopal throne has at length been placed in the choir of the cathedral. It is in the Early English style, is carved in oak, with a lofty pinnacled top or canopy, and makes a finish to the stalls on the southern side of the restored choir. It was designed by the late Sir Gilbert Scott, R.A., and was executed by Mr. Earp, of Lambeth, at a cost of 560*l.*

Viscount Falkland's Monument.—At a meeting of the Newbury District Field Club, on the 22nd ult., Mr. Money reported that the erection of the memorial to Viscount Falkland on the battle-field of Newbury, where that nobleman fell, was being satisfactorily carried out by Messrs. Freeman, of Westminster, and that the work would shortly be ready for inauguration. After the meeting, a party of members and ladies assembled on the site on Wash-common, when a high block of granite, weighing 11 tons, forming the base of the memorial, was lowered to its place, a bottle being deposited containing some coins of the realm and a document recording the circumstances under which the memorial was erected. The memorial, it appears, will be unveiled on the 9th inst.

Plymouth Theatre.—The Plymouth Town Council have resolved, after nearly four hours' debate, to rebuild the theatre, which was burnt down in June, and which was corporation property. The insurance policy was only 2,500*l.*, and a strong protest was raised against burdening the rates with the cost of additions and improvements, which, it was contended, were illegal. The legality, however, was maintained by the town-clerk, and the motion was passed, ten members of the council voting against it. As we have previously announced, Mr. C. J. Phipps will be the architect of the new building. We publish elsewhere the list of tenders for the work.

The late Mr. John Ashdown, of 33, Norfolk-street, Strand, architect and surveyor, died very suddenly after a short illness on Monday last. He was articled as a pupil to the late Sir Gilbert Scott, and was a member of the profession for upwards of thirty years. His principal works were the Lambeth Cemetery, the Orphan Working School at Haverstock-hill, Bridlington Quay, Milford Haven, the designing and laying out of the town of Llandudno; Dalby House, Leicestershire, &c. The deceased at his death held the appointments of surveyor to the Conservative Land Society and the United Land Company, and architect and surveyor to the Cadogan and Hans Place Estate, Limited.

Hexagonal Cottages, Seacombe.—The third annual distribution of prizes to the inhabitants of the hexagonal cottages at Seacombe has taken place, the prizes being given by the owner of the cottages, Mr. Ellis, as a means of interesting the cottagers in the cultivation of the gardens they hold. The gardens are, from the manner in which the cottages are built, much larger than those usually accompanying houses of that size and rental, more especially those so near to a great town. There are at present thirty-five of these cottages, comprising five blocks and a half, four blocks having been built during the past year.

Messrs. G. Wilson & Sons' Mortising Machine.—"What, another?" says the reader. "Yes, another," we reply; and it must be evident that the value of a good mortising-machine must now be largely recognised, or there would not be so many varieties placed before the public. Messrs. Wilson's is a hand-lever machine, and the lever, of wrought-iron, is brought directly over the chisel. Simplicity and cheapness are the grounds on which the patentees take their stand, and with some reason.

Prize Distribution, Paris Exhibition.—The Government are determined to render the occasion one of great interest, and the presidents of the juries now in Paris are convened to enter upon the arrangements. The Palais de l'Industrie, used in 1862, had been thought of as the place for the present distribution, but owing to the numbers likely to attend, the Government are in negotiation with the proprietors of the Hippodrome, capable of holding 6,000 persons, and in all respects suited for a grand spectacle.

The Proposed Conversion of the Paddington-street Burial-ground.—The special committee of the Paddington Vestry, to whom was referred the question of laying out the Paddington-street Burial-ground as a garden and recreation-ground, have reported against the proposal. The vestry declined to confirm the recommendation of the committee, and the matter stands over for further discussion on the Board reassembling after the recess.

The Joiners' Strike at Bolton.—The strike of joiners at Bolton has terminated, after four months' duration, by the unconditional surrender of the men to the masters' terms.

Memorial Pulpit, Shidfield.—A memorial pulpit for Shidfield church has just been executed by Mr. S. Newman, of Winchester, from the design of Messrs. Colson & Son, architects. It is intended for Shidfield new church, of which they are the architects. A memorial brass is to be fixed in a panel, stating that the pulpit is erected in memory of Samuel Wilberforce, late Bishop of this diocese; and of Thomas Vincent Fosbery, M.A., one of his chaplains, and sometime Vicar of St. Giles's, Reading.

Staffordshire Engineers at Lincoln.—The *Lincolnshire Chronicle* for August 23 contained an interesting account of the visit of the North Staffordshire Institute of Mining and Mechanical Engineers to the well-known engineering and agricultural implement works of Messrs. Robey & Co., Lincoln.

The Knox Memorial Institute.—The public ceremonial of laying the foundation-stone of this building at Haddington, by the Right Hon. the Earl of Haddington, is fixed to take place on this Saturday, the 31st of August. The architect is Mr. J. Starforth.

Leicester Drainage Works.—At the meeting of the Leicester Town Council on Tuesday, Mr. W. F. Clayton, of Smethwick, was unanimously appointed engineer to the new drainage and flood works, at a salary of 400*l.* per annum

TENDERS

For the erection of shops and houses, numbered 137, 139, and 141, High-street, Poplar, for Mr. Thomas Rugg. Mr. E. C. Homer, architect:—

Staines & Son	£1,622 0 0
Boyce	1,577 0 0
Shurmur	1,435 0 0
Harper	1,475 0 0
Judd	1,397 0 0
Riddell	1,350 0 0
Alexander	1,349 0 0
Johnson	1,333 0 0
Sheffield & Frebble	1,267 0 0

For a new brick bridge, in lieu of the wooden structure known as Duckpool Bridge, on the road leading from Stixwould to Bucknall, for the Bardney Drainage Commissioners. Messrs. Padley & Thropp, engineers:—

Semper	£1,399 19 0
Walter & Hensman	935 0 0
Chapman	930 0 0
Binns	790 0 0
Hatcliffe & Bell (accepted)	727 0 0

For sewage outfall works, Oldbury, for the Local Board:—

Read & Jevons (accepted)	£4,638 12 0

For new workhouse schools at Marston Green, for the Birmingham Board of Guardians:—

Robinson (accepted)	£19,766 0 0

For the erection of a Wesleyan Chapel at Poole, Dorset. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove:—

Tilsed	£5,590 0 0
Jones	5,551 0 0
Stroud	5,089 0 0
Jones	4,825 0 0
Hoare	4,800 0 0
Snow	4,740 0 0
Lawson	4,736 0 0
Stephens & Bastow	4,720 0 0
Houey	4,632 0 0
Williams	4,590 0 0
Gridin	4,050 0 0
Clarke (accepted)	3,957 0 0

For rebuilding Nos. 34 & 35, Barbican, E.C. Mr. Benjamin Tabberer, architect:—

Jarrett	£5,605 0 0
Downs	5,440 0 0
Brass	5,420 0 0
Browne & Robinson	5,350 0 0
Merritt & Ashby	5,349 0 0
Marks	5,334 0 0
Braid & Co.	5,264 0 0
Ashby, Bros.	5,185 0 0
Sabey & Son (accepted)	5,150 0 0

For a warehouse, Aldermanbury. Messrs. Ford & Hesketh, architects. Quantities not supplied:—

Crabb (accepted)	£2,965 0 0

For the reconstruction of the workhouse for the parishes of St. Giles and St. George, Bloomsbury. Messrs. Lee & Smith, architects:—

Dove, Bros.	£76,555 0 0
Brass	72,628 0 0
Conder	71,580 0 0
Browne & Robinson	71,464 0 0
Kirk & Randall	69,244 0 0
Reading	69,243 0 0
Cullum	68,190 0 0
Howard & Dorrell	67,742 0 0
Mowlem & Co.	67,435 0 0
Holland & Hannen	67,330 0 0
Clarke & Bracey	67,114 0 0
Downs & Co.	66,920 0 0
Braid & Co.	66,500 0 0
Crockett	64,969 0 0
Chappell	64,873 0 0
Wagner	64,786 0 0
Nightingale (accepted)	63,373 0 0
Vernon & Ewins	61,049 0 0

For lighting St. James's Concert Hall with sunlight-burners. Mr. Emden, architect:—

Way	£200 0 0
Allison	199 0 0
Strode	197 10 0
Lea (accepted)	175 10 0
Defries	165 10 0

For villa in Ashburnham-road, Clive Vale, Hastings, for Mr. H. Kidgell, of Wolverhampton. Mr. H. Plowman, architect:—

Ditch	£1,410 0 0
Taylor	1,252 15 0
Reeve	1,150 0 0
Vidler (accepted)	1,116 0 0

For alterations and additions to the Tulse Hill Hotel, Tulse Hill. Messrs. Wilson, Son, & Aldwinckle, architects:—

Saunders	£667 0 0
Cox	664 0 0
Macey	650 0 0
Gammon	590 0 0
Malley	570 0 0
Taylor	567 0 0
Crook	528 0 0
Revised estimate:—	
Crook (accepted)	£445 0 0

For the construction of sewers in the Humber, Beaconsfield, and Mycenæ roads, Blackheath, Kent, for the West Combe Park Estate Company (Limited). Mr. W. Humber, engineer. Quantities by Messrs. Mann & Saunders:—

Gibson (accepted)	£4,954 6 6

For the erection of Heath House School, Horsmonden, Kent, for Mr. G. Tabor. Residence only. Contract No. 1. Mr. William Theobalds, architect. The proprietor supplies bricks and water, stoves and mantels, and paper. Reduced estimate:—

Martin (accepted)	£820 0 0

For rebuilding the Plymouth Theatre, for the proprietors, the Corporation of Plymouth. Mr. C. J. Phipps, architect:—

Berry	£9,093 0 0
Jones	8,159 0 0
Stephens & Bastow	7,599 0 0
Lapthorne & Good	7,334 0 0
Pethick, Bros.	6,973 0 0
Finch	6,675 0 0
Vernon & Ewins	6,490 0 0
Travena	6,370 0 0
Hubbard & Co.	6,292 0 0
McMillen	6,190 0 0
Clarke	5,784 0 0
Decorations and Gilding.	
Bell	520 0 0
Fouracre & Son	470 0 0

TO CORRESPONDENTS.

J. & M. C. (question is not remembered).—J. S. W. (the size of the rope is given as 2·7 in = 2¾ in. nearly).—C. B. & Son (yes).—A. S. (under our mark).—D. A. R. (too late for present number. Next week).—Condition of Tenby (several letters on this subject reached us too late for our present issue. They will have attention. People who wilfully should sign their names).—J. H. R.—H. G. H.—L. & S.—H. T. M.—F. & H.—"Tenby."—A Sufferer at Tenby.—R. B. F.—J. H.—M. & S.—S. M.—E. S. R.—E. C.—D.—J. F.—Messrs. R.—G. M. S.—W. F.—H. J. S.—A. & C. H.—W. B.—H. L.—B. T.—G. C. H.—S. & S.—Artist.—W. C. T.—E. W.—E. H.—J. J. H.—J. R.—E. & Sons.—W. T.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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RANDELL, SAUNDERS, & CO. (Limited),
Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
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Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [Advt.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [Advt.]

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Patent Ventilator, or Air-Propeller, for the introduction of Cold or Warm air into Dwellings, &c.
The machine may be seen in action at their Show-rooms, 127, Regent-street, London, W.
The apparatus consists of a drum with a double set of fans, which are worked by a fly-wheel placed in the centre, and on the same axle as fans. The motive for this fly-wheel is arrived at by a small jet of water being directed on to it, causing both the wheel and fans to revolve with great velocity; the air passing through the machine at a rate equal to 2,500 feet per minute, if desired, according to size of apparatus.
N.B.—The above machine may be used either as an exhauster or injector, as may be preferred, or both objects combined.
Also Patentees of the Fireclay Burners for Gas Fires and Cooking Purposes, and Patentees of the Tubular Gas Boiler for Baths and Conservatories, &c.
Designers and Manufacturers of Lamps and Candelabra.
Office and Works, 155, Queen's-road, Bayswater, W. [Advt.]

Helliwell Patent System of Air and Watertight Glazing without Putty and without exposing any outside woodwork to paint, and New System of Covering Roofs.
The fasteners are brass or copper. The peculiar arrangement of the glass covers the whole of the woodwork, and only the small fastener is visible; therefore the Roof is indestructible and outside painting unnecessary. The squares of glass can be easily removed, and the whole taken out and cleaned by any inexperienced person. Breakage is impossible except through carelessness or accident.
The Glazing is more air-tight than the old putty system, yet any amount of ventilation can be given.
Old roofs may be reglazed on this principle, and roofs are covered with slates or zinc on this system.
Extract from "Building News."
"Mr. T. W. Helliwell, of Brighouse, has recently patented and introduced a New System of Glazing and Covering Roofs, which is certainly superior to anything of the kind we have seen before; and it will, in our opinion, supersede any other system before the public."
Important References and all particulars from the Patentee,
T. W. HELLIWELL, Brighouse, Yorkshire;
And 19, Parliament-street, London.

The Builder.

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Natural Forms and Architectural Ornament.

IN the course of the remarks made by Mr. Waterhouse on things in general at a meeting of the Manchester Architectural Society, which we printed last week, there occurred an observation in regard to terra-cotta, to the effect that the extent of repetition which was almost unavoidable in terra-cotta ornament, and which would naturally lead to the employment of geometric rather than of natural forms as ornament, was hardly to be considered as any strong argument against the use of terra-cotta in architectural design. The omission of forms more or less reproducing nature need not be regretted nowadays, because it was so difficult to get carvers to execute even in stone figures and foliage which could be truly said to marry with the architecture of which they ought to form the chief attractions.

This expression of opinion is, we believe, only what many of those who have felt interested in architecture on its artistic side have more or less vaguely felt for some time past. It is becoming now not infrequent to find the feeling that a building is almost better without ornament than with; and when an architect builds a house for himself he not infrequently entirely omits ornamental embellishments which it would be considered almost a neglect of duty not to introduce in the case of a house built for a client. And there is no doubt that the style of carving capitals, &c., which was brought in with the Gothic revival, and was hailed as a return to nature and to reality in art-work, has palled upon our taste, and that it is becoming a common feeling now that a large spreading carved capital after the French Gothic type in a new building is rather an impertinence than otherwise, and a sign of want of refinement of taste on the part of the designer. A few years ago capitals innumerable of this kind were sketched, copied, re-designed and improved upon, and Gothic foliage ornament in a general way was regarded as a thing to give complete satisfaction; and carvers busied themselves with praiseworthy zeal, and often with much real taste and feeling in hunting up and reproducing in the church or other building they were engaged upon, the flora of the district in which it stood, pleased to think that they were then working in the spirit and on the method of the men of old time. And now it seems we are to find ourselves at the old conclusion in regard to this as well as so many other efforts of modern architectural art, that "There is nothing in it."

Perhaps the failure has not been altogether so great as some people would have us think. A great deal of healthful enjoyment for the art-workman, at all events, has come out of it, and a good deal has been done that we have all admitted to be very pretty, and sometimes original as well. But probably the truth is that it has been the same with architectural ornament as with architecture in general. While professing to copy nature, we have really been copying other persons' reproductions of nature, and adopting their taste as if it were really our own. All ornament which is founded on nature has a true and a real interest about it; and all that which is founded on mere artificial and arbitrary form is liable at last to be found wanting, and to be felt as pretentious and unreal. And the copying of that which is already a copy of nature by another hand is really the copying of the artificial, not of the natural, however we may disguise it to ourselves. It is of no avail to seek out plants and other objects direct from nature, if, after all, we only carve them in the manner and taste which is not born of our own spontaneous feeling, but of our admiration for what has been done by our predecessors in the art.

That appears to be the explanation of the distaste for naturalistic carving which is now springing up. As long as we confined ourselves simply to reviving Gothic *en masse*, the revived form of foliated carving did well enough, and sometimes a certain amount of originality and interest was given to it by the efforts of the cleverer among our art-workmen. Even at this stage of the proceedings, however, the modern Gothic carving was often felt to be rather trivial and flimsy in effect compared with the old,—a result which may be attributed not only to the impossibility of getting the work of one age to look like that of another, but to the over-refinement of finish arrived at in the execution of carving in stone specially selected for the purpose. The carved ornament of a Mediæval church or cathedral was almost always executed in the stone of which the main building was constructed, and hence seemed more intimately to belong to it. The appearance of a modern church with walls of a coarser stone, but with Caen stone capitals delicately undercut and finished, might be very neat, but it certainly had a much more artificial and pretentious effect; so that even here the spirit of Mediæval work was not revived. And now that Gothic forms of building have been, to a great extent, either abandoned, or so much modified as to be hardly recognisable, we feel that the Gothic spirit of ornament (the *modern* Gothic spirit that is to say) which still lingers is out of keeping with our buildings; that, as Mr. Waterhouse says, it will not marry with them; and that its style appears to our at present purged critical vision somewhat coarse and cabbagey, and more especially so when introduced so profusely as it often is into London buildings, where we feel at once instinctively that its only possible fate is to form a receptacle for soot and dirt, and to be gradually corroded and blunted, till first its salient angles, and then all its characteristic form, are gone.

All this, however, is no argument that the reproduction of natural forms in ornament is a mistake, or that we shall gain by abandoning it. Certainly the miserable festoon decorations which are coming into fashion are no improvement on Gothic carved detail; as far as such things are concerned, our practice in designing ornament is "nothing bettered, but rather grows worse"; for festoons and garlands are neither nature nor art, and the adoption of such a form of decoration can only arise from indolence, which induces men to save themselves the trouble of thinking or designing (and designing means thinking, in the first instance) by taking old examples of buildings just as they stand, faults and all. But it would seem that the adoption of natural growths as ornamental design depends for its success on a kind of transmuting effect of the artist's own mind and feeling upon them, fitting the forms for their situation, and the expression which they are intended to have or to give to the building. In Mediæval ornament this certainly was so. The carver transmuted the natural forms into the language of stone or wood, and into the style of treatment which his own habit of mind and method of execution, combined with the nature of the material, lead him to impart. It is of no use, however, for us to try to do the same thing in the same way; that is only the way to become mechanical and artificial; and it may be urged with all reason that it is better to have ornamental work really and unaffectedly mechanical, than to have that which professes to be individual work, but is really only ruled by a mechanical trick of hand acquired by the effort to imitate an old school of work. The point is to have our own way of doing it.

That seems to be really where the deficiency lies. There is in most of the ornamental carving that is put upon buildings in the present day no particular reason apparent either for the form assumed by the ornament or the position which it occupies. It is so many feet run of carved foliage, in regard to which it may be presumed that the architect who designs it (if he does design it), and the carver who executes it, exercise some kind of choice and taste, but it is not apparent on what grounds, or why it should be what it is rather than anything else. Usually it is a repetition of some well-known type of foliage ornament of a known style. If, instead of that, some natural forms in the growth of the district, for instance, were adopted as the standard for imitation (and to take the flora of the district is perhaps about as good a "lead" as an ornamentist can have), and then it were to be considered how such forms could most suitably be treated and conventionalised so as to suit the material in which they are to be

executed and the place they are to occupy, and at the same time to preserve and emphasise *what is most essential and characteristic* in the original natural growth,—character and originality in the ornament would grow and develop themselves in the process, without any such absurdity as would be involved in a carver taking up his tools and saying to himself "Let's be original!" which is a perfectly futile proceeding, producing no possible result save a search after eccentricity. We call especial attention to the importance of noting and realising what it is which constitutes the special character, the personality, as one may even say, of the natural object from which the ornament is taken; because that is what is so often missed, and especially so certainly missed, when the work of another man is copied instead of the work of nature herself. We see repetitions of types of floral ornament which we know by heart—which are obviously representations of a certain flower or leaf, but which seem to be made as if the designer were possessed by that same spirit of vague generalisation referred to in the line quoted from a contemporary poet in a recent number of this paper, apropos of the critic who could only see that one hand was "like another hand." But in regard to the adoption of floral forms, for example, into ornament, there is first the question, What is the real characteristic of the original form as a type, that which essentially gives it its peculiar expression in our eyes? The perception of this is quite a different thing from the mere perception that it is large or small, white or yellow, flat or round, or has less or more petals. All these things together go to make up its character; but there will generally be found to be a something not easily expressed, a peculiar turn of line or form, omitting which, the real character and grace and meaning of nature's workmanship are lost. Yet it is thus that flowers are constantly copied in art work and architectural ornament, and the newspapers that give an account of the work tell you that the carvings in such a position are taken from such a flower, which Mr. ——— has cleverly worked into the ornamental design. But all that has been thus worked in is the collection of dry facts which, put together, constitute nature's design; but in the putting together lies the magic. The difference is like that between the work of a painstaking realistic portrait painter and a man of genius; the first gives every little detail of the face, yet misses it somehow; the second is not perhaps so accurate in detail, but he seizes hold of what he sees to be the predominant and characteristic expression of his sitter, and gives the mind as well as the mere features. Then there is the consideration of the infinite minute variations in nature in the same type, which any mechanical means of producing ornament is obliged entirely to ignore and pass over, but in which a multiple charm resides. And when we feel that we know in what the characteristic beauty of the original body lies, comes the consideration how that may be best represented in the material with which we have to do. All the characteristics of nature we may presume we cannot represent; the tenuity, the fragility, perhaps the colour of the original, must be lost; we must then emphasise that quality which the material will represent,—the form, the surface modelling, the method of growth, and of grouping. If the form of the flower we are treating is essentially flat, we must keep it in a flat treatment in the translation of it into ornament; if it is bulky and prominent in outline, these peculiarities will be emphasised. As a general rule, it may be said that in town architecture we err on the side of giving too much depth and undercutting to our foliage ornament, making it a receptacle of dirt and rain-water; and that often both a more permanent and refined effect would be produced by a flatter and more delicate treatment in a suitable durable material. Thus the adoption of natural forms in ornament, even with the most direct effort to realise their naturalism to their fullest extent possible, does not exclude conventionalism; on the contrary, it demands it, only it is a conventionalism having for its object the more full realisation of the spirit (though not all the details) of nature, and differs entirely from that sort of conventionalism of which (though in place sometimes) we have had a good deal too much, and which seems to consist in squashing a flower out flat and drawing a circle round it, or pulling it in pieces and arranging the *disjecta membra* separately in some sort of geometrical relation to one another.

Some of these considerations may apply equally, one may say, to statues, considered as architectural decoration founded on life. In the case of buildings which are decorated with statues of personages whose history is connected with the objects of the building, as we so frequently see, in the majority of instances the statue does not the least succeed in interesting us by realising and rendering vivid the special character of the personage represented, if it be an historical personage; or any special character at all, if the representation be an abstract one. That is why in so many buildings we are impressed with an idea that some third-rate statuary's yard has been ransacked for figures that were in stock, and could be had cheap. We see simply so many figures in a row; and that they are figures seems to be thought sufficient. But the subject of the treatment of the human figure in decoration is much too large to be considered merely as an offshoot to the question of architectural ornament. But there is one consideration which the mention of this subject suggests, in relation to the employment of terra cotta. In the paper which led to these observations, it was observed that though terra cotta implied mechanically-reproduced ornament rather than carving, yet that for the highest class of ornament, that of figure-work, there was the best opportunity possible; since the material might be modelled by the master-mind, and carried directly to the kiln to be fixed by heat, without the intervention of any inferior hand in copying or mechanically reproducing the design. This is unquestionably one of the greatest advantages which the use of a clay material gives; but why this reasoning should not equally apply to the production and modelling of architectural ornament of all kinds we cannot perceive. Except where economy is a matter of the highest importance, it would seem that, in fact, terra cotta gives the opportunity for a greater freedom of design and execution in architectural ornament, rather than for an increasingly mechanical system; only, of course, the design must be prepared well beforehand, as it cannot be worked afterwards *in situ*.

If natural forms are used in ornament, it is certain that their natural characteristics, and something of the life and growth of nature, should be retained in their translation into the form of ornament, in accordance with the principle indicated above; otherwise their greatest charm is lost in the process, and the real and greatest advantage of going to nature for inspiration is thrown away. It may, however, be a question whether the naturalistic treatment, even under these circumstances, is or is not the characteristic of the highest and purest architectural style. The question would, probably, be answered differently in accordance very often with the personal feelings and associations of individuals. As far as the history of architecture can speak for itself, the answer seems to be rather in favour of artificial than of natural decoration. At least, admitting that Greek architecture carried the art of architectural expression to the highest point of refinement which it has ever yet reached, it must be owned that it did not depend very much upon natural form for its detail. The honeysuckle ornament and the Corinthian capital, the nearest approaches to nature in Greek detail, are yet essentially artificial, especially in their rigorously symmetrical form and refusal to allow of any of the little variations of nature. And, on the whole, it may probably be said that this is the natural result of the highest development of architecture in an essentially civilised age and society. Architecture is the most artificial of the arts, and when it is carried to its most complete artificial development, anything like the freedom and variety of nature seems impossible in it without introducing a discordant element. There is certainly a tendency at this moment towards artificial ornament, after the brief outbreak of naturalism in the Gothic revival: a symptom probably that the whole of our architecture is tending towards artificiality. The revival of truly "wolfish" Gothic in a society so artificial and luxurious as that of our day could hardly be more than a passing whim, though it has been a costly one in regard to the expenditure of money on buildings many of which are not likely to retain any one's admiration permanently. Two pleas, however, may be urged in favour of a more or less naturalistic school of ornament. A town is essentially an artificial creation; but in those quarters in which there is least of wealth and luxury, in which the artificial comforts of town life and the artificial beauties and refinements of architecture cannot be realised except to a very limited extent, it may be best and fittest and most beautiful (morally as well as physically) to try to convey through the decoration of the buildings something of that living and breathing life of nature which to the majority of the inhabitants is a thing seldom or never attainable in itself, a reminiscence or a hearsay only. Those in more favoured places and circumstances, who can move about as they will and visit various scenes, do not need, and probably would not care for such hints of nature conveyed through architecture. Their town life is artificial,—is meant to be so, and their architecture may well be artificial also, or at least there is in this case no moral reason why it should not. But from the artistic point of view it may be suggested that the combination in ornament of the forms and growths of nature in their most essential characteristics, with a great finish and refinement of style and execution, presents an ideal of architectural decoration which has hardly been accomplished yet in the western world, though we find it in India in something very near perfection. In the attempt to attain such a combination as this there lies perhaps a field for something new in the decorative treatment of town architecture in this country.

HADDINGTON.

FEW visitors to Edinburgh, when exploring the vicinity, find their way to the quiet market town of Haddington, yet it is well worthy of a visit were it for no other reason than that it is the birthplace of John Knox. An hour's run by rail from the Waverley station is all that is needed to reach it, and the line runs through one of the most fertile districts in Britain, where the traveller may observe the science of agriculture carried out in the most intelligent manner. Not a weed is to be seen in the large, richly-cultivated fields, the hedge-rows are in perfect order, superfluous trees are rare, but there is a fair allowance of wood around the dwellings of the landowners. Nor is the route devoid of picturesqueness, for all along to the left you catch glimpses of the glittering waters of the Forth, studded with sails and dotted with islets, and beyond lie the Lomonds of Fife, the advanced picket of the Grampians.

Then, again, you pass over scenes of great historical interest. After passing the gay watering-place, Portobello, "the Brighton of Scotland," you come to Inveresk, close to the battlefield of Pinkie, where Cromwell signally defeated the Scottish army, "the Lord having delivered them into his hands." At Tranent Junction the train stops on the battlefield at Prestonpans, where the undisciplined host led by "the Young Cavalier" defeated the trained troops led by Sir John Cope, which event was chronicled by Skirving as "he went for the coals in the morning," Tranent being the centre of a coal-mining district. As the train glides from the station you see Bankton, the residence of the pious and gallant Colonel Gardiner (known to every reader of "Waverley"), in front of which he fell mortally wounded, and at or near the spot stands an obelisk, with four *couchant* lions, erected to his memory. Onwards to the left you pass the modern Seaton Castle, with the ruins of its predecessor and of the beautiful chapel, delineated in Billings's "Ecclesiastical and Baronial Antiquities of Scotland," and not far off you catch a glimpse of a stately archway leading to the demesne of the Earl of Wemyss. This gateway was designed by Mr. Billings, and, like most of his works, it is peculiar. It was by some facetious person dubbed "Billingsgate." Here the train leaves the main line, and in five minutes more the traveller is landed at the west end of the ancient and royal burgh of Haddington.

The first object that engages the attention on entering the town is a monument in the form of a (not very lofty) Doric column, surmounted by a statue cut out of blue whinstone, and having four life-size figures in freestone of mourners at its base. This monument commemorates Mr. Fergusson, of Raith, sometime member for the Haddington district of burghs, and a most popular landlord. To the south of this monument the "Knox Memorial Schools" are in course of erection. They embrace a primary and secondary school, are to cost 10,000*l*., are Gothic in style, and are designed by Mr. Starforth, of Edinburgh. The style adopted is hardly appropriate for a memorial to the

great leveller of Mediæval observances. The principal streets of the town (which contains a population of about 4,000), are spacious and well kept, and the houses are of a good class, mostly modern, and without architectural features worthy of notice. The public buildings consist of the Court-house, in the Tudor Gothic style, from the designs of the late Mr. Burn. Beside this stands the Corn Exchange, designed by Mr. Billings, having an exterior which sufficiently declares its purpose. The Town-house is a fair example of the Georgian period, and has a lofty spire in keeping therewith, designed by the late Mr. Gillespie Graham.

The chief attraction of the place is the abbey church, *Lucerna Laudoniæ*, the Lamp of Lothian, so named from the circumstance that a lamp was kept constantly lighted which was visible from a great distance. The structure must have been a fine one, and is thus described by Fordun as it existed in the fourteenth century:—"Opus certè quod sumptuosum erat, ac totus patriæ illus solatium singulare, cujus chorus quidem ob luminis claritatem, Lucerna Laudoniæ vocabatur." The choir and transepts are in a state of ruin, but the nave is kept in repair, and is used as the parish church. The total length is 210 ft., and is uniform in style throughout, with the exception of two four-centred doorways inserted in the nave at the beginning of this century. The tracery of the aisle and clearstory windows is not varied, and shows the pear-shaped openings so frequently met with in Scottish ecclesiastical buildings. Another characteristic feature is the west doorway, which is semicircular-headed, and subdivided into two openings, formed by round arches supported by a clustered shaft, the cap of which exhibits the emblems of the Passion. The tracery of the west window is very massive, and in the transepts and over the high altar the windows are lofty, but the tracery is gone. The crowning glory of the abbey is the central tower, 90 ft. in height, which appears to have been surmounted by an open canopy of flying buttresses, as at St. Giles's, Edinburgh. When in its original condition, it probably excelled all similar towers in dignity. The situation of the abbey is very pleasing, for here the still waters of the Tyne curve round the churchyard, and beyond lies the suburb of Nangate, in which stands the house where the great reformer first saw the light. Before leaving the precincts, however, we remark that in a locked-up enclosure in the north aisle of the ruined choir is situated the burial-place of the Lauderdale family, where lie the remains of the first Duke who ruled Scotland with a heavy hand. The tomb contains alabaster monuments with recumbent figures in a somewhat dilapidated condition. In the churchyard rest the ashes of the wife of Thomas Carlyle, who was a native of the town. The tombstone bears the following inscription:—

"In her bright existence she had more sorrows than are common; but also a soft invincibility, a clearness of discernment, and a noble loyalty of heart, which are rare. For forty years she was the true and ever-loving helpmate of her husband, and, by act and word, unweariedly forwarded him, as none else could, in all of worth that he did or attempted. She died at London, 21st April, 1866: suddenly snatched away from him, and the light of his life as if gone out."

Here also may be seen the burial-place of the family of Mr. Samuel Smiles, the author of "Self-Help," &c. His parents were highly respectable, and kept a shop in the town. Samuel was educated to the medical profession, and after obtaining his diploma pitched his tent in his native town, but there a prophet hath no honour until his merit is recognised elsewhere.

When leaving the churchyard by its eastern gateway, you observe in front a stone structure of about 30 ft. in height, in the form of the letter H, but with the connecting band greatly elongated; the whole exhibits a surface of dead wall, and the spectator is puzzled to make out the purpose of it. This is the "ball-alley," where the game of hand-ball used to be played, but now it appears the game is not so much in favour as of old.

Passing onwards, across the old and narrow bridge which spans the Tyne, the suburb of Nangate is reached, where a convent of Cistercian nuns once existed, hence the name. A small ruin of a very rude type of architecture still exists to show the locality of the ancient foundation. In the Gifford Gate of Nungate, a house, with its gable towards the street, and having an outside stair leading to the upper story, is pointed out as the birthplace of John Knox. The village of Gifford, about four miles distant, sometime claimed the honour of being the place of birth of the Reformer, but it is now established beyond doubt that the Nungate of Haddington is the spot, and it is even hinted that the village of Gifford did not exist in his day. Another remarkable house in the town is situated near the north-east port; it belonged to the Earl of Bothwell, and in it the Earl and Queen Mary rested during their flight to Dunbar.

Haddington is a town of great antiquity, and from its vicinity to the Border has been the scene of many conflicts. As is not unfrequently the case, the derivation of the name is a subject of dispute amongst antiquaries. By some it is presumed to have been the place of settlement of a Saxon chief named Halden, or Haden; others have derived the name from Ada, the daughter of Earl Warren, who was married in 1139, to Henry, son and heir of David I., as this territory was settled on her, "but this etymon, we suspect, is advanced without the consideration that the name of Hadintun, the Hadina of Cambden, and the Hadintona of Fordun, was in use when this lady entered into possession."

David I. occasionally resided in the burgh, having a church, a mill, and other appurtenances of a manor. Ruined vaults of considerable extent had to be cleared off the site where now stands the county buildings, and these tradition pointed out as belonging to the Royal residence.

In the year 1178 Ada founded a convent of Cistercian nuns upon her lands, which was consecrated to the Virgin, and endowed with lands of considerable value. The manors and wealth of the convent afterwards excited the cupidity of the neighbouring barons of Yester and Mackerston, who violently took possession of certain lands called the Nauhopes, and retained them until compelled by Parliament to restore them to the nuns. In this convent the Scottish Estates, under Arran, met in 1548, and gave their consent to the marriage of the youthful Queen of Scots with the Dauphin, and resolved on sending her to France to be educated.

On the death of Ada, Haddington became the property of her son William the Lyon, and here, in 1180, he convened a conclave of clergy and laymen to settle a dispute between the monks of Melrose and Richard the Constable, regarding certain manorial rights in Roxburghshire.

In 1198, Alexander II. was born in Haddington, and during the reign of that sovereign, who had taken part with the English barons against King John, the latter in 1216 burnt the town. In 1244, the town was again destroyed by fire accidentally, and about 200 years ago it met with a similar fate from a nursery-maid having left a clothes-screen too near a fire during the night. As a warning against such negligence, the magistrates directed the following curious rhyme to be recited at dusk by the town crier, a custom only abolished recently:—

"A' guid men's servants whae e'er ye be,
Keep coal an' candle for charitie.
Baith in yeer kitchen an' yeer ha',
Keep weel yeer fire whateer befa',
In bakehouse, brewhouse, barn, or byre,
I warn ye a' keep weel yeer fire;
For oftentimes a little shark
Brings mony hands tae muckle wark;
Ye nurrices that hae bairnes tae keep,
Take care ye fa' na o'er soun' asleep,
For losing o' yeer gude renoun,
And banishing frae this buros toun.
It's for your sakes that I do cry,
Take warnin' a' ye neebours bye."

Besides being devastated by fire the town had also to contend against the element of water, as from its position on low ground at a bend of the river it was liable to be flooded. During one of these inundations, it is related by Bowmaker (the continuator of Fordun), that upon the waters approaching the convent a nun snatched up the statue of the Virgin, and threatened to throw it into the water unless she interceded for the protection of the building, "and from that moment the river retired, and gradually subsided within its limits."

Again, at the feast of St. Ninian, in 1421, the waters rose and swept away many dwellings, and the sacristy of the abbey and its appurtenances were greatly damaged. The last great flood occurred on October 4th, 1775, when the Tyne rose seventeen feet, and inundated half of the town, but, as recorded upon a tablet inserted at the angle of a street, "by the mercy of God no lives were lost." This flood is supposed to have been caused by the bursting of a waterspout in the Lammermoors.

From its situation near the Border, and on the direct route to Edinburgh, the town was liable to be attacked, and accordingly it was surrounded by walls of considerable strength, and had embattled ports guarded by cannon. These have now disappeared, with the exception of some fragments of the wall retained as boundaries to gardens.

Before the era of railways, Haddington, being on the route from Edinburgh to London, was enlivened by the passage of the mail and stage coaches, besides private and hired carriages; but now its aspect is sleepy, although it exhibits considerable animation on Fridays, on which day the weekly market is held. This was at one time the largest corn-market in Scotland, and is yet only second to that held in Edinburgh.

Several attempts have been made to establish woollen manufactories in the town, for which its situation seems well adapted, but those attempts have been unsuccessful. The town, until recently, was not in a good sanitary condition, and suffered severely when cholera visited this country, but now a supply of water has been introduced and a system of drainage laid down.

FANS AND FAN-MAKING.

FROM time to time during the past fifteen years, it has been our pleasure to record the resuscitation of several of the wealthy trading guilds of the City of London, who, after a lapse of a period the memory of man faileth to remember, have once more taken up their rightful position as overseers and encouragers of the crafts representing the names they bear. And yet the apparent indifference to the trading interests was not in every case the company's own fault. The privileges granted by the old charters have been from time to time superseded by modern Acts of Parliament, and these Acts, promoted by persons opposed to the companies, have, in very many cases, been passed against the wish of the guilds, and have too frequently, we regret to say, been against the interest of the very trades which the Acts were supposed to benefit. The real use of a company's supervision cannot be better illustrated than in the useful rights of search, &c., which the Fishmongers' Company carry out at the present time in the City markets.

When the Ironmongers' Company held their magnificent *Conversazione* in 1861, and the Painter-Stainers and Coachmakers inaugurated their Exhibition of Decorative Works specially connected with their trades, the dawn of a reform appeared, and since that date many other of the companies have also done the like, the last two on the list being the Tin Plate Workers and Fanmakers,—and the exhibition of the latter last month at the Drapers' Hall will long be remembered as a most successful and pleasing event in the history of that guild. So much interested have we been in the display that we began to look up a few notes relating to the "Art, Trade, and Mystery"; and these, after some researches, proving of more than ordinary interest, we think our readers will not object also to know something about one of the most extensive and fashionable trades now carried on throughout the civilised world.

It may be a fact unknown to a great many of our readers that the fan has flourished as an article of use for upwards of 3,000 years. The Egyptians painted it on the walls of Thebes, and Pharaoh is represented as surrounded by his "fan-bearers." And yet it is curious that in the few instances where the fan is mentioned in the Holy Scriptures the article is alluded to as of mechanical use, and not for cooling the atmosphere around us. It is a very interesting fact, however, that the ancient fan,—"flabellum,"—was a most necessary article with the Egyptians, Romans, and Grecians,—the vases of the latter showing figures using them,—although the fan of early days was not like that of our time: it was a somewhat ugly-looking instrument, with a very long handle, which must have borne a likeness to the Indian punka. When the Romans were at their meals, the slaves were hard at work cooling the atmosphere and driving away the flies, as is more particularly set forth in the Classical authors' works. In China and Japan the fan has ever been a most necessary part of dress. Whoever saw a China-

man without his fan? And they are now the largest exporters, the fans being manufactured of ivory, bone, bamboo polished and japanned, and paper covered.

The ancient "flabellum" was an important article in the office of a deacon of the Greek Church. We are told it was made of peacocks' feathers, of fine parchment, or of palm-leaves, fixed at the end of a handle of wood, circular in form, some having small bells attached. After the fourteenth century it ceased to be used in the Romish Church ceremonies; but in modern times the sovereign Pontiff has two carried before him. There are only two of these fans known to exist, and these have been described by the late Mr. Holt. One, in the Treasury of Monza, which is ten miles north-east of Milan, belonged to Thêodelinde, queen of Anthoris, king of the Lombards, and who became his widow in A.D. 593,—that is, 1,285 years ago. It is made of a long and narrow strip of leather, folded screen-fashion, the pleats being united at one end by a string. It was once ornamented and gilded, and there is an inscription upon it, which is not now decipherable. The other fan is of a different character, of ninth-century date, and one of the relics from the Abbey of St. Philibert, at Tournus, in Burgundy, and now is, or lately was, in the possession of a celebrated Lyons collector. It is made of parchment, with a bone handle, of cylinder form, and in sections. On the capital is placed the stock of the flabellum, formed of a rectangular box of plates of bone, fastened together by bands. On the handle are represented vine-leaves and birds, and on two of the bones is inscribed,—S . M . RIA . S . AGN . S . FILIB . JOHEL . ME . FECIT . IN . HONORE . MARIÆ. On the four sides of the capital are figures of the four Apostles. The parchment is folded into pleats, opening in a circular form, ornamented on both sides with foliage, saints, &c., and an inscription in letters of gold. The flabellum is mentioned in the old inventories of "the goods and chattels" of many priories and abbeys, especially Salisbury, Rochester, Southwold, York, and St. Paul's, London; and it is to be found in the inventories of Clemence, the daughter of Charles I. of Hungary, and queen of Louis X., who died 1328, and Isabella, the daughter of Philip the Fair, who married, in 1307, Edward II. of England.

The fan was used in England in the reign of Henry VIII.; for there is an anecdote told of Sir Thomas More having castigated his daughters with a fan made of peacocks' feathers, for the grave crime of running up a milliner's bill. Two suggestive thoughts arise out of this note: the first, was the thrashing done with the feathers or the handle, then commonly half a yard long; and, secondly, how many daughters and "children of larger growth" deserve chastisement to-day for a like offence? If fashion has brought about an improvement in the fan, it cannot say it has brought with it in every case improvements in dress or studied economy.

Queen Elizabeth was a great lover of fans, and at her death no less than twenty-seven were found among her articles of dress. In 1578, exactly 300 years ago, she dropped one with a silver handle into the moat of Hawstead House, in Suffolk, she being then on a visit to Sir William Drury. In 1589, Nichols tells us, Sir Francis Drake presented her with a new year's gift, "a ffanne of ffethers white and redd, the handle of gold, enamelled with a halfe moone of mother of perle, within that a halfe moone garnisht with sparkes of dyamonds and a fewe seede perles on the one side, having her Majestie's picture within it, and on the other side a device with a crowne over it." Now, the Queen was very fond of receiving gifts, and the wonder to us is where she stored them, for the majority of them were of enormous value. Among the Sydney papers we find a letter describing her visit to Sir John Puckering, the Lord Keeper, at Kew, in December, 1595. Of course he made her some acceptable presents, and these are briefly summed up thus:—"On her first lighting she had a fine *fanne*, with a handle garnisht with diamonds. When she was in the middle way, betweene the garden-gate and the house, there came running towards her one with a *nosegay* in his hand, delyvered it unto her with a short well-penned speech; it had in yt a very rich jewell, with many pendants of unfirled diamonds, valued at four hundred pounds at least. After dinner, in her privy chamber, he gave her a faire paire of *virginals*. In her bed-chamber he presented her with a fine *gowne* and a *juppin*, which things were pleasing to her Highness, and to grace his lordship the more, she of herself tooke from him a *salt*, a *spoone*, and a *forke* of faire agate." A portrait of the Queen, with one of her fans in her hand, will be found in Abraham Darcie's "Annales" of her reign, published in 1625. We also see the feather fan in the portraits of Anne of Denmark, queen of James I.; of Dorothy, the wife of Richard Cromwell; and in Hollar's portraiture of the Lady Mayoress of London, in his "Theatrum Mulierum." The portraits of other ladies of quality during the same periods, also exhibit the fan,—for it must be borne in mind it was an article of dress of no slight value, an ordinary one costing not less than 40*l.*, and ostrich feathers being used instead of peacock's, handles were chased and jewelled, while some had small looking-glasses inserted, as will be seen in the accounts of Eleanor of Austria, queen of Francis I. of France. These fans were suspended from a chain of gold.

During the reign of James I. men began to use fans, and these were often of extraordinary size, with handles corresponding. Aubrey, in one of the Ashmolean MSS., tells us that "Sir Edward Coke, Lord Chief Justice, rode the circuit with such a fan; Sir William Dugdale told me he was an eye-witness of it. The Earl of Manchester also used such a one; but the fathers and mothers slasht their daughters in the time of their besom discipline, when they were perfect women"! We must, therefore, suppose these noblemen used these fans to protect them from heat and flies while riding abroad, and as a correcting-rod for their children at home.

Both Skakspeare and Milton speak of the fan, the former in not very hearty praise. Bishop Hall alludes to it as used by a fashionable gallant, "to shade thy chalked face"; Greene, in his "Farewell to Folly," 1617, speaks of "bearing plumes of feathers in our hands, which in wars our ancestors wore on their heads"; Davenant, in 1649, says in his "Love and Honour," "All your plate vases are the silver handles of your old prisoners' fans,"—an imputation by no means complimentary; while the old diarist Evelyn, on May 22, 1664, notes that Tomson, a Jesuit, had showed him a wonderful collection of varieties sent by the Jesuits of Japan and China for the house of their order in Paris, and many of them were "fans like those our ladies use, but much larger, and with long handles curiously carved and fitted with Chinese characters." The increase in the importation of fans during the reign of Charles II. caused a duty of 40s. per dozen to be charged on those of foreign make, and the prohibition of those painted.

The eighteenth century brought about many changes in "the art and mystery" of fan-making, especially upon the incorporation of the City Company, while the article itself became more interesting in another way, Addison taking up the cudgels against the use it was put to. This use was designated "the art of fluttering," which took, on an average, three months to learn, but then a good practitioner was able to use the fan in an assembly, by which one well up in the secret could tell an "angry flutter" from a "timorous flutter," a "modest flutter" from an "amorous flutter," and, in fact, any other kind of "flutter." As the fan was then made about a yard wide, it is to be easily understood the peculiar use it was put to, and not only, be it said, to screen the object using it. But our country was not the only place which carried fan-flirting to extremes,—Spain, Portugal, and Italy were equally famous.

The next step in fan-making was the painting of the fan-mounts. Some of our best painters and designers worked at the art,—among them West, Reynolds, Cipriani, Bartolozzi, &c. At the late exhibition at Drapers' Hall were fans with subjects illustrating the history of Scipio, the Nursing of Cupids, Venus arising from the Sea, the Judgment of Paris (of which there were three specimens,—one having been the bridal fan of Lady Shelley in the middle of the last century), the Seasons, pug-dogs, Venus and Adonis, French armorial, the alliance between France and Austria, trial of Warren Hastings, &c. In topography were views of the Garden of Eden, eruption of Mount Vesuvius, the temples and other views of Rome, Margate (in 1798), St. James's-square, Windsor Castle, and a plan of the King's Theatre in 1788. This latter reminds us that at that period "the opera fan" was among those advertised:—"These fans present at one view the numbers of boxes, including the additional ones, with the names of the subscribers, &c." When Swift's "Gulliver's Travels" appeared in 1726, the fans immediately illustrated that popular book; so also the equally popular "Beggars' Opera,"—that remarkable play which made "Gay rich, and Rich Gay,"—Gay being the author, and Rich the proprietor of the theatre in Portugal-street. A writer in the *Gentleman's Magazine* for 1753 gives a curious list of twelve varieties of fan-painting, "elegantly executed, which at a late celebration of the Communion in a certain church of this metropolis were actually displayed by way of screens to so many pretty faces disposed in a semicircular arrangement about the holy table," and among them were:—The Humours of Change-alley, the Judgment of Paris, Vauxhall Gardens, and the Prodigal Son with his harlots, copied from the "Rake's Progress," by Hogarth. The writer justly questions whether they were suitable "to the original design of that sacred rite at which they assist on these occasions," and argues "whether, if our British ladies are too nicely modest to worship God with naked faces, they should not return to the ancient simplicity of a plain linen or carsenet veil, after the manner of the Jewish females." Perhaps that called "The New Church Fan" of the latter end of the last-century make, in Mr. Sandell's Collection, and painted with the Ten Commandments, was one of the most suitable for a place of worship at that date of loose manners. In 1750 a poetical essay commenced:—

> "Mira! take this painted fan,
> Of it make the most you can;
> When it rises, full display'd,
> To supply the cooling shade,
> Read these maxims, there expreat,
> Shade for man is sometimes best!"

And about the same date the ladies of the stage adopted the fan for two useful purposes,—the first was to cool the atmosphere around them, and the second was to use it as the "prompter" in the delivery of addresses.

Finally, the artistic manufacture of fans has improved during the past 100 years (whatever may be its actual position at the present moment),—the late exhibition gave ample proof of that. Formerly of feathers, some by no means small, with long handles; then of parchment, canvas, and paper; and, finally, of lace, the old fan has become a light and handsome article, and not without its use; but the old circular shape is now fast becoming a thing of the past. At the same time, in our importations, as in other articles of commerce where "free trade" and "trade unionism" have produced two great impediments to our progress at home, the manufacture of fans began visibly to decline at the latter end of the last century. In 1751 a writer in the *Westminster Journal* proposed a tax on plain fan-mounts, which he calculated would produce between ten and thirty thousand pounds a year, and would only injure "about half a dozen paltry plate-printers, who are enriching themselves, and starving hundreds"; and in the next year the *Daily Advertiser* announced that one thousand poor artificers in fan-making returned their best thanks to the Fanmakers' Company for petitioning the East India Directors to discontinue the importation of fans, and at the same time the ladies were asked to remember their own countrymen, and relieve distress at home before thinking of those abroad! Verily, this is a hint worth noting in this philanthropic nineteenth century.

And now for a brief notice of the City Guild. Upon the application of persons of stability of the trade, Queen Anne, on the 23rd of October, issued her sign-manual, and, on the 8th of December, 1708, through her Lord Treasurer, Godolphin, her docquet, warranting the incorporation of a company to be called "The Master, Wardens, Assistants, and Society of the Art or Mystery of ffan Makers in the Cities of London and Westminster, and Twenty Miles round the Same;" which charter was duly granted on the 19th of April following. Among other things, it granted the company *perpetual succession*, a common seal, the right of suing, to have a master, two wardens, and ten assistants, annually to be elected; a clerk, beadle, &c. That no person from henceforth shall exercise the said art, either in the whole or respective parts thereof, unless he has served an apprenticeship of seven years to a member or is a member of the said company. And all those exercising the art must join the said company within three months after the date of the charter. The com-

pany may proceed against any one offending, and justices are ordered to aid them therein.

This charter was duly enrolled at Guildhall on the 5th of October, 1710, and the company's bye-laws were confirmed by the Lord Chancellor and Judges on the 20th of February, 1741-2. Among these bye-laws is a direction as to payment of a quarterage, powers of search, &c., showing the society then *practically* existed. In fact, a few years later there were several prosecutions against "strangers,"—that is to say, those making fans not members of that company. In June, 1806, the guild were granted a livery of sixty members, and, according to their own return to the Commissioners, 333 persons took up their freedom in the company between the years 1813-33. Not having a hall of their own, they transact their business at Guildhall. Their arms are emblematical: *or*, a fan displayed with a mount of various devices and colours, the stick *gules*; on a chief per pale *gules* and *azure*. On the dexter side a shaving-iron over a bundle of fansticks tied together *or*; on the sinister side a framed saw in pale of the last. The crest is,—on a wreath a hand couped proper holding a fan displayed *or*. Their motto is, "Arts and Trade United."

Finally, will Mr. James Curtis, the hon. secretary of the late Exhibition, pardon us if we reproduce his poetic acrostic?

TO H.R.H. THE PRINCESS LOUISE.

T o thee, Princess, these lines we raise,
H eartfelt in tribute of our praise,
E ncircling thee our art to grace.

W hen first the fan to England came,
O nly 'twas used by high-born dame;
R enowned so much among the fair,
S anctioned by these the *débonnaire*.
H istory relates with truthful vein,
I ts advent in the Tudor's reign;
P lebeian ladies donn'd the fan,
F rolicsome grown under Queen Anne;
U nique in style, by art refined,
L o! Watteau then doth charm mankind.

C onsider now the wondrous skill
O f Diaz and Gavarni's will;
M ake mention, too, what prose has done,
P ortray'd by Steele and Addison;
A nd Gay and Pope alike in verse
N ew glories of a fan rehearse;
Y our meed of praise accord, ye Belles,

O ft echo what Maréchal tells.
F luttering with youth, for evermore,

F lourish the fan from shore to shore;
A ndalusia, China, and Japan,
N ot less than France or Hindostan;
M indful of this, our charter'd art,
A cknowledge to have play'd their part,
K now that 'tis now our chief desire
E ngland with love of fans to inspire:
R oyalty thus, through thee, Princess,
S miled, and became our Patroness.

Of "makers" of fans in Paris, there were fifteen in 1827, who employed over 1,000 hands, and twenty years later, 122, who employed 575 hands. In London, this present year, the actual number set down in the Directory as fan-makers is thirteen only, principally French; but it must be borne in mind there are fan-makers incorporated in other trades, therefore the Directory is not always the most correct summary. As the trade, however, shows evidence of a revival, let us hope it will continue to prosper "root and branch, and may it flourish for ever!"

THE IRISH BOARD OF WORKS AND NATIONAL MONUMENTS.

WE have already in the *Builder* given a sketch of the general duties of the Board of Works of Ireland, and shown how extensive and important these duties are, and have also noticed some of the proposals of the late Departmental Committee, by which the staff of the Board will be strengthened, and their duties more efficiently performed. We propose now to touch upon certain of the works which fall to the lot of this Board, since there can be no question that it is of paramount public importance that the investigations of the late Committee should not be allowed to fail in causing the improvements which they were intended to produce in this body.

We have lately in England heard a good deal about the preservation and the restoration of ancient monuments; we have seen Sir John Lubbock, one of the ablest and most practical men of the day, labouring to preserve those monuments which this nation still possesses; and we have seen advocates and opponents of restoration state their case, and cross swords in literary argument.

Meanwhile, in Ireland there has to some extent sprung up a kind of national supervision of a number of national monuments and ecclesiastical ruins. By the 25th section of the Irish Church Act of 1869, the Temporalities Commissioners were empowered to hand over for future repair and maintenance to the Board of Works the ruins of ecclesiastical buildings and other ancient structures of national or historical interest. Thus very nearly ten years have elapsed since the Board of Works became the guardians of the chief ecclesiastical buildings of antiquarian interest in Ireland, and in that period fourteen national monuments have been vested in the Board, and a sum of 22,000*l.* has been also handed over for the purpose of their maintenance and preservation. At the time when the Committee was engaged in taking evidence for the purposes of its report, the Church Commissioners were about also to transfer 100 more structures, and at the same time, a further sum of 30,000*l.*, for the purpose of preserving and maintaining these additional structures. But, on the other hand, though there may be 114 buildings now under the control of the Board of Works, it is estimated by the Assistant Commissioner of that body that there are at least 1,000 more monuments in Ireland which it would be desirable to preserve. According to his account, there were originally from 1,200 to 1,300 monuments of national interest; the Board selected 130 of the most important, and the Church Commissioners reduced this list to the present number, 114. But if the chairman is right in his estimate of the number of such ecclesiastical monuments which it would be desirable to preserve, it is obvious that there are a large number more which should be placed under the control of the Board of Works since the Government and Parliament have seen fit to make that body the guardians of the Irish buildings of national interest and importance. But, with the mass of work which has to be performed by the Board, it is not very likely that it is particularly anxious that its duties should be increased, for, of course, every additional building placed under its care increases its labour without any corresponding increase of pay or reputation to the members of it But, nevertheless, there can be no possible doubt that since the Board is now the authorised guardian of national buildings in Ireland, no time should be lost in ascertaining whether the one thousand and odd buildings are of such a nature that they also should be placed under the care of the Board. Since, however, the Board derived its information of the value of these buildings from the several county surveyors, it is no disparagement of these officials to suppose that in all probability the number of really valuable buildings is less that 1,000. But be this as it may, it is clearly time that the character and importance of the buildings which we have specified should be definitely ascertained by thoroughly experienced and learned persons. There is, of course, also this further fact to be considered,—that in many cases the interests of private persons are concerned in these buildings, and that therefore it is by no means certain that in every case the consent of such persons can be obtained for the transfer of some particular structure to the Board of Works. We have assumed, it will be observed, that it is desirable that all buildings of national importance should be handed over to the Board, since Parliament has constituted it the caretaker of ecclesiastical monuments. But we are by no means, from the facts shown in the report before us, prepared to admit that the Board of Works is a particularly efficient body for the purpose. For the Board do nothing in the way of restoration that can possibly be avoided, and only make absolutely necessary repairs. The repairs are superintended by Mr. Deane, architect, and he is the only person who practically has any supervision over these important buildings, as the following question and answer by the assistant commissioner sufficiently show:—(3,081.) "In repairing or preserving has any member of the Board visited the monuments, other than the architect in special charge?" "I have done so, and the chairman has also done so, upon some occasions." But though both the chairman and the assistant commissioner are men of ability and business knowledge, it would be quite too much to expect that, having regard to their endless duties, loans to railways and landowners, superintendence of harbours and inland navigation, tramways and land improvements, they could possibly do more than acquiesce in whatever work it had seemed good to the architect to order. Then, again, it is somewhat significant that the members of the Board have had no communication whatever with the Archæological Society in respect to these buildings, and there is no information that they have consulted with any persons of great architectural experience in regard to them. This is how they explain the manner in which the 22,000*l.* were to be spent:—(3,088.) "The way we dealt with the 22,000*l.* handed to us was this: we had an estimate prepared of what it would cost to put each monument in a proper state of repair; and we also had an estimate made of what would be the probable cost of maintaining it in that condition; also the cost of the necessary caretaker to attend it. The annual cost of these caretakers and of maintaining was capitalised, and the amount invested in Government securities, in which way a fund has been provided for maintaining these works. The amount of money immediately necessary for putting the monuments in such a thorough state of repair as would admit of their being preserved we have held in hand for the purpose of doing the work,—investing it in securities and drawing it out as we require." We have no adverse criticism to make upon the financial arrangements here set forth; but we think that it becomes more obvious, from a perusal of this answer, that the whole control of the national ecclesiastical monuments in Ireland is entirely under the control of Mr. Deane, of Dublin. Of Mr. Deane's qualifications for a task of national importance we have no information given us; but knowing, as we do, that he is an architect of skill and experience, we still venture to think that duties of such extreme importance should not be left completely under the control of one person.

Some arrangements should have been made whereby the opinion of persons well known in England and Ireland for their knowledge of ancient architecture and their study of what may be termed restorations, should have been obtainable. No doubt things run most smoothly under the management of a single mind, but we assert that the repair, the restoration, and the maintenance of the ecclesiastical monuments of Ireland should not be left wholly to the will of one person. The Board of Works has, in fact, delegated its functions in this respect to a third person, and when it was intrusted with the custody of Irish ecclesiastical monuments, and when such large sums of money were placed in its hands, Parliament must certainly have intended that the highest professional services in Great Britain should have been obtained when needful.

Before, therefore, further restorations and repairs are continued or commenced, it would be highly desirable in the interests of architecture in Ireland that some measures should be taken to review the manner in which this work has hitherto been performed, and to take steps that it shall be thoroughly fulfilled in the future. This, and also the question of the number of buildings which are worthy to be considered Irish national ecclesiastical monuments, are two subjects which cannot too carefully be considered by all well-wishers of architecture in Ireland.

INTERIOR ECONOMY OF THE OFFICE.

OF course there are many exceptions, but, as a rule, the interior economy of his office is, with an architect or engineer, generally the last thing to be regarded, and the strange anomaly exists of the surroundings of a man, whose daily business should teach him to value, more and more, order and regularity, being little less than a scene of indescribable confusion and chaos, where the right plan, letter, specification, or document is never to be found when wanted, and where, in endless search and re-search, hours, which in the aggregate cannot but form a large item in the professional life of a man, are literally thrown away, involving pecuniary loss and trial of temper, not only to himself, but in a great measure to his clients also.

Tot homines tot sententiæ: every architect or engineer who confesses to laxity in the matter of interior economy will have some different reason to adduce. One will plead press of business; a second the non-importance of such petty detail; a third, like Felix the governor, will attend to these things at a more convenient season; while a fourth, born and reared, so to speak, in the midst of chaos, cannot possibly conceive what there is to alter or amend!

Seriously speaking, however, the continued

maintenance of a thorough system of order and regularity in the business establishment of an architect or engineer cannot but be of the utmost importance, enabling as it does the rich store of letters, notes, memoranda, specifications, plans, and designs that have accumulated since the first starting of the business, to be laid hands on in the briefest time, and any required instruments, drawing materials, paper, &c., to be obtained at a moment's notice.

Who is more likely to do his clients justice and reap his own reward, than the professional man who, as engineer, architect, or surveyor, can, in a moment, produce any memoranda, letters, or drawings bearing on any required subject that have, in the exercise of his profession, accumulated in his office possibly during very many years, and can save them the cost and himself the toil and trouble of rereading-up, re-writing, re-planning, and re-drawing; or what better legacy can such a man leave his son or other successor in his business than a well-ordered office, where the experience of a lifetime is ready to the hand?

There would appear to be three chief rules to be observed in those offices where proper interior economy is aimed at, and which may be enunciated as follows:—

I. No letters, memoranda, or documents of any kind should ever be issued without copies, *fac-simile* if possible, being carefully retained.

II. No letters, memoranda, or documents received of any kind whatever, except unimportant printed matter, should be destroyed.

III. No plans, drawings, or designs should ever be issued without office copies being retained, each having the proper title, date, scale, north point, &c., duly marked thereon, also, in most cases, the draughtsman's name or initials.

In the present day, the first of these rules is one which, by means of the easily-managed copying-press, most men observe, the exceptions being generally M.P.s and clergymen who make a boast of never keeping copies of their letters.

There is no accounting for the pegs that humanity will attempt to hang its pride on. One man will boast he never spent a penny without duly recording the fact, another that he never yet kept accounts! One will boast he never was ill in his life, another that he has had all the illnesses under the sun; but while many may be found to scorn taking copies of their correspondence, more will be found of the contrary opinion. And we may, therefore, take it that the importance of Rule I. is everywhere generally recognised. Care should be taken to have the "Letters-issued" Book posted up at frequent intervals, and, when finished with, duly labelled with date of commencement and end, and relegated to some convenient shelf or cupboard, to be at some future period removed to the upstairs regions to await in peace, with others, the references that sooner or later will assuredly be made.

We cannot expect Rule II. to meet with so general an acceptance; our professional readers will probably exclaim at the bare idea of actually *keeping* the MSS., &c., that daily reach them by post or otherwise; and yet there is not one of us that has not over and over again deeply regretted the destruction of some letter that, at the time, seemed most unimportant.

The objection to Rule II. will probably be found to arise from the difficulty of filing and keeping, in anything like regularity, the variously-sized, shaped, and executed letters, &c., that are received. The "Letters-issued" Books can be shelved readily and easily enough, and readily and easily resorted to, but with "Letters Received" it would seem to be different; and, where they are kept, reference to the bulky and unmanageable packets, tied in the centre with tape or string, is always troublesome and tedious!

The use of Marston's Patent Letter-case (J. Heath, Birmingham) does away with almost all the difficulty alluded to. One of these cases, endorsed with the year and some distinctive letter of the alphabet, lies on the office table, and in it every letter as it arrives is duly filed. As each letter is answered the date of answer is marked on the same with a coloured pencil or otherwise. The case, when filled, is supplied with an index, and (its place being taken by another marked with a consecutive alphabetical letter) is then treated in the same manner as a completed "Letters-issued" Book.

In dealing with these "Letters-received" Books, as these cases really become, there are two points to be more particularly attended to, viz., the mode of "filing" and the mode of making a suitable index.

Of course, where there is a blank leaf or good margin to the "letter received" the filing is easy enough, otherwise it is necessary to keep at hand a number of strips of paper, each having a pair of arrow-heads projecting from one side. By folding in the barbs of these arrow-heads, they (the heads) can be inserted through two corresponding slits cut with a sharp penknife in the letter itself, which, on the barbs being unfolded, is held fast, and can, by means of the artificial margin thus afforded, be easily bound in the patent case.

Fly-boxes, as made by schoolboys, form a good instance of the application of the arrow-head fastening, and nimble fingers and a pair of scissors can produce in a few minutes a large quantity of these artificial margins.

One great advantage of the artificial margin is, that the letter can be removed from the book most easily, and replaced at any time in its original position without disturbing the other letters.

The indexing of the "Letters-received" Book is best managed as follows:—

After the case is filled, three or four half-sheets of lined foolscap are bound in, divided into columns under the headings of "Number," "Name," "Date," "Subject," "Purport," "Date of Reply," respectively, and each letter being numbered consecutively from the commencement of the book, the index pages are filled up accordingly. In addition to the index pages in each "Letters-received" Book, an Index Book will be required, formed entirely of index sheets similar to those of the ordinary "Letters-received" Book. In this Index Book the name of every correspondent, with his address, is alphabetically inserted, and in the appointed spaces opposite the name are inserted the alphabetical letters by which the books are distinguished, conjointly with the numbers with which the letters themselves are marked.

Thus, if John Brown, Esq. writes to the effect that the farm buildings you designed for him the year before last, have leaked greatly during the recent heavy rains, and that he cannot recollect having authorised you to use any but the very best tiles, you have only to turn to the Index Book, where, under the letter B, you find Mr. Brown's name, and opposite it somewhat as follows:—

1876. A/14. A/24. B/32. C/38. C/39.
1877. B/21. D/25.
1878. H/10. &c.

Sending for A B and C "Letters-received" Books of 1876, you turn to their index pages, when a glance at the purport columns of Nos. 14 and 24 in A Book, 32 in B Book, and 38 and 39 in C Book, should show you at once in which letter your client ordered the tiles in question, and the pencilled date of answer on the same will enable you, without hesitation, to turn to the "Letters-issued" Book, and see your reply.

Every one, we presume, will allow the importance of Rule III., and there remains but to be pointed out the best means of keeping such plans, drawings, and designs, in such order that when any one in particular is wanted it shall be immediately forthcoming.

Plans and drawings, necessary as they are, are generally a nuisance, they cannot be packed away like books in a library,—as can both "Letters Received" and "Letters-issued" Books, nor can they often, from their size, be placed in ordinary drawers or portfolios; their fate is, therefore, as a rule, to repose in cupboards and on shelves, where, buried in an ever-increasing thickness of dust, they await the sharp attacks of mice, or the more insidious ones of damp and mildew.

The best system to adopt is to roll up all plans and drawings and dispose of them in the attics, &c., much as bottles of wine are disposed of in the new-fashioned and most sensible iron bins.

The "plan-bin" should, however, be of wood, in the shape of a pair of light parallel frames of "square" trellis-work, ranged round the room, and reaching from floor to ceiling, the inner frame being some 2 ft. or so distant from the wall. Each of the inexpensive skeleton pigeon-holes thus formed is numbered, and affords a most convenient receptacle for a similarly numbered plan or drawing.

A bundle of common rollers should be kept at hand, rolled round one of which a plan, that in itself would not be long enough, can be securely kept. Auctioneers numbers, which are sold on gummed paper in sheets of a hundred, answer capitally for numbering the pigeon-holes, and indeed these numbers skewered in readiness on a long pin or wire, can be used advantageously in numbering the letters in the "Letters-received" Book.

A Plan Index Book will be required, and this should contain, in alphabetical order, the names or titles of the plans and the number allotted to each; the plans themselves, also being marked with these numbers, are packed away in their pigeon holes, to be found at once when required, and readily replaced when finished with.

It will be necessary to keep in the Plan Index Book a list of consecutive numbers, each to be scored through when made use of, and thus avoid further trouble and risk of confusion.

Should any plan or drawing be removed from the office for any period, a pencilled memorandum made opposite its number in the book will duly record the date and place of removal.

Mr. Jones, a client of yours, calls respecting the survey of some additions he has lately made to his estate at Blankside. You open the Plan Index Book at the letter B, and, calling through your speaking-tube, a clerk brings you in almost immediately No. 1,341, the draft plan of the Blankside Estate, which you made many years ago, and have not since seen or had occasion to think of.

Of course, many plans may be stored away in one pigeon-hole, which will save space, but at the expense of time in searching through them. It is astonishing to find how many pigeon-holes can be constructed in a room or attic of very ordinary size.

Having thus enunciated what we consider the three principal rules of office economy, and pointed out how they may be properly observed, we must leave it to a future time to consider some other minor points, which also tend to reduce time, trouble, and expense in this matter to a minimum, and while relieving the professional man of very much petty annoyance, afford him greater scope for the exercise of his talent and abilities.

WEAK AND STRONG POINTS IN THE ENGLISH SECTION AT THE PARIS EXHIBITION.

THE lateral gallery of the main building, which separates the machinery from the surrounding gardens, is devoted to the exhibition of articles of food, preserves, wines, spirits, and also to various sanitary and building appliances, and it is curious to note how differently the various countries have utilised this space, Spain, for instance, occupying almost every available inch of ground to display bottles of wine, while England, on the other hand, has a wonderful show of sanitary appliances. The one nation is satisfied in merely stretching out its hand to gather the rich produce of the soil; the other, bringing science, skill, and ingenuity to bear, succeeds, by its artificial contrivances, in lessening certain dangers which would otherwise result from its overgrown population and its unfavourable climate. Like other nations, we have found space for the display of our national drinks. The most celebrated brands that distinguish our Irish and Scotch whiskies are all there, and the more modest, though more popular, gin of England has its place among the alcohols that we produce. Nor are these objects of mere contemplation. The exhibitors, with interested liberality, are ready to afford full opportunities of tasting, and many a weak-headed foreigner has been compelled to acknowledge with tearful eyes the superior potency of, let us say, the Dublin whisky. Close at hand, however, relief may be readily obtained in the shape of a dry, powdery English biscuit, suggesting a mixture of sand, plaster, milk, and sugar, the whole, if anything, rather over-baked. Should the investigator who has ventured thus far attract the attention of the managers of the surrounding exhibits, he will be called upon to accept in rapid succession some preserved meats, which we need only qualify as stringy; some tinned fish of seedy complexion; some bottled fruits, which, in the acquisition of a watery, sticky liquid, called,—by courtesy,—juice, have lost their original flavour; a British cigar; some very gritty British chocolate; and, most cruel cut of all, some British bonbons! Thus the betrayed foreigner, after leaving the section devoted to the gastronomic products of perfidious Albion, will be fortunate indeed if his digestive faculties allow him to walk off in a direct line to the

nearest ambulance! Yet, many Englishmen, to his intense surprise and lasting wonder, consider all these things good. Indeed, some men even prefer these English delicacies to the bouquet of a Château Yquem, or a generous Chambertin; to the airy, perfumed wafer *plaisir*; to the rich succulency of *pâté de foie gras*; to the admirable harmony of thon or of sardines preserved in the most wholesome oil; to the *primeurs* from Potel and Chabot; to the vanille chocolats of a Ménier or a Marquis; to the fragrant fumes of a *loudrès*; and the untold delights in sugar, in cream, in fruits, in flowers, crisp or melting, cased in boxes of artistic elegance and unequalled originality, which attract all the world to feast on the marvels of sweetness retailed by Sirandin, Gouache and Boissier. Decidedly, in the refinements and arts of gastronomy, we are behind many other nations, and France in particular, and this is a fact forced on our attention just at the moment we were contemplating the proofs of our pre-eminence in sanitary matters. The unpleasant confusion in the same gallery of food exhibits, drains, ventilators, baths, sinks, &c., renders the above comparisons unavoidable. Also, we have had so many occasions of praising our own nationality that we do not regret this opportunity of showing some impartiality by recognising our inferiority, so far, at least, as refined food and artistic cooking is concerned. Finally, we must repeat that, if we have somewhat transgressed from the subjects we should treat of in these columns, it is the fault of the organisers of the Exhibition, who, for reasons best known to themselves, have placed Boyle's ventilators near some preserved fish, Doulton's new hand-basins close to English tobacco, Jennings's patent sink hard by Crosse & Blackwell's pickles, Peek & Frean's biscuits under the shade of Stiff's drain-pipes, and the "mountain dew" of Scotland not far, fortunately, from the water that inundates Smeaton's douche bath.

This latter exhibit has attracted much attention, for it is an imposing bath, in which a vertical, horizontal, and converging play of water can be produced, combined with the ordinary plunge-bath and douche, so that it is easy to carry out at home an elaborate system of water cure. Messrs. W. Smeaton & Sons, however, seek, we fear, somewhat too often, to combine with their admirable bath an ordinary wash-stand with special contrivance underneath, and a closet by its side. On sanitary grounds we cannot advise the presence of a closet, &c., side by side with the bath in the one small room. To render this at all safe, we must presuppose so perfect a system of trapping and ventilation that it would be much more prudent to keep these domestic services separate one from another. It is true that, if any one can render a closet innocuous, Messrs. Smeaton & Sons are thoroughly competent to accomplish this difficult task, and as the English agents for Bower's patent, they have at once the newest and most effective trap for a waste or sink pipe. In spite, however, of these facts, we do not see that any serious advantage can be obtained by crowding closet and bath together in the same chamber; while, considering the carelessness and ignorance so many persons display, such a system might at times prove dangerous.

We have already described in these columns the nature of Bower's patent trap; it remains for us to add, that it is certainly one of the most simple and yet effective novelties to be found in the Exhibition. It has been tested with ether and ammonia, and the trap has not given passage even to these volatile principles; it will resist, in a similar manner and for the same reason, the back-water which so often floods the lower floors of a house. Every ascending pressure only forces the ball which forms the valve tighter against the inlet, and it is easy to watch how, in a few hours, the water below the valve becomes discoloured with the sewer-gas it absorbs, while the water above the valve retains its ordinary colour. This is indeed an excellent and forcible way of demonstrating the amount of sewer-gas which is constantly seeking to enter our dwellings. Messrs. Smeaton & Sons also exhibit a method of applying this Bower's trap to a closet-plan. The contrivance is good and effective, and facilitates the cleaning of the closet; but it is unavoidably heavy. A bulky plunger is lifted to empty and flush the pan. When it is let down, a large rubber gasket, running round the base of the plunger, closes the main discharge of the water-closet, and the weight jams the elastic so tightly on the sides that the sewer-gas cannot pass. A small opening at the top admits the overflow water from the pan down into the centre of the plunger, where it passes through a Bower trap, and falls out into the drain underneath the plunger. Thus the side and bottom of the plunger serve as the valve and trap for the emptying of the pan, while the centre of the plunger contains the Bower trap, and is utilised as an overflow pipe. The whole can be lifted bodily out of the cylindrical aperture made for its reception, and cleaned or repaired without the least difficulty.

Mr. George Jennings is the nearest neighbour to Messrs. Smeaton & Sons, and contrives to attract the public by means of a luxurious washing-stand, which produces a shower of hot, cold, or tepid water for refreshing the face or shampooing the head. Here also are baths and closets: but they have for the most part been already described, and are familiar to the English public. To foreign visitors many of these things are novelties, and do us the greatest credit when compared with the exhibits of other nationalities. The endeavours made to exclude sewer-gas demonstrate the advance of sanitary science, though we must say that Jennings's anti-percussion admission regulating valve is somewhat complicated in its working. We would commend in preference his patent sink, which, however, we noticed when it was first introduced to the public. The opening carried across the width of the sink insures about six times as much escape-room without increasing the risk of a stoppage as that given in an ordinary sink. Mr. Jennings, in conclusion, should be congratulated on forestalling the growing exigencies of railway travellers. He has manufactured a pump-washstand for the Pullman cars, with a double-action pump, so easily worked that it can be handled successfully by a child, and water is brought from the tank to the carriage containing the lavatory without effort.

We then encountered, on leaving this stand, the equally familiar and excellent products of Messrs. Doulton & Co. Their appeal to their Continental customers is at once forcible and scientific. In their circular they point out the danger of bad drainage, and the reduction of mortality realised in those towns where their drain-pipes have been utilised. At Cardiff the death-rate was 33·2 per thousand; it is now 26·6; at Salisbury the reduction is equal to one-fifth; at Banbury the results are nearly as favourable. The mortality from typhoid or sewer fever is reduced by 25 per cent. at Salisbury; by one-third at Stratford-on-Avon, and by nearly 50 per cent. at Warwick, Ely, and Penrith. The secret of these asserted achievements consists simply in the fact that the drain-pipes were made and laid so well that they did not admit of any leakage. This, combined with the perfect trapping of closets, and the opening of waste-pipes to the air, a subject on which we have already written at length, lessened the chance of sewer contamination, that is, lessened the principal cause of typhoid fever. But the best of pipes will get blocked at times, and Messrs. Doulton's system of drain-pipe, which is so prepared that the top can be broken off evenly and replaced after the pipe has been cleansed, meets the difficulty. Stanford's patent spherical joints which can bend without causing a leakage, attract much attention. These have been used at Reading and Oxford, and often save concrete foundation. They are easily laid, and mistakes in fixing are rendered impossible. The cup-and-ball joints render this operation so simple that it can be accomplished by the most careless workmen, while the spherical shape enables us to bend the pipe up or down or sideways without letting the water out. A bituminous substance in the joints renders the fitting more secure. Thus the road may give way a little, or a slight earthquake occur, without causing leakage in the sewer or drain-pipes. The same exhibitors have also recently undertaken the production of ordinary painted ware, celadon colours, and ivory bodies. This is altogether a new branch of manufacture, worked in Staffordshire, and taken in hand only two years ago, so that the present in hand only two years ago, so that the present is the first exhibit of these products by the firm of Doulton & Co., and we may heartily congratulate them on the useful and artistic results achieved.

Sir John Steell, R.S.A.—We are glad to hear that Sir John Steell, who has for some time past been prostrated with illness, has now so far recovered as to be able to be out of doors.

WESTMINSTER ABBEY.

WE are very glad to find that the destructive work which was going on in the Cloisters has been stopped. It should on no account be resumed. In the application of any preservative, it is necessary that the object to be treated should be not only preserved, but preserved *unchanged*; therefore, any process that requires as a preliminary the removal of the existing surface, or of the efflorescence on that surface, or which immediately or ultimately changes the colour or texture of the surface of the stone, is to be strongly condemned.

It is not too much to say that Sir Gilbert Scott, had he been living, would have deprecated in the strongest terms possible the process that has been within the last month applied to the two northern bays of the western walk of the Cloisters of Westminster Abbey; for no man more strongly than he protested against the removal of ancient surfaces. The chief object of the treatment applied to the interior parts of the church was to preserve them; but, unfortunately, Sir Gilbert was not equally particular about retaining the colour of the stone, whether natural or imparted by age. His process was to blow off loose dust, and apply, by means of a syringe, a preparation of shellac. The result of this treatment may be seen in any part of the church. The forms are preserved, but the lac has darkened and entirely changed the ancient colour of the building. Unfortunately, this same process has been applied to the marble, which did not require it for protection, as well as to the stone, with the result of giving it an appearance as if it had been covered with a brown varnish. Those who knew the Abbey twelve years ago can alone appreciate the extent of the harm that has been done, but some idea may be formed by comparing the western with the eastern face of the two great westernmost columns of the nave, the former remaining "untreated." How very unlike the "treated" surface is to the original marble surface may be seen by comparing it with one shaft in the north transept, which, by a series of accidents, had been covered up and protected from the fourteenth century till the year before last. All this, however, is as nothing when we compare it with what has been done recently in the west cloister. There the first step taken towards preservation has been to remove more of the surface than would have perished spontaneously in a century. The ribs of the vaulting that remain untouched show the old mouldings, still effective and beautiful, although the surface is much decayed. On the "preserved" ribs scarcely a line of moulding remains, the stone having been reduced to a new and plain surface.

To make the matter more regrettable, the process appears not to be so effectual as was thought,—at all events, on surfaces partly exposed to the weather, as in the cloisters. Part of the east walk was "treated" some years since, and the result appears to be that the stone now falls in flakes instead of in powder. The ugly brown surface that was given to it is now flecked all over with white patches. It was scarcely worth while to destroy the charming tints of antiquity for such a result.

THE CAREER IN GREAT BRITAIN OF REVIVED GOTHIC.

HAVING spoken disparagingly, in a late paper under the above title, of some practices which are looked upon with especial favour by many prominent men, the following remarks, by way of strengthening my position, may not be deemed uncalled for.

The least generally acceptable of my remarks, perhaps, would be those condemnatory of the adoption of the lancet window. This feature as treated in many examples mediæval and modern,—grouped into three, five, or seven sister-lights, though still a mere slit in the wall, may have a not unpleasing effect, which it has in the new cathedral designs to which I referred. There the architect has made the most of it, and done all that could be done to add variety. But the lancet window is only the Norman single hole elongated; and, however grouped, it is not to be compared with the simplest form of the geometrical or curvilinear window that succeeded it, which is the grace and perfection of the style, and among the jewels of architecture. Going back from this is descending from architecture to building; and, as I remarked before, would

only be paralleled if the painter should fall back upon monochrome after revelling in all the harmonies of colour. The Perpendicular window has, along with the style to which it belongs, been pronounced by a great writer "detestable," and certainly, in some extremely perpendicular and characteristic examples of it, with head composed chiefly of parallel straight lines, which occur in some of our finest cathedrals, it so appears,—liney and monotonous. Yet the Perpendicular window may have such an infusion of geometrical or curved forms as will well-nigh redeem it. The great front window of Westminster Hall is not an ignoble form; the windows of the chapel of Henry VII. are elegant. I think the Perpendicular window is susceptive of great beauty; and examples of it could be pointed to, imitated in some modern ones, in which great beauty is displayed, and which have more harmony and unity than some geometrical ones. But for the lancet window there is no redemption. It is not detestable any more than it is lovable. It is simply empty, and can never be otherwise; and when it appears numerous enough in the side of aisle or clear-story, to give sufficient light, with intervening buttresses, a miserably cut-up and mean appearance is induced.

The great and sterling qualities of the phase of Gothic to which this feature belongs, and to which it in some measure owes its prestige,—a phase or style which, to much of the energy and grandeur of the Norman, unites grace and purity of form, has seduced architects to a literal revival or reproduction of it in the spirit of its time; than which, I conceive, no greater mistake could be made in reference to art. The embodiment in one building of all and the highest grace and perfection that Greek or Mediævalist has left us, would alone not constitute that building a true work of art, unless the character of the present period found expression in it. This only could give it a charm for the imagination, and genuine interest as a creature of architecture. How much more vain is it to reproduce in form or essence particular phases of art that were abandoned many centuries ago. It is ignoring all advance of the intervening ages, and character of the modern English mind, which ought to be reflected in its works. The buildings and style sought to be reproduced were the legitimate result of the state of things existing in the Middle Ages, which is almost diametrically opposite to that of the present, and can never return. How totally different it must have been from that which now prevails may be judged if we consider that even the vernacular language spoken in the Middle Ages has since perished, and is not the English language now spoken, words and forms of expression having grown obsolete. The most flourishing period of Gothic was prior to the dawn of the rising literature of Europe. In the thirteenth century chivalry was in its vigour, giving life to institutions and customs which have long since become extinct. Printing was undiscovered, and alchemists were dreaming of the philosopher's stone. On the thirteenth century Chaucer, the father of English poetry, Shakspeare, Spenser, Bacon, Milton, had not breathed; nor was it influenced in any measure by the revival of ancient sculpture and new birth of Italian and European art under Nicola, Cimabue, and Giotto. Moreover, since that period the magnificence of the inanimate creation, the "splendour of the grass, the glory of the flower," have grown into greater favour and taken firmer hold on humanity, and the poetic and artistic mind has discovered in the grandeur of external nature another great fountain of sublime emotions laid open to it. Whatever merit, therefore, the pure Mediæval architecture may have, it is impossible that the modern English mind can be in full sympathy with it. What is wanting to its interest, the modern impress and elements, it must receive in its passage into modern structures through the mind of the architect. The use of the Mediæval examples has been mistaken. What history is to the politician,—the highest form of human experience, the great remains of architecture are to the architect. They are pregnant with interest as expositions and illustrations of those great principles of art which are of unceasing obligation, and which were originally derived from the universal preceptress, Nature herself. Instead of being reproduced, they are to be submitted to the resolving and combining powers of his mind. Architecture is an imaginative art, and its practitioner needs something of the poet's creative and shaping faculty; and what measure of this he has he should laboriously cultivate; and not stultify and cramp his mind to the exclusive contemplation of past phases of art, and the endeavour to get into the Mediæval world of thought, the tendency of which is to weaken his own artistic powers and sympathies. While seeking to catch the spirit of the old architects and sculptors, he must neglect the cultivation and renewal of his own, and lose all that is best in his own individuality. It is ignoring his innate and peculiar faculties and individual dignity and worth. Every artist of any power has a decided bias in some direction or other; but the course in question must contravene this, and destroy whatever is fresh and vigorous and characteristic of himself. He may profit to any extent by the earnestness, simplicity, and singleness of aim of the thirteenth-century artists; he may nurture, purify, and elevate his own spirit by communion with theirs; but he is no more under obligation to adopt their motives and work in their peculiar spirit than is the modern poet to compose in the spirit of the Provençal ballads of the Troubadours and Trouvères. However indebted to another, it must be his own spirit that he works in. The highest merit and value of a design must come from the architect himself, his own earnest thought and feeling, which will give value to the meanest materials. "The eye of the Dutch and Flemish schools though shut to form, tipped the cottage, the boor, the ale-pot, the shambles, and even the haze of winter with orient hues and the glow of setting suns." "Consider it," says Fuseli, "as an unalterable law of nature that all your power upon others depends on your own emotions. Hearts alone can penetrate hearts." Work in the spirit of the old sculptors, and from their sphere of thought, supposing you could fully get into it, and you cannot advance upon them and their age, and be in harmony with the present one. The highest merit of your work, because that was its aim, will be that it is Mediæval, and out of harmony with the present,—Mediæval in spirit and character, and modern only in material and execution. The course in question is condemned by the fact that it affords no field for the operations of genius, the minister of art, which consists in the discovery and practice of principles previously unknown,—going beyond the received theory of art.

To a great proportion of the profession the foregoing remarks will not apply. They are blessed with larger views and are acting upon them. But the view I am contending against is held by many earnest and conscientious men at the present hour. In fact, their works betray it. They are thirteenth or fourteenth-century works, and have nothing of the present age breathing from them,—nothing to show that the architects have observed, and thought, and felt, in the nineteenth century. On them you look in vain for one inch of detail or ornament that might not have been placed there ages ago; and they might be mistaken by an enlightened American or Australian visitor, supposing the tinting and corroding effect of centuries on the stone were anticipated, for Middle-Age structures. They bear the same relation to original buildings that a translation bears to an original literary composition, the true object of which is to transfuse the spirit of the old work into new material uninfluenced by the individual habits and bent of mind of the translator, whose best praise must be that he has added nothing and omitted nothing, and that none of the depth or delicacy or sweetness of his original, if it have any, has escaped him.

Working on this principle the art could not only not advance upon the present, it could never get up abreast of the present, but be ever in arrears. It will be as stationary, as stagnant, as was philosophy in the hands of the Schoolmen; and the satire of the poet on the Mediæval disciples of Aristotle will apply equally to the present architectural worshippers of the thirteenth century, or any other period:

> "They stand
> Lock'd up together hand in hand;
> Every one leads as he is led;
> The same bare path they tread,
> And dance like fairies a fantastic round,
> But neither change their motion nor their ground."

This receives no countenance or support from Pre-Raffaelism, which is based on the conviction or impression that painters were neglecting certain essential qualities of art—that utterances of nature, or facts of life which ought to be expressed as it were in italics or in capitals were slurred over and scarcely expressed at all. The Pre-Raffaelite Brethren were sent back to the rich treasures of devotional thought and feeling embalmed in the works of the earlier period of Italian painting, more especially in those of Fra Angelico, whose whole art-life has been justly called a hymn of praise—works which were in advance of the contemporary poetry of Italy, and in which may be traced the influence of the mighty genius of Dante. Some of them have shown, it must be admitted, a blind infatuation for hard outline, and while ignoring harmony of colour have sought after mere brilliancy, a quality which depends more on the colour manufacturer than on the artist, and adopted the false perspective and other technical faults of their models. But these were not the legitimate teaching of the school, which had a lofty aim, and was directed to lead the artist to a more faithful rendering of the infinite beauty of nature, and, by the earnest and serious treatment of biblical and religious subjects reflect something of that "light which lighteth every man that cometh into the world." Its teaching might not inaptly be symbolised by the advice of Solomon, "Go to the ant, thou sluggard; consider her ways, and be wise."

The Gothic architecture, strange to say, is still dealt with in too archæological a spirit; too much time and talent is given to the history and distinctions of styles and periods. These archæologists, who are archæologists only, and have nothing else to do, should settle. But architects can have little call to them. What can it matter to an architect, for instance, with any artistic strength of his own, whether the Geometrical and Curvilinear periods are viewed as distinct styles, or as subdivisions only of the Middle-Pointed style? I am quite sure that William of Wykeham, when casting about for materials and suggestions for his grand west front of Winchester Cathedral, did not care a straw whether Iffley Church belonged to the Norman period, or to the Transitional, which I remember was a point in fierce dispute between eminent architects some years ago. To grasp the artistic teachings of that and of all other examples at his command, and use his materials with congruity and fitness and artistic harmony of form, would, I conceive, be his sole concern.

It is strange that while we hear so much about styles and periods, so little is said about invention, design, composition, expression, chiaroscuro, colour; but these are as important in architecture as they are in painting, and nothing would have tended more to promote a due appreciation of ancient examples, and the prevention of their blemishes and shortcomings being eternised in modern works, to the misleading of posterity, than due instruction in them. Along with constructive unity and truth they should have been made the chief subjects of Royal Academy lectures. The best advice that could be given to the young and undeveloped architect is, Respect your intuitions, assured that every surmise of the mind may be of value. "Sweetest melodies," sings Wordsworth,—

> "Are those that are by distance made more sweet,
> Whose mind is but the mind of his own eyes,
> He is a slave; the meanest we can meet."

Watch carefully the order in which feelings succeed each other; the movements of your inner life, and the way in which things appear when presented to your mind in its best and highest moods. Search into all art-works,—Ancient, Mediæval, Oriental,—for what truthful beauty or what beautiful truth you can find,—for that which is everlasting by its nature and can never grow obsolete; but digest it well in your thought-alembic, and make it the harmonious furniture of your own mind. And instead of trying to kindle in your breasts the fire of the elder artists, a practice by which no one ever warmed a cold heart, fan what fire you may have of your own. Imbue and enrich your mind, as if you were training for a poet, with images and sympathies from every available source in nature, art, and literature, and cultivate your innate feeling for the good, the true, the beautiful, wherever found. Study well the mathematics, both for mental discipline and insight, as well as the great principles that are common to the whole of the fine arts; and so deepen and broaden your thought. Nor forget, in the process of satisfying the reason, the emotional and poetical element of architecture, which is higher than the scientific. Slight not constructive consistency and truth, but consider it as a means to an end,—beauty and expression, which every architectural creation should have, as well as that complete finish

which shows that the heart of the worker was in his work. Act an independent part, and exercise an art not of tradition but of understanding and feeling. Be not an echo of the past but a living voice of the present. In short, be strong of mind, lofty of soul, tender of heart; which, let me add, involves the cultivation of a spirit of unworldliness. The highest artists have ever been unworldly in life and aim. The highest revealings in art as in religion are best understood by the pure and simple and true of heart.

The present age is sufficiently munificent and fostering to architecture to encourage hopes of the highest manifestation of its power and beauty. It should be seen in such edifices as cathedrals, which are now not unfrequently called for. A cathedral erected in the present day should show no imitation or following of one phase of Gothic, but be an harmonious development,—the flower and perfection of the entire system. It should profit by every mistake or shortcoming of its predecessors in every part of the world; and while indebted for some beauty or excellence to every one of them, it should be superior to all. Exaggerating their good and eschewing their bad qualities it would be an idealisation of the class,—an architectural Apollo. The wise architect would be anxious to take advantage of all advance in architecture and art, in science and literature, and in knowledge of architectural history in modern days, and show in his work that which the Mediævalists could not show or failed to show. He would take it the better, for instance, what Egypt, Greece, Rome, Spain, and India had taught him, and of what warmth of fancy and imagination he had acquired from communion with them and added to his original stock. If creative power or invention, which is the essence of the fine arts, is ever put forth, it should be in the design of a cathedral, which should show advance upon the Mediævalists both in form and essence. The architect could not create the style he wrought in any more than the poet can create his language; but as the latter would inhibit some metaphors and other figures of speech beyond what has been used by preceding poets, so he, the architect, would show some new elements or new modifications of the old, the result of new influences and inspirations; or he would enrich the old elements with new meanings. In designing a cathedral the unfettered architect would venture to depart from the Latin cross form, which, with long transepts, is scarcely the grandest of compositions, and adopt a more compact general form, which might have the effect of expanding and vivifying the style, disclosing new beauties in it; and showing the possibilities that are working within it, and only awaiting the magic wand of genius to draw them forth to the light. The central crowning feature he would, I think, make more curvilinear than the corresponding Mediæval forms. If the architectural imagination should run riot or luxuriate anywhere it should be in the conception of such a feature, which, sent up into the welkin only to gladden the eye, should be a vision of architectural glory.

Whatever plan he adopted he would regenerate the buttress, and make it as symmetrical as would consist with due perspicuity of expression, which would be making it more architectural, a character which it greatly lacks in its usual form; for only so far as it is shaped by the sense of beauty in the architect is the buttress a thing of architecture. Otherwise, and formed only in obedience to the law of the resolution of forces, it is an engineering feature, and in an architectural composition a dissonant object, and no more architectural than the pillars of a tubular bridge. He would so form it as to supersede the need of extravagant projection, which mars the perspective view; and render unnecessary its extension upwards into a finial, and placing the safety of the building at the mercy of any mischievous person. He would substitute the crocketed pinnacle by a human or angelic figure, or noble animal. Flying buttresses, if used at all, he would be still more careful to modify, as they generally prevent any good view of the clearstory windows being obtained. The omission of the buttresses from the design of the Church of the Sacred Heart would be an immense refinement of it.

The same feeling that would reform the buttress would desire a greater prominence of the cylindrical column, a feature which, under some condition or another, is an everlasting element of architecture, and essential to the brilliancy and delicacy which we look for in all high-art works, and which are wanting in buttressed and astylar erections. He would have the column, of nearly Classic proportions and purity, and on as large a scale as possible, to form and adorn the west entrance, where it might combine with the pointed arch to grander purpose than it has yet done; though it is here generally, I mean in the formation of the great doorways, that the Mediæval minsters rise to the greatest grandeur.

Reformation of the buttress, and greater prominence of the column, would render the Gothic Cathedral less atomic in appearance, and more brilliant and graceful, and consequently more meet, clothed with the splendour of sculpture and painting, and filled with the tenderest melodies of music, to symbolise and pay homage to the beauty of holiness.

In the house that connects, as it were, the present and future states,—the earthly gate and vestibule of heaven,—in which the curtain of futurity is withdrawn, disclosing a prospect of human glory that can never pale, we should naturally expect sculpture, and painting, and architecture to put forth their utmost strength, and raise their divine voices to the sublimest pitch. The lofty views of Christianity should animate them to nobler flights than classic paganism was capable of.

In the imaginary building under notice the most vital sculpture would animate and perfect the most symmetrical and sublime architectural composition, bringing it into an infinitely higher sphere and giving it greater power over the imagination. It would come as sequel and supplement to the structural beauty, to which its richness and brilliancy would perfectly assimilate. So subtile would be its correspondence with the ruling spirit and character of the structure that it would seem as if the building had attracted the sculpture by an inevitable operation of natural affinities.

No such object as instructing the ignorant in Scripture history would be contemplated. But high class sculpture could not fail to charm by its beauty, to touch by its expression, to elevate by its sublimity. By dint of it the building would shed a morally and spiritually helpful and healing influence around it, and scatter seed the rich fruits of which in the breasts of cultivated and uncultivated would be incalculable. Grand natures it might help to enlarge and enrich, lovely ones to beautify and refine, and all to lift into a purer air.

Art is of herself, I know, unable to purify the heart, or elevate or regenerate the character. But she may be one of God's chosen instruments for doing it, or for aiding in the work,—a work for which her intimate relations with life, and sympathy with its joys and sorrows, render her the more fit. The sublime works of Michael-angelo, and the great religious artists of Italy, which may be considered as material embodiments of Revelation, show that it is within her power to present the most lofty and pathetic scenes of the Bible with greater force than what lies in the words of the inspired page, and suggests that subjects could be selected therefrom, which, embodied in form or colour, could not fail to do their silent work, and bring its moral and spiritual ideals, and standards of virtue and holiness, more vividly before the eyes than they could otherwise be brought. If in Christian teaching it is proper to employ the finest art of rhetoric, the loveliest grace of fancy, the subtilest harmonies of elocution, it is fitting that the best efforts of the arts of form, which, as well as the other fine arts, poetry and music, are proofs of the unspeakable dignity of man, should also come in aid of the Gospel The fine arts seem alone of all earthly creations inspired by an idea or soul worthy of association with a future and infinite scene, where alone, perhaps, as suggested by some devout thinkers, they can be adequately developed and fulfil their earthly promise.

The above remarks refer chiefly to the exterior. The interior, adorned from the vivid glories of the painter's imagination, might be indued with still more subtile power over the heart to guide it in its struggle towards light. Painting might not only be instrumental in removing the usual hindrances to devotion in the shape of wandering and distraction of mind, but join with the solemn and awakening airs of the church music to sweetly influence and exalt the passions, and guide them towards their proper object, and so assist in adding to the amiability of God's tabernacle, and making a day in His courts better than a thousand. We should have to wait, I fear, some time for faces of saints and angels so irradiated with celestial glory as those of Fra Angelico, as such could only be painted by men leading the life of the pious monk. But surely there is religious earnestness and devotional feeling combined with enthusiasm and tenderness for art and beauty left in the world to take fire at the exalted characters and scenes of the Bible, and weave them into pictures which would embody the distilled essence of its poetry and wisdom.

The cathedral of the present century should, in short, exhibit the loftiest ideal of architecture —architecture in the full sense of the word, with all the highest aid of her handmaids. By means of one art or another, it should appeal to and satisfy the whole mind,—memory, reason, imagination, and the passions; blending the beautiful, the graceful, and the tender with the intellectual and sublime. New, and yet old, it would be in harmony with all about it, and seem as if it had grown out of the earth to the symphonies of angels. Conceived by an unfettered mind, inspired by all legitimate sources of inspiration, and executed in a like spirit, it could not fail to lay open some hitherto undiscovered regions of art and beauty.

SAMUEL HUGGINS.

THE LIVERPOOL WATER SUPPLY.

THE question as to the future water-supply for Liverpool has for some time past formed the subject of warm discussion in the town, one party contending,—as was the case upwards of twenty years ago, when the supply from the Rivington Hills led to an inquiry before the late Mr. Robert Stephenson, C.E.,—that there is a sufficient quantity of good and soft water under the red sandstone in the locality, without going to a distance for a supply. One of the most ardent supporters of this theory is Mr. Alderman Bennett, who, for several years, has clung to it with unflagging tenacity, and at a meeting of the Town Council which has just been held, when the entire question as to local or distant supply was discussed, Mr. Bennett observed that with a proper system of well-supply he would stake his fortune on the obtaining of good and soft water in the neighbourhood of the town, sufficient for all the requirements of the inhabitants. On the other hand the opponents of the well-supply urge that it is not only deficient in quantity, but that its hardness renders it unfit for general domestic purposes.

The supply from the Rivington Hills,—about twenty miles from Liverpool,—added to that obtained from the local wells at Bootle, having been found inadequate, the question of an additional supply has now for two or three years past occupied the attention of the Council, but nothing definite has yet been arrived at, although a large outlay has been incurred in surveys and engineers' reports on several schemes. The Water Committee and the Council appear, in fact, to be chargeable, in some sense, with an uncertainty of purpose, for no less than four different projects have, in turn, been favourably received and then abandoned, and now a fifth seems to be in favour. A supply from Windermere, Ullswater, and Haweswater Lakes, in Cumberland, together with a project for obtaining a supply from the neighbourhood of Bleasdale, near Lancaster, have in succession one and all been put aside, and the local authorities are now turning their attention to Wales, the river Verniew (or, in the Welsh vernacular, *Vyrnwy*) being the source now looked to. It forms one of the heads of the waters of the Severn, and on this project Mr. Deacon, the water and borough engineer, has just presented an interesting report, in which he describes the preliminary engineering steps which have been taken, and the proposed embankments, a lake to impound 10,500,000,000 gallons of water, and other works. He then adverts to the several alternative routes, and gives it as his opinion that the route along the eastern slopes of Montgomeryshire and Denbighshire to Helsby Hill, on the banks of the Mersey, is the best. On this route, he observes:—

"The total length of this line to Woolton Hill is sixty-nine miles, made up as follows:—First, by three tunnels, capable of conveying 40,000,000 gallons a day or more. The first between the proposed lake and Hirnant, having a length of two miles and a quarter in the Caradoc beds of the Lower Silurian formation; the second, two miles and a half west of Oswestry, having a

of support to this couch. A tiger's skin is spread on the floor; a large vase of white Algerian onyx, on a pedestal, stands near, with a palm in it; a little table of exquisite workmanship is placed near the couch, with a fan (also a work of art) and a rose thrown carelessly on it. No slightest detail has been forgotten to give the "picture" reality on the side on which the lady's eyes are supposed to rest when "dreaming" in this spot. A panel let into the wall represents Psyche asleep, though morning is just breaking. She is asleep among the clouds, of course, and one little cupid is floating up to draw the clouds of night away. Two more are sitting at her feet, trying to wake her, playing on a harp and flute, another little love is gently touching her. This graceful picture is now only an oil sketch by M. Majerolles, but is eventually to be executed in Gobelins tapestry work. An easel in carved wood, with crimson velvet draped over it, and supporting the sketch of a beautiful little girl, becomes by this arrangement, instead of an encumbrance, an elegant article of furniture. There are various other accessories that go towards completing the whole. But it is the extraordinarily "finished" arrangements of the various draperies that impress one. And all the ideas so well executed have emanated from M. Perron himself, who seems to have a high appreciation of art of a certain kind. His next exhibit is a large ebony cabinet, with bronze medallions, each a finely-finished female head, representing Sculpture, Architecture, Science, &c. It has two companion vases on pedestals. The vases are copied from originals at the Louvre, in metal *repoussé*. The cabinet is for family papers and such like, and will be unique, as no *replica* is made. His other exhibit is a large subject, that one takes at first for tapestry, but on a nearer approach it is seen to be all done by hand. It is a group *à la* Watteau, dancing, designed by M. Perron himself,—fifty women worked at it for six months; and it is as curious a specimen of modern needlework as I know of. Another singular piece of work is a portrait, supposed to be a family or historic portrait. The face is worked in Aubusson tapestry, the dress of the period the picture dates from in needlework; the ornaments are all in real stones, and the medals or chains supposed to have belonged to the individual are actually hung on the picture. The picture is unique, and fortunately is not likely to be imitated.

We leave an inspection of the very fine exhibits of M. Fourdinois and others until another day, and wander off to look at the display of silver ware at Messrs. Tiffany's, of New York. They have a most interesting collection, and an hour passes rapidly away in their domains. First of all, let me mention,—as Cyprus is still one of the topics of the day,—a very fine collection, or rather reproduction, of the Cypriot collection of antique jewelry discovered in the treasure vaults of Curium by General di Cesnola, and now owned by the Metropolitan Museum of Art in New York. General di Cesnola thus writes to the exhibitors concerning them:—"After a careful examination piece by piece of the copies you have made of the jewelry discovered by me in the island of Cyprus, it gives me the greatest pleasure and satisfaction to say your work has been most successfully executed. Were it not for your name stamped upon those you have made, I believe it would be almost impossible to decide which are the originals; and these copies so faithfully reproduce them that they must prove quite as useful for all purposes of study, or as objects of interest in representing the oldest jewelry known." The collection consists of necklaces, bracelets, rings, and so on, of graceful forms and workmanship, and one little pair of golden tortoise ear-rings (I suppose) especially attracted my attention. Messrs. Tiffany have also executed a very splendid silver service for twenty-four people, but so complete that when entirely finished it will consist of about 2,000 pieces. It seems incredible, but so it is. The service is valued at about 50,000*l.*, and belongs to Mr. Mackay. The design is very elaborate. But to my mind the objects, such as vases and jugs, decorated by the inlaying with copper nickel coloured alloys, and mixed metals, are the most beautiful things in Mr. Tiffany's collection. One silver jug has in relief the gourd vine, the leaves of that lovely red brown autumn tint we all know, and formed entirely of the alloy in the metal. This work is the speciality of Messrs. Tiffany, and does them the greatest credit. There is also a fac-simile of the Bryant testimonial vase; it is shown as a specimen of intricate electrotyping after elaborate *repoussé* work. "The actual vase was presented to Mr. William Cullen Bryant, the poet-journalist, to commemorate his eightieth birthday. A committee of gentlemen representing donors in every section of the United States met in New York, where it was presented to Mr. Bryant." The design is intended to symbolise Mr. Bryant's life and character through the medium of a classic form covered with ornamentation drawn from nature, and suggested by his works. It is a very elaborate affair, illustrating his life from youth to age, and we finally leave him, his hand resting on the crowning works of his life, the translation of the "Iliad" and the "Odyssey."

We forgot to remark that some of the articles in General di Cesnola's Cyprus collection date back to the period of the occupation of the island by the Phœnicians. On a bracelet of massive gold the name of a king of Paphos is found who reigned 672 years B.C. And some of these articles date as far back as eighteen hundred years before the Christian era.

We wander from Tiffany's to Faunière Brothers. Their jewelry and silver work is not of that showy style that attracts the eye immediately, but when examined more closely you find you are looking at real works of art. For instance, there is one pendant for the neck, —a shell of sculptured sardonyx, inside which a beautifully-chiselled little Venus is crouching, a bunch of enamelled sea-weed and dropping pearls at the end complete the ornament. Lapis-lazuli ear-rings, with silver cupids, with bow and arrow in hand, also attract attention; the model of an Eastern water-carrier; an inkstand, with Love bearing the world on his shoulders; and a handsome prize, won by Count Lagrange, of racing celebrity, representing Bellerophon (and which I mistook at first for a group of St. George and the Dragon).

We naturally go over to Christofle's to look at the silver service of the Duke of Santona, a Spaniard of great wealth, the "Triumph of Amphitrite," valued at 16,000*l.*; and also at the very elaborate cabinet, in bronze, silver, and enamel, with incrustations and enamelled medallions of the principal churches. It is destined for the Vatican, and is to hold manuscripts. It has already been taken to Rome, for the late Pope to see, and has been brought back for entire completion. Odiot, Foment, Meurice, and Grant Marly have exhibits of sufficient interest to be mentioned; but having had enough of this sort of thing for one day we wander away to spend an hour most agreeably amongst the tapestry,—the Gobelins, the Aubusson, the Beauvais. We glance at each in turn (not forgetting the Tapisserie-Savonnerie of Belleville). The Gobelins, of course, must always hold the highest place; but I confess, were I purchasing, that the Aubusson is more to my taste, the tints being, I think, even more softly brilliant. There was much silk thread used in olden times in the Gobelins, but it is now all of wool, I believe. But as I purpose a visit to the manufactory soon, I shall be able to study the subject more closely. The wise assistance Government offers to what are called the "decorative arts,"—such as the porcelain manufactory at Sèvres, the glass of Baccarat (the latter establishment alone receiving a grant of 20,000*l.* per annum from Government), gives them leisure and opportunity to attain to and carry out the highest aims in general grandeur of design. To convince oneself to what a point of perfection one of these "works" may be brought, you have only,—after looking at the "Study" of a lady in a wonderful yellow dress after Fra Gonard; the copies from the "Air" and "Water" of Charles Lebrun, as well as some from Correggio Chirlandago; the eight panels of female figures, with appropriate designs, representing Fruits, Tea, Coffee, &c., and destined for the buffet at the Grand Opera,—to look well at the lovely "Selène," a female figure floating upwards and holding the new quarter moon in her hand as a bow, and then go straight off and look at the original picture by Jules Machard in the French Beaux Arts. The only things that to my mind clash with these pictures are the borders: they are too ornate and too highly-coloured. Those of Autumn have steered clear of this, and have only a simple yellow scroll as the adjunct to the picture. A splendid carpet, covering a hundred yards, and destined for the palace of Fontainebleau, completes this exhibit.

The Aubusson tapestry is simply charming, and I linger long near this spot. Two very fine specimens first strike the eye. They are two "pictures," out of four Lord Dudley has purchased, and that he has already had possession of. One subject, especially life-like, is a winter scene. The clear opaque look of the Zee, the misty appearance of the atmosphere, the snow resting on the stripped branches of the trees (looking as if the first puff of wind would blow it away), and the general wintry effect of the whole are wonderful. A girl, with a brilliant crimson skirt looped over a pale blue one, and thrown lightly over her arm, is skating towards us; whilst on the left of the scene a cavalier, on his knees, is tying a skate on to the foot of another pretty, fair-haired being, dressed in a pale green dress looped up over pink. The whole is well harmonised. The other subject is a boy on a ladder, throwing down grapes to a girl. There is also "The Message,"—a country scene, a girl receiving a white pigeon, who bears a letter under his wing (the price of this picture is only 280*l.*). A quaint idea is a sofa that forms part of a *suite* for the King of Bavaria. The whole set illustrates a kind of story,—"The Village Wedding." On the sofa you see the large old Louis XIV.-looking carriage of the lord of the manor wending its way through green lanes towards the village church, whilst the villagers stand by to see it pass, dressed in the style Watteau has immortalised. The extremely obliging and intelligent representative of this exhibit told me the chairs, which are not here, each represent a portion of the tale, such as the church, the wedding, the village feast, the dance. This also is a unique set, and is not to be reproduced for any other purchaser.

It is to be hoped that Government will appoint a competent body of gentlemen to select and purchase some of the more remarkable works of modern art here, in the shape of tapestry, bronzes, glass, and china (which, magnificent as our own exhibit is of the latter two, have yet various qualities to recommend them), for the study of the nation at the South Kensington Museum.

MEMORIAL OF SIR G. G. SCOTT.

Through the liberality of Mr. Alfred Bell, of Bayford-house, Hampstead, who is one of the churchwardens of that parish, and a member of the firm of Clayton & Bell, a handsome stained-glass window has just been placed in the parish church of St. John, Hampstead, to the memory of Sir George Gilbert Scott. It is one of the gallery windows on the south side of the church, and represents a figure of St. Thomas Apostle, bearing his emblem, a square. The figure is on a white field, the entire light being bounded by a richly-coloured border, and the whole treated in pre-Renaissance character in keeping with the restored church. At the base of the window is the following inscription: "In grateful memory of Sir George Gilbert Scott, Knt., by one sometime his pupil."

ST. ALBAN'S ABBEY ROOF.

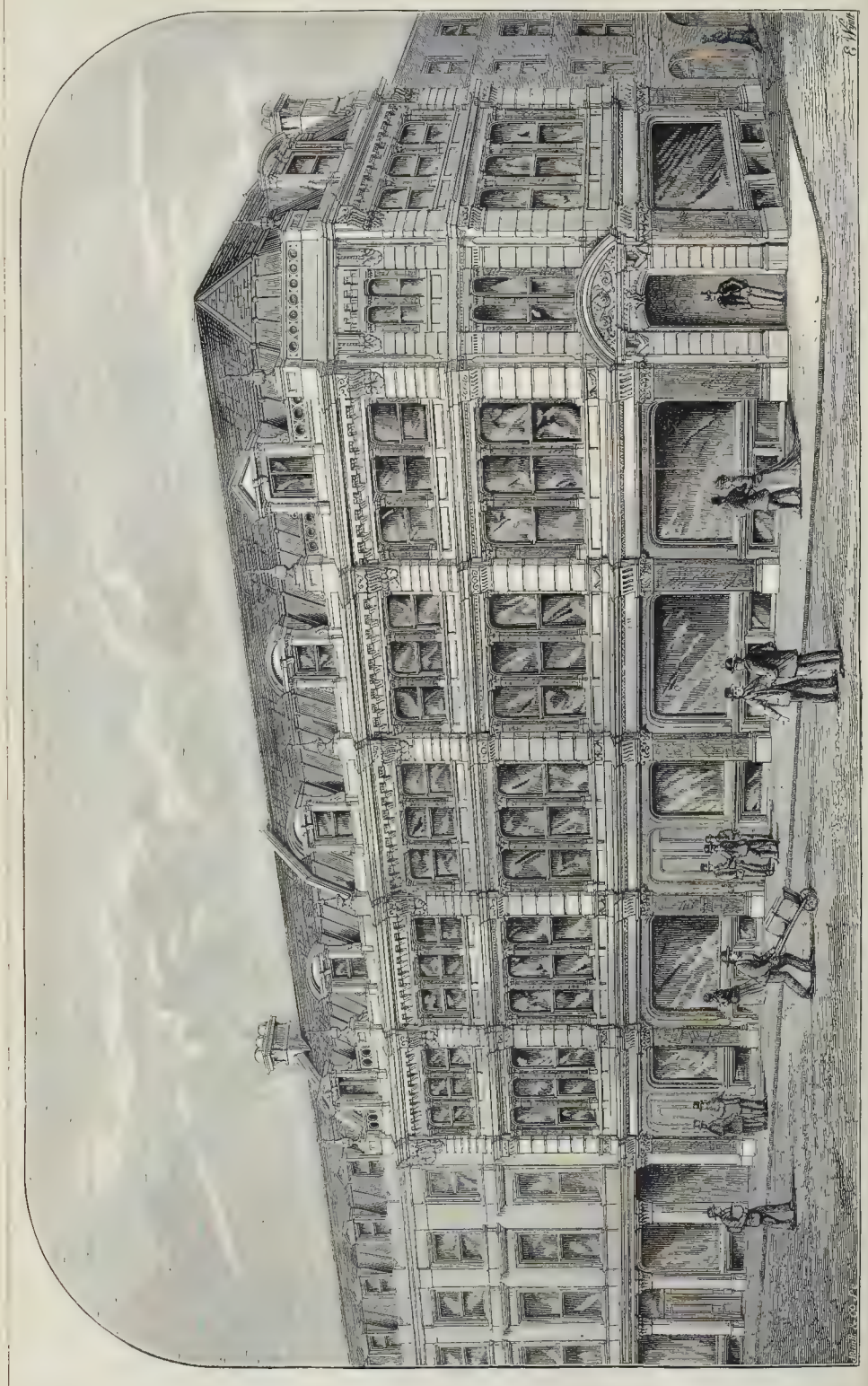
We have received a communication on this subject from Mr. James Neale, F.S.A., but, as Mr. Neale says, it appeared last week in the *Athenæum*, and we, therefore, cannot give space for it. The writer contends, as we have done, for the maintenance of the existing line of roof. The more we consider the subject the more fully satisfied we are that the view we took was the right one, and that if the committee carry out their resolution to cover the nave with a high-pitched roof, they will make a mistake, and do a great deal of mischief.

NEW WAREHOUSES, ST. MARY AXE.

We give in our present issue a view of Mr. Fairbank's new show-rooms, at the corner of St. Mary-Axe and Camomile-street, erected by Mr. D. Cohen, at a cost of nearly 10,000*l.*, from the designs of Mr. H. H. Collins, architect. The builders are Messrs. Kirk & Randall.

The whole of the front is constructed of stone, with red granite pilasters on each floor, and grey granite window fronts on the ground-floor, supplied by Mr. Outhwaite. The carving was executed by Mr. Sansom.

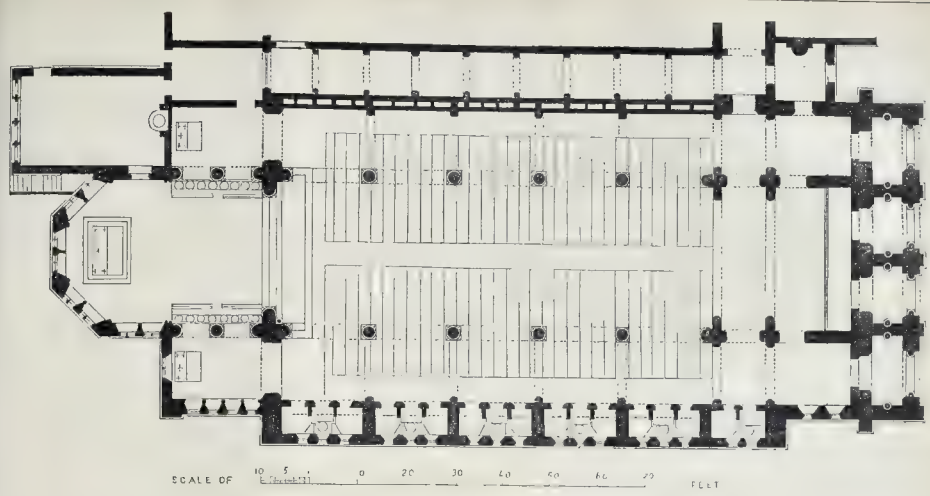
Art Exhibitions for Munich.—An International Art Exhibition is to be held in Munich next year, and thenceforth every fourth year.



NEW WAREHOUSES, ST. MARY AXE, LONDON.—Mr. H. H. Collins, Architect.



NEW MONASTIC CHURCH, WEST GORTON, MANCHESTER.—Messrs. Pugin, Ashlin, & Pugin, Architects.



CHURCH OF ST. FRANCIS, GORTON, NEAR MANCHESTER. PLAN.

NEW MONASTIC CHURCH, WEST GORTON, MANCHESTER.

A MONASTERY of considerable extent has been erected in West Gorton-lane, and fronts the roadway. On the right these buildings form a quadrangle, and on the left stands the church, a view and plan of which we give. The style is Early Decorated; the church was designed by Mr. E. Welby Pugin, and is being completed by Messrs. Pugin, Ashlin, & Pugin. It was built mainly by Father Patrick, one of the lay brothers.

The dimensions are very considerable; the length is 180 ft., the width 70 ft., and the height 98 ft. At the west front are four entrance porches, with doorways recessed. The centre two will give admission into the nave of the the church, and the outer ones into the north and south aisles respectively. The aisles are separated from the nave in the west front by two lofty buttresses, nearly 70 ft. in height, and of great projection. The front is again divided by a centre buttress, which supports and merges into an elaborate bell turret rising 150 ft. from the ground. On each side of the centre buttress is a lofty three-light window filled with tracery and bold arch mouldings above. On the centre buttress is a life-sized representation of the Crucifixion, in stone, with a canopy above. The chancel has an apsidal end, and the apex of the roof is surmounted by a large figure of an angel, in copper, gilt, carrying a cross. There are side chapels at the end of the nave, which are separated from the chancel by metal screens, in the latter there will be sixteen stalls for the Fathers. The arches dividing the nave from the aisles are 30 ft. high, supported by pillars, from which stand full-sized figures of the apostles.

THE THAULOW MUSEUM.

THE Duchies of Schleswig and Holstein have for centuries been noted for the success with which the art of carving in wood was carried on there. There were few great houses which were not embellished in their architectural details, their fittings and their furniture, or in one or other of these, by the hands of native carvers, and what they were able to do in the way of ecclesiastical ornamentation may be witnessed in the celebrated altar-piece of Hans Brüggemann, in the cathedral church of the city of Schleswig. During the early portion of the present century these relics of an artistic past fell into general neglect. The carved chest, presses, tables, and other articles of domestic furniture which at one time were found in every farm-house, if not ruthlessly destroyed, were turned into the lumber-room, and allowed to go to decay and ruin. From twenty to thirty years ago, however, collectors began to appear, and to buy up at a very low price whatever they could find of these old articles in a tolerable state of preservation, and not a few of their purchases have found their way to England, as well as to other countries of Europe. Among the most diligent of the *connoisseurs* and purchasers of the old carvings was Dr. Thaulow, a professor of the history of art at Kiel University. By degrees his entire house became filled with examples, more or less rare and valuable, of the old furniture which he bought for the most part for a very small sum. Dr. Thaulow's residence, in fact, became at length one of the sights or curiosities of Kiel. The fame of its contents spread far and wide, and no stranger ever thought of leaving Kiel without paying a visit to this remarkable collection.

One of the leading organs of art in Germany long ago spoke of Dr. Thaulow's house as "The treasury of Schleswig-Holstein wood-carving." The collection, some objects of which were of the rarest character, still went on increasing until its value was estimated by connoisseurs at not less than 10,000*l*. That it was pure love of art and not a mere desire of gain that inspired the Kiel professor in his unwearied search after these neglected treasures is evidenced by the fact that he announced some time ago his intention of leaving the entire collection to the province. It was his desire to secure them for the land and district which had created them, and he felt certain that in case they were submitted to the hammer they would be dispersed, and find a home in distant cities. The conditions on which he offered the collection to the provincial estates of the Duchies were that they should erect a suitable house in Kiel to contain the various objects, and that the new museum should be brought into close relationship with the University of Kiel. The city at once offered an excellent site for the purpose, and on it was erected, after the plans of the architect, Herr Moldenschardt, a building which is described as one of the greatest ornaments of the city and of the province.

In this, its new and permanent home, the collection, which has meanwhile been added to with unwearied zeal by its founder, has at length been placed. On Saturday, the 10th August, the Provincial Estates or Assembly of the Duchies proceeded in a body by rail from Rendsburg, where they were sitting, to Kiel, in order to be present at the inaugural ceremony at which the collection was formally handed over to the province and opened to the public. Count zu Rantzau-Rastorf, who presided at the opening, delivered an enthusiastic speech on the occasion, in the course of which the president of the province informed the donor that the Emperor Wilhelm had conferred on him the distinction of raising him to the rank of a Privy Councillor. It has been determined that the institution shall bear the name of the Thaulow Museum.

ANOMALIES IN ARCHITECTS' PRACTICE.

SIR,—This is the season which, either through the diminution of the pressure on the columns of journals, or the possession, for a brief period, of something approaching to leisure by their subscribers, is favourable to correspondence on subjects of general interest. In the hope that some of my professional brethren may take up the subject which I open in this letter, and that you, Sir, may be able to find room for letters upon it, I propose to try and point out one or two inconsistencies between our customary procedure as architects, and the formal, and, if I may so say, theoretical manner in which it is supposed to be conducted, *i.e.*, between actual practice and assumed practice.

In some particulars the actual and the assumed practice very rarely vary, in others they very rarely agree. This disagreement, in nineteen cases out of twenty, is a matter of no moment; but from time to time an untoward occurrence of some sort strains the relations between employer and builder, and the difficulty which then has to be surmounted is rendered much more serious by the fact that no one has done exactly what it was theoretically assumed he would do when the contract was drawn. This evil is not a small one, and if we architects could agree upon such modifications of our assumed, if not of our actual, practice, as would make the two consistent, I am sure that not only our own comfort would be promoted, but the interests of both builders and the public would be consulted.

The first inconsistency which I will point out refers to orders for extra works. Every building contract says that such orders must be in writing. The circumstances under which work is done render it so difficult to conform to this rule that many architects have given up the attempt, while few adhere consistently to the practice even if they reduce their most important orders to writing. Builders, on the other hand, rarely ask for written orders, and thus it comes to pass that, till the final settlement, a degree of uncertainty as to what extras there will be prevails, which is neither desirable nor businesslike. I could fill a page with illustrations of this inconsistency, were it not familiar to your readers. Hardship and actual injustice often arise when a contract of this sort has been entered into and extras have occurred. The matter presses both ways upon the builder and upon the employer, but the discomfort, if not the pecuniary loss, in either case reaches the architect also.

I am not so unpractical as to propose a great alteration in procedure. The men who have not given written orders, and the builders who have not cared to press for them, will not be induced to give or to ask for them because their attention is drawn to the subject in your columns; but might not some alteration in the customary conditions of a contract be made such as would leave that document not so glaringly at variance with what is actually practicable? For example, why not drop the usual form of written order clause, but require that all extra measured work, or all such work for which a definite order in writing has not been given, shall be claimed by the builder week after week just as extra day-work is customarily claimed? I do not mean that the dimensions should be given week by week, but that notice shall be given weekly that this or that work is considered extra, and failing such notice in any week, that it will be understood that all the work going on in that week is considered by the builder as contract work. This stipulation would not be oppressive on the builder. It would, if enforced, probably cause questions of extras to be disposed of during progress, which now accumulate to the end of a job and lead to serious disagreements. At any rate, I think this ought to be the result. Some of your correspondents can, perhaps, recommend a better resource, but they will, I think, admit that some change is required.

Another discrepancy between assumption and practice is in the mode of dealing with liquidated damages for delay. Delay on the completion of a building is a constant source of heavy pecuniary loss to proprietors, but I can honestly say that in a tolerably long and varied experience I have never been concerned as pupil, clerk, architect, witness, or arbitrator in a single case where a single shilling was actually deducted from a builder's bill for such damage, though I have often known it threatened; and I believe most of your readers will say the same. Does it not seem high time so to modify the usual conditions of contract, that they may be capable of being customarily enforced instead of customarily abandoned? The remedy here may possibly be found in some plan for extending the time in proportion to the amount of added or varied works, on a definite scale,—one day of time for each twenty, or fifty, or hundred pounds of variation, as the case may be. At any rate, some remedy must exist, and if we can find it out there will be advantage in adopting it.

There is another inconsistency between assumed and actual practice to which I will only allude. It is as wide as either of the others, but, so far as I have seen, it does not seem, in practice, to lead so obviously to serious inconvenience: I allude to the undefined position which the bill of quantities holds in our system of arrangement. It is the actual basis of the contract; it forms no part of the formal basis. In a case of a lawsuit or reference, it is the first document turned to for information, yet it has no theoretical *status* at all. This is a condition of things which is open to improvement, to say the least of it; and had I not already made this letter a long one, it would be interesting to inquire a little into the rights and wrongs of it. So wide and many-sided a subject would, however, be peculiarly fitted for discussion. The evils rising out of it are none the less serious that they do not lie on the surface. It is looked upon by builders, building surveyors, and architects from very different points of view, and it seems likely sooner or later to undergo some sort of modification.

T. Roger Smith.

Roman Remains at Usk.—At the annual meeting of the Monmouthshire and Caerleon Antiquarian Society, held at Pembridge Castle, Mr. A. D. Berrington, of Pontygoitree, described some Roman remains which he had found at Usk, in the course of excavations in that town. He said he had discovered distinct traces of three Roman roads, with the rare adjuncts of side-walks, and the remains of a Roman manufacturing town. This town had been of wooden houses, which had been burnt down, as was shown by a considerable bed of charcoal, which was covered with what was apparently the burnt remains of thatched roofs. Another interesting discovery was the monumental stone which had been placed over a child (three years old) of a soldier of the Second Augustan Legion, of which legion there were other evidences found in the course of the excavations.

THE HEALTH OF TENBY.

Sir,—My attention has been called to a letter published in your journal of the 24th ult., from a Mr. Burns, respecting the sanitary state of Tenby. Will you allow me, as briefly as possible, to reply to the same? I would premise that Mr. Burns was some time ago employed by the corporation of Tenby. His work, as I am informed, was not well executed, and his charge was disputed. An action, subsequently brought, was referred to arbitration, and the arbitrator's award has been for some time past ready for Mr. Burns to take up. This, however, for some reason or another, he hesitates to do. Perhaps he fears that the decision is against him. A near relative of Mr. Burns was, not long ago, collector of rates for the borough of Tenby, but was dismissed from his appointment in consequence of reasons, to which I will not further allude. A nephew of Mr. Burns brought an unsuccessful action against the corporation, and was condemned in costs, which he has not yet paid. I mention these little matters to show the animus that inspired the author of the letter. And now as to the facts. Mr. Burns condemns the drainage and the water-supply, deducing from his statements the (supposed) high rate of mortality of Tenby.

The Registrar-General's return for the quarter ending June 30 gives the death-rate of Tenby at 26·8 per 1,000, and the deaths from zymotic diseases at 3·59 per 1,000. These high rates are produced by the circumstance that thirteen rural parishes and a large, poor, and unhealthy parish in the borough of Pembroke (ten miles distant) are attached to it in forming the sub-district. Over these parishes the sanitary authority of Tenby has no control whatever, and cannot therefore be blamed for their defective sanitation, if such exists. The actual number of deaths in the town of Tenby from July 1st, 1877, to June 30th, 1878, was 90. At a low estimate the population was 5,500, exclusive of visitors, the actual death-rate thus being 16·4 per 1,000. In 1871 the census return gave the number as 3,810, since which time 179 new houses, chiefly large ones, have been built and occupied, whilst for the same period the births have exceeded the deaths by an average of 40 per annum. Although we exclude visitors from our estimated population, we cannot exclude their deaths from our mortality lists, and we find that of the 90 who died ten were visitors. This reduces the death-rate of resident inhabitants to 14·6 per 1,000. Seven deaths occurred during the year from zymotic diseases, viz., two from convulsions during whooping-cough, one from pneumonia following measles, two from diphtheria (one brought from a distant town already suffering from the disease, the other a single case occurring many months after), and two from "fever." This gives a death-rate of 1·3 per 1,000, instead of 3·59, as published in the Registrar-General's return. Making a further analysis, I find that of the 90 deaths, 19 were under one year and 28 over sixty years of age, 8 being over eighty. Of the causes of death, 14 persons died of diseases of the brain, 31 of affections of the heart and lungs, 19 of kidney, bowel, and liver diseases, 3 of childbirth or maladies connected therewith, 2 from accident, and 7 from zymotic diseases, as before mentioned. Climatic influences cannot be credited with any of the deaths of the 10 visitors; for 3 died of apoplexy, 2 of intemperance, 2 of chronic disease of the kidneys, 1 of phthisis, one (an infant) of atrophy, and one child of diphtheria (the imported case already referred to). In 1873 there were 7 deaths from zymotic diseases; in 1874, *one*; in 1875, eight; in 1876, *one*. I have not the return for 1877.

Now, as to the water-supply. Mr. Burns has pictured every possible and impossible source of contamination that may affect the reservoirs. He has drawn largely on his imagination with regard to "*tritons*" and other beasts, but a grain of truth is worth a ton of fiction, and as a matter of fact the water supplied to the people of Tenby is remarkably pure. Here is what Mr. Wilkinson of London said of it in 1849 (since which time the reservoirs have been much improved, new ones added, and filter-beds of gravel, charcoal, and sand constructed, to render it still more pure),—"The result of the analysis proves this to be a very pure *natural* water, the proportion of salts (1 part in 7,000) being so much smaller than is usually met with, that the tests will scarcely detect their presence until the water is concentrated by evaporation. It is seldom that water is met with in so great a state of purity, or so well adapted for every purpose for which it is required."

Recent analysis has confirmed the opinion cited above. So much for Mr. Burns's *tritons!*

Next, Mr. Burns falls foul of the drainage. The town of Tenby is built on the margin of a rocky peninsula rising to nearly 100 ft. above the sea. With the exception of one or two thinly-populated parts, a perfect system of drainage exists. There are no ashpits, all the house refuse being carted away daily to a farm some distance from the town. The sewers have a very considerable incline towards the sea, where most of the sewage is ultimately conveyed on one side by a large culvert, and on the other by iron pipes. The strong tides rapidly carry everything away. A portion of the sewage is used to fertilise some land about a mile from the town. As to the ventilation of the sewers, with a fall such as that indicated it is unnecessary. Mr. Burns's interesting description of the way in which the sea acts as a force-pump, driving the foul gases back into the buildings, would be very telling if it were true. As a matter of fact, however, all the dwelling-houses have trapped drains, and most of them ventilators connected with the closets. The main culvert has large gratings at intervals which entirely prevent any back pressure of gas.

I will not trespass further on your space, though I could say much more on behalf of this lovely and (in spite of Mr. Burns's assertions to the contrary) healthy watering-place.

Douglas A. Reid, M.D.

MATHEMATICS AND THE FINE ARTS.

Sir,—It is curious to note how devotedly one may labour through the years to a particular end, with very little effect. I think I may say that, for the last twenty or more years, the columns of the *Builder* will bear witness to my enunciation of the mathematical theory of the fine arts, which now finds completion in my science of æsthetics. But the mathematical theory, as I have enunciated it, has always been accompanied with the novel and broad generalisation, that the *form* of phenomena, of our consciousness, of our experience, of our knowledge, is *quantitative*. This generalisation, alone, renders the universality of the application of the mathematics intelligible. We are fundamentally mathematicians without knowing it. To the vulgar mind the mathematics imply only geometrical figures; but to the mathematician this is but a special section; and when Mr. Spottiswoode speaks of the mathematics, as applied to art, he does not mean that a nose may be struck with a pair of compasses, but that every different form of nose fundamentally inheres in a difference of propositions, is constituted in different ratios. In fact, the *regular* geometrical curves exist, I believe I may say, nowhere but in the mind, and approximately in artificial construction. They are not *natural* forms, in the narrow sense in which artists and critics for the most part understand the word *nature*, but only in that wider or philosophical sense in which the word *nature* signifies "the all."

In a letter of last Saturday, on this very topic, Mr. Conder refers to my project for a Gallery of Autotypes, instead of a Museum of Casts, for the illustration of the history of art. I have not the slightest doubt that what Mr. Conder says about the impossibility of obtaining the precise measures of the things themselves from photo's is perfectly correct. But neither is it possible to obtain correct measurements from plaster casts. These are subject to warping, to contractions, and to displacements. Autotypes, however, would furnish the history, not only of sculpture, but also of painting and of architecture. Mr. Conder forgets that the Gallery of Casts was specially asked for for the illustration of lectures on the history of Grecian sculpture, and not for the benefit of students of the fine arts. For the study of art we have the matchless collection at the British Museum, the supply of casts at the Royal Academy, at South Kensington, at the Slade School, at the Crystal Palace, and at all the provincial art schools; and yet the cry is, "More casts! more casts!" Moreover, for instruction in art, I maintain that example is powerless to raise other than a generation of sorry copyists. Europe has been acquainted with all the celebrated works of antiquity for centuries. It has carefully regis-

tered and conned the measures of all the celebrated antiques, but it has never approached them. The fact is, it is of little use, seeing what was done; what we want above all things to know is, why and how it was done. We want to know the motives which guided the Grecian artist, and upon this point museums of antique art maintain the silence of the grave.

Seeing, then, that we have already sufficient casts for the art student, the cheaper and more comprehensive project which I have put forward would, I think, be amply sufficient, if carried out, to gratify public curiosity, and to furnish illustrations to lectures on the history of the fine arts. W. CAVE THOMAS.

OUR LEAD MINES AND THEIR PRODUCE.

IT is true that our lead-mines are of subsidiary importance in the ranks of the mineral industries of Great Britain, but they are yet important, both in the number of the workmen they employ and in the extent to which they benefit wide tracts of country. The produce of these mines varies from year to year, the strata in which lead ore is found differs considerably, and the proportion in which some of the districts contribute to the output also changes; but, speaking generally, the statistics which record the actual output of the mines for the latest year for which official returns are available will afford a very fair idea of our British lead-mining industries. Taking for a time the lead-mines in the limestone formation, in the slaty rocks, and in granite, we have a total of 392 lead-mines in the United Kingdom. Out of these, four productive mines are in Scotland and one in Ireland. About 126 are in Wales, and the numbers in the English districts are as follows:—Cornwall, 16 mines; Devonshire, 4; Somersetshire, 2; Derbyshire, 140; Shropshire, 7; Cumberland, 25; Yorkshire, 23; Durham and Northumberland, 28; and Westmoreland, 6. But though these are the numbers of mines, we shall find that the actual output varies very greatly. In Cornwall, for instance, whilst one mine has an output of only 11 cwt. of lead ore, another has an output of over 1,500 tons, and there are similar instances of the "lottery of lead-mining" in other counties and districts.

Taking the various districts in order, we find that Cornwall has a total output of 2,727 tons of lead ore; and in company with this county, that of Devon may be included, which produced 137 tons of lead ore,—the most productive in the two counties being the West Chiverton and old Treburgett mines. Coming to Somersetshire, we find that two mines produced 578 tons; Derbyshire has had its lead-mines so long worked that there must be signs of exhaustion in some instances, and we find that the produce of its many mines is 2,264 tons only. Shropshire, enclosing its "Roman Gravels," Snailbeach, and Tankerville mines, is a noted lead-bearing county, and the produce of over 7,713 tons proves that there is ground for the fame. Cumberland yields 2,555 tons, and the dales of Yorkshire contribute the bulk of the 4,198 tons it brings to bank. The high moorlands which range from Yorkshire to the Border land give up from their limestone very great quantities of lead,—a fourth of the whole of that raised in the kingdom. The counties of Durham and Northumberland have an output of 23,285 tons, the Weardale mines of the Beaumont family alone producing 7,987 tons, and the Teesdale mines of the London Lead Company being also very productive. In Westmoreland, we have an output of 1,844 tons from its six mines, and this concludes the list of our English lead-mining districts. In Wales, Cardiganshire yields 5,961 tons; Carmarthenshire, 636 tons; Pembrokeshire, 15 tons; Radnorshire, 71 tons; Merionethshire, 60 tons; Denbighshire, 3,247 tons; Montgomeryshire, 9,041 tons—chiefly from the Van Mines; Breconshire, 35 tons; Flintshire, 2,716 tons; Carnarvonshire, 1,439 tons; and the Isle of Man contributes 4,353 tons; In Ireland one mine in Wicklow yields 1,825 tons; and in Scotland, Lanarkshire produces 2,353 tons; Kirkcudbright, 455 tons; and Dumfriesshire, 1,102 tons. We have thus, with parts of tons, a gross total of 79,096 tons of lead ore. The yield of lead from this was 58,667 tons; and the silver extracted was 483,422 ounces.

Over 15,000 persons are employed in the lead-mines of England and Wales, 546 being females. A comparatively large proportion of the remainder are youths under twenty years of age,—the number of males under twenty being 3,131. At the time of the last census the number of lead-miners was highest between twenty and twenty-five; above forty-five there were not a tenth of the total; above fifty-five, about a thirtieth part; and above sixty-five, little more than a two-hundredth part. The mortality of the miners in metalliferous mines, as a whole, is very much greater than that of the general population, or even than that of the coal-miner; and this fact has given rise to several expedients to lessen the exposure to the deleterious influences of the mine. In the great lead-mining district of the North, it is no unfrequent practice to limit the working week of the lead-miner to about forty hours, and where this is the case the working "week" is usually compressed into four or five days, and some of the lead-miners spend the remainder of the working week in agricultural or other outdoor and healthy employment. This is to be borne in mind when the low average of wages earned in the metalliferous mines is known, but there is considerable variation in the various parts of the country which give the details for the average. The death-rate by accident in the metalliferous mines, it may be added, is very greatly below that of the coal-mines,—one of the most fruitful causes of death in the latter,—explosions by marsh gas or fire-damp being absent in the latter.

THE LATE MR. BENJAMIN COLLS.

MR. COLLS, the head of the building firm of Messrs. Colls & Sons, of Moorgate-street and Camberwell, died suddenly on the 25th ult., at Bray, whilst on his return from an official visit, as a member of the Corporation of London, to the estates of the Irish Society at Londonderry and Coleraine. He was elected a member of the Common Council for the Ward of Coleman-street in 1867, and was at the time of his death chairman of the City Lands Committee, or "First Commoner" of the Corporation. He was sixty-three years of age, and highly esteemed. The funeral took place at Norwood Cemetery on Saturday. The works of the firm at Camberwell were entirely closed throughout the day, and several of the men attended the funeral. A long line of carriages joined in the funeral *cortège*, containing several members of the Corporation, and also members of the Camberwell Vestry, and of the Camberwell Board of Guardians, the deceased having been a member of both the last-named bodies for several years, but from which he some time ago retired.

JEDBURGH ABBEY.

THE nave of Jedburgh Abbey has long been disfigured by an excrescence of modern masonry. After the Reformation, the Reformers worshipped under the tower of the Abbey, and, in 1671, when Presbyterianism had given way to Episcopacy, this church was left for "ane capacious church," newly built in the west end of the nave. The latter church had no galleries originally, but in 1727 Provosts Richardson and Douglas obtained "liberty to build lofts over the localities of the Marquis of Lothian, Sir J. Rutherford, and Bonjedward." In 1792-93 the church was greatly altered in appearance, both externally and internally.

The late Marquis of Lothian, who regarded Jedburgh Abbey as one of the finest of the abbeys of Scotland, long cherished the hope of seeing it freed from the barbarous modern masonry; and at last a circumstance occurred which led to this being done, though it was not his lordship's lot to see the work accomplished. Difficulties which had arisen from a proposal to reallocate the sittings, and to extend and improve the old church, led to the Marquis making an offer to bear the whole expense of a new church in lieu of the old one, and this proposal was ultimately accepted. His lordship died before the necessary negotiations were completed, but the present Marquis determined to carry out the wishes of his lamented brother.

Shortly after the new church had been opened for public worship, the work in connexion with the removal of the old church from the Abbey was commenced, and we learn from a long and interesting article in the *Scotsman* that on taking down the walls of the old parish church a great number of beautifully-carved and moulded stones were discovered. The carved stones were all Norman transition work, and exhibit fine specimens of the chevron, the cable, the bone, the dog-tooth, the star, and other ornaments of the period. By the removal of these walls the whole nave is now seen from end to end. The basement story consists of clustered pillars with deeply-moulded pointed arches; the triforium of a subdivided arcade, the including arches being semicircular, while the dividing ones are pointed; and the clearstory of a detached arcade of thirty-six pointed arches, the wall behind every alternate two being pierced for windows. The length of the nave is 130 ft., and the height from the floor to the wall-head 50 ft. Along the whole extent of the Abbey that was included in the parish church, every vestige of the groinings of the side aisles had been knocked away, several of the foliated capitals were sorely disfigured, and the clustered pillars had been cut into for the purpose of resting the joists of the galleries. To show the proportions of the nave, the whole of the moulded base of the north aisle wall, which had been all destroyed, save a few inches, has been restored, as also a considerable portion of the south aisle wall. There has been inserted in the latter a *fac-simile* of the beautiful cloister doorway, which has of recent years become very much decayed. This doorway has long been looked upon as unique, and the late Sir Gilbert Scott, alluding to this and the great western doorway, said that they "are two of the most exquisite gems of architectural art in this island." The new doorway was erected in accordance with drawings by Mr. Robert Anderson, architect, Edinburgh, under whose direction all the recent works of restoration on the Abbey have been carried out.

Much anxiety was felt as to the safety of the tower, the two north piers of which were in anything but a satisfactory state. The present tower is an erection of the latter part of the fifteenth century, but the north piers and a small portion of wall above them belong to the first half of the twelfth century. The north-east pier is almost wholly encased in modern masonry, and there is a wall of the same kind between that and the north-west pier. This modern building is a portion of the church that was used at the time of the Reformation, and for more than a hundred years afterwards, and it has been allowed to remain simply because it was a support to the tower. Even as early as the year 1636, one of these "pryme pillars" was in a dangerous state, and John Mill, "a maister of work," was brought from Edinburgh for the purpose of getting his "advyce to sie with some masons quhat wer the dangers of the house, and quhat way it micht be repairit." At one time it was seriously considered whether or not it would be well to attempt to restore the north piers, but there were difficulties in the way, more especially as the north wall of the tower was not in a good state. Mr. Anderson, along with the late Sir Gilbert Scott, made a minute examination of the tower, and the opinion then come to was that it would be possible to shore up the tower and to put in new piers, but that it would not be without hazard. On the north piers being cut into, they were found to be, like many belonging to the Norman period, not solid masonry, but external walls or facings of ashlar-work, having the core filled with grouted rubble and gravel. The idea of restoring these piers having been abandoned for the present, steps were taken for the preservation of the tower by other means. One of the most important steps towards this object was the removal of the belfry from the top of the north wall, which would lighten the weakest part by about 150 tons of masonry. The belfry consisted of three distinct parts, namely, a central octagonal tower, which rose 20 ft. above the wall-head, and an open bell-cot on each side. To support the north-west pier a brick buttress has been thrown up against it, and the north-east one is supported by strong wooden beams placed in such a position as will best resist any pressure they may have to bear. Around the base of nearly every pillar, both in the nave and choir, concrete was laid, so as to prevent any sinking at the foundations. Among the other improvements effected was the removal of a large quantity of earth from around the north transept, by which the beautiful moulded base of that part has been exposed to view.

Brighton Exhibition of Modern Pictures. The fifth annual exhibition in the Pavilion Picture Gallery has been opened. It consists of 670 pictures, and includes a sprinkling of works by well-known artists.

ART IN IRELAND.

THE trustees and judges appointed for carrying into effect the trusts of the will of the late Captain George Archibald Taylor, in reference to the income arising from the sum bequeathed by him for the promotion of art in Ireland, announce the terms upon which 120*l.* will be awarded in the year 1879 for two scholarships and two prizes to art students The following extracts from the scheme as settled by the Court of Chancery in Ireland describe the amount and application of the fund at the disposal of the trustees and judges:—

The dividends of the fund (3,692 4s. 1d. Government Three per Cent. Stock) shall be applied, after allowing for the necessary expenses of the trust, to the endowment of scholarships and money prizes, or either, which shall be open to all students of art not exceeding twenty-five years of age, who shall have attended for twelve months at least a School of Art in Ireland, or who, being of Irish birth, shall have attended for the like period a School of Art in Great Britain or elsewhere, and who shall produce at the exhibition hereinafter mentioned a work or works of art displaying sufficient merit, or a fair promise of future excellence. In case a scholarship shall be awarded to any student for a period of more than one year, the successful competitor shall, if required, in each succeeding year while the scholarship is held, satisfy the trustees and the Royal Dublin Society that he or she is continuing the study of art.

The following are the arrangements for the distribution of the funds for the year 1879:—

A sum of 95*l.* to be applied to the formation of two scholarships, one of the value of 60*l.* and the other of 35*l.*, to be open to students, male and female, under the conditions of the scheme; also two prizes, one of the value of 15*l.* and the other of 10*l.* In the event of very marked talent being displayed by competitors for the scholarships, with promise of future excellence, it shall be discretionary in the trustees and judges to continue the scholarship for a second or third year, and, if advisable, to augment the amount. The exhibition of works in competition for prizes and scholarships is fixed to be held on Thursday, the 17th of April, 1879. Such works must be sent in to Leinster House not later than Saturday, the 12th of April, 1879. The only limitation as to subject fixed by the judges for the competition of 1879 is as follows: The pictures must be either (1) figure compositions containing not less than three figures, or (2) landscapes or sea pieces. The size of works in competition shall not be less than 2 ft. by 1 ft. 6 in.; they may be executed either in oils or water-colours, and must be unframed. The prize of 10*l.* is to be for the best work, without limitation as to subject, and such prize cannot be awarded to either of the works which shall have gained a scholarship. The judges are Mr. Thomas N. Deane, R.H.A., appointed by the Royal Dublin Society; Mr. Thomas Alfred Jones, P.R.H.A., appointed by the Royal Hibernian Academy; and Mr. Henry E. Doyle, R.H.A., Director of the National Gallery, appointed by the Governors of the National Gallery of Ireland.

"THE DECORATION OF ST. PAUL'S: A NEW VIEW."

SIR,—"Civis" would appear to be exceedingly aggrieved at my disparaging Stevens's talents, and at the impediments I have thrown in the way of the committee's present notions being immediately carried out. My opposition to the committee's project is certainly most determined,—"Civis" terms it factious,—but after a perusal of this letter I will leave you, sir, to determine whether my opposition to that project deserves to be thus characterised.

"Civis" is aggrieved at my disparagement of Stevens's design, but he would, nevertheless, himself, without the slightest compunction, utterly erase Thornhill's work, and thereby discredit the reputation of a very talented painter, and to a far greater extent than anything I have said of, or have proposed to do, with Stevens's design. The letter of "Civis" is another instance of that blind infatuation which strains at a gnat and swallows a camel.

Stevens himself never, that I can learn, put forward his design. We do not know even what he thought of it; whether it was merely, as it appears to be, a first crude notion, or a matured scheme. It has simply by some means been discovered and brought to public notice by the committee. The public, therefore, is in nowise committed to accept or to follow it. But the public and the profession are bound to consider whether it be either politic or in good taste to allow Thornhill's work, with a century's sanction,—nay, *with Wren's sanction upon it*,—to be utterly swept away,—whether it be expedient to reverse the judgment of the past; to discredit the fame of the only painter Member of Parliament; of an artist who died in the odour of British fame, and whose name has become a household word. Thornhill's work was prodigious for the times in which he lived; and this is an important consideration to be taken into account in estimating his position as a painter. It is possible that the world may ultimately decide that all old things shall make way for the new and the better, but the world has not yet come to that uncompromising view. The Italians did not destroy the puerilities of art when art had come to years of discretion. And men of culture are now willing to let Gothic barbarities remain in window and gurgoyle when they are most sorely tempted to become iconoclasts. We retain many things, not because they are beautiful, but because we feel bound to venerate even the weaknesses of our art ancestry. We should, therefore, be inconsistent, and completely at variance with established custom, to permit Thornhill's work to be ruthlessly erased, and the more so when the whole weight of evidence goes to show that that work is the right thing for the place.

In the foregoing remarks, I have simply dealt with the ethics of the question. There is, however, an array of facts in support of my views which is still more formidable. Can the committee, we ask ourselves, have given any very serious attention to the subject? Can they have given themselves very much trouble to acquaint themselves with the history of the decoration of the dome of St. Paul's? Do they know that Thornhill designed and painted the dome with Wren's full knowledge; that Wren and Thornhill were in office together; that the figure-subjects were designed to be painted in colour, but that this, the artist's intention, was frustrated by the opposition of the clergy; that Thornhill himself was also an architect, and that he frightened a great many architects of the period by threatening to make architecture his sole profession? What value, I say, are we to set on the protestations of those who have the conduct of this affair, when, in the face of the foregoing facts, they state that they are anxious to follow out Wren's wishes, or what shall we say of the opinion of those who object to the un-architectural arrangement of Thornhill's scheme of decoration, when that was executed under the eyes of Wren, and by a painter who was himself esteemed as no mean architect? The committee, and all who shall assist, in the face of these stubborn facts, to substitute their own pet projects will incur a grave responsibility, and, I venture to predict, an extent of future odium which they little suspect.

I have quoted the proverb, "straining at a gnat and swallowing a camel," but I am quite willing, if "Civis" object to the extreme disparity of the simile, to give, out of courtesy, a new value to the reading, and to say that in his case it should be straining at a camel and swallowing a camel. Still his letter remains one of those frequent illustrations of looking at a question from one only point of view. He forgets that the tenderness which he exhibits for Stevens's fame ought also to be extended to Thornhill's. And, in conclusion, I would admonish him to do unto Thornhill's work as he would have done by Stevens's. I would also have him consider the full import of the declaration of the Apostle to whom our grand cathedral is dedicated,—"*Civis Romanus sum.*"

METER.

THE WATER-SUPPLY OF HEXHAM.

MR. JOHN THORNHILL HARRISON, C.E., one of the engineering inspectors to the Local Government Board, held an inquiry on August 26th, relative to an application by the Local Board of Health for a loan of 3,500*l.*, to carry out additional works of water-supply. The scheme, prepared by Mr. E. Brown, C.E., Newcastle-upon-Tyne, was investigated, along with two others, by Mr. Harrison, at an inquiry held by him in April, 1877. Mr. Brown now again gave evidence as to the insufficiency of the existing drainage area, and was supported by Mr. John S. Hodgson, C.E., now residing at Hexham, who gave conclusive evidence regarding the restricted use of water for sewer-flushing and other sanitary purposes. Under his advice new and expensive flushing arrangements had been applied to the whole sewerage system last year, but these were not adequately made use of, owing to the way in which the water was husbanded. Dr. Jackson, medical officer of health, testified as to the connexion between an intermittent water-supply (in times of scarcity) and the outbreak of typhoid fever in 1874 and 1876, and corroborated Mr. Hodgson's evidence respecting the neglect of sewer-flushing and street-watering. Objections to the scheme were handed in to the inspector, and the Local Board's scientific witnesses were subjected to prolonged cross-examination. Mr. Harrison stated that he would report fully to the Local Government Board, and the inquiry, which extended over five hours, then terminated.

CONTRACT.

GODSON *v.* GIBBINS.

THE plaintiff in this case (heard in the Bow County Court), Mr. Fraser Goodson, a timber merchant, of Limehouse-cut, sought to recover of the defendant, a brickmaker, of Sittingbourne, the sum of 18*l.* 19*s.* 6*d.* for a deficiency in quantity of bricks ordered and paid for, and for their inferior quality. Mr. Brennen, barrister, appeared for the plaintiff; and Mr. Gibson, solicitor, for the defendant.

The plaintiff stated that he was told by a Mr. Lunn that the defendant had a quantity of bricks for sale, and he arranged with Mr. Lunn and the defendant's agent, Mr. Nash, to purchase 200,000 of them, 20,000 to be "grizzled" bricks, and 22,000 stock bricks, to be delivered at Mason's wharf, Stratford. Some were delivered at the end of May last, and the next morning the defendant sent a man for a check for the bricks delivered, which he said were 42,000. He wrote out a cheque for 79*l.* 17*s.*, being the proper amount less 2½ per cent. for cash payment, and the next day he went and examined them. He then found that they were of a very inferior quality, and that instead of there being 42,000, there were only 36,237, and out of these there were 30,291 grizzles and rough stocks, whereas there should only have been 20,000 grizzles. There were also a number of flawed bricks amongst the stock, reducing the number of stocks to 3,480. Plaintiff's manager said he examined the bricks, and found them of a very inferior quality. In his opinion they were just as they had been taken from the furnace, and never had been sorted at all.

Mr. Lunn said when he gave the order for them it was agreed that they should be good stocks and grizzles.

Alfred Butler, foreman to the defendant, said he had been in the brick trade nearly forty years. He had to superintend the loading of the bricks supplied to the plaintiff, and would swear that 42,000 were placed in the barge. The whole of the bricks were good common stock bricks. There were, as a matter of course, some inferior bricks, but there was not an unusually large proportion in those sent to the plaintiff.

Mr. Nash said when the arrangement was made between himself and Mr. Lunn for the purchase of the bricks, he told him they would be good but rough, and he showed him a rough stock brick as a sample of what they would be.

The Judge said he was of opinion that plaintiff had made out his case, and gave judgment in his favour for the amount claimed, with costs.

ALLHALLOWS CHURCH, TOTTENHAM.

SIR,—Believing you take a great interest in ancient buildings, will you kindly allow the writer to inquire, through your columns, if there is not a law in existence at the present time to prevent vaults and tombstones being bodily taken away (with their contents) from their original positions, and mystifying others against a wall like a row of herrings on the opposite side of the yard, recording the resting-places of bodies where the remains are not? This certainly is an impious act, worthy of those who were the cause of it, the mutilated vaults being minus.

Again, the escutcheons which used to adorn the interior of the church are there no more. What has become of them, with some fine old brasses once there located before the mutilation was begun? The visitor to this once beautiful building is also horrified at beholding the once lovely green and soothing ivy, which embraces the old steeple or belfry, gradually dying and disappearing through the violence of the spoiler. And even now it is rumoured that the property of God's Acre is about being desecrated or outraged to please the notions, it is said, of an enthusiast of limited ideas.

Please insert this communication in your columns, in the hope you may be the first to scotch enemies.

The writer and some inhabitants of Tottenham think it would be interesting to know if all the accounts of these alterations were thoroughly understood, especially after the defalcations which have happened at Tottenham and Edmonton recently. CYCLOPS.

Forfar.—A new Episcopal church is to be built here, from plans by Mr. R. Anderson, architect, Edinburgh. The cost is to be 6,000*l.*

LEEDS TOWN-HALL.

THE interior of Leeds Town-hall has been undergoing repair and redecoration, at the hands of Messrs. Roodhouse & Sons, of that town.

The dimensions of the Victoria Hall are as follows:—Length, 162 ft.; width, 71 ft.; height, 75 ft. The vestibule is 44 ft. square and 72 ft. high. The hall was opened by her Majesty Queen Victoria on the 7th of September, 1858, and very little has been done in repairs till the present time.

The ceiling of the hall is semicircular, and divided into five bays, decorated and gilded, and supported by Corinthian columns, the caps of which and entablature above are richly gilt. The wall space between each cluster of columns is formed into panels, with border of lighter colour than the ground. Above the panels a sub-frieze is formed, bearing suitable Latin and English phrases alternated, as "Magna Charta," "Weave truth with trust," &c., on a dark lake ground with gold-colour antique letters. Above this, and forming the frieze of the cornice, is inserted an imitation of Devonshire marble. The bases on which the columns stand, and which form a dado of 8 ft. all round the hall, are painted in imitation of marbles; the plinth is porphyry, above that is a margin of granite, and over that a moulding of Sicilian. The panels are verd antique, and the stiles of Ross of Mull. The shafts, the columns of which are marbled a rich Rosso-antico, are varnished in the ordinary way, then felted down with ground pumice-stone and deadened, giving a semi-polished appearance without the harsh glare usually seen on polished or varnished work, and producing a good effect. The bases of these columns are black, with gold torus mouldings. At the south end of the hall, over the new gallery, are five panels with band-painted decorations; the central one contains the Leeds arms; to the left are the Clothworkers' arms; to the right, the Ironworkers' arms; the outer ones are decorated with Mercury's mace.

The organ, which is one of the largest and best in the country, is decorated in soft colours and very richly gilded,—the ornament being outlined. The carved festoons and figures are gilded in solid, the radiation of central circle being relieved with metal; the mouths of the pipes are decorated alternately blue and red, with gold enrichments. The semi-dome over the organ is pale blue and starred with gold. The vestibule is decorated in much the same manner as the Victoria Hall.

The scheme of colouring is lighter than it was previously, and of a different tone.

Messrs. Strode's patent sunlights have been introduced into the hall, and fixed by Messrs. Nelson & Sons, of Leeds.

OPEN-MOUTHED PIPES *v.* VENTILATORS.

SIR,—Recent experiments seem to result mainly in an unedifying jumble of figures. I venture, therefore, to suggest a process which would be simpler, less liable to error, more difficult of interested manipulation, and more in accordance with common practice in matters analogous.

Inventors of particular cowls claim that they produce a distinct draught over and above any tendency which the air may have to escape upwards through the tube when not fitted with a cowl. Now, when a number of men think they can pull rather better than common they divide themselves into two teams and tug at the opposite ends of a rope until one or other party is drawn over the scratch. Why cannot the rival cowls be brought also to the "tug of war"?

Let two zinc tubes of (say) 6-in. diameter be fixed through the ridge of a suitable roof at about 10 ft. apart, and let their lower ends be fitted to a horizontal tube (made larger to reduce the friction of the air), and in the middle of this tube fix an anemometer. Then try the cowls each in succession, against a simple open-mouthed pipe, a trumpet-mouthed pipe, and, finally, against each other, fixing in each experiment one contrivance at the top of each of the two upright tubes, the outlets being on the same level. We shall thus have a fair struggle between them, and the anemometer will tell which is the stronger. If the "pull" varies with the force of the wind that will also be indicated; and should each cowl in turn during the same experiment be the stronger the result of a whole day's working would show on which side the balance of advantage lay.

I generally use an open-mouthed tube, the top of which is cut into several long, sharp points. Both this and the trumpet-mouthed form diminish the effect of a very strong wind, which practically stops the egress of air from a plain open pipe. The common lobster-backed cowl does this more thoroughly by keeping the outlet always turned away from the wind. If any of these patent cowls will give us, in addition, a substantial draught upwards in times of wind, and will not obstruct the flow of air during calm weather, we shall be better for knowing their names and which of them does the work best.

THOS. BLASHILL.

BUILDING CONTRACTS.

SIR,—A short time ago there appeared an advertisement asking for tenders for building a new warehouse on the Broad Quay, Bristol. I, among others, obtained a bill of quantities and estimated for the work, about which there seemed to be a glorious combination of land-surveyor, architect, and quantity-surveyor, the former having obtained the work, the architect having made the plans—I presume because the surveyor was incapable of doing so—and the quantity-surveyor took out the quantities. A day or two after the tenders were sent in a letter was received from the land-surveyor by the five contractors who were lowest on the list, saying that as the tendors amounted to a very great deal more than his estimate, would they send in amended tenders, either based on the surveyor's quantities, or quantities taken by themselves. On going to the surveyor and making inquiries as to the meaning of this, the first thing shown me was the list of tenders, and I was told there were to be no alterations whatever in the drawings and specifications. Nor were there any, but there seemed to be a suspicion that the quantities were greatly in excess of the actual work required. I had the drawings and checked the principal items, which was all I could do, seeing I only had a few hours to do that and make up and send in my amended tender. I, however, found the quantities so far as I could check them perfectly correct, and in my opinion reflecting great credit on the surveyor who took them out, and I sent back word to say I could make no material alteration in my tender; a day or two after I was shown a list of amended tenders, which, with the original list, I herewith append:—

	Original Tenders.	Amended Tenders.
Fay	£2,856	
Balmont & Quinn	2,766	£1,900
Boon	2,719	
Hayes	2,513	
Gorvett	2,427	
Eastabrook	2,380	
Price	2,280	
Stephens & Bastow	2,197	
Forse & Ashley	2,196	
Hatherley	2,190	
Wilkins & Hill	2,119	1,615
Stevens & Gardiner	2,090	1,825
Davis	1,999	1,995
Phillips, E.	1,970	1,865
Veals	1,913	1,900

The above figures are well worth studying, especially those second and eleventh from the top of the above list, the former having no right to give an amended tender. Now, I ask, is it fair or honest, taking into consideration there were no deductions in the work, that the quantities were perfectly correct, and that great care was taken to show the original list of tenders before the amended ones were sent in? Was it not simply a polite way of asking the chosen five to cut each other down for the sake of doing the work?

ONE OF THE CHOSEN FIVE.

NEW ORGANS.

Dunfermline. The directors of the St. Margaret's Public Hall, Dunfermline, lately resolved to provide an organ, at a probable cost of about 1,000*l.* The building of the organ was entrusted to Messrs. T. C. Lewis & Co., Brixton. It measures 24 ft. in height, and 18 ft. by 10 ft. otherwise. It has five pedals of combination, twenty-six stops, and 1,522 pipes, all the metal used being what is called "spotted metal." The motive blowing power is supplied by the hydraulic engine patented by Mr. Joy, of Leeds. The case of the organ, which is composed of pitch-pine, is decorated with moulded panels.

Greenock.—A new organ, for the South Parish Church, Greenock, has just been completed and erected by Messrs. Foster & Andrews, of Hull.

VENTILATION OF SEWERS.

SIR,—I see by a paragraph in a recent issue that the invention of the system of ventilating sewers by means of cowls always turned towards the direction from whence the wind blows is attributed to Mr. Parker. This is an error. If you will turn to p. 59, vol. i. of the "Proceedings of the Association of Municipal and Sanitary Engineers," you will find it there described by Mr. Ellice-Clark, C.E., who invented it two years previously.

H. TYLER.

The Brompton Oratory. As it still continues a matter of doubt as well as interest to many of our readers to know which design for the above is chosen for execution, we are authorised to say it is that to which the first prize was awarded, and that its author, Mr. Herbert Gribble, is appointed as architect for the same.

ST. SEPULCHRE'S CHURCH, HOLBORN.

THIS historic pile is undergoing a change internally, and during the time that it has been under the hands of Mr. Billing, architect, and Messrs. Dove & Co., builders, a discovery has been made calling for note. The contract is to remove the old galleries, the vestry clerk's office, the record-room, take up and renew the floor, and renovate the interior walls.

When the workmen began their labours, on taking up the floor, it was found that the interments underneath were of the most extensive character, and in some instances they must have taken place under very peculiar circumstances. For example, under the churchwardens' pew a skeleton was found without a coffin,—only the boards of the floor serving for a covering to what had been a human being. In another place was found a skull over which the skin was stretched like a piece of parchment, and with long yellow hair adhering with as much tenacity as during life. There were found underneath the floor, beneath the joists, "two cart-loads" of skulls, as well as bones of human beings, and three perfect skeletons; and these have been removed to the vaults below, and deposited amongst 140 leaden coffins that were already there placed.

NEW AQUARIUMS.

Tynemouth.—The Tynemouth Aquarium was opened on the 28th ult. by Mr. T. Eustace Smith, M.P. The building (of which view and plans appeared in the *Builder* for June 1st), has been erected by Messrs. Aldwin, Sons, & Bray, of London; and Mr. J. R. Binks has acted as clerk of works. The heating apparatus is by Messrs. Bacon & Co. The whole of the stained glass for the music-hall and the entrance hall windows, which will shortly be completed, also all the embossed plate-glass, are being executed by Mr. H. M. Barnett, of Newcastle. The architects are Messrs. Norton & Masey, of London.

Birmingham.—The new aquarium and assembly-room at the Aston Lower Grounds, Birmingham, are in progress. From end to end the aquarium will measure upwards of 340 ft., with a width of 56 ft. The exterior will be of red and white brick, and will be surmounted with a tower nearly 90 ft. in height. In the centre of the aquarium will be a promenade about 300 ft. in length, and the tanks are arranged in rows on either side. To the left are the show-tanks, twenty-one in number. Above the aquarium will be a large room upwards of 300 ft. in length, to be used either as a banqueting-hall, assembly or ball-room, or concert-hall. Another assembly-room, which adjoins the aquarium, is 220 ft. long by 90 ft. wide, and is calculated to accommodate 5,000 persons. The building contract is being carried out by Mr. Garlick, of Saltley, from plans prepared by Mr. Thomas Naden, architect, Birmingham.

RAILWAY MATTERS.

Russia.—The Russian Government has published the following returns with regard to the working of the railways in the years 1874, 1875, and 1876: In 1874 the length of railways open was, in round numbers, 11,000 miles, and the gross receipts, 20,000,000*l.*; in 1875 there were 12,000 miles of railway, but the receipts were only 100,000*l.* more than in the previous year; while in 1876 the length of railway had increased by about 200 miles, and the receipts by nearly half a million. Seven of the companies whose share capital is guaranteed by the Government do not pay expenses, and the seven companies possess more than 2,000 miles of railway, the deficiency from year to year being nearly half a million sterling. The receipts of twenty companies having between them more than 5,000 miles of lines, although just sufficient to pay the working expenses, have not been enough to pay the interest guaranteed upon their shares by the Government, which has had to contribute nearly 50 per cent. of the percentage guaranteed, and only eight companies have paid the guaranteed dividend without any assistance from the Government. Of the lines which were constructed without Government guarantees, all except one, 50 miles in length, have earned fair dividends; and the sole line worked by the State has, during the three years to which these returns relate, paid a dividend

of four per cent. on the capital spent in constructing it. In other words, 17 per cent. of the Russian railways have not earned their working expenses, 47·50 per cent. have not earned enough to pay the interest guaranteed, and 26 per cent. have paid their way.

Scotland.—On the 30th of August the new railway at Port Edgar, which has been constructed by the North British Railway Company, was inspected by Colonel Hutchinson, of the Board of Trade. The works were commenced about a year ago, by the contractor, Mr. T. S. Hunter, of Edinburgh, at an estimated cost of about 30,000*l.* The works consist of a landing-jetty constructed of timber, supported on piles, and measuring about 900 ft. in length. The station is placed at a little higher level than the pier, and has a wooden platform. Beyond the jetty there is a breakwater formed of whinstone blocks, from Carlinnose quarry, North Queensferry. It extends seaward for about 1,300 ft., and is finished with a massive coping of concrete. At the point of the breakwater an iron lighthouse is placed. On the shore side of the breakwater the railway is formed over a surface embankment consisting of slag. The Newhalls Station is to be discontinued, while a new station has been constructed at a point about midway between Queensferry and Newhalls. The works were carried on under the superintendence of Mr. Bell, engineer.—— Several other important improvements are in progress on the North British Railway Company's system, chiefly with the object of aiding the development of the mineral resources of Fifeshire. The absence of a direct road from the coalfields in the western district to the main shipping place—Burntisland—has long been felt, and in order to supply this want the company determined to have a loop-line constructed from a point not far from the Charlestown Junction to Townhill. The works were begun about nine months ago—the contract being taken by Mr. Thomas Chalmers, Dunfermline –and they are now in an advanced state. The line, though only measuring one mile and three quarters in length, has entailed a great amount of labour, embracing cuttings to the extent of upwards of 100,000 cubic yards, and the building of nine heavy bridges, besides a considerable number of culverts. In addition to a large staff of men, the contractor has employed one of Chaplin & Co.'s steam excavators, by which the work is greatly expedited. The estimated cost is 14,000*l.*

FINE ART EXHIBITIONS.

Edinburgh.—The third exhibition of the Albert Institute of the Fine Arts, which closed on Saturday last, is stated to have been a greater success than the two previous one. The sales of pictures have reached a total of 2,212*l.*

Kirkcaldy.—On Monday last the Kirkcaldy Fine Art Association opened its seventh annual exhibition. It contains 546 pictures in oil and water-colour.

Birmingham. The autumn exhibition of the Royal Birmingham Society of Artists was opened on the 29th ult. The exhibition is described as being somewhat above the average. The more distinguished representatives of art who exhibit are Messrs. R. Ansdell, Alma Tadema, Vicat Cole, T. Faed, R. Elmore, E. Armitage, James Archer, J. Houston, W. P. Frith, E. Hayes, J. Hodgson, Erskine Nicol, H. O'Neill, J. E. Millais, Sir Daniel Macnee, Britton Rivière, Pettie, E. M. Ward, W. F. Yeames, F. S. Walker, Clark Staunton, G. F. Watts, and H. T. Wells.

Glasgow.—The Fine-Art Loan Exhibition, which has been open in Glasgow for some months, the proceeds being in aid of the funds of the Royal Infirmary, was closed on Saturday, the 31st ult. About 100,000 persons have visited the exhibition since it was opened.

Liverpool.—On Monday the Autumn Exhibition of Paintings at the Walker Art Gallery was opened to the public. In the evening the President of the Liverpool Art Club (Mr. P. H. Rathbone) gave a dinner in celebration of the event.

Worcester. The sixth exhibition of pictures in connexion with the Worcester City and County Fine Arts Association opens at the Music-hall this day (Saturday), and will remain open for a fortnight.

Stockport.—An art exhibition was opened at Stockport on Wednesday. The exhibition originated with a suggestion made some months ago o have an exhibition of pictures by Stockport artists. It was subsequently decided to enlarge the scope of the exhibition by means of a loan collection. Application was accordingly made to the authorities of the South Kensington Museum for the loan of the cases of objects of art lately exhibited at the Royal Institution, Manchester, but the department declined to entertain the request. The committee of the Royal Institution, Manchester, however, considerably aided the promoters of the exhibition by lending the cases in which objects of art were shown in the recent exhibition, and Mr. W. J. Muckley, Mr. Ephraim Hallorn, Mr. Stephen Christy, Mr. Froggatt, Mr. J. Walthew, Mr. J. F. Cheetham, and Mr. James Watts have lent a number of objects, consisting mainly of Japanese *cloisonné* enamels, Persian and Indian metal work, carved ivories, mostly Indians Vienna and Dresden ware, and a few specimens of embroidery.

DRAINAGE ITEMS.

Knutsford.—At the meeting of the Altrincham Rural Sanitary Authority, on the 28th of August, the clerk reported that Mr. Newton, the engineer of the Knutsford, Dunham, and Hale drainage scheme, had had an interview with Lord Egerton, who had expressed himself in favour of the scheme, and his willingness to lease the whole of the moor to the Authority for disposing of the sewage. Mr. Newton, of the firm of Cawley, Newton, & Smith, engineers, Manchester, was instructed to prepare the necessary plans.

Dalry.—At a meeting of the Streets and Buildings Committee of the Edinburgh Town Council, on the 30th ult., letters were read from persons resident in Dalry complaining of injury to property from flooding, resulting from the overflowing of a public drain which passes under the Caledonian Railway, and threatening to hold the Council liable for the damage thus caused. The burgh engineer was (according to the *Scotsman*) instructed to do what he could for the purpose of temporarily remedying the defect, the committee not feeling warranted in recommending the Council to undertake the extension of the drainage system of Dalry at present, in view of the proposal to have the city formed into one drainage district, under the new Municipal and Police Act.

NEW INSTITUTIONS.

Children's Home, Edgworth.—On the 30th of August, Mrs. Charles Mitchell, of Aigburth, laid the memorial-stone of a new house, in connexion with the Children's Home, Edgworth, near Liverpool. The building is the gift of Mr. Mitchell, and is of the plain Italian style. It is estimated to cost 1,200*l.* The cost of furnishing it will be defrayed by Mr. Mitchell. Messrs. Parslow & Clarke, Liverpool, are the architects; and Mr. G. Neray, of Over Darwen, the contractor.

Home for Pauper Children, Ipswich. — A new home for pauper children has just been opened in Ipswich. The institution will accommodate about 200 children. The old buildings of the Boys' Home have been made to form a portion of larger building fronting on Freehold-road, St. John's. The boys' and girls' departments are separate and distinct. Besides dining-rooms, dormitories, day-rooms, kitchens, &c., there are tailors' and shoemakers' shops for boys, and at the back of the girls' department, a laundry. The latter is without special fittings, the object being that the girls should learn washing without the assistance of modern appliances. Mr. Brightwen Binyon is the architect, and the work has been carried out by Mr. R. Girling, builder.

The Prince of Wales's Monument at Bombay.—Four panels designed by Mr. Boehm to decorate the pedestal of the equestrian statue presented by Sir Albert Sassoon to commemorate the visit of the Prince of Wales to Bombay have been shipped on board the *Avondale*. The panels, which weigh upwards of three tons, have been cast from the original plaster model by Messrs. Elkington, of Myddelton-street, Clerkenwell, and are as follows:—The first, the reception of the Prince by the native chiefs; the second, a procession of native women bearing offerings in the shape of flowers and fruits; the third, the Royal arms; and the fourth, a huge square panel with an inscription.

DOCKS AND HARBOURS.

Bo'ness. — Considerable progress has been made with the harbour improvement scheme, begun in September last year by the Bo'ness Harbour Commissioners. The eastern pier and coffer-dam—the contract for which was held by Mr. J. W. Morrison, Edinburgh—are virtually completed. The coffer-dam is formed by double rows of main and sheet piles, bearing planking, the central space between the piles being filled up with a compact mass of clay, to which there is added, for the purpose of giving additional strength, a backing composed of slag and stones. The dam measures 410 ft. in length and 20 ft. in width. Stretching out from the middle of the dam there is a "spur," which is intended to exclude the water from the site of the dock entrance. The east quay wall is built of concrete, strengthened with slag. The entrance to the dock will be deepened to the extent of 6 ft., and as the east quay wall is to run in a line with the west pier, there will be afforded to vessels a passage of about 200 ft. wide, and having a depth of fully 24 ft. of water in ordinary spring tides.

Tasmania.—We learn from Tasmania that the harbour defence works are being vigorously carried out, in accordance with the recent recommendations of Sir William Jervois.

CASUALTIES.

A Railway Bridge partly Destroyed. — Information has reached the office of the Bombay, Baroda, and Central India Railway that a portion of the bridge that crosses the river Nerbudda at Broach has been swept away by floods Two spans yielded to the strong current, bu fortunately the bridge was clear at the time. When the last telegram was received in Bombay the water was rapidly rising, a circumstance which caused fears to be entertained that some portions of the rest of the structure might not be able to successfully resist the large volume of water which was sweeping along the stream with such great impetuosity. Indeed, later on another of the spans was washed away. The spans of this bridge are each 65 ft. wide, and the two spans which the floods carried away were about two-thirds distant from the south or Bombay end. The accident, of course, necessitated a complete stoppage of the traffic. The new bridge, which the railway company have for some time past been constructing at this spot to take the place of the old one, will, it is hoped, be ready by the next wet season. The last time the Nerbudda Bridge at Broach suffered from the floods was on September 6, 1876, when twenty-five out of the sixty-seven spans were clean swept away. Each span is 62 ft. 6 in. long, and is supported by five thin cast-iron columns, two of which and a double line of superstructure were added after the floods of 1867. The columns penetrate for a distance varying from 25 ft. to 40 ft. into first a bed of gravel, and then into blue and yellow clays, and are, at their greatest depth, deep as the deepest in India. At the time of the accident two years ago there were 59 ft. of water in the river, while there are now only 46 ft. The total length of the bridge is about 4,100 ft.

Great Fire in Pimlico.—On the night of the 28th ult., what proved to be a very destructive fire broke out at the extensive saw-mills belonging to Mr. Joshua Knight, timber and lath-wood merchant, 175, Buckingham Palace-road. Fireman Pelley fell from a loop-hole, while carrying a hose, a distance of several feet. On being picked up by his companions, he was found to be seriously injured, and was at once conveyed to St. George's Hospital. The value of the property destroyed amounts to several thousand pounds.

Great Fire at Riga.—On the 11th ult. a great fire broke out at Riga in the principal part of the town, and raged for nearly thirty-six hours. Fourteen storehouses were entirely destroyed.

Ladder Accident. –On the 29th ult. Mr. Humphreys held an inquiry at Hackney as to the death of James Ward, aged fifty, a zinc worker, living at Hoxton. On the previous Monday he was in the act of carrying a pole up a ladder raised against the front of a house in Dalston, when the rail that he was on, near the top, suddenly snapped, and he was hurled to the ground, falling on his head; death was instantaneous. Verdict: "Accidental Death."

The Fall of an Arch in Bishopsgate-street.—The inquest on the bodies of George Colley and

Thomas J. Higgins, who were killed by the fall of an arch in the City during a storm on Saturday week (as mentioned in last week's *Builder*), was resumed on Tuesday. After the evidence of the deputy-foreman of the works, who could not account for the arch giving way unless by the supposition that "it was caused by a heavy clap of thunder," Mr. Woodthorpe, District Surveyor, said he examined the arch after it fell. The wall was in his judgment strong enough to carry the arch. He believed the accident was caused by the violent thunderstorm. There was great concussion from the lightning and thunder. In his opinion the lightning struck one of the iron columns. The foundation was of the best concrete, with sets-off, as required by the Building Act. The arch was properly constructed. The plan of the arch was submitted to witness prior to the erection, and approved of. The weight of ballast was equally distributed over the surface. The jury returned a verdict of "Accidental Death" in each case.

Landslip at Chalk Farm Tunnel.—An accident has occurred at the entrance to the tunnel at Chalk Farm Station, but unattended by any very serious results. The main line at this spot is in course of widening, and the ground, which rises to King Henry's-road for some distance above the line, has been cut away, and a wall erected about 10 ft. thick and 40 ft. high. Huge buttresses support the wing thus formed, and apparently no power could move them. But the soil here to a very great depth,—over 200 ft.,—is composed of clay, and the recent heavy rains descended the slopes of Primrose-hill and King Henry's-road, and fell upon this portion of the tunnel. The fall carried with it at least 70 ft. in length by 50 ft. in depth and 10 ft. in thickness of the side of the roadway.

Collapse of the Sunderland Fish Market.—The *Newcastle Chronicle* says that about six o'clock on Sunday morning the residents in the vicinity of the Sunderland Fish Market were surprised to notice a large portion of the northern supports and roof of the market sliding gradually into the river. The tide was unusually high at the moment, and it is supposed that it had swept away the *débris* on which rested the metal pillars that formerly ran down the centre of the market, but which latterly have formed its northern boundaries. These pillars went down, and the roof they supported was consequently lowered and broken. A considerable portion of the roof in the centre has entirely disappeared, and the other portions are hanging towards the river. Altogether the market has now the appearance of an almost complete wreck. Fortunately no person was hurt. For some time past it has been the intention of the River Wear Commission to re-erect the quay in front of what was left of the Sunderland Fish Market. They had been making preparations for a practical commencement with the work of renewal, but it is denied that their men had done anything to cause the collapse of the market.

MASTERS AND MEN.

Paris.—The *vidangeurs* of Paris,—that is, the workmen employed in emptying the cesspools of the city,—have struck for an increase of wages.

Australia.—The labour market in Australia is, according to the *Melbourne Argus*, slowly recovering from the state of extreme prostration from which it has suffered for some time past. There is, however, but little improvement in the building trades, many persons believing that house-building has been overdone in Melbourne and the suburbs. Complaints of want of work for ordinary labouring men are reported from the country, but instances are frequent of men refusing 15s. per week and their rations to make improvements on farms. There is always a large portion of the floating population who would prefer loafing around Melbourne to accepting moderate wages in the country during the dead season. It is this class who crowd the works provided by the Government, to the exclusion of the tradesmen out of work, for whom they were provided.

Newcastle-on-Tyne. The joiners and house-carpenters of Newcastle and Gateshead are now partially on strike, against a reduction of 4s. 2d. per week.

The Nailers' Strike.—At a meeting of nailers held on the 30th ult., at Old Hill, it was resolved to "play on" until the masters conceded a revised list at the rate of 10 per cent. reduction from the list of 1875. The same resolution was passed at a similar meeting held earlier the same day at the Lye. Meanwhile, distressing accounts are given of the depth of poverty to which a great many of the nailers are reduced by the strike.

Fifty-one or Fifty-four Hours?—On Saturday a meeting convened by the Kipps workmen on strike, took place in the Temperance Hall, Coatbridge, for the purpose of discussing the fifty-one *versus* the fifty-four hours' system. Mr. Young, a delegate from Glasgow, explained the working of a new organisation instituted to maintain the fifty-one hours' system. Already, he said, fourteen different trades had amalgamated, and subscription-sheets were being distributed through the whole of the three kingdoms, from whence the money would converge into the Central Committee in Glasgow, who would distribute it to those striking for such a cause. He stated that if this fifty-four hours' system were introduced, every seventeenth man now employed would be thrown upon the labour market, and employers could fix their own terms.

Charge against a Union Secretary.—At the Wolverhampton Police-court on the 30th ult., David Price, late secretary of the Carpenters' and Joiners' Association, held at the Tiger Inn, Wolverhampton, was charged with having improperly withheld 10*l.* 18s. 1d., the moneys of the association. He was ordered to refund the sum of 2*l.* 16s. 11d., pay a fine of 2*l.* and 1*l.* costs, or in default be imprisoned for three months.

Rattening in Brickfields.—Some cases of rattening in brickyards are reported by the *Sheffield Telegraph*. At Norton Woodseats and Rotherham much malicious mischief has been committed. A third outrage has just come to light. Mr. Mayne, brickmaker, Walkley, some time ago rented a piece of land belonging to the Sharrow Vale Land Society. Last week several thousands of bricks were moulded and placed in rows to harden On Monday it was found that 11,000 of these bricks had been irretrievably damaged by being trodden upon during the night. Work is now at a standstill.

NOTES FROM THE NORTH.

Musselburgh.—The area known as the Mall Park, lying between the Station-road and Inveresk, has been laid out for feuing purposes. Upwards of seven acres will be occupied. Mr. J. Newlands, builder, has already commenced operations. The Musselburgh Heritages Company are at present erecting a large number of villa residences at Linkfield, closely adjoining the Links.

Edinburgh.—At a meeting of the Streets and Buildings Committee of the Edinburgh Town Council, on the 30th of August, the question of paving the footpath on the south side of Princes'-street was under consideration. Estimates were submitted, the cost for Caithness flagstones being stated at about 13,000*l.*, for Val de Travers asphalte at about 9,000*l.*, and for selenitic cement at about 5,000*l.* The committee unanimously agreed to recommend the council to sanction the paving of the footpath with selenitic cement.

American Efforts in Steam Locomotion on Common Roads.—A prize of 10,000 dols. offered by the State of Wisconsin to the inventor of a steam wagon satisfactory to the commissioners to test it as "a cheap and practical substitute for the use of horses and other animals on the highway and farm" has not yet been won. The Commissioners report that one wagon, known as the Oshkosh patent, made a trip of 201 miles, passing over grades of not less than 1,100 ft. to the mile, in thirty-three hours and twenty-seven minutes, or an average of six miles an hour. They report further that it was capable of hauling heavy loads, that it ploughed, and that it could be used to great advantage for thrashing and hauling heavy agricultural machines from farm to farm, for heavy work upon the highway, and for much of the work done upon large farms. The wagons cost 1,000 dols. each, however, and require an outlay of from two dols. to six dols. a day to run, and the Commissioners conclude that upon such terms they cannot be considered a cheap and practical substitute for horses, mules, or oxen upon the highway or farm.

Books Received.

Sanitary Engineering: A Guide to the Construction of Works of Sewerage and House Drainage. By BALDWIN LATHAM, C.E., &c. Second Edition. London: Spon & Co. 1878.

THE second edition of Mr. Latham's valuable work forms probably the most complete and fully illustrated work on sanitary engineering which we possess, and is remarkable for its clear and logical arrangement,—a quality not always illustrated in works of this class. Starting from a general "Introduction," in which the physical laws and conditions which form the basis of sanitary philosophy are broadly stated, we have then a sketch of the history of sanitation, so far as it is known (though, in fact, information on this subject can only be gleaned very partially and by implication from the comparison of ancient authors with ancient remnants of engineering work). We then come to a statement of the various systems which have been proposed for carrying out sanitary works, and the heads or sections into which the consideration of a scheme of sanitary engineering may most properly be divided. Mr. Latham classes them as follows:—

1. The area of the district to be sewered.
2. The rainfall of the district, and the proportion it is intended or desirable to admit into the sewers.
3. The geological character and physical outline of the district.
4. The present and prospective number of its inhabitants.
5. The supply of water in the district.
6. The sanitary appliances at present in operation, or to be adopted.
7. The position of the outfall, and the mode of disposing of the sewage.

The chapter devoted to the first section includes, however, in its heading "the area *and plans* of the district to be sewered," and in connexion with this part of the subject we cannot but notice the apparently unnecessary complication introduced into the preparation of the plans by the number of different scale plans which seem to be required of the engineer on one pretext or another: between the requirements of the Local Government Act Office and the Standing Orders in Parliament, it would appear, from Mr. Latham's account, that no less than eight sets of plans, all to different scales, are required before the entire demands of red tape are satisfied. The author makes no comment on this; perhaps he has become used to it; to us it appears a very heavy drag on the carrying out of a necessary series of operations. The question of the amount of rainfall to be admitted into sewers occupies considerable space, and leads to some very interesting considerations as the effect of admixture of rainfall on the value and carriage of sewage, and the means that may be adopted to control it. Some of the diagrams illustrative of old and very defective forms of sewers and drains gain a sinister interest from the footnote appended to one of the worst forms (p. 77), —"Many of the houses in the West End of London still remain drained in this manner." In the chapter on "The Course of Sewers," we are rather surprised to find the author passing over the evils of carrying drains under houses as "more imaginary than real"; he cites the high average of health in London, where "nearly every house has a drain under it," as evidence that this fact can have little influence on health, which is, however, rather an upside-down sort of argument; and, at all events, the great inconvenience and annoyance resulting from the examination and repair of a drain within a house ought not to be underrated. The most important novelty in the chapters on the materials employed in the construction of sewers is the suggestion for the larger employment of Portland cement pipes and concrete sewers, of which the former have the advantage that, being made without burning, they can always be produced with a perfectly true circular section, and the evil of possible obstruction from imperfect jointing got rid of. Another probable advantage which this material would give, but which the author does not suggest, is that a more scientifically efficient section might be given to a pipe-drain instead of the circular form: Mr. Latham gives in his sections of sewers one of an oval pipe-drain with a nearly pointed invert (plate iv., fig. 6), which he says had to be abandoned because of the extra difficulty of getting the section true and the joints tight; but in such a material as Portland cement there would

probably be no difficulty in carrying out this section in a satisfactory manner. The reliability and economy of combined brick and concrete as a material for sewers receives important illustration by the performances of the Croydon outfall sewer, a section of which is given, consisting of a circular brick ring of only half-brickwork, embedded in concrete, which, however, is only about 6 in. in thickness, over the upper half of the ring: "This sewer was constructed above the level of the ground, and for some months was running full bore without any earth backing at the sides; and yet, though containing such a small amount of material, not the slightest leakage took place." As the author observes, no ordinary brick sewer could have borne such a test.

The important and difficult subject of the ventilation of sewers receives a great deal of illustration, sections of nearly all the methods in use being given, all of which the author considers defective in one or another point. All these include ventilation through charcoal, the great difficulty in regard to which is to preserve the charcoal from damp from the rain and street surface water and mud entering the ventilator, the operation of the charcoal being soon killed by damp; and in most cases when the charcoal gets clogged the ventilator is practically plugged up and useless for its purpose. The author gives his own method for getting over these difficulties, in the shape of a circular ventilator with a water and dirt receptacle round it, and an overflow from this which runs in a spiral in the centre space; over this spiral overflow a spiral charcoal-holder is placed, screwed down, as it were, to its proper place by being turned, by a centre handle, on the spiral overflow trough. The advantages are that any escape of sewer-gas between the charcoal-holder and the sides of the ventilator (a frequent difficulty) is prevented by the gas coming in contact in such a case with the soffit of the overflow trough, which forms the other member of the screw, and which is cast solid on the sides of the ventilator so as to leave no interstice for escape; then the gas is not so much strained through the charcoal as passed in a spiral course over and over it, thus the charcoal filter is less clogged, and when it eventually becomes too saturated to do its work, the passage of the sewer-gas is still not interfered with, nor the ventilation consequently checked. The whole thing is remarkably ingenious: the only criticism we have to suggest on it is whether, in the inevitable clogging of every surface directly exposed to the action of sewer effluvia, there will not be some difficulty in keeping the spiral bearings sufficiently clean for easy removal and replacement; it seems a sort of thing that a workman would take out and find he could not get it in its place again, some morning.

The chapters on those portions of a drainage system more closely connected with habitations, on the arrangement of water-closets and house-drains, are so full and so admirably illustrated that even any one previously ignorant of the subject would gain a very good idea of it by their intelligent perusal; the action of the flows and traps upon one another, and the whole working of a system of house drainage, is rendered exceedingly clear and intelligible by the diagrams. The author is decidedly in favour of the water-closet as the only appliance for the purpose fit to be used within a good house; and in the end we imagine this will be the general conclusion, in spite of the other systems which have been so much recommended; though he admits (in which also most of our readers will concur) that a very large number of bad and unscientific constructions of this nature are in use. One system on which Mr. Latham bestows much praise, that invented by Mr. Fowler, of Newcastle, appears to require, at all events, a little explanation before it can be accepted as so entirely satisfactory as the author seems to consider it. This is the system by which the whole of the house drainage reaches the drains through the water-closet trap, which is placed sufficiently low to come into the fall of the drainage, though the seat may be placed on any floor level above the hopper if required, by the interposition of a number of earthenware pipes placed one upon another forming a kind of shoot. The utilising of the waste water from the house drainage is an obvious advantage; but as the advantage of being "self-acting" is also claimed for this closet, we presume that it depends entirely on the flow of this drainage for all flushing. Now, unless the drainage of water from house use is larger and more constant than is usual in an average dwelling-house, it seems obvious that in many cases matter will be lying in the hopper for a considerable period waiting for a flush; and that it may even happen, under some circumstances, that the hopper-trap would become choked. Simplicity is an immense advantage in all water-closet apparatus, provided it fulfils its ends properly; but so far as we understand the Fowler apparatus from Mr. Latham's illustrations, it seems to us a little too rude and uncertain in its principle and operation.

We should, of course, have devoted far more space to such a work as this, had it not been a second edition. The first edition was fully noticed in our columns; the second is greatly increased in value by the additions which have been made, bringing it up to the point of the most recent lights on the subject of which it treats. The extensive tables of velocities and discharge of sewers, &c., which are incorporated in the book, will be of great use to those who want such a work for practical reference. We noticed a few errors, and there may be others, which should be corrected when the opportunity occurs. The surprise is, however, that a man with so busy a professional life as the author should have time to produce such a book at all, rather than that he should not have had leisure to correct it throughout quite accurately.

Miscellanea.

A "Self-acting" Fire Alarm.—At the old Town-hall, Manchester, on the 29th of August, Mr. E. B. Bright, formerly secretary and engineer of the British and Irish Magnetic Telegraph Company, exhibited his invention, "The Self-acting Fire Alarm," to a large number of merchants, manufacturers, and others. Mr. Bright gave a description of his invention, which has been patented. A small metal box, called a thermostat, which is placed in a room or warehouse, and is the means of giving the alarm, contains within it, insulated at one end by a piece of ebonite, a spring composed of brass on one side and platinum on the other. The brass expands readily with heat, the platinum very slowly, and, therefore, when any unusual increase in temperature takes place, the spring is brought into contact with a small screw point. The spring is connected with an earth wire at the place which it is wished to protect. Another wire, which can be made to suffice for many buildings, communicates with the fire-brigade office, and rings a bell, calling attention to the fact that there is a fire or an improper heat in the particular building indicated by the apparatus. It is stated that by this means fires have been detected in buildings by the fire-brigade in New York even before the occupiers of the place in question have been aware of the conflagration.

A Year's Work for the Royal Dockyards.—An amended programme of work in her Majesty's dockyards for 1878-9 has been issued. It shows a total number of 6,180 men to be employed for shipbuilding and for completing ships afloat for sea service, as compared with 6,171 in the previous year. There will also be 11,264 men employed for repairs and refits, as compared with 9,829 last year. In addition to these there are 121 men employed for store purposes at Deptford, Haulbowline, and Portland. The total strength is thus 17,565, as compared with 16,109 in the previous year. This is the average number which will be employed throughout the year. According to the work stipulated to be performed, it appears that of thirty-two vessels being repaired twenty-two are to be completed during the current financial year. There are also fifty-five ships building.

Hyde Park and Kensington Gardens.—For a considerable time past public attention has been called to the condition of the trees in Hyde Park and Kensington Gardens. The First Commissioner of Works, it is stated, is about to order a careful survey, both of the park and the gardens, so that the full extent of the mischief may be ascertained. It is considered by competent authorities that, in order to effect a certain cure for the present state of things, enclosures of certain areas of plantation must be made; and that, in addition, new plantations or avenues of trees must be laid out. The need of taking some such steps has been frequently pointed out in the *Builder*.

Mr. Stephens's Group, "The Deer Stalker."—On Friday in last week the city of Exeter was presented with "The Deer Stalker," which is regarded by many as the masterpiece of Mr. Stephens, the sculptor. The presentation is chiefly due to the suggestion of a number of Devonshire men living in London. "The Deer Stalker" was felt by them to be the greatest of the many high works of art produced by Mr. Stephens, and it was thought well to pay him the compliment, and his native city the honour, of securing the sculpture with the object of erecting it in Exeter. The representation is that of a deer stalker, who, in a crouching position, is intently watching the movements of the deer; the pursuit has worked the stalker up to a pitch of high excitement, and this excitement has evidently been communicated to the hound alongside, so that the man has to hold in the dog lest he should set out in pursuit before the proper moment had arrived. The representation is in bronze. The sculpture has been placed on a pedestal of granite, which bears on its face a bronze tablet with the inscription:—

"'The Deer Stalker,'
by
E. B. Stephens, A.R.A.
Presented to his native City by a number of friends and admirers of the Sculptor during the Mayoralty of H. D. Thomas, Esq. A.D. 1878."

The High-street end of Bedford-circus is the site. The granite for the pedestal and base is from the Caerleon quarries, and was supplied by Messrs. Stephens & Son, of Fore-street (Mr. Stephens is a brother of the sculptor). The iron rail surrounding the statue was supplied by Messrs. Garton & King.

London Bridge.—A committee of the Corporation of London, to whom it was referred in March, 1878, to take the necessary steps for obtaining parliamentary powers for raising, upon the credit of the Bridge-house Estates, the requisite funds for increasing the width of London Bridge, at the estimated cost of about 75,000*l.*, have certified that they caused a Bill to be prepared and presented to Parliament for effecting the above object, but that it was abandoned owing to a communication from the Government that they could not assent to its passing during last session. The Bill having been withdrawn, the committee thought it advisable that, prior to the next session of Parliament, a conference should be held with her Majesty's Government as to the necessity and propriety of increasing the width of London Bridge, and that the Government should be furnished with all such information as they may require upon the subject, with the view of obtaining their consent to such widening; and the committee recommended that they should be authorised to hold such conference, and furnish the Government with the information they may require.

Finances of the Paris Exhibition.—In the original estimates, the total cost of the Exhibition buildings was calculated at 35,313,000 francs, or 1,412,520*l.*, but it has been ascertained that it will actually not be under 50,000,000 francs, or 2,000,000*l.*, the increased cost being due mainly to the great difficulties experienced in forming the foundations on the unstable grounds of the Trocadéro. The direct revenues of the Exhibition from the sale of season and daily tickets, &c., are estimated at 14,000,000 francs, or 560,000*l.*, being based on the takings of the Exhibitions of 1855 and 1867, which were respectively 3,100,000 francs, or 124,000*l.*, and 10,765,000 francs, or 430,600*l.* It is calculated besides that the sale of the old materials of the Exhibition buildings, when taken down, will produce about 7,500,000 francs, or 300,000*l.* Thus the total estimated direct revenue would amount to 21,500,000 francs, or 860,000*l.*, which, with a probable cost of 50,000,000 francs, or 2,000,000*l.*, leaves a deficit of 28,500,000 francs, or 1,140,000*l.* Against this are set surplus receipts by the Government and the municipality of Paris calculated to amount to at least 100,000,000 francs, or 4,000,000*l.*, derived from Customs' duties, taxes on railways, omnibuses, and cabs, stamps for letters and telegraphic despatches, and last, not least, excise duties on wines and spirituous liquors.

The Trade Union Congress.—The eleventh annual Trade Union Congress will commence its sittings at Bristol on Monday next, and the meeting will extend over the whole week. About 140 delegates from all parts of the country will be present.

Yellow Fever.—The Surgeon-General of the United States Marine Hospital Service has issued a report on the epidemic of yellow fever which is now raging in the Southern States. He says :—

"The weight of scientific evidence seems to warrant the conclusion that yellow fever is produced by an invisible poison, capable of self-multiplication outside of the human organism, which it enters through the air passages. The poison germ or miasm is a product of the tropics. Yellow fever has prevailed in most of the Gulf and Atlantic cities, and in many of the towns along the Mississippi river. In some instances it has been carried inland with the people fleeing from infected localities, but it has never shown a disposition to spread epidemically at points remote from the continuous water roads of commerce, or to lodge in high and salubrious places. The cities of the great lakes have always been free from the disease. Yellow fever cannot be said to be epidemic in the United States, from the fact that in some years it does not appear, though the imported germ undoubtedly survives the mild winters. It appears to have about as much resistance of cold as the banana plant. When the banana stalk is killed down by the frost, the yellow fever does not recur until again imported. The germ is transmissible. It is capable of being transported in the clothing or personal effects of passengers or sailors, but its spread from one city to another is chiefly accomplished by vessels, their damp, filthy holds and bilge water being its favourite lurking places. Confinement, moisture, and high temperature favour the multiplication or virulence of the poison."

The late Mr. David Cousin, Architect.—Intelligence reached Edinburgh on Tuesday night of the death, on the 14th ult., at Sans Souci, Louisiana, U.S. (whither he had gone for the benefit of his health) of Mr. David Cousin, architect, who for about thirty years was Superintendent of Works to the Edinburgh municipality. According to the *Scotsman*, he was born in 1809 at North Leith, where his father at that time carried on business as a joiner. After learning his father's trade, and receiving instruction in mathematics from Mr. E. Sang, David was articled to the late Mr. Playfair, architect, and remained in his employment while two of his most important works,—Donaldson's Hospital and the National Gallery on the Mound,—were in course of erection. In his 22nd year Mr. Cousin commenced practice on his own account, and speedily made headway in the profession. Want of space compels us to defer until next week any detailed account of his career and works.

Shipbuilding on the Clyde.—The *Scotsman* says that the amount of work turned out by the Clyde shipbuilding firms during the month of August has been considerably larger than in the previous month. In addition to a war corvette, three large first-class ocean steamships were launched. There was only one sailing vessel amongst the number built, all the others being screw steam vessels. The vessels launched numbered twenty-one, and their united tonnage was 21,100 tons—an average of 1,000 tons each. As compared with previous Augusts, the aggregate tonnage is about 10,000 over the same month in 1876 and 1875, but 4,000 tons under August, 1874. The nine months show better than any former year, excepting 1874. The improvement over last year is 48,000 tons, and the decrease as contrasted with 1874 is 105,000 tons. The number of vessels on the stocks is eighty-one.

Messrs. Mintons and their Workpeople.—At the Paris Exhibition Messrs. Mintons, of Stoke-upon-Trent, have taken the highest honours awarded for the productions of the potteries of the world; and in order to celebrate their success they entertained their workpeople on the 24th ult. The whole of the hands employed, about 1,680 in number, were paid their wages an hour earlier than usual on that day; and each man, woman, and young person was supplied with a railway ticket available to Rudyard and back. After tea Mr. C. M. Campbell, M.P., the head of the firm, delivered an address, in the course of which he said he thanked his workpeople sincerely for their active co-operation, which had enabled them to accomplish the work that had been done. Whether it be the labourer who removed the shraff, the clay getter, or the slip maker,—all, up to the highest branch, had worked for the honour now obtained.

A Dredger for Newhaven Harbour.—On the 15th ult. a new twin-screw hopper dredger of 700 tons, built and engined by Messrs. Wm. Simons & Co., was launched complete from the London Works, Renfrew. It is named *Neptune*, and is the property of the Harbour Commissioners of Newhaven, Sussex. The dimensions of the vessel are,—Length, 150 ft.; breadth, 32 ft.; and the capacity of its hopper-cavity is 500 or 600 tons. It will dredge from 6 in. to 25 ft. depth, and it is fitted with two sets of compound engines, of 75 nominal horse-power.

Corporations and Gas-Stoves.—Mr. Edwin Smith, the secretary to the Corporation of Birmingham Gas Department, publishes an official notification to the effect that the department is now prepared to sell cooking-stoves, the periodical instalments for which may be spread over three years. As this is quite a "new departure," and likely to form a precedent for other go-a-head corporations owning gas-works, we may explain that the Birmingham Gas Department proposes to charge for the higher price stove the bare cost: that is to say, the stove that they would sell for 7*l.* 10*s.*, less 5 per cent. for cash, they will hire and keep in repair for three years for the same amount paid in twelve quarterly instalments of 12*s.* 6*d.* each. For the smaller class of stoves the charge will necessarily be a few shillings more than the retail price, in order to cover outlay. In each case the cost of fixing the stove will have to be paid by the hirer, but beyond this, and the quarterly payment, no other charge will be made to him.—*Hardware Trade Circular.*

A Tornado in America. — A terrible tornado burst at Wallingford on the evening of the 9th ult. The names of thirty-two persons killed are given, and of very many injured. It was estimated that property was destroyed in Wallingford to the amount of $150,000. Right in the path of the gale stood the Roman Catholic Church, hemmed in on three sides by a cemetery. The church was a plain one, worth, perhaps, less than $2,000. The storm, to judge from the appearance of the ruin, ploughed into the foundations, pressing them away from the framework. Then the walls, side, and back were crushed in, and the roof fell so as to cover all completely. A more complete wreck than this church could not have been made except by fire. It is literally a mass of firewood.

Artisan Reporters at the Paris Exhibition.—More than 120 artisans have, up to the present time, been sent to the Paris Exhibition as reporters on the products of various trades and manufactures by the joint committee of the Royal Commissioners and the Society of Arts. The expenses are borne partly by the joint committee and partly by the employers of the men, and in some cases by the localities whence the artisans came. The rest of the men to be selected by the committee will be immediately sent to Paris. Some of the artisan reporters have returned to England, and are busy preparing their reports in their respective sections. The city of Bristol has sent ten, the city of Edinburgh twelve, Leeds six, and the city of Dublin twenty-five artisans to the Paris Exhibition.

Pillar Letter-Boxes.—A useful invention has recently been introduced by Mr. Thomas Ollis, engineer, in some of the pillar letter-boxes at Liverpool. The door of the pillar-box is made to shut with a spring, and in so shutting it moves a plate showing the hour of the last clearance. By this simple means the public are at once enabled to ascertain whether the box has been cleared for a particular delivery, and the post-office have a check upon their men. If an outlying letter-box were left uncleared, as now sometimes happens (or if cleared before the specified time, which is occasionally the case), there would be a ready means of detection. The mechanism would be, of course, worse than useless if it were not thoroughly reliable, but it is stated to have been successfully at work in Liverpool for some months.

Foresight. — Some recent occurrences on railways should lead careful men with families to look to the advantages offered by the assurance companies. Mr. William Hopkinson, of the Corn Exchange, who was killed endeavouring to cross the line at Addlestone Station, and leaves four children, held a policy against accidents, for 1,000*l.*, of the Railway Passengers Assurance Company, Cornhill.

Another Well, so called, has been found in the City, dating from the Roman occupation. The site is No. 9, Walbrook. It is about 22 ft. in depth, the upper portion being constructed with Kentish rubble, and the lower, to the extent of about 10 ft. being lined with chalk, without cement or other material between the courses.

Obituary.—We regret to learn that the family of Mr. John Everett Millais, R.A., are thrown into mourning by the death at Powerswell, Perth, N.B., of his second son, at the age of 20. He suffered much and died resignedly.

Hampton Court House.—This old mansion erected by Sir Christopher Wren, was sold by auction on Monday, by Messrs. Slade & Challen. According to the *Mid Surrey Times*, the bidding commenced at 6,000*l.*, and rose to 14,000*l.*; the property being ultimately bought in at 15,000*l.* The reserve price, however, was not nearly reached. The mansion stands in about 8½ acres of land.

Building in Edinburgh.—Building operations are proceeding apace in Edinburgh and its suburbs, and the *Scotsman* devotes two columns of space to an enumeration of the new streets which are being laid out and built on the Mayfield, Preston Grange, Craigmillar Park, Lower Grange, Blackford, and Woodburn estates.

Surveyorship, Ashford.—At a special meeting of the Ashford Local Board, on the 29th ult., Mr. A. S. Robinson, late surveyor of Newtown, in Wales, was elected surveyor to the Board, at a salary of 150*l.* per annum. There were fifty candidates.

TENDERS

For the erection of Congregational chapel, East Cliff, Bournemouth. Messrs. Kemp, Welsh, & Tindar, architects. No quantities:—

Stroud	£6,274 0 0
Minty	5,600 0 0
Sharlan & Griffin	4,975 0 0
George	4,689 0 0
Lawson & Stanley	4,398 15 0
Brown	4,200 0 0
Pike	4,013 0 0

For the erection of new printing-works, Tower-street St. Giles. Mr. C. J. Shoppee, architect:—

Bywaters	£8,875 0 0
Sewell & Son	8,838 0 0
Brass	8,590 0 0
Rider & Sons	8,518 0 0
Conder	8,475 0 0
Merritt & Ashby	8,354 0 0
Shaw	7,954 0 0
Cox	7,579 0 0
Braid & Co.	7,497 0 0

For the Wesleyan chapel and schools, Teddington. Mr. Maurice H. Pocock, architect. Quantities by Messrs. Bull:—

Colls & Co. (too late)	£3,397 0 0
Carless	3,389 0 0
Colinson	3,350 0 0
Harris & Bonell	3,280 0 0
Higinbotham, Brothers*	2,910 0 0

* Accepted. Described to us as members of the Building Committee, and the only competitors allowed to be present at the opening of the tenders.

For boys' school and residence at South Petherton. Mr Henry Hall, architect:—

Langdon & Pole	£1,780 0 0
Trask	1,600 0 0
Hallett & Mumford	1,504 13 0
Lye & Son	1,469 0 0
Staple & Son	1,367 0 0
Walter	1,354 0 0
Rowsell	1,320 0 0
Sanders	1,319 0 0
Davis	1,310 0 0
Pitman & Fane	1,300 0 0

For the erection of cemetery chapels, boundary walls, &c., Langport. Mr. Henry Hall, architect:—

Webb	£1,218 0 0
Davis	1,185 0 0

For farm-house and homestead, for the Tythe Farm, North Cadbury. Mr. H. Hall, architect:

Pitman & Son	£2,000 0 0
Francis & Son	1,985 0 0
Seward & Norris	1,883 0 0
Cox	1,760 0 0

For the demolishing and re-erection of the Town Arms Inn, Red Lion-square, Nottingham. Mr. S. Dutton Walker, architect:—

Messom	£995 0 0
Marriott & Wartnaby	990 0 0
Fox	984 0 0
Dennett	976 15 0
Underwood	967 18 0
Tatin	950 0 0
Hollingsworth	934 0 0
Ireson, Gray, & Wade	925 0 0
Jelley	899 0 0
Bailey	881 15 0
Harrison	880 0 0
Roberts & Perkins	847 0 0

For clerks' offices, dispensary, &c., for the parish of Saint George-in-the-East, Middlesex. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Hofern	£4,678 0 0
Somerville	3,895 0 0
Blandford	3,395 0 0
Wagner	3,297 0 0
Parker & Evans	3,230 0 0
Sampson & Parish	3,229 0 0
Dove, Brothers	3,175 0 0
Wise	3,050 0 0
Crook	2,997 0 0
Homan	2,995 0 0
Sawyer	2,950 0 0
Heurle	2,876 0 0
Prout	2,850 0 0
Taylor & Parfitt	2,847 0 0
Palmer (accepted)	2,599 0 0

For laundry, mortuary, &c., at the Highgate Infirmary, for the Guardians of the Holborn Union. Mr. H. Saxon Snell, architect:—

Kirk & Randall	£7,950	0	0
Crockett	7,745	0	0
Perry & Co.	7,543	0	0
Wall, Brothers	7,500	0	0
Brass	7,436	0	0
Chappell	7,370	0	0
Mowlem & Co. (accepted)	7,200	0	0

For additional stabling, Castle-street, for Messrs. T. M. Fairclough & Son. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Hearle (accepted)	£793	0	0

For house and shop at Bow-green, Kent, for Messrs. Walls & Son. Mr. G. Friend, architect. Quantities by Mr. T. Potter:—

Wiltshire	£2,377	0	0
Clements & Wallis	2,048	0	0
Bridge	2,040	0	0
Faircloth & Son	1,976	0	0
Calland & Son	1,959	0	0
Bishop	1,840	0	0
Wood (accepted)	1,674	0	0

For six cottages at East Malling, Kent, for Mr. T. Phillips. Mr. G. Friend, architect. Quantities by Mr. T. Potter:—

Bishop	£1,701	18	0
Wood	1,667	0	0
Church	1,452	7	0
Hodge	1,424	11	5
Pye (accepted)	1,398	10	0

For alterations and additions to servants' office, at Chilston Park, Kent, for Mr. A. Akers Douglas. Mr. G. Friend, architect. Quantities by Mr. T. Potter:—

Clement & Wallis	£3,080	0	0
Bishop	2,743	5	0
Vaughan (accepted)	2,679	0	0
Bridge	2,646	0	0
Fowler	2,566	0	0

For alterations and repairs to warehouse, Adam and Eve-court, Oxford-street, for Mr. Sellick:—

Gritten (accepted)	£195	10	0

For new offices for Messrs. J. Fuller & Co., brewers, Maidenhead. Messrs. Cooper & Day, architects:—

Groome	£2,159	0	0
Claridge	2,310	0	0
Kempster	1,990	0	0
Woodbridge	1,897	0	0
Jones & Co.	1,890	0	0
Steven & Barstow	1,889	0	0
Cox	1,889	0	0
Vilner & Sons (accepted)	1,864	0	0

For general repairs and re-arrangement of seating to St. Katherine Cree Church, Leadenhall-street, exclusive of glazing, heating, and gas-lighting. Mr. Robert P. Notley, architect. Quantities by Messrs. Linsdell & Gifford:—

Browne & Robinson	£3,485	0	0
Greenwood	3,445	0	0
King & Sons	3,180	0	0
Falkner	3,096	0	0
Ashby & Horner	2,959	0	0
Colls & Sons	2,957	0	0
Philps & Bisiker	2,778	0	0
Messom	2,525	0	0
Prebble (accepted)	1,918	0	0

For Chiswick main drainage. Contract No. 4. Mr. H. O. Smith, engineer:—

Priddle	£8,595	0	0
Williams, Son, & Wallington	8,500	0	0
Keeble	8,400	0	0
Nowell & Robson	7,828	0	0
Crockett	7,592	10	0
Dickinson	6,750	0	0

For alterations and additions to Latimer Chapel, Bridge-street, Mile-end. Mr. W. Blackmore, architect:—

Wood	£1,623	0	0
Judd	1,265	0	0
Saunders	795	0	0

For building house and shop, No. 333, Euston-road, for Dr. Knaggs. Mr. J. R. Furniss, architect:—

Baugh	£1,240	0	0
Bishop	1,148	0	0
Hatcham & Son	1,050	0	0
Anley	1,048	0	0
Gould & Brand	1,048	0	0
White (accepted)	983	0	0

For alterations at the Torriano Arms, 140, Leighton-road, Kentish-town, for Mr. James. Mr. J. R. Furniss, architect:—

Hatcham & Son	£880	0	0
White	747	0	0
Bishop	712	0	0
Toms	618	0	0
Beunstead & Sons	598	0	0
Gould & Brand	578	0	0
Anley (accepted)	530	0	0
Plate-glass for the above.			
Gibbs (accepted)	£109	0	0

For the erection of farm-building, Tottenham, for Mr. Howard. Messrs. Phillip D. Tuckett & Co., surveyors:—

Gibbon & Mitchell	£260	0	0
Pocock	230	0	0

For alterations and additional stories to No. 29a, Albemarle-street, Piccadilly, for Mr. Butcher. Mr. H. W. Perrers, architect:—

Gibbon & Mitchell (accepted)	£1,417	0	0

For the erection of stables at Cook's Bridge, Lewes, for Mr. James Nightingale. Messrs. Hill, Grylls, & Wilcocks, architects. Quantities supplied:—

Somerville & Hill	£1,126	0	0
Peters & Redford	1,062	10	6
Earnie	1,053	0	0
Longley	1,050	0	0
Beale	963	0	0
Fittings for the above.			
Musgrave & Co. (accepted)	£690	0	0

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N. H. (let him take advice on the spot. The district surveyor might help him. He has probably not occupied the house long enough to enable him to bring an action for obstruction of light and air).—A Builder (would seem to have a good case, but it would depend on circumstances. He should take advice on the spot).—Concrete Houses (several letters in reply to G. G. shall have attention next week).—H. G. H.—Dr. G.—G. W.—W. V.—T. R. S.—Mr. T.—M. & Co.—J. N.—J. S. M.—C. D.—T.—W. H. L.—T. B.—H. A. G.—W. Son & A.—W. & J. F.—A. T.—Sir W. A.—C. G.—J. E.—E. G.—H. O. S.—J. & H.

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The Builder.

VOL. XXXVI. No. 1868. SATURDAY, SEPTEMBER 14, 1878.

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The Programme of the Engineer and of the Architect.

HE have regarded the main divisions of the professional study of the engineer as far as concerns, first, survey; secondly, public works proper; and thirdly, the application of these motor-powers which nature herself offers to the service of man. The point thus reached may, indeed, be considered as a sort of landmark. The discovery, by Watt, of a means of applying for the production of motion the expansive power of steam, forms an epoch in the history of engineering. The mechanical engineer is sometimes regarded as if he occupied a lower position in his profession than his civil brother. No view can be more inaccurate. The civil engineer must be, to attain any eminence, a mechanist and a workman also. Our first engineers have been mechanics. The minute details of the locomotive have received as much and as enlightened attention from Robert Stephenson and from Isambard Kingdom Brunel as they have done from Fairbairn, or from any exclusively mechanical man.

The use of steam-power, first for the drainage of mines, then for the general movement of machinery, and thirdly, for propulsion by movable engines, both by land and by sea, had attained a very important development before the theory of mechanical motor-power was at all properly understood. It is forty-five years since Ericcson, by his successful construction of a hot-air, or caloric, engine, gave a practical proof that the value of the vapour of water for mechanical purposes was due to its capacity for heat; and that heat itself was the source of motion. The determination of the thermal unit was a step of extreme importance in the advance of mechanical science, and the researches which are now being daily pressed further and further into the study of electricity, point to a possible improvement in our methods of applying the force of nature, as much in advance of our present mechanical knowledge as that is superior to the science of a hundred years since. It is true that the cost at which a certain quantity of heat can be produced by the combustion of coal is very far less than that attainable by any other known process of chemical decomposition or recomposition. That fact has been a barrier to the use of electro-motor machinery. But the discovery of the conversion of motion into the electric current, as in the case of the magneto-electric machines of Gramme, is one of which it is impossible to foresee the ultimate results. We can command, in the tidal movement of the sea, a source of motive power that is practically unlimited, as well as gratuitous. The main obstacle to the future application of this power to the service of civilised life is the difficulty of transmission. The present means of hydraulic and of pneumatic transmission of power are limited, costly, and clumsy, as compared to the use of the insulated wire for the transmission of the electric current. Up to the present time only currents of low tension have been required for telegraphic purposes. But the extraordinary results of the application of a steam-engine of only seven-horse power to the production of the electric light by the Gramme machine, on the one hand, and the discovery of the quadruple or multiple divisibility of the electric current on the other, seem to intimate that we are possibly on the threshold of brilliant discoveries, as to the means of availing ourselves of an unlimited source of motive power now very little employed or regarded.

It is thus, first to the production, and secondly to the transmission, of mechanical motor-power, that we hold that the chief attention of the engineer is invited by the actual state of scientific discovery. The study of the accumulator, and of all the appliances of hydraulic transmission of motion, is already assuming a practical importance hardly less than that of the study of the steam-engine itself, whether fixed, marine, locomotive; or movable, as in the case of agricultural steam-engines. As to the latter, the chief attention at the moment, especially on the Continent, is turned to the improvement of what are called secondary locomotives, which are required either for the ascent of steep inclined planes, or for the propulsion of vehicles or tramways at comparatively low speeds. It is probable that the advantages thus to be obtained are at present rather overrated than otherwise. The economy which is attainable for locomotion over an approximate level, and at a speed not less than twenty miles per hour, is so great, as compared with the former methods of transport, that a saving of four-fifths in the cost is estimated to have been obtained. But with the introduction of the counteracting power of gravity, in steep ascents, and with the reduction of speed, the great economical advantages tend to disappear. We may find a steam-engine cheaper than a pair of bullocks to take a given load up a given hill. But it will be the persons who have to ascend the hill who will have, as a rule, to provide and apply the engine-power. There will not be even that return for the expenditure of the capital of independent persons, who merely seek a profit for their money, that is afforded by our railways; and even that is now only 4·32 per cent.

After the general study of the engineer with regard to the apparatus for the production, and for the transmission, of mechanical motor-power, comes the wide field for his skill in the application of such power. Here we enter on mechanism proper;—industrial mechanism, the substitution of mechanical contrivances, exact in their operation, for human skill, which is less exact. The line may here be drawn with unusual precision between mechanism and art,—between the mechanic and the artist. It may not be too much to say that we anticipate that almost anything, for the production of which skill may be acquired as matter of routine, will sooner or later, be better, as well as more cheaply, effected by machinery than by human fingers. On the other hand, in all that into which the real soul and genius of the artist enters,—all that which no toil or labour will enable an unsympathetic scholar to acquire,—will remain the province of man as distinguished from machinery. In the vast factories now erected for the production of textile fabrics, the operatives are becoming, more and more, the mere attendants on the machines. The saving of labour is now being made in the direction of increasing the number of spindles, of looms, or of other machines, which can be tended by one man. But while a faultless and accurate piece of machine-made lace, for example, is turned out at an incredibly low price per superficial inch, the manufacture of this fabric does not lower the price of Rose Point or of Honiton. The individuality of the artist, even in so humble a matter as the execution of a delicate pattern in thread, can never be attained by the machine. When what is wanted are great numbers of indistinguishable copies, they will be produced, from year to year, cheaper (and it may be hoped better) by the mechanic. When what is required is to gratify the taste, or to elevate the tone, it will always remain the province of the artist.

It is, of course, far beyond our present limits to attempt to sketch an outline of the application of mechanical power. An instance which may be cited as one of the most extraordinary triumphs of this branch of mechanics, of recent times, is the sewing machine. While for many purposes the work done by this instrument is inferior to hand-work, there is no doubt that the burden of an enormous amount of purely mechanical oil is thus taken off mankind, or rather womankind. The only question is, how far the workwoman has been raised in the social scale by the invention. We very much fear that it is precisely where the heaviest burden formerly fell that it is least diminished, even if changed in the mode of its incidence, by the change. Amongst the most striking of the modern mechanical applications of scientific principles, of comparatively late discovery, may be named the bicycle; and the beautiful American drilling machine, in which one coil of flexible steel wire revolves within another, and the instrument while rapidly working may be applied in any direction. The more wide becomes our acquaintance with the field of

mechanical invention, the more profound will be our conviction that the engineer is, in this branch of his calling, but at the very commencement of an immeasurable progress.

Among those special mechanical industries which at the present moment demand so much of the attention of the engineer, may be mentioned the transmission of signals to a distance by electricity, whether they are designed to attract the eye or the ear; the application of the same power to purposes of illumination, whether by way of instant ignition and extinction of coal gas, or as a direct source of light; the labour-saving machinery of which the farmer is daily making more and more use, and the application of steam locomotive power to what are called secondary purposes,—that is to say, to the ascent of steep hills, or to the propulsion of vehicles through the streets of populous towns. In these matters, we see on the one hand the successful application of patient care, and even the flashes of brilliant genius. On the other hand, we have to lament the adoption of suggestions, any one of which may in itself be good, but which, taken together, are mutually exclusive. Such, for example, is to be found in a recent report on local railways, or, as we should call them, tramways, in France, in which the combination of gradient, engine-power, weight of rails, and possible weight of train, is so impracticably proportioned that no train could exceed a gross weight of 7½ tons, exclusive of the engine; while a rate of charge equal to that at present made for horse haulage by the common road would be insufficient to make any return on the capital expended. Here is a case in which the schoolmaster is signally abroad, and in which the need of sound scientific programme is abundantly illustrated.

When we turn from the rough programme of the study proper for the education of the engineer to that appropriate to the architect, we shall see that there is at the same time a close resemblance, and a sensible difference, in the points which it is needful to block out, as compared with those already indicated. As the study of the engineer commences with survey, so does that of the architect. But as the aim of the former is to work in accordance with mechanical law and routine, while that of the latter is to produce the work of the artist, so from the very commencement of their studies should a certain difference of bias be impressed on the respective pursuits of two students. We have regarded survey, as conducted by the engineer, as composed of two branches,—that of the making of maps, plans, and diagrams, and that of the inspection of materials and workmanship. This second branch is common to the two professions, —the differences, when they exist, being only those of detail. But while the work of the engineer, in the wider branch of science, is mathematical, that of the architect is artistic. Not that the importance of exact and actual measurement of details is to be undervalued. Not that the drawing-board, the T and set squares, the dividers, and the compasses, ought to be less familiar implements for the one pupil than for the other. Not even that we undervalue for the engineer the use of the sketch-book. But his sketch-book, if what it ought to be, will be something very different from that of the architect. A certain degree of proficiency in freehand drawing, desirable for every one, is indispensable for the student of architecture. Above all, he must be gifted with that power,—rare as it may be,—which enables a man to see a picture where it exists; in fact, to appreciate the pictorial in nature. The survey of the architect, in this sense, consists in the filling his mind with the noblest and best specimens of structural beauty and excellence. His memory, no less than his note-book, will be enriched, his taste will be formed, and his judgment enlightened by travel and observation. Not only will he have to view a building in the grand, to appreciate the proportions of its most striking features, and to apprehend the law of architectural subordination, but he will at the same time become aware how far climate and situation are elements of style. He will understand how Egyptian architects burrowed in the live rock for a grateful shade from the burning sun of Africa; how Greek and Italian architects were contented with the artificial shade of peristyle or of vault for the brief heat of the Mediterranean summer; how Teutonic architects throw up pointed and gabled roofs to throw off the burden of the winter snows. As the survey of the engineer gives him exact measurements of space, so the survey of the architect should give him truthful ideas as to situation, adaptation, and proportion.

Distinct from this preparatory schooling and enrichment of the mind is scientific knowledge of structure, both as to mathematical construction and as to strength of materials. Here the architect for the most part has to deal with problems of less magnitude than the engineer; and tables and examples will be readily forthcoming to guide his ordinary practice. But the higher and more scientific forms of structure; the groined arch, the flying buttress, the frozen cobwebs of such ceilings as those of King's College Chapel, Henry VII.'s Chapel, St. George's Chapel, with pendentives that seem to mock the unsleeping power of gravity; the heavy dome of a Michelangelo or of a Wren; must contain no secret hidden from his research. Perfect structural skill, founded on mathematical knowledge, is an essential part of the furniture of the mind of the architect.

Hand in hand with this structural skill must rank what, if we retain the original meaning of the Greek word, may be called the economical skill of the architect—his ability in the distribution of the house. This part of his qualification may be described as the education and organisation of common sense. It is the portion of education which is most usually and most cruelly neglected, not in one pursuit alone, but in the general up-bringing of the young men and boys of England. By the service of this faculty the architect learns, as if instinctively, to make the best of a given site, to proportion means to object, to subordinate parts to the whole, as a matter of distribution of space. All questions of sanitary provision here come in; not only as to drainage, ventilation, illumination, and removal of smoke, but as to due proportion of open area to building, of vestibule and staircase to rooms, of offices and stabling to residences. An architect possessed of this kind of ability will never run a line of street so as to cross a line of thoroughfare and cut off a main street ventilation, as we so often see done in some of the ever-growing suburbs of London. He would as soon make his drains run up hill (as in fact has been done with some of the main drainage of London). Nothing is more easy than to undervalue, or to neglect, this important part of the education of the architect. Nothing is more fatal to the use and the value of his advice.

To these, the mechanical, although far from being the self-moving parts of his art, has to be added yet another element,—the æsthetic. Taste, it is true, cannot be given to him who has it not; but it may be cultivated in him who has it, even if the portion with which he is naturally gifted be but meagre. And even taste may be aided by intelligent perception of structural fitness. For all those features of building which give the finest contrasts of light and shade there is a structural reason. The man who attempts to beautify a building by *appliqué* ornament, stuck on without reason arising from structure, produces only costly abominations. It requires a noble and a cultured taste to make structural lines assume the most pictorial forms, as is the case in so much of our pointed ecclesiastical work. But the man who is unaware of this primary principle of decoration is like one who builds sham ruins to decorate a newly-planted shrubbery. The lamp of truth can never be left unlighted by any one who aspires to the fame or the name of an architect, except at the cost of his reputation.

Brief and imperfect as the above sketch admittedly is, it may yet not be altogether without use. The traveller who is encumbered with parcels soon becomes aware of the comfort and advantage that he derives from a list of his *impedimenta*. He knows each package, no doubt, well enough. Yet if they are not numbered or catalogued he will often feel puzzled to tell which is missing in the hurry of a railway station. The value of order, even of the most simple and unartificial kind of order, is often incalculable. Were those who direct architectural education to set before themselves the task of blocking out the duties of the profession —of watching against the danger of directing any one, instead of giving attention in proper proportion to all—the buildings now going on all over the country would be of a higher stamp than is too often the case. It is no doubt true, when we look back to the work of architects of a former generation, that much ignorance and neglect of detail often characterise their work. We may see many a building which, viewed at a certain distance, is imposing from its just or even noble proportions, but which yet pains the educated eye, on a closer approach, by its rudeness or even vulgarity of detail. It is quite intelligible that as architects have become aware of this deficiency their efforts to obviate it may have led them to err in the opposite direction. In the careful study of the best details of the old masters the students have but too naturally lost what is more important than any detail, namely, grasp of the dominant idea. With men of real taste, and real desire to excel, it ought to be sufficient to give this hint. When the architect takes breath—steps back from his drawing-board, as the painter does from the easel,—asks himself, "What, after all, was the original motive of this moulding, or of that feature of detail?" he may often start to see how he is forgetting the whole in a too careful study of the parts. The essential value of an exhaustive programme may thus be held to be twofold, both to the architect and to the engineer. First, it should insure exhanstive study, by enumerating every branch of skill and learning proper to the profession. Secondly, it should insure, by the order of its own arrangement, a corresponding order in the mind of the student, and a fit subordination of parts to a complete and perfect whole.

THE CHICKENS LIGHTHOUSE.

THE word "seaside" has for many a prosaic and dull rather than an exciting and interesting meaning. The promenade, the sands, the monotonous lodging-house, or the overcrowded hotel,—these are the first thoughts suggested, we fear, to too many by these two monosyllables. But, as the late Canon Kingsley, Mr. Gosse, and others have conspicuously shown, the seaside teems with never-ending interests, and in its changing scenes the imagination may find the most opposing contrasts, as Wordsworth has well suggested in his fine lines on the picture of Peel Castle, Isle of Man, which was painted by his friend, Sir George Beaumont, for at one time the castle is all peace:—

> "I would have planted thee, thou hoary pile,
> Amid a world how different from this,
> Beside a sea that could not cease to smile
> On tranquil land beneath a sky of bliss."

At another it is seen in all the solemnity of an Atlantic storm:—

> "And this huge castle standing here sublime,
> I love to see the look with which it braves,
> Cased in the unfeeling armour of old time,
> The lightning, the fierce wind, and trampling waves."

It is a building not cased yet in "the unfeeling armour of old time," but with new and solid granite blocks, yet equally unharmed by "the trampling waves," which is the subject of our seaside study. The Isle of Man itself is a somewhat remote spot, and scarcely anywhere on it is it possible to lose sight of the sea. Its southern coast presents bold and lofty cliffs to the sea, and there may be seen here pieces of coast scenery quite equal in grandeur to those Cornish cliffs which we have so recently seen depicted by Mr. Brett's exact brush. Right at the end of this southern portion, and divided from the mainland by a sound some quarter of a mile in breadth, through which the tide rushes, except at the moments of high and low water, with the disturbance of a mill race, and with a hundred times its force, lies another island, the Calf of Man. Here live some rabbits and sheep, the inmates of a single farm, and the lighthouse-keepers' families; and lastly, a spot in the wastes of the ocean, three-quarters of a mile distant from the extreme end of the Calf is the Chickens Rock, and firmly built upon it is the Chickens Lighthouse. This rock had for many years been a danger to navigation, for it rose out of deep water, and was only visible at low tide. Moreover, the neighbouring coast is of a perilous character, with its strong currents and rock-bound cliffs, and many a good vessel has perished on the rocks of the Isle of Man. Accordingly it was determined to erect a lighthouse on this perilous rock, and in 1870 the work was begun by the contractor, Mr. Hunter, from the designs of Messrs. D. & T. Stevenson, the well-known marine engineers of Edinburgh. It was completed in 1873, but it was some time after that date before it was ready for actual use, so that it is only a few years ago that its light began to illumine the surrounding seas. It is true that previously there were two lighthouses on the Calf of Man, erected in the year 1818, whose light was visible for twenty-two miles; but it was found that from the considerable height of the

id above the sea level these lights were by no ans the guide and protection which was sirable in so dangerous a spot. The material the Chickens Lighthouse is Scotch granite, om the quarries of Dalbeattie; the blocks are ge, and are dovetailed one into another, so as their union to add firmness to their resist- ce to the sea. The structure was first of all ilt at Port St. Mary, each stone was then mbered, and was carried in a lighter to the k, a distance of some five miles. But the fficulties of winds and tides made the actual tance more material than had these great cks to be carried on a sea always quiet and ooth, though in this respect the work was not arduous as that in connexion with the Skerry- re Lighthouse, on the western coast of Scot- nd, which is sixteen miles distant from the arest land. When completed, the Chickens ghthouse had cost 88,000*l.*, but it was a work hich in the interests of commerce and humanity uld have been cheap at double this sum.

It is not every day that it is possible to visit ph an uncommon object of the sea-side as the hickens Lighthouse, and it was with no little asure that we lately availed ourselves of an portunity of visiting this important addition the lighthouses of Great Britain. Nor is it ery day that it is accessible, for the rapid es which rush round the Isle of Man become en disturbed by only a moderate breeze fficult and even dangerous for boats, even en manned by men who have known each k from their very boyhood, and the Chickens ck itself, once the favourite resting-place of other Carey's Chickens, lies in the middle of a id rush of the tide, which often makes land- g an impossibility, and at the best of times it nly within two hours of low water that it is ssible to disembark on the rock. Thus, ring the storms of winter the rock is often accessible for three or four weeks together, l the lighthouse-keepers live as much cut off m their homes as though they were imprisoned a distant island in some far-off ocean.

But it was a sunny and tranquil August rning when we set off from the fishing village Port St. Mary in the official boat which every tnight, if possible, conveys provisions to the k. We say official boat, because the Chickens ghthouse is under the jurisdiction of the Com- ssioners of Northern Lights, and is thus garded, from the point of view of the light- uses of Great Britain, a Scotch light. We d a cargo of loaves and beef, many casks of ter, and some of ale, and four men to pull r craft if the wind were unfavourable for sail- g. As we went along beneath the lofty cliffs Spanish Head, and passed the fleet of rring-boats in the calm morning working eir way to sea, a more picturesque aspect of e ocean could not have been desired. In out an hour we put into a rocky cove called e South Harbour, near the end of the Calf, ose surface presented a rich expanse of lour where the hillocks of purple heather were ited to thick, low bushes of the dwarf yellow rze. Here we landed a visitor to the lighthouse- epers' families, and took on board the light- use-keeper whose fortnight off duty had ex- red; for there are three regular keepers, and fourth who is a sort of supernumerary, and ch of these men has to serve on the rock for x weeks, and then he has a fortnight on shore. ounding the cliffs which form the extreme uth-western point of the Calf, an isolated mass rock undermined by the sea, and which is ually known as the Burrow, the tide was rush- g by the rocks like the current of a great river, d the sea around was a mass of irregular and ssing waves. Passing these, we reached the ck where the tide was running past with a strong t a more tranquil current. The knowledge of e boatmen enabled us to make fast in the little rve which forms the species of rock harbour, t the tide was then too high to land, and for while the time was passed in landing provi- ons with a swing rope. For some time after e landing had been effected, we amused our- lves till the putting ashore of spars and em- arkation of empty casks and chests was com- leted by the sport of fishing for what in those arts are termed blocken (*Anglicè*, coal fish,—*erlangus carbonarius*), which at this season of e year appear where the tide is rapid in eat shoals. They agitate the surface of the ater, which appears alive with the heads and ills of fish, and at such times seize greedily on an tificial fly. They looked in the clear deep water hich lapped the rock like a mass of mad fish, they, various in size, dashed over and around each other. The sea presented a cheerful sight: there were some sixty of the herring fleet, with their sober brown sails, some working by the cliffs, others barely visible in the horizon, and here the smoke of a steamer was seen, and there the white sails of a trader going down Channel, and rising above was the graceful gray pile of granite so smooth and yet so strong, and the men cheerfully working at their stores, and around

> "No motion but the moving tide, a breeze,"

that it was not easy to conceive this scene in its other aspect,—the rock deserted, the open- ings to the lighthouse closed, the waves swirling round the impervious pile, and, to quote again from the same admirable poem of Wordsworth:

> "This sea in anger, and that dismal shore."

What, by way of courtesy, may be termed the door, was reached by an iron ladder fixed to the wall, about 40 ft. in height from the base of the lighthouse, which we may observe *en passant* is 142 ft. in height, being the highest yet con- structed, and 42 ft. in diameter at the rock, whilst the thickness of the wall at the entrance door is 9 ft., and at the height of 90 ft. it is reduced to 2 ft. 11 in. Up to what may be termed the basement floor the structure is a solid mass of stone, and afterwards it rises until it is terminated by a bell-shaped summit, the centre of which is one immense piece of granite dovetailed into the surrounding stones, and which forms the middle of the floor of one of the topmost compartments or chambers.

What we have termed the basement floor, or, more properly speaking, the lowest chamber, is wholly occupied by the coal-bin and the water- cistern. The second compartment is entirely filled by the oil-tank. Then comes the store- room, then the kitchen, then the workshop and library, then two chambers, each occupied by sleeping-berths one above another, and then there was the machinery-room, and finally, fixed on an iron stage, was the dioptric re- volving light apparatus, the lamp being sur- rounded by very powerful magnifying lenses more than 6 ft. in height, whilst outside it was encircled by a gallery or iron stage, and the whole being enclosed in what may best be described as a glass house, which forms the top of the lighthouse. The two bells which, when the sea is overhung by fog, sound every half-minute their melancholy note, are placed on a gallery running round and outside the machinery-room. The lenses are fixed in a frame which revolves slowly, so that the light is exhibited at fixed intervals, and the same machinery serves to toll the bells when neces- sary. The machinery is of the same description as that which works a clock, and requires to be wound up every hour, as the rope runs down in that period of time. As a man has to be on the watch for a fog, and to see that the light is burn- ing brightly throughout the night, the short time which the machinery runs is probably no actual drawback. But there can, we think, be no doubt that it would be better if the machinery did not need attending to so frequently, for in some lighthouses there might be fewer men and more duties, and many things might happen which the short time of the running of the rope might seriously affect. It is not out of the range of probability that the keeper on duty might be taken suddenly ill, and that in conse- quence the frame might cease to revolve from want of being wound up at the proper time. But Messrs. Stevenson have added so much to the value of the dioptric plan, and are so skilled in their profession, that the time may come when they will improve this portion of the lighthouse apparatus.

As regards the other portions and arrange- ments of the building, it would be difficult to imagine a more cosy abode under the circum- stances. The men are all supplied with books by means of a circulating library, of which the several lighthouses under the authority of the Commissioners of Northern Lights are the members, and each work, after a circulation from rock to rock, finally finds itself made a permanent addition to the library of some one of the lighthouses. The lot of men in a light- house on a submerged rock such as the Chickens or the Skerryvore, is of course much more deso- late than that of those on the point of some portion of the mainland, and it is somewhat a matter of surprise that means do not exist for housing a boat and moving it to or from the water. It is true that it is seldom that it would be possible at the Chickens Rock to manage a small boat with only a couple of hands, but there are lighthouses being erected on other rocks in other seas, where such an apparatus would be available, and there might be a time when such a boat might be the means of saving human life.

Again, it is becoming an interesting question in regard to lighthouses, but one which we have not space to discuss at length in this paper, whether oil should not be superseded by electricity or gas. The two objects to be aimed at are, cheapness in the cost of the illuminating material and powerfulness to give light, and there can be no doubt that gas has the supremacy over oil in this last point. But here again, a lighthouse on a rock in the sea and one on the land differs, especially as regards their capabilities of being supplied with coal. There is a lighthouse shortly to be erected on Langness Point, in the Isle of Man, the ground for which has already been surveyed, and it is possible that some changes as respects the above points may be introduced into it. But at the same time the Chickens Lighthouse presents the latest and most admirable specimen of the light- house fixed on an isolated rock in the midst of the ocean, and when we consider how much work in the erection of lighthouses there is to be done in the British Colonies, and on the coasts of many countries, it would be difficult to point to an example more worthy of imitation. For no work could be a greater success, both as regards the manner in which its construc- tion was carried out, and its actual structure, considering the purposes for which it is in- tended, than the Chickens Lighthouse.

When the survey was completed, and our boat was laden with its cargo, and the keeper whose fortnight of leisure had arrived was on board, we left the rock to its four inhabitants, and in an hour or two the low beams of the western sun were glittering on the rising tide, and there was nothing visible but the silent gray pillar encircled by the waste of waters, the lessening sails of the fishing-boats, and the cormorants flying low over the evening sea.

RAILWAY COLLISIONS AND THEIR PREVENTION.

ONE comfort may be drawn, by way of assurance as to the future, from the disastrous collision at Sittingbourne on August 31, followed as it was by a no less alarming, though happily a less disastrous, error at Princes Risborough within six hours; and, indeed, by nearly daily misfortune since. We need not refer to the comparative immunity enjoyed by the railway traveller from such wholesale slaughter as that of which the Thames has just been the scene. The thirty-six passengers, and twenty-eight rail- way servants, killed from causes beyond their own control on the railways of the United King- dom in 1876 bear but a small proportion to the terrible sum total drowned off Woolwich. Even if we add the 1,481 cases of reported injury, many of which may have been comparatively slight, we shall find that the proportion is but one injury to every 430,000 passengers. But statistical comfort is but poor consolation. Relative safety, no doubt, is a matter important to study. But what the traveller demands is absolute safety, so far as it is within the range of human forethought and human care to insure it. As to that, then, we can speak with some certi- tude. The means which have been invented, and to a great extented adopted, for the prevention of such collisions as those in question, have never yet been known to fail. Where these catas- trophes have occurred has been precisely where these means have not been applied. We refer, of course, to the system of interlocking points and signals. The interlocking system, and the block system, though usually combined, are, as our mechanical readers are aware, entirely different things. It so happens that, on the English rail- ways, to the end of 1876, the proportions of signals and points interlocked, and of lines worked on the block system, were the same, viz., 69 per cent. But in Ireland, at the same time, 25 per cent. of the points and signals were interlocked, and only 2 per cent. of the passenger railways are worked on the block system. It is of the mechanical arrangement that we now speak,—that rigid connexion of the points and the signals which automatically show when the line is foul. The whole of the London, Chatham, and Dover line is worked on the block system. But only 57 per cent. of its points and crossings were, at the date of the last accessible returns,

interlocked. Here, then, lay, we do not say the cause, but the reason of the absence of prevention, of the collision of the 31st ult. We observe that the experience of Lieut.-Colonel Rich has enabled him to call the attention of the jury to the subject. The railway company have also shown that they appreciate its importance, as the application of an interlocking apparatus to this very station had been resolved on by the directors.

It is certain that what has hitherto proved a very fertile cause of railway catastrophes may be prevented; and has, to the extent of 57 per cent. on one English railway been obviated, by the interlocking of points and signals. It is not, of course, to be pretended that absolute safety is ensured to the traveller by their universal adoption. The case of the rupture of a tyre, for example,—happily becoming extremely rare,—is thus not to be met. But it is an undeniable fact that collisions, as a rule, are rendered all but mechanically impossible by a contrivance that shows the driver of an engine, at an adequate distance, the actual state of any switch that he is approaching. It is, there can be no doubt, to the interest of the railway companies themselves that the system should be made imperative. The chairman of one of the oldest and best-managed railways in the kingdom said the other day, at the half-yearly meeting, that the expense of 14,000*l.* to which his company had lately gone in providing this kind of fitting would save them 1,000*l.* per annum in wages. When we come to the money cost of an accident (independent of the graver cost in life, limb, and human suffering), it is plain that that would be a beneficent compulsion that should improve the application of the interlocking system to any railway point that could in any way affect the safety of the passengers. London, Chatham, and Dover stock fell 2 per cent. on the announcement of the accident.

Under ordinary circumstances, we might look with confidence to the Government to introduce a Bill to render imperative the interlocking of points at the very commencement of the next session of Parliament. But it must not be forgotten that there is, already, a certain tension existing between the Board of Trade and the railway companies. The attempts made by the former, on more than one occasion, to obtain information that would throw light on the value of the mineral traffic have remained to this hour without any result, so far as the public are aware. Nor must the weight of the railway interest in Parliament be overlooked; or the high probability that that interest will resist to its utmost any compulsory measures, however much they may be to the advantage of the companies, as well as of the public.

We, therefore, express the hope that some independent member of Parliament will take the matter in hand, and ensure to himself that degree of public gratitude which should always attach to the prevention of preventible mischief to human life and limb. It would be difficult to oppose the proposal that, after a certain date, the use of non-interlocked points and signals, on a passenger line, should be an offence punishable by a definite fine per day. Arguments could not fail to the proposers and the supporters of such a Bill. The Board of Trade could hardly hesitate to throw the weight of their recommendation in its favour. The public would receive the proposal with acclaim. The companies would be the richer for its enactment. Who will be the patriotic member who, amid the cool breezes of Scotland or of Norway, will devote a portion of the leisure of the recess to the drafting of a short Bill to the following effect?—

"Whereas it is ascertained that collisions on railways arising from the mis-direction of trains may be for the most part prevented by the interlocking of points and signals, Be it enacted that from and after the *first day of January*, 1880, any railway company that shall have or use any point or switch connected with a line used for passenger traffic which is not interlocked with a proper signal, shall be guilty of an offence against this Act, and shall forfeit the sum of *Five Pounds* for every day during which such switch shall remain in position without such interlocking. The penalty to be recoverable summarily before a magistrate, and to be devoted, half to the informer, and half to the funds of the nearest hospital."

A brief measure like this would add an honourable repute to its proposer, and form a great safeguard to the travelling public.

DOUGLAS, ISLE OF MAN.

A SMALL island naturally is the last place usually affected by the improvements of modern times, and though the town of Douglas is becoming rapidly modernised, the other three towns of the Isle of Man still retain much of the quietness and the simplicity of which their characteristic feature.

Ten years have made great changes in the town of Douglas, but, whilst naturally improved by the various alterations which have from time to time taken place, it is quickly losing the quaintness which was one of its chief attractions in the eyes of the stranger. It is possible to find promenades and showy hotels in dozens of English towns, but it is not so easy to find a town which possessed the picturesque and quiet attributes of Douglas a few years ago. It was nestled in the southern corner of the bay, where the Douglas stream joins the sea beneath the precipitous head, with its houses rising on the slopes of the hill, whilst a fine bay two miles wide swept round to the north till it was closed in by the rocks of Bank's Howe. The situation of Douglas is, in fact, remarkably fine, for the two cliffs by which the bay is guarded, its graceful form, and the sloping background ended by the chain of hills from which Snaefell rears itself, with a foreground of unbounded sea, make a noticeable feature.

The town itself was ugly taken piece by piece; it presented no single admirable architectural feature, and its narrow, ill-paved streets, its ship-lined quay, were not in themselves actual objects of admiration. But it was the town taken as a whole which was attractive, there was a quaintness and a quiet dulness over it all which carried the sightseer back to less bustling times and habits than those with which we are now acquainted. But this is all being changed, and though the actual piece of harbour at the mouth of the Douglas about which the blue jerseyed seamen stroll, and which the low houses and small shops of the quay face, still preserves something of the past, the town itself is rapidly being transformed into the semi-fashionable watering-place with all the usual modern characteristics. This, as we have said, is not to be wondered at; from the point of view of the inhabitant and of the sea-bathing tourist the change is desirable; but those who like from time to time to light upon spots where a not dull monotony prevails suitable to the surrounding scenes, will regret the transformation of the little seaport into the "salubrious watering-place" of the nineteenth century. But the natural attractions of Douglas are so considerable that it is of interest to note how they have been utilised by the architect.

For a great many years a road has run along the edge of the bay from the northern end of the town, properly so-called, until it reached the curve where the northern headland commenced, where it ascended and crossed the hill. This road, running almost on a level with the shore, has had above it detached houses and gardens. But when the town itself was noticed, it was to be observed that the main street, or rather lane, ran at some little distance from the bay, through the centre of the lower part of the town; and backs of small houses presented themselves to the sea from the old pier, completed in the year 1800, which forms one side of the extreme seaward end of the harbour, to the spot where the main street debouched into the open and formed the road of which we have spoken. The Town Commissioners and their architect have, we are glad to say, actually taken notice of the remarkable advantages presented by this sweeping bay, advantages which few if any of the watering-places present. Contrast the monotonous stretch of Hastings and St. Leonard's, the dreary plain of sand on which that northern favourite, Southport, is placed, and others which could easily be called to mind, and it is obvious that the improver of Douglas has a long natural start. Beginning from the base of the new Victoria Pier, which runs out parallel with, but considerably beyond the old pier, the houses have been demolished, an embankment formed, on which a broad roadway and footway have been constructed, and the entire bay is, with the exception of the rocky headland at the north, lined by a road which bends with the curve of the bay. The idea is simple, it is not an improvement on, but merely a recognition of, nature's own work, and is naturally, therefore, quite successful. It is now only requisite that the structures which are to face the sea should be built on a clear principle,—they should be simple and substantial, not breaking the fine natural lines of the place, but harmonising with the breadth and simplicity of the general scene. At present, however, the prospects of such a consummation do not seem bright. The houses already built are stuccoed brick buildings, which are dreary to the beholder, and want both the appearance as well as the characteristics of solidity. For the Victoria Pier, stretching out so as to lengthen the harbour, is a bold and solid structure, and the breakwater, whose concrete blocks slowly but gradually emerge from Douglas Head, so as to protect the harbour from the easterly gales to which it is exposed, is of the same character. Moreover, the chief building of Douglas is an excellent example to be followed. In the centre of the bay, backed by trees, rises what is now called the Castle Mona Hotel. It was, however, constructed by the late Duke of Athol, then the ruler and proprietor of the island, as his residence, and one may say Royal palace, for here he held a miniature court. It cost nearly 40,000*l.*, and is constructed of white freestone, from the Isle of Arran, to which time has given a mellow grey tone. From the centre rises a circular embattled tower. The main portion is absolutely square with a wing on the south side, attached to which is a handsome portico. Here we have a building solid and simple, whereas when we come to the next large building of the town, the Peveril Hotel, which has been erected some eighteen months, and faces the open "place" which forms the root, so to say, of the new pier we find a large, square, dirty white stuccoed building, simple even to ugliness, and looking,—compared to the Castle Mona,—both common place and weak.

Joint-stock companies, whose main aims are high dividends, cannot perhaps be expected to regard either beauty or durability, but when we contrast this building with the fine and simple front of the London and North-Western Hotel at Liverpool, the solid and homely white brick front of the Adelphi Hotel, which the proprietors have recently added, much to the improvement of the great northern seaport (both built by companies), and many other similar buildings, a feeling of regret arises that the almost unique site presented by the shores of the Bay of Douglas should not be graced by architecture worthy of the natural opportunities. But as is the beginning so is likely to be the end of the new buildings in Douglas, and we may expect the architect to behold them and be thoughtful when he notices how, as soon as men were left to their own devices and were unaided by the gifts of nature, their works were poor and ugly. For there can be no doubt that with the roadway round the bay graced with solid structures, and the chief streets of the town gradually built so as to run at right angles to it, so as to give views of the bay at one end and of the inland hills at the other, with the heights outside the town, sprinkled by the white houses, the town of Douglas would be a worthy object of pride to the inhabitants of the Isle of Man. For it is certain that where nature, so to speak, has laid out the plans, the builder should so far as possible harmonise his designs with hers; when the town-maker of to-day has an absolute *tabula rasa* before him, as is the case in many seaside towns, there he must rest wholly on his own resources. The beauty of the Bay of Douglas must be acknowledged by the most careful seeker after the picturesque; its small harbour and squalid town used to recall to the stranger the times and manners, the smuggling and the semi-independence, of a past age. The possible improvements of to-day should have added to the charms of nature the grace and brightness of civilisation, but when one gazes on the stuccoed houses which are beginning to spoil the new embankment, and the crowds of rough and vulgar "trippers," whom the inhabitants regard as their best customers, one is inclined to think, in regard to them at least, of the old and not very complimentary Scotch rhyme:—

> "When Sathane tried his arts in vaine,
> Ye worship of ye Lord to gain,
> Ye yird, he said, and all be thine,
> Except ane place, it maun be mine.
> Though bare it is, and scarce a span,
> By mortale called ye Isle of Man.
> That is a place I cannot spare,
> For all my choicest friends are there." *

* "Irvine's Historiæ Scoticæ Nomenclatura," Edin. Edit. 1682.

THE PAST AND THE FUTURE OF ART-LABOUR.

IT would be hard indeed to find a subject matter of more immediate interest in the whole range of art than that of "art-labour," as it is at times termed, though the term be somewhat misleading. It would be equally difficult to find it treated in a more delightful and attractive way than it was by Mr. Gladstone at the distribution of prizes at the Hawarden Flower-show. Art-labour, or art-work, in the antique times, was not as what is termed "labour" now is, nor was it "work," as now understood by workmen. It then meant the work of the brain and the hand together in the same individual,—artist and workman. The subject, therefore, though so old, is new,—so new indeed that a detailed definition is all but necessary to make its real meaning and import clear. No art question can be more important than this, for in it is involved the main difference between the past and the present, as far as art and fine art are concerned. How far off the "future, in our present sense of the word, may be, is indeed a question.

It must be needless to say for how long a time we have urged on the attention of those most interested in it, and on the outer world, the importance of this great subject. So new in its details nowadays, but as old as the very hills themselves, if we but look a little out of the present, and into the past. We say as old as the hills, and we may well affirm this literally, for the art and handcraft of the workman of even that so far-off time have been, and are, found buried deeply in the very substance of the hills themselves, as at Troy, and places round about. So that of the *antiquity* of this art hand-work, and of the fact of the then actual presence and living action of the *workman as an artist*, however rude the character of the work he has left us, there can be no doubt. Indeed, we might go far beyond this even, and make note of the art-workman's power of eye and hand, coming from dates far beyond all written or even traditional records. But enough for our purpose is it to note the precise action of the art-workman of the simply "antique" days;—the Etruscan and Greek workmen, and their "skill of hand," and of which we may readily, in the British Museum, see so many proofs, though they be but a small fraction of what they actually did.

But Mr. Gladstone has touched as well upon a very momentous item indeed of this great subject, —at one time so all important; and it is that of the tendency of the time that now is to neglect this power of hand, and to pass it by if possible, and to devote attention to what are called "intellectual pursuits," and to look down with a certain amount of contempt on manual work, or work done with the hand. Indeed, might we not almost say that the whole tendency of things nowadays, and in this special generation, is to avoid it, and to hasten the time when this hand-work and manual power shall give way to the all-powerful machine, the workman then simply looking on, and seeing that all goes on as it should do, and without pause or mishap. And, as all know, in not a few "trades" the machine has entirely triumphed, and the "human machine" has simply disappeared! the proud boast of very many, indeed, being that this "division of labour" and power of machinery are competent to all things, and must needs eventually prevail. This was Cobden's idea, and he admitted once on a time to us that he had never considered the modern giant-power of machinery and the mighty potency of the "division of labour" from a "fine-art point of view" at all! It is, however, really so obvious a thought this that we might almost ask pardon for naming it here; but though so obvious it is but very rarely made note of. We might refer to the momentous fact that all the great art of the world, no matter where it is, has been the result of the very hand of the artist as well as his head; and that had the great artist-workmen of past days deputed other hands to do the work which they did themselves with their own, we should never have seen, to wonder at, what we now do. All would have been, as such work now is, mechanical and machine-like in structure; all its details would have been alike, and one side the mere repetition of the other. Not that this principle of mechanical copyism is quite new: far from it, it was often thought of, and sometimes attempted; and there are even,—and we could point them out,—examples of it. One sufficiently famous instance of at least a trial of this easy system of art-work was, in Michelangelo's attempt to get assistance in the painting of his world-famous ceiling. It is odd, indeed, that he should have thought for a single moment of it; for, if ever there lived an artist endowed with exceptional and all but superhuman powers of his own, it was himself, with his all-wonderful individuality! How, then, could he be helped to paint any more than to invent?

There is a very noteworthy remark, too, in Mr. Gladstone's address which might well furnish matter for many pages of comment on it. We refer to the complaint that there is a great deficiency of "art hand-labour," especially in this country. We are urged to go into the study of any sculptor in London, and it will be found that the sculptor, probably an Englishman, is obliged to have many assistants, for much work on the marble is required before the final finish comes, needing the actual hand of the artist himself. But these men even are not of English race, but foreign, Italians and French mostly. And why is this, may we ask? Why should our native artists be thus driven from the field? It cannot be said that there are not enough of them: witness only the number of Academy student sculptors, of whom we might say much, and much too, and more, on the system of teaching them in vogue. But in numbers certainly they are not deficient, nor, as we take it, in power or capacity, if only they be not asked to do work beyond their nationality, if the expression may be allowed. A vast field is here, indeed, opened out for improved methods, and it is melancholy indeed to be cognisant of the fact of the loss which art, and certainly architecture, suffers by the present, to say the least, imperfect system.

Again, needlework is mentioned, and attention is called to *embroidery*, which, it is contended, rises into a high art as it grows and advances. Needlework is now, as all know, the worst paid of all labour; but once raise it, Mr. Gladstone says, to a high-art standard, and it must needs become very well paid. A painful subject this almost, when we come to think for a moment of the magnificent sculpture which has but copied and perpetuated in enduring marble the thought and skill of those who thought out and designed, and then worked with needle and silk: the work of artist needlewomen,—of barbaric times even,—surely of Gothic days, and of the days of the magnificence of Venice. It is really grievous to think for a moment of how much of ever-living art and ever-visible art is lost to the world by the neglect of this most beautiful and graceful art, and by those who might, if they would, do so much with it. It was not, be it remembered, the imaginative power only of the sculptors and painters of the great past that urged them to their best work, and inspired them; but it was, after all, as in Venice, the constant presence before them of a noble fine art, in actual and living action, in costume, and all else, and of which this very needlework and embroidery are but exemplars. We see in it what can be done and what may again some day be done when the conditions of things and surrounding influences foster and duly encourage it.

How many lessons, therefore, are suggested to us, and to be drawn from this address, thus calling attention to what there is yet to do, and to the boundless field before the artist-workman of the future. We here can but touch on so wide and full a subject, and can but hope for a future fuller than the present of that which made the past so notable and enduring. In the main it was, there can be no doubt, the simplicity of the means employed, and we had almost said the directness and fidelity of the copying power. The magnificence and attractiveness of the old Venetian senator's robe of office, or that of the Doge himself, was not to be made more attractive, or eye and mind filling, by even the skill and genius of the best of the great painters of Venice. He painted but the material and the forms before him on more or less enduring canvas, not destined, happily, to so speedy a wearing out and destruction as the robes themselves, costly as they were, but destined to transmit to a distant future the memory of them in form and colour, and to picture to us those who wore them. But the art originally was that of those who thought about and worked at the material itself; and surely, as Mr. Gladstone remarks, it would be hard to say to what the following out of such a mode of doing art-work or labour might not in the future lead, or how profitable indeed it might not be made to be.

THE LATE MR. DAVID COUSIN, ARCHITECT.

INTIMATION has been received from Sans Souci, Louisiana, in the United States of America, of the death of Mr. David Cousin, on the 14th ult. Mr. Cousin, until about two years ago, held the office of city architect of Edinburgh, and also carried on an extensive private practice.

For several years past Mr. Cousin has suffered from heart disease and neuralgia, and to obtain relief has been in the habit of spending the winters at Mentone, Algiers, and similar resorts of invalids. Latterly he gave up practice entirely, and went to the United States, where he expected to find a climate suitable to his constitution; but the extreme heat of the past season proved too much for his strength, and reduced him to a state of prostration, from which he never recovered.

Mr. Cousin was in his sixty-ninth year, and has left a widow (his second wife), but no surviving issue. His father was a joiner in Leith, and with him he acquired the practical knowledge which afterwards proved most useful to him. In the early part of his career he exhibited a predilection for mathematics, and when still under age he entered the office of the late Mr. Playfair, then *facile princeps* architect in Edinburgh. When in the service of Mr. Playfair he assisted in the preparation of the plans for Donaldson's Hospital, the largest of Playfair's works, and also in the designs for the National Gallery, about the latest work by that architect. The influence of Playfair can be traced in the works undertaken by Mr. Cousin in his after-career. His happiest efforts are Classical in style; and when he did design after the Gothic manner, his bias was towards its later developments, as practised by his master.

When Mr. Cousin had attained the age of twenty-two years, he ventured to set up as an architect on his own account, and, like some other young architects, he owed his successful career in a great measure to his having been first in a competition. The competition in question was for the West Church at Greenock, and he was also the successful competitor in a competition for the parish church at Cambuslang. From these beginnings he came into some practice as a church architect, and soon afterwards received commissions to design Kingston Church, Glasgow; Olrig parish church, and Caithness Church, in all of which he showed his predilection for Classical models.

Mr. Cousin took a keen interest in the controversy which resulted in "the Disruption," and the formation of the Free Church, taking part with the Dissenters. The emergency called for the erection of numerous new churches. A scheme was concocted having equality and fraternity as its basis. All the new churches, although differing in size, were to be similar in style and unpretentious in appearance, and Mr. Cousin was appointed by the Free Church to furnish a series of suitable plans for churches on the cheapest possible model. This he did, showing how churches could be built at 16s. per sitting. In the emergency this was hailed as a masterpiece of ingenuity, and numerous churches were erected according to the published plans. Very few indeed of the original structures remain, for the Free Church, having succeeded far beyond the most sanguine expectations, abandoned the original ideas of primitive simplicity, and has since become very ambitious in the matter of church accommodation and adornment. One of the first of the original Free Churches abandoned by the congregation was Free St. George's, Edinburgh, and Mr. Cousin was appointed architect for the new edifice, which he designed in the Norman style. This church was erected in Lothian-road, and was afterwards taken down to make way for the extension of the Caledonian Railway Station, and re-erected at Stockbridge, having a tower added to it which did not form part of the original design. Another church, St. Thomas's, Rutland-place, was also designed by Mr. Cousin in the Norman style. The style as treated by Mr. Cousin does not exhibit the muscularity of the ancient examples, his classical training leading him to impart to it a degree of refinement which it will hardly bear if the original characteristics are adhered to. Mr. Cousin was requested by the Free Church

authorities to furnish designs for their new college in Edinburgh, but Mr. Playfair was ultimately chosen as architect for the building, which now forms a conspicuous object in the city.

Of the other designs in Edinburgh by Mr. Cousin we note the Corn Exchange, Italian in style, and the slaughter-houses with Egyptian façade. In the planning of this latter building Mr. Cousin bestowed great pains, visiting similar structures in Paris and elsewhere on the Continent that he might gain instruction; and the completed buildings fulfil the requirements so well that they have formed the model for other similar structures. The Corn Exchanges at Dalkeith and Kelso are also the work of Mr. Cousin, and in them he has adopted the latest or Tudor style.

Amongst the other buildings designed by Mr. Cousin are the parish church of Roseneath, Oban Free Church, the Combination Asylum at Lochgilphead; St. Catherine's Convent, Lauriston Gardens, Edinburgh; University Musical Class-rooms, Edinburgh; and a large and conspicuous circular mausoleum (Norman in style) in the Necropolis of Glasgow.

Mr. Cousin was also employed in renovating (not restoring) old Greyfriars Church, Edinburgh, and the nave of St. Giles's Church, which is used as a separate church. He was successful as a landscape-gardener, having laid out the grounds of the East Princes-street gardens, and the Warriston, Dean, and Newington cemeteries, Edinburgh.

Mr. Cousin, in combination with Mr. Lessels, carried out the plans for the City Improvement Trusts of Edinburgh, and one of his most successful efforts is the elevation for the finest street embraced in the scheme,—Chambers-street; but unfortunately, the requirements of those who have taken building sites in the line of the street have necessitated the abandonment in part of the original design, which was conceived in a manner combining utility of style with variety of treatment.

Mr. Cousin, from his official position, was to some extent precluded from taking an active part in political and other public questions, but in everything bearing upon the art which he practised he took a lively interest. He was one of the originators of the Scottish Architectural Institute,—an association from which he looked for happy results; but these, from causes which it is unnecessary to state, did not follow, and the Institute is a thing of the past.

AN IDLER IN PARIS AND ITS SHOW.

AFTER thoroughly studying and enjoying the exhibit which belongs to Messrs. Duplau and G. Hamot, of the Rue Richelieu, we pass on and spend a short time at Messrs. Braquenié & Co.'s, of the Rue Vivienne. Some of the tapestry subjects are taken from originals in the Louvre. The well-known picture of Charles I., by Vandyke, has been reproduced in that fine work. He is standing with one hand resting on his hips. In the back-ground, which is a landscape, a retainer is holding his horse. This picture, for such it deserves really to be called, has been purchased by Mr. Isaac Pereira. "The Harem," after Van Loo, is also a remarkable piece of colouring, as well as the "Doge's Palace," an Italian scene after Genty.

Braquenié, of Malines, has also contributed some fine specimens, notably two destined for the "Guildhall" of Brussels. One is "Le Serment des Escrimeurs" and "Le Grand Serment de l'Arbalète."

Beauvais gives us subjects from fables such as "The lion become old," "The wolf turned shepherd," &c. The tapisserie-savonnerie, manufactured at Belleville, the most Republican part of Paris, is not to be passed over, as it inaugurates a new style. The pile is raised, and has a soft, velvety look. The principal subject in their collection is a landscape.

I thought, before giving myself up to a happy hour in Austria, I would glance at the very magnificent glass exhibit of Bacarat. As I before observed, the grant of 20,000 francs per annum enables this manufacturer to offer objects of art to the public entirely out of the reach of private manufacturers. Of course the most striking object (however little it may be in accordance with the taste of many) is a temple to Mercury in solid glass. "It has an open cupola of flying spandrels, each a solid curved beam supported by massive, though light and graceful, columns. Mercury in a flying attitude is poised,—caduceus in hand,—on a rocky eminence. This figure and its pedestal are in bronze, frosted to resemble silver. The whole architectural portion of this temple is of crystal, translucent as water. A balustrade in glass also surrounds it, and on its edge at given distances rest crystal urns full of flowers. There is also an inner ledge inside the balustrade to make a parterre of flowers of. The cost of this temple is estimated at 4,000*l*. The remainder of the glass exhibit is very fine. The cutting, the engraving, the enamelling, are brought to a pitch of perfection that only our own remarkable show can vie with. There is in Bacarat a dessert-service consisting only of eleven pieces, and valued at 800*l*. Two vases of blue crystal enamel, with garlands of Cupids in bronze, are valued at 400*l*. each; two others in white glass, "lined" with purple, and engraved, the same price. Two elephants form a liqueur-stand.

There is a perfect canopy of chandeliers over our head, of wondrous design and brilliancy. We gaze amazed at the monumental looking-glasses of St Gobain and Jeumont. There are also very interesting exhibits of Clichy, Pantin, Sèvres, of private individuals, and of "gobleterie," lustres, laboratory apparatus, windows, lighthouses, &c.; but knowing how valuable your space is, I feel I must glide lightly over all these subjects. The principal centres of the manufactures are in the department of the Nord, the Aisne, Meurthe and Moselle, the Rhone and Loire. Paris is the great market for the sale of all the production of all kinds of glass in France, which amounts proximately to 105,000,000 francs, of which 35,000,000 francs' worth is exported.

Remembering the proverb about "all work and no play," we amuse ourselves before passing into Austria by giving a look at more frivolous things. The section where all the artificial flowers are exhibited is very pleasant. They are arranged so artistically, and vie in their bloom, and form so wonderfully with nature, that had the glass cases been open I should have been tempted to bend down and smell the bunch of Gloire de Dijon roses that was especially perfect; and even a little white flower, perfumed with the natural odour, that was placed in my hand as I passed, deceived me. Every plant of our own Europe, the palms and cacti of the tropics, make this spot a little bower of repose and delight. We wander away from this to what is very artificial, though in the manner it is arranged, without making a very bad joke, it might come under the head of the "Decorative Arts." And that is the hairdressers' exhibit, and which is as instructive as amusing. And when I tell you that there was a meeting the other evening of hairdressers from all parts of the world, organised by the syndical chamber of merchant hairdressers, when, at a given signal, the Turkish March was played, and each one manipulated some especial style on a dummy head, you will understand that it is evident this "art" is looked at in a more serious light than with us. Well, M. Caurse, artist to the Comédie Française, gives us a perfectly historical *resumé*. In the middle of his glass case is a pretty wax head of Madame de Fontanges, powdered, patched, and rouged in the fascinating style that only the marquises of that date (1680) could manage. Then we have a coiffure of Madame de Sévigné; a postilion's wig of the reign of Louis XV. Then we see how people did their hair during the "Reign of Terror" (1792); then in the Restoration (1825); and so on till 1843. The next exhibit is M. Loisel's, a theatrical hairdresser. In his case there are wax heads of Nillson as *Ophelia*, Celine Chaumont, and others, and underneath their photographs and autographs with some such speech as "Bravo and Thanks." A very slight look at these exhibits is sufficient, and then we devote ourselves to Austria-Hungary, as it is called now, and certainly that nation may well be proud of the high place it has taken, most especially in the Fine-Arts department.

We turn at once to the most magnificent historical picture of the Exhibition. The "Entry of Charles V. into Antwerp" ("L'Entrée de Charles Quint à Anvers"), by Mr. Hans Makart, a Tyrolian by birth, a professor at Vienna,—a pupil of Piloty's, and who is not yet forty years of age. On this immense canvas the artist spreads before us the incident actually (for if you retire further away and look through the heavy velvet *portières* between the two rooms, and which then hide the gilt frame, the whole seems instinct with life), and we also are at Antwerp looking at the Emperor as he passes. I should like to try and bring the scene distinctly before your eyes. Charles V., splendidly attired, young,—for I fancy the date of this entry must be between 1518 and 1520, though without referring to some history I cannot be sure,—but remarkable for the serenity and majesty of his presence, is on horseback, advancing towards us. With one hand, the left, he slightly reins back his horse; the other, the right, is extended towards a lovely little boy, evidently, from his gorgeous dress, of noble family, who is holding towards him with one hand a bunch of flowers, whilst he leans against his mother, a very lovely woman. Charles V. is preceded by a bevy of very beautiful young women, in the lightest of costumes, for they are merely draped in veils of gauze. These Bayadères of the North hold in their hands the insignia of royalty, and large branches of plants. On either side the halberdiers and soldiers help to keep the passage clear from the crowd that press on each side. Tribunes and houses are wreathed and dressed with fruits and flowers, and crowded with "fair women and brave men" cheering, waving hands, smiling; Charles's own court follow behind him. Each group has its separate significance, and yet each blends harmoniously into one perfect whole, like the tones of an organ. Over the whole of the Vandyke and Rubens-like tints a golden light seems glowing, as of sunshine. I have heard this tint found fault with; but I have observed the same effect myself on a summer's day. They say some of the lovely faces in this work are drawn from the great beauties of Vienna.

It is said there is no account in history of this gorgeous pageant, but I heard on good authority that Albert Dürer mentions it in a letter; and though the sort of masque-like look the scene bears gives it a tone of unreality, I think that Shakspeare describes something of the same sort in "Henry V.," on his return to London.

ANCIENT RECLAMATIONS.*

A VAST period of blank succeeded the departure of the Romans. Nothing seems to have been done till Norman times. The first work then appears to have been the reclamation of Deeping Fen by Richard de Rulos, in the time of Henry I. Between the years 1248 and 1569 we read of various inundations in consequence of the defective state of the drains and banks. The establishment of a Court of Sewers did something towards improving matters; and we are told that in one case a defaulter was placed in a breach in the sea walls and built in. This reminds us of the dwarf who stopped the hole in the drain at Haarlem with his body, observing that "little people sometimes do great things." In the time of Elizabeth, and more especially in those of James I., commenced the real work of draining the fenlands within the ancient Roman walls. The latter monarch proposed to drain Deeping, Spalding, and Pinchbeck Fens, Thurlby, Bourne South, and Crowland Fens, and it was agreed that Thomas Lovell should undertake the work. Nothing, however, seems to have come of it. In the year 1638, Sir William and Sir Anthony Ayloff made another attempt, and seem to have succeeded fairly well, but owing to the disturbance of the civil wars the country people seized the lands, and the works were neglected.

In the year 1630, Sir Anthony Thomas undertook to deepen the cuts leading to the natural outfall at Wainfleet, and to the artificial over at Boston. This he seems to have executed so satisfactorily that not more than 1,673 acres remained under water. The east, west, and Wildmore fens were finally drained by Mr. Rennie, in 1801, 1803, and 1818, by adopting the Roman system of separating the inland from the fen waters by a catch-water drain. The works have not, in the result, proved wholly successful, and in 1867 an Act was obtained for putting up pumping machinery for draining the fens.

Looking to the south of the river Nene on the map, we notice the great Bedford Level, the history of which is one of the most important in the Fenlands. In the year 1650, in the reign of Charles I., a Dutch engineer, Sir Cornelius Vermuyden, undertook this great work. He seems to have been an eminent man in his calling, and has furnished Mr. Smiles with one of his most illustrious examples of "Self-Help." By his bargain he was to receive 95,000 acres of the reclaimed land as his reward. The obstinacy

* By Mr. J. W. Grover, F.S.A. See p. 907, *ante*.

nd insular prejudice of the fenmen, however, ere too much for him, and his contract was nnulled. At this time, however, Providence ut it into the heart of a great English noble- an, Francis Earl of Bedford, to come to the escue. Thirteen gentlemen joined him, and he Adventurers, for so this company was called, ade Vermuyden their engineer. The old Bedford iver, Sam's Cut, Sandy Cut, near Ely, Bevill's eam, Peakirk Drain, and Hill's Cut were the hief drains made, and others were deepened nd improved. In the year 1637, at a Session f Sewers held at St. Ives, the level was declared rained, and the 95,000 acres were adjudicated. t appears, however, that the decision was pre- nature, for the works were proved ineffective; nd we find the king declaring himself the ndertaker of the new works which were found ecessary. Before he had done much, the Civil Vars broke out, and the work was stopped. he works he actually accomplished were a ank on the south side of Morton's Leam, ex- ending from Peterborough to Wisbech, and a ew river about two miles between the Horse hoe and the sea below Wisbech.

Wells, in his history of the fens, speaks thus f the character of the Earl of Bedford:—"He as a man of a noble and purely gifted mind; e stood high in the counsels of his sovereign; as the owner of extensive fen possessions; nd, above all, was the friend and neighbour of he fenmen. A more striking instance of self- evotion to the wishes of the people and the eal benefit of the State appears not upon the ecord of history." It is sad to find that his abours terminated in "a tremendous pecuniary acrifice, and base ingratitude was destined to e his ultimate and only public reward." Such, las! is too commonly the fate of all great ublic benefactors, no less in the nineteenth han in the seventeenth century. During the ommotion of the Civil Wars, this great and ood man died, and he was succeeded by his wn son William, who inherited his titles and his irtues. He concluded a treaty with Vermuy- en, and fresh operations were commenced. he various banks, sluices, and drains then xecuted formed the most important works which have been executed since the times of he Romans. After four years' labour, in 1653, uring the period of the Commonwealth, the Association saw their engagements completed, nd were adjudged their reward. Thanks- ivings were offered up in Ely Cathedral, for he completion of an arduous undertaking which, rom its first inception by Francis, Earl of Bed- ford, had occupied twenty years. For a few ears nothing seems to have been done, but in 657 the common people of the fens, conceiving h dislike to the works, proceeded to demolish hem, and were only kept in order by a special proclamation from Charles II. In 1663, how- ever, an Act was passed by which the original Association, consisting of the Adventurers and Participants, as they were then called, became ransformed into a Corporation for governing he Level, this Corporation consisting of "one governor, six bailiffs, twenty conservators and commonalty, with necessary powers and clauses." In 1697, this Bedford Level Corpo- ration divided its territory into three districts: he Middle Level, from Morton's Leam on the north to the Old Bedford river on the south, nd having Huntingdonshire on its west and Marshland on its east, contained about 120,000 cres; the South Level, extending from the northern one to the Upland country, contained bout 173,000 acres; the North Level, from Morton's Leam to the river Welland, covering ome 48,000 acres. After the completion of his great work and the rescue of a province from he waters, Vermuyden's name disappears from he history of the Fenlands, and, like most great benefactors of the world, in the general good he seems not to have participated. It is said he died in poverty,—some say in the workhouse, but this has been contradicted. It is certain that he mortgaged all his property to pay his army of Dutch labourers; and he not only reaped no reward, but had an action brought against him by the Bedford Level authorities, and we find him afterwards petitioning Parlia- ment for redress. Amongst others employed under him we find a number of Scotch prisoners who had been captured by Oliver Cromwell at the battle of Dunbar, and also some of the Dutch prisoners taken by Blake in one of his engagements with Van Tromp. One of his sons, it appears, was a colonel in the Parliamentary army, and one of his daughters, Caroline, mar- ried a Mr. Thomas Babington.

It is sad to find that great benefactors of mankind do so little for themselves. It is an old and true saying, "If you do pioneer's work, you must expect a pioneer's fate." I suppose it must ever be, whilst human nature remains as it is, that no great work is to be accomplished without the sacrifice of some great man, generally the originator, in its execution. It has been fashionable amongst some writers, who should know better, to criticise the works of this truly great man severely,—he did so much that people think he might have done more. There is a good French proverb, "*Le mieux est l'ennemi du bien*," and this really explains the controversy. In dealing with works of internal drainage it is impossible to foresee all the events which may arise in coming centuries; all we can say is, that Vermuyden did what he did well, but he left still room for posterity to improve on his labours.

The waters of the Level were not discharged by the Ouze outfall at Lynn as swiftly as had been anticipated; and in 1720 a Mr. Kinderley gave it as his opinion that the great bar or impediment to the outlet of the waters was the wide and crooked channel of the Ouze near its mouth, and this could only be remedied by making a straight cut. A violent opposition met this proposal. Six Acts of Parliament and ninety-nine years of discussion ended at last in the Eau Brink Cut being made at a cost of 300,000*l*. As, however, the object of this tract is not to record the modern engineering works in the fens, I will not pursue this subject further, but will retrace my steps to the Middle Ages.

It was in the reign of Edward I. when the important question of drainage was much agitated, Courts of Sewers, as they were called, were appointed, but, as I have before said, very little was done till the reigns of Elizabeth and James I. John of Gaunt is said to have contemplated the improvement of the fens. In the year 1438 one Gilbert Haltoft procured a commission for drainage and settling the marshes in the vicinity of Outwell. The first real improvements, however, seem to have been due to an enterprising churchman, Bishop Morton, and to him Wisbech is peculiarly indebted. He made the cut known as the Leam, which crosses the northern part of the great level from Guyhirn to Standground, and this he afterwards extended to Wisbech. The object was to improve the fall of the Nene, by preventing it from making its circuitous course by Whittlesea and Ramsey and March, below Wisbech. Although suffered to fall into decay for a time, it is said to have improved the outfall. The Wars of the Roses seem to have prevented this great man from carrying out his improvement schemes, as he was much occupied with weightier affairs of State, and amongst other things arranged the alliance between Henry Tudor and Elizabeth of York. He was made Lord High Chancellor of England in 1487. It was not till the reign of Queen Elizabeth that a commission was issued headed by the ancestors of the Fitzwilliam, Cecil, and Montagu families, with the object of draining part of the North Level.

The consideration of Morton's Leam involves some general explanation as to the river basins of the fen country. The principal rivers are the Witham, Welland, Nene, and Ouze, which together with some minor streams drain an area of 6,000 square miles, or about one-ninth part of the whole of England. The area of the fenland is over 1,300 square miles. It has been observed by Messrs. Miller & Skertchley that an important town, generally of Roman foundation, stands at the entrance of each river into the fens, and another at its mouth:—

The Witham	has	Lincoln	and Boston.
,, Welland	,,	Deeping	,, Spalding.
,, Nene	,,	Peterborough	,, Wisbech.
,, Ouze	,,	St. Ives	,, Lynn.

Originally the tide flowed as far as Lincoln, raising the water in Swanpool 2 ft., but in the year 1500 an engineer named Mayhewe Hake, of Gravelines, was instructed to put a sluice across the river to stop the tidal flow. Another sluice was erected at Langrick, in the year 1543. These sluices seem to have had a bad effect, for they not only caused the silting up of the river, but they caused the landowners to neglect the maintenance of the river banks, which were of much greater importance. In the year 1720 North Forty-foot drain was made by Earl Fitzwilliam for the drainage of the land north of Kyme Eau, by means of which a quantity of water which formerly entered the river at Langrick was carried direct to Boston. Thus the current in the river was weakened, an although in the year 1720 vessels of 250 tons could ascend the river daily, in 1751 only vessels of 40 tons, drawing but 6 ft. of water, could reach the town. Matters were made worse by the erection near the town afterwards of the Grand Sluice. That sluice has been condemned at various times by eminent engineers, but it still remains, and whilst it does no permanent good can be done.

The river Welland is the only river in the fens which has preserved its ancient course, as is proved by the Roman banks near Spalding. Until the drainage of the fens in the seventeenth century, the river divided at Crowland, one portion flowing through Spalding as now, the other, known as the South Holland drain, joined the branch of the Nene at Noman's-land-hirne. In 1660 this was the principal channel; now it is a mere ditch. The Spalding channel became defective in the thirteenth century, and in the beginning of the fourteenth century the adjoining lands were often flooded. It was improved when Deeping fen was drained by the Ayloffs. Vermuyden embanked the east side of the river to prevent the floods from coming over the North Level. In the year 1794 a new cut was made, the reservoir to Foss Dyke, but the river continued to silt up till it was taken in hand by the late engineer, Mr. James Walker, who by an admirable system of training banks of fascine work so strengthened the current that it now gives little trouble.

Of the Nene we hear little till the reign of Henry VII. At present the river passes from Peterborough to Guyhirn, along an artificial cut called New Leam, parallel to which is an older cut known as Morton's Leam, from the name of its engineer, Bishop Morton aforesaid, who constructed it about 1478-90. The original section of the Leam, according to to Dugdale, was 40 ft. by 4 ft., but as this was too small, it was afterwards increased in 1570 by 20 ft. In 1538 this channel having been silted up, it was cleaned out, but it seems to have gone back into decay, for we are told by Dugdale, speaking in 1631, that the Morton's Leam had to be "new-made." In the year 1721 Kinderley proposed and partially executed a scheme for straightening the channel. The river then ended four miles below Wisbech instead of twelve as at present. The cut was not, however, carried out beyond the end of the river, and hence the river below began to decay, and in 1804 we read of persons making hay in its bed.

With regard to the Ouze, which enters the fens at Earith, where it formerly branched, sending one stream in a north-easterly direction to the Nene at Benwick, and another southwards by Ely and Littleport, and thence northward along the Old Croft and Old Welney river to Upwell, where it received the waters of the Nene and the northern branch or west water, and thence passed by Wisbech to the sea, it will be noticed that the present course for Earith is quite different, and is now formed by the Old Bedford and New Bedford rivers to Denver; hence the northern branch and the west river, as it was called, has fallen into decay. The Old Croft river has become obsolete, and from Littleport the waters flow along the ancient but artificial cut known as Brandon Creek, anciently called Heming's Lode, and so by the channel of the Little Ouze past Denver, Downham Market, and Lynn, to the sea. Sir Henry Hobart, attorney-general to King James, in his "opinion" in 1617, as given in Dugdale, p. 372, says:—

1. The river of Ouse (its outfall by Wisbeche decaying) was not only cut straight, but by a new river made from Littleport Claire to Rebbech was let fall into Ouse Parva (or Brandon waters) and thence by Salter's Lode to Lynne haven; its former course from Littleport being by Wellenhee to Welle, and so to the North Seas at Wisbeche.

2. The west water (a part of Ouse Magna) having its course from Erith Bridge to Chatteriz ferry, and thence to Benwick, and so to March, was, for the crookedness of the way, conveyed by a new passage called Leame (through Chateriz, Dudington, and March), and thence by Elme Leame to Wisbeche (a course of 16 miles), and so continueth all this way.

3. A great part of Ouse and Nene united descending from Benwick by Great Crosse to Wisbeche; but Wisbeche outfall decaying, they both fall by March to Welle and so into the Ouse at Salter's Lode.

We then come to the formation of the Bedford rivers. Their object was to convey the highland waters from Earith direct to the sea; by a saving

of ten miles between that point and Denver sluice. The great sluice at the Hermitage turns the river into the Bedford canals, and the Denver sluice prevents them from re-entering at the northern end. The formation of the Bedford rivers necessitated the double sluicing of the Ouse, and they further involved the making of Tong's Drain and Downham Eau, for the relief of the Middle and South Levels respectively, which they did not seem to have accomplished, for we find that the sluices so deteriorated the river in 1695, that it was proposed to remove them, because "where boats and barges usually passed in the old river, grass and fodder is now cut." In the year 1713 nature took the difficulty in hand, and a high tide "blew" the Denver sluice "up," but as the Hermitage sluice remained, there was not sufficient water in the old river to produce a scour; moreover, the waters from the mouth of the Bedford river, instead of flowing seawards, turned back and flowed up the old bed of the Ouze and drowned the unfortunate South Level. For thirty-seven years matters remained in the most unsatisfactory condition, but in 1750 the Denver sluice was rebuilt by Labelye, a Swiss engineer, who built Westminster Bridge. Yet we find in 1777 both the Middle and South Levels were "in a most deplorable condition." Kinderley, in 1720, suggested the straightening of the river by the Eau Brink cut to Lynn, but it was not completed till 1821. It shortened the course of the old river two miles and a half, and the low-water mark at its upper end fell from 6 ft. to 7 ft.: a great benefit. It is stated that if the cut had been carried into deep water beyond Lynn harbour its effect would have been still more beneficial. In the year 1827 the river Ouse was still further rectified by a straight cut from Ely to Littleport Bridge, and since then another channel called New Cut has been made from Lynn into the Wash at Vinegar Middle.

It is the object of this tract to set forth archæological facts connected with the drainage of the Fens, rather than engineering ones; but *en passant* I should observe that the great error which all the early drainers fell into was that of looking after the internal condition of the rivers instead of providing for their outfalls. They began, in fact, at the wrong end. Their works should have commenced at the mouths of the rivers, and had these been properly attended to in the first instance, vast expenses would have been saved. But their chief obstacles seem to have been rather interposed by human nature, for we find that Vermuyden's great works were obstructed on various occasions by the Fenmen, who filled up the cuts and pulled down the banks which he had constructed. As Mr. Smiles says in his life of this great man:—"Difficult as it was to deal with the unreclaimed bogs, the unreclaimed men were still more impracticable." They looked upon the Fens as their commons, where they could fish and shoot wild-fowl; hence they met the "adventurers," as the reclaimers were called, with a furious but happily ineffectual opposition. Violent pamphlets were also published against Vermuyden, the most notorious of which were "The Draynes Confirmed," of 1629, and another of about the same date, called "The Anti-Projector; or, the History of the Fen Project"; small 4to. London, 1628. The agitation found vent in popular ballads, which were sung in the streets of the Fen towns about the time of the Commonwealth. A stanza from one of these, "The Powtes (poet's) Complaint," will give an idea of their nature:—

"Come, brethren of the water, and let us all assemble
To treat upon this matter, which makes us quake and tremble;
For we shall rue if it be true that Fens be undertaken,
And where we feed in fens and reed, they'll feed both Beef and Bacon."

In another we find the Dutch pointed at as the chief offenders:—

"Why should we stay here and perish with thirst?
To th' new world in the moon away let us goe;
For if the Dutch colony get thither first,
'Tis a thousand to one but they'll drain that too."

When, as I have before explained, Charles I. undertook the drainage of the Fens, the political troubles of the times reached their climax. In 1637, Hampden's trial on the ship-money question took place, and in the Fen districts the agitation was used for political purposes. It was made out that the king's venture was merely intended as a means of raising money, and in this agitation one Oliver Cromwell, member for Huntingdon, took chief part. He 'stumped" the district, making violent speeches against the reclaimers, and soon became known as the "Lord of the Fens," and so successful was his opposition that the king and his commissioners were forced to abandon the works. They also attacked the Lindsey Level, a district of about 35,000 acres, which had been drained by Lord Lindsey, and let in the waters upon it, killed the cattle, and destroyed the farm buildings.

Vermuyden, inundated by adversity, appeared in 1642 with another pamphlet entitled, "A Discourse touching the Drayning of the Great Fennes," &c., which met with many answers; but in 1649 authority was granted to William Earl of Bedford and others to prosecute the undertaking which his father had begun, and in 1652 the works were declared to be completed. On the 27th March, 1653, the Lords Commissioners of Adjudication, accompanied by the "Company of Adventurers," headed by the Earl of Bedford, the magistrates, and magnates of the districts, attended worship in the cathedral of Ely, when the Rev. Hugh Peters, chaplain of the Lord General Cromwell, preached a sermon on the occasion.

When we reflect on the vast magnitude of the work,—it being no less than the annexation of a territory of 680,000 acres to the area of our country,—we may well join the great Dutchman in the pious remarks with which he concludes one of his speeches:—"I presume," says he, "to say no more of the work, lest I should be accounted vain-glorious, although I might truly affirm that the present or former age have done nothing like it for the general good of the nation. I humbly desire that God may have the glory, for his blessing and bringing to perfection my poor endeavours at the vast charge of the Earl of Bedford and his participants." The best idea of the work of this truly great man will be obtained by an examination of the map which has been compiled from Dugdale and other sources; and where the "Great Fens" as they "lay drowned" according to their authority are shown by a blue tint. The other works, both of the Romans and later times, are also shown generally, and will be best understood by an inspection of the maps. Finally, in conclusion, I will make one remark: The object of our Congress I conceive to be not only the publication of information on the great works of past times, but the recording of the names of great men connected with them. I trust that this Wisbech Congress will give due honours to the name of Sir Cornelius Vermuyden, to whom our country owes so much; and perhaps the British Archæological Association may, in bringing his name forward at this time, be the means of obtaining the public recognition of his great service, by recommending a suitable monument, for he has deserved much from his adopted country, but his memory has been hitherto forgotten.

ON LIGHTNING CONDUCTORS AND ACCIDENTS BY LIGHTNING.

A PAPER on this subject, by Mr. Richard Anderson, F.C.S., was read at the Dublin Congress, and deserves to be widely circulated.

There is reason to believe that 100 persons are killed by lightning in England every year on the average. The terrible losses, both of property and human lives, still occasioned by lightning, are the more lamentable as they are in nearly all cases the result of the grossest negligence. The negligence is threefold,—namely, first, in not providing any lightning conductors at all; secondly, in not placing them in the right position, or in sufficient number to cover a given area; and, thirdly, in not having them regularly tested, so as to ascertain their constant efficiency. Of course, the first-mentioned cause of neglect is by far the most important. It is one alike astounding and baffling all search for a reasonable explanation. Every year brings its regular thunderstorms, more or less in number, and most of them accompanied by fatalities.* All see the terrible lightning flashing over their heads; all tremble before the approach of the electric force, the mere touch of which brings instantaneous death, and yet but an excessively small number of persons make any efforts to protect themselves, their families and houses, against the electric fire from the clouds. Public buildings fare little better than private houses. Even some of the first cathedrals of England, such as Peterborough, have no lightning-conductors whatever, while others, supplied with them, are insufficiently protected, as apparent to any competent observer. A glaring case of absence of protection against lightning is to be found at Windsor Castle, grandest of all the historic buildings of England, and the residence of her sovereign.

Mr. Anderson proceeds,—Having drawn attention to the chief causes of the numerous and fatal casualties caused every year by lightning, I have only to add a few words of advice as to how they might be prevented, or at least greatly diminished. First of all, I think it most desirable that public recommendation should be made, by local and other authorities, to place lightning-conductors on all exposed or high-lying buildings, whether public or private, as well as on those standing near woods and on moist ground. It might be well worth the trifling expense to place simple conductors also against trees in parks, under which there are benches, or where persons are likely to gather during a thunderstorm, they forming a prolific source of fatal accidents. Above all, no church, chapel, school, prison, or other large public building, ought to be without one or more lightning-conductors. There can be no excuse whatever for omitting this simple protective means against death and destruction, which may come at any moment, in the case of edifices devoted to public or national uses. But if it is necessary to greatly multiply lightning-conductors, it is equally so that they should be planned and erected by competent persons, with scientific as well as practical knowledge of the work. There are a hundred circumstances which ought to be taken into account in selecting the best positions for conductors, especially on large buildings and those of irregular construction; and only great experience, as well as cognition of all that we know about the movements of the electric force, can accomplish it. Of first importance are the considerations of the general design of the building that is to be protected; the soil on which it stands, whether dry or moist; the presence of masses of metal in or near the roof or the walls, as in the case before mentioned; the position of the chimneys; and similar matters affecting the course of the electric discharge of the clouds. It would be quite impossible to lay down absolute rules on the subject; still protection against lightning may be effected with the greatest certainty under the guidance of well-known facts and observations which throw light upon the undeviating path of the mysterious electric force. But if everything possible has been accomplished towards the erection of the most perfect lightning-conductor there still remains something to be done. It is, not only to construct a faultless conductor, but to maintain it always in good condition. This is a matter which, sadly neglected and overlooked to a quite astounding degree, cannot be too much insisted upon. It ought to be universally known that a lightning-conductor is worth nothing unless it is periodically tested. The testing should take place at regular intervals, perhaps best in the spring, before the advent of the summerly thunderstorms, and it should likewise be made whenever a building has been undergoing repairs, which may have damaged the conductor. To show the importance of constantly testing even the best-laid conductors, I can cite an instructive case, where a house was apparently well protected. On August 19th, 1876, shortly before midnight, a heavy stroke of lightning fell upon the mansion of Mr. Evans, civil engineer, Clayponds, near Kew Bridge, Middlesex. The electric force destroyed the top of a large chimney, knocking off part of the coping, not more than 2 ft. or 3 ft. from a lightning conductor, to which it then flew, making its way down to the earth, but not without causing the greatest disturbance all along its path, lifting up, among others, some heavy marble toilet-tables in bedrooms some 6 ft. distant on each side from the copper rope, which, under ordinary circumstances, would have carried the electric force noiselessly, as well as harmlessly, to the ground. The fact of this disturbance indicated at once the source of the mischief. The lightning conductor, good as it otherwise was, had no sufficient earth connexion. It went into the earth, it is true, but into soil

* Mr. G. J. Symons, the well-known meteorologist, who incessantly watches the skies from his house in Camden-square, mentions that in two storms, in June, 1872, nearly two hundred separate accidents came under his own knowledge, causing the death of ten persons and injury to thirty-three others. The lightning struck sixty houses, fifteen of which were burned down, and killed twenty-three horses and cattle and ninety-nine sheep. "This is," truly remarks Mr. W. H. Preece, commenting upon the figures, "the imperfect record of only two storms. What must it be for the whole year?"

altogether dry, and therefore the conductor did not, and could not, act properly. It thus came to pass that, first of all, the lightning did not touch, as it would otherwise have done, the conductor directly, but sprang upon the coping of the neighbouring wall, and that, although it made its way down into the earth afterwards, it did so, as it were, with the greatest effort, which caused the lifting up of the marble tables and other disturbances. Nothing was wanting in this case for protection against lightning but regular testing, in default of which it can never be known whether a conductor is actually efficient at any time. A well-organised system of inspection of lightning-conductors would be most inexpensive. The galvanometer used for the purpose has been latterly much improved in Germany, and small portable instruments, of the size of a diminutive carpet-bag, are now made, which leave nothing to be desired in the shape both of effectiveness and durability. As the clock in churches and other public buildings is methodically inspected by the clockmaker, so ought every lightning-conductor to be as systematically examined by an electrician or other competent person. Already such a system of inspection and testing of conductors exists in Paris and several other French towns.

IRISH ANTIQUITIES.

THE proceedings of the Dublin meeting of the British Association for the Advancement of Science were wound up with a series of excursions, during which they visited the great round tower of Donoughmore and the remnant of the neighbouring church. While the party gathered around the entrance, Mr. W. K. Wilde discoursed of round towers and the theories of their uses. The one at Donoughmore, he said, is perfect in every respect save that the cap is missing. It rises in six stages 106 ft. high. It is remarkable among its brethren for one altogether unique bit of evidence of its Christian origin. The entrance-door is raised some 12 ft. above the ground, and the keystone of the entrance arch is sculptured with what Petrie thought to be a rude representation of the Crucifixion,—the figure having its arms extended at full length, and the legs crossed after the manner of most early Christian crucifixions. Professor Zerffi controverted this view by pronouncing the sculpture to be a Buddha, and by stating that the Irish round towers were of the same character as those found scattered through Mexico and Peru, and were, in fact, gnomons to mark the time of day. Mr. Howarth, of Manchester, however, pointed out that the Buddhist idols have never their arms extended, and that when Irish antiquaries of the rank of Petrie and Lord Dunraven had agreed that the towers are of Christian origin, other people should be cautious before giving their opinions. Proceeding to the Marquis Conyngham's magnificent demesne at Slane, the party visited the Hermitage of St. Erc, the first Bishop of Slane. Portions of the original masonry are still distinguishable amidst the arches and windows of later centuries. Much was said by Mr. Wilde about the entrance-arch, carved with the emblems of the fleur-de-lys and the rose. Luncheon was partaken of on the Hill of Slane, and after a breezy ride through the valley of the Boyne they reached the royal cemetery of the Brugh-na-Boinne. For fully three miles this necropolis extends. Twenty-one immense tumuli or hillocks of stone and earth can be counted in the neighbourhood, each of them presumably built over the ashes of an Irish monarch. The three greatest of them are those at Nowth, New Grange, and Dowth. The excursion-party visited all three; but their explorations at New Grange were of special interest. This tumulus covers more than two acres, and might be taken for a large natural hill if there were not indisputable evidences that it has been heaped loosely together by the toil of man. It is surrounded by a circle of cyclopean gravestones, which, it is thought must have been transported thither from the Mourne Mountains, in the county Down. A passage has been found into the heart of this mighty pass, and the visitors crept through it in parties of fifteen. The first dozen yards had to be traversed on all-fours. In one spot the upright flagstones, of which the gallery is formed, jut so closely together that the body is squeezed through with some difficulty; but once this trouble is surmounted, the passage rises to a height of 6 ft., and then suddenly opens into a large cruciform chamber, with one great central domed apartment and four recesses at its angles. This chamber is some 19 ft. high to the top of the dome, which is formed by small stones gradually overlapping one another until they culminate in a great flat slab, which serves the purpose of a keystone. The walls are of Cyclopean masonry, and are stated to bear an extraordinary resemblance to those of the tomb of Agamemnon at Mycenæ, as Dr. Schliemann describes them. The stones are in many places carved with the distinct sort of archaic sculpture—spirals, lozenge-shaped, and zigzag lines. Mr. Wilde, in the course of his interesting talk about the tumuli, broached the theory that these tumuli must have been the work of the tall, yellow-haired, blue-eyed race of the Tuatha de Danaan, who ruled over Erin after prostrating the power of the Filbolgs. The party lingered so long in the recesses of this astonishing sepulchral cave, that there was no time for an examination of its brother tumulus at Dowth. They drove through Mr. Gradwell's demesne, and enjoyed afternoon tea in his mansion at Dowth Hall. In the demesne, a few hundred yards from the Boyne, they visited a circular rath of vast extent, enclosing little less than an acre within a single mound. Nobody was able to throw much light upon the name, date, origin, or business of it, but Mr. Wilde supplied the gap by an interesting sketch of the uses of Irish raths in general. Two miles more along the course of the river brought the party upon the famous battle-field of the Boyne, whence they returned to Drogheda.

The Kilkenny excursion started from the King's-bridge terminus at a quarter to nine o'clock. The excursionists numbered 300. The party on reaching Kilkenny visited the Protestant Church of St. John, in ancient days a Priory of Canons Regular, and founded by William Earl of Pembroke in 1220. St. John's was in olden days famous for its singular beauty, and was known as the "Lantern of Ireland," from the great number and singular beauty of its windows. In its present state it possesses scarcely a trace of its pristine beauty. In the church Mr. J. G. Robertson delivered a very interesting sketch of the history of this ancient edifice. Outside the church another equally valuable address was delivered by Father Neary, who, in the course of his address, alluded feelingly to the regret which all felt at the absence through illness of the Rev. Mr. Graves, who had done so much for the antiquities of Ireland, and especially of Kilkenny. Father Neary called special attention to the really interesting remains of the old church, which are outside the present edifice, and consist of a lancet window of great size and beauty, and a knightly tomb five centuries old, in which a noble of the name of Purcell and his wife are represented, in two fine statues of black marble, sleeping side by side. The next halting-place was the Protestant Church of St. Mary. The Very Rev. Dean Hare here welcomed the visitors, and pointed out all that was worthy of interest. The ancient beauty of St. Mary's has also largely disappeared, but it has a great number of fine tombs inside and outside the church. One of these, erected to a member of the once powerful family of Rothe in 1637, has recently been restored by Mrs. White, of Killakee. After the inspection of the riches of the church and churchyard was completed, the Mayor conducted the visitors to the Tholsel, or Town House, where they were entertained by the corporation. After the *déjeûner* Mr. Watters, town clerk of Kilkenny, read a sketch of the antiquities of the city.

After luncheon several places of note were visited, including the Mediæval houses of the Rothe family, and the Wolf's Arch, and the fine ruins of the Franciscan Abbey in Smithwick's brewery, remarkable for its delicate seven-light window, its graceful tower resting on groined arches, and its singular grotesque carvings supporting the arches. Proceeding through the town the grand object of Kilkenny was reached,—the Protestant Cathedral of St. Canice. Above the cathedral proper is the grand old round tower, which for twelve or thirteen centuries has defied the storms of time. Beneath its shadow is the great cathedral church, which 700 years ago Bishop Felix O'Dullarney erected in honour of St. Canice. It contains scores of monuments of the highest interest. The architecture and antiquities of the cathedral were explained by Mr. Langrishe, the diocesan architect, in an interesting paper. The next point visited was the Dominican Church, or Black Abbey. This ancient edifice is of great interest to Catholics, seeing that it is almost the only church in Ireland which, erected in pre-Reformation times, still remains a Catholic church. Its history after the suppression of the monasteries was related in a paper prepared by Father Neary, and read, at the request of the prior, in the church by the Rev. Mr. Callanan, the administrator of the Cathedral parish. The day concluded with a visit to the castle, where the visitors were welcomed by the Marquis and Marchioness of Ormonde. Although much of the structure is comparatively modern, three of the towers and two of the curtain-walls of Strongbow's castle remain to this day, and notwithstanding modern alterations impress the grand outline of the ancient Norman fortress on the structure. The party afterwards returned to Dublin.

Another party of excursionists visited the Rock of Cashel, the ruins on which are so well known. The round tower stands to the north of the church. It is 80 ft. high by 50 ft. in circumference, and the walls are 4 ft. thick. The two foundation layers are of limestone, and the remainder of sandstone. It contained five stories and four apertures, with a doorway entrance 12 ft. from the ground. The ruins, together with Hore Abbey and the Dominican Abbey in the town, are now in charge of the Board of Works, under the provisions of the Church Act; and it is satisfactory to be assured that no further ravages and decay await the precious relics. The Dean of Cashel acted as *cicerone*. He inclines to the Petrie view, that all these old buildings and sculptures are of Christian Irish origin. He, however, admitted that there is something arbitrary and insular in claiming as specialities for Ireland art objects which are found from here to Hindostan, and he felt the difficulty of imagining that this wondrous magic art sprang up here in a night like the Prophet Jonah's gourd, and then in an hour became an obsolete antique. He said that he did not like the Keane theory at all, but that as the Danish theory was pure nonsense, the contest lay between Keane and Petrie. After allowing an hour's inspection, Mr. Mahaffy read a very interesting paper on the ruins.

These notes are condensed from a long report in the *Morning Post*.

A LONG-LOST CITY.

AT the Annual Congress of the Somersetshire Archæological Society, held last week at Bruton, Mr. Kerslake, of Bristol, read a paper on "Pen Pits," for the purpose of showing that these remains, situated on the brow of a hill not far from Stourhead, and which had puzzled archæologists from the time of Camden, were really the site of an ancient British metropolis. It was called in the earliest written records "Caer Pensauelcoit," the last syllable meaning *wood*, so that in "Pen-sel-wood," as the place was now called, they could at once identify this archaic name. The hut circles covered 700 acres of land, and were about 20,000 in number.

The next day, the Society drove to Pen-selwood, in number about 100, when the Rev. T. W. Wilkinson called attention to Pen-pits, which are in his parish, and read an extract from a former number of the *Builder* describing the remains of an ancient British city still extant in Wales. The account herein given confirmed the views entertained by Mr. T. Kerslake with reference to the Pen-pits. About fourteen acres of glebe land are covered with these pits, and as some doubt had been thrown on Mr. Kerslake's theory because no water was supposed to exist on the spot, Mr. Wilkinson said that this was an error, inasmuch as there were springs on his land. He also offered to arrange with his tenant so that the Society, if so disposed, should carry on excavations in order to see if remains could be found to confirm the existence at an early period of a large population at this spot. The excursionists then adjourned to the pits, which, whatever their origin, are very remarkable. The summit of the hill, for the space of 600 or 700 acres, is completely honeycombed with cavities, varying in depth and size, but all preserving a circular shape. So closely are they packed together as to leave no more than room for one person to traverse the margin between them. They are lined with ferns, gorse and briars, the thickness of which imparts not a little beauty to the uneven surface. Though we have called it "the summit of the hill," the ground covered with these indentations really forms a hollow as compared with

the land around, and occupying such a depression, it would add to a commanding situation the strength of concealment. Groups of circles marking the primitive settlements of an early people exist in different parts of the country, but nothing approaching to the vast agglomeration at Pen-pits is known anywhere else. They are unique, and that of itself favours scepticism, besides presupposing a degree of civilisation and a power of organisation with the possession of which the aboriginal races, or the forerunners of the Romans, have not been hitherto credited. For this advanced social condition Mr. Kerslake cogently contended in the paper read by him on the ground, and his views were supported by the Rev. Prebendary Scarth and Bishop Clifford. The former was inclined to make the dwellers of Caer Pensauelcoit contemporaries with Stonehenge, Abury, and Stanton Drew, but at the same time strongly advised the Society to conduct some systematic investigations on the spot. Bishop Clifford urged the importance of the latter point, and contended that a large community like that supposed could not have existed without leaving behind some traces, such as bones, ashes, implements of the chase, or fragments of articles in daily use. With regard to the idea that the people dwelt in the pits, that he thought was altogether erroneous. He had lately been studying the scenes depicted on the column of Antoninus, at Rome, and he there saw that the Germans were represented as dwelling in round huts, with a rude basement of stone and a superstructure of wood or trellis-work, filled in with clay or wattling. There was one door and no window. He conceived that it was some such buildings that stood on that spot, with the floors sunk some little depth. When the huts were deserted they crumbled away and so formed higher ridges round the site of each habitation. The Rev. W. Hunt remarked that Mr. Boyd Dawkins considered that the pits were simply the remains of old quarries. Bishop Clifford said the answer to that objection was that no one would think, in quarrying for stone, to dig separate pits in that fashion. The plan would be to dig down and then follow the beds in a straight line.

Mr. Hunt explained, before leaving, that the question of conducting investigations on the spot had been considered that morning and it was thought better to appoint a committee, including some gentlemen living in the neighbourhood, and to make a grant for defraying the expenses. This announcement was received with marks of approbation.

LEAD AND ZINC MINES.

The exhaustion of the Belgian zinc mines, some years ago, led to a new search for the components of which this metal, so important to the industrial arts, and to the builder especially, is composed. Formerly, though many sources of supply existed elsewhere, the principal known mines existed in Belgium and Silesia, but in consequence of the former having practically failed, explorations were made, more or less successfully, in Sweden and Spain, though afterwards, almost accidentally, a splendid treasure of these minerals was discovered at Malfidano, in Sardinia, and, of course, a company was established to develop it, with a view of answering the Belgian and British demand. The name of Malfidano was adopted, for the sake of simplicity, but, in reality, these lead and zinc rocks, as they are called, constitute seven or eight groups, spread over about 3,000 acres of ground, for the most part absolutely barren, being nowhere able to support more than a sprinkling of goats and sheep. It was necessary, therefore, to create a community upon the spot, and provide them with the means of sustenance, and the central establishment was, for many reasons, fixed at a spot not far from the sea. Round it have now grown up a multitude of edifices, various in kind and use, though the chief of these, of course, are connected with the working of the mines,—ten ordinary and six reverberating furnaces, three enormous sheds for the storage of the calcined minerals, occupying altogether a surface of 2,000 square yards; another, about a fourth of the size, for materials; a huge forge and fitting workshops, with several others supplementary to it; a number of stables, a little street of shops for the sale of necessaries, a hospital, twelve houses for the accommodation of the officials, and an increasing cluster of buildings as dwellings for the miners and their families,—all constructed of masonry, and roofed with tiles. In various directions, other branch communities have sprung up, on a smaller scale, but similar plan, and, taken as a whole, the mines of Malfidano may be computed to support a population of rather over 1,000 individuals. Moreover, connected with the mines by a double line of railroad, is an extensive dyke—200 yards in length, indeed, built in the sea, with a depth of 7 ft. to 16 ft. of water on the exterior side, the space within having been filled up with stone so as to form a quay containing about 10,000 square feet of area. In a very few years this miniature city was called into existence. With reference to the mines themselves, there are three classes of them,—those which are open to the sky, and resemble immense jagged quarries; others carried through galleries, and connecting these; and others, composed of slanting and radiating galleries, following the ore wherever it presents itself, and creating curious labyrinths beneath the earth. A characteristic of the Malfidano works is that, as soon as a pit is pronounced exhausted, it is filled up, for the sake of preventing accidents, with rubbish from the next series of excavations, which are thus carried on without altogether honeycombing the rock with hollows. At some points, however, the ground is dug down to a depth of ten or twelve yards; beneath this it is burrowed to three or four times that depth; and below this, again, a perfect network is eaten out of the rock to a considerable distance in every direction, though, in many parts, it is found necessary to shore up the friable roofs and walls; for the substance of the strata is too valuable for much of it to be left as supporting buttresses or pillars. Elsewhere, a kind of exaggerated serpentine form is adopted, and the miners, having reached a certain limit, turn back upon a curve, advance as far as the head of the working, turn again, once more upon a curvilinear line, and so on, until the labyrinth assumes a sort of gridiron shape—a process, however, which, though easy, is regarded as exceedingly wasteful.

For this labour the men are not paid by regular wages, but for every cubic yard or ton of mineral extracted; nor is the scale the same in all the mines; being in some five, and in others fifteen, for the same measurement or weight. There are galleries, again, in which their earnings depend upon the rate of advance made,—and here, too, the range of payment is remarkably wide, varying from two to ten pounds sterling, English, for every three feet, according to the richness of the results; while, besides this, there are prizes awarded to the more intelligent or fortunate individuals who happen to hit upon a favourable course through the rock. In this way, an emulation is excited, by which the proprietors assert that they have not lost. The expenditure of Malfidano, therefore, varies considerably, as does the worth of its products; but it is confidently anticipated that Sardinia possesses numerous similar stores of the same wealth, and that the workings now measured by hundreds of yards will, before long, be carried on for miles beneath that which has hitherto been regarded as the most ungrateful and hopeless part of its soil. Moreover, it is hoped that, in due time, the processes carried on on the spot will be rendered much more elaborate and effectual. At present they are confined to the simple calcining of the "calamine," or zinc ore, and for this purpose the furnaces employed are cylindrical in shape, about 16 ft. in height above that which Italian miners term the "gridiron," or stoke-hole, and each capable of containing some thirty tons of mineral material, arranged in layers, separated by other layers composed of coal and charcoal in almost equal parts. The cost of these structures, up to the present time, has averaged about 120*l.* each, but the whole of the fuel, since the forests of Malfidano were recklessly burned out of existence, has had to be brought a long way upon difficult roads, which, in many instances, had to be specially prepared for the purpose, so that the calcining itself cost, in this respect alone, nearly 10*s.* a ton; and yet the Malfidano mines are exceedingly profitable. Lately, however, sea transport has largely superseded that by land, notwithstanding the irregular winds that, at all seasons, blow in the roadstead of Buggera. As to the men engaged, although the company is French, they are almost exclusively Sardinians, who possess certain particular aptitude for the work, and especially a power of withstanding extreme intensities of heat. They earn from 2*s.* 6*d.* to 4*s.* a day, upon a general calculation; but it is expected that a larger proportion of the profits may be devoted to the payment of labour, so soon as the steam and tramways, and the ordinary roads necessary to the full development of the works, have been completed, or nearly so. Wagons of many sizes have had to be provided, with metal ropes for haulage, and a special class of vessels for the sea-transport of the ore. It is not exclusively men, however, who are employed. There are also women, and even children, not one of whom has been brought from the Continent, though some of their husbands are Lombards or Tuscans. As a rule, all these people are decently educated, and their social manners are superior to those of many other populations of the Italian peninsula. There is a labour law for the mines, enacting that no one shall toil for more than ten hours a day in the open works. Even with this restriction, the labour is not considered healthy, especially by the "Continentals," as distinguished from the "Sardes," or islanders, many of the former returning to their homes during the months from June to September, and often taking considerable savings with them, while for those who stay a hospital is maintained, partly by the providence of the miners, and partly by the liberality of the proprietors,—an institution, too, meriting a word of notice. Spacious, well-ventilated, affording ample room for every patient, furnished with iron bedsteads and irreproachable bedding, having a surgeon, with two assistants, whose exclusive services are commanded,—a strict register of every case, it is certainly such an establishment as would not be expected to be found in a wild and lonely district of the Sardinian coast, wholly given up to mining for lead and zinc. Indeed, the entire locality, to which a social life has so recently been given, and which is scarcely known beyond its own limits, possesses a more than common interest, above the importance of its products to English or to Belgian industry. The coal it consumes comes principally from Cardiff and Swansea, while the charcoal is burnt in the forests of Sardinia itself.

THE OBELISK ON ITS PEDESTAL.

By the time the men left work last Saturday the monolith had been lifted to the height required (50 ft.) with a view to its being swung from the horizontal into the vertical position and set at rest upon its pedestal, which operations took place on Thursday last. The pedestal was finished last week. In the top course room was left (by not laying for the present the middle row of stones east and west) to allow of the passage of the wrought-iron strap. In this strap (which is of the dimensions and construction of a girder, being built up of plates and angle-irons), it will be remembered, the obelisk's foot rests as in a stirrup to prevent the stone from slipping out of the iron jacket which encases the centre of the stone. The obelisk, as we have already stated in our description (p. 679, *ante*) of the mode in which it was to be raised, has been carried to its present height by means of elevating, by hydraulic jacks, a pair of iron girders working upwards in grooves left in the main angles of the scaffolding. Upon these girders a pair of peculiarly-formed trunnions projecting from the iron jacket before mentioned have rested, and have supported the obelisk in a horizontal position during the time it was being raised. The monolith having attained the necessary altitude, it was only necessary to swing it on the trunnions, or, in other words, to pull down the butt or thick end, so as to get the stone into a vertical position, when it was only a few inches above the top of the pedestal. The operation of "swinging" was completed in about three quarters of an hour, and by lowering the girders before mentioned, the obelisk was allowed to rest on its pedestal, and the "Union Jack" and Turkish ensign were run up in token of the success of the work. The iron jacket and strap will now be stripped off, and the scaffolding removed.

For the accommodation of those who have taken a special interest in the progress of the work, Dr. Erasmus Wilson and Mr. John Dixon chartered a steamer, which was moored abreast of the works. Those gentlemen are to be heartily congratulated on the success which has attended their difficult undertaking, concerning which we shall have something more to say.

YORKSHIRE ARCHÆOLOGICAL SOCIETY.

HEMINGBOROUGH AND SELBY.

THE Yorkshire Archæological and Topographical Association had its twelfth annual excursion on the 28th of August, the locality selected being Selby and Hemingborough. Trains from Leeds, Huddersfield, York, Hull, and other places, brought many excursionists to Selby, and on their arrival the party, which numbered nearly 200, was conveyed in two steamboats to Hemingborough. As the company approached Hemingborough Church, the prominent spire of which, standing as it does 126 ft. above the tower battlements, is visible for miles around, the bells rung out a peal of welcome, and the party were received by the vicar, the Rev. W. H. Wright, B.A., and churchwardens. After a brief inspection of the curiosities of the church Mr. Fairless Barber, F.S.A., one of the hon. secs. of the Association, read a paper on its history, and pointed out some of its principal features. He stated that the evidence of the architecture showed that there had been four complete buildings, and that parts of the three latest had been blended together to form the present fabric. The church, under this process, took 350 years to grow to its present size, and had continued to exist very much as it now was for 350 years more. The first church was that mentioned in the Domesday survey. Of this building no trace was visible, but it was the undoubted parent of the church which followed. Dr. Burton was very concise in his account that William the Conqueror gave to Bishop Walcher, of Durham, "this his royal manor and town of Hemingburg and the church thereof"; but this statement was subsequently demolished by Canon Greenwell. Of the second church they found traces in the eastern half of the north and south arcades of the present nave. Its arches were in the so-called Norman or English Romanesque style, very plain and simple in character. With reference to the third church, they at once found ample indications of its extent and character. First they had the nave of the second church, extended two bays westward by two pointed arches on each side having plain round columns, with single caps for central supports. The lines of the roofs of this third church still remained in each side of the tower, and showed clearly that there was no clearstory, and the nave, chancel, and each end of the same transept were covered with roofs of the same high pitch, continued downwards over the aisles of the nave and the single aisle of the north transept. Coming to the fourth church, Mr. Barber said that the above additions were added to the third church to give them the noble fabric in which they were assembled. They had first the addition of the aisle or chapel on the south side of the chancel, opening to it by the entire removal of the wall, and building in lieu thereof an arcade of four-centred or Tudor arches on piers, the capitals of which had carved foliage, not gracefully executed, of the same date. They had also a similar arch broken through the east wall of the south transept to connect this new chapel with it. All the windows of this south chapel were late and by no means pleasing examples of the rectilinear period. This was the most important addition, and was accompanied by the erection of the chapel on the north side of the choir by Sir John Babthorpe. Overhead great changes were at this time made. A magnificent spire was added to the tower, the really fine rectilinear clearstory of the north and south transepts was built, and tracery of the same period introduced into all the windows of the north and into the south window of the south transept. The character of the roofs could be readily made out by a careful examination of what was left. It was not clear that the pointed roof of the choir was not then erected, for there was such a recent look externally about the eastern gable that it and the present flat roof, which seemed modern, might be of late date. Of Mediæval monumental remains none are left perfect. There is a mutilated figure in the Babthorpe Chapel, representing a skeleton in grave-clothes, and he (Mr. Barber) understood that it had been the practice in past years to be sworn before this effigy. Alluding to the registers, he said they contained some most curious entries, including one of a cock-fight having taken place in the church on February 11, 1661.

Luncheon having been partaken of in the Public-rooms, the Rev. Mr. Ormsby proposed "The health and prosperity of the Society." Mr. Fairless Barber in responding, referred to the substantial position of the association. He stated that they had received from 112 life members and 11 deceased members 645*l.* 15*s.* The total number of annual subscribers was 314, and the income from this source was 164*l.* 19*s.* The society had now really a capital account of over 1,000*l.*, and he was not aware of any other society, except the Antiquary Society, which was in so good a position.

The company then visited the Abbey Church of Selby, under the guidance of Mr. J. T. Micklethwaite, F.S.A., who gave an address relative to its history.

Mr. Brooke also spoke, and said that the church was dedicated to St. Mary and St. Germain. It was the best preserved Benedictine church in England, and Yorkshire ought to be proud of it.

Mr. J. Fowler, F.S.A., of Wakefield, next read a paper on the ancient glass of the east window. It belongs to the first half of the fourteenth century, and must when perfect, it is said, have been one of the most magnificent in existence. The design is to indicate the first and second coming of the Saviour.

The remainder of the time at the disposal of the company was spent in inspecting the edifice, and Mr. Morrell exhibited some curious paintings of the gatehouse of the abbey, the abbey well with the original central tower of the church appearing in the background; and the gateway and middle row extending from it to the Market Cross.

THE ORIENTAL CONGRESS AT FLORENCE.

THE fourth Congress of Orientalists held in Europe is now taking place in Florence, commencing on the 12th and ending the 18th. The first took place in Paris, the second in London, the third in St. Petersburg, and this, the fourth, is expected to be the most brilliant, as at the same time the most learned and effective. None but students of Oriental languages and the professors and learned visitors are to be present at the respective meetings, at the first of which will be under consideration the Semitic languages, including the Assyriac; at the second, the African, including Egyptian; third, the Indian, comprising the Armenian; fourth, Hindoo-European Philology; fifth, Language of Central Asia; sixth, Language of the extreme East, comprising Polynesia. The meetings are to be held in the Luca Giordano Hall of the Palazzo Ricardi (now the Palace of the Prefect). A hundred of the most learned among the Oriental philologists are expected to take part in the proceedings of the Congress, among whom may be reckoned about sixty foreigners to Florence. Among the latter may be mentioned Renan, Lenormant, Oppert, Schefer, Maspero, Barbier de Meynard, Leon de Rosny, of French celebrity. From England come Rost, Beale, Sayce, Legge, Chenery, Deane, and others. From Germany, the celebrated Indianist, Weber, Roth, Benfeg, Tusti, Pertsch, the Semitic scholar Krahl, Weil, Merx, Dieterici, &c. Two learned linguists come from Denmark, two from Scandinavia, two from Iceland, two from Finland, five from Russia, two from Hungary, two from Spain, two from Roumania, Professor Whitney from the United States, &c. The Senator Amari is the president of the Congress, himself a deep student of Arabic; Professor Angelo di Gubernatis, Professor of Indian languages, the Secretary-General. An interesting collection of Oriental manuscripts, works of art, &c., will be exhibited to persons invited by the committee. A number of Eastern musical instruments, the property of M. Krans, will be added. Many are sending from their private collections objects of interest, the whole forming, though small, an exhibition instructive and admirably adapted to the occasion. The *salons* of some of the Florentine nobility and of Prince Demidoff will be opened to receive the eminent men attending the Congress, which promises to inaugurate the earnest movement made to render Florence the seat of literature in Italy,—its Athens.

The Chapel of the Felstead Grammar School has lately had a large subject of the Ascension fixed, being one of a series. It is painted on linoleum. The drawing of the figures is from life, slightly conventionalised. It was designed and executed by Mr. J. R. Thomson, of Southwark, under the superintendence of the architect, Mr. F. Chancellor.

THE ELECTRIC LIGHT AT THE PARIS OPERA-HOUSE.

IT is well known that the superb paintings which adorn the crush-room (*foyer*) of the Grand Opera House, as also many of the details of the interior decorations of this magnificent building, lose much, and in every way, from the circumstance that they can be seen at night only by gaslight, which is quite insufficient, notwithstanding the multiplicity of apparatus for lighting up dispersed about the rooms of this enormous edifice; and besides, the sulphurous emanations and sooty deposits are rapidly affecting the colours on the ceiling and the panels, at the same time that they are tarnishing and dirtying the gilding and mosaic work. M. Garnier, and the principal artists who have contributed to the decoration of the Opera-house, are very anxious about this state of things, and they think they have found the means of warding off any serious results. A few days ago, M. Garnier and his chief colleagues were present at some experiments for lighting up the interior, especially undertaken to study the effect of the electric light on the pictures of the ice buffet, just newly inaugurated. From the point of view of decorative effect, the superiority of this new light is incontestable. Blue, which in the gaslight takes a green tinge, and pink, which turns to orange, preserve under the electric light their delicate tints. There was only one opinion on this subject amongst all the connoisseurs thus met together.

As to the preservation of the works of art for the future, it is certain that a light which emits neither heat nor sulphurous and sooty smoke solves for artists and for the public so important a question that it has been resolved to interview the Minister of Fine Arts on the subject. An official request will be made by MM. Garnier, Baudry, and colleagues, that the *foyer* and buffet may be lighted during a certain time with the electric light. All the artists, sculptors, and administration of the "Beaux Arts" will be convened to discuss this interesting innovation, and it is scarcely doubted that the Ministry and Administration of the Grand Opera will assist in carrying out their views.

WARRINGTON INFECTIOUS DISEASES HOSPITAL EXTENSION.

THE foundation-stone of extensions to this hospital has been recently laid. The present hospital buildings consist of a twelve-bed ward, outbuildings, and lodge. The buildings which are now being erected comprise a twelve-bed ward, four-bed ward, and an administrative ward. The site is capable of holding two additional twelve-bed wards, which no doubt will be built when occasion requires. When the whole is complete it is expected there will be accommodation to treat the principal diseases of the zymotic type. In laying out the buildings real isolation has been aimed at, and care has been exercised to make them as complete as possible for the treatment of disease, and they have been designed to get as much internal comfort and space at a minimum of cost, and the health of the sick not sacrificed to architectural effect. The wards are built of brick, with slated roofs, and have been designed on the detached block system, viz., to keep each block of buildings for treatment of separate diseases. Each hospital is complete within itself, having accommodation for male and female patients, the centre being occupied with rooms for the store of linen and other matters connected with the working of hospitals of this description, and with nurses' compartment designed that in emergent cases the nurse can reside in the ward. At the end of each ward are sculleries with sinks, also water-closets and bath-room. The baths will be so constructed that they can be either used in the room or wheeled to the bedside of the patient requiring them. The wards are fitted throughout with the patent Manchester grates, which pass a copious supply of warm fresh air to the room, the fire-place acting as an exhaust for the vitiated air; whilst the ventilation of the wards has been obtained by means of slide grids, windows, and diaphragm ventilators through the roofs. All the walls are cavity walls with slate and pitch damp-proof courses, and the ground underneath the floors is concreted, so that as far as practical damp is excluded. The air-space in the wards is 2,280 cubic feet for each patient, which is a little above the Government standard for hospitals of

this type. The outbuildings comprise a mortuary, ambulance-shed, and disinfecting-room, laundry, and boiler-house. The disinfecting-room has been fitted up with Goddard & Massey's patent disinfecting stove, which is worked by gas, and is capable of being heated to 250 deg. Fahr. This is considered requisite to destroy any germs of disease which might possibly be in any bed or other clothing used by the patients and which require disinfecting. A close-covered van is connected with the disinfecting department, so that clothing or bedding can be removed from houses in any part of the town that may have had infectious cases in, and so taken and passed through the disinfecting process to render innocuous any germs of infection, and thus tend to prevent the spread of disease throughout the town. After being disinfected they are returned in the van to the owner. The laundry is fitted up with wash-troughs and mangling-machine, to facilitate the speedy washing, &c., of infected articles. The administrative ward is entirely separate from the hospital wards, and comprises suites of rooms for nurse and surgeon, including dispensary room, stores for linen, kitchen, and other offices. This building occupies the central position close to the entrance and fronting Aikin-street. From the back of this ward a sheltered or covered corridor, with open sides, will be constructed, connecting each of the wards, which can be utilised for a walk or exercise ground for convalescents. When complete, there will be a communication by bells from each of the wards to the administrative department, so that no time will be lost when the immediate services of the officials are required. The kitchen of the administrative ward will be fitted up with a Leamington cooking-range, and the cooking for the patients in all the wards will be conducted in this department. The whole of the buildings will be supplied with waterworks water, and hot water will be conducted to each of the each of the wards, baths, &c., by a boiler fixed for the special purpose.

The hospital was designed by Mr. R. Vawser, formerly surveyor to the borough, and is being erected by Messrs. J. Gibson & Son, under the direction and superintendence of Mr. Longdin, the present borough surveyor.

AN INVENTOR.

Mr. William H. Thomson seems to possess a natural inventive genius. The Edinburgh *Daily Review* gives an account of some of his doings. One of his inventions is a machine which is on the point of completion, and which has for its purpose stone-dressing, or the working of stone mouldings. Various attempts have been made to supersede the primitive methods of working in stone. The inventors would seem to have worked upon wrong lines. Expensive steel cutters, made to the shape of the mouldings, were fitted to powerful machinery, and under them the stone to be worked was passed to and fro. As soon as they commenced action the tools were found to lose their cutting edge and grind out of shape, with the result that the moulding could not be formed. Observing the weakness of this complicated tool, Mr. Thomson set to work to devise a machine which would have a simple tool, and form the moulding by some independent motion that could not be affected by coming in contact with the stone. It was intended to operate upon the stone by a circular saw set with black diamonds, but Mr. Thomson has recently patented, and is experimenting with, a new and cheap tool formed of a novel composition. A circular thin saw, composed of this new material, will be guided in its movements by a cast-iron developing form, working in conjunction with suitable machinery, in such a manner that at the termination of each cut the saw is alternately moved or fed until the moulding is completely formed, thus mouldings of all sizes and characters are worked by one and the same saw or tool; and as one developing form produces mouldings of any size, only one simple cast-iron form is necessary for each distinct pattern or character of moulding. Again, there being practically no wear on those cast-iron developing forms, no matter how great a quantity of mouldings are worked, there will not be the slightest degree of variation. Another advantage obtained by forming all sizes from one development is, that the whole of the mouldings are increased or diminished in size to a true scale, and these developing forms may be set out so as to produce the various members of a moulding with care and precision. With such a machine,—which may appear more complicated in its description than it is in its reality,—there is the prospect of working stone on more economical and expeditious principles than have hitherto prevailed. There seems no reason why the example set by those engaged in the wood trade should not be followed out in masonry. With a little enterprise, and such a system of machinery as this set to work at the quarries, mouldings, door-porches, columns, &c., might be turned out and become staple articles of commerce, to be bought at the various local depôts of the companies who manufacture them, and sent thence to the building site.

THE TREDEGAR MEMORIAL EXCHANGE, NEWPORT.

On the 4th inst. the Tredegar Memorial Corn and Metal Exchange, Newport (Mon.), was opened by the Duke of Beaufort. Previously to the death of the late Lord Tredegar it was proposed to build the Exchange, and formally present it to him, but on his lordship's death it was decided to erect the building as a memorial of the deceased nobleman. The design and style of the building are Italian. It comprises a clock-tower at the angle of the two streets, flanked in High-street by a loggia, affording entrance to the exchange-room. In the rear, beneath the exchange-room, are cellars, entered from Thomas-street, and the necessary offices for the use of the exchange. Above the exchange-room are three suites of office chambers containing seven rooms, which it is intended to let, and devote the income to the dispensary and other charitable institutions. The tower rises, in five stages, to a height of 76 ft., and the height of the end stage is broken by an entablature. The principal story has in the High-street front a bold hooded and moulded niche, with a projecting elliptical corbel, intended to receive a statue of the late Lord Tredegar, and beneath it is a black marble panel, incised with gold letters. The exchange-room is lofty, and may be described as being arcaded and pilastered on each side in five compartments with circular and moulded arches. The compartments on the left are filled in with Venetian windows. The end of the room is also arcaded with piers and pilasters, enriched with carved composite capitals and arches, the spandrels containing medallions with the crest of the Tredegar family and the date of the year in high relief. Above this are a fretwork frieze and moulded corona. The lower part of the room will be finished with a polished pitch-pine dado, with bold moulded surface, and the walls are of buff brickwork, with Bath stone caps, arches, and imposts. The ceiling is divided into panels by moulded pitch-pine beams carried on twenty scroll corbels of Bath stone, twelve of which are carved with fruits and flowers of the various months, four others represent the seasons, and the angle ones have heads of animals, representative of Agriculture and Hunting. The panels of the ceiling are enriched with medallions, alternately conventional and naturalesque, with fruits and flowers. A four-faced illuminated clock will be shortly placed in the tower, at the cost of the corporation.

The building was designed by Mr. Benjamin Lawrence, architect, Newport. The builder was Mr. Charles Miles. The cost is upwards of 4,000*l*.

THE NEW PALACE OF JUSTICE, VIENNA.

Amongst the edifices of a monumental nature which are destined to make Vienna one of the most beautiful cities of the world, the new Palace of Justice (*Justizpalast*) occupies a most prominent position).* It concludes a long series of monuments of Austrian national art, of which two—the Academy of the Plastic Sciences and the Exchange—have already been delivered over to their occupants, and on which labour the most eminent architects of Vienna, and, it might almost be said, the whole brotherhood of art of the metropolis on the Danube. The design for the new Palace of Justice is by the architect Alexander von Wielemans, a young man, who by this work has leaped from comparative obscurity into prominence, by the side of such men as Semper, Hasenauer, Hansen, Schmidt, and Ferstel. Among the competitive designs, representing nearly all styles of architecture, that of Herr von Wielemans, a talented disciple of Herr Dombaumeister Schmidt, was selected; and as early as the autumn of 1874, the young architect was charged by the Ministry of Justice with the duties of superintending the erection of the important work. Building operations were begun in the spring of 1875, and in September, 1877, the principal façade was completed. At the present moment, the roof is on the greater portion of the building.

The new Palace of Justice, erected in the German Renaissance style, covers an area 358 ft. long and 256 ft. deep. It has been placed next to the new Houses of Parliament, with its principal façade to the Amaliengasse. The free space in front, as far as the Ringstrasse, as well as the space between the Palace of Justice and the Auersperg Palace, is to be laid out in ornamental grounds. Gardens 33 ft. wide will also run along the lateral façades towards the Volksgartenstrasse and the Reichsrathsplatz, so that the building will stand completely free. The palace is in four stories and elevated basement, and is to give accommodation to the Tribunal of Commerce, the Imperial Court for Civil Cases, the Appellate Court, and the Supreme Court of Justice, arranged in such a manner that the two first occupy basement, ground story, and mezzanine story; the two latter, the first and second stories.

The total height of the building is 82 ft. The great front, facing the Justizplatz, has four entrances and vestibules, adorned by columnar portals. The principal space in the interior of the building is the so-called Central Hall (see view), a court surrounded by arcades, and covered by a stained-glass ceiling; it contains the great staircase, and from it access to all the courts is obtained. In a niche at the top of the first flight of the staircase, adorned with columns and entablature, a figure of Justice, 10 ft. high, in white marble from Laas, and executed by the sculptor Pendl, will be placed. The arcades of the first story will be supported by columns of red granite, with bases and capitals of white marble. The principal vestibule in the great façade will contain twelve columns of Untersberg marble, with decorated pedestals. The columns of the portals are of grey Karst marble. The dressing of the basement is a brownish Oslop stone, that of the other stories is of Margaretha stone.

The principal façade, which will be adorned by artistic *motifs*, receives an imposing ornament in the form of a handsome pediment in the German Renaissance, which will contain in the tympanum a gigantic Austria, and be surmounted by a massive imperial coat of arms. The statue, in the *atelier* of the sculptor E. Helmer, is already near completion.

The same façade is flanked by two turrets (of iron, with metal sheathing), which rise to a total height of 154 ft. over the pavement. The centre block of the great façade contains in the first floor a large hall, reserved for solemn occasions, which is 39 ft. 6 in. high, 79 ft. long, and 36 ft. broad; this will receive along the walls a free row of columns and be covered with a rich barrel-vault.

Great regard has been paid to practical utility in the arrangement of the building; and in its whole aspect, as well as in its decorative details, the new edifice will form an architectural ornament of the Austrian capital.

* See *Builder*, September 29, November 3, December 29, 1877, &c.

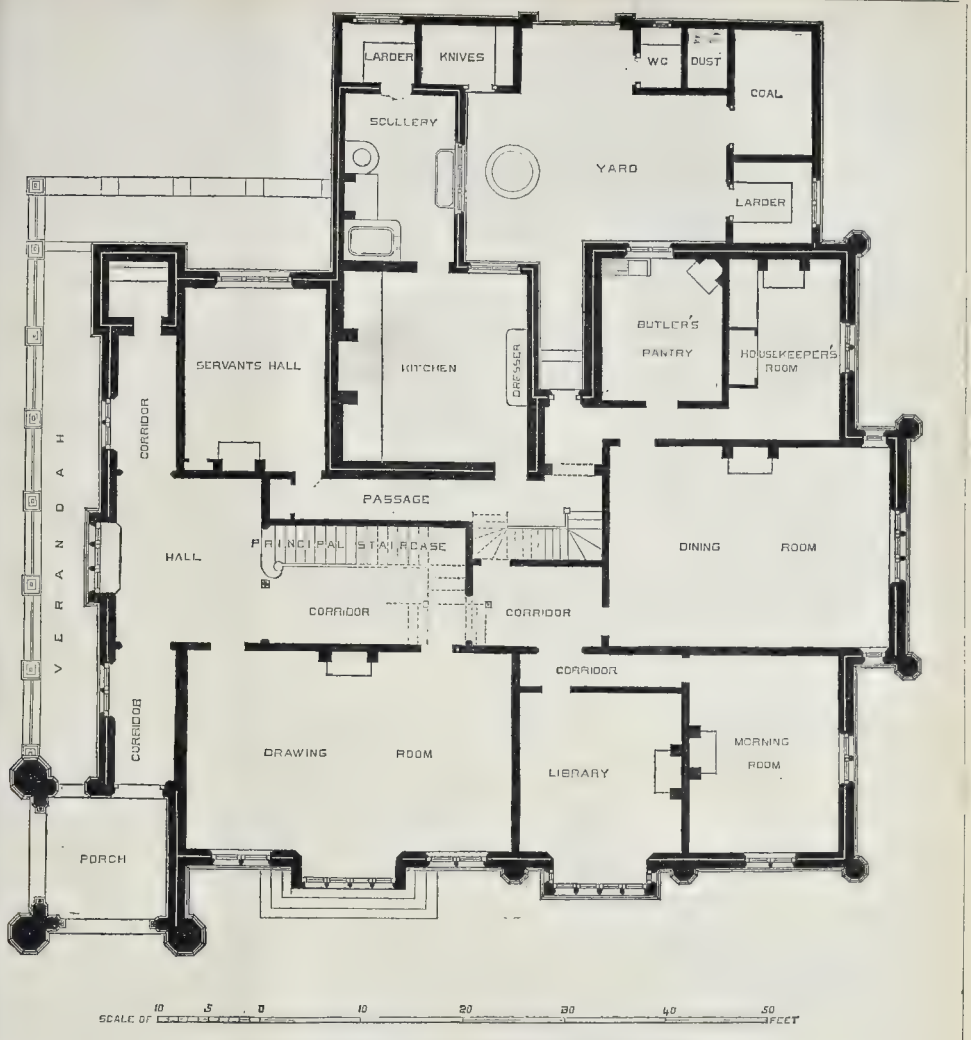
Assyrian Antiquities.—A correspondent writes:—"The authorities of the British Museum are exhibiting a praiseworthy desire to submit at the earliest possible moment to the inspection of the public the antiquities brought from Kalakh and Koyunjiy by Mr. Hormuzd Rassam. Already one moderately-sized case has been temporarily arranged in the most spacious of the Assyrian galleries, and others are to follow as soon as the preparations for that purpose have been completed. Nothing in the way of Assyrian or Babylonian archæology has for some years created so much stir amongst the learned and the public generally as the present collection of Mr. Rassam. The most attractive and important of all the specimens shown in the single case which has for two days been exposed to view are the singular and unique plates, belts, or scrolls of bronze, on which bas-reliefs record the military exploits and the more peaceful events of the reign of Assur-Nazir-Pal."



THE NEW PALACE OF JUSTICE, VIENNA: INTERIOR VIEW.—Herr von Wielemans, Architect.



LANGLEY MANOR HOUSE, NEAR LYNDHURST, HANTS.—MR. J. O. PALMETTER, ARCHITECT.



LANGLEY MANOR HOUSE, HANTS. PLAN OF GROUND FLOOR.

LANGLEY MANOR HOUSE, NEAR LYNDHURST, HANTS.

THIS mansion, built for Mr. William Vaudrey, was designed from sketches made by Mrs. Vaudrey, and has been carried out from the plans, and under the superintendence of Mr. J. O. Parmenter, architect, Kingsfield, Southampton, by Mr. H. J. Sanders, of that town. It is situated on a commanding eminence on the brow of a hill, from which extensive and picturesque views over the New Forest and surrounding country may be obtained, including the Southampton Water and the Isle of Wight. The elevations have been boldly and carefully designed in the style of the domestic architecture of the fifteenth century, manor-houses then partaking somewhat of the ecclesiastical and baronial styles of art, and the study has been to render all the parts harmonious one with another.

The external walls are built hollow, with red bricks and black mortar-joints. The jambs, mullions, transoms, sills, and cusped heads to the windows are executed in red Mansfield stone, as are also the bay-windows, oriels, arches, columns, and capitals. The plinths, copings, label mouldings, bosses, and strings are in red Alton stone, from the quarries in Staffordshire.

The entrance to the mansion is under the tower, which rises at the south-east angle of the building, and gives a striking appearance to the elevations forming an entrance-porch. It is paved with Minton's tiles, and has an ornamental pitch-pine ceiling, with brass and bronzed pendant for the lamp; under this ceiling is an Alton stone arcade with cusped-headed arches, and carved and moulded corbels, forming a rich cornice; on the floor above is the boudoir. There are two Mansfield stone moulded and cusped oriel windows, the floors of which are raised, forming recesses for seats, the walls are lined from floor to ceiling with moulded and carved panelling. Above this is the smoking-room, lighted by four large windows similar to the boudoir, with boarded walls and ceiling. On the top of the tower is a large provision for the storage of water, and these tanks are supplied by pumps from a well of 20 ft. in diameter. From the tanks pipes are distributed over the several floors, and connected with hydrants, &c., ready for any emergency in case of fire. Two other wells have been provided as a supply, and the water is conveyed through block tin encased pipes. Great attention is understood to have been paid to the drainage; all the drains are ventilated through charcoal, and most of the rooms are ventilated on Tobin's principle.

The building contains on the ground floor the entrance tower or porch; corridor, in which is placed a pair of carved, cusped, and moulded inner doors; hall, principal staircase, drawing-room, library, morning-room, dining-room, housekeeper's-room, butler's pantry, servants' hall, with a complete set of offices. The pointed arches in the hall and corridors are in Mansfield stone, the capitals are carved with conventional foliage; the walls have moulded and V-jointed dado with cornice, and the ceilings are painted, all the paving being of Minton's tiles. The drawing-room, which is 32 ft. long by 20 ft. wide, is bordered with Arrowsmith's solid parquet; the walls are lined with a carved and panelled dado out of American walnut wood, with cusped heads, carved strings, bosses, and cornice; these are touched in with gilding. The chimney-piece, from the architect's design, is of Mansfield stone, the former being fitted with a dog-grate made to design, with the family crests, &c., and the hearths and linings of the sides are of tiles.

The ceiling assimilates with the dado, and is panelled in a diagonal shape, with moulded and turned pendants, having carved foliage and fruit as enrichments placed between the panels These are also picked out with gilding. The door is carved and moulded to match the dado. The fittings are of brass. The library and morning-rooms are fitted with parquetry, and have panelled dado and ceilings, the chimney-pieces being fitted with Feltham's dog-grates, to design. The dining-room, which is 28 ft. long by 20 ft. broad, has a solid parquet border, the walls having a panelled dado, filled in with V-jointed boarding, the cornice of which is battlemented. The ceiling is formed from the construction of the floor over it, the joists being wrought, and stop-chamfered, with massive wrought and stop-chamfered beams with hammer-beams; the latter are ornamented with shields for armorial bearings, and parts of the ceiling are picked out with gilt. The door and chimney-piece, which are in Mansfield stone, have been designed so as to form a feature with the dado, which here is panelled and carved, each panel forming a shield.

The bay mullioned hall windows are filled with stained glass, with heraldic bearings, and all the windows throughout are fitted with a wrought moulded iron interior margin.

All the bedrooms, which are lofty and well lighted, have a border of solid parquet, and are fitted with Mansfield stone chimney-pieces, fenders and dog-grates, with tile-hearths, and are all ventilated on the principal adduced by Dr. Arnott and Tobin.

The bath-rooms are fitted with the royal porcelain bath, moulded and glazed in one piece, as designed by his late Royal Highness the Prince Consort. All the table-moulds are carved, and terminate with grotesques or foliage. Some of the capitals of the arcade are cleverly carved. The roofs are covered with tiles made at Bishop's Waltham, with an ornamental ridge, while over all are the solid copper tape lightning conductors.

The stable range has the blue Staffordshire paving, the walls being of white bricks, lined with Minton's light blue tiles, and fitted with patent iron fittings. The carriage-houses are heated with hot water. The clock in the turret has been supplied by Frodsham, and strikes the hours, chiming the divisional parts.

THE HIGH-LEVEL BRIDGE QUESTION.

"The uses of mediocrity are for every-day life, and the uses of genius, amidst a thousand mistakes which mediocrity never commits, are to suggest and perpetuate ideas which raise the standard of the mediocre to a nobler level."—*Lord Lytton.*

SIR,—Having read your article of the 13th ult., on the proposed Tower Bridge, I forward to you the following remarks, containing a few facts and reasonings which I think have some claim to form part of that full inquiry and debate of the question which you agree is necessary to prevent the adoption of "poverty of invention disguised under the undeserved name of economy."

Allow me to introduce myself as a 'twenty years' amateur student of iron bridge architecture, who entertains very revolutionary ideas upon the subject. In a recent letter to Sir J. W. Bazalgette I have expressed the opinion that iron bridges are mostly "an abomination unto art." But as you have described them as "some of the ugliest structures ever erected on our planet," I trust you will not find fault with me for my unvarnished plain-speaking. Within the limits I know this letter must be confined to, I will not attempt even to sketch the skeleton, but merely a few bones ("of contention") of the subject, as follows:—

The first question I would ask is, Why has not the Metropolitan Board of Works called for a competition of designs for so great and important a structure as was done in the case of the Houses of Parliament, the Government Offices, the Nelson Monument, Law Courts, &c.? What is the difference of circumstances that has rendered a competition unnecessary in this case, though necessary in those instanced and many others? In the cases cited, excellence in architecture or art alone was requisite (except in a very minor degree). But in the unprecedented bridge in question, a masterpiece of science and architecture combined is the need of the occasion. If no individual architect or sculptor can be depended upon as being unsurpassable in the exhibition of one talent, upon what ground is it assumed and concluded that an individual engineer possesses two talents in a pre-eminent degree, in neither of which he has yet distinguished himself? If the Metropolitan Board of Works does not feel sure that its engineer possesses such extraordinary abilities, it is not justified in recommending his plan for adoption by Parliament, untested by competition. No committee of the House of Commons, I believe, has ever taken upon itself to act so narrowly and exclusively in a matter so important. And the most to be learnt from this Tower Bridge project appears to me to be that the Metropolitan Board of Works has been set upon too high a horse, and is in danger of riding too far; and that its business functions require to be not unlimited, but as clearly defined and circumscribed as to its geographical operations. The effect of allowing a Commission to spend public money by the million upon whatever it pleases that happens to come up to its notions, and be first presented to it, and not enforcing comparison and examination, must be to stifle art and improvement in all such great public structures as are placed under such commission's control. Thoughts and art creations are each born of one person, not of committees. All the Royal Commission of 1850, and scores of architects and engineers, could not create the Exhibition building of 1851; but one Paxton could. A committee's ideas are necessarily mediocre (and unfit for uncommon purposes), unassisted with means of comparison. The people of a village who had never seen or heard of any other kind of lighting than candles would regard "wax-moulds" as the acme of the art of artificial illumination. Emerson says, "It is in the soul that architecture exists. Santa Croce and the dome of St. Peter's are lame copies after a divine model. Strasburg Cathedral is a material counterpart of the soul of Erwin Steinbach." If the Metropolitan Board of Works had power to build a metropolitan cathedral, would it give the job to its chief drainage engineer and shut its door in the faces of Erwin Steinbachs and Christopher Wrens? I contend that if the Metropolitan Board of Works had such power, and were so to exercise it, it would be acting on the same principle, and in no worse manner than it is doing now. A great bridge, I submit, is as sacred a work as a great church. Both are sublime tasks, and equally entitled to the consecration of a human mind in their production. Why may not an arch or span of a thousand feet (if there is any grace in its form) lead to reverence of the fountain of intellectual power as effectually as a 500 ft. spire? Is "the pure wine of imagination" to be devoted to the latter, and common mental beer deemed good enough for the former? Is it wise or defensible to pursue any work of art with only one of our several shutters open, and in all probability produce a lamer model than we might, through wilful lack of light. The Metropolitan Board of Works was established to overrule and control the petty plans of local commissions of sewers, who I believe sometimes managed to swamp each other's districts. But shall we not get rid of that mischief by creating another as bad, if we permit the said Board to swamp some of the highest forms of intellectual energy of the whole country in an ever-present flood of monopoly? National fame is at stake in the decision. A great metropolitan bridge is no more a mere metropolitan question than Spital-fields drainage is a mere Spital-fields question. "British interests" require watching and guarding in the choice of a public structure as carefully as in a European congress. I submit, then, that a public competition, or a good reason why there should not be one, is the first point that should be debated.

I shall not discuss the question of the necessity of a bridge in the proposed locality. There is, I think, a balance of evidence in its favour (as well as the approbation of the Metropolitan Board of Works), *if it can be so made as to accomplish its purpose.* I shall go no further in this letter than criticise Sir J. W. Bazalgette's plan of the southern approach, and offer for consideration another plan as an amendment upon it. I cannot reconcile the published statements and certain provable facts respecting the plan of the southern approach. Sir J. W. Bazalgette said (March 22):—"The southern approach would commence in Tooley-street, east of Queen Elizabeth's Grammar School, and would rise by taking one turn and a half round a spiral curve about 300 ft. in diameter at the back of the Anchor Brewery, and thence on to the bridge at Hartley's Wharf." It is not quite clear where the approach is to commence, for Tooley-street terminates considerably westward of the Grammar School. But I suppose Sir J. W. Bazalgette means in Queen Elizabeth-street. The illustration of the Tower Bridge in the *Graphic* (April 13) presents a level soffit throughout the length. Assuming the depth of platform to be 5 ft. (it is at least 8 ft. as drawn), the surface of road at the abutment would be 70 ft. above high-water mark. Queen Elizabeth-street is not more than 5 ft. above high-water mark, so that the rise would be 65 ft. The *Graphic* says the incline is 1 in 40. Mr. Hanson said, at the Common Council (May 2), that the "spiral road was 714 yards long. The distance from Queen Elizabeth-street to the side of the water is less than 500 ft. It is evident that either the statement that the incline is only 1 in 40, or that the spiral curve would be about 300 ft. in diameter, must be greatly wrong. If the incline is 1 in 40, and the rise 65 ft., the diameter would be 550 ft. (60 ft. or 70 ft. more than the whole space between Queen Elizabeth-street and the Thames), and the length of the road would be 2,600 ft., or 866 yards 2 ft. If the incline or gradient is 1 in 40, and the length of the spiral road (as Mr. Hanson says) is 714 yards, the diameter would be about 454 ft.,—nearly all the distance between the Thames and Queen Elizabeth-street. And I may here observe that the space from the front of the houses on the north side of Queen Elizabeth-street to "the back of the Anchor Brewery" premises is certainly less than 240 ft. I reckon that a circle and a half of 33 (allowing a trifle for slope) has a diameter of 7. And if the spiral curve would, as Sir J. W. Bazalgette states, be 300 ft. diameter, its length would be 1,414⅔ ft. And if the gradient was 1 in 40, the rise of the road would be only 35⅓ ft. Now I want to know where the other 25 ft. or 30 ft. are to come from. Suppose we say that the top of the spiral road is only level with the soffit of the central part of the bridge, and that Queen Elizabeth-street is more than 7 ft. above high-water mark, we should then require 57 ft. of depth in the spiral road, which, if the diameter was 300 ft. would give an incline of full 1 in 25. In these calculations I have only given the minimum rate of incline at the outside edge of a spiral road; at the inner side the steepness would be from 15 to 20 per cent. sharper. In the last supposed case (if the carriage-road were 36 ft. wide) the incline at the inner edge would be 1 in 19; and if the depth were 65 ft.,—1 in 16⅓. Surely such wide discrepancies and seeming contradictions require clearing up by a consistent statement of something approaching to exact details.

Now let us look at the gist of this southern approach part of the question. No doubt a foot-bridge (with stairs) would be very useful, but a quarter of a million would cover that; but before the million or more is laid out, there ought to be good evidence that the money would not be wasted. Experience of the avoidance of Southwark Bridge should teach caution. In recommending, without more inquiry and knowledge of the subject than it at present possesses, the plan of Sir J. Bazalgette to the House of Commons for adoption, I think the Metropolitan Board of Works has shown too much confidence in its own prescience. It must be composed of wonderful men, if they can safely dispense with experiments in great undertakings involving largely new conditions. Many thousands of pounds were spent in experiments before such eminent engineers as the late R. Stephenson and Sir W. Fairbairn proceeded to the construction of the Britannia Tubular Bridge. If a spiral road of the proposed full dimensions does not exist anywhere in the country available for experimenting, I submit that common prudence demands that a central section of about 8 ft. of the intended spiral roadway should be erected (in timber) in one of the parks, and paved the same way as the intended spiral road, and tested in all kinds of weather by all kinds of full-loaded carriages and vehicles, and the strain upon horses tried. That would be the only way to *know* really the time saved, and (taking the vote of metropolitan horse-owners) the merits of the said spiral road. We must remember that no clear comparison can be drawn between a straight hill and a curved hill of the same height. In the latter horses abreast must to some extent pull at different angles and against each other, while the load can never be fairly in line behind either. The spiral road in West Smithfield has been mentioned, but it should be noticed that it is not much, if any, more than one-third of the height of the proposed road at Horsleydown; and it will not do to calculate by

mple multiplication the time and strain in the vo cases, any more than to conclude that if a orse could run a mile in three minutes, it could in three miles in nine minutes. The cost of such xperimental road would, I should think, not xceed 3,000*l.* Would it not be better to spend hat sum and make sure, than risk throwing way more than a hundred times the amount? or the reason above stated, I greatly doubt he utility of any spiral road at the *locus in quo*, nd I therefore suggest the consideration of keeting the difficulty by a steam-lift (toll-free). robably a steam-lift, site, station, and approach ould cost half a million less than a spiral road, te, and approach; and I think that half a illion (most of it reckoned as invested, which need not be) would suffice to "make and aintain" a lift service, that would rise and wer (six to each lift) 240 carriages per hour, esides cattle and sheep, &c. Taking in the welve busiest hours, 5,760 of the 12,000 vehicles ated to pass through Eastcheap, Gracechurch nd Thames streets "daily,"—whatever number f hours "daily" may mean,—I believe it would e found that the steam-lift would be quite as uick as well as cheap as the "spiral curve," ith all the labour of ascent and descent saved. 0*l.* for fuel, and 30*l.* for other expenses per ay, I reckon, would not be exceeded. Other de ails I deem here unnecessary. Believing in it myself as the best plan under the circum tances, I offer this suggestion as a fit and roper one for investigation before a final ecision is arrived at.

I have to apologise for not justifying the eading of this letter by any remarks upon the ridge itself. But I felt bound to draw attention h the first place to the two subjects I have troduced; they appear to me to be the due nd necessary A and B of the matter.

If this communication be favoured with your nsertion I purpose to proceed in my next to the uestion,—"Is the art and science of wrought on (including steel) combination in relation to ridges in a crude and unsatisfactory state?" aking the affirmative. Sir J. Bazalgette's pro osed Tower Bridge is confessedly only a re ish-up of old arrangements, and I submit that he present occasion is a seasonable time to verhaul the whole subject of the state of the rt of combination of the metals named, for ridge purposes. I will just observe in conclu ion that there is an assumption in connexion ith this steel bridge proposition, which has een purveyed and swallowed without notice. t is a generally accepted idea that existing rought-iron bridges represent all the strength f the material they contain, and that to get ore strength without increase of weight and uantity, steel must be resorted to. Such idea think I can show is a gross fallacy, refutable y Fairbairn's own pages. But I do not, how ver, propose to use iron (mainly) for bridges in his or any case where weight and bulk are an bject to save, but to show that neither the trength of wrought-iron nor that of steel is or an be fully developed by the present riveted late system of combination.

C. G.

WORKS FROM JAPAN.

SIR,—I have recently received from the Government of Japan a most valuable present n the form of models of some of the ceilings of he great temples of Tokio, and also some onderful old nails from temple gates, which re a present from the chief of the Museum in eddo. The ceilings are divided into square anels, which panels are treated in various ays. The most simple and, to my thinking, he most beautiful, is said to be a copy of a orean ceiling; and when in Japan I was often stonished to hear that beautiful works were ere copies of objects in the Corea.

Thinking that it might interest your readers, send you the following copies of the two ind letters which accompanied these valuable ifts:—

"26th of 3rd Month, 11th Year Meiji.

DR. DRESSER,—Sir: In January of last 10th year Meiji ou have brought the articles sent by Mr. Owen to our Iuseum, and I am much obliged that you have taken the rouble to arrange them. After your returning home last April, the articles have been exhibited to all the people, nd I have notified all through the country your valuable nformations regarding to the important points of industry hich you have given to the officer who attended you uring your visit to several industrial establishments. It ust be for your kindness that I could make all industrial ies to understand the points which were obscure heretofore, and I can assure you that in the future time they will ake a progress and bring great interest upon the ommerce.

During your visit you have requested our Museum to make the models of ornamental ceiling of several temples at Tokio, and now they have been finished.

Although they are very trifling, and not enough to compensate your last service, I present them to you. You will please accept them as the token of my highest regard. With compliments.

OKUBO TOSHIMICHI,
Minister of Interior Department."

"26th of 3rd Month, 11th Year Meiji.

Sir,—During your traveling through our country last year, I have had the honour to see you at Nara in the time of my official visit to that place, and soon you have departed this place, before I could get the occasion to behave friendly toward you. While I feel great regret, it has passed one year already, and now I will take the pleasure to write and to express my earnestness to you and ask your health.

The articles which you have taken the trouble to arrange at our Museum, and which were presented by various English manufacturers, have attracted much attention of our people, and have got great renown to our Museum, among others the porcelain-makers at Kanadzawa, Kaga, asked to copy some in order to make the models of design and colour.

I have never forgotten your valuable information which you have given Mr. Sano: so I have not permitted these men to imitate them, but, regarding to the design and colour, as our artists are yet far from being equal, I believe you will allow that it is one of our industrial improvements to take the excellent parts of your design and colour without imitating their whole forms and figures.

During your visit to Tokio you have requested to make the models of ceilings of existing temples at Shiba and Uyeno, and now they, being finished, are presented to you from our Minister of Interior.

And I present two ornamental coverings of nail-head used in Rashōmon and Congōshuin, and twenty-one old irons to you, one iron cylinder of which is presented by Mr. Suge Sōho, a subordinate, who have seen you at Nara. You will please accept them. These ornamental coverings and irons are, as you know, things used in our ancient buildings, and their particulars are to be found in the information herewith annexed, so here understood.

Mr. Tanaka Joshio, second secretary of Interior, and Mr. Shioda Makoto, attaché of Interior, who were acting for me, told me that they ought write to you, but as I am writing to you they request to me to avail themselves of it, and to express their thanks to you; also, Mr. Shiodo requests to present fifty patterns of plastered wall to you. These patterns show the plasting condition of walls in our buildings, and he ask that they will be of a little interest to your architects.

In conclusion, after your receiving my letter, you will please inform my sincere thanks to Mr. Philip C. Owen, Messrs. Londos & Co., and other manufacturers.

MACHIDA HISANARI,
First Secretary of Interior and Chief of Museum."

The first letter is from Mr. Okubô, who was dragged from his carriage and brutally assassinated on the 14th of May last, while on his way to a cabinet council at the Mikado's palace. He was a gentleman of the modern school, and earnestly sought the advancement of his people.

In the second letter, reference is made to nail-heads. Those who have visited Spain well know that many of the cathedral doors are studded with large nails of Moorish origin, many of which are highly ornamental in character. The Japanese nails, to which reference is made, are very similar to those of the Moors, and prior to my visit to Japan I should have mistaken these nails for Moorish works.

I was surprised to find in many Buddhist temples in Japan a lamp in common use, which is identical with the particular lamp used in the Jewish synagogues in Morocco, but here I have been tempted to enter upon a field of inquiry, which has no relation to the letters of which I send you copies; but the coincidence in form of nails and lamps in countries so distant is worthy of special note, and these are only two instances out of many that I observed during my travels in the interior of Japan and in China.

CHR. DRESSER.

THE TRADE-UNIONS CONGRESS AT BRISTOL.

THE eleventh annual congress of representatives of the various trade unions of the country was commenced at Bristol on Monday.

Mr. Bailey (president), chairman of the Parliamentary committee, presided at the sitting of the congress, and said that, taking into consideration the depression of trade in all branches of industry during the past year, and the struggle which had taken place in various industries in connexion with trade unionism, he thought the attendance at the assembly showed that the working men of the country had every confidence in the usefulness and benefits of unionism. Though they had sustained defeats in Lancashire London, Northumberland, and other places, they had not become wholly demoralised, but retained a nucleus by which they could improve their position at no distant period and become as strong as ever they had been in the past. They had now to contend with a strong federation of employers, and he thought the day was not far distant when they, as trade unionists, would have to extend their lines and have a strong federation, instead of existing simply as isolated societies.

Mr. G. F. Jones, secretary of the Bristol Trades Council, was elected president; Mr. Kennedy, of the United Trades Council, vice-president; Mr. J. F. Hopkins, secretary; Mr. John Burnett, London, secretary of the engineers, treasurer; and Mr. Fitzpatrick (Liverpool) and Mr. Caunt (Bristol), auditors of the congress.

The Standing Orders Committee having been elected and some minor officers appointed, Mr. Jones assumed the office of president.

Mr. Broadhurst (London), secretary of the Parliamentary Committee, presented the report of that committee, which congratulated the Congress on the progress made during the past year with the Employers' Liability for Injuries Bill. Although there was no actual legislative gain to report, the question had made enormous strides in the amount of public attention it had attracted, and public opinion had undergone a remarkable change in relation to it. The Attorney-General had promised to introduce a Bill on the subject of employers' liability, but although Mr. Macdonald had constantly pressed the Government to introduce a Bill, nothing more had been heard of it. The associated employers were offering a most fierce opposition to any Government action on the question, and the committee had been informed that a large deputation had an interview with the Attorney-General, urging him not to proceed with the Bill. Whether the Attorney-General intended to comply with their wishes or not, it was only too evident that the workmen would have to throw their whole influence into the agitation, or no legislation would be obtained. The report next referred to the passing of the Factory and Workshop Act, in which some important modifications were conceded by the Home Secretary; but on the whole the Act contained all the important principles of the Bill in its original draft. The committee, remarking upon the general position of trade unions, stated that the past year had been one of great depression in nearly every branch of productive industry. The want of employment had not been peculiar to Great Britain; other countries had suffered much more severely in that respect than our own. Reports from America and the Continent all testified to the prostration of trade throughout the world. The present year had witnessed the close of two remarkable disputes in the building trade,—the masons of London and the joiners of Manchester. In both cases the men were supported by powerful unions, with large accumulated funds, and great resources in the power of levying for extra support, but they regretted to say that in both cases the men failed to establish their demands. That might be accounted for in many ways. First, although the building trades in Manchester and London were in a prosperous state at the commencement of the disputes, yet under the power of the strike clauses now inserted in all contracts, the employers are enabled to postpone the completion of the works to an indefinite period. Second, the sympathies of nearly all classes of people, except the workers, are on the side of capital, without regard to the special point in dispute. This applies more especially to local corporations and other governing bodies. Third, the employers in nearly all branches of industry are now united in powerful organisation. This form of united action they have undoubtedly copied from our own unions. This almost unlimited concentration of authority gives them a power of offence and resistance hardly equalled by our best unions. Fourth, the collapse of American industries and Continental works has flooded the labour market with skilled hands of all trades. The superfluous wealth of English employers enabled them to import this labour into England, not from motives of economy, but from a determination to defeat the workmen's combinations, even though it should entail a greater outlay of money than would have satisfied the requirements of native workpeople. The English unions (says the report) are thus brought face to face with a most wealthy, most unscrupulous, and skilfully organised opposition, a power not directed by the open form of government known to our unions, but for the most part working in secret and shunning the light of day. Its deliberations are conducted in private, and its edicts go forth in strictly private and confidential circulars. Its victims are struck by unknown hands. The greatest offence known to these secret associations is membership of a

trade union. The highly skilled and industrious workman is punished equally with the worthless should he be determined to exercise his birthright of association with his fellow-worker. The committee observed that it was not their duty to point out the means of dealing with those new elements in industrial conflicts; but they ventured to warn the unions that in order to meet that new condition of things their societies must be placed on the soundest foundations. The directing authority, which was now so scattered as to be almost useless, must be concentrated. Organisation was fast becoming a science requiring experienced statesmanship. To successfully conduct them, the revenues of the unions must be enlarged and their area of influence must be considerably extended. Nobody more earnestly regretted the ever-recurring conflict between capital and labour than the committee, but it nevertheless ventured to warn the employers that the stamping-out process would not succeed. Unionism was too firmly rooted in our soil to be destroyed by capital, however powerful and insidious its opposition might be. Workmen only asked for the wages necessary to maintain their homes, and to meet the constantly increasing demands of taxation. To secure that, they believed combination to be as necessary now as it had ever been, and they had no hesitation in saying that the unions had a future before them immeasurably greater, more powerful, and more successful than their past.

We shall return to the proceedings of the Congress.

"CONCRETE HOUSES."

SIR,—With your permission I shall be glad to give your correspondent "G. G." the information asked by his letter in your last issue.

There is no doubt of the practicability of constructing the proposed houses on the Duke of Sutherland's estates entirely of concrete, including walls, floors, stairs, and roofs. Neither is there any doubt, if "rightly directed," of the economy (especially in a district where clean sand and gravel are plentiful), and skilled labour scarce) and other advantages, such as dryness, warmth, being fireproof, durable, and, especially as regards the roofs, less liability to need repairs.

Ample proof already exists in the North of Scotland of these advantages of concrete building. Five or six years ago my firm built walls floors, and stairs of the Aberdeen Theatre in concrete, and a present examination will show how good and valuable a material concrete is for such uses.

I have built also in Aberdeen the new Epidemic Hospital, cottages at Torry, new slaughter-houses for the Flesher Incorporation, and other buildings, and mention these that "G. G." or his agents may have the opportunity to satisfy themselves by personal examination.

No example, that I am aware of, exists in Scotland of the best form of concrete roof, the domed concrete roof of the Arlington-street Swimming Baths, Glasgow, being the best of the concrete roofs I have executed in Scotland. Many flat concrete roofs have been built, but I prefer to make them curved, like rather flat arches; then, getting the advantage of the tensile, as well as the compressive strength of Portland cement, these curved roofs may be made thinner than flat ones, giving the walls less weight to carry, and even less thrust or lateral pressure to resist, and giving also all better form for throwing off rain and snow. Gutters are formed on the top, no iron or other gutters are required, and there will be no broken slates or tiles; and, when properly executed, no other repairs whatever.

Such a roof may be seen at our new building in Wandle-road, Wandsworth-common, near London. The same building will also show how colour and other effective finish may be obtained cheaply, and the ordinary "stucco" avoided.

CHARLES DRAKE.

SIR,—There can be no doubt that on landed estates, the many advantages possessed by concrete can be realised to a greater extent than in many other places. The principal materials, either gravel, stone-chippings, broken flints, burnt clay, or some like substances, are usually procurable without any outlay on the part of the landowner beyond the labour in digging or collecting, and in many cases the cost of removing *débris* from old buildings is avoided by re-using it as an aggregate in concrete construction.

As unskilled workmen only are necessary (but with proper supervision), facilities are afforded for employing agricultural labourers at times when they would have but little else to do, and they are preferable as a rule to ordinary town labourers for this kind of work.

The present price of iron, and facilities for obtaining it of almost any size and section, enable iron and concrete floors to be constructed at about the same price as with wood in the ordinary way; but for roofs of cottages and farm-buildings, there are many objections to its general adoption. The numerous requirements in erecting labourers' cottages and farmsteads, such as water-troughs, tanks, ponds, pavings, copings, cills, &c., render concrete almost invaluable when once its general usefulness is appreciated.

I make these remarks from the experience gained in having erected during the last ten years a very large number of buildings in concrete on Lord Ashburton's estates without any failure of consequence that I am aware of.

THOMAS POTTER.

SIR,—Referring to the letter from "G. G." in your issue of August 31st, I beg, through your columns, to invite his careful attention to the article in your paper of September 8th, 1877, of Concrete Building according to the system of Mr. Edge, of Birmingham, in which the subject is fully treated and explained. Q. E. D.

ON SHAMS.

SIR,—That flimsy piece of bunting on which "Down with Shams" is inscribed is so often flaunted in one's face, as if it were the Royal Standard of art, that the sooner it is torn to shreds and tatters, and converted into tinder, the better. All who enrol themselves under this cotton rag are so sensitively conscientious that they are constantly expressing their abhorence of art-fibbing, as if art in its legitimate "shamming" were guilty of atrocious lying. This sensitiveness is only paralleled by that reported of some of our American cousins, who are so easily shocked that they clothe table-legs in "continuations." The followers of this flag, or, rather, rag, "which has *not* braved a thousand years the battle and the breeze," are unable to discriminate between the moral delinquency of a nefarious purpose, of an intent to defraud with *mal prepense*, and the legitimate shamming of art, whose very province is, and was, as it were, to hold the mirror up to nature, to imitate, to counterfeit, with paint, with marble, with voice, and gesture. Surely these are not the things themselves, but "shams," or counterfeit presentments of them; and in the higher kind of art, as I took care in a former letter emphatically to express it, this shamming must be done not *too* well or closely, but *wisely*. It must be done within certain limitations. We must in this shamming, as the poet expresses it, "beget a temperance."

Is it not curious to contemplate, however, that that numerous following of painters of the present day, self-styled "realists," and which vociferates the loudest against "shams," is yet bound, in obedience to its fundamental tenet, to "sham" nature with all its might, to carry nature—"shamming" to its greatest lengths? The Dutch excelled in this closely imitative painting, and have been duly admired for it, and one Quintin Matsys, of Antwerp, had the villainous and "lying" audacity to "deceive the expectation" of an innocent burgomaster, and what is worse, of his future father-in-law, by "shamming" a bluebottle to such an entomological nicety, that the "expectation-deceived" burgomaster sought to sweep it off the canvas. It is, we believe, this very fact which has placed the painter of Antwerp in English estimation before Michelangelo and Raffaelle, and which has given such formidable and full-blown sanction to the realistic school in this country.

But if "shamming" is to be done *wisely* in the higher art, there is a kind of art in which "shamming" *de rigueur*, as we have already instanced, has been countenanced, nay esteemed, more especially in "still life," copies of bas-reliefs, and in the imitation of woods, marbles, &c. If anybody's "expectation is deceived," anybody is cheated, by this innocent "shamming," these artistic fibbings, or white lies, the success may be forgiven. Such "shammings" have, indeed, not only been forgiven, but accounted merits, from the time of Matsys to the present day.

Is Nature herself, however, free from the imputation of "shamming"? Let us see,—why, at the very outset we are confronted by the fact that man's "expectation is deceived" into believing that he sees the things themselves whilst all that he really knows of them are the impressions which they make upon his senses, the shams which Nature foists upon him. We have never seen Nature herself; we do not know what she is really like, and if we push reflection to extremities, we must conclude that we have never seen anything but ourselves. Our "expectation is deceived" into thinking that light is in the outer world, when it is light only in our own consciousness; externally it is simply vibration, and the same may be said of sound. What shall we say, too, to Nature's "lying," "shamming" mirage by ocean and by desert, "deceiving the expectation" of the tra- develop into the shapes and lines of leaves with the purpose of "deceiving the expectation" of some other of Nature's creatures. Where, oh where does all that which the poor "supersensuous" art critics tell us is *not nature* reside? In a world outside this? or does Nature include the right and the wrong, everything that is possible to be, in the great All? The latter, of course. "Shamming" is therefore one of Nature's faculties, one of the delectations provided for our brief entertainment.

Again, descending to lesser things, shall we condemn Wren to the bottomless crypt of architects for placing a "sham" dome in St. Paul's, or the monkish architects who created that "shamming," "lying" Gothic, which trickles up to vault and clearstory, "deceiving expectation," but which does not utterly collapse, simply because those sly buttresses outside are propping it up. Or what of "sham" wings to angels, of "lying" centaurs, hypogrifs, and all the nondescript paraphernalia of art? Or what of "lying" dramas, novels, fairy tales, &c.? Or, yet again, of "lying" pictures representing events as they never occurred, and in inferior art as they never could occur? And, finally, what shall we say of all that "lying" early and imperfect art which far from "shamming wisely" could not sham well enough? Yet this, according to some people's logic, should give early art the precedence of maturer.

So far from industrial progress having diminished, it has prodigiously increased the production of "shams." The electrotype process has enabled people of moderate means to rejoice in the presence of seeming gold and silver surroundings. And compositions of various kinds are used to multiply articles of taste at a small cost. If these be well designed they are intrinsically, as matters of taste, as good as if they were made of solid gold or silver. The eye receives no more than the superficial value of the precious metals when they are solid, the great mass of costliness is buried beneath that. A false value is attached to gold and silver on account of their scarcity. Iron and copper have a much greater real value. If gold were as abundant as these it would be regarded as mere "yellow dirt." It is only when veneer is used to display egregious taste, vulgar forms, that the "sham" becomes reprehensible, and that we associate it with the *entourage* of "shoddy." In the worship of real gold, and in the display of false taste, we alike see that there is an inability to appreciate what is actually the real and intrinsic in life.

"'Tis true, and pity 'tis 'tis true," that with all our art-treasures, with all the patent processes for developing art, we should have to re-write the art-catechism,—but so it is. We may bring the art-collections of the world to our doors, but if common sense is not at home art must lie outside the understanding. Fine-art requires deeper thought than this present age seems able to give it; we are only dinned with superficial twaddle. Let us hear no more about "shams," unless that be of the laws of shamming wisely, which after all is but another title for the principles of art. METER.

Kew Gardens.—Sir J. D. Hooker, in a report on the progress and condition of Kew Gardens during 1877, states that his experience of the management and working of the Royal Gardens, extending over upwards of thirty years, led him unhesitatingly to the belief that neither the collection nor the grounds could be maintained up to their present standard if the public were to be admitted in the mornings.

WORKS AT THE SCHOOL FOR THE BLIND.

THE School for the Blind in St. George's Circus and the Lambeth-road, is at present undergoing very extensive restorations and repairs, both externally and internally. The window-dressings, copings, and other main features of the several frontages, have for some time been in a very decayed condition, and it has at length been deemed advisable to re-face the entire building. The renewals are being executed in Portland cement, and the brick-work, which forms the main face of the elevations, will be cleaned and pointed. Mr. Drew, of Queen Anne's Gate, is the architect, and Messrs. George Baker & Sons, of Stangate, the contractors.

The interior of the building is also being renovated and decorated throughout.

A WELL-EARNED TESTIMONIAL.

ON the 4th inst. a meeting was held in the Cutlers' Hall, Sheffield, to present to Mr. W. Bragge, F.S.A., his portrait and an illuminated address on the occasion of his leaving the town, to take up his residence in Birmingham. The desirability of in some measure recognising the very valuable services Mr. Bragge had rendered to the town was first discussed at a meeting of the Council of the School of Art, held in May, 1877. Subsequently a meeting of the Council of the Free Library and Museum Committee of the Town Council, of the Council of the Literary and Philosophical Society, and other gentlemen, was called, and it was then decided to open a subscription for the purpose of presenting to Mr. Bragge his portrait. The commission to paint the portrait was given to Mr. R. Smith.

Mr. M. Hadfield was voted to the chair.

In the picture Mr. Bragge is seated in his library at Shirle-hill, and a portion of his famous collection of books forms the background of the picture.

The address is illuminated on four pages of vellum, executed in the early Italian style of illumination by W. A. Nodder, of Howard-road, Walkley. The arms of the Cutlers' Company are emblazoned on the right hand side of the border of the page commencing the address; the arms of the town of Sheffield are on the left side; and the arms of Mr. Bragge in the centre, at the top of the border. The first page contains a photo of the painting, enclosed in a gold ornamental border. The address is engrossed in old English, and includes this paragraph:—

"It is in the realm of Science and Art that we especially recognise the benefits which have accrued to our town by your painstaking exertions. The Museum at Weston Park, now an accomplished fact, owes its existence to your endeavours, while its contents bear repeated evidence of your generosity. And the School of Art, of whose Council you long were an esteemed member, and over whose deliberations you for three years presided, testifies to your efforts for the upholding and development of the highest art, and for the education of the rising generation of the artisans of Sheffield."

Several pleasant speeches were delivered, and Mr. Bragge made a capital address in reply. The portrait is to be placed in the Cutlers' Hall.

"HINTS FOR LIVERPOOL."

SIR,—The letter under the above title in your impression of the 24th ult. is not quite accurate in its statements. We are not altogether such Vandals as are there represented. Allow me in a few words to correct an evident misimpression. St. John's Churchyard is undoubtedly "a disused graveyard." Whether it is hideous or not is a matter of taste. It is certainly not "an absolute desert of sand," for the simple reason that it is almost entirely paved with flat gravestones. Tufts of weeds and grass there may be, but the writer omits to state that round the churchyard there has been planted a row of trees, which, though young, are flourishing and vigorous. That further improvements have not been carried out is not the fault of the Corporation, who have had plans prepared for the planting and decoration of the disused churchyard, and are prepared to pay the expenses, but have hitherto been prevented by the opposition of the ecclesiastical authorities. By the permission of the incumbent the churchyard was for a time thrown open preparatory to its general decoration, but it was closed again by order of the bishop. St. Peter's Churchyard, a large area in the very centre of the town, was also proposed to be planted and ornamented, but the assent of the rector was limited to a narrow pathway leading up to the church-door to be fenced off by iron rails. Under these circumstances we can only wait for the advent of better sense to "our bishops and curates and all committed to their charge."

One further inaccuracy I may notice. The writer states that St. John's churchyard "is surrounded on the south and west by a brick wall, and on the north, facing the museum, by a wall adorned with pilasters." This is not so. On the north and west sides the level of the churchyard is considerably above the street, requiring retaining walls which are of handsome ashlar stone, surmounted above the level of the churchyard by an open stone balustrade with turned balusters. The south side only has a wall, which is of ashlar stone, now somewhat dilapidated. J. A. P.

Liverpool.

THE FALKLAND MEMORIAL.

ON Monday last the Earl of Carnarvon unveiled, with Masonic honours, a memorial which has been erected on Wash Common, Newbury (an elevated tract of ground to the south of the town, and the site of the battle between the army of Charles I. and the Parliamentarian forces) to Lucius Cary, Viscount Falkland. To Mr. Walter Money, F.S.A., a leading member of the Newbury District Field Club, belongs the credit of suggesting a memorial such as that which now marks the scene of one of the most sanguinary of the struggles between Charles I. and the Parliamentarians. The site, which is within a few yards of the spot where Lord Falkland fell, was given by Mr. Walter Money, who has with great energy discharged the duties of hon. secretary to the committee; and liberal contributions were made by Lord Carnarvon and others towards the cost of the monument. The design of Mr. James Money, architect, Newbury, was accepted; and Messrs. W. & J. R. Freeman, of Westminster and Penryn, took the contract, which they have satisfactorily carried out. The memorial is erected entirely in Cornish granite, the base being formed of a series of rock-faced steps, from the Lamorna quarries; upon these rests a block of Penryn stone, weighing about 12 tons, on which the four inscriptions in lead are cut. The superstructure comprises a boldly splayed octagonal plinth, with gablets on four sides, having sunk panels filled in with a cross on the front face, and coronets and ciphers of Lords Carnarvon, Sunderland, and Falkland carved on the other panels. The octagonal shaft which surmounts this is a monolith, 17 ft. in height, the total height of the memorial being about 33 ft. About 40 tons of granite have been used in the work. The east side bears a passage from Thucydides, and the west side a quotation from Livy. On the north and south sides respectively are the following inscriptions:—

"IN MEMORY OF THOSE
WHO, ON THE 20TH SEPTEMBER, 1643,
FELL FIGHTING IN THE ARMY OF KING CHARLES I.
ON THE FIELD OF NEWBURY: AND ESPECIALLY OF
LUCIUS CARY, VISCOUNT FALKLAND,
WHO DIED HERE IN THE 32ND YEAR OF HIS AGE.
THIS MONUMENT IS SET UP BY THOSE TO WHOM
THE MAJESTY OF THE CROWN AND
THE LIBERTIES OF THEIR COUNTRY ARE DEAR."

"THE BLOOD OF MAN IS WELL SHED
FOR OUR FAMILY,
FOR OUR FRIENDS, FOR OUR GOD,
FOR OUR COUNTRY, FOR OUR KING;
THE REST IS VANITY,
THE REST IS CRIME."—*Burke.*

Cellar Dwellings in Clonmel. — The Public Health (Ireland) Act provides that it shall not be lawful to let, or suffer to be occupied, any cellar not 7 ft. high in every part, and at least 3 ft. of its height over the surface of the adjoining street, unless there is outside the cellar, and extending along the entire frontage thereof and upwards from 6 in. below the level of the floor thereof up to the surface of the street, an open area at least 2 ft. 6 in. wide; unless the cellar is effectually drained, and has an earth-closet, ash-pit, &c., and unless it has a an earth-closet, ash-pit, &c., and unless it has a fireplace, external windows, &c. The *Tipperary Free Press* says that there are a considerable number of cellars occupied in Clonmel, but not one of them will come up to the requirements of the Act.

RAILWAY COMPANIES AND THE PUBLIC.

SIR,—Great trouble is experienced in dealing with railway companies, and the feeling is growing that these monopolies are inimical to the interests of the trading public. Against the fiats of directors there is no appeal, and at obvious injustice small traders can only grumble. In no case, perhaps, is this more glaringly displayed than in the farce of attempting to recover for damage to goods during transit. Tradesmen know, to their cost, how difficult it is to meet with satisfactory recompense for what must annually form a very serious item, viz., the breakage or damage of their goods in transit. When the damaged articles have been viewed, and a claim has been made, an intimation is received that the matter will be inquired into; and, often enough, this is the last of it. Compensation is certainly made sometimes; but even then it is a poor compensation. A great deal of time is expended in inquiries and wearisome delays, and if the goods are urgently required, or are of a special description, no allowance is made for the inconvenience and loss of time. Many tradesmen suffer this annual loss patiently, although they wince under it. They know full well that it is ridiculous for private individuals to cope with high-handed monopolies; for to fight a railway company one need possess a gold-mine.

It is not merely that there is much procrastination in settling claims. Some are never settled at all. And, worse still, the railway companies' representatives sometimes endeavour to cheat the public. An instance of this occurred recently. A gentleman, changing his residence, directed some articles of furniture, &c., packed by experienced men, to be forwarded to him, and caused them to be carefully labelled, "At the Company's risk," and paid the company's special rate for such articles. On delivery, some of them were broken, and the head of the household being away, his wife called upon the station-master to inform him of the damage, whereupon he roundly and positively asserted that the company "never, under any circumstances, carried anything at their own risk." After a great deal of equivocation, he promised to send a man to view the articles, and also to institute inquiries. He has not done so, however, and no more has been heard of it. The owner of the goods dubs the affair "a swindle." But, dismissing him and his righteous indignation, I may be permitted to ask these questions: Is it just or expedient for the general public to be at the tender mercies of the railway companies? Is it just that when they engage to carry goods at their own risk, and impose special rates to cover loss, they should treat claims for damage with indifference, or attempt to defraud those who have paid special rates, relying upon the company's *bona fides?*

T. B.

ABBOT TRUMPINGTON'S TOWER-ROOF.

SIR,—Perhaps an attempt to interpret some statements of Matthew Paris having reference to the aspect of the Norman Tower at St. Alban's during the period of the high-pitched roofs may not be deemed inopportune by some of your readers:—

Translation from the "Gesta Abbatum," book i., p. 280, in the Chronica Monasterii S. Albani,—Rolls Series.

"In his time (William de Trumpington's) both the transepts (*alæ*) of the church were fortified with roofs of oak timber, admirably tied and united with short beams; for the previous roofs, being decayed and worm-eaten, freely admitted the rain. The tower-roof also, which rose aloft like a huge machine (*quod præmaximæ machinæ instar protendit*), was reconstructed of the best timber, well jointed together, being raised to a much greater elevation than the old roof (*multo excelsius veteri*), which threatened to fall. And all these constructions were covered with lead, not without considerable outlay." These works were executed by Richard de Tidenhangaer, lay-brother and chamberlain. . . . . "Nevertheless, the Abbot himself, after the death of the said Richard, of blessed memory, caused the same steeple (*turrim*, which here appears to mean *the tower-roof* or *spire*) to be stripped, and covered afresh more congruously and correctly, a considerable addition being made to the quantity of lead; decorative additions being made to the sides (*collateralibus additis ornamentis*),

viz., eight linear projections (*linearibus elevationibus*). (perhaps projecting ribs are intended), extending from the finial (?) (*tholus*) to the wall-coping (?) (*murale*) (corbel table, ?) so that the spire appeared more distinctly octagonal (*octogona*). This was undertaken at his own cost, by the persuasion and instigation of Dom Matthew, surnamed, *of Cambridge*, his staff-bearer and seal-bearer, as was proved by the fact, that the latter was put in charge of the work, as a careful overseer, director, and warden. Moreover, he altered the covering (*co-operturam*) into the fashion which exhibits transversely conical projections (*quæ ex transverso conos protendit*) (or, which exhibits cones rising at opposite points). And the forementioned linear projections, commonly termed *aristæ*, admirably strengthened the spire, and adorned it at the same time, and also more effectually resisted the rain; whereas previously when the eight sides (*costæ*) were blended (or, died into one another), the spire presented a smooth, slender, and meagre appearance, uncouth, and out of keeping with the corbel-table (?) (or, parapet) (*minus murali concordanter*)."

The rendering, where the Latin is annexed, is offered with diffidence, on account of the obscurity of some of the Mediæval terms. But, perhaps, from a careful consideration of the whole passage, we may gather as much as this:—Abbot Trumpington thought the Norman roof (which was probably pyramidal) too low and heavy-looking; and, as he was compelled to rebuild it, he substituted an octagonal lead-covered spire, of much greater altitude, and afterwards added ribs or mouldings to its edges. The cones were perhaps the cappings of the corner turrets. In outline and proportions his wooden spire may possibly have resembled the Early English stone one of the cathedral of Christ Church at Oxford. At any rate, it seems a reasonable supposition that it added considerably to the effective height of the tower in its relation to the elevated roofs of the surrounding pile.

It appears that this spire was injured by lightning in the time of Abbot John of Hertford (1235—1260)), the Papal seal affixed to its summit notwithstanding (Gest. Abb., i. 313). After this it disappears from the annals. But in the Mediæval representations of the church still existing, viz., on the reconstructed shrine, and in the illuminations of the Cotton MS., Nero D. VII. (*circa* 1400) a spire is shown. The feature was therefore probably maintained.

The visible proofs of Trumpington's taste forbid the notion that his tower-roof had any resemblance to the attenuated peak which was removed some forty years ago. H. F.

CASE UNDER METROPOLITAN BUILDING ACT.

CHIMNEY BACKS.

AMONG several summonses taken out by the Metropolitan Board of Works under the Dangerous Structures Act, heard before Mr. Flowers (Bow-street), were two against the owners and occupiers of Nos. 39 and 40, Drury-lane.

Mr. Napier, who appeared in support of the summonses, said the owner of the house No. 39 had caused one of the recently-invented cooking ranges to be placed in an ordinary fireplace without having the proper firebricks placed in the flue. The result was that the party-wall became so heated on the side belonging to No. 40, that a thermometer burst at 200 degrees when placed against the wall, and a match held in the same place ignited without the least friction. The owner of No. 40 admitted the danger, and had consented to an order being made for his share of the necessary work to be completed in twenty-eight days. The owner of No. 39, the person whose action had created the danger, however, resisted the application for the order.

Mr. Robert Walker, district surveyor of St. Martin's-in-the-Fields, gave evidence as to the danger arising from the overheating of the flue. He said a similar case occurred some time back in St. Martin's-lane. The last Building Act was passed before these kitcheners were invented, and consequently no provision was made for these cases: but one of the clauses provides for certain works to be done in the case of a steam-boiler being used, and this case was somewhat similar to that. Witness thought that the magistrate could deal with the case as with a dangerous structure.

Mr. Flowers said it was like the bicycle case: invention had outstripped legislation. However, in this case he should certainly deal with the party-wall as with a dangerous structure.

The owner of No. 39 said he might tell his Worship that there would be no danger at all if the people in No. 40 had not put up a lot of wooden fixings next to the party-wall.

Mr. Flowers observed that this statement would decide him to make the order against the owner of No. 39. The owner of a house certainly had the right to put up what fixings he liked. He then made the order for the necessary work to be done in fourteen days.

THE LATE MR. E. W. LOWER.

SIR,—It may interest many of your readers to know that Mr. Edward Ward Lower, formerly Surveyor in the Office of Metropolitan Buildings, died at his residence at Guildford, on the 7th inst., where he had for many years practised largely as an architect until recently, when enfeebled by paralysis, he gave up the business to his son, Mr. W. G. Lower.

In 1855, when the present Building Act was passed, he was the author of a very useful edition, containing "Notes and Suggestions," which his large experience under the official referees enabled him to give with every reliance to the profession.

HENRY HART,
District Surveyor, West Kensington.

PUBLIC-HOUSE VALUATION.

MILLER *v.* DOBBIN.

THIS was an action brought in the Exchequer Division of the High Court of Justice to recover damages for alleged misrepresentation as to the value of the public-house known as the Three Compasses, Sidney-street, Mile-end-road, upon the sale of the house in May, 1877, by the defendant to the plaintiff. From the statement of the plaintiff's claim, it appeared that the plaintiff, Mr. Henry Miller, entered into an agreement to purchase the lease and goodwill of the premises from the defendant, Mr. Harry Dobbin, for 6,400*l.* (exclusive of the stock), upon the representation that the takings of the house amounted to 340*l.*, and the payments to 235*l.* per lunar month. That on May 17, 1877, he took possession of the house, and found that neither the takings nor the payments at all came up to the sums which had been so represented to him. The defendant, by his statement of defence, denied that he ever made such representations, or that the plaintiff was induced thereby to purchase the house. He further stated that if any such representations were made the same were *bonâ fide* and true, and he also denied that the plaintiff had sustained any damage whatever. With the consent of both parties, the matters in dispute were referred to the arbitrament of Mr. Daniel Cronin, senior. The hearing of the case occupied six days. The arbitrator has published his award in favour of the plaintiff, assessing the damages at 1,198*l.*, which he directed the defendant to pay to the plaintiff, together with the plaintiff's costs of the action.

MASTERS AND MEN.

Depression in the Lead Trade.—It is stated that owing to the great depression in the lead trade, the London Lead Company, Teesdale, have intimated their intention of discharging a large number of workmen, including pickmen, mechanics, labourers, and others. The precise number to be discharged is not yet known. This company, one of the oldest in the United Kingdom, has long afforded employment for the great bulk of the inhabitants of Upper Teesdale.

The Industrial Outlook in America.—Trade news from America is discouraging to every attempt at emigration just now. The building trade in New York, in order to deter emigrants from Ireland from venturing forth to seek their fortune in the States, gives notice that no "excursionists" from Europe are henceforth to be employed as masons or bricklayers in the new buildings now in course of erection in the city. It is stated that a regular organisation of building operatives has been established to prevent the arrival of the numbers of unwelcome visitors who usually emigrate at this season of the year and serve only to increase the distress and lower the wages of the native workmen.

Visitors to the Paris Exhibition.—The visitors to the Paris Exhibition, up to the end of July, numbered 6,570,093, or, reckoning only those who paid for admission, 5,056,139, as compared with 3,846,479, up to the same date in 1867, though the opening was that year a month earlier.

CLOCKS AND BELLS.

Stowmarket.—The bells of Stowmarket Church tower are now undergoing repair by Messrs. G. Day & Son, Eye.

Pollokshields.—A turret-clock is being provided for the parish church, Pollokshields. It has four illuminated dials, each 7 ft. 2 in. in diameter—the dials, it is said, being larger than those of any other turret-clock in Scotland. The clock will strike the hours on a bell weighing 24 cwt. All the wheels are made of the finest gun-metal. The main wheels are 18 in. in diameter, and 1½ in. in thickness. The escapement is "Graham's dead-beat," with wooden rod pendulum, 14 ft. long, the ball of which weighs 1¼ cwt. The striking weight of the clock weighs 5 cwt., the gong 1¼ cwt. The clock is fitted with a self-acting lighting machine for illuminating the dials. Messrs. H. & R. Millar, Edinburgh, are the makers.

SURVEYORSHIP ITEMS.

Poole.—A meeting of the Poole Town Council was held on the 31st ult., to receive "tenders" for the appointment of borough surveyor and inspector of nuisances to the Urban and Port Sanitary Authorities, which offices had been rendered vacant by the death of Mr. Edmund Pearce, sen. The mayor said there appeared to be an omission in the advertisement, which did not state the term for which the appointment would be made, and he thought it would be advisable, before they opened the tenders, to determine whether the appointment should be for one year or three years. At the request of Councillor Curtis the town clerk read the advertisement inviting tenders for the offices. Applicants were desired to specify the amount of salary expected, and the candidate might receive pupils, but must not engage in private practice of any description, and must devote his whole time to the duties of the offices, which he must be competent to perform. Councillor Stone moved that the appointment be for twelve months certain, afterwards determinable by three months' notice being given on either side. This was agreed to. In answer to a question the town clerk said there were sixty-three tenders. The applications were referred to a committee.

Bognor.—At a meeting of the Bognor Local Board on the 5th inst., letters were read from the six selected candidates for the post of surveyor, viz.: Mr. Billington, of Leicester; Mr. Inkpan, Chichester; Mr. J. H. Moore, Bournemouth; Mr. A. Smith, Bognor; Mr. Stringfellow, Brighton; and Mr. F. Wilson. The clerk reported that, in reply to letters sent by him, the first three applicants replied that they had no special knowledge of sea defences, but the remainder said they had had much experience in that department on different parts of the coast. The Rev. A. Conder then moved, and Mr. Jenkins seconded, that Messrs. Billington, Inkpan, and Moore be eliminated from the selected applicants. Mr. Jenkins was of opinion that the Board ought to have an interview with Mr. Stringfellow and Mr. F. Wilson before venturing to elect either. Mr. Coote observed that Mr. Smith was appointed surveyor two or three years ago, but in consequence of some illfeeling he was obliged to resign. Mr. Long thought a special meeting ought to be held to decide the matter. It was then resolved to adjourn the meeting.

Irish County Surveyors.—The *Freeman's Journal* says that there has been printed a return, moved for in the late session by Mr. Gray, describing the county surveyors and their assistants in each county in Ireland for the year ending with the summer assizes, 1877, as follows:—Name of each county surveyor, with amount of salary and allowances; name of each separate county in which he has served, and number of years served in each; name of his immediate predecessor, and whether same resigned, was dismissed, was removed to another county, or was superannuated, with the amount of retiring allowance granted to him; average annual cost of works for last five years in county other than roads, drains, and other routine work, and requiring special engineering skill in their design; number of assistants under each county surveyor, with their salaries.

Dr. Schliemann is said to have obtained permission from the Greek Government to commence certain excavations at Ithaca.

DRAINAGE ITEMS.

Burnley.—On the 23rd ult. a lengthened inspection was made of the Burnley Sewage Works by Mr. J. Bentley, C.E., of Brighouse; Mr. J. Farrer, C.E., of Bury; Mr. J. Green, C.E., of Manchester; Mr. H. Jobling, surveyor to Canon Townley Parker, who obtained the injunction against the Burnley Corporation; Mr. Storey, surveyor to Mr. Townley Parker; Mr. Creeke, town clerk of Burnley; Mr. Edwards, the borough surveyor of Burnley; and others. A general opinion was expressed that the works and system of General Scott were well worth a visit and study from all the sanitary authorities of Lancashire.

Hartford.—At a meeting of the Northwich Sanitary Authority, on the 30th ult., the report of the committee appointed to inquire into the question of the sewerage of Hartford was read. The committee recommended that the system of sewerage for the township of Hartford as originally designed by Mr. Vawser, and marked No. 1, be carried out. The committee also recommended the Authority to apply the pail-closet system in the whole of the township of Hartford at once; and further suggested that the filtered sewage might be well used for irrigating purposes at the outfall near Hartford Hall. The report of the committee was adopted.

Handsworth.—At a meeting of the Handsworth Local Board, on the 4th inst., a resolution was carried empowering Mr. Humber, C.E., to proceed with the contract plans, sections, detailed drawings, specifications, and quantities for the No. 1 sewer from Witton-lane to Hamstead-road, so as to be ready to advertise for tenders as soon as the sanction of the Local Government Board to the loan had been received. With respect to the Handsworth and Aston sewerage scheme, the clerk received authority to write to the Local Government Board for their sanction to a loan for 6,750*l.* for the joint sewers.

Torquay.—Ten years ago the local authorities of Torquay resolved upon providing a proper system of drainage, and finally adopted a suggestion by Sir Joseph Bazalgette to construct an intercepting sewer, from the railway station to a point nearly four miles distant, rejoicing then, if not now, in the designation of Hope's Nose. The work was commenced in 1875, but the contractors found that hard shale and limestone existed to a far greater extent than they had anticipated; and, further, that although the shale was particularly difficult to blast, yet on exposure to the air it decomposed, and the tunnel in which the sewer was carried had to be lined with concrete and brickwork to an extent that had never been thought of. Further than this, large bodies of water poured in, and the combined misfortunes led to the failure of the contractors. Fresh tenders were invited, but the lowest amounted to 75,000*l.*; and in further necessary additions the total cost would have been brought up to over 100,000*l.* Seeing this, the Local Board determined to execute the work themselves. The rock has been bored by drills similar to those used in driving the Mont Cenis tunnel, and eleven tons of dynamite have been used in blasting. The entire work has been completed by the Board at a cost of 65,000*l.* The sewer is in its first lengths 5 ft. 6 in. in height, and the last tunnel is a mile in length. The sewer is said to have a good fall, the flow is at the rate of two miles and a half an hour, and the discharge is 8,000 cubic feet per minute.

Windsor.—The town council of Windsor, acting as the Sanitary Authority, have entered into a contract with Mr. Hillé for the treatment of the sewage by the process known as "Hillé's system," and in a few days the new works will be in operation. It is now more than ten years since the Windsor town council was served with the first notice under the Thames Conservancy Act, to discontinue the drainage of the town into the River Thames. Having only about ten years before constructed a system of drainage at a heavy cost, this new responsibility fell heavily upon the town. The corporation at once set to work, with a view to devise some new system; but the town was so hemmed in by royal property, that every proposed site for drainage works was strongly opposed. About three years ago a piece of land was obtained on the Ham, at Old Windsor, about two miles distant, and adjoining the Castle Sewage Farm, where it is intended to treat the sewage by a combined system of precipitation and filtration. Under the direction of Mr. Hawksley, C.E., a new outfall sewer from the point where the existing sewers concentrate to Old Windsor has been constructed, crossing under the navigation cut to the Ham. This has been a work of great difficulty. A portion of the sewer has been constructed in a tunnel; but at Old Windsor it had to be laid in a cutting in a wet sandy soil, at a depth of over 40 ft. The tanks on the Ham are very extensive, and the buildings are most substantially built. The cost of the works, it is estimated, will be about 40,000*l.* Mr. Hillé, who is to be paid a royalty of 50*l.* a year, will manage the works for a short time at his own charge, and will then hand them over in full operation to the town council.

HOSPITALS.

Bury.—On the 24th ult. the Guardians of the Bury Union opened a new infectious hospital close to the workhouse. The plans, which are stated by a Manchester paper to have been described by the authorities at the Local Government Board as "excellent in themselves, and greatly in advance of anything hitherto attempted," are the result of visits to different infirmaries and hospitals, and consultations between the architect of the guardians, Mr. L. Booth, of Manchester, and Dr. Mouat, Mr. P. Gordon Smith, and the late Capt. Bowly, who represented the medical and architectural authorities of the Local Government Board. The site is a plot of land situate between the cemetery and the workhouse buildings, and is open on three of its sides. The patients are to be accommodated in four several and distinct blocks, each one of which is fitted up complete in itself as a separate hospital. The only connexion between the blocks is a wide covered way, open at the sides, and covered by a wide projecting roof, affording protection in all sorts of weather. By this arrangement any one block can be used for a distinct kind of fever, or for either sex, without interfering with the proper and safe use of the other departments in any way.

Northwich.—The Northwich Rural Sanitary Authority proposes to erect a new hospital for infectious diseases, and Mr. L. Booth, architect, Manchester, has prepared plans for a permanent building. These plans have, it seems, been criticised by Dr. Fox, the medical officer of health, who is apparently in favour of a series of temporary sheds or shanties. Mr. Booth, in an exhaustive reply, maintains that to erect a permanent building will be much cheaper in the end, and that due isolation of cases can be provided for.

Non-Pauper Hospitals for Infectious Diseases.—Dr. Talbot, the medical officer of health for the Bow and Bromley division of the Poplar district, points out, in his annual report just issued, that during the past year he has frequently been unable, through the want of accommodation at Highgate, to order the removal of private cases. He therefore contends that the action of the Poplar District Board of Works in proceeding to erect a non-pauper hospital for the district is only in accordance with what experience has proved to be necessary, and he expresses the conviction that the decision of the Board in this respect will do more to earn the thanks of the ratepayers than any other local work hitherto done. He further urges that the 37th section of the Sanitary Act must be made compulsory, or the Poplar district will be supplied with cases from all parts of the metropolis, and adds that his experience justifies the belief that when the requisite accommodation is provided the public will become anxious to be removed to hospitals.

Gateshead.—On the 3rd inst., the Mayor of Gateshead (Mr. J. W. Robinson) opened the new schools which the Board have erected at Low Fell, for the accommodation of the children resident in the district. The new buildings comprise a commodious and well-lighted school-room, a large class-room, a mistress's private room, children's cap-room and lavatory, and two rooms for the resident caretaker. In the play-ground are the children's conveniences and a large covered play-shed. Externally, the schools are executed in red bricks, with stone dressings, slated roof, and red ridge tiles. The works have been carried out, at a cost of 1,500*l.*, by Mr. Thomas Robson, builder, of Low Fell; and Mr. Edington has acted as clerk of the works. Mr. Thomas Oliver, of Newcastle, is the architect.

"THE VENTILATION QUESTION."

"Who shall decide when doctors disagree?" is the question suggested by perusal of the letters by Mr. Buchan and Mr. Weaver in your last week's issue. It is at least a remarkable coincidence (if nothing else) that the figures published by the different writers should always show in favour of the ventilator patented by the particular writer. The inevitable conclusion of impartial persons who are unable to verify the readings by experiment is that whatever the merits of the various ventilators may really be, the figures given are worthless as an evidence of these merits. May we, then, depend upon testimonials signed by men whose names, one would think, ought to be a sufficient guarantee? To dispel such an illusion it is only necessary to compare certain advertisements constantly appearing with published results of tests lately made. The conclusion practical men are apt to arrive at is that one ventilator is as good as another, and that none are of much use.

May we take leave to suggest that the safest, and indeed under the circumstances the only prudent course to take in selecting a ventilator is to test a few specimens (not models) by simple experiments before purchasing or fixing. If a cowl is capable of producing an up-current at the top of a building it is as capable of producing an equally strong up-current in a shop or a room. The only difference so far as efficiency of ventilation is concerned is the absence of wind, which is easily supplied by artificial means. If vigorous fanning over the mouth of a fixed ventilator or rapid revolution in the case of a revolving cowl is not *found on experiment* to produce a positive current upwards, so as to carry up light pieces of paper or oil silk, it cannot be wise to expect that it will increase the up-draught of a pipe or chimney, however useful it may be as a cap to keep out rain or prevent down-draught. On the other hand, if the up-draught is clearly demonstrated by experiment in a room with the same or precisely similar cowl, an increase of an up-draught may be reckoned upon for pipe or chimney.

EWART & SON.

CHURCH-BUILDING NEWS.

Croft.—The ancient church of St. Peter, Croft, has been reopened, after partial restoration, under the direction of Messrs. Ross & Lamb, architects, Darlington. The works embraced in the contracts have comprised the new roofing of the nave, tower, and south aisle, repairing and pointing the outside stonework; opening out old windows which had been walled up; stripping the plaster and whitewash off the internal stonework; re-seating the chancel and south aisle with pitch-pine stalls; repairing and re-setting old tracery and glass in windows; re-hanging the bells in the tower; taking down and rebuilding the south entrance-porch, which was in a ruinous condition; and excavating a sloping trench round the church down to the original floor-level, for the purpose of freeing the church from damp. The expense of restoring the nave was undertaken by Miss Harriett Chaytor, and of the south aisle by Sir William Chaytor, bart.; Lady Chaytor presenting a stained-glass window, by Hardman & Co. The repairs in the north aisle were at the expense of Mr. Wilson-Todd. The clerk of the works was Mr. Salmon; and the contractors were Messrs. Adamson, Gainford; Messrs. Russell, Mr. Wandless, and Mr. Swinbank, Darlington.

Milton (*Devonshire*).—The new church dedicated to the Holy Spirit has just been consecrated. It is in the Early English style, and consists of nave, chancel, vestry, and south porch. It is built of local walling stone, with Bath and Ham Hill stone dressings. The roofs are open, and of pitch-pine. The nave is furnished with chairs. The stalls are of oak, and so is the chancel screen. The font is of Bath stone, and is copied from an ancient one in the neighbourhood. The pulpit is of Bath stone. The east window has three lights, and is filled with stained glass by Messrs. Fouracre & Watson, of Stonehouse, Plymouth. The subjects represent the Baptism of our Lord, and the Descent of the Holy Ghost, the Gift of the Holy Ghost at Pentecost, and SS. Germanus and Lupus preaching upon the Banks of the Tamar. Over the porch is a tympanum, emblematic of the descent of the Holy Spirit, carved by Mr. Harry Hems, of Exeter. Over the vestry door is a picture in needlework by Miss Meadows—subject, the Annunciation. The dimensions of the building are:—Nave, 37 ft. 6 in. by 20 ft.; chancel, 20 ft. by 15 ft.; vestry, 12 ft. by 11 ft. The work has been carried out by Mr. Blowey, of Buckland Monachorum, builder, at a cost of about 1,600*l.* The whole has been executed from the designs and under the superintendence of Mr. Edward Ashworth, architect, Exeter.

Paddington.—The new church of St. Jude, Queen's Park, Harrow-road, was consecrated on the 3rd ult. It forms the chief feature of a group of buildings, to be hereafter completed by the addition of a parsonage-house, and is in the Early English style, stock bricks with red bands and arches being used throughout, and the whole covered with a tile roof 50 ft. high at the apex. All the sittings are placed in the nave under a roof of 40-ft. span, the nave being

separated from the aisle passages by arcades, thus affording to every member of the congregation a view of the pulpit and reading-desk. The building is lighted principally by a clear-story and aisle windows, with a large four-light window at the west end. The church contains 800 sittings, and has been erected at a total cost of 6,000*l.*, inclusive of tower and spire, but exclusive of boundary-wall and font, by Mr. Wheeler, of Highgate, under the personal superintendence of Mr. John T. Lee, architect. The pulpit is executed in Caen stone, with marble columns selected from various quarries, and has been given by the widow of the late Mr. Benjamin Shaw.

Slapton.—During the past year the nave and tower of Slapton Church have been restored, at a cost of 650*l.*, under the direction of Mr. William White, F.S.A., architect. At the present time, Mr. William Evans, of Abthorpe, is restoring, from the plans of the same gentleman, the chancel, at an estimated cost of 230*l.* When that is completed it is hoped to proceed with the south aisle and porch; and, in fact, to effect a complete restoration, at a total expense of 1,200*l.*, exclusive of the 650*l.* mentioned above.

Maesbrook.—On the 20th of August a new church, dedicated to St. John the Evangelist, was consecrated by the Bishop of St. Asaph at Maesbrook, in the parish of Kinnerley, Shropshire. The church has been built by the Misses Croxon, of The Lawn, Oswestry, in memory of their late brother, Mr. R. J. Croxon, and will serve as a chapel-of-ease for Kinnerley. Mr. Haycock, of Shrewsbury, was the architect, and Mr. Yates, of Shifnal, the contractor. The total cost of the church, which will accommodate 150 persons, was a little over 1,900*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Teignmouth.—A new Roman Catholic church, on the Dawlish-road, Teignmouth, Devon, has been opened. The new edifice is situate only a short distance from the smaller building in which the Roman Catholics have worshipped for many years, and from which they have been compelled to remove in consequence of this church forming a part of the property purchased some time since by the Great Western Railway Company to enable them to double the line between Dawlish and Teignmouth. The old church would only seat about 100 worshippers, whilst the new church, which is dedicated to Our Blessed Lady and St. Patrick, provides quite double the accommodation. The church stands nearly north and south, and consists of sanctuary, nave, two aisles (of which only one is now built), lady chapel at the north end of the east aisle, and the baptistry at the other end. In the contemplated extension of the west aisle is comprised another side chapel, a calvary, and a permanent confessional. It is further intended, when the means admit it, to build a presbytery. The style is the Geometrical Decorated, and the cost has been about 3,500*l.* The contractor is Mr. Slocombe, of Teignmouth, the architects being Messrs. Joseph A. Hansom & Son.

Wigan. — A new Roman Catholic church, dedicated to St. Joseph, has been opened at Wigan. The church is 87 ft. in length, and 60 ft. wide, and accommodation is provided for about 1,000 persons. A residence for three priests has been erected in contiguity to the church. The cost of the church has been nearly 7,000*l.*

Liverpool.—A new Roman Catholic Church, situated in High Park-street, Liverpool, has been opened for worship. The foundation-stone of the new edifice was laid on July 16th, 1876, and in the following year building operations were commenced. The building was designed by Mr. O'Byrne, and has been erected by Messrs. Roberts & Robinson, of Bevington-hill, at a cost of nearly 7,500*l.* It has no galleries, but has a lofty nave, with open-timbered roof, supported on columns of Shap granite, the capitals of which have been carved by Mr. Hanley, of Chester. The building is of pressed bricks, with Runcorn stone dressings, and is seated to accommodate 800 persons.

Rugby.—On the 12th ult. the Rev. Dr. Ullathorne, the R.C. Bishop, laid the foundation stone of a new Roman Catholic Chapel to be built adjoining Newnham Paddox, the seat of Lord Denbigh. The chapel, which is to be a Gothic structure, with handsomely decorated interior, runs east and west, and its west end will form a portion of the west side of the mansion. It is intended for the use, not only of Lord Denbigh's family, but of the Roman Catholics resident in the neighbourhood. Mr. J. Bromwich, of Rugby, is the contractor, and Mr. W. J. Allen the clerk of the works.

Dundee.—A Scotch paper says that in celebration of the re-establishment of the Roman Catholic diocese of Dunkeld, which has been in abeyance for a period of 292 years, it is proposed to erect a cathedral church in Dundee. The Marquis of Bute has initiated the subscription by promising 5,000*l.* It is hoped that 60,000*l.* will be raised.

SCHOOL BOARD SCHOOLS.

Bradford (near Manchester).—The memorial stone of the first schools built by the Bradford School Board, which will be situated in Grange-street, and are expected to be completed in the early part of next year, has been laid. The schools will provide accommodation for about 1,000 children, in four departments, viz., 300 infants, 250 girls, 250 junior boys, and 200 senior boys. In planning the schools, 10 superficial feet have been allowed for each boy and girl, and 9 superficial feet for each infant. The schools are all on the ground floor, and are so arranged that a considerable portion of the teaching will be conducted in class-rooms. The whole will be warmed with hot-water pipes, and in each of the large rooms there will be an open fireplace, with a Manchester school grate. A board-room, waiting-lobby, caretaker's residence, and covered playgrounds are provided, and in connexion with each department there will be a lavatory and cloak-room. The whole of the inside walls to a height of 4 ft. are intended to be faced with coloured enamelled bricks, so as to be easily washed clean; and all the inside joiners' work will be of pitch pine, varnished. The work is being carried out by Mr. Joseph Grason, for the sum of 5,838*l.*, under the superintendence of the architect, Mr. Thomas Chadwick.

Brixton.—In a remote corner of Brixton, near to Clapham Common, new schools belonging to the London School Board have been publicly opened. The building, designed in the Queen Anne style, is situated at the top of Lyham-road, and in it accommodation has been provided for 791 children, at a cost of 14*l.* 3s. 6d. per head. The site covers 21,280 square feet, thus allowing of an ample playground. Mr. E. R. Robson is the architect.

Walworth.—New schools in Beresford-street, Walworth, have been opened by the London School Board. The cost of the building, including the site, was 13,588*l.*, and as it is to accommodate 697 children, the average cost of the accommodation for each child is 19*l.* 9s. 11d. There is a good playground attached, and room has been left for an enlargement of the school. Mr. E. R. Robson is the architect.

VARIORUM.

An interesting discovery is communicated in the last number of *L'Art* by M. Courajod, of the Louvre, who has found amongst the MSS. in the National Library the design by Germain Pilon for the Mausoleum of Cardinal René Birague. The principal point established by this document is that the bronze figure of the Cardinal, one of the most beautiful monuments in the Musée de la Renaissance at the Louvre, is unquestionably the work of Germain Pilon. The contents of *L'Art* continue to be remarkable. English art, too, is well looked after in it under the special and able direction of Mr. J. Comyns Carr. ——We take the following as to Decks from the new number of *Great Industries of Great Britain*:—"The usefulness of decks as structural strengtheners was scarcely recognised a century ago: and until iron ships of large size became common, the full advantages derivable from carefully-constructed decks were not realised. Now it is a generally accepted principle of construction that the decks, and especially the upper deck, should be classed amongst the principal parts of the structure, effective against strains tending to alter the form of a ship either longitudinally or transversely. Longitudinal bending in a ship, — 'hogging' or 'sagging,' as a shipwright would say, — can only result from an extension or compression of the upper and lower parts of the structure; and ordinarily it is the upper deck which has to sustain the most severe tensile or compressive strains. Comparing a ship to a hollow tubular girder, like the Menai Bridge, her upper deck corresponds roughly to the top of that girder; her bottom, from the bilge downwards, corresponds to the bottom of the girder; while her nearly vertical sides correspond to the side webs of the girder connecting the top and bottom. There are, however, a few important differences between the ship and the bridge. In the latter all the bending strains tend to stretch the bottom and compress the top; whereas in the ship there are great *variations of strain*, the top being sometimes compressed and at other times stretched. The bridge is fixed in position, the top and bottom not changing their relative positions; but the ship rolls from side to side while she is being strained, and it is impossible to define absolutely what parts shall be regarded as the top and what as bottom. Moreover, the circumstances sketched for the ship obviously create simultaneously transverse as well as longitudinal strain, a matter which still further complicates the problem. A deck, for example, may not merely have to act as part of a girder resisting longitudinal bending, but at the same time may have to tie the two sides of a ship together, and assist in preventing change of transverse form, in addition to acting as a platform carrying heavy weights of cargo or equipment."——"Old and New London" says:—"To place the matter in another point of view, we may state that the size of 'Greater London,' with its population of three millions and a quarter (according to the last census returns), may be inferred from the fact that if the metropolis was surrounded by a wall having a north gate, a south gate, an east gate, and a west gate, each of the gates being of sufficient width to allow a column of persons to pass out freely six abreast, and a peremptory necessity required the immediate evacuation of the city, the task could not be accomplished under four-and-twenty hours, by the expiration of which time the head of each of the four columns would have advanced a no less distance than seventy-five miles from its gate, all the people being in close file, six deep. Or, to take another illustration: if all the Londoners of to-day—men, women, and children—were to stand joined shoulder to shoulder, the line formed by them would stretch nearly from one end of England to the other. Again, if the entire people of the capital were to be drawn up in marching order, two and two, and each couple to be 2 ft. apart from the next, the aggregate length of the great army of Londoners would not be less than 662 miles, or long enough to reach from London to Inverness; while, supposing the file to move at the rate of three miles an hour, it would take more than nine days and nights for the aggregate troop of the metropolitan population to pass by."——At the present time, when the scientific mind is awakened to the importance of those less evident forms of motion in matter which we designate variously as vibrations, undulations, heat, light, sound, &c., it may prove of interest to learn the results of a series of experiments, carefully instituted by Mr. A. Tylor, F.G.S., as to the mode in which undulations are propagated in water, and the bearing of these results on the accepted theory of tidal waves, &c. Some of these experiments have been detailed in the September number of the *Mittheilungen der K. K. Geographische Gesellschaft*, of Vienna, for 1877; and others have been laid before the London Institution by Mr. Tylor himself; but the facts are not so generally known as their importance merits. By means of a specially constructed apparatus, consisting of a circuit of 24 ft. of 10-in. glass pipe, laid horizontally, and provided with a box, in which waves could be generated by a head of water of about 1 ft., Mr. Tylor found that a wave traversed the whole circuit under ordinary atmospheric pressure in 4·475 seconds, but that its velocity was so far diminished as to require 4·925 seconds to make its second circuit, which is equivalent to a loss of 9 per cent. of its velocity. A wave caused by the same head of water in the generating-box, but moving in a partial vacuum (18 in.), took 4·76 seconds to complete its first circuit, and showed no calculable loss of velocity in making its second circuit. Mr. Tylor concludes from these results, "that the velocity of a wave is dependent on the quantity of air which it has to move, and that a wave can only propagate itself until it has displaced its own weight of air," leaving out of account the loss of power due to friction and other obstructions. Upon this basis formulæ have been constructed, which give the limit of possible propagation of any given wave.——We have received a copy of a

special number of the *Illustrated Australian News*, which contains a series of engravings representing the more important buildings, manufactures, and works at Melbourne, and some of the other towns of Victoria, Australia. It also contains an interesting account, in French and English of the colony, its history, its climate, its institutions, and the advantages which it offers to Colonists. It must be regarded as a remarkable number, considering the locality.

FIRE ALARM.

SIR,—Observing in your paper of September the 7th a description of a self-acting "Fire Alarm," exhibited by Mr. E. B. Bright, at the Old Manchester Town-hall, on the 29th of August, I beg to say I patented this invention December 1st, 1864, and have ever since been in the habit of fitting up these "Fire Alarms," in connexion with my electric bells, which are very extensively used throughout the country and metropolis. My invention being made in the form of an ordinary press-button, it combines the utility of electric bell to that of "Fire Alarm" thermometer. I have also supplied large numbers to the cotton manufacturers of Yorkshire, who place them in their bales of goods in order to give notice of extra heat, and so prevent spontaneous combustion.

JULIUS SAX, Telegraph Engineer.

THE BROMPTON ORATORY.

SIR,—Our attention has been drawn to the letter of a correspondent in your last impression, stating that the design for the new Church of the Oratory chosen for execution is that to which the first prize was awarded, and also that the services of its author, Mr. Herbert A. Gribble, are secured in carrying out this building.

Whilst this information is correct as far as it goes, will you allow us to complete it by saying that the execution of the building has been entrusted to the joint care of your obedient servants,

HERBERT A. GRIBBLE,
J. T. WALFORD.

Miscellanea.

The New Sheriffs of London and Middlesex.—Messrs. George Burt and Thomas Bevan will enter upon their duties as sheriffs of London and Middlesex on the 28th instant. Mr. Burt (according to the *City Press*) was born at Swanage, Dorset, October 2, 1816. His father, Mr. Robert Burt, was a stone merchant there. At the age of 19, the late Mr. Mowlem (also a native of Swanage, and Mr. George Burt's uncle) brought him to London as an assistant in his business. In 1844, Mr. Mowlem took Mr. Burt and Mr. Freeman (who had previously married Mr. Burt's elder sister) into partnership, the firm from that time being known by its present title of "John Mowlem & Co." The senior partner died in 1868, and the business was carried on by Mr. Freeman and Mr. Burt until 1875, when Mr. John Mowlem Burt, the elder son of the newly-elected sheriff, was taken into partnership, and these three gentlemen now constitute the firm so well known in London as road and general contractors, and in Aberdeen and Guernsey as quarry-owners. They were the first to manufacture and lay down the pavement known as "narrow cubes." The first roadway so laid was that of old Blackfriars Bridge in the year 1840. Mr. Bevan is the son of the late Mr. Thomas Bevan, M.D., of Finsbury-circus, and was born in 1829. He entered business-life in 1853 with Mr. J. M. Knight and Mr. Alfred Sturge, constituting the firm of Knight, Bevan, & Sturge, who carried on for many years the business of cement manufacturers at Northfleet and elsewhere. Since the death of Mr. Sturge, and the retirement from business of Mr. Knight, the business has been carried on under the same title by Mr. Bevan, who has recently admitted into the firm his eldest son, Mr. Robert Bevan. It will be remembered that the introduction into the firm of Mr. Robert Bevan was made the occasion of opening a club and institute, erected by Mr. Bevan for the use of his large staff of workmen and others at Northfleet, at a cost of 10,000*l.*

The New Bow-street Police-court.—An Act of Parliament was passed in the session before last for the purchase of certain buildings and lands for the erection of a new Police-court for Bow-street, and also for the building of a new Police-station in conjunction. The property was duly secured, and the old buildings demolished. It is now found it will be necessary for the authorities to obtain a supplementary Act, as the Duke of Bedford, the adjoining ground-landlord, has obtained an injunction against the authorities on account of the boundaries encroaching on his land. In these circumstances the new building cannot be commenced until the middle of next year.

The Walker Art Gallery, Liverpool.—At the meeting of the Liverpool Town Council on the 4th inst., on the recommendation of the Library, Museum, and Arts Committee, the offer of Mr. Edward Aikin, on behalf of the family of the late Mr. James Aikin, of a full-sized copy in marble of the antique statue "The Crouching Venus," was accepted with thanks. Alderman Weightman called attention to the defective ventilation of the gallery. Alderman Samuelson (the deputy-chairman of the Library Committee) said the attention of the committee did not require to be directed to that, because the defective ventilation had been most sensibly appreciated by the committee since the gallery was opened. At first, however, as the gallery was scarcely out of the hands of Sir Andrew Walker, the committee had some delicacy in taking measures to improve the ventilation. Mr. Sherlock (the architect of the building) subsequently made some experiments which did not succeed, but at no distant date the committee would take the matter into their own hands and see what could be done.

Sewage Deposits in the Thames.—The operations connected with the recovery of the wreck of the ill-fated *Princess Alice* have again called attention to the highly detrimental effect of pouring the London sewage into the Thames. The extremely offensive slimy deposits found in both portions of the hull of the broken steamboat to the depth of 3 ft. or 4 ft. afford further corroboration, if such were needed, of the statements made by Captain Calver and others as to the injurious effect of sewage upon the river. True, the terrible calamity which has grieved the nation happened almost at the very outfall of the greater part of London's sewage. It is even alleged by some that the slimy state of the river bottom prevented many of the victims from rising to the surface, and that many of those who did not get stuck in the slime were poisoned by the sewage-laden water.

Jerusalem.—It is stated that, at the cost of Sir Moses Montefiore, bart., all the land in front of the Judah Touro houses has been prepared for cultivation by the removal of the rocks. Terraces are built all along, as in King Solomon's time, and divided into twenty-two partitions whereby all the inmates of the Touro houses will have an opportunity of cultivating the land, which will produce the necessary vegetables, &c., for their maintenance. In addition, the venerable baronet has caused a very large cistern to be constructed in the centre of the field, which will secure to them in future an abundant supply of water.

The Exhibition of 1851.—Mr. Chamberlain, M.P., has received a reply to the deputation of provincial municipal representatives which attended the meeting of the Royal Commission at Marlborough House last July twelve months, in reference to the freehold property at present occupied by the Horticultural Gardens and the Exhibition galleries, intimating that the Commissioners adhere to their proposal to apply that portion of their funds which they propose to dedicate specially for the benefit of the provinces in the establishment of scholarships.

The Ronalds Catalogue.—The Society of Telegraph Engineers are proposing to publish a Catalogue of Books and Papers on Electricity and Magnetism, compiled by the late Sir Francis Ronalds, F.R.S. This catalogue, which contains more than 12,000 entries, and will probably extend to over 600 pages, is believed to include every important work, and almost every paper which has been published upon the subject of electricity and magnetism up to the date of its author's death in 1873. It also forms a valuable catalogue of scientific works generally.

Lodging of Plans.—At a meeting of the Edinburgh Town Council on the 3rd inst., it was moved by Mr. Buchanan that in future all plans of buildings to be erected should be lodged with the Town Clerk for the approval of the Council. After some conversation, the Depute Town Clerk suggested the alteration of the motion to the effect that plans of buildings requiring the sanction of Council should not be approved of by committee without having been submitted to the Council; and in this form it was understood to be agreed to.

Government Offices, Downing-street.—The entire length of carriage-ways in the court-yard here are being laid with Claridge's asphalte, the same as was used at the Palace of Westminster, with the exception of two of the courts.

Sunday Opening of Free Libraries.—The Manchester City Council have instructed their Free Libraries Committee to make arrangements for the opening of the reference and branch library of that city on Sunday afternoons. The resolution was carried by 28 votes to 20. The public free libraries and reading-rooms in Manchester were opened on Sunday last in accordance with this decision. The new arrangement was not, it is said, taken advantage of to the extent that many persons had anticipated.

Boulogne Harbour.—Boulogne has been *en fête* on the occasion of laying the foundation-stone of a monument to commemorate the passing of the measure authorising the construction of a deep-sea harbour, accessible to large steamers at all states of the tide. The work will take fifteen years to complete. The plans and estimates have been made by M. Stocklin, chief engineer of the Pas de Calais, and the cost is stated at 17,000,000 francs (680,000*l.*).

Water Supply, Inverkeithing.—At a meeting of the Inverkeithing Town Council, on the 28th of August, for the purpose of considering what further steps should be taken in regard to the proposed water supply for the burgh, it was resolved to employ Mr. Buchanan, C.E., Edinburgh, to prepare a report as to the best mode of laying pipes from Milesmark in connexion with the Glensherup scheme, and the probable cost of the same.

Newcastle Arts Exhibition.—The first exhibition of the Newcastle Arts Association, established early this year, was opened on the 6th inst. by a *conversazione*, to which invitations had been issued by Sir William Armstrong. The exhibition contains about 700 pictures, contributed by English, Scottish, and Continental artists.

Silicate Paint.—At the Paris Exhibition a medal has been awarded to the Silicate Paint Company, of London and Liverpool, whose paints received favourable notice at the Paris Hygienic Congress.

TENDERS

For additions to the Abbey Flour Mills, Reading, Berks, for Mr. George Palmer. Messrs. Morris & Stallwood, architects:—

		Unloading-shed.
Grover	£2,290 0 0	£48 0 0
Filewood	2,285 0 0	38 0 0
Searle	2,263 13 0	33 11 9
Dodd	2,258 0 0	45 10 0
Barnicoat	2,257 0 0	52 0 0
Woodroffe	2,250 0 0	50 0 0
Higgs	2,231 0 0	48 0 0
Sheppard	2,222 0 0	43 0 0
Poffley	2,184 0 0	45 0 0
Wheeler, Brothers	2,150 0 0	45 0 0
Lawrence	2,096 0 0	51 3 0
Wicks (accepted)	2,071 0 0	42 0 0

For building a factory chimney-shaft in connexion with the recently-erected factory for Messrs. Huntley, Boorne, & Stevens, Reading, Berks. Messrs. Morris & Stallwood, architects:—

Strong, Brothers	£315 0 0
Higgs	304 0 0
Searle	304 0 0
Wheeler, Brothers	300 0 0
Silver & Son	297 0 0
Grover	286 0 0

For additions to parish schools, Kidmore, Oxon. Messrs. Morris & Stallwood, architects:—

Slade & Cox (accepted)	£291 6 0

For the restoration of the tower to the Parish Church at Wokingham, Berks. Messrs. Morris & Stallwood, architects:—

Wheeler, Brothers (accepted)	£1,000 0 0

For the restoration and reseating of the Parish Church at Sulhamstead Abbots, Berks. Messrs. Morris & Stallwood, architects:—

Wheeler, Brothers (accepted)	£709 0 0

For new tower, south aisle, and porch, being the first portion of the enlargement and restoration of the Parish Church at Caversham, Oxon. Messrs. Morris & Stallwood, architects:—

Wheeler, Brothers, and Dodd (accepted)	£2,351 0 0

For alterations and additions at Deanwood, near Newbury, Berks. Messrs. Morris & Stallwood, architects:—

Hopson (accepted)	£1,022 5 0

For additions and alterations to a farm-house at Uppertown, on the Brightwell Park estates. Messrs. Morris & Stallwood, architects:—

Holly & Butler (accepted)	£957 0 0

For the erection of four labourers' cottages at Uppertown, on the Brightwell Park estate (including a well). Messrs. Morris & Stallwood, architects:—

Cox (accepted)	£812 0 0

For the erection of six cottages at High Cross-lane, Tottenham, for Mrs. Harvey. Messrs. H. S. & C. A. Legg, architects. No quantities:—

Steed, Brothers	£1,425 0 0
Knight	1,405 0 0
Judd	1,398 0 0

For the erection of a stable building at Turret House, Reading. Messrs. Morris & Stallwood, architects:—

White	£420 0 0
Poffley	420 0 0
Woodroffe	413 0 0
Whiting	403 0 0
Searle	399 0 0
Sheppard	390 0 0
Higgs	385 0 0

For stables for Mr. Albert P. Prowse, Yennadon Manor. Mr. J. O. Parmenter, architect:—

Blatchford & Son	£410 0 0

For a villa residence on the Knoll Estate, for the Rev. Sir G. W. Cox, bart., M.A. Mr. J. O. Parmenter, architect:—

Fitchen (accepted)	£550 0 0

For villa residences, Nos. 1 and 2, to be erected at Ascot for the Ascot, Sunninghill, and General Land Company, Limited. Mr. John Norton, architect:—

	Villa No. 1.	Villa No. 2.
Pink	£2,400 0 0	£3,790 0 0
Boyce	2,198 0 0	3,694 0 0
Lawrence	2,000 0 0	3,740 0 0
Braid & Co.*	1,990 0 0	3,600 0 0
Colls	2,224 0 0	—

* Accepted.

For alterations to Messrs. Samuel Smith & Co.'s banking premises, Ripley, Derby. Mr. George R. Isborn, architect:—

Clewer (bricklayer)	£159 5 6
Cooper (joiner)	182 10 1
Frost & Sons (plumber)	109 12 9
Tealby (painter)	85 9 6

For alterations and additions to the Prince Alfred Tavern, Eleanor-road, Dalston. Mr. Chas. H. Finck, architect:—

	Contract No. 1.	Contract No. 2.
Beale	£610	£1,200
Cole	640	1,150
Downs	515	1,065
Steed	485	—
Harris	450	925

For Pontfaen School, to accommodate 172 children, with residence and boundary-walls, for the Christchurch Extra Municipal School Board. Mr. H. A. Goodman, architect. Quantities supplied:—

	If Pitch-Pine Joinery.
Jones & Co.	£2,484 £2,504
Miles	2,240 2,300
Williams	2,200 2,180
Linton	2,195 2,200
Prosser	2,145 2,195
Richards	2,140 2,210
Moulton & Brownscombe	2,093 2,130
Jones & Son	2,037 2,047
Biggs	2,010 2,200
Small	2,000 2,050
Orphan & Swanton	1,769 1,789
Jones & Diamond	1,750 1,800
Richards	1,700 1,750
Wilkins (accepted)	1,681 1,686

For stabling, billiard-room, &c., Shirley Lodge, Clapham Park, for Mr. C. S. Whitburn. Mr. E. D. Mathews, architect. Quantities by Mr. R. C. Gleed:—

Loat & Co.	£1,040 0 0
Battley	979 0 0
Downs & Co.	960 0 0
Newstead	950 0 0

For new roads, sewers, and surface water-drains, on the Holly Park Estate, New Southgate, for Mr. Henry Davis. Mr. Henry B. Michell, surveyor:—

Killingback	£2,927 0 0
Dunmore	2,288 0 0
Bloomfield	2,227 0 0
Harris	2,225 0 0
Pizzey	2,177 0 0
Keeble	2,072 0 0
M'Kenzie	2,070 0 0
Peill & Son	1,950 0 0
Wainwright	1,950 0 0
Jackson	1,949 0 0
Richardson (accepted)	1,748 0 0

For pulling down and rebuilding No. 52, Castle-street, Long-acre, for Messrs. Combe & Co. Mr. Henry R. Cotton, architect:—

Patrick	£2,074 0 0
Williams & Son	1,965 0 0
Eaton	1,875 0 0
Toms	1,766 0 0

For the extension of the Wesleyan Chapel and erection of new organ-chamber, class-room, &c., at Ratcliffe-on-Trent. Mr. S. Dutton Walker, architect:—

Vickerstaff & Hickling	£400 0 0

For the erection of a pair of villas, Knight's Hill-road, Lower Norwood, Surrey. Mr. Frederick C. Notley, architect:—

R. & E. Smith	£3,144 0 0
Candler	3,000 0 0
Buckland	2,986 0 0
Hayworth	2,983 0 0
Thompson	2,920 0 0
Tarrant & Sons (accepted)	2,888 0 0

For the erection of a detached villa at Knight's Hill-road, Lower Norwood, Surrey. Mr. Frederick C. Notley, architect:—

R. & E. Smith	£2,084 0 0
Buckland	1,997 0 0
Tarrant & Sons	1,990 0 0
Hayworth	1,989 0 0
Thompson	1,980 0 0
Candler	1,900 0 0

For new laundry building, exclusive of fittings, for the Staines Union. Mr. George Judge, architect. Quantities supplied by Mr. W. H. Brayshaw:—

Boyce	£1,294 0 0

For the rebuilding of No. 73, Bishopsgate-street Without, for Messrs. Thomas & Sons. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Chessum	£6,214 0 0
Scrivener & Co.	6,175 0 0
Browne & Robinson	6,105 0 0
Downs	6,075 0 0
Tarrant & Sons	5,970 0 0
Stimpson & Co.	5,833 0 0
Pritchard & Son	5,823 0 0
Nightingale	5,753 0 0
Ashby, Brothers	5,730 0 0
Woodward	5,534 0 0

For alterations and additions to No. 113, Church-street, Chelsea. Mr. A. E. Hubert, architect:—

Chappell	£385 0 0
Somerville & Hill	362 0 0
Wright (accepted)	353 10 0

For the erection of farm buildings, chapel, boundary-walls, and lodge to new Lunatic Asylum, Portsmouth. Mr. George Rake, architect. Quantities supplied by Mr. H. P. Foster, and Mr. C. M. Houghton:—

	Farm Buildings.	Chapel.	Walls & Lodge.	Boundary
Burbidge	£3,833 10	£4,785 0		£3,682 10
Roberts	3,810 0	4,747 0		3,545 0
Ward	3,784 0	4,720 0		3,622 0
Cooper	3,961 0	4,255 0		3,127 0
Quick	3,650 0	4,142 0		3,023 0
Prout	3,342 0	4,007 0		2,911 0
Stevens & Bastow	3,434 0	3,999 0		2,820 0
W. & H. Evans	3,202 13	3,966 19		3,017 12
Stiff	3,189 0	3,930 0		2,921 0
Hayter	3,340 0	3,850 0		3,000 0

Stables at Cook's Bridge.—The word "accepted" after Messrs. Musgrave & Co.'s tender was inserted erroneously.

TO CORRESPONDENTS.

E. G. B.—H. T.—G.—C. A. L.—H. B. M.—E. T.—H. L.—H. P. P.—W. D. & Co.—T. K.—J. & R.—E. R.—E. W.—J. B.—C. S.—B. & C.—I. D.—G. E. M.—E. B.—H. A. G.—G. M.—J. W.—P. G. S.—W. C. & Sons.—W. B.—J. R. C.—C. C. H.—Mr. O.—J. F.—Rev. H. F.—R. C. P. C & J. P. S.—E. H. (no rejoinder has been received).—J. J. (out of our province).—R. L. (next week).—A. B. (next week).

Erratum.—In recent notice of Mr. Bell's window, in memory of Sir Gilbert Scott, the style is spoken of as "*Pre*-Renaissance"; it should read *Free* Renaissance.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

VOL. XXXVI. No. 1859. SATURDAY, SEPTEMBER 21, 1878.

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A Sketch for the Future of Westminster.

TO those who are interested in the progress and the changes of various parts of London, it must be obvious that a considerable alteration in the neighbourhood adjacent to the Palace of Legislature is likely to take place before long. The spirit of rebuilding, clearing, and beautifying has drifted that way for some time past, and Victoria-street is one of the results; but extensive rebuilding has already been achieved in other sites in the district, of such a nature and in such positions as must inevitably lead to further operations. Indeed, it may well be matter for surprise that the erection of so great a building as the Parliament Houses has not exercised a more speedy influence on the architectural remodelling of its environment. For the existence of this building, with its two great towers so completely associated with modern London, and the proximity of the Abbey (which is still more hallowed in its artistic and moral associations, though standing less prominently forth as a landmark), undoubtedly render Westminster in effect the architectural centre of London; and with equal truth it may be said that it is the historical centre of London, when we consider the supreme importance of the one building in reference to the life of to-day, and that of the other as the shrine of the memorials of the past of England.

Compared with Westminster Abbey, even St. Paul's must take a secondary place in architectural and historic interest; and when we regard the whole material and historic importance of Westminster for a long period past, we must feel that the City, the original nucleus of London, sinks into comparative insignificance from this point of view, whatever conventional civic importance may still be assigned to it. Regarding Westminster, therefore, as the real centre of London, and considering the state of change in which property in its neighbourhood now is, and the very great need of change, rearrangement, and improvement in many portions of the district, it seems very much to be desired that some definite object should be kept in view in regard to these changes, that they should not be suffered to grow up piecemeal and in such a way as to interfere with and neutralise each other, but that, so far as is possible in accordance with what has been already done, the improvements carried out should "orb into a perfect whole," or, at least, should be grouped effectively and with a certain degree of system round those points which seem naturally to suggest themselves as central features, in such a way as to make the most of the opportunities for adding to the beauty and architectural effect of the neighbourhood.

In proposing any scheme as worth adopting, it does not, of course, necessarily follow that this should be only such as can immediately, as a whole or in its main features, be carried out; or that anything which cannot thus be immediately available should be regarded as Utopian and chimerical. It is a sufficient concession to the practical side of the question if what is proposed be a reasonable and desirable scheme as a whole, and its execution possible in due time and at convenient intervals. The scheme we are here suggesting, and of which we append a general plan, without which our remarks would be unintelligible, is, we believe, perfectly feasible as a whole; and it has, as we shall be able to show, this recommendation, that in nearly all its principal points it arises out of, or carries to completion, ideas of improvement which follow naturally upon the lines of what has been already done, and which, considered separately, would most probably be done sooner or later. Our object is that they should be done, not independently and piecemeal, but systematically, and in relation to one another as parts of one plan.

Glancing at our proposed map of the Westminster of the future, then, the first alteration we propose is what must have been for some time seen to be inevitable sooner or later,—the widening of the southern end of Parliament-street by setting back its western line of frontage to the line of the present Foreign Offices. This is a necessary improvement, even as a matter of ordinary convenience, in a part of the street where, during the Parliamentary session especially, traffic is so heavy. But it is rendered a matter of course by the proposal of Government to take the land between Great George-street and Upper Charles-street for new offices. The improvement would in either case mean, of course, the abolition of King-street, the narrow back street dear to cabmen as a supposed short cut, but which has an historical interest from the important part which it once played (still remembered in its name) as a route of royal procession to Parliament upon State occasions. It is a pity that a street with so interesting a history should be obliterated, and it may well be suggested that in the building of the new offices some record should be embodied in them of the site and name of this historic alley. At the further end of the new block of buildings we have shown Delahay-street, still retained in its name, and nearly in its position, only with the twist taken out of it. There is a word to be said about this corner of the plot of land. The original aim of the Office of Works was to purchase the whole piece of land between St. James's Park and Parliament-street, demolishing of course the whole of the buildings now standing on the site. This would have involved the destruction of one of the most interesting and best preserved seventeenth-century houses in London, situate just in the turn of Delahay-street, and which has the historical interest of having once been the abode of Judge Jefferies, of evil memory. This interesting house we are glad to be informed is in any case to be spared, and the angle block including it to be left as an "island." The rest of the small space west of Delahay-street and between it and the park (see A on plan), we should propose to retain on the same level as Upper Charles-street (which is raised by a flight of steps from the Park), and turn it to advantage as a small ornamental balustraded garden,* an oasis in the region of Government offices.

The proposal to build a new block of these on the north side of Great George-street must be almost necessarily followed, at no very long period, by the rebuilding of the south side of the same street, thus completing what we have long regarded as an improvement greatly called for on architectural grounds at least. Such a building as the Westminster Palace should have fine and dignified approaches, and there is a decided anti-climax in the sight of the visitor approaching from the west, when, after traversing Birdcage-walk, he finds this very uninteresting street of dingy brick houses, turned (mostly) into offices, interposed between the boulevard he has left and the great building he is approaching. Great George-street ought to be made, as soon as possible, a fine and worthy architectural approach to Westminster Bridge, the Embankment, and New Palace-yard. At the same time the entry between this line of road and St. James's Park (B) may be made more dignified by removing the small lodge standing in the centre of St. James's Park walk to the west side of the walk, or rather by building a new lodge in that position, and connecting it with the end of the Great George-street buildings by an open colonnaded screen with an entrance-gate, somewhat after the manner of the Hyde Park-corner entrance.

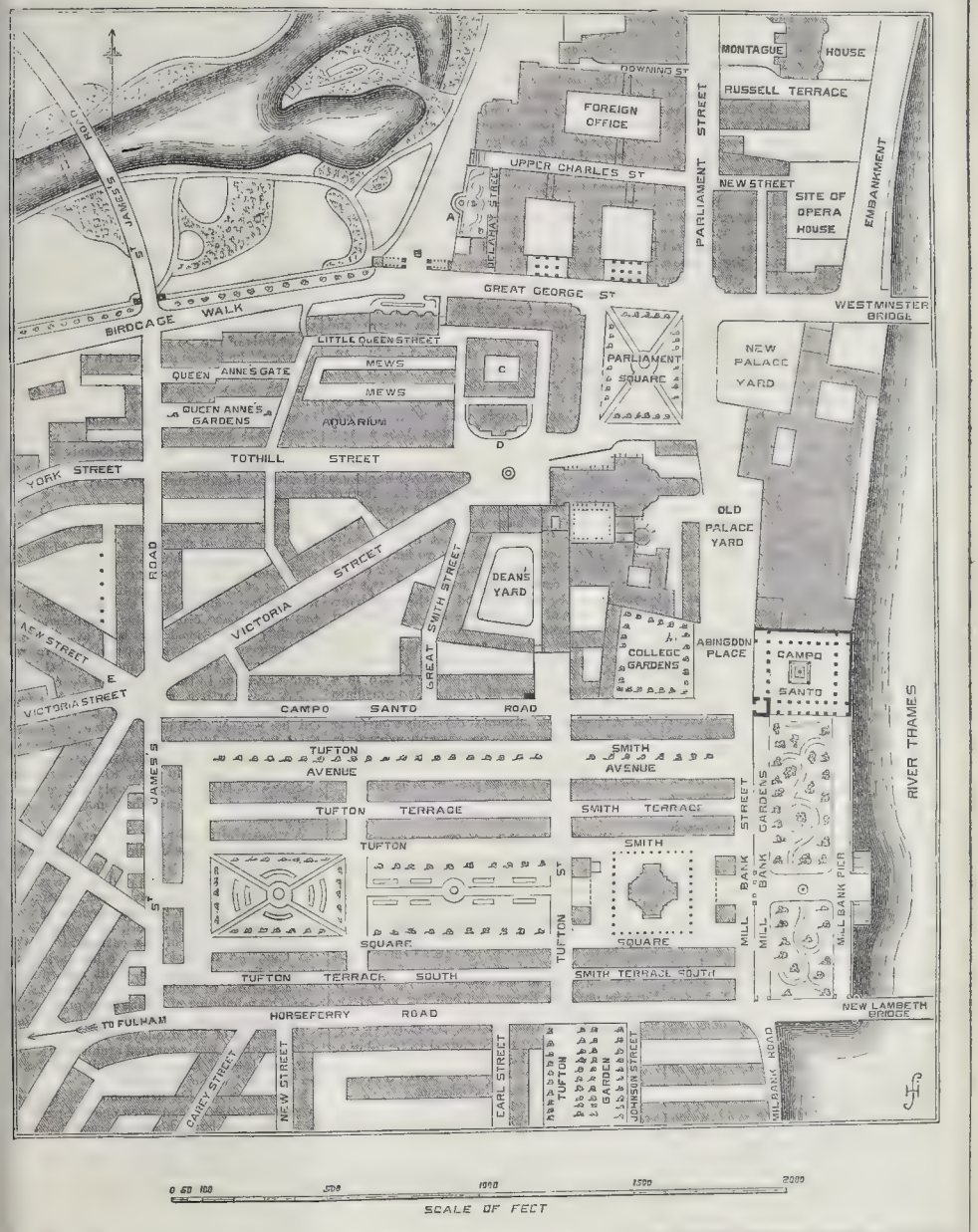
There are, however, other than merely architectural reasons for the rebuilding of the southern side of Great George-street; for, owing to the change in the social character of the neighbourhood which is obviously impending, the clearing away and rebuilding of the narrow and mean little streets contiguous to the site now occupied by the Aquarium is almost a matter of course. We do not mean to infer that the existence of the Aquarium in itself renders this necessary; for, on the contrary, the intrusion of this establishment into the neighbourhood of the Abbey and its surroundings is the principal obstacle at present to the advancement of Westminster to the position

* Unless it be decided to leave all the houses in this strip, and fronting the park, *in statu quo*. Some of them seem too good houses to be lightly removed, though the collection is rather a motley one; but none of the interiors, we believe, have the architectural and historical interest of the special house above referred to.

of a first-class neighbourhood. In regard to the most serious part of the objection felt to it by those already living in the neighbourhood, an amelioration is, of course, possible. Architecturally the building is there, and must be made the best of, though it is lamentable that so tawdry an erection should have been allowed to flaunt in the precincts of the Abbey, and spoil the whole architectural genius of the place. But it would be possible that the building might be made available as a winter-garden and a place of recreation of a higher class than it is at present, and it has, at all events, provided in advance a theatre for the new neighbourhood. The other building which has interfered sadly with the possible future architectural character of Westminster is the now well-known Queen Anne's Mansions. There is this to be said, however, for this warehouse-looking pile of dwellings, that it has the negative merit of being purely and simply ugly, nothing worse,—neither tawdry nor pretentious; and in other ways its existence has probably formed a considerable influence in the improvement of the neighbourhood. The treatment of the property stretching from this point to New Palace-yard seems to resolve itself into this. The very interesting eighteenth-century houses on the north side of Queen Anne's-gate, and looking over the Park, ought certainly to be left untouched; they are, it is true, very badly built and ill-drained; but the latter evil is capable of amelioration, and the houses, which once formed one side of what was then called Queen-square, have considerable historical interest, the place having held at one time much the same social estimation as a fashionable place of residence which Grosvenor-square holds now. Those on the south side, though not all equally interesting, have the same kind of claim to consideration, and belong partly to the same period; but the property south of these, and intervening between Queen Anne's-gate and Broadway, would have to be cleared (and in many respects the sooner the better), and a line of superior buildings substituted, continuing the north line of Tothill-street as defined by the Aquarium buildings, while an open space might be left between these and the Queen Anne's-gate houses, and the site receive the name of "Queen Anne's Gardens." The oblique line of the narrow street (Dartmouth-street) separating this property from the west end of the Aquarium, must be retained now, as the latter building has adopted and fixed the line of the street, rather unfortunately. Coming eastward, the houses along about one half of the north side of Little Queen-street are good residences of some interest; the rest of this side of the street would have to be rebuilt, and as this new portion of the street would immediately face our proposed new gateway to St. James's Park, there would be every inducement to build houses worthy of the position. The ground on the south side of Little Queen-street, and between it and the Aquarium, would be the best utilised as mews,—it would be of very little use to put houses of a good class in that position, and new mews would be wanted for the neighbourhood, as the proposed Government alterations will disestablish one set of mews contiguous to King-street, not to mention one or two other smaller ones which our improvements would abolish. The next question is what to do with two or three large and not unimportant buildings which adjoin the neighbourhood of Great George-street and New Palace-yard; the Stationery Office (C); the Westminster Hospital (D); the Guildhall, &c. The Westminster Hospital, on which a good deal has been spent lately, and which is a quiet building in unobtrusive style and good taste, no one would propose to interfere with; and the Stationery Office immediately in its rear, though a building which nothing could render interesting or attractive, it would probably be very inconvenient to move far from its present site; but it can be left where it is, and shut out from interfering with architectural amenity. But the Guildhall is a building of no beauty, and little or no interest in itself, and as a police court, it is, in its present position, a great nuisance already, and would be still more so when regarded from the point of view from which we are at present proposing to regard the Westminster neighbourhood. Under these circumstances it appears to us that the Guildhall and the buildings in its rear might very well go, and we have then the opportunity of making a grand *place* in connexion with the Houses of Parliament and the Abbey, stopping short the new line of houses south of Great George-street as soon as they are clear of the back of the Stationery Offices, and then turning them round, to hide the east side of these offices, and form a fine terrace of houses or business buildings facing the Houses of Parliament. We should then have, instead of the small enclosure of grass and flower-beds now seen at this point, a square large enough to be planted with trees in the centre, which would make a splendid combination with the surrounding architecture—a square opening out the whole north flank of the Abbey on one side, with the Houses of Parliament skirting it on the east, and part of the new Government offices on the north. By way of giving more architectural interest to these new offices and to the street and square which they would adjoin, we have proposed them arranged in two courts, with open arcades or colonnades on the south side, giving a perspective view of the quadrangles from Great George-street, and "Parliament-square," as we would propose to call our big square. The fountain which now stands at the south-east corner of Great George-street might be worked into the new site, and the various statues of eminent Parliamentary leaders which are already placed in the present open space, and those which may join them in future, would be placed with equal or better effect around the new enlarged square. Finally, we might suggest, as a completion to the *coup d'œil*, the removal of the ugly and incongruous upper half of Westminster Abbey towers, and the rebuilding of this portion of them in accordance with the lower portion and with details which are not so mere a travesty of Gothic as those of the present towers; while a well-designed and not too pretentious *flèche* on the crossing would complete the whole.

Turning now towards the Houses of Parliament, we of course assume that the courts and their accessory buildings adjoining Westminster Hall may come away eventually, as they will be provided for in the new Law Courts. By this means, therefore, the narrow gut between them and Henry VII.'s Chapel will be widened, and Old Palace-yard more opened out than before, and a better view obtained of the Victoria Tower from "Parliament-square." We now come to the vacant space of land south of the Houses of Parliament and fronting the river, where it was long ago suggested that a kind of *Campo Santo* should be formed, where monuments of distinguished men might in future find place, instead of further crowding up the Abbey. This suggestion, already made and talked about with favour, we have therefore assumed as carried out, arranging the space in the form of a cloister, with perhaps a central feature in the middle of the court for receiving some of the more important and prominent monuments. Opposite this the houses now forming Abingdon-street are removed, and the frontage line set back, and the wider area thus formed becomes "Abingdon-place," by way of keeping up old names, which it will be seen we propose to do in all cases where it is possible and not inconsistent. And now we come to the consideration how far it is possible to lay out Westminster, or any part of it, as a first-class neighbourhood for residential purposes. For such a purpose it must be confessed we find ourselves restricted within certain rather narrow limits. Gasworks and breweries, it is true, on whatever scale, may have notice to quit; but when we get south of Horseferry-road we find ourselves stopped by the Millbank Penitentiary; and when we go westward towards Victoria Station we are brought up in like manner by the Middlesex House of Correction; both of these being too hard nuts for the improver to crack; too big and expensive buildings to be lightly removed, and quite unfit for inclusion in districts to be inhabited by those who are too respectable to commit the kind of sins for which these *loci penitentiæ* are made and provided. And in regard to the Victoria district, the status of the neighbourhood has already been pretty well fixed by the new terraces which are run at various oblique angles through the old lines of streets, and which certainly are not first-class, though eminently respectable-looking in their way. It is a pity, we may observe in passing, that the oblique line of Victoria-street,—very convenient and right as a traffic line,—has been made the basis for all the new laying-out of the Pimlico district as far as it has been proceeded with; the consequence is that everything is at angles and elbows, and the shapes of the building sites, both occupied and unoccupied, are compelled into very awkward and very wasteful forms with unmanageable acute angles at every turn. To return to our immediate subject, it will be seen that in consequence of the obstacles we have mentioned, we are restricted very nearly to the region bounded by Horseferry-road on the south and west (the present Horseferry-road goes round a corner) and by the river on the east. But this is not at all a bad site to operate upon. It consists mainly of narrow, unhealthy, and dingy streets, some of them, we may add, very immoral streets, the clearing out and rebuilding of which would be a benefit in every way. What we propose is that a clean sweep should be made of the whole of this, and that on the site thus cleared there should be formed what we may call another Eaton-square, rather larger, and we may hope better, in an architectural point of view, and with the advantage of a river-frontage contiguous to the site.

A glance at our plan again will show how we propose to do this, and at the same time to preserve some old landmarks and old names, and to make material improvements in the main lines of traffic going over this portion of London. In the first place, it will be seen that next to the river and passing across the eastern end of our site we propose an embankment garden running from the Campo Santo down to the end of Lambeth Bridge. This garden it would probably be necessary to place under certain restrictions as to right of entry, so as to prevent it from becoming flooded by incursions of the multitude, and keep it reserved as a special enjoyment for the residents in the neighbouring square; adding also a semi-private water-stair or pier for their use when required. Our site is bounded on the north by a road running east and west and connecting the Campo Santo with a point in the middle of Victoria-street, where also some other routes meet, of which more just now. The Campo Santo building would have a leading architectural feature over the principal entrance opposite the end of this road, so as to make an architectural object to be seen along the road, and also commanding the gardens: for we have kept in view throughout our plan the importance of so arranging the alignment of roads as to obtain effective views and vistas; a matter, as we have often remarked, so much disregarded in England, and which has certainly been even more than usually neglected in metropolitan improvements. Now this road, which we have called "Campo Santo Road" (as there is no name on the site of it which seems worth preserving) is already in effect proposed to be commenced, for its western portion is identical with the new line of street proposed by the Metropolitan Board of Works in connexion with what is termed the Old Pye-street improvement scheme, the plan of which is now to be seen at the Board of Works Office. It is an application (proposed) of the Artisans' Dwellings Act, not specially a street improvement scheme, but it involves the substitution of a straight and wider street for the present crooked lane called Old Pye-street; which new street, as observed, is on the lines of our "Campo Santo-road," so that here again we are going hand in hand with improvements which are feasible and are already contemplated, and assisting them to a further development. With the odd angles of Dean's-yard and College Gardens and their adjacent buildings, including the rambling Westminster School buildings, we have not, of course, shown the slightest hint of interference, which would be absurd. But south of Campo Santo-road a new Tufton-street crosses our residential district at right angles. This is very nearly on the lines of the existing Tufton-street, and only deviates from them in order to keep a right angle (which is more convenient for laying out houses and terraces), and to get the west towers of the Abbey visible along the whole street as a culminating object. We shall see, too, that the line of street has an object if we turn the other way and look southwards, for there we find it terminates opposite what is now called on the Ordnance map "disused graveyard," but which is really a very nice good-sized open piece of field, railed in and planted with trees, and apparently used by nobody for any purpose, but which we suppose to be laid out as an ornamental ground under the name of "Tufton Garden," with a handsome gateway central with the end of the street. On the principle of keeping to the old names of a site as much as possible, Tufton-street gives its name also to the greater portion of one residential district lying westward of it, and which divides into Tufton Avenue (a broad boulevard) Tufton-terrace (north and south), and Tufton-square, with a central garden.



It will be observed that the longitudinal axis, as we may call it, of the land, is not midway between the northern and southern boundaries; and we see the reason of this on turning to the other portion of the land eastward of Tufton-street, and nearer the river. Our principle is to make as much use as possible of existing objects of importance as centres of arrangement and of vista; and here we find that the large and well-known church (St. John's) so conspicuous an object from the river, and which has been often irreverently compared to an elephant with its legs in the air, is obviously the dominating object. It would be absurd to think of removing it; nor, in spite of the sneers that have been directed against the building, is it destitute of a certain dignity and impressiveness. What we must do, therefore, is to help this as much as possible by arranging the site so as to make the church the centre and culminating point of the whole. We not only make it a central object from the Square gardens, but we open it out to the river, and place the main cross walk of the river garden and the river stairs centrally with the church. The church at present stands in a small and cramped square, called Smith-square, which, small and quiet as it is, forms at present the principal centre of this corner of the district, and is the only portion which we should feel some compunction at removing; for the houses, though small, seem well built, and are good specimens of brick building at a time when work of this class was better done, though with less show, than it generally is now. But the square is very cramped, and would be the better for opening out; so we remove the old houses, but keep the old name, Smith-square, leaving the church still as the centre of the square, but with a wider space on every side. Smith-square again gives its patronymic of Smith to the adjacent avenue and terraces, just as Tufton-square does on the other side of the road. The road running north and south between Smith-square and the gardens occupies the line of the present Millbank-street, and retains the name with its indication of the nature of the locality in early days. It will be observed that all the lines of houses in the two squares are built at right angles to the river, and so arranged in parallel lines as to keep the vista to the river, and to the river garden and its trees, open every-

where; a very important point in making the most of a river-side site, and one that is often entirely overlooked. The method of building *along* the river bank is capital for the terrace which is next the river, but all the rest of the property loses the sight of the water, and the additional circulation of air altogether. The line of houses is turned crosswise across the site only at the further end, where the terrace serves as a barrier to close out the view of the less-desirable Pimlico neighbourhood.

In regard to the roads which form the southern and western boundaries of the site, there is something to be said as to their influence upon lines of communication. We have called the southern road Horseferry-road, occupying as it does in part the line of the road so named, because, though the name does not sound very dignified, it is a great pity to lose a name which (like "Mill Bank") embodies so much of the history of the former state of the locality. The existing Horseferry-road, however, only runs a part of the way on this site, and then turns up at an angle which would cross obliquely the western part of our Tufton-square, and runs nearly up to Victoria-street. This portion of Horseferry-road, therefore, disappears from recollection in our plan, and, apart from sentiment, perhaps the road we have shown might be more suitably called "Lambeth Bridge-road," just as the road from Victoria-station to the next bridge up the river is known as "Vauxhall Bridge-road," for we must observe that our scheme includes the proposal for what is much wanted, and would be still more wanted were any other parts of this plan to be carried out, viz.: a solid stone or iron bridge over the river at Lambeth in place of the light suspension-bridge which is there at present. Not only is such a bridge wanted for general purposes, as traffic between the two banks at that point is increasing very much, or rather would increase very much if it had the opportunity; but such a bridge would also, in conjunction with our new road of approach, afford an important shortening of the route into the City from Fulham and Brompton, as will be readily seen on looking at the map of London as a whole. Moreover, the road is here designed as affording a continuation of a main line of road which is at present abruptly cut short. The reader will see that our road leaves the plan on the left, with a slight dip southward, where we have placed the arrow with the words "to Fulham." If the direction here indicated be followed out on a general map of London, it will be seen that the road would cross the southern end of Victoria station, and if continued, would exactly join the line of the long "King's-road," which forms the main route into London from Fulham, but which is abruptly cut short at Sloane-square, after which point the passenger has to find his road by angles and byways. The difference between going to the City across Lambeth-bridge from this point and the present route, traversing the north side of the river, is, as will be seen on looking at the position of the abrupt bend of the river near Westminster, the difference between the chord and the arc.

But we must now ask the reader to look at the road which forms the western boundary of our new Square, and divides it from the Pimlico district, and which we have termed "St. James's-road." This follows the line of no road which at present exists, and the reason for its name will be at once perceived on tracing its course northwards. After joining the general meeting-point of the new roads in the centre of Victoria-street, it goes on past the end of Tothill-street, and cuts into Birdcage-walk at the point at which the carriage-way from Queen Anne's Gate at present does so. It then continues across St. James's Park, taking a slight bend westwards, and crossing the Park water by a bridge nearly on the site of the present small suspension bridge, the position of which is shown by the dotted lines a little to the left. If this line of road be continued beyond the point at which it quits our plan, it will be found to join the Mall exactly opposite Marlborough-road, so as to provide a direct line of communication between the new Westminster district and St. James's-street and Pall Mall. The want of such a communication is already much felt and complained of, and of course in connexion with such a plan as we have proposed it would be an absolute necessity. To do it thoroughly it would be necessary probably to sacrifice one small end house in the Queen Anne's Gate row, as the new houses west of the present gate into Birdcage-walk have been built so close up as to afford only room for a very narrow carriage-way; but otherwise there is no difficulty in the matter. The new bridge might be made an additional ornament to the park, and only a little give-and-take of levels would be required to get the roadway high enough not to interfere with promenaders by the Park water, who would in this case, perhaps with a little dip in the footwalk, pass under the bridge, in the same way as at the bridge over the Serpentine between Hyde Park and Kensington Gardens.

We have now come round nearly to the point whence we started in our survey, and must close our suggestions, hoping that they will not altogether fall to the ground. In regard to the two new routes, Lambeth Bridge and St. James's-road, we are convinced that these must be adopted before many years, if not sooner than that phrase would imply. We may notice that in addition to the road over St. James's Park, we have a road (marked E on plan) running obliquely from the Victoria-street centre, and connecting the new district directly with Buckingham Palace and Constitution-hill. We had, indeed, half indulged the "fearful joy" of a large boulevard direct from the west front of the Abbey to Buckingham Palace, forming an acute angle with Birdcage-walk, passing over the site of Queen Anne's Mansions, and getting rid of that *ruda indigestaque moles* at the cost of an adequate compensation. But, unfortunately, the sacred enclosure of the Wellington Barracks would bar further progress, so that chance must be abandoned. York-street would have to be cleared and rebuilt, though its line could not be materially altered; and perhaps some day we may hear of the Victoria Station preparing to put on an architectural countenance worthy of the importance of the terminus and of the neighbourhood, in place of the paltry sheds which are at present a discredit to the site.

There is one point in favour of the "Tufton-square" scheme we have omitted to mention: it would afford a "fashionable" square in a really interesting part of London, in immediate contiguity to what we have called the historic centre of London. There is certainly something in this, for perhaps no neighbourhood in London could be less interesting in respect of association than that in which the chief squares (socially speaking) are at present to be found.

A NEW LEGEND OF THE RHINE.

A new legend of the Rhine, scarcely less apocryphal than the famous legend of the Lurlei, and only by a few weeks of less antiquity, has been suggested to the imaginative Rheinlanders by the alarming earthquake of last August 26th, when it is believed by not a few that the unusual shock which visited this portion of the Rhine district may have been occasioned by the turning in his grave of the famous Cologne burgher Dickoff, of building notoriety, painfully grieved at the disastrous destruction, by fire, of his beloved creation, the Getrudenhof, which some years back he caused to be rebuilt, or rather restored. Poor burgher, his demolished creation is not the only fine work that has suffered (by restoration) in Cologne.

Recalling our first visit, just twenty-four years ago, we can remember no other city that we have since seen that has suffered more from the hands of the improver.

There is still, and, as we all know, there has been for centuries, the famous scaffolding of the unfinished Dom, adding a picturesqueness to the form which suggests to some minds that the completion of the spires may not prove thoroughly satisfactory, revealing as it does by its concealment beauties that the imagination is thus able to supply, leaving so much to charitable doubt, and allowing of the hope that the beauty which has existed so long in other parts of this gorgeous fabric may be successfully emulated in the completion.

In much, however, that has been recently done, emulation has been sadly absent, while the imitation strikingly manifests the danger that must be inseparable from the mere work of the copyist.

The northern portal still shows, injured as it is by time, but still most lovely, a number of figures almost in the perfection of art, while at its side, the central restored door is all but finished; it really is too much praise, which some are disposed to give it, when they say that the modern work, although claiming to be precisely in accord with the work of the past, is simply wanting in the spirit of by-gone days; the work in all cases is not by any means of the finest, and this may be easily detected by the expert in figure work, while architectural critics detect even greater errors in the exquisite lines that their noble science reveals to them.

In the recently added sacristy, the lean-to at the south side of the cathedral, the work of which is again said to be a thorough renewal of the old, the common-place character of the whole design appears to be of the very lowest order, as does that of the fountain at its base, and it is a question to our mind whether the addition of the most modern ways of gardening and bedding out plants around the cathedral adds in any degree to the beauty of the whole.

It is, it is true, a delightful feature to see the, by this time, quite antique office of the clerk of the works embowered in graceful ivy and creepers, carefully trained; but if this office stood alone, and the great cathedral in the midst of its piazza, as so many other great cathedrals of the world have stood for centuries, we should be better pleased with the effect.

As for the enormous quantity of modern stained glass which the religious and artistic enthusiasm of the last forty years has added, it is simply sad to think how much beautiful old work must have been destroyed to make way for highly-coloured and badly-conceived modern work, which must in time, and as we advance in artistic intelligence, give way for superior designs.

Everything seems to have been done at Cologne, in the immediate neighbourhood of the cathedral, to destroy as much as possible the religious and holy atmosphere that has environed the great monument until the present moment of exaggerated Continental travel; and if anything could add to the desecration that has taken place around this magnificent pile, certainly the utmost has been attempted by the engineers who have constructed the railway-bridge across the Rhine, and which brings one immediately on to the entrance of the cathedral.

Art and artists appear to have refused all alliance with the engineer, who has carried out his project with no other view, apparently, than to show his acquaintance with some of the most elementary principles of strength, and this bridge rivals in size, while it painfully clashes with, the excessive beauty and dreamt-of perfection of the cathedral now so nearly completed.

A wonderfully and powerfully expressed feeling leads the gorgeous Middle-Age pile to produce an impression which we in the present day seem incapable of rousing, while still more unable do we seem to be to effect any union, sentimental or otherwise, between the most modern of work, the iron bridge, and the work of completion, so different in its aims, of the cathedral. On the one hand we are met with a cold, staring, and straight-lined construction, built according to the correctest of technical principles; on the other, by a building of divine conception, which in its unending play of curves and lovely lines, in the wealth of art displayed in each portion of its entwined and entangled architecture, combines the laws of the strictest unity vivified by the breath of divine inspiration.

Materialism and idealism could not be more harshly contrasted than when one compares the iron bridge through whose construction one sees a crowd of men, locomotives, and wagons, as if in some gigantic rat-trap, and the calm, quiet cathedral separated from the bridge but by a few yards and yet seemingly descended as it were from some other world.

The iron bridge is so truly the production of the full-blooded materialism of the present day (alas! for the time-honoured and quaint old bridge of boats), and the cathedral is so thoroughly the creation of the Middle Ages, strong in its religious faith, and whose whole life was impressed with that doctrine of eternal and divine salvation, which more than one fervent artist has in modern times endeavoured to realise.

Should these criticisms on the Cologne suspension-bridge and the restoration of the famous Dom not appear to every one correct, it must be taken into consideration that they are made, not on the merit of the undertaking, but rather on the way in which it has been carried out, and suggested by the unsatisfactory appearance which the modern portions present to the appreciative eye. We slightly doubt the artistic capabilities of the Cologne architects and sculptors. An art city Cologne certainly is not. It

is no city of artists; but it is essentially a city of artistic work.

As an art city there exists a very natural rivalry between Cologne and the town from which we are at present writing; Dusseldorf is called an art-city and a city of artists, and yet Dusseldorf possesses none of those extraordinary treasures that are the property of the Cologne authorities; in the first place, in their unrivalled collection of their own early masters, and in the one Classic authority, the deservedly famous head of the Medusa, which is almost sufficient, one would think, to found a school of art. Yet judging by their exhibition of modern pictures, which is now open to the public, it would scarcely be ill-natured, it would simply be just, to say that they do not show at the present moment that they can have any claim to be considered, whatever they may have been in the past, an artistic community, while here in Dusseldorf, at least lingers still something more than mere traditions, and good work is yet done, notwithstanding the depressed commercial condition, and the withdrawal of the trade patronage which here killed the very life that the artists have worked so hard, but in so mercenary a spirit to uphold.

Dusseldorf.

THE BOULOGNE LIGHTHOUSES.

THE projected new Harbour of Navigation and Refuge at Boulogne promises to be one of the most splendid on any coast of France, notwithstanding some apparent paradoxes in the scheme of its construction. Its group of lighthouses, however, may be regarded as of even more general importance than the contemplated haven itself, because they will afford an infallible guide to the mariner exactly where he is most liable to mistake his way on the Channel waters. They are to be four in number, furnished with the most powerful lights, upon the best-known principles, and capable of casting a gleam at least of their radiance upon the opposite shore. No similar cluster, supposing this to be completed, exists in the world, the utmost hitherto attempted having been the establishment of two, generally at the extremities of an extended bay in which vessels were in the habit of taking shelter, or where the business of the sea was customarily carried on by night. But it by no means follows that the quartet of beacons at Boulogne will be without a parallel in point of number, different though the arrangement may be. There are no fewer than eleven illuminated signals of the first, second, and third class, flashing their rays upon the river approaches of the Gironde. At first these were no more than iron baskets of burning coal or wood, suspended on lofty poles; then, lamps were substituted, fed with coarse oil, and supplied with round or flat wicks; next, the inventions of Argand came into use, with Carcel following them, whose mechanisms, indeed, have not yet gone out of use, though greatly improved by the combinations of Arago and Fresnel, with whose names the history of the French lighthouse system will always be connected. The catoptric system, with which mirrors or reflectors were introduced, was an improvement, perhaps, though nearly parallel with, the dioptric, applied by Fresnel to his famous "tower" at Cordouan, almost in the very mouth of the Garonne. This was succeeded by a lighthouse at Mount Agda, on the Mediterranean coast, and another at Cape Bearn, visible to one another at a distance of more than seventy miles. At present, aided by peculiarities of apparatus, the lighthouses of the French coast are nearly all illuminated with colza oil, though the electric element is expected to displace it in lanterns of the first order, and at the greater height. Petroleum was used, in several instances, with no great success, as at St. Gaubain. But it will be less with the kindling power than with the durability of the edifices constructed by them that the marine architects of Boulogne may be expected to principally concern themselves. The building of a lighthouse may necessitate many and different conditions. It may be undertaken on the summit of a mountain, as at Cape Bearn, near Port Vendres, or on the height of a cliff, as at L'Ailly, Fécamp, and La Heve, on the Norman coast; or it may have its foundations laid in deep water. Moreover, it must, naturally or artificially, be stationed at a commanding elevation above the sea-level, both because it may be seen from afar, and also that no trees, houses, or even sails of ships, may intercept its friendly signals. The loftiest structure of this class on the French coast, at present, is that of Cordonan, more than 200 ft., or about the height of the towers of Notre Dame, and followed by those of Dunkirk, Calais, and Baleines, on the western extremity of the Isle of Ré. Frequently, however, the walls have to be carried up from rocks, or groups of rocks, continually beaten over by the sea, as at the Eddystone, though few of these incidents will occur at Boulogne, where they will stand upon, or rather rise out of, an artificial breakwater, not destined, it may be hoped, to the doom to which that of L'Ailly, one of the great lights on the Norman coast, is inevitably condemned. Erected on a chalk cliff, it is already nearer to the sea, by one half of the distance, than when its foundations were originally laid, and the day must come, in spite of sea-walls and buttresses, when it will topple over, and mingle with the wrecks it was destined to prevent. Perhaps, however, the most remarkable among French lighthouses now existing is that already referred to, of Cordonan, at the mouth of the Gironde, built towards the close of the sixteenth century. Originally, it was not much more than half its present height, which is calculated from the level of the highest possible tide. Among its singularities is that, while the exterior suggests the idea of a fortress, the interior recalls that of a palace, elaborately sculptured and adorned. Isolated in the midst of the waters, it has, nevertheless, far above them a vast platform, on which the habitations of the assistant-keepers stand in comparative safety. Somewhat similar is the position of the great Pharos of Henri de Brebat, on the Brittany coast, reared upon a huge porphyry rock, formerly the sailors' terror, commenced in 1836 and completed in 1839, in defiance of extraordinary difficulties, occasioned by the violence of the tides acting upon a multitude of formidable shoals and reefs. It was here necessary, not merely to construct an edifice, but also to hew out or blast a little port among the rocks, where the craft employed by the constructors might lie in safety. As the slim though solid tower grew up, every course of masonry was, twice a day, covered by the waves, until a certain elevation had been reached; being thus bestrewn with slime and sea-weed which, as will be well understood, were no facilities to the builder. Sixty workmen, however, under the direction of the engineers, performed their tasks so well that their platform has scarcely ever since needed a repair. They squared, grooved, and dovetailed every separate block, employing cement which, as they declared, and as it seemed, acquired in a few hours the durability of stone; but whatever the truth in that respect, the result has justified their confidence. Since that period, however, French lighthouse architects have unfortunately been content with foundations of less Roman solidity; and the lighthouses themselves have been constructed of less massive materials. In fact, the manufacture of these edifices in iron for trans-oceanic ports has become almost a distinct branch of French industry, and some of the perilous points on the French coast itself have been thus supplied,—as at Pontaillac, near Royan, which indicates an entrance, amid thick-set sand-banks to the Gironde; and at Walde, which points out a dangerous stretch of the same obstructions, fronting the port of Calais, which, scarcely less than Boulogne, requires a new port, a new pier, and a new set of warnings to navigators.

The French side of the Channel, indeed, has hitherto been singularly deficient in its supply of these structures, so essential to any thickly-crowded coast. Up to the present time there have been three lights visible at English ports,—those of Dunkirk, Calais, and Cape Grisnez. Between the first two are two others, belonging to the second rank,—at Gravelines and at Walde. At Étaples, at L'Ailly, at Fécamp, and at La Heve, the three great Norman ports are signalised; but hardly anything has hitherto been done, in this direction, for Boulogne, notwithstanding that it is, after all, the principal English gateway to the Continent. Harfleur and La Hague, the mouths of the Loire, Triagoz, and Tremorvan, Finisterre—the guiding-mark of Brest, Belle-Isle, L'Orient, and Chapiron,—had their lighthouses; but only one, on Cape Grisnez, belonging to Calais, however, assisted the Channel pilot on his way across the most popular of the Channel passages.

The Mediterranean coast of France, it may be remarked, is singularly free from embarrassments to the navigator. Seven lighthouses of the first order, and a few inferior beacons' suffice for the whole; one of the former, in fact, and four of the latter, for the immense and teeming port of Marseilles. Six, with a few secondary lights, are given to the entire circuit of Corsica, while the Algerian harbours are scarcely lighted at all. On certain parts of the French shores, the inhabitants have contrived rude day-signals for ships by building lofty walls, of an intense white, or peculiar shape, or monumental piles, as on "the Isle of Antioch," or towers with windmill tops, as on the Isle of Oleron. But these, with bells, whistles, trumpets, and gongs, all put together, do not by any means compensate for the absence of a lighthouse, adapted to modern scientific principles. As an illustration, it was impossible a few years ago to enter the great port of Brest by night, whatever pilots might be employed; but now, two small illuminated towers indicate the practicable channel. The French compute the cost of these edifices, in the mere building, at from 8,000*l.* to 25,000*l.* upon an average. But what hitherto have been the sea-signals available for Boulogne, by night or by day? The Lower Jetty, on the north-east, with a flagstaff and a bell, to the south of the old port, announcing the depth of water in the passage, and the state of the weather, whether misty or not, the hammers striking about once in a second. Then, there were the bells of Ambleteuse and Bazinghelle; the Fort de Croï, with its ramparts by day and its lanterns after dark; the lofty monument raised in honour of the Grand Army, Fort l'Heurt; and the little lighthouse of Alprede. This was positively all, with hundreds of thousands of passengers entering the harbour, year after year. Calais was slightly better provided for, with its Bank of Quenses, Barrier of the Line, beacon at Walde, tower, mills, belfry, and lighthouse, already referred to on Cape Grisnez, besides two or three signal-masts, hoisting "osier balloons," which, of course, are only useful by day, and that only when the light is perfectly clear. It is interesting, however, to note now that so much attention has been attracted by the Boulogne project, that about the middle of the seventeenth century there was near the existing jetty a lighthouse of Roman construction, reputed to have been erected by Caligula, when upon his expedition against the Gauls. Montfaucon affirms that it succumbed in 1644, in consequence of the cliffs below giving way, and he supplies the design of the building, which has every appearance of authenticity. The ground-plan of this tower was octagonal, and the tower itself was composed of twelve stories, diminishing, like those of a Chinese pagoda, each by a step, as they rose one above another, and each also having a broad cornice, constituting a sort of gallery, like that of the more famous, but kindred, building at Alexandria. Each of the eight sides was 25 ft. in width; but with reference to the height, concerning which no exact details remain, it is calculated that if the measurements of Montfaucon were estimated with any approach to accuracy, it must have approached to that of the structure at Cordouan, or slightly over 200 ft. The walls were carried up in irregular courses, following, however, a systematic plan; to three layers of Boulogne greystone succeeded two layers of a stone softer in substance, and in colour yellow; then two layers of immense dark red bricks, followed by the grey stone, and so forth to the end. This lighthouse would appear to have been restored by Charlemagne, who, rekindled the beacon-fires which his barbarian predecessors had permitted to die out; but, after his epoch, it was abandoned, in what particular period is not known. Curiously enough, however, as M. Reynaud points out, in his exhaustive work, in quarto and folio, upon the whole subject, there have been discovered near Dover the remains of a tower, built apparently upon the same lines with that at Boulogne, evidently designed to answer the same purpose, and, moreover, so far as may be ascertained, belonging to the same period. The architects of Boulogne, therefore, may, in some measure, take unto themselves the credit of reviving a Roman work. The longevity of some among these structures has been remarkable, notwithstanding the furious weather to which their inevitable elevation and the very purposes they serve expose them. That of Genoa, lofty as it is, dates from early in the sixteenth century; and many others, still in use, are equally ancient. France, when the four lamps of Boulogne are kindled, will possess fifty of these beacons, of the first-class, altogether.

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M. Reynaud, the most eminent authority upon this topic, perhaps, discusses practically the different shapes to be recommended,—round, square, or octagonal, the various elevations necessary at different positions, the comparative solidity of foundations, and the most convenient modes of exit and egress. It is clear that this variety of architecture, differing essentially as it must, of course, do, is a matter of characteristic importance for communities which have the ingoings and outgoings of their commerce carried on through stormy approaches to ports which are worth rendering safe at any cost, so that the progress of the works at Boulogne, little as any of it may be visible for a considerable time to come, will be watched with peculiar interest.

ARCHITECTURE IN THE PARIS EXHIBITION GARDENS, ACCORDING TO M. CHARLES BLANC.

The articles which have appeared from time to time in the *Temps* detailing M. Charles Blanc's theories on architecture, as demonstrated at the Paris Exhibition, have excited so much interest and been so keenly appreciated that we need not apologise for again referring to them.

On a previous occasion we gave a synopsis of M. Charles Blanc's criticisms on the Avenue of Nations; now we have before us an interesting paper on some of the various typical structures which embellish the gardens of the Trocadéro and the Champs de Mars.

Mr. Charles Blanc opens his criticisms by acknowledging that though sentiment ought and actually does exercise great influence on architecture, nevertheless the more we study the question the more readily do we recognise the effect of climate on men's minds and the works of their imagination. After all, the thoughts and beliefs of a people really originate in the air they breathe, the latitude they inhabit, the mildness or severity of the climate. These are the causes which form the national temperament and create a predisposition in favour of this or that school of belief. Indeed, to these considerations we may safely add that, should the dream of a universal religion be ever realised, the expressions given to this religion would still differ in accordance with climatic influence. Each people would adopt and emphasise that phase of the common religion which harmonised best with their natural disposition, and this tendency, based, in the origin, on race and climate, would undoubtedly be illustrated by the architecture of the various nationalities.

To return to M. Charles Blanc, the structure raised in the Trocadéro Garden by the care of the Egyptian Government, is, he maintains, a striking proof of climatic influence. In a country where intense heat weighs down on the populations, where the sky but rarely changes, where the temperature is permanently oppressive, and the inhabited districts are surrounded by appalling deserts, ideas become fixed, beliefs immutable, customs are perpetually maintained, and generations succeed and resemble each other. Under such circumstances, it is easy for men of superior intelligence, and capable of gaining the respect of the crowd, to establish a religion which shall live, if not for ever, at least for centuries upon centuries; but all such sacerdotal domination envelopes itself in enigma, hides itself under symbols, and will not allow itself to be approached or understood by the profane or the vulgar.

Let us look, therefore, at the imitation of an Egyptian temple, such as it may be seen at the Exhibition. The architecture is formidable. It consists of high walls which exclude all light from the outside, unless we take into consideration small openings pierced high up, far above the inquisitive gaze of those who pass. This temple, carefully closed on all sides, has but one entrance; it is the impenetrable abode of the divinity and his priests. In appearance, the temple is imposing, especially on the mind of the masses; it suggests internal galleries with abundant air and shade and obscure sanctuaries. The architecture seems to indicate thoughts which shall not be revealed to the multitude. An eloquent mystery is the very condition of its existence.

Let Egypt, however, be conquered by the Arabs, and immediately the genius of the Semitic races will modify the architecture by imprinting upon it the trace of their customs, which were instituted on another soil and under the influence of another climate. The nomadic life of the Arab has given him the love of change. What was grave, monotonous, immovable in Egypt, becomes, under the Mussulman domination, enlivened, expressive of movement, and relieved by alternations. The surfaces, which were flat and plain, will be carved, engraved, embossed, and even pierced so that here and there a slight draught is created. There is a sense of activity, change, and movement engendered. The base is alternately yellow or brown; the dressings in white stone or red brick. The openings in the walls are precisely what we should imagine a polygamous people seeking to imprison their women in harems would desire. These are windows carefully closed by delicate trellis-work, which does not hinder the inmates from looking out, but prevents any one looking in.

If we wish to have a correct idea of the religious architecture of the Mussulman of ancient Mauritania, M. Blanc recommends the model of a mosque built by a young architect, M. Charles Wable, at the foot of the slope in the space consecrated to Algeria. This mosque is a free imitation of the building admired by all travellers at Tlemsen. It is remarkable by its proportions, and the contrast between the nudity of its exterior walls and the rich ornamentation covering the interior surfaces of the monument. After describing this building, M. Blanc remarks that the exterior door of this temple is covered with pottery work, and the gemell-windows are surmounted by a rectangular framework, which the English imitated in their Tudor style of architecture. A curious point to be noted, illustrating how architecture expresses ideas, principles, and doctrines, is the fact that all the small Algerian constructions at the Trocadéro possess extending roofs or verandahs, thus offering shelter or shade to those who are outside. The temple is the only exception to this rule. This clearly proves that the awning, so useful in places where people assemble,—the bazaar, the public fountain, &c.—is not considered proper for a mosque. A mosque was not intended to afford external shelter to the faithful: it is their duty to enter the house of God, and seek internal consolation. If the temple is approached at all, it should be for the purpose of worship, and not merely to avoid a shower of rain, or to escape the searching rays of the sun. It should also be noticed that the temple is covered with loopholes, and has been built with a view of resisting invasion; it seems to relate how the town of Tlemsen was besieged by the Moors from Fez, and that the inhabitants of Algeria had to defend themselves against these incursions for about a century.

Travelling, by the force of conquest, through the different countries of Asia and Africa, the architecture of Islam was modified principally in accordance with the respect which the conquerors could not but bestow on the monuments of an anterior civilisation, and by the nature of the materials found in the conquered countries. When it was imported into Persia, the Arabian style became what the ancient Persian architecture had been,—merely the art of decoration. The same Arabs who had raised at Cairo colossal monuments, and notably the mosque of the Sultan Hassan, became the necessary raw materials were ready at hand, built in Persia edifices composed of small stones, covered with plaster and hardware, hiding the form under a mass of decorative art. The miniature palace which the Shah of Persia caused to be built at his own expense in the Trocadéro Gardens, between the Chinese bazaar and the Tunisian *café*, is a model of one of his own residences in Persia, and a striking example of this theory. M. Blanc estimates that some ten million visitors will gaze on this little palace, which might be called in Paris, as in Persia, the Palace of Mirrors. But those who have not entered the principal room, where the Shah is presumed to rest, will have formed but an incomplete idea of this peculiar style. The vaulted ceiling is covered with small pieces of glass, presenting innumerable surfaces. Eleven hundred thousand little pieces of glass have been employed to ornament this ceiling. The Persian carpets are reflected in the prismatic surfaces of the cupola. The furniture, covered with shells, produces on the myriad of reflectors the most irregular effects, the diamond or crystalline shape of the glass increasing the glitter and sparkle. The windows, also, are of stained glass, and the frames painted with brilliant colours; finally, rays of light fall from the summit of the cupola, and strike violently against some red globes; the whole presenting a spectacle of light without shade, colorisation without end or rest, increasing sparkle and reflection, utterly dazzling to the unprepared visitor. The Shahs of Persia must attach marvellous importance to their persons, to their image, to the slightest change of their countenance, the most insignificant movements of their life, to have thus desired that their every action should be reflected a hundred thousand times over on the walls of their dwellings. What would a Greek philosopher have thought of this mad prodigality of mirrors, of this puerile luxury and barbaric taste?

The Shah was not, however, content with this single example of the minute in decorative work. The other rooms of the miniature palace were to have their walls covered with Persian pottery, imitating in colour the numerous and wonderful shades of Indian shawls; but, fortune, in alliance with good taste, sent a storm which so shook the ship conveying the porcelain to Marseilles, that it was all broken to atoms. Instead of the shining enamelled porcelain we have only paper, which, however, was manufactured on purpose in Paris, and designed to imitate the wrecked wares from Persia.

The bazaar constructed by order of the Bey of Tunis, the *café* opened by the exhibitors from Morocco, all bear the characteristic marks of Arabian architecture, with the modifications denoting sojourn in Western Africa or in Spain. M. Charles Blanc denounces here the grievance we have already mentioned. He complains of the questionable Armenians, the false Orientals, who disturb every visitor by their efforts to sell pastiles, Turkish pipes, and other trifles, which can, not only be bought, but even manufactured, in any part of Europe. In fact, it is only necessary to cross the Champs de Mars, and, in the great gallery that runs parallel with the École Militaire, a number of French women may be seen daily employed making, painting, enamelling, &c., Turkish pipes, and similar articles, which others sell as coming direct from Constantinople.

M. Charles Blanc is particularly impressed by the contrast between the Persians and the Japanese,—the first deeming that life without a profusion of looking-glasses is not worth living; the latter, on the contrary, being content with an old-fashioned metallic mirror,—and, as he suggests, recalling the verses from the "Orientales,"—

> "Les vierges au seins d'ébène,
> Belles comme les beaux soirs,
> Riaient de se voir à peine
> Dans le cuivre des miroirs."

The little model house, made with materials brought expressly from Nippo, does not possess a single pane of glass or of looking-glass. The Japanese close their windows with rice-paper, so prepared that the rain slides off, and it remains impermeable. All is organised with intelligence and simplicity; but the Japanese cultivator and merchant, the artisan and the clerk, seem, one and all, thoroughly impressed with the inherent instability of things human. There is nothing permanent in their home. All is built with a view to sudden change, excepting, perhaps, the little rice-straw padded mat, about 1 in. thick, which serves as a mattress at night, as a table for meals in the day, as a carpet for the children's bare feet, as a lounge where the parents sit on their heels, drink tea without sugar from lacquered cups, or discuss over hot rice wine, or *saki*, served in vitrified enamelled porcelain, which seems like unpolished glass. A what-not or cheffonier and a few folding screens constitute the rest of the furniture of a modest dwelling, and here all changes, all is transformed according to the requirements of the moment. By means of movable partitions and sliding sashes the small rooms are converted into a large room, or the large room into small compartments. At night the drawing-room is split up into bedrooms. In the morning, the bedrooms, well aired, are changed into shops. The outer wall is removed; the floor, which is built some 2 ft. from the ground, forms the counter, on which the goods for sale are laid out. An open space above the framework, protected by bamboo trellis, admits the air both day and night, and insures good ventilation. All these results are attained with bamboo, and bamboo alone. It is slit bamboo which serves as tiles for the roof; a larger slit bamboo is used as a half-pipe, to carry away the rainwater. Finally vegetable string is employed for palisade-work, and will resist the effects of the atmosphere. Here and there, in the garden, huge umbrellas protect tender plants and the gardener who cultivates them.

M. Blanc then continues to dilate on the extended range of architecture, which is no longer content to build houses and monuments, but seeks to imitate the accidents of nature by creating a waterfall in the Bois de Boulogne, and digs into the slope of the Trocadéro to introduce a grotto with reservoirs of water, where the fish of the aquarium disport themselves. The building, in civilised and overpopulated centres, imitations of wild and unfrequented scenery, is, indeed, a new but now a common diversion from the architect's ordinary scope of work. In this strange structure subaquatic dramas may be witnessed; for, despite the Society for the Prevention of Cruelty to Animals, little fish have been placed within reach of big fish, so that the latter may fatten on the former; while the public can contemplate at ease, and even envy these animals, who have the reputation of leading happy lives, and who, in any case, have nothing to do but to live peaceably, and have no other fear save that of not finding any small fish to eat, or of being themselves devoured by larger fish. To them the claims of the rival schools of art, the competitions of commerce and industry, remain matters of supreme indifference!

SCULPTURE IN THE HOUSE.

UPON an impartial survey of the state of the arts in England, it is impossible to consider that sculpture is either flourishing or popular. It might possibly be said, indeed, that an art if it is flourishing is necessarily popular, but that position will, upon further consideration, be found to be unsound, since it is obvious that if two or three sculptors such as Flaxman and Thorwaldsen were in the zenith of their power sculpture might be considered as flourishing, even if the productions of the sculptor's chisel did not attract the attention of the world at large.

But it is obvious that one of the chief reasons at the present day why sculpture is not a calling upon which artists eagerly enter is because there is, speaking generally, no market for it. We are, of course, aware that certain public statues to statesmen or philanthropists are annually erected, that a certain number of persons desire to have the busts of certain of their relatives or friends represented in marble, and that there are a few men possessing æsthetic tastes and large rooms who will purchase statuary. But when all is said and done the amount of demand for works by sculptors from these three sources is most small, and when it is compared to that for paintings and drawings it is absolutely infinitesimal. Nor to counterbalance this want of demand is the calling of the sculptor regarded by the world as the high and honourable, it may be even said almost sacred, office which it was in times gone by. The ancient Greek regarded Myron or Phidias with the reverential awe which is generally reserved for the great benefactors of their country, and a Mediæval pope,—the most proud of prelates and potentates,—would obsequiously desire Michelangelo to execute for him a commission. Such a position might compensate even in these days for a want of clients, but when even it does not now exist it is not wonderful that from this and other causes sculpture does not flourish. Yet it is obvious that for the benefit of the world at large the taste for sculpture should be as largely developed as possible, and that the desire to possess it should be made as keen and as available as possible. Indeed, in an age when simplicity of life, and of taste, is somewhat at a discount, the influence of sculpture, at once so pure and beautiful, should be cultivated as far as possible.

Whether, therefore, sculpture be regarded from the point of view of the interests of the artists or from the higher standpoint of that of art generally, it is clear its encouragement in the house is most desirable. The finest public galleries are, after all, only the places to which the national taste should look for its leading examples, and it is in the home that some of the most valuable results of art must be produced, and fostered, too, by the careful collection of works of art, not so high a kind, it may be, as will be found in the public galleries, but yet truthful and solid. And those houses may be of a twofold kind. They may consist of those stately houses of England, many of which already, such as Chatsworth and Eaton, possess very noble works of art, or of those newer and equally magnificent mansions erected within recent years; or secondly, of those smaller houses in town and country, where plenty, if not profusion, reigns, and where there is space without vastness. The owners of both kinds can do, and should do, and in some cases now do, all that is possible to encourage sculpture; but the encouragement it meets with is, in fact, very small. The number of houses where sculpture is really cultivated may be counted, we venture to assert, almost on the fingers of two hands; for where there is a house in the country which is of any importance, there should belong to it a sculpture-gallery; for, in those cases where it is possible sculpture should, so far as practicable, be exhibited in a room fitted for the purpose. For it is of the utmost importance that the light from above, and the colour and form of the background should be carefully attended to, in order that the works of the sculptor may be seen to the best advantage. The idea of a sculpture-gallery sounds at first possibly too confusing; but a gallery is, after all, only a room, and a room may be of any size you please. Consider for a moment the care which now-a-days is given in every house of any size to the billiard-room. How carefully the dome lights are considered, and how, when the architect is instructed to make plans for a new house, the billiard-room is a matter of the first consideration. The statue gallery needs little more attention than the billiard-room; it should be lofty, well lighted from above, and the walls should be painted or draped with some colour suitable for the proper display of works of art, though some little care is requisite in this particular both as regards colour and extent if bas-reliefs are introduced into the walls. We have at this moment in our mind a very excellent example of the feasibility and the attractions of such a gallery. The house is one erected under the high architectural skill and knowledge of the late Sir Gilbert Scott. It is a large, a roomy, and an essentially comfortable house, but it is not a palace, and there are numberless houses scattered throughout England much larger and more magnificent. It stands upon a terrace; the suite of entertaining-rooms looks out over the bright flower-beds and the varied tints of the wood, the spire of the village church, and the hills, rising up behind. First there is the dining-room, which opens into the library; this in its turn opens into the drawing-room. Then comes a high sliding door, which gives access into a short recess, or rather archway, 6 ft. or 8 ft. long, and which forms the entrance to a circular sculpture-gallery. It is not a large room,—smaller, indeed, than any of the three we have mentioned,—but it forms at once a home for sculpture, and adds to the beauty of the other rooms, since, when the door is thrown open, it forms a very striking outlet to the drawing-room, adding much to the attraction of this room. The ceiling is of wood, the walls are of a light pink colour, and the floor is also polished wood. Here, in all its tranquil beauty, may be seen Gibson's most successful and most graceful work, the "Aurora," passing with light feet over the morning sea; the more masculine form of his "Hunter and Dog"; and some other noticeable modern works.

We have gone into this example because it is one which could not be more apt for our purpose. Here among the Welsh hills is a comfortable English home, but here is also a small sculpture gallery which adds at once to the attractions of the house as such, affords opportunities for pleasant contemplation, enables the work of the sculptor to be regarded quietly and thoughtfully, and must, therefore, be the means of enlarging and cultivating a knowledge and appreciation of art. There is no more powerful influence upon the young than association. A young man of merely ordinary abilities, if brought up in the society of those who take an intelligent interest in politics, who from his earliest youth has been accustomed to hear political subjects small and great discussed with vivacity and thoughtfulness, insensibly draws them into his scheme of life, and is almost sure, till the day of his death, to take a more intelligent and more of his death, to take a more intelligent and more of his death, to take a more intelligent and more casual interest in national matters than if he had not had this early advantage. It is just the same in regard to art. Given a sculpture gallery, there is certain to be some continuing interest in the progress of sculpture in that family. The history and the lives of sculptors from a subject of conversation and research from time to time, and the great works of antiquity necessarily come in for their share of attention. Hence the mind becomes more cultured; a taste for sculpture or for works of art generally may be sometimes vigorously fostered; in some cases what may be termed an intelligent interest only in artistic matters will be aroused. But in either case the profession of the sculptor has been raised in the estimation of some of the public; the minds of some men have been more or less cultivated, the possibility of the spread of art is enlarged, and the probability of a larger demand for the works of the sculptor is also produced.

So much for galleries, but there may be houses where it is not possible, for various reasons, to erect galleries. In such cases a lofty room may be utilised; in others, a hall may be adorned with bas-reliefs or with statues in the round. In any case, the hall, if no other room is available to be set aside for sculpture, is the most fitting place, because there is a simplicity and a soberness about it which suits well with the character of sculpture. For certain kinds of sculpture the library is a very fitting place. M. Thiers, as we know, regarded as his most precious ornaments the bronze duplicate of Michelangelo's "Nursing Madonna." Copies, too, of classical works, either of busts or of ideal works, reduced in size, may often be well and properly housed in the library. Indeed, of this we may cite for an example the library of M. Thiers, as we have already taken the gallery of an English country-house for an example of the possibility and advantages of galleries of sculpture in the house. It would be interesting to describe the paintings and drawings which adorned the rooms of the illustrious statesman, but we must rest satisfied with noticing only those things which directly concern this paper. "M. Thiers made few hard-and-fast rules in his life. One of the few was not to give house-room to any but first-rate articles of *virtu*. . . . . He bought from the Salviati family the bronze duplicate of the marble [the 'Nursing Madonna'] which was given by Michelangelo to Salviati, Bishop of Florence. The doors of the library were kept by an Apollo, and a Satyr, copied from the antique. 'The Last Judgment' was flanked by reductions of the Farnese 'Hercules' and the 'Slave' of Michelangelo. Bronzes, copied for M. Thiers from the tomb of Lorenzo de Medici, were stolen from the Garde Meuble, where Fontaine, the Communist, placed them. Other copies in marble were since done, but somehow they did not speak to M. Thiers the same language as the lost ones. 'Day and Night' and 'Dawn and Dusk' were recovered, and stood at the corners of the library. A common sentiment,—that of intense grief,—agitates them. Between two of them was placed an alto-relievo in terra cotta of an entombment, also by Michelangelo."* And these works of art became very dear to the statesman, and were always a solace. Thus, as he said himself, "when I find myself in a flat country, I shut my eyes, and evolve the statues of Michelangelo."

The drawing-room is the last place where, as a rule, we would place sculpture, though, if care be taken, there are some rooms which, by their formation, may be fitted for a statue or a bas-relief. But as a rule a statue in all its beautiful simplicity looks out of place among the thousand and one odds and ends of a modern drawing-room, though, as we have said, if some suitable recess or corner can be provided and properly prepared, a statue may be fitly placed in a drawing-room. But a statue does not tend towards the *general* embellishment of a room: it must be regarded for its own beauty alone, and it will not permit itself to be made a part of the furniture, so to say, of a room. It must be admired for its own sake or not at all. But small bronze or marble works may often be introduced with good effect into a room, though they, too, should be carefully placed with a full regard to the character of the art. How often do we see John of Bologna's, vigorous "Mercury," among a mass of ormulu, possibly backed by a picture of Birket Foster's, or an engraving after Sir Edwin Landseer. But if care were taken in this respect, and if modern sculptors would endeavour to popularise the taste for sculpture by the introduction of copies of the antique, would seek to do work in small pieces in the round or in moderate sized bas-reliefs, it would largely tend to the improvement of the state of sculpture in England. There is not a room in any house in England in which such works as Flaxman's diploma bas-relief in the Royal Academy would not be welcomed, and Gibson's "Christ Blessing the Little Children" is also one which may be cited as a similar but yet a

* "M. Thiers: a Sketch from Life, by an English Pencil." By Emily Crawford. *Macmillan's Magazine*, November 1877.

differing example. These things alone will not popularise sculpture, but it is clear that if those who can were to adorn their houses by sculpture-galleries, if the proper use of sculpture in houses were continually inculcated, and if young sculptors were to endeavour to work especially at bas-reliefs, and at small works in the round, there would be more chance of sculpture becoming a popular art, and consequently of sculptors being more appreciated and more encouraged. There are no doubt times and nations among which sculpture is more likely to flourish than in other days and among other peoples, and this country and this century are not on the whole favourable to this tranquil art. But with the spendid example of Flaxman before our eyes, it is impossible to say that great artists in this branch cannot spring up in these latter days. True, Flaxman had all the devotion to his profession, all the simplicity of life and mind, and all the carelessness for the opinion of the world, which was characteristic of the great artists of old, but yet his example is capable of being followed; and if those who can will encourage the introduction of sculpture into the house, we are more likely to see future Flaxmans arise in English art.

OLD RAMPARTS AND NEW BREATHING GROUNDS: FRANKFORT.

The German military engineers of the Mediæval and later periods could have had no idea of the benefit their plans for the fortification of cities would prove to future generations of dwellers in German cities. Their only thought was to devise and carry out cunning plans for securing the safety of the towns from sack and pillage; and so they encircled them with thick, high walls and deep ditches, the double girdle being strengthened here and there by lofty castellated towers. It never entered into their remotest imaginations that in after-days these very plans would prove the salvation of those cities from other and perhaps worse evils than even pillage and bloodshed, namely, from disease and sufferings worse than death. Those were days of disorder and insecurity, and the first duty of civil life was self-preservation in view of the constant danger to life and property, from the unsettled state of the times. The necessary security could only be gained by the means adopted; that is, by surrounding the city with as impregnable a circumvallation as possible. The risks to which modern civic life is exposed were not present with them, or, at least, they were not conscious of them to the same extent which we are. Populations were not so large; overcrowding, except in war time, was probably not so great; and so the evils of insanitation were not so rampant. Besides, when plagues and pests did not break out with decimating fury, they were regarded as being in some way spiritual retributions, to be averted by prayer and penance. They had not yet learned to regard them as evidences of the violation of natural laws, as we have, and so they could not be expected to make provisions against them.

With the passing away of the times of constant war and bloodshed, and with the inauguration of a happier era, the need of these girdles of stone, with their watchmen on tower and rampart, no longer existed, and those whom business or pleasure prompted could transfer their abodes from the narrow street or narrower court to the open country beyond the walls, without fear of molestation by robber or other. But with the extension of the city beyond its former bounds, and the rapid growth of populations consequent on times of peace, came the other danger of insanitation as it had not presented itself before. It was no longer easy for the tired worker to find fresh air and relaxation without the city, the distance being too great, and the temptations inside too many; added to which, the citizen was no longer compelled to repair at certain times to some meadow outside the gates, and exercise himself in the arts of war. Then it was that the means of defence against a human foe proved of inestimable advantage under altered circumstances. No longer required for military purposes, ramparts, bastions, and towers could be toppled into the dry and grass-grown moats, and a smiling garden take the place of frowning battlements.

This is what took place in scores of German towns. Where once stood the ancient wall, with its adjuncts of ditch and glacis, now run beautiful wide promenades, in most cases extending quite round the city: a vast circle of park, with ornamental waters, walks, shady by-paths, arbours, seats, even heaps of sand, for the little lovers of dirt to roll and revel in. Fancy the Metropolitan Board putting cartloads of sand on the Embankment, or in the squares, for the children to dig and spade in! As instances of towns possessing these promenades, we may mention Hamburg, Bremen, Frankfort, Wurtzburg, Cassel, Mannheim, and a score others, not to forget Vienna, whose magnificent Ringstrasse, with its grand mansions and public buildings, extending in a wide semicircle around the inner city, stands on the ground formerly occupied by the fortifications. The completion of this latter work is of comparatively recent date. The Wurzburg promenades date but from the eventful year 1866, and cannot therefore compare in beauty with some older ones, but in the course of a few years they will be attractive enough. In this article, however, we propose to give you some idea of the promenades of Frankfort, and to show how enjoyable a public resort has sprung up on the old city battle-ground. The town stands on the north bank of the Maine, here a broad, rapidly-flowing stream. The old fortification consequently formed an arc, with the river as a base. When, about the beginning of the century, it was resolved to raze the wall, the city authorities had the good sense to listen to Burgomaster Guiollet's suggestion, that the space thus obtained should be kept for the public, and laid out in promenades. It was accordingly levelled and planted with trees, now monarchs in their way, the home of numberless birds, that make the evenings and mornings resonant with their songs. Never was there such a *rus in urbis*; and the city fathers who gave their town such a cincture deserve not only the thanks of their fellow-townsmen, but of their fellow-men throughout the world for setting such an example, one it were well if all towns would emulate so far as possible.

The Frankfort promenades extend from the river Maine, near the public library, about two miles in a semicircle, and reach the river again some mile lower down, there joining other promenades stretching along the river side. A more delightful walk could not well be imagined for the early morning or the cool of the evening. Even in the heat of noonday there is grateful shade beneath the magnificently-spreading trees. The path varies at every turn: here we have beautiful groups of trees, there a mass of blossoming shrubs; now a neatly laid-out and fragrant bed of flowers, and now a well-kept grass-plot; then we come, perhaps, on a portion of the old moat, or are surprised by a glimpse through the trees of an antiquated tower, to which cling ivy and legend and poetry, if nothing more. Further on we are tempted to tarry and watch the foraging operations of a number of waterfowl on an ornamental sheet of water, or to listen to the cooling splash of a fountain. Everywhere art vies with nature to produce the most effective and delightful pictures. On either hand aristocratic mansions and snug villas, surrounded by all that wealth can supply, lend a finish to the scene. Such is the rendezvous and promenade of the Frankforters, especially in the evening and on Sunday afternoons. Rich and poor there meet, sit on the same forms, admire the same beauties, take their refreshment at the same *cafés*, and enjoy the same fresh fragrant breeze. Mrs. Jameson, speaking of these "Anlagen," as the Germans call them, says:—"One of the most delightful peculiarities of Frankfort, one that most struck my fancy, is the public garden, planted on the site of the ramparts; a girdle of verdure and shade, of trees and flowers circling the whole city, accessible to all and on every side,—the promenade of the rich, the solace of the poor." It is a delightful drive all round, but it is more charming as a walk, since on foot one can take time to examine the multifarious objects of interest that attract the eye,—the busts and statuettes, the many relics of the past, the wooden birds' nests in the trees, and the birds that hop about and pick food almost at our feet, so unmolested and consequently so tame are they.

This belt of gardens was laid out, as already stated, at the beginning of the present century, under the direction or Burgomaster Guiollet (who is generally considered to be their creator), and have from time to time received additional embellishments. Perhaps the reader would like to accompany us on a walk round the city, which will occupy, may be, about three quarters of an hour. It will be an entertaining and instructive walk, and may introduce us to a little Frankfort history, and a few Frankfort worthies. We start at the lower point where the promenade touches the river, and one of the first places we pass is the Rhine railway depôt. A little beyond we come upon a bust of Bacchus over a pump, much resorted to for the supposed medicinal virtues of its waters. Beneath it is the following inscription:—

"Blessed the drink to us shall be;
The water to you, the wine to me!"

Proceeding a little further, we come to the Bockenheimer Anlage, by the gate of that name, one of the principal thoroughfares to and from the town. Here, on a small mound, in the centre of a cluster of trees, is a monument to Guiollet, by Von der Launitz. The pedestal bears some fine figures in high relief representing the destruction of the old fortifications, and the laying out of the promenades on their ancient site. It is surmounted with a bronze bust of Guiollet, and an inscription recording the thanks of his fellow-citizens. Guiollet's grave is also on one of the Anlagen, the Obermainanlage, at the corner of the eastern wall of the Heilige-Geist Hospital, and the Rechneigraben Urbergang. It is beneath a group of shady trees, and is marked by a neat Gothic tombstone, whereon is the inscription:—"I. Guiollet, born 25th February, 1786, died 5th September, 1815." Somewhat further on near the Eschenheimer Thor or gate, is a bronze bust of the naturalist, J. C. Senckenberg. Here we must pause a moment to look at the picturesque old tower, one of the most perfect relics of the ancient fortifications.

The Eschenheim Tower is a quaint-looking structure, reminding one more of a wax-candle, with an extinguisher on it, than anything else one can imagine. It dates from the year 1346, or from that to 1350, and formed a part of the city walls built by the Emperor Ludwig, the Bavarian. Up aloft resides a Frankfort burgher,—a knight of St. Crispin, we believe, whose duty it is to strike the hours as they pass, and keep a good look-out for fires. In earlier times the watchman on the Eschenhim Tower had to report therefrom the coming of foes, or the more welcome approach of friendly merchants bent on doing business at the semi-annual fairs. But other times, other manners. The arts and accomplishments of peace and civilisation have even mounted so high: the cordwainer watchman has his piano aloft! The steep ascent to the summit is well worth climbing for the view it affords one of the city and the surrounding country. Legend has made a home in the old tower. The highest pinnacle is surmounted by a vane, in which nine round holes can be discerned, forming a figure of 9. The story goes that once upon a time, when the forest extended to the city gates, there was a notorious outlaw named Hans Winkelsee, who caused great trouble by reason of his misdeeds. Some say he shot the finest deer of the forest, others that he succeeded in stealing away the hearts of nine of the fairest daughters of the city. At any rate, a price was put upon his head, and when finally caught, he was incarcerated in the Eschenheim Tower, in a room immediately beneath the vane, there to await the carrying out of the capital sentence passed upon him. For nine days and nights, the period of his durance, he was prevented from getting a wink of sleep, because of the screeching of owls and the creaking and wheezing of the constantly-gyrating weathercock. On being led to execution, he begged of the city fathers one favour,—to be permitted to let fly nine bolts at the offending vane, and pierce it with a figure of 9, as a memento of his skill. Not only was the favour granted, but the bold bowman was promised his life and freedom if he succeeded in his self-imposed task. He sped nine shots, and the result was that wonderful vane. Says the old ballad:—

"Talk not, ye proud old England, of your bold Robin Hood,
For in these German lands of ours are bowmen stout and good;
Boast not your sturdy hunters, rude Swissland and Tyrol,
For on the Maine are archers who seldom miss the goal."

But the historian and the local chroniclers know nothing of Hans Winkelsee and his skill; and we are sorry to say we have only to do with a simple legend,—perhaps with mythology; for the number "9" plays therein an important *rôle*, as the reader can, if he likes, find out in Simrock. The existing vane, it should be said, is not the original one; it has been renewed on several occasions, the last time

being in 1874, after the tower had been struck by lightning.

Proceeding on our walk, we next come to the Friedberger Anlage. Here we find a monument to Baron von Bethmann, who succeeded, in 1813, in averting a descent upon the city for plunder, threatened by the First Napoleon. Next, just before reaching the Ariadneum, we come upon the Hessian Monument, erected in 1793, by Frederick William II. of Prussia, in honour of the Hessians who fell on the 2nd of December, 1792, in storming the city, then occupied by the French under General Custine. The monument consists of a heaped-up mass of rock, surmounted by a massive cannon-ball, and crowned with helmet, sword, battering-ram, and other warlike symbols. Close to the miniature lake, opposite the Bethmann Museum, known also as the Ariadneum, because of its containing the celebrated piece of sculpture representing Ariadne on the lioness, is also a bust of Bethmann (by Von der Launitz). On a slight eminence, above the water, is the Kursaal Milani, a pleasant *café*, where we may rest for a few minutes, and, the chief objects of interest before we reach the river again, having been passed, partake of refreshment, and where, on certain evenings during the week in summer, we may sit and enjoy the music of a first-rate band, while we drink in the scent-laden air, and refresh our eyes with the sight of the neatly-kept flower-beds and the pyramidal foliage of the trees.

Close to the promenade also are the Zoological Gardens, the Palm-gardens, &c., delightful places of resort. More interesting, however, is a spot to be found close by,—I refer to the churchyard of St. Peter's, where is the grave of Goethe's mother. The Church of St. Peter (on the Schaefergasse) possesses but little of interest to the stranger. Its graveyard, however, now transformed into a pleasant public garden,—another excellent example for the corporations of English towns,—contains some curious ancient gravestones, monuments, and sculptures. The tomb of the mother of Germany's greatest poet, however, is its chief attraction, and will not fail to be visited by all admirers of the bard. The "Frau Rath," as Frankforters delight to call her (born on the 17th of February, 1731), died on the 13th of September, 1808. Her grave is found to the right on entering the garden from the Schaefergasse. It is neatly surrounded with stones, and at the head is planted a weeping willow. Goethe's mother had a great influence on the intellectual development of her gifted son. The poet himself said of her:—

"Von Mutter hab ich die Natur
Und Lust zu fabuliren;
Von Vater hab ich die Statur
Und des Lebens ernster Führen."

"From my mother I have inherited my nature and the love of the romantic; from my father my stature and the more earnest characteristics of my life." Goethe himself did not have the enjoyment of the beautiful promenades that later were created around the city of his birth. In his days the worthy citizens wandered out of the city gates, across the river, and to the shades of the forest beyond to find enjoyment and recreation. Even now the forest is the goal of thousands of persons every Sunday afternoon, though the modern institutions, the Zoological and the Palm Gardens, attract the more aristocratic crowds. But the Anlagen remain the most popular promenading ground for the citizens on Sundays, the wander-ground for the idler and the poet, and the playground for the nurses and children during the days of the week. The planners of English towns would do well to study the pleasant promenades and parks of Continental cities; they would find much to admire, and much worthy of adoption. They would learn how to make a provincial town a pleasant and attractive place, and to give the dwellers thereof beautiful parks and promenades that every one could enjoy, instead of, as is often the case, large parks at so great a distance that but few can enjoy them except on Sundays and holidays. In Frankfort, from the old ramparts have been created the charming promenades that we have attempted to describe as the Green Girdle of Health.

A Memorial Pulpit has been erected in the parish church of Slough, from the design of Mr. J. O. Scott, architect, and executed by Mr. Henry Terry, of the Lambeth-road. The materials are alabaster, rose antique, and Derbyshire red fossil marble columns, and marble mosaic. This church will be consecrated on Tuesday, the 24th instant, by the Bishop of Oxford.

AN IDLER IN PARIS AND ITS SHOW.

I FIND myself still loitering by Mr. Hans Makart's great work in the Austrian department, the "Entry of Charles V. into Antwerp." Of course this picture has been the subject of much discussion, many objecting to the preponderance of the light "amber" tint that pervades it; others, that notwithstanding the wonderful unity and clever grouping of the crowd, the faces do not seem to express either astonishment or curiosity; indeed, one critic thus expresses himself,—"This enormous canvas is rather a splendid operatic decoration than a picture." This I do not in the least agree with, and that its merit is acknowledged is proved by Mr. Hans Makart having been awarded the gold medal.

The other gentleman who shares this honour with Mr. Makart is Mr. Matejko (a Pole from Cracow, but long known and appreciated in France). He, also, exposes a very large and important picture, the "Union of Poland and Lithuania,"—the subject, the Diets of Poland, where the turbulent Palatines delighted to display their opulence and the splendour of their attire, gives great scope to the artist, as does his "Bénédiction d'une Cloche à Cracovie." The "Baptism of King Stephen of Hungary," by a Hungarian,—Gyulo Beneyur,—is also a very remarkable work. The gorgeous tone of the vestments, the expression of the prelate's face as he blesses the kneeling king, imbues the whole with life-like reality. Munkacsy, another Hungarian, has attracted considerable notice by his "Milton when Blind 'dictating 'Paradise Lost' to his Daughters." Milton is sitting in an arm-chair with his face towards us bent downwards, his three daughters are grouped round a table near him. One is writing, one spinning, and the other,—the prettiest one,—looking on and listening. Over the whole picture Munkacsy has thrown that grey yet warm, obscure yet lively, tone he seems to possess the secret of. The picture has been purchased for the Lennox Museum at New York. One corner of the saloon has a melancholy interest, for the young artist whose pictures occupy it is no more. One subject of which Mr. Cermack has given a touching representation is a wounded Montenegrin, whose comrades are bearing him back on a *brancard* of branches and leaves, and above him are placed those arms from which a Montenegrin is never separated. The other picture, "The Return Home," shows some unhappy Herzegovinians, who find on their return their houses in ruins and their fields devastated.

That which so singularly strikes one in the Austrian school of art is its grandeur; its Velasquez tone of colouring; its aiming after something higher than, perhaps, the artist is able to carry out, but who yet convinces you the aim *is* there, and carries you beyond the actual representation to the inspiration, and makes one think with Tennyson, slightly altered, "We need must love the highest when we *feel* it."

But in every department Austria has reason to be proud of her achievements: her glass, her jewelry, her bookbinding, which latter is a perfect marvel.

To the glass exhibit we naturally first direct our steps, and on every side see the loveliest tints, from palest pink to deepest rose, like the heart and leaf of that flower; deep royal purple blue, the turquoise, and the hue of the Neapolitan sky; green, from the dark shade of the forest-leaf to the pale tinge of the waters of the Nile; jewelled, enamelled, glittering goblets and vases, cup and beaker, glowing with the varying hues of the rainbow, or again with the changing light of the opal, greet the eye. The form and designs of their greatest works are *à la Renaissance*, and taken from models in the Gallery of Apollo at the Louvre and the Museum at Vienna, which possesses magnificent specimens of old work. The glass itself is very pure and clear, and the engraving on it is very fine.

But every style in its turn invites and claims attention, from "show" pieces, such as urns executed after designs by Professor H. Herdtle; some flattened amphoræ, after J. Salle, ornamented with handles in enamelled silver; the fine jug and goblet incrusted with precious stones, having at the base beautiful little silver figures emblematical of the rivers Wien and Danube, and presented by Mr. Lobmeyer (whose entire exhibit is very perfect) to the Hôtel de Ville of Vienna, down to the huge Scandinavian-looking drinking-horn that only some mighty Viking of old could have drained to the dregs.

We pass on to look at the porcelain, which is not only very beautiful, both in form and colouring, but also very reasonable.

Fischer & Mieg have a very interesting exhibit: their establishment is, in some measure, I believe, a sort of Austrian "Sèvres," and 1,200 workmen are constantly employed there. The Austrian jewelry is very cheap, and Messrs. Markowitch are especially to be commended.

The bookbinding is very remarkable. The leather-work, the incrustations of enamel, the silver-work, mixed with it, make them things of sufficient beauty and value to be handed down as heirlooms in a family. As workers in iron the Austrians also excel. In plying, bending, chiselling, rounding it, in making it take every conceivable form, they are not to be surpassed. I heard the other day, though I know not how true it be, that they have discovered some means of working the slag or refuse iron into a fibre softer and more flexible than silk, and that it may be woven into dress material. However, as I have not seen any specimen of the kind, I will not vouch for the truth of the statement. The furniture, the rich brocaded silks, the stamped velvets, the hand-made lace sent from the mountains of Bohemia, a magnificently chiselled silver coffer belonging to the Emperor, the endless pretty little "nothings" peculiar to Vienna,—each in turn claims attention; and then we pass on to the extraordinary exhibit Mr. Louis A. Goldschmidt offers us of opals from the mines of Lubnik and Eperies, near Kaschau, in Hungary. Hungary is, I believe, the only country in Europe where opal-mines exist, or, at all events, it is the principal spot (with Australia) in the world where the finest ones are found. Here we have before us pieces of the rock with the opals still embedded in them, and which look, ere they are cut and polished, like bits of *blanc-mange*. Then a new idea has been inaugurated, the opal and rock are cut and partly combined together, and the metallic colours of the rock give a singular appearance to the jewel. There is also a rare specimen of a black opal,—one nearly green,—one nearly red, and one immense stone, supposed to be the largest one known, which is uncut, though polished, and is valued at 8,000*l*.

To end a pleasant day we wander away to the French exhibition of rare books and manuscripts, which was first pressed upon my notice by reading one of the very delightful articles of an American gentleman, who writes under the *nom de plume* of "Broadbrim," and who is as well known and esteemed in the circles of New York and Paris for his genial social qualities as for his keen intellect. I cannot do better than quote his own words:—"Close to the main hall on the north-west end of the Exhibition building, and immediately adjoining the British department, is a rare exhibition of statuary by the modern artists of France, but it is not of this that I now propose to speak, but of a little exhibit in a room on the left of rare and exceptional merit. Thousands daily pass it by; no statues mounted on pedestals attract them, no splendid pictures challenge their admiration. There is nothing here but a few books, manuscripts, and medals. Only this and nothing more. Yet in these low and unpretending cases are priceless treasures richer than Pluto's mine, not treasures of silver and gold, not jewels, not costly array, but rare books and curious old manuscripts, whose stories go back into the very twilight of im The mere pleasure-seeker and sight-seer a better pass on his way, for this exhibition a no attraction for him; but it is sacred as Mecca to the scholar and man of letters. This is the exhibit of the French Bibliothèque, and of manuscripts -some of them so old that we have no authentic history of the people by whom they were originally written. They are Egyptian, Assyrian, Greek, Persian, Arabic, and Hebrew. Before me is a contract for a piece of land, written 500 years before the birth of Christ, every character as bright and clear as if cut by an engraver's tool. The cases are full of rare reprints of works—choice specimens of that art which has made immortal the names of Guttenberg and Faust. Right royally here an ancient Theban bears testimony to the virtues of his departed wife, and yet, when this hoary manuscript was indited, Queen Esther was pleading for the life of her people before the great King Ahasuerus. Hear the dead man speak after a lapse of more than thirty centuries, and listen to the testimony with which he has embalmed in immortality the gentle memory of this fair Theban wife. "She was comely to look upon," says the chronicler, "and of temper, so sweet and placid that in all her life I never saw it

ruffled. She was kind and charitable and loving, and of life so pure and holy that the breath of suspicion or scandal never assailed her." Three thousand years have passed since this grand testimony of virtue and love was written. The race to which she belonged has been annihilated and blotted out. The sands of the desert roll like an angry sea over the proudest of its imperial cities. Yet surviving the history of its magnates and kings is this shining tablet to the virtues of a Theban wife, whose holy life is thus immortalised, but whose name is unfortunately lost to posterity for ever. Near by is a will written about the time that Hiram was preparing the stones which were used in the Temple of Solomon. The characters are Greek, and the oldest known to literature. It was made in the island of Cyprus, before Homer had written the "Iliad," and whilst philosophy was yet a stranger to the sacred groves of the Academy. Not only houses and lands fell to the lot of the dainty Cypriot dame, but stores of jewels and gold that might have furnished the outfit for "the Queen of Sheba."

Here, also, in a brief space, France has enshrined her immortal dead, and here she has preserved in gold and silver and bronze the heads of those who, through all past time, have built up her greatness and her glory. The memory of her emperors and her kings receives no more gracious tribute than that accorded to her philosophers and scholars, and the men whose humanity and self-sacrifice have earned an enduring immortality. Ludovicus Magnus is near to the gentle Melancthon, and the little Corsican captain, who rose to imperial power and died at last a captive and in exile, lies quietly beside Pascal, from whose bed of agony came forth the noblest and sublimest philosophy of France.

The horse-show, which has been held on the Esplanade des Invalides, has just come to an end. About 1,000 horses,—belonging to France, England, Russia, Belgium, Holland, Hungary, Italy, and Denmark,—were there congregated. The costumes of the various men who take care of them rendered the exhibition rather picturesque. The Hungarians have a sort of brown vest with white tunic; the Bretons, round jackets; the French, a kind of semi-military uniform; the Russian moujiks, red and black, with peacock's feathers in their caps. One of the most beautiful horses there was a Russian horse called Drouze, black as jet, graceful as an Arab, and gentle as a child. He has been all through the last Russo-Turko campaign, and bore his imperial master, Duke Nicholas, safely across the Balkans.

A very pretty sight was a Russian drosky, with blue and silver harness, and three "dappled greys" to conduct it.

The postponement of the distribution of the prizes has been a cause of great annoyance to many here, and poor M. Krantz has not had the most enviable life lately. But I must say, I think the date he has chosen a wise and rational one, however little my opinion may be in unison with that of the majority.

FROM LIVERPOOL.

THE annual picture exhibition at Liverpool, opened the other day in the Walker Art Gallery, may probably be safely characterised as the best "annual" exhibition of the kind that has been held in any provincial town. A good many of the most striking works from both the Academy and Grosvenor Gallery exhibitions of this year have found their way there, including Leighton's "Winding the Skein," Tadema's "Sculptor's Model," Watts's "Death and Time," Burne Jones's "Laus Veneris," &c.; but in addition to these and other centres of interest, there is also a very high average of merit and interest in the collection generally, and a remarkable scarcity of bad pictures. This is the more gratifying, as some of the previous exhibitions since the revival of the annual exhibition were so exceedingly mediocre, and the taste and judgment displayed in the choice of pictures purchased for the town so more than doubtful, as to give rather poor promise for the future of Liverpool in these matters. But this year's exhibition is a great step in advance, and we may confidently hope that this great commercial centre will now hold its own as an artistic centre also in the provinces. It would be a good step, however, to begin by getting rid (if possible) of three-fourths of the pictures which in previous years have been purchased or presented as contributions to the formation of a permanent gallery of art in the town, and which in regard to such an object are of no value whatever, and in one or two instances show an absurd want of knowledge on the part of whoever has been responsible for their acquisition. The ventilation of the galleries should be ameliorated as soon as possible; they have unfortunately other defects which it is too late to mend, but this particular ill may be modified. It appears, by the way, that Mr. Tadema has given dire offence to the moralities of some of the natives of Liverpool by his picture before mentioned, and quite a storm in a saucer was raised over it by moral and indignant correspondents in the local journals. It is a pity that people who do not understand what pictures are made for should be allowed to go into exhibitions. Could not a test examination be established in a few brief and pointed questions, the satisfactory reply to which should be the condition of entrance?

The group of buildings now formed by the Brown Museum, the Picton Reading-room, and the Walker Art Gallery (all, it may be observed, named after munificent townsmen of Liverpool) is an unusual one to come upon, and only wants a little of being a very effective combination. The good effect which it has partly arises from the combination of a formal style with an informality of grouping; the Library and the Art Gallery standing at an angle to one another, and connected by the circular Reading-room. The latter, with its colonnade of the Corinthian order, has a very elegant appearance; it is, however, a pity that the roof is so low as not to show as part of the design, and the building has the appearance of wanting a finish to it. The other two buildings are somewhat commonplace in detail, but still the whole has a stately effect, especially now that the masonry is still fresh and new. The Art Gallery has its statuary decoration also, which has been before mentioned in our columns; but the great building opposite still remains undecorated with the sculpture which Elmes designed to be its crowning beauty. We have often called attention to this, and we fear it is likely that we shall often have to do so again. It is surprising that a town which seems so desirous to take rank as an artistic place should thus persistently neglect the completion of its greatest building.

Opposite to St. George's Hall the addition to the London and North-Western Company's Railway Station is slowly progressing. The addition consists in nothing less than doubling the size of the station by the erection of a second span of iron roof alongside of the existing one, the present roof of which replaced, not so many years since, a previous one of smaller span, but which was considered in its day one of the best efforts of modern engineering in this class of structure. To facilitate egress from the enlarged station, a great part of the tunnel leading out of it has been enlarged, or rather turned from a tunnel into a cutting. At present the majority of the roof principals of the new half of the new station are up. How the front is to be finished there is as yet no indication: it can hardly be by another hotel, considering the great size of that which forms the front to the existing station. While on railway matters, we may mention that the new station at Birkenhead is now open, which brings the train service from Chester and other parts of the country directly to the gates of the principal river ferry. The new station has a double span iron roof of simple construction, and very light; there has been some attempt at architectural treatment of the substructure in a semi-Gothic taste, not altogether unsuccessfully, though more might have been made of it with the same materials. The defect of the station is that the covered portion is not long enough to take any but a rather short train fully under cover; a great deficiency in a new station. It is, however, a great and much-needed improvement on the dingy and confined establishment which has long served Birkenhead for a railway station.

There is a continued progress in Liverpool street architecture. A new Stock Exchange and Corn Exchange are both in course of erection; in the latter, which is still in an early stage, Mr. Hornblower's patent fireproof construction, which has been a good deal spoken of in connexion with this class of construction, is employed. The Stock Exchange building, near the Exchange, is in an advanced stage, and, in fact, nearly complete, externally. Its connexion with the adjacent buildings affords rather a ludicrous instance of the effect which considerations of property interest sometimes exercise upon architectural appearance. The site is close to the corner of Dale-street and Exchange-street, and the promoters of the building wished naturally to make an angle building of it, and give it two fronts, but on the Exchange-street side there intervened a very narrow slice of old building consisting of small shops only a few feet deep from the frontage: the holders of which property, supposing it a *sine quâ non* for the Stock Exchange building, were so exorbitant in their demands that it was ultimately determined to dispense with the frontage, and the new building was carried up in the rear of the shops, rising considerably above them; and it now presents the absurd spectacle of a large block of new work with an exceedingly thin slice of dingy brick building clinging to its side. In regard to architectural improvement, the result is very unfortunate, and it is a pity that powers were not obtained to compel the sale of the old property on the ground of public interest in the improvement of the town, as the whole of Exchange-street has been rebuilt in recent times except this portion, and it must be exceedingly difficult for any one to know what to make of it now. This is one of the cases in which a little despotism would be of advantage to architecture, as it often has been before.

THE CITY TEMPLE, HOLBORN VIADUCT.

THE City Temple, which has been closed since the last Sunday in July, in order that the decorative details originally proposed by the architects of the building, Messrs. Lockwood & Mawson, might be completed, will be opened again on the 29th of September. The associations of this edifice are closely connected with the growth of Nonconformity in London. If we say it is the meeting-place of the oldest Congregational Church in London, it may perhaps surprise some persons, but it is consonant with fact. The congregation which owns this edifice was first founded in the year 1642, by Dr. Thomas Goodwin, as the tablet erected in the principal vestibule, by Mr. Physick, of Marylebone, shows. The inscription says:—

"The Church first met in Anchor Lane, Thames Street;
Thence removed in 1672, to Paved Alley, Lime Street;
Thence in 1755, to Miles Lane;
Thence in 1766, to Camomile Street;
from
thence in 1819, under the ministry of the
REV. JOHN CLAYTON,
to the Poultry, Cheapside;
And thence in 1873, under the ministry of
JOSEPH PARKER, D.D.,
to the south western end of Holborn Viaduct."

The congregation assembled in Anchor-lane had been gathered by the celebrated Dr. Thomas Goodwin, soon after his return from Holland, at the beginning of the Long Parliament, in 1640. It next worshipped at a meeting-house in Paved-alley, Lime-street, erected about the time of King Charles's Indulgence, in 1672. The Church in Lime-street continued to flourish under Dr. Thomas Goodwin, Dr. Thomas Harrison, Thomas Mallery, John Collins, Francis Howel, John King, Nathaniel Mather, Robert Trail, and a succession of valuable ministers, till Christmas, 1755, when the congregation had to quit, as the East India Company purchased the site. Mr. Richardson, the pastor from 1736, then resigned; the church and congregation divided. One part went to Artillery-street, where Mr. Richardson resumed the pastoral office. That which was considered the largest branch removed to Miles-lane, where they worshipped on Sunday morning in the meeting-house of Mr. Jollie's congregation. The church books were retained by this branch of the division, and are now in the possession of the City Temple. The congregation next erected a new meeting-house in Camomile-street, opened in 1766,—"a good brick building of moderate size, with three galleries." During Mr. Clayton's ministry (1805-1847), the church rapidly increased, and in 1819 the Poultry Chapel was erected. Mr. Clayton was succeeded by Mr. Bergne, who resigned in 1853 to accept the post of Secretary to the British and Foreign Bible Society, which position he still holds. The latter's successor, the late Rev. Dr. James Spence, commenced his ministry at the Poultry Chapel in June, 1854, and resigned in 1866, when he went to the Old Gravel Pits Church, Hackney. Then followed a vacancy of three years.

We come now to deal with the immediate past and the present time. After negotiations extending over three years, they were at last brought to a successful issue by Dr. Parker

accepting the pastorate in September, 1869, upon the distinct understanding that the church should "embrace the earliest appropriate opportunity to sell the property [the Poultry Chapel], and erect a noble structure on the best available site that could be obtained." Dr. Parker preached his first sermon in the Poultry Chapel on September 19th, 1869. The consent of the Charity Commissioners having been obtained, the property was sold by public auction on May 21st, 1872, realising the magnificent sum of 50,200*l.*, the London Joint-Stock Bank being the purchasers. That company immediately utilised the building by converting what was once a church into a bank, leaving all the exterior walls in their entirety, but fitting up a gallery and all accessories required in a banking establishment.

The Charity Commissioners, before consenting to the sale, insisted upon another site being secured, and provision made for conducting the services in the interim in a suitable place. Turned out of the Poultry Chapel, the congregation found temporary accommodation for morning service in the great hall of Cannon-street Hotel, and at Exeter Hall for the evening. The congregation had been successful in securing the convenient and central site the City Temple occupies, from the City Corporation, for a sum of 25,000*l.* The preliminary arrangements being quickly completed, the foundation-stone was laid by the late Dr. Thomas Binney at the base of the tower, on May 19th, 1873. Twelve months after, on May 19th, 1874, the church was opened for public worship.

The City Temple is situated on the south side of Holborn Viaduct, and immediately to the east of St. Andrew's, Holborn. The foundations are 30 ft. below the level of the Viaduct. The edifice consists of two stories, the lower being of the Roman Doric, and the upper of the Corinthian order. It bears favourable comparison with the rest of the buildings in its vicinity. The centre of the principal front is formed by a recessed portico, and at the north-west angle there rises a square tower, surmounted by a belfry, and capped by a dome, the elevation of which is 125 ft. from the Viaduct. On the ground-floor are five doors, which give access to a vestibule, from which, on each side, a staircase leads to the gallery. The breadth of the building is 78 ft.; height, 50 ft.; length, 147 ft. The whole area of the building, with the exception of the staircases in the four angles,—a space 120 ft. in length, and 63 ft. in width,—is utilised for seats, and provides, with the galleries running round three sides of the great hall, sitting accommodation for 2,500 persons. There being eleven windows on each side, and five over the front doors, there is no want of light and ventilation. The basement contains a schoolroom, 64 ft. by 57 ft., and 18 ft. in height; also a ladies' committee room, 41 ft. by 25 ft.

The circular stained-glass window of the south wall was presented to the Temple by Dr. Nathaniel Rogers, of Exeter, and has been put in since the opening of the building. The sixteen memorial windows of the clearstory, erected at the expense of some private friends of Dr. Parker's, were unveiled on March 11, 1877. The windows are semicircular in form, and at considerable height from the floor. Eight are entirely decorative in design; the other eight contain winged seated figures representing the virtues: Patience (dedicated to the memory of Richard Baxter); Charity (dedicated to John Bunyan); Truth (to George Whitefield); Chastity (to Anne Askew); Wisdom (to John Howe); Hope (to Charles Wesley); Faith (to John Wesley); and Temperance (dedicated to Oliver Cromwell); Charity, Truth, Hope, and Faith being female figures. The building being of a quasi-classic type, it was necessary to make the figures approach the same style, and so to depart from the description of glass usually used for non-secular purposes. All the glass is pot-metal, without any enamel. The cartoons were drawn by Mr. Walter Hensman, and the glass was executed by Messrs. W. Phillips & Son.

To mark its interest in the movement, the Corporation of the City, by a vote in the Court of Common Council of fifty-six to thirty-two, presented to the Temple a pulpit of inlaid marble, at a cost of 300 guineas.

The organ, placed in a recess behind the pulpit, and pronounced by a competent authority to be "as beautifully voiced and evenly balanced as any in the City churches," was built by Messrs. Forster & Andrews, of Hull, and was opened on May 1, 1876. The case has circular towers, and is carried out in pitch-pine. The front pipes are decorated. The whole of the bellows, feeders, and hydraulic engines are placed in the basement of the building, from which the wind is conveyed, through metal tubes, upwards of 50 ft., to the organ. There is pneumatic movement to the great manuals and all couplers in connexion therewith.

The entire cost of this building was 56,537*l.*, exclusive of the organ, pulpit, and memorial windows; which sum includes 25,000*l.* for the land, 26,444*l.* for the contract with Messrs. George Myers & Sons, the commission for the architects, and 1,500*l.* for one and a half year's ground-rent to the City during the erection of the building. Towards this sum, the committee had in hand 50,850*l.*, which was derived from the sale of the Poultry Chapel, leaving a deficiency of nearly 6,000*l.*, which has since been covered by subscriptions.

This year has been chosen for completing the building in order to pay a mark of respect to Dr. Parker, who on the 8th of November will complete his twenty-fifth year as a Congregational minister—in Banbury, Manchester, and London. The architectural reason for delaying the completion until now is that it was desirable to allow a building of such magnitude time to settle and to perfectly dry before putting the finishing touch to its internal decoration. The funds required for the purpose, about 3,000*l.*, will be collected by spontaneous contribution.

The works on the point of completion, the contractors being Messrs. W. Phillips & Son, include the construction of a gallery around most of the area of the large school-room; erecting and furnishing private rooms for the use of the pastor in conferences, &c.; the introduction of a heating apparatus for the warming of the corridors, vestibules, and staircases; also improvement of the ventilation generally; finally, the cleansing, painting, and decorating of the entire building, internally and externally, which is now nearly completed.

ANOTHER ROUND OF VISITS.

THE SOCIETY OF ENGINEERS AT CROYDON.

On Wednesday in last week the members of the Society of Engineers, to the number of about thirty, visited Croydon, and there spent a most agreeable and instructive day. Arriving at East Croydon Station shortly before half-past ten o'clock, the visitors at once proceeded to the extensive and widely-known steam clock-factory and bell-foundry of Messrs. Gillett & Bland, situate in White Horse-road. Here they were courteously received by the principals, and conducted through the various departments of the establishment, which, as was remarked by one of the visitors, is probably unique of its kind, seeing that every branch of work required in the manufacture of clocks and bells of all kinds is executed on the premises. Raw material, in the shape of iron, brass, copper, and timber of all kinds, may be said to go in at one door of the establishment, only to come out in the shape of clocks or bells at another. It is from the fact that the works are thus self-contained that a visit to them is so exceptionally interesting and instructive. Proceeding first to the foundry, the visitors witnessed the casting of a couple of bells, one of which, a tenor, weighing 10 cwt., is to be hung at St. Luke's Church, Maidenhead. Among many other bells awaiting tuning, prior to being despatched to their respective destinations, the visitors saw one weighing 8 cwt. (the tenor of a peal of eight), which has been cast for Sir Henry Peek's new mansion at Rousdon, Devon, and smaller ones for Totnes and Wincanton town-halls, Ainmouth, Rossie Priory, Wincanton town-halls, Ainmouth, Rossie Priory, Wincanton town-halls, Ainmouth, Rossie Priory,

Proceeding next to the Croydon Waterworks, in Surrey-street, under the guidance of Mr. Baldwin Latham, the visitors were received by Mr. Corrie, the chairman of the Water Committee, and by Dr. Strong, a member of the Local Board of Health. Mr. Latham first of all explained some simple contrivances devised by him for registering the water-level in the wells from day to day, the registration being effected by means of pencil marks on scaled diagram paper. By similar means Mr. Latham registers the varying levels of the subsoil water, and a comparison of the diagrams thus obtained for several years past affords an instructive commentary on the connexion subsisting between the level of the subsoil water and fever epidemics. Two Cornish pumping-engines are located in a building of some architectural pretensions, in the Gothic style, erected from the designs of Mr. Baldwin Latham some ten or twelve years ago. These engines are now, however, partially disused, the bulk of the water (2,800,000 gallons a day) being now derived from a large new well which has been sunk adjoining the main building. This well is pumped by one of Davey's compound differential pumping-engines, which is housed in a wing or annexe to the main building, erected from the plans of Mr. Walker, the present engineer to the Local Board of Health. This new engine was fully described by Mr. Davey, its inventor (Hathorn, Davey, & Co., Leeds). The following details may be interesting. The engine has a high-pressure cylinder, 30 in. diameter, and low-pressure cylinder, 60 in. diameter; the length of stroke is 7 ft., and it makes ten strokes per minute. The diameter of the barrel pump is 26 in.; diameter of plunger, 17 in.; height of lift, 200 ft.; number of gallons raised per minute, 2,500; boiler pressure, 50 lb. per square inch. The surface condenser has 452 horizontal tubes, each 7 ft. long and ¾ in. diameter; the tubes have a superficies of 640 ft. The engine is connected to a double-acting pump (placed vertically in the well) by means of a wrought-iron quadrant, and lifts water through the mains at a speed of 230 ft. per minute. The peculiar characteristics of the engine consist in the differential valve gear, and in the quality the engine possesses of realising a high degree of expansion, with a moderate piston-speed, with little dead weight to put in motion, and small variation of strain on the engine and attachments. It, together with the other portions of the waterworks, as well as the method of dealing with the sewage, should be seen by engineers and others interested. There is every facility for seeing all that is to be seen, the Croydon Local Board and its officers making it a great merit not to hide their lights beneath bushel measures. While chronicling the visit to the waterworks, we may notice that Mr. Baldwin Latham stated that there is a great flaw or fissure in the chalk beneath Croydon, and hence the copiousness of the water supply. He expressed the opinion, however, that it was a great mistake to have enlarged the water supply on the present site of the works in Surrey-street. He had to some extent been a "thorn in the flesh" of the Local Board by his opposition to the extension, and he hoped that, before very long, the Local Board would see the importance of removing the new pumping-engine further afield, so as to improve the supply.

Mr. Latham, having handsomely entertained the visitors at luncheon at the Greyhound Hotel, made a few remarks in responding to the toast drunk in his honour. In reference to the Beddington Sewage Farm, he observed that it was an indisputable success, both from an agricultural and from an economical point of view. The Croydon Local Board of Health came into existence nearly thirty years ago (in 1849), and they had been the pioneers in much good work that had been done in sanitary matters. It was now eighteen years ago since the Board adopted irrigation as the mode of dealing with their sewage, and during the whole of the period that had since elapsed the town had been free from actions and lawsuits, whereas previously the Board was beset and bewildered by innumerable lawsuits and injunctions, restraining it from turning the sewage into the River Wandle. By means of passing the sewage over the land at Beddington, the effluent was rendered quite inoffensive before it went into the river. Not even the most fastidious and captious critics had been able to show that the farm was a nuisance in any way. There was no miasma, and it was impossible that the water-supply could be in any way affected, as the level of the highest land on the farm was absolutely lower than the lowest water in the wells at Croydon. The farm having been so successful, and a model for imitation in other districts, it was only right to say that it was laid out by Mr. Fenton, formerly surveyor to the Board, acting on a suggestion contained in a report on the subject by Mr. Cox and Professor Donaldson.

The visitors then proceeded to Brimstone Barn, where they saw two of Mr. Latham's rotary sewage-extractors at work. The solid matters obtained from the sewage are mixed with road-scrapings, and sold to the farmers for manure.

After a long and bracing walk over the fields, the visitors found themselves on the farm, where they were received by Mr. Parrett, the manager. The farm is cultivated alternately with rye-grass, mangold wurtzel, &c., and has a gentle fall towards the River Wandle, so that the ground is admirably suited for the purpose to which it is now so successfully devoted. The visitors having noticed the state of the sewage as it flows on to the farm, had the opportunity (after a good deal more pedestrianism over rather rough ground) of seeing its condition as it flowed off after once passing over the land: its appearance was certainly very limpid, but before it was allowed to pass into the Wandle it was again run over the land, the resultant effluent being, to the eye at least, all that could be wished for. The "carriers" are simply channels or miniature canals made in the ground, and those not in use were innocent of sedimentary matter to an extent which testified to the efficiency with which the extractors at Brimstone Barn do their work. Neither was there any offensive smell pervading the farm, notwithstanding that the day was warm.

Altogether the visitors had a most pleasant and instructive outing.

THE PALACE HOTEL, SAN FRANCISCO.

THE Palace Hotel occupies the entire block upon the south-west corner of New Montgomery-street and Market-street, rearing its huge fronts 120 ft., extending 275 ft. westerly up Market-street and Jessie-street, and stretching its vast flanks 350 ft. southerly along New Montgomery-street and Annie-street. This architectural monster lifts its colossal bulk above the business and social centres of the city. Lines of horse-cars connecting directly with all principal streets, business centres, leading places of amusement or resort, and all notable localities, constantly traversing the vast city even to its remotest suburbs, run directly by or within a minute's walk. At the neighbouring foot of the city's grand Central Avenue, which passes directly under its northern front, are the stations and docks of the Great Overland Railway Terminus, with the piers and slips in every habitual or pleasurable direction. A few blocks south lie the immense docks and basins of the P.M.S.S. Co., with their grand fleet of trans-Pacific mail steamships, for the Sandwich Islands, China, Japan, Australia, India, and the nations of the Orient; 96,256 square feet, or nearly 2¼ acres underlie the stupendous structure itself, while the sub-side walk extensions increase the basement area to upwards of 3 acres.

Its general form is an immense triplicate hollow quadrangle, including one grand central glass-roofed garden-court, flanked by a lesser and parallel court on either side. Seven lofty stories surmount the lofty basement, and through a considerable portion it has eight. The lower story has a height of over 27 ft.; the uppermost, 16 ft. The deep foundation-wall is 12 ft. thick. Stone, iron, brick, and marble are the chief materials. Of bricks alone, its construction consumed 31,000,000. All the outer and inner partition-walls, from base to top, are of solid stone and brick, built around, within, and upon a huge skeleton of broad wrought-iron bands, thickly bolted together, and of such immense size as to have required 3,000 tons of iron for this purpose alone. Thus the building is really duplex,—a huge self-supporting frame of iron, of enormous strength, within massive walls of firm-set brick and solid stone. The outer and visible walls are proof against fire; the inner and invisible frame secures against earthquakes. The supporting columns, within and without, are iron; the cornice, of iron and zinc.

Four artesian wells, having a tested capacity of 28,000 gallons an hour, supply the great roof-tanks, holding 130,000 gallons. Three large steam fire-pumps force water through forty-five 4-in. wrought-iron upright fire-mains, reaching above the roof, and distribute it through 327 2½-in. hose-bibs and 15,000 ft. of five-ply carbolised fire-hose, thus doubly and trebly commanding every inch of the structure, from roof to basement, within and without.

Five patent safety-catch hydraulic elevators, running noiselessly within fire-brick walls, ascend even to the roof promenades. Electric fire-alarms, self-acting, are arranged instantly to report at the office the exact locality of the fire, or even of extraordinary heat in any parlour, bedroom, closet, hall, passage, stairway, or store-room. Special hotel watchmen regularly patrol all parts of the building every thirty minutes day and night. A self-acting and self-registering tell-tale indicator instantly reports at the office any neglect or omission of their duty. Besides all these precautions, a fireproof iron staircase, inclosed in solid brick and stone, and opening through iron doors, upon every floor, ascends from basement to roof. Every floor has its exclusive annunciator, and its own tubular conductor, carrying all letters for the post-office directly to the main letter-box in the general office. A pneumatic despatch-tube instantaneously conveys letters, messages, or parcels to or from any point on the different floors. Two thousand and forty-two ventilating tubes open outwards upon the roof, including every room, bath-room, and closet, and so insure constant purity and thorough sweetness of air in every part.

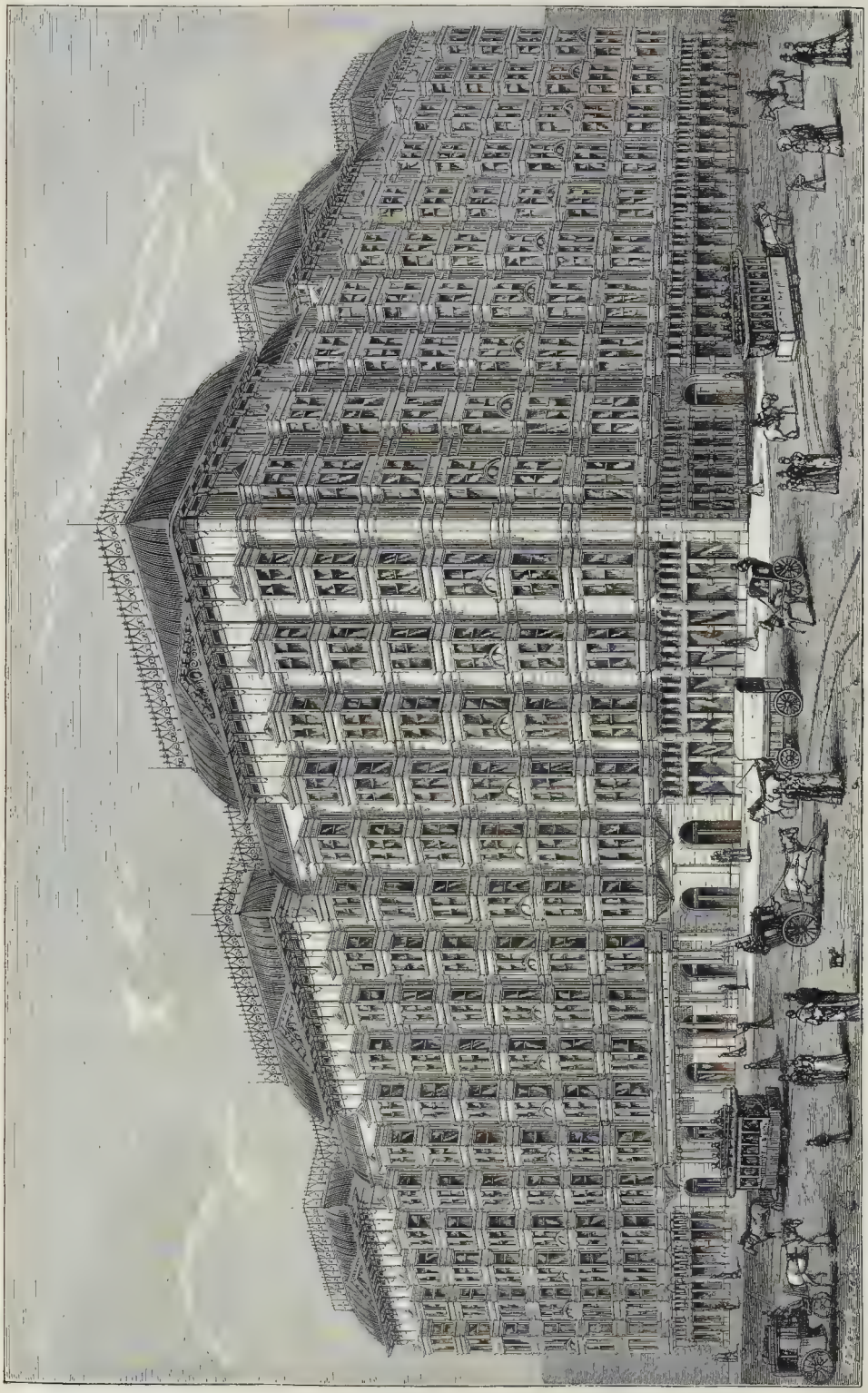
The grand central court, 144 ft. by 84 ft., has a carriage and promenade entrance through the east front on New Montgomery-street of 44 ft. width, expanding into a circular driveway 52 ft. in diameter, surrounded by a tropical garden of rare exotics, with statuary and artistic fountains. Within this court, opposite the main entrance, is the music pavilion, in which the instrumental band, exclusively attached to the palace, render choice selections.

Off the central court open the main entrance to the hotel office, 65 ft. by 55 ft.; entrances to the breakfast-room, 110 ft. by 55 ft.; the grand dining-room, 150 ft. by 55 ft.; the music and ball room, 65 ft. by 55 ft.; the ladies' lower parlour, 40 ft. by 40 ft.; reading-room, same size; billiard-rooms, 65 ft. by 40 ft.; barber's shop and bath-rooms, 40 ft. by 40 ft.; committee and other compartments for convenience of patrons. On the second floor are dining-rooms and ladies' drawing-room. The total number of rooms exclusively for guests above the garden floor is 755,—most of them are 20 ft. square, none less than 16 ft. by 16 ft.,—they are beautifully furnished. The carpets are designed exclusively for this hotel; the furniture has been made in San Francisco of the native woods, at a cost of over half a million dollars. All the rooms have approaches from the arcades surrounding the inner courts.

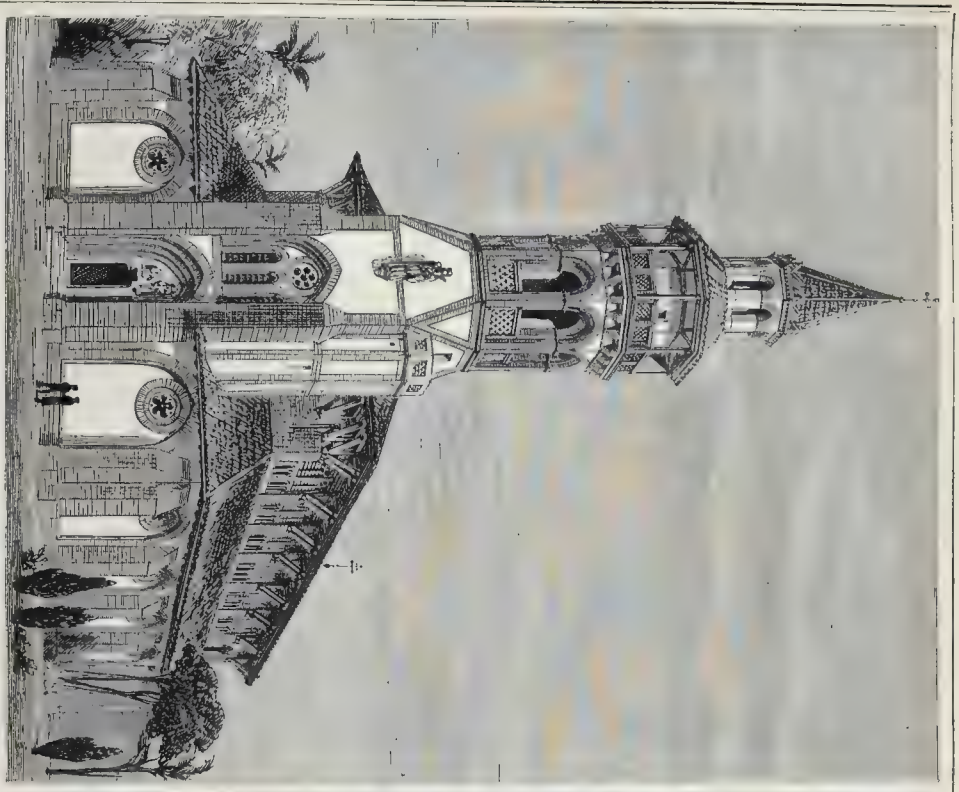
From broad walks and observatories surrounding the roof, and readily accessible by the elevators, the guests enjoy a panoramic view unsurpassed.

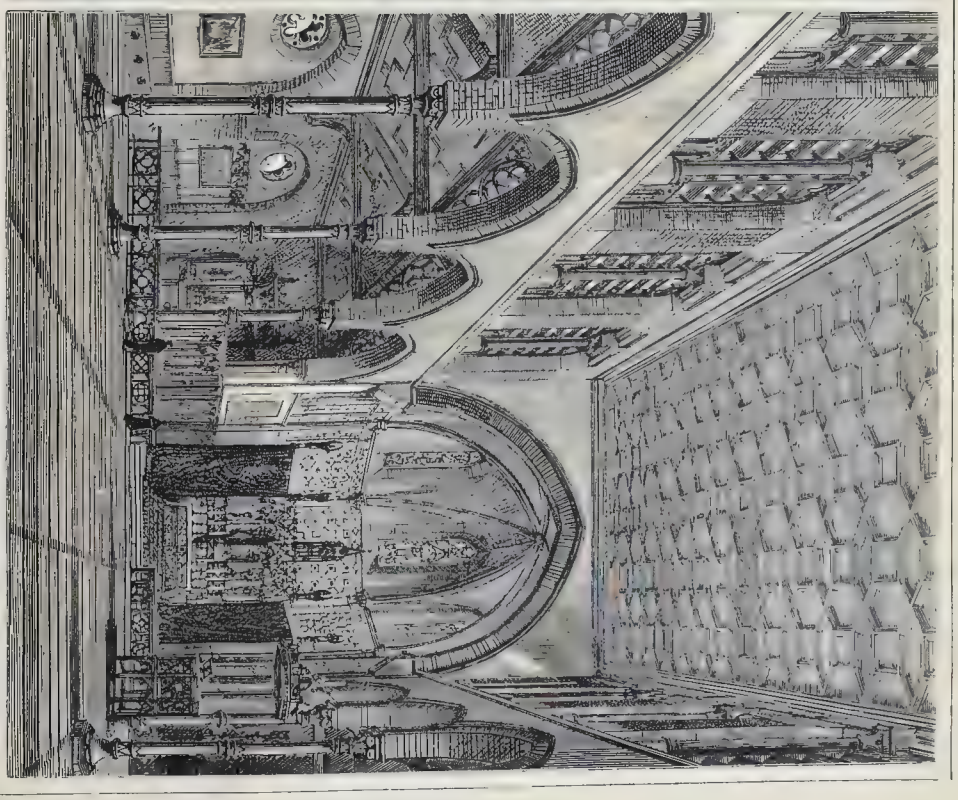
This structure claims to surpass, not only in size but in grandeur, all the hotels in Europe or America; Mr. John P. Gaynor was its architect, and it is called, not without some reason, the PALACE HOTEL.

Geological Changes in Greece. — At a recent meeting of the Geographical Society of Halle, Professor Hertzberg read a paper on the old and new conditions of the Balkan Peninsula. He pointed out how the upheaval of the shores of the Ægean Sea, and the alluvial deposits of the rivers, had reclaimed considerable tracts and altered the configuration of the country. Miletus, once an important port, is now a miserable inland village; and the Pass of Thermopylæ, which formerly was defended by a handful of men against a host, owing to the narrowness of the passage between the steep face of the mountain and the maritime swamps, has now widened to the extent of a mile seaward. Regarding the ethnographical changes, the Professor remarked that the Islamite and Greek religions had made many converts of people, and even races, whose origin was far different from what their creed would have denoted. The term "Greek" is often applied at this day to people who are nothing but Grecised Bulgarians.



THE PALACE HOTEL, SAN FRANCISCO.—Mr. John P. Gaynor, Architect.





THE PROPOSED (R. C.) CHURCH FOR D'URBAN, IN THE DISTRICT OF NATAL, SOUTH AFRICA.—MESSRS. GOLDIE & CHILD, ARCHITECTS

CHURCH FOR D'URBAN, NATAL, SOUTH AFRICA.

THE church which we illustrate is to be erected for the Catholic population of D'Urban in the district of Natal, South Africa. The design has been made by Mr. Goldie, under the instructions of Dr. Jolivet, the Catholic bishop of the district, and is adapted to the climate and locality. The material is brick, partly covered with plaster or rough cast. The clearstory windows are filled with thick glass louvres. The circular openings in aisles will not be glazed, but will have metal fillings. The eaves project, with the object of shade. Cast-iron columns are to support the nave arcade, as stone can only be sparingly employed. The nave has below the roof a wooden ceiling, panelled in each bay. The floor will be in a kind of cement with air-channels for ventilation. The total external length of the church will be 113 ft. by a total width of 51 ft. The leading idea in the design has been to combine simplicity and economy with a certain Oriental character, in which the Pointed arch remains a distinctive feature. The architects are Messrs. Goldie & Child, of Kensington-square.

THE BATTLE OF PROPORTION.

"Truth, like a single point, escapes the sight,
And claims attention to perceive it right."
POMFRET.

LET the result of an inquiry into proportion be what it may, of this I am certain,—that the ancients designed and arranged their beautiful buildings upon a strict geometrical basis, and as they were eminently successful, it is not only to our interest, but our duty, to discover their principles and to enunciate them. Whether it be desirable or practicable to apply the ancient geometrical system to modern buildings and present uses is another question, and a serious one. Our religious observances are not those of past times; our materials are different; the introduction of iron roofs and ironwork generally, of course, call for a different treatment to that of stone. Glass, terra-cotta, and a host of modern inventions have to be considered. To retain one style of architecture is not in accordance with the perpetual flux as ordained.

"Nature knows
No steadfast station, but ebbs or flows:
Ever in motion; she destroys her old,
And casts new figures in another mould."—OVID.

Thus, "the world itself is ever young, but its transitory scenes pass swiftly by. Men come, men go, eager as in a race; each stretches forth his hand to seize the torch of life."—*Lucretius.*

Few will deny the importance of the study of proportion; students may rely upon there being no royal road to geometry. Its study is by no means a favourite with those who cannot draw or delineate with thick lines, or who are short-sighted. The subject has met with more favour from the amateur than the architect. Unfortunately, however, the amateur not being a practical man—plans, sections, and details being enigmas to him,—the elucidation of proportion has made no progress from his efforts. The architect fashions matter actually into parts, whilst the amateur only proceeds mentally. Art consists in practice and theory. Theory is common to and may be known by all, but the result of practice occurs to the artist in his own art only.

As an illustration, Mr. Cave Thomas, lecturing on "Architectural Proportion," says, "It does not satisfy the exigency of scientific inquiry (though if it were proved that certain famous structures were conformed in some way to the circle, the square, and the equilateral triangle) to be told that they were so conformed because these are the most perfect figures. We require to know why those figures have claims to be considered more perfect than the ellipse, the parallelogram, or any less regular triangle." Alison has explained why an equilateral triangle is more beautiful than a scalene or an isosceles, a square than a rhombus, a hexagon than a square, an ellipse than a parabola, a circle than an ellipse. He says, "because the number of their uniform parts is greater, and their expression of design more complete. In general, in this subject, regular figures are more beautiful than irregular, and regular figures of a greater number of parts more beautiful than the same figures of a smaller number of parts: they cease only to be beautiful when the number of their parts is so great as to produce confusion, and of consequence to obscure the expression of design." And Mr. Thomas further observes "that a science of proportion should be established on a more satisfactory basis than precedent." On the latter point Sir Walter James's opinion (a well-known art amateur) is more correct. In a letter, in 1854, he says, alluding to my works on the connexion of architecture and geometry, "I apprehend that the most perfect architectural beauty was invariably found in accordance with correct geometrical proportion. This is a matter of fact which, of course, can only be decided by reference to strict data and historical antiquity.

Regular and symmetrical figures are of greater value to the architect than oval and elliptical forms, however pretty the latter may appear to the eye of the painter. The reason why the equilateral triangle and square have a preference is on account of their constructive properties, of which the amateur knows nothing.

Vitruvius asserts that if the point of a pair of compasses be placed in a man's navel, and his hands and feet extended, a circle or a square described will touch his fingers and toes, "by attention to which the ancient painters and sculptors obtained so much reputation." The Classic artist must have been no adept in free-hand drawing if he were compelled to resort to such a mechanical process of drawing. The application of geometry to an existing object is one process, but to create by geometry a beautiful building is another. Consequently, the architect ranks before the painter and sculptor as an inventive genius.

As a rule, writers have insisted that no positive proportions regulated the designs of our ancient architects, as works of nearly the same date, manifest such an extraordinary variation in their proportions. One London professor declared proportion to be a mighty and important question, and another proclaimed it to be positively cruel to torture the plans of old churches by geometry; and a popular writer says that proportion was dull, to say the least of it. However, on this subject, as upon many others, doctors differ; in 1734, Morris published lectures on architecture, founded upon harmonic and arithmetical proportions, designed "as an agreeable entertainment for gentlemen." This sounds anything rather than dull.

The principles of proportion have still to be enforced; there are many who have spent years in studying mathematics, and have never been able to apply the science to a useful purpose And it must be recollected that the subject in former times occasioned much discord. The disputes on the great question of proportioning the cathedral at Milan, 1387-1392, by the foreign system of squares, or by the native theory of triangles, have been noticed in Gwilt's Encyclopædia, 1867. In this instance thirteen artists declared that the church should be raised on the triangular proportion, and one artist was dismissed for holding a contrary opinion.

The system depending on the equilateral triangle continued in use till the beginning of the fifteenth century in France, when it underwent a great and important change by the introduction of the isosceles triangle, and its compound the pentagon, called also *pentalpha*. This unfortunately led to actual murder. A pupil of Berneval, the designer of the church of St. Ouen at Rouen, proved that these figures could furnish novelties in design; and the master was so incensed at the clergy preferring the rose-window of the northern transept executed by his pupil, where this innovation was first introduced, to that of the south, of his own execution, upon the ancient triangular system, that in a fit of jealousy he killed his rival, and was himself condemned to be hanged! Let this story be true or not, it proclaims the existence of a geometric system.

Even in 1099, a certain Bishop of Utrecht was killed by the father of a young Freemason, from whom the prelate had extracted the mystery of laying the foundations of a church. These Masonic jealousies were not limited to the Continent; the well-known story of the "'Prentice's Pillar," in Roslin Chapel, among others may be alluded to. The master mason, being unable to execute this pillar, went to Rome to see one of a similar description there. During his absence, his apprentice proceeded with the execution of it, and the master on his return finding the column as we now see it, killed his apprentice on the spot with his mallet. "As the pen now supersedes the sword," the different opinions on architectural proportion can be combated without such serious results.

In 1847 an angry conflict with the pen took place in the *Builder* between Mr. John Browne, of York, and Mr. Chantrell, which will be hereafter noticed. In 1853 another encounter occurs in the same journal, between myself and Mr. White; and, in 1855, a skirmish at the Institute of Architects may be noted on the part of Mr. Hay and Mr. Papworth.

In 1521 Cæsar Cæsarianus added to his edition of "Vitruvius" a plan, section, and elevation of Milan Cathedral, set out by the square and equilateral triangle. This Mr. Hawkins accidentally discovered in 1813; he first finds a *curious geometric print*, gives chase, and ultimately succeeds in securing the above work. He considered the volume so scarce, that, besides his own, there were but two copies existing in this country. There are, however, many copies extant. Mr. Hawkins's discovery was a genuine one, so far as it goes, but it gives a very limited portion of the great Mediæval geometric system. The plan of Milan is arranged on the square, and the section and elevation on the triangle. "If," remarks Carter,* "by this geometric scheme Mr. Hawkins can in reality discover any clue to ascertain the positive principle, whereby the relative heights, widths, and bearings of the main parts of the Milan edifice are determined, he certainly has the benefit and satisfaction all to himself, as I cannot, and, I may predict, not one of his readers, discover anything of the matter. A random laying down a number of inclined lines on an elevation, a mere scramble in the dark for professional points and bearings; a few, of course, are gained; but the greater quantity of them are non-effective, and of no use whatever." Hawkins simply gives Cæsar Cæsarianus's drawings of Milan Cathedral, proportioned by equilateral triangles, and consequently is not answerable for their effectiveness. Carter's opinion on this subject is valueless; he informs us "that no positive proportions regulated the designs of our ancient architects, as works of nearly the same date,—Westminster and Salisbury, -manifest such an extraordinary variation in their proportions." This objection is explained away by the fact, that the sections and elevations of Westminster Abbey are designed by the equilateral triangle, and those of Salisbury Cathedral by the square.

Vitruvius had no knowledge of Gothic architecture: hence the folly of Professor Cockerell† attempting to prove the contrary, because Cæsar Cæsarianus inscribed the geometrical schemes for proportioning Milan Cathedral in his edition of Vitruvius in 1521. The Professor's attempt to proportion by geometry the chapels of Wykeham at Oxford, was a complete failure; and, as the *Ecclesiologist* observes,‡ "There is an indefiniteness in the statement of the rules, as well as the arguments on which they seem to rest, which fatigues the mind, or drives it from very weariness away from the subject."

In 1525, Albert Dürer, in his "Geometry," sets forth rules for proportioning the details of Mediæval architecture, and is the first to re-introduce the *vesica piscis*. In 1817 and 1819, Kerrich§ very successfully applied this figure to the plans and minor portions of Mediæval buildings; he gives no elevations or sections. Mr. John Browne, in 1828; Mr. Billings, 1840; Professor Cockerell, 1845; Mr. Chantrell, 1847, and Mr. White, 1853, availed themselves of Kerrich's application of the *vesica piscis*. Now, as I pointed out in 1847,‖ the *vesica piscis* is an oval produced by the intersection of circles, but the equilateral triangle and its multiples form the kernel. The circle, or *vesica piscis*, as a nutshell, containing the multiplication of regular figures, is very well as far as it goes; it is the *kernel*, however, to which we must look for potent effects; and what can be more beautiful than an equilateral triangle, either as a simple figure, or as a symbol of the Trinity?

Mr. Billings, Mr. Cockerell, and Mr. Chantrell acknowledge Kerrich, directly or indirectly. Not so Mr. White; he applies the *vesica piscis* freely, and the equilateral triangle, and says that he had not seen any of my works until his arguments and diagrams had been drawn out, and was not even aware of the existence of Kerrich's paper. In 1849, a paper was read at an architectural society "On the Principles of Architectural Proportions," by the Rev. ———, who observed the singular and undesigned coincidence by which several indi-

* *Gentleman's Magazine*, vol. 85.
† Archæological Works of William of Wykeham, 1846.
‡ Vol. vi., p. 236.
§ "Archæologia."
‖ "Ancient Gothic Churches."

viduals had arrived at the same conclusions on this subject; and a short time after, a letter from the secretary stated that the lecturer used my diagrams and theory! How widely different from this clandestine kind of conduct has been that adopted by the Rev. P. Freeman in a paper read at the Cambridge Architectural Society, 1848; and Mr. Fowler Jones, at the York Philosophical Society, 1849. If each investigator would resume the inquiry from where the last one left it, and properly acknowledge that which has been previously worked out, something more tangible would be realised, and the better appreciated.

In a letter to Mr. Cresy in 1847, I observed that "the importance of the application of regular figures in architectural construction, not in merely arranging parts, but in positively deciding the construction of actual buildings, has been enforced by me for many years. It is a matter of pleasure to me, after having devoted years in endeavouring to obtain some one to coincide in opinion, to find now many earnestly engaged in its study. There have been several attempts made by Mr. Billings and others in showing a centre here and there; but no one has ever laid down the subject systematically, and devoted works solely to the subject, except myself. Mr. D. R. Hay, whom you mention, is a house-decorator in Edinburgh: consequently, not being an architect, he has not produced anything practical. He took from me, without acknowledgment, my three primary figures bounded by the circle,—viz., the equilateral triangle, square, and pentagon;* Mr. Hay having formerly maintained that the circle, triangle, and square were the primary figures.† And in one work he borrowed from the "Geometrical Proportion of Grecian Architecture,"—of course, without acknowledgment.

In 1848, I addressed a letter to the "Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels," in which their attention was directed to the necessity of making themselves "acquainted with the construction of Gothic edifices as based upon the geometry of regular figures, in order that they may be enabled to test and to judge the nature of all designs submitted for proposed new churches, and more particularly with respect to any enlargement or reparation of our ancient churches; that the said alterations or additions may be effected thereto in keeping with, or corresponding to, the proportions existin the churches proposed to be altered. The numerous sums of money which have been innocently voted for the spoliation of our ancient churches is surprising, and the ignorant prejudice of some architects to the introduction of any settled rules, whereby architecture may be raised to the position of a science, is equally to be regretted. If you require from an architect a design for a church, he will probably ask what period of Gothic architecture you desire for it; and presuming you chose the 'Decorated,' he refers to his examples and specimens, and takes a door from one church, a window from another, and a column from another, and then amalgamates his materials without the slightest idea of proportion; in fact, the architect who has been the most successful is the one who has *copied the most closely*. Many of our new churches exhibit profound ignorance on the subject of design. I frequently see existing in one church three different periods of art."

In 1849, in answer to an inquiry from Dr. Whewell, I remarked to him that, "in reply to your letter as to 'whether my attention has been drawn to some papers of Mr. Kerrich in the "Archæologia," containing somewhat similar views published thirty or forty years ago,' I beg to refer you to the first part of my 'Ancient Gothic Churches,' p. 10. As you may, perhaps, not be able to lay your hand upon that part without loss of time, I will quote the observations:—'When Mr. Kerrich's‡ paper was published on the use of the mysterious figure, called *vesica piscis*, he discovered *the nutshell*, but *the kernel* he has left for us to unfold. The *vesica piscis* is an oval produced by the intersection of circles; for instance, in plate 3 (the plan of King's College Chapel, Cambridge) are seven of them; but the equilateral triangle, and its multiples, as exemplified in plate 3, figs. 1 to 5, form the kernel. The circle, or *vesica piscis*, as a *nutshell*, containing the multiplication of regular figures, is very useful as far as it goes; it is the *kernel*, however, to which we must look for potent effects, and what can be more beautiful than an equilateral triangle, either as a simple figure of form, or as a symbol of the Trinity? Mr. Kerrich has shown two or three analogies, not as a system, but suggestive; and Messrs. Cresy, Billings, and others have illustrated a point; no one has submitted a perfect system, nor any system, except myself. The connexion, also, between architecture and music, I believe, has not been attempted by any one else. In 1843 I published a work entitled "Geometrical Proportion of Grecian Architecture"; and in 1845, "The Natural System of Architecture," &c. In these works the architecture of the Greeks was proportioned in a perfect manner, and a system suggested and propounded, in which I set forth three primary figures of form, viz., the equilateral triangle, the square, and the pentagon, and showed their sundry workings in producing Greek and Gothic architecture. I believe on the subject of geometrically proportioned Greek architecture I am not only the first but the only one. With respect to Gothic architecture, I have delineated the method of producing in a perfect manner, by geometry, a plan or a section, and even details. The discoveries which I have made have been deduced from an analysis of the actual admeasurements of Greek and Gothic buildings, the former given by Stuart and Revett and the latter partly from Britton's works and from my own measurement. It is pleasing to me to hear of any writer who may have touched upon the subject, as it seconds my endeavours. Notwithstanding the several hints upon proportion in books, it never has taken a practical turn or shape until my re-introductions.'"

In 1849, Archdeacon Hale, in a letter, truly observed that "I think it quite within possibility that the gift of architectural skill may be possessed, like that of music or painting, or number, without the artist being himself aware how all that he does is in its parts proportional. The converse is certainly true that they who are defective in architectural skill are the last persons to suspect that their failures are from their own ignorance, either of proportion or of the means of applying it. One of the best exercises which a young architect could perform would be that of tasking himself to discover of any work, commonly said to be beautiful, how it differs from others like it, but which do not produce the same effect. They would be surprised at discovering how rapid is the transition from beauty to deformity; and they would learn that in works of stone, as in the human form, the slightest change in the proportion produces at once loss of beauty."

In the works of nature beauty is seldom found without utility, but in the numerous essays on proportion and beauty in architecture, propagated by Mr. Hay, Mr. Jopling, Mr. Penrose, Mr. Watkiss Lloyd, Mr. Cave Thomas, and others, there is a total absence of practical results.

In 1823, Mr. Jopling published a "Septenary System of Generating Curves by continued motion." He says that "eighteen years' experience in civil architecture enables him with certainty to state, that those persons who are practically engaged in Gothic works will find the principles of the septenary scale of the greatest importance in generating curves for arches of large dimensions. He is convinced that any person who may have made himself acquainted with those principles will never again attempt to form a Gothic arch by ordinates, by intersections of right lines, or by putting together sweeps of different circles." Mr. Jopling gave no illustrated proofs, and if he had, they would have ceased to be Gothic. At a later date, and in 1844, Mr. Jopling issued a further exposition of his system by double cranks with illustrations, but they were wholly useless as far as Gothic architecture is concerned. In 1848 I called his attention to this point, and stated that, to render his labours useful, they must be made to assume a practical shape, and the curves applied to tangible purposes; to this Mr. Jopling demurred, and wrote in reply, "I beg to thank you for your suggestions; which, if I was able to accomplish, but which I am not, I feel convinced, from long consideration, that they would not answer the purpose I contemplate, as you suppose, but tend to retard it. What would you think of the individuals procuring materials leaving the quarry and forest to instruct builders how to apply them? Besides, would it not be an insult to architects and artists if they had numerous well-arranged correct examples of mathematical lines placed before them, which they could study, compare, and reproduce to various scales, and combine in designs, to suppose that they could make no application of them, without the way being pointed out? Can they derive ideas of forms from leaves, &c., and also appropriate them, and even think they can discover geometrical rules for perfecting them? How, then, can it be supposed to be necessary for professors as well as students to be instructed to apply true and beautiful mathematical forms, when both the laws and apparatus for their production, as well as the lines, are proposed to be placed before them?" However singular it may appear, it is undoubtedly necessary that professors should be instructed how to use Mr. Jopling's cranks; the more so, as he could not apply them to any useful purpose. The same may be said of mathematics. Dr. Lamotte, in 1730, observes that though you were to read a proposition of Euclid a thousand times over to a scholar, he will be as much at a loss as he was before; but show him a figure, and delineate a plan, then all difficulties vanish, and everything is clear and plain.

The extraordinary disbelief of geometrical proportion by architects engaged in designing some of our largest churches is exhibited in the following extract from a discussion at the Institute of Architects, March 19th, 1860:—"Mr. Street believed there was no building extant which could not be reduced to the principle of either the square or the triangle." Now, the real truth is this, that no building whatever can be successfully tested by geometry that has not been based upon the square or the triangle. And one of the strongest proofs which can be urged is this, that in nearly all *accurately measured* Mediæval edifices, the geometric test will apply, and only fails when the drawings are not correctly delineated. For example, apply the triangle to a bay of the nave of Westminster Abbey, and six triangles exactly mark its height; then test the same bay, inaccurately shown in Gwilt's "Encyclopædia of Architecture," p. 986, 1867, and it does not apply at all.

Without extreme accuracy of measurement, no reliance can be placed upon geometrical proportions. In Cresy's "Treatise on Bridges, Vaults, and Arches," plate 65, five equilateral triangles decide the height of a compartment of Wells Cathedral; by comparing this with Britton's plate 7 of the same compartment, it does not coincide, although both are from alleged actual admeasurement.

The subject of geometrical proportion is now being introduced into our architectural encyclopædias and dictionaries, but unfortunately not in a truthful and concise manner. In Gwilt's "Encyclopædia of Architecture," 1867, are many pages on Proportion, by Edward Cresy, transferred from his "Encyclopædia of Civil Engineering." Instead of proportioning the tetrastyle, hexastyle, and octastyle temples of Greece from actual measurement in the accurate manner set forth in my "Geometrical Proportions of Grecian Architecture," 1843, Mr. Cresy takes a square and a half as the form to comprise a hexastyle portico, and a double square for an octastyle portico. No further remark is necessary here than the fact that there are no Grecian temples on record which approach in measurement such an assumption. The able editor of Gwilt's Encyclopædia (edition 1867) admits that "the idea is now generally sanctioned that the Mediæval architects had some settled system of proportioning their designs either by simple geometric forms, or by combinations of them." This is a move in the right direction, as for many years past it has been maintained that the Gothic presents the most ridiculous proportions, with details formed without rules or order.

Mr. Cole, in 1847, alluded to Boston Tower, Lincolnshire, being proportioned by the square and its diagonal; and Sir G. G. Scott, in 1859, stated that in an old work of the Freemasons it is said that good proportions may be obtained from the square, but better from the triangle, and that another proportion, common in old works, is derived from the diagonal of the square. The fact is, that the diagonal of the square is not another system of proportion, but is deduced from the square, upon which it is dependent. In any given square, if the diagonal be divided into seventeen equal parts, twelve will form each side of the square. Then if the diagonal be placed perpendicularly, the base or width of the square has twelve equal parts, and

* See the *Builder*, vol. v., p. 170, 1847.
† In 1837, Mr. John Bennett, engineer, gives the circle, square, and triangle as primitive geometrical figures, in his work entitled "Original Geometrical Illustrations."
‡ "Archæologia," vol. xix., 1821.

its height seventeen parts; but then the five parts above the regular square are component parts of the original square, and commensurate with it.

In conclusion, because rules and systems can never reach every possible case, is no argument for despising them. The fundamental error of imitators in all arts is, as observed by Payne Knight, that they servilely copy the effects, which they see produced, instead of studying and adopting the principles which guided the original artists in producing them.

W. PETTIT GRIFFITH, F.S.A.

ANOMALIES IN ARCHITECTS' PRACTICE.

SIR,—I looked last Saturday for some remarks in reply to Mr. Roger Smith's letter on this subject, but having looked in vain, I write these lines in order that a statement of matters so worthy of consideration should not be suffered entirely to drop.

1. Mr. Smith objects to the provision in ordinary contracts that orders for extra work shall be in writing, because of the practical difficulties the architect finds in conforming to this rule, and suggests its replacement by a provision that the builder shall have no claim, on the final settlement of accounts, for any extra work, unless he have made a claim in writing for such work in the week when he says the order for it was given.

2. He remarks with displeasure upon the frequent,—in his experience, indeed, universal,—neglect to enforce the "penalty" for overtime, and to assist in ensuring its enforcement suggests "some plan for extending the time in proportion to the amount of added or varied works."

3. He objects, finally, to the uncertain position the bill of quantities holds in a contract, and appears to hint at its confessed embodiment in the contract.

As to the first remark, I must needfully admit the watchfulness and trouble called for to ensure written orders being given for all extra work. Being human, like my "brethren," I should also needfully rejoice in any suggestion for the reduction or obliteration of that watchfulness and trouble. A written record of extra work, acknowledged by both builder and architect, being at the same time that which has to be secured, I do not see how watchfulness on the part of the architect is to be avoided; and as to the trouble, whatever device may be suggested to avoid that, I cannot think that a device which, like Mr. Smith's, could throw it on the builder, would prove desirable, or in the long run workable.

Reserving the second subject in Mr. Smith's letter for my final remarks, I turn to the third. Here, again, if we are careful to have it understood by all who tender, that the quantities are taken out by the quantity surveyor on his sole responsibility, the contractor will be bound to erect such a building as appears in the drawings and specification, irrespective of the quantities; and the quantities will become evidence only of how the surveyor understood the drawings and specification, and in this position, except in rare cases, it appears to me it is most desirable to leave the matter.

The second subject in Mr. Smith's letter opens a most interesting field of inquiry. Mr. Smith's suggestion would provide for extra time being given in consideration only of added or varied works; but surely as a rule much more than this is meant and understood. The delay caused by strikes is now openly provided for, and sometimes that which may result from bad weather. The contract for completion within a definite time appears to me, indeed, really to mean that the contractor shall use reasonable and due diligence to so complete, and I feel justified in thus interpreting the contract from the habitual non-enforcement of the "penalty" for overtime.

If we accept this account of what is intended, I can see no way of carrying out the intention with any efficiency, except by having a definite time for completion, with penalties for non-completion, and the waiving of those penalties whenever reasonable ground for such waiving exists. Practically, I admit that in the case of building contracts the penalty is most rarely enforced, but it is used as a spur,—dull as that spur may have become,—all through the contract. If the time is exceeded, the penalty incurred also is a by no means inefficient power in the settlement of other disputes, if such there are, and, unlike Mr. Smith, I have known a part of the penalty enforced in more cases than one.

While thus arguing, I quite feel, with Mr. Smith, the great objection to saying one thing and intending by it another,—to saying definitely a work shall be completed by such a time under such penalties for non-completion, and meaning only that due diligence shall be used. The practice, however, of saying one thing and meaning another is not (among matters which come immediately under our cognisance) confined to building contracts. The repairing covenants in a long lease are very similar. While providing definite penalties, even to the forfeiture of the lease, for the slightest non-performance of its covenants, the lease (in most cases) so far from meaning what it says in its bare harshness, simply intends that due diligence shall be observed in keeping the fabric in repair. The division between law and equity, with which we are all familiar, is indeed an outcome of the infirmity in our nature which compels us to make engagements with each other of the most definite kind when read in the letter, while in the interpretation of the very engagements we have found in common use, we have to find relief from the letter by reading them in the spirit. "Equity," says Blackstone, "in its true and genuine meaning, is the soul and spirit of all law." To sum up generally these remarks on Mr. Smith's interesting letter, I would say, Let us amend our practice as may be needful rather than change the instruments to which use has accustomed us.

HORACE FIELD.

SIR,—Referring to Mr. Smith's letter in your issue of Sept. 7th, and seeing that no professional brethren have up to the present thrown any light upon it, we desire to make a few remarks upon the subject, as the gist of the matters in question very seriously affects the interests of the builders generally.

We cannot see, with reference to the first inconsistency called attention to, that there should be any reluctance on the part of an architect to give orders for extra works as they occur, without the builders having to press for them, as he should best know what actually constitutes an extra. It is well known that builders have difficulty in obtaining written orders, and in many cases this arises, we have observed, from the fear some architects exhibit of properly asserting their position in determining them; but we would ask of your correspondent, supposing the builder first seeks written orders for extra works (verbally ordered), and fails to get them, and he then, as suggested, supplies weekly day-sheets in duplicate, which are never acknowledged or returned; and then, when the contract is completed, they are disputed, where is the builder's remedy, but through the very unpleasant, tedious, and uncertain decision of law or arbitration?

As to the question of time of completion, it is assumed by your correspondent that builders in general are never fined for non-completion to time. Our experience tells us that fines have been often enforced by the client, through his architect (if not actually by the architect's wish); and with reference to a pecuniary loss falling on the architect himself, we have found builders very loth to ask an architect to pay out of his own pocket for any omission or discrepancy caused by him or the errors of his assistants.

Whilst on the question of delays, in what position does the builder stand if works supposed to be completed by agreement in six months, and which really occupy twelve, and the supervision, foreman's wages, &c., costing double the contemplated sum, if that delay is caused by the negligence of the architect in supplying such information and documents as are necessary for conducting the work?

As to quantities, our experience tells us that they are as often repudiated as acted upon in a final settlement, according to which way, in case of dispute, they work best for the client; but as the drawer of all agreements and papers, &c., referring to a contract is the architect, it is in his own power to determine them to be or not to be part of the contract, and it should be so laid down.

A FIRM OF LONDON BUILDERS.

A Statue of Humboldt, cast in the Royal Foundry at Munich, is about to be forwarded to St. Louis, United States, the gift to that town of Mr. Henry Shaw, who last year presented it with a Shakspeare memorial. The sculptor is Herr Ferdinand von Miller.

ON THE MATHEMATICAL THEORY AND ART TEACHING.

SIR,—Man himself is, when he is at his best, the most perfectly constituted mathematical instrument to subserve the purpose of taste. He is, from the fundamentally quantitative nature of his experience intuitively a ratiometer, *par excellence*, the æsthetic measure. The Americanism "I calculate" expresses a literal truth. Man is a calculating-machine, the more or less perfect as his nature is either in or out of gear, as it is either perfectly or imperfectly developed. It was, doubtless, a certain dawning of this important truth that led Michelangelo to admonish a student that he ought to depend on the compasses of the eyes rather than on those of the hand; for the great master full well knew that if the æsthetic compass were not in the student's nature, the callipers would be of very little use. Excellence can alone be attained in the fine arts, as in everything else, by perfecting the instrument of thought,—the humanity. It is to this end that educators should, before all else, direct their attention. If they would care for that main purpose they need take no thought about museums of casts, or about the future of art. Everything would be evolved in due order.

It is to curves of varying gradation, rather than to the regular and more mechanical geometrical curves, that the cultivated human nature inclines, and the attempt to force children and students into drawing regular geometrical figures, to which the mechanism of their frames and of their senses is not adjusted, is one of those mistakes into which *dilettanti* art-reformers inevitably fall. Architecture certainly stands apart as a kind of a crystalline structure, which, having no counterpart in external nature but the rocks, is, to a great extent, a compilation of geometrical forms; and nothing can very well show the more simply mechanical nature of architecture, as compared with either painting or sculpture, more than the fact that the carcass of the Parthenon might be exactly repeated by a mason skilled with rule and compass. Not so, however, the pediments and friezes of that structure, which would require a skill, even to faintly approach them, of a higher and subtler kind. Creative nature and fine taste delight in curves of more varied motive than the regular geometrical ones. The orbits of the planets and the curves of growth are not circular. Good taste selects the oviform in preference to the constancy of the curves of either the circle or of the ellipse.

We moderns have more complete mechanical appliances for the reproduction of art than the ancients. The Greeks had no mechanical aids to facilitate the production of sculpture equal to the "pointing machine," and even in the Cinque Cento the Italians had nothing but the rudest of contrivances for the same purpose; and yet we are behind both. The painter of the present day, too, can bend photography to his assistance. But you shall find it a law of human nature, that, as you multiply external aids, native energy and skill decrease. This is a matter which should be taken to heart. For all the higher purposes of art we should, as much as possible, rely upon the unaided human nature: go-carts make the humanity rickety. For all art purposes, no mechanical contrivance can compare with the delicacy of the perfect human eye under the control of the fully-developed intellect. Fine-art is the result of common sense, of correct, not erratic thinking. We English seem to think that taste and art are to be evolved by multiplying ancient examples, and leaving out the thinking, unless this be of the very "fluffiest" kind.

W. C. T.

THE GREAT NORTHERN NEW GOODS STATION, FARRINGDON-ROAD.

THE works at the extensive and costly goods station for the Great Northern Railway Company, in Farringdon-road, which have been in progress during the last five years, are now drawing to a close, the completion of the last section of the immense block of warehouses having just been effected, with the exception of the internal hydraulic machinery, which is now being placed in the building, and the whole will be opened for the business of the company in about a month from the present time.

Inclusive of the heavy amount of excavation and the underpinning which was required previously to the commencement of the erection of

the warehouses, the work has been one of the heaviest engineering undertakings of its kind in the metropolis. The block of warehouses has a frontage to Farringdon-road of 300 ft. in length, the Charles-street frontage at the south end being 135 ft. long, the building extending northwards beyond the boundary of the Metropolitan Station, but narrowing in width, the north frontage of the warehouses being reduced to 50 ft. The warehouses thus occupy a ground area parallel with Farringdon-road of about 28,000 superficial feet. Independently of the basement, which is 23 ft. below the street line, and where the chief business of the depôt is carried on in the despatch and arrival of merchandise by the Metropolitan Railway to King's-cross, there are two lofty stories above the ground floor, and as the basement is of the same dimensions as the three floors above, the building, contains an aggregate floor-space of about 112,000 superficial feet, or between two and three acres in extent, in addition to the large station-yard at the south end, from which the basement is approached by an inclined plane, and where stables for the company's horses have also been erected. The warehouses are 60 ft. in height from the street line, and the elevations are slightly ornamented. Each floor of the Farringdon-road frontage contains a range of twenty-four windows, with three wider entrances for lorries. The main face of the elevation is in Burham wire-cut white brick, the window-jambs, string-courses, and panelling, immediately under the main cornice, being in Pether's pressed brick, whilst the arches of the windows are in red cut brick, surmounted by a blue brick string-course.

The floors and other portions of the interior are for the most part of iron. No less than 3,000 tons of wrought and cast iron have been used in carrying out this portion of the works, including sixty tons of cast-iron trough girders, and thirty-five tons of cast-iron columns for the ground-floor above the basement. Messrs. Westwood & Baillie, of the Isle of Dogs Iron Works, have supplied the ironwork, the floors throughout being laid with Westwood & Baillie's patent corrugated truss flooring, which are the first floors of this description which have been laid down by the patentees. The hydraulic machinery throughout the warehouses forms a prominent feature in the buildings. This machinery consists of thirteen hydraulic cranes in the basement alone. Two of these cranes will lift three tons each, and the remaining eleven 30 cwt. each. There are also four capstans, of fifteen horse-power each, together with wagon-hoists for lifting wagons from the basement to the ground-floor. These hoists will lift a wagon of 25 tons' weight. There are likewise two large hydraulic lifts, one at the south end and another at the north end, for lifting merchandise from the basement to the upper story of the warehouses, a height of more than 60 ft. These lifts will raise and lower two tons' weight each. In addition, there are also four jiggers, each of which will lift 10 cwt. from the basement to the top of the building. It may be added that there are ample facilities for the reception and delivery of merchandise, not only by the inclined road on the south side leading down to the basement, but also by the Farringdon-road and Charles-street entrances, and the yard and station area in the basement have space for 150 railway trucks, which can be worked at one and the same time.

The works are designed by Mr. R. Johnson, the Company's engineer in chief, and have been carried out by Messrs. Kirk & Randall, as the general contractors, Mr. Charles Randall, brother of one of the firm, personally superintending the works from their commencement to the completion. Mr. J. N. Thompson has acted as clerk of the works. Exclusive of the land, which the Great Northern Company had to purchase from the Metropolitan Company at an outlay of upwards of 40,000*l.*, the works now just on the point of completion have cost upwards of 100,000*l.*

A Narrow Escape.—With reference to the lamentable loss of the *Princess Alice*, Mr. Lowe, the surveyor to the Hampstead Vestry, and his wife and only child, who had gone for the day's trip to Sheerness and back, were amongst the few who left the boat on its return journey at Gravesend to come home by rail. Every friend of Mr. Lowe will feel thankful for the safety of a valuable public servant.

PARIS EXHIBITION AWARDS.

We hear that amongst the Englishmen rewarded by the Exhibition jurors, Messrs. Doulton, of Lambeth, have received a *grand prix*, two gold medals and two silver medals. George Tinworth, one of their artists, has been rewarded with a silver medal for his terra-cotta group. Minton has had a *grand prix*, and Worcester a gold medal. Messrs. Jas. Stiff & Sons are said to have received two medals, the character of which has not reached us. Messrs. Clark & Co. have received a silver medal for their noiseless steel shutters; Messrs. Dunnill & Co., of Jackfield Works, have obtained a bronze medal; and to Mr. Harry Hems has been awarded "honorable mention" for sculpture and wood-carving under Classes 17 and 18.

THE LATE MR. ROBERT BOYLE.

The death of this gentleman, which took place on the 2nd inst., at the age of fifty-seven, has elicited some strong testimonies in Scotland to his ability and energy. He appears all his life to have been devising and inventing. In 1854, Mr. Boyle opened, under the patronage and with the assistance of the Lord Provost and magistrates, and the leading temperance reformers of Glasgow, an Industrial Museum and Hall of Science and Art, being the first of its kind in Scotland. It was situated in the large building at the corner of Trongate and Brunswick streets, on the east side, and occupied three flats. Lectures were given nightly during the winter season, and three times a week during the summer, on all subjects coming within the range of science, and which would tend to promote the public weal. The scientific lectures were always illustrated when possible with experiments, the different apparatus for which Mr. Boyle usually made himself. He invented, after two and a half years' continuous application and experiment, a detonating powder, the power of which was something terrible, and yet it combined the greatest safety in handling and moving about, quite different from other detonating compounds. In combination with this powder he also invented an improved shell, but could not induce the Government to adopt either. He will be best known by our readers as the inventor of what is called Boyle's Patent Self-acting Air-pump Ventilator, and which, with the exertions of himself and his son, Mr. Robert Boyle, jun., has proved one of the most successful and useful inventions of the kind, and brought the subject of ventilation and the importance and absolute necessity of fresh air to sustain health strongly before the public. It is in general use, and is extensively employed by the Government.

Shortly before his death Mr. Boyle laid another invention before Government in connexion with war weapons, and which when first submitted was highly approved of, but was pronounced to have one defect, which, if overcome, would make it perfect. It was overcome and made as desired, but when again submitted, the usual intimation was received, "Not found suitable," &c. This, it is asserted, had a great deal to do with hastening Mr. Boyle's death. He died bringing out an invention which was to reduce the chances of explosions in mines to a minimum, and had succeeded in perfecting it. When remonstrated with by his family about taxing his brain so much, and warned that it would kill him, he made the reply, characteristic of the man, that it was better his life should be sacrificed, which was but one life, than that, perhaps, of thousands.

NEW MARKET BUILDINGS.

Huddersfield.—On the 5th instant, Alderman David Sykes, chairman of the markets committee of the Huddersfield Corporation, laid the corner-stone of the New Market-hall, which is being erected from designs supplied by Mr. E. Hughes, architect. Mr. Radcliffe, the contractor, presented the trowel, and Mr. Hughes presented the mallet and level to Mr. Sykes with which to lay the stone. After the stone had been laid with the usual formalities, Mr. Sykes gave an address, in which he pointed out the capabilities of the new building, and expressed the hope that by its means the people of Huddersfield would be able to buy produce as cheaply as they were enabled to do in Leeds and other large towns. The new building is to cost 23,900*l.*

Rugby.—The new cattle-market at Rugby was opened on the 10th inst. The site is near the railway station, and the market proper extends over three acres, and has been laid out from the designs of Mr. W. Stewart, the town surveyor. The market is provided with every convenience, and paved and drained throughout. It comprises settling-house, first and second class refreshment-rooms, iron pens for the accommodation of about 3,500 sheep and 2,500 beasts, with sheds for calves and pigs, and yards for implements and horses. Large water-troughs are provided for the animals. The cost, including the site, will be between 6,000*l.* and 7,000*l.*

COMMITTAL OF A BUILDER.

Mr. E. Clarke, a builder, of Pratt's-road, Hackney, was brought up on a warrant at the Worship-street Police-court, under the following exceptional circumstances:—Mr Clarke, it appeared, had built eleven small houses in Pratt's-road, Hackney, about the commencement of the year, and Mr. Frederick Meeson, surveyor of the district in which such houses are situate, complained that they were not built in conformity with the requirements of the Metropolitan Building Act. Mr. Clarke not having complied with a notice of the surveyor to alter the houses as required, was summoned for breach of the Act. An order was made on the defendant to do the work required, but at the end of two months he was again summoned to the court for non-compliance with the order. He was then ordered to pay certain penalties provided by the Act, and amounting in this case to 25*l.* The money was recoverable by distress, and the officer (Allpress) received a warrant from the court to levy for the amount. He subsequently made a return that he had been unable to discover sufficient goods to cover the amount. By the terms of the order for the payment of the penalties, Mr. Clarke became liable to two months' imprisonment, and being now brought up in custody was ordered to be committed to Holloway Gaol (debtors' side) for that term.

"OVERTIME."

At the Birkenhead Police Court, on the 13th inst., Mr. William Taylor, builder, Old Chester-road, Tranmere, was summoned before Mr. Preston, stipendiary magistrate, by four men lately in his employ, for the sum of 1s. alleged to be due to each of them. The men were John Cooke, John Williams, John Thomas, and Thos. Garner, joiners, and they were represented by Mr. Moore, while Mr. Hannen defended.

Mr. Moore said that the case was prosecuted in consequence of an infringement of Rule 6 of the Liverpool Master Builders' Association, namely, "All employers to commence to pay their men not later than ten minutes after leaving-off time. If not paid within half an hour, overtime to be charged." These men were employed by Mr. Taylor in July. On Friday, the 19th of that month, they received from the foreman joiner new time-sheets on which to mark their time, and on the back there was an intimation stating that after that date immediate notice to leave would be given or received on either side. Up to that time two hours' notice was required. The men objected to this, and they refused to fill up their time-sheets, considering the new rule an infringement of those under which they had hitherto worked, and that if they had used the sheets they would be bound by them. On the next day (Saturday), they would not fill up their papers, and thus a delay of an hour and a half took place, which constituted the time now charged for.

Mr. Hannen said that the new rule had been made because some time ago some men in receiving two hours' notice to leave went and smashed a number of things in the place.

Mr. Taylor said it was his rule to pay the masons first, and then the joiners; but on this occasion, when the latter came their time-sheets were not filled up, and thus a delay took place, for which the men charged as for time worked.

The case of Cooke having been heard to this effect,

Mr. Preston remarked that he did not think the men would be bound by the rule simply because it was printed on the back of the time-sheets. They worked a certain number of hours, for which they were entitled to a certain rate of wages, but to charge for the time occupied in expostulation was going rather too far. He dismissed the summons, and on being applied to on behalf of the Amalgamated Society of Carpenters and Joiners, to state a case for a superior court, refused the application.

Chester Cathedral Restoration.—Dean Howson, preaching at Liverpool on the 12th inst., alluded to the restoration of Chester Cathedral. He said the restoration had gone on from 1868 to 1876, during which period 90,000*l.* had been expended, including 10,000*l.* set aside by the Ecclesiastical Commissioners and 80,000*l.* collected. Of the 5,000*l.* still necessary for the completion of some details, 2,000*l.* had been collected, and 3,000*l.* was still required. As far as they could see, the River Mersey was likely to become the boundary between two dioceses. But Chester was still the cathedral of Liverpool. Apart from that, it should be preserved as a great historical monument associated with distinguished names in history,—royal names and ecclesiastical names during the period extending from 1100 to 1500.

NEW UNION BANK, GEORGE STREET, EDINBURGH.

THE new premises of the Union Bank of Scotland, at No. 64, George-street, have been opened for business. The buildings are in the Italian style, and have a frontage towards George-street of 100 ft., the greatest depth from front to back being about 140 ft. The most prominent features of the elevation towards George-street are three porticos, the centre one giving entrance to the bank proper, and those at the sides to the dwelling-houses above. These porticos consist of Ionic columns (the centre one having four and the others two), with pilasters next the wall, supporting an entablature carried along the whole front, and surmounted by a balustrade, which is repeated in the windows of the first floor. Over the doors are clam-shells and carved heads. The masonry between the street-floor windows is in courses,—vermiculated and plain alternately. The first-floor windows are flanked by pilasters resting on the pedestals of the balustrade, and supporting a pediment over the window, enriched by a shell. The second-floor windows are treated with architraves and moulded sills, and over these is the main cornice, supported by trusses, and crowned by a balustrade the full length of building, to the cope of which the height is about 62 ft., and behind which are the windows of an attic floor.

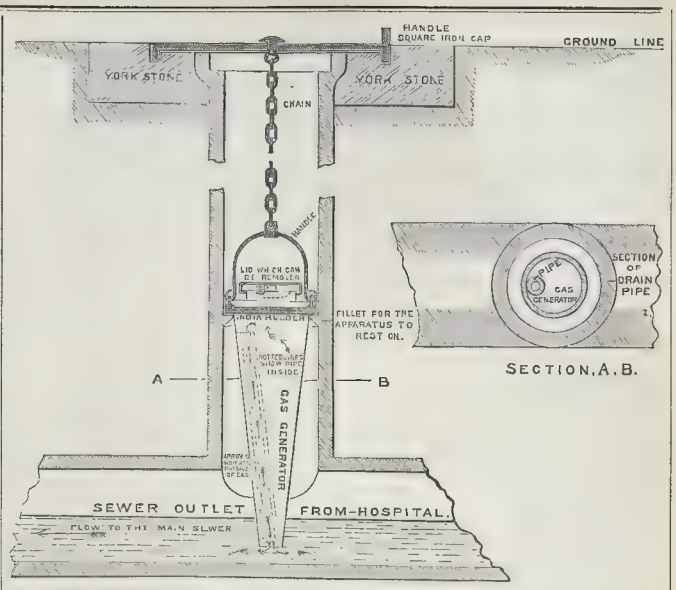
The street floor and the floor below are entirely devoted to the purposes of the Bank, while the three upper floors contain two dwelling-houses, which have been completed and occupied for some time, and to which entrance is gained by the porticos at either end of the George-street front. Entering by the central portico, and passing through the entrance-hall, the telling-room is reached, which is large and commodious, and well lighted from the roof, and also by a large three-light window at the end and another at the side. The floor is laid with encaustic tiles from the entrance to the telling-table, beyond which it is formed of oak in narrow width. At the entrance end stand four Corinthian columns and pilasters of polished red granite, with bronzed capitals supporting a wall, which, higher up, forms part of the outside wall of one of the dwelling-houses. All the fittings, including the desks, &c., behind telling-table, are of mahogany. The principal cornice, which is carried round the room, is supported by projecting cantilevers, enriched by festoons, the spaces between being filled in with panels. Above this cornice springs the cove of the ceiling, rising to the central portion, which is flat and oblong in form, and divided into panels by stiles, in the centre of which runs a leaf enrichment, having at each intersection a boldly-modelled pendant.

The panels in the cove all round have been designed for the admission of light, and are filled in with glass of a pattern corresponding with the ornament of the other panels. The buildings were designed by the late Mr. David Bryce, but he having died before this portion was considered, the detailing of this, as well as the general internal finishing, fell to be accomplished by the junior member of the firm, Mr. John Bryce, under whose supervision the works have been completed.

On the basement floor are a large plate-safe and a spacious library, provided with a hoist, communicating with the telling-room; safes for bank-note paper, and cellarage, and also dwelling-houses for the porters and messengers employed by the bank.

The contractors for the work are:—Mason's, carpenter's, and joiner's work, Messrs. William Beattie & Sons; plumber's work, Mr. R. P. Beattie; plasterer's work, Messrs. W. Campbell & Son. Messrs. John Taylor & Son, Princes-street, supplied the cabinet and upholstery furnishings.

The City of London and Open Spaces.—By the new Act on open spaces the Corporation of London may acquire by purchase, gift, or otherwise, the freehold or interest in common lands not within the district of the Metropolis Management Act, but within twenty-five miles of the City, and may, among other matters, appropriate ground for cricket and other sports, and also for volunteers, having due regard to the enjoyment of the lands as open spaces for the recreation of the public and the rights of common.



THE HOSPITAL DRAIN DISINFECTOR.

THE HOSPITAL DRAIN DISINFECTOR.

THE ingenious arrangement illustrated by the accompanying diagram has been invented and registered by Mr. William Soper, M.R.C.S.E., and almost explains itself. The fundamental principle is the slow and constant evolution of chlorine gas in immediate contact with the sewage of infectious and other hospitals.

The question of sewerage disinfection has long occupied the attention of the leading chemists of the day, and the numerous experiments that have been carried out all point to the fact that, with the increasing growth of towns, so much more potent agents must be called into play to modify, at least, the injurious effects of sewage-gas. It has been asserted by a competent authority that "there is no known chemical process that effectually purifies sewage." It is claimed for this apparatus, that if it does not absolutely destroy every particle of gaseous and solid excreta, yet it minimises to the utmost the poisonous qualities of hospital excreta, and prevents the return currents of gas in its vitiated condition. It is recognised that typhoid, diphtheria, dysentery, cholera, and diarrhœa can in many instances be directly traced to sewage contamination. It is well recognised that chlorine is second to none in its potency in regard to disinfection and deodorisation. Now, carbolic acid, unless concentrated, acts merely as a preservative, temporarily arresting decomposition. Chlorinated lime and charcoal are soon exhausted, and cause obstructions. Condy's fluid is very costly. But chlorine gas as evolved from the apparatus can never obstruct the drains, is not expensive, and is universally disseminated through the mass of the liquid, and has the superlative advantage that it acts not only upon the liquid itself, but upon the gases in the upper level of the drain-pipe, while its solubility is so considerable that the whole of it is economised, and as the fluid passes onwards, so it carries it away in solution. The reservoir is charged with a mixture of common salt, binoxide of manganese, and diluted sulphuric acid, and this pours out the gas for three or four days. The conical form of the apparatus has much to do with its slow evolution, as a fresh surface is exposed and dissolved hour by hour. The indiarubber ring is to allow the generator to fit tightly upon its bed, and so prevent the escape of sewer gas up the shaft. The generator may be suspended at the base of a ventilating-shaft, as was done at Deptford. The sewer gas was most offensive at the top, but after the generator was introduced no smell was apparent, but only a faint chlorine odour, as was readily confirmed by the oxide of potassium and starch paper test. A modification of the apparatus has been designed for the disinfection of ambulances, dissecting-rooms, mortuaries, &c., and this has the special advantage that it may be wholly immersed in a putrescent fluid, and will render its solid and gaseous elements perfectly inodorous and innocuous.

Messrs. James Stiff & Sons, of Lambeth, are the sole manufacturers.

In a report of Dr. Buchanan, and an inquiry into the death-rate from all causes, and the death-rate from some particular diseases in twenty-five towns before and after sanitary improvements, the works have resulted in a lowering of the rate in nineteen out of twenty-five towns; the average reduction in these nineteen cases being 10·5 per cent., and the reduction in typhoid in twenty-one out of twenty-four being 45·4 per cent. This serves to remind us how important it is that improved sanitary arrangements of every kind should receive the fullest consideration, and be forthwith adopted if found efficacious.

IMPROVEMENTS IN COAL MINES.

A LARGE and influential number of mining and other engineers met together on the 3rd inst. at the Earl of Dudley's No. 30 coal-pit at Cradley, near Birmingham, to witness some experiments with Mr. F. Leonardt's patent safety cage and locking collar, the latter of which is designed to detach the cage from the rope in the event of overwinding; and the former is so constructed that, in that event, or the breakage of the rope, the cage becomes fastened to the guides by its own weight, and is so held until the cage is relifted by the rope. The locking collar is constructed of two wedges, one of which is attached to the rope by its thin end, and the other attached to the chains supporting the cage. When these wedges are placed together in position, they form a parallelogram over which a stout collar is driven just so lightly that any extra force brought to bear upon it will cause it to slide off. A small hole is drilled through both collar and wedges, into which a pin of any soft metal,—say copper,—is driven. In the event of overwinding, the collar is caught by the cross-beam at the top of the staging, and is forced off, thereby detaching the cage, which would, of course, fall to the bottom of the pit but for the safety appliances attached. These consist of two nearly circular cams, designed when in action to press tightly upon the steel guide-ropes. These cams are geared eccentrically, and are operated upon by two strong helical springs, acting on forked rods attached,

the other end of the rods being attached to chains which pass over pulleys, and are connected with the lifting-rope. The effect of this arrangement is that when the cage is going up or down steadily, the springs of the apparatus are compressed and the cams withdrawn, but on any sudden release the springs at once cause the cams to take effect, and the descent of the cage is prevented.

The general feeling expressed by the company was one of great satisfaction that at last we were placed in possession of means whereby winding accidents might be reduced to a minimum, both in mines and in ordinary lifts, and the inventor was warmly congratulated on its success. A vote of thanks was accorded to the Duke's agent, Mr. E. Fisher Smith, for his kindness in allowing the inventor a two months' trial of his apparatus, and for permitting the assembly to witness the experiments that day.

THE HIGH LEVEL BRIDGE OVER THE THAMES.

SIR,—This matter is of such great importance to the metropolis that I hope you will not cease to draw attention to the mistaken policy of the Metropolitan Board of Works. As I have taken occasion to point out elsewhere, the resistance to haulage which steep gradients present is not sufficiently appreciated, although, doubtless, carters and others similarly occupied can make shrewd guesses about it. Sir J. Bazalgette does not give us any information on this point, except to instance other bridges where there are steeper gradients than those he now proposes. But the fact that horses are heavily taxed in going up one hill, does not justify the construction of a hill elsewhere, which might be avoided; and it may be well to state in figures which all can understand what is involved in the climb of 35 ft. up to the summit of the high-level bridge. About 30,000 vehicles pass over London Bridge every twenty-four hours, and as the bridge nearest the sea always becomes the most important, it may well be assumed that a new bridge would take at least half the traffic. Moreover half the trading or manufacturing population of London is east of London Bridge. But assuming only one-third, or 10,000 vehicles to pass over per day, and also that an average weight for each vehicle with its horses is 2 tons, then 20,000 tons have to be lifted 35 ft. per day; or, to state it in convenient units, the work to be done equals 700,000 foot-tons. Doubtless horses have a reserve of strength which will enable them, in the case of cabs and other light vehicles, to surmount the hills without too much distress by reducing speed; but, as those who own and feed them know, the strain upon them is so much taken from their total daily capacity. But the Tower Bridge will receive a larger proportion than any other in London, of slow-moving heavy wagons, and with these the horses would not have such a reserve of strength. To draw 1 ton on a level granite-paved road, a force of from 30 lb. to 40 lb., according to the smoothness of the surface, is required; on a gradient of 1 in 40 an additional force of 56 lb. is needed to overcome gravity; and a carter can realise what effect upon his horses this more than doubling of the work will have,—the weight of the horse having also to be lifted.

Owing to the lower level on the Surrey side, the ascent to the bridge is there the most severe, and the spiral road proposed, with a continuous gradient of 1 in 40, is utterly unsuited for such an important line of traffic; and as horses cannot pull their best when climbing on a curve, the haulage force would have to be increased even in a greater proportion than that above mentioned. Unless, therefore, the police regulations are very stringent, it is probable that much of the heavy traffic,—which is just that for which a new crossing-place in the east of London is needed,—will still continue to pass from Surrey to Middlesex by London Bridge. A steep ascent from the Surrey shore can only be avoided by making much longer approaches,—a matter deserving attention; but accepting the starting-points now proposed, it is obviously desirable to avoid the unnecessary extra climb to the summit of a high-level bridge. On the Middlesex side the approach to a low-level bridge could be made nearly horizontal. If the east of London were generally hilly, and roads were apportioned to horses accordingly, one more short climb in the journey would not so much matter; but with level roads north and south of the bridge, a great waste of power will be incurred if the loads have to be kept down because of the long inclines of the high-level bridge; while if this ruling gradient be ignored, horses drawing wagons with the accustomed loads will be greatly distressed.

To shut out sea-going vessels from the wharfs between the Tower and London Bridge will doubtless cause loss to those interested in certain trades. On the legal question whether the wharfingers are entitled to compensation, it is not necessary here to enter; but the estimate of loss has probably been exaggerated. The river frontage above London Bridge commands high rentals, and in the difference between these and those now obtained below London Bridge, will the basis for computing compensation be found. The tendency of the shipping trade is, as in most river ports, to pass lower down the river. The construction of the new Victoria Dock below Woolwich will increase this tendency. Even now no vessels of importance come above the Tower. The wharfs whose trade is affected are ill-adapted for loading and discharging vessels. Most of the trade is even now carried on by lighters, and probably the wharfingers who require compensation will discover immediately after they shall have received it that they can still carry on their trade. At any rate, an estimate of the amount needed for compensation can be made, and a million more or less for so great an improvement as a new bridge would not be of supreme importance, while the permanent loss from the want of a low-level bridge, or from the wasted energy in crossing a high-level bridge, cannot be assessed.

In any case, invite the talent of Europe and America to send in competitive designs for the best solution of the problem, based on such preliminary instructions as Parliament may decide. The competition either to be open to every one, with rewards worthy of the importance of the case and of London, or let a certain number of the leading bridge engineers of the world be invited, with a handsome payment to each, as was done in the Law Courts competition.

EWING MATHESON, M. Inst. C.E.

THREATENED DEMOLITION OF THE CARLIOL TOWER, NEWCASTLE-ON-TYNE.

SIR,—One after another the old gates and towers of this town have been swept away for trivial reasons, together with the adjacent walls, until now little remains of what was formerly the chief glory of the town. The Town Council recently determined upon the erection of a free library, and upon a portion of the site chosen stands the Carliol tower, the most interesting of the old towers remaining. There is ample room for both the free library and the tower. Mr. Oliver, an ex-town councillor and an architect of repute, who originally suggested the site, prepared plans at his own expense, to show how the necessary building could be arranged without interfering with the tower; but, for the sole apparent reason of obtaining a straight line of frontage, the borough engineer proposes to demolish this most interesting feature!

As in former cases, I trust you will lend your powerful aid against the perpetration of this fresh act of vandalism.

NOVOCASTRIAN.

"THE VENTILATION QUESTION."

SIR,—Messrs. Ewart & Son suggest, at p. 973, that the proper way to try a ventilator is inside the four walls of a shop, by turning the revolver rapidly with the hand in the case of the Archimedian screw ventilator, or "vigorous fanning" in the case of fixed ventilators. Now, I beg to state that such experiments are altogether delusive, for this reason, that under the above circumstances there is no counteracting force for the ventilator to fight against, while the revolver of the Archimedian may be turned by the hand ten times quicker than the wind will generally turn it. I have seen a good up-current in a ventilating-shaft surmounted by an Archimedian ventilator when the said ventilator was standing still; also down-draughts when it was moving, especially, of course, when the movement was not very quick.

What is really necessary in the present state of the question is to have a new and different series of tests from those at Kew, viz., to place the cowls and ventilators and the open pipes upon a building with a fire or fires on in it, and admit only a certain amount of air, and have regulators to do so; then bring the amount of fresh air coming in down to that amount, which will nearly cause the plain pipes to blow down. This being done, or something similar, then try the plain pipes and the ventilators, and let us know the results.

In the building at Kew there was nothing to cause a down-draught or suck-down of air in any of the pipes; hence the said building cannot be taken as a pattern for houses or halls with fires on in them, and for this reason I cannot go entirely with the judges at Kew in their verdict, although agreeing with them to a considerable extent.

In the trial of ventilators I suggest, as many ventilators should be tried against the plain pipe as are sent in, a fee of from one to five guineas,—Mr. Banner suggests 100 guineas, but then it is only himself that might care to put in an appearance at that rate,—being taken to pay expenses.

W. P. BUCHAN.

CONCRETE HOUSES.

ANOTHER VIEW.

I KNOW Sutherlandshire well, and I feel convinced that concrete walls will not keep out the wet, and, if built, the exterior will have to be tiled or slated over, and the inside of all external walls would require battening out, leaving a clear air-space well and sufficiently ventilated to prevent the damp coming through. I know a shooting-lodge built at a large expense, under the direction of an experienced Scottish architect, of the best bricks, which has cost considerable sums to make habitable consequent on the water forcing through the external walls. The Duke of Sutherland's factors can give his Grace information as to the rainfall and the difficulties of building an external wall that can resist the humidity of the climate.

J. S. S.

THE FINISHING OF FURNITURE.

SIR,—Excellently as many firms turn out their furniture, one cannot help noticing what appears to be a decided defect in their upholstering, viz., the use of common white or black tin tacks. These always reveal their presence, and are very unsightly. I would, in certain cases, suggest the use of brass tacks instead, the colour of which would accord with the fashionable yellow bordering and render their presence almost, if not quite, invisible. And in cases where brass would be as objectionable as black and white, why not adopt some means of overcoming the difficulty? If they must be visible, why not endeavour to render their presence as little conspicuous and objectionable as possible?

There is another suggestion I would make with respect to the finishing of furniture generally. The shape of rooms will not always permit persons to arrange furniture as they would, and thus the wash-stand or toilet-table has frequently to be placed before a window, and the consequence is the rough finish and bare wood are disagreeably exposed to the gaze of the public. Why not treat the backs as the fronts, and make these articles available for any position? At present, the only satisfactory way of treating these blemishes, is to arrange antimacassars tastefully over the backs, and so conceal them from public view.

The truth is, it is too often the manufacturer's aim to make articles look well, and throw all the attractiveness and finish into the portions generally exposed, and the other parts are rough in execution, slovenly in finish, as compared with joiner's work. If persons have the means, it is better to procure furniture made by joiners although more costly. It is better finished, and will last much longer than that made by cabinet makers.

T. B.

TRAMWAY SLEEPERS.

SIR,—Have you observed the sleepers used in the tramways which are being taken up and relaid in the metropolis? They appear simply yellow deal, without any preparation against decay. If we omit all consideration for the shareholders, the public surely should be able to require such a mode of construction as will be most efficient against decay, when the relaying is so great a public inconvenience. I remember rightly, a correspondent called your attention to the use of timber similarly unprepared when some of the tramways were originally laid.

F.

SKETCHING IN OUR CATHEDRALS.

SIR,—A few days ago I visited the neighbourhood of Worcester, and in the afternoon I entered the cathedral, which was being prepared for the Triennial Music Festival. In the course of my looking round, I saw a large hall known as the Grammar School; finding the door open, I had no hesitation in entering, and was gratified at seeing a fine old hall of early date; it was fitted up with temporary galleries for musicians and visitors. At the east end, in the centre of the wall, a very beautiful carved altar enrichment has recently been uncovered. It is of Early English date, with a mutilated figure life-size in the centre, with the head gone. Immediately over this is a small square-headed five-light window of Flamboyant tracery: such a window in England is of rare occurrence. As no one was in charge of the place, I immediately began to sketch it. The tracery has been mutilated in the upper part, and the glazing has been removed, and the lights blocked up. As soon as I saw it, I remembered having seen in Mr. Rickman's "Gothic Architecture," published in 1848, at p. 153, an illustration of a window very similar to this as being at Bolton Abbey, Yorkshire, yet when I was there it was not to be seen, nor did the aged clerk remember ever having heard of it or seen it, and I then in my own mind judged that Mr. Rickman had made a mistake in the name of the place, especially as I did not see it in his subsequent editions. However, while I was sketching, a workman came up and asked me if I had leave to sketch. I said "Yes." He asked from whom? and I replied, "Mr. Hughes." He said he did not know of the name as having any right to give me leave to sketch, that I ought to have asked Mr. Simpson the deacon. He left me for a few minutes, and then returned, saying I must go to Mr. Simpson, which I did in the cathedral, and when confronted with him the informant said, "This is the man that I found sketching in the Grammar School." I said I had asked Mr. Hughes in the nave. The deacon said it was wrong of him to give leave, and that as the place was being prepared for the musicfestival, he could not allow me to sketch. I said no one was in the way, nor had I obstructed any one, as there was not a single workman at that end of the building, and he briefly said I must come another time. I said I lived at a distance, and it would take but a few minutes to complete what I had begun. He would not hear of it, so I made my exit. In our various cathedrals there is a remarkable difference in the treatment of strangers who may go to the extent of sketching in the portions open to the public. At most of them a visitor will receive no check in his desire to sketch any portion of the building, while at others the dignity of a deacon is very much upset by a stranger attempting to sketch in a cathedral without his permission, although he may be inaccessible at the moment, as was the case with myself. During the last twenty years our minor cathedral officials have given up their objection to sketching visitors, and I trust that before long this may be the case at Worcester Cathedral. J. B. WATTS.

THE HEALTH OF TENBY.

SIR,—Douglas A. Reid, M.D., in replying to my letter on the sanitary state of Tenby, has adopted a most extraordinary method of doing so. It has been said that when a lawyer has a bad case all he can do is to abuse the opposite counsel; but that is considered rather a low trick. Mr. Reid has descended to a still lower trick, for he has fallen foul of my wife's relations for the purpose of withdrawing attention from plain facts with which they had no concern. . . . . What Mr. Reid states with respect to relations may be true or false for anything I know to the contrary, I can say on that matter is that I never knew or heard anything of what he states concerning them until I read his letter in the *Builder*. How, then, could any "animosity be inspired" by what he states concerning them?

The facts communicated by the Registrar-General's reports cannot be annulled by a personal letter. Mr. Reid has attempted to show that the mortality of Tenby is not so excessive as the Registrar-General puts it by a process of weeding. He first weeds out certain outlying districts, and then deducts the deaths of certain visitors, by doing so he reduces the death-rate to 14·6 per 1,000, which is still excessive when compared with other towns under similar circumstances. If Mr. Reid is to be allowed to make deductions for outlying districts and the deaths of visitors from the mortality of Tenby, we must make similar deductions from the other towns with which I compared Tenby; by doing so we shall find the death-rate of Tenby still more than double that of other sea-side watering-places which I named in my former letter. Even without making such deductions, Herne Bay stands at 8·5; Lowestoft, 12·5; Worthing, 12·3; and these places have a greater proportion of visitors than Tenby. So that when we compare Tenby with other watering places Mr. Reid gains nothing by his weeding process, for it shows that a high rate of mortality does exist in Tenby when compared with the towns I have named.

Now with respect to the water supply, I adhere to everything I stated regarding it in my former letter. I have witnessed the droppings of cattle washed into the old reservoirs; I have caught dozens of tritons with my own hands in the reservoir; I have seen the road-dust blown into the new reservoir. Mr. Reid says, "Filter-beds of gravel, charcoal, and sand have been constructed," but he is very careful not to say that the whole of the water supplied to Tenby is filtered through these filter-beds, although he would lead us to infer that the water is all filtered. The fact is, a very small portion of the water is filtered.

As to the drainage, I still assert that it is very imperfect, and the drains are very badly ventilated. The smell from the outfall sewers has been often complained of both by residents and visitors, and the smell has even been complained of at public meetings. Mr. Reid says, "There are no ash-pits, all the house refuse being carted away daily." Does Mr. Reid mean that to be a complete answer to my assertion that there are many *foul cesspools* in Tenby? I will now add that there are many open privies, which ought not to be allowed to exist in a place like Tenby. If the Corporation of Tenby had done their duty, these cesspools and privies would have been abolished years ago. No town can be said to have a "perfect system of drainage" where privies and cesspools exist.

Mr. Reid refers to an action I brought to recover a just claim, which could have no connexion with the sanitary condition of Tenby. He says, "The arbitrator's award has been for some time past ready for Mr. Burns to take up." That is true; and it has also been ready for the Tenby Corporation to take up; "for some reason or other they hesitate to take it up."

I brought the action for payment for certain surveys, plans, and specifications, ordered by the Tenby Town Council, which were approved of by the Corporation, and also by a committee appointed to examine them. The Town Council offered to refer the case to arbitration if I would accept the arbitrator appointed by them. That I agreed to do. The Town Council also suggested that in order to keep down expense, neither party should employ counsel in the case, but only to engage a solicitor each, which I also agreed to. It was also agreed that my claim should be tried on its merits alone; but, to my surprise, when my case came on, the Tenby Corporation appeared by counsel and two solicitors against my one solicitor, and even then they found they were getting beaten on every point in equity, when the counsel turned round and put in the technical objection that there was no contract *under the seal of the Board*. The arbitrator took counsel's opinion, and made a *preliminary award* on that technical point only. I decline to pay the arbitrator's charge, 170*l.*, to take up his award on a technical point, but I must say I consider it was a dirty trick, as well as a dirty plea, on the part of the Tenby Town Council, for they have deprived the arbitrator of his fees, as well as me of my just claim. I decline to take any further notice of a writer who can so far forget his position as to drag in personalities for the purpose of hiding a plain statement of a fact that *the death-rate of Tenby is greatly in excess of many other watering-places in England*. WM. BURNS.

OPEN-MOUTHED PIPES *v.* VENTILATORS.

SIR,—I quite agree with the very sensible suggestion which was made in the *Builder* of Sept. 7 by Mr. T. Blashill, under the above heading. I have no doubt he sees the difficulties which would attend a complete—a satisfactory inquiry, and has not thought it necessary to state more fully the conditions. I venture to think that if his suggestion can be properly carried out it will prove of greater value to the public than horse-shows, dog-shows, fan-shows, and the like. It will also doubtless prove of great pecuniary advantage to the makers of such ventilators as shall be found to be the best for all the practical purposes of proper ventilation. The conditions will require of course to be carefully settled with that object solely in view, and gentlemen who have already acted as judges in late cowl-tests would probably consider themselves ineligible as judges in the suggested inquiry, which I would submit had best be undertaken by the Society of Arts, the Institute of Civil Engineers, or the Institute of Architects, or a committee formed of members of all three.

Playing at cowl-testing would have no useful result. Ventilation is perhaps as little understood as any science. It is a very important branch, and there can be no doubt the committee would be undertaking a most difficult and arduous task, and one, in fact, which would scarcely be worth while, unless the tests extended over a period long enough to include all winds and all weathers, ever-varying velocities of winds, different states of the atmosphere within and without, permanence of "pull" when there is not a natural up-current, and freedom from down-draught when there is a natural down-current, exclusion of water in wet weather and through condensation, serious failings in plain open or trumpet-mouthed pipes, even if they be capped or be made lobster-backed, and which alone may upon consideration be thought sufficient to exclude them from the comparative tests; besides which they freely,—often too freely, admit cold air down them, although at other times they allow of the *escape* of vitiated air up them. Considering the various and great changes which so often and so suddenly occur in some of the most important conditions, it may be considered necessary to test the various ventilators more continuously *at the same time* against each other, and in such case two tubes will perhaps not be enough. I feel certain such an inquiry cannot be carried on without considerable expense, towards which exhibitors should mainly contribute.

Exhibitors of ventilators, cowls, and pipes should be divided into at least two classes; those who do not intend to enter any of their exhibits as competitors for supremacy, and those who do. The judges or committee should have power to exclude from the contest any ventilator, cowl, or pipe which they may deem ineligible from whatever cause. Each competitor for supremacy should pay an entrance-fee (in proof of his own good opinion) of, say, 100 guineas, and those who intend to exhibit only should pay a fee of, say, ten guineas. The final, after payment of expenses incurred, to be applied as the committee may direct.

I shall be glad to pay 100 guineas for the privilege as mentioned, and no doubt others who have equal confidence in their ventilators will be glad to do so also.

L. GELDSON BANNER.

ECCENTRIC.

THE contents of Dulford House, near Collampton, Devonshire, have been sold by auction during the past week, the sale lasting six days. Messrs. Frost & Collings, of Teignmouth, were the auctioneers. The late owner was Mr. Bethell Walrond. His will was disputed on account of alleged insanity, and this sale is the result of proceedings in the Probate Court.

Dulford House is an intensely ugly mansion, built a hundred years since by the late Lord Monteith. It and its thirty acres of ground are inclosed by a brick wall 12 ft. high, and upwards of one mile in circumference. Mr. Walrond's eccentricities were manifold, and well known. He kept for a number of years the embalmed body of his daughter in his dressing-room, nor was she buried till after his death. He slept upon a massively-carved old oak bedstead, and upon the footboard he had the skulls of five females facing inwards; whilst above, at the four corners overhead, were waving hearse-plumes. He believed in the transmigration of human souls into animals, and had a cemetery upon his grounds wherein the dogs were buried, and over whom headstones, giving the name, date of birth, &c., are erected. His collection of carved oak furniture, nearly all of a pronounced Devonshire type, was very extensive. Over a hundred carved oak chests were knocked down by the hammer. Some of these were very handsome, and all fetched high prices. One bedstead went for 50 guineas, and an unfinished one, bearing the date A.D. 1601, made 40*l.* Two small cases of seals, after a spirited competition with the British Museum's representative, were bought by Colonel Ridgeway for 100 guineas. A bust of Napoleon by Canova was sold for 75*l.* to Mr. Doddington, of Horsington House; and a large figure in Spanish chestnut of the "Madonna and Child" were bought for 18 guineas by Mr. Harry Hems, who was also a large purchaser of carved oak-work. The pictures had all been sold previously. A fine collection of armour, which originally cost the owner more than 1,000*l.*, was also sold. It had suffered much from neglect, and its value therefore was much deteriorated. Four lay figures, clothed in ancient armour, went for twenty, sixteen, fifteen, and twelve guineas, the best going to Mr. Brand. Mr. Walrond owned quite an armament of artillery, and fifty cannons, from eighteen-pounders downwards, were offered for sale. The eighteen-pounders went for three guineas and less a couple, but four pairs of bell-metal guns, weighing about 100 lb. each, fetched twenty guineas per pair. The sale attracted a large assembly.

CHURCH-BUILDING NEWS.

Beer.—The new Church of St. Michael, Beer, near Seaton, Devon (which has been built at the sole cost of the Hon. Mark Rolle), has been consecrated. It consists of a nave, with north and south aisles, chancel, north and south transepts, clergy and choir vestries, and a tower on the north side of the west end, with a square spire, rising to the height of 112 ft. The material used is the blue stone found in the neighbourhood, with Beer stone dressings. The spire is entirely of Beer stone. The style throughout is Early English. The nave is 72 ft. long by 21 ft. wide, and is covered with an open roof of pitch pine, the height to the ridge being 46 ft. The north and south aisles are divided from the nave by four arches supported on columns of Devonshire marble with carved capitals. The church will hold about 700 persons. A pulpit of Beer stone is erected on the north side of the chancel arch. The front is panelled and enriched with marble columns. On the south side of the chancel arch is an oak lectern, presented by the Hon. Miss Trefusis, a sister of Mr. Rolle, who did the carving herself. The work has been carried out from plans prepared by Messrs. Hayward & Son, architects, Exeter, by Messrs. Stephens and Bastow, builders, Bristol. The marble work has been supplied by Mr. Blackler, of St. Mary Church. Mr. Harris has acted as clerk, and Mr. Charles Hampton as foreman, of the works. The carving has been executed by Mr. Harry Hems.

Minnishant (*near Ayr*).—A new church, erected at Minnishant, about five miles from Ayr, by Sir Peter Coats, was opened on the 25th of August. The church is intended as a memorial of the late Lady Coats. Messrs. Turnbull & Thomson, of Glasgow, are the architects.

Great Sutton.—The foundation-stone of the new Church of St. John, Great Sutton, near Eastham, on the Chester and Birkenhead-road, was laid on the 28th of August, by Mr. John Torr, M.P. The designs show an edifice in the style of the latter part of the thirteenth century, consisting on plan of a nave, large chancel, organ-chamber, vestry, south porch, and attached tower and spirelet. Sitting accommodation is provided for 256 worshippers, whom, for the present, it is intended to seat on chairs. The whole of the roof will be open-timbered to the ridge, divided by moulded principals, and plastered between the rafters, the chancel roof being boarded in panels and divided with ribs. The internal decorative and dressed features are to be of Stourton white stone, and the remaining walls plastered upon an internal lining of brick. The external facing of the walls is of shoddies from the Wrexham quarries, of a warm brown tint, with dressings of white Stourton stone, and silver-grey slate for the roofing. The tower, rising square on plan, and breaking into an octagonal form some height above the nave walls, is continued circular on plan, and terminates in a stone spire with ornamental cross, the whole rising to a height of about 70 ft. The present

contract, amounting to about 2,000*l.*, embraces the tower and spire to the plinth line only, and is being executed by Messrs. Tomlinson & Sons, of Leeds and Chester; the architect being Mr. David Walker, Liverpool.

Doune.—St. Modoc's Episcopal Church, Doune, N.B., was consecrated on the 29th of August. The plan (which was prepared by Mr. Brooks, architect, London) shows a chancel, nave, north transept, north aisle, vestry, tower, and spire, the lower portion of which serves as porch. These have all been erected save the north aisle and tower. The style chosen is that of the early part of the thirteenth century. The church is built externally of Polmaise freestone, with "random rubble," droved with rustic face; and internally, with Dairsie freestone, with rustic face. The chancel is groined throughout. The nave has a wagon-roof, boarded on the underside with red and white pine, and divided into compartments so as to admit at some future time of painted subjects. The contractors were—for mason work, Mr. Jones; and for joiner work, Mr. M'Niven, Doune.

SCHOOL BOARD SCHOOLS.

Fenton.—New Board Schools have recently been opened at Fenton, Staffordshire, by the Stoke School Board. The building has a frontage to the street of about 90 ft., and is of two stories. The boys' school is on the first floor, and consists of a main room 70 ft. long and 22 ft. wide, with two large class-rooms, the accommodation being for 320 scholars. The girls' school is also on the first floor. There are in this department a main room and two class-rooms for 240 children. The school for infants consists of main room to accommodate 120, and two class-rooms large enough for 95 children each. The cost, inclusive of the site, was 6,440*l.*, giving an expenditure of 6*l.* 10*s.* a head on the accommodation provided.

Oystermouth.—New Board Schools for 450 children have been opened at Oystermouth, near Swansea. Mr. Thomas is the architect. The schools give 185 cubic feet of space for each child, with an area of 8 superficial feet. Mr. Billings was the contractor.

Greenwich.—New school buildings in Randall-place, Greenwich, have lately been opened by the School Board for London. The site secured is sufficiently large to allow of ample space for a playground. Accommodation is provided for 763 children, at a cost of 1,200*l.* for the site and 9,145*l.* for the building, exclusive of incidental expenses. Mr. E. R. Robson is the architect.

Sherwood.—On the 6th ult. new Board Schools at Sherwood were opened, under the auspices of the Nottingham School Board. The schools have been built from plans by Mr. Herbert Walker, the builder being Mr. Stainforth, the desks and inside fittings being supplied by Messrs. Colman & Glendenning, of Norwich. Accommodation is provided for 150 children, at a cost of 2,400*l.*

Books Received.

House Drainage and Water Service in Cities, Villages, and Rural Neighbourhoods. By JAMES C. BAYLES. David Williams, New York. 1878.

THIS is an American contribution to the sanitary question, arising, as the writer tells us, from the extensive correspondence on the subject which, as editor of *The Metal Worker*, he had long carried on with persons practically interested in the mechanics of hygiene. The work, however, is concerned not so much with sanitary engineering, as with that part of the operations in which the householder and plumber are mainly interested, after the engineer has done his part of the work. So, at least, the author limits the object of his treatise, though a chapter headed "Water Supply in Country Districts" seems to belong rather to the engineer. We ought to have something to learn from an American book on the subject, if it be true, as Mr. Bayles tells us (and we are inclined to think that it is true), that the Americans, on the whole, "live in more comfortable houses than are to be found in any other part of the world." On the subject of sewer gas, to which his first chapter is devoted, the author confirms the view which some theorists have already started in England, that it is not the noxious-smelling part of the sewer emanation that does the mischief; and he reasons out the matter logically, pointing out that sulphuretted hydrogen, the most strongly-smelling of the elements of sewer gas, is often diffused in a chemical laboratory in stronger proportions than it ever comes out of sewer openings, and yet that chemists are not worse in health than other people. He explains the evil effects of sewer gas by the presence of organic germs,—organic vapour, as he calls it, which sows the seeds of disease, and is at present undetected by chemical analysis. This, of course, is another application of Professor Tyndal's now well-known theory. Looking at the matter in this way, the author is, no doubt, right in assuming that the sense of smell affords a very uncertain criterion as to whether a house is or is not healthy and properly drained. Nevertheless, we hold to our old opinion that a bad smell is a warning of danger.

It would be interesting to find any fresh light or experience from American practice in regard to the removal of excreta and the provision for adequate trapping in connexion with water-closets, or any of the other arrangements that have been proposed in substitution for them; but here we find the author pretty much where we are ourselves. He recommends iron for soil-pipes in place of lead, but chiefly for economical reasons, holding that lead soil-pipes should be thicker than they are usually made, but that in that case they become heavier and more costly than an equally efficient iron pipe. He admits, however, that he has seen much harm arise from unsatisfactory jointing of iron pipes,—a matter which it is very difficult for an architect, or even a contractor's foreman, always to see to, and which we should be sorry to leave to the care and conscience of the average workman. In regard to closet-traps, we find the now nearly universal opinion as to the untrustworthy character of the ordinary water-seal repeated. He gives (p. 81) a section of a trap which he recommends as more impervious than the most usual forms of S-trap, and not liable to be drawn by syphoning, and it would probably have these qualities, but it also appears to be a form very liable to detain fœcal matter unless served with an unusually strong flush of water. On the whole, however, our American coadjutor is in favour of the water-closet against any other system yet advanced; strongly recommending, however, simplicity of construction and action as one of the most important qualifications of a closet-apparatus. The proposal for the adoption in houses of the "ship's-closet" apparatus, where the removal of the contents of the pan and its subsequent flushing are effected under pressure by the up-and-down stroke of a piston, may be worth consideration: the apparatus has the advantage of acting very directly and forcibly both in emptying and flushing. The author draws attention repeatedly to a source of nuisance in closet-traps which is not thought of or contended against so much as it ought to be, that, namely, which arises from the detention and accumulation of matter on the sides or in the bottom of the trap. Even if the water-seal be sufficient to check (under proper ventilation) all in-draught from the drains, there can hardly be purity of air in the closet when the trap itself, which is intended as the safeguard, is tainted with foul matter. This is just the radical difficulty of the S-trap system; if shallow, the water is hardly a sufficient seal; if deeper, there is additional difficulty in keeping the trap unfouled, and making the flush effective.

It appears from the chapter on Service Pipes that considerable experiment has been made in America in regard to finding a satisfactory substitute for lead for this purpose. The author thinks there is a great deal to be said for iron piping, the only real objection to it being the liability to internal rust to such an extent as to require too frequent replacement. In regard to sanitary conditions, it was found, in the only case in which the author was able to observe the results of an iron-pipe supply over some years, that not the slightest ill effect was caused upon the water. This was in the case of Swarthmore College, Delaware County. "Water was introduced into the college building through iron pipes in 1869, and from that time till March, 1875, at which date my inquiries were made, they had required and received no attention or repairs. In February, 1875, some changes were necessary, and a piece was cut out of one of the pipes which had been in constant use for six years. Its original diameter of bore, —1½ in.,—had been reduced to about 1 in. by the accumulation of rust on the interior surface. At my request, the respected president of the institution, Professor Magill, caused a series of analyses to be made to determine the chemical effects of the iron on the water. Samples were taken from the spring and drawn from the cocks inside the building, and the latter were found very pure, containing no trace of organic matter. The most remarkable fact was that the percentage of iron in the water taken from the cocks was only about two-fifths of that found in the water taken directly from the spring. This was established by repeated determinations, and the fact cannot be doubted that the passage of the water through iron pipes had caused it to deposit three-fifths of the iron it had previously held in solution." Still the rusting up of the pipe is of course a serious practical objection. Of the various methods that have been attempted to provide a satisfactorily lined iron pipe, the author recommends as the best that which is formed by placing a thin tin pipe of slightly smaller diameter within the bore of the iron pipe, and then expanding it under powerful hydraulic pressure till it clings to the interior of the iron pipe, adjusting itself to all irregularities in the latter, which, in fact, form a key for the tin lining. This the author recommends as "the best pipe for water conveyance ever made." It appears that glass-lined iron pipes have been tried in America. They are, as one might expect, troublesome in fixing, owing to the brittle character of the lining, and are likely also to give considerable trouble if allowed to freeze; though, on the other hand, "I am informed," says Mr. Williams, "that water in glass-lined pipes will bear exposure to a temperature 14° Fahr. below that which would freeze water in lead pipes": an important quality, certainly. Anything that would help to preserve us from the nearly annual epidemic of pipe-bursting in frosts would be a great boon.

We must pass over the long and full chapters on the hydraulics and the chemistry of plumbing; but those on drainage and water-supply to country houses are of interest to English readers as affording some information on the state of sanitation in country districts in the States. This seems to be very backward, and the author leads us to conclude that outdoor privies may be found in connexion with country residences of a good class (not, we presume, among the more recently erected) of such a type as in England would only be found in the cottage yards of a poor village, or on a very neglected estate. For country districts earth-closets have the author's recommendation, and in fact are in many localities the only possible alternative to the privy. It appears, however, that "the common method of draining country-houses of the better class in the United States is into stone or brick cesspools"; nor is the author prepared to advocate their abolition, but only to insist on their proper construction; namely, that they should be perfectly tight, that they should be so small as to necessitate their being emptied every few weeks (by means of a suitable pump fixed for the purpose), and that they should have efficient ventilation to relieve the drains from pressure of gas. An illustration is given (p. 277) of a form of ventilator that has been found to answer well, consisting of a kind of wooden cupboard, about the shape and general appearance of a sentry-box, but with closed sides and a louvre opening under the cover, placed over an opening in the stone cover of the cesspool: within this are successive shelves bearing charcoal, between and over which the gas from the cesspool passes in finding its way out.

The supply of water to isolated country-houses is often a matter of considerable difficulty, mechanically speaking. Our author, however, wishes his readers to lay stress on the importance, not only of having a convenient and economical method of supply, but of paying more attention to the natnre of the source whence the supply is drawn. It would seem that, in country-houses in the States, this is not unfrequently quite neglected, as if any water that came out of the ground from natural sources must be healthy. "It is a well-established fact that, since the introduction of aqueduct water into large cities, typhoid and many other fevers,—resulting, among other causes, from water-poisoning,—have become more common in the country than in cities." An instance is mentioned in which a family "of refined tastes" were for years content to draw all the water they used for drinking and cooking from a spring choked with rank weeds and mosses, full of reptile life, and lying in the middle of a foul mud-bed, kept soft by the con-

stant tramping of horses and cattle which were allowed free access to it. They had never given the condition of the spring a minute's thought; and even when diphtheria broke out among the children in consequence, it was difficult to persuade them of the necessity for reform. In the great and only partially explored geological formations of America, it is probably much more difficult to know where good water may be reckoned on than it is with us. Many abundant natural water-supplies in newly-inhabited localities have proved utterly delusive as to the character of the water. The author remarks:—"I have seen and drunk very wholesome and satisfactory water,—notably, that drawn from the juniper swamps of Virginia,—which one not accustomed to it would hesitate to taste; and I have also seen water drawn from deep wells,—cool, clear, and sparkling,—which was the means of poisoning many people, some of them fatally, and which no one could drink with impunity." Concerning the mechanical means of lifting the water from the source of supply to the house, in the case of a country residence, little or nothing is said. In England we are rather "expecting" in that way, and divers patent contrivances, self-acting and otherwise, have been offered to the public. The author's chapter on "the plumber and his work," not ill-natured, though sarcastic, might be read with advantage by plumbers on both sides of the Atlantic.

Handbook for England and Wales, Alphabetically arranged for the Use of Travellers. With an Outline Map. London: John Murray. 1878.

HAVING filled a library with detailed handbooks for England and Wales, Mr. Murray has had them all boiled down or submitted to the hydraulic press, and now issues one little red volume, which contains the result. The editor, however, claims that he has visited nearly every county, and has verified or corrected, either by himself or others, the information given. The alphabetical arrangement has been wisely adopted, and we unhesitatingly commend it to tourists as the most compendious and accessible guide to England and Wales that can anywhere be found.

Miscellanea.

A Railway up Vesuvius.—This seems to be now seriously intended. Plans submitted by the banker, M. Oblieght, have been approved by the Department of Public Works, and the necessary "concession" has been made by the Prefecture of Naples. The carriages on this railway will be drawn, not by a locomotive engine, but by a wire rope. The line will be double. The rails will be laid on an iron framework supported by pillars, also of iron. The pillars will be a little over six yards and a half apart. According to the report upon the plans, it appears that the length of the railway up the mountain will be about 919 yards. The station near the summit will be 420 mètres (nearly 460 yards) higher than that at the foot of the mountain, which gives the very steep gradient of one in two. The traffic will be carried on by eight carriages, each having room for four persons; these will be so distributed that while four are engaged in making the ascent, the remaining four will be descending the mountain. The carriages will be kept 210 mètres (nearly 230 yards) apart from one another. To guard against accidents, each carriage will be fitted with two newly-patented automatic brakes, which, should the rope happen to break, will instantly stop the carriage. The whole machinery will be set in motion by two steam-engines of twelve-horse power each. How long will the wire rope last under such conditions? A wire cord with which we once suspended a bird-cage over a pulley, raised and lowered only two or three times a day, frayed and broke, and was useless in a singularly short time.

Kirkintilloch Gasworks.—The following award has been issued by the arbiters in the submission between the Police Commissioners and the Gas Company of Kirkintilloch:—The works are to be taken over as at the 15th of May last; the Company are to have right to all outstanding debts, and are to pay all outstanding liabilities as at that date; the price to be paid is 14,000*l.*, which includes the gas reserve fund, which amounts to about 1,300*l.*; and interest is to run at the rate of 5 per cent. from the 15th of May last.

The International Meeting of Printers, Paris.—The September number of the *Printing Times and Lithographer* contains an interesting report of the proceedings at the International Banquet given at the Grand Hotel. Our connexion of long-standing with the house of Wyman & Sons shall not prevent us from complimenting Mr. Charles W. H. Wyman on the part played by him on that occasion. He referred eloquently to the meeting as being the first friendly reunion, at an international banquet, of the printers of the Old World and the New. He believed that the future would exhibit a closer relationship between printers everywhere. In these times it was almost impossible to strike out a new idea, yet to Herr Goebel belonged the merit of having proposed, what France had so successfully carried out on the present occasion, the first international meeting of printers which had ever been held. He regarded it as a fact of great interest and significance in the annals of printing, and one which should make every one present conscious of assisting on a great historical occasion. The meeting showed by their applause how fully they agreed with him.

Cornish Antiquities.—An interesting discovery of antiquities is reported to have been made at St. Just, near Penzance, during the past few days. On the summit of some land which rises immediately from the edge of Berthnal Cliff, St. Just, Mr. W. C. Borlase, F.S.A., discovered a pile of surface stones, which appeared to him to be a cairn of the same description as others in the neighbourhood, but of unusually large size. On driving in a level from the north-east side a wall was soon reached, 11 ft. in height, built of solid dry masonry, and sloping inwards as it reached the top, in the manner of a beehive. This proved to be part of a circle, 30 ft. in diameter at the top, where the cone had been truncated, and not less than 40 ft. or 50 ft. in diameter at the base. On cutting through the outer wall, at a height of 5 ft. from the solid ground on which it was built, a second wall, similarly constructed, was discovered, placed concentrically with the outer wall, at a distance of 5 ft. 6 in. within it. The whole of this structure, when perfect, cannot have been less than 18 ft. or 20 ft. high, and by the quantity of *débris* found around it may have been entirely covered in by a pile of stones.

South Willingham Church, Wragby, Lincolnshire.—A turret-clock, showing time on four dials, has just been fitted in the tower of this church. Its manufacture was entrusted to Mr. J. W. Benson, of Ludgate-hill. The clock strikes the hours, and a blow at the half, upon the tenor bell, weighing 13 cwt. The whole of the wheels are of hard brass, the main wheel measuring 12 in. diameter, and ¼ in. thick. As usual with most clocks made by this firm, the escapement is a Graham's dead beat. The pendulum is 7 ft. long, and beats 1½ second, with a bob weighing 1¼ cwt. The entire weights for working this clock are about 3½ cwt.

The Platt Monument, Oldham.—On Saturday a monument to the late John Platt, M.P. for Oldham, was unveiled by his widow in front of the Town-hall. Mr. Platt was member for Oldham from 1865 to 1872, and head of the machine firm of Platt Brothers & Co. This firm, which at the time that Mr. Platt joined his father as partner employed only 400 hands, employed in 1872 between 7,000 and 8,000, and is still increasing, although the present commercial depression is producing slackness at the works. The monument, which consists of a statue in bronze, is the work of Mr. D. W. Stevenson, Edinburgh, and cost 3,000 guineas.

Giving Trouble.—The secretary of the Hampton Court Gas Company has informed some of the candidates for the office of Collector to the Company, salary 150*l.* per annum, that over 1,800 applications have been made, the "great majority of which, *primâ facie*, indicate adaptability for the post." It seems to us that to advertise for candidates for such a post as this, the qualifications for which are universally possessed, is little short of reprehensible, serving simply to give profitless trouble to a large number of persons.

Accident in a Church.—An accident happened in Bedminster Old Church, Bristol, which is undergoing cleaning and redecorating. While the contractor, Mr. Manning, and three workmen were engaged over the chancel arch the scaffolding gave way, and the four men fell about 40 ft. Mr. Manning, it is feared, has sustained concussion of the brain.

Elgin.—The operative masons in Elgin are at present on strike, in consequence of a resolution of the employers to reduce the wages a halfpenny per hour. The men, it is stated, do not object so much to the reduction itself as to the breach of the agreement which has taken place. They say that three months' notice of any reduction should have been given; whereas one week's previous notice only on this occasion was made.

Chingford Railway Station.—On the 13th inst. the *employés* of Mr. T. D. Ridley, contractor for the new Chingford Railway Station, had a dinner at the "Bull and Crown," Chingford, in commemoration of the erection of the station, and extension of the line from the old temporary station.

Engineering.—Mr. J. H. Taylor, of Buxton, has been appointed resident engineer for the completion of the new reservoir for the Buxton Local Board, and he has also been appointed engineer for the intended reservoir to supply the district of the Local Board of Fairfield.

TENDERS

For the alterations and redecoration of No. 27, Sussex-place, Regent's Park, and rebuilding stables in the rear. Mr. F. W. Hunt, architect:—

Phillips & Son	£2,545	0	0
Simpson & Son	2,445	0	0
Bywaters	2,270	0	0
Philps & Bisiker	2,258	0	0
Blyth	2,247	5	0
Clark & Bracher	2,058	0	0

For alterations at the Brandon Arms, Brixton, for Mr. F. Garner. Mr. Edward Brown, architect:—

Miller	£463	0	0
Kiddle & Son	315	0	0
Marr (accepted)	3 9	0	0
Palmer	295	0	0

For alterations at the Sugar Loaf, Great Hermitage-street, Wapping, for Mr. N. Argent. Mr. Edward Brown, architect:—

Stamp & Bowtle	£459	0	0
Marr	438	0	0
Salt (accepted)	395	0	0

For the erection of a villa residence in Romford-road, West Ham, Essex, for Mr. G. Roberts. Mr. Edward Brown, architect. Quantities supplied:—

Outhwaite & Son	£1,955	0	0
Norton	1,9 0	0	0
Kiddle & Son	1,892	0	0
Marr (accepted)	1,881	0	0

For alterations at the Weavers' Arms, Pelham-street, Mile-end New Town, for Mr. F. Garner. Mr. Edward Brown, architect:—

Kiddle & Son	£835	0	0
Marr	697	0	0
Allard (accepted)	560	0	0

For villa residence, Romford-road, for Mr. George Roberts. Mr. Edward Brown, architect:—

Marr (accepted)	£1,881	0	0

For repairs to the Marylebone Stores, Paradise-street, High-street, Marylebone, for Messrs. Hanbury & Co. Mr. Edward Brown, architect:—

Salt	£238	0	0
Marr	192	0	0
Palmer	185	0	0

For alterations at the Marlborough Head, Pelham-street, for Mr. F. Garner. Mr. Edward Brown, architect:—

Marr	£485	0	0
Kiddle & Son (accepted)	375	0	0

For building seven shops and warehouses in Jewin-street and crescent, on site of Wesleyan chapel. Messrs. Ford & Hesketh, architects:—

Kirk & Randall	£11,640	0	0
Mark	11,644	0	0
Downs & Co.	10,637	0	0
Conder	10,370	0	0
Peto, Brothers	10,328	0	0
Browne & Robinson	10,292	0	0
Scrivener & Co.	10,261	0	0
Killby	10,219	0	0
Braid	10,148	0	0
Crabb	10,100	0	0
Ashby, Brothers	10,096	0	0

For rebuilding the Rainbow Tavern, Liverpool-road, Islington, for Messrs. Watney & Co. Mr. H. J. Newton, architect. Quantities supplied by Messrs. Lamb & Church:—

Grimwood & Sons	£3,970	0	0
Godden	3,897	0	0
Hockley	3,820	0	0
Dove, Brothers	3,775	0	0
Axford	3,625	0	0
Lamble (accepted)	3,420	0	0

For rebuilding the Artichoke public-house, Lower Marsh, Lambeth, for Messrs. Watney & Co. Mr. H. J. Newton, architect. Quantities supplied by Mr. H. W. Budd:—

Grimwood & Sons	£2,730	0	0
Godden	2,677	0	0
Lamble	2,627	0	0
Dove, Brothers	2,575	0	0
Hockley	2,390	0	0
Ainley	2,187	0	0

For alterations at the Catherine Wheel public-house, Little St. James street, for Messrs. Watney & Co. Mr. H. J. Newton, architect:—

Grimwood & Sons	£698	0	0
Godden	667	0	0
Lamble	645	0	0
Hockley (accepted)	625	0	0

For laundry buildings at the Workhouse, Bethnal-green. Messrs. A. & C. Harston, architects. Quantities supplied :—

Sampson & Parrish	£3,100 0 0
Gough	2,898 0 0
Hearle & Son	2,856 0 0
Heiser	2,847 0 0
Crockett	2,795 0 0
Josolyne	2,684 0 0
Sawyer	2,594 0 0
Shurmur	2,583 0 0
Palmer	2,545 0 0
Parker & Evans	2,485 0 0
Wise	2,460 0 0
Johnson (accepted)	2,368 0 0

For new premises at Greenwich, for Messrs. Merryweather & Son :—

Sheffield & Prebble	£4,815 0 0
Lark	4,812 0 0
Harris & Woodrop	4,631 0 0
Kirk & Randall	4,326 0 0
Hobson	4,198 0 0
Downs & Co.	4,030 0 0
Jerrard	3,963 0 0

For block of warehouses, St. John-street, Smithfield. Mr. Ben. Tabberer, architect :—

Dickson	£12,995 0 0
Lane	12,993 0 0
Conder	11,480 0 0
Rider	11,488 0 0
Downs	11,450 0 0
Braid	11,400 0 0
Browne & Robinson	11,308 0 0
Mark	11,193 0 0
Merritt & Ashby	11,125 0 0
Lawrence	10,975 0 0
Sabey	10,880 0 0
Crabb (accepted)	10,685 0 0

For new factory, Chicksand-street, E., for Messrs. Noakes & Sons. Mr. James Tolley, architect :—

Marr (accepted)	£1,594 0 0

For rebuilding the Well and Bucket public-house, Bethnal Green-road, for Messrs. Truman, Hanbury, & Buxton :—

Marr (accepted)	£2,927 0 0

For completion of a villa residence in Camfield-road, Kilburn, for Mr. T. Yeo. Mr. Banister Fletcher, architect :—

Turner	£1,269 15 0
Butcher	1,091 16 9
Prout	973 0 0
Hobern	953 0 0
Whiteman	755 0 0

For No. 1 block of model residences at Trafalgar-square, Mile-end-road, for Mr. W. Nicholson. Mr. Banister Fletcher, architect :—

		Credit old materials.
Castle, Brothers	£1,860	£50 0 0
Price	1,635	115 0 0
Hobern	1,525	100 0 0

For the erection of a new steam laundry and premises, for the Camden Steam Laundry Company in York-road, King's-cross. Messrs. Thomas Bradford & Co., engineers :—

Colls & Sons	£9,825 0 0
Nightingale	9,162 0 0
Bangs & Co.	8,750 0 0
Gammon & Son	8,600 0 0
Downs & Co.	8,530 0 0
Merritt & Ashby	8,44[illegible] 0 0
Mowlem & Co.	8,197 0 0

For the erection of three houses and shops, Nos. 137, 139, and 141, High-street, Poplar, for Mr. Thomas Rugg. Mr. E. C. Homer, architect :—

Staines & Son	£1,622 0 0
Boyce	1,577 0 0
Shurmur	1,495 0 0
Harper	1,475 0 0
Judd & Hawkings	1,397 0 0
Reddall	1,350 0 0
Alexander	1,349 0 0
Johnson	1,333 0 0
Sheffield & Prebble	1,287 0 0

For Public Baths at Aberystwith. First contract for swimming-baths only. Messrs. Wilson, Son, & Aldwinckle, architects :—

Fisher	£3,618 0 0
L. & J. Evans (accepted)	3,383 10 0
Rees	3,389 0 0

For laundry and boiler-house at Bethnal-green, for the Guardians of Bethnal-green. Messrs. A. & C. Harston, architects :—

Sansom & Parrish	£3,100 0 0
Goff	2,898 0 0
Earl	2,856 0 0
Izar	2,847 0 0
Crockett	2,795 0 0
Joslin	2,684 0 0
Sawyer	2,594 0 0
Shurmur	2,583 0 0
Palmer	2,545 0 0
Parker & Evans	2,485 0 0
Wyse	2,450 0 0
Johnson	2,368 0 0

For repairs, &c., at the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road. Mr. W. F. Potter, architect :—

Herse	£242 18 0
Pritchard	200 0 0
Hayworth	158 10 0
Butler (accepted)	138 0 0

For the erection of a pair of detached residences on the London Foresters' Asylum estate, Bexley Heath, Kent. Quantities by Mr. C. R. Griffiths. Mr. W. F. Potter, architect :—

Payne & Balding	£3,870 0 0
Woodward	2,399 0 0
Ayers (too late)	1,995 0 0

As the amounts exceed the expectations of the Committee, the matter is deferred for the present.

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The Builder.

VOL. XXXVI. No. 1860. SATURDAY, SEPTEMBER 28, 1878

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Fireplace by Messrs. Verity Brothers (designed by Mr. W. F. Randall), for which a Medal was awarded at the Paris Exhibition (Separate Plate).

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Edinburgh City Improvements.

BY the Edinburgh Improvement Act, 1867, certain trustees were appointed, who were authorised to impose a tax not exceeding 4d. in the pound for a period of twenty years, and to borrow on the security of the assessment a total sum of 350,000*l.* At the 1st of August, 1877, the total expenditure was 442,621*l.* 18s. 6d.; receipts, 265,599*l.* 18s. 5d.; unrecovered outlay, 177,022*l.* 0s. 3d.; amount at credit of Sinking Fund account, 6,752*l.* 14s. 10d.

Now that the labours of the Trust are drawing to a close, we take the opportunity of reviewing the scheme of improvement, and the manner in which it has been carried out. But it will be desirable at the outset to take a glance at the physical and artificial features of the scene of operations.

The original city of Edinburgh occupied a ridge of ground of about a mile in length, having at its highest or western point, the rock upon which stands the castle, and at its eastern or lowest extremity the Palace of Holyrood. This ridge is bounded on the north by a valley formerly filled with water, and called the Nor Loch, but which is now converted into public gardens through the centre of which runs the North British Railway. The valley to the south is occupied by a narrow street, running along its whole length, called the Cowgate. This old town was fortified and encompassed by a wall, a necessary precaution against the frequent incursions from beyond the Border.

The main street from the castle to the palace is broad and spacious, and the houses on either hand are unusually high. Many of these tenements formed the residences of the ancient nobility and gentry of Scotland, and behind them were gardens running down the slopes to the valleys on either side. As the population increased, the house accommodation within the walls became insafficient, and as the existing tenements had reached the maximum of height, the gardens behind were resorted to as building sites. The practice adopted generally was to form an arch right through the ground-floor, and upon either side of the garden ground to erect lines of new buildings having a narrow passage or close between. So narrow were some of these closes that conversation could be easily carried on between opposite neighbours, and into the recesses of some of them the sun could not penetrate.

When quieter times ensued, and the citizens ventured to build outside the walls, the old town was gradually deserted by the upper classes, and the dwellings were let to an inferior class of tenants. To meet the requirements of the new tenants, the old houses were divided and subdivided, and it became no uncommon thing for a family in the lowest state of destitution to be the occupants of a room enriched with a panelled ceiling, and a mantel-piece exhibiting the relics of heraldic devices. The sanitary condition produced by the crowding of numerous families into closely-compacted houses unprovided with the necessary appliances can be readily conceived, and to mitigate this evil was the principal object of the formation of the Trust, and at the same time to open up new lines of communication.

The improvements were not only intended to be such in a sanitary and utilitarian point of view, but were also to be so in an æsthetic sense; and the more effectually to carry out that purpose, the late Mr. David Cousin and Mr. John Lessels were appointed joint architects to the Trust.

The first scene of operations was upon one of the most wretched slums in the city, St. Mary's-wynd, the Rag Fair of Edinburgh. It was a very narrow and stifling ally, to navigate the intricacies of which required some amount of courage. You could not help coming in contact with cast-off apparel of all kinds, you were apt to knock down a pile of old boots, to stumble over a dilapidated armchair, or to overthrow a pyramid of pots and pans. If decently attired, you were looked upon as an unwelcome intruder or importuned to purchase an example of the old masters (?). St. Mary's-wynd is a thing of the past, and St. Mary's-street is a spacious thoroughfare, presenting on one side at least a handsome façade in the Scottish domestic style, which displays a picturesque variety of outline and detail. The west side of the street, with the exception of its southern angle, has been left in its original state, in the expectation that in course of time it will be treated by the proprietors in a similar manner to the other.

A short distance to the west of this was Blackfriars-wynd, which has been treated in the same manner as St. Mary's-wynd, but in this instance the result is not so satisfactory, owing to a difference between the levels of the footways on either side. The footway on the west side is so much below the level of the street as to necessitate its being fenced off from the roadway by an open railing. The street has thus a decided look of incompleteness, and the buildings preserved are of the poorest description, and seem as if ashamed to face the light of day. It would have been better for all concerned had they been entirely cleared off, but the authorities were actuated by economical motives, and looked to the probability of this being done by private enterprise; but there are so many conflicting interests that combined action is difficult, a single tenement belonging generally to several proprietors. Behind these old houses an extensive area has been cleared, between Cant's and Dickson's closes, thus opening them on both sides, and greatly enhancing the value of the sites. Altogether it seems to have been a short-sighted policy which left one side of a street in its original state, and always has been found so.

St. Mary's-street is in a direct line with the Pleasance, which, with its continuations, runs due southwards till it meets the open country. To render this thoroughfare more completely available, it was deemed necessary to continue it in a north-westerly direction to the Waverley Station. This has been done by forming a roadway which takes a semicircular sweep from the head of the Canongate, behind John Knox's Church, onwards to the south end of the North Bridge. The south end, and the whole of the west side of Leith-wynd, have disappeared in these operations, and the north ends of several closes have been opened up. One large tenement, designated the "Happy Land," the haunt of the most abandoned characters, has disappeared, amongst the rest, and upon its site now stands one of the fine schools erected for the School Board, *sic itur ad astra*. The fall of the ground from the Canongate to the lower level at the north-west is about 27 ft.; and as the ground slopes rapidly to the north, it was necessary to form a viaduct, the arches of which have been left free towards the railway, to be made available for storage, and the south side only is to be built upon. The new street has been called Jeffrey-street, and is still incomplete; at its upper or southern end it has been occupied by shops and tenements designed by the architects of the Trust. About half-way down the decline stands the new Trinity College Church, designed by Mr. Lessels, and beside it is a large and picturesquely-treated warehouse, from the designs of the late Mr. John Paterson, architect. Other sites have been taken, one of them for a new Episcopal church, which has been entrusted to Mr. Robert Anderson, architect.

The next scene of the operations of the Trust was a confused and confined mass of buildings to the north of the University. The clearing away of these left a large and valuable area available, and this it was resolved should be set apart for a superior class of buildings to those hitherto contemplated. A feuing plan was accordingly prepared by Mr. Cousin, showing a thoroughfare 80 ft. in width, and elevations of a highly ornate Renaissance character. The new street was designated Chambers-street, in compliment to the then chief magistrate of the city,

to whose exertions the carrying out of the scheme is mainly owing. The south side of the street is almost entirely occupied by the lengthy side, façades of the University and the front of the Museum of Science and Art, but a short space at its western extremity is still occupied by some unsightly tenements, which, through a shortsighted idea of economy, were not acquired, and they are now worth three or four times what they might have been got for at first. The new line of buildings is divided by openings into four blocks, and each of these Mr. Cousin has treated in a different manner. The ground-floors of the two easternmost blocks are appropriated to shops, but in the other two blocks no provision is made for such. All the sites, with one exception, have been appropriated, but unfortunately the requirements of the parties who acquired them have not, in every case, been compatible with the elevations prepared. The first deviation from the plans was occasioned by the acquisition of one of the sites for a church, and as the plans for it were not entrusted to the architects of the Trust, there was some disparity of sentiment displayed as to the style of the sacred edifice. It has been erected as designed, and was fully described in these pages. The second deviation from the original plans was on account of a Normal School which is now in progress; it is designed by Mr. David Rhind, and occupies the westernmost angle of the second block, counting from the east. Whilst Mr. Rhind has adhered to the elements of the style adopted by Mr. Cousin, he has deviated therefrom in giving greater height to his elevations, and by breaking up the skyline by Mansard roofs; this is not done in the rest of the block, which shows a line of dormer windows. Between the two westernmost blocks there is a vacant space which abuts upon the works of a brewery, and, as a sufficient depth for building sites at this point could not be secured unless at a great outlay, the buildings behind are to be screened off by an ornamental wall, leaving a semicircular recess towards the street, which will form an appropriate site for a public monument or fountain.

Proceeding further to the south, we find that a new thoroughfare has been opened up between Nicholson-street and Bristo-street. This has been done by the removal of very little property, as the line of the new street (named Marshall-street) embraces two squares, Nicholson-square and Alison-square. The short space between the latter and Bristo-street is now occupied on one side by a handsome Board school, and on the other by two blocks of dwelling-houses and a Baptist chapel of strongly-pronounced Lombardo-Venetian character. This chapel was fully described by us at the date of its completion. A great improvement has been effected here upon the unsightly garden which occupied the centre of Nicholson-square; it has been slightly curtailed to provide for the flow of traffic, the dilapidated railing has been replaced by a new and more substantial one, and the ground laid out in a suitable manner.

A similar improvement to that of Marshall-street has been effected by demolishing a tenement between Davie-street and Simon-square, and opening up Gibb's-entry onwards to the Pleasance. The only new erection on this line is a large warehouse, designed by Messrs. Thornton, Shiells, & Thompson, which displays an effective arrangement of crow-stepped gables and dormers.

The last scene of operations to which we will refer is the Grassmarket, the south-east entrance to which has been considerably widened. This necessitated the removal of a number of very picturesque tenements, which were, however, in the last stage of decay, and the new buildings substituted for them are carried out in the old style, and every way suitable to the locality.

Such are the principal objects embraced in the scheme; but, besides these, open spaces have been cleared in densely-crowded localities, so that sun and air may penetrate, but these clearances are mostly in the rear and out of view of the general public.

The trustees cannot justly be accused of extravagance, but it might be hinted that they have not gone far enough, and have left undone some things that are desirable, and of which the longer they are delayed the greater will be the cost. But it should be kept in view that at the outset powerful opposition was offered to the entire scheme by that portion of the ratepayers who object to the imposition of any tax for whatever purpose.

TRUTH ABOUT "SHAMS."

We printed the week before last a letter from a witty and outspoken correspondent maintaining that all that has been said or sung against the use of shams in art is but a self-delusion, or a shallow pretence on the part of those who have hoisted this anti-sham flag, "that flimsy piece of bunting," as our correspondent called it. Let us, he urged, hear no more about the iniquity of shams, seeing that to sham well or wisely is, in fact, the real object of art.

The frank utterance of such an opinion is only an instance of what we constantly see, that the over-persistent proclaiming of a special truth, or the insisting upon it as the central and chief truth when it is not so, gives rise to a reaction of opinion in favour of the opposite view,—a reaction which is apt almost unavoidably to go too far in the other direction. This is the case with our correspondent "Meter," with whom we are by no means prepared to say that all which has been urged against shams in art by a certain school of critics is mistaken and trivial, or, in fact, that there is not much truth and reality in that crusade, though the zeal of some of the combatants may have carried them too far, and landed them in conclusions which it is at times hard to reconcile with what is called "common sense."

In the first place, in considering what is the real truth, *pro* and *con.*, in the matter, there is a certain confusion of thought or expression to be cleared away, as to what sham in art really means. The view has been put forward that all art is really "shamming nature," or at least that the realistic painting, which has mostly been admired and recommended by those who have also taken up the sword against shams, is so; and that its main end and triumph would consist in imitating nature so closely as to deceive. *Apropos* of this, we may remark in passing that the assertion that Quintin Matsys has ever in this country been placed before Michelangelo or Raffaelle, either for his deceptive painting of a fly or from any other cause, must have been news to most of our readers, and that our friend "Meter" certainly overstated his case in that particular. But what we specially refer to as a confusion of thought is the idea that realistic painting in its wider sense, as the endeavour thoroughly and minutely to represent nature, has anything in common with the kind of thing which has usually been denounced as a sham, such as the endeavour to make a material resemble or mimic another superior or more costly one. The two things are radically different. In the first place, the picture can deceive no one as a whole, because it is necessarily on a smaller scale than nature, and is hung against a wall in a frame; to speak of it, therefore, as if it were an attempt to cheat the eye into the belief that it is really seeing nature through an opening or a window, is absurd. The only kind of picture in which a momentary deception is sometimes possible, and has been occasionally aimed at, is in small representations of objects of still life of the real size; and here, in a general way, it may be said that the object is mimicry; but then no one thinks of giving such works the highest place in the art of painting, or regarding them as exhibiting the chief aim and achievement of the art. When of the highest degree of ability, they acquire great value and interest as wonderful specimens of what the manipulative art of the painter can do; for *bravura* of executive power in any art is always a fascinating thing, and tends, moreover, to keep up the standard of technical ability, a thing never to be despised, as being the necessary means to the end. But the painter who executes with great care and realism a scene in nature, or a tree or collection of trees, or the tones and curves of the sea in motion, is not endeavouring to cheat our eyes into the belief that the trees or the sea are there. The mere fact that he cannot represent movement on his canvas pulls him up at once in any such attempt, if it ever entered his head. The real motive, even with some very professedly realistic painters of nature who endeavour to give all her detail exactly as they see it (and who, as before observed, are usually among those who make the most open objection to "shams"), is either a feeling that everything in the growth of nature is so interesting and beautiful that it cannot be too carefully studied and painted (if it is painted at all), or a conviction, which we know some exceptionally-gifted painters among us at present really entertain, that the poetic feeling which underlies nature, and is her metaphysical expression, is best and most truly reached by him who gets the outward semblance of her face most fully and truthfully,—a theory against which the only real objection to be urged, though it must be admitted to be a fatal one, is that, except in a very few peculiar cases, such complete imitation of the infinite multiplicity of nature is simply impossible by any finite mind and hand. But even in cases where something like this is possible, we are unable to see how any reasonable criticism can charge the painter with "shamming," except in a sense in which that word never has been used or understood in common parlance. When we come to those broader and freer schools of art which translate or transmute rather than imitate nature, it is obvious that the word is still less applicable. When the countryman stooping over M. Rousseau as he was painting a tree, said, "Why are you making the tree, when it is made already?" he asked a question altogether beside the mark, because the artist was not imitating or "making" the tree except in a very secondary and modified sense; he was interpreting it rather than copying it. So with portraiture, which might be called "shamming" with more show of reason, perhaps, than landscape painting; we, nevertheless, know well enough that the finest portraits are often those which it is least of all possible for one moment to mistake for reality. Artists like Merle and Madrazo aim at deception sometimes, at shamming reality so as almost to deceive the eye: we have seen, for instance, a head of a lady by Merle which, had it been deceptively mounted or framed in any way, it would have been very difficult to tell from a real head without shifting the position of the spectator; but the picture was, comparatively speaking, of little value, and no very critical collector would have allowed it in his gallery. It is obvious, therefore, that "sham," or anything which can be fairly called so, has little or nothing to do with painting as an intellectual art and in its highest forms. The only kind of painting which is really a "sham,"—that is, which is purposely contrived and intended to cheat the eye, is theatrical scene-painting, the objects of which, it is needless to say, are very different from those of the art of painting in the abstract.

But when we turn to the kind of processes which, by those who may be called purists in art, have been denounced as "shams," such as artificial materials, marbling, graining, veneering, and plating, we find the standard by which success is judged in regard to these achievements is radically different. They are deceptions or they are nothing. It is intended that the walnut-grained door should pass for walnut, that the ebonised cabinet should pass for ebony, that the "scag." should pass for marble, and the plated article for solid silver. It is nonsense to say otherwise. Every one who remembers the first production of electrotype, for example, must remember that the very form in which it was recommended in advertisements implied that its great advantage lay in its presenting the appearance of solid gold and silver without the reality and consequent expense. Our critical correspondent inadvertently admitted this in so many words. "The electrotype process has enabled people of moderate means to rejoice in the presence of seeming gold and silver surroundings." Exactly so; and could there be a greater or more decided "snobbery," artistically as well as socially? It might have been possible to put the case better than that; to urge that gold and silver surfaces are sought purely for the beauty of the material, for no doubt this is partly the truth in many cases. But that is not the whole aim. It is unquestionably the fact that the possession of gold and silver plate, on account of the costliness of the materials, has long been associated with a certain social position, a certain degree of wealth and prosperity; and articles made of these metals, on account of their intrinsic value, have been carefully preserved and become heirlooms from generation to generation, and have thus associated with them also a kind of hereditary and historic dignity, which (though it may be overrated) is connected with a more respectable sort of pride—family pride—than that which is based on mere wealth and prosperity. And the real and central object of plated ware, however it may be glossed over, is to sham the possession of valuable "plenishing" of this

kind. The process is done now with a completeness and verisimilitude such as to deceive the eye of most people not learned in Hall-marks. But, for all that, when we discover that a richly designed and ornamented piece of plate is not in substance what it appears to be, is not its dignity, even its beauty, immediately and hopelessly impaired in the eyes of true taste? It is, of course, perfectly true that the art-workmanship which ought to constitute in our eyes the highest value of "the cup and platter," may be nearly as well displayed (not quite) in imitation precious metals as in the real material; it is also true, as we have often urged, that it would argue a better and purer artistic taste among us if, in selecting objects for the adornment of our daily life, we were more particular as to *how* they are made (designed), than as to *what* they are made of. But then that applies to things which are honestly and ostensibly made of the less costly material, and which appeal to artistic judgment only for the pleasure to be derived from their possession. However habit may have accustomed us to overlook the fact, it is certain that the shamming of the more costly material by imitative processes is essentially a vulgarity, and would be felt to be so by all persons of good taste and really refined feeling, if all had time to think about it, and opportunity to gratify their own better judgment. In a great many cases this is not so, and people have to purchase what is set before them in the shops and make the best of it, putting their own private tastes on one side, and taking up with what the judgment of the more vulgar-minded majority has pronounced to be the correct thing. "Thou shalt have silver and gold on thy table, and if it be too costly for thy purse thou shalt sham it"; that is the verdict of modern society, and consequently, on the moment, there is nothing else to be got, for the verdict of the majority rules the manufacturers and dealers. And it may, of course, be added, that for articles that are for table use the mock-silver material is a ready means of insuring a surface which is wholesome and comparatively indestructible by contact with various condiments, which cannot be said of some of the less costly metals. But if we go out of the groove of habit and come to exercise our own unbiassed tastes, would not good taste and "common sense" any day pronounce in favour of an earthenware teapot of good design, and a horn spoon with a little mounting of real silver on it, in place of mock-silver articles of either kind?

And we believe the same feeling holds good, and is perfectly in accordance with "common sense" as well as with æsthetic taste, when we turn to the development of shams on a larger scale, which are more directly connected with architectural adornment. We very well remember the kind of disgusted feeling which found expression among a party of architectural visitors looking over old Northumberland House shortly before its demolition, when it was realised that the pompously described "marble staircase" had not a particle of marble in it; but was all "scag," from floor to ceiling. That is an extreme instance which is a good illustration of the carrying out of sham on a large scale, and in the most complete manner; and we hold that the feeling of annoyance and repulsion which such a proceeding excites in many people, as on the occasion alluded to, is a healthy and sound one, entirely in accordance with common sense. We are met every day, and at every turn, by smaller specimens of sham of the same kind; graining doors and wainscots in imitation of superior woods, &c. This has been said by its apologists to be an imitation of the beauty of nature, and to stand thus on the same level, in regard to the "sham" question, as landscape-painting, or any other imitation of nature. But whatever may be said for it, and without intending to attach too much importance to a comparatively trivial detail, imitation graining at all events cannot be defended on that ground. The highest object of landscape-painting, for example, is to reproduce in us the feeling which nature arouses; the gloom or the brightness, the pathos or the joy of nature; and mere imitation of surface-detail is not necessarily a part of the process; a comparatively rough sketch, in which there is not the faintest pretence to optical illusion, may accomplish it more fully than a finished picture which wants the poetic *afflatus*. But the grain of oak or maple or walnut is not a thing that appeals to our feelings or causes intellectual pleasure of a high order; it is simply a rather richly-marked and elaborate surface which gives a kind of complexion to what otherwise might seem a too dead and blank surface; and the imitation of it must be an imitation, an illusion, or it is nothing.

It does not stand the least on the same footing as paint, because in painting a door we frankly say, "I am not satisfied with the raw colour of the natural material, and I am putting an artificial colour, and perhaps an artificial decoration over it"; but in imitating the grain of a superior wood on a deal panel, what we really say is, "I like the grain of a fine wood, but as I cannot afford the wood, I will take a cheap wood and imitate the marking of the better wood upon it." That is the plain English of it, and without riding the high-horse and making such a thing an infringement of moral principle, we may still fairly ask, is not the feeling and taste which prompts this essentially a vulgar one? And is a man's time well employed (that is another question) in doing this laborious mechanical imitative work, which never answers its end after all? For in this respect graining stands worse than electrotyping; it never does really deceive the eye or thoroughly reproduce the marking of nature: and it may fairly be said that life is too short, and there are too many things better worth doing, to make it desirable that a man should spend the cunning of his hand and eye on work of this kind.

So far, then, we distinctly think that the condemner of shams is in the right, provided only that he does not expend too much and too solemn vaticination upon matters which, after all, are only among the less important questions which affect our life. It is, in fact, the overwrought eloquence and loftiness of moral rebuke which has been poured forth about shams by a section of enthusiasts, which has not unnaturally led some persons to suppose that "common sense" must lie in the opposite direction. But there was at one time a good deal said in condemnation of what was called sham construction, or the concealment of construction in buildings, which did amount to something very like nonsense. A typical enthusiast of the class was Pugin, who built his house with bare stone walls in the interior, denouncing plaster as a sham; and some followers of the school carried the matter so far that they would hardly admit the timbers of their open roofs to be dressed. So far as the mere fact of putting an internal covering on the rough wall, as a more comfortable finish, is concerned, we might almost as well denounce our own skin as a sham, because it conceals the muscles. The fair ground of objection to plaster would be, not that it is a sham, but that it is not the best, most durable, or most pleasant material that can be used for lining a house. A tile lining or an oak wainscot would, no doubt, look more durable, more dignified, and be cleaner and more washable; but then it becomes simply a question of economy of expenditure, sometimes of comfort.

The still larger question in regard to architectural shams, the question which in the most important manner affects architectural design, is whether it is or is not allowable, or good architecture, to put irregular plan into regular design; to make a symmetrical façade for an unsymmetrical arrangement of rooms. At one time it was propounded as a matter of architectural faith, and is still held so by some persons, that no piers and window should be spaced evenly externally unless they naturally came so from the internal division of the plan; and the same principle was to go throughout the building. If everything not built on this principle is to be condemned, there is no question that we should have to condemn nine-tenths of the buildings of the Renaissance period, many of which have been all but universally admired ever since they were built. What we should say is, that it is impossible to draw a hard-and-fast line, and that the sense or nonsense of the thing very much depends upon circumstances. When the discrepancy between exterior design and interior plan is carried beyond a certain point, as for instance in the often-cited case of Blenheim, where the kitchen exactly balances the chapel, every one feels the absurdity at once; but to say that in no circumstances is a symmetrical façade to be made unless what is behind it is in every respect equally symmetrical, seems to be removing from architecture what is really one of her functions,—that of giving a fair and stately aspect to a building which is essentially utilitarian in its objects, so far as plan is concerned. What should be aimed at is to keep the character of the exterior and interior in harmony with each other. The more important a building is in its purposes, the more it approaches being an edifice of state, the more it will tend to take symmetrical forms in plan, because in a such a building there is always room to lay out a plan without economising space by utilising odd angles. If, therefore, the general plan is formal and grandiose in its arrangement, it will fitly allow of a symmetrical architectural treatment, even if the symmetry of design do not in detail exactly coincide. For instance, if we have a row of five windows forming a symmetrical group externally, we are not called upon to break their symmetry, and the consequent stateliness of the external façade, merely to show that they are divided between one room with two windows and another room with three windows: always supposing the two rooms are of nearly equal importance or belong more or less to the same *suite*. On the other hand, to place our symmetrical group of five windows in front of a congeries of small offices, a staircase, and a lavatory snatching light out of the corner of one window, may be pronounced to be bad and "sham" architecture, showing either that the designer has got these features of his plan in the wrong place, or that he has failed to appreciate the general relation between the character of the plan and the character of the exterior, and to understand that while a stately character of plan will bear a stately exterior, a rambling and rabbit-warren plan demands an entirely different architectural treatment.

One word more as illustrating the attitude of what is called "common-sense" towards real and unquestionable architectural sham. St. Paul's Cathedral comes into every discussion of the subject; it was brought into the communication which suggested these remarks. Leaving the dome alone this time, we take the case of the flank design of the nave, with its upper order forming a screen to the Gothic construction behind it. We have several times, when passing St. Paul's in company with some acquaintance who had no connexion with art or architecture, and professed no theories whatever upon such matters, made the practical experiment of directing the attention of such companion to the screen wall, and informing him of its real function, by way of testing the effect of the information upon the average public mind. And we have in every case found that the first surprise at the discovery (for we verily believe not one person in ten thousand who pass the cathedral knows this fact about it) has been followed by an expression of disgust or derision, and that the representative of average public opinion has gone on his way thinking rather less of the metropolitan cathedral than he did before. So much for our experience of the attitude of "common sense" towards sham architecture.

WATER SUPPLY.*

IF not *the* subject, yet may water supply be correctly characterised as one of the subjects which rightly command the most anxious attention of all those concerned in the guardianship of the public health, or the housing of the people. Nor is Mr. Ansted unknown as a writer. His works on "Physical Geography," on the "Elements of Physiography," and on the "Ionian and the Channel Islands," are cited by the publishers of the present work in their list of publications. And on more than one occasion discussions have taken place at the Institution of Civil Engineers on papers drawn up by the same writer.

The announcement, therefore, that "there is a great body of information in existence, justifying an attempt to bring together for the use of practical men an outline of the facts bearing upon water supply, and calculated to suggest important matters for study and application," is one that is calculated to call attention to the book. It is the more needful to point out that the expression "bearing upon water supply" is to be taken with extreme exactitude, as being quite distinct from that which forms the real desideratum of the day,—the facts of the water supply. As to these, the book is chiefly notable as an indication of how very little practical information has as yet been collected on the subject; nor has the reader been helped by proper reference to the best authorities.

* Water and Water Supply: chiefly in reference to the British Isles. By Professor D. T. Ansted, M.A., F.R.S., &c. London: W. H. Allen & Co. 1878.

A writer may do good service who, in a like case, brings industriously together all that is really known. The chief defect of the book in this respect is the almost invariable absence of citation of authority. "Communications made to the Institution of Civil Engineers, the Society of Arts, and other public bodies, concerning the storing, distribution, and flow of water," and evidence given before Parliamentary Committees in reference to public undertakings for water supply, are mentioned in the preface, in addition to the Reports of Royal Commissions, as the sources of this information. As far as we have tracked the writer, he has done himself injustice by this neglect of citation. Much that is taken, and faithfully taken, from the Reports of the Transactions of the Institution of Civil Engineers, and of the Institution of Surveyors, would come before the reader with more weight if the sources were made plain. In many cases fuller quotation would have been preferable to the digest given to the reader; as in the instance of the description of the bore in the Severn, of which an admirable account, given by Mr. Parkes, is to be found in vol. v. of the Transactions of the Civil Engineers. For the lecturer, who expects to be listened to as speaking with Academical authority, or for the merely popular writer, exact citation of authority may be to some extent considered as a matter of taste or of honesty. But for the serious writer, for the man who would produce a standard work on any scientific or historic subject, clear, full, and accurate citation of authority is essential. In the present case, the great bulk of the book consists of a topographical account of the various rivers and streams of the United Kingdom. We have read the book with some care, but have failed to find any clear indication given of the data on which this account is based, or the sources whence it has been taken. Those who are familiar with the ordnance map will conclude that valuable survey to be the source in question; but it is unfair to the readers, as well as to the author, to leave a point of this kind, affecting the very marrow of the book, to be mere matter of guess. In one or two instances in this part of the work, indeed, authorities are quoted, as in the case of the account of the course of the Derwent, from Phillips's "Physical Geography of Yorkshire," but these cases are the exceptions, not the rule.

Togographical lists (although it may be said with some justice that topographical survey is the basis of hydraulic engineering) tell us, however, next to nothing about water-supply. The utmost that can be said of them is, that they may serve as a sort of skeleton for the arrangement of future observations. To know the names and the directions of the courses of the feeders of a given stream is no great step towards a knowledge of its hydraulic character. We want to know the area drained in each case. Still more needful, perhaps, is some idea of the profile of the stream. If measurements of its flow do not yet exist, care should be taken to prevent the reader from coming to the conclusion that he is much the wiser for having placed at his fingers' ends an abstract of this portion of the information which is given by a map. As a step, the summaries may be of use; but they will do mischief if they are regarded as more than a mere preliminary for obtaining full information. As to this, however, Mr. Ansted is not even exclusively negative. He says, as to the lake rainfall, "It would be difficult, if possible, to determine any true mean, nor would the determination be of value for any practical purposes." If this be so, why make any observation? Why write anything about water-supply? We should like to hear the comments of Mr. Bateman or Mr. Symons on this statement. Again, the geology of the several watersheds is a matter essential to be known. Not only does the permeability or impermeability of the soil determine the collection of the unevaporated rain into rivers or torrents, but the lie of the strata will at times carry rain that falls within the physical limits of one watershed to supply the springs of another, as in the instance of the Cotswold Hills.

With regard to the general distribution of the kingdom into natural outfall provinces, indeed, a very important step has been taken. The chief drawback to the very valuable annual reports on British rainfall which we owe to the indomitable energy of Mr. G. J. Symons is the adoption, which at first was, no doubt, very convenient, of registration divisions, "which are almost identical with those adopted by the Registrar-General of England and Scotland," instead of the more available divisions of the outfall basins of the country. District No. 1 of the Registrar-General contains 77,991 acres, and appears, from Mr. Symons's map, to have been adopted as his first registration division. But this small area of ground, important as it is as a matter of density of population, forms but a very unimportant fraction of the watershed basin of the Thames, which covers (including the 997 square miles of the Medway district) 6,160 square miles, as Mr. Ansted cites from Sir Henry James. The rainfall of London is chiefly of meteorological importance as forming a part of the rainfall of the whole Thames basin, a natural district, which is divided over portions of six of the "registration districts" of the Registrar-General.

In considering England as physically divided into natural drainage areas, therefore, Mr. Ansted's book has made a decided advance on the usual method of investigating the water supply question. It would, however, have been a graceful recognition of the service of fellow-labourers in the field of research, and have added materially to the claims of the author of "Water and Water Supply" on public acceptance, if the book had referred to the authority from which this hydrographic division of England was taken. To our own readers the subject is not a new one; although so recently as April, 1876, the very valuable maps of the floods in England in 1875, engraved in vol. xlv. of the Transactions of the Institution of Civil Engineers, give no further indication of the existence of natural hydrographic provinces than is afforded by dotting in some of the most noted crests of the water-sheds. It is true that that the indications there given of the areas flooded on the 21st of July 1875, are calculated to call attention to the basins of the Wash and of the Thames. But the very clear division of England, accompanied with an estimate of the area, population, and rainfall of each province, which is to be found on page 42 of the pamphlet on "National Water Supply," published by the Society of Arts in the present year, should not have been passed over in silence by a writer who adopts with exactitude the principle, and the greater part of the details, there laid down. Mr. Ansted has, indeed, arrived at a total of eight, instead of ten, divisions of England and Wales. It is difficult to understand on what principle he has abandoned the systematic arrangement followed in England when he comes to Wales. Minor questions may always arise in making distributions of this nature. Thus the attribution of the Medway as an affluent of the Thames, of which it only enters the estuary at the Nore, is matter rather of convenience than of principle. In the same way the question may arise whether the Usk, which bears somewhat the same relation to the Severn that the Medway does to the Thames, should be ranked with the former, or with the Welsh coast rivers. But there can be no possible excuse for grouping the southward, westward, and northward flowing rivers of Wales, with the long inland course of the Severn. "The drainage area of the Severn," Mr. Ansted says, "includes three-fourths of Wales and large parts of seven English counties." "The total drainage area is 8,580 square miles, according to the map published in the report of the Rivers Pollution Commission." Why 4,420 square miles more, drained by rivers running directly into the sea, one of which forms at its mouth the noblest harbour to be found in the island, should be added to this great natural province it is difficult to guess. Again, the Dee drains 862 square miles. It issues from the largest lake in Wales, which covers an area of 1,352 acres, at a level of 1,000 ft. above the sea; and it "passes into a noble estuary three miles wide, which, at high water, forms a magnificent arm of the sea, being about six miles wide when it reaches the coast. The length of the course of river is about eighty miles, from Bala lake to the beginning of the estuary, and the length of the estuary is fourteen miles." On what grounds this important river should be ranked as an influent of the Severn, of which the estuary is separated from that of the Dee by the whole length of Wales, may well be thought a puzzle. In the division of England into ten natural outfall districts, the Welsh rivers between Usk and Dee form a congruous group. The Dee itself may be most conveniently grouped with the Mersey, the estuaries being almost confluent. "The rivers that find their way into the sea in the estuary of the Mersey," says Mr. Ansted, "rise, almost without exception, from the dividing range of the Penine Chain. The whole drainage area of the basin is 1,103,520 acres, or 1,724¼ square miles." The division between the basin of the Mersey and that of the Ribble is a natural feature of this part of the country, and the estuary of the Ribble, Morecambe Bay, and the Solway, form a natural hydrographical group. With these imperfections Mr. Ansted reproduces the exact plan of Mr. Conder, which ought to have been acknowledged.

The next step, after the division of outfall districts, which it is necessary to take in order to arrive at the controlling facts of the water supply, has been indicated, rather than taken, by Mr. De Rance, in a paper brought before the Water Supply Congress of May, 1878. This is the division of the water-shed basins into their geological areas, especially with regard to the permeable or impermeable character of the soil. On this latter element depends, as before remarked, the question whether an overflow shall have the character of a stream or of a torrent. Mr. De Rance has drawn up a table, showing across division of England into fourteen river basins and again into fourteen geological systems. But the exactitude which is requisite in order to make this cross division one of practical use is wanting. Thus "various streams and Thames" form one division, containing 9,897 square miles; an arrangement which rather perplexes than enlightens the inquiry into the geology of the 6,000 miles of Thames basin. Again, the oolites are grouped together, as covering 6,671 square miles, without distinction of the four grades of permeable, partly permeable, impermeable, and wholly impermeable, which are given as the respective characters of the great and inferior oolites, the forest marble, the Kimmeridge clay, and the fuller's earth, strata, which together make up the oolite system. Thus, again, the Witham and the Ouse run over a district comprising 3,700 miles of oolitic strata. But from the mere statement of that fact, without distinguishing the permeable from the impermeable beds, but little information is given to the hydraulic engineer.

Mr. Ansted has pursued into minute detail the subject of the analysis of water from different sources. As to this it must be matter of satisfaction to those who would steer an even course between absence of chemical knowledge and absence of common sense to find that the indefensible heading of "previous pollution" is now disappearing from official returns. In the nitrogen existing in water in the form of nitrates and nitrites, Dr. Frankland has imagined that he can detect the evidence of a "previous contamination by sewage," taking as his datum the quantity of nitrogen present in 100,000 parts of raw London sewage. This he calls the determination of previous sewage contamination. Mr. Ansted certainly confronts Dr. Frankland with the irresistible weapon of the *reductio ad absurdum*, and shows that if the theory of previous contamination be accepted, no water will be safe for human dietetic purposes that has not been distilled. The Dover Beck, which enters the Trent a few miles below Nottingham, rises "in very strong springs, yielding from two to three million gallons per day from the pebble conglomerate of the Bunter, or lower part of the new red sandstone. The water, except during floods from heavy rains, receives scarcely any accretions from surface drainage, both the soil and rock being exceedingly porous." It seems incredible to find it stated that, according to Dr. Frankland's analysis, this water is represented as indicating 3,038 grains per gallon of previous sewage contamination. This represents the statement that more than one-twenty-fourth part of the whole volume of the brook was formerly sewage! The entire population of the watershed, according to the census of 1861, was only 391 persons. If we turn to p. 310, under the head of the Basin of the Trent, we find that the course of the Dover Beck is ten miles, and that the area of its watershed basin is 17,981 acres. "There is no evidence [p. 30] that the district was ever more peopled than it is at present." As the density of the population over the basin in question is thus about one soul to 45 acres, it would be difficult to contrive a more absolute disproof of the value of Dr. Frankland's theory. "Previous sewage contamination," says Mr. Ansted, "if a fact, renders analysis useless. It will be observed that the estimate and statement of what has been described by Dr. Frankland as

'previous sewage contamination,' have no real reference to the quality of the water, and that the chemical examination of waters had better be left alone altogether if, as he states, in those samples that contain even the strongest indication of so unpleasant an early history, all calculable and discoverable danger has disappeared; while, on the other hand, those which contain little do so only because,—although really not less dangerous,—they have had the evidence of their danger destroyed."

"The analysis of water, and the various means adopted by chemists to determine, not only the actual elements in their various proportions, but the combinations presumed to exist in solution, is a matter for chemists to determine, and does not," says Mr. Ansted, "at all belong to the plan of the present work." In chapter L, however, our author enters into the very important question of the purification of polluted river water by exposure to air. On this point authorities differ. Dr. Frankland maintains that the waters of polluted rivers are "not rendered potable and safe by any mere exposure to the air present in water." The late Dr. Letheby, on the contrary, remarked "that ordinary London sewage containing 100 grains of solid matter to the gallon, of which 14 or 15 grains are organic, mixing with twenty times its bulk of ordinary river water, and flowing a dozen miles, contains no quantity of sewage discovered by any reliable chemical process." The late Professor Miller, of King's College London, took specimens of Thames water in 1859 at Kingston, at Hammersmith, at Somerset House, at Greenwich, at Woolwich, and at Erith, on the same day, and examined the quantity of oxygen in each. At Kingston it was the ordinary and normal proportion usual in Thames water; at Somerset House the proportion was much diminished; at Greenwich the whole of the oxygen had disappeared; but at Erith the water was already much improved.

The most novel contribution made to this conflict of opinion is one of which we shall gladly hear more. "Dr. Tidy has recently made a series of laboratory experiments on the rate of oxidation of disturbed sewage water, and is still pursuing these important investigations. I am informed by him," says Mr. Ansted, "that at the present time his results prove that when water containing one pint of ordinary London sewage added to twenty parts of water was allowed to fall slowly from a height of 17 ft. in five minutes and a half through the air a certain number of times the result was as follows:—

	Grains.
Oxygen required to oxidise organic matter in dilute sewage at commencement of experiment	1·563
After 10 falls, oxygen required	1·120
„ 20 „ „ „	0·820
„ 30 „ „ „	0·633
„ 40 „ „ „	0·486
„ 50 „ „ „	0·352"

We confess our inability to understand how water can be "allowed to fall slowly from a height of 17 ft. in five minutes and a half through the air." Still it is clear that some actual experiments are alluded to; the result being, as we take it, that organic matter contained in water is oxidised when that water is allowed to pass through the atmosphere in a jet, and that at a rate represented by the figures given. We should be glad to have an intelligible account of the experiments in question. It does not follow that if a dribble or a jet of water is rapidly acted upon by the air that a volume of water flowing in a pipe, or in a channel exposed at the surface, would be acted upon in the same way. The distribution of the effluent water in the form of a more or less minutely divided spray would be likely to have a powerful effect upon its quality. Results thus arrived at might throw light on the question of the oxidising that occurs in river-flow, especially if weirs are introduced. On the other hand, they might prove to be regulated by such conditions as to render comparison unavailing. Mr. Ansted expressed the hope that he should be able to insert an account of the further experiments of Dr. Tidy in an appendix. This has not been done, and we can only regret that, as the subject has been so far brought forward as to yield numerical results, we have not some description that would enable us to form an idea of the mode in which the experiments made by Dr. Tidy have been actually conducted. For our own part, we can say with justice that the report submitted to the Society of Medical Officers of Health by Dr. Meymott Tidy in January last is a little work of a nature calculated to give confidence in any thing proceeding from that gentleman's pen. At the same time, nothing can be more unwise, in a case of such extreme importance, and such admitted difficulty, as that in question, than to accept a summary statement of the "results" of experiments without fully understanding in what manner the experiments have been conducted.

The general features of the meteoric supply of water, and of its subaërial flow, are discussed in Chapters 1, 2, 3, and 18. The intervening chapters are devoted, as before intimated, to the topography of the various drainage areas, not alone of England, but also of Scotland and Ireland. The illustrations include an outline map of the drainage system, of which we have already spoken. Another sketch, showing the distribution of rainfall in the British Islands, appears to have been copied directly, except in so far as regards the rude, coarse style of execution, from the Hydrographical Map of the British Isles, by G. J. Symons, which is to be found in the Transactions of the Institution of Surveyors, vol. ix., part vi., although, as in the former case, no acknowledgment is made. There is also an outline map of the geological structure of the British Islands. These maps are on the small scale of eighty miles to the inch, but the omission of details reduces them to mere general illustrations of the text. Sketches of fourteen drainage areas, on a scale of twenty-five miles to the inch, are apparently copied from the map in the Sixth Report of the Rivers Pollution Commission. Without claiming accuracy of definition, they serve to explain the chapters to which they correspond. The outline map showing the chief elevation axes of the British Islands, though simple to the degree of rudeness, is well calculated to give a notion of the general lie of the physical features which constitute the natural catfall province. The chief defect of this map is the want of any indication of watershed, or division of any kind, in such cases as the boundary between the great central plain of England and the lower basins of the Thames, the Wash, and the Humber. As far as the mountain axes are indicated, a sort of trough reaches from the Tees to the North Downs, hemmed in by the Penine chain, the Cheshire hills, and the Cotswolds on the west, and by the Cleveland hills, the Wolds, the Fens, and the Chiltern hills on the east. This gives a notion of an orographic structure resembling that of Ireland, and hardly enables the student to form a correct idea of the skeleton arrangement of the watersheds. Mr. Ansted says,—"A study of the outline map of elevation axes, which indicates in a simple manner the principal lines of ridge, hill, or mountain, without reference to river basins, will show, better than any description, when compared with the outline maps of river basins, geology, and rain, how completely the physical geography and geology of Great Britain correspond with the hydrography." The idea is an excellent one. But it requires either the definition of contours (if as much as 200 ft. apart), or the presentation of longitudinal and transverse sections of the island, in order to be fully available for the guidance of the student.

There is a good index, and the contents of the chapters are so divided into numbered paragraphs as to facilitate reference. The rain-distribution map at the commencement of chapter xi. is intended to illustrate, by showing the relative rainfalls in the British Islands. We presume that this map has been introduced by the kind permission of Mr. Symons. If so, due acknowledgment should have been made. If otherwise, the authorities should have been cited. The difficulty which is thrown in the way of the reader who seeks to verify any statement made by Mr. Ansted is the main fault of the book, and it is one from the presence of which the author is even a greater sufferer than the reader. It is especially to be noted in all that refers to rainfall. Thus under the head "Rainfall Distribution," p. 62, will be found copious extracts, without acknowledgment, from the general tables of foreign rainfall, at p. 80, of "Rain: How, When, Where, Why, is it Measured?" published by Mr. Symons in 1867. At p. 67 a difference of opinion between Mr. Glaisher and Mr. Symons as to the value of calculations of averages is mentioned, which, we rather think, is wholly imaginary. The authority for the statement, "it has been concluded that, other things being the same, the increase" of rainfall "is about 2 in. per 100 ft. rise above a given level" is desirable. We rather think the usual and preferable rule is a diminution of 3 per cent. of the low-level fall for each 100 ft. If Mr. Ansted has been in the habit of recommending gauges for rain to be made by a tinman, "at the expense of a few shillings," it is not matter of surprise that he attaches so little value to the results of observation. As to this, indeed, we may note that the statement as to the register of a rain-gauge in the valley of the Tarn beck is curiously erroneous. Near Seathwaite tarn, says Mr. Ansted, "is the spot where the heaviest rainfall in western Europe is recorded. A rain-gauge in the valley has registered 160 in. in the year, and in one month 30 in." The fact is, that there are two Seathwaites. The wet one is at the head of Dorwentwater, and has nothing to do with the river Duddon, into which the Tarn beck flows. There is a reference to Seathwaite fell, a little later, as the site of a source of the Derwent. The actual figures are given in the Report of the Royal Commission on Water Supply, and are as follows: The Stye, 1,077 ft. high, rainfall in 1865, 224·86 in.; Seathwaite, 422 ft. high, rainfall in 1861, 182·58 in. But in 1872, 243·98 in. fall was registered on the Stye.

THE CONSERVATION OF ENGLISH ART WORK.

A TOPIC of considerable importance, in regard to the preservation of our English decorative art as a national possession, has been here and there agitated of late,—the possibility, namely, of our being surreptitiously deprived of a great proportion of the remains of such works which are in private collections in this country, in the course of the increasing tendency, amounting with some persons almost to a mania, towards the collection at all cost of the best attainable productions of the art of other times and other countries than their own. It is probable that this particular taste (we do not wish necessarily to stigmatise it as a "mania") hardly ever ran so high, or certainly not for a very long time since, as it does at present; and among Englishmen, especially the possessors of recently acquired wealth, it seems to run highest. Most of us have been witness to the assiduity of some neighbour or acquaintance, blessed with a large banker's balance, in collecting all the specimens he can come across of the national art-work of some particular age and country, or even some particular class of article or material which the collector either especially admires or which he thinks no one else appreciates or possesses,—for this latter feeling, the desire to possess what other people have not, seems to be as powerful an inducement as any other with "your collector." The better phase of "collection," however, arising from a real admiration for what is good and characteristic in old decorative or industrial work, wherever to be found, is by no means unusual among Englishmen, who will often go out of their way and expend a great deal of pains, when travelling in country-places abroad, in endeavouring to unearth old specimens of native art. Then such a collector comes home, and it spreads among his friends that he has really made the best collection of old Scandinavian candlesticks that is known in this country, and his name finds its way into the columns of artistic journals as what would once have been termed a *virtuoso*. And if the articles are of beauty and of archæological interest, so much the better, from our point of view, that a native of our country should have imported them. But the question may be asked, on several grounds, is it desirable that the country whence these treasures have been brought should thus be deprived of its specially national art-relics in order to gratify the pride, curiosity, or æsthetic taste of an individual of another country, in exchange for coin which cannot really represent their value except in a merely commercial sense, since they are things unique in kind and irreplaceable by any modern hand? And if this consideration touches us not, how does it appear if we reverse the case, and suppose the man of taste from another country, going about our districts armed with his irresistible cash, and carrying off to his private collection, and far out of our reach, the best and most characteristic productions of the artistic minds and hands of the England of the past?

This particular aspect of the subject was brought forward the other day in a letter to the *Times* by a correspondent whose opinion is of some value on such a topic, on this account at all events, that he is himself known as a collector

and connoisseur, and therefore (on the principle of "set a thief to catch a thief") is likely to know something of the ways and doings of this portion of humanity, more than is known always to those who do not profess collection. And what this member of the fraternity* hints at as a possible result of a slight turn in the direction of the current of collection is really rather a serious matter for any one who considers that the art-productions of a country are a part (and perhaps the most interesting part) of its vital history and existence. He tells us that many are not aware how much the tide of collecting is setting from this country to foreign shores, so far at least as paintings are concerned, in comparison with the circumstances of ten or fifteen years ago.

"At one time English gold carried away everything, even from the most ardent amateurs of France and Germany, but now the wealthier successors of those latter, or their agents, come over to us and literally ransack this country, bringing to the task an amount of taste, knowledge, and enterprise which shames and overshadows us. Already they have found the way into not a few of our lordly homes, —the proud ancestral homes where to hint even at a wish to purchase would once have been deemed an unpardonable insult. The inevitable temptation which in former times reduced the galleries and cabinets of many a high-born Italian duke or French marquis almost to the level of a standing curiosity-shop has, in fact, begun to cast its spell even over our own nobility. Who, indeed, can resist when the value of a landed estate even is eagerly preferred for a single picture, a cabinet or a vase? People who know will be well aware that in this I am drawing no exaggerated picture. As yet, however, monuments of art, other than pictures, have not, as a rule, been coveted by foreign collectors; but any day the fashion might suddenly arise in Continental art circles for old English plate, furniture, miniatures, Chelsea china, &c., and then in a year or two almost every notable specimen might be swept out of the land."

To which we may well say, with Snout, the bellowsmender, "By'rlakin, a parlous fear!" In regard to the abduction of paintings from this country in exchange for fine gold, there are two considerations to modify our regrets. The one is, that the paintings most sought after are probably not those which are racy of the soil, but those productions of foreign artists which have in times past come into the possession of English owners by purchase, and perhaps in some cases, therefore, are going back to their native soil; and, at all events, their loss makes no gap in the history of our own art. The other is, that an old picture of any high value, and the work of a master, though transferred from one owner to another, is seldom lost to view, so to speak: persons interested in art, and conversant with the doings of the art world, know where such and such a picture is, and it can eventually be repurchased if occasion arises, and is, at all events, often accessible enough to those who have a good reason for asking for the sight of it. But it is otherwise with works of decorative art, in most cases with no manufacturer's or artist's name, and no distinguishing subject or name by which they could be traced, as a picture can be traced; and therefore, unless in such a case as a noted collection purchased as a whole, articles of this kind sold out of the country are lost, except for the mere chance of their turning up again at some future change of ownership.

If it be asked what steps we are to take to counteract any such wholesale pillage of the art of the country by foreign *dilettantism*, supposing the taste for the possession of English decorative work should develop to the extent suggested above as possible, it seems hardly possible to suggest anything beyond endeavouring in a general way, and at every opportunity, to quicken the public interest and pride in the possession of works of national art. Even in regard to works which are not the product of our own race, such as the paintings of the great Italian masters, it might be thought that there should be some pride as well as pleasure in their possession, and that it indicates a very lamentable declension in tone and feeling among the aristocracy of this country, if it be really true that they are becoming willing to barter for cash masterpieces of art which have been the pride of their families, and through them of artistic England itself, for many generations. It is on record somewhere that Cromwell, who knew and perhaps cared little enough about art himself, was stimulated to retain the Raffaelle cartoons for the nation, chiefly in consequence of the inadvertent remark of the Spanish ambassador, who was commissioned to treat for them for Spain, that it would be "a glorious thing" for the king, his master, to possess those pictures. In the mind of Oliver it appeared that if there were any glory in the matter, it should be for England, and not for any foreign country. It has been matter of pride that this country possessed in its "ancestral halls" almost untold riches of the finest schools of painting,—how great, the loan exhibitions of late years have afforded to the general public but a partial indication. The possession of such works by Englishmen should surely be rated at something more than their mere money value, unless we are to conclude that the desire of amassing wealth has spread from the *nouveaux riches*, and is infecting the whole community, and swamping the hereditary and traditional feelings of English gentlemen. But, at all events, as we have said, if such works as these are leaving the country, we shall probably know where they are; but if a raid should be made upon our decorative art, it may disappear almost hopelessly, as far as we are concerned, and such art, whether it be gold and silver work, furniture, potters' ware, lace, embroidery, or whatever else, embodies a very important part of the history of the taste and manners of the nation at various periods, and should be considered a matter of national interest. In the hope of awakening a more general interest in the subject, as well as of arriving at a fuller knowledge of what we and others really do possess of English decorative and industrial art, we cordially welcome and recommend the suggestion which has been made in the course of the correspondence above referred to, that there should be held in a year or two a loan exhibition purely of Old English art of this description, to which every one possessing examples of the decorative art of this country (say previous to the present century), should be earnestly invited to contribute; and that the same invitation should be extended to all possessors of English work in Europe. It is more than probable that there are scattered about Europe many rare treasures of English workmanship of which we know nothing. In mentioning the proposition with approval, we will endeavour to advance it a step further by suggesting the actual place for the exhibition, viz.,—the galleries in Exhibition-road, or a portion of them. Several International Exhibitions have been held there: why should we not now have a National Exhibition?

* Mr. J. C. Robinson, whose name was recently prominently before the public in relation to the authenticity of the Madonna dei Candelabri, said to be by Raffaelle, of which he claimed to possess the real original.

AT THE PARIS EXHIBITION.

VASES AND VENTILATORS.

It is not surprising that prize medals are awarded to Messrs. James Stiff & Sons and Messrs. Doulton, of Lambeth. Nothing could be more natural or better deserved; for, as we have remarked on numerous occasions, England has won universal admiration by its hardware and pottery, taken both from the utilitarian and the artistic point of view. Perhaps the latter quality is the newest feature of our home industries; and it is no small credit that we should make so many and such successful efforts to acquire the taste and artistic instinct with which, as a nation, we are not abundantly gifted. The manufacturers who have helped to bring about this result have had to fight an uphill battle, and we are glad to note that their perseverance has won the approbation of the most difficult of all tribunals, an international jury. Messrs. Stiff have some decorated salt-glazed stoneware vases, &c., edged and painted in a refined style, in which the seagreens and dead blue colours predominate, together with effective turquoising. Ornamental vases, of varied design, notably an owl pattern and Renaissance vase, have attracted much attention; while salad-bowls, salt, and pepper-castors, goblets, tankards, &c., prove by their moderate price and their beauty how easily art may be associated with the commonest exigencies of every-day life. This particular ware need only be placed once in the kiln in the course of manufacture. The paint, the glazing, all is put on the raw clay, one baking sufficing to produce a perfect article; and the contemplation of these objects manufactured simultaneously with hundreds of miles of drain-pipes, countless air-bricks, tiles, &c., is, to say the least of it, a grateful relief to the eye. But the latter and more prosaic wares are, on their side, equally worthy of comment. The patent damp-proof course is, for instance, an undoubted improvement. A perforated course admitting through ventilation is a comparatively old idea; but in practice it was found that the damp came through the joints, instead of being carried away in the air-passages, as it was more easy to force its way through the former than into the latter. The patent in question obviates this difficulty by making the joint over and under the centre of one of the air-passages, so that the damp, having forced its way through the first joint, is carried off by the current of air in which it must then fall before it touches the other joint. Again, we have Stiff's white glazed enamelled sink, which is not absorbent, like the old stone, and can, therefore, be kept perfectly clean. Finally we should not omit the patent "intercepter" sewer-air trap. This is an entirely new invention, with which, however, our readers are probably familiar, though it has not been before the public for more than some few months. It is an ordinary syphon, which can be inserted in any drain-pipe anywhere between the house and the sewer. A ventilating-shaft communicates with this syphon, and may be concealed either among the bushes of the garden, carried to the roof of the house, or otherwise disposed of. As the mephitic air arrives from the sewer, there is immediately above the water-level of the syphon an opening by which it can escape into the ventilator, or which may be closed and used only for cleaning purposes. This first opening being closed, the gas will then force its way into the water of the syphon; but here it will be intercepted by a diaphragm, which dips some 3 in. below the water-level, and carried up to a little chamber communicating with the ventilator. Behind the intercepter is the communication with the house-drains. The question is, whether the gases are likely to dive deeper than the intercepter, and thus rise up in the house-drains. There are answers, however, to this supposition.

From this exhibit we wandered to that of another firm close at hand, which also combines art and utilitarianism. Messrs. Verity Brothers are well known for their artistic *repoussé* work in brass and copper, and they have recently patented a ventilator or air-propeller, which was described a few weeks ago in these columns. The most notable feature of their art exhibit is that precisely which is the least noticed; or for which, at least, they but rarely receive credit. This is a magnificent brass *repoussé* fireplace, of old design, a marvellous piece of workmanship, both as regards the ideas and their execution; but it forms part of Messrs. Howard & Sons' striking collection of artistic furniture hangings, wainscoting, &c.; and it is not every one who can distinguish that the furniture, walls, and drapery belong to one firm, the brass *repoussé* work to another. Nor does the catalogue throw any light on this matter; but, in any case, the two firms have between them produced a good effect, and daily attract crowds of visitors. Nor had these objects been exhibited many days before they found a purchaser. The fireplace and its surrounding furniture are destined for the dining-room where Mr. Wilson, the member for Hull, will in future assemble his guests.*

Concerning the air-propeller, we have made several careful experiments to test its real power. This, of course, depends on the jet of water which is forced through an aperture about the size of a pin by the pressure derived either directly from the main or merely from the cistern situated at the top of the house. The latter is the weakest and the least expensive. According to the pressure brought to bear, the consumption of water may vary from three to twelve gallons per hour. As in town water costs tenpence per 1,000 gallons, the outlay for motive-power is insignificant. The pressure of water at the Paris exhibition was very slight, and the current of air created by the fan-wheels thus set in motion was so feeble that it gave a very false idea of the efficacy of the invention. In London we were able to give the implement a better trial. Our first experiment was made with pressure derived from the main. The aperture measured 6 in. by 4 in., and we found, with the assistance of J. H. Steward's anemometer, that the air came in at the rate of 990 ft., or, let us say, 1,000 ft. per minute. This gave us, therefore, a column of air 1,000 ft. long, 4 in. deep., and 6 in. wide, per minute, or, in round numbers, 10,000 cubic feet per hour. Our next experiment was with house-pressure, derived from a cistern situated 35 ft. 4 in. above the apparatus. The anemometer now only recorded a velocity of 700 ft. per minute, which was equal to a volume of about 116 cubic feet per minute, or, within a minute fraction, 7,000 cubic feet per hour.

* A view of this fireplace will be found in our present number, in addition to our ordinary cuts.

Dr. Angus Smith estimates that town-air contains 0·04 per cent. of carbonic acid. One man, by breathing for one hour, would infuse the same quantity of carbonic acid gas in 1,000 cubic feet of air. If this was town-air, it would, therefore, contain 0·08 per cent. of carbonic acid at the end of the hour. It would have become twice as impure as the external air, and at this point we may draw the line, and consequently conclude that for each adult we must provide 1,000 cubic feet of external air per hour. With the assistance of Verity Brothers' ordinary sized ventilator, we could, therefore, obtain, over and above the ordinary supply, enough air for ten or for seven persons, according to the pressure brought to bear. This is an enormous addition for an ordinary room, where the windows, doors, chinks, chimneys, and anything but air-tight walls, are unfortunately considered by most people sufficient in themselves. But we need not limit ourselves to one apparatus. Several may be inserted into one room, and some placed on the level of the ceiling, which work in an inverse sense and act as suckers to draw the air out. There are, however, many problems involved in the placing of these ventilators, and no fundamental rule can be laid down to decide how they should be used. The disposition of the room, its angles, its furniture, may alter the course of the air currents, and render even violent ventilation comparatively ineffective. On this point we must reserve our judgment till we have had more ample opportunities of judging the manner in which Messrs. Verity apply their invention. At the present moment, they are fitting up the Reform Club with their patent air-propeller; and when this work is completed we may be able to ascertain how far these useful ventilators have been scientifically and successfully employed.

Mr. James Hamilton, of Rochdale, also exhibits a ventilator which has the advantage of simplicity; though it must at the same time be stated that the idea is but a simplification of what already exists. It is a cowl, so contrived that a down-draught is, it is said, impossible. The top of the shaft, or chimney, is protected by a cone or disc, which prevents the rain falling down; but it has been found that this old contrivance obstructed the currents of air deflected by roofs of buildings, and pressed them down the shafts with great force, thus producing the dreaded down-draught. Hamilton's patent consists simply in placing below the top of the ventilating-shaft a deflecting plate, which stops the up-current of air as it rushes along the outside of the shaft. This is so contrived that the air entering between the cone and the lower disc must strike an obtuse angle, which will carry the down-current beyond the shaft, and thus prevent a down-draught. This principle can be applied, not merely to shafts and chimneys, but to the entire length of a roof; if it is judged expedient to make an opening several feet long, by which the air will be drawn out without down-draught. The whole question of cowls, however, is just now in debate.

In close proximity to this invention are the well-known and useful Archimedian screw ventilators, patented by James Howorth, of Bolton and London. This contrivance is so familiar that we cannot dwell at length on the subject. At the same time we must also protest that we were unable to find the representative of the firm at the Exhibition. We should have been glad to record any new experiments made to further confirm the efficacy of this now somewhat ancient invention; but there was not much evidence of this character forthcoming. We are informed, however, that the ventilator was applied to the soil-pipes of the Union Bank offices at Brighton a few months ago, and most effectually extracted and scattered the sewer-gas. When the screw which produces the up-current is made to revolve by steam-power it will draw from a factory or other building from 2,000 to 10,000 cubic feet of air per minute. These calculations, based on the evidence given by Mr. Howorth himself, we had unfortunately no opportunity of confirming during our visit to the Paris Exhibition building.

In conjunction with these inventions, we should mention the very good display of Boyle's self-acting air-pump ventilators, which are so prominently placed that no one can pass in the section without noticing them. These were invented in 1869 by Mr. Boyle, with a view to reducing the rate of mortality, which had been particularly high that year in Glasgow. This ventilator, it is well known, has no mechanical movements or working parts that can possibly get out of order, requires no attention, and cannot lose its power through neglect. It consists of four similar sections, acting separately, and catching the wind as it comes from either of the four quarters of the globe. The air on entering one of the sections of this cowl or ventilator strikes the point of an angular-shaped louvre plate or diaphragm, and is consequently deflected at varying angles over the central radial plates. A down-draught cannot occur, and the deflection of the wind causes a suction which draws the air up the shaft. The rate at which the air travels must, however, depend on the strength of the wind; and this is the chief objection that can be made to this form of ventilation. Thus, some experiments made at Mr. Boyle's office with one of his ventilators attached to a 6-in. pipe or shaft showed that, on one occasion, when the wind was blowing a gale, the suction produced was so great that the air travelled up the pipe at the rate of 1,235 ft. per minute. On the other hand, when there was a calm the air would not move faster than 220 ft. per minute. The average up-draught is, however, estimated at a velocity of 740 ft. per minute: equal, we believe, to 150 cubic feet; and, undoubtedly, the extraction of 9,000 cubic feet of air per hour must render great service in maintaining the wholesomeness of dwellings.

Finally, we cannot conclude our remarks on this subject without also congratulating Mr. Banner for exhibiting his system of ventilation, though this is done in a manner that we fear will not be considered very intelligible by many foreigners. Mr. Banner may boast of having combined various ideas, initiated by others, but not previously brought together, so that they might derive increased power by their union. Mr. Banner traps the drains near to their fall into the sewer; he ventilates the closets, not merely by a tube or shaft, but renders this truly effective by providing an inlet for air into the shaft, and by placing a cowl which will attract the air in, through, and out of the shaft. Thus there is no accumulation of foul air in the shaft, which often renders this contrivance worse than useless. This, and the other systems we have mentioned, conclusively prove how deeply the question of ventilation has been studied in England; and in this matter, at least our section at the exhibition is pre-eminent.

INTERIOR ECONOMY OF THE OFFICE.

HAVING enunciated the three chief rules of interior economy, and set forth how they may, in our opinion, be best observed,* it remains to treat of those minor points which, though small in themselves, yet play no insignificant part in the development of a proper system of office economy, by which delay, trouble, and research, waste of time, money, and temper can be reduced to the lowest possible degree.

And here it may be well to raise a voice of warning, and point out that while those who steer farther from Scylla are, as a rule, only in greater danger of running on Charybdis, so the professional man, by becoming too particular and precise in office *régime*, runs the risk of becoming lax in weighty and important matters, to the detriment of that business he seeks to benefit.

Office economy must be looked on solely as the means to the end, the end being the development of talent and abilities to the utmost and to their widest and most bountiful use, the attainment of the quiet frame of mind that habits of order and regularity, when properly cultivated, seldom fail to induce, and the general regard that will most assuredly be obtained from not only all clients and patrons, but also those who may have business connexions of any kind with the office, and—as an outcome of all these results—a fair proportion of success in life.

Bis dat qui cito dat, and double satisfaction will the architect or engineer afford who, by return of post, so to speak, can give the information asked for, instead of the usual reply "that such and such a document has unfortunately been *mislaid*," the word *lost* being, in professional phraseology, apparently obsolete!

Of the minor points of our subject the principal would seem to be as follow:—

1. How best to arrange for and supply, as wanted, the paper of various kinds that will daily be required for the reception of the thoughts and workings of the minds and the creations of the hands of yourself and your *employés*.

2. How best to arrange and keep the instruments, colours, and other adjuncts of a draughtsman, so that they may be ready to his hand at any and every moment, and calls made neither upon his attention nor his time in perplexing and irritating search.

3. How best to arrange and keep the plans and drawings of those subjects that may be in hand, so that they may be readily taken up and laid down again without trouble or confusion.

4. How best to arrange and keep the "Field" books, in which your out-of-door measurements, surveys, and notes are recorded, so that they may be referred to at once, and whenever desired.

5. How best to arrange and maintain that your *employés* enter their daily work, so that your clients are justly charged, and that you yourself are credited with fair reward for your labours.

6. How to maintain a proper system of accounts, without which, indeed, all other rules, followed out in their entirety as they may be, are as nothing worth.

1. Whatever your fancy or requirements under the head of "paper" may be, it is well to lay in and always keep on hand a good stock in some appointed and suitable place, and in charge of a particular *employé*, who will deal out as may be wanted to the others; for where each individual in an office can go and forage for himself confusion and waste will inevitably result. It will be the duty of this *employé* to see that the stock of any particular nature never runs too low; and, to avoid mistakes, a sample sheet, &c., of each kind should be always kept, and, being marked "sample, to be returned," forwarded, where practicable, with the order for a further supply.

Under the head of stationery must be classed also glass-paper, drawing-pins, tape, paper-fasteners, sealing-wax, gum, ink, colours, blotting-paper, pens and pen-holders, pencils, brushes, india-rubber, string, labels, &c.; these articles being in charge of one individual and served out whenever necessary.

The prudent man will, in the case of stationery, settle on no more different natures than are absolutely necessary, and will keep to them, and the firm who supplies them, until he is perfectly certain he has found better.

The headings for all note-paper will be plain and suitable, no flourishes or ridiculous designs, and yet none of that pride which apes humility; you merely want your name, profession, and address to be read at a glance by all, high and low, with whom you may chance to have communication.

The ordinary "*papeterie*," placed on the writing-table before you is, perhaps, as suitable a receptacle as you can have for your writing-paper, &c., and should contain foolscap and common-sized note (headed, plain, and, if you are entitled to it, crested also), with envelopes to match, book of stamped telegraph forms, post-cards, packet of post-office order forms, stamped newspaper wrappers, and, in the drawer beneath, receipt stamps and postage stamps,—the latter not in sheets as you received them, but all single, so that when in haste to catch the post a stamp is always ready to the hand.

As for fancy-sized or fancy-tinted stationery, the office of a business man is no place for it; let it serve for the correspondence of school-girls and effusions of lovers, who are not supposed to have a thought towards expediting the postal transmission or delivery of letters.

Without doubt the compulsory use of envelopes of certain sizes would be a great feature in post-office economy, for the labour of sorting, transmitting, and delivering must be seriously increased by the indiscriminate use of fancy stationery.

Drawing-pins are, in many an office, a source of continual trouble. They may, however, be easily kept in small wooden or metal cups, attached by a screw to the under side of the table, and pivoting on the same, just as chalk is kept under a billiard-table.

Such a drawing-pin cup may be affixed at all four sides of the table, and thus all stretching for or passing of pins from one draughtsman to another is happily avoided.

Ink is an article which meets with, as a rule, but scant ceremony, being generally exposed in wide-mouthed bottles to the ready admixture of dust and dirt. The thermometer ink-bottle

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(simply on the ordinary bird-fountain principle) is the best we know of, for the volume of ink being large, loss by evaporation is reduced, while the surface exposed being very small, little chance is afforded for admixture of dust, &c.

We are surprised these simple and efficient bottles are not in more general use; we have tried to procure them in vain in many of our large towns, yet they are not uncommon in British India and elsewhere.

We should imagine a triple thermometer ink-bottle for registration, copying, and red ink, would command a ready sale, and well remunerate the manufacturer who may care to introduce it.

2. Drawing-instruments, colours, &c.

Most draughtsmen prefer using their own instruments, each having a separate case to himself; but where this method does not obtain, a good one is to have fixed against the wall at a convenient height, a cabinet (resembling a gentleman's wardrobe in miniature), each little shelf, or rather tray, of which is labelled respectively, "pencils," "brushes," writing-pens," "india-rubber," crow-quills," "compasses," "bow-pens," &c., while one shelf is marked "for repair."

Each room in the office that is used for drawing purposes should possess a cabinet of its own, similar and similarly labelled in every respect, so that it would be possible for any *employé* to go to any of the cabinets in the dark, if required, and at once lay his hand on an instrument of any particular sort.

As any instrument becomes broken or damaged, it is at once placed in the "repair" tray to be attended to at the next opportunity.

A great advantage of the cabinet system is that, if through carelessness or accident any instruments are left lying about, the first *employé* who may come across them, or even the office boy or old woman in charge, can at once put them in places where they will be ready to the hand, whether required next day or next month. Underneath the cabinets should be fixed small drawers, with zinc trays inside, triangular in section, and divided into compartments, each duly labelled with the name of a colour.

The colours (in cakes) are thus quickly found, readily grasped by finger and thumb, and easily removed, to be as easily returned.

Scales are a class of drawing instruments that give a good deal of trouble, especially when the nature of the business involves the use of many kinds.

You go to the scale-box wanting a particular scale; you may take out half a dozen, one after another, before you get the right one, or after reading every one in the box, find the particular one you require is absent.

Alongside every cabinet a scale-rack, made in the following way, should be fixed:—A piece of deal or other board is taken, the width corresponding with the length of the scales, and as deep as required. On this board slips of deal, grooved top and bottom, are nailed horizontally, and at a distance from each other sufficient for a scale to be slidden easily between. Over these slips a piece of board corresponding to the first is fastened, and then in the centre shorter grooved slips for the "offset" scales; over these a facing-piece, and the rack, varnished and labelled, is complete.

To facilitate the removal of the scales with the finger and thumb, the boards should be, to use a heraldic term, ingrailed at the sides.

Labels suitable for cabinet-trays and scale-racks are sold at most stationers', ready gummed, in boxes of 1,000, principally for use in drapers' shops.

Tee-squares, set-squares, curves, protractors, &c., are best hung on nails in the walls, care being taken, as also with cabinets and scale-racks, to avoid the neighbourhood of flues, the heat from which might cause great injury.

3. Plans and drawings "in hand" generally manage, even after the lapse of only a day or two, to get completely out of hand, and thus a general unrolling and rolling-up of all plans in the neighbourhood is ever going on in search of what is wanted, to the annoyance of such draughtsmen as may be at work in the room on other subjects, and to the waste of much valuable time.

Here the "plan-bin" system may be advantageously adopted, but with this difference, that whereas the plans in the attics, &c., are exposed end on, plans in hand should be kept, for the sake of economising space, *parallel* to the walls. In fact, the plans-in-hand-bin is in reality but a magnified skeleton scale-rack, reaching from floor to ceiling.

As each piece of work, where drawings will be required, is taken in hand, the name of the work is printed in large type on a slip of stout paper, and affixed by small drawing-pins to the outside of the uppermost of the series of allotted pigeon-holes, the remainder being labelled "Ditto." In this way plans in hand and on reference may be laid aside and resorted to in a moment by any one in the office.

After the happy completion of the work, the drawings are duly numbered, rolled together, and transferred to the attic bins, leaving room for fresh plans and drawings, the label being reversed and inscribed with a new title.

4. With regard to "Field" books, which generally, from the rough usage and soiling they have to endure, cannot (unlike your bank-book, for instance) be permanently inscribed with any title or designation, a simple plan is to affix consecutive numbers, cut out of sheet zinc, to their covers by means of the ordinary paper-fasteners.

The books, all being of one size, are kept on an allotted shelf, and an alphabetical index-book (which may be No. 0 field-book, if you like) will tell you at once which is the field-book required.

An improvement would be to have a field book-case made, with, say, ten pigeon-holes in a row and as deep as necessary. In the topmost row, books No. 0 to No. 9 are kept; in the next, Nos. 10 to 19; in the next, Nos. 20 to 29, and so on. So that, should you require a particular book, you could at once go to the units, tens, or twenties, &c., row, as the case might be, and take it without hesitation. In allotting a separate pigeon-hole to each book, a great advantage is, that an empty pigeon-hole will tell you at a glance what book may be missing, and lead you to make due inquiries for the same.

Nos. 5 and 6, minor rules, bearing as they do on the financial part of office economy, are reserved for future consideration.

A STEAM "NAVVY."

The application of steam power to the execution of earthwork is a subject that has for some years engaged the attention of the civil engineer. To that mode of applying power, indeed, we owe the execution of the Mont Cenis Tunnel. The experience gained in that great work has led to so much improvement in the construction and the manipulation of automatic rock-cutting instruments, that the estimates for the St. Gothard Tunnel were considerably lowered in consequence. It is now some time since we have heard anything of the application of mechanical means to the cutting of coal, from which great economy was expected to result at the time when coal last attained its maximum price. The excavation under water by the application of the steam dredge is not only convenient, but highly economical. The steam plough has shown how it is possible to open a furrow, or to turn up a broad surface of soil, with far less expenditure of power than by the application of a horse-plough, or of a spade and pick worked by hand. And now we have an account of a more comprehensive attempt to apply mechanism to excavation in a machine made by Messrs. Ruston, Proctor, & Co., of Lincoln, which has been christened the "Steam Navvy."

No less than four engineers have made communications to the Institution of Civil Engineers illustrating the construction and cost of working of the steam navvy. These papers, which will appear under the section "Other Selected Papers," in the next quarterly volume of the "Transactions of the Institution," are respectively by Mr. Charles Douglas Fox, by Mr. James Brand, by Mr. Henry Michel Whitley, and by Messrs. Ruston & Proctor. There is also a very brief paper on the same subject by Mr. C. A. Harrison.

Looking at that which will first command the attention of those who need the services of the navvy, whether fed with coal and water, or with beef, bacon, bread, and ale, we observe a wide range of estimate to be offered, which requires some kind of explanation before the papers in which it occurs can be regarded as standard contributions to the literature of the profession. Messrs. Ruston & Proctor state that they "have even been informed that the stiffest clay has been excavated and filled into wagons with a working expense of 2d. per cubic yard." Nothing, however, is adduced in justification of this remark; and in the absence of some confirmatory data, those of us who draw our experience from the cost of the old navvy will think that it had better not have been printed. Mr. Fox gives particulars of the employment of the steam-navvy on the West Lancashire Railway, from July 17 to December 31, 1877, during which time the engine worked for ninety-three days, and excavated 22,209 cubic yards, or 239 yards per diem. The cost of working for this time, including fuel, labour, stores, cost of repairs, and an allowance for depreciation of the machine at the rate of 25 per cent. per annum, was 87*l*. Mr. Fox observes that during the whole period quoted, 24,000 cubic yards of material have been turned out of the cutting, including some wagons filled by hand, at a cost of 8¾d. per cubic yard. Messrs. Ruston & Proctor state the cost of excavating the same material by hand at 10¾d. per cubic yard. The material was a stiff brown clay throughout, free from large stones. The price of contract work must have enormously advanced since the construction of our main lines of railway, if 10¾d. has been paid for merely excavating stiff clay and filling it into wagons. It must be remembered that the interest of money on the cost of "navvy," the cost of wagons, rails, and other materials, that of lead, that of tipping, that of formation and soiling of bank, and slopes of cutting, and that of maintenance for twelve months, have all to be added to the cost of wagon filling. Clay cuttings, under a quarter of a mile lead, have been let at from 10¾d. to 1s. per cubic yard to cover all these items; and the cost of 8¾d. seems to us high for wagon-filling alone.

Mr. Brand's experience of the steam navvy was in a cutting of about 50,000 cubic yards of stiff, hard, and tough clay, containing boulders weighing from a half-hundredweight to four tons. The machinery employed was the seventh made by the firm at Lincoln, and there were at first many breakages. These led to the replacement of the broken parts by stronger and better substitutes. Mr. Brand has obtained a higher daily duty than that recorded by Mr. Fox, the latter being 190 cubic yards per day, and the former 240 cubic yards. There is, however, a difference of more than twenty-five per cent. in the daily cost according to the two papers, and there is no allowance for depreciation made by Mr. Brand. If we take Mr. Fox's estimate of cost, as being given in more careful detail than the other, the cost of the wagon-filling at the station where Mr. Brand was at work (which is not named) would have been 6¼d. per cubic yard instead of the 4¾d. which he estimates. Mr. Brand gives the cost of operating on the material by hand-labour at 1s. 6d. per cubic yard, exclusive of horses and tipping. Mr. Fox, from actual details, arrives at an estimate of 10¾d. for handwork. As the description of the soil excavated in each case is much in favour of the West Lancashire cutting, it is evident that comparison and revision of details are necessary before we can come to the question of saving in cost. Mr. Whitley's paper gives results of the working of his machine on the Castle Eden and Stockton Railway. He gives no prices, but obtained an average of 228 cubic yards per diem in Embleton cutting, of 305 cubic yards per diem in Grindon cutting, and a maximum daywork of 470 cubic yards on one occasion in the latter. The material was clay, with some boulders. Mr. Harrison neither gives prices nor describes materials. He filled, at the West Hartlepool docks, an average of 112·8 wagons per day by the steam navvy. The wagons had a capacity of three cubic yards, so that the solid stuff moved, allowing 2½ yards to be filled into each, would amount to 280 cubic yards per diem.

Taking an average of the above accounts, we find that the navvy has been good for about 248 cubic yards per diem. Looked at in a practical way, this would be equal to sixteen sets of six wagons each put out of a cutting. Taking the wagon-fillers at 4s. per diem each, twelve men, at a cost of 48s. ought to fill that quantity of stuff. The gullet men would not be more than half that number, say 27s. The number of wagons is so small that 8s. 4d. for a ganger, or rather as much of that price as can be fairly attributed to wagon-filling, is a high charge. We thus come to a little under 4*d.* for the excavation and filling of 248 yards by hand, and do not see, so far as the accounts go, any economical advantage in the use of the machine.

On the other hand, it is to be remembered that the machine is yet in its infancy, that the

cuttings undertaken appear to have been composed of material very ill suited for its action; and that any well-deserved labour-saving machine is an object of material value, as adding to the productive power of the country. In sand-cuttings we should anticipate that the steam-navvy would be capable of a very economical application. Less than 500 yards per diem it is hardly worth while for a contractor to take out of a cutting, and the machine ought readily to perform such a duty as that.

In its present state, the steam navvy consists of an iron truck, mounted on small flanged wheels; and, supporting a heavy boiler, engine, winding apparatus, and a powerful wrought-iron jib. From this is suspended by a beam, working at right angles to the jib, a sort of iron scuttle, which is scraped, by the action of the machine, up the face of the cutting, taking out a slice of the material, which is dropped into wagons by a horizontal movement of the jib. The advantages which are claimed by the makers, and which we think that the machine may be expected ultimately to offer, are these:—"It is suitable for any kind of material, from sand and gravel, to the toughest clays. It will excavate and deliver into wagons 500 to 600 cubic yards of stuff per day. It can be readily handled by two men and a boy. It effects a great saving in time, especially when the cost through strikes is taken into account. Finally, it can quickly be set to work in situations where it would be difficult to get the hand labour, and still more so to keep together a large body of men." It is here that the essential value of the machine lies. As giving command of labour, we can readily conceive that the invention may prove of great service to the engineer. As a means of saving money, neither of the professional gentlemen who have written on the subject has yet made out a clear case. It does not follow that a clear case is not to be made out by a report fully dealing with all the items of practical use, as to which, however, it is not matter of surprise that contractors should be reticent. It is not from estimates, but from bookkeeping, that the facts are to be collected; and contractors are not very willing to exhibit their books to their professional masters. Nor are they to be blamed for wishing to keep their own counsel.

THE KNOP AND FLOWER PATTERN IN INDIAN ART.

A SECOND edition has been issued of Dr. Birdwood's "Handbook to the British Indian Section," Paris Universal Exhibition, and we are not at all surprised at the demand which has led to it. It is an exceedingly interesting little volume, and a capital shilling's worth, as well for those at home and for those in the Exhibition building.* We wish some of the other sections had found a Birdwood. We extract the chapter on the Knop and Flower pattern:—

We have traced the gradual development of Aryan civilisation, from the Punjab and Valley of Cashmere westward to the British Isles, and the rise of Semitic civilisation in the lands which the to-and-fro trade of Europe and Asia had to cross about half-way down the *litus Arianum*, in consequence of the interposed obstruction of the Isthmus of Suez and Africa, and the peninsula of Arabia. We have seen how this line of coast and overland intercommunication between the East and West Aryans was subject to be constantly interrupted by the incursions of Scyths, Mongols, and other Turkish hordes, whom we may associate with "the Shut up nations" of the Alexander legends; and how it still went on, even after the Ottoman Turks had established their dominion between the Tigris and Euphrates, the Nile, and the Danube, and was only discarded on the discovery of the ocean way round Africa to the East. This is but 400 years ago, and for 4,000 years before the road between India and the Mediterranean countries had been through the Tigris and Euphrates valley, and the valley of the Nile. From the time of Alexander, and through all the time of the Ptolemies and Seleucidæ, and under the Roman Empire, until Egypt, Syria, and Persia were conquered by the Saracens, the intercourse between India and Greece through Persia, Assyria, Syria, and Egypt was unbroken and intimate. Although interrupted at first, it again revived under the Saracens, and, under the Ottoman Turks, was only finally suspended after the Portuguese had obtained possession of Ormuz. Even then, the Armenians continued, as they have to the present day, the local intercourse between India and Assyria and Western Asia; going to India and purchasing goods on the spot, and returning with them to Bandar Abbas, Ispahan, Baghdad, Mosul, and Tabriz.

This is quite sufficient to account for the remarkable affinity between Assyrian and Indian decorative art, and the frequent identity of their ornamental details; which, in turn, prove the continuity and intimacy of the commercial intercourse between India and Assyria. Of course, the general affinity between Indian and Assyrian art may be in part due to the common Turanian substratum of Indian and Assyrian civilisation. When the Aryas made their way through Cashmere into the Punjab, they found the plains of the Upper Indus already occupied by a Turanian race, which they indeed easily conquered, but which, as the caste regulations of the Code of Menu prove, was far superior to themselves in industrial civilisation. These aborigines already worked in metal and stone, and wove woollen, cotton, and linen stuffs, knew how to dye them, and to embellish their buildings with paintings: the descriptions of Megasthenes prove that, even at its highest development, Hindu civilisation was more Turanian than Aryan; and the pre-Aryan Turanian civilisation of India must have been similar to the pre-Semitic Turanian civilisation of Babylonia, Chaldæa, and Assyria, and probably preceded it. All that is monstrous in the decorative forms of Indian and Assyrian art, all that is obscene in Indian symbolism, is probably derived from common Turanian sources, anterior to direct commercial intercourse between India and Assyria. But, when we find highly artificial and complicated Indian decorative designs identical in form and detail with Assyrian, we feel sure that the one must have been copied from the other, and indeed there can be no doubt that the Indian ornamental designs, applied to and derived directly from sculpture, which are identical with Assyrian, were copied from the monuments of Assyria; Egyptian, of course, from Egypt. We cannot trust alone to the allusions, references, or even descriptions of the Bible, Homer, and the Ramayana, to identify the art manufactures of India with those of Assyria, Phœnicia, and Egypt; by themselves they indicate generic likeness only; and their specific identity can only be demonstrated by a comparison of the actual remains of ancient art, and of the carved and painted representations on contemporary monuments. But when this identity has been proved from the monuments and other remains, the Bible, Homer, the Ramayana and Mahabharata, and Pliny, are invaluable in that they enable us to complete our information on the sure and certain foundation so laid; and, to the picture thus composed of the early civilisation of the world, we are justified in giving colour and motion from the strictly traditional, still living civilisation of India, while it is reasonable to suppose that the Indian was the earliest of those primitive civilisations.

The Bible, and Homer, and the Greek poets generally, are full of idyllic scenes from the life of ancient Greece, Syria, and Egypt, which are still the commonplaces of the daily life of the natives of India, who have lived apart from the corruptions of European civilisation. There are many passages also directly illustrating the handicraft of the ancients. In Proverbs xxxi. we read the praise attributed to Solomon, about B.C. 1015-975, of a good wife: "She seeketh wool and flax, and worketh willingly with her hands. She is like the merchants' ships, she bringeth her food from afar. She riseth also while it is yet night, and giveth meat [bread] to her household. . . . . She considereth a field, and buyeth it; with the fruit of her hands she planteth a vineyard. . . . . She perceiveth that her merchandise is good: her candle goeth not out by night. She layeth her hands to the spindle, and her hands hold the distaff. . . . . She is not afraid of the snow for her household; for all her household are clothed with scarlet. She maketh herself coverings of tapestry: her clothing is silk and purple. Her husband is known in the gates, when he sitteth among the elders of the land. She maketh fine linen and selleth it; and delivereth girdles unto the merchant. Strength and honour are her clothing; and she shall rejoice in time to come. . . . . Her children arise up, and call her blessed; her husband also, and he praiseth her. . . . . Favour is deceitful, and beauty is vain; but a woman that feareth the Lord, she shall be praised. Give her of the fruit of her hands, and let her own works praise her in the gates." And in Exodus xxxv. 30-35, about B.C. 1500, we read of Bezaleel and Aholiab the master craftsman of the first Temple:—"And Moses said unto the children of Israel, See, the Lord hath called by name Bezaleel, the son of Uri, the son of Hur, of the tribe of Judah; and He hath filled him with the spirit of God, in wisdom, in understanding, and knowledge, and in all manner of workmanship; and to devise curious works, to work in gold, and in silver, and in brass, and in the cutting of stones to set them [jewelry], and in carving of wood, to make any manner of cunning work. And He hath put in his heart that he may teach, both he and Aholiab, the son of Ahisamach, of the tribe of Dan. Them hath he filled with wisdom of heart, to work all manner of work, of the engraver, and of the cunning workman, and of the embroiderer, in blue, and in purple, and in scarlet, and in fine linen, and of the weaver, even of them that do any work, and of those that devise cunning work." These passages, and there are numbers of the same description in Homer and Aristophanes, are sufficient to prove the close affinity of the primitive Hindu civilisation of India, in the simplicity and beauty of its life, in the profound religiousness of its animating spirit, and in the identity of many of its industrial arts, with the civilisations of Assyria, Phœnicia, and Egypt, and with that of Greece in the heroic age at least; while even in the midst of the growing corruptions of imperial Rome, we find that Augustus Cæsar brought up the females of his family and household on the antique model, and wore no clothing but such as had been made by their hands.

The researches of Mr. Fergusson have shown that stone architecture in India does not begin before the end of the third century B.C. He has also drawn attention to the similarity in ground plan, and, in some instances in elevation, of Indian temples to Assyrian and Egyptian. He observes that if the description given by Josephus of the Temple at Jerusalem, as rebuilt by Herod, be read with a plan such as that of Tinnevelly, it is impossible to escape the conviction that these coincidences are not wholly accidental. In their grandeur and splendour of detail, and in the labour bestowed on them for labour's sake, the resemblance between the temples of Egypt and Madras is most remarkable. Not less startling are the traces of Assyrian art in these temples, and Mr. Fergusson expresses the opinion that, if we are to trust to tradition or to mythology or to ethnological coincidences, it is rather to the valley of the Tigris and Euphrates than to the banks of the Nile that we should look for the *incunabula* of what are found in Southern India. The jewelry of Madras is distinctly founded on its temple ornaments. A Madras silver incense-stick holder, exhibited by Mr. FitzGerald, formed of an antelope hunted by a dog along a conventional flower-stalk, and taken from the sculptures common on all Madras temples, is identical with some of the representations of hunting scenes on the Assyrian monuments given in Rawlinson's "Ancient Monarchies." In this it is clear that India is the copyist. The knop and flower, or cone and flower, pattern is represented, with local variations, on early Indian monuments in the same form and general style as on the marbles of Assyria; and in the Bharhut sculptures, at least, the lotus is repeatedly represented in the identical half-conventional form in which we find it, *en silhouette*, in the hieroglyphic paintings of Egypt. Here, again, India is obviously the copyist.

It is quite possible, however, that some of the very forms in India which can be proved to be copied from Assyrian temples and palaces may have originally been carried into Egypt and Assyria on Indian cotton or woollen fabrics and on jewelry. The knop-and-flower pattern commonly found on Scinde pottery is identical with the knop-and-flower pattern on the Koyunjik palace doorway figured in Rawlinson's "Ancient Monarchies," vol. i., p. 417. In the same volume, at p. 493, is a circular breast ornament, on a royal robe, from a sculpture at Nimrud. Here the cone does not alternate with a lotus-flower, but with the fan-like head of the *Hom*. Nor is the cone a lotus-bud, but a larger representation of the fruit of the *Hom*. In a common form of Persian plate, which may (chiefly because of the circular shape of the two objects) be compared with this breast ornament, the cone is developed into a form conical in shape, but *Hom*-like in

* London: Offices of the Royal Commission, Canada-buildings, King-street, Westminster.

etail, and the flower is metamorphosed into a strange Chinese style of scroll. That it is the knop-and-flower pattern is proved beyond dispute by the curved line which unites the base of the knop with the base of the flower, and which is found surviving in ornaments derived from this pattern when almost every other trace of it has disappeared. A modification, in point, of this pattern is repeated on the inner border of the plate. A very beautiful variation of the pattern is one of the commonest seen on Scinde tiles, in which the knop has become the regular Saracenic cone, and the flower not the head of the *Hom*, or lotus, but a full-blown Iris. On Delhi and Cashmere shawl-borders the *Hom*-head-like flower often looks very like the "Shell" in Renaissance. On these shawl-borders the knop and flower are often also combined, the knop becoming the cone or cypress-like trunk of a tree, the branches of which fan out like the fronds of the *Hom*. In some Indian and Persian carpets the knop or cone throws out graceful *Hom* fronds, one on each side, from the ends of which hangs a large flower, presenting the alternation of a branching cone and flower. Every other branching cone is also, as it were, upside down, so that we get a winding floriated line running in and out between each cone and flower. When the cone is large it is filled in with floral detail, as in Cashmere shawls, the last bright inflorescence of the original hard Egyptian and Assyrian knop-and-flower pattern. A few engravings are added from Owen Jones's "Grammar of Ornament," to show the modification of this pattern in Egyptian, Greek, Italian, and Renaissance art. Chapters have been written by puzzle-headed *savans* to account for these scrolls and for the cone, but surely their origin is so plain that he who runs may read. The Greek "honeysuckle and palmette" scroll is simply the knop and flower, as are the Renaissance "shell," and the "tongue-and-dart," and "egg-and-tongue," patterns in classical mouldings. Long ago Mr. Fergusson pointed out [illustrated "Handbook of Architecture," vol. i., p. 7] that in the "*lat*" at Allahabad the necking immediately below the capital represents with considerable purity the honeysuckle ornament of the Assyrians, which the Greeks borrowed from them with the Ionic order. Its form is derived originally from the date, *Hom*, but it really represents, conventionally, a flowering lotus, as the Bharhut sculptures enable us to determine. The "reel-and-bead" pattern running along the lower border of the necking represent the lotus stalks. One Chinese modification of the knop-and-flower pattern is very significant. The flower is here a pomegranate, and the cones have become green pomegranate-buds; but, instead of being in their original Assyrian places, they are attached to the edge of the vermilion corolla, one on each side, while their old places are filled by a panel formed by the curved lines, which should have joined the flower to the bud, running down between the flowers in parallel lines to the lower edge of the patterned border.

The Assyrian breast ornament figured by Canon Rawlinson proves that the fan-like pattern throwing off its long-stalked cones, arranged alternately round the border with the larger cones, is the head of the *Hom*, represented in the centre, and a multitude of representations of the *Hom* in Rawlinson's "Ancient Monarchies" and "Herodotus," and on old Saracenic and Sicilian brocades, prove that it is the date-tree, and that the long-stalked cones flourished out from it, and the large cones which alternate with it round the border of this breast ornament, are great clusters of dates, highly conventionalised. These cones are sometimes replaced by pomegranates, and, strange to say, the Tree of Life represented on modern Yarkand rugs is always a pomegranate-tree. The cone figured by Canon Rawlinson, vol. ii., p. 212, as a pine-apple, is clearly a bunch of dates bursting from its spathe. This cone appears on late Italian and Early Renaissance brocades, crowned, with flames rising from the crown, and alternating with oak leaves, from which long-stalked acorns are represented issuing forth like the cones from the trunk and head of the date *Hom*.

The original *Hom* was the Sanskrit *Soma*, *Sarcostemma brevistigma*, a leafless (the rudimentary leaves are scarcely visible) scandent Asclepiad, with its flowers collected in umbels, fan-like *en silhouette*, a native of the southern slopes of the Cashmere valley and Hindu Kush, the fermented juice of which was the first intoxicant of the Aryan race. It is still used as an intoxicant by the Brahmins, and the succulent stalks are chewed by weary wayfarers to allay their thirst. It is admirably represented on the Assyrian sculptures; and in Rawlinson's "Ancient Monarchies," vol. ii., p. 236, it is figured, twined very characteristically although highly conventionally, about the date-tree, forming the "Tree of Life," *Asherah*, or "Grove," sacred to Asshur, the Supreme Deity of the Assyrians, the Lord and Giver of Life. Canon Rawlinson notices the resemblance of the *Hom* head to the Greek honeysuckle ornament, and adds, "I suspect that the so-called 'flower' [*i.e.*, honeysuckle] was in reality a representation of the head of a palm-tree." Probably the date was substituted for the original *Hom* in Assyria, in consequence of the Aryas finding that they could not naturalise the true *Hom* plant, or because the date yields a more abundant intoxicating juice. Its fruit, also, would become the staff of life in the region of the Euphrates valley, and hence would naturally be consecrated to Asshur as the "Tree of Life." Later, the vine took its place in Asia Minor and Greece. As the "Tree of Life" is associated in the Bible with the Serpent and the Tree of Knowledge of Good and Evil, which brought death into the world, so it is very suggestive to see in Rawlinson, vol. ii., p. 167, the date *Hom* arranged alternately with a serpent-encircled cypress in the scene in which an Assyrian king is feasting his queen in a bower (*gloriette*) of the royal gardens.

In Egypt the knop and flower were represented by the date-palm and its fruit, by the lotus and its bud, and by the lotus-flower and a bunch of grapes, or the lotus-flower and a bull's-head; sometimes the flower by the papyrus-head. In Owen Jones's "Grammar of Ornament," plate 4, fig. 6, the ornament, which looks like a lotus-headed form of some sort, is proved to be a date, by the rippled mass of red and green hanging down one side of it, representing the ripe fructification of the date burst from its spathe. That the ripple is taken from the zig-zag of the branching date-stalks, any botanist will see. On the monuments, the Phœnician Venus Chiun [Amos v. 26] is shown, presenting snakes to Remphan or Moloch, the Author of Death, and lotus-flowers to Khem, the Author of Life, on whose altar we find the Tree of Life represented by a loto-papyro-palm-headed plant form, with a cypress form, evidently derived from the lotus-bud, on either side, and guarded by the *cabiri*, which suggested to the Hebrews the Cherubim, placed at the east of the Garden of Eden, to keep the way of the Tree of Life, and to the Greeks, "the dog" Cerberus, that guarded the entrance to Hades. The Tree of Life is represented throughout Greek and Roman and Italian and Renaissance art. It is still represented on the commonest Spanish and Portuguese earthenware by a green tree that looks exactly like a Noah's ark tree; but it invariably springs from two curved horns, which betray the secret. In India the knop and flower change like the transformations of a dream. Indeed, in Hindu art imagination is let loose as in a dream. In the Amravati and Bharhut sculptures the transformations go on under your eye, and reveal the whole mystery. The cone is generally the lotus-bud, and the elephant is never represented in carved stone without it in its trunk. Sometimes the cone of budding plantain-fruit takes its place. The flower is generally the lotus represented *en silhouette*, like a fan, or full-faced; and sometimes the fan-like form of the date *Hom* is given to the peacock's tail, as to the many-headed cobra; and not only these cobra-heads, but the water-lily is represented in true honeysuckle form. The cone is also represented by the mango and jack. In short, anything full of the glory of life becomes the symbol of life: The peacock's tail, the glorious lotus-flower, the mighty jack, the nutritious and unclosing plantain, the luscious, golden mango, the thyrsus-like clusters of the flowers of the *cadumba*, and the sacred fig, throwing down rootlets from every branch, which take root again and spring up in forests round the parent stem; all are natural and obvious symbols of life. The melon-shaped finial on the pagodas of Indian temples is probably derived from the unripe fruit of *Nymphæa rubra*. We have, however, to be on our watch for the vagaries of Hindu imagination. The entire leaf of the jack, *Artocarpus integrifolia*, is represented so swollen and bursting with life as to pass into the divided leaf of the bread-fruit tree, *Artocarpus incisa*. Again, we find the catkins of the jack, from which the long pendent ornaments worn by elephants in front of their ears are modelled, represented hanging out of the flowers, from the fruit of the lotus, from the branches of the sacred fig, and about the *lingam*, and *trisul*, which I believe to be the combined *lingam* and *yoni*. In the earlier sculptures a lotus plant is represented issuing from the proboscis of an elephant, the stalk running along in an undulating line, between the curves of which the flower is seen alternately in full face and *en silhouette*, in the most superb style of conventional art. In the Bharhut sculptures a lotus springs in the same way from an elephant, and its flowers alternate with the jack and mango; and, between each lotus "flower," and whatever fruit takes the place of the "knop" or cone, we have representations of the Buddhistic fables or *jatakas*; while the fruitful mystic lotus is represented pouring down all manner of good things, and jewelry in countless forms. In one place a woman from a tree, reminding one of the woman in the Egyptian Tree of Life, is pouring water into a man's hands, from a veritable teapot. In the Amravati and Takht-i-bhai sculptures, the lotus-stalk is looped up in festoons by dwarfs, as we see similar festoons, in Roman architectural remains, held up by genii. It may be that the Takht-i-bhai sculptures were influenced by Greek examples, or were executed under Greek direction; but really the intercourse with Assyria will account for a good deal that looks like Greek inspiration in India, just as it is now evident that the ornamental details of Greek sculpture also were derived from Assyria. The "knotted rope" pattern may have been taken from the knots in the stalks of the cone issuing from the stem and head of the date *Hom*, and the wedge pattern, alternate dark and light, from the conventional representation of the leaf scars on the stem of the date *Hom*. The tree-like figures given in plate 2, compiled from Owen Jones, and Mr. Fergusson, and Mrs. Jameson, all recall the *Asherah* or "Grove" of the Assyrians, particularly the Mediæval representation of the Cross, as the tree with twelve leaves for the healing of the nations.

Sometimes on Persian rugs the entire tree is represented, but generally it would be past all recognition but for smaller representations of it within the larger. In Yarkand carpets, however, it is seen filling the whole centre of the carpet, stark and stiff, as if cut out in metal. In Persian art, and in Indian art derived from Persian, the tree becomes a beautiful flowering plant, or simple sprig of flowers; but in Hindu art it remains in its hard architectural form, as seen in temple lamps, and the models in brass and copper of the Sacred Fig as the Tree of Life. On an embroidered Pindari bag it is represented in two forms, one like a notched Noah's Ark tree, and the other branched like the Temple candelabra. In this bag the cone is represented with the trees.

Neither is it difficult to conjecture how these religious symbols of the first worship of the Aryan race, afterwards darkened and polluted in Turanian India, and Egypt, and Assyria, by a monstrous and obscene symbolism, came to be universally adopted in the art ornament of the East. It originated in the embroidered hangings and veils worked by women for the temples, which they embroidered with the representation of the symbol of the deity worshipped.

The women "who wove hangings for the grove," or *Asherah*, are alluded to in 2 Kings xxiii. 7. They probably embroidered on cut patterns, and worked the larger patterns in *appliqué* into their work; and they cut the patterns by folding the cloth double, so as by one undulating or zigzag cut to get a two-sided symmetrical pattern. Nor is this entirely conjecture. This method is everywhere practised among the artistic peasantry of Europe. I have a number of such patterns, which I once saw a French peasant boy cutting out in paper, to while away the time. It happens that they are all of trees, some cypresses, and others trees with the cross introduced in the most strange conventional manner about them,—trees, in fact, of life and death. The method of cutting out patterns in this way tends to perpetuate a symmetrical and rectangular representation of ornament. The Noah's Ark-like trees, on the Pindari bag, is certainly derived from a bit of paper or cloth folded and cut crossways, and then notched. Be this as it may, the knop-and-flower pattern, and the Tree of Life pattern, pervade all decorative art, and by direct derivation from the Assyrian lotus and lotus bud, and *Asherah* and cone, but no longer symbols. This absence of

symbolism is the weakness of modern European decoration, as, indeed, it was of Grecian; and yet what conventional form is more beautiful than the French *fleur-de-lis*, more beautiful and worhipful than the Tudor rose, or than such heraldic symbols as the cross crosslet; and the most natural decoration for wall-papers, curtains, and book-lining papers, would be, for people who could afford it, to use family arms, alone or in combination with national symbols, and conventionalised representations of national flowers or animals. But no symbols can approach in beauty of form and meaning to the knop and flower, and the *Hom* of Assyria, and, purified of all local taint of Asshur, Ashtoreth, or Astarte, they belong to all the Aryan races in the Old World and the New.

The history of mankind is in its direct impulses the history of surplus populations in search of food; but wherever men have been able to rest, and to found civil and political organisations, they have raised up testimony to the truth that man shall not live by bread alone. We find it figured everywhere in Oriental art, and we cannot take up a talisman of Egypt, an engraved gem of Assyria, a Syrian silk, an alabastron of Persian perfumes, or a Persian illuminated MS. or carpet, a Cashmere shawl, an Indian jewel or *kincob*, any of the great store of these splendid and precious stuffs, and arms, and vessels of wrought gold and silver, presented to the Prince of Wales, on which we do not find the acknowledgment of the Divine author and finisher of every perfect work; in symbols taken from the most majestic of trees and the loveliest and most graceful of flowers, and which express more simply, directly, and fully than can any form of words, the wisdom and beneficence of the Creator, and the gladness and praise of men. The Portuguese, the first discoverers of India, always carried the Cross at the mast-head of their ships, as a sign of the higher aims of their enterprise, and of all human intercourse and effort. They erred grievously in seeking to give too dogmatic an effect to their aspirations, and the Inquisition of Goa is the blackest spot in the history of the connexion of Europe with the East. But not the less valuable is the recognition of the true position and destiny of men in the world,—that only in responsibilities incurred, and duties discharged by each for another, is there any hope either for individuals or for States, and that to weary of and shrink from them are the first signs of the sinking fortunes of an empire.

INSTRUCTION IN MUSIC FOR THE BLIND.

WE have been requested to make known the invention, by an Italian, of a method for teaching the blind to read music, and to acquire the rules of harmony and counterpoint, without the assistance of teachers who teach only by the ear. In Italy it is reckoned that there exist 35,000 blind persons, many of whom could gain a competency by playing in orchestras, &c., were they capable of studying thoroughly the theory of music, independently of the scant teaching in asylums. For example, in the Milan Asylum, one master alone is provided for the instruction of music, thus rendering those whose natural talents might be developed for usefulness and gain dependent entirely for teaching on the verbal instruction of one individual. Counterpoint is impossible to be taught, except by harmony and the correct ear. The problem to be solved is, how to provide the blind with a plentiful supply of music, printed in a way easily legible to them, and this also at the lowest possible price, so that they may have the means of studying harmony and counterpoint without the aid of the voice or the plastic example of individuals enjoying the power of sight. Does there exist a musical notation for the blind which will supply the requirements of the art?

Italy, since 1866, in imitation of the French institutions, has introduced for the blind the so-called system of the priest Braille. In Paris the musical notation according to Braille has been, and still is, regarded as a temporary expedient—a *pis aller provisoire*. It has failed in accomplishing the end aimed at. The illustrious Pennisi Calanna, born blind, mentioned among the most celebrated blind persons in the account published in Vienna on the subject, and who this year has caused so much wonder at Geneva by the different displays of learning exhibited by him in mathematics, music, literature, criticism, &c.,—and who, in February, 1878, lectured in the Athenæum of Geneva on the difficult question of the influence of the Papacy in times past on literature,—this Pennisi Calanna pronounced against the Braille system:—1. Because by it the rhythmical expression can never be rendered exact. 2. The notation of the chords presents indescribable difficulties. 3. The over-multiplicity of signs generates confusion. 4. The impossibility of arranging the accord of the different parts. 5. Counterpoint becomes impossible. 6. The impracticability of correcting what has been already written without rewriting the whole page. 7. The composer cannot re-read what has been already written, and continue his writing—hence, cannot avoid the thousand errors of harmony of parts which may be made by the most experienced in their first copies. 8. With the Braille system, writing orchestral parts must be renounced, because the machine does not allow the requirements of going from line to line to provide for the separate exigencies of the different instruments. 9. That the Braille system is only to be adopted by those who are already acquainted with music.

All systems introduced from Germany, France, Russia, and America have failed in teaching the blind to study by themselves the theory of music. It has fallen to the lot of an aged Italian professor, after a study of nearly twenty years, to solve the difficult problem. Professor Emanuele Gambale, of Naples, now a resident of Florence, pronounces the theory of his system to be the simplest ever invented in point of extreme clearness in pointing out the notes, mathematical precision in fixing their value, impossibility of doubt either in representing the different parts, or in the embellishments. The printing for the use of the blind having become so easy, clear, inexpensive, and expeditious, they can quickly have a rich collection of music either for solo or part playing; and adopting the system of Gambale, the most difficult and complicated compositions of Beethoven, Bach, Listz, &c., seem easily executed at first sight, so to speak. Still more, with this system, a blind person can study counterpoint through the perception of sounds and their connexion of place and rhythm, and so on till he is able to direct an orchestra. The system has been approved of by Lauro Rossi, director of the Conservatore of Milan, and others, before whom some youths, instructed to the method by Prof. Gambale during less than two months, were able to read off and play on the pianoforte a composition written on the spot by Lauro Rossi, by means of the signs in relief invented by Professor Gambale, executing also scales and exercises prepared in the same manner.

Promises were made for its adoption in all the institutions existing, but the want of means has caused the old system to be continued, and the unfortunate blind to be deprived of a real help and endless resource both of occupation and gain. Professor Gambale is now nearly eighty years of age, but possesses great energy and powers of intellect. His most earnest desire is to see his invention used for the amelioration of the condition of the poor blind, and failing to see it adopted by his own countrymen—not from its inutility, but from the paucity of his country's finances,—he desires to make it known to others.

OBITUARY.

Mr. G. P. Bidder, C.E., F.R.S.—Mr. George Parker Bidder, the well-known Civil Engineer, died on the 20th inst., at his residence, Ravensbury, Dartmouth, whither he had lately retired from professional pursuits. He was born about the year 1806, at Moretonhampstead, in Devonshire, where his father was a mason. At an early age he attracted much attention by his talent for mental calculation, which earned for him the cognomen of "the calculating boy," and led to his appearance at Court ("when George III. was king") at an unusually early age. Unlike some other youthful prodigies, he did not fail to maintain a reputation for ability in his after-life. The kindness of a friend enabled him to acquire a solid education at the University of Edinburgh, where he formed an acquaintance with the late Robert Stephenson, which influenced the whole of his subsequent career. After a short engagement at an insurance office, distasteful to himself, he was employed for a time upon the Ordnance Survey. The experience which he acquired here enabled him to fill the post of assistant engineer to Mr. Henry Robertson Palmer, who was then engaged in the construction of the Eastern Dock at the London Docks. Mr. Bidder's next engagement was with Messrs. Walker & Burgess, in superintending the construction of the Brunswick Wharf at Blackwall—noteworthy for the first use of cast-iron piles in river-walls. When Robert Stephenson, about 1831, planned the London and Birmingham Railway (now forming part of the London and North-Western system), Mr. Bidder joined him as assistant; and during a long series of years he took part in many works on which the two Stephensons were engaged. He played an active part in the obstinate Parliamentary contests concerning atmospheric railways and the "battle of the gauges." Mr. Bidder was afterwards sole engineer of several important works. At an early period in the introduction of the electric telegraph system he recognised its importance in connexion with railways, especially in working single lines; and he introduced it on the Blackwall and the Norwich and Yarmouth lines. He was one of the founders of the original Electric Telegraph Company, and was a constant adviser to the Board down to the transfer in 1870 of the company's wires and rights to the Government,—a transfer which he assisted in completing. Mr. Bidder became a member of the Institution of Civil Engineers in 1825, and was one of the oldest of the body in that capacity. He was for many years a member of the council, and was president in 1860 and 1861. A paper published in the fifteenth volume of the "Minutes of Proceedings" of the Institution of Civil Engineers, gives a curious account of his powers in mental calculation. This paper was the result of two oral lectures given by him at the Institution, under the presidency of Mr. Robert Stephenson.

THE STORY WITH SOME INTEREST IN ST. LUKE'S.

IT will be remembered that the Metropolitan Board of Works, at their meeting of July 26 last, adopted the following resolution, which had been drawn up by a sub-committee appointed by the Board to consider the position of Mr. Storey, a member of the Vestry of St. Luke, and chairman of the Improvement and Parliamentary Committee of the Vestry, with regard to certain property required for the Whitecross-street and Golden-lane improvement scheme:—

"That from the facts and circumstances which have come to the knowledge of the committee, relative to the past and present interested connexion of Mr. Joseph Storey, the representative to this Board of the parish of St. Luke, with property in that parish required for the Board's improvement scheme in Whitecross-street, under the Artizans' Dwellings Act, and for the local improvement in Golden-lane, now being carried out by the same Vestry, and to the cost of which the Board have agreed to contribute a moiety, and from the fact that a claim is now before the committee, signed by Mr. Storey and his co-adventurers, demanding a sum of no less than 47,062*l.* in respect of property in which he is largely interested, the committee are of opinion that Mr. Storey's duties as a member of the Metropolitan Board of Works, are in complete conflict with the private interests of himself and of his co-adventurers, and that his conduct in relation to the properties in question is calculated to reflect discredit upon local self-government."

On Tuesday last an adjourned meeting of members of St. Luke's Vestry was held, and the following resolution was submitted to the Vestry:—

"That this meeting, considering the memorial presented from the Banner-street meeting, and the memorial which it was forwarded to the Metropolitan Board of Works (this latter was by the Vestry, approving of what their representative had done), on the 29th of July last, recommends the retirement of Mr. Storey from the membership of the Metropolitan Board of Works."

To this resolution the following amendment was laid before the Vestry:—

"That this Vestry having considered the memorial presented to them at their last meeting and the oral representations of some of the memorialists then made and the charges brought forward, and also the explanation of Mr. Storey in relation thereto, are of opinion that the charges have been made for personal objects only, and that the transactions of Mr. Storey in the purchase and sale of property in this parish have all been fair and legitimate, as a buyer and seller of property carried on by him for many years past, and long prior to his becoming a vestryman or a member of the Metropolitan Board of Works; and this Vestry considering that he has done no act deserving censure, or which can cast the slightest slur on his honour or integrity, or renders his retirement from the Vestry or the Metropolitan Board of Works necessary, expedient, or desirable, they beg to express their full confidence in and hereby offer him their thanks for the very able manner in which, as chairman of the Improvement Committee, he has fulfilled the duties of that arduous office."

The amendment was carried by 20 to 12.

SANITARY INSTITUTE OF GREAT BRITAIN.

The Congress of this Institute is to be held at Stafford, and will occupy from October 2nd to October 5th inclusive. A list of promised papers is published, and we have no doubt a certain amount of good will be done. We must confess, however, we have no warm words of welcome for the society. It is an endeavour to supersede the Health Department of the Social Science Association, and by holding the meetings two or three weeks before the time fixed for the Social Science Congress in Cheltenham, the shine to a certain extent is naturally taken off the latter. As to the Exhibition of Sanitary Appliances announced by the Institute, it is a downright pillage of an idea carefully worked out and brought into action at all the recent Congresses of the Social Science Association, mainly by Mr. James Robinson, and a small committee who sought sedulously to prevent the dominance of the trade element, and to make it subserve to the utmost the public good. One result of the plagiarism will probably be the absence of a Sanitary Exhibition at Cheltenham. We notice, with some surprise we must confess, the names of several long attached and much esteemed members of the Social Science Association in the programme of the Sanitary Institute, such as Mr. Chadwick, Mr. R. Rawlinson, Captain Galton, and a few others, so that possibly our views are wrong,—we hold them, nevertheless.

SURVEYORSHIP ITEMS.

Bournemouth.—Mr. G. R. Andrews, late clerk of the works to the Bournemouth Commissioners, has been appointed surveyor to that body, at a salary of 200*l.* per annum.

Epsom.—Mr. S. M. Pratt has been appointed assistant surveyor to the Epsom Highway Board, at a salary of 100*l.* His father, Mr. Sampson Pratt, holds the position of surveyor to the Board.

Barton-upon-Irwell.—On the 18th inst. Mr. J. Price, C.E., resident engineer on the Barrow-in-Furness main drainage works, was elected to the post of surveyor to the Barton-upon-Irwell Rural Sanitary Authority, at a salary of 275*l.* a year. There were seventy-eight candidates.

THE ENCLOSURE OF CLERKENWELL-GREEN.

The Clerkenwell Vestry having, at their meeting on the 19th inst., finally resolved upon enclosing the open space in Clerkenwell, notwithstanding the opposition of the several bodies who are in the habit of holding meetings there, a notice of the manner in which the ground is to be laid out—as shown by the plans prepared by Mr. Cox, the surveyor to the Vestry,—may be interesting. The area of that portion proposed to be enclosed is 200 ft. in length, and 40 ft. in width at the west end immediately in front of the Middlesex Sessions House, narrowing in width at the east end, where it is only 20 ft. in width, the entire enclosed ground occupying an area of about 6,000 ft. At the west end there will be iron gates, leading on to an asphalted roadway, 20 ft. in width, which extends to about half the length of the enclosure. At this point, in the centre, an ornamental fountain will be erected, on each side of which the asphalted road, continued to the right and also to the left, gives egress from the enclosure through gates on either side. Each side of the asphalte road will be fitted with seats, while the space beyond, on the north and south sides respectively, extending to the boundary of the enclosure, will be turfed, and planted with shrubs and flowers. That portion on the east side of the fountain will be principally turfed and planted with shrubs and flowers, outside of which will be footpaths leading to a drinking-fountain at the north-east corner. The whole will be enclosed by ornamental iron railings, surmounted by globular lamps all round. The space as enclosed will leave a carriage-way on the west side, in front of the Sessions House, and also on the north and south sides, of from 30 ft. to 35 ft. in width, in addition to 12 ft. of footpath. The gates will be closed in the evening in accordance with the system adopted in many other enclosed spaces in the metropolis.

CHURCH RESTORATION AND EXTENSION IN THE SOUTH YORKSHIRE MINING DISTRICTS.

The numerous new and extensive collieries which are being opened out and developed in the South Yorkshire mining districts have rendered it imperative upon the owners of landed estates and those who have the spiritual welfare of the people in their hands to either greatly enlarge existing churches or erect new ones. Most of the new collieries are laid out on a scale capable of producing 1,000 tons of coal per working-day, and giving employment to from 500 to 800 men. As a rule, the coal is being sunk to in hitherto unexplored parts of the coalfield where the population has for years been stationary. Most of the owners of these vast undertakings have been compelled to erect houses for their workmen, so that in several parts of the district entire new villages are springing into existence where only agricultural pursuits have been followed for generations. At Carlton, near Barnsley, where the Yorkshire and Derbyshire Coal and Iron Company have sunk a large colliery on the estate of the Earl of Wharncliffe, a new church is being erected at the sole expense of his lordship. At Monk Bretton, where of late years a vast colliery undertaking has been developed by the Monk Bretton Colliery Company, the church has been recently entirely rebuilt. The most striking instance of the rapid changes referred to is to be found at South Kirkby,—a quiet, rural, agricultural village about seven miles north-east by east of Barnsley, and about equal distances from Pontefract and Doncaster. The village in 1838 consisted of 615 inhabitants, and these have since not been materially increased. A rapid change will, however, soon come over the entire district, owing to the south Kirkby Colliery Company having secured the whole of the coal belonging to Mr. Allott, the lord of the manor, and, having sunk two of the deepest shafts in Yorkshire to the coal, which has been met with in one shaft at a depth of 630 yards from the surface. As the company will give employment to more people than exist in the village, even where they are all miners, they have erected a number of houses, which will shortly be very greatly increased, and in all probability the population will shortly be more than doubled. Under these circumstances, the vicar, and those acting in concert with him, have very creditably resolved to partly restore the village church, and greatly increase the accommodation for worshippers. The structure, which is dedicated to All Saints, was erected in the early part of the fourteenth century, and is a very neat specimen of the style of architecture which flourished at that period. It has a large tower and six bells, and everywhere bears traces of good workmanship. The exterior, it may be stated, is in a state of decay, and requires immediate attention, but the amount of funds forthcoming will not allow of this being given at present, though it is to be hoped this defect will be remedied. The carrying out of the work of restoration has been intrusted to a firm of London architects, and under their care the restoration is rapidly progressing. The work, which is for the most part confined to the interior, will be defrayed by subscription and a grant from the York Diocesan Society. The whole of the old wood flooring, which caused great dampness, has been removed, and a layer of concrete has been placed under the flooring, which is composed of wood, with tiled passages. The old-fashioned square pews, which were nearly 6 ft. in height, have been swept away, and open seats substituted. The old gallery at the west end, which disfigured the interior, has been entirely removed. The tower-arch has been opened out, thus affording a full view of the western window in the tower. The chancel has been restored and rendered much more commodious. The stonework generally has been scraped down, care being taken to preserve and retain the original characteristics of the building. It has been found necessary to remove the old lead roof of the nave, the replacing of which has been carried out by Messrs. Taskers, plumbers, of South Kirkby. Owing to the level of the ground being higher than the flooring, the architects have constructed a trench round the outer walls of the church, as a preventive against damp disfiguring the internal walls, which up to the present time has been the case. The contractor is Mr. W. Anelay, of Doncaster. It may be stated that in the west porch of the church there is a small piece of thirteenth-century work; whilst in the south porch a very fine piece of fourteenth-century work is to be seen. The edifice has been added to at several times, the tower being a fine specimen of Early Perpendicular work. Some of the inscribed stones removed in taking up the old flooring have been restored in the tower-floor; one or two bear evidence of ancient workmanship. Under the old system the church would only seat 250 worshippers, but it will now accommodate fully 400. The edifice will be heated throughout by flat hot-water pipes, running on the same level as the tower-floor. The work has made considerable progress. Another church already gives evidence of a comfortable and commodious edifice.

THE NEW GERMAN INDUSTRIAL MUSEUM, BERLIN.

INTERIOR VIEW.

A few weeks ago* we furnished an illustration of the building now in course of erection in Berlin, under the direction of Professor Gropius, for the New German Industrial Museum. Particulars of its principal architectural features were given at the time, and we need only add that the museum, when completed, will form the corner of the Zimmerstrasse extension, near the War Office, that it will cover an area 230 ft. square, and have an elevation to the roof of 88 ft. 6 in.

We are now enabled to supply an interior view of the building, representing the inner glass-covered court reached on passing through the vestibule, approached by a staircase from the principal entrance. This court has a length of 131 ft. 6 in., a breadth of 72 ft. 6 in., and is surrounded by arcades 16 ft. 6 in. wide, supported on square piers. Its centre will be occupied by a fountain surrounded by plants. This court is to serve for the exhibition of works of the plastic arts of large size.

THE HALL OF THE TROCADÉRO.

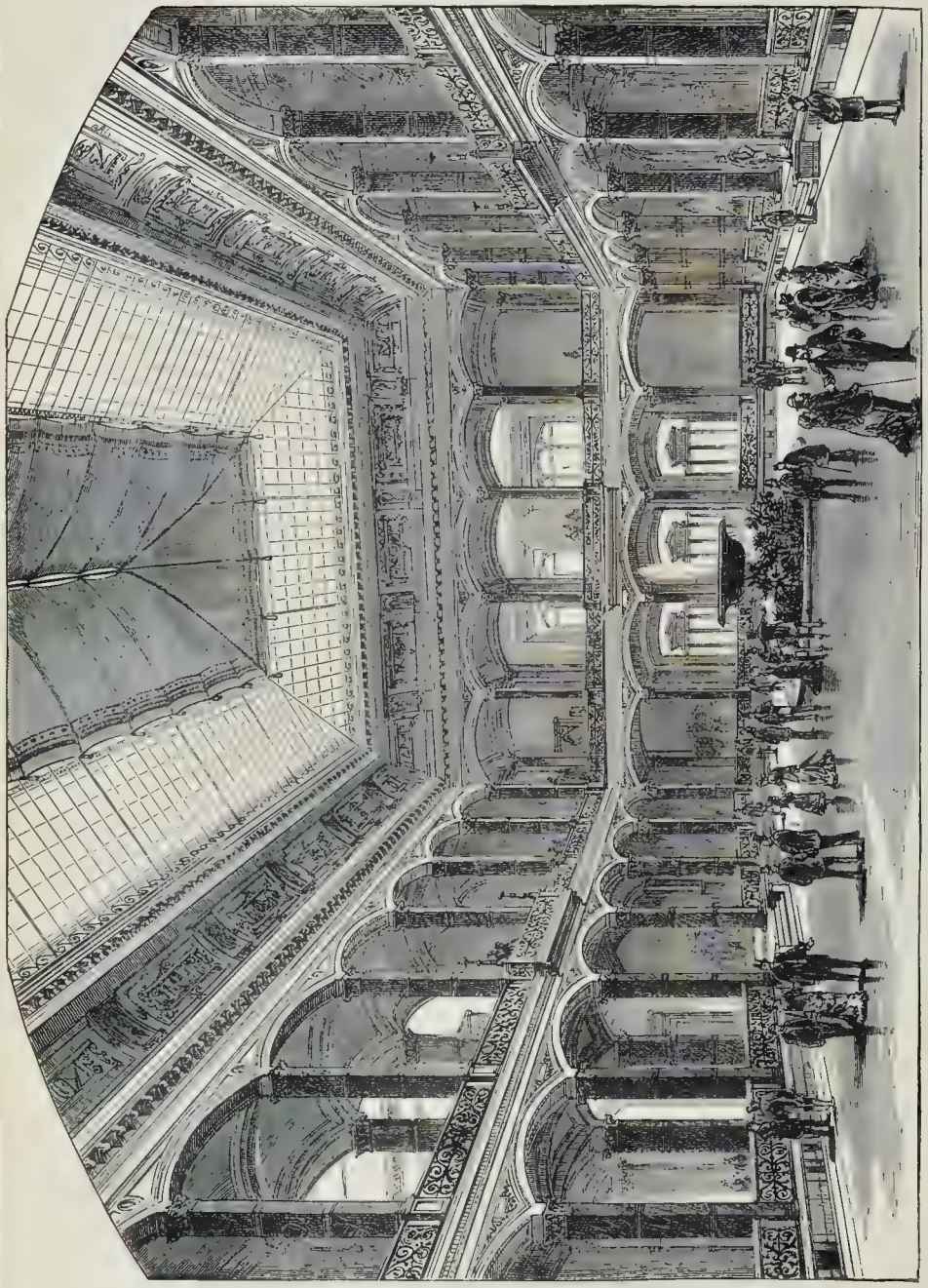
The great hall of the Trocadéro has proved a complete success: capable of seating over 6,000 people, the faintest note can be heard by the most distant spectator. Ample light is secured from the immense bay windows, and the hall is well ventilated. A series of gilded sphynxes support the ribs of the enormous dome. The decorations, perhaps over-done, "*à l'article de Paris*," are, nevertheless, light and elegant.

The form of the hall is that of a horse-shoe,—the shallow, but capacious stage, forming the base, flanked by two columns supporting allegorical figures of Glory and Honour. Above the proscenium is a picture, painted by M. Lemaire, representing Peace inviting the nations of the earth to her throne. The stalls are raised on a very sharp incline, so that everybody enjoys an excellent view of the stage. Above the closed boxes at the back of the stalls is a row of open ones, while behind these rises the vast amphitheatre, and again, beyond, some boxes are formed in the wall. This great hall is kept religiously closed except on concert days, or when there are gratuitous performances on the grand organ. The public are then admitted at two o'clock; but, as these are rare, visitors have very few opportunities of seeing the interior of the Palace of the Trocadéro.

The correct views of the Exterior of this building† and the Façade of the Exhibition Building‡ were first given in our pages, and we believe the same may be said in respect of the Interior of the first-named building, which we now illustrate.

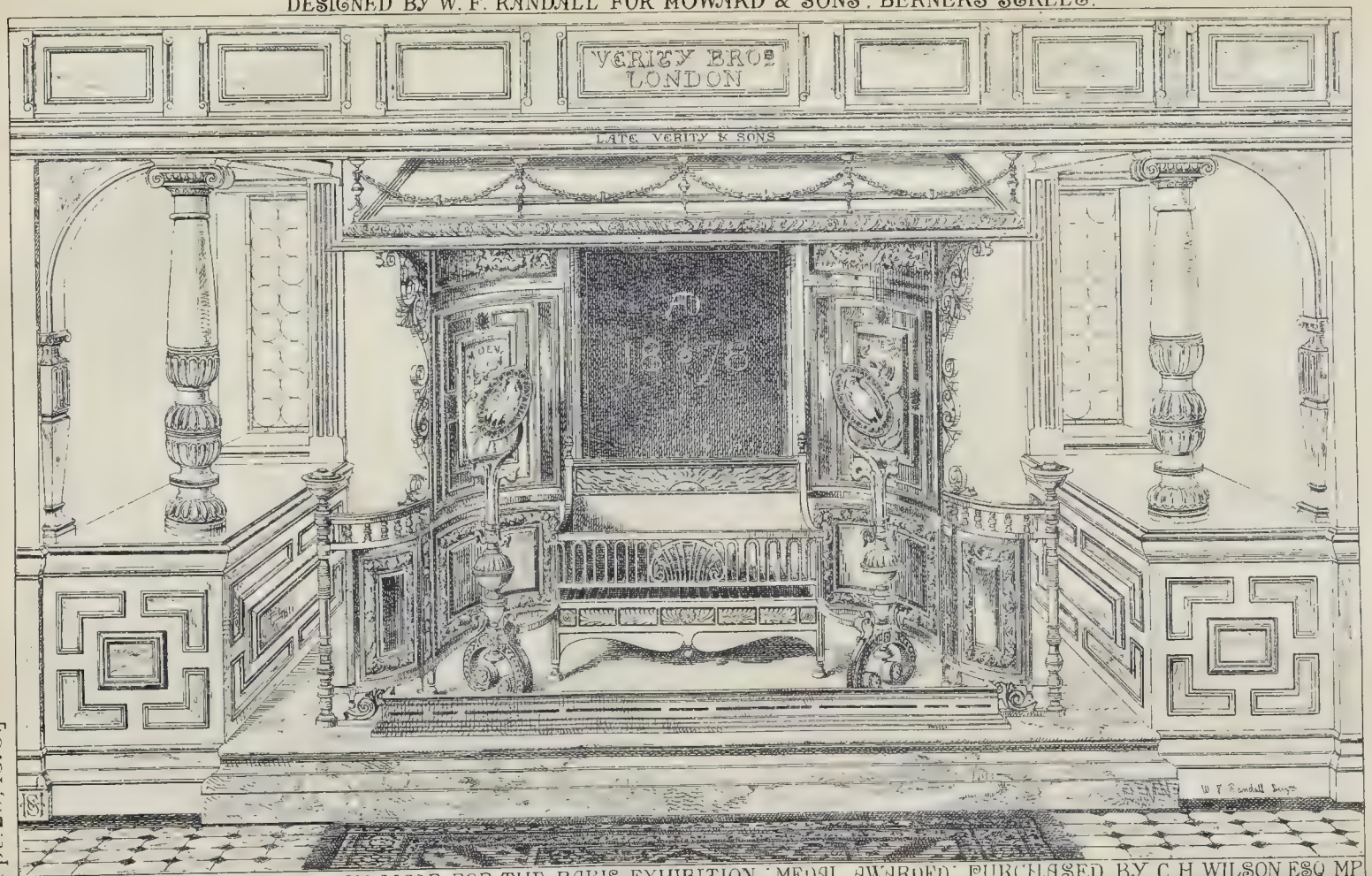
Fall of a Platform at Blackfriars Bridge. On the 19th inst., at about a quarter past three, a heavy wooden platform, built on the Middlesex side between the railway bridge at Blackfriars and that used for ordinary traffic, fell with a crash. The platform, which was on a level with the roadway, and supported by massive wooden beams, was built over the river, and used as a place for loading barges. At the time of the accident a barge was being filled with rubbish, carts being taken to the edge of the platform, and there tilted to allow their contents to pass down an incline. Fortunately, all the men at work were enabled to get away before the platform entirely fell, although there must have been many narrow escapes.

* See p. 750, *ante*. † Vol. xxxiv., pp. 1097-99.
‡ Vol. xxxv., pp. 761-63.

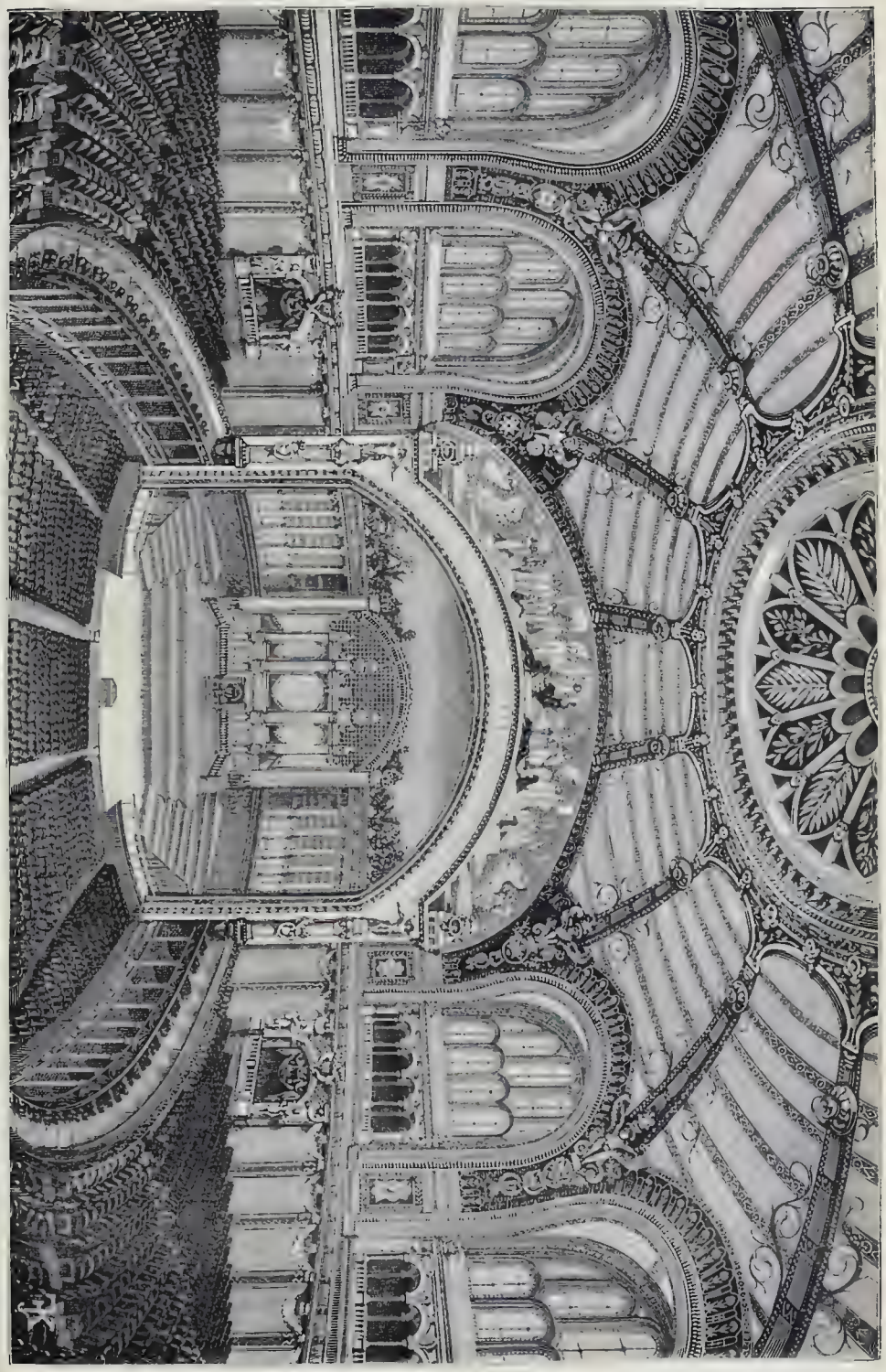


INNER COURT OF THE NEW GERMAN INDUSTRIAL MUSEUM, BERLIN: AS IT WILL APPEAR WHEN COMPLETED.
PROFESSOR GROPIUS, ARCHITECT.

DESIGNED BY W. F. RANDALL FOR HOWARD & SONS: BERNERS STREET.



THIS STOVE WAS DESIGNED AND MADE FOR THE PARIS EXHIBITION: MEDAL AWARDED: PURCHASED BY C. H. WILSON ESQ MP



THE GREAT HALL OF THE TROCADÉRO, PARIS.—Messrs. Davioud & Bourdais, Architects

THE TRADE UNIONS CONGRESS AT BRISTOL.

As we have already stated (p. 969), the eleventh nnual Trade Unions Congress commenced its ttings at Bristol on the 9th inst. We have iven an outline of the first day's proceedgs. On the second day,

Mr. G. F. Jones, the president, delivered his augural address. After some introductory emarks, he alluded to a speech referring to the peration of trade unions made by Mr. S. Morley, .P., at the meeting of the Bristol Chamber of ommerce, in April, and read a letter explanaory of that speech. On this the president emarked, "It is a kind of eulogium on trade nions for the good they have effected, both to mployers and employed; in the second place, contains a charge implying a change of policy, y creating an estrangement or alienation etween masters and men; and then it suggests he necessity of introducing a system altogether ifferent in its arrangements, and involving oncessions in the method of conducting our egotiations. Now, the value and importance f trade unions to us who labour have been so learly and forcibly demonstrated on former ccasions, and to which your presence testifies, hat it is a fact requiring no further proof. A ery important programme still remains to be ccomplished, and the successful carrying out f that programme will mainly depend upon the ay in which we individually and collectively bserve and value the first essential principle of he existence of our unions, viz., that they shall e purely voluntary. It is of the utmost imortance that this voluntary principle should be aintained in its entirety, for it forms the basis f our political liberties guaranteed to us by the onstitution. It has been won for us by the fferings and the sacrifices of our ancestors, nd should be especially dear to trade-union orkmen, because of their struggles to secure he right of combination. The sacredness of ersonal freedom should be held intact, and be efended at all hazards; for the violation of his principle will but endanger the common ause, and jeopardise the very existence of our nions. Another noticeable fact in regard to hese and other gatherings of labour represenatives is the altered tone of the Press in its omments on labour questions and working en's movements. This, undoubtedly, is a ealthy sign of the times, and one that cannot il to exert a beneficial effect on the public ind; for, in proportion as the Press is modeate, so will its influence with the working lasses increase, and even its adverse coments on matters of policy be listened to with espect. With regard to the second charge, I ail to see the slightest tendency of modern times hat is at all calculated to alienate employers rom employed. In addition to the teaching f history, experience has long since demonstrated the fact that the invariable laws of trade nions, which relate to the question of wages, are check to unfair competition, and a guarantee or just and equitable conditions of labour to each nd every employer; and while they engender spirit of self-respect, they inculcate thrift n the part of its members, and in contradisinction to the wild assertions frequently made hat their tendency is to reduce the energetic to he level of the mediocre workman, I am bold to ssert that, on the contrary, they encourage mulation, both as to methods and skill, and they end to elevate the character of the members y cultivating habits of industry, sobriety, and rovidence,—social elements which cannot fail o exert a beneficial influence on all with whom hey come in contact, who are not previously linded by prejudice. As to the question, what oncessions are we prepared to make in the node of conducting our negotiations with emloyers? I think it only reasonable to inquire what further concession is required. If it mplies conciliation and arbitration, then I say hese are no new features in connexion with our rganisations; it is one of the fundamental rinciples of many societies, who not only enjoin s observance by their members, but make it mperative on the part of their officers, in all ases where applicable, to offer conciliation, or, ailing in that, arbitration, thus casting the nus of disruption on the employers by their efusing to meet the men in conference; and yet he public mind is kept in a state of ferment by gnorant and irresponsible persons, who allege hat trade unionists are opposed to all reasonble modes of settling the wage and other quesions in dispute. One of the most remarkable incidents on record bearing on this question has just occurred at the recent meeting of the British Association in Dublin. The rarity and genuineness of the production will be my apology for placing it before you as a counterbalance to the statement of the hon. member for Bristol. In the Economic Section of the British Association, Mr. Campbell, in a short paper on the "Social Aspects of Trade Unionism," said:—

"The time seems almost to have arrived when all further attempts by argument or abuse to overthrow trade unions must cease, and these associations be recognised as a powerful existing feature in our social economy. Trade unions place workmen in a position to secure better terms in bargaining with their employers, and they are only double to the working classes in so far as they serve as benefit societies. It is, moreover, to the persistent agitation of these unions, aided by the efforts of political reposts, that are to be ascribed the many legislative enactments of modern times against the employment of women and children in unhealthy and too-protracted labour; against the use of defective and dangerous machinery, and all tending finally for the erection of comfortable and well-arranged dwellings. In so far as trade unions can consistently with the state of trade endeavour to equalise the fluctuations of wages, they are performing a function eminently beneficial to themselves, their employers, and the community. The confident belief that the difficulties between capital and labour would find their solution in the growth of the system of co-operation has been but indifferently fulfilled. It is evident that the extension of a system which would demand from our working men the unswerving attention and intelligent devotion to business required by the fierceness of sudden industrial competition—such economy and self reliance as would accumulate the necessary capital, and secure a provision for seasons of depressed trade,—and above all, such a regard for economic laws, and such an unselfish interest in the welfare of their fellows as would prevent mutual encroachments—supposes a higher standard of social and intellectual refinement than at present exists among them. Towards the creation of such a standard, much has been done, and is still being done, by trade unions. And if they content themselves with supplying their members with accurate information of the state of the markets at home and abroad, and concentrate all their energies on the work in which they have made such a rapid strides towards the social and intellectual advancement of the working men, they will have earned the sympathy and respect of all right-minded people, and their successors will reap the reward in benefits to which they could never have attained under the baneful dominion of strikes."

I commend the above to the careful consideration of all to whom it was intended to apply (not omitting our own responsibility in the matter); but I am fully persuaded that to the attainment of so desirable an object suspicion and prejudice are the two great obstacles to be overcome. The prejudice which found vent in the expression of Nathaniel of old, when he said, "Can a good thing come out of Nazareth?" is as deep-rooted as ever at the present day in the minds of many, some of whom sit in high places, and in respect to every attempt that is made by working men (especially trade unionists) to improve their position, is calculated to supersede these institutions which have been all-powerful in the past as a means of promoting the wellbeing of their members in all matters appertaining to their daily labours. The recent contests between capital and labour in the building trades in London and Manchester, and which (speaking plainly) resulted disastrously to the cause of labour, is fraught with interest, and the lessons they are calculated to teach should be carefully observed and stored up for guidance and direction in the future. I do not presume to question the legality of the disputes referred to, but will at once concede to them the right to be the better judge of the time and circumstances most favourable to their application; nor shall I do more than record the fact of the persistent refusal of the employers to conciliate with the men, nor the artifices resorted to in order to supplant the men on strike, because we have no legal or moral right to fetter the action of the employers; the perfect freedom of action we claim for ourselves must in honour be conceded to those who are opposed to us, even though they resort to the unpatriotic action of importing foreigners from the Continent and America in order to defeat the object of the men to whose industry and skill, doubtless, the majority are indebted for their exalted position. The enormous expenditure necessarily incurred in this foreign trade in human kind is to us comparatively unknown, and will doubtless remain a secret. The cost on the side of labour was correspondingly great; but the cause of unionism to-day is as good as ever, and reverses such as have been recorded during the year should stimulate its members to a careful study of the circumstances which led to the defeat; for it is a truism that to make light of what we are doing is to ensure failure. It is doubtless the first duty of the officers and members of the unions, when considering the propriety of asking for an advance of wages, to understand the condition of their respective trades, the demand for work, and the amount of business in prospect; these are essential conditions of the wages problem that require to be thoroughly understood. Assuming, then, that these requirements were fulfilled, how came it to pass that the subsequent attempts to enforce the demand so ignominiously failed? This recalls to memory the names of a number of gentlemen who have distinguished themselves in promoting useful legislation, and who have otherwise deeply interested themselves in advancing the cause of labour, all of whom have expressed themselves very strongly on this subject. Mr. Brassey, in his address to the Leicester Congress on this subject, said,—

"It is evident the problem cannot be solved without an intimate knowledge of the state and prospects of trade; it is not enough to understand the condition of the labour market in this country; an international knowledge of the situation is essential."

Again, in his essay on "Work and Wages," he multiplies instances where attempts, not only to raise wages, but even to resist a reduction, had proved futile in a declining or depressed state of trade. The theory here propounded, I confess, is both new and unpopular among trade unionists; it is, doubtless, one of those lessons that are hard to be understood. "And yet," wrote the late John Stuart Mill, "nothing is more simple than the political economy of labour." I am of opinion that the result of the contests alluded to affords the most convincing proof that the price of labour, like that of commodities, is governed by the proportion between supply and demand; the effect of a plentiful or a deficient harvest in raising or reducing the price of bread is familiar to every one; it is a fact of such common knowledge that it need not be enforced. The cases I have quoted are not mere speculation, but rather demonstrate the existence of two truths of great importance, first, that wages depend on the greater or less competition for employment; and, secondly, that it is not the employed, but the unemployed workmen who fix the price of labour. The connexion of these two propositions with the rapid increase of population must be apparent to all. It follows, then, that we are, to a great extent, the arbiters of our own destinies; for I am convinced that we have a higher and nobler mission to fulfil than to be perpetually engaged in the turmoil of costly and unnecessary labour disputes. Our real strength, as a community, lies in the heart and the brain, and the sooner we turn our attention to the consideration of these questions, earnestly and seriously, the sooner will this great problem be universally understood; until then we cannot look forward to any lasting improvement in the people. In the meantime, it is clearly our duty, as well as our highest mission, to husband our means and resources, having special regard to the ever-increasing claims on the benevolent side of the question, as well as for a day of need, when it becomes necessary to act on the defensive. It is with the deepest regret that I revert to the overt acts of violence and lawlessness which a short time ago were rampant in North and North-east Lancashire. It would have been to me a far greater pleasure to record the fortitude and law-abiding character exhibited by our kinsmen in the principality under the most trying circumstances, as applicable to each and every district; but there the fact remains, however much we may deplore it. And I feel it to be a duty incumbent upon me, with the greatest confidence of your undivided support, when I say that we have not the slightest sympathy with the perpetrators of the diabolical outrages that were committed, either on person or property, under any circumstances whatever. Perfect freedom of action we have already contended for, and again repeat; the policy of menace simply destroys the chance of reasonable concessions,—the very fact of disregarding the law under such circumstances simply means disaster for the workman. However good the case may be, the moment that law and order are set at defiance, that moment is the protection afforded by the law at once forfeited, and the chance of success irretrievably lost. The merits of the dispute, which contains the principle of limitation *versus* over-production, I do not propose to enter upon; but the refusal of the employers of every overture by the operatives is a significant fact, as is also the assurance we personally received that the depredations we deplore were committed by persons outside the pale, and, consequently, beyond the moralising influence, of trade unions. It is, at least, some satisfaction to know that during the recent crisis through which we have been passing, when trade unions have been fairly put on their trial, many of our tried friends have been faithful in their

allegiance to the cause of labour. Notwithstanding all that has been said and written derogatory to trade unions, it is gratifying to note that there are slight indications of a revival, and I know of no more effectual mode of silencing our opponents than by a consistent perseverance in well-doing, and with unflagging zeal, and increased earnestness and determination, enter afresh the arena of legitimate conflict, until the just and reasonable claims of labour are recognised and perpetuated to the generation that shall follow.

The Congress resumed the debate upon the Parliamentary report, and, on the motion of Mr. William Fitzpatrick (Liverpool) seconded by Mr. C. Williams (Birmingham), it was unanimously adopted, an amendment submitted by Mr. Laird (Newcastle-on-Tyne), in reference to skilled and unskilled labour, in which he suggested the insertion of the words, — "That the relations of iron shipbuilders and shipyard helpers were not satisfactory, and would not be until a mutually equitable system of work and payment was established," being withdrawn, after explanations given by Mr. Burnett and Mr. Broadhurst, the treasurer and secretary of the Parliamentary Committee.

On the question of employers' liability for accidents, Mr. Burnett moved that the best thanks of the Congress be accorded to Mr. Macdonald, M.P., for his services in urging the claims of his Compensation Bill upon the House of Commons; and requesting him to pursue in the future, as he had done in the past, the question of compensation until something like a satisfactory result was arrived at; and the Congress urged Parliament to pass into law such a measure as would satisfy the wishes of the workpeople of this country.

The resolution having been adopted,

Mr. Macdonald, said the matter was one he had for many years felt a very deep interest in. Since the year 1857 he had never hesitated by day or night, when he could get an opportunity, to endeavour to work upon the public mind for an alteration in the existing law. His reasons for that were these:—He firmly believed that it was the duty of those who get the profits of labour to maintain the poor that were caused in the operations that they derived a benefit from. In the next place, he had ever been of opinion that in proportion to the laxity of law for compensation there was a laxity in regard to the care for human life; and he felt perfectly convinced, because there was strong proof, that a law for compensation in accidents and deaths, making owners responsible where they ought to be responsible, would take off a third of the disasters that occurred in mines and factories and workshops. They would not occur had they a strong compensation law for the workmen. Up to 1837 what he wanted was the law of Scotland, and he merely asked that it should be again law. It was asserted, too, although it was combated by many men of eminence, yet it was asserted by Mr. Lowe and Lord Justice Brett, that it was the law of England as well, and that the whole change and departure that had taken place was due to judge-made law. He affirmed here what he affirmed in the House of Commons, that there was no form of law half so dangerous as the law made by the judges in this realm. He heard nothing of that law as it now stood till 1837. The greatest departure had been made by the Lord Chancellor of England, Lord Cairns; and if that state of things did exist, his desire was to get the law as it formerly was. And if it was not formerly so, then, looking at the altered condition of things, at the increase of machinery, and many more dangerous appliances in the productions that went to make their country great, they had come to a time when they should have a law, in order to have a simple check upon the employers for their servants, making them responsible for preventible accidents to such servants. They were met now by a very formidable opposition in this matter. He noticed the other day that at the meeting of the Associated Chambers of Commerce, held at Sheffield, the question was taken up, and of course their view was that the Bill introduced by himself and others was a very dangerous measure. Mr. Mundella, the member for Sheffield, was reported to have said he agreed that, if they were to carry Mr. Macdonald's theory so far that the employer was to be made responsible for every act of every workman, the result would be that they could not carry on the business of the country. He (Mr. Macdonald) again asserted that they carried on the business in Scotland, and that they made Scotland great as a commercial country; also, that the law as they wanted it in England was what the law of France now was. The cry heard above all others during the last few years was, that the unreasonableness and the exacting demands of the working classes would drive trade from the country. They were told if they insisted upon having a Bill of this kind, the employers would take up their capital and go to Germany. But the law of Germany was nearly what they wanted the law to be here, and it was so with regard to France: and he wondered that one so intelligent as the hon. member for Sheffield should have ventured to have made such a statement as that the passage of the Bill would prevent the business of the country being carried on. But if they sought to meet all the cavils raised against a measure of this description, their whole time would be wasted. The principle that had governed him through life had been that, having satisfied himself that a principle was right, to march steadily forward irrespective of slander or reproach, which would fall behind them, and they would be sure to accomplish their purpose. After referring briefly to the position of the Bill, Mr. Macdonald said there were nearly a thousand petitions last year, but next year let them have ten thousand,—let them have petitions from every workshop, every factory; from every railway office; from every mine; and let them have them also from the agricultural labourers, for they were exposed to danger. Let them have one cry throughout England and Wales for the same redress for workmen as the public had against employers, and if sufficient pressure were put on he believed there would soon be a law made satisfactory in its character, and which would contribute to the safety of the working classes in a way which the law at present did not do. He trusted the result of this congress would be that every one would go away with a thorough determination to attain the object in view, and when the victory was completed the honour would be the greater, because truth and justice were on their side, and must prevail if they were in earnest.

Mr. Memmott (Sheffield) brought forward the subject of patent laws. He said they knew great depression of trade existed, and they had had to undergo great hardship in England. They were told from time to time that they were being outdone by foreign countries. It seemed to him that they were giving a premium to foreign countries to outstrip the English. If any working man in England got an idea into his head whereby he could cheapen production or improve an article he worked upon, if he desired to have the benefit of that skill, down came the Government upon him for a tax, something like 200*l.*, which of course prevented that man from realising the benefit of his invention. But if that man chose to take a trip across the Atlantic and introduce his invention there he might get it through for about 7*l.*, and then America got the benefit, whereas had their own laws not been so oppressive, England would have had the benefit of the invention. Mr. Memmott then moved,

"That this Congress regrets the delay in placing the patent laws of the country upon a satisfactory footing, and urges the Parliamentary Committee to continue their efforts to secure to the inventor, by reasonable payments, the benefits of his invention."

On Wednesday, Mr. Crompton, a barrister, addressed the Congress on the subject of the summary jurisdiction of magistrates, after which,

Mr. John Morley read a paper on "Over-production."

During the subsequent proceedings of the Congress,

Mr. Slatter (Manchester) moved a resolution giving instructions to the Parliamentary Committee to prepare and introduce into the House of Commons, at the earliest opportunity, a Bill to reform the jury system, based upon the widening of the institution by lowering the qualification, and the payment to jurymen of such moderate compensation as will secure the poorer jurymen against actual loss. This was unanimously adopted.

Mr. Fitzpatrick (Liverpool) moved a resolution, recommending the extension of the provisions of the Employers and Workmen Act to seamen, saying that the only working man now existing who could be seized and imprisoned for not fulfilling a contract was the British seaman. This was also adopted.

Mr. Birtwistle (Manchester) proposed that in view of the Factory and Workshops Consolidation and Amendment Act coming into operation on the 1st of January, entailing considerable additional labour upon the already insufficient and consequently overworked inspectors, the meeting, in order to prevent the Act becoming a dead letter, instruct the Parliamentary committee to take immediate action to secure the appointment of a considerable number of respectable practical working men as assistant sub-inspectors.

Mr. Cocking (Blackburn) seconded the motion.

Mrs. Patterson suggested that the words "and women" should be added after working men, but the suggestion was not accepted by the mover of the resolution.

A Manchester delegate said no inspection would be complete and honest without the appointment of a certain number of female inspectors, and, referring to the large wages earned by tailoresses in the city from which he came, often amounting to 2*l.* and 2*l.* 10*s.* a week, said they frequently worked in large numbers in small rooms, and on sanitary as well as other grounds inspection in such cases was much to be desired.

Mrs. Patterson moved, as an amendment, the insertion of the words "and women," and contended for the appointment of female inspectors.

Mr. Broadhurst (London) hoped the Congress would not put itself in the position of asking Parliament to appoint women as inspectors knowing that they had always opposed the extension of the Factory Acts themselves. One reason why he had doubted the wisdom of inviting ladies to their congresses was that by their persuasive eloquence and manners they might be led into an illogical position, and be found voting for a proposition which, in their more rational moments, they would not have entertained.

After an animated discussion, the amendment was carried, 46 voting for it and 33 for the resolution.

Mr. Rhodes (Tunstall) moved a vote of thanks to Mr. Burt, M.P., for his efforts in bringing before Parliament the question of providing efficient persons to take charge of steam-engines and boilers, and the resolution expressed the opinion that no person should be employed in such a capacity who had not passed an examination and obtained a certificate of competency.

Mr. Macduff (Glasgow) seconded the proposition, which, after a brief discussion, was adopted.

Mr. Adam Weiler (London) then read a paper on shortening the hours of labour, in which he said, that since it had been proved by statistics and high authority, that the working people by over toil did not attain the age they might attain under more favourable circumstances; and since it was well known that a large proportion of the working classes could not obtain employment and that labour had in most instances to be sold at less than the recognised cost of living, he had come to the conclusion that the best means of improving their condition was to reduce the number of hours of toil, the effect of which would be to give every worker a better chance to obtain employment, and by that means lessen the sort of competition which was caused by hunger and want; secondly, it would give time and opportunity for rest and amusement and the cultivation of their minds. It would, he submitted, be a lever against unfair competition, if the working classes agreed not to sell more of their daily working power than they could afford consistent with their health, mental culture, and general welfare, and he believed that the reduction and equalisation of the hours of labour guaranteed by law would be a great step towards improving the position of the working classes.

On the motion of Mr. Davies, seconded by Mr. Toyne, it was resolved:—

"That in the opinion of this congress the subject of federation of organised trades is of the utmost importance and deserves the serious consideration of the Congress and of trade societies, and that a copy of rules be prepared by the Parliamentary Committee and sent to all trade societies at least four months prior to the next Congress, and to be returned two months before that time with such alterations as they may deem necessary, so that the question may be brought before the Congress for consideration."

Mr. Lindsey (Birmingham) proposed:—

"That this Congress, recognising in the co-operative movement a great and beneficent means of assisting in the elevation of working people, hereby desires to express its heartfelt sympathy with both the distributive and productive aspects of the co-operative principle, and trusts it may further extend and develop among the people."

As a trade unionist of twenty years' standing and co-operator of eighteen years, he had had opportunities for watching the conduct of these

stitutions, which gave them facilities for vesting small savings. Co-operation, too, lped them in a trade union aspect, because eir difficulty was that their capital was their bour, while this gave them a chance of becom- g capitalists. Co-operation and trade unionism mbined instilled into their minds respect for pital when they partook of the benefits.

Mr. Ball (Leamington) seconded the motion, ging that as men became more intelligent they ould have co-operation on a larger scale.

Mr. Davey (Gateshead) said he was sorry to ave to move an amendment, but the action of -operative societies in reducing the wages of eir own servants was detrimental to the best terests of labour. He moved as an amend- ent, -

"That in the opinion of this Congress the principle of co- eration, if fairly carried out, is calculated to improve cially the condition of the working classes, but the system variably pursued by co-operative stores committees in re- ucing workmen's wages below the ordinary employer is strimental to the best interests of labour. That we, erefore, request the Congress to use its influence with e different societies to pay their *employés* at least the verage wages of the district."

Mr. Thornton (Nottingham) seconded the mendment.

On a division, the amendment was rejected, nd the motion carried by 39 to 28.

Mr. W. Count (Bristol) proposed,—

"That recognising the necessity of labour being pro- erly represented in Parliament, this Congress recom- ends all trade unions to do the utmost in their power to sturn competent men of their own class to Parliament, nd likewise to agitate, so far as possible, for the advance- ent of manhood suffrage as the basis of representation."

The motion was agreed to *nem. con.*

The final sitting of the Congress was held on Saturday, the 14th inst., when

Mr. H. Broadhurst was unanimously re-elected ecretary of the Parliamentary Committee. The Congress next elected by ballot the Parliamen- ary Committee as follows:—Mr. J. Burnett, London engineers, 73 votes; Mr. Prior, Man- hester carpenters, 68; Mr. Ball, Leamington abourers, 62; Mr. Birtwistle, Accrington weavers, 60; Mr. Slatter, Manchester printers, 58; Mr. Shipton, London Trades Council, 53; Mr. Knight, Liverpool boiler-makers, 52; Mr. Crawford, Durham miners, 50; Mr. Inglis, Glasgow blacksmiths, 48; Mr. Fitzpatrick, Liverpool Trades Council, 39.

The next business was the selection of the place for the next Congress. Mr. Patterson of Glasgow, moved, and Mr. Inglis, of Glasgow, seconded, that the next Congress be held at Edinburgh. Mr. Judkins moved that it should be held at Oldham. Mr. Count proposed Cardiff, and Mr. Richards Birmingham, and when the vote was taken there appeared 55 for Edinburgh, 28 for Oldham, 5 for Cardiff, and 4 for Birmingham. The President, therefore, declared that Edinburgh was selected as the next place of meeting.

Mr. Shorrocks (of Manchester) moved,—

"That the action of certain daily and weekly news- papers, both in London and the provinces, in refusing to publish advertisements for men to keep away from cities and towns where disputes are pending or expected, is con- trary to the principles of justice and equality, and seeing that all newspapers accept similar advertisements from employers with the union and non-union workmen while disputes are pending or expected, we strongly condemn such proceeding on the part of newspapers practising the course complained of."

Mr. Harry (of Manchester) seconded the resolution, and it was carried unanimously.

ANOMALIES IN ARCHITECTS' PRACTICE.

SIR,—All of us have discussed, with ourselves and with plenty of others, the subject of variations from contracts so frequently, that we are a little indisposed to touch the thorny subject when not compelled to do so. Mr. T. Roger Smith has, however, done such useful work in fixing and improving professional practice, that sheer gratitude should lead us to steady consideration of suggestions from him, which are sure to be of value. Let us, ostensibly in consideration for an outsider who may read the correspondence, but quite as much in order to arrive at clearness and common ground, make a miscellaneous note or two.

1. Drawings and specifications should be complete and definite, in respect of all the works to which they are intended to apply,—as nearly perfect as skill and pains can make them. It is useless to expect that they shall comprise everything in any building—certainly in any large building. Human nature, and the conditions under which actual work is done, may settle that. Still every important matter should be well thought out, and well laboured in detail. If this could be always the case, no considerable wrangling about extra or no extra could occur. At times, special pains are taken to recite in the specification what the contract does *not* include, so that the employer may be compelled to see for himself the degree to which the completion is to be carried: and this guides other people usefully as well.

2. Some intelligent and active-minded builders' clerks are sadly given to self-gratulation at their own acuteness, and take an unbecoming pride in knowledge of weaknesses of the world. Without being indifferent to human progress, one might be contented to see the last examples of "turning every variation into an extra," ignoring omissions, and other graceful arts. Pointing out that trifling alterations, which may be ordered, involve extras, is not the easy-going way of carrying on business; and a contractor with his wits about him should cure himself and his people of such a habit,—trusting to the law of give-and-take, which right-dealing architects have an affection for. But that kind of precision is a leaning to virtue's side in comparison with a defective memory,—deviations made, for instance, to suit the contractor's convenience in getting in, maturing into full-blown extras in the course of a few months. The change of practice suggested by Mr. Smith would at least put an end to this. Such patchy memories,—here faded into blankness, there preternaturally vivid. It might, on the other hand, lead to constant little claims, and counter-arguments in writing,—all of which would remain in evidence for the arbitrator; or the desire to avoid more of them might be to the detriment of the building. Little improvements that suggest themselves in the execution of a building should be encouraged in every possible way.

3. The ordinary builder's bill should always be accepted by an architect as a document strictly *sui generis*. Legally, of course, it is a statement of claim; but, as a matter of practice, it is commonly understood to be merely,—the builder's *pourparler*,—a diplomatic paper, which shapes out the matter, and gives something to work further upon. It is a good plan to get this into the employer's hands as soon as possible after it is received. Delivered personally to a reasonable man, the architect says:—"This is A's account. make your own remarks, and see me again in the matter before I see him. Consider every item is uncertain till it is tested. The fair adjustment of such accounts in a friendly way is a matter of every-day occurrence."

4. It should be seen more clearly than it is by every one that important variations are a nuisance all round,—to builders as well as to the other parties to the contract,—unless a builder has an absurdly low contract, and looks to the chapter of accidents to right himself, if confusion threatens the accounts. As excuses for delays, variations are valuable,—but if extras and omissions are priced at the prices at which the rest of the work has been taken, the contractor would generally be better without the extra work;—at least, so his foremen will say, who know about countermanded orders, setting-out boards thrown on one side, workpeople idle for a day or two while things are got ready for them in another part of the job, &c. Many variations are made from sheer caprice; and part of the irritation in paying for them results from seeing little for the extra money.

5. The only suggestion I would make is to alter the clause of the contract into "ordered or admitted in writing by the architect." This would not, it is true, meet the case suggested by "A Firm of London Builders," where the architect becomes the tool of a piratical employer, being frightened into disallowing extras; builders must not work under such an architect again (if such there be). But it would do away with an anomaly in ordinary practice, and keep the power well in the architect's hands. The best way is to settle a price at once for our variation. Get a distinct authority from the employer, and order it distinctly. This has been done and might with advantage be more frequently done than it is; but that is moral sentiment, not ordinary practice. The next best course is to order extras in writing, being watchful and taking trouble about them, as I understand Mr. Field to say is his uniform practice. When counsels of perfection cannot be followed, then everything, or some number of things, will be left hazy till the end; the bill will come in in the ordinary way, and be fought out and settled fairly, or not agreed. Then the architect will examine his orders, already in writing, and add to them such admissions as are just. The arbitrator's duty will be to take these orders and admissions, and find for an amount. The intention of every building contract should be to make the architect the judge of the meaning of it, and a judge without appeal,—"his decision shall be final," except as to the actual amount to be paid, which is to be settled by an arbitrator, if need be. It appears to me that this is what architects should look to, and contractors should learn to desire it steadily, not fitfully, or as a bit of conventional commonplace.

I have occupied so much space with this "anomaly," that I must leave the others named by Mr. Smith for a future communication, unless some one, in the interval, says all that I have to say about them.

S. F. C.

SIR,—In the hope that our principal and distinguished architects and builders will take this matter up, I venture to offer a few observations, feeling that, without countenance and interest are shown on this very important subject, no good will come out of it, unless those who have position and influence recognise the necessity of framing a code of rules, so as to set at rest many evils that frequently arise out of building contracts.

An experience of twenty-nine years in the building trade convinces me that, with the very best intentions on the part of all concerned in the successful carrying out of a contract, in many cases alterations, misunderstandings, and complexities occur during its performance, terminating in disappointment and loss of time and money, through different views being taken upon one or more "queries," and which often are only settled by costly litigation.

Now the questions are,—Why "every-day" disputes should not be set at rest? What is the proper method to be adopted to prevent them from occurring? Whose business is it to move first? And upon whom should the burden fall?

Without doubt, most architects, whilst protecting the interests of their clients, are in no way desirous that the builder should suffer; but there are a few who would not deem it their duty to give him much consideration, looking upon him as a person well able to take care of himself; but how is it when the builder is bound, as in many instances he is, to conform to the directions and decisions of the architect, and in cases where his decision is final? The builder may appeal, and appeal in vain,—there is no remedy.

It surely must appear that it is not just for any man to be sole judge of his own case, yet very often it is so; then, supposing the judgment does not meet with acceptance, many know the cost of endeavouring to set matters right.

But when any dispute arising out of a building contract is referable to arbitration, should not every point in that contract be sufficiently clear, so that the arbitrator shall not feel it expedient to suggest a compromise, as is often the case, ending in loss to one or more of the parties concerned.

I will not touch upon the many points which might well be ventilated, because they are already known to most men of experience in these matters, but I am of opinion that if some course were adopted to prevent questions occurring from "anomalies," much time, money, and trouble, and many heartburnings, would be saved.

A BUILDER.

ON SHAMS.

SIR,—I would preface this letter by stating that since my communication upon the "Decoration of St. Paul's," I have seen the essays of Dr. Anderson upon "Grecian and Gothic Architecture," wherein I find that so far back as the year 1800 he expressed similar views to those contained in my letter to the *Builder*, Aug. 17. These essays, though not generally known, are the finest that had been written upon the subject up to that time, and probably have not been equalled since.

"Meter's" latest effusion in favour of shams is certainly unique and original. Thus far they are commendable. Nothing would probably be gained by prolonging this controversy, especially on the part of such "sensitively conscientious" individuals as those who are enrolled under that contemptible "piece of bunting" so flippantly alluded to by your correspondent,—were it not that the generality of art criticism takes cogni-

VENTILATOR TESTING.

Sir,—It is to be hoped some practical result may accrue from the discussion on this question. The letters from Mr. Buchan and Mr. Banner (pp. 998 and 999) give ground for such hope. Mr. Banner's suggestion of a 100-guinea fee is bold, and would keep out of competition others than those who have no less confidence in their ventilator than Mr. Banner has in his. Mr. Buchan's amendment is more to the purpose. We shall gladly avail ourselves of the opportunity, if offered, on anything like such terms, and so we should think would all who believe in their own speciality, unless they have already as much trade as they care for. At the same time, we cannot agree with Mr. Buchan that trial of a ventilator within "four walls of a shop" (which is hardly a correct rendering of our suggestion) is delusive. Trials of very small models may be, but if a ventilator of the size *proposed to be used* does, upon revolving or being fanned, actually produce a strong up-current in a room, it will do so, in spite of "counteracting force," at the top of a building. In the latter position it has only to assist or increase, while in the former it has to create the up-draught. A very slight breeze only is needed to turn a well-made revolving head, and experiment will prove that *a very slow revolution even* produces a positive up-current. Whether any down-draught can occur must depend very much upon the construction of the cowl. That Mr. Buchan has seen an up-draught when the archimedian ventilator was still simply proves that there may be a draught up a pipe without any top to it.

The question is,—Does the archimedian increase the draught when it turns ever so little? for, if so, there can be no doubt of its usefulness, and of its superiority to any fixed head.

Ewart & Son.

SLATES.

Sir,—I note in your paper that one of your correspondents is horrified at the idea of re-roofing St. Alban's with slate. There are "slates and slates," and there is a deep rich brown slate which has a more mellowed and warmer look than the Westmoreland. It is little known, and comes from Swaledale, a district above Richmond, in Yorkshire. I have lately used it on a building for the Rev. S. Surtees, of Dinsdale-on-Tees, and the effect is all that could be wished. I should be glad to call the attention of the committee of St. Alban's to this roofing; it would avoid what your correspondent calls a "length of cold, cheerless slate."

J. R. Naylor, Architect.

THEATRICAL ARCHITECTURE.

"PIE-CRUST."

Sir,—I have had my attention directed to your able article on the above subject, p. 795, with which I most cordially agree, save in one particular. The "raised pie-crust" so justly condemned is not, and never has been, made of papier mâché. This material is uninflammable, and has excellent acoustic properties. The substance to which reference is made is known as carton-pierre, and contains a large percentage of plaster.

Walter F. Clare.

CONCRETE HOUSES.

Sir,—Had "J. S. S." taken yet "Another View" through the medium of concrete buildings many years extant, and thoroughly tested for resistance to dampness, instead of viewing the proposed concrete houses in Sutherlandshire through the brick walls of a shooting-lodge which did not keep out dampness, he would not have been misled by "feeling convinced" merely, but would have been convinced by knowledge of facts that concrete walls are the only ones to be relied on, and may be safely relied on, to resist the most humid climates, even where the best bricks fail.

Properly-built concrete walls do not require to be tiled or slated on the outside, nor battened on the inside, to insure perfect dryness.

I have resided in a house, built over five years ago, where the bottom of the water-cisterns is of concrete, 4 in. thick; the under side of the same 4 inches of concrete, forming the ceiling of the apartment under. The cisterns have been constantly full of water, but never so much as a stain of dampness has appeared through the 4 in. of concrete.

I know it is possible to build concrete walls that will not resist damp, just as it is possible to do inferior work of any kind, and I have seen such walls in concrete; but so sure am I of the certainty of successfully resisting dampness by concrete walls that I am willing to undertake to lose the whole cost in the event of failure in any concrete wall that I undertake to build damp-proof.

C. D.

LIGHTNING CONDUCTORS.

Sir,—I quite concur with the views expressed in the paper read by Mr. Anderson at the Dublin Congress, and reported in your journal of the 14th inst., as to the neglect manifested by many persons,

Firstly, in the non-protection of their property by the erection of lightning conductors.

Secondly, in allowing such conductors to be untested for years, and consequently worse than useless.

The latter neglect, however, I have no doubt, arises in many cases from the difficulty of ascertaining to whom one should apply for the efficient testing of a lightning conductor by means of the galvanometer named.

In my own case, if you, or any of your numerous readers, will inform me to whom such an application can be made, in London, you will confer a favour upon

Dulwich.

LIGHT AND AIR CASE.

HUGMAN *v.* HAYWARD.

In this case (tried in the Chancery Division of the High Court of Justice),

Mr. Bristowe, Q.C., applied for an injunction to restrain interference by the defendant with the access of light to the plaintiff's premises, formerly the Alexandra Music-hall and Salmon public-house, but more recently known as the "Beaconsfield Music-hall," in Union-street, Borough. The defendant's premises are on the other side of the street, which is only 35 ft. wide, and were formerly so much lower as to leave a large area of sky space visible from the plaintiff's basement, whereas they had now been so raised as to darken and greatly diminish the value of his premises.

Mr. Millar said the defendant's case was that no substantial damage was caused by what the defendant had done, and another reason for the Court not interfering was that the building was completed and the roof was on.

Mr. Bristowe believed it had been hurriedly run up since the plaintiff had given notice.

Mr. Millar said the height had not been increased, though the roof had been put on. Any slight darkening of the plaintiff's cellar was immaterial.

Mr. Bristowe urged that the plaintiff had a right to his property in the light, which was now the more necessary as the basement of the Beaconsfield Music-hall and "Salmon" public-house had been converted into a grill-room and restaurant.

The judge said he would be very unwilling to make an order on the defendant to pull down, as he must if the case were gone into and injury were shown. The case had better stand over to the hearing, on terms of no further obstruction being caused to the plaintiff's light, and the defendant might agree to pay for the gas used in the meantime in lighting the plaintiff's premises.

Mr. Millar submitted that such terms had never been imposed by the Court in any case.

Some conflicting "expert" evidence was read, and after discussion it was agreed that the case should stand over, the defendant to be answerable for any damage occasioned to the plaintiff's premises by his new building as ascertained by a referee to be appointed.

FIRE-RESISTING CEILING.

Messrs. H. Leigh & Sons have patented a simple mode of producing a fire-resisting ceiling. By substituting hoop-iron suitably prepared for ordinary wood lathes, and coating with good plaster, a ceiling can be made through which it is next to impossible for fire to penetrate. The action of fire on such a ceiling appears to be that the plaster is hardened and baked on the laths. A striking proof of this took place a little before midnight on Monday, the 16th inst. One of the cotton-mills of Messrs. Barlow & Jones, Bolton, was discovered to be on fire in the second floor. The flames spread with great rapidity to the third, but could not get into the fourth room, owing to the roof of No. 3 room having been plastered on these hoop-covered iron laths. The fire raged in the third floor more than an hour without penetrating the ceiling.

A New Synagogue.—Dr. Adler, Chief Rabbi of the United Jewish Congregations of the British Empire, has consecrated a new synagogue attached to the Hand-in-Hand Asylum, Well-street, Hackney. Since its establishment in 1840 the institution has carried on its charitable operations in Wellclose-square, Whitechapel, in maintaining, clothing, and providing an asylum for aged and decayed tradesmen, but the lease of this building expiring last year, the committee determined on removing to more commodious premises. A large sum has been expended in adapting the building acquired to the requirements of the institution.

CHURCH-BUILDING NEWS.

Bath.—The Episcopal Chapel of St. Mary Magdalen, Holloway, Bath, was re-opened on the 29th ult., after reseating and other changes in the interior, which have been carried out by the Municipal Charity Trustees. The present chapel, with its battlemented tower at the west end, is an enlargement of the structure which preceded it. Between the years 1489 and 1499 the original chapel was rebuilt by John Cantlow, Prior of Bath, and this building, after undergoing restoration in 1760, was enlarged and converted into the present structure in 1823, when many of the features of the old chapel were, to the regret of the antiquary, swept away. It was opened for divine service in the following year, was closed at the opening of Widcombe Church in 1833, but again reopened in 1837, and in 1855 it passed under the government of the Municipal Charity Trustees, under a scheme established by Act of Parliament. In the present renovation of the chapel, the principal structural alteration has been the removal of an unused gallery staircase from the tower, which has been opened out to the nave, the walls being cased, and a tracery window glazed with cathedral glass has been inserted in the tower. The work of reseating and renovation has been carried out from the plans of Mr. H. Spackman (architect to the Charity Trustees), by Messrs. Hayward & Wooster.

Chipping Norton.—Considerable progress has been made in the restoration (under the superintendence of Mr. Bruton, architect, Oxford) of this interesting church. The galleries, pews, and benches have been removed; the flooring, which had become in places so decayed as to be unsafe, has been all taken away, and a wooden pavement laid down on concrete; and the aisles and porch will be paved with encaustic tiles. Open oak benches are being placed over the nave and aisles, the mutilated columns have all been restored, all plaster and wash removed from the walls and stonework, and the old historical marks of the church brought to light. Amongst these are the remains of the ancient shrine at the north-east end of the nave, the place of the founder's tomb (as supposed) in the south aisle, and the opening of two entrances which led to successive rood-lofts by the chancel arch. The remains of the old western arch have been shown, the hexagonal porch has been restored within to its ancient condition, and the original entry to the parvise above it, by a staircase from the church, has been restored. The old stoves (which were quite worn out) have been removed, and a new method of heating the church (by Haden) is to be adopted.

Walsham-le-Willows.—The parish church of Walsham-le-Willows was reopened on the 17th inst., after restoration under the superintendence of Mr. E. Martineau, architect. The church is a large edifice in the Perpendicular style, consisting of nave, with clearstory, chancel, and north and south aisles. The chancel was the first portion of the church to undergo restoration, it being put into thorough repair by Mr. Martineau, the lay impropriator, at his own cost, not more than a year ago. The new roof on the chancel is an open-timbered roof of stained and varnished pine. The restoration has now been effected of the nave and aisles. The roof remains intact and in its old condition. In taking the plaster off the walls the workmen came upon other traces of the painters' skill in the spandrels of the chancel arch, which appear to be frescoed representations of angels or cherubim, and on the east wall of the south aisle, where some diaper and panelled work was discovered. Some ancient tiles found in the church are let into the floor at this spot. The benches, which have replaced uncomfortable and unsightly pews, are of English oak, many of them in the south aisle having the old carved bench-ends, which had been utilised in the construction of the pews, and in other dishonoured ways. The benches provide accommodation for 450 persons. Porrett's hot-air apparatus has been fitted up beneath the floor of the nave. The pulpit is a new one of Caen stone, supported on dwarf pillars of red Mansfield stone. It is placed at the south side of the chancel arch, and is the gift of Miss E. Wilkinson. The total cost of the restoration (not including the cost to Mr. Martineau of restoring the chancel) has been 1,640*l*. The contractors were Messrs. Cawley, (of Bardwell) and Adams (of Stanton), their contract being 1,040*l*. The carving for the reading-desk, &c., was done by Mr. Wesley Baker, of Walsham.

Wribbenhall.—The foundation-stone of a new urch for Wribbenhall, near Kidderminster, as laid on the 14th inst. The old church, hich had been originally built as a sort of apel-of-ease, has been long utterly inadequate the wants of the parish. The architect is r. A. W. Blomfield, of London, and a contract s been entered into with Mr. Horsman, con-actor, of Wolverhampton, to build a church r 6,000*l.*, to accommodate 400 people. Accord-g to the present contract the builder will have go no higher than the string-cross of the base the octagon of the tower, but it is hoped fficient funds will be raised by that time to mplete the church in accordance with the esign, which is Early English in character. rs. Hemming, of Spring-grove, gives the unificent sum of 3,000*l.* towards the work.

Upper Bullinghope.—The corner-stone of a ew church for the three parishes of Upper ullinghope, Lower Bullinghope, and Grafton, as been laid by Mrs. de Winton. The builders, essrs. W. Wingate & Son, Gloucester, presented rs. de Winton with a silver trowel. The pre-nt ancient church of Upper Bullinghope is ated to be in a most dilapidated and even angerous state, and it has been found abso-utely necessary that a new church should be uilt for the use of the three parishes, which are ncluded in one. The estimated cost of the new hurch is 2,000*l.* The church will be built rincipally of native stone. Mr. Kempson, ereford, is the architect.

Water Orton.—The foundation stone of Water rton new church has been laid by Mrs. J. D. Vingfield Digby. Mr. J. D. Wingfield Digby ives the site and contributes 600*l.* towards he building. The church is to be dedicated to t. Peter and St. Paul, and is to be erected rom the designs of Messrs. Bateman & Corser, rchitects, of Birmingham, the builder being Mr. Henry Motteram, of Tamworth. The edifice s expected to cost 3,000*l.* There will be accom-nodation provided for 250 worshippers, but the hurch is to be so constructed that it can easily e enlarged to seat 300 persons. The church will consist of a nave of three bays, north aisle, ransept, organ-chamber, vestry, &c. The roof s to be open-timbered, and the exterior will be lesigned in Decorated Gothic of the Geometrical eriod. A tower will be erected at the north-vest end of the aisle, terminating with a stone pire. Derbyshire stone will be used for the xterior of the building; but the dressings of he windows, doors, and interior will be of Bath stone.

DRY WALLS.

UPON reading the complaint of "J. S. S." on his subject at p. 998 of the *Builder*, I was reminded of a passage I had read years ago in, I think, Hugh Miller's "My Schools and School-masters," which says that "the humidity of the climate" had no effect upon the walls built by a certain old mason, which were always dry, whereas the walls built by the other masons got damp in wet weather. The explanation of this was that the old mason chipped off the top edges of his stones so as to cause the water to run off outside; the others were not so particular, but put in the stones as they came to hand, at times with high edges at the top front, which caught and conducted the rain into the interior of the wall.

W. P. BUCHAN.

Fall of a Wall in Kentish Town.—On the 23rd inst. Dr. Hardwicke resumed and concluded an inquest as to the death of a little boy named Carwarden, five years of age, who was killed by the fall of a wall,—caused by a loaded timber van being driven against it by a carman named Bidnall, three other children being severely injured. The father asserted his belief that blame attached to the carman whose car knocked down the wall, and to the owner of the wall, as the wall was in an unsafe condition before the sad occurrence took place. Evidence was given that the wall before this accident was 2 in. or 3 in. out of the perpendicular, and dangerous to the public. Mr. Kelly (the owner of the wall) and Mr. H. H. Bridgman, architect, and gave evidence at considerable length, the jury, after consultation, expressed their opinion that the death was from accidental causes, but that there had been great neglect on Mr. Kelly's part in allowing a dangerous wall to exist for so long a time.

SCHOOL BOARD SCHOOLS.

Great Usworth (Durham).—The new schools erected at Great Usworth, by the Great and Little Usworth School Board, were opened on September 5th. The buildings, which are designed in a domestic type of Gothic, and built of stone, comprise mixed and infants' school-rooms, with class-rooms, hat and cloak rooms, and lavatories, together with a detached residence for the master and a large room for the meetings of the School Board. The site is one acre and a half in extent, and affords ample playgrounds, playsheds, &c., for the children, and garden-ground for the master. Although nominally for 350 children, the accommodation, calculated on the 8 ft. basis, is sufficient for 475. A well has been sunk on the site, and an abundant supply of excellent water obtained, which, by means of a force-pump, is distributed to the several parts of the establishment where required. The architects were Messrs. Sept. Oswald & Son, of Newcastle-on-Tyne, and Mr. G. E. Forster, of Washington, was the contractor. The seats and desks have been supplied by the North of England School Furnishing Company, Darlington.

Hornsey.—New schools erected by the School Board for Hornsey, in the Wordsworth-road, South Hornsey, have been opened. The schools are planned on the class-room system for the boys' and girls' departments, and, with the infants' schools, give accommodation for 1,200 children,—480 infants, 360 boys, and 360 girls. The central hall, which is 69 ft. long by 36 ft. 6 in. wide, with a height of 31 ft. 6 in., is designed as an examination-hall for the whole of the schools under the control of the Hornsey School Board, and will be used for assembling the children for lectures, drill, or collective singing. The long lantern roof is of wrought iron in arched ribs, and is lighted by vertical and sky lights. The class-rooms are grouped round the central hall, both on the ground and first floors, each room accommodating sixty children. The boys' and girls' departments are approached on distinct sides. The building is Gothic in style, the dressings to the street-front being of Bath stone. The building has cost upwards of 15,000*l.* Mr. T. Chatfeild Clarke is the architect.

Cannock.—On September 2nd the Cannock School Board opened their new schools in Walsall-road, Cannock. The schools will accommodate 220 boys and 220 girls; residences for the master and mistress are attached. About four months ago the Board opened a mixed school at Rawnsley, which provides accommodation for 200 boys, girls, and infants, with master's house attached. Both blocks of schools have been built by Messrs. H. & R. Inskip, of Longton, Staffordshire, at contracts of 4,964*l.* and 2,675*l.* respectively. Messrs. Scrivener & Sons, of Hanley, are the architects, and Mr. J. Siddalls is the clerk of works of both erections.

High Felling (Durham).—New schools which have been in course of erection by the Heworth School Board during the last twelve months at High Felling, from the designs of Mr. Thomas Oliver, were opened on the 19th ult. without ceremony, for the admission of scholars. The schools are arranged upon the mixed principle to accommodate 750 children, the boys and girls being taught in one department, and separate provision being made for the infants. The mixed school accommodates 500 children, and consists of one large room, with four class-rooms, so arranged that whilst the head-master has complete supervision of the main school and class-room, the children in the latter can be dismissed without passing through and disturbing the scholars in the former. The infants' school seats 250 children, and is composed of one large room and two class-rooms, grouped upon the same principle as the mixed school. The desks in the mixed school are placed five rows deep, and in the class-rooms three, and throughout the school the floors upon which the desks are placed are arranged as steps to facilitate teaching. Hat and cap rooms and lavatories, together with teachers' private rooms, are provided for each department. Covered sheds and latrines and separate playgrounds are also provided in connexion with the above departments, and in each case a large portion of the playground is cemented. A caretaker's house, of four rooms, is provided upon a portion of the site set apart for the purpose. The whole of the buildings are executed in brick, with stone dressings, and slated roof. A bell-turret is placed over the main schoolroom roof. The buildings have been carried out at a cost of about 7,300*l.*, by Messrs. White & Sproat, contractors, of Blyth. Messrs. Walker & Emley were the contractors for the hot-water apparatus and ventilation; and Mr. Lowes has acted as clerk of the works.

Smethwick.—The Smethwick and Harborne School Board has commenced the erection of new schools on a piece of land forming the corner of Ballott-street and Corbett-street, near the Windmill, Smethwick. The building, when complete, will accommodate 722 children, and will have large class-rooms for boys, girls, infants, and babies respectively. It will be ventilated with a series of ventilation shafts, which will be carried into, and have their outlet through, the tower, proposed to be built on the eastern corner of the structure, and Haden's system of heating will be adopted. A suitable teachers' residence will form a separate block building. The contract has been let to Mr. Hartley, of Birmingham, who will carry out the works, under the superintendence of Messrs. T. C. & J. P. Sharp, of Cherry-street, Birmingham, the architects to the Board.

Sowood.—The first sod of the excavations for the foundations of a new school at Sowood, for the Stainland School Board, has been cut. The school is intended to provide accommodation for 174 boys and 100 infants. The front of the building will face the turnpike-road leading from Stainland to Outlane. The roof of the building is pointed, and the front elevation shows two gables, one at each end, having a pointed tracerried window in the centre of each gable, the entrance for the girls and infants being near the centre, over which is a belfry and turret. Adjoining the school, at the east end, is the master's house. The following are the contracts:—Mason's work, Mr. B. Edwards, Stainland, 1,250*l.*; joiner's, Mr. James Holroyd, Stainland, 375*l.* 16s.; plumber and glazier's, Mr. Joseph Aspinall, Elland, 102; plasterer and slater's, Mr. S. Collins, Stainland, 293*l.* 15s.; heating apparatus, Mr. R. P. Stafford, Halifax, 50*l.*; painter's, Mr. B. Brook, Lindley, 16*l.* 15s.; ironfounder's, Mr. James Dyson, 7*l.*; and land, 370*l.* Mr. C. F. L. Horsfall, Halifax, is the architect.

Felsted.—Plans for new schools about to be erected by the Felsted and Rayne (united districts) School Board have been prepared by Mr. Pertwee, architect, Chelmsford, and approved by the Education Department. Messrs. Parmenter & Gosset have obtained the contract.

Greasley.—New schools, erected by the Greasley School Board, were opened at Hill-top on the 16th inst. They have been erected, at a cost of between 5,000*l.* and 6,000*l.*, from the designs of Mr. Sutton, architect to the Board. The site of the schools and playgrounds is an acre in extent, and being at the junction of two roads, the buildings have been erected so as to take a double frontage, the boys' school extending along one road, the girls' along the other, while the infants' department projects into the angle between the other two, towards the rear. The schools will accommodate 550 children, 200 boys, 200 girls, and 150 infants, allowing 10 feet of space for each child. There is a dado of white enamelled bricks around the whole of the interior, with an ornamental border. The builders were Messrs. Coxon & Donnelly.

Bagillt.—New schools erected at Bagillt by the Holywell School Board, have been opened. The buildings, which have cost 6,000*l.*, are planned to accommodate 500 children—145 boys, 145 girls, and 210 infants. The architect was Mr. John Hill (Hill, Grylls, & Wilcocks, London), and the contractors, Messrs. Thomas Hughes & Son, Holywell.

Stratton St. Margaret.—New schools at Gorse-hill, erected by the Stratton St. Margaret School Board, have been opened. The schools are situate on the right-hand side of the main road leading from Swindon to Blunsdon, at the end of a street known as Avening-street, on a plot of land one acre and a half in extent purchased by the Board. The schools are a one-story building, and are fitted up for the accommodation of 450 children—boys, girls, and infants. The lavatories and other offices have all been fitted up by Messrs. Macfarlane & Co., of Glasgow. Whitwell's patent grates are used in all the rooms. On the left hand side of the yards, opposite the boys' school, the master's house is erected. The whole of the works were designed by Messrs. W. H. Read and W. Drew, joint architects to the Board, and have been carried out by Mr. Wiltshire, builder, of Swindon. The build-

ing contract was 4,150*l.*, and other expenses for land, &c., about 630*l.*, or nearly 10*l.* 10s. per head of accommodation provided.

SCHOOL BUILDING NEWS.

Scarborough.—The corner and memorial stones of a new Wesleyan Sunday School and lecture-hall, in connexion with Queen-street Wesleyan chapel, have been laid. The new building will be situate at the north end of the chapel, with which it will harmonise, being of red brick, with stone dressings. On the ground-floor will be provided five class-rooms, average size 15 ft. by 14 ft., and an infants' school-room, 37 ft. by 19 ft., all opening on to the central entrance. The large room will afford sitting accommodation for over 600 adults. The contractors are:—For brick, stone, slating, and plastering work, Francis Bastiman; for wood work, Thomas Fletcher; for plumbing and iron work, Whittaker Brothers; and for painting, Francis Thompson, all of Scarborough. The contracts amount to about 1,800*l.* The work is being executed from the designs and under the supervision of Mr. William Watson, architect, Wakefield.

Woodborough.—The new schools of "Wood's Foundation," at Woodborough, have been completed and opened. The schools are situated on the road leading from Woodborough village to Lambley, and the block comprises a large schoolroom in the centre, flanked on one side by a house for the master of the school, and on the other by a spacious class-room, behind which is an infant school, the rear being occupied by playgrounds and the necessary outhouses. Exteriorly, the new buildings may be described as in the Tudor style. The windows are open-sashed, and the schools are ventilated on Tobin's system. Accommodation is provided for 150 children; the large school-room being 40 ft. by 20 ft. Mr. W. B. Saunders is the architect, and Messrs. Tyres, jun., and W. D. Smith, the builders.

Winchester.—Mr. Thos. Stopher, architect, has prepared plans for the intended new "Winchester Modern School." The style selected is "English Domestic," and, including a master's house, the buildings have a frontage to the south nearly 250 ft. long, broken by two gables, and a rectangular embattled tower over the principal school entrance, the rest of the elevation showing two stories in height, with a provision for future dormitories if required. The external walls are to be of faced and squared flint, with red brick quoins and dressings of that material and of stone. Two bay windows,—one over the other,—lighting assistant masters' rooms, project from the tower face, and on each side in the two stories of the main portion of the building are three double-mullioned windows with segmental heads, and the windows in the gables are of the same character. The internal arrangements include on the ground floor six class-rooms 20 ft. by 16 ft. 6 in., a dining-room, apparently admirably lighted from the east and west, 51 ft. by 24 ft. and 16 ft. high. This is also, for the present, to be the schoolroom.

Bamborough.—A new school building which has been erected by the trustees of Lord Crewe's Charity in the village of Bamborough, has been opened. It will accommodate 150 children. The architect was Mr. John Henry, Durham; Mr. Carse, Amble, was the builder; Mr. Adam Gordon, North Sunderland, did the joiner work; and Mr. William Ramsay, North Sunderland, the painting.

Pontclown.—The foundation-stone of new schools has been laid here. Mr. R. Williams, of Llantrisant, is the contractor, and the cost of the building is to be 500*l.*, exclusive of fittings. Mr. Burnett is clerk of the works.

Ellesmere.—An influential meeting has been held at Market Drayton in support of the Church of England Public Boarding School about to be built at Ellesmere. It was stated that the school is to be begun forthwith; that the roads to the site are completed; that the cost of the building will be limited to 50,000*l.*; and that it will be built for 500 boarders.

Tatenhill.—A new school for this parish, erected by voluntary subscription, was formally opened on the 13th inst. The building was erected by Messrs. Lowe & Sons, Burton-on-Trent.

Llansaintffraid.—A new national school has been opened here. The land was given out of the glebe by the vicar, and the landowners, resident and non-resident, contributed liberally The farmers carried materials to the site with great willingness. Mr. Hurst, of Welshpool, was the architect; and Mr. Pickstock, of Hereford, the contractor.

Inverness.—The foundation-stone of a new "high school" for Inverness has been laid. The school is situated on the lands of Abertarf, Kingsmill-road. It is designed by Mr. Rhind, architect, and will cost about 6,000*l.*

STAINED GLASS.

Northampton.—The west window of St. Sepulchre's Church, Northampton, is to be filled with stained glass, the gift of Mr. William Colledge, churchwarden, and his brother, Mr. H. Colledge, as a memorial of their late father. Mr. Hardman is to be commissioned with the work.

Leominster.—In the year 1863 it was proposed to effect a thorough restoration of the venerable priory church of St. Peter and St. Paul, Leominster, and for this purpose a committee was formed to consult the late Sir Gilbert Scott, R.A., upon the subject. After a thorough survey, he estimated the cost at upwards of 15,000*l.*, and in May, 1864, the work was commenced, with the Norman nave and aisle, and north end of the church. A second committee has recently been formed, with a view to the restoration of the south side of this fine old pile, and also to fill with stained glass the noble central window of the west side; the latter being a memorial to a member of the Arkwright family. This window is in the Perpendicular style, and consists of seven lights, with tracery work, measuring altogether about 40 ft. high. Last year Messrs. Mayer & Co., of Munich and London, were selected to prepare a design, representing in the centre, compartments scenes from the life of St. Peter and St. Paul, the patrons of the Church, and in the outer divisions the twelve Apostles. As, however, the expense of painting the whole of this window was beyond the present means of the committee, the centre portion only has been so far executed, and was lately erected, the whole of the stone-work having been completely restored by Mr. Edwards, of Leominster.

Wellow.—A painted window is about to be placed in the chancel of Wellow Church, in memory of the late Mr. W. S. Ward, of Wellow Hall. The window is to be executed by Mr. C. E. Kempe, London.

Rock Ferry.—At St. Anne's (R.C.) Church, Rock Ferry, on the 15th inst., a new stained-glass window, which has been erected over the altar by Messrs. Rowland & Co., of Liverpool, was unveiled. The window is circular. The figure of St. Anne is the centre-piece, and among the scenes depicted are the Last Supper, the Resurrection, the Ascension, St. John Baptising Our Saviour, and also a figure of the Virgin. The cost was 160*l.*

Antwerp.—The King and Queen of the Belgians have lately presented to the cathedral at Antwerp a stained-glass window, designed by M. Van der Ouderau, and executed in Antwerp by MM. Auguste Stalins and Alphonse Janssens. In the centre of the window is represented the Virgin, patroness of Antwerp, with St. Joseph, patron saint of Belgium, surrounded by angels; beneath, the various Belgian provinces are represented by their patron saints in the attitude of prayer. The upper part of the window is occupied with the Royal arms, ciphers, and devices of their Majesties and of the kingdom of Belgium, and round the edge of the window are the various quarterings of the King and Queen.

VARIORUM.

"The Arts of Writing, Reading, and Speaking: Letters to a Law Student," by Edward W. Cox, Serjeant-at-law (10, Wellington-street), has obtained the circulation it well deserved, and we find on our table a copy of the third edition, revised and corrected. It is easier, as *Portia* says, to tell twenty people what they should do than to be one of the twenty to follow the teaching; still, no one who wishes to excel in the arts of reading, writing, and speaking can possibly study Serjeant Cox's little volume, with a desire to learn, without great and lasting benefit. It is a most valuable work, and, so far from being confined to law students, ought to be made a school-book throughout the country.——"Nelson" is the title of "a play in four acts, and a tableau," by Emilia Aylmer Blake, now Mrs. Aylmer-Gowing, published by Chapman & Hall. Mrs. Gowing is the author of several acted plays, and shows in "Nelson" a full knowledge of the exigencies of the stage. The play written mainly in blank verse, avoids the "stilts," and if set forth by able exponents, could scarcely fail to be successful in the theatre. It deals mainly with the time when Nelson was in and off Naples, and ends with a tableau from West's picture of his death.——Messrs. Cassell, at all events, usually obtain the best available men for the works they publish. Their "New Testament Commentary for English Readers" is edited by Dr. Ellicott, Bishop of Gloucester and Bristol, and the first volume now published contains the Gospel according to St. Matthew, St. Mark, and St. Luke, by the Rev. Dr. Plumptre, and the Gospel according to St. John, by the Rev. H. W. Watkins, M.A., Professor of Logic and Moral Philosophy in King's College, London. It makes a handsome volume, and will doubtless be appreciated by the large class of thoughtful men and women to whom it is addressed.

Miscellanea.

Commutation of Tithes.—The Act just passed to amend and further to extend the Acts for the Commutation of Tithes in England and Wales has been issued. In all cases where land charged with rent-charge in lieu of tithes is taken for the building of a church, chapel, or other place of public worship, the making of a cemetery, the erection of a school under the Elementary Education Act, the erection of a town-hall, court of assize, lunatic asylum, hospital, or any other building used for public purposes, or in carrying out any improvements under the Artisans' Dwellings Act, 1875, the formation of any sewage-farm under the provisions of the Sanitary Acts, or the construction of any sewers or sewage works, or any gas or water works, the persons to carry out such works are, so soon as they are in possession of the land, and before the land is applied to any of the purposes mentioned, to apply to the Tithe Commissioners to order the redemption of the rent-charge for a sum of money equal to twenty-five times the amount thereof, to be paid within the time to be fixed by the Commissioners. The existing powers in the recited Acts from the 7th Will. IV. are to apply to the present statute; and with reference to the exchange of the glebe lands for other lands, the provisions are to be deemed to authorise any spiritual person (clergyman) to exchange for lands or for tithe rent-charge any annual payment or augmentations belonging to him in right of his benefice, and charged upon or payable out of any land or tithe rent-charge.

Study of Archæology.—Mr. Percy Gardner writes:—I am glad to see that the claims of classical archæology upon English scholars have found so able an advocate as Professor Jebb, a name likely to carry weight at the Universities. Mr. Jebb proposes as a remedy for the indifference to and ignorance of archæology which characterise England as compared with Continental nations, the establishment of schools at Athens and Rome like those already established there by France and Germany. But it would be useless to set men to study archæology unless that study is to lead to something. In Germany every University has its Professor of Classical Archæology; in France the Academy opens its doors freely to men who distinguish themselves in the study. In England, what is there to be had by the study of archæology? The Cambridge professorship is, I believe, worth 100*l.* a year. I do not know of any other professorship in the subject in the United Kingdom. The examinations at both Oxford and Cambridge are philological and philosophical, and a knowledge of ancient life and art goes for nothing. Yet a very successful Cambridge tutor told me that his one greatest difficulty was to persuade his men of the reality of ancient life, that the Greeks and Romans were men and women, not puppets or counters. And this is just the feeling which can be produced only by travelling in the scenes of ancient history, or studying the art remains of antiquity.

The "Stanley" Sash Opener and Fastener has received "Honourable Mention" at the Paris Exhibition, 1878, class 66. We have already spoken well of this invention. Practical experience of it for several months since would lead us to strengthen the testimony we gave in its favour.

Westminster as it Will Be. — "The *Builder* contains a plan showing the Westminster of the future. It certainly presents many interesting features, and its general characteristics are justified both by the importance of the position and the several improvements which are either now in course of being carried out or projected. One of the most important alterations will be the setting back of the entire block of houses on the western side of Parliament-street, making the roadway run on in a line with the present Foreign Office. This will be partly caused by the taking by the Government of the entire block of buildings between Parliament-street and the park. King-street will thus be abolished, but Delahay-street, slightly altered, is proposed to be retained; and a very ancient house, said to once belong to Judge Jefferies, is not to come down. The new Great George-street will become the home of Government offices, and palatial buildings form a fitting approach to Westminster Palace from St. James's Park. Regret is expressed that the Aquarium must remain, as the architectural belongings of the building are not in accordance with that of the Abbey and Palace. Queen Anne's Mansions find no favour with the writer, and a broad street is proposed where now Tothill-street exists. The hospital it is proposed to retain, and the Stationery Office, but the old Guildhall is to go, forming on its site a grand *place* or square, and, to complete the picture, the towers of the Abbey are to be altered and partly rebuilt. Then the New Law Courts will cause the existing dens next to Westminster Hall to be removed, and thus considerable space will be obtained in this locality. South of the Parliament Houses it is proposed to put a *campo santo*, and, taking down the houses on the opposite side of Abingdon-street, the street is widened. The remaining portion of the altered district is now composed of wharf-factories and buildings of a very poor and neglected character, and it is boldly proposed to clear the entire space and create another but handsomer Eaton-square, with some other alterations towards the Pimlico end. The entire area from the park to the river is laid out in a very admirable manner. We have no doubt, could the scheme become a fact, that it would not only be a considerable improvement both as far as health and convenience are concerned, but it would be eminently a paying speculation, and worthy the attention of those building capitalists who in many cases sink fabulous sums quite away from centres of population."—*Metropolitan.*

Alleged Failure of Concrete Drain-pipes.—At the last meeting of the Bournemouth Commissioners, the Sanitary Committee presented two reports stating, in effect, that many of the concrete pipes being used by the contractor, Mr. Stickland, in the new drainage works, were broken, or had become broken since being laid, and recommending that no more of them be used. It was also alleged, in the course of the discussion which followed the reading of the reports, that many of the pipes are so porous that they will allow of the intermixture, by percolation, of the sewage and subsoil water. In answer to these charges, a letter was read from the manufacturers of the pipes, Messrs. Sharp, Jones, & Co., maintaining that the pipes are not defective, either as to material or manufacture, and that the sewer "has failed under conditions that would tend to destroy any ordinary sewer, brick or pipe." Messrs. Sharp remind the Commissioners that when it was first proposed to use the pipes, an expert of the Commissioners' own choosing (Mr. Henry Reid) was called in, and reported very favourably as to the capabilities of the pipes. In conclusion, they say, "We have engaged two engineers of well-known standing to make a thorough investigation on our behalf, and we must inform the Board that we shall resist to the utmost, and at all costs, any attempted impeachment of these pipes, and more especially so upon a false issue." The Commissioners, for their part, have also resolved to request "two qualified engineers" to report upon the matter.

St. Bride's, Fleet-street.—The outer vestibule, which has been completed within the last few days, has been laid down with marble, principally in black and white squares laid diagonally. In the centre of the vestibule is a star in a circle, formed of black, white, and dove marble, with a centre of Panderma (Turkish) marble. The repaving of the inner vestibule, in which the same material is used, has been commenced.

The Chapel on Rochester Bridge —The demolition of the Bridge Chamber at Rochester Bridge has led to the opening up of the remains of the ancient chapel of Alle Solven, or All Souls, the existence of which was well known to antiquaries, although what remained of the ancient edifice was entirely hidden by the surrounding buildings, a portion of the chapel being, until very recently, a dwelling-house. The whole of the walls of the chapel, up to what once was the roof, are now visible, together with portions of the oak beams, while near where the altar formerly stood has been found a piscina. The main entrance through the porch, which still stands, is in a perfect state, while the stone mouldings of the door and windows, and portions of the pointed arches, may still be traced. The chapel of All Souls was founded by Sir John de Cobham (who, with Sir Robert Knolles, was the founder of the ancient bridge over the Medway at Rochester), and was built in 1399 in accordance with the then prevailing custom of building chapels near bridges, and was intended primarily for the use of travellers crossing the bridges. The restoration of the ancient chapel is spoken of.

Building Bye-Laws for Kingston-upon-Thames. — The Kingston Town Council has postponed for two months the adoption of the proposed new bye-laws, as submitted by the Joint General Purposes and Improvement Committees. Councillor Bussell said these bye-laws appeared to be the most extraordinary set that ever were framed. For instance, No. 30 ran thus,—"A person who shall erect a new building shall not place in any party wall of such building any bond timber, or any plate, block, brick, or plug of wood." How a man was to put up a party-wall without a brick he, for the life of him, could not understand. The Mayor said he had in committee raised the same objection, but it was not a brick in the ordinary sense of the word. What was meant was a "brick of wood." [Any builder would know that, but the clause would be likely to prove somewhat ambiguous to what is called "the legal mind."]

Discovery of Ancient Remains in the City.—During the demolition of houses which is taking place on the south side of the upper part of Ludgate-hill, for improvements designed by the Corporation of London, distinct remains have been discovered of a massive wall running in the direction of north-west-by-west. A daily contemporary says,—"A spacious area is being cleared at the back of Ludgate-square, and one block of the wall occupies several yards near Creed-lane. The materials are Kentish rag-stone, flints, and chalk, the well-known courses of tiles forming layers at intervals." We failed to discover any wall displaying these bonding courses; we found, however, a length of rubble wall of considerable antiquity, without the bond-courses, and which the workmen have considerable difficulty in destroying.

The Awards at the Paris Exhibition.—The *Paris Exhibition of* 1878, an illustrated weekly review, gives in its number for September 19th (No. 27) a list of the prizes and medals awarded to English exhibitors, exclusive of the Art Section. It occupies twelve pages of the review, and must have cost much labour, as no official list has yet been published. It is rumoured, we hope untruly, that numerous awards to exhibitors have been made since the juries broke up.

City of London College, 52, Leadenhall-street.—The Michaelmas term will commence on the 7th of October. There are Technical, Drawing, Machine, and Building Construction classes, under Mr. Henry Adams. The syllabus of class-work reads well. Students in these classes are eligible for a number of prizes. A class in land-surveying will be commenced in November.

Fall of a Wall at Plymouth Theatre.—Great alarm was caused at Plymouth by the sudden fall of a large portion of the wall of the theatre, which is being rebuilt after destruction by fire. A mass, 40 ft. long by 30 ft. high, without any warning, fell bodily; but the workmen having just left work, no one was injured.

Buildings for Ipswich.—At a meeting of the Ipswich Town Council, it was decided to build a museum, school of art, and a free library, at a cost of 8,100*l.*, and also to erect a hospital for patients suffering from infectious disease, at an outlay of 3,600*l.*

Working Men's College.—A free library and reading-room will be opened on the 1st of October next at the Working Men's College, 143, Upper Kennington-lane. Professor Huxley will give a lecture early in October at a general meeting to be held as a formal opening of the new premises of the college.

The Conservative Land Society.— Mr. Charles Belton, who has been accountant to the Conservative Land Society for twenty-five years, and to the United Land Company ever since its formation, has been appointed secretary to both the Society and Company, in place of the late Mr. John Ashdown.

Birkbeck Literary and Scientific Institution, Southampton-buildings, Chancery-lane.—The fifty-sixth session of this, the parent Institution, commenced this week. One hundred classes meet weekly in various subjects. A new laboratory has been erected during the recess.

Carlisle.—The City and District Banking Company are about to erect new branch offices at Brampton and Haltwhistle, from the designs of Messrs. Hetherington & Oliver, architects, Carlisle.

A New Cathedral Church (R.C.) is to be built at Oban, N.B., from the designs of Messrs. Pugin, Ashlin, & Pugin, architects.

TENDERS

Accepted for alterations to Hindpool road Congregational Church, Barrow-in-Furness. Mr. Howard Evans, architect:—

Rothwell (plumber, painter, &c.)	£120 0 0
Kelsall (excavator, bricklayer, and asphalter)	64 0 0
Eccles (smith and founder)	45 14 6
Ormandy (carpenter and joiner)	15 10 0
Bushby (mason)	5 14 9

For alterations to City Scotch Stores, Knightrider-street, E.C. Messrs. Pain & Clark, architects:—

Judd (accepted)	£255 17 0

For the erection of Infant School, East Oakley, Basingstoke, for the Wooton and Tadley School Board. Mr. James Gibson, architect. Quantities supplied:—

Mussellwhite	£494 0 0
Stephens & Bastow	485 0 0
Batton	475 0 0
Groome	419 0 0
Wyeth & Garrett	411 0 0
Goodall (accepted)	400 12 8

For the erection of stables at Herman-road, Old Kent-road, for the London Tramways Co. Mr. G. Wade, architect:—

Thompson	£837 0 0
Lang & Co.	667 0 0
Holliday, jun. (accepted)	657 0 0

For shop in Chatsworth-road, Clapton-park, for Mr. Harding. H. Shaw, architect:—

		Allowance for old materials.
Stamp & Bowtle	£1,087 0 0!	£65 0 0
Jones	1,062 0 0	95 0 0
Upson	926 0 0	25 0 0
Shurmur	949 0 0	67 0 0
Salmon	900 0 0	50 0 0
Wood	595 0 0!	60 0 0

For house, St. James-road, Upper Tooting, for Mr. J. Miston:—

Downs & Co. accepted.

For warehouses, Currier-street, Oxford-street, for Messrs. Deed & Son. Messrs. Searle, Son, & Hayes, architects:—

Downs & Co. accepted.

For erecting building, sinking well, &c., and forming bridge over creek, for Ammonia Works, Rainham, Essex, for Mr. M. Solomons. Contract No. 1. Messrs. Walter Graves & Hulbert, architects. Quantities by Messrs. Whitmore & Reunard:—

		Bridge.
Wood	£768 0 0	£70 0 0
Vears & Co.	755 0 0	59 0 0
Jefferson	675 0 0	48 12 6
Hunt (accepted)	594 0 6	48 0 0

For works at public baths, &c., Hastings and St. Leonards-on-Sea. Messrs. Cross, Jeffery, Skaller, & Wells, architects:—

Additional Ironwork.

Rother Ironwork Company	£2,529 14 0
Fraser Bros.	2,293 0 0
Tillotson	2,108 5 0
Moreland & Son	1,971 14 0
Bunnett & Co.	1,875 10 0
Alderton & Shrewsbury	1,863 18 0
Measures Bros.	1,636 0 0
Dawnay	1,627 0 0
Gielgud	1,527 7 0
Shaw & Co.	1,500 0 0
Homan & Rodgers (accepted)	1,496 0 0

Finishings to Skylights to Gentlemen's Baths.

Rodda	£373 0 0!
Hughes	190 10 0
Harman	187 10 0
Cruttenden	171 10 0
Parks	167 12 0
Eldridge	166 0 0
Vidler	158 0 0
Howell & Son (accepted)	152 0 0!

For alterations at Alexandra Tavern, Bow-street. Mr. W. Paice, architect:—

Bodein	£225	0	0
Hocking	168	0	0
Bangs	160	0	0

For alterations, additions, painting, &c., Freemasons' Tavern, Great Queen-street, Lincoln's-inn-fields, for Mr. Alfred Best. Mr. John Pugh, surveyor:—

MacIntosh (accepted)	£915	0	0

For patent ventilators, the estimate of Messrs. Verity Brothers has been accepted.

For foundations up to line of ground floor, Municipal Offices, Leeds. Mr. George Corson, architect:—

Thornton	£6,692	0	0
Wade & Son	5,626	10	9½
Plows	5,380	0	0
Hall	4,840	0	0
Ives & Son	4,631	0	0
Brier, Son, & Wilson	4,450	0	0
Wilson & Sons	4,390	0	0
Franks & Evans	4,300	0	0
Garland	4,290	0	0
Whitaker Bros.	4,233	0	0
Haunan & Barber	4,226	0	0
Bentley & Burn	4,000	0	0
Boothman	3,987	15	0
Pickard	3,933	0	0
Nicholson & Son	3,893	0	0
Armitage & Hodgson	3,786	0	0
Irwin	3,696	11	11
Longley Bros.	3,660	14	3
Wood (accepted)	3,600	0	0

For the erection of No. 148 and 148A, Oxford-street, for Mr. F. Marsh. Mr. Aug. E. Hughes, architect:—

Higgs & Hill	£8,940	0	0
Colls & Son	8,620	0	0
Simpson & Son	8,602	0	0
Grimwood	8,588	0	0
Rider	8,478	0	0
Williams & Son	8,320	0	0

For new stables, for the London General Omnibus Company, Lower Clapton. Mr. Tosh, architect:—

North	£2,839	0	0
Berry & Evans	2,376	0	0
Anderton	2,300	0	0
Wells & Martin	2,295	0	0
Larkin & Son	2,192	0	0
Hammond	2,109	0	0
Newman & Mann	2,005	0	0
R. & E. Smith	2,000	0	0
Hobern	1,990	0	0
Aitchison & Walker	1,890	0	0
Saw	1,714	0	0
Lamper & May	1,700	0	0
Sherlin	1,683	0	0
Wyse	1,674	0	0
Crab	1,665	0	0
Parker & Crab	1,658	0	0
Perkins	1,621	0	0
Beal	1,618	0	0

For additions and alterations to offices, 10 and 12, Cheapside, Hanley, Staffordshire, for Mr. E. Tennant. Mr. W. A. Keates, architect. Quantities supplied:—

Redfern	£453	9	4
Mathews	418	0	0
Ellis (accepted)	410	0	0

For new conveniences to the Bethesda Chapel Schools, Hanley, Staffordshire, for the Trustees. Mr. W. A. Keates, architect:—

Ellis	£143	0	0
Matthews	116	0	0
Brereton (accepted)	114	10	0

For alterations at premises, Broadway, Deptford, for Mr. T. Parry (exclusive of shop-front). Mr. Hunt, jun., surveyor:

Thomas	£600	0	0
Garlick & Cain	590	0	0
Slade	573	0	0
Hubble & Trott	529	0	0
Rowe (too late)	525	0	0
Thomas (accepted)	499	18	6

For building a new wing to residence in St. Mary's, York, for Mr. R. Johnson:—

Jackson & Spencer (brick, stone, and joiner's work)	£299	0	0
Dodgson (slater)	34	18	0
Dickinson (plumber and glazier)	41	10	0
Waud (plasterer)	40	10	0
Huggons (tile pavements)	26	0	0
Thomas (painter)	10	13	0

For rebuilding the Fox Inn, Holgate, near York, for Mr. Francis Barlow:—

Barry	£1,060	0	0
Biscomb	1,005	0	0
Keswick & Son	964	0	0
Weatherley (accepted)	920	0	0
Harrison	875	0	0
Simpson	834	0	0

For additions to Acomb Hall, for Capt. Starkey:—

Keswick	£116	12	0
Harrison (accepted)	112	0	0

Accepted for new warehouse, North-street, York, for Mr. R. Sherwood:—

Simpson (bricklayer and plasterer)	£435	0	0
Harrison (carpenter and joiner)	375	19	0
Kilvington (mason)	53	0	0
Carlile (slater)	62	10	0
Shouksmith (plumber and glazier)	40	0	0
Arnitt (painter)	10	18	0

For additions to three farmsteads on Carlton Towers Estate, Selby, for Lord Beaumont:—

Jackson Bros.	£250	0	0
Shouksmith (iron spouting)	68	17	0

For the erection and completion of Christ Church Parsonage, Beckenham, Kent, for the Rev. J. Welsh. Mr. Charles Fitzroy Doll, architect. Quantities supplied:—

Temple & Forster	£2,240	0	0
Shearburn	2,017	0	0
Smith	1,965	0	0
Graham	1,897	0	0
Barber	1,899	0	0
Jarratt	1,780	0	0
Cooper	1,775	0	0
Taylor	1,773	0	0
Hooker	1,684	0	0

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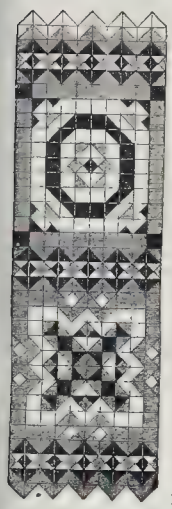
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The Workmen's Exhibition, Paris.

In a previous occasion we alluded to the efforts made by the working men of France to organise an exhibition which should be purely representative of their class. Applications were made for space to be devoted to this purpose at the International Exhibition; but the movement was viewed with great jealousy by the authorities; at least, during the reign of the Gouvernement de Combat. The workmen's position is an anomaly in France. The right of association is not yet definitely conceded. Practically, the police does not now interfere with the trade-unions representing the members of one particular trade, and each restricted to its special locality; but directly these different societies begin to associate, then the authorities take alarm; and, availing themselves of unrepealed laws against coalitions, dissolve these too ambitious societies. A Workmen's Exhibition would tend, it was feared, precisely in the same direction. It would facilitate a federation between the various trade-unions, and hence the opposition which has impeded the Exhibition. With the advent, however, of a more liberal form of government, these susceptibilities somewhat subsided; and a Workmen's Exhibition was not only held, but actually opened by a member of the Government,—the Minister of Agriculture and Commerce, the indefatigable M. Teisserenc de Bort. It is true that the space allotted for the Workmen's Exhibition is not within the Exhibition grounds; but it is so close to the Porte Rapp, the principal entrance, that it can be easily visited at the same time as the great Exhibition. Nor can the charge for admission, limited to the trivial sum of 25 centimes, have a deterrent effect.

The structure, we must confess, is plain. It just suffices to afford shelter for the exhibits; and, barring the fact that it has been built by the workmen themselves, without any middle-class assistance, it has no further feature of interest. On the other hand, we must make allowances for scarcity of funds. The Municipal Council of Paris voted 2,000*l.*, and the General Council for the Department of the Seine voted 800*l.*; but these subsidies could not go far. Then another difficulty arose. A great many workmen were anxious to exhibit various inventions, but could not afford the money to secure letters patent; and feared that their ideas would be pirated if publicly exposed. A decree from the Ministry of Commerce finally removed these objections; but it was not issued till May, and the exhibition itself could not be opened till June. It is now decided that all objects exhibited shall be protected by the law in the same manner as if they were patented, during the time of the exhibition and for three months afterwards. The exceptional guarantee thus offered will not in any way interfere with the granting of a regular patent should the exhibitor ultimately desire to obtain this protection. If, however, all has ended well, there have been, it will be seen, many delays; and, for a long time, it was very doubtful whether the exhibition would ever be held at all. These facts have not helped to render the show particularly attractive, and it would not be fair to judge the results without taking into account the difficulties which have beset the promoters of this curious exhibition. It is, nevertheless, well worth a visit, and it is important to know what the workmen, unassisted by employers, have been able to accomplish in spite of the opposition they at first met from the Government.

On entering the grounds that surround the building, it is at once apparent that many of the objects exhibited are of direct interest to the building trades. Thus, M. L. Lefèvre, 67, Rue Picpus, has a system of glass roofing for hot-houses, &c., fixed without the assistance of putty, plaster, or any sort of cement, and which will nevertheless exclude water. This consists of a zinc frame-work on which the glass is fitted. Wherever a joint occurs, and a slight leakage might result, the edge of the frame is curled up underneath the edge of the glass, so as to form a little gutter, about ¼ in. wide, which will drain off all the drops that may filter through. The plan, however, is inferior to some patented in England. M. Paul Thué, 3, Rue Linne,—we give the address, for these are not tradesmen but individual workmen, who, for the most part live in lodgings, and whom it would be difficult otherwise to find,—has an appliance for holding slates on a vertical roof. This is a small wire contrivance which stands out in the form of a Y. The tail of the Y is passed between two slates, while the arms stretch out over the lower and middle portion of the slate above. Thus, between each slate a forked-shaped grappling wire protrudes, to be pressed down upon, and to hold the slate placed above. It is to be feared that the action of the atmosphere cannot fail to corrode in a comparatively short time these small wire supports.

On the opposite side of the little garden there is an ornamental façade and colonnade in plaster, built by the Plasterers' Trade Union, to demonstrate how well plaster can imitate stone, and more particularly to demonstrate the ability with which the workmen can utilise these qualities. Close by, M. François Perrière, mason, 45, Avenue de la Labourdonnaie, has some partitions conceived for the purpose of excluding sound. The composition with which the partitions are made is very light, and gutta-percha piping of about 4 in. in diameter is used to prevent sound travelling through the partition.

M. Chevalier, 33, Rue de Linne, shows some imitation stone which is worth looking at.

On entering the building itself by the central and principal door, we encounter at once the political colouring which the workmen could not refrain from imparting to their Exhibition. A huge square stand with shelves all round is the central ornament, and holds the most attractive objects in the Exhibition. This pyramid of shelves or counters culminates in a sort of catafalque, where a ghastly chalk cast of Raspail's head rests on black velvet. Beside it a gigantic crown in black and white beads commemorates the mourning of the working classes for their lost friend and veteran champion. It bears the simple inscription, "À Raspail, les Ouvriers de Paris reconnaissant." The French have often been accused of ingratitude, of forgetting the good men they have lost; any symptom that may serve to contradict this unfavourable impression should be welcomed, even though introduced where more hopeful and joyous thoughts should be engendered. The thoughtful French workmen do not pretend, however, to participate in the proverbial Gallic gaiety. Their position is fraught with anxiety and humiliation. There is not a workman in Paris who does not remember the loss of a good friend or relation shot or transported a few years ago; and those who remain must suffer from the depression of trade and from laws aimed solely against their class. While architects, surveyors, engineers, doctors, members, in a word, of every other class, nationality, and profession, have held congresses in Paris,—have met freely and discussed freely,—the French workmen were forbidden to unite in congress, and the police arrested those who came to discuss working-class questions in Paris. Under such circumstances it is not surprising if a shade seems to hang over the Working Men's Exhibition; and, when so many men are arraigned against them, they are naturally inclined to pay special honour to the memory of so true and rare a friend as the people's doctor, the Socialist and Republican deputy, the well-known apostle of camphor as a universal remedy, and the oldest member of the National Assembly, M. V. P Raspail.

Below these mementoes, and facing the entrance, there is a handsome bronze copy of Malarmet's Republic of 1848, which is certainly preferable to Clesinger's Republic of 1878. Contrary to Republican principles, Malarmet also gave his Republic a sword, but it is pointed downwards in a purely pacific manner, and its blade is bared only to shield the tablet of the Constitution, and the triangle, the emblem of fraternity. To the left of this familiar statue, M. F. Lassaux gives his notion of John Brown, in terra cotta, with a released and grateful negro at his feet; while on the right-hand side, M. Eugène Buffier, 130, Rue de l'Ouest, has a model of a clock in chalk, designed to represent the working classes labouring and learning. A handsome workman is sitting by a carpenter's

table, he is resting and reading. The contrast between the attitude of bodily rest and mental concentration is well rendered.

All round this central stand there are several objects of art worthy of notice. M. J. B. Bourgoin, 26, Rue Paradis Poissonnière, for instance, displays several statuettes in terra cotta, some coloured, all pretty, and a few humorous. M. Toulouze, 10, Rue de Genève, has some handsome portraits on plates; M. Taillandier, 13, Rue du Pré, exhibits some specimens of porcelain of high merit; and M. Goffaux, chalk mouldings. In other parts of the exhibition we admired, among the art work, M. Margotteau's cupboard. It is 8 ft. high, and consists of solid wood, sculptured; Diana on one panel faces Leda on the other, while Venus reigns triumphantly over both. There were several other specimens of wood carving, but not of equal importance. M. Alfred Gauvin has contributed some delicate iron *repoussé* work, and we found a looking-glass frame in mosaic, stated to comprise two million pieces! On the whole, however, the art-work was not as good as we should have expected at the hands of French workmen; some of the porcelain was quite inferior in colour and design, but, after all, at the great Exhibition, and under the name of celebrated firms, there are triumphs of art workmanship shown which are due entirely to the skill and taste of the Parisian artisan working under proper direction.

Among the various objects which workmen have exhibited, we may enumerate toys, musical boxes, a few pianos, some castles cut out of cork, a good deal of sempstress's work, a few dresses, samples of tailoring work, artificial flowers, Berlin wool work, pipes in meerschaum, &c., microscopes and other implements of precision, surgical instruments, bandages, guns, rifles, and a very beautiful model engine. There is, of course, the inevitable patentee who professes to have discovered a new folding-chair which can be converted into a bed or sofa, and finally rolled up and "carried away under the arm,"—of a giant, we might add. We have also two or three new fire-escapes; and notably that of M. Lamon, which consists of an inexpensive rope ladder rolled up and fixed at the summit of theatres and similar places. It can be detached in a moment, and hangs in front of the window by which the persons inside the building are the most likely to make their escape. This precaution could be easily taken and utilised long before an ordinary fire-escape could be brought upon the scene. It is to be hoped the material is fireproof.

Among the various ingenious contrivances, we should, perhaps, mention M. J. A. Markowski's (78, Rue des Cascades) velocipede. This consists of four wheels, and is worked by four persons. It occupies, nevertheless, very little space, and is remarkably light. Again, M. Halon (75, Rue de Dunkerque) shows a stove where, instead of iron bars to keep the coal in its place, he has copper tubes. These are filled with water, and carried off to any distance. Thus we can have a *bain-marie* some way off from the fire; and hot water is naturally produced much sooner. M. A. Baudin has devoted himself not to the production of heat, but to the prevention of fire. He has a patent solution which will render clothes, paper, wood, carpets, curtains, furniture, &c., fireproof. This invention has been patented, and, we believe, applied at the Grand Opera House, the Opéra Comique, and the Théâtre-Historique. If it is really efficacious it could be used in a thousand manners, and might on many occasions prevent disastrous fires. Finally, M. Doré, on his side, exhibits a liquid solution which will render the walls of a house, and even plaster partitions, quite watertight. It is also useful for the preservation of paintings, and of iron against rust. We regret that we were unable to obtain a sample and make some experiments to test its efficacy and its commercial value.

Such are some of the points of interest in this peculiar exhibition. It seems but as a Lilliputian bazaar when compared to the giant on the Champ de Mars; yet it may be the germ that will develop a good growth. The French trade unions are determined to become, not merely benefit associations, but great co-operative trading and producing companies. Thus this small Workmen's Exhibition may mean something far more important for the distant future. In the mean time, however, we must acknowledge ourselves disappointed with this exhibition, taking it as a whole. There are things of note and interest in it; but we are convinced that if the Paris workmen enjoyed a few years of the liberty which, in defiance of the Republic, they do not yet possess, they could make a far better display of their products. The exhibition also fails entirely in the international character it professed to assume; but, after all, if we consider all the impediments which were to be overcome, we must not withhold our congratulations to those workmen who have achieved a partial success where others might probably have done nothing.

SEWAGE IN THE THAMES.

A MOTION made by Mr. Richardson, at the meeting of the Metropolitan Board of Works on the 27th of September, was, to the credit of that body, carried unanimously. It was to the effect, "that it be referred to the Works and General Purposes Committee to consider and report on the statements made that the water of the River Thames, when the unfortunate accident to the *Princess Alice* occurred, was 'poisonous,' and 'its taste and smell something it was impossible to describe,' and whether such state of the water, if correctly described, arose from the main-drainage outfalls." The only rider that we would wish to put to so excellent a motion would be to the effect that competent testimony should be adduced, and that impartial judgment should be passed. In the conflict on which the Board of Works have entered with the Conservators of the Thames, and with all persons who desire to promote the purity of our chief river, they have hitherto had the great advantage of receiving violent and unmeasured attacks. Such attacks it is easy to repel,—and then the victory remains with the defendants. Of such victories they have known how to make the most adroit use. Now if we look at the speech with which Mr. Richardson supported his motion, we shall see that the inquiry may be so conducted as to result in the same sort of victory that was claimed as to Capt. Calver's report. "As regarded the assertion that had been made that 500 or 600 persons had been poisoned by the discharge of sewage from the Board's outfalls, Mr. Richardson gave such statement the most unqualified denial." No doubt. We quite assent. Such a statement would be incapable of proof, if correct in the main. Beyond that, we do not hold that it is correct in the main. That the melancholy loss of life referred to was caused by drowning is a matter as to which no juror could hesitate for a moment. Whether that mode of death was, or could be, embittered by the greater or less impurity of the water in which the sufferers perished is, we cannot doubt, equally incapable of proof. We hope, for ourselves, that it was not possible for such to be the case. If the matter is put on this issue, the verdict will be for the Board of Works.

But it is quite another thing as to the state in which the wreck and the remains in it were found after a few hours of submergence in the neighbourhood of the Barking outfall, although, be it noted, up the stream. It is quite another thing as to those who, having happily escaped with life, may be asked to give their own account of the water with which their clothes were drenched, and their mouths and chests more or less filled. Mr. Richardson, no doubt to the satisfaction of his colleagues, proved his case by a diagram. He showed the locality of the wreck, and the state of the tide at the time. Did he not see that this only made the indictment more formidable? Had the wreck occurred below the outfall, and during the discharge of the sewage, it would have been said that the case was exceptional. During half a tide half the sewage of the twenty-four hours is poured into the river. When the river is not swelled by floods, less than seventy millions of gallons of fresh water run down during the hours in which sixty millions of gallons of sewage are run out from the two outfalls. Any obstacle caused to such a discharge, the Board might safely allege, will naturally cause a deposit of sewage. "It is unfortunate, but unavoidable." But the real case is very different. The two points have to be kept apart, viz., the condition of the wreck, and the perception of those who were submerged, but not drowned. As to the latter, their personal evidence will probably carry more weight, at least outside the council-chamber of the Metropolitan Board of Works, than the most elaborate diagram. As to the former, Mr. Richardson's diagram goes to furnish direct proof of the statement made by Captain Calver, and denied by the Engineer of the Metropolitan Board, to the effect that the sewage makes its way up the river, and forms solid deposits in its channel. In fact, the statements made as to the indescribable condition of the wreck should be read side by side with the following paragraph of the report of Messrs. Bazalgette, Law, and Chatterton,—"We have shown that there is no documentary evidence to prove that foul and offensive accretions have recently formed within the channel of the Thames."

But while assenting with alacrity to an inquiry which, if the issue raised be "drowned or poisoned," must, of course, be decided in favour of the former, the Board hold firm to their position that crude sewage is neither noxious nor offensive. Having given, as our readers will remember, not a little attention to this subject, we cannot but feel some satisfaction on seeing the Board thus nail their colours to the mast. Mr. Cook said that, "from his judgment, he did not believe, in respect to the discharge of the sewage at Barking, that it was either one or the other,"—that is, either noxious or offensive. The entertainment of this belief by the members of the Board of Works may account for the scant courtesy and unmitigated hostility with which they hurled back to the Conservators of the Thames the report of Captain Calver. But what is more difficult to understand is, how any one can honestly entertain such a belief. It is not stated as a question of less or more,—as a matter of difficulty and of regret,—but as a positive fact. "The works," said one member, "which the Board had effected were amply sufficient to take away all the sewage from London, not only at present, but for many years to come." Positive enough, and comfortable enough, for the Board; but, unfortunately, not the statement of an expert or of an impartial judge. Mr. Cook and Mr. Runtz "objected altogether to the implied assumption that the sewage at all contaminated the river!" Mr. Fowler followed on the same side, and said that "it was a popular fallacy to imagine that solid sewage was discharged into the Thames." We should like to know the meaning attached to this expression by the speaker. What is a fallacy? or what is "solid sewage"? Of the latter we do not remember to have heard. Of crude, raw, or undiluted sewage, whether putrescent or only putrescible, we have heard. That is what is thrown into the Thames; and we should be delighted if Mr. Fowler would prove that this statement involves a fallacy, popular or otherwise.

The unanimous, or at least the preponderant, belief of the Board in the innocuous character of anything but "solid sewage," was somewhat rudely opposed by one member who had the misfortune to know what he was talking about. Mr. Jackson is a resident in the neighbourhood of the outfalls. He was, unfortunately, not provided with a diagram, and, therefore, being reduced to the fallacious testimony of his own senses, "bore personal testimony to the offensive character of the discharge from these, and which floated up and down the river on the tides." We regret that here the report ceases to be verbatim. We should like to know with what sort of a chorus of disapproval poor Mr. Jackson's personal testimony was received. It was indeed a heresy! A member of the Board to find anything proceeding from their works to be offensive! At all events, such a novel and altogether unexpected defalcation seems not to have troubled the majority. The second original motion of Mr. Richardson was,—"That it be referred to the Works and General Purposes Committee to consider and report whether the sewage discharged into the river at the Board's outfalls could not, at a moderate cost, be so purified before its discharge as to render it innocuous and inoffensive, as well as free from solid matter." "That will never do," said the Board. "If they voted for that resolution," said Mr. Cook, "they would be condemning themselves, as by so doing they would admit that they discharged into the river at the outfalls sewage that was noxious and offensive," but which, as before said, he did not believe was either one or the other. It is pretty clear that either the medical profession, sanitary reformers in general, the Rivers Pollution Commissioners, and Parliament on the one hand, or the Metropolitan Board of Works on the other, are utterly and frightfully wrong in this matter. The former authorities all agree that crude sewage is not only an offensive and disgusting compound, but that it is a substance dangerous to health; and

one the destruction or oxidation of which is one of the chief and most difficult duties of the engineer at the present day. The Metropolitan Board of Works, overruling the recalcitrant Mr. Jackson, declare that this compound is neither noxious nor offensive. "Well," says Mr. Richardson, "not perhaps positively noxious and injurious, but most decidedly offensive." "By no means," replies the majority of 19 to 7. So even the modest amendment, to the effect that the Board should inquire whether the sewage could not, "at a moderate charge, be purified before its discharge," was put and lost, and the inoffensive and innocuous character of crude sewage was thus adopted as one of the principles for the defence of which the Metropolitan Board are determined to use their own great powers,—and the money of the ratepayers.

This is not subject of congratulation for those who pin their faith to the wisdom of public bodies at large, or of a certain public body in particular. But we confess that we have read the account with some satisfaction. It is well that the question between the Conservators of the Thames and the Metropolitan Board of Works should be defined. "You are polluting and injuring the river," said the former. "We are within our rights," was the reply. The indictment was met by a demurrer. We pointed this out at the time and we also intimated that, sooner or later, the legal reply (if a reply) would not be enough, and the case would have to be discussed on its merits. This has come to pass sooner than we anticipated. The safe, if ignoble, shelter of the demurrer has been abandoned. The Board has gallantly gone in for an issue of fact. How far the outfalls at Barking and Crossness are, or are not, authorised by the Metropolitan Acts of Parliament no one but a lawyer can form an opinion. As to the offensive or non-offensive nature of sewage, every one provided with a nose can form an opinion. Nor can we for a moment doubt that, however large the majority that may support the view of Mr. Runtz within the Board, he will find himself in a very small majority outside of that charmed circle.

Even on this head, however, trouble looms on the horizon of the Metropolitan Board of Works. Our readers may remember that on the 3rd of August we ventured to express the opinion, founded on as careful a study of the case as we were able to make, that the Metropolitan Board had not the legal right to throw crude sewage into the Thames. In the *Times* of the 28th of September there is a letter signed "Lex," which speaks with remarkable precision on this point. We should not, as a rule, quote the opinion of an anonymous writer as being likely to add much weight to anything which we have taken the responsibility of bringing before our readers; but in the present case the publication of so positive an opinion, under so significant a signature, is so far clothed with the editorial authority of the journal, that it is inconceivable that it should have been allowed so to appear unless it came from the pen of some person competent to speak without hesitation as to what is the law of England. The letter is remarkably incisive. It goes straight to the point, and does not contain anything that we are not disposed to endorse. "I submit," says the writer, "that it is wholly unnecessary to issue a Royal Commission to make further inquiry. All the facts are known. Fresh action must be taken at law or in Parliament. If by law, the City of London and Conservators of the Thames should do what is necessary. THE MASTER OF THE ROLLS WOULD ISSUE AN INJUNCTION AT ONCE IF APPEALED TO; and the only question to be decided is,—Is the Metropolitan Board of Works entitled to pollute a river by sewage unpurified, which is an illegal offence in every other part of the kingdom?" On the 25th of September a letter in the same journal, under the signature "C. E.," recited the authorising clauses of the Metropolitan Acts of 1855 and 1858, and pointed out that the conditions "so as not to commit a nuisance" and "so as to prevent the sewage passing into the Thames within the metropolis" were embodied in those clauses.

Thus the matter draws towards an issue. Good at times springs out of evil. The melancholy catastrophe of the *Princess Alice* will not have been altogether without some good results if it has only wakened a persistent resolution, on the part of those who have been forced to look this terrible question in the face, that London shall not, so far as it is in their power to resist, be exposed to the slow but steady approach of pestilence, in consequence of the light-hearted resolution of the Metropolitan Board of Works that sewage is "inoffensive." "The question," says the last cited writer, "is not one of a few feet of deposit, or of a few millions of gallons of refuse. It is whether the Thames should be rendered the common sewer of a province containing four millions of people, because no one has the courage to test the sense of an Act of Parliament, passed at a time when no such evil result was anticipated." Another gentleman offered to subscribe towards a fund for trying the question at law, by an action against the Metropolitan Board of Works. It is desirable that efforts should not be frittered away. Any one who has enough of the courage of his opinions to offer thus to back them with his funds may be expected to give a hearty assent and aid to whatever may be found the most available mode of working for the common good. This mode we have some time since pointed out to be most readily attainable through the action of that eminently respectable body, the Conservators of the Thames. To this end both of the writers we have above cited point. "As far as it is possible for a layman to form an opinion on a point of law," says the civil engineer, an injunction would be issued "if the Thames Conservancy Board were to apply for an injunction against the Metropolitan Board of Works." "The Master of the Rolls would issue an injunction at once, if appealed to," says "Lex" in the *Times*. So far as we can judge, there is likely to be a remarkable unanimity on this subject in the press. Who, indeed, would venture to stand forward as the advocate of the pollution of the Thames, or of the innocuous character of crude sewage? It is one thing to make courageous or jocular remarks in a snug room, when nineteen out of twenty-five of your companions are ready to applaud them; it is another to submit to the more searching criticism that attends on written or on printed matter. We should like, for instance, to see any one who would venture to tell the public in print that "the whole of the sewage that was passed into the Thames from the Board's outfalls formed but about the proportion of one to the seven-thousandth part of the stream." Yet that ridiculous mis-statement is not only reported as being made uncontradicted at the Board, but commented on by a respectable contemporary, who seems struck with the disparity between the proved state of the stream, and the very small proportion of poison which, according to the member who hazarded the remark, has had such a fatal influence. The misfortune of these zealous advocates usually is that they reply one to another. The concrete, obvious, odious, fact is the unexpected discovery, owing to a fatal disaster, of a state of the Thames above the outfall worse than even that which Capt. Calver was laughed at for describing below the outfall. One member of the Board, with his diagram, calls attention to this fact of position, which is more damaging than any analysis hitherto attempted. Another says that he sees no harm in the outfalls; a third tells us that there is only one part of sewage in 7,000 parts of water! How much more pestiferous and deadly must that subtle poison be, if those gentlemen are right, than the advocates of public health have ever yet ventured to indicate! Truly, Mr. Richardson and Dr. Brewer are important witnesses,—the more reliable because of their hostile purpose.

The *Evening Standard* laments the resolution of the Board as a positive misfortune. We have spoken of it as a matter for congratulation. But there is little difference between us as to the bottom of the matter. We should have been among the first to rejoice, if the Metropolitan Board, on being afforded an unusually ready opportunity for repairing some of their worst blunders, had availed themselves of it as men of the world. "Really," they might have said, "we are, like all our fellow-citizens, so shocked at the revelation, that we will have the matter looked into thoroughly, and will concert with the Thames Conservators as to measures to be taken to carry out the demands of that important body. We are sedentary people ourselves, we don't go east of Charing-cross; but we were shocked to hear what one of our own members, who does, said the other day. We see the Thames so much clearer at Westminster than it used to be, that we took the word of our officers for it that it was pure all the way to the sea! We are disappointed: but the welfare of London above all things! After all, the great thing is to do what is grandiose; and perhaps as much advantage may be derived, by those who know how to derive it, from laying out a million or two in defecating sewage, as by building a bridge with a spiral ascent, or by making another crusade against the water companies. At all events, what must be, must be." But as this has not been the tone taken, again we say that all who are for the salubrity of the Thames must rejoice that the Metropolitan Board have nailed their colours to the mast, and given the public to understand, once for all, that they consider that there is nothing offensive in raw sewage, and that they have no intention of paying any heed to the purity of the Thames unless they are absolutely compelled so to do.

At all events, there can be no illusion now remaining on the minds of those who have looked for something like respect for the representations of the Thames Conservators on the part of the Metropolitan Board. What is at present essential seems to be this. The two parties are now fairly marked out:—London and its authorities and inhabitants, the persons engaged in the commerce of the Thames, and the riparian inhabitants of the Lower Thames Valley, supported by the press, on the one hand; the Metropolitan Board on the other. Success can only waver on the view that the minority is so compact—the majority so scattered and unorganised. We therefore urge that those who take a lively interest in the matter, those who are ready, like the writer in the *Times* the other day, to put their hands, if need be, into their pockets, should, in the first instance, give a prompt and signal moral support to the only body that has already moved in the matter—the body to which, at all events in the first instance, we have to look for action. The writer in the *Times* suggested the opening of the campaign by memorialising the Conservators of the Thames. We think the suggestion so practical, that we subjoin the draft of a memorial to carry out that suggestion.

"To the Honourable the Conservators of the River Thames.

The memorial of the undersigned citizens, householders, and residents in London, and in the Lower Valley of the Thames,

Respectfully sheweth,

That your Honourable Board has been constituted by Parliament for the conservation of the Thames and of the Port of London, for the preservation of the Thames from encroachments, and for the security and convenience of the public.

That penalties are provided by the Thames Conservancy Act, 1857, to be imposed on every person who shall unload, put, or throw into any part of the River Thames any rubbish, earth, ashes, dirt, mud, soil, or other matter, or allow any offensive matter to flow into the Thames.

That by an Act of Parliament called the Metropolis Management Act, 1855, the Metropolitan Board of Works was authorised to execute certain works, namely, to make all such sewers and works as they may think necessary for preventing all or any part of the sewage of the metropolis from flowing or passing into the Thames within the metropolis, and that they were authorised to dispose of the sewage and refuse of such sewers as they may see fit, but so as not to create a nuisance.

That notwithstanding these obligations to provide for public health and decency, the Metropolitan Board of Works have turned the sewage of the metropolis in a crude and unpurified state into the channel of the River Thames at Barking and at Crossness, thus creating a nuisance of the most noxious description, and allowing the sewage to flow into the Thames within the metropolis during each nate period of the rising spring-tides.

That the members of the Board have declared, as recently as the 27th of September, 1878, that in their opinion such disposal of the raw sewage of between three and four millions of people is not only innocuous but inoffensive.

That the report made to your honourable Board by Capt. Calver, R.N., dated the 15th of October, 1877, concluded by expressing the wish 'that the noble metropolitan river committed to your care may be freed from a drawback which is impairing its convenience and usefulness, and which must continue to do so at an increasing rate without an effectual remedy is speedily applied.'

That your memorialists have been advised and do believe that the discharge of crude sewage into the Thames by the Metropolitan Board of Works is a violation of the provisions of their own Act of Parliament, as well as of the general provisions of the Common and Statute

Law regarding nuisances; and constitutes a serious peril to public health, and to the navigation of the Thames.

That they are further advised and do believe that a remedy at law may be readily obtained by your honourable Board, if they should apply for an injunction to prevent the continuance of this dangerous nuisance by the Metropolitan Board of Works.

That your memorialists therefore pray your honourable Board to take such steps as in its wisdom it may think fit for the immediate obtaining of such injunction, reserving the faculty of applying to Parliament for further powers to protect the public interest should such hereafter appear to be necessary.

And your memorialists will ever pray, &c."

THE ARTIST AND HIS WORK.

A truly great work of art is something more than a mere specimen of manipulative dexterity,—it is the visible expression of inward emotions, the manifestation, in a material form, of the intellectual appreciation of the beautiful. The true artist imparts to physical beauty an intellectual beauty, and interprets the spiritual language of inanimate nature. He places objects, whether animate or inanimate, in their best position, and throws upon them an ideal light which awakens the highest sensibilities of the beholder. He ascends from the effect to the cause, and gives expression to his deepest thoughts and most subtle imaginings.

To reach this high level much toil and striving is required. There is no such thing as a "heaven-born artist." The greatest genius can only display itself after unremitting travail of the soul, and by ever keeping in view a noble aim. It is your weakling,—he who finds the pathway too difficult to traverse, and never thinks of cutting one out for himself, who endeavours to reach the goal at a bound; and various are the means by which he attempts to do so. He prates about drudgery and the dignity of his mission, and will not condescend to adopt the ordinary means placed at his disposal. He affects what he calls originality, but what is simply oddity and singularity, although his friends may dignify it by the name of eccentricity.

Confident self-assertion and unbounded impudence often make themselves conspicuous when modest worth is overlooked, but in the long run true merit is sure to be recognised, although it may not always secure the reward during a lifetime. It is really startling to see some of the productions palmed off as examples of high art, works in which there is not the slightest attempt at the union of the possible with the ideal, in which there is perhaps a vague suggestiveness, but no combination of thoughts. There are some who affect to admire such whims and vagaries, to see in them a subtle beauty which is invisible to the uninitiated, but there are others who see through the flimsy superficiality which is adopted as a covering for the absence of those sterling qualities which can only be obtained by hard work and study. He who has by genuine study acquired a mastery over technical requirements, whose hand answers to his brain, needs not to indulge in extravagances, but restrains himself within due bounds, and is not necessarily a slave to academic formula; his work may be the result of painstaking care, and yet that may not be apparent. A suggestion of detail is much more true to nature than an elaborate delineation of each separate part; for when that is attempted the stereoscopic effect of nature is lost. To produce a really natural effect the artist must concentrate his efforts in giving emphasis to the leading incident or phase, and make the remainder subordinate thereto. As it would be foolish in an author to write a whole chapter in italics, or for an orator to give emphasis to every word of his speech, so would it be for the artist to make every object in a picture equally important, or to place each in a strong light. Genuine suggestiveness can only be acquired by study, and is much more difficult of attainment than the more mechanical process of direct imitation. But slovenliness must not be mistaken for suggestiveness: the material or medium used then becomes too obvious, it obtrudes itself, so that the canvas seems to smell of paint, the parts do not blend together, and there is no harmony of effect.

There are some who look at everything through the narrow casement of their own chamber, and fancy they see the whole world, and the portion of it they do see is viewed through a distempered medium; the glass is full of flaws and gives to objects a distorted aspect. The time is past when we accept an attenuated figure, with head twisted to one side and hands stiffly crossed on the breast, as an adequate representation of saint or martyr. Nor will a refined taste be satisfied with the morbid obtrusion of human suffering and agony, or anything that is repulsive or forbidding. Art should attract and not repel, produce pleasing and not painful sensations; it aims at the realisation of the beautiful, and the subject, whatever it be, should produce pleasure, whether it be by awakening our sympathies for suffering or inviting us to rejoice with the happy. "Art should be an instrument of progress by always selecting the best phase of every individual, the best form of every type, *i.e.*, the Ideal." But while art is an instrument of progress, its province is not to teach morality; it may, indeed, and should, express what is noble and good, but unobtrusively, for wherever it obtrudes virtue it fails as art. The images it presents should awaken pleasing associations, but whenever the associations aroused are vicious, then the art is low art; for "in proportion as a mind is high in the scale of humanity, the objects of its Love are certain to graduate towards Beauty": not mere sensuous beauty, but that spiritual beauty which pervades all the works of the Creator.

In order fully to apprehend a work of art, the spectator must be possessed of a nature alive to sympathy, a sensibility to outward impressions, and have an eye keenly alive to beauty of colour and grace of form. And although he has not been taught morality by the study of art, the measure of his moral nature may be gauged by his appreciation of it. "The man who loves nature most will be always found to have most faith in God," says Ruskin; and why? because nature is the visible manifestation of "Him in whom we live and move and have our being."

The love of the Beautiful, whether in nature or art, differs only in degree from that which is kindled within us by what is good and noble in living action. A work of art is the embodiment, in a visible form, of inward emotion, and speaks more directly to the initiated than any other product of man's brain. "Exact imitation is not necessary to reverence." It is not the outward seeming which engages the attention of the true artist so much as the underlying sentiment and evanescent expression which he endeavours to arrest and retain; and he will be the greatest who, filled with the spirit of the times, gives expression to them, not he who repeats, in however dignified a form, the supposed expressions of a bygone period. "It is the genius of the hour which always sets his ineffaceable seal on the work and gives to it an inexpressible charm for the imagination." Each man will ultimately be judged by the amount and value of the originality in his work, and originality can only be obtained by freedom of action. The worship of precedent, the slavish adherence to dogmatic rules, is destructive to originality. The value of a work depends upon the creative power and the good taste and judgment displayed in its execution. Mere fluency of expression and elegance of diction will not suffice unless there are ideas conveyed; if devoid of ideas the result will be,—

"A thing of little meaning, though the words be strong."

Manipulative dexterity will not alone suffice. The work of the scene-painter may be very clever, but it can never be classed as high art. Ephemeral works produced for the gratification of the passing hour cannot be placed on a footing with those which are the most precious gifts to posterity. Neither will mathematical exactness, a knowledge of history, anatomy, botany, and geology effect the purpose. These are all aids,—most valuable aids,—and in some instances absolute requisites, to the formation of the artist; but, unless he has the heart to feel, the handiwork will be jejune and spiritless. The conceptions of him who aims at a high ideal and falls short of it are often of more value than the more perfect productions of him whose ideas are trite and commonplace; but the sense of beauty must be displayed in every direction where the work is genuine, and not affected and superficial.

It has been said that in England we have no school of art, but merely scattered items of personality. There is no tribunal to which an appeal can be made whose decision would be received with anything like general approbation. It is unreasonable to expect that the artist will be satisfied unless his work is appreciated. He may, indeed, do much to satisfy the longings and aspirations of his own soul; he may have the strongest conviction that his work is worthy of approval; but without the stimulus of sympathy his mind is certain to be burdened with an incubus which he cannot throw off. If he secures the generous approval of contemporaries who have gained a good position, he may then, although unsuccessful in a pecuniary point of view, be satisfied that his labour is not in vain. But there is apt to be a spirit of rivalry amongst contemporary artists, who, in the heat of the strife, cannot, with coolness and deliberation, pause to adjudicate upon the works of those with whom they contend. The very fact of one artist taking up a stand-point, from which he views the field of art, acts as a disqualification to his freely gauging what does not lie within his immediate range of sight. A fine appreciation is not always combined with original invention. The approbation of him who has cultivated his taste by the study of art for its own sake, and is not swayed by professional predilections, may be of more value than that of him who has acquired a mastery over the technical requirements necessary to constitute the artist.

The world of art is under obligation to the world of letters, although it may affect to deny it. The writings of living authors have done much towards imparting to the public right principles, and have performed good service in calling attention to true merit, which might otherwise have been overlooked. W. G. S.

THE PIANOFORTE ARTISTICALLY CONSIDERED.

Notwithstanding all that we hear and see of "art-furniture," there is plenty of evidence that the taste of the regulation cabinet-maker still exercises its tyranny in many forms and over many varieties of household furniture. There are certain set patterns of the trade which you must take as you find them, or incur the expense and delay of having a specimen properly made to order. As a rule, the stock-in-trade of the furniture dealer, if he happens not to be an "art" man, consists of objects which are not so much in a bad style as absolutely without style of any kind, and shaped,

"If shape it may be called that shape has none,"

with reference to no motive either practical or artistic, but only in fulfilment of a long-acquired hereditary trick of the craft. The good which the move for art-furniture has done (combined as it is with a good deal of nonsense) is that it has brought into existence repositories of furniture in the making of which a better and more artistic trick of hand has been acquired, though it is often still a trick, got up to meet the demand of the day. But among articles which do not come so regularly into the art-furnisher's stock, the case of the man who wants something not annoying from its commonplace or pretentious appearance is nearly hopeless. We have known the most persevering research fail in discovering so simple an object as an umbrella-stand made in a simple and rational manner; even the plan of asking to see the cheapest form failing, for, however "cheap," there is always some "nasty" ornament, or what is supposed to be ornament, to be put on. Endeavour to procure an office elbow-chair: wherever you go, a particular form with a particular sort of unmeaning cut-out ornamental rails meets you; ask if there is not a plain one, and you will be stared at as an eccentric person; give an order for a plain one, and ten to one it is no use, and the thing comes to you cut (or cast as one might think) in the regulation mould. "Art-furniture" is not concerned as yet with these more utilitarian articles.

But it is certainly surprising that, in regard to one article of furniture which is usually the most prominent and largest in a modern drawing-room, and is certainly the most distinctly artistic and the least utilitarian in its associations, there should still be not an effort made systematically to provide it with an outer shell, such as a man or woman of refined taste can at least find suitable and unobjectionable. The pianoforte, like some of the humbler objects we mentioned, is not in the stock of art-furniture; in saying which we are by no means withdrawing our former condemnation of much which is called art-furniture, and, to a great extent, of the movement

which has invented that expression. Only we may recognise the said movement as the result of a desire for improvement in the artistic character of our furniture, and in that connexion cannot but be surprised that it has not laid any hold on a piece of furniture so important and so suggestive to the artistic designer as the pianoforte. One reason for this, no doubt, is that as the piano has to be made by its own special manufacturers, they, to a great extent, keep the case and the external treatment in their own hands; but another reason may be that the modern piano being necessarily altered in size and form from its older precursors, the harpsichord and spinet, there is no precedent in old furniture design to fall back upon; and "art-furniture," as we all know, lives almost exclusively on precedent.

But if we grant that the pianoforte-makers must of necessity have the case in their own hands, it might not unreasonably have been expected that they should have made some effort to keep up with the demand of the more educated public for improved artistic conditions in furniture. They are not in the position of common tradesmen, for pianoforte-making is itself more or less an art, and one demanding great knowledge and culture to carry it to perfection. But the pianoforte manufacturer is not a whit before the dealer in office-chairs in his notions as to taste to be displayed in the external design of his costly and elaborate productions. Suppose that an architect is asked by a client in the country, let us say (and this is an incident within our own knowledge), to choose for him from the stock of some leading maker a piano which may be not only good as an instrument, but have an artistic form and make, and good (if any) decoration, so as not to interfere with the harmony of the intending purchaser's tastefully furnished rooms; or if this cannot be had, at any rate to secure one with simple and at least unobjectionable forms, which may serve as the basis for treatment at the hands of a decorator. The architect goes, not very hopefully, to a very renowned firm, explains what he wants, and asks to look over their show-rooms, and the result is that it is absolutely impossible to find a single thing which any man regarding the matter from an artistic point of view would admit into his house. There is the usual form of "grand," with the legs like elongated decanter-stoppers; there is the regulation upright or cottage form, with cut crinkle-crankle panels in the front, showing a raw red or green silk through the perforation; and the key-board has its coarsely-moulded brackets or Gothic props of an approved pattern, and its lid elaborately twisted into a serpentine section, against the nature of wood, although the top of the keys is a flat surface, and would be more appropriately and closely covered by a flat lid. On the front of the piano are fixed two rickety tinsel-looking candle-brackets, probably not fixed to any firm portion of the woodwork, but as likely as not on to the flimsy perforated panel, which shows a tendency to buckle whenever the candle-brackets are touched.* The only things among the regular stock which are at all fit to look at are the specimens of the very cheapest model of the small cottage pianos, because in them no "ornament" at all can be afforded at the price, so they are left plain and so far unobjectionable, though weak-looking enough. Even the idea of getting a piano which can be designed upon afterwards by a decorative artist has to be given up, for the forms are too bad, to begin with, for any one to make them the basis of a good design. But as our visitor leaves the rooms, he catches sight of one instrument which he had not noticed before, put rather carefully aside in a recess. This has not a bit of what the pianoforte-maker generally regards as "ornament" about it: no red silk, no perforated panels, and no sinuosities; but it is solidly and well made, the few mouldings which form almost the only decoration are delicate and refined in execution, the pedals and the candle-brackets look as if they would do their work, and the whole, though (or because?) almost the simplest-looking instrument in the rooms, is such as the most fastidious critic could not raise an objection to on the score of good taste. In answer to an expression of appreciation, the showman says, "Yes, that *is* a nice piano, sir; that was made specially for a gentleman who furnished a design for it." And, seeing that this perfectly satisfactory case has nothing specially costly about it, the question naturally follows, "Why don't you make others in that style, instead of these abominable things?" But all that can be elicited is, that "it is not our habit" to make any difference from our usual pattern, except to a special order.

This is a true tradesman's answer; and yet, as we said, the followers of so fine an art as pianoforte-making ought to rise a little above the tradesman in these matters. The heads of the great pianoforte houses are gentlemen of large means, and probably, at least, average culture; they might very soon improve public taste themselves if they would only get into the "habit" of thinking a little about the artistic appearance of their instruments, and endeavour to institute a more tasteful and sensible model. We say a model, because we admit that for the firm to be always designing new and various forms and decorations would not pay. There must be a certain recognised general form for the general run of the instruments, or they could not be supplied at the same price as they are. But why not at least endeavour to get hold of or invent a good model instead of a bad one; to knock off the "flummery" and vulgar finery, to make the construction truthful and sensible? The particular specimen mentioned just now was, it was understood, charged extra for the case; but there was no reason why that should have been if the same general model had been commonly adopted. In fact, it may be presumed that a perfectly good, tasteful, and unobjectionable form of piano may be produced at less cost, when once adopted, than the vulgar and tasteless forms which the trade generally seem quite content to go on repeating without the slightest attempt at improvement.

The existing regulation type of piano-case took its origin from the style of furniture in vogue at the time the grand piano was brought to near its present size and efficiency, and seems to have traditionally remained in the same state. The radical objection to the appearance of the average piano, whether grand or upright, is that it is a thing that is made to look showy by means of bad ornamental detail, of a cheap form, and designed with no thought or taste. Certain woods have become the stock material for cases; and it is considered enough to state to the purchaser that the instrument is in a rosewood or walnut wood case to entitle it to all respect from him, as a presentable article of furniture. It would be much better if the case were made of the plainest wood, provided some real taste and thought went to its decoration. As it is, the fact of a handsomely-marked wood is supposed to make everything go off well, and to counterbalance all the coarseness of detail. The objectionable character of the detail consists mainly in the weak and ineffective sections of mouldings employed; in the use of brackets or shafts (in the case of uprights) pretending to support the keyboard, and which are to be found in stereotyped forms which look as if cut out with a dinner-knife; in the needless twisting of the wood into curves which are, one may presume, thought to give a "handsome" appearance; in the vulgarity and utterly meaningless character of the additions of what can only in a spirit of satire be termed "carving," and in the miserable notion of giving colour to the whole by the bits of red, blue, or green silk stretched behind the inevitable perforated wood. We have before our recollection a specimen of one of the largest and most costly class of uprights by an eminent firm, and put forward as a specially fine instrument both in tone and appearance, in which the combination of brass gimcrack and wooden gimcrack, and the very strongest and most raw blue in the silk lining, was something almost insulting to the eye. Now we want to see all this kind of vulgar glitter done away with; and there is not the slightest reason why it should not be, if only some leading manufacturers will think it worth while to give the subject a little attention, and to institute a model which, if not emphatically a work of art, shall be free from ostentation and vulgarity, and therefore, at all events, not offensive to good taste.

What is wanted is, in the first place, that no part of the case should be rickety, either in fact or appearance,—it often is so, for the case is mostly a mere veneer put over the actual framework; and where it is really the only screen interposed in front of the mechanism, it is often so flimsily made that one cannot move the instrument about at all without shaking the case very much. This should not be. Everything should be solid and well put together, so that one need not feel afraid of damaging it in handling.* The lines of the instrument should be such as wood naturally takes,—straight lines, not artificially curved ones, which in an upright at all events are quite unnecessary, as the framework of the internal mechanism does not fall into curved lines; and the keyboard, as before observed, is a flat surface best covered by a flat lid. If ornament is added, let it be in the shape of mouldings at suitable points, carefully and finely executed, not in bad carving done after a regular pattern, nor flimsy sheets of pierced wood-work which appears ready to crack on your merely looking at it. Perforated wood design may be made to look very well and very tasteful, but what is put on pianoforte-fronts is rarely if ever so. Its usual object is apparently to make a sort of pattern in combination with the coloured silk which is strained in front to let the sound through; but if this silk front is considered a necessity, it would be far better, instead of putting on a raw staring colour, and then reducing it by filagree woodwork interposed, to choose some Oriental silk that is beautiful in itself, and has sufficient variety of design and texture to give surface and detail without putting over it a wooden tracery for this purpose. In some old instruments we have seen the silk in this position worked in a special design for the position, and left, of course, uncovered by any woodwork. This not only looks much better in itself, but it also affords an opportunity for imparting a little individuality of artistic design to the instrument; and in such a case the lady of the house, or her daughters, if they be given to and are expert in "art-needlework," may make their own design for the front of the piano, and indulge their own taste and fancy therein. If they also fall a little into mannerism and fashions inspired by South Kensington, they will at least produce something better than either the filagree woodwork with silk backing which is now in use, or the even more dreadful arrangement of silk strained in folds or puckers radiating from the centre of the panel, which was in vogue before the pierced woodwork was introduced.

It is not, be it observed, an absolute necessity that the front of an upright piano should be thus partially open and silk-covered, under the idea of letting out the sound. Wood, as every one knows, is an excellent conductor of sound, and it will be found on experiment that the difference in effect between a piano with a wood front and one with a silk front is of the very slightest. Indeed, it may be a question whether the silk, which possesses no sonority in itself, does not absorb as much sound as it passes. When it is desired to get a sharper and more brilliant tone than emanates from a covered-up soundboard, the opening of the top does it. The top of the upright piano is a portion of it which requires some reconsideration. It is always made flat, like the top of a bookcase, generally with half the top hinged as a lid and opening backwards. Now, there is not only no necessity for the top being flat, but it is even to be deprecated, because it leads to this portion being made a shelf for books and music, which is a bad thing for the effect of the instrument (checking sonority), and most inconvenient when the top is required to be opened. Every one must have observed how frequently in the course of an evening's music, when it is desired to open the piano to give more effect to a solo, there is quite a business in getting off the lid the music which has accumulated on it, and probably some one pushes it up before the clearance is effected, and then down go all Miss ——'s songs between the piano and the wall; affording opportunity, no doubt, for her admirers to show their devotion and agility in recovering them, but otherwise causing delay and annoyance. All this only results from the fact that the upright piano has never been treated naturally as the necessities and uses of a piano would dictate, but always under the traditional idea of form derived from a cabinet or bookcase. The instrument would look much better and lighter with a top sloped back, and there would then be no possibility of making a wrong and inconvenient use of it as a bookshelf. The shape of

* A practical nuisance also of these gimcrack things is that they almost invariably rattle and jingle when the instrument is played, and frequently have to be taken out of their sockets during the time when they would be wanted, if they were made so as to be of any use at all.

* An average upright piano is very seldom in possession for long without some part of the ornamentation having come off,—broken away at the merest touch, as if it were meant for nothing else.

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the lower part of the instrument is in the same way dictated by a conventional method derived from other classes of furniture. There is no need that the lower part should be a square box over the whole length and breadth occupied by the instrument, any more than that the grand piano should be a square box of the length and width each way of its extreme dimensions. The piano is essentially a harp enclosed in a mechanical framework, and with a sound-board to give tone, and with the strings acted upon by mechanism instead of by the fingers. The sound-board naturally takes the harp shape; and it is the one good point in the design of the average grand piano that this shape is retained in its exterior, so that the instrument has its own characteristic general form, and there is no mistaking it for anything else. Now, the "harp" which is placed horizontally in the grand piano is placed vertically in the upright; the sound-board, with its strings at the bass or left-hand end occupying the whole height of the instrument, and diminishing towards the right-hand end. What is above the keyboard is level, what is beneath it is oblique. If it were treated accordingly, the lower part of the instrument would show an oblique line rising to the right, like the foot and raking side of a harp. If frankly treated in this way externally, a great deal more character would be imparted to the instrument, the lower part of which on the right of the player is practically merely an empty piece of casing, assuming the form of a square pedestal. The instrument would, of course, in any case require its right-hand support on the floor; and then the oblique soffit would, on our suggestion, be shown, with an oblique strut from the right-hand foot to strengthen the whole. And if candle-brackets be added to our piano, let them be of solid appearance and of honest metal, and not gimcrack-looking pieces of gilt scroll-work.* It seems almost absurd to have to add that they should be so placed and of such length as to be of real use in throwing light upon the music-desk; but as a matter of fact they hardly ever are so, and often will only throw so oblique a light on the page as to dazzle and confuse rather than help the performer in reading the music. Lastly, let us add that the back of the upright piano ought to be made as presentable as the front. At present it is always assumed that the back of an upright piano is to be placed against the wall, the worst possible position in which a piano can be put, either for sound or for convenience in singing to it.

The modern grand pianoforte, as has been observed, has the one merit in design of assuming externally the general form which is suggested by the internal construction; and that it does so is probably due in great measure, if not entirely, to the fact that it is the direct descendant of the old harpsichord, and the form of the modern instrument is based on that of the old one. Otherwise there is little doubt that the modern grand also would have been made into a great oblong trunk, and the spandrel space at the narrower end of the sound-board wasted. It is not, in fact, so realistic in form as the harpsichord, for the latter in all old examples we have noticed follows the precise line of the stringing frame, and at the narrow end is canted at an oblique angle instead of being squared or rounded at the end, as the modern instrument is. A difference between the old and the new forms in make is that the harpsichord has four legs, two close together at the angles of the narrow end; the modern piano has only one central support at the small end. This latter is undoubtedly the most convenient arrangement for moving, and, on the whole, the neatest in appearance; but the rounded form of the end, now most usually adopted, is not in accordance with the construction of the instrument, and is probably due to that love of curved lines which possesses the modern cabinet-maker, whose special style of production, artistically, is exhibited in full force in a grand piano of the ordinary type. The same kind of criticism before applied to the ornamentation of the upright piano applies with equal force to the details generally characteristic of the larger class of instruments. There is less of gimcrack, certainly, about them; their size and weight necessitate solid construction to bear the strain of moving and lifting about; but the stamp of commonplace is on them as distinctly as on the others of their kind. The plainest are, as usual, the least objectionable; wherever the least ornament is added all pretence to taste and fitness vanishes at once. Polished and shining surfaces, thick bulbous legs of the ugliest outline and detail, and the eternal perforated woodwork in the music-desk and the panels flanking it, and the usual characteristics.

As in the case of the upright pianos, the elimination of all the ornament usually employed would be the first step in the right direction. One feels, however, in regard to a grand piano, that something more than mere utilitarianism is usually suitable and desirable. The instrument in this form is so large and costly that it may be assumed that those who can spend money on it can usually afford a little margin for decorative treatment. Such decoration should, of course, be executed on surfaces which naturally form part of the construction; it should never be an addition put on to look ornamental. The lid is frequently slightly bevelled at the edges (which in itself has a good effect); a little well-considered inlay ornament, even of the simplest kind, applied here as an edging to the whole, would almost in itself make all the difference between a bald and a sufficiently ornamented instrument. A lesson in regard to good taste might be taken from the violin-makers. A violin is really a work of art, for it is a production in which every portion is shaped in the best way for its purpose; and no excrescences or impertinences of ornament were permitted by the great makers. The received decoration of a good violin is a thin black band of ebony inlay lining out the edge, sometimes a double line, sometimes a triple line; this is called the "purfling," and a "trebly purfled" old instrument has increased value from the existence of this very suitable, refined, and permanent method of decoration, the treble purfling being also generally an indication that the instrument is of special excellence in other ways, as extra care has probably been given to it. The front of the piano (to return) above the keyboard, when the piano is opened, is a good place for a little ornamental treatment, on the under-side of the lid; and it would certainly be in better taste than the statement with which this part is generally alone ornamented, that "Brown & Brown" made the instrument, followed by their address. This is another matter in which the violin-makers have the advantage in point of taste: they do not advertise themselves on their instruments; the maker's name can only be found in its place on the inside of the back, when looked for narrowly. If we wish to carry decoration further, we may get some hints from the old pianos, or rather spinets and harpsichords, in the South-Kensington Museum. The very pretty treatment of the ends of the keys, carved with a sunk ornament, which seems to have been the favourite fancy in Italian instruments at one time, is worth attention; so also is the idea of decorating with painted ornamental design the under-side of the lid of the instrument, which when raised for concert-playing of course faces the audience, and makes thus a decorative background. This seems more suitable than elaborately ornamenting the upper surface of the lid, which, when down, is of course not much seen, and when up is always turned from the audience. Fancies have prevailed sometimes for variously coloured keyboards; black for the long keys and white for the short ones, or tortoiseshell and some other material that contrasted with it, &c., but this cannot be recommended. Not only do the ivory and ebony form the cleanest and most clearly-cut keyboard in appearance, but the look of these white and black keys is indelibly associated with the piano in the minds of all lovers of those "beautiful cold keys," as an enthusiast once called them. And it is according to all sound principles that the decoration should be applied to the parts which form the framework of the keyboard, not to the actual keys which do the work; at least, not to their surface, the lights and darks of which are a great guide to the player, who can still catch them with the eye when not looking directly at them. This is, in fact, the one portion of an ordinary piano which is made in accordance with common sense and practical suitability; and the application of the same degree of common sense to the whole design would be the best basis for improved artistic treatment of the piano.

* Messrs. Broadwood alone (as far as we have observed) have improved on these absurd brackets, and have placed on their best recent upright models solid-looking metal brackets of plain and suitable design: though in regard to practical efficiency in lighting these are still deficient, being usually too short and too far from the music-desk.

A PAPERHANGER'S FACTORY.

The paperhanger, so termed, is, to employ the modern phrase, an important factor in the fitting up of houses after their actual structure is complete. He, like other craftsmen, has his industrial history and development, the latter of which receives its highest illustration, from the French point of view, at any rate, at the factory of Desfosse & Karth. The fabrication of "painted paper," as the French call it, though belonging by origin to the seventeenth, is, in its existing state, a creation of the nineteenth, century. The idea was conceived, no doubt, at Rouen by François, Lebreton, and others, so far back as A.D. 1680, but the annals of the manufacture really begin with Reveillon, D'Aubert, and Zuber of Rixheim, the last of whom said, in the plainest of language, "This new art is the art of falsification." The first attempt made by François of Rouen was in imitation of high-warped tapestry, then in fashion for the draping of walls. This tapestry had become so fashionable, and was so dear, that the inventor of its semblance speedily made a fortune for himself, preserving for nearly fifty years a monopoly of the manufacture. Curiously-concocted powders sifted through sieves were spread over large and long surfaces, and, falling upon oil, were caught by it, and produced what was then thought to be an artificial velvet. Thence an advance was made towards mimicking on burgher walls the green pastures of Flanders, the hangings of Gobelins, and the carpets of Aubusson. The world accepted this innovation on account of its comparative cheapness, but complained on two grounds,—that the paper thus decorated was not pliant, and that it could only be carried from place to place when rolled on enormous cylinders of wood. Originally, it should be observed, human figures were not attempted,—only marbling, with threads of mimic gold and silver, for the covers of books. Before that time, every ornamentation of paper,—very much resented by the builders and architects of the period,—was a separate act of engraving, and costly in the extreme, the result being obtained by a succession of complicated processes. It was when the production of paper became a great industry that the paperhanger's manufacture became a great industry also. In 1810 there flourished in Paris only one considerable firm devoted to it,—that of Jacquemart, the successor of Reveillon, and its principal productions consisted in paper ornamented with the forms and colours of exotic flowers and shrubs, copied from the Jardin des Plantes,—not very faithful either in shape or tint; but as no competition arose, the profits of the business were large. Yet the competition was forthcoming, nevertheless. A speculator in a small way, at Mâcon, came to Paris, and engaged as his designer a young artist of great and original talent, who combined a certain amount of audacity with grace and elegance in his compositions, while, in addition, he understood how to economise in the purchase of materials. In 1810, what was known as the Greek style prevailed throughout the cities of France, and the capital especially, and false architecture was the rage,—false mantelpieces, moreover, sham curtains, mock frescoes above all. One of these, representing Psyché submitting to the mercy of Juno, was long esteemed as a first-class work of art. Thirteen years later this artist betook himself to the designing of panels as distinguished from rolls; but in 1830, the fashion had entirely changed, the Greek had given way to the Etruscan, the Egyptian to the Saracenic, the Saracenic to the Gothic, and that to the Renaissance, in which all the ancient arts were swallowed up. Further on, the Exhibitions of 1851 and 1855 displayed a wonderful progress, but the specimens were *de luxe* altogether, and scarcely available for the use of the house-decorator at all. Things are in a different condition now, as we find in the factory of the MM. Desfosse & Karth, who are courteous to all strangers, and will allow them to follow the series of processes from the moment when the white paper arrives, to that in which it is distributed, covered with decoration,—flowers, figures, gilding, imitation of tapestry, chintz, marbles, and wood. The qualities are various, from the roughest to the most delicate, priced accordingly, but generally coming from the manufacturers of the Vosges and the Sommes. They are measured in breadths of from a yard to a yard and a half, and in lengths of from eight to thirty yards. Occasionally, however excep-

tional sizes are made, to the customer's order. The colours used are mixed in a paste composed of rabbit, hare, and horse skins, with vegetable dyes added, liquefied lacquer, and Mendar white, which is the base of all the ordinary tints, together with carbonate of lime. Other materials employed are:—Damptain white and carbonate of barytes, dissolved by hydrochloric, and precipitated in sulphuric, acid. This white never turns yellow, under the influence either of time or of atmosphere. But we see, also, in the hands of these peculiar artists, "satin paste," ochres of every shade, yellows, and chromes, perfectly distinct from them, amber-tinted lacquer, grains of Persia, and the peculiar American colour called "yellow oak." Here you have green for a dining-room,—yellow chrome and Prussian blue, they say. This, again, with a slightly different effect, is Scheinfurt green, an admixture of arsenic, and a mingling of that which is recognised by artists as ultramarine. Ultramarine, also, with the aid of Prussian blue, assists in the production of blue drawing-room walls; red dining-room patterns are due either to wood dyes or to cochineal, while antique oak is imitated by the use of bone, German, or Brunswick black. In order to communicate these colours and shades and tints to paper, we observe various processes which are employed; but, in the main, they are either stamped or brushed—that is, in the enormous factory of which notice is now being taken. When stamped, they are usually laid on in three impressions, from blocks of pine and pear-wood successively, elaborately engraved, as though the work in hand were the pattern of an Indian shawl; and a sort of supplementary apparatus is necessary, too minute to allow of description. But, before the paper is either adorned by hand or printed, it is subjected to what is called a "primitive colouring" or "tone," after which, according to the phraseology of the manufacturer, it can the more easily "imbibe" the various colours. One man spreads the "lush"; another brushes it, again and again, along the surface; a third watches to see that it comes to a level; and from this point the distinctions of quality appear. For some, several impressions are necessary; there are "polished," "lustrous," "satin," and "velvet" surfaces,—the last produced by the friction of "Venice stone," reduced to dust,—beyond which we are shown processes of refining and polishing, to produce imitations of marble, agate, wax, ebony, and precious woods innumerable. It is at this point that the manufacture becomes most interesting,—very little machinery can be employed; nearly all the work is hand work; the painters have the air of real artists in studios, although they are simply engaged in copying colours. Their *atelier*, however, is not suggestive of any particular art, with its half-tinted rolls hanging over ropes resembling clothes-lines, its troughs of water, its great oak tables, rollers, palettes, and, as they seem to a stranger, huge array of printing-machines, each alive and bright, however, with colours that shall shine from the walls of the family drawing and dining rooms for, it may be, a generation to come. The paper-printer, like other printers, of course, takes his "proof," sees where the pattern comes out properly, and where it does not, lays on fresh patches of red, blue, or green, where they are needed, and so forth; but, by an ingenious combination, it has been found possible to work off even the most elaborate variegation by simply raising and depressing, in due order, the pieces of the platforms upon which it was laid. Thus, blue came up first; then red; afterwards green; next, perhaps, yellow, without more than an almost automatic shift of the machinery. By another arrangement, two colours can be made to come up together, and to vary their positions according to the complexity of the pattern which is being wrought out. At one time, these patterns were excessively ambitious. From demanding Greek and Roman architecture, the public taste insisted, in paperhanging, upon extensive landscapes, and sea and sky views,—vast horizons, indeed, graduating from azure to orange, and descending thence to pale green and grey. For a long time, as we have said, the process of typography was imitated; but, ultimately, the general taste required more flowing and fantastic outlines,—and a great proportion of the work was simply manual. The vast factory we speak of, however, has brought this industry, as every other industry in Europe has been brought, under the dominion of machinery. The proprietors of this establishment complain that they are compelled to conform with a vitiated public taste. They would prefer to produce large paper panels, in paper frames, representing scenes of pastoral, hunting, or classic life; but they tell us people insist upon grotesque commingings of flowers and fruits, vulgar parodies of popular pictures, and common groups, fit only for the coffee-rooms of hotels. But the MM. Desfosses have not been daunted by these obstacles. They have combined machine with hand work, and reproduced with wonderful effect the outlines sketched by Müller, the paper being thickened, in the first instance, with a perfectly white surface, changing to grey, and then capable, like a prepared canvas, of carrying any variety and complication of colours that is conceivable. In modern days, however, the imitation of wood and marble is the principal object, and to this end planks, scrapers — of copper or leather, — sponges, brushes, and straps, are employed, until the result is obtained, which the manufacturers themselves say is a falsification,—a forgery to the eye, in fact, of stone and marble, of the richest velvets and their pile, of shot-silk even, and of chintz. This last, as fabricated at Rouen, is brought to perfection by means of a preparation composed of linseed oil, white-lead, and other ingredients in the form of litharge, and various mordant dyes, the latest result being, for the ornamentation of rooms, an exact imitation of the Utrecht velvet used for that purpose 200 years ago. Upon the borders of this, gilding, plain or powdered, may be applied at will; but we were informed by the MM. Desfosse & Karth that they preferred the simple products of their own art—for an art it unquestionably is—to any meretricious allurements which might be borrowed from another.

IRON PROMENADE PIERS.

In view of the many promenade piers which now form an almost necessary adjunct of every watering-place which has its own welfare at heart, and wishes to thrive, and of the large viaducts which bridge some of the many estuaries that indent our coasts, and depend for their foundations on iron piles in some form or other, it may be interesting to our readers if we jot down a few practical remarks on the construction of these piers and viaducts.

As all the viaducts and piers we are speaking of have to withstand the attacks of the sea or of fast-running water, it is necessary that they should be so substantial that the waves may beat on them without injury to the structure, or that they shall offer so little resistance to the weight of water that its force may simply pass them by. Piers founded on cast-iron piles aim at accomplishing the latter object, and with reason. Such a structure meets all the requirements necessary: it is far cheaper than the more solid construction, and takes less time in building; it is safe, except under very exceptional circumstances; and from its form it offers very little resistance to the force of the waves, therefore it is not liable to have its deck washed by showers of spray, or even torrents of green sea, as that of a stone pier generally is. The circumstances under which a pier built on cast-iron piles and columns is unsafe are when a vessel drifts from her moorings, or is carried by the force of a storm athwart the pier; then the latter must go, and it is better so than that the ship should be lost, and the crew drowned.

Timber piles, except perhaps when made of greenheart, do not last long when they are alternately wet and dry, though elm piles will remain in good condition for almost any number of years if entirely submerged; timber piles also, from their form, offer more resistance to the waves than a cast-iron pile of equal strength, though smaller dimensions.

There are many systems of foundation piles. We will consider first that which depends on a cast-iron screw attached to the end of the column for its stability. Engine-power has been applied to the sinking of cast-iron screw piles, but, as far as we know, without satisfactory results. A worm-wheel was keyed with a long feather on to a wrought-iron vertical shaft, flanged at the bottom end, where it was attached by bolts to the pile to be driven; the worm-wheel was rotated through the medium of gearing; the speed, however, could not be made slow enough, and if the least obstruction was met with, the pile ceased to descend, and in all cases it rotated faster than it sank, the ground was disturbed, and it was difficult to secure a firm foundation. The usual mode of sinking screw piles is by means of a capstan turned by ropes, working on to crabs driven by hand. The capstan is built up of wrought-iron plates, and has a hole in the centre large enough to pass over the flange of a pile; it is slung at a convenient height by means of ropes or chains attached to the head of the pile. A collar of cast-iron, made in two halves, and fitted with suitable feathers to gear into the capstan, is then slipped into the hole and round the pile, and four steel keys, having sharp cutting edges, are inserted in recesses provided for the purpose in the casting, and are driven up so as to grip the pile. Three keys are better than four, as the pressure on them must be equal; however, practice will ensure that the keys are driven under a nearly equal pressure. Arms of timber are inserted in the capstan, and two ropes are coiled round them, and led to crabs placed at a convenient distance, and worked by hand. These arms are a source of failure, for if they are not braced they are apt to break, and if they are braced they are troublesome to unship. The keys also often cause breakages; if they are not tightly driven they only score the metal; if they are tightly driven they frequently split the pile, especially when the nature of the ground is such that the speed of rotation is uneven, the pile moving by fits and starts. When a top length is being used and is broken it only means so much loss of material; but when it is a foundation pile which is fractured there is the loss of the material, and the pile has also to be withdrawn in most cases, often a matter of time and difficulty. Instead of the arrangement of capstan described above keyed on to the columns, a top length of thicker metal than that used for the piles, say 1⅛ in., and having two or more strong ribs running vertically along it, may be used with advantage, the capstan having suitable recesses formed in it for receiving the feathers. This special top has also the advantage that it is heavy, and the more weight there is on them the better the screw piles go down; of course, on the other hand, this weight is a disadvantage in handling. Even these special tops are sometimes broken, so great is the strain on them. When boulders are met with, the pile either refuses to sink, or is driven out of the perpendicular, and must be brought back to the vertical position, and to accomplish this it is necessary to provide timber guide piles and walings from which pressure may be brought to bear on the cast-iron piles. In stony ground it is often advantageous to bolt a steel cutter to the lower end of the pile, which either ploughs a way through the stone, or turns it on one side. Cast-iron screw piles are well adapted for foundations where mud is met with, but if the bottom is variable and not soft, some other more suitable form should be employed. These remarks are intended to apply to cast-iron structures only; where the piles and screws are of wrought iron they will bear a considerably greater strain without damage, and the difficulties of attachment of the capstan are not so great; the cost, however, is greater, and wrought iron is more liable to rust in salt water than is cast iron, though, again, it is not so liable to fracture.

Another system applicable to places where the foundation is entirely of sand, is that employed by Mr. Brunlees in the Kent and Leven Viaducts and in Southport Pier, where the foundation piles are cast with a large disc on the lower end. The column is entered into the sand a little, the top is closed, and water is pumped into the interior, forming a quicksand at the bottom, and the pile sinks by its own weight, or such as is added to it. This system also has the advantage that, simply by bolting on another length of column, the pile may be sunk to any required depth; there is also in this plan little difficulty in maintaining the piles in a vertical position.

In cases where gravel, clay, or soft rock is met with, cast-iron piles are often driven just as wooden ones are. The pile may be either pointed, the tip being chilled, or it may be cut off square with a cutting edge. The last form is, we think, the best; for where boulders are met with, the pointed pile is apt to be turned aside, the square-ended one generally goes straight on, displacing the boulder or breaking it, and not being in itself displaced. In clay or gravel the resistance to driving is less, as some of the material passes up the centre of the pile,

and for the same reason the disturbance of the ground is decreased and a better foundation secured. An ordinary pile-engine is used, with a heavy monkey,—say, 35 cwt., and a short lift,—say, 5 ft. It is impossible to specify any exact numbers, they will vary with the nature of the ground and the dimensions of the pile to be driven. The pile must not be struck directly by the monkey; an elm dolley, hooped at the top, and having a cast-iron end below fitting the pile, must be used to receive the shock, and a copper ring is introduced between the pile and the dolley to prevent jarring, or the pile will be split.

In cases where firm rock is met with near the surface, holes may be drilled in it, and a wrought-iron bar with roughened surface extending a couple of feet above the rock introduced and cemented in. A column of suitable dimensions without any flange is placed over it, and the interstices between the column and the bar filled in with cement.

As it is seldom possible to sink the piles to a uniform level, it is usual to cut them off at some convenient height above the surface of the ground, either at one level or in steps; a double-ended thimble is provided rather larger than the pile, and of total length equal to about 1½ times its diameter, having cast in it half-way up three chipping-pieces for resting on the top of the pile and receiving the weight of the column. This thimble is put over the pile, the column is introduced into it; it is then keyed up, and the interstices filled with iron borings and sal-ammoniac. The piles and columns may with advantage be filled up with whatever material is handy; it soon becomes cemented up, and adds to the solidity of the structure.

It is of the utmost importance for the economical construction of a pier or viaduct that everything should be as simple as possible; that the columns should be cast in uniform lengths; and that there should be few, if any, special castings. The bracing should be simple in form, not liable to be entangled with wreckage, easily attached to the columns, and not difficult to adjust for length, as the position of the piles is seldom exact, and their level is decided by circumstances.

One of the first considerations should be the height of the deck, which should be well above the water; a very small blow from a wave will shift it, and, perhaps, endanger the whole structure. The level of the deck ought to be particularly considered at the abutments if it is subject to the wash of the waves, as, forming a solid barrier to their progress, they rise higher here than elsewhere.

Where it is intended that vessels should come alongside the pier, the head to which they approach should be made of timber; that is to say, the piles and bracing should be of timber, the superstructure may be of iron. If cast iron is used for the piles they are liable to be broken by the repeated shocks of vessels. The timber head should be entirely free from the rest of the structure, so that it may move without damage to the pier proper. Greenheart should be used for the piles at any rate, as all other sorts of timber are liable to rot when alternately wet and dry, and are subject to the attacks of worms, which destroy them in a wonderfully short space of time when they have once got into them.

For the superstructure of the pier it is best to use lattice girders; they are easily handled, and offer less surface to the wind, and they have a lighter appearance than plate girders and are more in keeping with the rest of the structure. Whatever form is used, it should be kept well above the surface of the waves.

For the deck, pitch-pine planking laid diagonally is satisfactory; the planks should not be laid longitudinally, as they wear unevenly. If the planking is laid close, the deck should have a camber for drainage; if open, this does not matter.

It may be here remarked that it is as easy to make a pier of this description sightly as unsightly, and there is no reason why the one should cost more than the other; all that is required is that every care should be taken that the design is complete but simple, that the knowledge of ironwork employed should be thorough, and that there should be no patching. Ornament should be excluded from the pier proper; its appearance should depend on the neatness, simplicity, and elegance of the design, not on elaborate castings. If ornament is required, it may be introduced in the entrance and deck-houses.

SOME ABUSES IN HOUSE FURNITURE MANUFACTURE.

A craft was anciently a "mystery" or art, the user of which was a member of a guild that regulated its practice. The cabinet, chair, sofa, and bedstead maker, and other kindred workers in wood, were classed for guild purposes under the term of "joiners" in contradistinction to the older term of "carpenters," which is still understood in the British Islands to include that of joiners as a general name for wood-workers in house-building. The word "cabinet-maker," though accepted for a couple of centuries or more as an expressive denomination for those craftsmen engaged in making furniture, still is nowise expressive, strictly speaking, under the modern conditions and organisation of the furniture-making trades. Like many other trades during our time, cabinet-making, taking it in its widest sense, has been split up into a number of subdivisions or branches. Indeed, we might say with truth that a cabinet-maker, as the trade is now practised in London, is a craftsman who works ofttimes the whole year round in executing but one class of work. Some men are continually kept to turning out sideboards, some to secretaires, others to round tables and chests of drawers respectively. In fact, workmen from their own choice, and having acquired a speciality in making a certain article of furniture, continue mostly at making that single article so long as their employers can give an order for it, or there is a demand in the market for it. Half a century ago, in many of our cities and towns in the British Islands, cabinet-makers to a pretty large extent worked by the day-work system; but, in London and other large cities and towns for many years back, the piece-work system is almost universal in the cabinet, chair, and sofa making trades. The writer has a pretty long experience of the ways of the trade or trades under notice in different parts of the British Islands, and he is compelled to say, in a general way, that as far as skilled execution and good work are concerned, the cabinet-making trade has gone rapidly from bad to worse during the last thirty years. Were the "mysteries" of the cabinet trade, as now carried on in London, unfolded in all its details to the general public, it would, we have no doubt, create not a little surprise. Food manufacture has of late years been subjected to considerable analysis, but furniture manufacture goes "scot" free, although there is a considerable amount of fraud and positive danger connected with the latter, as well as the former. Since the advent of City and Metropolitan Improvements, a great exodus of the workmen engaged in the various departments of the cabinet trade has taken place, and is still proceeding. This migration is more observable in East London than at the West End, for the great centre for several years of the cabinet trade has been Curtain-road, Shoreditch, a portion of the E.C. district. Particularly during the last ten or twelve years the chamber workmen, and the small chamber masters, who once had small workshops in their own houses and back yards, in the courts and alleys of the east of the city, have been driven suburbs-wise, or afield, and many hundreds of these will at the present moment be found in back streets, courts, and alleys, extending eastward from Curtain-road to Stratford on the one side, and to Islington, Tottenham, and to Walthamstow, beyond the river Lea, on the other. The districts of Hackney, Bethnal-green, and Hackney-wick (on the borders of the Marshes) contain a large number of working cabinet, chair, sofa, and looking-glass frame-makers, as well as makers of various other articles of household furniture. The City, West End, and Curtain-road warehouses are principally supplied by the labour of East London workmen working for themselves, or working for small masters who find a market for their goods in Curtain-road, but who prefer to find it in other warehouses where they are better paid. Before recent Metropolitan Board demolition and improvement schemes were carried out in the Curtain-road district, the locality in question was regularly matted with furniture-makers of all kinds. Long lines of large warehouses and workshops, and side streets and alleys, were almost choked to repletion with workmen in their small rooms, busily engaged from morning until late at night executing some one piece of furniture or another to order, or on "spec." From causes already indicated, there are now fewer large furniture warehouses in Curtain-road. Some of the large firms have removed to adjacent streets, and the chamber masters and numerous hosts of home workmen are driven afield. It is a patent and undeniable fact that of furniture now thrown into the British market, both that which is sold at home and exported, is to a very large extent of the most inferior description. It may be taken for granted that with the advent of low speculative house-building in London several years ago, cropped up the desire for cheap furniture. With bad house manufacture soon followed cheap and bad furniture. The one evil led to the other, and as houses were built to sell and not to last, so was, and is at present, the major part of our house furniture. We found by numerous inquiries, and an intercourse during some months back with some respectable members of the cabinet trade, that they are fully alive to the abuses in connexion with the trade, but they say they are obliged to go with the tide, and they are powerless to effect a reform. They know that tables, chairs, sofas, &c., of the flimsiest kind are now manufactured, and that these articles if put into constant use will walk asunder in a few weeks or at most months. Not only is the scantling used of the thinnest description, but it is often most unsound, particularly where the work is veneered. Table tops, and the tops and broad planes of other articles of furniture, are by well-known expedients made to carry the thickness or solidity of honest, substantial, and durable work. The fact is, however, that thin leaves of the most common description of deal are not only veneered, but their front and side edges are made to assume a solidity which they do not possess, by planting upon them, or rather under them, rounds and hollows or ovolos and astragals, or a combination of other mouldings. There can be no reasonable objection to good veneered work, for a solid mahogany table, sideboard, nest of drawers, &c., would be expensive to the general run of purchasers, and entirely beyond the means of many others. But a half-inch deal leaf (veneered) should not be imposed upon purchasers as work of an inch in thickness, or, in other words, the thirty-second part of an inch in mahogany on a half-inch deal ground. The mahogany or other veneers now used are knife-cut instead of sawn, and the former will soon be universally used. The small masters and workmen were for a long time disinclined to use the knife-cut veneer. The sawn veneer is the more solid, and takes the staining and French polish better than the knife-cut material, which soon absorbs the polish, and does not so well maintain the body or gloss that the sawn veneer holds. It is a rather deplorable fact that cabinet workmen earn more wages at present by making cheap and flimsy articles in the furniture line than solid or elaborately-finished articles. As it is with the workmen, so it is with the small employers; they also make more profit out of cheap furniture than good. Novelty in design, though the articles may be poor in material, and flimsy in construction or framing, will often sell well for a few seasons, until some other flimsy novelty in cheap furniture supersedes it. Curtain-road warehouses of late years have got a bad name, though side by side with a large mass of the most trashy kind of furniture you will find in the same warehouse some excellent work. The demand, however, for good cabinet-work (which is dear) is not very brisk; while, on the other hand, for cheap drawing and sitting room suites there is a constant demand. We have heard some working cabinet and chair makers speak strongly against the warehousemen of Curtain-road as skinflints, who grind down small masters and workmen engaged in making furniture to starvation prices. Indeed, among some classes of small furniture-makers in East London, Curtain-road is known as "the Slaughter-house." To what extent the term may be justified we are unable to say, but we think it only right to register the words, that an opportunity may be afforded to both sides, either in corroboration or denial. This much, however, we do know, that very poor prices are paid by several of the warehouses in Curtain-road and adjacent localities to working cabinet-makers and small manufacturers for the articles made to order for them, and much smaller prices still for those articles which the small manufacturers or working masters are obliged to sell when finished, having made them up on "spec."

From what we have above stated it may be inferred that there is at present in the London cabinet and chair trades an abuse somewhat

akin to that known in the tailoring trade as the "sweating system." Men and boys, or youths, are obliged to work long hours in the making of several articles of furniture to earn sufficient wages to live. Many unscrupulous furniture sellers or brokers get a hold of youths at the cabinet trade who have not much experience. They will show these youngsters a piece of new furniture (perhaps a new design); they will offer them a price, and, as an inducement, will tell them in an off-hand manner, they will give them an order for a half-dozen or a dozen of the articles in question. The raw youths, who never made the articles before, on being tempted with an order, clutch at it often, but soon to their grief find before they have executed a third of their work that they have been completely "sold." The price offered involves long hours, hard work, and little or nothing for their labour. The furniture man, who has calculated his chances beforehand, and has left himself a wide margin, can afford to increase his price, which he is often obliged to do for his own safety, that the work may be finished, which it mostly is to the great profit of the furniture seller, and the sore loss and disappointment of the young workman.

A very large amount of the furniture now turned out in the metropolis, though made for use, is only fitted for mere show or ornament. The chairs and sofas mostly to be found in the houses of our middle classes and in the homes of respectable artisans and clerks are a fraud and a calamity. Where mortises and tenons should be found there are nothing but single dowels or pins of wood, and where dovetails should exist there are nails or screws. Cabinet and chair makers of late years have taken to "scamp" their work in the most barefaced manner. Screws are used to fasten on the top rails of chairs where hidden dovetails were formerly used, but to hide this slip-shod and reprehensible work the heads of the screws are sunk, and projecting buttons of wood inserted. Mahogany and oak work is often treated in this manner, a practice which would not have been tolerated some years ago. In the manufacture of chairs in white wood, or of cane-bottomed chairs, the framework of the seat is often halved into the backs instead of mortised and tenoned, and screws, sunk and covered, are made to hold the whole together. This and kindred work, in the furniture-making line, which we might describe in detail, is veritable "Jerry" furniture manufacture.

We have talked with cabinet and chair makers who declaimed loudly against the wretched "Jerry" houses they were obliged to live in, and they considered no terms were too severe to use in denunciation of carpenters, bricklayers, and speculative builders. Had these masters and workmen, however, seen themselves as others have seen them, they would have to acknowledge they were contributing largely to the perpetration of that evil in their own trade which they so strongly denounced in another.

In connexion with chairs and sofas of the class we have been describing, the upholstery is wretchedly bad,—merely done up for the eye. Any stuffing, save good horsehair, or curled hair, is pressed into service,—pig-hair, hay, alva marina, flock, straw, finely-cut shavings,—anything but honest material. Canvas and web are, of course, used as of old, but of cheaper description; and the inevitable weak springs, to afford a temporary elasticity for a few weeks. Constant use soon brings on the dreaded calamity; the cheap American leather, or highly extolled inferior rep covering, cracks and tears asunder, and exposes the stuffing, and the seat sinks as flat as a British pancake.

Any young cabinet workman or student interested in the history, progress, and manufacture of durable, beautiful, and elaborately-finished chairs and cabinet work, should pay a visit to the South Kensington Museum, and its adjunct, the East London Museum. In both of these places he will see specimens of cabinet work of the sixteenth, seventeenth, eighteenth, and the earlier part of the present century worthy of admiration and deep scrutiny. Of plain and massive work, and of highly complex and ornamental work too, he will find several exquisite examples. Good veneering, grand inlaying, rich marquetry, &c., are in both museums, the work of native cabinet-makers as well as foreigners. The East London cabinet-makers and their present-day employers will learn much by a few hours' study and careful observation in Bethnal-green Museum; for there will be found some fine specimens of the works of Chippendale, Sheraton, Heppelwaite, and others, some of them practical cabinet and chair makers as well as designers, and authors of excellent treatises upon their respective crafts. Unless to order, for some wealthy person, furniture such as the above historic cabinet-makers designed is not manufactured for the market in these days. To make such furniture now would not, unfortunately, pay; the workman would not earn subsistence wages upon it; and the employer would be likely to have it a long time upon his hands before he found a purchaser. It is only under special order, or as a labour of love, not depending on ordinary trade conditions, that the elaborate and substantial cabinet and chair work produced in the last century is possible now. Still there is no reason why good and durable cabinet and chair work at fair prices should not be turned out at present in London. The why it is not turned out is from reasons already stated, and other additional causes easily guessed. We will not enter into further details at present, reserving for another occasion some further under-glimpses of the art or arts of furniture manufacture. In this journal for years, close as has been its affinity to the art of building, it has never ceased to denounce the abuses in connexion with its practice. House-furniture manufacture and house decoration are closely allied with the profession of the architect and the arts we advocate, and we are quite within our province in what we have written. As we have not heretofore spared bad builders, we are not likely to halt short in meting out to furniture-makers the share of blame that legally attaches to them and others in a system that is working much scandal and injury in connexion with their art, our art, and the homes of the people. In a word, house-building reform, to be complete, must include house-furniture reform; and if those upon whom the latter duty devolves are not equal to the occasion, the architect may soon perforce, for his own credit sake, have to lead the way.

INTERIOR ECONOMY OF THE OFFICE.

The two minor rules of office economy yet remaining for discussion,* bearing as they do on financial matters, are certainly not the least in point of importance, and yet it is not at all an uncommon occurrence to find the architect or engineer treat such matters with very great indifference. "Accounts will keep," one will say, as he turns to some professional and far more interesting work. "My clients press, and I must attend to their interests before my own," another will urge, and so on. Indifference of this sort is much to be condemned, for as no man would think of trying to complete a long journey by road without, at the proper stages, pulling up and baiting his horse, and looking to his harness (and this, too, however eager he may be to get to his journey's end), so should no man attempt to go through his professional career in life without halting at proper stages, and attending to financial matters, despite the claims or clamours of clients, or the self-absorbing nature of his work. Thus, and thus only, can he, like the freshened horse, hope to do justice to himself and to his employers at large; for the man who knows his accounts are muddled and in arrears can never bring the same clear intelligence and unclouded spirit to aid him in his work as can he who, by the exercise of a little forethought and careful arrangement, has his books posted up and accounts in order.

Apart from these considerations, also, want of method and regularity in keeping accounts must result in unmethodical and irregular charges to clients,—too little to one, too much to another, with probably the corresponding results of little or no thanks, and much, and not unnatural, grumbling.

An architect or engineer maintains, say, some half a dozen *employés* of different calibres, from the juvenile, indifferent and idle when he can be, clerk, to the tried, trusted, and hardworking senior assistant; and we take it his duty is so to arrange matters that these *employés* are, during the whole of office hours, fairly and honestly engaged in the separate duties assigned them, and that their time, with a due percentage added for supervision, instruction, rent of office, use of materials, wear and tear of instruments, &c., is fairly and honestly booked, at the close of the day, to the proper clients. To insure fair and honest work on the part of the *employés* will necessitate the unremitting care and attention of the head or heads of the office, while fair and honest booking of time may be managed as follows:—

At the commencement of the year an ordinary shilling diary is served out to each *employé*, which, labelled with his name and a distinctive number, is ordinarily kept in a similarly numbered pigeon-hole of the diary-rack or shelf, fixed in the principal or most generally-used room of the office. Prior to quitting office for the day, each *employé*, readily finding his diary by its number, should record the name of the client for whom he has been working, the subject itself, his expenses if any, and the time expended; and for which last purpose an office day need hardly be divided into less than quarters, it being obvious that smaller divisions would be too troublesome and tedious for general adoption.

The sixth and last of the minor rules may be briefly summed up in the two words "double entry"; and it will hardly be too much to say that where the architect's or engineer's accounts are not kept by this method, loss and injustice to both self and clients must ensue.

A dissertation on the merits of "double entry" would be somewhat beyond our province. Those who use the system know full well its advantages; and those who do not use it must be persuaded by other words than ours.

It will be our endeavour merely to point out a convenient method of entering the accounts in the "journal," so as to be ready for posting in the "ledger."

The bases or foundations for building the journal upon may be said to consist of four, viz., the cash-book, the cheque-book, the telegraph-form book, and the abstract-of-work book. The two former need no comment or explanation save that it will be found very advantageous to have the cash-book ruled with double columns for cash, while the telegraph-form book is merely the book now issued by the post-office authorities. The "abstract of work" book is the abstract of all the diaries for any one month, and is made up as follows:—A half-sheet of foolscap being taken, it is divided by folding and refolding into four equal divisions or columns standing perpendicular, to the long side or edge of the paper, and by another fold or crease, the second column from the left hand is also subdivided into two columns of unequal width, the narrower being to the left.

A longitudinal fold of the paper marks off, also, a convenient margin for the following headings to each of the five columns:—"Date," "Number of Days," "Client," "Subject and Details," "Charges."

To each *employé* a half-sheet of the above description is devoted, with his name, also the month and year, being inscribed in the right-hand top corner, and the monthly record of his time (as abstracted from the diary) inserted as follows:—Running through the diary the different clients' names are picked out and inserted in the proper column, and then, in the "Date" column, opposite each respective client's name, are placed the days employed in his service, each day being designated by its numerical monthly number, annexing, where parts of the day only have been taken up, their proper fraction. On completion of the "Date" column, the total number of days given to each client is inserted in the "Number of Days" column, which should amount, if no mistake has been made, and it is, say, the month of September, to a grand total of thirty.

In order to account for every day in the month, several "dead horses" will have to be worked in the client column, *e.g.* "Sundays and holidays," "office," "sick-list," &c., and opposite which, in the "Charges" column, unfortunately no entry can appear.

The column for "Subject and Details" can be readily filled up as the "Date" column is being proceeded with; while, last of all, comes that set aside for "charges," these depending on the particular *employés'* work, increased by the percentage due for superintendence, cost of office, &c., before alluded to.

The total of the "charges" column will give *employés'* earnings during the month, and the grand total of all the half-sheets, now pinned together, and forming the "Abstract of Work" book, the professional earnings during this period, which should, of course, correspond exactly with the amount shown on the credit side of the professional account as set forth in the ledger.

It may be objected to the above scheme that there are so many cases where "commission"

* See pp. 930, 1009, *ante*.

is received by the architect or engineer, irrespective of the time expended on any particular work, but all time should duly appear in the professional man's books, whether he is to be paid by commission or otherwise; for thus, and thus only, can he tell what the value of each *employé* has been to him during any particular period, whether he gains or loses by the commission received; whether, gauged by the usual commissions, his time-charges are too high or too low, &c.; while all differences between amounts charged to clients as commission, with the actual amounts set forth against them in his books, can easily be reconciled by means of the "profit and loss" account.

Time being fixed as the basis of the financial part of the business, it behoves the architect or engineer at the head of an office to ever keep in view the serious responsibility that rests with him in insuring, as far as lies in his power, that his *employés* not only work well and diligently during office-hours, but also duly and properly record such work in their respective diaries, and to the attainment of these ends he must bring to bear the force of precept and example, and, if necessary, a strong hand.

The architect or engineer, like the skilful and judicious "whip," must endeavour to handle his team of *employés* to the mutual advantage of his clients and himself, while those subordinate to him must learn to recognise that their own comfort and welfare depend on the professional success of their employer, and therefore that it is their part to willingly aid him in carrying out all his plans and wishes as far as lies in their power. Subordinates must bear in mind, too, that while pursuing the even tenour of their way, and enjoying the blessings of regular hours, regular pay, and the absence of all professional anxiety, the head of the office has a far more thorny path to travel, when disappointments, bad debts, troublesome and exacting clients, and anxieties they know not of, meet him at every turn, and that on the whole they are perhaps as well off, perhaps far better, than their employer.

In conclusion, while venturing to express a hope that the system of interior economy now advocated may be found useful (it certainly is practicable) to many of our readers, we must again remind them that interior economy, whether practised after this fashion or after that, is but a means to an end,—a means whereby, while the scope of intellectual power is extended, and greater time afforded for the pursuit of professional knowledge and the study of art in its various forms, every professional man, be he architect, engineer, or surveyor, is enabled, in his generation, to do the greater good.

LEEDS.

A maxim of old Fuller must have been well learned by Leeds, that "Haste and rashness are storms and tempests, breaking and wrecking business, but nimbleness is a full, fair wind blowing it with speed to the haven." Leeds is old, it has long been commercially famous, and it has gathered not only a large but a varied trade, so that it does not feel either the feverish impulses of anxious demand or the corresponding depressions which the whirligig of time invariably brings in the train of the first. It owes its growth to its position, to the seizing of the advantages naturally given to it, and to the increasing of these as well as the development and perfection of chains of communication, and these have brought about a steadiness in the rate of its advancement. Into the olden story told of Leeds we need not now inquire. Taking it as a patent fact of great magnitude more than two score years ago, let us contrast its state then and now,—when the Hunslet suspension-bridge over the Aire had just been erected; when the old "Oil-Gas Company" had just been wound up, and out of its ashes the phœnix of coal-gas was arising; when the echoes were dying away of the first election, at which John Marshall, junior, and Thomas Babington Macaulay were elected with 2,000 votes, as the highest number polled; the new baths were being opened, and before railway communication had extended to the town, it was even then a place of magnitude. It was the principal seat of the woollen manufacture; it made "broad and coarse narrow cloths, pelisse cloths, shawls in great variety, stuffs, Scotch camblets," &c. It spun flax for canvas, made cotton and silk, glass and pottery, dug coal near, and had even then notable foundries. It had thirty-two places of worship, and three weekly "respectable and talented journals," two of which have taken the new departure into daily journalism since that date. Dull reading is an old directory, but those who know the changes of two score years will find it suggestive to revert to the days when the seven banks of Leeds included those of Beckett, Blayds, & Co.," of Bywater, Charlesworth, & Co., and of J. & W. Perfect & Co.; when brickmakers had their fields in Meadow-lane and Headingley; when there were only two consuls; when Kirkstall forge was in the hands of Beecroft, Butler, & Co., and Hird, Dawson, & Hardy hailed from Low Moor. These were the days when the names of Joseph, Josiah, and Newman Cash, of Aldam, Pearse, and Birchall, of Luccock, of Stansfield, and others,—were well known amongst the stuff manufacturers and merchants; and the Jowitts, Wades, and Whiteheads were amongst the magnates of the woolstaplers in Albion-street, Call and Boar-lanes. Conveyance by water bore then no small part of the productions of the town away, and "fly-boats," and Hawkswell's & Stancliffe's vessels were well known on canal and coast and in the Aire and Calder Dock. In those days, when the "town and liberty" had a population of 123,393, it had even then a public spirit beyond many a larger town, and to this its noble infirmary, its dispensary, "fever house," and lying-in hospital bore ample testimony, as did in other directions its philosophic and literary society, its early mechanics' institute, its two museums, its many libraries, and its cloth-halls. Its trade was vast, the then recently-published annals accrediting it with the possession in its manufactories of 228 steam-engines, of some 4,048 horse-power, and then estimated to need 157,870 tons of coals for fuel for steam-raising purposes yearly.

There has been full growth in the years between then and now, and at the present it may be said that Leeds is numerically and commercially great, and that there are all the tokens of a vast and a growing population, and that the trade on which it subsists also shows signs of continued vitality. It is in that great South Yorkshire coalfield which enriches with its mineral output so many towns, and which gives in the mineral statistics to the Leeds district a claim to the possession of no less than 141 collieries. It is in the Yorkshire iron district,—not the great Cleveland district, which has sprung up with mushroom rapidity, but the old and early-famed West Riding one, to which it contributes three sets of smelting-works, not the least noted or least productive. It has eight sets of finishing ironworks—the capacity of production of which will be indicated to the technical reader when it is stated that they have in connexion with them 157 puddling-furnaces and about thirty-six mills. In addition to these, there are works in which the product of the ironworks is wrought into articles for which Leeds is noted, and there are the various establishments of the railway companies for the repair of the rolling stock. One of the chief of these,—that belonging to the North-Eastern Railway,—though only serving some of the smaller branches of that company's lines, occupies over six acres of ground, and employs nearly a thousand workmen. Nor is the steel trade wholly unexistent in the district, for in the list of firms employing the Siemens Regenerative Gas Furnace is included the Monkbridge Iron Company, Leeds, which has seventy-two crucibles for which furnaces have been built. At the same time, seeing that, on the one hand, Leeds is not a large consumer of steel for purposes of manufacture, and that, on the other, its distance from the coast and from rivers navigable for large vessels, it is placed under some disadvantage in this respect, and its steel industries are not likely to be developed to any very great extent, but unquestionably its eminence in other trades renders it needless to endeavour to reach greatness in a manufacture it has not great advantages for. In the manufacture of paper, for instance, it has some fame, and the half-dozen mills it owns include some known for the "browns and glazed browns," as well as the grocery and other kinds of paper they make. It believes that there is nothing like leather, and some years ago was believed to employ close upon 2,000 persons in the leather trades, and a considerable number in the manufacture of boots and shoes,—of which it then turned out 60,000 pairs monthly. Tobacco is made to the extent, as given in the report to which reference has been made, of 46,000 lb. weekly; glass in comparatively large quantities is made, as well as earthenware. The chemical trades prospered for a time, employing some 500 persons, as well as the oil trade, though the latter was not a large contributor to the labour market; but there has not been the growth to the full extent in this industry that there has been in some others of recent years. In the great textile trades which are the staple of Leeds, the most reliable figures are those laid before the British Association on its visit to Leeds some years ago, when it was stated that there were 128 firms engaged in the woollen manufacture, having in use a nominal horse-power of 2,924, and employing 10,193 persons. In the worsted trade it was believed that some 10,000 spindles were employed; whilst silk and flax contribute largely, though in a minor degree, to the prosperity of the town, as does dyeing, toolmaking, &c. The horse-power of its engines, and the consumption of fuel for steam-generating purposes, are more than double what they were at the date for which they have been given, and it is at least probable that the consumption of coal in the borough proper is now above 1,000,000 tons yearly.

In fact, the trade of Leeds has known an almost continuous growth since the days when Thoresby declared its "famous cloth market" to be the "life, not of the town alone, but of these parts of England." The manufacturers of the whole of the clothing district along both banks of the Aire for a dozen miles make the great cloth-halls of Leeds their market, and thus Leeds gathers in not only its own manufactures for sale, but those also of the numerous manufacturing villages and towns studding that immense district. Uncounted millions are yearly paid for goods sold in these halls; and a very large proportion is distributed in the shape of wages in these communities, whilst the Pactolian stream is added to by that paid for other industrial productions. The growth of these vast industries has caused a corresponding growth in all the tokens of population, of citizenship, and of associated effort, and now the townsmen of Leeds may boast that they are citizens of no mean city. Leeds has grown with the growth of its trades, nor has its public spirit lagged behind; and thus, in its public buildings, in its associations, and in some of its surroundings, it is now fairly entitled to take no undignified place in the roll of British cities. It is not free from the evils which are usually known in large towns, as the fact that one out of 164 of its population is annually taken up for drunkenness, and the allied one that it has a house licensed for the sale of drink to every 316 of its people jointly testify. It has "one of the most successful reformatories," having between one and two hundred inmates; the total of the indoor poor is 1,260, and that of the outdoor over 3,700, so that it has "the poor always with" it. At one of its public dispensaries the weekly tetal of persons treated musters up to about 1,400. But whilst there are these and other similar signs of depravity and disease, there are those which fully testify to the attempts that are being made to cope with them by educational, philanthropic, and religious effort. Already an admirable work has been done by the School Board, in the provision of accommodation and in the compelling of the use of that accommodation; and other less known organisations have done their full share of the work of education. Few towns have had more philanthropists than has Leeds, and there are abundant results to be found from their labours—results to be placed in the most unsatisfactory medium for inspection, tabulation—if need be. Too recently to need recapitulation a statement was made as to a part of the work of the Established Church in Leeds, and dissent in its many phases has not been a whit behind.

Of the future of the town much need not be said. The extent and the variety of its trades, its dependence upon so varied and so numerous supports, the full facilities for traffic and transit it has, and the public spirit of its citizens, all combine to give ground for the belief that, progressive as has been its past, its future will not be the less so. The tokens that capital gives of its appreciation are there; and the returns of the investment of that capital in bank and company, railway and tramway, are good. There are no flies in this pot of golden ointment, for the depression in the trade of the country, though marked in Leeds, was not marked so fully as in centres where there is dependency upon one branch of trade, the mineral trades

especially. These, so far as known in Leeds, were affected there, as were in a minor degree other trades. With its trade on these varied bases, with extension in one or more continually going on, and with improvements of various kinds ever mooted and carried out, the town should have a high commercial future. The old unhealthy state it knew forty years ago it knows no longer: the provision of cemeteries and of sewerage systems, and the "opening out" of some of the rookeries it then held, have since done much, with the provision of "town's lungs," to improve the condition of its peoples. It is not as yet a model town in these or other respects; but the irrevocable past is not wasted, for, "rising on its wrecks," the town aims ever at something nobler and higher. It has yet much to do, but looking back at what it has done, it may take heart and go forward in that path which towns must take if they would not by being themselves stationary be retrogades in the race of communities.

A GERMAN RAILWAY STATION.

It is a gloomy prospect which Mr. Ruskin holds out for the lover of the picturesque in the future, if it really is to be the case that "instead of cathedrals, castles, or abbeys, the hotel, the restaurant, the station, and the manufactory must in days to come be the objects of England's artists' worship." Seriously true as may be this sad prophecy, the enthusiast who, sketch-book in hand, finds himself in the venerable town of Neuss, on the Rhine, will centuries hence, find a railway-station when in ruins not unworthy his pencil.

Even were the town to suffer as much as it has done within the last century, and were all vestiges of the antique Neuss (which was a flourishing Roman colony at the time that Pompeii was a fashionable watering-place) to pass away, still will remain the stately pile of the recently-completed railway-station.

This building, in the style of the German Renaissance, exhibits most of the salient peculiarities of the sixteenth century. Pretentious in its appearance exteriorly and interiorly, pretentious in its apparent regard of detail, it is somewhat amusing to read the equally pretentious way in which the local newspaper speaks of this wonder, which, commenced three years ago, has recently been thrown open to the public.

The façade of the stately edifice (whose photograph may be seen in every stationer's shop throughout the town) has certainly been the result of labour, the architect, however, having, within a day's journey, many perfect examples to study. The same may be said of all the interior arrangements; though, as one enters, and turns to the ticket and luggage offices, whose announcements are carefully painted in black-letter, it is somewhat difficult to realise, notwithstanding the carved and tinted pillars, and other necessary accessories, "the hypocritically devout mood" of the local editor, in surveying "this quiet alley which so closely resembles a cloister."

This "cloister," the glass in whose doors is carefully guarded by much tortured and painted wrought-iron work, leads to the waiting-rooms, one for the third and fourth class passengers (for here in Germany a certain famous bishop would be able to fulfil his desire); the other for the first and second class passengers. In each of these rooms the style of the Renaissance exterior is "rigorously" kept up in the oaken tables and settees, the strong seats, the raftered ceiling and rondelled windows; and already, perhaps, more than one modest traveller has "entertained a doubt whether he were worthy to sit down in one of the antique oaken seats with their high backs." Once seated, however, "the calm feeling which makes itself felt in the austerity and correctness of the room would afford him a striking proof of the impression which remembrances of the long bygone past are able to produce when architecturally embodied."

But the chief efforts of the architect have been directed to the principal waiting-room, all the details of which have received (at a first glance) a studious attention. A well-arranged half-light, which streams in through the stained-glass windows, shows us the walls carefully covered to a third of their height with well-imitated stamped leather, while the ceiling, professedly of carved oak, is painfully decorated with variously-coloured patterns. Round the room run quaintly-lettered inscriptions recording the commencement of the building and its completion, while the lamps are avowedly counterparts of examples which once existed in the Carmelite Church at Düsseldorf.

Special pains have been paid to the (however unsatisfactory) stained glass, the escutcheons on the principal window showing the arms of Cologne and Neuss, as also those of the patron saints of the two churches. At each side of this chief window are smaller casements, decorated with inscriptions appropriate to the place, recalling to the traveller the fact of his transitory visit to the spot, and urging him to make good use of his time, as also of his eyes, for the good of his country. The carved buffet, another effort of revival of the German Renaissance, is also decorated with appropriate inscriptions.

But it is the ladies' *salon* which is the most satisfactory effort, probably, of the whole. In this room, separated from the principal room by hanging curtains, the usual-patterned velvet chairs and sofas have been banished, to be replaced by (still more inappropriate) lounges, while the light coming through the not however too-carefully-planned rondelled windows, allows the fair travellers to admire themselves in imitation Venetian mirrors. Surely the architect was somewhat of a cynic, for under each of these is carved, in undying letters, the two following cruel mottoes:—

"Each object has two sides,
I only show you one of both.
I paint for you your face's features,
As you appear to me—not otherwise."

It will be seen that no inconsiderable effort has been made in the building of the Neuss Railway Station, and an initiative given which is sadly wanted in Germany, where the railway stations, in common with all the modern architecture of the country, call for great improvement.

In the present day we are accustomed to see in the houses designed by some of our successful professional men, many satisfactory revivals of past times; as yet, however, the initiative of restoring some picturesqueness to our railway stations has to be more universally followed. The only pity lies in the fact that when such revivals are made, even greater care is not bestowed on them than at the present the architect is willing or able to give.

That in the town of Neuss, in the country of Albert Dürer's Nuremberg, and a few miles only from Cologne, a more perfect specimen of work should not have been produced, when so much time and expense have been ungrudgingly bestowed, is strange.

For Neuss is a town worthy the study of the architect as well as of the painter. Apart from the stately church (a venerable remnant of antiquity, familiar to all students, but alas! ruthlessly restored),—surmounted by the bronze statue of the holy knight St. Quirinus, which has alone escaped destruction by the happy state of the matrimonial market,*—and the Roman gate of Drusus, which saw the fifty-six assaults of Charles the Bold's Burgundian army in the fifteenth century, there exist many quaint old-world specimens of architecture of a period which, at the present especially, very many of us admire.

Only a few steps from the railway station, in the ancient Niederstrasse, there stands the old crow-step-gabled inn of the Black Horse, over whose narrow and sculptured doorway is the carved and painted sign,—"Zum Schwarzem Ross, anno 1603." It is a characteristic hostelry, which, however, modern times have sadly altered; still, the old lustred glass remains in the windows, on whose sills stand quaint pots of flowers; still in the back room, with its carved oak rafters and dainty cupboards, there is a true smack of the past.

But more attractive is another inn not many yards from the Rathhaus, a signless inn (not quite so celebrated as the *Three Moors* at Augsburg and its world-famed cellar), whose well-kept stained windows (with their strong stone mullions) light up a large open room to the street; on one side the entrance of the cellar yawns, and on the other, the stairs lead to the upper stories by a gallery opening on the principal room, and where, in a dark corner, may still be seen burning, as it has burnt for many a generation, the Madonna lamp.

* A local legend tells us how each year the statue of the saint ought to be scrubbed bright by the old maids of the town. It will be remembered how the authorities of Rotterdam had to forbid the cleanly housewives of that famous city from polishing the statue of their beloved Erasmus.

Though Neuss is to the visitor but a somewhat deadly-lively provincial town, in its government it has an energy one would little expect to find, and within the last few days has been unveiled, under the shadow of the antique cathedral, a costly monument to those townsmen who fell in the great wars of 1866 and 1870–71, which have made Germany what she is, and what she is now beginning to deplore. A work of no mean pretensions, this monument is one of many hundreds which within the last few years have risen in almost every large town throughout France and Germany.

It was in the autumn of 1875 that we had the opportunity of seeing a like monument (but sadly inferior to that of Neuss) erected at Bazeilles, a village for ever famous in the pages of history as the scene of the great battle of Sedan, and in the world of art as the scene of perhaps the finest of the numerous battle-pictures which the Franco-Prussian war originated, the *Dernières Cartouches* of Alfred de Neuville.

Should the sketcher of the future, a kinsman of Macaulay's more fortunate New Zealander, go to Bazeilles, he will probably have but little need of his pocket-book and pencil, for by then the ruins of the unfortunate village will have been restored, but when in the further course of his rambles he will penetrate to the then more than venerable city of Neuss, he will probably be able, with thorough satisfaction, to sit down before the War Monument in the Cathedral Close, if not before the by then weather-beaten remains of the Neuss railway station.

Düsseldorf.

ELY: KING'S SCHOOL.

Important works are in contemplation, under a scheme of the Charity Commissioners, for providing increased accommodation for the school founded by Henry VIII., and attached to the Cathedral at the dissolution of the Monastery, 1541. The school is at present located in the ancient gateway (known as "Ely Porta"), built by Prior John Barton about 1380, and in certain other buildings both ancient and modern on the east side of the street known as "The Gallery" leading from Ely Porta to the Galilee.

A new hostel for sixty boys is to be built on a plot of ground opposite Ely Porta, and will include accommodation for masters' and servants' offices, as well as the dormitories, day-rooms, and studies for the boys.

Alterations are to be made also in the old buildings, in what is now the head master's house and dormitories. This will be carried out with the utmost care, for these buildings are a part of the ancient monastic buildings, and are of great interest. The dormitories and day-rooms are in a long block on the east side of "The Gallery," 118 ft. by 28 ft. wide, built about 1180, at the time when the lower portions of the Cathedral, west front, and transepts were in hand, and raised and altered by Alan de Walsingham, about 1320. This block then formed the "guests' dormitory." That great architect removed the former wooden floor and inserted a new floor, carried on pointed arches and vaulting. He raised the walls, re-using, in some instances, the beautiful Norman corbel tabling, and inserted larger windows in lieu of the very narrow original ones, some of which still exist, though blocked up.

Adjoining this block, and communicating with it at its north-eastern angle, De Walsingham built a "reception-room for the guests," opening (by a passage now destroyed) into the guests' dining-hall at its south-west angle. This hall (now the deanery) is a magnificent building of the thirteenth century, much altered in later times. This reception-room was known as "The Fair Hall." It is 50 ft. long by 24 ft. wide (outside), and is constructed with all the skill and science of which Alan de Walsingham was a master. It is in four bays, on a lofty-vaulted substructure. There are existing perfect windows in two bays, and at the south end remains of windows in the other bays. Although the height is 35 ft. to the cornice, the wall is only 16 in. thick; but by means of arches resting on grand corbels, the weight of the roof is brought on to the buttresses, which are of considerable projection. The tracery of the windows is of the beautiful type then used at Ely. This hall is of about the same date as the beautiful Prior Crauden's Chapel opposite, with which it was connected by a gallery.

These buildings are to be modified and altered to suit the new requirements, and will be

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carefully done, so as to bring out and retain their interesting characteristics and details as far as is at present practicable.

The works will be carried out for the Dean and Chapter of Ely under the direction of Messrs. Carpenter & Ingelow; and plans are being prepared by them for the next meeting of the Chapter.

THE GLASGOW BUILDING TRADE.

Sir James Watson, Lord Dean of Guild for Glasgow, at the last court of the session, held on the 26th ult., made a speech, in the course of which he dealt with the position of the building trade in the city. It had had, he said, a series of years of continued commercial prosperity, which, lasting till near the end of 1875, led to a demand for improved dwellings on the part of many who had profited by that prosperity; while, in addition, the operations of the School Board for the erection of their numerous schools and schoolmasters' houses helped materially to increase the stimulus. The consequence was a rage for speculation in property, which changed hands at greatly enhanced prices, and gave rise to an extensive amount of building, until it was found, by about the middle of 1877, that the supply exceeded the demand, and that over-production in this, as in other cases, had led to a serious and rapid decline. They found accordingly that, while for the year from September 1st, 1875, to August 31st, 1876, the "linings" granted by this court for the erection of property amounted in value to 2,125,249*l.*, those granted in the following year, viz., from September 1st, 1876, till August, 1877, amounted in value to 1,564,360*l.* Since then the linings granted had greatly diminished, those granted from September 1st, 1877, to August 31st, 1878, amounting to 755,717*l.* One of the evils resulting from the building speculation was that it induced men with insufficient capital to rush into the trade, to purchase ground at high prices, borrow money at high rates, and after having so far proceeded with the erections, find that from want of funds they are unable to finish them. The result had been a serious loss, if not a ruin, to these persons, while the inconvenience to the public from barricades standing while no work was going on had been considerable. It was not for him to say how long the present decline might continue, but it was only reasonable to expect that it would revive when trade recovered from its present depression. Looking to the serious accidents which occurred in other places from insufficient ingress and egress in public buildings, in cases of panic, the court thought it right to order a strict inquiry to be made in regard to this in the various churches, theatres, and public buildings, and the result had been satisfactory, such persons as had buildings in any way deficient of these requirements having readily agreed to the wishes of the court. In conclusion, he thanked the sub-dean (Mr. James King), the members of the Bar, and the officials, for the assistance they had rendered him in the court.

It is stated that the Merchant House have unanimously agreed to appoint Mr. John Muir, merchant, as Sir James's successor.

THE CARLIOL TOWER, NEWCASTLE.

NEWCASTLE SOCIETY OF ANTIQUARIES.

At the monthly meeting of the Newcastle Society of Antiquaries, held on the 25th ult. in the Old Castle, Mr. Martin Dunn in the chair,—Mr. W. H. D. Longstaffe said a public meeting was to be held in the town to protest against the destruction of the Carliol Tower. Seeing that Newcastle was now losing everything of interest, so far as the history of the town was concerned, he thought the Society should demonstrate against the destruction of the tower. They should make some attempt to preserve the remaining towers and portions of the wall. He had walked round the portions of the wall remaining. He was aware there was very great dispute about the date of the wall. The eastern wall was exceedingly good masonry; when they got to St. Andrew's Church it was exceedingly bad; and beyond St. Andrew's Church there were certain breaks in the masonry. They should preserve every tower and piece of the wall which now remained. He exhibited a photograph of the east end of St. Andrew's Church as it was before its restoration a few years ago, and said that up to that time there was a very delicate and beautiful piece of architecture at the east end of the church, and the masonry was good, and there was no need to pull it down. The churchwardens and folks chose to pull down the east end gable, and build a new gable, and the old line was completely obliterated. They might go and see the place; he did not like to go, as it was very disgusting. He brought this forward to show how silly it was to destroy pieces of ancient work. The castle was falsified some years ago, before his time; and when he was writing the history of it, he had to go to some ancient etchings or engravings to see what it had been. The door, the oriole, and the original appearance of the chapel, had been destroyed; and one had to grope out, as well as could be done, the history of the building. They could not bring these ancient things back, but they might put a stop to further destruction. When Mr. Bell wrote to him about the Carliol Tower, he thought it well to put Carlyle, Ruskin, Hunt, and other people who really had the voice of the nation with them, in motion on the subject, but they would not meet for about a fortnight. If the Carliol Tower was to be destroyed, it should be done in broad daylight. It might be destroyed, and they perhaps could not help it any more than they could help the falsification of the castle; but if it was to be done the same as the Black Gate, then it should be done in broad daylight. He concluded by moving:—

"That this Society petition the Town Council not to remove or destroy, or consent to the removal or destruction of the evidences of the history of Newcastle-upon-Tyne, and especially the remaining relics of the wall and towers."

Mr. Oswald suggested that special reference should be made in the motion of the Carliol Tower.

Mr. Longstaffe said he had written to the Society for the Preservation of Ancient Monuments, stating that for many years past there had been a persistent destruction of ancient monuments in Newcastle; and he now wished the motion not to refer to only one tower, but to all the ancient towers and wall.*

CLERGY-HOUSES.

Folkestone.—On the 24th ult. the Archbishop of Canterbury laid the foundation-stone of the new vicarage at Folkestone. The building will be Early English in style. It is estimated to cost 2,500*l.* The builders are Messrs. R. & D. Baker, and the plans have been prepared by Mr. Ewan Christian, the diocesan architect. The building will have a sea frontage of 67 ft., and an elevation of 44 ft.

Ripley.—On the 23rd ult. the memorial stones of a minister's house adjoining the Ebenezer Chapel, Ripley, were laid. The house will cost nearly 600*l.* The architect is Mr. Geo. Eyre, of Codnor; and the contractors Messrs. Wetton & Worley, of Ripley.

PROPOSED LIVERPOOL EYE AND EAR INFIRMARY.

Not before it was wanted, a new building for this institution is about to be erected from the designs of Mr. C. O. Ellison, architect, Liverpool. We give a view of the exterior. The style adopted is English Domestic Gothic. The materials employed are red brick and sandstone. The picturesque appearance of the building is greatly due to a somewhat novel management of the dormer windows. The building consists of a main block facing Myrtle-street, and two wings—one containing the out-patient department facing Stowell-street; the other running parallel with the gymnasium. The wards are capable of accommodating eighty patients. Special wards have been provided for cases of a contagious nature, and a few private rooms have been set apart for patients who can afford to pay. The minimum allowance of air per patient is 927 cubic feet. Each ward is in direct communication with a nurse's room. The lavatories and offices are arranged with a cross ventilating passage between them and the wards, so that they are separated from the interior of the building. There are four sitting-rooms for the use of those patients who are not required to remain in bed. In the centre of the main block, equi-distant from the male and female wards, is the operating theatre. A large bay window facing the north will afford the steady skylight needful for the performance of delicate operations. Space has been provided for the accommodation of students, and two waiting-rooms for patients communicate directly with the theatre. In the administrative department, rooms are provided for the house-surgeon, a resident pupil, matron, nurses, and a staff of servants. The Board-room and smaller anterooms for visitors, &c., open out of the entrance-hall. The general wards and corridors will be warmed by means of hot-water pipes; other apartments by means of open fire-places. Fresh air will be admitted by tubes in the floors, and by an arrangement of double sashes in the upper part of the windows. Foul-air chambers or tubes will be placed in the roofs of the wards and corridors, communicating with a large extracting shaft. In this an upward current of air will be maintained by means of the heat generated by the kitchen and boiler flues. The shaft terminates externally in a lofty *flèche*.

The work of the out-patient department will be carried on in the west wing. Patients entering by Stowell-street will be admitted into a waiting-room capable of seating nearly 200 persons. At the north end of this is a room for the clerk, whose duty it is to investigate the eligibility of applicants for charity, to issue prescription notes, &c. Beyond is the consulting-room, lighted by a large window facing the north, and communicating on one side with a small operating-theatre, and on the other with a dark room for the use of the ophthalmoscope. After consultation, patients will proceed to the dispensary, where they will obtain their medicines, and then pass out into Stowell-street. By means of barriers and turnstiles, arrangements have been made for the management of the crowd of out-patients, so that the work can be accomplished quickly. The out-patient department is entirely separate from the interior of the hospital, but communicates with it by means of a glass-covered passage. Some idea of the magnitude of this department may be gathered from the fact that, in 1877, the total number of separate applications was 10,015, that these patients attended and were prescribed for 38,750 times, and that 480 operations were performed. The estimated cost of the new building is about 15,000*l.*

THE CHOIR-SCREEN, DURHAM CATHEDRAL.

The Northumberland and Durham Archæological Society paid a visit the other day, unexpectedly, to Durham Cathedral, and denounced in unmeasured terms the choir-screen, the pulpit, the reading-desk,—in fact, all Sir G. G. Scott's new work there; Mr. Longstaffe and Mr. E. R. Robson, of the London School Board, being the most sweeping in their abuse.

Some of our readers may be glad to see what the much-condemned screen is like, and we give a view of it.

It is of very massive character, being 3 ft. thick, 33 ft. long, and 36 ft. high to the top of the cross. It is constructed wholly of Cumberland alabaster and marble. The supporting cluster-shafts are of Frostaly fossil, which in Durham takes the place of Purbeck marble in the southern cathedrals; the caps, annulets, and bases are Devonshire marble; and the spandrels are filled with mosaics, to harmonise with the pulpit. The cross in the vesica is a copy to large size of the pictorial cross of St. Cuthbert, now preserved along with his vestments in the library of the cathedral, and consists of gilt metal, with mosaic of red jasper. The step on which the whole stands is of black Dinart fossil.

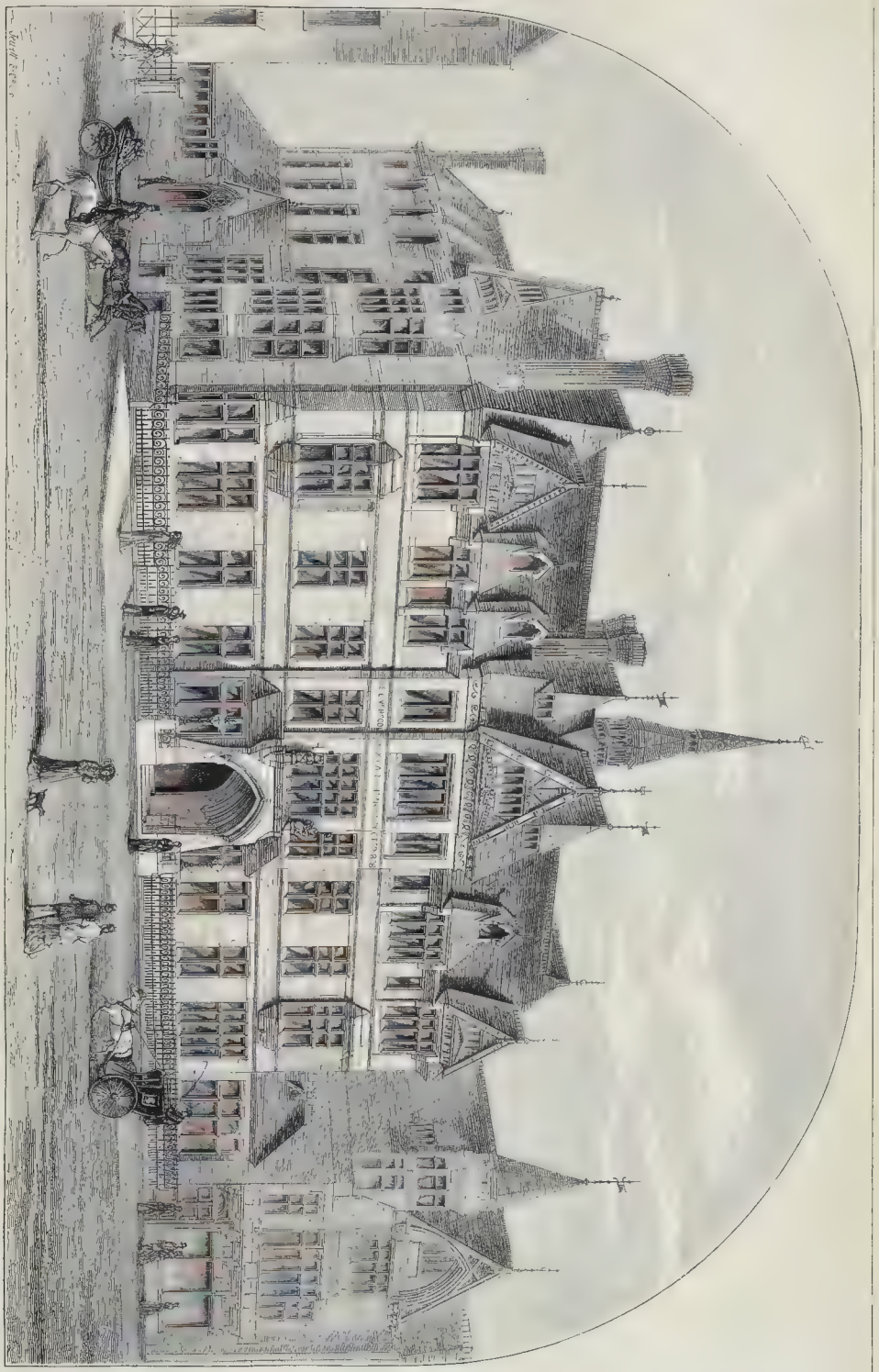
The screen, pulpit, and marble mosaic floor of the choir have all been executed by Messrs. Farmer & Brindley, the late Sir Gilbert Scott, as already mentioned, being the architect.

Edge's Patent Grooveless Tramway System.—This system, patented by Mr. Edge, well known as an architect in Birmingham, proposes to combine the advantages of the present system without the danger and inconvenience to ordinary traffic, arising from the grooved rail now in use. On the face of it much annoyance would be saved to the occupants of other vehicles. Upon reference to the drawings and models it is seen that the rails are provided with a series of equi-distant round or oval holes through the top part or plate, the wheels being supplied with corresponding projecting studs of conical shape, either round or oval at their base. How this may work in practice time will be required to show.

* A protest against the destruction of the tower has already appeared in the *Builder* (see p. 998, *ante*).



THE CHOIR-SCREEN, DURHAM CATHEDRAL.—The late Sir G. G. Scott, R.A., Architect.



THE LIVERPOOL EYE AND EAR INFIRMARY.—Mr. C. O. Ellison, Architect.

ON SANITARY CO-OPERATION.*

Chaucer uses the word sanative, and so does Bacon, but sanitary, or sanitation, connected with the science of public health, is not nearly so old as our patriarchal president, Mr. Chadwick, who, I am inclined to think, was the father who invented the term sanitary science.

In this year of grace we have sanitary newspapers,—the *Builder* and the like papers,—and here is a Sanitary Institute sitting, which is not yet old enough to be recorded in "Whitaker's" or other almanacks, or such like registers.

There was once a Public Board of Health, and there may be again. The Society of Arts and other public bodies do duty for it, and discuss health continually. In the mean time, public opinion on sanitary questions of all kinds is gradually fermenting, and is still working its way. Health has even crept into the Revised Code of the Education Department, and public grants are made to encourage a knowledge of its principles according to rules which make it difficult for schools to earn the grant. The Local Government Board virtually is responsible for doing what a public department might do if it pleased to advise upon and promote the health of the people throughout the kingdom, except in the metropolis, which is protected by vestries, and the representatives of vestries, and as respects sewage, can do nothing better than pollute the Thames with it, and suffocate unfortunate wretches who are immersed in it. The Local Government Board is afraid to do more than follow in the wake of public opinion, at a safe and long distance. Reports and returns are printed by Parliament, which are far more difficult to buy than a newspaper or any sanitary paper, and are not systematically to be found even in public free libraries,—not in the excellent reference library at Manchester, or even in the British Museum, until a long time after publication. No authority is charged to make the information known. Our ancestors once stuck public notices of Acts of Parliament and proclamations on the church-doors, but the practice is hardly followed now. And yet health and religion are companions, and the work of churches and chapels in all their phases of thought, which would, I think, be helped; but then the Home Office should take measures to inform the registered ministers of religion when all the publications which were issued by Government to promote a knowledge of public health appeared, and I venture to recommend this Institute to consider this suggestion, and, if need be, cause it to be discussed in Parliament. Year after year Parliament makes laws permissive rather than obligatory, and the execution of them is a dead letter, comparatively.

Mr. Cresswell, in an admirable paper read at the Health and Sewage Conference of the Society of Arts, last May, which should be carefully studied, observes,—"There has been a redundance of legislation embodied in a tortuous series of enactments." The Public Health Act of 1848, the Nuisance Removal Act of 1855, the Local Government Act of 1855, the Sanitary Act of 1866, the Sewage Utilisation Acts of 1865 and 1867, the Pollution of Rivers Act of 1876, and a Consolidated Act, "The Public Health Act," 1875; and, lastly, a Water-Supply Act in 1878, brought in by Mr. A. H. Brown, the member for Wenlock. Mr. Cresswell continues to say, "Legislation has dragged its slow length along, while events have galloped with portentous haste, and neither imperial nor local effort keeps pace with the needs and expectancy of the nation. In 1876, popular excitement induced a palliative measure in the Rivers Pollution Prevention Act, but that measure has failed of its purpose, and given to wrongdoers a quasi-legislative sanction for their delinquencies and incapacity. At the same time, the Thames Conservancy Acts of 1857 and 1867, after much ado about nothing, have suffered a palsy, and received their *quietus*,—for a time, at least,—in the Lower Thames Valley Drainage Act of last year. In the meantime, a cry has gone up for water,—water for the food and ablutions of man, as well as the requirements of our great staple industries. Every river, from the Tay to the Dart, has been contaminated with the refuse of homestead or factory. The salmon kelts of Westmoreland and Cumberland are in process of destruction by a parasitic fungus plant, the newest development of sewage pollution; and, while professors dispute as to final causes, and means of prevention, the patient public waits for the *Deus ex machinâ*, in the form of some miraculous intervention, to save them from the natural consequence of their own apathy and ignorance. In presence of these and other startling phenomena, where shall we seek the signs of progress, or compute the net results of practical sanitation? . . . . In this respect it may be expedient to reorganise the Local Government Department, and readjust it on its own proper bearings. Further legislation in this direction will rid us of that red-tape and circumlocution which encompass every limb, and paralyse the functions of local bodies, reducing independent self-government to the shadow of an empty name. From the investigation of a grand scheme of arterial drainage to the contents of a workhouse plum-pudding, is a wide range of official supervision, yet nothing is too large or too minute for the elephantine prehension of the Whitehall department. There is a veritable plague of inspectors abroad, and the native stubbornness of the provincial mind, although it may need the spur and impulse of the central authority to set it in motion, resents this constant yoke of official supervision, which will not permit the expenditure of a few pounds, or the construction of a workhouse pigstye, without a local inquiry and departmental sanction. This was not the intent of those who framed the Public Health Acts, nor is the system compatible with the divine right of self-government. The functions of imperial administration end where those of local self-government begin; each has its proper uses in the economy of the State; and there is scope enough for each within its own particular province. The Rivers Pollution Prevention Act is in point. Such is the superfinity of safeguards and precautions in the provisions of that Act, that none save a Government department would venture to put it in force; nor can a sanitary authority take any proceedings under it without the consent of the Local Government Board. Here, then, was a field for the energies of Government, where both the resources and influence of the State might be usefully employed. Yet nothing has been done to enforce or direct the operation of an Act which is, as it were, stillborn, and truly a most lame and impotent piece of legislation! On the contrary, we can cite cases where local enterprise has been hampered; and official interference has blunted the edge of many a bold resolve on the part of those who have striven, humbly, but honestly, to help themselves." What, then, can be done? We can say what ought to be done, but it may be years before impediments are removed and the work be done. So I offer some suggestions as a beginning; better, I hope, than remaining as we are. My suggestions will apply to the pollution of rivers by sewage, which, for the last two or three years, I have had reasons for studying.

You cannot remedy the pollution of a river unless you can get some federation of interests, and treat the river, from its source to its discharge into the sea, as a unit, and look to see that the whole work is done properly, in the interest of all the places which empty sewage into the river or its tributaries. Voluntary co-operation here, at present, is indispensable, and may be possible, but Government alone can make it obligatory, which it has shrunk from doing. Self-interest may be called into action. Take the case of the rivers Irwell, Irk, and Medlock, flowing through Manchester. Purification of the rivers in Manchester and Salford is paralysed because the towns above have not begun to remedy the nuisance of their own sewage, but send it down to pass Manchester on its way. Oldham and Rochdale have done nothing, therefore Manchester does nothing.

There is an instance nearer at hand which the Institute may examine on the spot. The Trent is at present made the common sewer for all the pottery towns from Tunstall to Stafford, rendering Trentham Hall almost uninhabitable. These towns are so independent and republican in spirit that they will not co-operate. Co-operation, as affording the best and cheapest way of proceeding, has been recommended by all the local surveyors. The towns know it well, but have it they will not, and each will have its own system, although at greatly augmented cost and reduced efficiency, with a great likelihood that twenty years hence the work will have to be reformed. Thus Tunstall adopts a feeble precipitation system dirtily carried out. Burslem, the next town, adopts irrigation at very great and unnecessary cost, almost sure to be reformed in future years. Then Hanley has its own independent precipitation scheme of some kind, which will be burdened with sludge; whilst Stoke-on-Trent, at every meeting of the Council for years past, has oscillated between irrigation, or filtration, or precipitation, or a jumble of all, one meeting undoing what the last meeting settled, whereas one main drainage along the River Trent, and one outfall would have cleansed the pottery towns for all time and at far less cost in the end. But the towns flinch from doing the simple problem of arithmetic in settling among them the proportions of the cost!

Mr. Cresswell thinks there is a ray of light in the darkness afforded by the Bill lately before Parliament for the constitution of County Financial Boards, or local parliaments in every county. Alas! this Bill never passed, and even if it had, I doubt if it could deal with a river passing through several counties like the River Trent. Each county would have to agree with several others in establishing one conservancy. The Trent begins in Staffordshire, passes into Nottinghamshire, then Lincolnshire, and gets to the sea in Yorkshire, collecting eighteen other streams, besides several tributaries.

The House of Lords, on the 23rd of March, 1877, appointed a Select Committee to enlarge the powers of authorities over drainage and river navigation, "so as to provide more efficiently for storage of water, the prevention of floods, and the discharge of other functions." The Committee consisted of the following most qualified members to judge on this subject:—The Duke of Richmond and Gordon (the Lord President), the Duke of Bedford, Duke of Northumberland, Marquis of Salisbury, Marquis of Ripon, Earl of Sandwich, Earl Cowper, Earl Stanhope, Viscount Eversley, Lords Monson, Vernon, Stewart of Garlies, Meldrum, Ker, Penrhyn, Somerton, and Winmarleigh. The Committee passed a unanimous report. They "entirely concurred with the witnesses that to secure uniformity and completeness of action in dealing with each river, each catchment area should, as a general rule, be placed under a single body of conservators, who should be responsible for maintaining the river, from its source to its outfall, in an efficient state," and are of opinion "that the Conservancy Boards should be enabled to execute the powers for the prevention of the pollution of rivers, conferred on local authorities by the Rivers Pollution Act."

Purification of rivers is obviously connected with supply of good water, and both are connected with the proper preservation of water, and all should be under one authority.

Until public opinion emboldens the Government to adopt this wise principle, so authoritatively recommended, that a whole river shall be under a single authority, and enforce it, I throw out for the consideration of the Institute the suggestion if commercial principles may not be applied at least to initiate a system of helping the purification of a whole river from its source to the sea. Commercial companies were formed to establish and work railways, and supply gas and water. If commercial companies had not been formed to provide railways, when would they have been started by our Government in this free country, which only follows public demands cautiously? Constitutional Governments do not originate measures.

A public company might be formed to manage the purification of the Trent on the best known scientific principles, with far greater economy and efficiency than the many towns, each by itself polluting the Trent, could do it. Such a company might deal not only with the sewage, but with manufacturing refuse of all kinds.

We may hope that the letter which the Prince of Wales addressed to the Society of Arts, as its president, on the National Supply of Water, may start public investigations into the catchment basins of rivers,—inquiries that will have useful connexion with the purification of the rivers. In the meantime, let private enterprise try what can be done, until Government, as with telegraphs and local intelligence, has ripened up for universal action in treating water sewage.

* By Sir Henry Cole, K.C.B. Read at the Stafford Congress of the Sanitary Institute, October, 1878.

Questionable "Mortar."—At the Edmonton Petty Sessions last week, Frederick Bryen, builder, was fined 5*l.* and costs for using mortar on buildings in Tottenham which had not been approved by the Local Board of Health of the district, as required by a bye-law of the Board, framed in accordance with the Public Health Act, 1875.

THE HIGH-LEVEL BRIDGE QUESTION AND STATE OF METALLIC BRIDGE ARCHITECTURE.

Sir,—Allow me to thank you for the insertion (on the 14th ult.) of my letter respecting the proposed Tower Bridge. I assume your willingness to afford me an opportunity of showing that the art and science of wrought-iron (and steel) combination in relation to bridges are in a crude and unsatisfactory state. But in order to exhibit the scope of my views, and, as nearly as possible, bring your readers to the same point and scope of observation, I must beg your permission to make some general remarks connected with the subject. Some forty years ago, George Stephenson enlightened Dr. Buckland with the truth that the passing railway train they were observing from Tapton House was being driven by sunshine that had been "bottled up" in a pre-adamite age. Since then Dr. Joule has demonstrated the equivalence of mechanical force and heat; and shown us that they are, as Emerson says of cause and effect, "two sides of one fact." But there is another truth which I am not aware that particular attention has ever been drawn to, which appears to me little less interesting to the philosopher and valuable to the mechanician: and specially so, to ship and bridge architects. The appellation I will give (till a better is found) to the truth or idea I mean, is "The advantageousness of banking strength in structures for resistant purposes to the extent of their capacity." Such banking, looking at it from the broad interest of humanity (not with the squint eye of swinish speculation, or the contracted vision of a to-day's economy), is, I submit, capable of yielding a profit that does not accrue from either of the two beautiful truths before mentioned. The one-pound-power of sunheat that was stored in a tree beneath whose shade juvenile mammoths gambolled, is to-day only a pound of power that, like a shilling, can be spent no more than once. But in a ship or bridge (and many other things), from the steam-engine, hydraulic or screw-jack, the human arm, and other means, weightless power may be transferred, absorbed, and fixed. Speaking roundly, 100 lb. of power employed for an hour would endow a fabric with a pound of power of resistance that may be used thousands if not millions of times over. If "cast upon the waters" in the building of a ship, compound interest as well as capital expended in that weightless strength may be found amid the fury of a storm, and the "bread" of life returned "after many days" in the form of a literal fifty years. I believe it is quite possible to reduce the loss of life and property by ship casualties at least half, consistently with a broad economy.

Please to grant me here, Sir, the digression of stating that, though my present subject is bridge improvement, I regard ship improvement as of more than tenfold the importance; and that if I should prove able to contribute to the former, I purpose to use the status thus acquired for obtaining attention to my views on the latter.

Next to ships, I contend it is desirable that all possible strength should be put into bridges. The late Sir W. Fairbairn identified himself with such principle in claiming credit for increasing the rate of strength of girders by altering their forms; speaking of such improvements, he says (p. 93 *),—"They are not only highly interesting in themselves, but involve practical considerations of deep importance in relation to the future interests of civilised society." I submit, then, that any bridge-architect who is content to copy the designs of his predecessors, with no more of originality than consists in making a coat of a given pattern in fine cloth for a large man, instead of making it of coarse cloth for a small man, with mere adaptation, must have a very inadequate idea of the claims of his creative noble profession, and the duties of its members. Before determining upon a design (for any work of magnitude involving deep science), surely the architect ought not only to read the best written books upon the subject, but, remembering that,—

"To the solid ground
Of Nature trusts the mind which builds for aye,"

take also the book of Nature in hand, and setting his phrenological No. 9 to work, till it swells and feels as if it had been punched on both sides, "leave no stone unturned" to try and discover if anything that has hitherto been done can be altered with advantage. To evade the obligation of thus tasking ourselves is to live ingloriously upon dead men's brains, and only exercise our own in that talent which Bacon calls "left-handed wisdom."

My first argument is the introductory one of putting Fairbairn himself in the box, as a witness in favour of a further, full, and, as far as possible, exhaustive inquiry upon the subject. At page 145 he says:—"Our knowledge of the properties of wrought-iron beams and girders may be considered as still very imperfect, and confined within an exceedingly narrow compass." And in his opening remarks, Part IV., speaking of bridges, he says,—"Surely, then, every improvement and every new application, which increases our power of contending with the irregularities of the earth's surface, is entitled to the most careful consideration of the philosopher, the engineer, and the community at large."

When I framed the question,—"Is the art and science?" &c., I purposed to discuss, first, the artistic form or architectural character of existing styles of iron bridges. But I now think that it will be best to begin with the more strictly scientific, or combination and utilitarian, part of the question; because, if the present forms are the most economical and useful possible (or it cannot be shown that they are not), the question is reduced to this,—How much material and money shall we waste or expend merely for taste and appearance? For, I trust, obvious reasons, I must decline fully describing here my plan of bridge; but I shall describe its outlines and some other particulars for comparison with Sir J. Bazalgette's plan. The first practical point of the subject I will notice is the strength of the steel of Sir J. Bazalgette's proposed bridge. In an article lately upon the subject in the *Morning Advertiser*, it is stated that four steel arch girders would each be of the *required* weight of about 640 tons, "while an iron girder *would be* 1,600 tons." It is put "800 ft." span, but whether 800 ft. or 850 ft. is meant does not much affect the argument. At the above reckoning, the saving of weight in the girders alone would be 3,840 tons. If we say 160 tons saved in other steel parts, we have 4,000 tons total reduction. I will assume that the weight of all the metal contributing to strength is 5,000 tons; that of paving and all other materials not contributing to strength is 2,500 tons, making a "permanent weight" of 7,500 tons; and that the load is estimated at 2,500 tons: we then have a total of 10,000 tons; margins of strength being equal in both cases, the weight, if the girders were iron, would, of course, be 14,000 tons; so that the *rate* of strength would not be as it appears, 2½ times, or steel 250, iron 100, but only tenfourteenths of 250; viz., 171·2 steel, 100 iron. I will give steel the benefit of reckoning its strength 175, or seven-fourths of the strength of iron, and upon that basis let us see about what the quality is of the steel intended to be used for the Tower Bridge. Fairbairn (p. 217) tells us that by four-line chain riveting he obtained 24·4 tons to the square inch, "*nearly* equal" to the strength of the "solid plate." I have also a printed report of a set of experiments upon boiler-plates at the Testing Works of Mr. Kirkcaldy, Southwark-street, London. The *mean lengthway* tensile breaking strain was (per square inch) annealed, 50,466 lb.; unannealed, 53,405 lb.: so to "keep within compass" *in relation to the argument* I will call the lengthway strength of iron 25 tons or 56,000 lb., seven-fourths of which would be 98,000 lb., or 43 tons 15 cwt. I venture to assert that steel of only such strength is of a very poor quality. I would use steel that would have as great a rate of advantage over the steel proposed to be used (according to the *Morning Advertiser* writer) for the Tower Bridge as that steel has over wrought iron. I admit the steel so intended is probably of as strong a quality as it is expedient to *punch* rivet-holes in, but that does not prove that such punching is the best possible plan of either steel or iron combination. I propose to use a cast steel having a strength of 100 tons to the square inch. And as some may think this too high a calculation, I appeal to the following evidence to show that it is not an extravagant one. In "Chambers's Information" we are told, in a paragraph upon tenacity, that steel wire of a hundredth of an inch diameter has a strength of 134 lb., which is at the rate of more than 761 tons to the square inch,—more than 7½ times the rate of strength I propose to use. And when I say that (exposed to tensile strain) I intend to use steel plate not exceeding a quarter of an inch in thickness, and steel rod not exceeding a seventh of a square inch in area, I think it must be admitted that there is nothing unreasonable in my expectation of such calculation being realised.

I will next endeavour to show that the rivet system of combination does not and cannot develop the strength of iron (or other material) within a very considerable percentage; and that it is a system having several objections. Unfortunately, Fairbairn does not give us (at least I have not found it) the proved or calculated transverse strength of a simple wrought-iron girder of equal breadth throughout the depth; so I must do the best I can without. He gives (p. 74) 472 lb. as the centre or transverse mean breaking strain of 1 in. square bars of Low Moor cast iron (No. 2) on a span of 54 in.; and at p. 78 he gives 15,458 lb. as its tensile breaking strain, so that the transverse strength is (at 54 times length to depth) to the tensile as exactly 1 to 32·75. The lightest proportioned tubular or box-girder bridge I have met with in Fairbairn (p. 227) is one of 300 ft. span; the permanent weight of which is 1¼ ton per lineal foot, and also 1¼ ton rolling load per lineal foot; how much of the permanent weight is ballast and other material not contributing to strength is not stated; and so I am obliged to strike an average of half a ton, which appears about fair; for it must be admitted that transverse girders and ties do contribute to strength. So we have an average of a ton of wrought iron to the foot of length—300 tons. As the centre is thicker in the flanges, and more than mean depth of the whole bridge, I reckon its section at a *mean*, not the *actual*, sectional area, at the rate of 25 cwt. in lineal foot, which would, at Dempsey's rate of 440 lb. the cube foot, give 911 in.

But I must halt, having yet to beg a postscript, and hope, with your kind permission, "to be continued" in a third letter. C. G.

P.S.—I have read with much satisfaction Mr. Matheson's letter in your number of the 21st ult., corroborating so fully, as it does, the opinions expressed in my first letter to you, published in the *Builder* of the 14th ult. I feel personally obliged to Mr. Matheson for his exact information upon up-hill haulage, if it is (as I have no doubt) well founded. If then (as Mr. Matheson states) the expenditure of force on a smooth straight hill of 1 in 40 is 86 lb. to 30 lb. on a smooth, level road, I think we may safely reckon that it would be 20 lb. additional on a spiral curve of the same gradient, making a total of 106 lb.,—fully three-and-a-half times the labour of a smooth level road of the same length. If we accept Mr. Hanson's statement at the Common Council, on the 2nd of May last, that the length of the spiral road would be 714 yds., and measure the length by the multiplied force of three-and-a-half,—the direct distance of 500 ft. from the water side to the approach terminus,—we get 7,497 ft. And after deducting the 500 ft., there is a dead loss, as on a level road, of 6,997 ft., or nearly a mile-and-a-third; measured by time to a vehicle going at nine miles per hour, it is equal to a detention of eight-and-half minutes; to a vehicle going seven miles per hour, a detention of eleven minutes; at five miles per hour, a detention of over fifteen-and-a-half minutes. Taking the average at eleven minutes, my lift plan, already mentioned, would only be half as much loss of time.

Mr. Matheson, agreeing with me in the expediency of a competition of designs, says,—"The competition either to be open to every one," "or let a certain number of the leading bridge engineers of the world be invited." "Open to every one," I emphatically say. It cannot do harm, and may do good. Last week I mentioned Paxton. Pardon my reminding Mr. Matheson that the Exhibition Commission was a Babel of profitless babble till a gardener came to the rescue. It, too, should not be forgotten that the only time that Lord Palmerston what is called made a fool of himself in Parliament was when, through believing in the infallibility of the magnates of 25, Great George-street, he made himself their mouthpiece, and told the House of Commons that the Suez Canal was impracticable. As an English artisan, I protest against the faith and doctrine of the all-sufficiency of one or a thousand "guinea-stamp" C.E.s.

"A man's the gowd for a' that."

If other instances were not almost "as

* See "Fairbairn on the Application of Iron to Building Purposes," including a "Treatise on Wrought-Iron Bridges." Which work is always referred to by the writer in connexion with the name.

lentiful as blackberries," "Watt" we know of ie progress of the steam-engine is a proof to ie contrary. I submit that from the days of olumbus, at least, but few brighter mental ars have ascended to the empyrean of human ntellect than those which have risen from the anks of labour; and that a history of science in eneral, or of engineering in particular, in which ey were unmentioned, would be a good deal ke a celestial globe with the signs of the diac left out. C. G.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

A special general meeting of the subscribers nd friends of this Institution was held at the ffices, 27, Farringdon-street, on September 24, Ir. Thos. F. Rider, president, in the chair, when Irs. Hannah Wade was duly elected a pensioner n the funds, and a resolution for increasing the nnual pensions from 20*l.* to 25*l.* for men, and rom 15*l.* to 20*l.* for widows, was carried almost nanimously.

"Previously to the passing of the latter resolution, Mr. Rider aid, "In urging this proposed increase in the pensions, wish particularly to point out the greatly increased cost living since your Institution was established ten years go, and that the Builders' Benevolent Institution, upon he model of which your own was formed, have recently aised their scale of pensions upon the same ground. I ardly know whether the fact of our having only one candiate for the vacant pension, who has this evening been lected, is a subject for congratulation or not. On the one and it may prove there is not much destitution at the resent time among builders' clerks, or it may prove, as I ore fear is the case, that your Institution is not sufficiently nown throughout the trade to bring before us all the cases ligible for the assistance we have so much satisfaction in ving. Your treasurer reminds me that it is no part of the ity of an institution to seek for candidates, but to attend o the relief of such as seek its aid. Still I am very desirous at this Institution should be known in every builder's ffice in London. I am well aware that the increase in the mount of pensions will necessitate increased exertion on ur part to provide the funds to meet it, but I would not ive you at all timid on this point. Attend well to the lief of the necessitous, and you will have a strong case appealing for new and increased subscriptions. I notice e same occurs in your Orphan Fund, and that there is dy one candidate for the presentation you are about to urchase in the Orphan Working School."

At the close of the meeting the following onations were announced:—Mr. T. F. Rider, 0*l.* 10s. (and 1*l.* 1s. annual subscription); Mr. . S. Rider, 5*l.* 6s.; Mr. Charles Kynoch, 5*l.* 5s.

ELLESMERE, SHROPSHIRE.

A new college is to be built near Ellesmere, s briefly mentioned in our last, on a site secured n easy terms from Earl Brownlow, commanding magnificent view of the Welsh hills from the ale of Llangollen to the mountains near lanymynach. The college will be in connexion ith that of St. Nicholas at Lancing (Sussex), nd is intended (like that at Ardingley in ussex) for the middle classes of the district. he school will be a boarding-school for 500 ys. The buildings are to be commenced at ace, from the designs of Messrs. Carpenter & ngelow, the college architects, and will eventuly include chapel, dining-hall, with crypt nder (to serve as a temporary chapel), offices, chool-rooms, and class-rooms, with dormitories nd day-rooms, and masters' blocks of rooms. nd separate houses for the head and second asters, with dormitories attached to them. The aterial will be local bricks, with dressings of efn or other stone, and mouldings of Ruabon ricks. The cost is estimated at about 50,000*l.*, nclusive of all expenses.

ON "SHAMS."

Sir,—It would seem, then, that when a agic actor "dies" upon the stage, he really es die; that when he performs, acts, or imics Julius Cæsar, he really and truly Cæsar; and also, that when a painter paints flesh" and "cloth of gold," and the sapient itics stand round the picture, and fancy emselves Sir Oracles in exclaiming "marvelus!" the painted "flesh" and "cloth of old" are also the real things, and not "shams." ow, your supersensuous art-being calls a piece either good marbling or of good graining a sham," but the "flesh" and the "cloth of gold" arvellous work, when the only difference beween the two is a difference of degree, and not kind,—that the one is much easier to do an the other. Truth in art is a relative truth, a truthfulness in relation to the object which shams, mimics, or portrays. The *ideal* in art a truthfulness to the abstract conception, and not to the accidents, the individualities, of nature. The artist who aims at abstract truthfulness is he who "shams" wisely.

"Shamming" is a good word,—an exceedingly good word,—a word which was used with a suppressed fund of mirth behind it,—which was used, indeed, unreservedly to children who feigned sickness, sleep, &c., or to grown people assuming without *mal prepense* various characters and moods. But the morbid critic has now done his worst to begrime and blacken it. We do not call base coin "sham," but either spurious or counterfeit. I believe that I am perfectly justified in applying the word "sham" to the mimicry and feigning of pictorial and dramatic, and the "romancing" of literary art. Your modern critic appears unable to separate the innocent "sham" from that immoral counterfeit which is intended nefariously to deceive. His notions upon art are in inextricable confusion; he does not even understand the manifold changes in the signification of the word "nature" which he is continually bandying. My last letter covers the whole ground of the matter, in so far as a single letter can, in a general way, do so. And if that be attentively and coolly read, I believe it will be found to contain the principles of art in a nutshell, and also what your correspondents, in those points on which they are right, only reiterate. My views are not the reaction from one extreme to another, but aim at rightly dividing the truth, and at unmasking nonsense in a serious garb.

Popular sayings often contain a world of truth. That,—that "beauty is but skin deep," is no exception. All that is *real* in pictorial and plastic art lies on the surface, and this superficial *reality* is more valuable than silver,—ay, than fine gold. The truth and the reality of art consist in its being conformed to the taste, the judgment, of the highest human nature. This constitutes the real gold, in comparison with which gold itself is but tinsel and counterfeit, and other things but leather and prunella. When fine taste rather than much gold and quantities of silver shall be the criterion of social status, it will be well for art and for England.

I was not aware, till I received last Saturday's *Builder*, that I had been disturbing the even tenour of these exemplary pages by using "bad language"; that I had had the audacity to call some one or something a parallelopipedon, as O'Connell once did an old crone in the Emerald Isle. The language of Truth has always been considered abominable language by conservative Error. In fact, its piercing sharpness has, from time immemorial, been regarded as pestilent "heresy." But for such language there is no occasion to apologise to the editor of the *Builder*. Meter.

IMPENDING CALAMITIES.

Sir,—A favourite occupation of mine while walking about in the corners of the old City of London is to watch the old houses, and notice how they stand their years and the changes that modern enterprise has brought about. Railway companies usually choose, where they have a choice, some crazy, ramshackle property, infested with courts and alleys, and demolish them in a summary and satisfactory manner. But how about the property on the edge of their clearings? My remarks at the present time have reference to the neighbourhood of Clifton-street and Sun-street, Finsbury. The property here is for the most part very old, and somewhat tottery. When the end house of a row is taken down, the next two or three mostly shift a little towards the gap, and old houses, like Humpty Dumpty, cannot be set again as they were before. In some of these houses, which look healthy and strong enough outside, I have no doubt the walls are dropping, the ceilings cracking, the windows rattling, and the doors refusing to shut, or being shut, refusing to open. The floors are quite out of level, and when the trains rush along, or the heavy wagon traffic lumbers past, the houses tremble as though they were going to collapse. These facts I know, partly from trustworthy information, and partly from actual experience, and if some steps are not taken to provide that this property does not fall down, we shall have to chronicle another appalling accident. People live and do their business in these places, and those who depreciate their property and jeopardise their lives ought to be instructed that they have not done everything possible to be done when they build and see to their own premises. That some of these houses are absolutely unsafe I know, and every one of them should be examined by a surveyor at once, before they have time to collapse, and bury their occupants in the ruins. A Citizen on Foot.

*** A note to the District Surveyor would lead to the required survey.

A WORD TO TRADE UNIONS.

I am an advocate for men uniting to secure a fair reward for their labour; to assist each other in acquiring knowledge; and, if need be, to resist the oppression of masters who make unreasonable demands upon those they employ; and, if they have it in their power, men ought to aim to secure to themselves the advantages arising from the increase of wealth which become their due. But I am sorry to say that there seems to be a spirit manifesting itself, which shows a want of knowledge of the history of times gone by, and which have been condemned as oppressive times. Of late years tyranny in any form has been regarded as disgraceful, while liberty and equality are professedly sought after. We have passed the time when men were put to death and otherwise punished because they would not conform to the Established Church. The times are passed when tradesmen could not carry on their business unless they belonged to some company. And why? Because men have become wiser, and, therefore, more self-dependent and generous. But I find we are being carried back to bygone days, to days of tyranny and persecution, by means of certain rules of the trade unions. A master employs without distinction a number of men. Some are members of trade societies, others not. For a time they work together amicably, but when it suits their purpose, the unions demand of their members to come out from the employ, unless those who do not belong to their society choose to become members. When I first heard of this rule, I was in conversation with a mason who told me that such was their custom. I felt as if I had been transported to a country of savages, and said to him, "Then that is abominable tyranny." But I now know that it is done, from facts, and I urge upon those who make the rules to rescind such as these, for they disgrace whomsoever become members of the society. Every man has a right to his own opinion, and no man has a right to oppress his fellow. Charitas.

YORK MINSTER.

The work of restoring the exterior of the south transept of the Minster is (according to the *York Herald*) making satisfactory progress, but, owing to the great amount of carving, and the pains taken in its execution, and the fixing of the stone work, it will be some time yet before it is finished. The stone used in the restoration is brought from near Tadcaster, and is known as Jackdaw Cragg stone. Nearly the whole of the Minster is constructed of the same kind of stone, so that in respect to material the new portion of the south transept will be in keeping with the general building. The stone is a magnesian limestone, and some of it is very difficult to work, but it is considered very durable, and thus repays the time and labour which is necessarily expended on it. The quarries from which it is obtained belong to Mr. J. Smith, Tadcaster, and until recently were the property of Lord Londesborough. The east aisle was completed about a year ago, and the west aisle has been proceeded with as far as possible at present. The central aisle of the transept is now undergoing restoration, and it is calculated that it will be completed in about eighteen months. Four new octagonal pinnacles have been added to the east and west aisles. The carving has been entrusted by the architect to Mr. G. Milburn, Stonegate. Mr. G. Bradley is clerk of the works.

Our supposition as to a certain report was correct. Sir E. Beckett, in a letter addressed to the *Herts Advertiser* of the 28th ult., says:—"Let me add a line on a very different subject, or it may be thought that, as I am writing, I acquiesce in a wonderful paragraph which you copied from the *Athenæum* last week, that I have been appointed architect for the further restoration of York Minster instead of Mr. Street. It is a mere piece of nonsense. It oddly happens that the Minster is the only church in that diocese over the alterations of which I have no jurisdiction

as Chancellor thereof. If I had, I should certainly not have allowed the alterations he has made there under his favourite pretence of 'Conservative Restoration.'"

TRAMWAY SLEEPERS.

Sir,—The letter in your impression of the 21st of September, from "F.," is perfectly correct as to the quality of the sleepers used in the construction and repair of some of the London tramways. It is the most defective portion of the whole system,—a grievous evil, and the cause of continual annoyance to the public, by reason of unnecessary opening up of the public way on the company's lines. I have scores of times seen the paving disturbed in order to refix loose metals, and it has in nine cases out of ten been found that the sleepers have rotted, and allowed the dogs (that should hold the metals) to draw from the sleepers, because of the rottenness of the timber; whereas, had they been properly pickled, or hard-wood sleepers, such would not have been the case.

Granite paving, when well rammed on a solid concrete bottom, will remain in good order for a considerable time, and when disturbed for relaying, seldom finds its level with the adjoining paving as well as when first properly laid; but, owing to this false economy in the preparation of the sleepers, the pitching has to be taken up in hundreds of places annually, and the result is the pot-holes that are to be found along the lines of the existing tramways; but still this neglect continues.

The numerous cross-overs with which the tram-roads are provided would be materially lessened if it were compulsory on the company or their contractors to use nothing but good pickled or hard-wood sleepers, as they would not be required were it not for the numerous openings for repairs which defective sleepers are the cause of, thereby rendering it necessary for the cars to be dragged from one line to the other, because their line in consequence of these unnecessary repairs is so frequently impassable.

The attention of the Metropolitan Vestries should be turned seriously to this subject, and no doubt would be if the cost of these repairs were on their shoulders; but as this is not the case their interest seems to cease, because it is only a public inconvenience, and does not touch the pockets of the ratepayers whom they represent.

I speak in this matter from practical experience and not from mere casual observations, and can vouch that the use of "simple yellow deals without any preparation against decay" is the cause of more than half the openings so unnecessarily made in our London tramways.

G. W. B.

SANITARY FITTINGS.

Sir,—With reference to a paragraph in your paper relating to "Paris Exhibitions Awards," I am pleased to be able to inform you the efforts I have made for the improvements of sanitary and other appliances necessary to health and comfort have been again recognised by the jury, who have adjudged me the only silver medal (the higest award) in class 66.

The sanitary arrangement and fittings of the pavilion of H.R.H. the Prince of Wales, and of the offices and private apartments of the Staff of the Royal Commission, were entrusted to me, the whole having, up to this time, given the greatest satisfaction.

As *apropos* of your recent description of the Palace Hotel, San Francisco, you may not object to my telling you that 550 of my patent valve-closet and trap in one piece were put up there, and I enclose you a copy of a letter received from the manager of the hotel, in reply to an inquiry I sent him, showing the entire satisfaction they have given.

The fact of these closets being so largely used and favourably spoken of in the "States" is also interesting, taken in connexion with your review of an American work on "House Drainage," &c., in another column.

George Jennings.

White Tiles. — We have received from Messrs. W. T. Copeland & Sons some samples of white tiles, very suitable, we think, for internal and external decoration. They are "hand-made," and consequently better able to stand the test of weather. They are glazed, but not disagreeably shiny. The manufactory is at Stoke-upon-Trent, Staffordshire.

A CONCRETE MIXER.

Messrs. Day & Lampard have patented a concrete mixer. It consists of a wrought-iron box, whose transverse section is somewhat in the shape of a cross. To one end of this box is secured a circular plate, with an opening in the middle, through which opening the machine is fed, and the circumference of this plate is turned, forming a roller path, upon which the box rotates on a series of rollers. At the other or open end of the box is a cross whose arms at their ends are bolted to the sides of the box, and in the centre of the cross is fixed a wrought-iron shaft; the other end of this shaft runs in a bearing. The action of the machine, which is simple, is as follows:—

The materials for forming the concrete are fed into a shoot either by hand or by crane,—a sliding door being partially opened; the machine tipped to any desired angle and set in motion; a continuous stream of well-mixed concrete is then turned out, and no stoppage of the machine for either filling or emptying is required from morning till night. Should it be desired to mix concrete in charges, the mixer is filled as before but with the door closed, and when a sufficient number of revolutions have been given, say ten or twelve, the door is slidden back, the machine tipped, and the concrete is discharged in a mass.

The machine is said to be capable of mixing over 100 cubic yards of concrete a day, of a quality superior to the generality of that made by hand.

ROMAN CEMENT.

Sir,—I have just made a fountain with space for flowers in outer edge with Roman cement and part sand: I find it sweating through the pores. As it is made in a conservatory with boarded floor, I think it will soon rot the floor. Are there any means of stopping the pores in the tank without destroying the fish? And will the sweating soon make it fall to pieces?

J. S. S.

"MAY DIFFERENCES OF OPINION NEVER LESSEN FRIENDSHIP."

Sir,—Herewith I send list of tenders for the West Pier Extension, Shoreham, Sussex:—

Goodenough	£8,410 0 0
Marshall	6,000 0 0
Bail & Gammon	4,780 0 0
Hayter	3,760 0 0
Harrison	3,592 6 0
Hill & Co.	3,431 0 0

A comparison of the above will be much more instructive than any remarks I can offer.

A Competitor.

WHERE IS THE CITY TEMPLE?

Sir,—In order that there might be no mistake as to the locality of this building, an inscription has been drawn up, and, no doubt, examined and approved by all the proper authorities, cut on a costly marble tablet, and fixed in the vestibule, as is duly recorded in your paper for Sept. 21st. We have, by these means, the evidence of the writer, the marble mason, the authorities aforesaid, and the gentleman who paid the bill, that the City Temple is situate at "the south-western end of Holborn Viaduct," for surely none of these would have lent themselves to a misdirection which might turn the stranger out of his way.

Yet, if the stranger goes thither he will find,—firstly, that the City Temple is nearer to the middle than the end of the Viaduct, between which and it a large church and a row of houses intervene; secondly, that the Viaduct does not in any part of its length run to the south of west, but more or less to the northward. Indeed, at the spot where this building stands it runs (by the map, and as one might suspect from looking at the church) considerably to the north of west, say rather more than W.N.W.

I have never quite believed that the celebrated definition of a crab as "a red fish that walks backwards" was more than a joke. Now, that or any other combination of blunders seems possible. Thos. Blashill.

STREET IMPROVEMENTS IN THE PROVINCES.

Newton Heath.—At a meeting of the Newton Heath Local Board on the 26th ult., a letter was read from the Local Government Board, acknowledging the receipt of the clerk's letter in reference to a proposed loan of 7,500*l.* for works of private street improvements, and stating that before deciding upon the application they would direct a local inquiry to be held by one of their inspectors.

Derby.—A new street, to be called "The Strand," is about to be opened out by Mr. Councillor Woodiwiss, from St. James's-street to Sadler-gate Bridge, and rescued, so to speak, from the site of what was not long ago an uncovered and stinking brook-course. The laying of the memorial stone of the buildings opposite the Post-office, and the naming of the new street, took place on Monday last.

Liverpool.—It has been decided by the Improvement Committee of the Liverpool Town Council to recommend that body to obtain authority to widen a portion of Dale-street, to widen portions of other important streets, and to extend the North Haymarket. The Committee propose to borrow 300,000*l.* from the Local Government Board for the carrying out of these improvements.

Manchester.—It is stated that alterations of an extensive character will shortly be carried out by the Manchester Corporation in Spring-gardens and the neighbourhood. The street will be widened in several places so that there may be a uniform frontage, and arrangements have also been made for the closing of Sickle-street, and the formation of a street leading from Milk-street to Market-street.

DOCKS, HARBOURS, AND PIERS.

Shoreham.—The Shoreham Harbour Trustees met on the 23rd ult., to receive tenders for the works connected with the extension of the western pier. It was reported that six tenders had been received, and these varied from 8,410*l.* to 3,431*l.*, the latter being sent in by W. Hill & Co., of Gosport, which the General Purposes Committee recommended should be accepted. The recommendation was adopted. Mr. A. M. Rendel is the engineer.

Macduff.—On the 27th ult. the new basin of Macduff Harbour, a work which, together with numerous alterations and improvements, has been in progress since January, 1876, was publicly opened. The new basin, which was formerly an outer harbour for boats only, is enclosed by substantial piers, and covers about an acre.

Plymouth.—At a meeting of gentlemen interested in the formation of a new pier at Plymouth, for which a provisional order was obtained last session, it was resolved to build a pier, promenade, and concert-hall, from the Hoe into the Sound, at an estimated cost of 50,000*l.* A portion of the capital was subscribed in the room, and provisional directors appointed to carry out the scheme.

Harwich.—Extensive works are being executed at Ray Island, for the Great Eastern Railway Company, by Mr. Ridley, contractor. Ray Island, hitherto comparatively unknown, would seem destined to be the centre of trade in the district at no distant period, for it is to there, it is said, the traffic of the Great Eastern Railway is to be removed, and it is estimated that the works will be sufficiently far advanced in eighteen months' time to admit of the steamers discharging there. The company's engineers have been engaged at Ray Point in taking soundings for a pier. Perhaps (according to a local paper) the greatest difficulty which has to be overcome is the building of a sluice water-way at this point; and after this has been accomplished the sea-wall will be extended to a point where a junction with the railway will be effected in the neighbourhood of the Dovercourt Cement Works. At the present time there is more than a mile of impprovised railroad connected with Ray Point at one end, and with the cutting in the rising ground at the other end. The earth required for the purpose of forming the sea-wall is obtained from this cutting by the "steam navvy," recently described in the *Builder*, and conveyed over the metals in trucks drawn by an ordinary shunting engine. The cutting at its greatest depth will be about 53 ft., so that as only 28 ft. have been dug out at present there is plenty of work to be done. It is not, as some suppose, to be converted into a railway when completed, but into a roadway connected with the dockhouse and Upper Dovercourt. The railway will pass round near the sea-wall, and have a junction with the Harwich branch line near Wrabness. It is expected that it will take three years to complete the undertaking, and the amount of the contract is 10,000*l.* Mr. Abernethy is the engineer, and Mr. Eckert is clerk of the works.

Architecture at University College, London.—The lectures on Architecture and Construction, by Professor T. Hayter Lewis, F.S.A., will commence on October the 8th. There will be two courses as heretofore,—Construction and Fine Art.

SURVEYORSHIP ITEMS.

Gorton.—At the meeting of the Gorton Local Board, on the 26th ult., the resignation of Mr. B. Bell as surveyor to the Board was tendered by that gentleman, owing to ill-health, and accepted; and the salary of a successor was fixed at 250*l.* per annum.

Sunderland.—At a special meeting of the committee appointed by the Sunderland Town Council for the reorganisation of the engineer's department, to consider the applications for the office of out-door superintendent to the Sunderland Corporation, the following twelve were selected for personal interview from seventy-five applicants:—William Naisbet, Felling; William Lawson, Middlesbrough; R. J. F. Carter, Monkwearmouth; John Donkin, Leeds; R. H. Howgood, Carlisle; R. C. Forster, Gateshead; C. H. Holt, Houghton; John Williamson, Gateshead; H. H. Hall, Harrogate; Thomas Alderson, Annfield Plain; R. Stafford, Sunderland; F. E. Thorwald, Ornsly. At a meeting of the Town Council on the 25th ult., the committee presented a report in which they recommended that Mr. Rounthwaite, head draughtsman, be appointed assistant surveyor, at a salary of 150*l.* per annum. The recommendation was agreed to. The committee also recommended that Mr. Thwaites, the Borough Engineer, have authority to appoint a draughtsman in the place of Mr. Rounthwaite at a salary of 120*l.* a year. Mr. Preston proposed that this be passed, and mentioned that a young man had been obtained, and was in the office on three months' trial. Mr. Wadsell asked by whose authority the young man was in the office, and by whom would he be paid. Mr. William Bell moved as an amendment that they advertise for a draughtsman for his post. The Council had appointed men by this mode hitherto, it had worked well, and, without saying an unkind word of the engineer, he thought they should engage their servants themselves. After some further discussion, Mr. Bell's amendment to advertise was carried by seventeen to sixteen. It was agreed that Mr. George Hamble's (engineer's assistant) salary be increased to 100*l.* a year. The appointment of an out-door superintendent was then proceeded with, the voting being for R. Stafford, twenty-seven; R. H. Howgood, eight. The name of Mr. R. C. Forster was also on the paper, but no votes were recorded for it. Mr. Stafford was therefore elected.

Southend.—At a special meeting on the 20th ult., the Local Board went through the seventy-eight applications for the office of surveyor and inspector of nuisances, and decided that each member should write down six names which he thought best, and it was resolved that the three highest of the selected candidates should attend a subsequent meeting of the Board. Those elected were Mr. Harrington, Rochford, ten votes; Mr. Abron, of Ryde, Isle of Wight, eight votes; Mr. Loch, of Chelmsford, seven votes. The Board met again on the 25th ult., when the voting (by paper) showed the following results:—Mr. Harrington, nine votes; Mr. Abron, two; Mr. Loch, none. It was then resolved that Mr. Harrington be appointed surveyor and inspector of nuisances, at a salary of 150*l.* per annum.

Sevenoaks.—Mr. Pain has resigned his position as assistant surveyor to the Sevenoaks District Highway Board, and Mr. Wood, of Shoreham, has been appointed his successor, at a salary of 90*l.* per annum.

Darlington.—Mr. T. Smith has been appointed surveyor to the Corporation and Urban Sanitary Authority of Darlington.

SCHOOLS OF ART.

Maidstone.—The annual meeting of the Maidstone School of Art was held on the 25th ult., when Sir Sydney Waterlow, M.P., distributed the prizes won by the students during past year. The Rev. H. Collis then read the report, which stated that during the year about 404 drawings had been finished. Three pupils had obtained third-grade, and nine second-grade prizes, and at the Government examination fifteen students obtained eighteen certificates, three of them full ones. Regret was expressed at a falling off in the subscriptions.

Falkirk.—A new Science and Art School for Falkirk was opened on the 21st ult., by the Earl of Rosebery. The new building, which is two stories in height, has been erected in Park-street. It is designed in the Italian style,—its chief features being a pilastered doorway and a balcony with balustrades below a large double-light window on the upper floor. On the left of the lobby is a hall, 45 ft. by 30 ft. by 16 ft., where the elementary art classes will meet. This will give accommodation to from sixty to eighty pupils. The woodwork of the room, as of all the others in the building, is of light pine. The room will be lighted at night by four star-burners depending from the ceiling. On the right of the lobby are two science class-rooms, 24 ft. by 18 ft.; and to the back again is a lavatory and a small house for the janitor. The principal room on the upper floor is about 27 ft. square, and in it the study of the antique will be prosecuted. The ladies' painting-room adjoins, its dimensions being 27 ft. by 16 ft.; and in this flat are also a small modelling-room, an apartment for the head-master, and a class-room. In a wing to the back, to which access is had from the first landing, there is a room, 30 ft. by 21 ft., which is to be furnished as a chemical laboratory, and in which sixteen students can find working-places. Mr. Boucher, of Glasgow, was the architect.

LOCAL GOVERNMENT BOARD INQUIRIES.

Tottenham.—On the 27th ult. Mr. J. Thornhill Harrison, C.E., one of the inspectors of the Local Government Board, held an inquiry at the offices of the Tottenham Local Board of Health, with reference to an application made by that body to the Local Government Board to determine what is a reasonable cost at which a proper supply of water may be required to be furnished. It was explained that under the 62nd section of the Public Health Act, 1875, where, on the report of their surveyor, any Local Board came to the conclusion that any house within the district was without a proper supply of water, they could compel the owner or occupier to take a supply from the Board at a charge not exceeding twopence per week for every house so supplied. Application, however, could be made by the local authority to the Local Government Board, to determine what, under all the circumstances of the case, would be a reasonable charge. The Tottenham Board had ascertained that, in one portion of their district alone, eighty-nine houses were not supplied with their water, but obtained their supplies from wells. On complaints that the water in some of these wells was impure and injurious to health, the Board had samples analysed, the result being that the wells were condemned. Inasmuch, however, as the water-rate was 1s. 4d. in the pound per annum, and some of the houses having wells would be charged 2*l.* 2s. for water if calculated in the usual way upon the rateable value of the premises, while only the payment of 8s. 8d. could be enforced if the Board exercised their compulsory powers, they have delayed taking measures for closing all suspicious wells until they could charge more than 2d. per week for a supply. The inspector, after considerable discussion, said there could be no dispute as to pure water being a necessity, and the official analysis showed that the quality of the water supplied by the Tottenham Board stood very high. He did not believe wholesome water could be obtained from shallow wells, and he did not think 2d. per week was a reasonable charge for a proper supply of water. No doubt the Legislature intended to confine that small charge to cottages; but, as the Act stood, no more could be demanded, however large the premises, where Local Boards exercised their compulsory powers, unless the Local Government Board fixed some other charge. It seemed to him to be unfair to the great bulk of the population (who took the water and paid according to the amount of their assessments) to charge less, in certain cases, than was generally paid; but Local Boards had no power to compel the use of their water where a "proper supply" already existed.

Newcastle-on-Tyne.—On the 28th ult. Mr. Arnold Taylor held an inquiry, on behalf of the Local Government Board, into the proposed alteration of a site for the accommodation of 782 persons of the working class, from the area known as "Battle Field," to that known as "Miller's Hill," near the Ouseburn. Mr. Alfred M. Fowler, the borough engineer, gave evidence to the effect that Miller's Hill was the least expensive site, and was quite eligible for the erection of artisans' dwellings to accommodate 782 persons. The site contains 4,719 square yards; 4,070 square yards of the area were the property of the Corporation. The proposed site was about 200 yards from the Quay, and from centre to centre it was about 300 yards. It was 60 ft. above the Quay wall. They were now making a new street on the south side of the plot. This work was actively carried on at present, and if the Local Government Board approved of the scheme they would make the ground level for the erection of artisans' dwellings. Its highest point above the Quay would be about 90 ft. In answer to a question as to the cost of the respective schemes, Mr. Fowler said that 18,300*l.* was to have been the cost of the former one, and 16,650*l.* for the present. At the same time they were going to take down buildings which were not considered to be in a satisfactory condition, and make a new street. Dr. H. E. Armstrong, medical officer of health, testified to the salubrity of the Miller's Hill site, which was afterwards visited by the inspector.

PROPOSED NEW VESTRY-HALLS.

Battersea.—At a meeting of the Battersea Vestry on the 26th ult., it was resolved,—(1) That in consequence of the great increase of parochial work, the approaching expiration of the lease of the Lammas Hall, and the desirability of improved accommodation for the vestry and the various local Boards, it has become necessary that steps should be forthwith taken either for the acquisition of other and more commodious premises, or for the purchase of land on which to erect a new vestry-hall for the parish of Battersea. (2) That the consent of the Local Government Board be applied for to adopt and put into force in Battersea so much of the Act, 13 & 14 Vict., c. 57, as relates to the powers given to vestries for the erection of vestry-halls. It was also resolved to advertise for plans and estimates.

Fulham.—At the meeting of the Fulham District Board of Works on the 25th ult., the committee charged with the matter reported that they had examined the replies to the advertisement for a new site for the Board-room and offices, and that they had inspected the most eligible sites; but they did not see among them one that they could recommend to the Board for the erection of new offices. They therefore advised that the Board should proceed with the erection of a new Board-room, and with certain alterations, at Broadway House, according to the plans and specifications already prepared and approved, and that tenders for carrying out the work be advertised for. The report was adopted.

Limehouse.—Steps are being taken to purchase some property required for the site of the proposed "Town-hall" at Limehouse. ["Town-hall" in this and some other metropolitan instances is simply Vestry-hall "writ large."]

Wandsworth.—The Vestry of Wandsworth has applied to the Local Government Board for permission to borrow 14,000*l.* for the erection of a new vestry-hall and offices. The proposed site is in Wandsworth High-street, and has a frontage of 68 ft., and a depth of 154 ft.; it will cost 2,000*l.*

NEW HALLS FOR FRIENDLY SOCIETIES.

Tunbridge Wells.—The new Friendly Societies' Hall at Tunbridge Wells (the foundation-stone of which was laid fifteen months ago by H.R.H. the Princess Louise) was opened on the 26th ult. The building has a frontage to the Camden-road of about 62 ft., the lower portion being devoted to three shops. The entrance has a porch of Portland and Bath stone, with granite columns on either side supporting elephants' heads, carved by Mr. Handley, of Grove Hill-road. On the ground-floor accommodation is provided for the manager, together with a large room which will be used for lectures, entertainments, club-meetings, &c. In the yard at the back it is proposed to have an American bowling-alley. There is also a large bar for the supply of refreshments. On the first-floor there is a large club-room, 34 ft. by 60 ft. in extent, and running from the front to the back of the property. This room is 21 ft. in height. On this floor there is also a reading-room, a committee-room, lavatory, &c. On the second-floor there are bedrooms and suitable offices for the manager. Messrs. Weeks & Hughes are the architects. The contractor was Mr. Henry Elwig, the sub-contractors being

Mr. Handley, stonemason; Mr. Church, bricklayer; Mr. Harmer, plasterer; Mr. Ryder, plumber, decorator, and painter; and Mr. Simpkins, smith and ironfounder.

Reading.—On the 17th ult. the memorial stone of a new Foresters' hall in West-street, Reading, was laid by Mr. George Palmer, M.P. The building is designed by Messrs. Wm. & J. T. Brown and Albury, architects. The hall is situated on the ground-floor, and about 3 ft. above the level of the street, being approached by an entrance, 7 ft. wide (between two shops which face the street), having a lobby 15 ft. by 14 ft., with lavatories. A pay-office is adjacent, also a staircase leading to a committee-room 30 ft. by 12 ft. on the first floor over the entrance, and there is a balcony to the street front, which is simple in character. The hall itself is 79 ft. long by 38 ft. 3 in. wide, and 27 ft. high, with semicircular apse at the platform end, and will accommodate between 700 and 800 persons; and by the addition of a gallery at the east end 150 more seats may be obtained. Beneath the hall there are a court-room 39 ft. 6 in. by 30 ft. with apse 20 ft. by 12 ft., together accommodating about 300 persons; two committee-rooms, each 30 ft. by 14 ft.; stores, cellars, &c. The total cost will be about 4,500*l.* Mr. W. H. Simonds is the contractor, Messrs. Wright & Shackel having undertaken the smiths' work and gasfittings, and Mr. S. Gocher the painting and glazing.

GAS JOTTINGS.

Laying Mains.—At the thirteenth half-yearly meeting of the West of Scotland Gas Managers' Association, held at Kilmarnock on the 26th ult., Mr. Fairweather, of Barrhead, read a paper upon "Gas Mains," in which he advocated, among other things, that a stone should be placed underneath the joints, so as to secure them from breakage and leakage. A discussion followed, in the course of which it was pointed out that while this system might be advantageous for country districts, where there was no heavy traffic, yet in towns there would be a danger of the pipes giving way between the joints.

Profits at Manchester.—It is stated that the profits of the Gas Department of the Manchester Corporation during the year ended June last amount to 111,594*l.*, against 100,539*l.* in the previous year. Of this sum 15,030*l.* will be appropriated as interest on loans, 27,408*l.* will be transferred to capital account towards the mortgage debt; 51,936*l.* will form the portion of a surplus payable to the improvement department; and 17,111*l.* will be carried to the reserve fund. There has been an increased consumption of gas of nearly 73,000,000 cubic feet, the amount supplied being 2,142,997,000 cubic feet. The borrowed money owing by the Gas Department amounts to 407,028*l.*, and the assets amount to 1,107,593*l.*

DRAINAGE MATTERS.

Brechin.—The local authorities of Brechin having been urged to take steps with a view to the purification of the River Southesk, special meetings of the town council and police commission were held on the 25th ult., to consider the matter. Plans for the drainage of the town have been obtained from Mr. Willett, C.E., but after a good deal of discussion it was decided that a sluice should be put in to the East Mill dam dyke, according to Mr. Willett's plan, and to delay doing anything more for the present.

Hipperholme.—The scheme of sewerage for the district of Hipperholme, Lightcliffe, and Bailiff Bridge, under the Hipperholme Local Board, commenced in June, 1877, is now completed. It is designed on what is known as the dual or separate system, the sewers being constructed to carry the sewage with only a limited portion of the storm or surface water of the district. No. 1 outfall sewer carries the sewage of Lightcliffe, Hill Top, Bramley-lane, and Hipperholme village district; No. 2, that of Bailiff Bridge only; and No. 3, that of the Hipperholme Lane-ends district. The whole of the sewers are provided with manholes and ventilators at each change of gradient and direction; also with down outlets and flushing stations at convenient intervals. The sewage from Hipperholme and Lightcliffe will be treated by a process of filtration in six tanks, in duplicate, situated at Bailiff Bridge. The Bailiff Bridge Sewage will also be dealt with in tanks on the lower portion of the same land. The sewage of Hipperholme Lane-ends will be run in carriers over land in Wood Nook-lane, leased by the Board for irrigation purposes from Major Stocks. The total length of sewers constructed is about 4¼ miles, and cost of works 7,000*l.* The scheme has been carried out from plans, &c., prepared by Mr. Richard Horsfall, Halifax, under the superintendence of Mr. J. P. Wilkinson, as resident engineer; by the following contractors:—Mr. Henry Birkby, Wyke; Messrs. Slater, Brothers, Halifax; Messrs. Shaw & Taylor, Lightcliffe; and Messrs. Robinson, Fielding, & Co., Thornton, Bradford.

MASTERS AND MEN.

Durham.—There being but few new buildings in course of erection in the city of Durham, the trade of the plasterers in that city has become exceedingly dull, and the masters some time ago gave notice of a reduction in wages, amounting to a little over 2*s.* per week. A small number of the men having refused to accept this reduction they have been out on strike nearly three weeks.

Birmingham.—Messrs. Chance, Brothers, of the Spon-lane Glass Works, have (according to the *Birmingham Gazette*) been reluctantly compelled to call together their workmen engaged in the manufacture of sheet glass, and to announce their intention of making a reduction in wages. This step has been rendered necessary by the increasing foreign competition, and other circumstances. The usual notices of reduction have been issued.

"WATER AND WATER-SUPPLY."

Sir,—In the notice you have given in the *Builder* of my recently-published work on "Water and Water-Supply," there are some statements and imputations concerning which I beg to submit a few words in reply. Of course I have nothing to say to the general criticism and the conclusion to which your critic arrives, that "what is new is not true, and what is true is not new."

The hydrographic division adopted claims no other merit than that it is convenient and comprehensive. It was adopted by me after some consideration, and was not only in type, but printed, some time before the conference at the house of the Society of Arts was summoned.

I need hardly say that the Welsh coast drainage is in no way mixed up with that of the Severn drainage, either in my mind or my book. The Dee certainly is not an affluent of the Severn.

The maps given were not copied either directly or indirectly from any bearing Mr. Symons's name, either in the Transactions of the Institution of Surveyors or in the Sixth Report. For the outlines of the British Islands map I am indebted to a German source, and for the outline of the maps of the various drainage areas I made use of a map published long ago by Mr. Petermann. For the filling up of the outlines I am responsible, and though aware that there are errors, I think the object I had in view is attained. For the detailed accounts of the rivers I am largely indebted to the Ordnance map.

I have not, so far as I am aware, quoted Mr. Symons without acknowledgment, and though making use of his tables, have by no means adopted them exclusively. Where it was possible I have taken Mr. Glaisher's figures.

To both these observers I have, I think, acknowledged the obligations due for their exertions in recording rainfall.

The experiments by Dr. Tidy on oxidation of sewage were not in a sufficiently advanced state to allow of further notice when the last sheets of my work were in the press. The nature of the experiments recorded is, I think, clear from Dr. Tidy's note given in the text.

D. T. Ansted.

Dry Rot, according to the *Kilburn Times*, has appeared in the new part of the parish church at Willesden. When it was discovered by the churchwardens, the flooring underwent a careful examination, and in one part a fungus, about 2 ft. by 3 ft., was found. The flooring was so affected that it threatened the safety of the organ gallery, and to avoid mischief in this quarter it has been found necessary to substitute iron pillars for the wooden supports.

ORGANS.

Plymouth.—The new organ which has been erected in the Guildhall, Plymouth, by Messrs. Willis, of London, at a cost of 5,000*l.*, is to be inaugurated on October 16, when Dr. Stainer, of St. Paul's Cathedral, will give some recitals.

London.—During the long vacation (says the *Law Times*), the fine organ in the Temple Church, which had suffered considerable damage in the early spring by the severity of the then prevailing storms of rain, has been undergoing reconstruction, enlargement, and thorough renovation, at the hands of Messrs. Foster & Andrews, of Hull. These improvements are fast progressing towards a state of completion. The instrument has received an accession of new sound-boards, numerous local wind reservoirs, three sets of pneumatics, and an entirely new fourth manual or solo organ; while the old and valuable original pipes have been most carefully repaired and restored, and their mellow and sweet tone strictly maintained. The several systems of mechanism throughout the organ have also been entirely renewed. The organist, Mr. E. J. Hopkins, has written a new service, consisting of a "Te Deum" and "Benedictus," for the occasion of the re-opening of the organ on the first Sunday in Term, November 3.

Sheffield.—The alterations to the parish church, Sheffield, have necessitated the enlargement and rebuilding of the organ, and the work has been carried out by Messrs. Brindley & Foster. The instrument was heard for the first time in its new form on Sunday last. The screens separating the chancel and nave have been removed. The transept gallery has been removed, a portion of the north gallery taken away, and the organ replaced in the north transept. It has been so rebuilt as to leave the tower pillars clear, and not to intercept the view, as was the case before, from the body of the church into the chancel. The front of the organ has been rebuilt in accordance with a Gothic design, furnished by Mr. Flockton. The case-work is of wainscot oak, stained to match the old oak work in the church. The organ has forty-seven stops and three complete manuals, CC to A, fifty-eight notes, and an independent pedal organ, CCC to F, thirty notes. The instrument contains 2,566 pipes; the whole of the front pipes (many of which form the 16-ft. double-open diapason on the great manual) being of the finest quality of burnished "spotted metal" without ornamentation of any kind. The instrument is supplied with wind by two bellows blown by three-throw cranks and two fly-wheels. The stops draw diagonally, and the great composition pedals control also the pedal organ. The pneumatic action is applied to both great and swell manuals, and also to the composition pedals. The organ has been rebuilt under the superintendence of the organist, Mr. T. Tallis Trimnell, Mus. Bac. The cost of its enlargement is about 1,500*l.*

NEW ALTARS AND REREDOSES.

Chester.—A new altar at St. Francis's (R.C.) Church, Chester, has just been dedicated. It is of Stourton stone, supported on red marble shafts and carved capitals, at the back of which is the super-altar. The tabernacle stands in the centre, encased in polished red marble, with enamelled door, bearing the characters "I.H.S." On either side of the tabernacle are two panels of inlaid marble, in the centre of each of which is a shield bearing the monograms of the donor (Mr. J. B. Topham) and his wife. A richly carved cornice, running the entire length of the altar, finishes this part. Immediately above the tabernacle is a niche, which contains the statue of the Virgin and Child, and above it is a canopy, supported on polished marble shafts, with delicately carved capitals. This is terminated by a spire rising to a height of 17 ft. In front of the statue the crucifix rests on a corbel. On either side of the canopy are three compartments, containing statues of the apostles St. Peter and St. Paul. The remaining four compartments are filled with foliage. The builder of the altar is Mr. John A. Hanley, architectural sculptor, Chester.

Weobley.—On the 16th ult. a new reredos for the parish church of St. Mary, Weobley, was dedicated. It is the gift of Mrs. Peploe, of Garnstone Castle, and has been designed by Mr. Gambier Parry and executed by Mr. Boulton of Cheltenham. It is of alabaster, white and coloured, with a cross in the centre, flanked by

vo kneeling angels. There are also four infant heads, two on each side, and the Alpha and Omega. The altar-cloth was furnished by Messrs. Jones & Willis, of Birmingham.

Scarborough.—The Roman Catholic Church at Scarborough has just received an addition in the shape of an altar and reredos for the lady-chapel. The stonework has been executed by Mr. Earp, of London, and the gates by Messrs. Hart, Son, Peard, & Co., of London, both after designs by Mr. George Goldie, architect.

Galway.—On the 22nd ult., the new altar for the Jesuit Church of St. Ignatius, Galway, was consecrated. The work has been designed by Mr. William Hague, architect. The whole superstructure of the altar is composed of marbles of varied colours, all the Irish marbles available being introduced. The design embraces the altar proper, with flanking wings, reredos, and canopied arcading, tabernacle, expositorium, and tall spire in two stages, terminating in a floral cross. The general structure is of white Italian marble, with deeply-moulded and recessed panels and niches, enriched with foliation and carved and sculptured figures of saints. The front panel of the altar contains the subject of the "Pieta," sculptured in statuary marble on a large scale.

Banagher.—A new high altar has been consecrated at St. Renagh's (R.C.) Church, Banagher. The altar, which is the gift of Sir George Penrose, of Cork, is a combination of red Cork and Sicilian marbles, richly carved. The side altars are the gift of Mr. James Nevin. The communion rails are of wrought iron, representing a vine branch, and surmounted with stained pitch-pine coping. The stained-glass windows are by Mayer, of Munich, the donor being Mr. William Hannon, Banagher. Mr. Hague, Dublin, is the architect.

York Minster.— The framework of a new reredos in English oak, from the designs of Mr. Street, has lately been placed in York Minster, at the expense of the Dean. It contains some rich and delicate carving. The whole work partakes somewhat of the nature of a triptych, inasmuch as the side panels or wings are fitted with hinges, and can be folded upon the centre and locked. When completed there will be nine groups enclosed in as many panels. The central one is in progress at Messrs. Doulton's establishment, Lambeth, by Mr. Tinworth, as was mentioned by us a few weeks ago on the occasion of the visit of the Society of Engineers to that establishment. It consists of one panel about 9 ft. in length, the base of which will be at the height of 8 ft. from the footpiece. It depicts the scene upon Mount Calvary at the third hour.

Athlone.—A new altar has just been consecrated in St. Mary's Church, Athlone. It is the work of Signor Leonardi, of Rome, and is a combination of fourteen different kinds of marble. The altar-steps and rails were erected by O'Neill, of Dublin, and the encaustic tiling inside the sanctuary is by Messrs. Craven, Dunnill, & Co.

CHURCH-BUILDING NEWS.

Guyhirn.—The new church of St. Mary, at Guyhirn, near Wisbech, erected from the designs of the late Sir Gilbert Scott, was consecrated on Tuesday, the 24th ult., by the Bishop of Ely. The church, which is cruciform on plan, is in the Early English style, having a lofty nave and chancel, with transepts, and is built of white Whittlesey bricks and Ancaster stone. The floors are laid with Godwin's encaustic tiles. The benches of the nave are of pitch-pine; the stalls and other fittings of the chancel are of oak. There is a massive oak porch at the south entrance, and a lofty bell-turret at the west end, with three bells, the whole forming an appropriate village church. The contractor for the works is Mr. Wm. Girling, of Wisbech, under the superintendence of Mr. Geo. Hannaford.

Bristol.—On the 26th ult. the Mayor of Bristol laid the foundation-stone of a new church at Clifton-wood, which is intended to supplant the structure at present dedicated to St. Peter. The site, which has been purchased from the Society of Merchant Venturers, is almost close to the old church, which, when the new building is completed, will be used for school purposes. The dimensions of the church are to be as follow:—Nave, 39 ft. 7 in. by 83 ft. 1½ in. long; the aisle or side next the road, 65 ft. 8 in. long and 13 ft. 8 in. wide; aisle on the west side, back from the road, 81 ft. 1½ in. long and 13 ft. 8 in. wide; the tower, on the side next the road, about 20 ft. square at the base, and the height from the ground to the top of the spire will be about 150 ft. or 160 ft. The chancel will have a semicircular end, and will be 30 ft. 6 in. long and 27 ft. wide. There will also be a small chapel on the side next the road, so as to utilise as much of the ground as possible, and thereby increase the accommodation. The size of the chapel will be about 13 ft. 6 in. wide and 22 ft. long. The church will accommodate 900 or 1,000 persons. The style adopted is Early Gothic. There will be one low gallery, approached by a staircase in the tower. The architects are Messrs. F. W. Voysey and F. W. Wills, and the work of putting in the foundations has been entrusted to Mr. E. J. Hatherley, of Stoke's-croft. The cost of the building is estimated at about 8,000*l.*

Woking.—St. John's Church, near Knaphill, Woking, is being enlarged by the addition of an aisle. It is intended to add a second aisle when funds are available. Messrs. Welman & Street, of Godalming, are the architects.

Studley Royal.—The new church which has been erected at Studley Royal by the munificence of the Marchioness of Ripon for the villages of Aldfield and Studley Royal, was consecrated on the 23rd ult. by the Bishop of Ripon. The church, which is dedicated to the Virgin Mary, is situated at the upper end of the Park Avenue, midway between the two villages named, and forms a conspicuous object along the road from Ripon. It is in the thirteenth-century style of architecture, from designs by Mr. W. Burges, of London. It consists of a nave, with aisles, chancel, and inner chancel, vestry, and west tower and spire, 152 ft. in height, and is built of stone obtained from quarries on the estate. The interior of the building contains a good deal of sculptured work by Mr. T. Nicholls, including the tracery of the west window, which represents the root of Jesse and the ancestors of our Lord, the reclining figure of Jesse being on the sill of the window. On the corbels supporting the vaulting ribs of the tower are carved representations of the beasts of Daniel. The stained glass in the window contains eight familiar scenes from the life of the Virgin, whose figure occupies a central position in the upper tracery. The nave is divided from the aisles by an arcade of four bays on each side, supported by cylindrical columns, enriched with black marble shafts and carved caps. The division of each bay is marked by a black marble column projected from the clearstory, and these spring from carved corbels and are carried up to the roof principals. The whole of the stained glass work has been done by Messrs. Saunders & Co., London, from cartoons prepared by Mr. F. Weeks. The principal feature of the interior is the chancel. The choir-stalls are of Spanish walnut, carved, and in the north aisle, occupying the second bay from the east end of the nave, is a fine two-manual organ, by Mr. Lewis, of London. The church will accommodate 400 persons, and has cost about 15,000*l.*

Longham.—On the 19th ult. the parish church of Longham was re-opened, after restoration. The unsightly painted deal boxes have been removed, and pitch-pine sittings fixed in their stead. These latter were designed by Mr. Dunt, of Witchingham, and executed under his superintendence by Mr. Brown, builder, of the same place. The pulpit, desk, and lectern, which are of oak, were designed and carved by Mr. Chapman, of Hanworth. The pulpit is the gift of Miss Hastings, and is erected in memory of her father.

New Radford.—On the 26th ult. a new organ-chamber, which has recently been built on the south side of the chancel of New Radford Church, Notts, was opened. The organ formerly stood in the gallery at the west end of the church. The expense incurred by the alteration has been about 270*l.* The builders were Messrs. Fish & Son, the plans being furnished by Mr. R. C. Sutton, architect. The organ itself has been rebuilt by Messrs. Walker & Sons, of London.

Ottery St. Mary.—On the 15th ult. the south tower transept of the well-known Church of Ottery St. Mary was reopened, after being embellished by Lord Coleridge as a memorial to his parents and to the late Lady Coleridge. Previously to certain alterations in the church a quarter of a century ago, the south tower transept was occupied by two large galleries, and it was also used as a belfry. Since then it has been filled and blocked completely by a large organ. This organ has been removed and fixed in the north chancel aisle. The erection of two additional screens being necessitated,—one portion to screen the organ, and the other to correspond,—this has been done by Lord Coleridge. They are of oak, and are being coloured and gilt. The transept rendered vacant now affords accommodation for about fifty people. The new floor is of oak, tiled in the passages. The seats are of oak and walnut, with carved ends. There is a large clock gallery, with a clock like that of Exeter Cathedral, coeval with the church and tower. This has been renovated, and the clock-works, which have temporarily been removed, will be replaced. The oak work has been done by Mr. Digby, of Ottery. The whole of the walls of the transept have been covered with mosaic tesseræ, of different colours, in which dull grey and red prevail, by Simpson, of St. Martin's-lane, London, from the designs of Mr. Butterfield, architect, who has carried out all the improvements. In the place of the nine plain glass windows there have been substituted windows of stained glass, thirteen lights in all, by Mr. Alexander Gibbs. The central figure in the five-light east window represents our Saviour, and the other lights contain the Evangelists. The Bishop of Oxford, Mrs. Mackarness, and Miss Coleridge gave three of the windows, which represent St. Paul, St. Matthew, and St. John. All the others are the gift of Lord Coleridge. The roof has been painted to correspond with the tints of the walls. The cost of the improvements will exceed 2,000*l.* Beneath the east window there is a marble slab, on which will be placed a recumbent statue of Lady Coleridge, from the studio of Theed.

DISSENTING CHURCH-BUILDING NEWS.

Liverpool.—A new Welsh Presbyterian chapel for the South-end, Liverpool, has been opened recently. The new chapel is situated on the north side of David-street, Park-road, on the site of the Old Pine Apple Inn. The shape is cruciform, with nave and transepts, the extreme length of the building inside being 51 ft., width of nave 33 ft., length across transepts 49 ft., transepts 17 ft. wide. There is also an end gallery over entrances, seat-room being provided for 450 worshippers. The style adopted is Geometrical Gothic, carried out in brick with red stone dressings. The work was designed and carried out under the superintendence of Mr. Richard Owens, architect, by Messrs. Nicholson & Ayre, contractors. The cost of the building is about 2,500*l.*——A new Wesleyan chapel in High Park-street, Toxteth Park, was opened on the 27th ult. The building will accommodate from 800 to 850 persons, and there are new schools attached to it which will hold nearly the same number of children. The style adopted is Gothic, the material used externally in construction consisting of selected grey bricks, with bands and arches of red and black bricks, white Stourton stone, and a little granite. A light spirelet rises at one angle to a height of 80 ft. The cost to which the committee limited the architect (Mr. C. O. Ellison), exclusive of heating, lighting, &c., was 6,000*l.*, and the contract was let about a year ago to Mr. A. Bleakley, builder, of Birkenhead, for 6,070*l.*

Henley.—The memorial stone of the new "Tabernacle" at Henley was laid on the 20th ult. The building occupies a prominent position in the Market-place, and is intended to accommodate 300 persons. The material is red and grey brick, with stone dressings to windows. A class-room and school-room form part of the undertaking. Mr. Clements, of Henley, is the contractor.

Stretford.—A new chapel was opened at Stretford, on the 22nd ult., by the Primitive Methodists. It is situated in King-street, and is designed to accommodate 500 worshippers. The school-room, which was opened a few weeks ago, will accommodate 360 scholars. The contract was let to Mr. R. Gell, of Stretford, for 4,400*l.*, but, with the chapel-keeper's house, &c., the entire cost will be 5,000*l.* The works were carried out from the designs and under the superintendence of Mr. Arthur Moray, architect, Manchester.

Statue of Mr. Robert Raikes.—Mr. Brock, of Osnaburgh-street, Regent's Park, has been commissioned to execute a statue of Mr. Robert Raikes, the founder of Sunday schools. The statue will, it is believed, when completed, be erected on the Thames Embankment.

LIVERPOOL ARCHITECTURAL SOCIETY.

The thirty-first session of this society was inaugurated on Wednesday evening, when the president, Mr. Henry Summers, delivered an address, in the course of which he said the Society was composed of 48 fellows, 13 professional associates, 35 associates, 24 students, and 3 honorary members, showing a total of 123. He referred to the recent conference of architects in London, at which the Society was ably represented by Mr. Boult. Mention was made of the various business and other premises in course of erection in Liverpool, and of the approaching opening of the Picton Reading-room, which would form an important addition to the public buildings of the town; while the completion of the Art Gallery and Steble Fountain would afford ample matter for future architectural criticism. Mr. Summers suggested the erection of some handsome public building on the west side of the space in front of the Art Gallery, and touched upon the subject of the Liverpool water supply. He hoped the cathedral which was proposed to be erected in their midst would be one worthy of the town. He next criticised, from a professional point of view, Mr. Broadhurst's speeches at the Trade Unions Congress at Bristol, and said the great evil of unionism, which was correct in principle, was its levelling all distinction between skilful and unskilful workmen.

Mr. Picton proposed, and Mr. Boult seconded, a cordial vote of thanks to the chairman, which was carried.

OBITUARY.

Sir Richard Griffith. — Sir Richard John Griffith, bart., who died on the 23rd ult., at Dublin, attained the age of 94, and had been for sixty-nine years a public officer. He entered the service of the State in 1809, having been then appointed to inquire into the best means of draining and improving the Irish bogs. In 1812 he was elected Professor of Geology and Mining Engineer to the Royal Dublin Society. He soon after began his geological map of the country. In 1822 he laid out a great many new roads. In 1824 he was selected by the Marquis of Wellesley for what was called the perambulation or boundary survey of Ireland, which prepared for the Ordnance Survey. In 1826, Mr. Henry Goulbourn being Chief Secretary, he was chosen to prepare a Bill for the general valuation of Ireland. In 1868 he retired from the post of Commissioner of Valuation. Till the time of his death he was one of the Commissioners of the Board of Works. He was buried on the 26th ult. in Mount Jerome Cemetery.

Mr. John Penn, C.E., F.R.S.—Mr. John Penn, principal of the renowned firm of John Penn & Sons, marine engineers, Greenwich, died on the 23rd ult., at his residence, Lee, Kent. He was in his 73rd year. It is stated that Mr. Penn's various improvements in marine engines were thought so highly of by the Admiralty, that no fewer than 740 British war-vessels were fitted with his machinery. Under his management the works at Greenwich and Deptford continually extended, until they at present give employment to over 2,000 men. He was a past-president of the Institute of Mechanical Engineers.

THEATRES.

Cambridge.—The *Cambridge Chronicle* states that it is proposed to convert the Old Corn Exchange of that city into a theatre, capable of accommodating as large an audience as that of the old theatre.

Edinburgh.—It is stated that the building so long known as the Operetta-house, Waterloo-place, is to be converted into a large dining-hall, according to plans prepared by Messrs. Paterson & Son, for Mr. John Grieve. The work has been contracted for by Messrs. Wm. Beattie & Sons, builders.

Glasgow.—At a meeting recently held in Glasgow it was resolved to erect an opera-house and aquarium close to the New Public Halls in the west end of that city. A company has been formed to raise a capital of 80,000*l.* in 10*l.* shares.

Blackburn.—Early on Monday morning the Star Theatre, at Blackburn, was burned down. The theatre was a wooden structure capable of seating 4,000 persons, and had been erected at a cost of 3,000*l.* On Sunday evening "Revival" services had been held in the theatre.

ACCIDENTS.

Blackwall.—A shocking accident has occurred at some new works which are in progress on the Midland Railway Company's premises at Blackwall. A man named William Guttridge, a mason, fell off the stage on which he was at work, a distance of about 40 ft., and was killed.

Dalston.—An inquest has been held at Dalston touching the death of James Glenister, aged 83, a bricklayer, residing in Mildmay-street, Ballspond. Deceased was engaged in repairing the roof of the house attached to his own. When ascending the ladder he slipped and fell to the bottom, a distance of 20 ft. He died three hours afterwards, from fracture of the skull. Verdict, "Accidental death."

Oldham.—A lamentable accident has happened at Higginshaw Gasworks, belonging to the Oldham Corporation. A chimney there is nearly completed, all but the top part being finished. Two men, named George Livesey and Patrick O'Connor, were being wound up in a hoppet by means of a crane. They were inside the chimney, and when they were near the scaffolding at the top the rope broke, and the men fell to the bottom of the shaft, a distance of nearly 60 yards. They were both killed.

RATTENING.

Sir,—On Wednesday night last, the 2nd inst., my Stone Saw Mills, Archer-street, Vauxhall, were entered by some person or persons, and five of the machine-bands which drive the machinery in the turning-shop cut up into pieces about 6 in. and 9 in. long. Of course the case is in the hands of the police, and I have every reason to think I shall bring it home to the parties who did this cowardly action.

Andrew Perriman.

*** It is to be hoped so. Every man who can should assist in bringing the scoundrels to justice.

VARIORUM.

A new edition has been published of "The Transfer of Gas Works to Local Authorities," by Arthur Silverthorne, engineer (Lockwood & Co.). It contains valuable statistics and analyses of the results of working under Municipal Management.——The October number of *Science for All* gives particulars which will instruct some of our readers as to "Slate and Shale":—"Ordinary slate, like shale, is hardened mud, and there is no doubt whatever that it was originally formed in the same way, namely, as a deposit of fine clayey ooze accumulated at the bottom of the sea. There is no doubt whatever of this, but the proofs of it do not lie at the surface, and are, therefore, not very easily recognised. If, however, you take a piece of Scottish or Welsh slate, or, better still, if you go to a slate-quarry and look at the rock upon a large scale, you will be able to see that slate is composed of alternating layers of mud of different thicknesses and different grain. Very often, also, there is a difference of colour in these different layers, giving rise to what is called the "stripe" of the slate. That these differently-grained and differently-coloured layers represent the original layers of mud, as successively deposited on the ocean bed, is proved to conclusiveness by the fact that very often—in some slates, at any rate,—you may find lines of shells or other fossils running along these layers and corresponding with them. So far, then, slate and shale agree with one another, and this is sufficient to prove that they are essentially the same, and that they were originally formed in the same way. At this point, however, we have to face a difficulty, which appears to be almost an insuperable one, and in which lies the fundamental distinction between slate and shale. If we look at our piece of shale, we see at once that the differently-grained and differently-coloured layers of which it is composed are all *parallel with the flat surfaces of the fragment* which we are examining. It is along the line of these layers that the shale splits if we apply force to it; and if any shells or other fossils are present in the fragment, they are found in layers which are also parallel to its upper and lower surfaces. On the other hand, in a piece of slate we find all this reversed. We find the same alternating *lamina* of varying grain and colour; we sometimes even find the same layers of fossils; but all these now *run at some angle, often at right angles to the flat surfaces of the slate.* The slate no longer splits along these alternating layers; in fact, it usually strongly resists violence applied to it in a direction corresponding with these; but it will now split almost indefinitely in a direction which cuts these layers at a greater or less angle. This singular difference in the behaviour and structure of slate as compared with shale is its distinguishing peculiarity."——From "Great Industries of Great Britain" for October, we get the following as to masters and men:—"The unparalleled success of nearly all departments of English manufacture which culminated in 1872 has not been altogether advantageous to the country. The working classes,—who on the whole certainly obtained no more than their fair share of the exceptional profits on the transactions of that time,—can hardly be blamed for stoutly and sullenly objecting to the reductions of wages since insisted on by their employers. How much justice there is in their complaints, and, on the other hand, what warrant the employers have for asserting that their businesses cannot be carried on without the prescribed reductions, it would be out of place to discuss here. It is only too evident, however, that the disputes between masters and men,—which have become far too plentiful,—are very disastrous to the country. It is also evident that, in demanding higher wages than are given for the same amount of labour in foreign workshops, the English artisans threaten seriously to embarrass the prospects of our trade. Belgium is not the only country that is now competing with England in some of the trading occupations in which it formerly excelled; but the remarks of Mr. Lumley, one of our Secretaries of Legation at Brussels, in his report on the commerce and industries of Belgium, dated January, 1878, fairly illustrate the usual opinion of the capitalist classes as to the present state of affairs. After pointing out other circumstances that have saved Belgian iron manufacturers from the actual ruin that has befallen some of their English rivals, Mr. Lumley attaches special importance to the lowness of the wage rate for which they have to provide. "Wages of skilled labour," he says, "which in 1872 stood at 11 francs, had fallen in 1876 to 5 francs, and are now standing at 4 francs. At 4 francs, or 3*s.* 4*d.* a day, it is difficult for an English workman to live and support a wife and family; but business will never flourish unless masters can find a sufficient inducement to invest capital. This the Belgian workmen, with their better education, have the good sense to see, and, as a rule, they accept work at such rates as they can obtain. It must be borne in mind, too, that the Belgian workman's day is of twelve hours. He works from six in the morning till six in the evening, time being given for meals, and he works six days a week. There is thus a saving on every element that enters into the cost of production; and the Belgian manufacturer is enabled to buy pig-iron in England, pay for freight, and deliver that same iron manufactured into beams and girders in the most central parts of England, or even in the heart of the iron districts, at a lower price than it can be made for by English firms on the spot."

Miscellanea.

Liverpool.—The new buildings for the Liverpool *Daily Post* and the *Weekly Post*, now in process of erection, are situate in Victoria-street, and, it is believed, occupy a larger space of ground than any other newspaper office in England. The new premises are being built after the designs of the Messrs. E. & H. Shelmerdine, architects, Liverpool. Mr. John H. Addison, with a desire to benefit and secure the health of the large number of *employés* under his control, has resolved that the building shall be illuminated by the electric light, and gas will in a great measure be dispensed with. In the composing and editorial rooms the electric light will be used.

Jarrow Fever Hospital Competition.—Discussion is going on in the Jarrow papers as to the way in which this competition was conducted. It is alleged that a prominent member of the Town Council so far forgot his position as to be in direct communication with the author of the design placed second by the committee while it was in preparation; and, during the adjudication, to urge its acceptance. In the course of the communication referred to, it is alleged that certain exclusive information was supplied to the competitor, thus giving him an undue advantage over his rivals.

Trees in Tombs and Churches.—The appearance of the ash or other trees within the space of enclosed graves is no uncommon occurrence. In Perivale Churchyard there is an altar-tomb, surrounded by an iron railing, within which several self-grown trees had got, and quite embowered the tomb with a dense growth of verdure. Three of the trees were ash, hawthorn, and elder. In a churchyard near Worcester a nature-planted ash-tree sprang up within the railings of a lady's tomb,—likely enough, in time, to displace both tomb and railing. A hawthorn and a sycamore were, some five years ago, to be seen within the railing of a tomb in Conway Churchyard. These are not trees planted by sorrowing relatives; for such use weeping willows and evergreens, which do not thrive so well as nature-planted trees. The ash, from having winged seeds, is most likely to get into neglected spots, and will even mount upon old pollard willows. Occasionally trees get within churches, as at Ross, Herefordshire, where the stolons of a felled elm in the churchyard have forced their way within the sacred structure, and now embower a pew; and in Kempsey Church, near Worcester, in a recess of the north wall, is the recumbent effigy of a knight in armour, which is shadowed by a horse-chestnut, in full foliage. In Finchley Churchyard there are two trees, or, rather, bushes, which grow out of enclosed tombs. The stems of both appear to spring from mere crevices between the bricks, which have been very slightly displaced.—*Timber Trades Journal.*

Yorkshire Fine Art and Industrial Exhibition.—It is proposed to erect, in York, permanent buildings specially adapted for the reception and exhibition of paintings and works of art, and also for the accommodation of a technical museum and of the York School of Art, the whole forming the nucleus of a Yorkshire Art Institution. To inaugurate this scheme, it is proposed to hold a general exhibition, similar in character to that of 1866, for which accommodation is to be provided in buildings erected for the purpose on the site. In order to raise the funds to carry out the object contemplated, a loan fund has been established, consisting of sums of not less than 10*l.*, to be advanced as required, for the purchase of site and on account of buildings; the amount so advanced to bear interest at 5 per cent., to be paid off by drawings, dividends, or otherwise, out of the profits, as they arise and are available for the purpose. Already upwards of 14,000*l.* have been promised in subscriptions and donations. The exhibition will be held between the 1st of May and the 31st of October, 1879.

Fires.—On Tuesday evening a serious fire occurred on the newly-erected premises of Messrs. Pellatt & Co., glass manufacturers, St. Bride's-street, Ludgate-circus. While the firemen were engaged in endeavouring to subdue the flames, portions of the stonework fell to the ground, without, however, doing damage to life or limb. Thanks to a substantial party-wall, the adjoining premises of Messrs. Macintosh, India-rubber manufacturers, together with their large store of inflammable goods, were saved. On the same evening fires occurred on the premises of Mr. Norris, cabinetmaker, St. Allder's-buildings, Bethnal-green. On Wednesday, shortly after eight p.m., a fire occurred on the premises of Messrs. Crabb & Co., builders, Kingsland-road. Several workshops and a private residence at the back of the premises were entirely gutted. A large stock of timber was almost entirely destroyed. The origin of the fire is unknown.

Church Building in Manchester.—The Bishop of Manchester has consecrated a new church, dedicated to St. Clement, at Salford, at the sole cost of Lord Egerton of Tatton, who has likewise built a parsonage and provided an endowment. All the seats are free. The church, which is a building in the Decorated style, is in length 108 ft., and its width is 51 ft. The Bishop expressed the deep sympathy which he was sure was felt by all at the absence of the founder, caused by the severest possible domestic affliction. As an advocate of the free and open church movement, his lordship rejoiced that the new church contained no rented sittings. The first bishop of Manchester, he observed, had consecrated 130 churches, of which only nineteen were free and open. He himself had consecrated sixty-six churches, of which twenty-nine were entirely free, while considerable portions of many others were so likewise.

Sebastopol.—Vice-Consul Moffat, in his report on the commerce of Sebastopol for the year 1877, says:—"The town of Sebastopol is almost in the same state of ruin as twenty years ago. Of late years some few new buildings have been erected, as the railway-station, the custom-house, and five corn magazines, each capable of holding 8,000 chetwerts. These are handsome stone buildings. Two fine cathedrals are in course of construction, one in the town and the other at the Khersonese. The streets are not lighted. There is no pavement deserving the name. In spite of the exceptional advantage that Sebastopol enjoys in the procurability of stone on the spot, the streets are almost as bad as those of any town in the midst of the steppe. The population is about 12,000. In winter the temperature is very variable. On one day in December the weather may be that of an English June, and on the next a north wind may bring many degrees of frost. The water is often bad, and sanitary arrangements leave much to be desired. There is said to be more fever in Sebastopol than in any other Crimean town. The past year being the first after their general restoration, the British cemeteries are in a fair state of preservation. Time and money are both required to ameliorate their present bare and dreary appearance. There are, besides isolated crosses and obelisks, thirteen cemeteries, some of them five miles distant from the cottage built for the guardian in charge."

Contractors' Claim for Extra Works.—A claim amounting to upwards of 10,000*l.* has been made upon the Corporation of Hythe by Messrs. Lucas & Aird, the contractors for the main drainage of the town. The contract for the construction of the main sewers was taken by Messrs. Lucas & Aird for 7,000*l.*, and it was further agreed that 250*l.* more should be paid for certain extra work. The contractors have been paid the 7,000*l.*, and the Council are ready to pay over the remaining 250*l.*; but Messrs. Lucas & Aird say that a vast amount of pumping and excavation beyond their calculations was found to be necessary in order to make a sound, complete job of the drainage, and they furnish the items, which amount in the aggregate to about 17,700*l.*, and say they consider they have a claim upon the Corporation for the difference between that sum and the total of the payments on account. A special meeting of the Town Council was held on the 25th ult., at which it was remarked that had the contract turned out favourably instead of adversely, Messrs. Lucas & Aird would not have entertained the idea of making a monetary concession to the town. Further, while it was admitted that the work had been admirably performed, it was said the great cost of pumping had been incurred through the drain having been commenced at the wrong end, the contractors instead of beginning at the outfall having begun at the farthest point from it, so that they lost the advantage of having the sewer to carry the water off as it was constructed. The Council instructed the Town Clerk to inform the contractors that they had no power to entertain the claim.

Illicit Commissions.—Serious allegations are made in the Scotch papers against Mr. Deas, the engineer to the Clyde Trustees. He is charged with carrying on practice on his own private account, after giving an undertaking not to do so, and with receiving commissions from contractors. At a meeting of the Seventh Ward Committee, Glasgow, held on the 27th ult., Mr. Andrew Paton, convener, in the chair, the following motion was unanimously agreed to:—

"That the committee feels strongly that the good name of Glasgow is involved, and hopes that the Clyde Trustees will shrink from no step that may be called for, and that their decision, whatever it be, will be accompanied by a full statement of the facts."

TENDERS

For alterations and new shop-front and fittings, at 349, Edgware-road, for Mr. R. Chapman. Mr. Horace Gundry, architect:—

Hook & Oldrey	£1,090	0	0
Thomas & Butland	967	0	0
Atkins	964	0	0
Aitchison & Walker	962	0	0
Lamble	939	0	0
Bowles	928	0	0
Temple, Bray, & Foster	905	0	0

For the erection of small cottages at Leighton Buzzard, Beds. Mr. Frederick Gotto, architect:—

Adams	£589	0	0
Gibbs	462	10	0
Holdstock (accepted)	440	0	0

For stripping and repairs to the roof of a house, &c., at Tring, Herts. Mr. Frederick Gotto, architect:—

Honour	£190	0	0
Fincher (accepted)	138	15	0

For stables, Pont-street, Belgrave-square (Cadogan and Hans-place Estate), for Mr. J. H. Hiley. Mr. R. Baker, architect:—

Shaw	£7,197	0	0
Sewell & Son	7,154	0	0
Fish	7,124	0	0
McLachlan	7,105	0	0
Nightingale	7,071	0	0
Stimpson	6,980	0	0
Kirk & Randall	6,940	0	0
Downs & Co.	6,790	0	0
Pink	6,660	0	0
Perry & Co.	6,636	0	0
Martin, Wells, & Co. (accepted)	6,600	0	0

Sun-street Contract, for the Metropolitan Board of Works:—

Cooke & Co.	£13,030	0	0
Webster	12,300	0	0
Hook & Oldrey	11,643	0	0
Crockett	11,000	0	0
Aspinall	11,000	0	0
Stevens & Co.	10,000	0	0
Mowlem & Co.	9,985	0	0
Nowell & Robson (accepted)	9,785	0	0

For surface drainage, Dover:—

Hall	£3,146	0	0
Bourne	2,981	0	0
Adcock	2,983	0	0
Stiff	2,778	0	0
Chamberlain (accepted)	2,724	1	10

For the erection of twelve terrace-houses at Colney Hatch, for Messrs. Davies, Thomas, & Co. Mr. Henry Webster, architect. Quantities supplied by Messrs. Whitmore & Kennard:—

Guttrell	£6,574	0	0
Taylor & Co.	6,249	0	0
W. T. Niblett	5,750	0	0
Jefferson	5,600	0	0
Hobern	5,555	0	0
E. Niblett	5,475	0	0
A. Taylor	5,447	0	0
Sayer	5,225	0	0
Boyd	4,778	0	0
Frost	4,700	0	0

For building a chapel at West Kensington Park. Mr. Charles Bell, architect. Quantities supplied by Mr. Lovegrove:—

	Reduced Estimates.	Deducted from Original Estimate.
Staines & Son	£7,490	£1,566
Stimpson & Co	7,146	1,810
Whittaker	6,639	1,318
Lucas & Son (accepted)	6,553	2,007

For Penistone Town-hall and Borough Offices. Mr. J. Hill, architect. Quantities by Mr. W. Hofmann Wood:—

Ashbury & Co.	£4,433	0	0
Wilcocks & Turner	4,380	0	0
Hook (accepted)	4,288	10	0
Middleton	4,285	0	0

For mansions on the Cadogan and Hans-place Estate, for the Cadogan Mansions Company, designed by the late Mr. John Ashdown. Carried on by Mr. W. Forbes F. Ashdown. Quantities by Messrs. John S. Lee & Son:—

Martin, Wells, & Co.	£28,209	0	0
Colls & Son	27,80[illegible]	0	0
Fish	26,300	0	0
Lucas Bros.	26,224	0	0
Nightingale	25,940	0	0
McLachlan & Sons.	25,900	0	0
Higgs & Hill	25,583	0	0
Peto Bros.	24,977	0	0
Shaw	24,828	0	0

For the erection of new casual wards, on the cellular system, and other works connected therewith, for the Guardians of the Fulham Union. Mr. A. C. Bean, architect. Quantities by Messrs. Messenger, Coe, & Robinson:—

Wheeler & Co.	£11,969	0	0
Chamberlain Bros.	9,579	0	0
Beman & Ewen	9,353	0	0
Aitchison & Walker	9,240	0	0
Avis & Co.	9,197	0	0
Cook & Son	9,022	0	0
Eyles	8,899	8	0
Torkington	8,875	0	0
Lathey Bros	8,709	0	0
Nightingale	8,635	0	0
Tucker	8,633	7	0
Sawyer	8,587	0	0
Marsland	8,585	0	0
Hobern	8,570	0	0
Wyse	8,555	0	0
Parkinson	8,520	13	1
Johnson	8,515	0	0
Mears	8,500	0	0
Braid & Co. (accepted)	8,470	0	0
Priddle	7,909	0	0
Parker & Evans	7,694	0	0

For building shops and offices in Jewin-street (A), and warehouse in Well-street (B). Messrs. Ford & Hesketh, architects:—

	A.	B.
Perry & Co.	£7,545	£3,455
Peto Bros.	7,499	3,471
Conder	7,471	3,428
Mark	7,454	3,460
Adamson & Sons	7,416	3,449
McLachlan & Sons.	7,360	3,444
Scrivener & Co.	7,348	3,415
Brass	7,294	3,401
Browne & Robinson	7,279	3,383
Hobson	6,777	3,252
Braid & Co.	6,401	3,083
Crabb	6,353	3,021
Ashby Bros. (accepted)	6,307	3,069

For restoring premises in Addle-street. Messrs. Ford & Hesketh, architects:—

Palmer	£2,295	0	0
Merritt & Ashby (accepted)	2,130	0	0

For rebuilding premises, Friday-street and Watling-street. Messrs. Ford & Hesketh, architects:—
Holland & Hannen (accepted)... £31,990 0 0

For building Baptist Tabernacle, Shoreditch. Mr. T. Lewis Banks, architect. Quantities by Mr. J. Sargeant:—

Dove Bros.	£9,600	0	0
Kirk & Randall	9,428	0	0
Downs	9,086	0	0
Higgs & Hill	8,764	0	0
Ashby Bros.	8,720	0	0
Bangs & Co.	8,689	0	0
Morter	8,569	0	0
Downs & Co.	8,510	0	0
Sargeant	8,340	0	0
Perry & Co.	8,330	0	0
Merritt & Ashby	8,100	0	0
Joselyne	7,882	0	0

For erecting five houses at County-grove, Camberwell, for Mr. J. R. Measures:—

Moncrief	£4,195	0	0
Fisher	3,995	0	0
Sheffield & Prebble	3,919	0	0
Smith	3,750	0	0
Taylor & Parfitt	3,725	0	0
Newstead	3,697	0	0
Phillips & Rice	3,127	0	0

For repairs, painting, &c., at the City of London Union, Homerton. Mr. G. Judge, architect:—

Boyce	£744	0	0
Harrison & Keen	738	3	6
J. & W. Cocks	696	10	0
Foster	695	0	0
Shurmur	648	0	0
Semour	615	0	0
Taylor & Parfitt	589	13	0
Taylor & Sons	544	0	0

For new Board Schools, Albion-road East, Shepherd's-bush. Mr. E. R. Robson, architect:—

Mark	£10,672	0	0
F. & F. J. Wood	9,563	0	0
Pritchard	9,055	0	0
Thompson	8,930	0	0
Kirk & Randall	8,878	0	0
Grover	8,843	0	0
Boyce	8,480	0	0
Hook & Oldrey	8,422	0	0
Higgs & Hill	8,260	0	0

For new Board Schools, Somerford-street, Bethnal-green. Mr. E. R. Robson, architect:—

Grover	£13,303	0	0
Williams & Son	12,989	0	0
Hook & Oldrey	12,980	0	0
Higgs & Hill	12,957	0	0
Kirk & Randall	12,631	0	0
Sheffield & Prebble	12,487	0	0
Brass	12,425	0	0
Hobson	12,379	0	0
Pritchard	12,319	0	0
Cox	12,177	0	0

For house and boundary walls at Mortlake, for Mr. F. Stratton:—

		Boundary walls.
Davis	£2,700	—
Hoare & Sons	2,400	£260
Hobson	2,350	268
Hook & Oldrey	2,320	260
Mallett	2,160	150

For additions and alterations to house at Maida-hill, for Mr. B. Davis. Mr. H. H. Collins, architect:—

	Allowed for Old Materials.
Robinson	£3,797	£33
Temple & Forster	3,680	38
Abrahams	3,393	90
Mark	3,383	20
Merritt & Ashby	3,333	65
Knight & Co.	3,317	10
Hook & Oldrey	3,300	—
Green & King	3,135	50

For the erection of large shop, warehouse, stabling, cart-shed, and outbuildings, with two shops adjoining, at Leytonstone, for Mr. Stoffel. Mr. D. R. Dale, architect. Quantities by Mr. Birdseye:—

Arber	£7,275	0	0
Bangs & Co.	7,237	0	0
Hart	7,172	0	0
Pritchard	7,125	0	0
Morter	7,117	0	0

The Wool Exchange, &c., Western Extension, for Col. A. Augus Croll. Contract No. 2. Mr. Francis T. W. Miller, architect. Quantities supplied:—

Stephenson	£8,860	0	0
Simpson & Sons	8,383	0	0
Hill & Higgs	8,280	0	0
Perry & Co.	8,230	0	0
Langmead & Way	8,150	0	0
Hook & Oldrey	7,580	0	0
Higgs (accepted)	7,169	0	0

For repairs and additions to houses at Sanford-lane and Sanford-place, Stoke Newington, for the Incorporated Society of Licensed Victuallers. Mr. J. Groom, architect:—

McCormick	£1,886	0	0
Ware	1,650	0	0
Grimwood	1,633	0	0
Cole	1,492	0	0
Mattock Bros. (accepted)	1,443	0	0

For additional stabling for the London General Omnibus Company, at Holloway. Mr. Alfred Tosh, architect. Quantities supplied:—

Shurmur	£396	0	0
Perkins	377	0	0
Crabb	365	0	0
Aitchison & Walker	345	0	0
Gadd	340	0	0
Cole	315	0	0
Wise	310	0	0

For shop-front and repairs to Crimea Villa, Woodgreen. Mr. W. Smith, architect:—
Mattock Bros. (accepted)..... £297 0 0

For new billiard-room and alterations to The Elms, Sutton, Loughborough, for Mrs. C. Tillotson. Messrs. Freeman & Naylor, architects:—

Allen	£1,294	0	0
Black	1,194	0	0
Vernon (accepted)	1,145	0	0

Omnibus Company's Stables. — Messrs. Sampson & Parrish state that they tendered in this case; amount of tender, 1,700*l.*

Works in York.—Mr. W. Lewis is the architect for several works, for which the tenders were printed in our last. No intimation of the fact was given in the lists sent.

TO CORRESPONDENTS.

W C, Wisconsin (we will give his letter publicity, but we cannot assist commercially).—J. H (we cannot interfere in private disputes as to wages. He should have inquired the exact wages allowed before going to work).—J. A.—F. C.—H. C.—Rev. Dr. P.—W. P. B.—Mr. R.—M. J.—H. W.—C. C.—W. & J. K.—F. & S —O. E.—J. W.—J. S.—J. S.—J. B.—F. C. P.—Contractor.—J. W. S.—F. T. M.—T. & P.—W. S. J.—W. J.—W. A.—H. H.—C. B. & Co.—G. W. B.—H. M.—J. H. H.—W. C. K.—T. Van P.—M. Bros.—F. & H.—N. & R.—F. & N.—A. C. B.—W. L. S.—C. B.—J. S.—H. & Sons.—H. & O.

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The British Museum and the Advancement of Popular Knowledge.

AT the close of the merry days which a Charles II. sufficed to make illustrious,—in the great age of Louis Quatorze, when Colbert was founding academies of literature, science, and art,—in the days, merry for England, when France was the centre of the enlightened world and French the language of refined Europe, a national collection of books would have been, in the eyes of the great mass of the British public, quite as much an old curiosity-shop as most of the objects and antiquities in the British Museum now appear to them. In rural districts books were then unknown. "Few knights of the shire," says Macaulay, "had libraries so good as may now perpetually be found in a servants' hall or in the back parlour of a small shopkeeper." A lady of the manor and her daughters were satisfied with the orthodox literature contained in a prayer-book and a receipt-book. "No circulating library, no book society, then existed even in the capital"; as late as 1724 circulating libraries were unknown in London, but there was always a crowd at the booksellers' shops. At the end of the reign of Charles II. the metropolitan student frequented the booksellers' shops around St. Paul's Cathedral, and, to quote Macaulay again, "A known customer was often permitted to carry a volume home." Two hundred years ago libraries were, it is true, formed in the homes of a few rich and comparatively learned men, but such places were inaccessible to any but personal friends. Some forty years later Dr. Johnson had the rare privilege of visiting occasionally the library at "the Queen's house," in St. James's Park, where Buckingham Palace now stands. One day King George III. graciously caught the Doctor at his studies,—a circumstance which Boswell describes as one of the most remarkable incidents of Johnson's life. That was in February, 1767. Yet, barely eight years before, an amazing collection of MSS., books and rarities of various kinds, had been opened for "publick use to all posterity"; and in the manner of a time, which, by-the-bye, has only recently died out, "publick use" then meant the use by that portion of the public possessing pluck and interest enough to overcome the troublesome obstacles with which red tape and a visionary body of sham trustees fenced "the National Repository."

How the National Repository was formed—many years before the National Gallery had any existence—is soon told, and the name that should be perpetually linked with it is that of Sir Hans Sloane. About a hundred years after the most brilliant period of the great age of France and Europe, the British Legislature accepted an offer from Sir Hans Sloane of his celebrated library and collection of curiosities. They had cost him at least 50,000*l.* to obtain, and for them he or his executor was satisfied with about 20,000*l.* It was creditable to the George who loved neither "poetry nor painting" that he permitted his ministers to perpetrate such a deed of apparent extravagance. The same Act of Parliament that authorised this acquisition further directed the purchase of a collection of MSS. belonging to the Earl and Countess of Oxford, and collected by their greater relative Robert Harley; it also ordered that the famous Cotton Library, which was housed along with Major Edwards's library—near where the Westminster clock-tower now rises—should form, with the collection of Sir Hans Sloane, the future British Museum. George II. did even more than acquiesce. He presented to the nation—then a mere phrase—the royal library, collected from the time of Henry VII., and, with it, transferred the privilege, acquired under Queen Anne, of being supplied with a copy of every publication entered at Stationers' Hall. Thus, in 1759, was opened to the public the British Museum, consisting of three Departments:—one of Printed Books, another of MSS., and a third of Natural History.

SOMETHING ABOUT THE BUILDING.

That same Buckingham House, in which Johnson had conversed with the king, was at first designated as the best place for the National Repository, but thirty thousand sterling pounds were asked for it, whereas Montague House could be obtained for ten. Now the latter was one of the famous houses of the metropolis. It had been built at the close of the seventeenth century upon the smouldering ruins of a French palace erected by the Duke of Montague; it had been designed and its construction superintended entirely by Frenchmen. Bordering the great Bedford estate, adjoining Bedford House and the celebrated Bloomsbury-square, then one of the wonders of the world, no better home could have been chosen. It became the National Repository. But the second Montague House was not destined to exist long. Before the present century had seen the years of a generation, Sir Robert Smirke was building a new British Museum, and in 1845 not a vestige of the old French-designed edifice remained. It is a little late to say anything disparaging of the exterior of the present building, the front of which is composed almost entirely of a Grecian portico long since voted—to use the words of a well-known critic,—"a public nuisance." Indeed the grand front, behind the colonnade, of the British Museum is almost entirely composed of rooms for the trustees and officials and of an entrance-hall. Within the building the chief feature,—and a feature to which the arrangement of the interior was sacrificed,—was the once splendid quadrangle. The proper place for the great staircase was undoubtedly exactly opposite to and facing the entrance-doors, where in fact the new Lycian room has been just placed, on either side of the door leading to the present Reading-room. But there it would have spoilt the view of the Quadrangle. The new building had been occupied only a few years when it was found to be too small for both men and things. The great quadrangle to which convenience had been sacrificed was itself sacrificed; a new Reading-room,—a marvel and a delight at all times, but a very snare for bronchial affections nine months in the year—was planted within it. About the same time the position of the grand staircase was discussed by the officials in charge. Mr. Edmund Oldfield and Mr. Panizzi made a plan showing how the staircase ought to be removed to the vacant space between the entrance-hall and the new Reading-room; and how it would there face the entrance-doors, leaving a broad passage to the door of the Reading-room. In such a position the staircase would have led to the first-floor galleries, logically right and left, instead of, as at present, to only one side of the building. The large space now occupied by the staircase would have been transformed into two splendid sculpture galleries, one on each floor, and each possessing a north light. It may be asked why we hark back to that which was not done, and which has been regretted over and over again. We hark back to it because the country has just been saddled with a bill for 21,000*l.* to effect a monstrous blunder: to put in the very spot where a new grand staircase ought to have stood a hall for antique sculpture which cannot, by any ingenuity, be lighted as it should be lighted; and to leave in its present position a huge and cumbrous staircase which impedes circulation above and divides, or at least cramps, the space for antiquities below. Moreover, as has been stated in evidence, there is hardly a hall or gallery in the British Museum that is now devoted to the purpose for which it was designed. One room, however, which was built expressly, at a great cost, to hold the Lycian collection, was known to be an exception to the amusing rule; and within this year even that room has been dismantled to compose an incongrous collection of restored stones and dubious models misplaced in two open lobbies miscalled the Lycian gallery. The total estimate for the erection of this gallery and a smaller one over it, together with alterations consequent thereon, is 21,000*l.*,—an outlay incurred in defiance of evidence accumulated before Royal Commissions and Select Committees, at the bidding of trustees who have not time to understand the matter, and under the control of a Principal Librarian, whose province is the care of books. Her Majesty's architects are spending the money and superintending the works. A little forethought on the

part of the Office of Works, with the influence such an office is known to possess, might surely have remedied the acknowledged defects of the British Museum Staircase, and without a larger expenditure than the present estimate. At least, there would have been gained two new galleries in the very spot where they are most required; and had such an improvement cost more than 21,000*l.* the money would not have been grudged, or lamented over as many who know lament over it now.

THE STORY OF MISMANAGEMENT.

When the impartial critic or the intelligent foreigner, in search of the truth, has waded through the historical records of more than one noble institution which helps to make the glory of this prosperous country, both critic and foreigner must often arrive at a helpless conviction that the story told therein is one of good intentions thwarted, of unblemished integrity misdirected, of thoroughly honest and triumphant goody-goodyism encouraged and protected by the State. "What can be done to move forty-five illustrious gentlemen who are unpaid?" That was the counter-reply made by Sir Henry Cole to a question put to him by one of the great unpaid who was a Royal Commissioner, sitting in 1871 to hear evidence on scientific instruction and the advancement of science. The aforesaid illustrious gentlemen to whom Sir Henry alluded were the trustees,—now swelled to the number of fifty,—of the British Museum; how they came to reign over the national repository of MSS., Printed Books, and Natural History, is seen in the fact that such was the original government in 1759, and such is it now. The tardy innovation of a public library for London was not effected without due regard on the part of Parliament for its future care and trust. The Act of 1753, which authorised the purchase of Sir Hans Sloane's collection, appointed twenty-seven trustees, who were enjoined to elect and nominate fifteen other persons to be associated with them in the execution of the trust. The same Act made these gentlemen, drawn from the highest ranks of society, a corporate body, and placed in their hands the sum of 100,000*l.*, raised expressly for the purpose by a public lottery. The Act also decreed that the chief officer or general manager of the Museum should be appointed by the sovereign from two persons to be recommended to him by at least two of the three principal trustees, and that all the other officers and servants should be nominated and appointed by at least two of the three principal trustees, which said trustees were to be for ever and ever,—

1. The Archbishop of Canterbury.
2. The Lord Chancellor.
3. The Speaker of the House of Commons.

In so splendid a manner was the trust inaugurated. So reverently has it been maintained that a gentleman in authority,—one not given to jesting,—was able to declare before the Royal Commission aforesaid that "persons drop from the clouds" into sacred posts, be they those of officer or servant, within the Museum precincts. Nevertheless, during nearly the whole of this century, there have existed doubts in the minds of many,—even of some of the trustees,—as to the efficacious working of an irresponsible trust. In the years of grace 1835-36, Mr., afterwards Sir Benjamin, Hawes got up an inquiry on the subject, and a Select Committee of the House of Commons sat to hear evidence. On the 14th of July, 1836, they reported to the House, and amongst other equally weighty remarks they said:—"That though the number of official trustees may appear unnecessarily large, and though practically most of them *rarely if ever* [the italics are our own] attend, yet no inconvenience has been alleged to have arisen from the number." This extraordinary effort of logical judgment on the part of a Select Committee sufficed to allay any agitation that had cropped up with respect to the trust of the British Museum until the year 1850, when several facts of a more or less amusing nature were duly inscribed in the records of the British Parliament. Then a Royal Commission, consisting of twelve persons, among whom were the Lords Ellesmere, Seymour, Canning, and Wrottesley, Sir Roderick Murchison the geologist, Joseph Hume the economist, Samuel Rogers the poet, Sir Philip de M. Grey Egerton, and the present Lord Houghton. An important revelation was elicited by these Royal Commissioners. It appeared that in 1755 the trustees, then forty-seven in number, had appointed from among themselves a standing committee with powers to manage the ordinary business of the trust and to report thereon to the general body of trustees. This standing committee had been acknowledged, referred to, credited with special duties, from 1755 to 1850; but, during the space of ninety-five years, no standing committee had ever been appointed except that which originally sat in 1755. For the period of at least three parts of a century the standing committee had been confounded with the general board, the majority of which, according to the Report of 1836, "rarely, if ever," attended. The Report presented to the Queen by the Royal Commission of 1850 was one of singular ability, masterly and exhaustive in the treatment of details. The Commissioners did not content themselves with stating what had, or rather had not, occurred at the British Museum during the ninety-one years it had been opened for public use and study. They suggested a radical change:—"With respect to the executive management," said they, and in italics, just as we print the words, "your Commissioners are *unanimously of opinion that a change should be adopted, involving the abolition of the offices of Principal Librarian and Secretary as they now exist, and the establishment of a responsible executive council.*" This was definite and conclusive—quite unlike the ordinary Report of conventional Royal Commissioners. These of 1850 went even further. They described the kind of executive council they would like to see; they defined some of the duties of such a body. Two of its ordinary members were to be appointed by the Crown and to be paid a salary. This suggested executive council was to appoint the officers and servants of the Museum, and to submit such appointments to the approval of the Secretary of State.

Obviously, the Report was shelved, and except that a well-bound copy lies secreted in bin 2,048*g* of the Museum Reading-room, the Report and the minutes of evidence which provoked it, are conveniently forgotten. Nevertheless, it had a momentary effect upon the trustees themselves. A standing committee, after having lain for nearly a century in abeyance, was re-appointed; it was re-intrusted with the ordinary business of the Museum, but with what result will be seen a little further on.

It is needless to add that since the year 1850 several Select Committees, not to mention the Government itself, have sat upon the trustees of the British Museum. Only ten years afterwards Mr., now Sir Antonio, Panizzi, was examined by Mr. Lowe on the subject of Museum administration, and Mr. Panizzi very plainly told the Select Committee of 1860 what was wanted. "Supposing the trust to be preserved," said he, "the best alteration in the management of the Museum would be to have another person in my position as Principal Librarian. There ought to be a much higher person than I am; he ought to be a trustee in virtue of his office, and I should say even chairman of trustees, and have a great deal to say to everything that was done there." Whatever good things exist for the benefit of the public at the British Museum may be traced to Mr. Panizzi, yet he said to the Select Committee:—"It is not an humble individual like myself who can manage that establishment." Mr. Lowe then asked if any member of the Government ought or ought not to be present at the meetings of trustees, and Mr. Panizzi's reply was,—"Certainly, the very constitution of the Museum is founded upon that, that the Government should have the whole control of it." It may, however, be maintained with apparent exactness that the Government already have the entire control of it, or at least they can, when they choose, control it. The trustees, whose very weakness makes their strength, are masters while the "how not to do it" principles remain to be defended; when anything has to be done, the Government can snap fingers at the trustees, and do it. Witness what occurred in 1864. In the first month of that year, an advertisement appeared in the newspapers, informing architects that the Commissioners of H.M.'s Works and Public Buildings were prepared to receive designs for two new Museums at South Kensington. This announcement fell in Great Russell-street like a thunderbolt. The Principal Librarian energetically collected the forty-eight trustees; the forty-eight trustees flocked feebly to the call of the Principal Librarian. We have in our mind's eye his Grace of Canterbury taking water at Lambeth to consult the Lord High Chancellor rooted as it were to the Woolsack, and the latter sending a special "chit" to the Right Honourable the Speaker, fixed fast to the chair of the Commons. The thing was, indeed, so unprecedented that a quorum of the Standing Committee of the forty-eight trustees met and immediately burst into a resolution intended to avert the treachery that was now patent in the official camp. The Superintendent of the Natural History Departments having humbly confessed that he had, unknown to the Principal Librarian, conversed with H.M.'s First Commissioner of Works, the quorum of the Standing Committee of trustees deplored the fatal occurrence. The Standing Committee having learned that certain communications had passed between members of Her Majesty's Government and certain officers of the Museum,—

Resolved, "that all such communications relating to the government, management, buildings and collections in the Museum ought, in the first instance, to be made through the Principal Librarian, and by the Principal Librarian submitted to the trustees."

There was a tinge of rosy office in the resolution; reports, letters, inclosures followed. The soothing hand of time passed over the ruffled quorum of trustees. The Principal Librarian relented, the Superintendent of the Natural History collections repented, men were forgiven, and events forgotten. A few years afterwards, Mr. Norman Lockyer revised the proofs of 14,533 paragraphs, large and small, which formed the evidence collected, from 1871 to 1874 inclusive, by a Royal Commission on Scientific Instruction and the Advancement of Science. These Commis-ioners dealt, in their fourth report, with the British Museum, and in paragraph 10 they made the following statement:—"It has accordingly been recommended by various witnesses that the British Museum should be placed under the direct control of some responsible Government authority,—a Minister of Public Instruction, if such an office be created; or, in existing circumstances, the Lord President of the Council." Four years afterwards, on the 13th of August, 1878, a Conservative Legislature, red with the annexation of Cyprus, broke the tie that bound the three Departments of which the British Museum was composed when it started into being six score years ago. But the Act to which we allude, smuggled through both Houses at the very close of the session just departed, reforms nothing in the management or the organisation of the Museum, or the control of expenditure; it merely enables fifty trustees to mismanage two public buildings instead of one: to re-arrange the Natural History collections in the new building at South Kensington, where they may continue to govern with a quorum of the Standing Committee, and where the triple heads of Church, Lords, and Commons, may dispose partly in imagination the patronage of office as before,—to the foolish detriment of public education and the needless swelling of the common burden.

AN EXPERIENCED TRUSTEE: HIS OPINIONS.

We have casually alluded to the re-appointment, after the disclosures of 1850, of that Standing Committee which had lain in abeyance for almost a century; it was then again intrusted with the ordinary business of management, and ordered to report thereon to the general body of trustees. According to the testimony of an experienced trustee,—Sir Philip de M. Grey Egerton,—given before the Royal Commissioners of 1871-74,—this Standing Committee attended very regularly between 1850 and 1870, the two periods of Royal inquiry. The result, however, was not so practically beneficial as it might at first sight appear. During those twenty years only one vital question involving reform was deliberately decided upon by the Standing Committee, and that was immediately vetoed by the general body of trustees. Sir Philip shall tell the story in his own words. In describing "the only vital question" settled by the Standing Committee, he says that "the general policy of the Museum, adopted the year after by those trustees, who were presumably best qualified to judge, was set aside by a general meeting, of which the majority was composed of *ex officio* members," that is to say of trustees who never attended to see what was being done or left undone on behalf of the trust voluntarily or involuntarily accepted by them for the good of the nation. To be more explicit, "the only vital question," which had been settled by those few trustees who had taken

e trouble to execute the trust, was arbitrarily
: aside by the larger number, who had virtu-
y taken no trouble to inquire into its work-
s,—in other words, into the management of
e Museum. Sir Philip was further asked a
ry pertinent and important question. The
atutes declare,—"If any trustee shall give no
tendance for a year, that circumstance shall
equivalent to a resignation of office." Yet
was possible for Sir Philip de M. Grey
gerton,—described by Royal Commissioners as
most experienced trustee,—to make in 1871
e following solemn statement:—"Both the pre-
nt Speaker and the former Speaker attended
ry regularly *when they could get away from
eir other duties*. The late Archbishop attended
ry constantly; the present Archbishop I have
t seen *so often*,—his health has not been good.
*e Lord Chancellor I never saw there in my
e*." Now Sir Philip was and is one of the
ost experienced trustees; and while referring,
fore the same Royal Commission of 1871, to
e reforms thought to have been effected by
e Report of the Commissioners of 1850,
dded,—"I am not satisfied with the present
stem, because, when the British Museum was
t under the general Act, all the candidates
r office were required to undergo examina-
on." That is to say, the British Museum,
ing a public department raised and augmented
public money, ought to be subjected to the
les and practices enforced by the Civil Service
ommissioners. Instead of which it is said to
, as Sir Henry Cole told the Commissioners of
71-74, "the refuge of all the invaluable
tlers that gentlemen are grieved to part
ith,"—a piece of evidence that is sadly con-
med by an inspection of many of the subordi-
te officers and attendants even at the present
ur.

OUR VISIT AS ONE OF THE PUBLIC.

Having a sort of innate presentiment, engen-
ered from the weary looks of the uncultured
rt of the population seen issuing from the
ational Repository in Great Russell-street, that
e British Museum is not the best place in which
spend a happy day, we lately paid a tentative
sit to its halls and galleries. Our first duty
as to purchase the guide-books printed "by
rder of the trustees" for the instruction of the
eople. On payment of 3s. 7d. we obtained
irteen volumes 8vo., and one volume 16mo.
rmed with these, we proceeded with some
onfidence to deliver up the accustomed um-
rella. On opening the largest of the volumes,
l carefully sewn in paper covers, we found it to
e "A Guide to the Exhibition-rooms of the
epartments of Natural History and Antiqui-
es," price 6d.; we perceived at once that this
really the popular instructor prepared by
everal contributors who have signed their
ames respectively at the end of the different
rticles. Our first duty was to read Mr. J.
Vinter Jones's preliminary account wherein the
isitor is instructed to ascend the principal
taircase in order to see all the collections
escribed,—among them the Antiquities which
re on the ground-floor and in the basement.
his was so puzzling that we referred to Mr.
. W. Franks's contribution about the Antiqui-
ies, and there we found:—"The peculiar form
f the galleries has made it necessary to place
he most ancient remains at the north-western
xtremity, which is farthest from the entrance-
all; so that a visitor wishing to pursue the
nore *natural historical* course (that is obviously
course through the *Natural History* galleries)
s recommended to descend the north-western
taircase from the gallery of minerals and
ossils on the upper floor, and enter the ground-
loor by the Egyptian vestibule." This was a
trange thing to read at the very entrance-doors
f the building; it also implied the possession
ither of a mariner's compass, or an intimate
nowledge of the locality. It was still funnier
o read the end of the sentence from which we
ave just quoted, telling the visitor to proceed
through each apartment in the reverse order
o that adopted in the description." Imagine the
ondition of the untutored mind on receiving an
ntimation to read a popular guide-book on the
Hebrew system of printing, whereby the last
page of the book is the first,—instead of the
ulgar European method of recent centuries.
Well, we found the grand staircase, and after
aving marvelled how the statue of the Hon.
Mrs. Seymour Damer, holding Thames in her
and, got to be mixed up with Shakspeare and
Sir Joseph Banks in the entrance-hall, we
eached the Zoological collections. Not far from
the entrance to these galleries we requested an attendant,—nodding in a corner, with his wand of office reposing at a little distance,—to direct our course in a north-westerly direction. This was of the utmost necessity; for, had we followed the natural bent of what passes for the ordinary public mind, we should have reached the north-eastern staircase, and descended into the vestibule leading into the King's Library. On reaching the first-floor, it is necessary to turn sharp round,—thereby missing all the eastern galleries,—to reach the north-western staircase. But to return to our fourteen volumes, particularly the sixpenny guide. Therein is the zoological contribution, signed "Albert Günther," doubtless the same gentleman who stated in evidence, before one of the Royal Commissions or Parliamentary Committees, that the British Museum "was far in advance of all other museums in respect of catalogues." So it may be in the matter of scientific catalogues; they were, however, of no use to us, for we went as one of the public expecting to be taught, or at least to be assisted in attempts to learn. We looked first at the announcement over the door of the room in which we were standing, and found that it was the Southern Zoological Gallery; then at our guide-book, wherein, at page 4, there is a description of the cases containing llamas and camels. The latter, it appears, are "remarkable for their stomachs, complicated with cells for holding water, and for their humps, which are stores of nutriment whereby they are fitted for long journeys across the Desert." This extraordinary description is no doubt perfectly intelligible to a naturalist, but we, being merely one of the populace, looked perplexedly at the animals in question, and wondered whether they stored food under or upon their humps, or whether, being in the Desert together, they fed off each other's humps, moistening the repast with the water they carried in the cells of their stomachs. Then there follows a description of thirteen cases containing oxen; all the animals concealed therein are jumbled up in a general description, ending with three lines of print about the sloths, which have to be sought for in the thirteen cases aforesaid. The Mammalia Saloon afforded some consolation. Cases 21 to 51, while protecting from public appreciation most of the carnivorous quadrupeds, have enabled the Guide to descend, in details of description, to the level of the plebeian intellect. The carnivorous quadrupeds, we are told, "are particularly organised to live on flesh, and most of them catch or kill their prey." Then, again, the badgers. They are, according to the same informant, "very strong creatures, living in holes, which they dig in the ground." We hastily retreated to the Eastern Zoological Gallery. There we found, in case 57, the fly-catchers, "so named from their feeding on insects, which they capture when flying"; and again, in the same room, case 135 contains the flamingoes, which are described as the longest-legged of the web-footed birds. But this truthful description is followed by a unique sententious statement, more fitted for a work on the Descent of Man than a dry guide to a Zoological Museum. According to Dr. Günther, "ancient epicures regarded their tongues as a most luxurious dish." The contents of the Northern Zoological Gallery do not afford equal pabulum for critical mirth; still, in these days, when the appetite for burlesque is keenly developed, we cannot omit to signalise the description of a snake's nose, which would have delighted the English translators of Euclid. It refers to the "tree-snakes, called from the length of their bodies, the Coach-whip Snakes; one kind has the nose much *produced*." After all, a snake, like a line, is length without breadth, and is not that the mathematical description of a line? Why should not a snake, —and if a snake, therefore a snake's nose,— be "produced" in a like fashion? The same remark may be applied to eels. In case 26, according to our Guide, may be seen "the great Salamander from Japan, the Siren of Carolina, which looks like an eel with front legs." Now, in the course of a varied and lengthened existence, a good deal of technical description has passed through our hands. For a naturalist to tell Muggins or Mike that the salamander,—the badge of François Premier,—is nothing more than the Siren of Carolina, or an eel with front legs, is alike refreshingly simple and sagaciously instructive. It must equally astonish, not only the plebeians aforesaid, but even scientific men, to learn from Dr. Günther, without further explanation, that "some of the most interesting sponges are creatures," and that others belong to "a class of mostly microscopic beings."

Mr. Franks's advice to those who wished to see the antiquities on the ground story, was to ascend the grand staircase, and descend the back stair at the north-western extremity of the building. We followed it, and found ourselves in the northern vestibule of the Egyptian galleries. There we determined to discard the general guide, price 6d.; and to consult another volume, price 2d., entitled "A Guide to the Egyptian Galleries in the Department of Oriental Antiquities." It contains thirty-nine small octavo pages, and a note by Dr. Birch, stating that "each object in the galleries has a number attached to it, with a description of its purport, and the dynasty under which it was made." So far so good; but though the guide to the Egyptian galleries contains a notice of the religion, architecture, and sculpture of the Egyptians, it describes only the objects exhibited in the northern vestibule, which is a comparatively hidden recess containing a superficies of about 700 square feet, whereas the Egyptian galleries cover an area of about 25,000 superficial feet. In them the objects exhibited are, to the scientific and unscientific student, the popular or plebeian visitor, totally undescribed in any guide or handbook whatever published by order of the trustees. There is, it is true, a short notice of the Egyptian galleries in the sixpenny guide-book, but the description it contains is of the following character:—"Hieroglyphics," it says, "are characters which are all representations of visible objects, and are generally executed with great care and finish." Nor are some of the other keepers much more desirous to assist the public with lucid writing. Even Mr. Newton describes the celebrated Propylæa as "*a building* which *stood* at the entrance to the Athenian Acropolis."

There is one room on the first floor not without its amusing peculiarities. The door to it, like that of the Print-room, is always closed, and the presumptuous visitor awakens attendants within by pulling a bell. This is the Gold Ornament-room, into which people enter through a narrow passage containing on one side books relating to gold ornaments, gems, and coins; on the other, a table for the public exposure of certain catalogues. One of the latter we, of course, having purchased the whole collection, carried in our hands; but after having inspected all the charms of the Gold Ornament-room, we discovered that the aforesaid catalogues describe only the contents of one glass case placed in the vestibule leading to the room in question; this glass case, containing a superficies of about 7 square feet, concealed electrotype copies of some select Greek coins. True, the Gold-room did contain a very intelligent *cicerone*, in the welcome form of a policeman, who was not only awake but most desirous of imparting the information that an ingrained system of monopoly compelled him to bottle up. Having the advantage, however, of remaining for a few minutes alone with this officer in blue, we learnt a great deal about the Gold-room,—a room, by-the-bye, containing a gallery, which seems to serve the purpose of a private lavatory for occult officials,—but we found that even he relapsed into a tomb-like silence when any one of the Museum attendants entered with a party of confiding sightseers, and at once destroyed any latent hope they may have entertained of understanding what they came to see. Nor was our experience of the mental capacity of some of the wand-bearers in different parts of the building encouraging. In one of the Egyptian saloons we learnt from an attendant that the numbers upon the antique objects were not intended to be read by the visitor,—that, in fact, they referred to a catalogue never visible to the unofficial eye. In the Elgin-room, anxious to follow a description which guides by the points of the compass, we did learn from an attendant, after proper hesitation, which was the north end of the apartment. The Mausoleum-room, though we know something about the trophies of Halicarnassus, was to us seriously one jumble of perplexities; the Hellenic-room, another, of incongruities. For an ordinary observer to attempt an archæological study in any of the ground-floor galleries of antiquities would be hopeless; to study architecture there would be impossible. One incident that afflicted us remains to be told. Having sought relief in the quiet of the King's Library, from a night mare of zoological, palæontological, mineralogical, botanical, and archæological objects, some demon prompted us to ask a broad-browed and eminently

respectable functionary,—who might have been a dignitary of the Church, or a nobleman's confidential attendant, had he not vegetated in Great Russell-street,—whether the books before us were collected by George II., and presented to the nation by George III.? The functionary, in reply, repeated the words after us, and added a complaisant, "yes." We accidentally looked up over both the doors, and there, in Latin and English, was recorded a different story, which in the popular tongue ran thus:—"This library, collected by King George III., was given to the British nation by his most gracious Majesty George IV., in the third year of his reign, MDCCCXXIII."

THE PRESENT STATE OF THINGS.

As we have already said, the Act of last August alters nothing in the unreformed constitution of the Museum government, and nothing in its mode of management. It simply orders a transfer of the Natural History Collections from an old building in Great Russell-street to a new building at South Kensington; and fourteen years have elapsed since the first practical steps were taken to effect the transfer. The trustees who do not attend at Great Russell-street will not attend at South Kensington. Of the three Departments of Printed Books, MSS., and Natural History, described in the Act of George II., two will continue to be housed at the British Museum, the third will obtain fresh quarters at the Natural History Museum. But are there only three departments now as in 1759 for a Principal Librarian to rule? Of a certainty, instead of three there are thirteen departments, with thirteen keepers or under-librarians, and six assistant keepers; and obviously these thirteen departments comprise many other things than Books, MSS., and Natural History. Yet a "Principal Librarian" reigns over all, and, as far as the Act of last August goes, he will reign at South Kensington as well as at Bloomsbury. It is, however, not unlikely that the Natural History departments—of zoology, of geology and palæontology, of mineralogy, and of botany—will be removed from the control of the Principal Librarian; and also that the trustees will deliver over to the National Gallery most of the pictures in their possession, and to provincial galleries various duplicates of objects they are empowered to sell. Putting out of consideration, therefore, the Natural History Collections, which, as Mr. J. Winter Jones well said, ought not to be administered by a person appointed for his knowledge of books; putting aside printed books, MSS., charts, guide-books, &c., of which a librarian is master, the Principal Librarian is at the present hour sanctioning and controlling an expenditure annually of about 12,000*l.* for Greek, Roman, Oriental, and Mediæval antiquities, for Assyrian excavations, for coins and medals. Surely these are sections of his comprehensive charge about which he cannot be expected to know much, even had he time to study them. Furthermore, the Principal Librarian is saddled with the duties of secretary or expenditor. The whole of the 109,990*l.*,—the amount required according to the Civil Service Estimates in the year ending 31st March, 1878,—must have been first demanded, expended, and then audited by him. Very few questions about the money required for the British Museum are asked in the House; the trustees are so eminently respectable. Indeed, the Museum is not directly responsible to Parliament at all. "Sometimes," said a witness, "Mr. Walpole moves the estimates if he be in opposition, but if Mr. Lowe be in opposition he moves the estimates." The cost of the Museum was declared by the same witness to be three times as great as it ought to be, and he attributed the fact to "the system of trustees," and to "the system of appointment." That inestimable creature, a first-class butler, is not likely to practise more economy in the service of the nation than he did in that of an individual master. The soap and brooms at the British Museum cost 300*l.* a year; the washing of dusters and towels amounts to 200*l.* annually. A messenger draws 150*l.*, a wand-bearer 120*l.*, a time-keeper 130*l.*, a senior assistant 400*l.* per annum; while Dr. Birch, one of the greatest Egyptologists in the world, receives 600*l.* a year, with the expensive incumbrance of an unwieldy house. A learned scholar like Mr. Newton receives a similar salary; but five of the thirteen keepers get only 500*l.* a year each. The potentate who rules over all these, who spends in one year one hundred and nine thousand nine hundred and ninety pounds of the public money, receives for the joint offices of Principal Librarian and Secretary a salary of 1,200*l.* per annum.

A bad thing connected with the British Museum Act, 1878, is the almost indecent haste with which the Bill was concocted and passed. In so doing the Fourth Report of the Royal Commission on Scientific Instruction and the Advancement of Science, made in 1874, was contemptuously ignored. That Report quoted the views taken by scientific men, who regretted "that the national collections should be managed by a body of gentlemen whose time is, in most cases, fully occupied by other important duties, and the majority of whom are not selected with reference to any special qualifications for such a post." Moreover, the Royal Commissioners added these words,—"It is held to be singularly inappropriate that the three important personages who are the principal trustees, occupied as they are in the discharge of the highest functions of Church and State, should be burdened with the duty of making appointments to *offices of every grade in the British Museum.*" Before the Bill of 1878 became law there should have been a searching inquiry made on the lines of the Report of the Royal Commissioners of 1874, with the avowed purpose of deposing the Museum from its notorious celebrity as an Institution for the Secretion of Knowledge, and of starting it on a novel and noble career of wide-spread diffusion.

We have not a word to say against the British Museum as a vast store of learning. To those who know, to the learned man, the accomplished antiquary, the bookworm, the bookmaker, the scholar, it is a delightful retreat, where a lifetime may be profitably spent. But to the general public it is an enigma and a snare; they go there because it is a free institution, but they rarely buy a guide. The two Miss Pecksniffs were escorted there by Mr. Jonas Chuzzlewit because avowedly it cost him nothing. Children there acquire an early detestation of such places. How many Londoners know that the Rosetta stone, without which the history of untold centuries had perhaps remained in almost total darkness, is one of the links in the chain of historical research; or, knowing it, that the said stone is hidden in the British Museum? There is absolutely nothing to lead the stranger or the ignoramus to pause before the Rosetta stone; if he do pause, there is nothing to teach him its story or the subsequent effect of its discovery. The same remark applies to the greater number of objects in the entire National Collection. Before reform can be obtained it is necessary to admit that Museums are, first and foremost, for the instruction of the people; this done a properly-edited handy-book or numbered catalogue becomes an indispensable adjunct. In the Great Museum at Naples a page of the general catalogue is often posted up over the objects exhibited; thereby reference becomes easy. The whole thing is a matter of management, and the present system of management in Great Russell-street ought, if only for the sake of the managers, to be carefully inquired into at the convenient opportunity which the approaching transfer to South Kensington will afford. If the British Museum be to the public generally a huge curiosity-shop instead of a great instrument of popular education, it is because the administration and management are bad. Not a breath of suspicion exists; there is neither bribery nor corruption. It is only an old womanish system that stops the way of reform. Alas, to repeat the words of Sir Henry Cole:—"What can be done to move forty-five illustrious gentlemen who are unpaid?"

Kingscourt. — The new Roman Catholic Church of the Immaculate Conception, Kingscourt, has been consecrated. It replaces an old building, and has been erected from plans prepared by Mr. William Hague, architect, Dublin It is Gothic in style, and comprises nave, aisles and transepts, with apsidal chancel, and two side chapels. All the dressings are of limestone, contrasting with the wall, which is of sandstone. The windows throughout are mullioned with varied tracery in the heads. The pillars of the nave arcade are of polished granite, and the roof is of pitch pine, divided into panels for future decoration. There is a good deal of Irish marble work introduced. The flooring is formed of ornamental tiles, with encaustic tile passages. The dimensions of the whole building are—108 ft. in length by 45 ft. across the nave and aisles, and 70 ft. across the transepts.

THE SEQUEL OF THE OPENING OF WATERLOO BRIDGE.

We have to advise all those of our readers who take interest in the architectural improvement of London to watch with attention the results of the free opening of Waterloo Bridge, on which the public may be now congratulated. It is true that it may be said that the improvement thus effected is stratigraphical rather than architectural. But the reply is, that these two orders of consideration can never be disunited without evil results. Elevation must suffer if plan suffers. Elevation is, or ought to be, to a great extent dependent on position. Such has always been the case. It has usually been true with regard to the cities of Europe, as Horace tells us it is true with regard to the poet, *nascitur, non fit.* Our villages have grown into towns, our towns into cities. When adequate breadth has been, in the first instance, allowed for the main lines of communication, stately houses, in proportion to the means of the owners, and to the more or less splendid taste of the day, have gradually arisen. Where narrow lanes, bordered at first by small gardens which have ultimately been utilised by their owners as building ground, have given access to the remoter parts of a town, the architecture has adapted itself to these sunless alleys. The rows of Yarmouth may be familiar to some of our readers,—little long alleys, so narrow that a special kind of narrow cart has been constructed at Yarmouth for the express purpose of passing through them. At the other end of the scale, in the City of Palaces, Genoa, stately buildings crowd and jostle one another closely; divided, at times, by streets hardly wider than the rows of Yarmouth. Here we find that the architect reserves his decorative work for the fronts, and for the interior of the quadrangles; and that the flanks and rear of many a noble palace savour of the guard-house or of the prison. Open areas, wide streets, spacious squares, are essential elements of a stately metropolis. And no less essential is such an arrangement of thoroughfare, whether as regards plan or profile, as will allow of the unimpeded circulation of pedestrians, carriages, and sweeping and salubrious breezes.

Special interest attaches to the removal of the toll-bars from Waterloo Bridge from the information which the change will allow us to collect on the effect of this mode of checking the direction of street traffic. No bridge across the Thames is better situated for the facilitation of traffic than Waterloo Bridge. It crosses the river in the very centre of the great bend by which the existing channel changes its direction from its northward course from Vauxhall, to its eastward course, past the Tower, to the Docks. To the south, a straight line leads to a point where five great roads from the north, and as many from the south, of the river converge. From the centre of the bridge, for a distance of an eighth of a mile, there is a gentle fall of 1 in 650. Hence, according to the report of Sir J. W. Bazalgette, to York-road, for a distance of 287 yards, there is the rather severe inclination of 1 in 34½. From York-road, for a length of 379 yards, the road falls as 1 in 95 to Pear-street, near the New-cut. The total height of 38 ft. 6 in., which is thus gained for the headway of the bridge, measures the actual work done in approaching from the south. But the effect on a horse of the rise, if the gradient were of a uniform pitch of 1 in 68, would be only about half as much felt in the limitation of load as is that of the 379 yards at 1 in 34½. Up to the present time, to the dynamical obstacle to the use of the bridge has been added the economical obstacle of the toll. With the removal of the latter we shall be able pretty closely to estimate how much the service of the bridge has been interfered with by the physical, and how much by the pecuniary obstacle.

This gradient of 1 in 34·5, more elegantly expressed by Continental engineers under the form $\phi = 0{\cdot}029$, compares favourably with the limiting gradients of all the other Thames bridges, with the exception of Westminster. Thus while it must limit the load to be drawn over Waterloo Bridge, it will not have any effects in the way of diverting the traffic over any other route. For the crossing of Westminster Bridge the most severe gradient is one of 0·026, for 60 yards from Delahay-street to King-street. On the south side of Blackfriars Bridge occur 220 yards rising at 0·038. On the south side of Southwark Bridge, there is a rise for 66 yards of 0·036; but on the north there is the

more formidable pitch, for an equal distance, of 0·045. London Bridge itself has 69 yards of its south approach graded at 0·037. Thus as far as the question of the limit of load by the steepness of the maximum incline is concerned, Waterloo Bridge may now compete with any other line that crosses the Thames, with the sole exception of Westminster, where the line of approach, it must be remembered, runs almost at right angles to that which crosses the Strand.

It is only just to a name that stands deservedly high,—if not as yet so high as it deserves,—in the annals of English engineering, to call attention to these facts. Judged by the two rules of plan and of profile, or section, of approach, the design of Waterloo Bridge affords an honourable testimony to the skill and wisdom of Rennie. The one point in which the structure is now exposed to criticism, that of the permanent durability of its foundations, is one as to which we do not think that any aspersion can be fairly thrown upon the engineer. The man who is entrusted with the expenditure of large sums of money, whether for the public or for private clients, has no right to buy his own immortality by a lavish outlay of that money. To provide for the visible future is his first duty. But when the question is not that of the visible or immediate, but that of the distant or contingent future, the case is different. It is like a question of insurance. There are natural limits to this kind of foresight. We can now wish that the foundations of Waterloo Bridge had been laid 10 ft. lower than is actually the case. It is more than probable that our children will have reason to wish that the level of the basement of the Palace at Westminster had been laid 10 ft. higher than is actually the case. But what would have been said sixty or even forty years ago, if Rennie or if Barry had proposed such enormous additions to the estimates they prepared, as would have been involved by the extra work? Had they said, "There is reason to anticipate that the tidal action of the Thames will increase, year after year, and that by 1880 we must provide for at least 6 ft. more vertical range than at present," what would have been the reply? "It will be time enough," it would have been said, "to provide against the change when it has been shown to be in actual operation. To make the addition to the present estimates which would be required for such a distinct anticipation would be to spend an additional sum of money sufficient, if laid out at compound interest, to rebuild the bridge, when the necessity should arise from the gradual deepening of the river."

Regarding Waterloo Bridge as thus centrally situated, and horizontally disposed, with reference to the South Bank of the Thames, let us now look at its probable future with regard to the northern lines of communication. There, it will be at once seen, there is room for great improvement. More than that, there is encouragement to effect such improvement.

From Waterloo Bridge to the Strand, a distance of 386 ft., the line of approach is approximately level. From that point we have to suggest the formation of a new street, running almost directly north, and pointing to the Great Northern Railway Station at King's Cross; the line being so drawn on the detailed survey of London as to avoid interference with Drury Lane Theatre, to which it would open a most direct and convenient access. This line would intersect Holborn close to the end of Queen-street. It would open up a close and poor neighbourhood, and, form a natural line of street, of the utmost value as a thoroughfare. While demanding a large capital for temporary use, the ultimate cost of this line of street would not be excessive, owing to the great improvement that it would effect in the district, and to the great value of the new frontages. The distance is almost exactly 1,000 yards. The ascent may be taken at 0·025, or 1 in 40 for about 400 yards. This compares very favourably with the gradients of 0·031 for 387 yards (taking the mean rise) of St. James's-street, of 0·029 for 390 yards in Regent-street, and of 0·027 for 353 yards up the Haymarket. In the first of these lines, moreover, there is a maximum portion of 0·043, in the second, one of 0·039, and in the third, one also of 0·029. Over the new line from the Strand to Holborn the mean gradient of 0·025 might be made continuous, so that in the facilities offered to the horses, no less than in the direct saving of distance, this new road would offer a great boon to the traffic of London.

The new centre of traffic that would be thus formed would depend for its exact location on the two conditions of a straight line being maintained from the point where the centre line of Waterloo Bridge strikes the Strand, and of the clearance to be left in passing Drury-lane Theatre. We do not profess to fix the spot to a few yards, but it will evidently be not far from the intersection of King-street with Holborn. At this point, or at the intersection of the street leading along the north side of Red Lion-square, we propose to pause. From the spot thus determined a straight and open line of street leads to the Euston Station. The increase of traffic for which it would be necessary to provide would no doubt be best accommodated by a police regulation to the effect that carriages from Holborn to Euston should take the line of King-street, Southampton-row, Woburn-place, and Tavistock-street, while carriages proceeding from Euston to Holborn should take the line of Bedford-place, or that of Montague-street. By this plan a complete and unexceptionable line of communication from the Waterloo Station on the south, to the Euston Station on the north, would be established. The demolition necessary would be reduced to a minimum, covering only a length of some 1,000 yards. The general convenience of the north and south traffic would be consulted, and that in a degree which it would be impossible to improve. The main point to be cared for would be the arrangement of the crossing of the two lines of traffic at the Strand and at Holborn. The levels do not readily lend themselves to the project of providing crossings by bridges. Loop lines, and diversions of the up and down traffic, so as rather to darn in with the course of crossing vehicles than directly to run athwart it, is an arrangement long since pointed out in the *Builder* as one that would by-and-by become absolutely necessary whenever two main lines of Metropolitan traffic crossed on a level; and the arrangement of this nature, as in the case of the line from Blackfriars Bridge a little to the east, would be the only point in the new route demanding unusual care on the part of the surveyor.

We propose, in the first instance, to stop at Holborn, from economical reasons. It would be desirable to see how far the estimate that the construction of a thoroughly good line of street, according to the conditions of plan and section which we have shown to be so unusually favourable, would recoup the authorities for the purchase and demolition of the low-class property to be pierced, would be verified, before proceeding with the remainder of the line to the Great Northern and Midland stations. It is even possible that the latter companies would contribute towards the formation of a line of approach which should rival that on which Robert Stephenson had his eye when he selected Drummond-street as the terminus for the London and Birmingham Railway. It is well, in passing, to bear a tribute to the foresight, in this respect, of that great engineer. When the London and Birmingham Railway Company went to Parliament, in 1835, for an extension of their line from Camden-town, the question of expense was regarded with much more anxiety than has, unfortunately, since been the case. It was, however, then under contemplation that the Great Western Railway would join with the Birmingham Railway at Wormwood Scrubs, and run into a joint terminus. With that view land was happily taken, and works constructed, for four lines of rails; an extravagance which has proved to be a great economy in the long run. With the prospect of thus halving his outlay, Mr. Stephenson had two main objects in view. One was to select a position for a permanent terminus at a spot from which straight and unimpeded lines of street should allow the cab and carriage traffic most freely to radiate from the station; the other was, of course, to approach as near to the heart of London as could be done without demolition of house property to any great extent. This latter condition was, in 1834 and 1835, regarded as much more important than it is at present; not only because directors were afraid of the vast expenditure with which they have since become familiar, but also because Parliamentary opposition, on the part of owners and occupiers, was then much more formidable than is now the case. The enormous aggregation of the capital of the great railway companies has invested them with a power to go where they think fit, of which no one dreamed as possible forty-four years ago.

These conditions were so unusually fulfilled by the position of Drummond-street, that the choice of Mr. Stephenson was naturally determined by them, with hardly any room for hesitation. It so happened that fields, market gardens, and the territory of a great milk-yard, occupied almost the entire length of the Euston extension; and that one or two houses only had to be pulled down, at the crossings of Park-street and of the Hampstead-road. Mr. Stephenson, indeed, has been heard to say:—"What a magnificent site Euston-square would be for our station, if we could hope to buy it;" but this matter was never, so far as we are aware, seriously on the *tapis*. Drummond-street formed, in 1834, the boundary of building in this part of London; and at Drummond-street, therefore, the terminus was fixed. So much did the considerations of respect for the metropolitan roads, and the actual state of building property in London, take precedence of those of the formation of the best engineering line, that two inclined planes, of the then unusual severity of one in seventy-five and one in sixty-six, were adopted in order to minimise the interference of the crossing of Park-street and of the Hampstead-road by the new line with the roadway levels. And this involved the use of a rope, worked by an engine at Camden Town, for the haulage of the trains from Euston Station, in the condition of the locomotive in 1834–1836.

The question of the best position for a central metropolitan station is one which has never been thoroughly faced by any one of our great engineers. The Great Western Station was at first only intended to be temporary; and Mr. Brunel contemplated other lines into London, when the difference that arose as to gauge led to the breaking-off the negotiations for the joint Euston Station. The London and Southampton Railway halted for a long time at Vauxhall before it pushed on, through a comparatively poor district, to its not very central station at Waterloo. The King's-cross and St. Pancras stations were of much later date, and in a position that can only be regarded as a *pis aller*. The Great Eastern station was as much out of the running, in position, as was every other feature of that wretchedly mismanaged line, which fell into bad hands from the beginning. The position of the Brighton and South-Eastern stations might have been much better adapted for the ultimate convenience of the public if it had been always considered that the Thames must, sooner or later, be bridged for railway service.

As to whether at any future time a central station for London will be constructed at the joint cost of the nine great radiating railways we do not, at the present time, wish to express any opinion. So much has been done in the bit-by-bit, hand-to-mouth system of extensions, and junctions, and makeshifts, that less imperative call for such a station now exists than at one time appeared to be urgent. But our present business is not with the work of the railway engineers, but with that of the surveyors of the metropolis. The great stations being where they are, it is the duty of the latter to provide for such direct and ready access being given to them as may at once serve the needs of the travelling public, and so adapt themselves to the stratigraphy of London as to adorn and improve the metropolis however the railway companies may now or hereafter endeavour to convey the local traffic over their own lines, and to interlink their termini one with another.

With these views, we not only venture to point out the new link in the Waterloo and Euston line of street as one that is extremely desirable, but to hint that, sooner or later, it will appear to be absolutely essential. And we confess that we think it of no small importance to the architectural beauty of London that such a work should be thoroughly done—done as a whole, and done as a noble straight line of street, and not unsatisfactorily cobbled up by pulling down an alley here, cutting off a corner there, taking down half of a street in another place, and thus making the needed line resemble that taken by a darning needle through a stocking, instead of that taken by an arrow through the air.

For the continuation of this line from Holborn to King's-cross much the same arguments as those already used will apply, although in a less urgent degree. All that we at present recommend as a *sine quâ non* is, that the southern point of the line be so laid out as to allow of its prolongation at a future time without impediment. As to this, as Drury-lane Theatre is a determining point in the southern portion of the line, so is the Foundling Hospital in the northern. We have to avoid the destruction or the injury of these two important buildings.

Judging from the maps at hand, there is no difficulty in carrying out this object, so only that it be kept in view from the first. Were there a question as to the relative importance of a line of direct southern access to the London and North-Western and to the Midland and Great Northern lines, the matter might be more complicated than we think it really is. The piercing of a new street, however desirable it may be in a traffic or in a sanitary point of view, is a serious matter. It involves great outlay; and, even if that be fully justified, it involves a degree of interference with the convenience of the householders and tenants which should never be rashly undertaken. Were the question simply that of the true line to the three northern stations, it would be one of more immediate magnitude, as well as of more difficulty, than that which we have ventured to raise. As it is, the fact that the foresight of Mr. Stephenson has provided a mile of straight and open street, out of the 2,800 yards that separate Euston Station from the Strand, will now have its proper weight. The Gray's-inn line is that which naturally serves for the southward traffic of the Great Northern and the Midland Stations. Those who are interested in attracting traffic to those lines, instead of to the London and North-Western, may lament that such is the case, or may direct their energies to an improvement of that line. Sooner or later, no doubt, such an improvement will be effected. But it will be costly. Nor can it be expected that it will be self-supporting or remunerative at all in the degree that such advantages may be predicated for the new Holborn and Strand line of connexion. The case is one in which, long after his death, the patient study given by a professional man to the main interests of his clients, bears rich and permanent fruit. It has needed the removal of that petty, irritating, strangling charge which has hitherto reduced the great work of Rennie to the rank of a noble monument, rather than that of a chief convenience of the metropolis, to bring out in its full light the fitness of the point selected for the terminus of his line by the clear intelligence of Robert Stephenson.

It was stated at the meeting of the Metropolitan Board of Works on the 4th instant, that the cost of purchasing Waterloo Bridge had been 475,000*l.*, and that of the foot-bridge at Charing-cross the immensely disproportionate figure of 98,540*l.* The original cost of the former bridge was 565,000*l.*; that of the approaches, besides the land and buildings, 112,000*l.* Land, buildings, and contingences amounted to 373,000*l.*, making a total of 1,050,000*l.* The bridge was opened with great ceremony by the Prince Regent on the 15th of June, 1817.

SUGGESTIONS FOR THE INSTITUTE.

Every one who thinks, as we do, that it is to the advantage of the architectural profession that they should be as closely as possible related to a central representative body, and that the Institute should become *de facto* the representative of the profession throughout the country, will attach some importance to the suggestion we have to make in regard to giving increased facilities to members not residing in London to take their part in the concerns and business of the Institute. We use advisedly the round-about phrase "members not residing in London," because the recognition of any distinction between "town" and "country" members has been abolished in the late alteration of the bye-laws, and within five minutes of the passing of the said bye-law we remember that a non-resident member took exception to the expression, pointing out to the president on the occasion that he had no right to refer to him (the speaker) as a "country member." Let the susceptibilities of non-resident members, therefore, be duly considered, and obnoxious distinctions no longer remembered now that they are officially done away with, and that demands on the pockets of all members of the Institute, whether residing in London, Cyprus, or Timbuctoo, are equalised, and their *locus standi*, therefore, rendered in every respect theoretically alike.

But then it is, in one sense, theoretically only. With the best and most liberal intentions, the Council of the Institute cannot (in the present state of architectural science) abolish distance. Even if they could do as some specially virtuous railway companies do when their annual meeting comes round, issue free passes by rail to all shareholders in the concern, they could not at the same time provide that a member busily at work in a distant county should have time to come up and vote on some question of professional practice, or of Institute politics, which may seem to him of considerable consequence. And as non-resident members have all been raised to the privilege of paying the same as resident members,—and wisely so, we think, as it removed some difficult questions of precedence and put all members on the same footing in regard to their interest and influence in the Institute affairs,—every effort should be made to give them all the same facility in taking part in its management. And on this ground we recommend strongly the adoption of a suggestion which we believe has been unofficially mentioned, that of allowing members residing more than a certain distance from London to vote by letter on any question of which previous notice has been given. The limit of distance should be such as renders it impossible to come into town to a meeting and go back the same night.

A little arrangement and discussion of details would be necessary, no doubt, to get it to work all right and in a manner satisfactory to all parties; but we cannot imagine that there could be any difficulty worth speaking of in making the arrangement, and we must regard it as highly important, if the Institute is really to take its proper place as the organising and representative body of the whole of the profession in England, that all professional members should have the facility of voting on questions in which they may feel interested, without the expense of time and cash incurred in a journey to Town for the purpose. Unless such an arrangement is made, we feel strongly that there never will be that real equality between resident and non-resident members which the alteration of the bye-laws contemplated; and the members living in the country will naturally feel that while they are paying as much for membership as the London men, the latter will, from being always on the spot, have really a most disproportionate power of managing things their own way, if they have any temptation to exercise it. One or two country members we know resigned on their subscription being raised (it was only one or two, we believe, or perhaps only one), which we hold to have been a decided mistake; for the alteration, along with all the others that have been made, was made entirely in what were believed to be the interests of the profession at large as represented in the ranks of the Institute; but it is certainly desirable to remove every feature in the working of the Conduit-street meetings which can leave the impression that some among the members would necessarily have an advantage over the others in influencing the conduct and decisions of the meetings.

Another point which we consider of great consequence to the continued, or rather to the increased, success of the ordinary meetings (for we suppose no one would be satisfied with a mere *continuance* of the rather insufficient and languid attendance which has been the usual average at the meetings), is the repeal of the very ill-advised regulation which places the paper for the evening at the close of the proceedings, and relegates the discussion till the next meeting. On this point we have before spoken strongly, and we have some reason to think that the authorities are beginning to see the matter in the same light: certainly the exodus of half the audience on one or two occasions before the paper was read ought to have opened their eyes to the natural consequence of the arrangement. We say the natural consequence, because it is almost inevitable in such a case that one portion of those who attend come to hear or join in the discussion on the old paper, and another portion to hear the new one read. There are so many different kinds of subjects to be treated in relation to architecture, that it is inevitable that some should interest one class of members more than another: consequently, under the new system there must always be a double element in the audience, to each of which only half the evening's proceedings is of particular interest. The result naturally is that some drop in in time to hear the paper, and that others who have heard the discussion, and are not interested in the subject of the paper, are disposed to leave without hearing it, and hence that indecorous stampede, not very consoling to the reader of the paper, which has been seen to take place in the middle of the evening, in spite of rather pathetic remonstrances from the chair. The thing is utterly illogical. Mr. Chasuble has promised, we will say, a paper on the decorations of St. Minimus the Martyr, and he finds the room full of gentlemen more or less known to fame in connexion with their theories or experience in the trapping of water-closets. They do not, as he too well knows, care a brass farthing for St. Minimus; they are all intent on refuting the erroneous and dangerous views propounded at the last meeting by Mr. Syphon, in his paper on house-drainage. A dozen people, all with equally strong belief in so many different systems of trapping, carry on the contest over the dead body of Mr. Syphon's paper with increasing interest; always when time is called a new speaker has something which he *must* say; and then Mr. Syphon has the right of reply, and after he is warned that it is really time to close, he pathetically begs for just ten minutes more in which to demolish his adversaries; which ten, of course, expand to twenty. Finally the votaries of sewage drain off in a body, and Mr. Chasuble, feeling very decidedly "trapped," presides over the apotheosis of St. Minimus before a greatly diminished and yawning audience. And that is exactly what is sure to happen in five cases out of six. Whereas when the paper of the evening takes the principal place in the programme (as it does at all other meetings of the kind that we ever heard of), and is discussed *tout de suite*, the meeting is composed of the people who are all interested in that subject, and are prepared to give proper attention to it. As to the idea of giving increased value to the discussion by postponing it for a fortnight, we have not yet heard or seen a report of a single discussion which included anything that might not have been said without any elaborate preparation; nor do we believe any one gives the subject special study during the intervening fortnight. People are much more likely to discuss a subject with interest and vivacity when it is just fresh in their minds; and the opportunity of looking up the subject specially would be fully provided for by giving, in the circular announcing the paper, a brief statement of the points to be touched upon, and the line which the lecturer means to take. This has been already done in some cases, but with a little assistance from the intending reader of the paper it might be done rather more fully, and then every necessary aid would be given to promoting a useful and practical discussion.

There is one other point we may touch upon, one in regard to which a great many remarks of discontent have reached us, viz., the habitual monopoly of the discussions by a few members, who seem expected always to speak, and who always dutifully fulfil the expectation; some of whom are almost habitually called upon from the chair. The result of this is, of course, that others who may really have more to say do not speak from a feeling that they are not wanted, and will appear to be interlopers. The younger members think they do not receive much encouragement to take part in the proceedings, and the consequence is that things in general get into a groove, which is on many grounds undesirable.

QUEENSFERRY AND INCHGARVIE.

On Monday, September 30th, 1878, Mrs. Bouch, wife of the well-known engineer, in the presence of a small company of ladies and gentlemen who had braved a rain-charged north-easter and a rough sea, laid on the rocky islet of Inchgarvie the foundation-stone of a bridge, which it has been stated will no doubt in due time assert itself as the greatest engineering enterprise of the day. By means of this bridge the passage across the Firth of Forth, that is, between North Queensferry and South Queensferry, will be accomplished in a couple of minutes.

Of the tens of thousands of summer pilgrims who wend their way "over the Border" to the glens and mountains of the North, only a few know anything concerning the islet of Inchgarvie, which is almost midway between the two Ferries. The reason of this ignorance is that the route is far from agreeable. The drive from Edinburgh to the Southferry is, weather being favourable, most delightful, but on arriving there the horrors of the middle passage have to be encountered on board of a little tubby steamboat, or a pinnace that is greatly given to shipping as much water as possible.

This ferry, so much fallen into disuse, "has seen better days." Previously to the Reformation, the ferry and all the fees connected with it belonged, by right of office, to the Abbot of Dunfermline; but when mutterings of a coming change, political and religious, were heard throughout the land, the Abbot prudently disposed of his rights to a joint-stock company,—perhaps the first transaction in shareholding business known in Scotland. The Abbot was anxious to raise money, and at the same time was fearful lest he might be deprived of his property, so he precipitately ordered an agent to dispose of the ferry to one or more persons, according as he should be able to raise money to satisfy his employer. The amount of money asked or obtained is not stated. According to the late Robert Chambers, the agent divided the ferry into sixteen shares. The project was immediately successful. The agent continued to sell as he found persons willing to buy; and, scandalous to relate, there is evidence still in existence that he actually sold eighteen sixteenth shares of the Queensferry passage. Three centuries pass away. "It was early on a fine summer's day, near the end of the eighteenth century, when a young man of genteel appearance, journeying towards the north-east of Scotland, provided himself with a ticket in one of those public carriages which travel between Edinburgh and the Queensferry, at which place, as the name implies, there is a passage-boat for crossing the Frith of Forth. The coach was calculated to carry six regular passengers, besides such interlopers as the coachman could pick up by the way." All readers of "The Antiquary" will recognise the above quotation, and will recall the indignation of Monkbarns at the non-appearance of the vehicle at the starting time and place. "Woman," said he (addressing the old dame who dispensed the tickets), "is that advertisement thine?" showing a bit of crumpled printed paper. "Does it not set forth that, God willing, as you hypocritically express it, the Hawes Fly, or Queensferry Diligence, would set forth to-day at twelve o'clock? . . . . Is this base annunciation a mere swindle on the incautious, to beguile them of their time, their patience, and three shillings sterling money of this realm?" The strife of tongues comes to an end, by a query on the part of the antiquary, whence we learn the ferry charges. "Will it hire, I say, a pinnace, for which alone the regular price is five shillings?" As a matter of course, the diligence reaches the Ferry too late to permit of crossing till the following day, and the travellers make themselves comfortable at the Hawes Inn, facing the South Ferry pier. At this very inn, on September 30th, 1878, did the ladies and gentlemen who in storm and rain had inaugurated a great engineering work, sit down and bravely dine.

A little bit of Dryasdustism will, perhaps, be allowable. The royal burgh and sea-passage of Queensferry, within nine miles from Edinburgh, derived their name from Margaret, the Saxon princess, afterwards consort to Malcolm Canmore, the Scottish king, having been driven ashore in the neighbourhood by a storm in her flight from England immediately after the Norman Conquest. Tradition points out a small bay to the west of the north ferry, and which is named St. Margaret's Hope, as the spot in which her little fleet found refuge. Even to this day the memory of good Queen Margaret blossoms sweetly along the southern shore of Fife. After her death she was interred before the altar of the Holy Cross in 1093. The student of English history is, perchance, better acquainted with the sainted queen's daughter, "Good Queen Maude," wife of Henry I. of England.

Inchgarvie is the rocky islet on which will rise the central pier of the two great spans of the bridge. As far back as 1818 it was proposed to throw a wire bridge of two arches across the narrow strait at this point, the central pier to be established on Inchgarvie. Shortly after the Restoration the Bass rock was purchased by Government and converted into a State prison,—previously to which purchase the principal establishment of that nature in Scotland was placed upon Inchgarvie. Among many other prisoners of distinction who had been confined in it was Lord Home, who signalised himself at Flodden Field,—

> "Of gallant Gordons many a one,
> And many a stubborn Highland man,
> And many a rugged Border clan
> With Huntley and with Home,"

and fell a prey three years afterwards to the implacable hate of the Regent Albany. When Charles II. sojourned in Scotland, in 1651, he visited Inchgarvie, and in connexion with this visit it may be mentioned that a mile distant from the islet are the ruins of Rossyth Castle, on a rocky promontory a little to the west of North Queensferry, which was once the seat of that branch of the family of the Stuart from which Oliver Cromwell was descended. There is a tradition that as Cromwell's grandmother was a daughter of the Laird Rossyth, and, furthermore, was born in the castle, the Protector visited it when encamped in the neighbourhood.

DISFIGURED STREETS AND BUILDINGS.

It must often have struck many thoughtful explorers into the mysteries of art and architecture at how small a cost, comparatively, our London street-ways and thoroughfares could be improved and made to exhibit far more of art-feeling than they now for the most part do. And this might be done, not only, or even so much, by additions, as by subtractions and leavings out. How many things might be *added* may be sufficiently indicated by the accounts which every tourist, especially at this time of the year, brings back with him of what he has seen in Continental cities, and how much he misses in returning to even so huge and wealthy a city as London! We hardly dare to specify any one desideratum, or to point to one thing more than to another that is missed if we but look out for it. Take the "silent highway" for example,—not quite so silent, by the way, as it used to be, for the evidences of the presence and power and noise of steam are now never for a moment absent. Seek on its shores for the gardens and palaces which you might expect to find in long and imposing rows. Here and there a striking show, a house somewhat larger than usual, or a palace in an unexpected spot, but a continuous and systematically-built row or line of houses, or palaces, or public buildings, nowhere exists. The spirit of trade has built up the tall loopholed warehouse where the palace ought to have stood!

Now this all but total absence of what we might naturally look for in so conspicuous and notable a line of way is not a little remarkable; and we might then fancy, it being absent, that a something of the kind would be found elsewhere, and may be in some other, perhaps, even more accessible locality; if so, where is it? London can boast of no long-drawn-out line of stone or marble palaces, churches, and public buildings. All such lie scattered about and away from each other, and without any sort of connecting links. We have often thought, in a dreamy way, of some such line or street of palatial structures in London city, if only made up of what already exists, and of the novelty of it. A striking display, architecturally looked at, it would make a point to aim at and a place to go to see. It seems now a pity indeed that Wren had no such chance; all his buildings lie scattered about. Inigo Jones would seem to have made an attempt at it, but no more. It is a problem yet for the future, like so much else in architecture. We allude here not to the long rows of evenly-built blocks of houses, all of the same pattern, with but street separations between the blocks, but to separately-designed and built houses or palaces, with spaces next each one of them, each house or palace being quite distinct in character and occupation. Pall Mall, even as it is, is perhaps the nearest approach to this that exists at present, but what there is of it is but on one side of the way.

But it is not so much to lament over what is absent in huge London that we here intend to speak, but to say a word or two on some items that are ever and always present, and, we are sorry to be obliged to say, on the perpetual increase. One of them, and perhaps the chief one, is the presence everywhere, and on all sides, right and left, of staring bills and advertising placards, covering at times the whole front of a building, the passages in it, and all but the very windows themselves, blotting out the very daylight itself. These, as all know, are everywhere, and none need be told what they are about, or of the sameness of the perpetual repetitions. Nay, so fast is the present growth of this mode of communicating information, that there are some buildings,—and public ones, too,—that seem all but doomed to extinction, as far as their architecture is concerned, by the pasting over them of this voluminous printed matter. We might mention, by way of conspicuous example, the inner courtyard of no less a building than the Royal Exchange, where the whole of the lower half of it, to the first-floor windows, is devoted to this purpose, and huge white and coloured "posters" all but cover the architecture, and deprive the upper story of all but a mere printed paper support! Surely a something better might be devised, and a more artistic and less damaging mode of bill-posting be resorted to. The railway time-bills excepted, it is difficult to see what these have to do with the purpose of the building; for we cannot, nor will not, suppose for a moment that the few paltry shillings that these unsightly placards produce weekly can be of moment to the citizens of the largest and wealthiest city in the whole world. If any curious reader should doubt, let him but stand for a few moments under the painted arcade of the Exchange, and look for the supports of the upper stonework, not yet paper covered, and he will see how much is lost to architecture by this poor way of doing things. The Royal Exchange, be it noted, has quite a history, and is a typical public building, and is surely worth a little artistic looking to, if worth any care at all.

We have thus cited more particularly the Royal Exchange, because so conspicuous, and seen by all the world, but not because it is the only instance of the kind; far from it, for it is hardly possible to enter a public building wherein these posters,—many feet high, sometimes,—and railway time-tables, do not all but hide the lower portion of the building, and creep up the staircases. No architecture, however carefully worked out in detail, or elaborate in "ornament," can stand against this paper and huge printing display, and it is a pity that a something else and better, and less obtrusive, cannot be devised to obviate the necessity of it, if, indeed, it be necessary. No element in architecture is so needed as a sense in it of repose, and it need hardly be said what the effect of such additions to it must needs be.

Mighty London, without its miles upon miles of "posters," would hardly be known or know itself. There may be, indeed, no help for this; but that its art and *architecture* suffer, and suffer a good deal, from it, there can be no doubt for a moment. Indeed,—and the subject might be pursued into details,—there is nothing which seems more to *put out* art in an object, whatever it be, than huge, loud, and awkward printing, and displayed lettering and figures. Any popular collection will evidence this, and we could point to many objects where the eye is sadly distracted by the efforts made to convey information in huge unsightly lettering, and on labels at times fully as big as the objects they profess to tell the date and the style and the ownership of. In antique days, when things were so different to what they now are, this lettering and writing was quite an art, and a fine art in itself; and even in remote and out-of-the-way places, as told us by Sir Charles Fellowes, no small skill and artistic power was displayed in the inscriptions to be found everywhere, and incised in the stone or marble,—an all but lost art, yet one that it would be comparatively easy to revive. It would certainly be a new thing in architecture now-a-days, in whatever style the architecture might happen to be, to see the plain wall surfaces of it covered with incised inscriptions as *artistically* thought out and executed as those yet to be found in old Assyria, Egypt, or Greece!

There is yet another item in the "progress" of London improvements which it is strange has not excited a little at least of architectural anger. We allude to the ever-increasing number and size of the visible telegraphic wires which run from house to house, from building to building, and from street to street, all over London. Indeed, so many and conspicuous are these, and so fast are they being added to, that we seem in some places to be covered by a huge wire network. This, too, may be an imaginary evil, but it is a pity that some other mode of electric wire communication cannot be readily devised, as it certainly would be did but the art leanings and feelings of the public mind demand it. The church steeples and church towers have been, as might have been anticipated, eagerly seized on as convenient and strongly-built posts to hold the wires, together with a whole apparatus of holdfasts and ties of different kinds, and none need to be told, who have noticed them, how much they disfigure the structures to which they are fastened,—a dozen in a row sometimes. A necessity, as we have said, this may be, but it serves to show how art and architecture must need give way when the spirit of the age, and

the all-dominating spirit of trade and business, demand a new arrangement of things.

We have thus ventured to name one or two eyesores the omission of which might go to help to improve our town arrangements and architecture. To many, perchance, they may appear at first glance trivial; but they are not so. They take up more of daily attention than many might think, and, without doubt, do much to put the art, and certainly the *architecture*, of London out of countenance. An ideal street of London houses, public buildings, churches, and other buildings which the future may have in store, of the very best of materials and of the very best and most careful workmanship, and full of the best of decorative and sculptured details, would be all but lost and put out of sight by the posters and printed bills and time-tables, *et hoc genus omne*, and the very finest of outlines, by the most careful of designers, marred by being tied up by a network of copper wires, however useful their purpose. So much is said on all sides, and being done, too, for the education of the public in matters artistic, and to cultivate what is termed the "eye" to the beauty of form, proportion, colour, harmony of arrangement, and so on, that it would seem a little strange that such incongruities and unsightly additions should be borne with as they are. But it is never too late to mend; so that we would hope in the future to see a something better, not only here, but in many other little matters of detail, which sadly perplex very many who are striving for an art influence in all common things about us.

EDINBURGH.

All Saints Church, Brougham-street, may be considered the St. Alban's of Edinburgh. It is, we believe, the only church in the city in which Mr. Mackonochie has officiated, and ritualism is here carried to its fullest stretch. In connexion with the church, and having a frontage to Glen-street, there is a group of buildings, including a mission-house, schools, home for the aged, and a hall capable of accommodating about 600 persons. The group has now been augmented by the addition of a parsonage which is in course of being roofed in. It occupies a site facing Brougham-street to the north-west of the church, with which it communicates by the narthex. It has been designed by Mr. Robert Anderson, architect, and groups effectively with the church. The west elevation consists of a gable of three stories and an attic; the windows on each flat are lintelled, and of two lights, but the attic window in the gable is pointed, and has a label moulding and shafts with caps on the ingoings; this window opens upon a stone balcony, having an open parapet, which is supported on moulded corbels. On the second floor of the south elevation there is a corbelled oriel, roofed in with stone, and the attic is lighted by a double dormer.

A large addition has been made to the Corn Exchange. The original building presents to the street an Italian façade of three stories, with a clock-tower at its western extremity. It has more the appearance of a club-house than what it is intended for; it is quite out of keeping with the surroundings, and the exterior elevation bears no relation to the interior arrangement. Mr. Moreham, the city superintendent, in designing the addition, has departed entirely from the style of the original, and has designed a façade showing two gables and dormer windows, which is, no doubt, in accordance with the traditions of the locality. The composition is graceful and picturesque, but, pleasing though it be, we are of opinion that if Mr. Moreham had adopted a style having some affinity to the original structure, and which, although differing from it in degree, would have formed a connecting link with the surroundings, the result would have been more satisfactory. The new gables slightly overtop the horizontal cornice of the old portion, and the tower which stands between has now a dwarfed appearance; to remedy this it is proposed to add another stage to the tower.

On a site between Canongate and Cranston-street a new institute is in course of erection from the designs of Messrs. R. Paterson & Sons. The building is to measure 108 ft. by 48 ft., and is to have entrances from Canongate and Cranston-street. It is designed in the Scottish style, and the elevation towards Cranston-street consists of a crow-stepped gable, having in the centre a large three-light window, which is flanked by two-light windows, having pediments supported on trusses and ornamented with carved shields and terminals. The first floor is to contain a hall seated for 200 persons, a room for social gatherings, 40 ft. by 23 ft., and three class-rooms, each 23 ft. by 13 ft., all of which communicate with a spacious corridor. On the ground-floor is situated the janitor's house, heating apparatus, &c., a class-room, 63 ft. by 23 ft., which can be divided into two portions by means of a movable partition, and another apartment, 23 ft. by 15 ft. 9 in., to be appropriated as a session-room for an adjoining church. The estimated cost is about 4,000*l.*, and it is expected that the Institute will be set in operation early next summer. The promoters of the Institute intend to make a small charge for the use of the rooms, but in the event of the scheme proving a success it is proposed to hand over the building as a gift to the people of the district.

The central spire of the cathedral is now built up to the corbel-table from which the spire is to spring, and the choir is roofed in. The decoration of the exterior is approaching completion. The granite shafts of the west doorway are inserted, and the carving of the tympanum has been completed. It represents a sitting figure with a key (presumably St. Peter), under which is a row of demi-angels holding scrolls. The oak doors are hung and being decorated with elaborate wrought-iron work. The statues in niches under the figure of Our Lord, at the east end, are now in their places, and five statues occupy the niches over the great rose-window in the south transept. The glazing generally is of plain tinted glass, but stained glass has been inserted in the south clearstory of the nave. This stained glass does not appear to us to be worthy of the structure in which it appears, being of a commonplace character, suitable enough for an ordinary parish church, but not for where it is. The paving of the nave, composed of polished flagstones, relieved with squares of a red colour, is in progress. The state of the work holds out a hope that the nave may be fit for occupation in the course of next month.

The new premises of the Union Bank, in George-street, are now occupied by the officials. The building will not compete in grandeur with some of the other banks in the city, but it possesses a quiet, sensible, business-like appearance, and is a notable addition to the architecture of the street, distinguishable from the surrounding buildings by its massive simplicity. Another addition to the adornment of this street is the Chalmers statue, placed at the intersection of Castle-street. The eminent divine is represented of heroic proportions, robed as Moderator of the Church, and holding a large open Bible. The pedestal, which is of red polished granite, has been much criticised; it is in the form of a truncated obelisk, having a wide spreading base. The statue, as seen from some points of view, does not seem to have sufficient standing-room. Being the third of a series, it would have been better had the same kind of pedestal been used as in the other two, for this is an instance where repetition would have been advantageous to the general effect.

The improvement of Princes-street is being pushed on with vigour, the heavy traffic being diverted to allow of greater freedom to the workmen. The widening of the street, which was called for by the laying down of tramways, promises to be eminently successful. The chief difficulty in the carrying out of the scheme is the position of the Royal Institution, and it was proposed to curtail the steps leading to the portico, so as to admit of the rails being laid in a straight line from end to end of the street, but this has been opposed by those in authority, and the line will form a bend in passing the Institution. Everything connected with the work is being done in the most durable material, so that repairs may be required as seldom as possible. The carriage-way is being laid with whinstone blocks, 3 in. broad, a material which, after mature investigation, has been preferred to wood or asphalte. The tramway rails and sleepers are formed of steel in one piece, joined in such a manner as to form a continuous solid mass. The widening of the footways on each side is much appreciated. That on the south side is to be formed of selenitic cement, the portion of which already laid presents a smooth and pleasing appearance: its durability remains to be tested, but it looks as if it would last well. Along the edge of this footway a perforated pipe is to be laid for the purpose of watering the street the more readily. A new sloping bank and terrace have been formed in the West Gardens, and to reach the walk, which is in a lower level than the old one, broad flights of steps have been formed at either end, which are provided with stone parapets and balusters. These gardens, which are now the property of the city, are becoming a favourite resort, and form a most enjoyable lounge in the very centre of the city.

OBAN NOW AND THEN.

Exactly 105 years ago a portly gentleman, leaving the delights of Fleet-street behind him for a while, was wandering "now on the wave and now on the land" through the Hebridean archipelago. After "doing" Skye and some of the minor islands, he landed on the island of Mull. Sir Allan McLean, of Lochbuy, kindest of hosts and cicerones, gave him a true Highland welcome. The parting had to come; and it was in this wise, writes Boswell, "we bade adieu to Lochbuy and our very kind conductor, Sir Allan McLean, on the shore of Mull, and then got into the ferry-boat, the bottom of which was strewn with branches of trees or bushes, upon which we sat." Seated thus, the deckless ferry-boat tacked and retacked for hours till she ran up the sound of Kerrerra, as the sun sank behind broad Benmore. Thanks to Messrs. Hutcheson & Co., the journey can now be accomplished in a couple of hours, and if the traveller can steal himself away from the sublimity of the scenery, he may pass into the saloon or descend into the cabin and seat himself on velvet cushions or recline on satin settees. To resume Boswell's narrative,—"We had a good day and a fine passage, and in the evening landed at Oban, where we found a tolerable inn. After having been so long confined at different times in islands, from which it was always uncertain when we could get away, it was comfortable to be now on the main-land, and to know that, if in health, we might get to any place in Scotland or England in a certain number of days." A certain number of days! How stands the time now? After a satisfactory breakfast at any of the numerous hotels at Oban, get on board, at 9 a.m. the coach for Dalmally; at this point transfer yourself to the railway train, and at 8·40 p.m. sit down to a late dinner or an early supper in merry Carlisle. Every reader of classical English knows how Dr. Johnson's heart warmed up as he trod the sacred soil of Iona, but not a word had he to say for Oban,—"the little bay," say certain philologists, but more probably, mingling Scandinavian and Celtic, "the fair haven." Eight hundred years ago or more, Hako, the Norwegian Viking, anchored his fleet in Oban Bay, and after him came Alexander II. of Scotland, to expel the Northmen, and to die within the storm-beaten walls of Dunolly Castle. Four hundred years pass away, and James V., the minstrel king, drops his anchor in "the fair haven," to rest and recruit his mariners before sailing further north, to inflict summary justice, not unmingled with vengeance, on the M'Leods, M'Donalds, and M'Rimmons. But long before the Norwegian galleys crunched with their keels the green and grey pebbles of Oban Bay, troops of pilgrims to Columba's Shrine had lingered on the strand, waiting to be conveyed to the hallowed island of Culdee Christianity.

Boswell does not say how Johnson passed the night in Oban. Morning came, and the travellers were in a hurry to reach Inveraray. Oban was powerless to assist them on their way. "We could get but one bridle here, which, according to the maxim *detur digniori*, was appropriated to Dr. Johnson's sheltie. We crossed in a ferry-boat a pretty wide lake, and on the further side of it, close by the shore, found a hut for our inn." For "hut," read "Port —— Hotel, Lochawe. Situation unrivalled. Visitors will find this hotel replete with home comforts. Passengers from the lake steamer landed at the Hotel pier." Only one bridle in Oban in the days of the burly lexicographer, and now "Posting in all its branches" is writ large over the stable-gates of Oban's numerous hotels. On arriving at the "hut," Boswell records, "we were much wet. I changed my clothes in part, and was at pains to get myself well dried. Dr. Johnson resolutely kept on all his clothes, wet as they were, letting them steam before the smoky turf fire." Such vapoury conduct as this on the Dr.'s part would not now be permitted across the threshold of the Port —— Hotel.

Who visits Oban nowadays for its own sweet sake? The Palace of Dunstaffnage, the seat of the Scottish monarchy previously to its transference to Scone, and whence came the Stone of Destiny, which now forms part of the Coronation Chair in Westminster, is within the limits of an after-dinner stroll. Dunolly Castle, the seat of the M'Dougalls, and the Casket of the Brooch of Lorn, and Clach-a-koin (the stone of the dog), a huge boulder, to which Fingal used to chain his staghound Bran, are almost at the doors of the hotels, and yet they are unvisited. The fact is that Oban is the Charing-cross or Clapham Junction of the Western Highlands. It would fain assert itself as a Scottish Brighton. But at present the traveller cares not to linger in the metropolis of Lorn. "It is true," remarks the *Oban Times*,—a well-got-up publication,—"that a good many visitors find their way to Oban in June and July, but they are only casuals, and it is not till August has commenced that Oban shows at its best; and when September commences, with it there begins an exodus to the south, which continues till the end of the month, by which time the last stranger has gone." Probably in two years at furthest Oban will be connected by rail with the south. Some assert that tourists will not linger at Oban when once it is connected with the outer world, but will betake themselves to places where the shriek of the locomotive does not waken the sleeping echoes. The proposed Oban terminus of this railway is sorely exercising the æsthetically inclined inhabitants. Professor Blackie, with his *perfervidum ingenium*, comes to the front, and though by no means sharing in Wordsworth's dainty sentiment against railways, writes:—"If it be the fact, as I now distinctly am given to understand, that the terminus is to be advanced into the Esplanade, this procedure will certainly not act as a contribution towards the beauty or the enjoyableness of Oban bay. For, observe that when people come to a Highland town they expect to see the Highlands, and all things most characteristically Highland, with as little of what reminds them of Paddington or Euston-square as possible:" Elsewhere the Professor remarks, "As beauty to a woman, so is a certain picturesque character to a Highland town in a picturesque situation. People do not come to the Highlands to settle down amidst huge blocks of obtrusive ugliness"; and he follows these remarks up with an onslaught on certain of the obtrusive and ugly buildings of the town.

Nigh forty years have passed since the writer of these lines visited Oban for the first time. The one inn on the shore was sufficient to accommodate all the visitors. The town was then a departure point for Staffa and Iona, Glencoe and the Caledonian Canal. Few tourists were daring enough to penetrate further north to the Isle of Skye, which was his destination. With the exception of the baker's, there was not a shop, properly speaking, in the place.

Such was the Oban of 1840. The Oban of 1878 can, as the phrase goes, supply you with everything, from a needle to an anchor. It has its streets, its terraces, and its squares, its chief magistrate and town council, its churches of many denominations, and is now debating the question of a public park and recreation-ground. Its trade by sea and land, independently of those flitting swallows, the tourists, is rapidly increasing, and enthusiastic Obanites speak of their town as "the future Liverpool of the Highlands." Who shall predict what the vigorous little town will be forty years hence?

WHY THE DEATH-RATE IS NOT LOWER.

The following paper by Mr. E. B. Ellice-Clark, on "The Administration of the Public Health Laws," was read at the Stafford Congress of the Sanitary Institute:—

Great, if not insuperable, are the difficulties experienced in administering the sanitary laws. To the general public, who know that thirty years ago a Public Health Act was passed, and that legislation has been active on the subject ever since, it will be a matter of surprise to learn that in a majority of towns, and in nearly all rural districts, the sanitary laws have hitherto proved comparative failures, for the normal death-rate of England is as high in 1878 as it was in 1848. Nor is the cause of this difficult to find; probably no series of laws ever passed by the Legislature have interfered with the rights and privileges of property to such an extent as these Acts; therefore, when we find they have to be administered by what may be termed a voluntary-permissive, instead of an absolute, executive, it is not surprising to find that little progress has been made after more than a quarter of a century's work.

The permissive character of the Public Health Act places a power of inaction in the hands of those who are pecuniarily or otherwise interested in the *status quo*, which it is time should be removed for one of absolute authority. Those who have watched the actual progress made in giving people the essentials of a healthy and long life in cities have not failed to be struck with the slight advance made during the past twenty years to secure these. Towns are still undrained, having acres of filth beneath the houses; streets are unpaved. In the heart of the very metropolis itself houses are so badly built as to come tumbling about their owners' ears; hundreds and thousands of filth-reeking dens, unfit to be the resort of animals, still less the homes of mankind, cumber the earth in all our large towns, and too frequently are to be met with in the smaller towns and rural districts. And, notwithstanding the fact that Parliament considered the then evils so great as to pass an Act for their amelioration in 1848, not only do the same insanitary conditions exist, but others have grown and are growing up every day as bad as, if not worse than, those pointed out by the Health of Towns Commission. Streets that in no case should be less than 40 ft. in width, in more than one of our greatest cities may be made 20 ft. in width. Walls for dwellings, that in no case should be less than a brick thick, in scores of towns are built half a brick thick only. Cesspools and privies that sanitarians so loudly denounced forty years ago are being excavated and used at this day in the heart of many densely-populated towns. Back-to-back houses, without air-space at the rear or side, as required by bye-laws innumerable, are being constructed; and it is within the mark to say that the very evils pointed out so vividly by Mr. Chadwick and his co-workers so many years ago exist, more or less, in all their stages of rottenness, in nearly all the great centres of population throughout the kingdom, when we except about twelve of the drained and water-closet towns. In many of the former no really sustained effort has been made to carry out to a conclusion the intentions of the Legislature.

It is a matter much to be regretted, but none the less true, that, excepting the above-mentioned twelve towns, the majority of the members of the various sanitary authorities are not drawn from the classes having a sufficient and appreciative knowledge of the evils around them; nor have they the independence and ability so necessary to an administrative executive when discretionary powers, such as we find under bye-laws, are placed in their hands. It was anticipated, when Local Boards were first formed, that parochial business would receive an impetus which would raise it from the level into which it had sunk; that men would be attracted as candidates who would fearlessly carry out the reforms so urgently needed,—but such has not been the case. In many towns a great show has been made, and much money spent; for instance, towns have been sewered, but when persons have objected to connect their houses therewith, no one has had the courage to put the law into force to compel them. As the type of a town where the Sanitary Acts have been so great a failure, the writer may cite a city having a population of 80,000 souls where the Act of 1848 was adopted in 1852. Bye-laws were passed for all the matters that local authorities have to control: officers were appointed; main sewers were constructed, and all the machinery for securing the inhabitants healthy houses to live in, factories to labour at, and streets to walk in, was put into motion only to stop within a few months. Almost directly the authorities came to administer the laws they found themselves and their neighbours at open war, and the thought of the next November election was sufficient to deter them from interfering further with sanitation in its public action. The dead-lock has prevailed ever since. Twice only have offenders been brought before the justices for breaches of the building bye-laws, and nearly 3,000 houses have been erected in defiance of their existence. The party-walls were specified to be 9 in. thick in the bye-laws, but 4½ in. of badly-burnt clay, facetiously called brickwork, intervenes between each dwelling. This, instead of being carried through the roof, terminates at the bedroom ceiling; the latter, plastered in mud for the hour, very soon falling off, giving ventilation into the roof of the entire row, and, in the case of an epidemic, providing a fine for the conveyance of disease germs from house to house. The main sewers, admirably constructed a quarter of a century ago, are still without ventilation, and serve the purpose of carrying away slop and rain water only, for, side by side with the jerry wigwam, termed, with a spirit of irony, by the local auctioneer, "that eligible dwelling-house," is found the open privy, in the most confined parts of the town,—not by the score, but by the thousand,—in hundreds of cases not 3 ft. from the living-rooms; in a great number the walls for the reception of the filth being the lower part of the dwelling-house walls. Water being a commercial article of necessity, from which a net profit of 10 per cent. on capital can be made, is well supplied, the company having this work in hand being alone in doing its duty as a sanitary body. Densely-inhabited courts, unpaved, with every nook and cranny occupied, with all these filthy appendages without, and still worse within, can be found within ear-shot of the Council Chamber, where the Sanitary Authority holds its meetings.

The main commercial streets of the town have been widened, and a grand and lofty market-place, erected at immense outlay, rears its head above any other edifice in the town, where,—in parenthesis let it be named,—a costly iron roof, 80 ft. high, has been constructed for the purpose of sheltering the vendors of carrots, bacon, and old books, but not a penny-piece has been expended in sweeping away the courts entered from the almost equally narrow streets, under low archways, with the typical row of open privies staring you in the face as you enter, and much more of the kindred evils which fall on a neglected population springing up at every footstep. Year after year goes by, fortunes are piled up by the magnates who rule the town, but no man makes a lasting effort to remedy the evils, or if he does, receives his *quietus* in November, and the "cold shoulder" of his brother councillors.

The sanitary authority has met for a quarter of a century; its sanitary committee, whose chairman and a majority of the members are the owners of the courts, or who have friends who are, have sat in solemn deliberation 2,000 sittings, and yet no sign of a change takes place. No; nor will it, until a different class of men sweep them away from their stools of culpable indolence and negligence,—not until the law of the land is compulsory, and men are appointed to see it executed.

It will be asked, But why does not the town surveyor, or the medical officer, or the sanitary inspector expose these evils? Alas! the former holds his situation by a tenure as weak as a web, that can be broken by the very men who perpetuate these abominations; for they are the administrators of the law, and the givers and takers of offices. The surveyor is underpaid and overworked, and knowing the result of his spreading broadcast the state of the town, a seal is set upon his lips. The medical officer is a general practitioner, receiving 50*l.* a year for his public work, that is honestly worth 500*l.*; whose heart ached at the sight he saw for the first time when appointed, though he was bred and born in the town; whose reforming spirit entered into the office with the ardour of an enthusiast; but the *vis inertia* has sobered him down to the stern reality that the principal members of the Sanitary Board, who hold the keys of his office, are themselves the genii of filth; and although half his salary is paid by the Imperial Exchequer, which gives him an appeal to the Central Authority in London, such is the nature of social life in England, that were he to denounce the sanitary evils that dog his steps every hour, his private practice would be gone.

This is but one phase of the administration of the sanitary laws in urban districts. It is sufficient to have one evil under consideration at a time, otherwise there are many and grievous wrongs permitted and perpetrated by similar bodies, which require amending. The first work of sanitary law reform should be to supersede the permissive action of local authorities for one of compulsion. Bye-laws could be made for all the purposes of local government, and if sanitary authorities were compelled to make these, a great step would be gained.

The next point would be to see that these laws were carried out. And while we have unprotected local officers, it is impossible to expect they can take the initiative. Therefore

the Local Government Board should appoint inspectors to visit each town to see that the sanitary laws are actually at work. It is the case with coal-mines, alkali works, and lunatic asylums; and if every town council knew that an official report from year to year of the state of their district would appear, it would stir them to activity at once. Inquiries are now held after disease has broken out, and before money is borrowed for public works; but no inquiry is made as to whether or not the money borrowed is properly applied.

The Sanitary Acts were meant to be preventive; that they have not been so let the death-rate tell.

To those authorities who do their duty as many do, it would be a pleasure to have a report of the progress they are making, and the only possible objectors would be those who notoriously neglect their duties.

How better qualified members are to be obtained for sanitary boards, is a difficult question. Probably they will not be until public opinion is more enlightened as to the class of men that should represent them. Then we may hope to see high-minded impartial educated men filling the seats of local authorities. To educate the people in sanitary matters is the main object of this Institute. Successful administration must rest on the broad base of the people themselves, and it is to be hoped, by disseminating sanitary knowledge, this society will in time bring about a public demand for active honest administration of the public health laws.

LEAD POISONING.

In a paper on the Chemistry of Dirt, read at the Stafford Congress, Dr. H. C. Bartlett said: All commercial undertakings dealing with articles which may propagate and distribute disease to an unknown extent, have only one course to pursue. They must make war against dirt in any and every form, to accomplish which the best scientific advice and supervision is required. Less than the most advanced knowledge of the subject will not be found successful, for dirt assumes an infinity of disguises, and creeps in under many unsuspected cloaks. Untiring watchfulness and an intelligent comprehension of the details can alone combat with the ever present and insidious enemy.

True cleanliness is a matter of minutiæ, and admits of no subterfuge. If dirt can find a crack, a ledge, or an absorbent surface which cannot be reached by the ordinary method of cleaning, there dirt will accumulate, and where dirt is there will disease be also.

To avoid the possibility of dirt finding shelter in our domestic habitations, what must be done? Carry out, says the scientific sanitarian, the minutiæ of cleanliness by insisting upon an almost microscopic inspection, and use every valid means to maintain the large surfaces of the walls and ceilings as free as possible from injurious matters which may be absorbed or given out.

If we are to look to our neighbours for painstaking cleanliness, we must go to Holland for example, where it is popularly believed that no gastronomic injuries would ensue from dining directly off the flooring boards or tiles. Beyond the delightful duty of scrubbing everything which is not painted, the Dutchman and his wife find no such esoteric and sanitary delight as in painting everything which cannot be scrubbed or rubbed bright. And the Dutchman is right.

No layer upon layer of paperhangings, with brown, gray, or green arsenical dust to slowly poison the more susceptible of the family,—no sham plaster walls, porous to sewer gas and corrupted with putrefied paste, can be allowed.

If we have lath and plaster, let it be painted, and if we cannot have wainscot or mahogany kept brilliant by continued cleanly friction and polish, let us have a clean, painted wooden surface, as artistic in tint and in the disposal of the colours and decoration as taste and means will permit; but to carry out a determined war against dirt and disease, let us have paint. These are no longer notions peculiar to the Dutch. They are sanitary axioms which we cannot afford to ignore.

But there is another side to the proposal "to paint and believe in paint," as I observed in the commencement of this paper; sometimes the very means taken to keep our dwelling clean adds to the real dirt. So it is with paint, for there be paints *and* paints; some leave little to be desired from a hygienic point of view; others, as I shall show, are injurious to health and even deadly in their direct effects.

In July, 1873, I was instructed to investigate the causes which brought about, I believe, some of the severest cases of lead-poisoning ever made public. I found at Devonport Dockyard twenty-four cases had occurred among the shipwrights working there, dating between May 3rd and June 30th. There were sixty-four painters employed, and on the average about four cases of lead-poisoning per annum were reported of these men, or at the rate of eight per cent. of those engaged in laying on the white-lead paint. When the space to be painted was confined and ill-ventilated, the symptoms were such as Dr. Thomas Brown, R.N., described in his report, which, by permission of the Director-General of the Medical Department of the Navy, I am able to quote. "After a few weeks' work a pasty, lustreless look appeared upon their faces. There was a sense of great depression and weakness, together with headache and loss of appetite. A metallic taste was sometimes complained of, and a blue line was observed upon the margin of the gums."

It was only after persevering for some weeks that the graver symptoms were produced, and the men, becoming wholly incapacitated, sought medical advice.

But it was among the shipwrights that the symptoms appeared in a still more aggravated form. These men were employed in cleaning off Day's cement, together with the paint and red lead. All the symptoms previously enumerated were presented, but in a more intense degree, attended with greater depression, and in every case epigastric pain was described as a dull heavy pain, giving the sensation of the bowels being drawn towards the spine. Cramp in the muscles of the extremities was common and of great severity, but it was observed with surprise that there were no cases of paralysis. The most stringent precautions have since been taken; perfect cleanliness of the skin, and frequent washing of the working clothes was insisted on. A chemical respirator was recommended to be worn while at work, and sulphuric acid drinks were always to be kept in readiness. No precautions, however, prevent the use of white or red lead paints being exceedingly injurious both to the painters and to those who inhabit rooms in which the paint has not properly dried.

Now comes the important question, how long a time must elapse before white-lead paints can be considered to be so perfectly dried as to be absolutely free from diffusing their injurious influence?

I will reply that it depends upon circumstances over which we have frequently no control. I state this feelingly, as in my house, a few doors from Grosvenor-square, London, the whole staircase from top to bottom has paint upon it which is not dry now, although it was laid on at Easter last, while I was at Brighton.

The slightest greasy deposit upon the old paint will prevent white-lead paints from ever really drying, and while a skin of apparently hard paint cheats the superficial observer, there is a continual exosmosis of volatile poisons being given off. The truth is not revealed until a general tone of depression and lowered vitality throughout the house arrests the attention of observers on the look-out for such causes and effects. Or, perchance, the spirit of cleanliness, that handmaiden to the goddess Hygeia, insists upon an early cleansing of the paint all over the house, with the unpleasant result of detaching the false skin of the new paint and leaving the greasy under-coat which no length of exposure will ever dry. It is no exaggeration to assert that very little paint, containing white-lead as its basis, becomes so hard and dry within months of its application, as to preclude the possibility of poisonous matters being given off.

I have had distinct proof that the injury accruing from the diffusion of lead in the air exists to an extent far surpassing the well-known poisonous influence of minute quantities of lead in drinking-water. I have, therefore, always recommended the substitution of zinc-white for white-lead, for the all-important reason that it is harmless. Many reasons, however, tend to limit the use of the ordinary zinc-white (oxide of zinc), the weightiest of which are that it does not possess the body of white-lead, will not cover so much surface, and is, therefore, not so economical either in labour or in cost. Several coats of zinc oxide are required to equal the opacity of white-lead, and in mixing with other colours, a much larger quantity of zinc oxide must be used.

I have lately had brought before me a new preparation of zinc, which is stated to have overcome all these defects. As I have carefully investigated its properties, I am happy to find that we have at length obtained an antiseptic white zinc paint which is free from the objections raised against zinc oxide. I find the oxy-sulphide of zinc pigment, invented by Mr. Thomas Griffiths, of the Liverpool Silicate Paint Company, to be a very curious instance of the fulfilment of the demands of sanitary science. We insisted that we must have a non-poisonous white as the basis of the oil-paints used in our dwellings. Zinc oxide was proposed, and, I believe, large fortunes have been made out of its manufacture, notwithstanding the drawbacks. The economics of labour and expenditure must, however, be included within the demands of sanitation, or the use of the best and most harmless of pigments is certain to be evaded. The fiat of the trade is issued against it, and it becomes doubly dear and difficult to ensure its use. Oxy-sulphide of zinc is then brought forward, as dense as white-lead, and as opaque, its covering qualities even exceeding those of the lead paint; and, as it does not change colour like white-lead, is as cheap, all things considered. We may welcome another powerful auxiliary, which, while innocent of itself, will help us immensely in our campaign against dirt and disease.

HOSPITALS FOR INFECTIOUS DISEASES.

On this subject Mr. Ernest Turner, architect, read a paper at Stafford. After some prefatory observations the writer said,—

I have not time to discuss in detail the principles upon which these permanent hospitals should be built; but for the practical success of the hospital it is necessary particularly to study the following conditions, which have been thus ably and tersely expressed in a Memorandum issued by the Local Government Board, as follows:—

The site must possess these qualifications:—

"Accessibility of situation, so that the sick may not be exhausted by long journeys; wholesomeness of situation; and, as far as consists with these conditions, an open, uncrowded neighbourhood."

Then, as regards the wards themselves, we must secure,—

"Adequate ward-space for each patient; approaching, as nearly as circumstances allow, to 2,000 cubic feet, with a floor-space of not less than 144 square feet.

Thoroughly good provision for ward ventilation (*i.e.*, for sufficient unceasing entrance of pure air and of exit of ward air), with arrangements, also, for immediate change of air in the whole ward when necessary.

Perfect security against the possibility of any foul air (as from privies or sinks) entering any ward.

Means of warming each ward in winter to a temperature of 60° Fahr., and of keeping it cool in summer."

How these requirements are to be best and most economically secured is the duty of the practical architect to study and advise.

Ventilation, as I have often pointed out, cannot be secured by any single appliance, patent or not, but must be considered in conjunction with warming, and requires for the attainment of a satisfactory system the intelligent application of our knowledge of physics, and a considerable amount of practical experience.

The cross-ventilated lobby between the ward and the closets may be regarded as essential to a properly-constructed hospital, and yet in some of the most recent designs we see this, and other considerations of the utmost importance from a sanitary point of view, sacrificed to obtain some external architectural effect.

For warming small wards the open ventilating grate will be found most convenient, but for larger institutions I most certainly prefer warming by hot water, on the score both of economy and efficiency.

"Next," says the Memorandum previously alluded to, "safe means must be provided (safe both for the hospital and for the neighbourhood) for disposing of excremental matters and of slops, and for cleansing and disinfecting infected linen and bedding; and facilities for obtaining, in the use of the hospital, the very strictest cleanliness of every part."

Experience has proved that for the hospitals

of which I am treating there is no better system than the earth-closet. In this connexion there is one little practical point to which I would call attention, namely, the advisability of providing an opening with a door in the wall through which the receptacle may be removed from the outside. For the disposal of slop-water I believe there is no better system than that generally known as intermittent downward filtration. For disinfecting linen, &c., a heating chamber must be provided.

For obtaining the strictest cleanliness of every part of the hospital, all mouldings, ledges, or corners where dirt can possibly accumulate should be carefully avoided. Wooden architraves round windows and doors are not only unnecessary, but positively objectionable; rounded corners and impermeable materials should be used in every part. For the floors there is nothing better than asphalte or Portland cement. For walls of wards, many materials have been used, and many failures have taken place. Glazed bricks or tiles have been recommended, but they are expensive, and the numerous joints necessary are very undesirable. What is required is a hard, smooth, non-absorbent surface, which may be washed down, and which will not be affected by disinfectants. Some time since at one hospital I tried to make a hard coloured cement in order to render unnecessary the application of any decorative material after the cement was trowelled. It was not wholly satisfactory, the difficulty being to obtain an even unclouded tint, and I gladly yield the palm to another inventor, who has produced a material which, in my opinion, is undoubtedly the best that can be used for the purpose. I refer to an enamel paint manufactured by the Liverpool Silicate Paint Company. It appears to be an admixture of paint with some peculiar gelatinous substance, and the effect produced is a beautiful enamelled surface in any required tint; it is much harder than any varnish I have ever seen, and its application is very simple. The manufacturers recommend that it be used over the silicate paint, but I have used it in one of the London hospitals with great success upon a cheaper material made by the same firm, which is called petrifying liquid, or washable distemper. This work has now stood for two years, and looks as well as when first executed.

In conclusion, let me say a few words upon cost of construction. You are all aware of the great increase in the cost of building, owing to the price of bricks and the rise in the wages of skilled workmen. Now, there is a much neglected material which is admirably adapted for, and in every way suitable to, buildings of this class. I refer to Portland cement concrete. It is stronger than brickwork, and the walls can therefore be built of less thickness. Moreover, it is considerably cheaper, since while the cost of brickwork varies from 14*l.* to 17*l.* per rod, the cost of Portland cement concrete is not greater than from 9*l.* 10*s.* to 11*l.* per rod, thus effecting a saving of about one-third on the cost of the walling. If the soil upon which the hospital is to be built be gravel (and this is always to be recommended), the greater part of the material is of course already on the ground. Even if no gravel is available, there are many materials of which the concrete may be made, such as burnt ballast, brick-bats, stone chippings, slate *débris*, flint, refuse from furnaces,—indeed, almost any hard substance, which, mixed with the cement, will form a most durable wall. If one good foreman be employed to see that the materials are properly gauged and mixed, nearly all the rest of the work may be done by common labourers. The inside of the walls can be more cheaply treated than if brickwork were employed, and externally a pleasing if not an artistic effect may be produced by a simple rough cast of sand, pebbles, &c. I have used this material with great success for dwelling-houses, factories, &c., and hope to induce a sanitary authority which I am now advising to use it for their hospital. I throw out the hint to sanitary authorities generally, in the hope that the great economic advantages over brick-work of Portland cement concrete will prove a new and potent factor in inducing them to establish these hospitals.

What Land is Coming to!—An American paper states that 360,000 acres of white oak timber and mineral land in Western Virginia were sold in New York the other day in large lots for about one cent an acre—probably the cheapest sale of land on record.

EXPERIMENTS IN PAVING IN THE CITY.

An experiment with reference to two new systems of paving has been going on under the auspices of the City authorities during the past few weeks. The locality in which the novel systems have been tried is Shoe-lane, which was selected as affording a fair test of the average wear and tear in a London street, the traffic passing along that thoroughfare between St. Bride's-street and Holborn being, indeed, very large. The principal material in the first system is granite. The blocks, however, are not, like those commonly used, of a depth of 9 in., but are merely 3 in. deep. Beneath the granite, and laid on a bed of concrete, are sheets of thick felting; and another peculiarity is that the interstices between the separate stones, instead of being filled with mortar, or sand, or tar and gravel, are filled up with lead, or rather an alloy in which lead is the main ingredient. Passers-by cannot help remarking the great diminution of noise as vehicles pass from the ordinary 9-in. granite paving over this short reach of 3-in. granite, felt, and lead pavement. So far as we can judge from personal inspection, this 3-in. granite as laid down in Shoe-lane will require a good deal of improvement before it can be adopted in place of any of the systems now in vogue. A week after it was laid down we noticed that it had become very uneven on the surface, and that a portion of the metal had been driven out of the interstices more or less over the whole area.

In the other system the principal material consists of asphalte. This is prepared in oblong bricks of about 15 in. long by 9 in. broad. They are ready for laying down, and can be very rapidly fixed, the process being very simple. They are laid on a bed of concrete without felt, and their chief peculiarity is that at intervals of 3 in. to 4 in. flat stars of iron are visible all over the surface, this expedient being intended to do away with the slipperiness, which is so great an objection to ordinary asphalte, by presenting a sufficient roughness or elevation of the surface to form a firm foothold for horses. On comparing this new asphalte and iron pavement with the old 9-in. granite and the new 3-in. granite, felt, and lead pavement, it is obvious that while far quieter than the former it is inferior to the latter in point of absence of noise. The iron stars appear to serve their purpose very well, and we shall not be surprised to hear that the asphalte and iron pavement proves a useful addition to the systems already in existence.

MESSRS. EPPS'S NEW COCOA MILLS.

On the site on which formerly stood the old Falcon Glass Works, in Holland-street, Bankside, Southwark, a very large new building is in course of erection for Messrs. Epps & Co., the well-known cocoa-manufacturers. The building will occupy a ground area of about 25,000 superficial feet, or more than half an acre in extent, and will have two bold main frontages, one to the north, and the other to the west. The north frontage, which is circular in form, has a sweep from east to west of 160 ft. in length, and is 65 ft. in height. It consists of the ground-floor and three lofty stories above, and in the centre is a covered carriage-way, 10 ft. in width, by which the vans and other conveyances will reach a large area at the south-east side of the building. This area will be covered over with a roof of glass. The building is faced with red Suffolk brick, relieved by Bath-stone dressings, projecting piers being introduced at intervals the whole length of the elevation, and carried up to the main cornice. The ground-floor portion of the frontage is rusticated. Above the ground-floor a stone string-course runs the entire length of the frontage, and a similar string-course above the first-story, whilst the second-floor is surmounted by a bold moulded stone cornice. Above the third-floor cantilevers support the main cornice, and the elevation is surmounted by a parapet. Each floor contains a range of nine two and three-light windows. The window-frames and sashes are all of iron. The west frontage is uniform in design with that on the north side, but a portion of it is only carried to a height of two stories above the ground-floor. It is 160 ft. in length, the extreme length of the two frontages being thus 320 ft. The principal entrance to the building is by a porch at the north-west angle, and above this entrance there is a clock-tower, surmounted by a dome, the height of which from the ground-line is 110 ft.

The internal arrangements of the building provide for the complete working of the various departments of the manufactory, as well having accommodation for the several *employés* who will dine and take other meals within the building. The basement contains the men's dining-room, a spacious apartment 37 ft. by 15 ft.; also the country packing-room, bottle-washing room, bin store, powder mills, and cooling-room. In this room arrangements are made by which the floor can at any time be flooded with water to assist in the process of cooling. The ground-floor contains, on the north-west side, the vestibule and waiting-rooms, clerks' offices and private room, luncheon room, and timekeeper's room; and on the north-east side there are several large apartments, including the stock-room, 50 ft. by 30 ft., together with the men's cloak-room, lavatories, and other conveniences. On this floor is also the great machine-room, an apartment 90 ft. long by 45 ft. wide, and immediately adjoining is the dry-block store, 50 ft. square. On the first floor, at the north end, is the lower labelling-room, which occupies nearly the whole of this portion of the floor. The women's tea and dining room, an apartment 46 ft. by 30 ft., is also on this floor. The second floor contains the upper labelling-room, the box-labelling room, the roasting-room, 40 ft. by 45 ft. The portion of the floor in which this room is situated has an open hopper roof for carrying off the fumes, and for ventilation purposes. The floor of this room is paved with tiles, laid on concrete. The second floor has also two large rooms containing stores and raw material, and on the upper floor is the packing-room, the packet and working room, and the powder store. On each floor tramways will be laid down in order to facilitate the conveyance of goods from one portion of the floor to another, and there are likewise lifts for raising and lowering goods from the basement to the top of the building. The whole of the staircases leading to the upper portions of the building are external, and composed entirely of brick and stone. There are also hydrants to each floor, so arranged externally that in case of fire it might be kept under control. At the top of the building there are two tanks, each of which will hold 10,000 gallons of water. It may be observed that the process of manufacture commences at the top of the building, where the raw material is stored, and is gradually conveyed down from floor to floor, until it is finally ready for sale and despatch.

At the rear of the main building, at the south-east side, stables, and residences for the men in charge of the horses and men, have been erected, together with an engine and boiler house, the engine-house being erected above the boiler-house, and resting on plate girders.

Mr. Edwin T. Hall is the architect of the building, and Messrs. Bangs are the contractors, the ironwork, including the columns, girders, roof principals, and tanks, having been supplied by Messrs. Stanley, Hall, & Co. The cost of the building, exclusive of fittings, will be 29,000*l.*, whilst the entire estimated cost, including the land, is about 50,000*l.*

MOUNTAIN RAILWAYS.

Sir,—A paragraph in the *Italia* informs us a road is to be constructed up Mount Vesuvius, by which, so it goes on to say, "one can attain the crater of the volcano comfortably and commodiously by means of a railroad, in the style of that of the Righi. The heads of the Ministry of Public Works in Italy (*Conseil Supérieur*) have given their consent to this project of the Mount Vesuvius Railway, presented by a banker, who has obtained from the Prefecture of Naples the concession of this line.

The railroad in question is to be constructed on the system called *Funiculaire*, and supported by iron columns, placed at a distance of six mètres apart. The length of the line will be 840 mètres, and the station at the summit of the mountain will be 420 mètres above the station, at the foot of the volcano. This railroad, with two lines, will be provided with eight carriages of four places each, of which four will ascend whilst four descend. A distance of 210 mètres will always be kept between each train. To avoid accidents, each carriage will be supplied with an automatic brake of a recently-patented invention, and destined, in case of a rupture of the cable, to stop the

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carriage immediately. The mechanism will be put into movement by a fixed steam-engine of 12-horse power.

The mention of the Righi in this paragraph, and of the singular railway that enables travellers to accomplish so easily the ascent of this mountain, reminds me to ask you if it is generally known that the original idea of this mode of locomotion is claimed to be due to our clever "American cousins," however much it may have been improved on afterwards.

A pamphlet was published in Switzerland in 1868, entitled "Crossing the Alps by a new System of Cog-wheels and Rails," which caused a great sensation. In 1869 the Government of Lucerne was applied to, and they granted the concession for a railway up the Righi. The rail was opened from *Vitznau* to *Staffelhœhe*, May 21, 1871, and from *Staffelhœhe* to the summit of the mountain (*Kulm*), June 27th, 1873. But in referring to an American paper ("Frank Leslie's Illustrated Paper" of August 21, 1875), I see underneath an engraving of the "White House," Mount Washington, the following description, which places the original arrangement as far back as 1866:—"The Summit House stands upon Mount Washington, the highest of the White Mountains in New Hampshire, which has been aptly called the Switzerland of America. It is at an elevation of 6,291 ft. above the level of the sea. It has long been a favourite resort for tourists, and even before the present facilities for reaching it were afforded, hundreds made pilgrimages to its doors for the purpose of enjoying the grand scenery that can be viewed from this point. A horizon of nearly 600 miles bounds the prospect, and all around stand the lofty peaks of the giant mountains. If the sky is clear the eye can roam westward almost to the Catskills, northward into Canada to the mouth of the Saco, and eastward to where Mount Kaladin raises its giant head in the far west woods of Maine. The ascent of the mountain is now made easy by the Mount Washington Railroad, which is a triumph of engineering skill. The road was commenced in 1866, under the superintendence of Sylvester Marsh, the inventor, and after three years spent in its construction was opened to the public. The success which has attended the enterprise has been so marked as to almost revolutionise travel in many mountain regions. This road has served as the model of the road up the Righi in Switzerland.

The railroad is nearly three miles long, and ascends 3,625 ft., starting from a point 2,668 ft. above tide water. The maximum grade is 1,980 ft. to the mile, or a little more than 1 ft. in 3, while the average is very nearly 1 ft. in 4. The road is built in the most substantial manner, of timber interlaced and bolted, resting on the solid rock of the mountain side. Besides the usual rails there is a centre rail of peculiar construction to receive the motive-power. It consists of two bars of iron, with connecting cross pieces at a distance of every 4 in. A centre cog-wheel on the locomotive plays into this rail and secures a sure and steady mode of ascent and descent. The driving-wheel of the locomotive is geared into a smaller wheel which connects directly with the crank. Four revolutions of the engine are required to make one of the driving-wheel, thus sacrificing speed to power. The engine is not connected to the car, but simply pushes the car up the track. On the return it allows the car to follow it down at a slow rate of speed.

Near the east part of the ascent can be seen a tablet that marks the spot where Miss Lizzie Bourne, daughter of Judge Bourne, of Kennebuck, died near midnight, September, 1855, where her uncle and cousin kept watch till dawn. They had started in the afternoon without a guide to walk to the highest point; night and fog overtook them, and the young girl perished among the rocks, but a few rods from the house they were in search of. Near also is the shelving rock where a gentleman lost his life who attempted the mountains alone, and was overtaken by a storm. Other tales of suffering and adventure are told of this region, but since the completion of the railroad to the summit there is but little possibility of such accidents occurring.

The summit is now occupied as a station of the Meteorological Department of the United States Army, and observers have passed the entire winter there. They have experienced no unusual difficulty in making weekly visits to the country below, although they have been subjected to severe weather. The wind has sometimes assailed them with a velocity of a hundred miles per hour, and the thermometer at one time during the first year of observation indicated fifty-nine degrees below zero (Fahrenheit). C. S.

THE NEW SEWAGE WORKS FOR THE CROYDON RURAL DISTRICT.

A very extensive sewerage scheme is about to be carried out by the Croydon Rural Sanitary Authority. The works about to be executed are in that portion of their district comprising Beddington, Merton, Mitcham, Morden, and Wallington, in order so to dispose of the sewage without polluting the river Wandle and the Beverley Brook, which flow through the district. The pollution of the Wandle had become so serious that, some time ago, a perpetual injunction was granted to restrain the Rural Sanitary Authority from discharging sewage into the river. During the last few years several projects for sewering the district have been brought forward, including one in 1874 for the construction of thirty-three miles of sewers, of which about five miles were on private property. In consequence, however, of the landowners withdrawing their offer to sell the land the project had to be abandoned, and another scheme, recommended by Mr. Baldwin Latham, and favourably reported upon by Colonel Cox, R.E., and Mr. Robert Rawlinson, C.B., and sanctioned by the Local Government Board, is now about to be carried out. This scheme involves the conveyance of the sewage to Byegrove Mead, and there purifying it by intermittent filtration. The scheme includes the construction of thirty-six miles of sewer, all of which are within existing or contemplated roads. About six miles of sewers are to be made in roads which have been constructed in the district since the scheme of 1874 was propounded, to meet the requirements of the district, parts of which are being rapidly built upon. The outfall at Byegrove Mead is partly in the parish of Mitcham and partly in Wimbledon. An area of thirty-eight acres has been purchased, of which about thirty acres are gravel, which will be surrounded by a puddle wall, and then be thoroughly drained. This area will then be used as a filter. The sewage will be prepared for the land in tanks, within a covered building, and the mud will be directly solidified by air-pressure in suitable presses, so as to be dealt with without creating a nuisance. The sewage from two-thirds of the whole district will reach the land by gravitation, and the remaining third will be required to be pumped to a height of about 20 ft.

The tender of Messrs. B. Cooke & Co., of Phœnix Wharf, Battersea, has been accepted for the construction of the works, and for treating the sewage for upwards of three years, during which it is calculated the works will be in hand. The land for the outfall works have been purchased at a cost of 11,300*l.*, and the contract for the works is between 60,000*l.* and 65,000*l.* The estimated total cost of the works, including engineering and superintendence, is about 90,000*l.*

Copyright in Artistic Property.—The resolutions of the International Congress on Artistic Property, held in Paris, recommend a copyright of 100 years. The right of reproduction should not necessarily be involved in the sale or in the presentation to the State of a work of art, except in the case of the portrait or statue of the vendor or any member of his family. Piracy should include the reproduction or imitation for sale by any different art or industry, and also the unauthorised transcription and setting of music. The assumption of an artist's name, signature, or distinctive mark should be punishable. Societies should be founded for the protection of artists' rights, the collection of dues for reproduction, representation, and execution, and the creation of relief funds. An international artistic society should also be founded. Foreign artists should have equal rights with natives, without condition of reciprocity, on simply proving their copyright in their own country. Artistic copyright treaties should be independent of commercial treaties, and should apply to works anterior to the conclusion of the treaties. Uniform legislation on artistic property is also desirable. The Congress request the French Minister of Education and Fine Arts to promote the meeting of an official international commission for the purpose of framing a uniform law.

THE NEW BELLS FOR ST. PAUL'S CATHEDRAL.

The bells in St. Paul's have been rung experimentally with satisfactory results, and we give a representation of the whole family and their cage.

It is about a year since the solitary bell which occupied the northern tower of the cathedral, and which used to call to divine service, was dismounted, and the works were commenced which were required to strengthen the floor that was to carry the new peal, which was being cast at Loughborough by Messrs. Taylor & Sons.

The tower itself was found to be admirably suited for a large peal of bells, and the eye of the vaulted chamber below was large enough to admit the new tenor, 5 ft. 9 in. in diameter; and as regards the support of the bells, nothing was required beyond some additional floor-beams and a system of strong struts carried down so as to bear on the walls of the tower, on an offset ready for them, at the level of the floor below. These beams and struts are of teak and oak.

The bell-frame, which was prepared at Loughborough, is of oak, and very massive. It is connected by bolts passing from the top of the frame to the bottom of the floor-beams. The works required for the preparation of the tower were executed by Mr. Geo. Shaw, of King Edward-street, under the direction of the surveyor to the fabric, Mr. Penrose.

Below is a list of the weights and notes of the bells, with the names of their donors:—

	Weight.			Note.	Donors.
No.	Cwt.	qr.	lb.		
1	8	1	16	F	The Drapers' Company.
2	9	1	15	E flat	
3	10	0	3	D	The Baroness Burdett Coutts and the Turners' Company.
4	11	3	21	C	
5	13	2	14	B flat	
6	14	0	4	A	
7	16	2	21	G	The Salters' Company.
8	22	1	18	F	The Merchant Taylors' Co.
9	28	0	7	E flat	The Fishmongers' Company.
10	30	2	22	D	The Clothworkers' Company.
11	44	2	0	C	The Grocers' Company.
12	62	0	0	B flat	The Corporation of London.
Total	271	3	1		

There are two points more than usually advantageous in the position of these bells,—one is the open character of the steeple above them, which will give great freedom to the emission of the vibrations, whilst their great height above the street (about 120 ft.) will prevent any harshness of sound from being a source of annoyance in the immediate vicinity.

It is expected that the first complete peal will be rung on All Saints-day, November 1.*

MONUMENT TO THE LATE LORD LYTTELTON, WORCESTER CATHEDRAL.

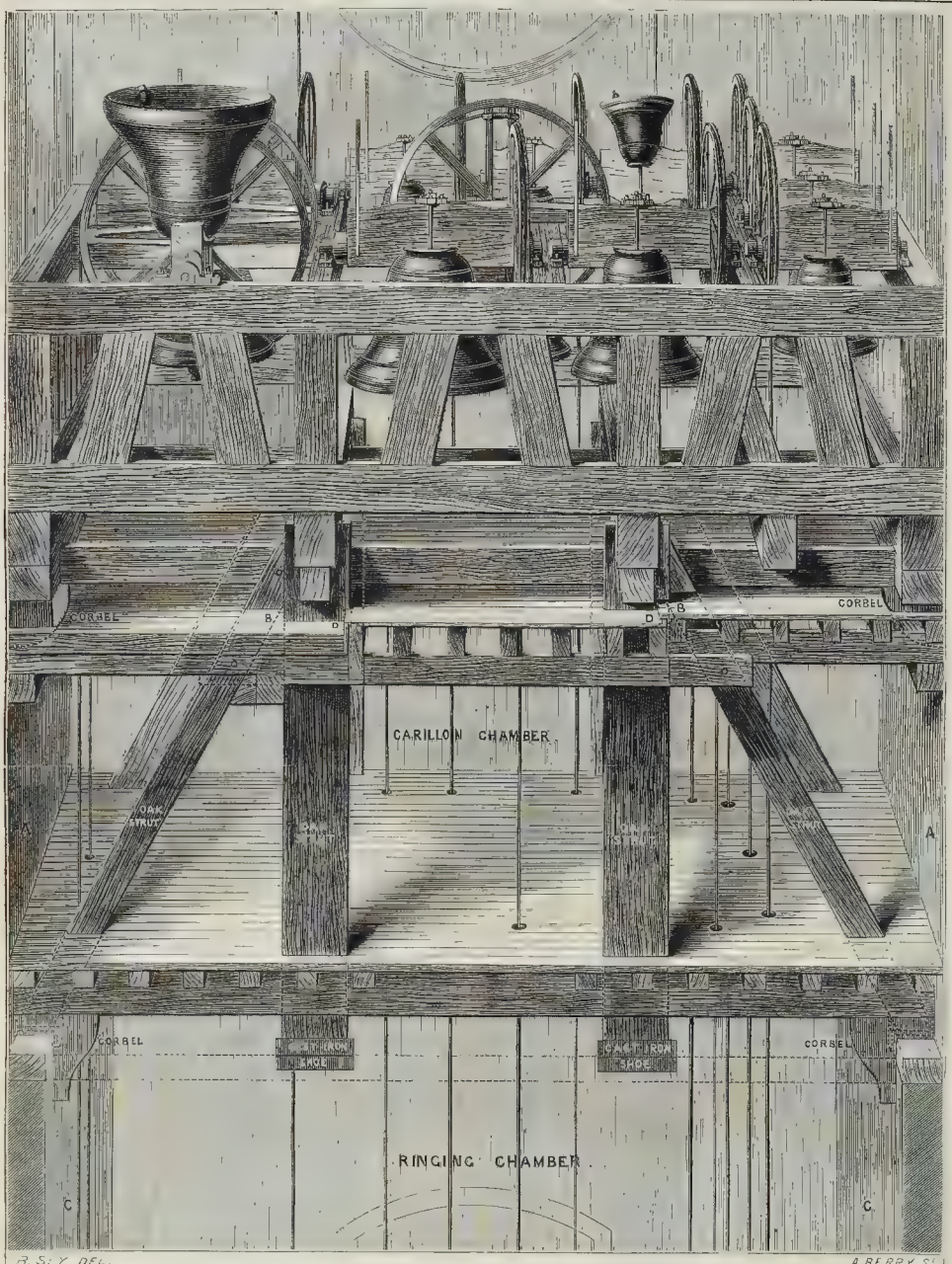
A few weeks ago we published particulars of a monument to the memory of the late Lord Lyttelton, executed by Mr. Jas. Forsyth, sculptor. It has since been erected in the transept at Worcester Cathedral. The general design of the monument was made by the late Sir G. G. Scott, R.A., and the execution of it is highly creditable to the sculptor. The likeness we can say, speaking from personal knowledge, is excellent.

The altar tomb, as we have already mentioned, is executed in alabaster and different coloured marbles; and shields emblazoned with armorial bearings, illustrating the genealogy of the Lyttelton family, occupy the panels. On the top of the tomb reposes the recumbent figure of the deceased, in pure white marble, draped as a peer, with the head inclined to the left. The following inscription runs round the top of the tomb:—

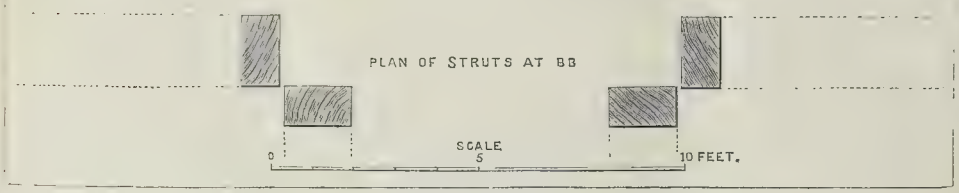
"Hoc · monumentum · in · memoriam · Georgii · Gulielmi · Baronis · Lyttelton · per · xxxvi. · annos · hujusce · comitatus · sub · Victoria · Regina · præsulis · amicii · quidam · lugentes · posuerunt · ex · iis · inter · quos · ut · Dei · gloriæ · hominumque · saluti · inserviret · operose · laborabat. Natus, · Martii · xxxi. · a.d. · m.dcccxvii. · obiit · Aprilis · xix. · a.d. m.dcccLxxvi."

St. Alban's Cathedral.—Messrs. Longmire & Burge have received the order to proceed with the new roof for the nave, of the old high pitch. The present subscriptions will be about 2,600*l.* short of what is requisite for flat tiles, and about 3,000*l.* short for Coniston slates, and not enough for lead by at least 4,600*l.*, and more if the present low price of lead rises again.

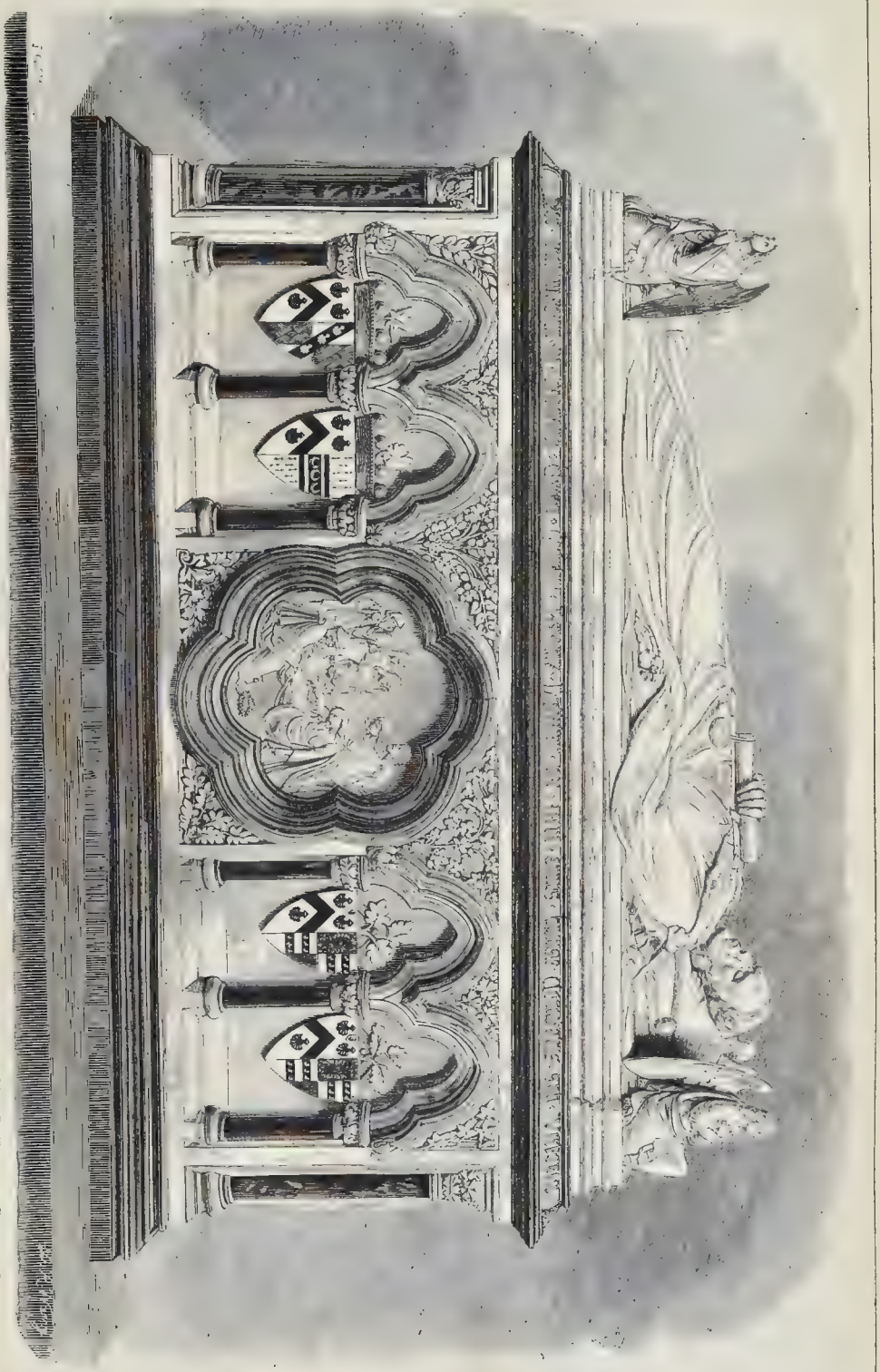
* A view of the bells and bell-cage at Worcester Cathedral, Carillon, &c., will be found in our volume for 1874, pp. 239—242.



THICKNESS OF THE WALL AT AA 5 FEET 9 INCHES.
CC 6 FEET 9 INCHES.
DD DIPS TO CARRY OFF WATER.



THE NEW BELLS AND BELL-CAGE, ST. PAUL'S CATHEDRAL, LONDON.



MONUMENT TO THE LATE LORD LYTTELTON, WORCESTER CATHEDRAL.—The late Sir G. G. Scott, R.A., Architect; Mr. J. Forsyth, Sculptor.

ANOMALIES IN ARCHITECTS' PRACTICE.

Sir,—I hope this question will be thoroughly ventilated now it is before the building public, for there are certainly many matters needing reform.

Architects in many cases show weakness in not taking a firmer stand with their clients. If extra work is necessary, the client's consent should be forthwith obtained, and an order given for it, but this is not always done because the architect fears to show the client he is increasing the amount to be paid, and he has probably told him it *shall* not exceed a certain sum; then, at the end of the work there is a cutting down of extras to keep the account within the promised limit. I do not think an architect should have arbitrary power to define what is an *extra*. If neither specification nor plans show what is required, then it should be paid for, unless taken in the quantities, and they form part of the contract; if they do they should combine the two, and if it is not taken in the quantities then it is an extra, even if it is shown, as the builder is not paid for it.

I am certain, from experience, that the reason contractors lose, as they often do, over contracts, is that they do not get paid for the extra work that exists. In large firms many extras are passed unnoticed.

I submit the following suggestions, and should like to offer more if the subject is continued.

1. All *details*, for it is in details most disputed items arise, should be sent to the contractor's *offices*, not works, for his inspection before putting them in hand.

2. A list of all extra work the builder claims should be sent to the architect before "measuring up."

3. A competent surveyor in *all* cases should be appointed to meet the builder's man and measure up; this does away with what your correspondent sarcastically calls the builder's *pourparlers*.

4. The old forms of contract should be ignored, and only the one used that was approved by the Institute of Architects and Builders' Society, a copy of which has been published.

Contractor.

Sir, — I should like to add another to the notes, for which you found room on p. 1021, as to variations from contractors, before making remarks on another "anomaly" to which Mr. T. Roger Smith called attention in his interesting letter on p. 941.

The candid friend of architects, who does not fail to tell them and the world of all their faults, —actual, possible, and impossible,—has made a great point of orders for extras being sanctioned in writing in every case by the employer,—implying that architects have a happy knack of landing employers in all sorts of monetary difficulties by straining their powers as agents. I fancy I have detected a little sharpness of tone in dealing with this, and have not been surprised. Architects who have worked for a goodly term of years, doing their duty by employers, may be pardoned for feeling their self-satisfaction profaned when receiving rough blows from an untender hand,—it is so difficult to deal quite temperately with a critic who conveys, by a tone of voice, or by written innuendo, more than he says, or perhaps than he would care to say, or to mean. No practical person disputes the value of an employer's interest in a work, nor of his control of it, so long as the control is very wise, intelligent, equable, and excellent generally; nor is there any wish to say that a very distinct authorisation of extras (and if possible an agreement as to the exact sum to be paid in each case), is not a very proper and satisfactory piece of business. The only objection is, that in real life, and with employers in general, especially with compound employers,—such as committees, boards, &c.,—the thing is impossible. The avoidance of delays in critical stages of a work, the absence of the employer,—his laziness or indifference it may be; his varying moods,—but why make a list of all the rocks and sands among which the architect must steer discreetly if he wants to move at all? No doubt, as a barrister feels and argues in his everyday experience, a wise man will choose cautiously those who are to act for him, and will not tie them up with a short chain.

Let us, in order to get anomaly No. 2 fairly before us, quote the gist of three clauses of an ordinary building contract:—"The contractor shall . . . . . complete and deliver over to Mr. — on or before the — day of —, &c. [liquidated and ascertained damages stated at a certain rate]. If the works shall be suspended during any local or general strike, then such time for the completion of the works may be delayed for a period equal to the time of such suspension. The architect shall have power to make such allowance of time to the contractor as he may deem fit and just on account of badness of weather, additions, enlargements, alterations, deviations, or any other cause whatsoever, and such allowance of time shall be," &c.

Mr. Smith's questions seem to lead on to such as these:—Are such clauses bits of a comedy,—light trifles that no one need seriously regard? Would it not be better if everybody agreed to treat them seriously, or else to cut them out of ordinary contracts altogether? Would a mere undertaking on the part of a contractor to reach completion at such a time as might be considered reasonable, be less or more effective? Might not then the cases where expedition is essential be treated in an exceptional way, and the contractor bound and kept most rigidly to his time,—the damages being charged to him, without the employer regarding himself, and being talked of by others, as an objectionable Shylock?

1. Mr. Smith's statement that deductions for damage by delay,—although threatened frequently,—are rarely enforced is true enough,—but he hardly seems to do entire justice to contractors by his way of putting it. Dilatoriness, muddle, bungling, miscalculation, — a whole alphabet of charges might be hurled at the building trade;—and be no truer than any other "charging at large;"—that is, true enough to make the charge unpleasant, and untrue enough to make it unjust. I have known men who prided themselves, and built reputation, on finishing to a specified date. It is difficult and hazardous to speak without a heap of statistics, but I fancy that a large majority of buildings for trade purposes are really done to time. A contractor catches pretty cleverly the tone of employer, architect, and the rest; and, when he finds that literal compliance is meant,—literally he complies, if at all possible. No one need be expected or asked to have relays, or even to drive his men to lengthy overtime,—with all its admitted evils both to the men and the work,—when he knows that the specified time has been fixed almost at hazard, and is not even remembered by the employer.

2. Building contractors have, however, acquired, or been credited with, a reputation for delays, which should be got rid of as soon as possible. If architects would apply to sufficient builders for tenders, contractors would not, in their anxiety to keep busy, snatch at more work than they can manage; if architects would always select men who are strong enough for any special work, incapable people would not mar their own and other people's reputation by going into matters with which they cannot grapple properly; if, in short, we could always secure the right sort of people at the right time, in the right relation to one another, there would be little excuse for delays,—or, indeed, for other complaints as well.

3. One ought not to shirk the hint by "A Firm of London Builders" (p. 995) that architects are sometimes blameworthy,—"not supplying such information and documents as are necessary for conducting the work." I understand the suggestion to be that a contractor might make a special claim, if he liked, on that account. In an extreme case, no doubt, he might, and get it allowed too, but such extreme cases must be very rare indeed. Contractors have been known to exhibit great skill in divining as to negotiations with neighbours, possible modifications in the superstructure, and so on; and an almost superhuman prevoyance in consequence,—an anxiety beyond praise to be prepared beforehand with the work in those parts of the building. They have been able, in this mood of virtue, to write recitals of their anxieties, which a year after would read like the arraignment of an injurious architect, and would excuse any quantity of delay. A good surveyor contrives to give himself useful points on his base lines, which can be brought in again when he comes back. A contractor may pardonably feel a wish to train himself in all kinds of forethought, and to imitate exemplars, but he should in his own business avoid "base lines," and plotting too.

4. The result of all considerations would be to maintain the present system; the defined time for completion, the damage for non-completion, the extension of time for adequate reasons. The time should be settled very carefully with a view of giving ample time, for a contractor of the class who is to take the contract. It might be possible to classify rates of progress as (1) ordinary time; (2) quick time; (3) special rate; and even to get some authoritative statement from contractors as to what they would consider adequate average time at each rate of progress in certain well-understood types of building,—a 10,000*l.* church, a 4,000*l.* parsonage, a 12,000*l.* block of warehouse buildings, &c. Such model accepted, times could be modified to suit cases. Then the damages should be put at the probable damage, and not at a fancy rate. When there are no adequate reasons for extension of time, it should be the custom to enforce the contract literally. "Adequate reasons" would, of course, be an elastic phrase, interpreted by the architect who would weigh the facts and would find generally (one would hope) that the contractor had come near to his duty, and would rarely have to find that damages had accrued except where incapacity, or wilful neglect, or disregard of reasonable instructions, were too decided to be overlooked. Some one may say that this is pretty much what every body is doing now; but I do not think it is. We are a little uncertain in movement at present, every one seems agreed; and we might as well be more precise if not actually more active. In the words of Mr. Field (p. 995),—"Let us amend our practice as may be needful"; to do this, I think we need make no change in the forms of our documents.

S. F. C.

MANCHESTER SCHOOL OF ART.

NEW PREMISES.

A site in Cavendish-street has been secured by the committee for the erection of new buildings for the Manchester School of Art. The cost of the land has been 10,500*l.*, and, according to the *Manchester Courier*, an additional sum of 23,000*l.* will be required in order to defray the cost of the new buildings. Of this sum nearly 16,000*l.* have been subscribed, and so sanguine do the committee feel that the people of Manchester, recognising the importance of the institution, will subscribe the balance, that they have resolved to proceed with the erection of the buildings. The architect is Mr. G. T. Redmayne, of King-street, who has prepared a design which is an adaptation of the Romanesque in style, and the building will have a frontage to Cavendish-street of 148 ft., and extend back with its side to Ormond-street a distance of about 70 ft. It will consist of a central portion or body with two wings, one at each end. The height of the central portion will be about 50 ft., and the wings will be some 70 ft. high. On the ground-floor there will be rooms for the male senior and junior students, and rooms also for the head-master and the secretary; in addition to which there will be a reading-room, a mechanical drawing-room, male cloak-room, a library, a committee-room, lavatories, and a room for the porter. On the first floor there will be the antique-room, a model-room, and rooms for the female students, second and third masters' rooms, and lavatories. There will be a number of private studios on the second floor. Here also there will be two galleries,—one at each end of the building,—in which it is proposed to arrange a permanent collection of works of art.

A MEMORIAL FOUNTAIN AT THE EAST END.

The representatives of the late Sir Francis Goldsmid, M.P., who was recently killed at the Waterloo Railway Station, have resolved upon erecting a fountain to his memory in Dock-street, at the East End. The structure will be of marble and granite, and, it is said, will be very handsome. It will entail no cost to the local authorities. The permission to erect the fountain in place of one now standing on the spot, which is in a dilapidated condition, was made to the Whitechapel Board of Works last week, when the Board readily complied with the request.

The New Eddystone Lighthouse.—The contract for the supply of all the granite for this important work has been given to Messrs. Shearer, Smith, & Co., of the Dalbeattie Granite Works.

DEATH OF SIR FRANCIS GRANT, P.R.A.

It is our sad duty this week to chronicle the death of Sir Francis Grant, president of the Royal Academy. He had been in feeble health for the past two or three years, and suddenly, on the morning of Saturday last, he was struck down by heart disease, at his residence, the Lodge, Melton Mowbray. The fourth son of Mr. Francis Grant, of Kilgraston, Perthshire, he was born in Edinburgh in 1803, and was, therefore, in his seventy-fifth year. As a young man, he was greatly devoted to field sports, and this circumstance influenced him in some of his earlier works, notably in "The Meet of his Majesty's Staghounds" and "Melton Hunt." According to a passage in the diary of Sir Walter Scott, whom he visited at Abbotsford, he was accustomed to avow his purpose of spending his patrimony in field pursuits, and of then devoting himself to the law. The fortune soon went, but Grant had by this time discovered that the bent of his talents lay in the direction, not of law, but of art. Confident of receiving liberal support from his many distinguished friends, he decided, in or about the year 1829, to make painting his profession, and studied drawing under Somerville, a local artist of some repute. During this time he numbered among his most intimate friends Sir J. Watson Gordon (subsequently president of the Royal Scottish Academy), and by the kindness of the Earl of Elgin, who always gave him much encouragement and assistance, he was enabled to form his taste in that nobleman's gallery. He soon began to "make his mark." Proceeding to London, his first picture was exhibited in the Royal Academy (then quartered at Somerset House) in 1834. From the outset he devoted himself chiefly to portraiture, even in the hunting scenes before referred to, for the "Meet of his Majesty's Staghounds," painted in 1837 for the Earl of Chesterfield, contains forty-six portraits of celebrated sportsmen of the time. His facile brush has depicted the lineaments of some of the most celebrated men of his time, including Macaulay, Mr. Disraeli, Sir Edwin Landseer, and Lords Hardinge, Gough, Campbell, Derby, Palmerston, Clyde, Russell, Stanley, and his brother, General Sir J. Hope Grant, G.C.B., who, after a long and brilliant career in the service of the State, died three years ago.

Sir Francis (then Mr.) Grant was elected an Associate of the Royal Academy in 1842, and in 1851 he became a full Academician. In 1855 he received one of the three first-class gold medals awarded to British artists at the Paris International Exhibition of that year for his "Meet of his Majesty's Staghounds," and was elected an honorary member of the Société d'Artistes Belges. In 1866 the president's chair in the Royal Academy having become vacant, through the death of Sir Charles Eastlake, and Sir Edwin Landseer declining to serve, and Mr. Maclise not being desirous of the post, Mr. Grant was elected, on February 1st, to the vacant presidential chair by 23 votes out of 29, as the ninth president of the R.A., and soon after received, according to precedent, the honour of knighthood. His geniality and courtliness of manner soon made him very popular at the annual Academy banquets. In 1870, the University of Oxford conferred upon him the honorary degree of D.C.L. He was also an honorary member of the Royal Scottish Academy, and of the Pennsylvania Academy of Fine Arts. He married, early in his career, Miss Emily Farquharson, of Invercauld, and, subsequently, a daughter of Mr. and Lady Elizabeth Norman, through whom he became allied to the noble house of Manners. Lady Grant and a numerous family survive him.

Mr. Leighton is most generally named as Sir Francis's successor as President of the Academy. Mr. Millais, Sir John Gilbert, and Mr. Calderon are also mentioned as possible candidates.

New Park for Newcastle.—At the last meeting of the Newcastle-on-Tyne Town Council, a letter was read from Sir William Armstrong, in which he offered to present to the town twenty-six acres of land adjoining the twenty-two acres recently purchased by the Corporation for an east-end park. The land is worth about 20,000*l*. The gift was accepted with thanks, and it was proposed to call the park the "Armstrong Park."

OBITUARY.

Mr. Chas. Charnock Nelson, Architect.—We hear with great personal regret of the death of this gentleman, which took place on the 13th of September last. Mr. Nelson was elected a Fellow of the Royal Institute of British Architects in 1842, and for a number of years acted with the greatest advantage to the Institute as honorary secretary, devoting, indeed, the greater part of his time to the duties of the office. His pecuniary means being ample, he seems to have made no efforts to establish a practice. He afterwards served as a vice-president of the Institute. He was skilled as a linguist, and possessed a cultivated mind. Mr. Nelson was elected a Fellow of the Society of Antiquaries in 1862. We understand that he has left "all his books of an architectural character" to the Institute.

Mr. Charles Baily, Architect.—An inquest has been held at Reigate on the body of Mr. Charles Baily, 63, of Eastleigh House, a retired architect. Elizabeth Barton, a trained nurse, stated that she had been in attendance on Mr. Baily for some weeks, and slept in the dressing-room adjoining his bed-room. All through Monday night he was very violent, and employed himself in moving his furniture about, a caprice in which he frequently indulged. While listening to his movements early on Tuesday morning, she heard a strange noise outside the house, but paid no immediate heed to it. Presently, there being unwonted silence in his room, she became alarmed, and rushing in, found the window open and Mr. Baily gone. She then went downstairs and found him lying on the ground, conscious but in great pain. With assistance she carried him to his room, where he died on the following day. The window out of which he forced himself was only 14 in. in width, and he fell about 20 ft. The jury found a verdict of "Suicide while of unsound mind." Mr. Baily was an excellent draughtsman and a good antiquary; and was for some years chief assistant in the office of the City Architect, London.

Mr. J. T. Woodhouse, C.E.—The death is announced of Mr. John Thomas Woodhouse, civil and mining engineer, Derby. He was born in 1811, and was a pupil of Mr. Twigg, mining engineer, Chesterfield. He held the post of consulting mining engineer to the Duchy of Lancaster; and was the first president of the Midland Institute of Mining, Civil, and Mechanical Engineers.

LIVERPOOL ART CLUB.

Thanks to Mr. W. Bragge, F.S.A., a remarkable collection of Chinese snuff-bottles and other articles, in enamel, porcelain, and ivory, connected with the use of tobacco, is on view at the rooms of this club. Mr. Bragge points out that this is the only collection, of any magnitude, of Chinese snuff-bottles yet formed; and in no work on Chinese manners and customs which he has had the opportunity of consulting, has he found any adequate description of the Chinese appliances for snuff-taking. Yet this collection shows that the practice is in extensive use amongst all classes, and that, as in all other snuff-taking nations, the utmost skill, labour, and ingenuity are lavished upon these receptacles of the fragrant powder, for 600 bottles are shown, and afford a complete illustration of the skill of the Chinese worker in porcelain, glass, enamel, and stone.

None of these bottles can claim any high antiquity. Tobacco was not introduced into China until the end of the sixteenth century.

Many of the specimens of porcelain and jasper-ware are equal in colour, density, and surface to anything which the great Staffordshire potter ever produced. In the preparation of various colours, and in the making of variegated glass, the Chinese are evidently as clever as the Venetians of the Middle Ages, or the more ancient Romans, but they do not appear to have discovered or used the Venetian practice of uniting sticks of coloured glass so as to form flowered or geometrical patterns.

Extreme and unwearying patience is evidently a characteristic of the Chinese workman. One can understand how the irregular lump of the hardest rock crystal, chalcedony, or cornelian, is ground and rubbed to its outward form, and how its surface carving is done, but as to the manner in which the interior of the bottle has been ground out, and its inside perfectly polished, the owner of the collection can give no information. Should any of our readers be able to throw light upon this subject, or upon their mode of manufacturing variegated glass, we shall be glad to hear.

The session was opened on Monday, the 7th instant, when Mr. Bragge was entertained at dinner. The exhibition also includes some singularly interesting specimens of Italian carved woodwork, of the fifteenth and sixteenth centuries.

ART EXHIBITIONS.

Cork.—The twelfth exhibition of the Irish Fine Art Society was opened on the 30th ult. at the Round Room, Opera House. The Society had its origin eight years ago in the town of Lismore, when a few friends agreed to form a small amateur society for the mutual encouragement of the fine arts.

Reading.—A loan exhibition of paintings, water-colour drawings, engravings, and photographs, was opened on the 2nd inst., in the Victoria Hall, Reading. It contains over 500 pictures.

ARCHÆOLOGICAL SOCIETIES.

Glasgow.—The Glasgow Archæological Society had its annual excursion on the 26th ult.,—to Linlithgow. The party, on arriving at their destination, first examined the curious old square tower near the railway station, which at one time belonged to the Knights Templars, and subsequently to the Hospitallers, and which is said to have been for a time the Scottish Mint. Afterwards the old church of St. Michael and the ruins of the palace were visited, and a couple of hours were spent pleasantly in rambling about the latter, a paper on the history of which was read by Mr. J. D. Duncan, honorary secretary. Coming back to their hotel, the members next drove over to Bridgeness, at which place the Antonine Wall terminated. Here they were met by Mr. Cadell, of Grange, who pointed out the spot where the tablet erected by the Second Legion, now in the Antiquarian Museum in Edinburgh, was found on his estate in April, 1868. The party then walked along the line of the wall to the neighbourhood of Borrowstounness, returning thence to Linlithgow. Subsequently the members and their friends dined together,—Dr. Mackinlay in the chair,—and returned to Glasgow in the evening.

Chester.—At a meeting of the Chester Archæological Society, on the 30th ult., Mr. John Cordy Jeaffreson (who has during the last two months been inspecting the records of the city on behalf of Her Majesty's Commission on Historical Manuscripts), delivered an exceedingly interesting lecture on "The Charters and Records of the City of Chester."

North Staffordshire.—The North Staffordshire Field Club and Archæological Society had an excursion the other day to Derbyshire, under the guidance of Mr. Lynam, of Stoke. The places visited included Bakewell Church, Haddon Hall, Eyam Church, Tideswell Church, and the "Blue John Mine."

Meath.—At the last monthly meeting of the Meath Antiquarian Society, the committee received instructions to examine some of the ancient buildings in the neighbourhood, with the view of adopting measures for their preservation.

Holyrood Palace, Edinburgh.—Holyrood Palace is being reroofed. The roof just removed is believed to date from the year 1671, when the palace was partially rebuilt by Charles II. in its present quadrangular form, after a plan by Sir William Bruce. The native fir had been used for its couples and ties; but through the lapse of time the woodwork had become so dilapidated that some years ago it was found necessary to shore up a considerable portion of it, lest it should give way beneath the weight of the slates. Latterly the timber had become so rotten as to render it evidently unsafe that the roof should be left for another winter. The timbers of the new roof are to be of well-seasoned red pine, from the Baltic; while for its outer covering new slates will be used. The work, which will occupy several months, is being carried out under the superintendence of H.M. Board of Works. Messrs. Beattie are doing the joiner-work; Mr. Andrew Slater, Canongate, is the slater; and Messrs. Stewart & Rae, Register-street, are the plumbers.

THE ELECTRIC LIGHT.

The electric light, in one form or another, is just now attracting a great deal of attention, and is beginning to be adopted for practical use in this country.

In London, Messrs. Wells & Co., stove and chimney-piece makers, of High-street, Shoreditch (opposite the church), having obtained permission from the Shoreditch Vestry, have erected in front of their premises two lamp-standards for the purpose of displaying the Jablochkoff light, as used in the Avenue de l'Opéra and other places in Paris. The light was tried here for the first time on Wednesday evening, with a tolerable measure of success, inside as well as outside the building. Messrs. Wells's premises, newly built, are well adapted for the exhibition of the light indoors, consisting as they mainly do, not of an ordinary storied building, but of a large and lofty oblong block, open from the ground-floor level to the skylight in the roof, four galleries running round the entire area one above another in lieu of the ordinary stories. Four of the Jablochkoff lights are fitted up inside the building, two about 15 ft. from the ground, supported on curved rods carried across, one towards each end, from side to side on the floor level of the first-floor gallery; and two some 8 ft. above the level of the second-floor gallery, one at each end, supported by a movable arm or bracket projecting outwards and upwards from the hand-rail of the second-floor gallery. Two other lights are in the street. The motive power required to produce the light is supplied by the steam-engine in ordinary use at the works. The light is generated by two machines, the invention and manufacture of M. Gramme, of Paris. These machines are made to revolve 1,000 and 1,100 times respectively per minute. They are capable of producing a current sufficient for six lamps, and require a power equal to about one-horse per lamp. The material consumed (if such a term may be allowed) is graphite. The electric current passing from one rod of this graphite to another, over a short space of less than ¼ in., called the "electric arc," heats the extremities of these rods to an intense state of incandescence. This is the source of the light. The system is known by the name of its inventor, M. Jablochkoff, and is furnished by the owners of the patent, the Société Générale d'Electricité, Paris. The carbon rods are placed side by side, separated by a slip of kaolin, over which the electric arc passes. In order to ensure equal combustion of the rods, an "alternative" current is adopted, for which purpose two machines are employed. In other words, currents pass from rod to rod in opposite directions at the rate of about 8,000 per minute, a total of double that number, and the carbons are equally consumed. Each lamp is provided with holders for four "candles," but only one is used at one time. Each "candle" will last for one hour and a half. When it is nearly consumed a switch moved by hand, or automatically by an electro-magnet, turns the current to another candle. The light is placed within opaline globes, about 2 ft. in diameter, for the purpose of diffusion. The colour of the light is pure white, and each lamp is considered to be equal to about 100 gas-lights.

Mr. John Blount, C.E., in a letter to the *Times*, quotes statistics gleaned in Paris to show that the cost of electric lighting is greater than by the present mode of gas, but, he says:—

"Improvements are being made which will diminish this cost, especially that of the burner, if it may be so termed, which is now the principal item of expense. As electricity cannot be employed for ordinary domestic use, as is gas, and it is too expensive for street illumination, except in special cases, there is no present danger of its affecting, to any serious extent, the interests of gas companies. What may be the results of further experience and of scientific research it is impossible to foretell, but that electric lighting will pass away with the Paris Exhibition, as has been stated, no one can seriously suppose. The fact is already established that the light can be, and is made pleasant to the eye, and as a means of illumination is practically easy of execution. For special situations where effective illumination is requisite it is eminently adapted, and for large establishments, workshops, railway stations, and such like places, it is not only well suited, but could, with advantage, be adopted. One important element the electric light possesses is its purity; it gives off no smell, nor does it heat or contaminate the air, and with this light colours appear in their true tints. Lighting and extinguishing are instantaneous, and the risk of fire or explosion is done away with."

The *Daily News*, in an article on the subject, having stated that "even in the streets, at a great distance and modified by opaque glass, it [the light] is almost too much for the eye to bear directly, and in a room it would be out of the question," Mr. E. Nelson Haxell, of the Strand, writes to say that

"On the Boulevard des Italiens, within a few doors of the Place de l'Opéra, there is a shop, a newspaper-office if I mistake not, lighted by a small electric light, which, so far from being painful to the eye, is pleasing rather than contrariwise. The light is perfectly steady, shaded by a species of opal, not ground glass, and is so attractive that the office is literally besieged nightly. Speaking generally, I may say that the light is coming into universal use in most open spaces. The Avenue de l'Opéra is lighted entirely with it, although the gas-lights are occasionally lighted, apparently to point the contrast only. The standards are about 5 ft. higher than those for gas, and each electric light supplants fifteen gas-burners."

Five of the metropolitan gas companies have met within the last few days, and, as will be seen, they seem to regard the threatened rivalry of the new light with comparative equanimity. At the meeting of the London Gaslight Company, the chairman (Major Hawkins) said:—

The electric light can only be produced by means of an engine, and he believed if it came to be used in places where people could afford to pay for it they would find that gas would be the material used to produce the electric light, so that he had not the faintest doubt that so far from the future of the company being injured it would rather be improved, for he believed that the electric light would enable them to use their gas in a new field altogether.

Mr. Leng, of Dundee, speaking at the same meeting, said,—

He had seen the electric light used, and had read all the books, articles, and pamphlets upon it, and the conclusion he had arrived at was that it would be one of the lights of the future, but not to the exclusion or superseding of gas-light. He was satisfied that for public squares, for some kinds of public buildings and entertainments, and for special illuminations, the electric light might already be regarded as a scientific, though perhaps not an economical, success. The intense brightness of the light, the want of radiation, and the depth of shadows, were objections to its adoption for domestic purposes. He then alluded to the little effect that the lighting of the whole of the public lamps by electricity would have on the gross revenue of the gas companies, which in his opinion would affect the net profits and dividends very imperceptibly.

Mr. Rawlinson, C.B., a director of the company, said he fully agreed with Mr. Leng,—

He was firmly convinced that the electric light could not come into use for domestic purposes, and that the use of gas for engines and other purposes was likely to largely increase. He was of opinion that gas-shares were a safe and profitable investment, and he advised the shareholders not to be frightened into sacrificing their property.

At the meeting of the Phœnix Gas Company, the chairman, Mr. E. Horner, said,—

He was of opinion that the use of gas could be largely extended, and with great economy, in generating motive power for engines, and another fact was that that class of engine could be worked without any increase on the insurance premium. With respect to the electric light, everything resolved itself into the question of cost. . . . . At the Avenue de l'Opéra at Paris the cost for gas was 885*l.* a year, and that of the electric light amounted to 10,625*l.* He thought that very few of the London vestries would care about spending ten times as much for the purpose of having the electric light as they were now paying for gas, and even if this company lost the whole of the public lighting it would make but very little difference to them, as 1d. per 1,000 cubic feet would cover the loss.

Mr. R. Bradshaw, presiding at the meeting of the Commercial Gas Company, said that,—

The directors had every confidence that, notwithstanding the proposed introduction of the electric light, they would be able to meet the shareholders every half-year for many years to come with as favourable reports as had that day been presented.

The prevailing view at the meeting of the Surrey Consumers' Gas Company was that the new light, while of acknowledged utility for lighting open spaces, would never supersede gas for household and domestic purposes, both on account of the inconvenience attending its introduction, and because of the extra expense. One speaker (Mr. Pocock) spoke very hopefully of the prospects of a greatly extended use of gas for cooking.

Mr. George Livesey, C.E., the secretary and engineer of the South Metropolitan Gaslight Company, in answer to questions put to him at the meeting of that company, said,

He did not think that they need be afraid of the electric light, though he considered that if it could be produced cheaper, and improved, it might be used for large and central spaces in the city of London, which at present were badly lighted. . . . . It had been stated that the loss of the public lighting would only decrease the income of the gas companies one per cent. This was a mistake. It would amount to from 7 to 10 per cent. of the total income from gas. . . . This was assuming that the electric light could be used for all public streets. He, however, maintained that it would not be a fit light for that purpose, as they did not want a concentrated, but a diffused light. The electric light could not be diffused, and all they would have with it would be brilliant centres of light at long intervals, and the difficulty they had to contend with was that the intensity of the light could not be diminished. He therefore maintained that the electric light was totally unsuited for ordinary lighting, for so great was its intensity that it must be screened so as to destroy 95 per cent. of the light it gave.

Professor Barrett, lecturing at Birmingham on Monday evening, announced that Mr. Edison had solved the problem of the subdivision of the electric light indefinitely.

The announcement has had a considerable effect in depressing the share market.

DRURY LANE THEATRE.

Under the title "The Coming Season at Drury Lane Theatre," Mr. Charles Lamb Kenney has published a pleasant pamphlet in the interest of Mr. F. B. Chatterton, who commences his thirteenth season with a revival of Shakspeare's "Winter's Tale." A long and serious illness has kept Mr. Kenney out of the sight of the public for some time, and many will feel pleasure in again seeing him in black and white. He puts forward a strong claim for Mr. Chatterton as having "made more sacrifices of time, toil, and treasure, in the cause of the more elevated form of dramatic writing, than any living manager, and many dead." Whether these endeavours have been made with wisdom he does not say, and we will not stop to discuss. We are glad to find Mr. Kenney in the list of those who feel that some interference is necessary to maintain a home for the poetical drama.* "What a complement" says he, "and crowning of our latter-day strivings for the more solid education and broader enlightenment of the coming generations would have been such an establishment as a national theatre, subsidised by the State, to hold up, against all vicissitudes of fortune, the grandest models of the grandest and most difficult, yet most impressive, of all forms of poetical creation,—the Drama! But, as things are, and, alas! are likely to continue, the manager of a great metropolitan theatre is but the head of a great commercial enterprise. Whatever be his aspirations, he must watch the turn of the market, which, in theatrical matters, means the tide of public fashion, and this, be it mean, frivolous, and unworthy, or all the reverse, must be keenly followed and implicitly obeyed, else will disaster and deficit for a certainty ensue."

As regards Mr. Chatterton's efforts, the *Times* correctly points out that the "present production is not more a revival of a play by Shakspeare than a revival of a pageant by Mr. Chas. Kean." The revival, however, of the pageant is not to be compared with what was done at the Princess's any more than the acting can be. Even the chronological congruity aimed at by C. Kean has been dropped. While adopting the Temple of Syracuse as the locality of the trial, Mr. Beverly, admirable artist as he is, has managed even to make the architecture of the Temple unmistakably Roman instead of Greek. As regards the acting, it was in parts on the first night terribly bad. It was the pleasure and privilege of the conductor of this journal to take considerable part in the production of the "Winter's Tale" at the Princess's, and we could say much on the subject, but it would require more space than we can just now afford. We give Mr. Chatterton praise, notwithstanding some previous observations, for good intentions, and, indeed, good endeavours to produce a satisfactory result, and we earnestly trust the public will fully support him in the course he has entered upon.

ALLHALLOWS CHURCH, TOTTENHAM.

Sir,—With reference to your correspondent "Cyclops's" letter in your journal of the 7th of September respecting Allhallows Church, a local contemporary of yours refers to it as under.

Lynx Eye.

"A correspondent who has sent us the above says he would also feel obliged by some information on the subjects mentioned. He also wants to know what has become of the window which used to be in the western wall, the design for which was prepared by a resident of Tottenham. The inhabitants of the town subscribed its cost, and he, therefore, thinks it right that they should know what has become of their property. What, too, has become of the old font which has stood for centuries in the church, and what has become of the pulpit which the present Lord Mayor placed in the church at his own charge? Yet another question: Who is responsible for the hall-paper-like appearance of the west wall, which has given the dear old building a more patchwork appearance than ever? Whoever it was, the adornment does no credit to his taste."

TESTING LIGHTNING CONDUCTORS.

Sir,—In reply to your correspondent who wishes to know where he can obtain the testing of his lightning conductor, I can, after a somewhat extensive experience, well recommend him to Messrs. A. Proctor & Co., of Turnagain-lane, Farringdon-street, who have fixed conductors for me in a satisfactory manner, and who also make special arrangements for testing their conductors at stated periods, and ensuring conductivity. Charles Bell, Architect.

*** Another correspondent recommends Messrs. J. W. Gray & Son, of Limehouse.

* The desirability of obtaining a national theatre will be discussed in the Art Section at the approaching Cheltenham Congress of the Social Science Association.

EXHIBITION OF SANITARY APPLIANCES.

An exhibition of sanitary appliances was held last week in Stafford, in connexion with the Congress of the Sanitary Institute of Great Britain. At a meeting held on Saturday evening, Dr. Lory Marsh read the list of awards made by the judges. They recommended that medals be given to (among others) the following exhibitors:—

Messrs. Billing & Co., apparatus for cooking by gas; S. Leoni & Co., apparatus for cooking by gas; the Liverpool Silicate Paint Company, for "Griffith's zinc white paint," "silicate paint," and "petrifying liquid"; Doulton & Co., stoneware sanitary pipes and joints; Moule's Patent Earth-Closet Company, for their earth-closets; the Sanitary Appliance Company, Salford, for patent portable cinder-shifting ash-closet; Hassall & Singleton, Phœnix portable range and Birmingham range.

The judges further recommended that certificates of merit should be awarded to the undermentioned exhibitors:—

J. Stiff & Sons, for patent ventilating trap; Potts & Co., patent Edinburgh air-chambered sewer gas trap; Rufford & Co., porcelain baths; G. H. Harris, economical cooking range; S. Leoni & Co., for "the Rheometer"; T. Larmuth, for patent dual desk; Coleman & Glendinning, for school desks; Gillon & Co., patent lavatory; J. Slione, pneumatic liquid ejector; Oates & Green, for patent drain-cleaning rods, sanitary pipes, &c.; the Ladies' Sanitary Association, for various publications; H. Snell, for patent thermhydric ventilating hot-water open fire-grate; G. Bridgett, for warming and ventilating apparatus; Thorne & Co., patent artificial stone filters for cleansing domestic water; B. B. Harescough & Co., excreta receptacle, with patent spring lid; and D. T. Bostel, patent excessior water-closet.

THE OBELISK.

At a meeting of the Metropolitan Board of Works on the 4th inst., the Works and General Purposes Committee submitted the following report:—

"The attention of your committee having been directed to the question of the preservation of the surface of Cleopatra's Needle, they directed the engineer and the consulting chemist of the Board to report to them on the subject. Those officers have accordingly considered the question, and have presented a joint report, which your committee submit for the information of the Board, and in which they recommend that trial be made of the material known as 'stone solution' upon the obelisk so soon as may be convenient, in order that they may have the opportunity of judging of its effect, and may be enabled to report their opinion of the result of such trial. Your committee concur in this suggestion, and recommend accordingly."

Mr. Runtz, in moving the adoption of this recommendation, said that the committee had taken the advice of the Board's consulting chemist (Mr. Keates) and the engineer (Sir Joseph Bazalgette) on the subject, and now recommended that the Board should try this solution, which they were advised would effectually fill up all the interstices, and render the stone perfectly impervious to either frost or moisture, and at the same time not injure or deface the surface of the monolith.

Mr. Leslie opposed the motion, as he objected altogether "to Cleopatra's Needle being turned into an advertising station for a limited liability company." In the first place, he understood that this was a patent solution, and he contended that the Board ought to be informed of what it was composed. He had been told that this liquid had been tried at the Houses of Parliament and had utterly failed.* He appealed to the Board to pause before committing this act of barbarism in regard to an ancient monument. He moved an amendment to the effect that the further consideration of the report should be adjourned, and that the subject should be referred back to the committee for them to furnish the Board with further particulars as to the solution.

Dr. Brewer seconded the amendment, inasmuch as he thought it was possible that the solution might do more harm than good.

In the discussion which followed,

Mr. Richards, in support of the motion, said that according to the report presented by Mr. Keates and Sir Joseph Bazalgette, the obelisk had already been materially injured by atmospheric changes, and if nothing was done decay would go on at a very much increased rate. The solution recommended to be used was almost colourless, and would render the surface of the stone perfectly waterproof.

Mr. F. H. Fowler suggested that inquiries should be made as to the means taken to preserve the Luxor Obelisk,† and the obelisks in Rome.

The question arose whether the Board had the power, until the obelisk had been handed over to its custody, to take any such steps as were recommended by the Committee, and ultimately Mr. Leslie's amendment was very properly in substance adopted.

We may add that the scaffolding and machinery used in placing the obelisk *in situ* have now been removed.

The following inscriptions for the four sides of the pedestal have been submitted to the Metropolitan Board of Works, whose approval has yet to be given to them:—

THIS OBELISK
WAS QUARRIED AT SYENE AND ERECTED ON HELIOPOLIS
BY THOTHMES III., ABOUT 1500 B.C.
FURTHER INSCRIPTIONS WERE ADDED TWO CENTURIES LATER
BY RAMESES II. (SESOSTRIS I.),
REMOVED TO ALEXANDRIA, THE ROYAL CITY OF CLEOPATRA,
IT WAS ERECTED THERE IN THE SEVENTH YEAR
OF AUGUSTUS CÆSAR, B.C. 23;
TRANSPORTED TO ENGLAND AND ERECTED ON THIS SPOT
IN THE FORTY-SECOND YEAR OF
QUEEN VICTORIA,
BY ERASMUS WILSON, F.R.S. AND JOHN DIXON, C.E.

THIS OBELISK
HAVING FALLEN PROSTRATE ON THE SANDS AT ALEXANDRIA,
WAS, IN GRATEFUL REMEMBRANCE
OF NELSON AND ABERCROMBY,
PRESENTED TO THE BRITISH NATION A.D. 1819,
BY MOHAMMED ALI, VICEROY OF EGYPT.

ENCASED IN AN IRON CYLINDER, IT WAS ROLLED INTO THE SEA,
AUGUST 29, 1877.
ABANDONED IN A STORM IN THE BAY OF BISCAY,
IT WAS RECOVERED AND TOWED INTO FERROL HARBOUR,
WHENCE, IN CHARGE OF CAPTAIN CARTER, IT REACHED
THE THAMES,
JANUARY 20, 1878.

THE WORK WAS FURTHER AIDED BY
H. H. ISMAEL PACHA, VICEROY OF EGYPT.

GEN. SIR J. E. ALEXANDER	JOHN FOWLER, C.E.
HON. C. H. VIVIAN	BENJAMIN BAKER, C.E.
GIOVANNI DEMETRIO	GEO. STEPHENSON, C.E.
CHARLES SWINBURNE	WAYNMAN DIXON, C.E.

S. BIRCH, LL.D.

WILLIAM SMITH	MICHAEL BURNS
JOHN GARDINER	WILLIAM DONALD
JOSEPH BENBOW	WILLIAN PATAN

PERISHED IN A BRAVE ATTEMPT TO SUCCOUR THE CREW OF THE OBELISK SHIP "CLEOPATRA" DURING THE STORM,
OCTOBER 14, 1877.

STATE OF THE THAMES.

Evidence accumulates on every side to establish the correctness of the statements we have felt ourselves compelled to make. As amongst the most recent, we must mention that at the ordinary meeting of the Metropolitan Board of Works, to be held this (Friday) October 11th, a letter from the Town Clerk of the City of London will be read, stating that the attention of the Port of London Sanitary Committee has been called, by their medical officer of health, to the foul state of the water in the Thames near Beckton, and intimating that it is desirable that some means should be adopted to remedy the present evils consequent upon the state of the water near the sewage outfall.

SEWAGE IN THE THAMES.

A discussion took place on the 3rd inst. at a meeting of the Plumstead District Board of Works relative to the influence upon the River Thames of the London sewage discharged from the outfalls contiguous to the Plumstead boundary.

Mr. G. Whale, who introduced the subject, said he was glad to see that the Metropolitan Board had ordered an inquiry, and drew attention to another outfall from which the drainage from North Woolwich flowed directly into the river.

Mr. Lloyd (Metropolitan Board) said that although the Board's engineer had been ordered to report, no reasonable person would give credence to the assertions which had been made that the persons drowned in the wreck of the *Princess Alice* had been poisoned by the sewage from the outfalls. The sewage was discharged after high water, and it could no more come back against the outpour of the Thames and its tributaries than it could penetrate a wall of granite (!). Instead of being a seething mass of corruption, as it had been described, the sewage as it entered the Thames merely resembled dirty water, and if any remained in the Reach next day it was immeasurably diluted. He hoped that people would remember the state of the Thames when the Metropolitan Board took it in hand, before they complained of the remedy; and, after testifying to the comparative purity of the water at London Bridge, he said that the refuse from vessels going up and down the river, and the discharges from the docks, would account for its pollution at Greenwich and Woolwich.

Mr. T. Moon, who was formerly shipping-master at Woolwich, said he had seen the water come back on the flood-tide black with sewage, and a great portion of the discharge from the northern outfall never got away, there being an eddy tide, which carried it up instead of down the river. The floating powder-magazine used to lie on the north side of the channel; but the accumulation from the outfall was so great that the vessel had to be removed to the south shore.

Mr. Hughes said the outfall at North Woolwich had been made by the Metropolitan Board in direct violation of their Act of Parliament. He had seen sewer-mud 7 ft. deep on the shore below the southern outfall.

Mr. Kimber said that Mr. W. P. Jackson, who was for many years chairman of the Steamboat Company, and was now a member of the Thames Conservancy and Metropolitan Board, had testified that the sewage floated up and down with the tide.

Mr. Kimber gave notice of motion on the subject.

MASTERS AND MEN.

Aberdeen.—More than a month ago the master carpenters in Aberdeen gave notice that on the 1st of October the wages of their men would be reduced by ½d. per hour (from 7½d. to 7d.), and also that they would not recognise the bye-laws laid down by the men. Some months ago the men resisted these proposals, and neither party yielding, about 460 of the men came out on strike on the 1st inst. A meeting of the men was held in Lockhart & Salmond's hall in the forenoon, over 415 being present. Circulars were received from about a dozen of the masters, offering to continue the men at the old terms, and the men in the employment of those masters, to the number of about fifty, went back to their work. The others remained on strike. On the 4th inst. intimation was given to the ship-carpenters at Aberdeen that on and after the 17th inst. their wages would be reduced from 7½d. to 7d. per hour.

Carlisle.—About fifty operatives stone-masons in the employment of Messrs. C. & J. Armstrong, Carlisle, have struck work, in consequence of the refusal of the masters to agree to the new rules of the society.

Glasgow.—The Glasgow plasterers' strike has just terminated, after lasting four months, by the operatives accepting the employers' terms of 9d. an hour,—or 1d. reduction.

Birmingham.—Messrs. Chance Bros., Spon-lane Glass Works, Oldbury, have given notice to their workmen of a general reduction in wages. In some of the branches the proposed reduction is equal to about 40 per cent. The men appear determined to resist, and a strike is expected. The firm allege that the crisis is due to bad trade, and that if the men do not accept their proposal the works must be closed, as they are working at the present time at considerable loss.

North Shields.—The operative joiners of North Shields have unanimously resolved to close the strike by accepting the masters' terms of 8d. per hour. The strike lasted twenty-six weeks, and more than 200*l.* have been paid from the society's funds to the men while out.

Northwich.—It is stated that the master shipbuilders of Northwich have accepted the terms suggested by the carpenters in the letter which they sent in reply to the note received from the masters in July last. Having regard to the present depressed state of trade, the men consented to a reduction of 2s. per week in wages during the ensuing winter,—say six weeks before and six weeks after Christmas,—but they would not accede to any alteration that would increase the hours of labour.

Bridgwater.—At a special meeting of the corporation of Bridgwater, on the 27th ult., the corporate seal was affixed to a contract with Mr. Charles Chamberlain, builder, of Anstey, near Leicester, amounting to 9,425*l.* 10s. 3d., for the erection of engine-house, filtering-beds, &c., in connexion with the water-supply; and bills amounting in the aggregate to more than 1,300*l.* were ordered to be paid other contractors for works connected therewith.

* We believe we are correct in stating that the solution in question has not been used at the Houses of Parliament.

† This obelisk was covered, at the time of its erection in Paris, with a concentrated solution of caoutchouc, the quantity used being eighty-four quarts.

THE SMOKE NUISANCE.

Sir,—Excuse the intrusion of a stranger who has no other means of reaching your acquaintance, and who desires your opinion in reference to the abatement of the chimney-smoke nuisance of your metropolis.

I have my system in use here, but for another purpose, and can recommend it. The contrivance is used here to economise fuel by consuming all combustible matter in the fuel, so that no sparks escape. No soot accumulates, and there is no danger of chimneys taking fire, as the soot is already burnt to dust.

There would need to be a change in the position of the grate as used when I lived in London, so that it would allow a 10-in. cylinder to fit over it, and to carry off the ventilation to the chimney by a pipe that would be pierced into it. This cylinder is of Russian sheet iron, very neat, 10 in. by 28 in., and economises fully one-third fuel, giving out a greater heat to the room. The smoke is consumed in this cylinder, where a briskish fire is kept up, and the arrangements in it are not expensive. The whole work may be done for a guinea a chimney. Where new houses are built, or new grates being fitted into old ones, the cost would be less. This price would be more than saved in fuel in course of a season, whilst the apartments would be better heated. Could you put me in communication with some party who could turn the invention to some account for our mutual good?

Walter Carswell.

Green Bay, Wisconsin, U.S.

ABUSE OF THE GREEN PARK.

Sir,—It seems high time some public notice was taken of the deplorable treatment to which the Green Park is being subjected. Though one of the smallest of our inter-London parks, it was, perhaps, the prettiest. Its character and beauty mainly consisted in its almost uninterrupted slope of green from Hyde Park-corner to the mansions in the Queen's-walk on the far side, bounded on either hand by the beautiful fringe of trees along Constitution Hill and Piccadilly. There were but few paths, and those the most necessary ones from certain points where well-defined streams of traffic took their way; so that there was little to break a pleasant ramble all over the park in any direction, and in summer-time it was a most cheering sight,—always remembering that we are in London,—to see the troops of children disporting themselves in unrestrained enjoyment, kite-flying being one of the principal amusements. The number of more elderly persons who seemed to make a promenade over the grass was not less remarkable, and this, not simply as passing through the park, but pacing it backwards and forwards, evidently with a sense of pleasure and enjoyment.

Now all is to be changed. For some time past operations have been going on of which in their progress it was difficult to tell the precise nature and design, but these are now disastrously made plain. What has been done is this. The old existing paths have been widened to a wholly unnecessary extent by chopping away the grass on either side, and wherever these paths intersect, great wastes of gravel have been made by a further and extensive chopping away of the turf all round, so as to leave a formal and cheerless space, where seats are placed; the effect being dreary and depressing in the extreme. Indeed, to get rid of as much of the grass as possible seems to have been one main object. But this is by no means the worst of these "improvements." Fresh paths have been cut in various and uncalled-for directions, as unnecessarily wide as those already referred to, and precisely doing that which destroys the charm of the place by breaking up its continuity of greenness. The extent to which this has been done in some parts can only be believed by being seen; but it is a fact that the intersecting of all these paths, old and new, slices the park in places into an array of patches most uninviting to behold. The climax, however, is a wide path which has been driven from end to end, right up the hitherto undivided greensward which formed *the* promenade and playground of the park. To make matters worse and emphasise the evil, it seems to be intended to partition off the greensward from the paths by dwarf iron railings, which will make a continuous walk or game impossible, and, moreover, be in themselves very dangerous in the dusk, the park not closing till ten.

The only apparent plea for these doings is, that the public work paths for themselves across the grass, thus in effect cutting up the park; and that these new paths have mainly taken the directions thus indicated. But proper management could easily divert this no doubt pernicious habit of making a "track" of a "short cut," without permanently disfiguring the park and marring the enjoyment of those frequenting it.

The abolition of the new paths and the restoration of the open space of the park to its primitive uninterrupted slope of green is what must be insisted on. The Office of Works is to be as little complimented upon the inspiration which has led to these inroads as upon the doing away with more than half the length of the flower-beds which used to grace the Piccadilly side of the park with an elegant sweep, and formed a most charming feature. An experiment has been made of flower-beds along the Queen's-walk side. These also have disappeared. But these losses are not to be compared with the evil I have pointed out of so cutting up and fencing in the open green space with broad gravel paths and iron railings, that it will scarcely any longer deserve its beautiful name, "The Green Park." B.

ART "DODGICK."

Sir,—A man whose rational faculty has been cultivated, and not at the expense of his taste, cannot help being irritated at the frequent substitution, in dissertations upon art, of illogical tirade for rational argument. You cannot "have" such writers anywhere. They have no form nor substance of rationality to lay hold of. They place contradictory statements side by side in perfectly irrational innocence, and they glide from one position to its contradictory with such easy content and satisfaction that there is no bringing an argument to an issue. They do not perceive the antagonism of their various statements. Let me illustrate with a few examples:—

Here, for instance, are several statements from the letters of an advocate for the conservation of English art work, which, though intended to frighten, clearly show, from their own internal evidence, that the English in the aggregate are doing precisely what he would desire, save and except in the one particular of delivering over their art-treasure to a public institution. But I will place the contradictory passages side by side without further comment:—

"There is now danger that any day foreign appreciation may suddenly trench upon it."

"As yet, however, monuments of art, other than pictures of English origin, have not as a rule been coveted by foreign collectors, but any day the fashion might suddenly arise in Continental art circles."

"The tide now ebbs away from this country, and every day float with it to neighbouring shores the most precious and costly treasures of art."

"Our French allies were, I believe, before us on the occasion, but the specimens are, one by one, finding their way back to London."

Then, Sir, I come to one of your correspondent's letters, in which, in an argument against "shams," he asks the very pertinent question, "Are we not endowed with intellect and understanding to discover for ourselves that things are not what they seem?" He then answers it, as I have answered it, "Hence there is no deception." Just so! There is no moral delinquency where the intent is not to deceive. In those few words he upsets all his previous argument, and accepts my views.

Again, I come upon an article upon "The Artist and his Work," evidently written by one who wishes well to art, and therein I find the following passages:—

"It is the genius of the hour which always sets his ineffaceable seal upon the work, and gives to it an inexpressible charm for the imagination."

"Ephemeral works produced for the gratification of the passing hour cannot be placed upon a footing with those which are the most precious gifts to posterity."

The truth being, that the work which is lasting is not that which is founded upon the accidents and whims of the hour, but upon those eternal principles which remain fixed amidst the flux of accident. And then we have a grandiose and inflated sentiment attributed to Ruskin,—one of those airy nothings which are so frequently bandied about in discussions upon art. "The man who loves nature most will always be found to have most faith in God, because Nature is the visible manifestation of Him in whom we live, move, and have our being." Does the malefactor "live, move, and have his being in Him"?—ugliness as well as beauty?—vice as well as virtue? See, then,—for these are the visible manifestations of Nature,—to what conclusions we must come, if we were to accept the dictum that all Nature is but the visible manifestation of God. You will, I think, Mr. Editor, perceive, after what I have written, that we must in future avoid "Dodgick," and exhibit more common sense. I do not imagine that I am free from the fault I am condemning, but I am at least *striving* to be more logical upon art questions. Meter.

THE "STEAM NAVVY."

Sir,—In the *Builder* of the 28th ult. you gave an account of the "Steam Navvy," and the work of excavation which it turns out, with all recent improvements. The performances noted are neither new nor surprising. The machine was originally called in America, many years since, the "Steam Irishman," and has been much used on the other side of the water. In 1854 I was on a visit to the Falls of Niagara, and saw a rude model of the mechanical earth-excavator at work in a railway cutting, and I was informed by a shrewd Yankee who was in charge of it that it was a "ripper at its work, never struck for wages, and never had fever or ague." At that time I was engaged upon some heavy earthworks on the Grand Trunk Railway of Canada, near Toronto, on the northern shore of Lake Ontario, where the swamps in the vicinity of the large cuttings produced ague to an alarming extent amongst the navvies, and the works became deserted. I took the rough machine in hand, strengthened its weak parts, and four were made and put at work in the years 1854-5-6. We were anxious more to save time and interest upon capital expended than to reduce the cost price of excavation per cubic yard. The steam excavator worked day and night all through the summer months, say at least eighteen hours out of the twenty-four each day, and generally there was a greater amount of work done at the night than during the day shift. The earthwork frequently reached 1,200 cubic yards for the day and night, and the turn-out was about 26,000 cubic yards per month, after all delays from weather and accident. The cost, including the getting, filling, leading, and tipping the material, was about 1s. 2d. per cubic yard, and the lead would amount generally to two or three miles. Where the cutting was heavy and deep, two machines would be placed at one end of a cutting, the one above the other, with leading roads from each, at the different levels. The great difficulty was to lead the material away fast enough, as the excavator could tear away from the face of the cutting a cubic yard per minute, and that in stiff clays. In order to effect this rapid delivery with a three miles lead, there was a small locomotive, and about eighty wagons, holding one cubic yard and a quarter each, to each excavator. The wagons were "side tips," and discharged or tipped at the bankhead on a portable turn-table, which swung the wagons round from the down to the up-road, the man on the wagon tipping it over in its transit. No horse-tipping and bumping of wagons was permitted, as so much of the work was done by night. When these machines were introduced to a district, the effect upon wages was apparent, and 12½ per cent. was the inevitable reduction.

Instead of the performance being, as you state, 248 cubic yards per diem for the modern excavator, the result with us and with proper machines and management, should be nearer 600 cubic yards in the same time. While I write this I have before me a drawing of the mechanical excavator which we used on the Grand Trunk Railway, in Western Canada, in the years 1854, 1855, and 1856, and in form it closely resembles the machine you describe, only that a wrought-iron jib has been substituted for a wooden one, and one or two other minor changes. Where, then, the reason, for a patent? and especially so, considering that the modern machine is anything but an efficient one, so far as results go. I may mention that

in Canada the excavator took out a gullet of earth in advance of the general cutting, 45 ft. wide and 20 ft. deep, and the slopes were thrown down afterwards by hand, and trimmed off. The cost of each machine was about 1,200*l.*

V. Wyatt.

Beckton, North Woolwich.

LYME REGIS, DORSET.

Sir,—Over two years have elapsed since you were asked by a subscriber of your paper to insert a few remarks on the general condition of Lyme Regis, and although it was replied to in a contemporary, the *Sanitary Record*, of September 12th, 1876, the remarks of "Sols" met with the approval of the principal part of the inhabitants as facts; but I am sorry to say that in many instances the same state of affairs (as mentioned) is still existing. Certainly the commissioners have made an attempt at a little improvement, by the laying down of several yards of main-drain pipes in a few places; but if the pipes of the closets are connected to the main in one instance, it only tends to assist the pollution of the river, as its outfall leads into it.

Another good improvement has been made by the laying down of new main to better facilitate the supply of water (which is abundant), the corporate body having bought off the rights from the old company; but even this has not done away with the resort to the river by the inhabitants for water. In all other instances, however, the town is in about the same condition as mentioned in your valuable medium of August 5th, 1876, and if you would kindly insert this, so as to assist to arouse the powers that be *locally*, and the public in general, from their inactivity, I feel assured you would be doing a general good to the town, and, at the same time, you would oblige

An Inhabitant.

THE "ARCHIMEDEAN" SCREW VENTILATOR.

Sir,—Messrs. Ewart & Son, at p. 1024, come out pretty strongly anent the great power the "Archimedean" screw ventilator has in increasing the up-current. Now, as "the proof o' the puddin' s the preeing o'ot," I beg leave to publish the following experiments made at a large wholesale stationery and publishing establishment in Glasgow (Messrs. W. Collins & Co.'s), where a number of Howorth's "Archimedeans" are erected.

There are two large ventilating-shafts, 2 ft. 6 in. in diameter, and about 20 ft. high, and say 20 ft. distant, and in the same hall. One has no ventilator upon it, but is left quite open to the wind and rain, while the other is surmounted by a large Howorth's "Archimedean." The following was the amount of up-current, in feet per minute, which each showed:—

Plain Pipe.	Howorth's Archimedean.
360	300
430	250
400	280

When the "Archimedean" was stopped from revolving, the up-current still went on at the rate of 170 ft. a minute; and even when turning the wrong way, the up-current continued but at a still further reduced rate. Another "Archimedean" gave 140 ft. up when moving, and 90 ft. when standing, while a very large one scarcely moved at all, and allowed repeated down-draughts, even with the windows partly open to allow plenty of air in.

I observe that Messrs. Ewart & Son also affirm that the "Archimedean" is more powerful, steadier, and more constant in action than Mr. Banner's cowl. Now, I doubt that very much, and feel inclined to back up Mr. Banner's cowl against the "Archimedean" ventilator in the proposed new contest.

W. P. Buchan.

TRAMWAY SLEEPERS.

Sir,—In reference to the letter of "G. W. B.," in your issue of the 5th inst., some of the tramways in this district (Chester) are laid on fireclay blocks or sleepers, with holes in them, which are filled with wood to drive the spikes into.

The blocks can be and are made any shape or size, and almost as hard as granite. Would the use of them not obviate the "grievous evil" complained of?

John M. Gibson.

FIRE-RESISTING CEILINGS.

Sir,—In the *Builder* of September 28, is an article on "Fire-Resisting Ceilings," in which it is stated that,—"Messrs. Leigh & Sons have patented a simple mode of producing a fire-resisting ceiling. By substituting hoop iron, suitably prepared, for ordinary wood laths, and coating with good plaster, a ceiling can be made through which it is next to impossible for fire to penetrate."

I beg to state that twenty years ago I introduced this matter to the public, and applied the hoop-iron as laths, not alone to ceilings, but also to studded partitions and battened walls, which in dwelling-houses at least are of as much importance to be fireproof as ceilings.

I published a pamphlet at that time on "Fire-proof Building," in which this method of hoop-iron laths was pointed out, and thought the matter of some public importance, but not such as to have it patented.

I hope Messrs. Leigh & Sons will succeed in getting it adopted, and cannot but say the priority of invention was with me.

John Boyd, Architect.

BRIDGE OVER THE THAMES.

Sir,—If "bright mental stars" are to "ascend to the empyrean of human intellect," it will not be by "safely reckoning" after the fashion of your correspondent "C. G." If traction on a smooth, straight road be taken at 30 lb. to the ton, which is probably an unduly low estimate, it is, of course, equal to 56 lb. to the ton on a rise of 1 in 40. But for estimating an additional 20 lb., to overcome the slight inconvenience of a spiral curve, "C. G." fails to give any ground. Having a strong opinion against the proposed high-level bridge, I regret to see arguments brought against it that will not hold water. Will "C. G." be kind enough to give us his grounds for this "safe reckoning"? At the same time perhaps he will explain what he means by "the multiplied force of three and a half," which, I confess, baffles a plain student of

Cocker.

WHO'S TO PAY THE CLERK OF WORKS?

Some members of the Hove School Board appear to have curious notions as to the relationship between clerks of works and architects. At the meeting of the Board on the 27th ult. a letter was read from Mr. Thomas Simpson (joint architect, with Mr. F. W. Roper, of the new schools in Ellen-street), stating that the employment of a clerk of the works, at the Ellen-street schools, was indispensable to the proper carrying out of the works, and recommending Mr. Ayres for the post, at a salary of 3*l.* per week.

Col. Hansard inquired if it were the custom for a Board to provide the clerk of the works.

The Chairman said he understood that the agreement between the architect and the Board provided that the architect should superintend the works.

The Clerk read the 9th clause of the agreement, which was as follows:—"The architect whose design shall be approved, and who shall be engaged to carry out the works, shall receive five per cent. commission on the gross cost of the buildings, which sum shall include all expenses of plans and superintendence of works," &c.

Col. Hansard said it appeared to be quite clear that the architect should superintend the work himself.

The Chairman said he had made inquiries in Brighton respecting the matter, and he found that it was the custom of School Boards to provide their own clerks of works, and Mr. Simpson could not possibly undertake to provide a clerk of the works. He had also made inquiries in another parish in the neighbourhood, where the Board were erecting two schools, and there the clerk of the works was provided by the Board.

Mr. Gladstone said he also had obtained information on the subject, and it appeared the clerk was the servant of the Board, and not of the architect, but he was under the superintendence of the architect. It was a practice, as far as he could ascertain, that was universally adopted.

The Rev. Mr. Kelly then moved a resolution to the effect that Mr. Ayres be appointed clerk of the works at Ellen-street Schools, at a salary of 3*l.* per week. The works would, he said, certainly require some supervision, and, although the appointment appeared to be expensive, it would really be a saving to the Board, because they would know that the work would be thoroughly well carried out under his supervision.

Mr. Gladstone seconded the motion, believing that it was the common practice in carrying out works of the kind.

Mr. Field moved an amendment negativing the resolution. He said he had no fault to find with the architect, and he understood it was the custom for a Board to appoint a clerk of works, but evidently there had been some mistake in this particular case. The 9th clause of the agreement plainly told them that the architect should superintend the work. He could not see, in the face of that clause, how they could set up another officer over Mr. Simpson. If anything were done wrong they would naturally blame Mr. Simpson, but he would turn round and deny the responsibility. Mr. Simpson accepted 5 per cent., for that and other work, on the gross cost, which was 7,584*l.*, and his commission would therefore amount to 419*l.* Beyond that, he happened to know that Mr. Simpson got 2½ per cent. for getting out the contractor's quantities, which would bring his commission up to 620*l.* 10*s.* He thought Mr. Simpson could well afford to pay a clerk of the works out of that sum. The 2½ per cent. paid by the contractor practically came out of the funds of the Board, because the builder covered the expense by increasing the contract by that sum.

The Rev. Mr. Kelly said it seemed to him that the superintendence of the work meant the superintendence of the clerk of the works, as well as the builders and the foremen engaged upon the work. At the same time, this would be a warning for them to be more explicit in the future with their agreements, and to have them more clearly defined.

Col. Hansard said they had erred through ignorance, and it was a pity they did not take some advice on the subject at the outset.

The Clerk explained that Mr. Simpson took out the quantities because it would save the Board a great deal of money. When professional architects, whose sole business it was to get out quantities, were employed, the contracts were generally made as high as possible, in order to increase the commission.

Mr. Field replied, saying that any other architect would have had only one per cent. commission.

A vote was then taken, when all the members voted for the resolution, except Mr. Field.

The above report is extracted from a Brighton paper, and our readers will agree with us (and with Col. Hansard) that some members of the Board have "erred through ignorance,"—of the fact that the salary of a clerk of works is invariably paid by the building-owner.

ALLEGED CONSPIRACY BY WORKMEN.

FRAUDULENT TIME-SHEETS.

At the Lambeth Police Court, on Saturday last, William Baldry (35), Frederick Knight (32), carpenters, and Richard Williamson (33), foreman, were charged on remand with conspiring together to obtain certain sums of money.

All the prisoners were in the employ of Mr. B. E. Nightingale, builder, of Albert Works, Lambeth. The firm had some extensive alterations to carry out at Messrs. Atkinson's, Westminster-road. On the 27th of September, Mr. Headland, manager to prosecutor, found the names of Baldry and Knight on the time-sheet as having worked there 60½ hours. This sheet was signed by Williamson, whose duty it was to make out such sheet and send it in to the office. Baldry and Knight brought two pay-tickets. They were then charged with not having worked the time, and were given into custody. It was further shown that Baldry was not at work at Atkinson's all the week, and Knight had only worked seven hours last Saturday week, but was not there all the following week. When Williamson was taken into custody he said he was surprised at being arrested, as the men were at work.

Evidence was now called to the effect that at the time Baldry and Knight were supposed to be at work for prosecutor, they were doing a job at the West End for another employer.

Mr. Chance, the magistrate, decided to send the case for trial, agreeing to accept the personal recognisances of Baldry and Knight to appear at the Sessions. He refused bail for Williamson.

"KEEPING A DAY'S PAY IN HAND."

BAKER *v.* TAYLOR.

This case was heard in the Lambeth County Court last week, before Mr. J. Pitt Taylor. It was a "test action," brought by a builder's labourer, to recover from the defendant, a master builder, of Brixton-road, the sum of 4*s.* 1*d.*, being one day's wages, which the plaintiff alleged had been wrongfully detained from him.

Mr. Orfeur, clerk to the defendant, said his employer had contested this claim on principle, and without reference to the paltry amount involved. The facts were that it was a rule of the firm to keep a day's pay in hand from all their *employés*, and the plaintiff having been paid his wages on the Saturday night, but not returning to his employment on the Monday, they (the firm) were put to a deal of trouble and expense in getting another person to fill the plaintiff's place. The defendant therefore thought he was justified in retaining the small amount now claimed by the plaintiff, as some compensation for the loss and annoyance he had been subjected to.

The Judge said the defendant was not entitled to make any such deduction, as the law stood at present. For the defendant's future guidance, he would tell him that he could make any bargain he pleased with a man who entered his service, but for that bargain to be binding the arrangement must be mutual and binding on both sides. He (defendant) could tell the man that if he left him without notice he would have to pay a day's wages, or have the amount deducted from any wages that might be coming to him. If such a bargain were made on both sides, the defendant could,—in a case like the present,—retain the day's pay, or any other sum agreed upon. However, as no such agreement had been made in the present instance, he should give judgment for the plaintiff for the amount claimed.

ARBITRATIONS.

London.—Sir Henry A. Hunt, C.B., the arbitrator in the case of the London Pavilion Music Hall, has sent in his award. M. Loibl claimed 147,000*l.* for the freehold and goodwill, the building being required for the new street from Piccadilly to Oxford-street. The amount awarded is 109,300*l.*

Derby.—The claim presented by Mr. Thomas George against the Derby Sanitary Authority in respect of the compulsory sale of his premises in St. Peter's-street for town improvements, was argued on the 24th ult. at the Surveyors' Institute, Great George-street, Westminster, before the umpire and arbitrators, Mr. Edward Ryde, of London; Mr. Richard Bayliss, of Derby; and Mr. Fowler, of Birmingham. The claim was for 20,000*l.* The arbitrators have awarded 13,645*l.*

SURVEYORSHIP ITEMS.

Plymouth.—Mr. H. Alty has been appointed surveyor to the corporation and urban sanitary authority of Plymouth.

Romsey. -The *Hampshire Independent* reports that, at a meeting of the Romsey town council, held on the 3rd inst., it was resolved to appoint a borough surveyor, by eight to seven votes, at 20*l.* per annum. No doubt the councillors will get what they pay for, which is not much.

Old Swindon.—At a meeting of the Old Swindon Local Board of Health, on the 20th ult., the five selected candidates for the surveyorship and inspector of nuisances presented themselves for examination, and Mr. Thomas V. H. Davison, C.E., son of Mr. T. V. Davison, borough surveyor of Windsor, was elected to the post.

DRAWING CLASSES FOR WORKMEN.

Now that the evenings are lengthening, schools of art and drawing-classes for workmen are commencing their winter courses. Every workman who desires to improve his position will do well to avail himself of the advantages offered by these technical classes.

The *Richmond and Twickenham Times* puts in a plea for the drawing and technical classes carried on in that locality, and lays special stress on the importance of the class devoted to "building construction,"—

"Who does not know the 'dear-at-any-price carpenter,' who cannot correctly work to a plan, and who has no more ability to get out for himself a plan and rod for a set of 'boxing-shutters' than he has to divine the clue to the Etruscan language? He wastes good stuff by cutting it to wrong sizes, and his puny brain-power achieves its greatest performance when he 'sets out' correctly a simple four-panelled door. Making a sash or grasping the elementary mysteries of 'head and butt' are quite beyond his ken, and when these are wanted off his bench he has to turn in sheer helplessness to a more skilful mechanic, just as a child would to its teacher for its copy."

In this connexion, we notice that Mr. Parton Parry's metropolitan evening classes for the study of geometrical machine, architectural, freehand, model, and perspective drawing are commencing work in various parts of the metropolis. At Hoxton, last week, Mr. Parry commenced a class for teaching the drawing and designing of furniture, which it is expected will be largely attended by cabinetmakers, carvers, &c. Another class under the same direction was opened at the Mission-hall, Sandwich-street, St. Pancras, on Tuesday last. Mr. Buckmaster, of the Science and Art Department, was present, and in the course of his address he remarked that what was wanted in the present day was that work should be made the means of intellectual training and discipline. They wanted the working classes to throw more thought and sentiment into their every-day life. With good-humoured cynicism Mr. Buckmaster went on to say that there was a general anxiety for the welfare of the working classes, which usually reached its climax on the eve of a general election. He was anxious for the interests of the industrial classes; and those interests lay in their developing and making the best use of their own talents.

ACCIDENTS.

Railway Fatality.—A sad accident occurred on the 1st inst., on the Cornwall Railway, about fifteen miles from Plymouth. A new viaduct is being built at Moors Wather, for the Great Western Railway Company. A stone of about 4 tons weight was being lifted by a steam crane travelling on the line, when it caught at the truck, and suddenly slewed, the jerk capsizing the crane and truck. Mr. Gandy Cole, the resident engineer, who was on the truck, jumped off, but was caught and crushed to death under the machinery of the crane. The engine-driver was entangled in the chain, and could not be extricated for three hours. He was terribly scalded by steam from the boiler.

Fall of a Grand Stand.—At the Houghton-le-Spring Races, on the 7th inst., a grand stand, crowded with spectators, gave way. Twenty of the occupants were injured, six of them, it is feared, seriously.

Fall of a Wall in the City.—On the 4th inst. Mr. W. J. Payne, the coroner for the City and Duchy of Lancaster, held an inquiry in the Board-room, at St. Bartholomew's Hospital, as to the death of William Thompson, aged thirty years, who was killed by the fall of a wall in the City. From the evidence of George Ayling, and other witnesses, it appeared that the deceased was in the employ of Mr. Goodwin, contractor. The deceased was employed, with several other labourers, in excavating near a wall at the site of the late great fire in Watling-street, belonging to Messrs. Crocker & Son, wholesale drapers, &c. While Thompson was working near a temporary bridge, about three-quarters of a ton of old wall fell on him. He died soon after. The Coroner said he agreed with the remark of the foreman of the jury, "If the wall had been shored up or pulled down the occurrence would not have taken place." Verdict,—"Accidental death."

VARIORUM.

The *Leisure Hour* gives particulars of the artisans' banner, the "Blue Blanket":—"According to Pennicuick, the order of the Blue Blanket was instituted by Pope Urban II. in the twelfth century, and is therefore more ancient than any order of knighthood in Europe. This author tells us that a large number of Scottish mechanics who followed Allan, Lord High Steward of Scotland, and aided him in the recovery of the Holy Sepulchre from the infidels, took with them a banner bearing the inscription 'In bona voluntate tua edificenter muri Jerusalem.' This banner, which they styled the 'Banner of the Holy Ghost,' was from its colour, familiarly known as the Blue Blanket. On their return they dedicated it, at the altar of St. Eloi, in St. Giles's Church, St. Eloi being the patron saint of the hammermen of Edinburgh, the guardians of this celebrated banner. Further, Pennicuick tells us that in acknowledgment of a loyal service rendered him, King James III. confirmed the craftsmen in all the privileges of the Blue Blanket, which they obtained by permission as an immemorial possession, and he ordered it to be called in all times coming 'The Standard of the Crafts within Burgh.' At its appearance, not only they, but all the artisans within Scotland, are bound to follow it, and fight under the Convener of Edinburgh. In all cases of civil commotion 'up went the Blue Blanket.'"

Miscellanea.

Breaches of the Metropolitan Building Act.—At the last meeting of the Limehouse District Board of Works, the works committee reported, with reference to a request by Mr. Vulliamy (the Superintending Architect of the Metropolitan Board) that the District Board's surveyor would report any breaches of the Building Act occurring in the district and coming under his notice that it is not expedient that an officer of the Board should, under any circumstances, report to the officers of the Metropolitan Board without being so directed by the District Board. The committee were also of opinion that the District Surveyors under the control of the Metropolitan Board are the proper persons to undertake what was requested, and not the officers of the Board. The report was approved.

Building in New York.—According to the *Continental Gazette*, a new and useful paper, "permits have been taken out in New York for a larger number of new buildings erected or to be erected this year, than for any year since 1871. The new buildings include an unusually large number of small residences to be occupied by single families, and the erection of these is said to have stimulated builders to an improvement of "apartment" houses. New York's elevated railroads will help to extend the city in Philadelphia fashion, and possibly indirectly relieve the courts of suits about baby carriages, canary birds, and other nuisances in apartment houses."

New Masonic Hall, Shipley.—The Earl of Carnarvon opened a new Masonic Hall at Shipley last week. The building is situate in Wellcroft-court, Kirkgate, Shipley, and has been erected upon the site of the former New Inn, by Mr. Jonas Bradley. About 1,000*l.* have been expended upon the structure. The various works in connexion with the erection of the building were contracted for by the following tradesmen, viz.:—Mason, Mr. John Rhodes; joiner, Mr. George Yates; plumbers, Messrs. S. Rushworth & Son; plasterers, Messrs. Walsh & Son; decorators, Messrs. Sam Oddy & Son; gasfittings, Mr. C. Howroyd. The architects for the works were Messrs. Jackson & Longley.

Hall for the London Scottish Corporation.—At a meeting of the Court of Governors of the London Scottish Corporation on the 2nd inst., considerable discussion arose upon the protests of Mr. Gordon Laing against the action of the Building Committee in connexion with the erection of the new hall. At a former meeting it was decided by the Court that the interests of the Hospital would be best advanced by rebuilding the hall and offices on the old site in Crane-court, Fleet-street; but Mr. Laing contended that this by no means authorised the committee to build certain warehouses which they designed to occupy the site of some dilapidated old houses adjoining, and from which they hoped to derive income. Mr. Laing submitted plans of his own, which he suggested would be more suitable than those of Professor Donaldson, the Corporation's architect, and he expressed a belief that support could be more easily obtained from the Scotch nobility and gentry, were a handsome structure decided upon. He also urged that the chapel should be sold to aid in defraying the expense of his plans. Professor Donaldson defended his designs. It was then announced that this subject must come before the Building Committee and the Court at subsequent meetings, when Mr. Laing could urge his views; but the latter announced his intention of withdrawing from the committee, and of moving a resolution at the next Court to give effect to his opinions.

A Fire Extinguisher.—Last week a private trial was made at Hendon of Messrs. Atkins, Allen, & Aston's patent for extinguishing fire. The apparatus consisted of a small drum-shaped stove, about 1 ft. 8 in. high and 1 ft. 2 in. in diameter, charged with a mixture of animal and vegetable charcoal and coke. This stove was connected by a 1-in. pipe with the inlet supply-pipe of a fire-engine. Instead of the exhaust of the pump drawing in water alone, it sucks in simultaneously water and the gases given off by the burning charcoal and coke, the action being somewhat similar to placing two straws in one's mouth, sucking in water through the one and air through the other, and then violently puffing out the combined air and water through a third pipe. It is claimed for the invention that the gases generated in the stove, although presumably largely composed of carbonic acid gas, in place of being a deadly compound, may be inhaled with no more adverse effect than is experienced when breathing in an atmosphere of ordinary steam. A mass, containing some 3,000 cubic feet of fuel, was set alight, and the exterior walls were from time to time damped. When the whole interior and exterior were thoroughly alight, a jet of the patentees' fluid was played upon the shed. The effect is said to have been instantaneous.

The Colonnade of Old Burlington House.—As some of our readers know, the stones which once formed the celebrated colonnade of Burlington House, Piccadilly, now lie prostrate in an ont-of-the-way corner of Battersea Park. A correspondent of the *Metropolitan* calls attention to the neglected condition of these remains, and says:—"A little while ago it was suggested to the authorities that the colonnade might be placed so as to form an access, against the foot of Albert Bridge, for the Chelsea people to enter the park. They gruffly answered, 'It is only 210 yards for the Chelsea people to walk from the bridge to the present gate.' Would that 'My Lords' were made to do penance over these 210 yards of abominable loose gravel-stones; then, perhaps, they would sympathise with the multitudes of tender feet which suffer torment before they enter the paradise of the park."

Art and Technical Education at Bradford.—A letter has been received by the Bradford Corporation from the authorities at South Kensington, in reply to a memorial for aid in establishing a museum and art gallery in connexion with the Bradford Free Library, that the authorities will place at the disposal of the committee of the corporation six large cases, containing objects of industrial art.——A numerously-attended meeting of gentlemen interested in the Bradford trade was held on the 3rd inst., at the Bradford Town-hall, under the presidency of the mayor, Mr. B. Priestley, to consider the desirability of permanently establishing the recently-formed and already flourishing Bradford Technical School by the erection of suitable buildings for its location, at a cost of 25,000*l.* A subscription list was opened, and 12,000*l.* were subscribed at once.

Horticulture at the Paris Exhibition.—Horticulture is amply and powerfully represented in the Paris Exhibition, and fully justifies the prevision of the promoters, for everywhere over the vast spaces we meet with interesting and valuable illustrations of the possibilities of gardening. Not the least surprising and satisfactory of the horticulture features are the grass lawns, which were delightfully effective within three weeks of the date of the sowing of the seed, and now show a fine close sward of the most delicious green colour, delightfully harmonising the many gay scenes and curious objects by which they are surrounded. The successive competitions in the horticultural classes are so arranged that the gardens are perpetually changing in respect of their more striking features, so that we see at all times the best productions of the season, and the charm of freshness accompanies change and variety. The conditions that result in a series of magnificent displays have precluded the participation of British horticulturists in the competitions, for if their plants and flowers were not ruined by the *mal de mer*, the term of sixteen days, during which they must remain on view in the gardens, would be fatal to a large proportion of them, to say nothing of the expense and inconvenience of personal attendance during the full tide of our own exhibition season. Hence the French horticulturists compete amongst themselves with but little disturbance by foreigners of any country, and are utterly undisturbed by the intrusion of Englishmen. And the truth must be confessed that the affair goes very well without our aid; the classes are well filled, the competitions are spirited, and the results, generally speaking, are not only satisfactory, but splendid beyond all precedent. If the bedding system needed vindication, the clumps of celosias, standard zonals, flowering begonias, and the hedges of marguerites and petunias, would accomplish the vindication with startling completeness, but the fact is there is no vindication needed, except in behalf of those who have cast in their lot with a morbid idea that weeds should prevail even to the doorways of palaces, and who are, therefore, too far gone in foolishness to be open to conviction or worthy of any endeavour thereto. But the practitioners of bedding in this country may learn some fine lessons by a ramble through the gardens of the Exhibition while the flowers are in their prime, for there are effects to be seen that are at once simple, original, and magnificent, and that, perhaps, have never been attempted here, and would not possibly have been thought of in Paris except to meet the requirements of a bold schedule and a very peculiar case.—*Gardener's Magazine.*

Renaissance Wood-Carving. — In the Ecclesiastical Art Exhibition which accompanied the Church Congress in Sheffield, Mr. G. A. Rogers, of Maddox-street, London, has taken a good place. His work is becoming widely spread. In many of the London clubs his work is to be seen. In the oscillating cabin in the *Bessemer* steamship, Mr. Rogers carved the panels, and he also restored a number of carvings at Chatsworth, executed by Gibbons in the reign of Charles II. He was represented at Sheffield by four specimens. Besides these, Mr. Rogers exhibited a drawing of a pulpit in St. Michael's Church, Cornhill, carved by his firm; a very curious finial removed from an ancient bedstead at Bruges, and brought to this country by Mr. W. G. Rogers in 1815. Also a water-colour drawing of the reredos in Darlington Church, representing the Last Supper, realistically treated and worked in mosaic by John Dobbin, and presented to the church by the artist; a water-colour drawing of Lindisfarne Abbey; and another of Albert Dürer's parish church at Nüremburg. Of his own carvings we can speak well. The most important item was a floral pendant, similar to work in the Church of St. Mary-at-Hill, Thames-street, London. The execution has that peculiar finish which distinguishes Gibbons's school.

Dangerous Trades.—Another woolsorter in Bradford has been added to the already too numerous list of victims who have fallen a prey to the noxious emanations arising from Van mohair. It is satisfactory to learn that, at the suggestion of Dr. Bell, says the *Lancet*, Messrs. Ambler & Sons have given orders that for the future the mohair shall be washed or exposed to air twenty-four hours previously to sorting. Other firms will, it is hoped, recognise their duty at once, and take similar precautions for the cleansing of their wool.

Electrical Ignition of Blasting Charges—At a meeting of the Society of Engineers, held on Monday evening, a paper was read by Mr. George G. André on "The Application of Electricity to the Ignition of Blasting Charges." The author described the advantages afforded by electrical firing as of two kinds:— (1) Those due to the simultaneous discharge of the blasts, and (2) those resulting from the nature of the means of ignition. He showed that the total amount of work to be done was considerably diminished by simultaneous discharges, and that, as a natural consequence, the saving of time and money was proportionately increased; moreover, he proved that another distinct advantage lay in the fact that the whole face of the rock was brought away comparatively clean and smooth, no projections or bosses being left, as in the case of single blasts. The main advantage resulting from the nature of the means of ignition was the increased safety of the operator, owing to the fact that the charge could not possibly be ignited until he had had sufficient time to retire to a place of safety. With the ordinary safety-fuse, however, it is otherwise, the chargeman, after igniting the fuse, having to retire hastily from the spot, and always incurring a certain amount of risk. The author next explained that the majority of blasting accidents were due to the unexpected explosion of shots which had been approached by the men under the conviction that they had missed fire through a defect in the fuse. This difficulty is entirely removed by electrical firing, inasmuch as, in case of failure, the charge cannot possibly be ignited afterwards.

The Sanitary Condition of Paris.—The committee of inspection whose duty it is to examine into the sanitary condition of dwelling-houses in Paris, have made a report to the Prefect of the Seine on the work which they have done during the last eight years. They have visited upon the average 3,168 houses or dwellings every year, as against only 2,812 for the period comprised in their previous report. They have no right to inspect any houses except upon the receipt of a letter of complaint from one of the tenants or at the request either of the Prefecture of Police or of a medical man. For some time, the committee received very useful information as to houses the sanitary condition of which was unsatisfactory from the office of public relief and the medical attendants of the poor, whose duties took them into districts where improvements were most likely to be needed. The office of public relief has ceased to give this information, and the committee point out in their report how much this is to be deplored; for of the 40,000 families, or 100,000 persons, in receipt of relief, 15 per cent. pay less than 4*l.* per annum in rent, and 52 per cent. between 4*l.* and 8*l.* per annum. The committee, while asking that the supply of such information may be made compulsory, also point out the danger to health which arises from the sleeping of so many workmen in one room, known as a "chambrée," and the Prefecture of Police, which is alive to the evils of this practice, has asked the Municipal Council of Paris to grant a sum of 800*l.* for appointing several inspectors of furnished rooms to second the action of the present committee.

Sinking of Piles.—M. Ventillard, the port engineer of Boulogne, has introduced a new method of sinking piles. By it, we are told, "water is forced at high pressure through a gutta-percha tube into the sand and slush, which bubbles up and becomes loosened, when the pile can be driven into the ground almost by its own weight. The iron pointing of the piles is done away with, plain-pointed wood being sufficient, a pile 17 ft. long taking only from two to five minutes to be driven and rammed home." Supposing this to be a correct description of the *modus operandi*, it would be interesting to know whether piles sunk in this way will stand the severe strains to which those driven by the usual and more laborious method are sometimes subjected.

Buildings from Paris.—The Liverpool *Daily Post* says that a striking innovation in laying out land for building is to be carried out at West Kirby, a growing watering-place in what may be called the Cheshire suburbs of Liverpool. Messrs. Shelmerdine, architects, of Liverpool, have instructions to purchase a number of the houses now standing in the Street of All Nations, Paris Exposition, and to superintend their erection upon residential plots at West Kirby.

Supposed Italian Sculpture at Furness Abbey.—Mr. J. P. Morris, of Barrow-in-Furness, writes to the *Daily News*:—"In noticing the sale of the Right Hon. W. E. Gladstone's collection of pottery, which took place in 1875, a writer thus alludes to Lot 253:—

'This singular group recalls the sculpture of the same subject on the wall of the cathedral at Orvieto, attributed to some followers of the Pisani, where the Almighty, a full-length draped figure, appears to lift Eve by the shoulder, while her feet are still in the side of the sleeping Adam.'

Before seeing this notice, I had thus described, in a small handbook to Furness Abbey, a similar piece of sculpture in the hotel which was once a portion of the Abbey:—

'Over the fireplace in the coffee-room there is a bas-relief of the Creation, worked on a block of red sandstone of the neighbourhood. The scene presented by the artist is the moment when—

Adam's bride
Came from her closet in his side.

The Creator, in loose flowing robes, is bending over the pair, with his right hand upon the left shoulder of Eve, as she gradually rises from Adam's side. Four trees, with a few deer and other animals, form the background to the picture, and underneath is written—

Post orbem conditum sexto die creatur homo.'

The late T. A. Beck, esq., in his 'Annales Furnesiensis,' is of opinion that the sedilia and other ornamental portions of Furness Abbey were the work of Italian artists. This would seem to confirm that view."——Another correspondent says:—"The creation of Eve, was a favourite subject with the great Italian artists,—Giotto, Ghiberti, and Michelangelo having treated it. I wish here, however, to mention the alto-relievos of the Creation on the south side of Wells Cathedral above the west door. In one of these, Adam is seen in a reclining posture, while Eve, whose lower limbs are not disengaged from his body, raises herself in pleased surprise and stretches out her hands in adoring recognition of her Creator. The artist appears to have avoided the difficulty felt by many of his predecessors who had undertaken to represent the Almighty to the eye of sense, by abandoning the usual conception of the Ancient of Days, and resorting to that of the human appearance of Christ as if in the act of working a miracle, familiar in ecclesiastical art. Flaxman, who greatly admired the sculpture at Wells, has said of this particular composition that 'it is certainly the oldest, and not inferior to any of the others' executed by the Italian masters."

Sunday Art Exhibitions.—The Sunday Society's Gallery of Water-Colour Drawings at the old School Board offices, New Bridge-street, Blackfriars, was opened for the first time last Sunday afternoon from two p.m. till five p.m. Up to three o'clock about 100 visitors were present, but afterwards the gallery was inconveniently crowded, many of the prominent officers of the Society being present. The collection consists of 110 drawings and sketches of Swiss life and scenery by Mr. W. L. Thomas. In reply to inquiries made, it was stated that the committee of the Society intend opening a larger gallery early in the ensuing year, towards the accomplisment of which object they invite the assistance of all who are able to help either by pecuniary contributions or the loan of works of art. The present exhibition, we are bound to say, is but a small affair, up two pairs of stairs. We hope to see the experiment tried before long on a larger scale, and in a better locality. We have understood that facilities would be given at the Royal Albert Hall, and that some excellent private collections have been offered.

New Sanitary Apparatus.—An apparatus has been invented and patented by Mr. Joseph Robinson, inspector of nuisances at Aston, Birmingham, for loading night-soil, &c., direct from the barrow which brings it from the middens, into carts and wagons, thus entirely doing away with the stacking of filth in great heaps in our streets. The apparatus consists of a wooden frame upon which two rails are fixed in an inclined position, and upon these rails a carriage is placed. A box is carried in the centre of this carriage, into which the night-soil is placed direct from the ashpit. The whole apparatus weighs about 6 cwt., and is taken to the ashpit by simply chaining it to the back of the cart.

Chapel of Ease, Holloway-road.—This place of worship has been lately undergoing renovation. It has been cleaned and decorated simply, and at a comparatively moderate cost. The work has been carried out under the direction of Mr. G. M'Donell, architect, by Messrs. T. W. Smith & Son, of Islington.

St. Margaret's, Westminster.—A correspondent well entitled to speak desires to draw attention to the present condition of the remarkable painted monument there of Cornelius Van Dun, Yeoman of the Guard to Henry VIII. and other of our sovereigns, and who built twenty houses in Westminster "for poor women to dwell rent free." The writer says,—"Entering the church the other day, I turned my eyes to the north wall for the figure of Van Dun, but looked in vain; and I began to fear that, not content with sweeping away his almshouses from Petty France, his monument had been swept out of St. Margaret's. It is not so, however. On closer examination I found it; but to my horror it looked as if some parish Malone had whitewashed it. Unfortunately the case is worse. It is simply perishing by neglect. The outer and coloured portions of the bust have crumbled away, and no parochial authority appears ever to have taken the slightest trouble to preserve a monument highly curious in itself, and one which, erected about 1577, continued in good preservation well into the present century. The munificence to the poor of Westminster of him whom it commemorates ought to have secured its being properly cared for. Can nothing now be done to arrest its further decay? My mite towards the cost shall be forthcoming." He further asks, "Who pulled down Van Dun's 'twenty houses for poor women to dwell rent-free?' for where they stood in Petty France, now York-street, is occupied by the workhouse."

Illicit Commissions.—We referred last week (p. 1053) to the charges brought against Mr. Deas, engineer to the Clyde Trustees. At a meeting of the Trust on the 1st inst., the members decided to retain Mr. Deas as their engineer. By 17 to 5 they adopted the minutes of the Committee of Management, which set forth that Mr. Deas admitted fully, and with expressions of deep regret, that he had been guilty of what he at the time did not consider to be a wrong act; that he had voluntarily arranged to pay to the Queensland Government the amount of commission which he had received from the builders of a dredger, with interest; that the Committee resolved that Mr. Deas be requested to pay to the treasurer 500*l.* in respect of his services withdrawn from the business of the Trust; and that they had no ground for believing otherwise than that he had on all occasions acted honourably in the interests of the Trust in all dealings with contractors performing work for or supplying furnishings to the Trust. The amendment, which was lost, was that the minutes be not approved of, and that Mr. Deas be requested to hand in his resignation to the trustees.

Water as a Motive Power.—Messrs. W. H. Bailey & Co., of Salford, have recently introduced a mode of utilising water as a motive power. Their motor works under the ordinary pressure of the water sent through the street mains. In appearance it is somewhat similar to an ordinary horizontal steam-engine. It has an oscillating cylinder, with parts so arranged that the motion of the cylinder cuts off the supply of water at the end of the stroke, a reciprocating action being thereby obtained and imparted to the fly-wheel by the ordinary crank arrangements. One of the motors is working successfully, we are told, at the bottom of a colliery shaft near Bolton, the power being supplied by the water pumped up from the pit by the steam-engine. A large number of laden wagons are drawn up an incline with great ease by this means. The motion has also been utilised for sawing timber, printing newspapers, pumping water from low to high levels, and for many other purposes. The saving effected is not only in the difference between the price of the water which is used and that of the coal which would be consumed if the power were supplied by steam, but also in the labour required.

Poetry in the Paris Exhibition.—A reflection of the reporter of the *République Française* before Messrs. Doulton's house, in the Street of Nations, literally translated from the above journal, runs thus:—"How sweetly and calmly life must flow on in the bosom of these comfortable interiors, between the reading of the Bible on Sunday and of the *Times* on week days, the whole seasoned by an exquisite pudding, made by the hands of the blonde housewife, the dainty fragments of which are coveted by a cloud of babies!!!" This is something like writing. Here we get the genuine touch of nature w ich makes the whole world kin!

Working Men's College, Great Ormond-street.—After the usual recess, the new term of this college has just commenced, and a novelty appears on the prospectus in the shape of a series of Free Popular Lectures for Men and Women, to be given every Thursday evening, the object of the council being, as they frankly state, not only to supply free lectures of the highest class to the public, but to attract them to the college, so that they may become aware of the advantages so easily within their reach. How thoroughly the efforts of the council have been supported may be gathered from the fact that the list of lecturers comprises the names of such distinguished gentlemen as Prof. J. R. Seeley (author of "Ecce Homo"), Prof. W. H. Corfield, Prof. Lowne, Mr. Frederic Harrison, Mr. F. J. Furnivall (the editor of the "Leopold Shakspeare"), Dr. Casson, and also the Principal, Mr. Hughes, Q.C. The subjects selected by these gentlemen are both literary and scientific. We cannot doubt that the men and women of the classes to whom they are specially addressed will readily avail themselves of the opportunity afforded, which certainly merits the encouragement and support of all interested in the diffusion of sound knowledge.

Huts for Cyprus.—We understand that the War Department are arranging to ship from Woolwich to-day (Saturday), on board the *Craig Forth*, a number of huts of an elaborate character, intended to form official head quarters for the Lord High Commissioner, Sir Garnet Wolseley, and for the Brigadier General and Staff at Cyprus. These huts have been constructed with great despatch by Mr. George Shaw, of Westminster, and Messrs. Baker & Son, Lambeth; and the whole of the locks and door furniture, which possess some special features, have been supplied direct to the War Department by Mr. James Hill, of Upper Thames-street. The Governor's House comprises a suite of extensive reception-rooms, dining-rooms, boudoir, study, bedrooms, bath-rooms, and also includes rooms for the aide-de-camp and private secretary, together with servants' rooms, and every accommodation for an official residence.

Verdict of "Manslaughter" against Railway Directors.—The inquest on the people killed in the accident on the Cork and Macroom Railway was concluded last week, when the jury returned the following verdict:—

"We find that the deceased T. Mitchel Brew, Thomas Murphy, and James Rattray, were killed on the 8th of September, 1878, at Curraheen, by an engine of the Macroom train getting off the rails, and part of the train upsetting, owing to the defective state of the sleepers; and we find that directors, M. Massey, Sir John Arnott, Richard Tonson Rye, Timothy Mahony, Charles Roycroft, R. Mahony, Denny Lane, and William Harrington; F. L. Lyster, superintendent; and John Flynn, ganger, are culpably responsible; and that John Flynn is the least culpable, and we attach no blame to the deceased, James Rattray."

North Wales Slate Trade.—The slate trade of North Wales, which has been very dull for some time, several quarries being wholly or partly closed, now presents a slight improvement in certain districts. During August, 10,956 tons of slate were shipped from Carnarvon, against 7,682 tons for the corresponding month last year.

Paris Exhibition.—With reference to the terms of our notice of Messrs. Verity's fireplace, Messrs. Howard & Sons say "this fireplace was designed entirely, even to the working drawings, by our own draughtsman, Mr. W. F. Randall, and carried out by Messrs. Verity under his directions, and therefore belongs most exclusively to our exhibit."

Bas-Relief at the Walker Art-Gallery, Liverpool.—The second bas-relief on the front of the Walker Art Gallery was uncovered on the 1st inst. It represents the granting of the charter of incorporation by King John. The subject comprises several dozen figures, and they have been carved, from models prepared by Mr. Warrington Wood, by two Italian carvers.

Paving.—The Kensington Vestry has decided to pave a large portion of Brompton-road, and the whole of High-street, Notting-hill, and have entered into contracts with the Asphaltic and Hinson's Wood Paving Companies for about 6,000 yards each, and Messrs. Nowell & Robson for 8,000 yards.

An Open Competition for one situation as Architectural Draughtsman at an outport in the Department of the Director of Engineering and Architectural Works in the Admiralty will be held in London, under certain published regulations, on Friday, the 8th of November, 1878, and following days.

Ramsgate.—At a meeting of the Ramsgate Local Board, on the 1st inst., it was resolved, in pursuance of the report of the committee of the whole Board, to invite designs for constructing a road to unite the East and West Cliffs, premiums of 200*l.*, 100*l.*, and 50*l.* for the three best designs to be offered. It was agreed that the committee should engage an engineer, at a cost of not more than 50*l.*, to assist them in preparing the conditions of the competition.

Sunday Opening of the Philadelphia Exhibition.—The Permanent Exhibition at Philadelphia, in spite of opposition, has been opened to the public on Sundays. That the movement is a popular one is indicated by the large number of people who passed through the turnstiles each day. On the first Sunday about 6,000 were registered. On the second nearly as many visitors attended.

Concrete in Halifax.—The *Halifax Guardian* says that a large new reservoir and cooler, in concrete, have just been completed for Messrs. J. Aked & Son, Pellon-lane, by Messrs. Thomas Cordingley & Sons, concrete layers, of Bradford. Messrs. Utley & Grey are the architects. The coolers have hitherto been made in iron.

The Gaiety Theatre, Glasgow.—Mr. F. Matcham, of Rugby-chambers, Bedford-row (son-in-law of the late Mr. J. T. Robinson), has received instructions to prepare designs for the rebuilding of the Gaiety Theatre, Glasgow, for Mr. Charles Bernard.

The Architectural Association's Opening Conversazione for Session 1878-79 is announced for Friday, the 25th inst.

TENDERS

For Banstead School buildings, for the Kensington and Chelsea School District. Messrs. A. & C. Harston, architects. Quantities by Mr. C. Poland:—

Langmead & Way	£72,462 0 0
Longley	68,880 0 0
Martin, Wells, & Co.	68,318 19 0
Kirk & Randall	65,340 0 0
Higgs & Hill	62,980 0 0
Josolyne	57,965 0 0
Downs & Co.	57,690 0 0
Braid & Co.	57,500 0 0
Crockett	57,200 0 0
Hook & Oldrey (accepted)	51,698 0 0

For warehouse, Drummond-street, for Messrs. Trist & Palmer. Mr. W. T. Miller, architect:—

Langmead & Way	£1,600 0 0
Lamble	1,563 0 0
Longmire & Burge	1,535 0 0
Anley	1,527 0 0
Chapman	1,498 0 0
Patman & Fotheringham	1,495 0 0
Goodman	1,493 0 0
Brass	1,460 0 0
Higgs	1,350 0 0
Pickersgill	1,345 0 0
Taylor	1,239 0 0

For alterations and additions to 31, Marchmont-street. Mr. D. Cubitt Nicholls, architect. Quantities not supplied:—

Langmead & Way	£808 0 0
Collins	768 0 0
Axford	760 0 0

For sewers and roadmaking, Sir Spencer Wilson's Estate, Hampstead. Messrs. Farebrother, Ellis, Clark, & Co., surveyors:—

Anderson	£4,945 0 0
Keeble	4,870 0 0
Watts	4,715 0 0
Nowell & Robson	4,714 0 0
A. & C. Culverhouse	4,645 0 0
Killingback	4,580 0 0

For group of cottages, Hawks-hill, Wooburn, Bucks, for Mr. Alfred Gilbey. Mr. Arthur Vernon, architect:—

Banghurst	£799 0 0
Silver	776 0 0
Woodbridge	759 0 0

For a house at Ramsgate, for Mr. Mascall Newington. Mr. W. G. Osborne, architect:—

	Credit Old Materials.
Goodson (accepted)	£584 0 0 ..... £84 0 0

For Hadleigh House, High-street, Ramsgate, for Mr. H. Warren. Mr. W. G. Osborne, architect:—

Cowell	£3,460 0 0
Elgar	2,750 0 0
Harrison	2,675 0 0
Goodman (accepted)	2,609 0 0

For alterations and additions at The Elms, Minster, including new conservatory on Hellwell's system. Mr. W. G. Osborne, architect:—

Goodman (accepted)	£675 0 0

For villa residence South-Eastern-road, Ramsgate, for Mr. G. Keyte. Mr. W. G. Osborne, architect:—

Elgar	£650 0 0
Harrison	634 0 0
Osborn	630 0 0

For part repairs, &c., at the parish church, Stokenchurch, Oxon. Mr. Arthur Vernon, architect:—

Silver	£130 0 0
Selby	125 0 0
Taylor & Grist	90 15 0
Holland	65 0 0
Syred (accepted)	63 0 0

For additions to picture-gallery, Pall-mall. Mr. Dudley, architect:—

Hill & Co.	£1,024	0	0
Colls & Co.	987	0	0
Cooke & Co.	984	0	0
Newton & Trigg	757	0	0

For sewer and sewage outfall works near Harrow Station. Quantities by Mr. Whitaker:—

White	£7,320	0	10
Nowell & Robson	6,750	0	0
Neate	6,640	0	0
Thompson & Son	5,900	0	0
Larter	5,873	0	0
Botterill	5,677	0	0
Mackenzie	5,580	0	0
Shrubland	5,498	0	0
W. & H. Hill	5,236	19	5½
Rowland & Son	5,160	0	0
Cardus (accepted)	4,200	0	0

For alterations, additions, and decorations to 1, Eaton-place. Messrs. Drury & Lovejoy, architects. Quantities supplied:—

McLachlan	£1,795	0	0
Clemence	1,769	0	0
Bywater	1,696	0	0
Colls & Sons	1,684	0	0
Spake & Forman	1,673	0	0
Bowden	1,630	0	0
Higgs & Hill	1,444	0	0

Alterations and [additions] to 39, Craven-street, Strand, for Mr. Barnet. Quantities supplied by Messrs. Stoner & Son:—

Clemence	£729	0	0
Fairchild	726	0	0
Simpson	725	0	0
Pull	713	0	0

For building five warehouses at Armley, near Leeds, for the Earl of Dudley. Mr. J. Whittington, architect. Quantities by Mr. W. Hoffmann Wood:—

Smith & Son	£8,078	0	0
T. & W. Brown	8,040	10	0
Craven	8,000	0	0
Bishopp	7,994	8	6
Gard & Co. (accepted)	7,985	4	0

For the erection of stables and outbuildings at Grosvenor-road, Gunnersbury, for Mr. C. Brown. Mr. E. Tomlinson, architect. Quantities supplied:—

Barnes	£582	0	0
Whitman	532	0	0
Chamberlain Bros.	525	0	0
Osborne	508	0	0
Adamson & Sons (accepted)	486	0	0
Johnstone	485	0	0

For erection of proposed organ factory in the Metropolitan Cattle Market, for Messrs. Green & Savage:—

Sayer	£1,140	0	0 !
Goodman	1,049	0	0
Beach & Co.	1,003	0	0
Piggersgill	995	0	0
Niblett	973	0	0
Williams	956	0	0
Taylor & Co.	950	0	0
Stamp & Bowtle	949	0	0
Linfield	938	0	0
Beale	935	0	0
Crockett	914	0	0
Edgar	854	0	0
Sampson & Parrish	750	0	0
Eady	712	0	0
Somerville & Hill (accepted)*	562	0	0 !

* This tender was read 362*l.*, instead of as above, the 5 being mistaken for a 3.

For blinds to new premises in Cross-street, Mould-street, and New Market, Manchester, for Mr. Haworth. Mr. A. Waterhouse, architect:—

Guynan & Son (accepted).

For new premises and foundry, Brewery-road, Islington, for Mr. J. A. McLean. Mr. J. Lockhead, architect:—

Woodward	£2,465	0	0
Boyce	2,176	0	0
Niblett	2,171	0	0
Lane	2,160	12	0
Silby	2,140	10	0
Gould & Bradd	1,959	0	0
Crockett	1,947	0	0
Aitchison & Walker	1,837	0	0

For alterations, &c., at 60, Pall-Mall, Mr. Josiah Heale, architect:—

Langmead & Way (accepted).

For the erection of new schools in Oakwellgate, for the Gateshead School Board. Mr. T. Oliver, architect. Quantities by Mr. George Connell:—

Grey & Humble	£5,132	12	10 !
Inglis & Reak	4,280	0	0
Carrick	4,231	15	0
Town Bros.	3,926	14	11½
Gibson	3,836	13	10
Bradshaw	3,805	0	0
Johnstone	3,732	1	9
R. & J. J. Harrison	3,715	17	3
Armitage	3,698	17	0
Robson	3,691	17	0
Galy	3,606	18	0
Bell	3,564	3	0
Millar	3,531	16	7
Foggin	3,529	0	0
Veitch	3,528	3	8
Nicholson	3,500	16	2
Hutchinson	3,415	19	0
Elliot	3,350	0	0
Miller	3,349	10	5
J. Smith	3,349	2	8
Allison	3,347	13	0
Ferguson	3,272	11	0
Henderson & Parkinson	3,264	14	0
T. & R. Lamb	3,250	0	0
Broomhead & Keswick	3,203	9	1
Richardson & Co.	3,170	19	7
J. Atkinson	3,110	16	8
Burton	3,083	15	6
W. L. Smith	3,075	5	0
Robson & Trimbls	3,057	11	6
Leighton	3,041	0	0
H. Atkinson	2,999	5	0
Grisdale	2,962	0	0
N. & R. Reed	2,974	4	8
Clark	2,854	3	10
Greason & Stockdale	2,811	17	3
Thompson	2,802	3	0 !

For heating apparatus:—

Watson & Son	£80	0	0
Dinning & Cooke	73	0	0
Donkin & Nicholl	72	0	0
Walker & Emley	62	0	0

For new schools, Somerford-street, Bethnal-green, for the London School Board. Mr. E. R. Robson architect:—

Grover	£13,303	0	0
Williams & Son	12,989	0	0
Hook & Oldrey	12,960	0	0
Kirk & Randall	12,581	0	0
Sheffield & Prebble	12,487	0	0
Brass	12,425	0	0
Hobson	12,379	0	0
Pritchard	12,319	0	0
Cox	12,177	0	0
Tongue	12,111	0	0
Boyce	11,990	0	0

For the erection of endowed school for girls, Loughborough, exclusive of the department of the sick and the laundry and boundary-walls. Messrs. S. C. Gilbert and S. E. Stevenson, joint architects:—

Barnes	£5,250	0	0
Jewsbury	4,703	0	0
Johnson Bros.	4,599	19	0
Slater	4,434	14	3
Bromage	4,281	10	0
Needham	4,168	10	0
Jelley	4,150	15	9
Moss	4,109	0	0
Black	4,100	0	0
Harding	4,030	0	0
Main	3,950	10	0
Wheatley & Maule	3,940	0	0
Clipsham (accepted)	3,759	0	0

For the erection of a new Police-station and Court-house at Grays, Essex. Mr. Henry Stock, architect. Quantities by Mr. J. Marsland:—

Glasscock	£4,175	0	0
Greenwood	4,130	0	0
Wood	3,940	0	0
Rider & Son	3,818	0	0
Gardner & Son	3,810	0	0
Wells	3,800	0	0
Parmenter	3,757	0	0
Capon	3,685	0	0
Saunders	3,565	0	0

For additions, &c., Hughenden Cottage, Bucks, for Sir C. L. Young, bart. Mr. Arthur Vernon, architect:—

Silver	£1,125	0	0
Woodbridge	1,097	0	0
Hunt	1,026	0	0
Biggs	972	12	6
Loosley	946	11	0

For the erectino of a school at Penrhyndendraeth. Mr. Thomas Roberts, architect:—

Hughes	£695	0	0
Jones	690	0	0
E. Williams	666	0	0
R. J. & M. Jones	584	5	5
Evans & Co.	538	0	0
R. Williams	500	10	0
Pritchard	497	19	8
Gough	479	0	0
Rees (accepted)	465	0	0

For the erection of a leather factory in Long-lane, Bermondsey, for Mr. C. F. Fowler. Mr. G. Green, architect. Quantities by Mr. W. Grayson:—

Wall	£11,395	0	0
Downs	11,355	0	0
Hare	11,349	0	0
Tayler & Co.	11,341	0	0
Sharp & Co.	11,325	0	0
Smith & Co.	11,315	0	0

For widening the Green-lanes frontage, and laying in surface water-drains and gullies, on the Eaton Park Estate, Palmer's-green, for Mr. Thos. Kelsey. Mr. Fred. C. Kettle, surveyor:—

		Felling, &c.,	Trees, each.
Dunmore	£635 0 0	£1	0 0
Bloomfield	621 18 6	0	15 0
Finn	535 0 0	—	—
Green	394 0 0	0	4 6
Pizzey (accepted)	379 10 0	0	7 6

For brick culvert and diversion of Pymm's Brook, for the British Land Company (Limited), on their estate at East Barnet. Mr. Henry B. Michell, surveyor:—

Chick	£1,390	0	0 !
Harris	1,325	0	0
Ford & Norris	1,225	10	0
Pizzey	1,199	0	0
Acock (accepted)	650	0	0 !

For pulling down and rebuilding shops, High-street, Barnet, for Mr. Henthall. Mr. Edwin W. Brooking, architect:—

Baughan	£420	0	0
Pattison	410	0	0
Miller	389	0	0
Butler (accepted)	385	0	0

For alterations and additions to the Small Pox Hospital, Homerton. Messrs. A. & C. Harston, architects:—

Wheeler & Co.	£1,695	0	0
Norris	1,577	0	0
Cook & Green	1,393	0	0
Wood	1,3 0	0	0
Upson	1,290	0	0
Wise	1,280	0	0
Ivery	1,175	0	0

For new fire-engine station in Park-street, Thame, Oxon. First Contract. Mr. H. J. Heath, architect:—

Wells (accepted)	£264	0	0

For alterations and additions at Nos. 89 and 90, Cadogan-place, and 162, Sloane-street, Chelsea, for Messrs. E. J. Barker & Co. Mr. Gill, architect:—

Blandford & Co. (accepted)	£1,450	0	0

For new shop-fronts and repairs to Nos. 62 and 63, Hendon-street, Pimlico, for Messrs. Randell Brothers. Mr. Jones, architect:—

Blandford & Co. (accepted)	£160	0	0

For alterations at the Albion Tavern, Albion-road, Dalston:—

Lancaster	£132	0	0
Taylor & Parfitt	129	10	0
Smith	119	0	0

TO CORRESPONDENTS.

A. V.—C. S.—L. & W.—J. H. B.—J. O. B.—M. A.—W. F. S.—B. K.—S. R. S.—H. H.—F. C. & Son.—P. C. K.—J. S.—W. C.—G. G.—A. A. C.—T. R.—W. J. B.—W. & M.—T. B.—C. W. W.—F. B.—H. B. M.—T. O.—W. G. O.—F. M.—F. P.—W. L.—D. B.—C. & S.—J. P.—E. C. B.—W. H. P.—Piano-Forte Reform.—G. & S.—Model Easy Chair.—Domestic Sufferer.—"Chairs to mend."—C. F. W. (very doubtful) A. H. & Son (we should be inundated with more advertisemental).—The Piano-Forte, and Furniture (several communications on these subjects shall have consideration).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Notes.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

The Builder.

VOL. XXXVI. No. 1863. SATURDAY, OCTOBER 19, 1878.

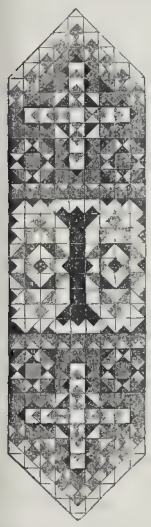
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The Light of the Future.



IN a former issue* we had occasion to refer to the work of M. Hippolyte Fontaine, "L'Éclairage à l'Électricité," at a time when public interest, in this country at least, in electric lighting had hardly begun to be aroused. Since then the importance of the electric light,—though still almost in its infancy,—has come to be so widely recognised that the appearance of M. Fontaine's work in an English garb ("Electric Lighting." London: E. & F. N. Spon) must be doubly welcome. It has been remarked, and with truth, that few subjects excite public attention to the extent of this question of the electric light. Trials have been made in this country, and on a more or less extensive scale on the Continent, as well as in America. They have taken place on vessels and quays, in dockyards and harbours, on fortifications and in encampments, in railway stations, workshops, theatres, &c. While this shows that the subject is of general interest, it will experience, and has already experienced, all the vicissitudes to which most questions of public utility are liable at their first appearance. On the one hand, enthusiasts have saluted the dawn of electric lighting by proclaiming loudly that it is a hundred times more economical than gas, that it may be employed anywhere and distributed indefinitely, and that its light is as beautiful and intense as the centre of all lumination, the sun itself. By others, at present the majority, who object to change either from habit or on principle, thereby hindering unconsciously or wilfully, as the case may be, the progress all rational minds desire, the service the electric light is destined to render to industry is not appreciated as it deserves. As in all other things, however, so with this important agent: its true value will be found in the mean between the two views. The future may have surprises in store for us; but our present knowledge enables us to confidently affirm that the part electricity is destined to play is far from being fully developed just yet. As time advances, and the elements of electric lighting have been put to more practical purposes, both its partisans and opponents will have had ample opportunity of testing its advantages. Meanwhile, and before considering what the electric light has already done for us, it will not be unprofitable to recall in a few outlines the history of the electric light from its origin.

When Davy, in 1813, first produced the electric light between the charcoal points of two conducting wires, it was at once proposed to use it for all the various purposes of illumination, simply because in volume of light it excelled all other known sources of light. But it became soon evident that great obstacles presented themselves to the general application of this light. Davy had used for its production a gigantic galvanic battery of 2,000 elements; the lengths of charcoal were quickly consumed in the enormous heat of the arc of light, and had to be moved towards each other, if the light was not to be extinguished, in the same degree as they were consumed; and, finally, the light was concentrated upon a small space, the attempt of dividing it into several lights having also failed. A step in advance was made when, using stronger acids, new elements were constructed which gave more powerful currents; it was possible to produce with from forty to fifty of such elements a beautiful electric light; and the efforts were successful of maintaining, by means of the current itself and a clockwork suitably connected with it, the charcoal points at the distance required for the supply of a continuous light for hours without manual intervention. But notwithstanding the great improvement of the galvanic elements, the cost of the light produced by them was still too great, and the management of the batteries too troublesome, for its general practical application for the purposes of illumination to be thought of. Its use was confined to some scientific purposes, and the occasional production of great effects of light in theatres, &c.

Faraday, in 1831, found a new way of generating electrical currents, by moving magnetic poles towards closed wire coils, or *vice versa*, and since then opened out to physicists and engineers a new, wide field to produce by the suitable construction of magnetic machines powerful electrical currents, and with these the electric light without batteries, consequently in a purely mechanical way. Step by step progress was made in this direction, while on the other hand it was tried to improve the electric lamps, with a view of keeping the charcoal rods at the same distance during combustion. Already in 1850, we find both, the magnetic machine and the electric lamp, improved to such a degree as to provoke serious thought of applying the electric light to lighthouses, for illuminating large spaces of ground for war purposes, &c.; and yet it was not until the end of 1863 that the first electric light was shining in the lighthouse of Cap la Hève, near Havre.

In the meantime, Dr. W. Siemens, of Berlin, already then well known for his eminent services rendered to telegraph engineering, had invented his induction cylinder, and had employed it both for the working of the telegraph and in the construction of a new magnetic machine, small but powerful; and Wilde (1866) undertook to make use of the Siemens machine in combination with a steam-engine of fifteen-horse-power in such a manner as to be able to produce electrical currents and the electric light of a power until then never thought of. But Wilde's machine was very expensive both as regards construction and working, and found but little favour in consequence.*

In the same year, Dr. Siemens discovered the dynamo-electrical principle, or the manner of changing any description of mechanical work without steel magnets into electrical currents. It is well known that there are no different descriptions of forces in nature, but only various forms of one and the same fundamental force, the essence of which is movement, either the movement of larger bodies (mechanical work) or the movement of the smallest particles and the ethereal body of the universe (heat, light, electricity). For that reason it is possible to transform any of these forms of force,—for instance, the muscular power of living beings, steam-power, water-power,—into heat or light or electricity. With this invention of Siemens, galvanic batteries were doomed, and a means offered to engineers of producing electrical currents of a power hitherto unknown, and on proportionately small machines.

Of the various magneto-electric machines that have been brought forward, that of M. Gramme is the most generally used. As soon as his machine became practicable, an English company purchased the English and American patents, the Société d'Encouragement awarded a gold medal to the inventor, and a large number of manufacturers ordered the apparatus. The exhibitor has been awarded prizes at the Exhibitions of Lyons, Vienna, Moscow, Linz, and Philadelphia; and now about 500 machines of his construction, with magnets or electro-magnets, have been delivered, and the demand for them is still increasing. Electric lighting, which before M. Gramme's invention did not exist, speaking industrially, is at the present day within the domain of things practical. It is not within our scope to give a detailed description of his machine; it is sufficient for our purpose to state that it furnishes continuous electric currents, the direction and intensity of which may be changed. The electric current having been generated is conducted through an insulated wire to a perpendicular rod of retort carbon, the point of which is placed exactly above the point of a similar rod, the distance between the points being less than a quarter of an inch. This intervening space is the electric arc, and the current passing through that interval from the rod above to that below heats the points to astate of intense incandescence, producing the electric light. The current passing only in one direction,—from the upper or positive pole to the lower or negative pole,—consumes the positive at double the rate of the negative, and

* See p. 499, *ante*.

* Mr. Wilde has obtained an interim injunction, restraining Messrs. Wells, of Shoreditch, from using the light which (as we reported last week) they have adopted at their premises, on the ground that it involves an infringement of his patent.

consequently the distance between the points has to be continually readjusted by clockwork and a magnet, constituting the regulator or electric lamp.

Davy made use of rods of wood carbon extinguished in water or mercury. They burned with great brilliancy and very regularly, but they were consumed very rapidly, so as to be useless for practical purposes. Now retort carbon, the deposit collected from the walls of gas retorts, is employed. It is much more dense than wood carbon, and resists for a long time the destructive action of the voltaic focus. Here, also, there is room for improvement, for retort carbon is not all that could be desired, but it gives satisfactory results in most of its applications.

The best known apparatus for regulating the consumption of the carbons are those of Archereau, Lacassagne and Thiers, Gaiffe, Foucault and Duboscq, Hefner-Alteneck, and Serrin. The first two are no longer in use.

By the side of the electric lamp with regulating apparatus for the carbon rods as they become consumed, Jablochkoff's candle has also become the material for electric lighting. M. Jablochkoff's light completely suppresses the regulator. His invention was presented to the Academy of Sciences in October, 1876. The carbons, instead of being opposed, are placed side by side, and are separated by an insulating fusible substance. When the current begins to pass, the voltaic arc plays between the ends of the carbons. The layer of insulating matter melts, volatilises, and the double rod of carbon slowly consumes, exactly as the wax of a candle progressively exposes its wick. M. Jablochkoff now burns in his candles, as they are called, powdered asbestos. It seems as if the interesting labours of M. Jablochkoff will have practical result, and that they will increase the domain of electric lighting, for his lamps are now largely used. In Paris, besides numerous larger electric lamps, at the present time, there are burning many Jablochkoff candles, of which we may mention eight on the Place de l'Opéra, twenty-four in the Avenue de l'Opéra, eight on the Place du Théâtre Français, six at the Palais Bourbon along the front facing the Place de la Concorde, seventy in the Grands Magasins du Louvre, eight in the shops of the Belle Jardinière, sixty in the Concert de l'Orangerie des Tuileries, thirty-two in the interior of the Hippodrome.

Returning to the Gramme machine, it appears that the first light machine constructed by M. Gramme fed a regulator of 900 Carcel burners; its total weight was over 2,000 lb. This machine served for a long time for the experiments on the clock-tower of the Houses of Parliament at Westminster. The fault found with this machine was that it became heated, and gave sparks between the metallic brushes and the bundle of conductors on which the current was collected. This, however, has not given rise to any serious inconvenience during five years. M. Gramme's next machine was less powerful, of a power of only 500 burners, and consequently of smaller dimensions. When a current is sent into two regulators, each will give 150 Carcel burners. This apparatus has been introduced on board the *Suffren* and the *Richelieu*, of the French navy; on the *Livadia* and the *Peter the Great*, of the Russian navy; it is employed by several Governments for service in fortified places. This machine is described as excellent, but its luminous intensity is slightly feeble when the atmosphere is foggy; its price, however, is somewhat high. The inventor has improved upon this machine, and constructed one which, when coupled in tension, gives a luminous intensity of 800 Carcel burners at 700 revolutions per minute, and, if coupled in quantity, 2,000 Carcel burners, with 1,350 revolutions per minute. It has been adopted by the French Ministry of War, by the Austrian navy and artillery, by the Norwegian, Turkish, and other Governments. By further simplification, M. Gramme has been able to introduce a machine most suited for industrial purposes, large iworkshops, and large covered spaces.

As has already been remarked, the electric light may be advantageously employed in a large variety of works, for it admits of obtaining a great quantity of light at a small expense. By its means, the loading and unloading of cargoes, the mounting of machinery, carpentry, weaving, dyeing, and similar trades may be carried on by night just as well as in broad daylight. It is necessary, however, to employ two machines, in order that the light of the one should counteract the shades thrown by the other. It has been found by experience that the naked light may be employed, the workmen themselves having asked for the removal of the opal globes which it was thought at first necessary to use. The electric light preserving the tints of colours, this property has been utilised with success by several dyers for standardising their colours by night.

The electric light is most effective for high rooms; when ceilings are of a less height than 12 ft., its introduction becomes more difficult. As a rule, there may be conveniently lighted with a single apparatus about 5,000 square feet of fitters' shops, lathe-shops, tool-shops, and modelling-rooms; half that space in spinning-mills, weaving establishments, and printing-rooms; and about 20,000 square feet of yard, courtyard, dockyard, quay, and open-air works.

In a country like the British Isles, where the safety of the mercantile marine and the navy depends so very much upon the amount of security with which ships may enter ports, and the care bestowed upon keeping up an effective system of lighthouses to warn the navigator against approaching dangerous coasts, the electric light would be sure to prove a welcome auxiliary in effecting those objects; and so in reality it has, being now employed at many of the stations. It renders visible at night, at distances varying from 2,000 to 6,000 yards, objects such as buoys, ships, coasts, &c. The electric light was first applied to lighthouses in 1863. In that year trial was made with an Alliance machine at the lighthouse of La Hève, near Havre, the results being so satisfactory that no doubt all lighthouses would have been provided with the new light if the question of expense had not stood in the way. It has been stated that the electric light is seen at least five miles farther than the oil-light, and that in hazy or foggy weather the range of the light is twice as great with the former as with the latter.

In England, official opinion was at first against the introduction of the electric light in lighthouses, on account of the peril of interruption; but this has been overcome. There are now electric lighthouses, besides those of England and France, in Russia, Austria, Sweden, and Egypt. Everywhere their action is pronounced satisfactory. Hitherto machines of only 200 Carcel burners have been tried; but it is stated on good authority, that the French Administration of Lighthouses are about to experiment with a Gramme machine of 2,000 burners. This machine probably will greatly enhance the advantages, already recognised, of electricity over oil, and will perhaps determine a radical change in the existing illumination of lighthouses.

The lighting of works by night is highly interesting. The Spanish Northern Railway, after trial, used the light as early as 1862 in the works proceeding in the Guadarama mountains. The expense per hour for material consumed was 2·90 francs per lamp; the saving effected upon the use of torches was 60 per cent. The light has also rendered important services in the mines of Guadarama. The air became so vitiated in the workings by the explosion of charges and the combustion of the miners' lamps that the ordinary lamp would not burn. When a Serrin's regulator was sent down, a complete change took place, respiration "becoming as easy as in the open air," the lamps remaining alight. Amongst open-air works may also be cited, as executed by the aid of the electric light, those of Fort Chavagnac at Cherbourg, of the Chemin de Fer du Midi, the reservoirs of Ménilmontant, the building for the *Moniteur Universel*, and, more recently, those of Havre harbour and docks, the Exhibition of 1878 in the Trocadéro, the Avenue de l'Opéra, the Grands Magasins du Louvre, and other establishments.

With respect to the introduction of the electric light on board ships, the experiments carried on on board *L'Amérique*, one of the steamers of the Compagnie Générale Transatlantique, were so conclusive that it seemed as if nothing could oppose the immediate adoption of the electric light on all vessels, for it is satisfactorily proved that the chief number of collisions result from the difficulty which captains experience in estimating the exact position of an approaching vessel. Yet it will be only gradually that the electric light will take possession also of the ocean. Quite recently, the electric light has been introduced into the British Navy. The electric lighting apparatus of Messrs. Wilde & Co., of Manchester, which has been tried on board the *Alexandra*, *Téméraire*, and other vessels, having proved efficient, the order has been given by the Admiralty to supply similar apparatus to the ironclads *Northumberland*, *Warrior*, *Repulse*, *Superb*, *Nelson*, the steel aviso *Iris*, and the despatch-boat *Lively*. For at least two years the introduction of the Gramme machine has been progressing on board the war-vessels of the French, Danish, Russian, and Spanish navies. As far as we know, up to the present time no disappointment has been experienced, and increasing labour will doubtless improve the first arrangements and lead to still better means.

As far as the application of the electric light to military operations is concerned, several Governments have ordered powerful Gramme machines for the defence of fortified places. An apparatus specially constructed for this purpose has been adopted in France, Russia, and Norway. From trials made at Mont Valérien with the apparatus, and a special projector, it resulted that an observer at the side of the apparatus could see objects 6,500 yards distant, and clearly distinguish details of construction at 5,500 yards. M. Gramme has also designed a machine for war-signalling of very small dimensions that may be turned by hand. The French army possesses at present two of these machines.

Very little attention has hitherto been bestowed upon the great service electricity will ultimately render in lighting up theatres and similar places of public resort. Besides the comparative cheapness of the electric light, its use will do away with the expensive fitting-up necessitated by gas. The great drawback to thorough enjoyment caused by the flare and heat of hundreds of gas-flames will be entirely removed. No longer broiled and heated up to almost fever-point, we shall be able to sit in comfort and, more than that, perfect safety against that most awful of all calamities, a fire in a theatre, or even a panic such as quite recently occurred at Liverpool. Panics will be avoided; for people will soon come to know that fire from electric light is impossible. We were forcibly reminded of the great danger to which audiences are now exposed during a recent visit, on a Saturday evening, to the Covent Garden promenade concerts. We pictured to ourselves the scene that would ensue if, during one of those crowded performances, the mass of inflammable material which has been piled up, in addition to what is already stored there,—with the evident endeavour to "decorate" the place,—were to catch fire; it required but a little fancy to conjure up a picture of an Inferno to which nothing was wanting. With the electric light, on the contrary, we should have, instead of a sweltering, gasping multitude, an audience able to enjoy the musical or dramatic fare set before it. As yet, however, little progress has been made in the employment of the electric light inside theatres.

What is said of theatres applies with even greater force to places of public worship. Let any one who doubts this attend on a sultry evening at such popular churches as the Metropolitan Tabernacle, or at Mr. Newman Hall's church, or even the City Temple, where the ventilation is said to have been recently improved. The heat in all those places is simply unbearable; yet people are expected to worship under such conditions.

For these reasons, it seems to us that the reform pointed out will not be long before it is introduced, especially as more perfect machines for producing the light are to be had. In Paris, as appears from the *Builder* of the 14th of September, experiments have recently been made for lighting up the interior of the Opéra, with a view of preserving the paintings with which the walls of the *foyer* are covered. The general opinion expressed was favourable to its employment.

But the electric light has not been a stranger to the stage for some time. It made its *début* in 1846, in the "Prophète," at the Opéra in Paris. At that early time, however, it was only employed to produce the effect of the rising sun. Its success was complete, and since that time it is rarely that a ballet or an opera has been mounted without the introduction of some effect of the electric light. Since 1855 a host of ingenious combinations have been realised by its aid,—rainbows, lightning, reflections of the sun, &c. At the new Opéra at Paris batteries are used, the architect not wishing to locate a steam-motor in any part of the building. At the Opéra in Vienna, where steam is employed throughout, use is made of a Gramme machine, which gives very good results.

These instances, however, are but isolated cases, or special occasions. What we insist on is, that the electric light should be employed throughout the whole house, and we shall not be accused of being too sanguine in this respect when we say that its use for theatres in the near future is a certainty. It is equally certain that a light which emits neither heat nor sulphurous and sooty smoke solves the question of preserving works of art for the future satisfactorily. The discussion which the experiments at the Paris Opéra will give rise to amongst artists, sculptors, and connoisseurs can tend but in one direction, that of the speedy introduction of the electric light also in museums and art galleries.

Among the various electric lights now exhibited in London, the Lontin light deserves especial notice. The Siemens light has proved of great value for the purposes of lighthouses, where great intensity is required. But so far as the illumination of open spaces, streets, and houses is concerned, the choice seems to lie between the Lontin and Jablochkoff lights. Outside the Gaiety Theatre, where the former is used, it puts the gas-lamps completely in the shade in the most literal sense, just as a gas-flame almost extinguishes the light of a tallow candle. The luminous effect of the Lontin light may be observed especially well from the London bridges. Looking, say, from Blackfriars Bridge on a dark night, in the direction of the Strand where the Gaiety stands, a large circle of radiance may be observed. Any one not aware of the fact that electric lamps are shedding their lustre might take it for the reflection of a fire. Visitors to Paris may observe the Lontin light at the Gare Saint-Lazare, the point of arrival of travellers coming to the French capital by the Newhaven-Dieppe route. It is also used at the Lyons Railway Station. The machine by which this light is worked produces a single current or several currents, direct and inverted currents. They may be distributed over several circuits, and several foci may be obtained, as many as thirty-six lights having already been produced. The lights at the Gaiety are worked by a steam engine in the *Echo* office, the wires conveying the current passing under the road; the wires might be prolonged to Covent-garden Theatre, or to Charing-cross, so that all three points might be lighted at once by the same machine. In Paris, the Lontin light has burnt continuously for twenty-one hours.

The promoters of the electric light tell us that the new lighting agent is only meant to supplement gas for certain purposes, where the use of the latter is impracticable or too expensive. This timid statement reminds us of what is reported of George Stephenson, who, when examined before the Parliamentary Committee as to the speed at which he thought his trains would run, diplomatically put it at a very low rate, well knowing at the time that a higher speed would have frightened Parliament into withholding its sanction for his proposed first railway from Stockton to Darlington. Though the electricians who are working for the perfection of the electric light are perhaps not so sure of their ultimate success as the eminent engineer who revolutionised locomotion, everything points to the conclusion that electricity will ultimately drive gas from, at any rate, many of its strongholds.

The question of the cost of electric lighting is such a highly important one, and has given rise to so much discussion, that we recur to it, though we have examined it already at some length on a previous occasion (see the *Builder*, p. 499, *ante*), when it was shown that, even under the most unfavourable conditions, the electric light is certainly below the cost of gas for equal amounts of light. The electric light as used by the London Stereoscopic Company, who employ a Siemens machine, is stated to be three times cheaper than gas, light for light. M. Fontaine calculates the saving with a Gramme machine to be over 22 per cent. Mr. Sprague, who was recently sent to Paris by the Commercial Gas Company to report on the electric light, comes to the conclusion that gas is twice as cheap as the Jablochkoff light. Other gentlemen have given their opinion for or against electric light with regard to its cost. But any unbiassed man not a shareholder or interested in gas companies, who has taken the trouble to look into the matter, will have arrived at the conclusion that the evidence points in favour of the new light. Moreover, as improvements are introduced in the production of the electric light, its present cost will be still further reduced. In fact, it is one of the conditions of its success that the spirit of inquiry and invention should be turned in the direction of reducing the expenses.

Since we last wrote on this subject, considerable progress has been made also in this country on the question of lighting by the electric lamp, as has from time to time been reported. We are gradually becoming alive to the fact that there are other means, besides gas, oils, and so on, for lighting up our thoroughfares and buildings. Gas is no doubt excellent in its way, but it has its great disadvantages. Oils take the place of gas in all cases where its use is out of the question, but on the whole they are now looked upon as "old-fashioned," and may be entirely dismissed in a comparison with the electric light. The advantages of the latter are manifold, among the principal being that a great deal of time is saved in lighting and extinguishing; the light is vastly superior to gas, and is not injurious; there is an absence of noxious smells, both in the production and combustion; the heat in a room, so often unbearable in the case of gas, is scarcely felt; the most delicate colours are preserved; air is not consumed as in the case of gas; there is no chance whatever of explosion, and although the light is so powerful, no accidents have occurred. There is only one drawback to the general employment of the electric light at present.

The great problem which remains to be solved is that of dividing the light in such a manner as to split up its intense brilliancy into separate useful atoms, each of which fractions must be powerful enough to serve for illumination under the same conditions and at least with the same effect as gas. When that is done, but not until then, the electric light will have proved itself a powerful rival to gas. The startling announcement has just been made that Mr. Edison, the inventor of the phonograph, if not of the telephone, has succeeded, in conjunction with Mr. William Wallace, an electrical manufacturer of Ansonia, Connecticut, to have perfected a dynamo-electric machine to such a degree as to make it the very thing wanted. As no details have yet been forthcoming, we prefer to suspend our judgment. It has been laid down as a very wise rule not to disbelieve anything that is not self-contradictory, and never to believe anything, plausible or otherwise, in a hurry; and to that rule we feel inclined to adhere also in this instance. Everything that has been said, up to the present, for or against this new lighting agent leads us to think that, though it would be not merely rash but erroneous to say at once that the days of gaslighting are numbered, it would be idle to try to disguise the fact that a formidable rival has arisen in the electric light. The latter, while it may yet take years to bring to such a state of perfection as will render it as practically available as gas, is destined, we have no doubt, to be "The Light of the Future." Gas will, nevertheless, long be a valued and well-paid-for servant.

GIORGIONE'S FOUR HUNDREDTH ANNIVERSARY.

On the 5th inst., at the picturesque Venetian town of Castelfranco, was unveiled, on the occasion of the fourth centenary of the birth of Giorgione, a statue to the great painter, and with it a commemorative stone to the memory of those patriots who have fallen in this century for the noble cause of Italian independence,—an exquisite thought, the celebration of the glory of Fatherland in the apotheosis of art and liberty.

The old town was crowded with visitors from all the neighbouring cities, anxious to assist at a ceremony which the municipality wished to render, and with reason, as solemn and as imposing as possible. Towards eleven o'clock the crowd gathered round the quaint old Loggia del Mercato, with its heraldic decorations, before which rose, still enveloped in its veil, the statue of Giorgione. Shortly afterwards, the guests of honour, consisting of many important personages from Venice and from Treviso, the deputies and authorities of the province, left the Municipio, and a few minutes later, on the signal being given, the curtains fell aside, displaying to the applauding crowd the statue of Giorgione, representing him in all the perfection of his youth, his familiar face with its long hair, and his manly figure in the costume of the splendid period which he so nobly adorned. The painter, who has raised his head in the attitude of observation, holds in one hand the chalk (*matita*), in the other his drawing-board, while at his side on a stool are his paint-box and palette, common-place enough accessories, but indispensable in the statue of a painter. He is dressed in the picturesque costume of the fifteenth century (the *quattro cento* of the Italians), the costume rendered with such beauty of colour in the pictures of Gentile Bellini and Carpaccio. From the characteristic *berettino* escapes the thick luxuriant hair, falling on his shoulders; the doublet is slightly open at the neck, and from the slashed sleeve appears the beautifully puffed shirt—the *camicia a sbuffi*—of the period, while from the left shoulder falls to the ground an ample and long mantle.

More than usual credit is due to the Venetian sculptor, Signor Benvenuti, for having thus recalled Titian's famous contemporary.

The speeches usual on such occasions succeeded the ceremony of the unveiling; among these, however, was specially noteworthy the discourse of the Barone Cattanei, representing the municipality of Venice, giving in the name of that city, as "the mother of the artist," a salutation to Castelfranco, "the mother of the man." Equally graceful was the speech of the mayor of the town, who, after thanking his guests, continued:—"Others will speak to you of Giorgione, whose fourth centenary all Italy celebrates to-day; others will tell you of those devoted patriots, who, in their glowing desire for liberty, shed their blood, and scattered with their bones more than one battlefield; to me is reserved only a modest share, but none the less agreeable, that of greeting in you, those noble citizens of this benign land, who in joy and in grief, in glory and in defeat, had ever before them but one thought, that of building up a Nation!"

At a later hour, and previous to the banquet, the guests visited the cathedral, there to admire the *pala* or altar-piece, the Madonna enthroned, and Saints Liberale and Francesco, the masterpiece of Giorgione, of which we have in our own National Gallery, and once in the possession of Samuel Rogers, the side of whose mantelpiece it adorned, the study for the gorgeous knight in armour.

In the evening, the houses, the gardens, and the quaint towers of the town were fantastically illuminated, the Bengal fire played in fitful light and shade on the statue, and over all, in the clearest of October skies, rising above the dark ivy-covered walls, the cold rays of the moon, enveloping in her mysterious light the whole. And so the evening's illuminations and the traditional fireworks ended a week's rejoicing in honour of the great master,—a rejoicing to which, and to the vintage which has already commenced, friends and relations from all parts had been invited,—sisters and cousins, from Venice, from Padua, and Vicenza, from Treviso and Verona, fair apostles bearing into these remote parts the gospel of the latest fashions, to provincial traditionalists, who still, as in the days of Giorgione himself, add a beauty to their fair features by powdering their hair.

For many weeks past, the municipality has been making preparations for the great event, preparations carried out thoroughly in the spirit of the graceful,—a title that Castelfranco has long borne. The evening previous to the ceremony the final touches to the whole were given, and as the sun of one of the finest of imaginable autumn days went down, the sweeping and cleaning of the old town was at last ended, the water in the still existing moat that surrounds the high and ruined walls, which had been allowed to run off through the sluices, the same that served in the old feudal days, flowed in again and round the base of the statue of Giorgione, situated on a rock in its midst.

Here, at a few yards from the spot where he was born, and no great distance from the cathedral where hangs his noblest work, under the shadow of the mediæval walls, the glory of whose colour he had studied in his youth in their warm contrast to the iridiscent distant hills, the Cadore hills, where Titian first breathed his aspirations, Giorgione's statue stands. The evening previous to its unveiling, and shortly before the sun set, the curtains were momentarily drawn aside to allow,—strange revolution of time,—the photographer to do his work; an hour later, in the twilight, the reflection of the re-draped statue might have been seen in the moat, the reality standing out against the dark background of ivy-covered walls.

For no town more than Castelfranco could be found, or even imagined, so exactly picturing the ideal birthplace of a painter, and such a painter as Giorgione. The flat tiled roofs, the decorated *loggie*, and the narrow streets, tell of a time long gone by, the quaint city gates, above the principal of which still grins the lion of St. Mark,—one of the few remains that tell of the once powerful republic, which Napoleon shattered at a blow,—the emblem was placed too high for his soldiers to destroy; but in many a village and town in the neighbourhood may still be seen embedded in the walls half effaced the winged lion of St. Mark. In more than one town, as at Bassano, still stand the pedestals of the *pili* or flagstaffs from which floated on the festa days the Venetian banner; but now even these are neglected, and nothing but tradition remains to tell of the power of the renowned republic.

But on this especial evening the artistic world of Venetia seemed to be represented, from its most favoured painters, sculptors, and architects, down to the humblest musicians, who crowded in numbers the old *cafés* and *osterie*, where might be heard, if not in all the ancient vigour, still the improvisatore, who chanted his amusing rhymes to the delight of crowded audiences, our own Northern appearance inspiring the poet with an appropriate couplet.

Untouched by succeeding generations, its red-brick castellated walls and turrets improved by the devastations of time, uninjured by the fortifying mania of the sixteenth century, Castelfranco, with more than one town in its neighbourhood, has remained such as it was in the fourteenth, and even earlier centuries, such as Giorgione saw in his boyhood, the home where were passed the early years of his too short existence.

His history is as simple as his life. Little known and obscure, hovering between a dream of art and a reverie of love, Giorgione was essentially the ideal hero of romance. With the grandeur of his features and his figure (a figure made familiar to us by his superb knight in armour) he was so admired, so tradition tells us, that all the *belle donne* of his time fell under the influence of his fascination.

"Of exceedingly humble origin, he was not, therefore, not noble," tells us old Vasari, and he certainly appears to have taken proudly his place among the proudest, in many of whose, what we would now call "vices," he freely indulged.

History tells us how, in the lovely moonlight nights of Venice, stretched on the soft cushions of a gondola, he used to sing, accompanying his "divine" voice with his lute, like the troubadours of old, uttering sweet sounds, and producing harmonious chords, ravishing the ear and soul. For it was at Venice, in the land of dreams and memories sublime, that after his elementary studies at the town from which we are at present writing, the young Giorgione, under Gian Bellini, made the first essays of his art, so soon to be succeeded by such innovations,—innovations in which he fairly rivalled his great co-disciple Titian.

Disdaining the timid and conventional art of his master, as wanting in inspiration and in genius, with a firm touch, full of nerve, free as his own nature, he blended happily in his perfect production the beautiful with the real. His canvasses glow with life, his figures are grandiose, the landscape rich in light and shade, the touch free and determined. In the present day, of his extraordinary *a fresco*, alas! only fragments remain, but his few canvasses are still preserved for us after the lapse of four centuries in all the brilliancy of their colouring, in all the strength of their tints, in all the richness of their execution, produced—greatest miracle of the famous Venetian school—with a palette consisting of but four colours.

Ougania of Venice has published at the moment a small volume, printed in beautiful Elzevir type, containing two interesting monographs extracted from the "Bulletino d'Arti e Curiosità Veneziane"; one, edited by Signor Urbani de Gheltof, is a careful article from historical authorities on the house in which Giorgione lived when at Venice, and containing an illustration taken from a photograph of a group of children painted in fresco by the master on the Palazzo Valier. The other, the work of the Avvocato Molmenti, is a short and critical biography of Giorgione, accurate in its historical details and artistic in its gracefulness. Among many curious passages one is specially interesting,—a commission which the young painter received from "Messer Aluixe di Sesti for four framed pictures of the life of Daniel, to be painted in good colours on linen canvass." This document, in sad condition, was ferreted out by the author, so he tells us, from the dusty arsenal of an antiquary in Venice.

In Giorgione all is grand, as he himself is grand,—*il grande Giorgione*. What a mind must his have been, to judge from the nobleness of his creations, their originality, their invention; and yet it is said that he suffered from envy because of the praises given to his "rival." Such great natures are incapable of envy; they feel too much their own value; the stimulus of doing nobler works, and the knowledge of their own ability, is their safeguard from passions which alone afflict the powerless, whose hand droops because their mind has failed first of all.

Had but Giorgione lived a few more lustres; if a premature death had not snatched him away, to what height might he not have risen, what masterpieces might he not, like Titian, have left behind him! For in the few pictures that we possess by Giorgione how striking is the difference between their conception and that of his predecessors' works. How strongly is manifested the spirit of the innovator. To him belongs, with his friend Titian, the merit of having smoothed a rough path, the glory of having shown his contemporaries unexplored worlds of fancy. Giorgione truly was, with Titian (whose fourth centenary will also soon be celebrated), the greatest figure in an important phase of the revolution of art, and Vasari, who understood this, truly says that Giorgione was born "to add a spirit to humanity and contrast the freshness of live flesh and blood."

Jolting from its rut the old system, Giorgione, in his figures, preserved the firm outline without displaying the peculiarities and mannerisms that still lingered with the older masters; he displayed a whole new future for art, a whole new science of effects; imitators he had many, but rivals never, for genius rarely has successors.

In the same way that he opened up to future painters the glorious methods of successfully dealing with light and shade, he seems to have established an ideal of an artistic life to the many artists who have since endeavoured to emulate him. Certainly to that French school of romantic painters and workers in the ideal world, which may be said to have originated during the lifetime of one great man who still lives, and whose "Hernani," fifty years ago, inoculated the Parisian students with an enthusiasm for romantic art (and this enthusiasm for Victor Hugo at the present moment exists in as high a degree as ever) which has borne the most glowing fruits that the world has known since the days of Giorgione and Titian.

Glorious as was the promise of Giorgione's life, its end was sad. We are told how his whole existence was divided between two deep loves,—his art and his Cecilia,—the source of each inspiration, the model of every study. In devouring the beauty of his *innamorata* his genius glowed, his sublimest conceptions were brought forth, from his lute flowed the sweetest melodies.

But his beauty (old, old story), careless of fame, fled to the arms of a new admirer, leaving the painter abandoned to die of passionate grief. Betrayed by his pupil and companion, no longer he seized his brushes, no longer he touched the chords of his lute, but, heartbroken, he wrote to the *bella infida*:—

> *" O mia diletta,*
> *Cecilia, vieni;*
> *Il tuo Caspetta*
> *Giorgio. . . ."*

And so Giorgione died, at the age of thirty-three, alone and lovelorn, at the height of all his glory.

Treviso.

Milland Church, which has been distinguished in ecclesiastical reports as one of the worst and most inefficient in England, is about to be replaced by a new Gothic building, the foundation-stone of which was laid on Saturday last by Mrs. Durnford, the wife of the vicar. The site has been presented by Sir John Hawkshaw, and although the district is comparatively a poor one, the building-fund now amounts to 2,600*l.*, leaving about 1,000*l.* yet to be raised to defray the cost of the intended building, which is to be erected in Bargate stone, from the designs of Mr. William C. Street, the contractor being Mr. Pink, of Godalming.

THE RUMOURED EXTINCTION OF THE EDDYSTONE LIGHT,

AND THE STRUGGLE OF THE ARCHITECT WITH THE OCEAN.

There is no edifice in Great Britain any sudden disaster to which would be more immediately and widely felt throughout the island than the Eddystone Lighthouse. Thus when the rumour spread through Plymouth and Devonport, sped thence by telegraph to other ports and principal towns, that the light on this sea-girt tower was no longer to be observed, the alarm and disquiet were intense. At Penlee point, from which the Eddystone light is usually most conspicuous, it was obscured on the 9th or 10th current. It has since been distinctly observed from the Hoe, and from other points, and it is probable that the temporary blinding of its ray was due to the great waves which, with certain winds, leap from their contact with the precipitous rock,—the Eddystone,—far above the 70 ft. at which the lantern is fixed.

Many causes concur to produce the strong feeling of national pride with which the great work of Smeaton is regarded. No church or chapel would have been regarded, in times when men devoted their lives and their wealth to the building of cathedrals and of abbeys, as of a more truly religious character. A ferry or a bridge was held, in the Gothic centuries, to be a work of piety. But no ferry, bridge, harbour, hospital, or public building of any description within our shores has been the means of saving more human lives, or averting more human misery, than the noble sea lanterns that guard our coasts. As a matter of design the building of the Eddystone lighthouse inaugurated, as Sir John Rennie declared, a new era in masonry. A contemporary which is almost alone among the daily papers in respect of the familiarity which it displays with the rudiments of structural and mechanical knowledge, is not quite correct in saying that the method which Smeaton first introduced has been followed ever since to the minutest detail of measurement. A different principle was introduced by Mr. Stevenson for the Bell Rock Lighthouse, and one which was so far an improvement that it made the stability of the structure dependent only on the durability of the stone employed; while in the Eddystone the durability of iron,—a far less certain safeguard,—was relied on. But the Eddystone was the first great model. It was the first outcome of the architectural genius of England in lighting our sea paths, when the circumstances were those of extreme peril and difficulty. Taking his guidance from the form of a forest tree, Smeaton rooted a stone bole to the live rock, and raised his lantern in the air at a height that might well promise to soar above the highest leap of the wave. Nor was it skill and perseverance alone that were needed for the task. The adventurous builders had to work with their lives in their hands. The size of the base of the tower was limited by the small surface of rock that was left bare by the tide in those unusual intervals when the sea was not washing over the spot. Twice had a light been fixed on the Eddystone, and twice had it been swept away, before Smeaton undertook his task. The wooden turret erected by Winstanley disappeared, together with its architect and watchers, in the great storm of 1703. A successor, built of wood on a stone base, was burned a few years later. The force of the sea in that neighbourhood may be conceived of from the fact that during the great storm of February, 1838, several of the largest granite blocks of the Plymouth breakwater, weighing from three to eight tons each, which were squared and dovetailed together, and embedded in good cement for their whole depth, forming a portion of the finished surface of the work, were torn from their position, and projected over the breakwater into the Sound. It is probable that pneumatic action was, in this case, superinduced by the motion of the waves. In 1840, during a storm, the sea-door of the Eddystone Lighthouse was forced outwards, and its strong iron bolts and hinges were broken by the atmospheric pressure from within. Mr. Walker, the President of the Institution of Civil Engineers, was of opinion that the sweep of the vast body of water in motion round the lighthouse had created a partial and momentary, though effectual, vacuum; and thus enabled the atmospheric pressure within the building to act upon the only yielding part of the structure. Mr. Thomas Stevenson, of Edinburgh, has been long engaged in making observations on the force of

waves, by means of a dynamometer. He has come to the conclusion that a wave 30 ft. high may exert a pressure of very nearly a ton on each square foot; and that, when reflected from a flat surface, such a wave would nearly double its weight. In a situation exposed to waves suddenly striking a vertical surface, more than 3,720 lb. per foot, or 1⅔ ton, displacing pressure, might be exerted. Mr. Scott Russell, who has, as is well known, given much study to the form of wave-lines, recommends cycloids of different orders for the outline of works which are intended to offer the least effectual obstacle to the sea, that is to say, to stand best, as most readily deflecting the wave. The common cycloid has the defect of transferring the force of the waves to the top of the wall, and thus sending a huge body of water into the air. The curtate cycloid, on the other hand, throws the crest of the wave over on itself. If the quality of the materials and workmanship are of the very best order, and the cost is unlimited, such a form may keep down the crest of the wave, and even turn one half to act against the other half. But unless the height of the work be very great, a wave might come large enough to carry off coping and parapet together. Mr. Scott Russell's investigation has been pursued rather with reference to sea walls than to lighthouses. The curved form of the latter edifices, on plan, tends to diminish the force of the wave by allowing it to divide around the shaft at the same time that it ascends against it. Thus, the actual quantity of water that gains the highest point, where, with the curtate cycloid section, it exerts its most destructive energy, will be very much less than that which commences its leap from the base of the tower. It is evident that, where the forces are so great, and the effects of even slight changes in the mathematical form of a curve are so serious, the experience of structures that have showed such endurance as the Eddystone is of primary value to the architect.

The Trinity House have for several years been anxious as to the stability of the Eddystone Lighthouse. During heavy storms from the westward, more especially from the west-south-west, great tremor is felt with the impact of each wave. Mr. James Nicholas Douglass, engineer to the Trinity House, has lately contributed a short paper to the transactions of the Institution of Civil Engineers, giving some particulars of the tower which it is now intended to erect. The present tower shows signs of yielding to the fury of the waves, and the joints of the masonry have more than once yielded to the heavy strain, so that the sea-water has been driven through them to the interior of the building. On two occasions, the first in 1839, and the second in 1865, the upper part of the building has been repaired or strengthened, and strong wrought-iron internal ties have been introduced, extending from the lantern downwards to the solid basement of the tower. On the last occasion, Mr. Douglass says, it was found that the chief mischief was caused by the upward stroke of the heavy seas acting on the projecting cornice under the lantern-gallery, which lifted the portion of the building above that level. This is in accordance with what we have previously remarked, and is a very clear indication that, in the supposition that a projecting cornice of some kind is found to be indispensable for the protection of the lantern, a properly defined curve should be continued from the shaft of the structure round the underside of the cornice, so as to turn over the wave gradually, instead of presenting a flat surface exposed to the lifting power. In Mr. Douglass's design for the Wolf Rock Lighthouse this consideration appears to have been present to the architect. The under-side of the cornice curves gently from the line of the tower, and though there is a square projection of the abacus, it is so protected by the curves as to offer but little resistance to the upward movement of the wave. In 1865 the projection of the cornice of the Eddystone tower was reduced about 5 in., and the stones were fresh bolted together. No further serious leakage has since occurred at that part of the lighthouse. But the portion of the gneiss rock on which the tower is built has been so shaken by the action of the sea, whether on the rock or on the tower itself, that it is now considerably undermined at the base. It has therefore been prudently determined to erect a new lighthouse, at a distance of about 127 ft. from the existing tower. A good foundation has been found, near low-water level.

The present lantern exhibits a fixed white light at an elevation of 72 ft. above high water, which is clearly visible for a distance of about fourteen nautical miles. In 1818 Mr. Robert Stevenson, the Engineer to the Board of Northern Lights, had the opportunity of making a very careful inspection of the rock, being favoured with a smooth sea and a low tide. He had examined it five years previously. He then reported (in 1818),—"The rock is shaken all through, and dips at a very considerable angle, perhaps one in three, towards the south-west; and, being undermined on the north-east side for several feet, it must be confessed that it has an alarming appearance. I am not, however, of opinion that it has altered its state, perhaps, since the date of the erection of the tower. Since my last visit in 1813, I am not sensible of any change in it. On the north-east side, however, at what is called the "Gut" landing-place, where the men sheltered themselves from the fire of Rudyerd's lighthouse, but especially at low water of spring tides, there is a hollowing of the rock which penetrates at least to the circumference of the base of the lighthouse. I therefore conclude that when the tide runs high there is danger of this house being upset, after a lapse of time, when the sea and the shingle have worn away the rock to a greater extent. Nothing preserves this highly important building but the hardness of the rock and the dip of the strata; but for how long a period this may remain no one can pretend to say." Furnished with this advice, from one of the soundest and most provident of the engineers of Great Britain, and able to ascertain how far the hollowing predicted by Stevenson has advanced, Mr. Douglass has had data on which to advise the Trinity House, and there can be no doubt of the soundness of his advice.

The focal plane of the present light we have stated to be at an elevation of 72 ft. above high water; 68 ft. of which height was composed of masonry, the 11 ft. at the bottom being solid. The Bell Rock Lighthouse, built by Robert Stevenson in 1807-11, was founded on a rock so low in the water that during the first season in which the works were carried on,—the season of 1807,—only an hour or two's work could be caught at each tide, and the whole time thus available amounted to no more than thirteen days and a half of ten hours each. The tower of the Bell Rock is 100 ft. high, and the solid portion of its base 21 ft. high. The floors of the Eddystone tower were constructed of a vaulted form, and the haunches of the arches were bound together with chains to prevent them forcing outward to the injury of the walls. But each stone of the Bell Rock floors was made to form a part of the outward walls, extending inwards to a centre stone. Independently of this, they were connected together with copper bats, with a view to preserve their square form at the extremity, instead of dovetailing. The stones were also modelled with dovetailed joggles across the joints. Mr. Smeaton followed the construction adopted by Sir Christopher Wren in the dome of St. Paul's. Mr. Stevenson found no difficulty in procuring stones of the large dimensions necessary for this method of building from Mylesfield quarry; and has the credit of being the inventor of this mode of building a continuous inner structure of absolute solidity and durability.

The new Eddystone Lighthouse is to have the focal plane of the light at an elevation of 130 ft. above high water. The range of the light will be thus extended from 14 to 17½ nautical miles, so as just to overlap the range of the new electric lights on the Lizard. The tower will be constructed of granite. It will have a cylindrical base, 44 ft. in diameter and 22 ft. high, having its upper surface 2½ ft. above high water of spring tides. From this base will spring the shaft of the tower, 35 ft. 6 in. in diameter at the commencement, and 18 ft. 6 in. in diameter under the cornice, the top of which will be 138 ft. above the rock. The tower is to be a concave elliptic frustrum the generating curve of which has a semi-transverse axis of 173 ft., and a semi-conjugate axis of 37 ft. Around the base of the tower, on the top of the basement cylinder, will be a level margin 4 ft. 3 in. wide, for a landing-platform. The tower is to be solid, with the exception of a water-tank, to the height of 25 ft. 6 in. above high water, spring tides. At the level the walls will be 8 ft. 6 in. thick, gradually diminishing to 2 ft. 3 in. at top. The tower will contain nine apartments, the two lower ones 10 ft., the seven upper each 14 ft. high. The whole of the work is to be dovetailed and cemented, both horizontally and vertically, on the system already adopted at the Hanois, Wolf, and Longships Rock Lighthouses. The total net quantity of granite in the work will be about 69,100 cubic feet, and the cost is estimated at 78,000*l.*

In speaking of this great work in the unconditional future tense, it must be remembered that the brief and modest account, given by Mr. Douglass, from which we derive our information, is not the theme of a novice. The writer has undergone the baptism, if not of fire, of sea and storm, and has shown himself a worthy member of the noble band who are content to rank Smeaton as their leader. In 1869 Mr. Douglass completed his fine work, the Wolf Rock Lighthouse, and the light which was then first exhibited on the 1st of January, 1870, has since been continued every night with regularity from sunset to sunrise. An account of this work was read to the Institution of Civil Engineers on the 1st of March, 1870. It called forth the testimony from Captain Owen that, having been acquainted with all the proceedings of the Messrs. Douglass in connexion with lighthouses, he was struck with the modest way in which the proceedings in the erection of the Wolf Rock Tower had been narrated by Mr. J. N. Douglass. Having been personally interested in the building of the Bishop and Wolf Rock Lighthouses, Capt. Owen bore his testimony to the qualifications of Mr. Douglass, not only as an engineer, but as a blacksmith, a carpenter, and a mason in his own person, as well as a seaman. If young engineers wanted to emulate such success, they must, in the same way, know how to take the tool out of the hands of the workman, and to put it to its deftest use. No site or position for a lighthouse, was the testimony of Mr. G. R. Stephenson, required more skill, or involved more difficulties and dangers, than the Wolf Rock. Situated about twenty-three miles W.S.W. of the Lizard Lighthouse, and twenty-one miles E. by N.¼N. of St. Agnes Lighthouse, on the Scilly Islands, this rock rises, in its highest part, 17 ft. above low water of spring tides, which here rise 19 ft. The rock is composed of a hard felspathic porphyry. The surface is rugged, and landing on it is at all times difficult. The depth of the water close to the rock is about twenty fathoms on all sides except the south-east, where a shoal extends for some distance, having only from four and a half to five fathoms of water on it at the distance of a cable's length from the Wolf. At the distance of a mile from the rock in this direction the depth of water on this reef is about fourteen fathoms, but in every other direction it is not less than thirty-four fathoms. Between the periods of high-water and the following low-water, the tidal stream here runs south-easterly, southerly, and south-westerly. From low-water to the succeeding high-water it sets north-westerly, northerly, and north-easterly. This peculiarity is supposed to extend to a radius of four leagues around the rock. Situated as the Wolf is in deep water, and exposed to the full force of the Atlantic Ocean, a terrific sea beats on it. In 1823, the question of building a lighthouse on it was raised by the Admiralty, and Mr. Robert Stevenson, the Engineer to the Commissioners of Northern Lights, then estimated the cost at 150,000*l.*, and the time required for its erection at fifteen years.

From 1836 to 1840, Mr. John Thurburn, a pupil of Mr. James Walker, was engaged in fixing an iron beacon on the Wolf Rock. The difficulties of the undertaking may be estimated from the account of the number of hours actually worked on the rock during each season in the erection of this beacon, which were as follows: –

1836	39¼	hours.
1837	65	,,
1838	85	,,
1839	68¼	,,
1840	44½	,,

Total, in five years, 302½ hours of work.

The cost of the erection of this beacon was 11,298*l.*, or rather more than 37*l.* 6s. 8d. per hour of actual work. The mast of the beacon, which was of old English oak, 12 in. in diameter, was carried away in November, 1840. It was replaced by a wrought-iron mast, 7¾ in. in diameter, by August, 1847. In the succeeding winter this mast was bent 3 ft. from the perpendicular by the force of the heaviest seas driving from the westward; and in October, 1844, it was broken off about 4 ft. above the top of the cone on which it was fixed, by a violent storm. In August, 1850,

another wrought-iron mast, 9 in. in diameter, and bearing a globe of 3 ft. in diameter was fixed, and contested the force of the sea until it was replaced by the present lighthouse.

In 1861 the late Mr. James Walker, Engineer to the Trinity House, was called upon for plans and estimates for the erection of a lighthouse on the Wolf Rock. A site for the workyard was taken, in 1861, at Penzance, 17 miles from the Wolf; and Mr. James Nicholas Douglass, who furnished the account from which we take the leading particulars, and who was then completing the Smalls lighthouse, was appointed Resident Engineer. The tower is very similar to those erected for the Bishop, the Smalls, and the Hanois Lighthouses. It is 116 ft. 4 in. high, 41 ft. 8 in. diameter at the base, and 17 ft. diameter near the top, at the springing of the curve of the cavetto under the lantern gallery. The work is quite solid for 39 ft. 4 in. from the base, with the exception of a tank for fresh water. The walls are 7 ft. 9½ in. thick at the level of the entrance-door, and gradually diminish in thickness to 2 ft. 3 in. near the top. The shaft of the tower presents the outline of a concave elliptic frustrum, of which the generating curve has a major axis of 236 ft., and a minor axis of 40 ft. The tower contains 44,506 cubic feet of granite, weighing 3,296 tons; and its centre of gravity is 36 ft. 2½ in. above its base. Each stone is dovetailed both vertically and horizontally, according to the system first suggested by the father of the Resident Engineer, and first adopted at the Hanois Lighthouse in Guernsey. A raised dovetailed band, 3 in. in height, is left on the top bed and end joint of each stone, a corresponding dovetailed recess is cut in the bottom bed and end joint of the adjoining stones, with just sufficient distance to allow of setting. The whole is put together with Portland cement; and experiments on the strength thus acquired have led to the opinion that the work thus executed is as solid as if it were a granite monolith. In addition to the dovetailing, two yellow metal bolts, 2 in. in diameter, are let into the twenty lowest courses of the tower, for the face stones, and 2 in. bolts of galvanised puddled steel are let into each stone in the interior work. The masonry to the level of the high-water spring tides was set in Medina Roman cement, mixed with salt water. Above that level, Portland cement, mixed with fresh water, was used. The sand in both cases was a clear, sharp, granitic sand, obtained from the stamps refuse of the Balleswiddin tin mine, near Penzance, which is of excellent quality for such work, every grain being hard, angular, and rough.

It will give some idea of the fury of the sea at the spot to mention that, in the course of building, notwithstanding the extraordinary precautions above mentioned, thirty-four stones of the fifth course (which course it had been found impossible to complete by the end of the working season of 1865) were carried away by a heavy storm which raged on the 25th of November of that year. It is supposed that they were displaced by the mast of the *Star of England*, which was nearly wrecked in that tempest, and which cut off her mizen-mast to avoid being driven on the Wolf.

During 1861 Mr. Douglass had only one opportunity of landing on the Wolf Rock to determine the exact site of the lighthouse, and had then to be hauled back on to his vessel through the surf by a line fastened round his waist. The time of work which it was found possible to snatch from the sea was as follows:—

1862 ...	22	landings...	83	hours of	work.
1863 ...	39	,, ...	206¼	,,	,,
1864 ...	42	,, ...	267	,,	,,
1865 ...	41	,, ...	256	,,	,,
1866 ...	31	,, ...	224	,,	,,
1867 ...	40	,, ...	313½	,,	,,
1868 ...	30	,, ...	276½	,,	,,
1869 ...	21	,, ...	194½	,,	,,
Total ...	266		1,814$\frac{1}{12}$		

Allowing 33 working days, of 6·8 hours each, per annum.

The total cost of the Wolf Rock Lighthouse, including lantern, illuminating apparatus, and all incidental expenses, is returned by Mr. Douglass at 62,726*l.* This cost, considering the extraordinary difficulties of the work, compares favourably with that of any similar work which has yet been executed. It will be seen, if we compare the cost by the unit of the hour's work, with that of the erection of the beacon, to have been not very far different, coming to 34·5*l.* per hour. Distributed over the cube of the stonework, the entire cost of the lighthouse comes to but a fraction over 1·4*l.* per cubic foot.

With the triumph of the engineer over the fury of the Atlantic off the Lizard should be compared that attained in 1867-1873, at the cost of 76,000*l.*, in the erection of the Dhu Heartach Lighthouse, by David Allan Stevenson. As to further notice of this, however, of the gradual improvement of the catoptric apparatus, and of the advancing displacement of the concentric Argand burner now used by the electric light, we must look for another opportunity. The rumour of the extinction of the Eddystone Light will not prove altogether to be regretted if it calls the attention of the public to the noble work done by a branch of scientific men whose works are as durable and as brilliant as their writings are usually modest and instructive.

SANITARY SCIENCE.

A SKETCH BY MR. ROBERT RAWLINSON, C.B.

Sanitary science includes works and arrangements necessary to comfort and health,—the individual must be cared for. History, for the main part, however, records the deeds and misdeeds of emperors and kings, but the condition of the people is most fully recorded in descriptions of epidemics, pestilence, and famine, aggravated by negligence of sanitary science, as also by war.

The strength of a nation has hitherto been estimated by the numerical force of armies and their power to destroy; but sanitary science, when fully understood and reduced to practice, will reverse the order as above enumerated, and the history of the future will take most note of the condition of the people, and the strength of nations will be estimated by a standard of health and intelligence rather than by numbers of armed men compelled to live unproductive lives at the cost of civilians.

Sanitary works must be useful generally; and, to be so to the fullest, they must be simple in construction and in their arrangements. Supervision must also be ample, economical, and unceasing.

The prime works for aggregated populations will be main-sewering, house-draining, scavenging, and a safe and proper disposal of excretal and of scavenged refuse, with a full and pure water-supply, and with public lighting. Villages and isolated houses must be sewered, drained, and have a supply of pure water.

Arterial drainage, the conserving of rivers, and land-drainage come within the scope of sanitary science.

Road and street surface formations are most important works to facilitate general and local traffic, and must be provided.

Having stated these general requirements, it may be instructive to describe briefly some of the great sanitary works of former times; as, also, some of the existing sanitary works in Great Britain, on the Continent, and in other parts of the world.

Main Sewering and Draining.—Main sewers and drains were constructed in some of the cities of antiquity, and some public buildings were drained, but we have no evidences, written or in buried ruins, that can warrant conclusions that any city of antiquity was completely sewered, including house-draining. There is no evidence that land-draining, in detail, was ever practised by any nation of antiquity, as is now considered necessary by British agriculturists.

Water-supply.—There is abundant evidence, both in history and in ruins, that works of water-supply were executed. Springs of water were utilised, wells were dug, natural lakes were made available, and streams and rivers were led by artificial canals contouring the intervening country. Reservoirs, bunds, and tanks of vast area and capacity were constructed, from which water was drawn for domestic purposes, but chiefly for land irrigation.

There are ruins of aqueducts of great age, especially in India and in Italy,—the principal ruins in Italy being those near Rome. There is no reason to conclude that the laws of hydraulics were not understood in early times, as water placed under pressure would rise to its head. The metals lead, silver, and gold were used for pipes and valves, in baths, and in the formation of fountains, as also for jets; the use of iron upon a great scale for main conduits and service-pipes is undoubtedly modern. The Romans, however, used lead for main-pipe conduits, necessarily limited in diameter and capacity to suit the strength of the metal.

Pipes of earthenware, moulded on a block by hand, or raised on a potter's wheel, were also made and used at an early period for water-conduits to supply towns, baths, and fountains; in some cases earthenware pipes were bedded in hydraulic lime concrete, so as to enable them to resist pressure, and to be used for street mains, as also to be used as inverted syphons to cross valleys.

Rome, and some cities of Rome, were supplied with water in vast volume, distributed to public and private baths, as also to public and private fountains; but there is no written record, or other evidence, proving that a domestic supply of water by separate and special service was ever given to the masses of the people.* Main roads were formed by the Romans in Italy, as also in the great Roman provinces, streets were also paved in the great Roman cities, but we have no evidence that at any period highways, roads, and streets were general and were formed and paved as perfectly as those which at present exist throughout the several countries of Great Britain, France, parts of some other Continental nations, and in some North American towns.

Improvements in sanitary science are, for the most part, modern, and up to this date (1878) have had exceptional application. In British India roads, railways, and canals have been formed. Calcutta, and some other Indian cities, have been partially sewered, and works of water-supply have been executed for Calcutta, for Bombay, for Nagpore, and for some other Indian cities. In the Australian colonies works for water-supply have been executed, and main sewerage works are at this time under consideration. There has been considerable movement on the Continent of Europe in main sewering and in water-supply; as, also, in Great Britain; but in few towns have sanitary works been fully completed; probably not in any one are sanitary works, sanitary appliances, and supervision as complete as these might be and ought to be.

Complete sanitary works, appliances, and supervision should provide as under:—

For Towns.—The sewering and removal of subsoil-water so as to dry the basements of houses; main sewering of the town and draining of the houses, with a daily disposal of excretal and scavenged refuse, so that there shall not be any removable cause of nuisance. There must also be the formation of good roads in the city and in the suburbs, with the paving of all street and yard surfaces, in such manner, and with such material, as shall best prevent accumulation of dirt, diminish noise, and admit of cleansing by washing. Public lighting must be ample and general, as proper lighting is useful for police purposes.

The main sewers of a town should be of such dimensions, and be laid at such gradients, as will transmit sewage evenly and regularly at rates not in any case less than one mile per hour. The sewers should also be fully ventilated, and have at command ample flushing power. In all main and tributary sewers side-junctions for house-drains should be provided in the first construction, and all houses should be drained, but the drains should not traverse house basements. Water-closets and sinks should be against external walls, and should have means for lighting and ventilation from the open air. Cesspools and cesspits should be abolished. If a drain must traverse a basement from front to back, as in London and in other street houses, such drain must be absolutely air and water tight, and be fully ventilated externally, both front and back. Cast-iron pipes will be safest to use for such drains beneath basements. Back draining is, however, the true mode of sewering and draining streets of houses.

Water-Supply.—A town supply of water should provide for each house and each tenement, having a separate service-pipe and tap within the walls, the service to be high-pressure and constant; a volume equal to fifteen gallons per head of a population, with sound service-pipes and taps, efficiently supervised and maintained in repair, will be equal to the requirements of ordinary populations for all purposes, public and private.

Great mistakes have been made in the design

* The volume of water brought into London per day is about 110 millions of gallons. It is recorded that the twenty aqueducts which supplied Rome poured in 300 millions of gallons per day, or nearly the dry-weather flow of the river Thames over Teddington weir. Ancient authors are not, however, always to be relied upon.

nd construction of sanitary works which it ay be useful to indicate. As previously stated, he science is new, and some men who attempt o practise it have not learned the alphabet, ot having had time, opportunity, or inclina- ion. About 1850 three of the principal English ngineers were required by the corporation of he city of London to advise and report upon he best forms and cross-sectional dimensions dapted for main sewering. In their report at bottoms to sewers are recommended, as eing the easiest to cleanse by hand labour, nd, according to the rules laid down by these minent men, no main sewer was to be con- tructed which was not of sufficient dimensions o allow men to enter. House-drains were not o be less in diameter than 12 in. This report as accepted by English and by European ngineers generally, hence the tunnel and anal-like sewers of Paris and of Brussels, xecuted for small sections of these cities at ast cost in proportion to the areas sewered. Many of the first-formed sewers in London ere large and flat-bottomed; scores of miles f such sewers remain to this day. The late ohn Roe and John Phillips first worked out he problem of egg-shaped sewers, with side- ntrances and flushing chambers.

Since the year 1850, when I first introduced mall sewers, laid at right lines from point to oint, with side-entrances, manholes, or lamp- oles at each change of line or gradient, as also t junctions of sewers, many entire towns have een so sewered by thousands of miles of small ewers and drains, laid on the principles above ndicated. The first town so sewered was Aln- ick, in Northumberland, under the supervision f Hugh M'Kie, C.E., the present most able ity engineer for Carlisle.

Defective sanitary works may be illustrated y Paris, which may be taken as an example of city laid out above ground on a most magni- cent scale. The main streets are in right lines, pen and well paved; the houses are regular in heir architecture, lofty, and being built of white tone, are clean-looking and imposing. Paris ay therefore be termed the finest-looking city n Europe. Street scavenging and watering are lso admirable; but there are many sanitary ores in Paris; as, notwithstanding its big and loatly sewers, it is a city of cesspools which re emptied at intervals, carts, or iron tanks on heels having been specially contrived for urpose. The covers of these huge cesspools re to be seen at the surface in the newest and ost architecturally imposing streets.

The supply of water to Paris is abundant in olume, and is used profusely for public pur- oses; as in grand cascades and fountains, road- watering, and street channel washing; but in uality the water is very hard, being to some eople absolutely painful to wash in; the distri- ution within the house and tenement is not eneral. The true use of water is to supply, t high pressure, every house and tenement o the entire abolition of hand-carriage; and he true use of sewers is to remove all waste ater and all human excreta at once, whilst nfermenting, to some outlet or outlets to be umped and applied to land. At present there re the labour and cost of all the separate umping from cesspools in detail, after putridity as set it, and the removal by horse-power f tanks and refuse which in the aggregate volves far more cost and power than dealing ith the sewage if delivered at outlets by a full ystem of main sewers and house-drains, as ater flowing down a conduit finds the neces- ary power to do so in gravity.

London is an example of a vast city, sewered most in its entirety, the houses being drained so into the sewers; cesspools and common rivies having been abolished, though not all lled up, water-closets being the rule. Taking he entire population at some three and a half illions of inhabitants, there is one water-closet to about every five persons; or, there are about 00,000 water-closets in London, soil-pans which re used as water-closets being included.

The water-supply of London is also most undant, and is far softer and consequently urer than the water supplied to Paris. It is ue that in London there are no vast cascades grand fountains, neither are the streets so ell watered and washed, nor the street channels fully flushed and washed, as in Paris; but the ty at large is vastly better sewered, has ater at high pressure, which is taken within nd to the top of the best class houses, and is elivered within the tenement, or near the door the poorest inhabitant. There are no large recognised cesspools in use, cesspool refuse carts, nor water-carriers. There are, however, defects both in sewering, in house-draining, and in water-supply in London, the result of defective information and divided jurisdic- tions. Parish vestrydom is not an apt learner: the local governing system is old, the form of election is old, and the ideas and pre- judices are old. London has not been im- proved, laid out, and reconstructed under Imperial authority, but has grown up under Dogberry blundering and speculative building, house-draining being the builders' work, the parish authorities having, and very impro- perly, only extracted a fee for each drain entering a sewer without taking the responsi- bility of seeing that each house-drain did properly join and enter the sewer as paid for, the results being no junctions in some cases, bad junctions in many cases, and no house-drain ventilation in most cases. The street-sewers are ventilated, but not house-drains as a rule. There are many miles of old flat-bottomed, broken-sided, shallow, and defective sewers in some of the richest London parishes, sewers which accumulate refuse and require to be hand- cleansed; but there are also very many miles of well-formed sound sewers, which, by the ordinary flow or by flushing, transmit sewage through the new intercepting and low level sewers to be poured wholesale in the crude state into the Thames at Barking and Crossness, the solids so scoured along, and in suspension, amounting to many thousands of tons per annum. Taking the ascertained results of some towns where the solids of sewage are inter- cepted, the volume and weight of silt and sludge annually washed into the Thames must amount to 200,000 tons or more.

Modern sanitary works have in some respects disappointed expectation, as reductions in local death-rates do not appear to have followed closely upon the expenditure of money and the execution of works; but it is probably overlooked that sanitary works of the most perfect design and execution, with the best regulations fully carried out, do not in themselves solve all the problems of human health. There are the wretched houses, hovels, and tenements of the poor in every town and village of Great Britain, so fre- quently described by the editor of the *Builder*, in which excessive overcrowding takes place, and out of which inevitably proceed pauperism, crime, and disease. Sanitary science does very little to improve these dens of foul air and misery, unless it entirely supersedes them by new and better dwellings, and the old cottages are im- proved off the face of the earth, and this is both a costly and a slow progress; then there are spirit and beer drinking, tobacco smoking and chewing, with defective feeding and want of proper clothing amongst the poor, and want of sense to clothe properly amongst the rich, to make up the sum of human neglect and human misery. When these things have been studied, learned, and considered, wonder at continued excess of disease will diminish.

As the strength of a nation is in the health of the people, it must be the duty of Governments to see that means of health are secured to every child born into the world. There is no value apart from human life, and there is no form of property so valuable as human life, and as the poor cannot provide their own dwelling-places, and as experience from the first dawn of history proves that defective tenements produce disease in excess, it must be a prime duty of a Govern- ment so to legislate, order, and regulate that health shall be possible within the cottage.

The inhabitants of a city cannot, however, all be treated as are criminals in jails; conse- quently the health attainable in a model prison is at present exceptional; but sanitary works, properly supervised, can prevent raging epi- demics by removing the soil in which the dis- ease, seed, or germ, fructifies. Typhus fever, cholera, and other zymotic diseases may deci- mate a filthy, drunken, demoralised population, and yet never enter the county model prison. The black-death, plague, and sweating-sickness of Mediæval Europe appear no more in England, but haunt the foul cities of Asia, and yellow fever now rages in the foul southern cities of America, teaching a lesson terrible to study, but instruc- tive to learn.

Photographic Society of Great Britain. The annual exhibition of this Society opened on the 9th inst. in the gallery of the Society of Painters in Water-Colours, Pall-mall East.

RETROSPECTIVE ARCHITECTURAL STUDY.

Our object under this heading is not to suggest any new analysis of architectural history, or to inspire any fresh enthusiasm in regard to the study of the relics of the past. The inclination for this part of architectural study exists strongly and widely enough, and no wonder, for few studies can be more fascinating than that of structures in which picturesque effect, historical significance, and the poetic interest of antiquity, are all combined. Wher- ever civilisation has cleared a tolerably easy way for the traveller, and even in places where it has not, architectural remains have been sketched and measured, and written about, often in a manner involving going over the same ground many times by different illus- trators. Our object is to suggest whether this view of architectural study has not too large a place with us, and whether it is not even exer- cising in certain ways a hurtful effect upon the modern practice of the art. In fact, our heading should, perhaps, have been "Prospective Archi- tectural Study," but that might have looked too daringly prophetic; besides that, it would have been taking the name of something which does not exist; the non-existence of which is our subject of complaint, in fact.

Of course, both in art and science, the basis of study must be, in the first place, the knowledge of what has already been done, without which it is impossible either to know what is wanted or to be in a position to supply it. But it must be apparent to those who compare the progress of art and science in the present day, that science invariably looks ahead, and makes past accomplishment the basis for further develop- ment; while we are compelled to confess that a great deal of modern artistic practice is confined to the effort to equal what has been done before, to do it again in the same way, and to be very well satisfied if the modern reproduction is in any degree worthy to be compared with the original production. The latter is assumed to be worthy of imitation almost on the mere fact of being old. The modern artistic creed, especially as to architecture and decoration, would make the optimist philosophy retrospective,—"whatever *was*, is right."

With the relation of the question to the purely artistic arts, sculpture and painting, we are not just here concerned, except as regards one word of comparison. Art, of course, is not, like science, progressive or nothing: we have no ground to demand that our modern painter should carry us further than Titian, in the same way that we demand that our modern physiologist should take us further than Cuvier, and that our modern engineer should surpass his predecessors. But modern painters, at all events, have recognised that it is of no use to be Titian over again, even if they could; that the modern world has its own feelings and sympathies, and desires to have them reflected in modern art. The interest of the modern school of painting may be (we do not say it is) inferior, its aims may be less lofty; but it is *sui generis*, it makes a chapter of its own in the history of painting. It is a singular contrast that a pursuit like that of architecture, which is much more blended both with science and with practical life than is the art of painting, is at present not only carried on, but deliberately studied, in a way more decidedly retrospective than is the case with any of those which are more purely fine arts, *i.e.* more independent of practical considerations and necessities.

The "carrying on" the practice of architec- ture in retrospective styles, is, of course, an old story, a complaint against contemporary archi- tecture which is almost worn out. But con- sidering the amount of complaining which there has been on this head, and the frequent candid admission, on the part of architects, that it was not the right thing, that it was what had never been done before in architecture, and that it does not even give themselves satisfaction,—considering all this, it seems curious that the studies most inculcated upon the rising architec- tural student are precisely those which tend to foster this reproduction of old architecture, and that this kind of study is the most popular with students, both with those who are technically *in statu pupillari*, and those of older standing. Apart from remunerative professional work, the possession of which may be assumed to consti- tute the highest and purest enjoyment which the professional architectural mind can receive,

there is nothing so fascinating to the architect as sketching ancient buildings, and, on the whole, nothing for which he gets so much credit.

The fascination is perfectly reasonable and comprehensible. It may be going a little too far to say, as an eminent architect has said in one of his publications, that no pleasure in life *can* be so great as that enjoyed by a sketching architect on a tour through old towns. A landscape-painter in a fine country would probably have something to say on his side; and we have heard a naturalist declare that no pursuit could afford a pleasure equal to the discovery of a new species of moth. But anyhow, there is no doubt that the combination of change of scene and air, picturesque and historic interest, and the exercise of a delightful occupation, justify the architectural sketcher in lauding his way of holiday-making pretty highly. What is not quite so clear is, why those who are learning their profession should be encouraged to give so prominent a place to this occupation, and should receive for its successful practice almost their highest rewards; and that their senior brethren in the profession, when they have time for a tour, should be content to devote themselves in general so exclusively to the monuments of the past and almost ignore the doings of the present.

Take the case of the Institute prizes to students. The most coveted of these is the Pugin Travelling Studentship, and the use made of it is always to bring back a portfolio full of sketches and measured drawings of old buildings not at present illustrated, which has a practical value, as it encourages the production of accurate records of structures as they at present exist. But these two are always the prizes most competed for, and what is practical in regard to modern architecture finds little of either encouragement or response. Now, when there is this encouragement given to running over Europe and sketching old buildings, with no corresponding impetus given to the study of modern buildings, their successes and their failures, it can hardly occasion any surprise that our modern architecture consists so much of buildings which look as if they were put together out of a sketch-book. Those who produce them have almost been brought up to think that to do this,—to make buildings in this way,—is the highest object of their profession.

In Scriptural phrase, we may say "these ought ye to have done, and not to leave the other undone." The cultivation of an instinctive feeling for what is noble and durable in architectural style cannot perhaps be so well attained in any way as by sketching the finest remains of architecture that are left to us; but the relation of this practice to the real requirements of modern architecture should be kept in mind. Sketching should take its right place; important, but not the principal and central object. It has become almost a commonplace of architectural criticism to say that a true style is founded on utility; yet we give the best honours to our students for a line of study which tends all the other way; which fosters a certain sentimental taste in regard to design, to which the practical requirements of the profession have to bend, instead of the reverse process, which is the right one. The English system of apprenticeship in an office is supposed, no doubt, to give an insight into the practical side of the profession; but then the probability is that the principal, whose work goes on before the pupil's observation, is himself practising a sentimental style; and in fact, this is most particularly the case in those offices into which clever and enthusiastic students specially endeavour to obtain admission. The error is thus propagated from one architectural generation to another, and everything which most impresses a student in the course of his studentship goes to confirm and strengthen it.

Now if, instead of giving undue prominence to prizes for sketching ancient buildings, a leading prize or travelling studentship, the best and most honourable, were offered to the student who should bring home the best and fullest notes of modern buildings and works in progress in different countries, the best illustrative sketches (where there was opportunity of obtaining them) of constructive detail and design, and the best critical suggestions for improvement in either respect where defective,—we venture to submit that a substantial annual prize offered with this object would do more to promote the advancement of architectural students in what is really the most important aspect of their profession than any of the prizes now usually offered and contended for. What the public look to from the architectural profession is, in the first instance, to provide buildings thoroughly healthy and thoroughly suitable for their intended purpose, and embodying the best scientific construction and arrangement which the resources of the day render possible. Questions of architectural style are really only secondary in public opinion; and though it is certain that part of the general indifference on this score is the result of ignorance and want of cultivation, and that it is much to be deplored, still in the main it must be admitted that the common sense of public opinion, in refusing to be put off with pretty and archaic structures which do not properly answer their practical purpose, is in the right in regard to putting the most important requirement first. Yet we really seem to take no decided step towards systematically encouraging the study of architecture on its practical side.

This subject is the more important, because upon the neglect of it depends, we thoroughly believe, much of the failure and want of genuine interest in modern architecture even on its purely artistic side. If the practical wants of the day were made more primary objects of study and investigation, we should see a more original and genuine style of architecture spring out of the endeavour to realise and express these wants: we should no more see baths built like town-halls, and law courts with frowning and barbaric-looking towers for keeping in awe a populace who are really the most law-abiding and peacefully-disposed people of Europe.

In the art of painting, as the study of it is now conducted, whatever admiration for the art of another time may possess the student, there is always interposed, between him and the school he might be disposed merely to imitate, the direct influence of the study of nature in the life-school. However he may be inclined to fall into the mannerism of this or that artist or period, he is not left to do so without the continual forcing upon his attention of Nature herself, and in his very conventionalisms and reproductions he is obliged to accept her genuine forms as the basis of his design. It is this kind of influence which we feel the want of in regard to architecture, although in a broad sense we may say that it is always before us if we will make use of it. The architect's life-school is the life of the society of his day; its demands, its habits, its inventions, its improvements. It is his part to take these up where they are, to judge where they are sufficient and where they want improvement; to bring all his observation, experience, and acquired knowledge, to perfecting them; and then to put them into as picturesque a dress as may be. In thinking of and studying the picturesque first, and the practical afterwards, he is putting himself out of accordance with the contemporary public; offering them what they (perhaps erroneously) do not much care for, and neglecting that for which they mainly look to him. It cannot be surprising if, under these circumstances, he has not only less real claim on the appreciation of society than he might have, but that he receives even less than he is entitled to; and that when he puts foremost that which should be secondary, public judgment is inclined to take away from him even that which he seems to have.

We beg to return again to the conclusion already indicated, that there should be some change in the relative importance given to practical and to archæological study on the part of those who specially concern themselves with architectural education, and on the part of the central body of architects in particular. We should like to see a travelling studentship established by the Royal Institute of British Architects, the object of which should be to encourage and promote the study of architecture in its most modern practical and artistic development in civilised countries generally, leaving the study of the picturesque element in ancient remains as a fascinating, and, if the reader will, a necessary element of the student's education, but still a secondary element. An aspirant for honours in such a studentship should be expected to take account of materials employed in various neighbourhoods, and their suitability, cost, and apparent durability; of new ideas in construction, ventilation, and drainage, and everything else which pertains to the well-being of man, considered as a creature living in houses. He should not by any means neglect, but rather give the most detailed attention to, engineering structures (which are only an important part of architecture unfortunately divorced from their natural place in its curriculum); and if he thinks them, as he no doubt will, less beautiful than old cathedrals, let him exercise his invention in showing how they may suitably be made more beautiful. He should form acquaintance with the building materials which are the special resources of each country, and consider which among them offer the best conditions for future use consistently with appearance, economy, and permanency, and what form of architectural or artistic treatment seems best suited to them. All this would not necessarily supersede the study and delineation of ancient buildings; but it would take precedence of that study, as embodying the first and most essential consideration which are the basis of all real architecture, and giving to them their right place. It might be some time before the habit of regarding architecture from the merely sentimental point of view was broken down; but an educational move of the kind we have been suggesting would do something to inaugurate a change, or at the least to suggest that a change was desirable, and that the modern architect, if he is to be the power in the world that he might be, must look before him and not behind him in his studies.

THE CLEANSING OF THE THAMES.

It is with the utmost satisfaction that we remark that the *Builder* is no longer unsupported in its efforts to promote the decent parity of the Thames. The evidence that has come to light as to the condition of the river at the site of the loss of the *Princess Alice* has brought conviction to all persons who have had opportunity to express their opinions on the subject, with the exception of the majority of the Metropolitan Board of Works. They, as yet, stand firm, but they do so like men who remain on a rock around which the tide is steadily rising. There are abundant signs that the public will not put up with the jaunty and contemptuous indifference displayed in what was offered by the Board as a reply to the first report of Capt. Calver. The City of London itself has spoken: The Town Clerk has called the attention of the Metropolitan Board of Works to the report of the medical officer of the Port of London Sanitary Committee on the foul state of the Thames near Beckton. The Woolwich Local Board of Health, on the 8th instant, ordered an analysis of the water to be made. In the report of the meeting we rejoice to see the fruits of that study of the law of the case which we have been so anxious to recommend. Ten days or a fortnight ago the positive assurances of the officers and advocates of the Board of Works, that they were acting within the rights conferred on them by the Acts of Parliament, were accepted as unfortunate, but undeniable. Now there are signs that the assertion is becoming valued at what it is worth. Capt. Behenna, R.A., at the meeting of the Woolwich Board of Health, spoke of the outfall which the Metropolitan Board had constructed and maintained, "in defiance of their own Act of Parliament." This is the true keynote. Nor are the Conservators of the Thames supine. Their secretary, Capt. Burstal, has officially addressed the Metropolitan Board, under date of October 9th, enclosing Capt. Calver's rejoinder to the joint report adopted by the Metropolitan Board, together with remarks by the secretary, and by the engineer of the Conservators, on the same document. We have received, too late for full noticed this week, copies of these papers. The Conservators maintain the position taken up by them in their letter of the 6th of December, 1877, to the Metropolitan Board of Works, and point out that if the Metropolitan Board still maintain their non-liability to dredge away the deposits complained of, or if they agree with Sir J. Bazalgette as to the origin of these deposits, "it would then become evident that a difference of opinion, such as that contemplated by section 20 of the Conservancy Act of 1870, has arisen between the two Boards." The Conservators express their "trust that the Metropolitan Board of Works will modify their views on this important question, and not only cause the existing deposits to be dredged away, but also adopt such measures as will prevent the formation of any deposits for the future." This is a mild and dignified remonstrance. It is, however, rather the Master of the Rolls than the Chairman of the Metropolitan Board of Works that we regard as the person

whom the Conservators of the Thames should address in order to produce any effect. The Board has resolved that a letter be written to Capt. Burstal asking for a plan showing the position and configuration of the shoals and obstructions in question. If the health of London and the purity of the Thames are to be made the stakes of a clever game of diplomatic chess, this is a good move on the part of the Metropolitan Board. We hope that the Conservators of the Thames will not fall into the trap so adroitly laid. The fact is, and it is well known into the bargain, that banks and shoals in the Thames, as in the Seine, and in most tidal rivers, are constantly shifting. Large banks accumulate in the ebbs, in the latter river, which disappear as the tides strengthen. We know too little of the Thames to predicate the exact manner in which the channel varies between spring and ebb. It would be of great value to London to have a continuous survey of the river made, extending over at least a year, in order to give some idea of the changes which are effected with varying winds, tides, and floods. But we do know that sewage makes its way some fourteen miles and more above Barking Creek in certain states of the tide. We also know that the river is steadily gaining, both in depth and in range of tide. It is thus very probable that any particular deposit, such as,—unexpectedly to every one almost,—so rapidly formed around the wreck of the *Princess Alice*, would hardly be formed, discovered, and surveyed, before it might be wafted away into some other part of the river. Thus any particular deposit pointed out by the Thames Conservators on the invitation of the Board, might be carried to some other locality by the time it was next sought for. And thus, without any accusation of bearing false witness,—or even of looking too persistently through a glass bent in a certain direction,—nothing is more likely than that any bank specified by Capt. Burstal might be found to have departed by Sir J. Bazalgette.

It is not on the dimensions of this bank or that mud-heap that the case can be allowed to turn. We hope that this firm and sensible ground will be taken by the Conservators of the Thames. It is on the unquestionable fact that the sewage of London is turned raw into the Thames that the gravamen of the case depends. This fact is contrary to the laws of public health, public safety, and public feeling. It is, in our opinion, and as stated by Capt. Behenna at Woolwich, contrary to the provisions of the Metropolitan Acts of Parliament. Here the Conservators of the Thames have firm ground, from which we trust that they will allow themselves to be neither cajoled nor driven. Here the Port of London Sanitary Committee, the Corporation, the Woolwich Board of Health, and even the minority of the Metropolitan Board of Works, will support them. Nor can we doubt for a moment what will be the verdict of public opinion, now for the first time having been thoroughly enlightened as to the real facts of the case. We doubt whether the Conservators of the Thames are aware of their own power, either to obtain immediate redress from the tribunals, or to secure the hearty support of the metropolis.

THE SOCIAL SCIENCE CONGRESS.

The annual Congress of the Social Science Association will meet at Cheltenham on the 23rd, and though there may, perhaps, hardly be expected to be the local interest in some of the topics of discussion which would be found in towns existing under different social conditions, there is certainly no lack of matter for interest in regard to the subjects to be considered, and it will be not without significance to observe the attitude with which they are regarded in the neighbourhood. In most cases the Congress has been held in towns which were full of active and busy life; and though there may be as much life in Cheltenham of another kind, it is essentially rather a place of quiet and retirement than of active business life, and the problems of social life must certainly, under such circumstances, present themselves under a different light from that in which they appear in places where the full tide of trade or manufacture is keeping every one practically on the *qui vive*. There may be less interest taken in some subjects than would be the case at other places; on the other hand, we may perhaps look for some suggestions from Cheltenham in regard to sides of social questions which would be less considered elsewhere.

In the two departments which are of special interest to our readers, the Health Department and the Art Department, there is a great deal down for discussion in direct relation to the practical working of architecture. The second main subject for discussion in the Health Department, on the better regulation of house-building generally, covers a field large enough, at all events, and would be perhaps even too vague were it not a little defined by the second half of the statement of the question, which gives it a turn in the direction of "the sanitary condition of existing houses." The object of this definition is, we believe, to induce the consideration of the best means of securing sanitary improvement at once, and of accordingly enforcing changes in existing houses, instead of waiting till all the habitable but unsanitary houses can be pulled down and replaced with better ones on improved principles. It is to be hoped something will come of this. While house-owners are waiting for the expiration of the life, so to speak, of their houses, ready to improve their sanitary conditions as soon as it becomes absolutely necessary to pull down and rebuild them, but not before, these unsanitary houses are not standing idle, but are busy in the work of death, and whilst their lives are lengthened, are shortening the lives of those who (endeavour to) live in them. If the outer shell of a house is so good that it cannot pay to pull it down, or be fair to the owner to compel this, let at least the interior arrangements be brought under compulsory improvement, that such dwellings be no longer whited sepulchres, more or less beautiful outward, but within full, if not of dead men's bones, at least of much uncleanness, calculated to lead to that kind of anatomical preparation.

How to prevent the evils of overcrowding, the third leading subject in the Health Section, seems practically limited to two alternatives,—either to have more house-room or fewer people. However, perhaps some one may strike out a new and unexpected light on the subject. In turning to the Art Section, we find again the subject of house or street architecture cropping up, in the question, "How can Street Architecture be best improved with due Regard to Economy?"—a form of question which obviously touches on the problem of bringing architectural embellishment to the poorer quarters of towns: a matter which the architectural mind of the day has hitherto neglected, or not had opportunity to solve, and which is one, perhaps, of the few things which it is left to architecture to attack as a comparatively new problem. The question is to be opened by a paper from Mr. H. H. Statham, who has already given some special consideration to the subject in its connexion with the objects of the Social Science Association. The other two leading questions in the Department are the promotion of a sound knowledge of music, and the best means of bringing good examples of art within the reach of the populations of small towns and villages. In regard to the former question, it is of some interest to observe that this is the first time that music has been introduced as a subject of consideration in the Art Section; or, as far as we remember, in the proceedings of the Association at all. Some difference of opinion existed, we believe, as to the fitness of the subject for discussion under the head of "Art," certain of those concerned holding the view that the term "art" was only rightly applied to that which was concerned with reproducing in some way or other the forms of nature. To show how and why the term and the idea generally implied in it are equally applicable to the process of musical composition, would perhaps take us over the line a little; but, apart from that, the criticism may be sufficiently answered by the consideration that what the Art Section is really concerned with is the development of the beautiful side of life, and that the word "art" itself is used not so much as defining quite literally the boundaries of the section, but as the most comprehensive and generally intelligible expression that we have to represent the class of subjects of which it is desired to treat. The fact that the paper on this question will be read by Mr. John Hullah, who has had more to do with musical education in this country than perhaps any other single person, is a guarantee that the subject will be handled in a thoroughly able and practical manner. The consideration of the possibility of bringing good examples of art within the reach of the dwellers in country districts (the third leading subject in the Art Section), is one in which we naturally feel much interest, since the *Builder* has for so many years dwelt upon the importance of bringing people to familiarity with the sight of first-class works of art, as one of the first and most certain steps towards making them care for it. The subject will be dealt with by Mr. T. C. Horsfall, a gentleman who has exerted himself very much in the cause of popularising art in Manchester, and is the author of an address or pamphlet on the subject marked by admirable critical perception as well as genuine enthusiasm; and we may hope that his paper and the discussion of the subject will give some impetus to a movement which is very much to be desired.

We are in a position to mention what will probably be the subsidiary subjects treated of in the Art Section, some of which are perhaps of equal interest with the leading papers. The arrangement of the sequence of papers has been made so as, as far as possible, to keep the subjects in groups which have an affinity with one another. Thus, the paper on street architecture it is intended should be followed on the same day by one on some neglected principles of decoration, by Mr. Skipwith, of Cheltenham. That on musical education will be followed by one on the subject of the improvement of dramatic art in this country, partly by the establishment of a national theatre in this country as in France; a communication on the subject will be read by the conductor of this journal, who, as a good many of its readers are aware, has long felt a special interest in the subject, and who will be able to bring forward very valuable and interesting letters in regard to it from two of the most eminent actors of the day. Professor Armstrong follows with a paper on the same question. The paper on question 3 will be appropriately followed by one from Colonel Blair, of Cheltenham, embodying, we believe, something like a practical application of the subject to Cheltenham. An important contribution is promised by Mr. P. H. Rathbone, of Liverpool, who was, in fact, the founder of the Art Section, and who intends to bring forward the subject of the use of the undraped figure in modern art, mainly with the view of correcting misunderstandings and misapprehensions in regard to it, which, as every one knows, are prevalent enough among the English public of all classes,—at any rate, out of London. The question is, in fact, mainly one of more or less education in regard to the aims and the technique of the art of painting. Mr. Rathbone, as being largely concerned in the arrangement of the Liverpool picture exhibitions, has already been in hot water with the "Philistines" of that town about a picture of Mr. Tadema's, as we mentioned in a previous number, and does not seem inclined to sit down quietly under their teaching. His effort is a laudable one, and may do good, though we fear he will hardly find a very largely sympathetic audience. Other papers will be contributed by Dr. Phené, by Mr. Hamilton M'Carthy (on Sculpture), and by Mr. Watherston on Jewelry Art.

It is gratifying thus to see that the idea of an Art Section does not seem to be found unpractical, or to be likely to fall to the ground, and, in fact, the number and variety of the papers promised this year are considerably in advance of those of last year at Aberdeen in the same section. The local committee seems to have made every effort for the convenience of the visitors, judging from their circular giving information as to the ways and means of Cheltenham; and we think everything promises a week both of pleasure and profit.

The Liverpool Landing Stage. — The dispute between the Gas Company and the Dock Board, as to the amount to be paid by the former towards the cost of the reconstruction of the Landing-stage, has been amicably settled, and arbitration, which was to have commenced on Monday last, is dispensed with. The Gas Company had made an offer to pay 17,500*l.*, in addition to the amount they had already paid (70,000*l.*), and this offer was considered on Monday at a special meeting of the Dock Board, when it was resolved to accept it by eleven votes to eight. The arbitration, the *Daily Post* understands, was to have gone on the basis of a claim made by the Dock Board for a total payment of 130,000*l.*, or 60,000*l.* more than the Gas Company contended they were entitled to pay under the agreement come to when the case was before the court, when the verdict was given for the Dock Board.



THE BASTIAT MONUMENT, MUGRON, FRANCE.

THE BASTIAT MONUMENT, MUGRON, FRANCE.

We illustrate a monument which has been erected to the memory of Frédéric Bastiat, the well-known French Free-trader, in the little town of Mugron, Département des Landes.

The town of Mugron, which has thus honoured an eminent economist, was not his birth-place. Frédéric Bastiat was born at Bayonne, on June 29th, 1801, where he continued to live until he was nine years of age. Having the misfortune of losing both father and mother, he was received into the house of his maternal grandfather, who was the owner of some property in the town of Mugron. In 1825, through the death of his grandfather, he came into the possession of about 200 hectares of land, and it was on this estate that he continued to live nearly the whole of his life. In 1831 he was made Juge de Paix of his canton; in 1832, Conseiller Général; and in 1848, his co-citizens sent him to represent them in the Corps Législatif. He sat for some time, but his health failing, he proceeded to Italy in hopes of improving it, and died at Rome, December 24th, 1850.

It would take too long to pass in review the numerous works of Frédéric Bastiat. Placed in the counting-house of an uncle at Bayonne, he applied himself sedulously to the study of the principles of trade; and having to visit Spain and Portugal on business in 1840, he availed himself of the opportunity of studying the commercial regulations of the two countries. He was throughout his life an advocate of Free-trade, and he gave early expression to his views on this important subject. In 1834, he published his "Reflexions sur les Pétitions de Bordeaux, le Hâvre, et Lyon"; in 1841, "Le Fisc et le Vigne"; in 1843, "Mémoire sur la Question vinicole"; in 1844, "Mémoire sur la Répartition de l'Impôt foncier dans le Département des Landes." In the same year appeared in the *Journal des Économistes* the article "De l'Influence des Tarifs anglais et français sur l'Avenir des deux Peuples," in which he first openly avowed himself the adversary of the principle of protection to trade,—a principle at that time universally acted upon in France, and almost universally recognised as just and expedient. This latter work established Bastiat's reputation. He soon gained adherents, and time and truth, with the example of England, carried his principles forward, till they were acknowledged and finally adopted and extended by the Government of France. In 1845, after a visit to England, where he had made the acquaintance of Mr. Cobden, he translated, under the following title, many of the addresses of the Free-traders, prefacing them by an introduction: "Cobden and the League; or, the English Agitation for the Freedom of Exchange." In this he adduced all the inconveniences of a prohibitive system. He became secretary of a society in Paris for promoting the freedom of trade, and editor of a journal devoted to the same cause.

Biarritz.—The new Anglican Church of St. Andrew, Biarritz, was consecrated on the 12th inst. by the Bishop of London.

IN PARIS THIS WEEK.

A stroll through the Workmen's Exhibition, near the Port Rapp, just outside the Great Exhibition itself, is interesting; but, as remarked in your leader of the 5th inst., is also a trifle disappointing. Our own Working Men's Exhibitions, at the Agricultural Hall, Islington, and at various places in the provinces, altogether eclipse this display made by their brethren across the water. A number of good things are certainly shown, but, as a rule, they are not quite up to the standard that, under the circumstances, one would expect to find brought together. Happening to have the copy of the *Builder* in question in my pocket, I begged its acceptance upon the manager, and have pleasure in testifying to the great gratification shown by him and a number of French workmen at finding their efforts noticed so kindly by this publication.

Delightful is a stroll through the picture galleries of the Exhibition, but still more pleasant and instructive is a saunter amongst the architectural galleries of Europe. The difference in style in getting up elevations and perspectives,—ay, and plans, too,—by the architects of various nations is very pronounced. In this I feel anything but sure that our own profession stands out very prominently. There is no building I know in Europe so magnificent, in my mind, as the tower façade of the new Manchester Town-hall; yet the large drawing Mr. Waterhouse shows of it, rather than intensifying its nobility, looks brown and smudgy; whilst pen-and-ink sketches, such as Messrs. Ernest

George and Peto's Rousdon, or Mr. Herbert Carpenter's interior of Lancing College Chapel even, look flat and cold, and unattractive, as compared with the productions of many foreign architects. I have often wondered why the architectural court at the Royal Academy is always so empty, even when a "crush" is on in the adjacent rooms, whilst the compartments of an architectural exhibition I visited some time ago at Amsterdam were thronged all the time I was there with an admiring crowd of Dutchmen. The educated classes in England, certainly, have sympathy with architecture,—the large sums spent thereon annually prove that,—but somehow the drawings do not appeal attractively to the eye. I suppose the difference between an architectural drawing and a pretty painting is just that which exists between a tall, noble, finely-chiselled, self-contained, and well-read woman, and a dimple-chinned, bright-eyed, and laughing girl, with nothing in her, but attracting everybody to her as surely as her companion, whilst commanding respect may be, repels. Another architectural treat is to be seen at the Trocadéro, where at the two ends of one of the main corridors may be found an exhaustive series of 352 photographs, 16 in. by 11 in., giving illustrations of as many restorations of churches and historical buildings. Some are internal and some external views; there are buildings complete, and others with scaffolding up and in course of renovation; but each is alike interesting and instructive. All round the circular corridor running within the open arcading on the exterior of the garden side of the Trocadéro, is an immense collection of drawings, showing what France can do in architecture,—religious, military, civil, and domestic. The drawings relative to the former predominate, and the whole are stretched in frames, averaging 4 ft. by 3 ft. 6 in. To my mind they go far to prove that the French architect stands very high amongst his compeers of the world.

The places of convenience are not too numerous by half in the Exhibition grounds, and are conspicuous by their entire absence within the building itself. The uniform charge of 2½d. for the use of one is also undoubtedly excessive, and falls heavily upon those whose duties keep them continually in the Exposition.

I could tell a curious story as to the abstraction of circulars,—how they are appropriated to purposes never contemplated by the exhibitors to whose goods they refer.

Great uncertainty seems to exist, even amongst the best informed officials, as to when the Exhibition will be closed, but it is pretty tolerably sure that it will not be kept open more than a fortnight after the time first stated, *i.e.*, the end of the month.

The original cartoon for the Diploma of Award is exhibited in the main pavilion, and is pleasing. It is 3 ft. 6 in. by 3 ft., but the engraving therefrom which will be given to successful exhibitors runs smaller, being (the engraved part) 1 ft. 8 in. by 1 ft. 5 in. It is somewhat similar to others of its class, but infinitely more artistic than is the Philadelphian one. On the top is a good figure of France sitting with her left arm thrown familiarly over the shoulder of Peace, who carries in her hand a spray of olives. France has unbuckled her sword from her waist, and lays it carelessly but handily upon her knees. With her right hand she grasps cordially the extended palm of Industry, in the garb of a workman, who is presented to her by a Cupid with a torch. In Industry's left hand are a hammer, pincers, &c. The supporting pilasters on each side are decorated on their panels with olive trees, and ribbons bearing upon them names dedicated to Industry and the Fine Arts. At the foot of the pilasters lean nude youths,—not too well drawn perhaps,—the one carrying a palm, whilst he looks up to France, the other holding a plan of the Exhibition and a Mercury's wand. At the base, is massed a group of agricultural implements and foliage, whilst as a centre thereto upon a plain panel resting in a triangle occurs the monogram RF (Republic of France). The subject is described in French:—"*La France appuyée sur la Paix protège le Travail.*" The design is from the pencil of Paul Baudry.

Perhaps the most beautiful bit of woodwork in the whole Exhibition is to be found in the French court, and is shown by Guéret Frères, 216, Rue Lafayette, Paris. It is a cabinet and secretaire in boxwood; and for design, general good workmanship, and for exquisite delicacy and carving, is simply superb. Messrs. A. Beurdeley Fils, of 24, Rue Dantoncourt, also exhibit wonderfully fine work in the same material. A small side-table contains a wealth of the most marvellously carved detail,—too fine, perhaps, for utility, but so lovely withal that I found myself upon my knees before it in unconscious admiration ere I realised my position. A very large panel by the same firm, in lime-tree, is also a beautiful specimen of carving. Messrs. Jackson & Graham, who have carried off the grand prize, show a glorious ebony and ivory cabinet, as well as several other inlaid ones, so perfectly made that the attendant facetiously offers a large magnifying glass, and defies, even with that artificial means, the discovery of a joint or a flaw in the inlaid woods. Every visitor to Paris has probably been in the Prince of Wales's Pavilion, and breathed the atmosphere of art that pervades that building. The walnut-skirted dining-room; the Adams furniture in the boudoir, with all the exquisite little boxwood figures upon ebony panels,—delicate as the finest of cameos,—the Japanese-room, and, indeed, everything that Mr. Collmann, the courteous attendant in charge, points out, are all as excellent as they can be. The furniture in Messrs. Collinson & Lock's house is all good, and although immensely less ambitious than that of Messrs. Gillow, is pleasing; especially so the oak panelling in the lower rooms, and the quiet pale-green grey Jacobean wood mantelpiece upstairs. In walnut wood there are few things to equal, and nothing to beat, the work shown by L. Frullini, of Florence. His walnut cabinet exhibits great power in the way of carving,—his foliage and birds being most artistic. Equally good are two long panels shown by him, and which, I am glad to see, have been purchased by the authorities at South Kensington Museum. They will long remain a lesson to our own wood-carvers, and it will be an honour to shake the hand of our countryman who can beat them.

The ascent of the towers of the Trocadéro is very easily made by the hydraulic lifts. These glide up and down without the least perceptible motion, and make the ascent and descent in about two minutes. The lifts hold about thirty people, and a franc is charged for the trip and return. The height of the towers is about 300 ft. These lifts are forced up by a long cylinder, some 2 ft. in diameter. As this immense iron rod must necessarily sink down its own depth into the earth when the lift is level with the floor, some idea of the costliness of the foundations may readily be formed. Upon the top of the towers are some polished marble columns. I notice that although they have only been *in situ* about six months, the polish has already left the surface of the marble. This applies everywhere else where marble is used externally in Paris, and goes to prove that atmospheric influences in France have the same effect upon polished marble as they have at home. Some huge blocks of marble are shown in various parts of the Exhibition. In an Italian court in the grounds there is a block of dove-coloured marble, 14 ft. by 3 ft. 9 in. by 2 ft. 3 in., and one of white statuary, 14 ft. by 3 ft. 6 in. by 5 ft. These are Serravezza marbles. Algiers shows a block of white veined marble 11 ft. by 2 ft. by 3 ft., and a fine monolith, 17 ft. by 4 ft. by 3 ft. 6 in., is exhibited by Dussert, of Bagnères de Bigorre, Hautes Pyrénées.

"Man, know thyself,"—one is apt to say upon going into the Italian Court, and looking at Mr. J. De Nittis's series of pictures of London. Coming straight, I suppose, from the blue skies of his native country, he found London under a cloud,—like himself, perhaps!—and he has immortalised his impressions by painting the metropolis just as if it were

"Down in a coal-mine, underneath the ground."

The production called "Canon Bridge" (he means Cannon-street Bridge) is an awful paradox; and the others are almost as bad. In his view of the Mansion House Corner he has unwittingly introduced the same old gentleman with white whiskers in two several prominent places in the crowd. The kindest view of all is of some ladies in a boat, and is labelled "Green Park." The surroundings, however, prove that De Nittis is again in error, and that he should have described it as "St. James's Park." Before the next Exhibition comes on, if it ever does come, I should like this gifted artist to visit Sheffield, and try his hand at a landscape (!) from the Victoria Station point of view. It is as well sometimes, as Burns wrote long ago,—

"To see ourselves as others see us."

HARRY HEMS.

THE WORK OF THE SCHOOL BOARD FOR LONDON.

SIR CHARLES REED, chairman of the School Board for London, in the address which he delivered to the members the other day, on the occasion of resuming business after the usual autumnal recess, touched upon some matters which will be of more than passing interest to many of our readers.

As to school accommodation, he said that at the present time the Board has under its control 278 schools, with 704 departments; of these, 187 are permanent schools, 43 are held in temporary buildings, and 48 have been transferred to the Board. These schools give accommodation for 192,000 children. This is an increase since this time last year of 36 schools, 112 departments, and 29,092 places. When the Board have completed works now in progress, it will have provided school-places for 240,000 children. Including those provided by voluntary schools, London has now 203,132 efficient school-places more than it had seven years ago, the increase being 77·4 per cent.

While in forty-six cases during the past twelve months the Board has had to enlarge schools, "in no instance," says Sir Charles, "has the migration of the people left us with excessive accommodation,—a fact that speaks well for the care with which sites have been selected, and the moderation with which requirements have been estimated. The cost of sites has of course depended on whether they were purchased in advance of general building, or whether the ground had to be cleared of houses. Sites and buildings together have averaged 15*l.* 4*s.* per child,—a cost which the Education Department recently informed one of the London vestries it could not regard as excessive. The buildings are well adapted for their purpose, although, for the sake of economy, constructed in several stories. One of H.M.'s Inspectors says:—

'I did not realise how defective the lighting of many voluntary schools was, until I came to compare them with the airy, brightly-lighted chambers of the Board schools. This has led to the improvement of the light in several voluntary schools.'"

As to the importance of "Domestic Economy" as a "specific subject," Sir Charles says,—"Few will grudge a girl some knowledge of this subject, which is simply 'food and its preparations,' of the warming, cleaning, and ventilating of a dwelling, or of the rules of health and of the management of a sick room, cottage income, expenditure, and savings. The Board encourages this subject, and hopes thereby to check those habits of waste which so often impoverish the family of the artisan. The same aim has led us to give instruction in cookery to our mistresses and senior girls. Under the scheme recently adopted by the Board, the girls in schools where domestic economy is taken, will receive their preparatory lessons from their own teachers, taking a subsequent course in practical cookery at centres in kitchens fitted with the ordinary appliances of a working-man's home."

Incidentally, allusion is made to the good work which has been done by the London Schools' Swimming Club. It is not in the power of the Board to contribute to its funds, but, says Sir Charles Reed, "we reap great advantage from its activity in securing in our public parks and baths places where swimming can be taught. Attention having been recently called to the great importance of this art, it may be of interest to state that this club has, without a penny of cost to the ratepayers, taught 7,577 children and teachers how to swim, and that this season there were enrolled 1,600 children, 105 being girls, and 120 female teachers. It need hardly be said that the suggestion that we should erect swimming-baths in connexion with our largest schools would carry us far beyond the line of our duty; but it may be hoped that some encouragement may be given by Government to this branch of physical training."

The interest taken by the Board in its scholars is further shown by instruction being given by approved lecturers as to the advantages of temperance and thrift. "Though we have established no savings-bank of our own, we have given facility for the deposit of money with the National Penny Savings Bank; and taking forty schools in various parts of London, the number of depositors in 1877 was 9,601; the amount deposited 3,112*l.* 1*s.* 10*d.* It has been the work of a committee during the past year to select, with great care, books for the libraries which are now connected with every school. These are different in each case, and are passed on

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every six months from school to school and centre to centre through our ten districts, so that a constant and fresh supply of healthy reading is supplied for the use of the elder children."

MUSIC FOR THE BLIND.

We are glad to learn that the invention of Professor Gambale, of Florence, introduced by us to the notice of the public, with a view of improving the instruction of the blind in music, is being examined by the Principal of the Normal College of Music for the Blind, Norwood.

It may be added that the movable types of Professor Gambale's writing-desk are the well-known ones of the alphabet, and the figures used in arithmetic. With it, a master possessing sight can with the greatest facility teach the blind not only to read, write, calculate in arithmetic and algebra, but also music from the first elementary principles up to a complete knowledge of harmony and counterpoint in eight parts.

The Blind thus taught can by themselves, with this desk, set up the types, print either prose, arithmetical propositions, music however difficult or complicated, and from what is written any number of copies in relief can be printed, equally legible by the blind as those possessing sight, and also readable in all countries. We have seen thirty-two bars of the chromatic fantasia of Bach printed by this system for the blind on a sheet of paper, 35 centimètres by 25 centimètres; a proof that it is not voluminous.

CRYSTAL PALACE CONCERTS.

So many of our readers are musical that it is not out of place to draw attention to the fact that the winter series of Saturday afternoon concerts at the Crystal Palace has just commenced for the present season. These concerts, which are of the very highest class in regard to selection and execution, have perhaps given more and wider fame to the Sydenham establishment than anything else that has been done there, and are recognised all over the Continent as the most important medium for the introduction of new instrumental works to the English public. We may be allowed, perhaps, to regret that the place of performance is not more practically suitable. The materials of which the building is composed render the Crystal Palace concert-room bad for effect; the glass and iron are not resonant, and impart a jar and harshness to the tones of the brass instruments especially, and the ventilation of the room is very bad, almost culpably so. As the building was not originally constructed for music the first defect is inevitable, and no one's fault, but something might be done to improve the ventilation. It is one proof of the high interest of the performances, that these drawbacks seem, it must be admitted, to have no influence in diminishing the numbers or enthusiasm of the audiences; but they are serious drawbacks, nevertheless.

Town Spoiling Country.—Professor Colvin distributed the prizes to the successful students of the Brighton School of Art on the 11th inst., and afterwards delivered an address on "Art Culture," in the course of which he remarked that:—

"Another matter which was of sovereign importance in a great and growing centre of population was the formidable fact that, as our population grew, as our centres extended, a positive amount of beauty was removed off the face of the earth, and a positive amount of ugliness, disorder, of mean irregularity of building, mixing up desecrated country with uninhabitable town, foul place, and scathed and devastated the land. Let them go into any suburb, into any place where the fingers of some great town are crawling and clawing out without regularity, without order, without any real sense of fitness between the houses and the country in which they are being built, and see if it were not so. Old bits of lane and country-side, old sweet, peaceful hollows, in which the houses were full of the charm of sober picturesqueness and quiet, suddenly, in a month, in a night almost, got transformed and defaced with these villainous new structures. He was not complaining of the fact that people wished to live in the country, but he was complaining that when they did go the houses in which they went to live made of that country an eyesore and an abomination. There was no necessity that these things should be so. He believed that a little more susceptibility on the part of those who cared to live in such houses—a little more sense of what was vulgar and absurd in the disposition of windows and would-be ornaments, in the pretence of a richness which was the reality of meanness—a little finer instinct of that kind would soon modify those difficulties, and there was no reason why the extension of dwelling-places into country-sides should make those country-sides abominable."

EXPERIMENTAL BUILDING: ARCACHON VILLA, NEAR LEEDS.

It is so seldom that any departure from ordinary models in house-building is attempted that we willingly illustrate a recent erection at Moor Allerton, wherein have been introduced several novelties. The proprietor, Mr. John Smith, built the house specially to test "a self-regulating double-current system of ventilation," and his suggestions in other respects were carried out by his architect, Mr. Walsh. We allow Mr. Smith to tell his own tale.

The special objects for which Arcachon Villa was designed are,—

1. To introduce a more pleasing and picturesque style of country-house or villa within reach of the means of merchants and gentlemen.

2. To construct it on the most approved system with respect to sanitary arrangements, ventilation, and water-supply; and

3. To economise labour, fuel, and water, and to prevent waste.

One of the ideas adopted by the proprietor is that chimney-shafts should always be in the centre of a house. These form a triangle, round which the rooms are built. It prevents draughts, makes a warm house, with even temperature.

Another idea is the use of the earth-closet, thus formed:—A kind of pit is made, which is well cemented (with no drain from it), over which is fixed the closet, with cinder or earth sifter at the side, roofed and well ventilated. A door at the back allows the refuse to be filled readily into a cart. The practical results are,—no nuisance, always dry, and good tillage.

The ventilation is obtained by means of Mr. John Smith's new patent double-current system of ventilation. The fresh air is admitted at the ceiling; the vitiated air escapes also at the ceiling. In practice it is found the fresh air comes in in such proportion as the vitiated air escapes.

The fresh air being made to ascend (contrary to the usual methods) prevents draughts.



The kitchen is specially designed, so that a lady can superintend her own *cuisine*. It is large, well lighted, and well ventilated; floors, tiled red and buff, with upper pantry; a scullery on one side, well supplied with hot and cold water. A spring water-indicator shows the exact depth of water in all the cisterns at a glance. An electric bell attached to a float gives twenty-four hours' notice before any accident could happen to the hot-water boiler. A double passport communicates with the dining-room, and a coal cooking-range, gas-stove, and French charcoal stoves are fitted up, so that if a dinner is required for only one person or for sixty, it can be cooked without inconvenience or waste.

All the joists are put into cast-iron pockets, instead of mortise and tenon, to retain the strength of the floors. Every room is ventilated.

The upper rooms lead on to three balconies, formed of iron girders and concrete (5 ft. wide). These command extensive views.

The roof overhangs from 4 ft. to 6 ft.; and one peculiarity of its construction is that it is intersected or cut across at two-thirds from the ridge, in order to catch the water for storage at the top of the building. The cisterns are roofed over, and detached from the house, well ventilated, easily cleaned out, and connected with an extra supply cistern, so avoiding that nuisance of country houses,—continual pumping to fill the cisterns. One point in the economy of water is the construction of a bath boiler and hot box (Walsh's patent), which allows the occupant to draw water at nearly boiling-point in the bath-room, and then pump up cold rain-water from the storage cistern, thus saving two-thirds of the water in the cisterns above from being wasted. All the rest of the rainwater enters into and passes through a strong vaulted chamber in the basement, well cemented and ventilated, which keeps water perfectly fresh and sweet. It is shut off from the house, so that no evaporation can take place.

From whichever side this villa is approached it gives a pleasing impression, especially so when passing by Roundhay Park, the property of the Leeds Corporation. The turret on the summit is provided with a lightning-conductor and an alarm-bell communicating with every floor. The cost was as follows. The conservatory and greenhouse are not yet erected:—

Burnet & Sons (mason and brick work)	£803	17	6
Joiner's work (executed by proprietor)	650	0	0
Ironwork, balconies, girders, &c. (Cooper & Dawson, and Tankard) ...	97	0	0
Slating (Pycock & Son)	123	5	0
Plumbing and glazing (all plate-glass).	160	10	0
Hot-water engineering (Walsh & Sons)	72	13	0
Plastering (Franks)	110	0	0
Painting	39	0	0
Marble masonry (Heaps & Robinson)..	67	0	0
Electric bells.....	18	10	0
Extras not included in above, as grates	50	0	0
	£2,191	15	6

Stables and lodge are built to accord in character.

REFERENCE TO PLANS.

Ground Plan.

1. Dining-room.
2. Drawing-room.
3. Breakfast-room.
4. Kitchen.
5. Pantry.
6. Scullery.
7. Store-room.
8. Conservatory.

Chamber Plan.

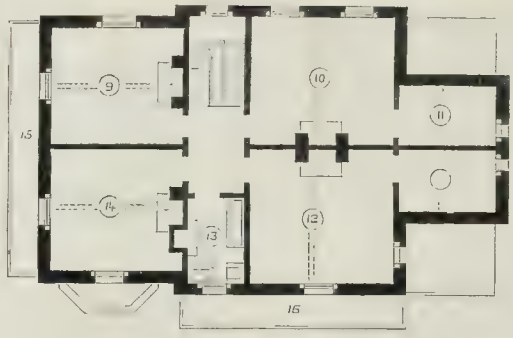
9, 10, 12, 14, Bedrooms.
11. Dressing-room.
13. Bath-room.
15, 16. Balconies.

NEW GREEK CHURCH, SAN FRANCISCO, CALIFORNIA.

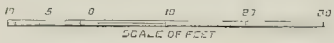
The materials from which the drawing we have engraved was made were sent to us from San Francisco many months ago, with a request that we would make known what was doing there architecturally, by publishing a view. It represents a handsome and costly building of its kind, and does credit to its designers, Messrs. Hoehhofer & Apponyi.

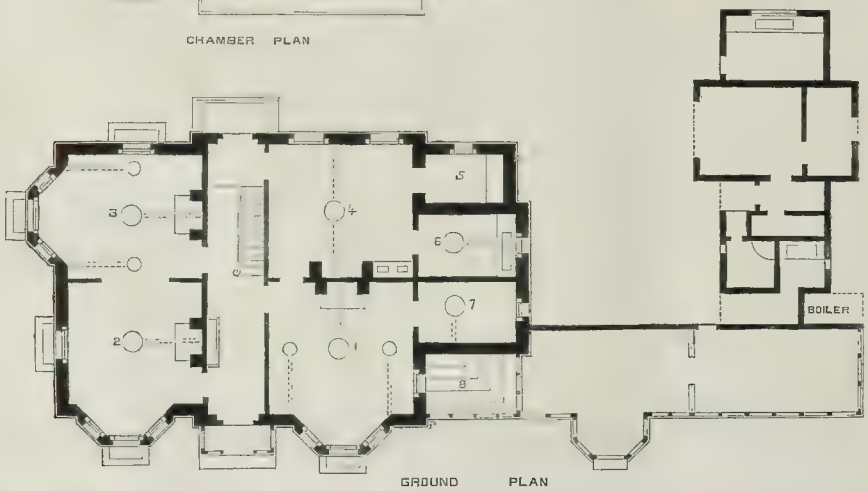
Recreation Grounds for Sheffield.—At a meeting of the Sheffield Town Council on the 9th inst. it was announced that the Duke of Norfolk had set apart three pieces of land as recreation grounds for the people of Sheffield. The land is situated at Parkwood Springs, Carlisle-street East, and in Beighton-lane districts, where thousands of working people will be able to use these open spaces. His Grace has given these grounds, which are upwards of twenty-six acres in extent, to the corporation on condition that they be preserved as recreation grounds for the people of Sheffield for ever. The thanks of the corporation were voted to his Grace for the gift.





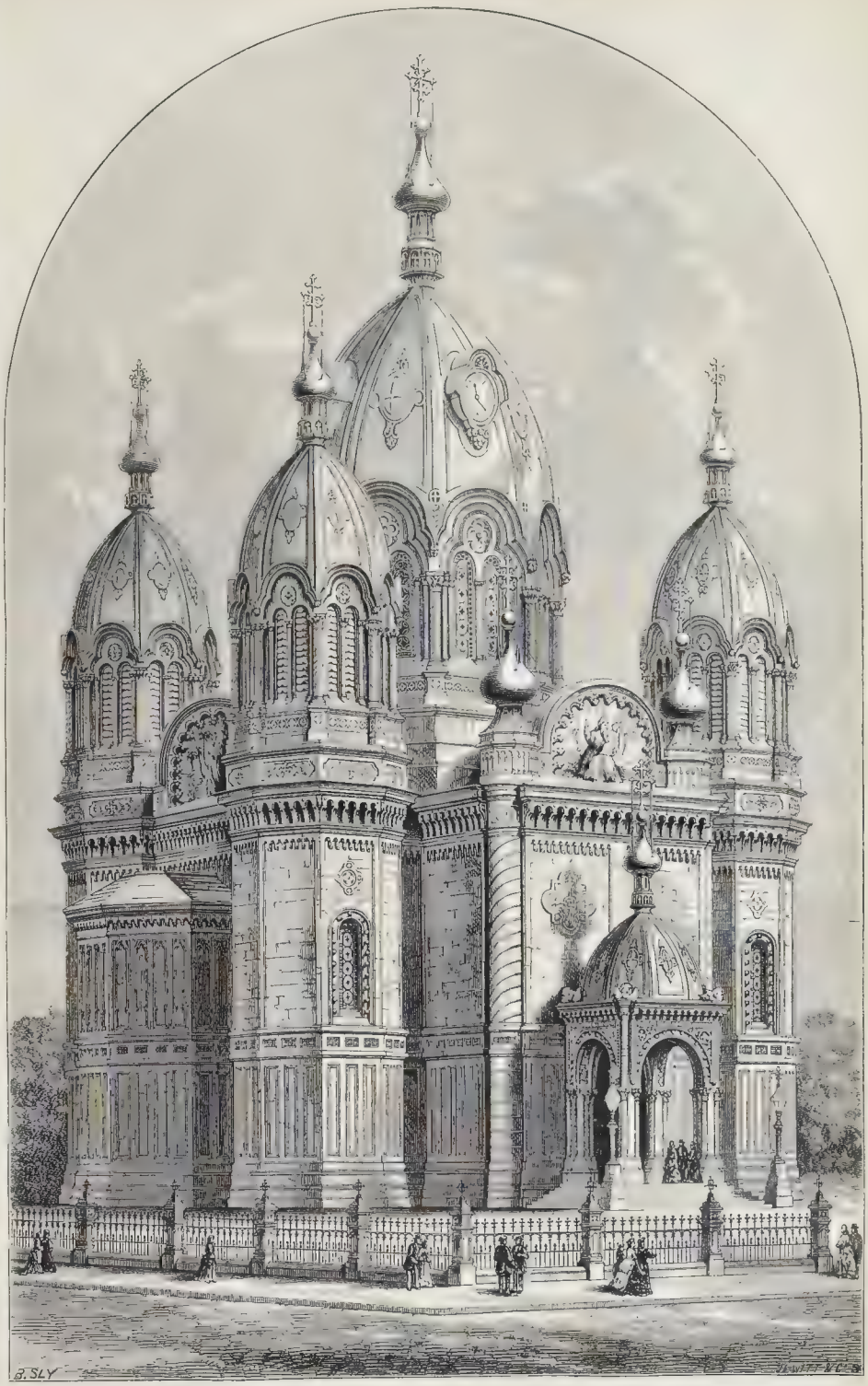
CHAMBER PLAN





GROUND PLAN

EXPERIMENTAL BUILDING: ARCACHON VILLA, MOOR ALLERTON, LEEDS.—Mr. Walsh, Architect.



NEW GREEK CHURCH, SAN FRANCISCO, CALIFORNIA.—Messrs. Hoenhofer & Apponyi, Architects.

ON SOME HYGIENIC CONDITIONS OF THE POTTERY MANUFACTURE.*

Among the hygienic conditions and surroundings of various manufactures, experience and observation have convinced me that we must make a distinction between those inseparable from, and those only incidental to, the manufacturing processes themselves, and that for the greater number of occupations and operating more energetically as factors in inducing disease, the latter play the more important part. This statement, in other words, amounts to this,—that with regard to the multiform occupations pursued in this country, the nature of the occupations is undeservedly blamed, in the case of the majority of them, for the ill consequences to the health of those engaged in them. Now I purpose in this paper to deal with a manufacture in which the essential conditions and surroundings are really fraught with danger to health; nevertheless, I shall be able to show that the non-essential or accidental surroundings are accountable for very much. To guard myself against misunderstanding, however, I need remark that the line between essential and non-essential conditions of manufacture cannot, in all particulars, be distinctly drawn; and that, in more or fewer of them, some will overlap others. For example, take the case of dust, which is the most prolific agent in inducing disease among potters, we may fairly regard it as inseparable from the processes of the trade, because the material cannot be handled in accordance with the necessities of trade without giving off fine dust; yet, on the other hand, the amount of dust thrown off may be lessened by care, attention, and cleanliness, and, further, may be dispersed and driven away by efficient ventilation. Still, notwithstanding this inability to accurately separate the essential from the non-essential conditions of manufacture, I regard it as important and practically most valuable to make the attempt; and, firstly, let me briefly sketch the conditions or surroundings of the pottery manufacture, which are non-essential, accidental, or outside the calling, but yet are answerable for more or less sickness, suffering, and death amongst those engaged in it. Of this whole class of morbific agencies I may predicate that they are preventible. I do not assert that practically they can all be removed and annihilated, but that we possess known remedies against them capable of being more or less efficiently applied.

The first in order I shall name is defective construction of workshops. In respect of this matter the manufacturers in the Potteries suffer, as do also those in other places, whatsoever be the occupation carried on, by the sins of their forefathers. They inherit old buildings erected ere sanitation had made good its existence. Their demolition and reconstruction is an affair representing capital expended, and the tendency is to "make them do" until better days dawn, or progressive dilapidation enforces destruction. Now, a fairly diligent inspection of the buildings used for the making of china and earthenware,—or, to use the comprehensive term of the district, of the banks,—will reveal too many shops or workplaces wretchedly built, at times in bad repair, with wet dirty floors, damp walls, low ceilings, scarcely high enough for a tall man to stand under, full of draughts, yet not ventilated, and with every trade appliance or fitting covered with a coating of dust of variable thickness. If these be the features of but a few, there are more to be found which, though less unfit as places of labour, are yet far from being what they ought to be. Defective elevation of rooms, and in its train draughts and bad ventilation, are far too generally found. Another common structural defect is the absence of a plaster ceiling in workshops having others over them, and, as a consequence, the precipitation of dust from the upper floor to that beneath it. Another prevailing structural defect is to be found in the unpaved yards and in the absence of water-spouts and drains to conduct rain-water away into the sewers. The consequence is, wretchedly sloppy and muddy courts and approaches, and concurrently wet feet and drabbled dresses, and the accessories,—colds, coughs, and rheumatism. Again, efficient ventilation is a thing far too widely neglected in pottery workshops, particularly when considered in connexion with the prevalence of dust, pervading especially those shops in which the clay is thrown, moulded, or turned, or in which scouring and dipping of the ware are carried on. The position, the size, and the construction of the windows as to the mode of opening and closing them, are such as make ventilation difficult, or even almost impossible. Add to these impediments to ventilation the frequent mode of warming by what are called pot-stoves, which, standing about the middle of the rooms, heat and unduly dry the air around them by their highly-heated or even red-hot iron surface, whilst causing at the same time very little atmospheric movement upwards through the small iron chimney-flue, and yet ever and anon dispersing into the apartment an inconvenient supply of smoke.

It is no new thing to condemn these pot-stoves as insanitary; but, for my part, I am almost equally disposed to condemn their modern innovators, the hot-water and steam pipes, which have found their way into several recently-erected factories. For this system of warming, when adopted, as too frequently happens, without corresponding arrangements for ventilating, is but a system of enervating the workpeople submitted to it, and provocative of evils as great, perhaps, as that of the cold it is used to guard against. Indeed, I maintain that it is better for a man at active employment to do without artificial warmth from a heating apparatus of the sort in question. The mischief to contend against is the separation of the heating from the ventilating process. When the former is attained apart from the latter, or the latter is let shift for itself, the air of the apartment soon becomes insufferable, doors and windows are opened, and draughts and colds follow, and inflict their injurious consequences upon people peculiarly sensitive to them by reason of the heated, almost motionless, air previously surrounding them. So far as concerns the pottery hands, it must be admitted they are difficult to deal with in this matter of ventilation. They have a morbid dread of cold air, and are, unluckily, in large numbers the victims of chest affections. As a consequence, they are prone to stuff up ventilators, to cover over any sort of apertures by which the outer air is to be admitted into the room, and to deliver themselves up to a warm, stagnant, effete air laden with particles of dust.

That man would be a public benefactor who could invent a simple plan for ventilating and warming the workrooms of potters, and persuade them at the same time to give it a fair trial. Overcrowding of shops is a further insanitary condition not essential to any process in the manufacture of pottery. According to my observation, it is likewise a widely-spread one; but I trust that the better-defined sanitary requirements of the new Factory and Workshop Act will gradually diminish this evil.

In the manufacture of pottery the use of machinery has heretofore found little application. It is now slowly making its way; but for its adoption to any large extent it will be necessary to replace old factories by new ones, the arrangement and relative situation of the shops of most old factories rendering the adaptation of machinery impracticable or else too costly. The use of machinery would exert a beneficial influence upon the health aspects of the manufacture. The introduction of presses for preparing the clay, in place of the old process of evaporation and blunging by men exposed constantly to an atmosphere of steam and to the influx of cold air at the same time from the half-enclosed shed in which the work was carried on, is a movement in favour of the health of potters. So, again, is the adoption of the pug-mill, to replace in great measure, or wholly, the process of wedging the clay. I can point to other examples, in the use of steam to turn the jiggers, the turners' lathes, and the thrower's wheel; and I could well wish to see the like mechanical agency more widely patronised; for my experience as an infirmary physician has shown me, in numerous instances, the injurious results to health of girls and young women employed in lathe and wheel turning.

Not actually pertaining to machinery, yet allied to it, are the arrangements now pretty generally used in substitution of the old "hot closets," in and out of which boys were kept continually running, with great detriment to health, from the excessive heat and ever-recurrent exposure to chills. These improvements in machinery and in mechanical appliances must be seen to be understood. I will now pass to another set of conditions unfavourable to health, for which neither the manufacturing processes nor the structural defects of the factories are to blame. I allude to the habits, the food, and the clothing of the workpeople. But to sufficiently discuss these matters would carry me far beyond the limits of a paper like the present. Let me say, in brief, that there is very far too much indulgence in intoxicating drinks, irregularity in living, indifference and carelessness in the selection and preparation of food, neglect of cleanliness, pride and folly in dress. I do not say these defects are peculiar to potters. I fear they prevail generally among factory hands as a class; but I fancy they are, as a whole, more productive of disease among potters than among many other artisans, because by their association with concurrent causes of sickness found in the occupation itself their power to do mischief is enhanced. For instance, the most fertile source of disease is the dust of potteries, and the morbid resultant affections of the lungs, wherefore the indulgence in alcoholic drinks, which load the vessels and lungs with carbonaceous matter, and otherwise prejudice the respiratory act, prepares the way and facilitates the action of the active morbific agent, the inhaled dust.

I will now turn to the conditions essential to the occupation of potters, or, if not positively essential, at least practically inseparable at present from it. The first to be noted is dust. This is evolved from the materials used in the manufacture of pottery: the china and blue clays, the stone and the powdered flint. It is a mineral dust and extremely fine, consisting mainly of silicious particles. It enters the air-passages, and finds its way into the bronchial tubes, great and small, where, as a direct irritant, it sets up a slow, inflammatory action, ending in altered pulmonary tissue—so altered by condensation and other changes, as to be useless for the purpose of respiration. This dust is apparent in the air, and is seen covering all objects in the workshops as well as the clothing of the potters themselves. Some processes are more dusty than others, but none of them in which the clay is worked up into the forms desired are free from it. In the finishing departments of painting, gilding, and burnishing the clay is transformed into china and earthenware, and no dust consequently can arise from it. We have, therefore, an obvious and direct cause of disease existent in the dust given off from the yet unbaked clay, and its evolution to some extent appears inevitable. As a matter of course, it is used in a moist or plastic condition; but its surface rapidly dries, and readily breaks down into a fine powder on touching, as shown by its soiling the hands. In some processes, particularly in that of turning, the lathe separates fine shavings from the surface of the vessels, still in the "green" state, and with them more or less of the clay in fine particles and in powder. The disposition of the surface to dry and form a pulverulent film is increased by the heat of the workrooms. Therefore, for preventive measures, we must seek such as will lessen the heat of shops, and the formation on the surface of the unbaked ware of a dry, powdery film, and withal such ventilation as shall disperse the dust generated and expel it from the workrooms. Airy, well-ventilated, and comparatively cool shops constitute the primary hygienic requirements in the manufacture of pottery. Subsidiary to these are plans for laying the dust by sprinkling the floor, the observance of all means of cleanliness, both of the shops and of the persons employed; but it is painful to add that these minor measures to remove a patent cause of disease are greatly neglected. I would throw it out suggestively, how far it might be possible to remove the dust from the atmosphere by employing from time to time forcible jets of steam. These we may imagine would induce the precipitation of much dust and lessen the dry heat of the air.

China-scouring has been especially singled out as most noxious to those engaged in it by reason of the dust generated, and the peculiarly irritating quality of that silicious dust. It is an occupation of women, and consists in scouring the flinty dust from the surface of the china cups and other articles. It is very provocative of lung disease, although not in the terrible ratio some have reported. The mode in which the work is carried seems certainly to place it within the scope of remedial measures. These must be in plans for withdrawing the dust from the workers as they sit at the bench with the ware before them, and it seems to me very feasible to effect this by having a perforated bench allowing the dust to fall through, or rather to be forcibly drawn through into an

* By Dr. J. T. Arlidge. Read at the Stafford Congress.

enclosed trough or cylinder below, in which a constant process of exhaustion of the air is effected by the rapid revolution of a fan at its open end driven by machinery. The perforated bench and subjacent trough have been adopted, but the withdrawing force relied upon has been the suction power of a heated chimney with which the trough has been connected. But this plan is better in theory than in practice. The chimney has not a constant and equal draught, and if the shop become heated when the chimney is cool, the current will be reversed, and no dust will be extracted through the perforations.

Another expedient preventive of the ill consequences of dust inhalation is the use of respirators worn over the mouth and nose. There can be no doubt of their efficiency in sifting the dust from the air before it enters the respiratory passages, but the difficulty is to get the workpeople to use them. There is on their part a recklessness and an indifference to consequences; the respirators increase the effort to breathe, and they feel hot and uncomfortable. But what is more fatal to their adoption is, they are innovations on the usages of trade, and above all they subject their wearers to the jibes and jeers of their fellow-workers, and no class of people are more sensitive to jests, or have so little moral courage in regard to the introduction of novelties, as factory workmen and workwomen. In very many factories the evils of dust might be reduced by the rearrangement of shops and of the several branches of labour. As said before, some branches are more dusty than others, and it is not uncommon to carry on two or more branches in the same workplace, so that all therein employed are exposed to the whole of the disadvantages of processes which otherwise would be restricted to a few.

But besides dust, there are other conditions of labour inherent in it. For instance, the position taken during work is unfavourable to the normal action of the chest walls. This happens to throwers and pressers. In the handle-making branch there is rapidly repeated pressure upon the lower part of the chest; and in all the finishing processes the position in sitting is more or less constrained. On the other hand, in the case of lathe-treaders, there is undue fatigue in standing and in the exertion by a sort of perpetual jumping on one foot of treading the footboard or treadle.

There is yet one more department of pottery labour destructive of health, which I must mention in order to give my paper any semblance of completeness. It is the department of dipping. In order to put the impervious glaze on the ware after firing in the biscuit-oven, it is dipped into a mixture of lead and borax, combined with other materials, which have previously been all fused together into a vitreous substance, then ground down into fine powder and mixed with water. The lead of the glaze is of course a poisonous ingredient, and as a consequence those engaged in dipping the ware are the subjects of severe colic and of paralysis in various and often very aggravated forms. Could lead be eliminated from the glaze, one great source of disease of the potter's craft would be abolished. I am told that the proportion of lead used is not so great as formerly, and that an increased quantity of borax may be substituted for the poisonous metal. Whether this be so or not is a question for chemists, and it would be a happy day could these scientific gentlemen contrive a new form of glaze of non-poisonous quality. Probably some lead is absorbed by the skin of the dippers, whose hands and arms are, practically speaking, immersed in the glaze during the period they are at work. But my impression is that the lead finds its way into their system chiefly in the form of dust inhaled by the mouth and nose. The glaze most rapidly dries on the absorbent surface of the ware, whilst the clothes of the worker become bespattered with it, and every surrounding object betokens the formation and presence of dust. Here, again, the like remedial measures claim attention as in the case of dust from clay. There is need of airy shops and good ventilation, and, above all, of cleanliness of person and of surroundings. Most manufacturers supply their dippers with means of washing, with towels, soap, and nail-brushes, and the Factory Act forbids the partaking of meals in dipping-houses. In fact, preventive measures are of the first importance in this department. If experience indicates that some individuals are much more liable to be affected by the lead poison than others, it proves even more forcibly that by care and cleanliness on the part of the men its ill effects may be largely obviated. The use of medicines calculated to eliminate the poison is well known to the workmen, and another excellent means of preserving their health is at their command in the way of hot-water, vapour, and Turkish baths. Respirators would serve them a good turn, but, as with other pottery artisans, their prejudices stand in the way of their use.

I have now made a rough survey of the principal un-hygienic conditions of the pottery manufacture. The general lesson to be derived from it is, that those conditions are largely remediable and preventible; that one group has most to do with structural and mechanical expedients to remedy it, and that the other is largely bound up with the willingness of the workpeople themselves to lessen and remove them. The reputed friends of the artisan class will do their clients far greater service by teaching and encouraging them in more sober and regular habits, in the observance of greater cleanliness in their work, in attention to the laws of health, in overcoming trade prejudices, in selecting and preparing their food, and in properly and sensibly clothing themselves, than by all their rhetoric in words and writing in favour of higher wages and of hypothetical advanced political action and power.

PROGRESS IN PURIFYING SEWAGE BY PRECIPITATION.*

The object of this communication is to lay before the Congress certain practical and economic results which the writer has arrived at in regard to perfecting the purification of sewage by chemical treatment, and in facilitating the disposal of the sludge derived therefrom. He desires to acknowledge the valuable co-operation he has received from Professor Wanklyn and Mr. J. C. Mellis, C.E.

In considering every system for dealing with sewage it is desirable that the question should be regarded as a means of enabling sanitary authorities to overcome the great and increasing difficulty in the disposal of their sewage refuse at the least cost, rather than as one for making money out of sewage, which has been too much aimed at, and has thereby thrown back sanitary improvement considerably.

In the course of the writer's experience in advising with reference to precipitation works and systems, he has seen more and more clearly that sulphate of alumina aided by milk of lime proves the most efficient agent to comply with the before-mentioned conditions for purifying sewage. This he has now advanced upon, inasmuch as he has discovered that the efficiency of sulphate of alumina is greatly increased by the presence of some protosulphate of iron, which apparently produces results *altogether out of proportion to its chemical equivalent* (the salts of iron being known to chemists as purifiers of foul fluids), the proportions varying with the composition of the sewage, but their combination having a marked sanitary and economic advantage.

Practical data on a large scale have already been obtained at the sewage precipitation works of the Rivers Purification Association (to whom the writer is engineer), at Coventry and Hertford, where the improved system of working has been adopted with complete financial and sanitary success. The process previously employed at these places was (as is well known with reference to Coventry) crude sulphate of alumina and milk of lime, which gave results admittedly of a highly satisfactory kind. The addition of the salts of iron has, however, led to the production of an excellent effluent, and at a cost even less than previously.

The employment of this combination has also resulted in the tanks and the sludge being deprived of the slight smell hitherto noticeable at times. The economic results attending this compound system of precipitation will be recognised when the writer states that at the Coventry Sewage Works the purification of the very foul sewage (containing between six and seven grains of chlorine per gallon, and between twelve and thirteen parts per million of albuminoid ammonia, with a large amount of dye from the manufactories) is now accomplished for *ll.* 1s. 6d. per million gallons.

At Hertford the improved system of working has been applied with equally satisfactory results.

* By Mr. Henry Robinson, C.E. Read at the Sanitary Congress, Stafford.

The way to dispose of the sludge from precipitation works has long engaged the attention of the writer. Artificial heat will accomplish it, and several ingenious appliances have been devised for this purpose. The cost, however, is heavy, and the value of the resulting manure is not yet sufficiently established to justify its employment on commercial grounds.

The writer has now adopted the system of removing the water from the sludge by means of filter-presses, and he has devised a simple application to economically effect this.

This press, which is founded on an old and well-known Belgian apparatus for filtering impure liquids by means of a combination of discs with filtering-cloths on their surface, has been arranged in order to economise labour and time in working, so that the discs open and shut automatically, by which the pressed sludge is removable quickly and without disturbing the filtering-cloths. The fluid sludge is thus converted rapidly and economically into the form of cakes, and the drying can be further carried on to any desired length either by exposure to the air or otherwise. The difficulty hitherto experienced in disposing of the sludge to farmers for utilisation upon land is thus got over, as the writer has found that there is no difficulty in selling the sludge from the process he is referring to, provided it is made portable. The theoretical value assigned to sludge from the writer's process is, according to eminent chemists, 16s. 9d. a ton if it contains about 50 per cent. of moisture, or 27s. a ton if dried down to 15 per cent. of moisture.

A NEW BRICK-KILN.

Two systems of continuous kilns for burning bricks, tiles, &c., have come into practical use—the French system of Colas, also known as that of Borie; and the German system of Hoffmann, the well-known annular kiln or Ringoven. The principle of the kilns of Colas, Borie, and their imitators, consists in placing the air-dried bricks on small railway trucks forming a long train. This is slowly moved through an arched chamber, provided in its centre with fixed fireplaces for burning the bricks; the fire in these kilns is stationary, while the bricks are moved forward. The principle of the Hoffmann kiln is just the reverse; here the bricks are stacked in an annular burning-chamber, and remain stationary while the fire travels through them, leaving burnt bricks in the rear and advancing into and amongst the green bricks. The annular shape of the burning-chamber allows a continuous operation of the kiln, the fire progressing in the circuit without interruption, while the burnt bricks behind the fire are continually replaced by green bricks. The first-named system is also worked continuously, the train being supplied in the rear with trucks containing green bricks, at the same rate as trucks with burnt bricks are withdrawn in the front.

All kilns of this kind, however, compared with Hoffmann's, have met with little success, much objection against them having arisen from frequent interruptions in their operation, caused by the fact that a long train of loaded trucks cannot be moved continuously through a fire in an arched chamber, with sufficient certainty. A brick, accidentally falling from a truck, or a piece of coal or cinder getting in between a truck and the kiln wall, will stop the whole train. The principal advantage of these kilns, the saving of labour on account of less handling of the bricks, is more than paralysed by the frequent interruptions in the operations of the kiln just referred to. Besides this, it has been found very difficult to keep the joints air-tight between the trucks and kiln walls, as well as those between the trucks themselves while these are in motion, and for this reason it is almost impossible properly to protect against the fire their axles and axle-boxes.

A kiln, invented by Herr H. Dueberg, of Berlin, is (according to the *Engineer*) probably free from these objections, while it combines the advantages of the Hoffmann system of annular kilns, viz., saving in fuel, uniformity in burning, and certainty in working, with the saving of labour obtained by the kilns of Colas, Borie, &c. These objects are obtained by constructing an annular kiln with a movable floor, which consists of a series of sections or platforms. These platforms are supported by wheels and axles, which run on a railway track extending along the floor of the burning chamber; the platforms, therefore, are railway trucks, similar to those used in the kilns of Colas and Borie,

but larger than these. The principal difference, and at the same time the principal advantage offered by Dueberg's kiln, compared with those of Colas and Borie, is that the platform trucks are not moved during the burning of the bricks. On the contrary, they are at rest during the entire process of burning, while the fire is advancing through the bricks, in the same manner as it does in the Hoffmann kiln. The fuel is dropped into and amongst the bricks to be burnt from above, through small holes in the arch of the burning chamber.

The trucks, after being loaded with green bricks, are run into the kiln one by one, each close up against the preceding one; the back of each truck is coated with clay before the next truck is pushed in, and thus the joint is made air-tight. The two sides of the platforms parallel to the wall of the burning-chamber are made air-tight by filling the joints between the platforms and the kiln walls with sand, after a truck loaded with green bricks has been run into the kiln, close up against the platform of the preceding truck. There is no danger of the joints between the platforms and the kiln walls, as well as of those between the platform themselves, not remaining air-tight during the process of burning, because everything is then at rest. On the other hand, the working of the kiln cannot be interfered with, as has been the case with the kilns of Colas, Borie, and their imitators, by accident, such as from falling bricks or cinders, which constitute the principal objection to the more general use of the above kilns. In Dueberg's kiln the trucks are not moved until the bricks are completely burnt, and sufficiently cooled down to be removed, when the trucks are drawn out one by one; they are, therefore, never moved all at the same time; and, moreover, the trucks are never moved while still hot, but only when cold. In the kilns of Colas and Borie all the trucks must be moved at once, and while a portion of them is passing through the fire, their axles being heated and no lubrication possible. In Dueberg's kiln the axles of each truck may be lubricated before the same is drawn out of the kilns, as they are then quite cold. For these reasons the trucks of this kiln may be made much larger than those of the kilns of Colas and Borie, and consequently the area of the burning-chamber, may also be made much larger than that of the said other kilns. It is evident that one truck containing 5,000 bricks can be moved much easier than a train of about thirty trucks, each containing 500 bricks, the axles of about one-fourth of which trucks are almost red hot. It is evident that the labour in setting, as well as in drawing the bricks, is much easier in this kiln than in that of Hoffmann; the labourers are not compelled to work in the hot dusty atmosphere of the burning-chamber, which is very objectionable in all other arched kilns. In setting the bricks for burning, as well as in removing them from the kiln, they are only handled once, while with other kilns they are in each case handled twice,—first put on a wheelbarrow, and then taken off again and stacked.

METROPOLITAN BOARD OF WORKS.

Fixing Iron Ties through Party-Walls.—The Building Act Committee has reported, with reference to an application of Mr. C. Fowler, District Surveyor for St. Leonard's, Shoreditch, and the Liberty of Norton Folgate, for appointment by the Board of fees for special services performed by him in superintending the fixing of iron ties through the party-walls of Nos. 40 and 42, St. John's-road, Hoxton, and Nos. 75 and 77, Worship-street, that the District Surveyor was under no obligation to render the special services in question, and that the Board therefore cannot fix special fees for such services, and recommending that Mr. Fowler be so informed. The report was adopted.

Facilities for Bathing.—On the motion of Mr. Runtz, it has been referred to the Works and General Purposes Committee, "to consider and report upon the desirability of forming lakes in the Board's open spaces, where suitable for the purpose, which could be used as swimming-baths for both sexes."

The Sewage of London.—The Works and General Purposes Committee have had under consideration a letter from Scott's Sewage Company, intimating that they propose to appeal to the Corporation of London and the Thames Conservators to assist them to provide the requisite practical demonstration of the adaptability of the Company's system for dealing with the sewage of London; but before doing so they would like to be assured of the cordial co-operation of the Board. On the recommendation of the Committee it has been resolved that the Company be informed, in reply, that the Board still feel that they are unable to do more in the matter than consider any proposal that may be made to them for guaranteeing the purification of the London sewage at a moderate cost.

Proposed Railway from Charing-cross to Tottenham-court-road.—On the recommendation of the Works and General Purposes Committee, Messrs. Ludlow & Parratt have been informed, in reply to their letter as to a scheme for the construction of a shuttle line of underground railway in connexion with the proposed new street from Charing-cross to the Tottenham-court-road, that the Board deem it premature at the present time to enter upon the consideration of any such proposal.

A Much-needed Improvement.—Mr. Runtz has succeeded in unanimously carrying the following motion:—

"That it be referred to the Works and General Purposes Committee, to consider and report as to the desirability of making an application to Parliament for the construction of a spur street from the junction of Theobald's-road and Gray's-inn-road towards the 'Angel' at Islington."

Those who know the perils of the present route, *viâ* Elm-street, Mount Pleasant, and Coldbath Fields, will agree as to the urgent necessity of such an improvement.

The Water Supply of London.—At the meeting of the Board on the 4th inst., Mr. Selway moved:—

"That it be referred to the Works and General Purposes Committee to consider and report upon the advisibility of preparing a Bill to be laid before Parliament providing for the acquisition by this Board of the interests of the several companies now supplying the metropolis with water, also upon what steps it will be desirable should be taken to insure an improved supply of water to the metropolis."

Mr. Lloyd seconded the motion, whereupon Dr. Brewer moved "the previous question," on the ground that the present time, while the Board was still smarting in consequence of the treatment its Bills had suffered at the hands of Parliament last session, was premature and inopportune for the reopening of the question. Mr. Watkins seconded the amendment, which was also supported by Mr. Leslie. Mr. Runtz, in supporting the motion, said it was the duty of the Board to do its best to obtain a pure and abundant supply of water for the metropolis. "Let us," he said, "discharge that responsible duty. If we cannot obtain the powers we require, let the blame rest upon whom it may." The amendment was lost by 21 to 6.

The Garden Railings, Thames Embankment.—Mr. Runtz, in moving, on behalf of the Parks and Open Spaces Committee,—"That it be referred to the Engineer to report what steps can be taken to protect the ornamental railings now in use around the gardens on the Victoria and Albert Embankments," said that the damage done to these railings had amounted, for some time past, to 200*l.* a month, or 1,200*l.* a year! The damage is done by boys, who break off the elaborate castings by wholesale.

The Artisans' Dwellings Act.—At the meeting of the Board on the 11th inst., Mr. Richardson introduced a deputation from the Greenwich District Board of Works, praying the Board to deal, under the Artisans' Dwellings Act, with an unhealthy area known as "Hughes's Fields," in the parish of St. Nicholas, Deptford. Mr. Roberts, who acted as the spokesman of the deputation, described the exceedingly unhealthy and overcrowded state of the area in question, and stated that while that area only covered a space of 14 acres, as compared with 111 acres covered by the entire parish of St. Nicholas, it contained a population of 4,500 persons, whereas the total population of the whole of the parish was 6,370! Shortly afterwards Mr. Selway moved the adoption of a report by the Works and General Purposes Committee, to the effect that the Committee have considered as to the course to be adopted with regard to the official representations from medical officers, under the Artisans and Labourers' Dwellings Improvement Act, 1875, upon which no action has yet been taken; that the Committee have instructed the Engineer and the Superintending Architect to prepare the particulars for draft schemes in respect of two areas in the parishes of St. Giles-in-the-Fields and All Saints, Poplar; and that having regard to the large amount of work now in hand in connexion with the eleven schemes for which Acts of Parliament have been obtained, it is not, in their opinion, desirable, for the present, to take steps for proceeding with any further schemes under the Act. Mr. Munro seconded the motion. Mr. Richardson moved the following amendment:—

"That the Engineer and Superintending Architect be instructed to prepare the particulars for a draft scheme in respect of the area known as Hughes's Fields, Deptford, in addition to the two areas in the parishes of St. Giles-in-the-Fields and All Saints, Poplar, in order that it may be proceeded with in the ensuing session, in conjunction with the two above mentioned."

In support of this amendment, Mr. Richardson referred to the extremely overcrowded and unhealthy condition of "Hughes's Fields," and said that the unhealthy state of the locality was most marked. The houses were mostly of wood, and very dilapidated, and the death-rate was 24 per thousand as compared with 20 per thousand in the adjoining parish of St. Paul, Deptford, and 15 per thousand in the parish of Greenwich. The medical officer of the district had strongly condemned the unhealthy state of the area in question, which at all periods of epidemic disease was attacked with unusual severity. Small-pox and fever here found congenial hotbeds, and during the prevalence of cholera some of the streets had been closed by barricades against the admission of the general public. Mr. J. Ebenezer Saunders seconded the amendment, because the spot in question was one which urgently needed the application of the Act. Mr. Lloyd, Mr. Runtz, and others, spoke of the difficulties in carrying out the Act, which, Mr. Runtz said, was really a Towns Improvement Act. The Board was about to clear several unhealthy areas under the Act, but they saw no prospect of any improved dwellings being erected, so that the people displaced had to seek accommodation elsewhere, resulting in the further overcrowding of other areas already sufficiently unhealthy. The amendment was lost, on a division, by 23 to 10.

Bye-Laws under the New Building Act.—The Building Act Committee submitted a code of bye-laws under the 16th section of the Metropolis Management and Building Acts Amendment Act, 1878, with respect to the foundations and sites of buildings, and other matters; and recommended that the said bye-laws be approved by the Board and referred back to the Committee with authority to send them to the Royal Institute of British Architects and the Institution of Surveyors in order to ascertain the views of those bodies with respect to such bye-laws before they are advertised and sent for confirmation to one of her Majesty's Principal Secretaries of State, as required by the Act. The recommendation was adopted.

FEARFUL PANIC IN A LIVERPOOL THEATRE.

The most terrible disaster of the kind which has ever taken place in Liverpool occurred on Friday evening in last week at the Colosseum Theatre, Liverpool. It appears that the theatre, which is now used as a music-hall, was filled with about 4,000 people, when, during the singing of a comic song, a disturbance occurred in the pit, and while this was going on, some person unknown, with or without malicious intent, raised the terrible cry of "Fire!" As a matter of fact there was no fire, nor the slightest sign of it, but, as in so many previous cases, the audience (which in this instance mainly consisted of young men and lads) instantly became panic-stricken, and the usual mad rush was made to the main entrance, in spite of the manager's assurance that there was no cause for alarm. Although there are no fewer than six available exits, they seem to have been nearly all either fastened or so hung as not to open outwards,—which in the case of a rush towards them from the inside when they are closed, would render them as useless as they would be if locked and bolted. It is not surprising, therefore, to read that everybody seems to have rushed to the main-entrance leading into Paradise-street. At the point where this entrance breaks up into passages and staircases there is a sort of well, and it was here that the crush took place. The converging streams of people surged together into a struggling heap, body falling upon body until the space was filled with a suffocating mass of human beings. A door-post which blocked in the dead and dying victims, was cut away by a police-officer, and the work of extrication commenced, and in a few moments no fewer than thirty-seven dead, and large numbers of

injured, had been carried out into the street. The majority of the victims are young and unmarried men.

The coroner's inquest has been opened, and no doubt full inquiry will be made into the alleged fastening of the doors,—a practice which the sad testimony of bygone catastrophes of the kind has shown to be fraught with the utmost danger. In this particular case the danger was doubly great, for the theatre, which is mostly frequented by the lower orders, was one of those in which there are two "performances" and two "houses" or audiences nightly. The first performance was nearly concluded when the panic arose. The building was bounded on one side by Whitechapel, on another side by School-lane, and at the back by Manisty-lane. On the ground floor there were the arena and pit, and on the second floor a balcony, above which was an upper gallery. There were two entrances in Whitechapel, only one of which was extensively used, and a door in School-lane, and one in Manisty-lane. The building itself has had a very chequered career. Thirty years ago it was a Unitarian Chapel. Afterwards it was transformed into a theatre. It continued as a theatre for some time, but, falling into disrepute, the dramatic licence was last year withheld by the magistrates.

In October, 1877, the Liverpool Borough Engineer (Mr. Deacon) made a report to the Health Committee on the means of egress at the Colosseum, when the lessee unsuccessfully applied for a renewal of his theatre-licence. Had the magistrates seen fit to renew the licence, they would probably have made it a condition that the alterations suggested by Mr. Deacon should be carried out. The lessee was left to carry on the building as a music-hall, and, thanks to division of authority, could please himself as to whether he adopted Mr. Deacon's suggestions or not. Whether he acted upon them is not stated, but it will probably be made clear at the inquest. Mr. Deacon's suggestions for improving the means of egress were thus summarised by himself at the end of his report:—

"1. To make the exit-door from the pit into School-lane open outwards.

2. To lock the gates of the gallery entrance to the walls when they are open.

3. To keep the outer door of the pit-entrance in School-lane open and locked to the wall during the performance.

4. To keep all the doorways of the three occasional exits from the pit ready for instant use as exits when the second audience is admitted, or to make them available at all times by admitting no part of the second audience before the whole of the first audience has passed out.

6. To fasten back by a lock the stage-entrance door in School-lane, and to restore the doorway from the pit which formerly communicated with the stage entrance.

7. To fix a proper handrail on each side of the gallery stairs.

8. To remove the pay-box to the side of the staircase.

9. To make the inner door of the additional staircase from the gallery open outwards in halves; to make the outer door of the same staircase open outwards, and to fix another handrail on the stairs.

10. To station a door-keeper wherever the doors are not kept securely open, and to use simple bolts for fastening the doors when shut."

PIANOFORTE DESIGN.

Our remarks recently on the artistic improvement of the pianoforte have brought us, among other communications, some lithographs of designs for pianoforte-cases by Mr. Percival, the superintendent of the cabinet-making department in Mr. Whiteley's well-known establishment at Bayswater, the merit of which, in comparison with the ordinary run of pianoforte cases, we willingly admit, though they do not touch what we regarded as the initial mistake, that of making the upright piano to imitate a cabinet, and ignoring the harp shape, which is the characteristic of the instrument, as shown in the harpsichord and spinet, and retained in the grand pianoforte of modern days. Still, there is the evidence in these that a better and more solid-looking form of design than we generally see can be made as a commercial success, so that we again ask why the great pianoforte-makers do not even attempt to do as well, or better.

SURVEYORSHIP ITEMS.

Bournemouth.—Mr. G. R. Andrews has been appointed surveyor to the Bournemouth Improvement Commissioners and Urban Sanitary Authority.

Smethwick.—Mr. J. C. Stuart, of Birmingham, has been appointed surveyor to the Smethwick Local Board and Urban Sanitary Authority.

THE PAVING OF LONDON BRIDGE.

Notwithstanding the arrangements made for the relief of the traffic by other routes during the paving of London Bridge, the bridge has presented a dead-lock at intervals during every day since its partial closing for traffic, many of those in charge of carts, vans, omnibuses, lorries, and other vehicles, preferring the delays and constant stoppages in crossing London Bridge by the single line on either side to and from the City, rather than face the steep gradients at Southwark Bridge. The result is that since the bridge was partially closed, the average time occupied by conveyances in effecting the passage from one side of the bridge to the other has been not less than half an hour. Nothing more than a walking-pace is possible, whilst blocks and actual stoppages on the bridge for several minutes at a time are frequent. One day during the present week there were three lines of conveyances between King William-street and the bridge approach blocking the thoroughfare for several minutes, unable to move, and this occurs almost daily. The two sides of the roadway over the bridge have been completed, and the paving of the central portion is now going forward. It is not expected that the works will be finished, and the bridge re-opened for traffic, before the end of the month.

NEW CATHEDRAL AT TUAM.

The new Protestant Cathedral of St. Mary, Tuam, was consecrated on the 9th inst., by the Right Rev. Dr. Bernard, bishop of the united dioceses of Tuam, Killala, and Achonry. The building of the cathedral has occupied sixteen years, and was originated, sustained, and completed by the zeal and energy of the dean, the Very Rev. Charles Seymour. The design was by Sir Thomas Deane. The style is Gothic. The cost up to the present has been 15,000*l*. The choir is seated in the chancel, as in St. Patrick's Cathedral. The seats of the prebendaries are faced, not with continuous desks, but with separate marble pillars that serve as lecterns,—an arrangement suggested and presented by the bishop. The pulpit and bishop's throne are of marble, carved. The pulpit was presented by the Rev. Mr. Phair, the throne by Mr. Nanny, the font by the Hon. Mrs. Bernard, and the lectern by Mr. Waithman. The great feature of the chancel is the ancient arch, which Mr. Keane pronounces to be a noble specimen of "Cuthite architecture." There is neither rood-screen nor reredos. The Communion-table stands out apart from the east wall.

RECORDS OF RESTORATIONS.

ARCHITECTURAL SOCIETY OF THE ARCHDEACONRIES OF NORTHAMPTON AND OAKHAM.

The thirty-third annual meeting of this society was held at Northampton on the 9th inst., the Rev. W. Thornton in the chair. The annual report, read by the Rev. N. F. Lightfoot, refers to faults in some of the plans submitted to the Society for alterations and "improvements" in churches, and says that such faults arise from the fact that,—

"Some persons will, for financial or personal reasons, undertake to direct matters in which they have no experience, rather than put themselves into the hands and under the guidance of those who have really made a careful study of architecture and of its several details. This is so frequently the case, that it is no wonder that an outcry has arisen against restorations, and that many an archæologist now hails an unrestored, unchanged church with the same satisfaction as that with which the few restored churches were commonly regarded some forty years ago. More than one instance presented itself to the minds of the committee where very considerable outlay has of late years been made (in the interior of churches especially), in which every change had been for the worse; inartistic roofs substituted for those of far greater beauty, all proprieties of arrangement set at nought, and every old landmark which had no apparent present use swept ruthlessly away. The Committee think that no local authority shou d have the power of doing just what it likes with the ancient monuments of a county because it may be able to provide the cost of making old things new; but that practically, as well as theoretically, the ecclesiastical authority of the diocese should interpose its veto to unnecessary changes, and should institute a more searching inquiry into the why and the wherefore, before issuing its faculty to do this or that. If a diocesan court had adopted the same practice before issuing a faculty, as the Church Building Society observes before making a money grant, requiring that every plan should be examined by a competent body of experts, there would not be so many complaints as are now rife against church restorations. As it is, complaints are often made, not without reason; yet when one wanders now and then into some distant corner of the land, where restoration is but little known, and sees good angel figures falling from the roofs because there is no desire to arrest the hand of decay, stained glass falling from the windows for want of a little lead, and *hoc genus omne* of neglect, one must confess that there are other evils to be deplored besides that of over-restoration."

The report having been adopted, and the officers of the society re-elected, the Rev. R. S. Baker read a paper on "The Excavations at Irchester Camp"; after which

Sir Henry Dryden read a paper entitled "Records of Restorations." The Society (said Sir Henry) has three functions with regard to old churches:—1. To advocate such repairs and fittings as will make them suited for the service of the Church of England. 2. To advocate such repairs and restorations as will not obscure, but rather elucidate, the history of the particular church, and the history of the art of architecture, and therefore to attempt to guide proposing restorers, and to prevent mutilation and deception. 3. To keep record of such changes and repairs as are made in the structures and fittings of the old churches. It has a function with regard to new churches,—to give opinion on the proposed plans, when asked to do so. The Society has all along paid attention to general archæology. The study of most sciences depends on examples for its great facts, hence it is of great importance that the examples should be trustworthy. Old buildings can be at once divided into those which are not used, and those which are used. The first class is comparatively small in number, and for the most part free from the hands of restorers. The second class is large, and spread over the kingdom. Great was the neglect and wretched the taste of the eighteenth century, but there cannot be a doubt that more harm has been done to British architecture in the last fifty years than in all previous time. The more church feeling has urged men to repair, and the more learned the architects have become when they and their *employés* were not also antiquaries, the greater and more numerous the mutilations and deceptions have become. . . . . There are three ways of looking at old buildings which are used,—the utilitarian view, the architectural or archæological view, and the picturesque view. . . . . In general, the clergy join the utilitarian view to the picturesque view, and ignore the archæological view. . . . . There is no duplicate of an old church or of old woodwork. Restored churches are often rendered valueless as examples. Many difficulties present themselves. We have to guard against mutilation and deception. It is better to say nothing than to tell a lie. He adverted to forms of difficulties. "As we can do but little to check these alterations and changes we should endeavour to keep records with scale drawings when they can be obtained." He quoted part of the address of the president of the meeting of the Archæological Institute at Northampton on this subject, and said he quite agreed with that address, and recommended its perusal to the Society, and that we had better act according to the probable circumstances. In church fittings we must be in part practical. All chairs, tables, stools, &c., do not fit all persons equally well,—they are compromises. There are two matters which have to rule church pewing,—are men to take hats to church, and are congregations to kneel? . . . . There are three positions of the body which go for kneeling in England,—a fourth position is often used abroad. The clergy mostly acquiesce in the second position, which the lecturer called "squatting." There were three advantages in long kneeling-stools over hassocks. He then described the state previous to repairs and alterations, and the repairs and alterations made in five churches near his own residence,—Adston, Moreton, Eydon, Woodford, and Byfield.

The City of London School.—At a recent meeting of the Court of Common Council, a report was submitted by the City of London School Committee relating to the removal of the school, and recommending that one acre and a half at the eastern end of the Victoria Embankment be granted as a site for the new buildings for the City of London School; that the necessary steps be taken forthwith to obtain the sanction of Parliament; and that it be referred back to the committee to obtain such detailed designs, drawings, plans, and estimates as they may think necessary, and to consider the best mode of utilising the present site in Honey-lane-Market, Milk-street, by sale or otherwise, reporting thereon to the Court. It was agreed that the report should be printed and circulated, and the consideration thereof adjourned.

BUILDERS' BENEVOLENT INSTITUTION.

The thirty-first anniversary dinner of this Institution is fixed for Thursday, the 7th proximo, Mr. Edward Conder, president, in the chair. Note should be taken of the change of *venue* from Willis's Rooms, St. James's, to the Freemasons' Tavern, Great Queen-street. We hope the anniversary will be signalised by a list of subscriptions commensurate with the deserts of the Institution, which has recently increased the amounts of its pensions, and has in other ways extended its work of benevolence.

THE THAMES CONSERVANCY AND THE LONDON SEWAGE.

At the meeting of the Metropolitan Board of Works on the 11th inst., the clerk, Mr. J. E. Wakefield, read the following letter from the Thames Conservancy:—

"Thames Conservancy, 41, Trinity-square, E.C.,
October 8, 1878.

Sir,—I am directed by the Conservators of the River Thames to state that, on receipt of your letter of the 23th of May last, they referred the joint reports enclosed therewith, respecting the condition of the River Thames, by Sir Joseph Bazalgette, and Messrs. Lee and Chatterton, and by Mr. Keates, and Dr. Du Pré, to Captain Calver, and to Captain Burstal, secretary, and to Mr. Leach, engineer of this Board, and I am now to forward, for the consideration of the Metropolitan Board of Works, copies of the following documents:—

1. Captain Calver's rejoinder to the joint reports made to the Metropolitan Board of Works by the above-named gentlemen respecting the sewage outfalls at Barking and Crossness.—September 6th, 1878.

2. Observations by Captain Burstal, R.N., on the report of Sir Joseph Bazalgette, and Messrs. Lee and Chatterton.—September 5th, 1878.

3. Remarks by Mr. Leach, Engineer to the Conservancy Board, on the same report.—August 31st, 1878.

A careful consideration of all the documents bearing upon this question has only confirmed the Conservators in the opinion expressed in the letter addressed to you on the 6th of December, 1877, when forwarding Captain Calver's report.

It was there stated that the conclusions arrived at by Captain Calver are correct, and that the Metropolitan Board of Works should without delay carry out the provisions of Section 20 of the Conservancy Act of 1870, by removing such banks and obstructions as have arisen from the flow of sewage at the outfalls.

If the Metropolitan Board of Works still maintain their non-liability to dredge away the deposits complained of, or if they agree with Sir Joseph Bazalgette as to the origin of these deposits, it would then become evident that a difference of opinion, such as that contemplated by Section 24 of the Conservancy Act of 1870, has arisen between the two Boards.

The public welfare is so greatly concerned in maintaining the clear navigation of the Thames and the purity of its water, that the Conservators trust the Metropolitan Board of Works will modify their views of this important question, and not only cause the existing deposits to be dredged away, but also adopt such measures as will prevent the formation of any deposits for the future.

I am, &c.,
E. Burstal, Secretary.

J. E. Wakefield, esq., Metropolitan
Board of Works."

Mr. Roche moved that the communication (together with one from the Town Clerk of the City of London) be referred to the Works and General Purposes Committee, and that the following letter be addressed to Capt. Burstal:—

"I am desired by the Metropolitan Board of Works to acknowledge your letter of the 8th inst., enclosing copies of Captain Calver's rejoinder to the joint report, and the observations and remarks thereon, and to inform you that the same has been referred to the Works and General Purposes Committee for consideration and report. You proceed to state that a careful consideration of all the documents bearing upon this question has only confirmed the Conservators in the opinion expressed in your letter of the 6th of December, 1877, to the effect that the conclusions arrived at by Captain Calver are correct, and that the Metropolitan Board of Works should without delay carry out the provisions of section 20 of the Conservancy Act of 1870 by removing such banks and obstructions as have risen from the flow of sewage at the outfalls. The Metropolitan Board are not aware of the existence of any banks or obstructions which have arisen from the flow of sewage at the outfalls, and they desire me to request that you will furnish them with a plan and section on a sufficient scale showing the position, configuration, and extent of the banks and obstructions which you allege to have been so caused, and which you now formally require the Board to remove by dredging. I shall feel obliged if you will supply me, for the use of the members of the Board, with sixty or seventy prints of the above reports."

Mr. Runtz seconded.

Mr. Leslie moved as an amendment that the letter should be confined strictly to asking for additional copies of these reports, and for a plan showing where the alleged shoals existed.

Mr. C. Legg seconded the amendment; and in the course of the discussion which ensued,

Mr. Fowler expressed the hope that nothing would be done which would have the effect of shelving this question, for a very decided opinion prevailed among the public that something should be done with regard to the discharge of sewage into the river.

Mr. Richardson remarked that this communication from the Thames Conservancy had nothing to do with the state of the water in the river. The question was whether the sewage discharged from the Board's outfalls did leave such deposits at the bottom of the river as to result in the formation of these shoals.

Mr. Selway supported the motion, and thought it the simplest thing in the world to ask the Thames Conservancy exactly what they wanted the Board to do.

Mr. Jackson (of Woolwich) had no hesitation in saying that the shoals at the outfalls both at Crossness and Barking were caused by the sewage, and if they applied to the Thames Conservancy as suggested he believed they would be most happy to point out where these obstructions were to be found. It appeared to him that the Board must do one of two things. They must either filter the sewage before it entered the river, or remove the outfalls lower down the river.

After some remarks from Mr. Cook and other members, the amendment was negatived, and the original motion was carried by a large majority.

CONGRESS OF THE SANITARY INSTITUTE.

Sir,—Permit me, in reply to the article on the above subject in your issue of the 21st ult., to assure you that nothing can be further from the mark than the idea that the Sanitary Institute is intended to interfere with the Health Section of the Social Science Association. The Institute, being an independent body doing regular sanitary work in London, and having at all times under its consideration some sanitary detail or advancement, has no help for it but to hold one or two general meetings in the course of the year. That is essential to its usefulness and work, and the occurrence of its time of meeting near to that of the Social Science Association is simply an accident, for which it is not responsible, inasmuch as the time of meeting was fixed long before the meeting of the Social Science Association for the present year was announced. It is equally unfair to accuse the Sanitary Institute of pillage of the Sanitary Exhibition; in fact, the Social Science Association had itself dropped its exhibitions; and if the Sanitary Institute had not taken up the matter as it did, these useful competitions would have entirely closed.

In the great work of advancement there is room for our Institute as well as for the Health Department of the Social Science Association; and if the Institute supplants that Section of the Association, it is because the subject is more completely in hand in an independent society than in a mere section of an Association so comprehensive in its objects as the National Association for the Promotion of Social Science. Lory Marsh, Registrar.

*** We must leave the public to form their own opinion as to how far the Sanitary Institute attempted at its formation to supplant and make stock out of the Health Department of the Social Science Association. Although several prominent members of the latter were induced to belong to the Institute at first, the *modus operandi* of the Institute has served to convince many that it is a mistake to increase the number of societies for one particular object. It is not correct (Dr. Marsh is probably misinformed) that the Association has relinquished the idea of a Sanitary Exhibition in connexion with their Congresses; indeed, arrangements for an exhibition in connexion with the forthcoming Cheltenham Congress were for some time under consideration.

Knockers for Liverpool Town-hall Door. During the meeting of the Liverpool Town Council, on the 2nd inst., a heavy door-knocker was placed upon one of the tables for the inspection of the members. It was cast in bronze, and apparently represented a figure of Neptune standing upon two sea-horses. The presence of the article was explained by the following communication addressed to the Mayor by Mr. P. H. Rathbone:—

"During your mayoralty the Town-hall doors have been so hospitably and persistently open, that I have hesitated to offer you so apparently useless a gift as a pair of knockers. But, having met at Venice with a pair of knockers, belonging to one of the old palaces, and which a competent judge,—the Rev. Greville Chester,—informs me are the finest pair he has seen, and which, Mr. Leighton tells me, are becoming yearly very scarce and valuable, I do not feel justified in not making my native town the offer for the front doors of the Town Hall, especially as the design might have been specially adopted for that position."

The matter was referred to the Finance and Estate Committee.

WORCESTER GUILDHALL RESTORATION.

ALLEGED SHORT "QUANTITIES."

At a recent meeting of the Worcester Town Council, the following letter from the contractor for the restoration of the Guildhall was read:—

"15, Foregate-street, Worcester,
5th September, 1878.

Dear Sir,—I must request you to lay this letter before the Corporation of the city of Worcester, and give them the notice contained herein at their next meeting. I have, by an agreement dated 1st October, 1877, agreed with the Corporation to restore the Guildhall for the sum of 11,643*l.* 8*s.*, but I was induced to enter into such contract by the statements made to me by the agent of the Corporation (to whom I applied in pursuance of their advertisement of May, 1877) as to the quantities required for the works. These statements I have lately discovered to be erroneous and much understated, and I am unable to complete the works at a price which I agreed to accept relying upon the accuracy of the quantities supplied by the agent of the Corporation. I must, therefore, request that a proper modification be made in the contract price, on account of the difference between the quantities of materials which will have to be used and those which were represented to me to be necessary for the works. If the Corporation will not accede to my request, I must beg to give them notice that I must stop the works and repudiate the contract entirely. I must request the favour of a reply to this letter in the course of fourteen days from this date, for otherwise I shall be very reluctantly compelled to stop the works at the end of that time, and to seek that remedy against the Corporation to which I may be entitled.—I remain, yours obediently,
Thomas Dixon."

The Town Clerk stated that the letter had been laid before the Guildhall Restoration Committee, and they instructed him to reply to it, and he wrote to Mr. Dixon to the effect that the question of quantities was not mentioned in the contract. The advertisement for tenders for the work stated "quantities will be supplied," and they were supplied by Mr. Hawkes, of Birmingham.

Mr. Bozward moved that the matter be referred to the Guildhall Restoration Committee, and asked who endorsed the quantities.

The Town Clerk said he could not tell. He saw no necessity for Mr. Dixon stopping the works. He could complete the work, and then charge for what he had done.

Alderman Wood said that the same quantities had been handed to a certain number of builders, every one of whom put his price to them. He thought the great error was in the price put to the quantities, and not in their deficiency.

Alderman Jones observed that if there was an error in the quantities that was not the proper time to make the complaint, but at the completion of the work.

The motion was then carried.

At a subsequent meeting of the Council, it was, after some discussion, unanimously agreed that, in order to effect an amicable arrangement with Mr. Dixon, [and to prevent a stoppage of the work of restoring the Guildhall, and without prejudice to the legal rights of the Corporation, the Council agree,—on Mr. Dixon continuing and completing the work of restoration of the Guildhall,—to pay him for all work done in excess of that provided for by the quantities prepared by Mr. Hawkes, subject to the allowance for any excess in the quantities as to any work or old materials, the prices to be ascertained according to the bills of quantities priced by Mr. Dixon for his tender, so far as applicable, and that the question of the amount to be paid or allowed in respect thereof be left to the decision of the architect, pursuant to the contract, Mr. Hawkes, and a surveyor appointed by Mr. Dixon, being at liberty to attend before the architect and support their respective views.

GLEANINGS FROM GLASGOW.

Proposed Building Regulations.—The Glasgow Association of House Factors have resolved to strenuously oppose the Provisional Order anent new building regulations becoming law, as they allege that if it were passed 30 per cent. of the property of Glasgow could not be rebuilt in the event of fire or other accidents destroying it. The Association consider that, in view of the proposed regulations, provision should be made for compensating proprietors and others, whose ground and security would be confiscated.

Disposal of Sewage.—A short time ago it was mentioned that a Bill was likely to be introduced into Parliament, having for its object the disposal of the sewage of Glasgow by some method which would keep it out of the Clyde. It is now stated that Mr. Bateman, C.E., is engaged drafting a Bill for this purpose. Mr. Bateman has put forward three alternative schemes. By the first, the sewage would be raised by pumping from the south to the north side, the whole to be taken to Dalmuir, at a cost

of 858,000*l*. The second proposes that the sewage on the north side should be taken to the south, and the whole conveyed to Shiels, in the parish of Govan, at an estimated expenditure of 716,000*l*. The third scheme suggests that the sewage on the north side should be taken to Dalmuir, while that on the south side should be taken to Shiels, the cost in this case being 867,000*l*. These sums do not include the price of land and interference with property, nor do they estimate the cost of dealing with the sewage at the outfall, which may be set down at from 40,000*l*. to 45,000*l*. per annum. The schemes are estimated on a future population of 1,350,000.

The University Hall.—At the Dean of Guild Court, on the 10th inst., plans were passed for the erection of the great hall of the University at Gilmorehill. It will be remembered that the Marquis of Bute some time ago contributed a sum of 40,000*l*. towards the erection of the hall, and so put the University authorities in a position to begin operations. The building, however, will cost considerably more than the sum stated. Sir James Watson (late Dean of Guild), hoped that in a building of that kind the greatest care would be exercised, both as to workmanship and materials. He did not want to say anything about what had been done, but he thought there might be some improvement in that respect.

Fine Art Galleries.—Plans prepared by Mr. Burnet for the proposed Fine Art Galleries in Sauchiehall-street were submitted to the Dean of Guild Court on the 10th inst., but they were not passed, Mr. White, master of works, pointing out that the front line of the building encroached a little on the street. A site has been procured on the south side of Sauchiehall-street, and the building is to have a frontage of 100 ft.

Proposed Industrial Exhibition.—The proposal to organise an industrial exhibition at Glasgow, as suggested by the Earl of Rosebery on the occasion of his recent visit to Glasgow, is being actively promoted. A proposal is stated to have been made by Mr. Cunliffe Owen, C.B., Secretary of the British Commission to the Paris Exhibition, that a special feature in the project should be a complete exhibition of iron and its varied products, and that this department at least should be international, embracing exhibits from America, France, Belgium, and Sweden. The Swedish Commission at the Paris Exhibition has intimated its willingness to send to Glasgow in 1880 the whole exhibits of the process and tests in the manufacture of Swedish iron. The proposal to connect a permanent museum and winter garden scheme with the exhibition has also met with warm support.

Painted Glass in the Merchants' House.—The large windows in the new hall of the Merchants' House, where the Dean of Guild holds his courts, have been filled with stained glass by Messrs. W. & J. J. Kier, of Glasgow. The subject of one of the compartments is "The Letter of Guildry." It represents the occasion, on the 6th of February, 1605, when Sir George Elphinstone, the provost of the burgh, sat in their hall in the old tolbooth, surrounded by the bailies and "great council," and there came before them the commissioners chosen by "the merchant rank," and those chosen by "the deacons and body of crafts," and presented the arrangement come to as expressed in the Letter of Guildry, and asked the magistrates to interpose their consent and authority to it. The other subject represents the first court held by the Dean of Guild. In the corridor of the Merchants' House there are six other windows, containing allegorical subjects filled up with conventional architectural designs in the Cinquecento style.

The Will of Mr. Benjamin Colls, late of 53, Moorgate-street, and of Sutton-common, who died on the 25th of August last at Bray, Wicklow, Ireland, was proved on the 3rd inst. by Mr. William Abraham Colls and Mr. John Howard Colls, the sons, the executors, the personal estate being sworn under 18,000*l*. The testator leaves to his wife, Mrs. Elizabeth Colls, such of his household goods and effects as she shall select, 100*l*., and 400*l*. per annum for life; to his niece, Elizabeth Richardson, and his friend, Jemima Davis, 100*l*. each; to his sister, Mrs. Martha Shaw, an annuity of 50*l*. for life; and the residue of his real and personal estate to his said two sons.—*City Press.*

NEW THEATRES.

Worcester.—The Theatre Royal, Worcester, opens on Monday next, having been rebuilt, with the exception of the greater part of the main walls, after destruction by fire. Increased means of entrance and exit have been provided. The sun-burner has been provided and fixed by Messrs. Strode & Sons. The proscenium, ceiling, &c., have been elaborately decorated by Mr. E. Bell, of London. The architect is Mr. C. J. Phipps; Messrs. Wood & Sons, of Worcester, were the contractors; Mr. Greenway, Worcester, supplied gas-fittings; and Mr. R. Jefferies, of London, has acted as clerk of the works.

London.—On the 2nd inst., Mr. Lecock Webb, Q.C., and Mr. Young, moved before Mr. Justice Hawkins, sitting as Vacation Judge, on behalf of the "Alcazar," Limited, for an injunction to restrain Mr. John Baum, late of Cremorne Gardens, from applying to the magisterial authorities for a licence to use the Holborn Amphitheatre for musical and other entertainments under the name of The Alcazar. The plaintiff company was recently incorporated with a capital of 100,000*l*. for the purpose of purchasing Savile House, Leicester-square, and other property, and building there an immense theatre and Parisian *café*, of the character of the well-known Paris Alcazar, the name of which the company has adopted. On the 6th ult. the company's prospectus was registered at Stationers' Hall, under the name of the "Alcazar." The company alleged that the defendant was about to use that name for his place of entertainment, and that they had already acquired a property in that name. An interim injunction was granted, and on the hearing of the motion, on the 12th inst., Mr. Justice Manisty held that Mr. Baum had an inchoate right to the title of which nobody by the forming a company could deprive him, and dismissed the motion with costs.

BUILDINGS FOR POOR-LAW ADMINISTRATION.

Birmingham.—The foundation-stone of the schools and cottage homes which are being erected by the Birmingham Board of Guardians at Marston Green was laid on the 8th inst. About twenty acres of land have been obtained, at a cost of 140*l*. an acre, and it is intended to erect schools, workshops, cottage homes, an infirmary, and a head-master's residence. There will be three schools, one for boys, one for girls, and another for infants. In the workshops instructions will be given in shoemaking, painting, carpentry, baking, &c. There will be fourteen "homes," each of which will accommodate thirty children. Each home will be presided over by a man and his wife, who will be styled the "father" and "mother." The homes will consist of a dining and play room for the children, and a sitting-room for the "father and mother," together with a kitchen and scullery, and dormitories. Each home will be constructed in the form of a Maltese cross, and every room is of the same dimensions, viz., 16 ft. by 20 ft. The washing in connexion with each home will be undertaken by the children,—boys or girls, as the case may be,—composing the "family." The infirmary will contain four wards. It is estimated that the buildings will be completed in about fourteen months, and that the total cost will be 20,000*l*. Mr. W. N. Horneyard, of Birmingham, is the architect; and Mr. W. Robinson, of Birmingham and Worcester, is the contractor. As will be gathered from the foregoing particulars (for which we are indebted to the *Birmingham Gazette*), the Birmingham Poor-Law Guardians are about to initiate an important experiment in the education of pauper children,—an experiment which, we hope with Mr. Muntz, will be productive of large results in the depauperisation of pauperism.

Clayton.—The new infirmary erected in connexion with the North Bierley Union Workhouse at Clayton has been completed. It occupies a position detached from the main building, having its principal frontage to the east, but being equally open to the west. The wards occupy the entire breadth of the building, and have windows on each side. The length of the new building is about 240 ft., and the interior width of the wards 25 ft. The accommodation provided is estimated at seventy-two beds. The style adopted in the exterior is Italian. The plans were prepared by, and the works have been constructed under the superintendence of, Mr. John Drake, architect, Queensbury, the following having been the contractors, viz.,—Messrs. Balmforth & Reece, masons; John Patchett, joiner; Abraham Hill, slater; J. S. Stead, plasterer; Henry Crowther, plumber; E. & B. Briggs, painters. The entire cost has been about 9,000*l*.

OBITUARY.

Mr. John Walker, Builder.—The death is announced of Mr. John Walker, one of "the pilgrim fathers" of Birkenhead, and the builder of nearly all the principal streets, including Hamilton-square, in "the City of the Future." He was a member of the first board of Birkenhead Commissioners in 1833, and held that position for twenty years; after which he retired from business, and has since devoted himself to farming at Storeton, near Bebington, where he died on the 12th inst., in the eighty-sixth year of his age, having been born at Carphin, in Fife, in 1792.

Mr. H. Gandy Cole, C.E.—We mentioned last week (p. 1077) the accident at the Moorswater Viaduct, on the Cornwall Railway, by which the engineer, Mr. Gandy Cole, lost his life. "Cornubian," in the *Cornish Telegraph*, gives some particulars of Mr. Cole and his brief career. Although he had not yet reached his twenty-fifth year, he was, after having designed and superintended the building of a stone viaduct near Bodmin-road, called upon to design the greater work across the valley at Moorswater. When tenders were invited, the lowest exceeded his estimate by several thousand pounds. The result was that the Great Western directors resolved to build it themselves, giving Mr. Cole entire charge of the work, not only because they believed in his estimate, but in order to insure thoroughness in the work. Only a few days before his death he spoke proudly of it as the largest stone viaduct in the country, being 130 ft. high, with eight arches of 80 ft. span; and told how the crane, by which he afterwards met with his death, was so nicely constructed and controlled.

ENCLOSURE OF ANTIQUITIES.

Dunse.—A few years ago (says the *Kelso Chronicle*) attention was called to the propriety of enclosing and preserving the "Covenanters' Stone," an interesting relic of the encampment on Dunse Law of the great army of Covenanters, numbering somewhere about 30,000, under the command of General Leslie, in June, 1639, as numerous and frequent visitors had adopted the practice of chipping off and carrying away pieces as mementoes of their visits, until the stone was under the level of the surrounding turf, and which had nearly closed over it. It has now been enclosed, the surrounding turf which had recently covered it has been pared away, and its surface again presents the same form that it did when it stood about 2 ft. 6 in. above the ground. Its original form was oblong, measuring nearly 5 ft. by 2 ft. 6 in. The stone itself is an obtruding piece of the old red sandstone, highly metamorphosed through the action of heat, resting upon the subjacent trap or greenstone, of which the hill, as well as some of the surrounding hill, are composed.

Roman Camp at the Lawe, near South Shields. At a recent meeting of the South Shields Town Council, upon the proposition to expend 425*l*. upon enclosing the site of the Roman Camp at the Lawe, Mr. Shotton moved that it be struck out. He was quite astonished that any person should propose the expenditure of such a sum in connexion with a few old stones. He hoped he would never again hear of the Roman remains in that Council. Mr. Wardle seconded the proposition. Ald. Williamson hoped they would not for 425*l*. allow South Shields to sever its connexion with ancient Rome. The Ecclesiastical Commissioners had behaved in a most liberal manner to the town, and the Council ought not to allow anything to be done to slight their offer. Mr. Bowman suggested that the matter be done by subscription, and presented to the town. The motion was afterwards lost, and an amendment (to allow the vote) was carried.

TO CLEAN LEAD.

SIR,—Will some of your correspondents tell me what is the best way to clean leaden milk-pans? My dairywoman has used salt, which seems to bring off a blackness.

BETA.

THE OBELISK.

Sir,—Is it not rather unsatisfactory, if not alarming, to hear of Sir Joseph Bazalgette reporting that our granite obelisk is already decaying from the effect of the gases of the London atmosphere, when he has but recently completed the costly Thames Embankment in that material? Egyptian Syenite obelisks have hitherto been considered the most durable monuments the world has produced. May we not, then, ask, in some alarm,—Is the Embankment decaying, and does Sir Joseph confess to having made a mistake in using this material in its construction?

We must all hope that there is some mistake in the evidence on which the report has been made.

May not the effects observable upon the obelisk be due to the salts of sea-water absorbed during its voyage to this country, or when lying exposed on the Thames? The Egyptians were well aware of the effect of salt on granite, and consequently never used it underground. Experience of the durability of granite in London is both ample and conclusive. London Bridge, the York Column, the Crimean monument in Westminster, the Nelson Column, and numerous other granite structures, varying in age from nearly one hundred to twenty years, are in perfect condition. No person ever heard of the proposal to apply chemical nostrums to their surfaces. Many of our decaying stone buildings have been so treated, but, unfortunately, with no good result. Under these circumstances it is very satisfactory to hear that the report is referred back for further inquiry and information. There is a national interest in the obelisk, and, therefore, before the "stone solution" is applied, it would be satisfactory to be informed *where* it has been used, upon what material, and *when*, inasmuch as time is an important element in the test.

I think I have read that the Egyptian obelisks were burnished, and it is, perhaps, partly to this that their durability is due.

If so, should not this have been done before ours was elevated? The cost is about 2*s.* 6*d.* per foot super. Henry Travis.

SANITARY SHORTCOMINGS.

Newlyn.—A correspondent of a West of England paper calls attention to the insanitary condition of Newlyn, which, with its 3,000 inhabitants, has, he says, "absolutely no system of drainage. Open drains and dirt-heaps abound, and the result is that fever has become endemic in our midst. . . . The Medical Officer of Health has presented a very strong report to the Sanitary Authorities. All they do is to send round an old man with a cart, who skims the top of the dung-heaps, and leaves the rest to decompose in the sun, and pretty much the same operation is performed upon the open drains. A few years ago (four or five) an officer from the Sanitary Department of the Privy Council inspected the village, and reported very strongly on the subject; but all to no purpose. The persons who ought to move in the matter are silent, for fear of giving offence."

Leith.—At a meeting of the Edinburgh and District Water Trust on the 10th inst., the Clerk read a letter from the Town Clerk of Leith, dated the 2nd inst., complaining of scarcity of water in Leith. Mr. Coyne explained that all the water which the pipe could possibly carry to Leith was being sent, and that there was always a deficiency of supply in some localities there owing to the cisterns being wretchedly small. Mr. Garland said there was a general scarcity of water in Leith,—in fact, the streets where it was felt were too numerous to mention. Amid some laughter he exhibited a centipede which had been drawn off with some water on the previous night by the Medical Officer, and said that perhaps some girl might have drunk that and lost her life in consequence. If a constant supply of water were kept on, it might prevent these nasty reptiles, as he might call them, being sent into their tanks. On the suggestion of the Lord Provost, the matter was remitted to the Works Committee to inquire, and with powers to provide an additional supply if necessary.

Musselburgh.—At the close of the Court held on the 9th inst. at Musselburgh for the registration of voters, Sheriff Davidson, who presided, asked,—"Who looks after the sanitary matters of the town?" Mr. Macfarlane (Town Clerk.)—"The Local Authority, which the Town Council constitutes." The Sheriff.—"Have they any officer?" Mr. Macfarlane.—"They have a sanitary inspector, Mr. Turnbull." The Sheriff.—"He had better be set to do his business. I never saw a dirtier place in my life,—from Newbigging townwards." Mr. Turnbull subsequently waited upon the Sheriff and explained to his lordship that the sanitary condition of the district in question was due to the fact that residents there, as elsewhere in the town, had nowhere to empty filth except in the gutters in front of the houses. The gutters, it was further stated, were swept thrice daily.

ARBITRATIONS.

Ryde.—On the 10th inst. Mr. J. Soames, Under Sheriff, opened a court in the Town-hall, Ryde, I.W., for the purpose of arbitrating in a dispute between Mr. R. C. Spencer, of Ryde, and the London, Brighton, and South-Coast, and South-Western Railway Companies, respecting the value of two houses in Melville-street, called Nos. 1 and 2, Chester House, which the companies require for the purpose of carrying out their new works. A jury having been sworn, proceeded to view the premises. The evidence was long and conflicting, Messrs. F. Newman, T. Dashwood, and J. Binfield Bird, and Mr. W. H. Wallis, giving various estimates of the value of the houses, the general average being 2,456*l.* Mr. Virgoe Buckland, surveyor, Mr. Stephenson, of the firm of Hunt, Stephenson, & Co., Mr. R. C. Driver, Whitehall, and Mr. Thomas Hellyer, architect, of Ryde, all gave much lower estimates, averaging 1,498*l.* The jury gave a verdict for 2,000*l.*, the railway companies to pay costs.

Shoreham.—At a meeting of the Shoreham Harbour Trustees, on the 8th inst., the clerk read the award of M. A. Easton, the arbitrator in the matter in dispute between the trustees and the late contractors, which ordered the trustees to pay 8,755*l.* 11*s.* 9*d.* of the amount claimed, 9,145*l.* 3*s.* 3*d.*, together with 95*l.* 14*s.* 4*d.*, being half the costs of the award.

ACCIDENTS.

Landslip at Huyton.—An inquest was held on Monday last at Huyton, Cheshire, on the bodies of Michael Kelly, aged twenty-one, and Thomas Dunne, twenty-eight, who were killed in a recent landslip at some sewerage works in progress near Sandy-lane, Huyton, at which also, three others were injured. It appeared from the evidence that 30 ft. in length of the trench had fallen in, and that no shores were used. Mr. G. Rayner, of Bootle, contractor for the sewerage works, was called, and deposed that the cutting which fell in was commenced on the previous Tuesday. He had no reason to believe that timber ought to have been used for shoring up the sides of the trench where the fall took place. There was first about 1 ft. 6 in. of sand, under which was a bed of shale about 10 ft. in depth, and after that the solid rock commenced. After deliberating together for some time, the jury returned a verdict that the deceased had come to their deaths by the accidental fall of earth.

Fall of a Steam Lift.—On the 10th inst., one of the steam lifts used by Messrs. Cook, Son, & Co., of St. Paul's Churchyard, for the conveyance of persons and goods to the respective floors of the warehouse, fell with a loud crash. It appeared that some part of the engine by which it was worked suddenly broke, and the lift being at the top of the building, a height of about 60 ft., was precipitated with its contents to the bottom. A boy who was driving it at the time was so much hurt that he died almost immediately. A woman named Green had both legs broken.

Slung Platform Scaffolds.—An inquest was held at Woolwich on the 12th inst., on the body of James Richards, aged 39, employed as a driller at the pier extension works at Beckton Gas Works, North Woolwich. The evidence showed that, on the previous Thursday deceased was working upon a scaffold 30 ft. above the river, drilling a hole in an iron girder. He was suddenly missed by a companion, who, looking down, saw only a man's hands above the water, and a couple of short planks upon which deceased had been standing were floating away. It was surmised that the planks, which formed part of a sling-platform, had slipped from a ledge upon which they had been resting, and that the deceased fell feet foremost, and stuck in the mud, the tide being low. An attempt was made to rescue him, but some time was occupied in getting a boat, and the deceased had then disappeared. A model of the scaffold was produced at the inquest, and it was stated that every precaution was taken; but the coroner and jury were of opinion that the slung platform was a cheap and careless contrivance, which might have been made quite secure with a little trouble. Verdict: "Accidental death."

MASTERS AND MEN.

Birmingham.—On the 11th inst. the sheet-glass makers concerned in the dispute at Messrs. Chance's glassworks, Spon-lane, had a meeting, and resolved to strike. They afterwards had an interview with the masters, to whom they communicated this fact, and the masters, on the other hand, said they were determined to close the works. Under these circumstances, about 750 people will be thrown out of employment. It is expected that the men will come out on strike this Saturday, October 19th.

Edinburgh.—At a numerously-attended meeting of master joiners, Mr. John Smith in the chair, it was unanimously agreed that owing to the present stagnant state of the trade, immediate intimation should be given to the operatives that, on and after Friday, October 18th, a reduction of ½*d.* per hour will be made on the present rate of wages, making the rate in future 7½*d.* per hour for competent workmen.——It is stated that one of the largest employers of labour in the Edinburgh building trade has given notice of a reduction of 1*d.* per hour on the standard rate of wages at present paid to operative masons, a corresponding reduction being at the same time intimated on the wages of the labourers. Six months ago the operative masons submitted to a reduction of wages from 9*d.* to 8*d.* per hour, so that the one now in question will bring the rate of payment down to 7*d.* per hour, while the wages of the labourers will be at the rate of 4½*d.* per hour.

Aberdeen.—The carpenters' strike continues. Representatives of the Operatives' Society are said to be watching every steamer arriving in Aberdeen that is likely to bring workmen from other quarters. One firm is stated to have engaged from forty to fifty men in Glasgow, and arranged that they should come through to Aberdeen by the train due there at 3·20 on Tuesday morning in last week. The men were met at Glasgow by persons understood to be in co-operation with the Aberdeen Trades' Society, and the result was that only fourteen reached Aberdeen.

Staffordshire Iron Trade.—Mr. Chamberlain, M.P., as president of the South Staffordshire Iron Trade Wages Board, has, as arbiter, decided that wages should be reduced 5 per cent., or 6*d.* per ton for puddling, the reduction to take effect from the 21st inst., the rate now settled to be subject to reconstruction by the Board at any time on one month's notice by either party.

ARCHITECTURE IN GERMANY.

A large number of German and foreign architects are expected to pay a visit to Berlin towards the end of October, when several events of interest are to come off. Among these is the public exhibition of the competing plans for the new Kaiser Wilhelm University of Strasburg. At the same time the general Fine-Art Exhibition, to which a variety of plans, designs, and objects of importance to architects have been contributed, will be opened. A third Exhibition of interest will be that of architectural monuments and other remains of ancient Greek art discovered in the wonderfully successful operations conducted under the auspices of German *savans*, and at the expense of the German Government, in Olympia. The Society of Architects of Berlin are already making preparations to render the visit of their brother professionals from a distance a pleasant one by securing them facilities for the inspection of public edifices and collections, as well as by entertaining them at a special festival in connexion with the first of the series of social reunions of the Society during the coming winter season.

Dean of Guild, Edinburgh.—At a meeting of the Council of the Edinburgh Guildry on the 10th instant, it was unanimously resolved to recommend for re-election Mr. John Smith as Dean of Guild for the ensuing year.

GLASGOW INSTITUTE OF ARCHITECTS.

The eleventh annual general meeting of the Glasgow Institute of Architects was held on Tuesday afternoon, in the offices of Mr. William Maclean, the secretary, at 196, St. Vincent-street, Mr. John Burnet in the chair.

It appeared from the report for the year, which was adopted, that the members numbered forty-nine, and that while two had been added to the roll, one had died. The laws of the Institute had, it was stated, recently been amended, "so as to mark still more decidedly the Institute's disapproval of architects having any pecuniary interest in any trade contract for their clients, except what they directly receive from such clients." It was thought that this rule was calculated to promote a higher standard of conduct in all professional relations. The gold medal for the encouragement of good draughtsmanship among the pupils and assistants of members had, it was reported, been gained by Mr. A. J. Russell, of the office of Mr. D. McNaughtan, for a drawing of Paisley Abbey; and a prize given by the president for the same purpose had been gained by Mr. J. Robertson, of the office of Mr. J. L. Cowan. It was mentioned that the Institute had sent Messrs. Honeyman and Douglas as a deputation to the Town Council to urge that a matured General Building Act was required in the public interest. The report, in conclusion, expressed the hope that a greater number than had yet joined the Institute would now identify themselves "with members of the profession who pledge themselves to resist the vicious system of double commissions and other temptations to partiality in the exercise of their onerous professional duties."

It was intimated by Mr. James Sellars, jun., the treasurer, that the funds were in a satisfactory condition.

The following gentlemen were then elected members of the council for the ensuing year, viz., Messrs. William Forrest Salmon, Alexander Petrie, J. L. Cowan, James Thomson, John Baird, John M'Leod, Matthew Forsyth, Campbell Douglas, John Honeyman, and R. A. Bryden.

The newly-elected council, at a meeting later in the day, chose the following office-bearers for the same period:—Mr. Campbell Douglas, president; Mr. James Thomson, vice-president; Mr. James Sellars, jun., treasurer; Mr. Wm. M'Lean, secretary; and Mr. John Burnet, auditor of professional accounts.

ARCHITECTURAL ASSOCIATION.

Syllabus of Papers.

1878.

October 25.—Opening *Conversazione*.
November 8.—Address from the President. Mr. H. L. Florence.
November 22.—Windows. Mr. Aston Webb.
December 6.—Organs and their Treatment. Mr. Somers Clarke, Jun.
December 20.—Discussion. Architect, or Architect and Surveyor. To be opened by Mr. A. Payne.

1879.

January 17.—
January 31.—Hotels and Restaurants. Mr. F. J. Francis.
February 4.—The International Congress of Architects at Paris. Mr. R. P. Spiers.
February 28.—Trimmings. Mr. E. W. Godwin.
March 14. The Schools of St. Luke, at Ghent. Mr. W. H. James Weale.
March 28.—Party Walls: The Law and the Practice. Mr. Thos. Blashill.
April 18.—Members' *Soirée*.
April 25.—Ancient Paris. Mr. G. H. Birch.
May 9.—Notes on Measuring Old Buildings. Chiefly intended for students. Mr. J. Neale.
May 23.—Late Wrought Ironwork. Mr. W. Penstone.
June 6.—A Tour on the Continent. Mr. H. W. Pratt.

CIVIL ENGINEERS AND DOUBLE COMMISSIONS.

We have been requested to give publicity to the following letter:—

Sir,—The Council of the Institution of Civil Engineers have been informed that a statement has been made to the Clyde Trustees, that civil engineers are in the habit of receiving double commissions,—that is to say, from their employers, and from the contractors engaged to do the work.

I am requested by the Council to give the most unqualified contradiction to this statement; and to add that, in the opinion of the Council, such a practice would be distinctly dishonest, and would constitute a disqualification for membership of this Institution.

James Forrest, Secretary.

Engineering Appointment.—Mr. Alex. Fraser, at present gas and water engineer, Barrow-in-Furness, has been selected out of above forty competitors, to be chief engineer of the Bolton Gas Works.

Books Received.

A Descriptive Treatise on Mathematical Drawing Instruments, &c.: with Hints upon Drawing and Colouring. By W. Ford Stanley, M.R.I. Fifth Edition. E. & F. N. Spon, London and New York. 1878.

The author of this useful little book, whose name is familiar to all who have to do with drawing-instruments, observed in the preface to the first edition of the work (published twelve years ago), that he had been convinced of the want of such a book by the fact that much of his time was occupied in answering letters requiring descriptions of the character and use of instruments which, on account of their extensive use by some of the profession, ought to have been known at least to all. The fact that his treatise has reached a fifth edition may justify the conclusion that this ignorance in regard to the subject must be to some extent enlightened by this time, for the book contains plenty of information, very clearly given in a brief and comprehensive manner, and we make no doubt that a continued sale will be found for it, on account of the convenience of having all the requisite practical information in regard to drawing-instruments and their work thus collected into a single small volume. The value of the book is increased by the considerate and critical spirit in which it is written. The author, who is mathematical-instrument maker to the Government, the Science and Art Department, the Admiralty, &c., brings to his task abundant practical knowledge, combined with judgment and common sense: his remarks furnish to some extent a critical guide as to the choice of instruments; the various instruments invented for some special object are compared, and their merits and demerits summed up, and they are recommended, or not, accordingly. Even in regard to implements which are his own special invention, Mr. Stanley, with admirable candour, states their faults or imperfections, leaving the reader to judge whether these are overbalanced by their advantages: a temper which is unfortunately not very common with those who write on matters in which they are personally and professionally interested.

Even to those to whom drawing-instruments have long been "familiar beasts," there is a great interest in looking through Mr. Stanley's pages, and taking a general survey of the many beautiful and delicate contrivances which have been made to assist the draughtsman in bringing his work as near to perfection as possible. The consideration of them tends to give one a great respect for fine and precise drawing, as an art in itself too much neglected and depreciated in the present day, among architects at least. The finest drawing at present,—"finest" in the sense of being precise and minutely exact,—is probably turned out by mechanical engineers, to whose work mathematical accuracy is a necessity. Some of the civil engineers keep up very fine drawing, and take a pride in it, but we believe that even in their profession drawings are in many cases (for railway work, for example) made with a roughness and want of finish which would have once been thought almost immoral. That this is the case with a large number of the architects, especially the younger generation, it is almost needless to remark. They look on it with the feeling with which Hamlet confesses that he had looked upon penmanship,—

> "I once did hold it, as our statists do,
> A baseness to write fair:"

though it appears he acquired the art nevertheless. There is no doubt that in the days when fine and exact drawing was *de rigueur* with the architect, there was a great deal of very dull designing drawn out with a care and labour worthy of a better cause. Perhaps it may be that the kind of temperament which goes to produce picturesque architecture is incompatible with that which leads to scrupulous care in drawing. There is no doubt which quality is of the most value to the world; still, we confess to being discontented sometimes with the slap-dash style in which what are called working drawings are so often turned out now: drawings from which no one could really "work," except by the help of the appended measurements, which cover such a multitude of sins. The perfection of a geometric elevation is attained when parts and details can really be scaled from it with accuracy, within the limits of dimensions that are distinguishable by the naked eye. In first-class drawing, the profiles of mouldings ought to be distinguishable on a very small scale, and with the old schools of architectural draughtsmen it was an object that they should be so. Nowadays, a sort of approximate scratching is made on the profile of a cornice, or the longitudinal lines are drawn through, "and there an end."

We may just make some brief comments on one or two points that strike us in Mr. Stanley's book. In the chapter on the most used of all drawing instruments, the drawing-pen, we notice a pen with a crank-shaped handle, which the author says has much pleased some draughtsmen, though we cannot think it would be so steady in working as the straight handle. The object is to keep the hand from interfering with seeing the action of the pen while drawing a line. The very simple improvement of having a square holding-piece on the ivory handle, so as to preclude any danger of the pen turning at all in the hand while making a line, was of real value, and we have been surprised not to find this form of handle universally used. There is one little direction in regard to the pen, by the way, which may be amended; it is said that the pen should be wiped by "passing a piece of folded paper" between the nibs before putting it away; it should be *blotting*-paper: ordinary paper does not bring out all the ink. The patent needle-holder figured at the end of the following chapter is worth attention, and would save a good deal of trouble.

In the chapter on "Dividers and Compasses" we very much question whether the application of wax to the working surfaces of the joints in these instruments is not a degeneracy from the highest traditions of workmanship; our impression is that the best work ought to be, and used to be, independent of this aid for the perfect action of the joint. The author's "Brick Gauges," for pricking off the proportionate thicknesses of brick walls for the most usual scales, are useful little things, and might tend to ensure greater accuracy in drawings in this respect; one often finds on a plan walls of which it is difficult to say whether they are meant for 9 in. or 14 in. The author has a theory of his own as to the best form of divider points for keeping sufficiently sharp and not piercing the paper; the extreme end is formed in a rather obtuse cone, of which an enlarged illustration is given to show the make. We agree with the author that points are often made too thin and sharp in these instruments; and we should go much further than he does in the denunciation of movable needle-points; they are always giving trouble through not being perfectly firm. We do not much admire his model of spring bows: the handles are too short, and they are not elegant in appearance, and we must be allowed to add that our practical acquaintance with them has not had satisfactory results. In the matter of appearance, by the way, we are often struck with the want of elegance in the proportion and finish of instruments in the present day, as compared with the best make of *the* old firm, Elliott's.

An instrument for satisfactorily and easily striking arcs of large surfaces where they cannot be struck from the actual centre is a great desideratum. How much time one has known to be lost over the describing of one such arc in a drawing, where it was necessary to find a surface large enough for the radius, and then to manage some sort of *extempore* means of describing the arc. Mr. Stanley delineates a "centrograph," so called, apparently, *quasi lucus a non lucendo*, because it will draw an arc of a circle without finding the material centre, the instrument being set for the required arc. He admits, however, that it is far from perfect in its operations, so far as readiness and ease in use are concerned. The Heliograph, an instrument for producing spiral lines, has, it is to be feared, lost much of its use and glory now that the Ionic volute is so seldom used. A section is devoted to the "antigraph," a very elaborate-looking instrument for drawing a symmetrical design on either side of a centre line, simultaneously, and with supposed mathematical accuracy; but as this entirely depends on its travelling straight on its wheels, we have not much faith in it, nor in any drawing-instrument in which wheels or rollers are an element; they may at any time take a slip which is probably unnoticed by the draughtsman until he finds out that his result is inaccurate. The roller parallel-ruler is a most useful instrument, no doubt, for the subordinate lines of a drawing,—more so, in fact, than it generally gets credit for,—but no one can for a moment trust it for

main lines, and it requires continual correcting and testing by reference to these. In the same way Mr. Stanley proposes that the rolling centro-linead, with wheels of different (proportional) diameter, should be worked always from a fixed starting-line on the drawing. We should never trust it, even under those circumstances, where accuracy was an object.

Our space will not allow us now to go further into detail here in regard to this very useful book, though some of the special subjects suggest a great deal which might perhaps be said on another occasion and in another form. We may mention, in conclusion, two little instruments which Mr. Stanley has been good enough to send us, intended for assisting in perspective sketching: the one, looking like a small pocket centrolinead of ivory, is intended to enable the sketcher to get the precise apparent angle formed by two lines having different vanishing points, and transfer it at once to the paper; and the other, a foot-rule with very large figures, is intended to be held at arm's length and to measure the apparent relative lengths of lines; the edge of the rule being notched at each figure to facilitate its projection by the eye against the object to be drawn, while a piece of cord attached to the centre, with an ivory button at the other end to be held between the teeth, ensures the rule being kept at the same distance from the eye during the measurement: in fact, it is the old "dodge," so familiar to artists, of the pencil and pocket-handkerchief, in a more genteel form. We do not recommend the habit of trusting to these artificial aids in sketching (nor, we gather, does the author), but in making a view of a difficult interior they may lawfully save some time and trouble by enabling the sketcher to be certain of his main lines and dimensions before filling in the detail.

CONTRACTORS' CLAIM FOR EXTRA WORK, HYTHE.

Sir,—I observe in your paper of the 5th instant a paragraph which does a great injustice to Messrs. Lucas & Aird. No claim for upwards of 10,000*l.* extra has ever been made or sent in.

The facts are that Messrs. Lucas & Aird undertook the drainage, and although no doubt considerable losers, carried out the works in a most complete and satisfactory way. The cost of the extra pumping, with other works which the contractors submitted for the consideration of the Council, amounted to 3,500*l.*, not 10,000*l.*, as stated, and even this was not submitted as a claim; but the Council were asked, for the reasons stated, to meet the contractors to that extent. The Council expressed no opinion as to the mode of carrying out the works involving the additional cost, or as to the course the contractors would have pursued had the contract been a favourable one. General regret was expressed that any loss should have occurred, but in the presence of the contract, and of the engineer's report, the council felt they were powerless.

George Wilks, Town Clerk.

*** Our paragraph was condensed from statements reported to have been made at a meeting of the Town Council.

PARIS EXHIBITION.

Sir,—We note in your last issue that Messrs. Howard state that the stove made by us for the Paris Exhibition was exclusively their own. This we deny, as previously to our undertaking to make it for them, it was expressly stipulated we should be joint exhibitors.

Verity Brothers.

*** We cannot carry this matter further.

CHURCH-BUILDING NEWS.

Barrow-in-Furness.—On the 26th ult. four new (temporary) churches, built by private subscription, were opened in Barrow-in-Furness. Previously to the erection of these new edifices there were but three Episcopal churches in the town for a population of 4,000 people. Two of the old churches were built and endowed by the Dukes of Devonshire and Buccleuch, and several gentlemen connected with large works in the town, while a third,—St. Paul's,—was raised by public subscription. The Bishop of Carlisle, in a sermon preached two years ago at Barrow, pointed out how essential and necessary it was to extend the church accommodation in the town, and a movement was set on foot by Sir James Ramsden and other gentlemen with this object in view. After mature consideration, it was determined to build four new churches in various parts of the town, and to dedicate them to the four Evangelists. A sum of 24,000*l.* was required to carry out the scheme, each church and parsonage to cost 6,000*l.* The Duke of Devonshire gave 12,000*l.*; the Duke of Buccleuch, 6,000*l.*; Mr. H. W. Schneider (Mayor of Barrow), 1,000*l.*; Sir James Ramsden, 500*l.*; and the remaining 4,500*l.* have been given by ladies and gentlemen interested in the large industries which have been the means of creating the town. It was resolved that temporary churches should be erected in the first place, and permanent parsonages, but it is ultimately intended that permanent churches shall take the place of the temporary edifices. The churches are constructed of wood and brick, and embrace the ordinary church arrangements,—chancel, nave, and north and south aisles. Their extreme length is 102 ft., and their breadth 50 ft. The sittings are open, and afford accommodation in each church for 520 worshippers. The length from the floor line to the top is about 40 ft. The churches are lighted from the clearstory. Messrs. Paley & Austin, of Lancaster, were the architects.

Crofton (Hants).—This church, built in a central situation, on a site the gift of Mr. Montague H. Foster, to take the place of a very small and dilapidated structure some distance from the population, has just been completed, and was consecrated on the 2nd inst. by the Bishop of Winchester. It is built of flints, with Bath stone dressings, lined on the interior faces with Isle of Wight primrose-coloured bricks, pointed with pink mortar, and consists of a nave of six bays, with clearstory and north and south aisles. There is a raised chancel, having vestry to the north and organ-chamber to the south, while at the north-west angle is the base of a tower, over which is a temporary cot, with one bell. The church holds 550 persons, and is fitted with stained deal open seats. The roof is open-timbered, with curved ribs resting on carved stone corbels, that to the chancel being boarded and panelled. The reredos, the gift of the Marchioness of Bath, is of Canterbury tile, with super-altar of alabaster, all executed by Messrs. Minton & Hollins. There is a handsome brass lectern, the gift of Lady Sykes. The organ (by Bevington) is the gift of Sir F. H. Sykes, bart. The font is of Caen stone, with shafts of Irish marble, and is the gift of the Hon. Miss Baring. The pulpit is of oak, executed by Mr. Hammer. The floors are paved with tiles, also by Minton; and there is a complete heating apparatus by Mr. Grundy. The style is Transitional, of the thirteenth century, freely treated. The builders are Messrs. Plummer & Gamblin, of Fareham; and the whole has been carried out from the designs of Mr. T. Goodchild, architect.

Grosmont.—The parish church of St. Nicholas, Grosmont, Monmouthshire, was re-opened on the 19th ult., after the restoration of the transepts. The church had for many years been fast going to decay, when the late incumbent commenced the restoration of the chancel, and the Eleanor chapel on the south side, which were restored some years since, under the superintendence of Mr. J. P. Seddon, architect. At this time the tower arches, which had been the chief source of danger to the edifice, were threatening to fall, and they were carefully shored, up and rebuilt. After this very little was done for some years, when the present incumbent, the Rev. R. J. Duncan, caused plans to be prepared by Messrs. James Seward & Thomas, architects, Cardiff, for the restoration of the whole remaining portion of the edifice. The work just completed includes the partial re-erection of the transepts, the re-roofing, and fitting them with open-timber ceilings; new ceiling to the tower, and a new stone and alabaster pulpit. The contractor for the work to the transepts is Mr. Thomas James, of Abersychan; the cost has been about 500*l.*

London.—The Church of St. Augustine and St. Faith, which stands at the corner of Watling-street and Old Change, has been repaired and decorated under the superintendence of Mr. A. W. Blomfield. The south and west galleries have been removed, and by throwing the lobby into the church almost as many seats have been gained upon the floor as were formerly available in the galleries. The windows have been improved. As to the decorations, the roof is treated principally with greyish blue, white, and gold; the walls with sage-green, relieved by bands of other colours, charged with festoons of fruit, flowers, &c. The reredos has been cleaned, restored, and coloured, and upon its panels has been painted a picture of the Ascension, flanked by figures of St. Augustine and St. Faith. A mosaic pavement has been laid in the sacrarium by Messrs. Simpson & Co. The decorations have been designed and executed by Messrs. Campbell & Smith, and the builder's work is by Mr. Walden.

Monteith.—The new parish church at Port of Monteith has been opened for worship. The style is that of the middle of the thirteenth century. The architect was Mr. Honeyman, of Glasgow, and the contractors were Messrs. Lyall & Leckie (Glasgow), masons, joiners, and plasterers; Buchanan (Kippen), slater; and Carson (Stirling), painter. The stained glass of the east window is by Adam, of Glasgow.

Bassenthwaite Lake.—On the 24th ult. the Bishop of Carlisle consecrated a new church and burial-ground at the village of Hause, at Bassenthwaite. The church, which is dedicated to St. John the Evangelist, comprises nave, 62 ft. by 25 ft.; apsidal chancel, 24 ft. by 21 ft.; organ-chamber, vestry, south transept, with bell-tower and spire at east angle 90 ft. high. The external walls are faced with light grey shoddies, and all dressings are in Howrigg stone, from near Carlisle, the roofs being covered with green Langdale slate. Internally, the walls throughout are faced with rubbed Howrigg stone. The whole of the internal woodwork, sittings, doors, and ceilings is in oak. The nave has a boarded ceiling, wagon-headed, with groin ribs, and the chancel is vaulted with oak groin vault and moulded ribs and carved bosses, roof-ribs springing from attached moulded stone shafts and foliated caps. The style adopted for the church is of the end of the twelfth century, and the character of the work is (for that locality) of an unusually costly character. The cost has been chiefly defrayed by Mr. J. Boustead, of Armathwaite Hall. The architect is Mr. Daniel Brade, of Kendal, the design having been selected in competition a few years since.

SCHOOL BUILDING NEWS.

Little Hulton.—New schools in connexion with the Church of St. John the Baptist, Little Hulton, have been opened by the Countess of Ellesmere. The buildings have been erected of brick, at a cost of 1,000*l.*, from the design of Messrs. Medland & Henry Taylor, architects, Manchester, and consist of one large room for boys and girls and another for infants, each having a separate entrance.

Salford.—A new Wesleyan school is being erected in New Park-road, Ordsall Park, Salford. The building, which is designed in the Gothic style, will be 52 ft. by 37 ft., and 28 ft. from the ceiling to the floor. The walls will be of brick, with stone facings, and there will be two stories, the upper story containing a gallery. Three rooms, suitable for class meetings, are to be added to the building. Accommodation is provided for 350 children, and the cost will be 1,700*l.* The schools are being built by Messrs. Statham & Sons, Pendleton, from the designs of Mr. Crowcroft, architect, Manchester.

Whittington.—On the 24th ult. a new Church school for the parish of Whittington, Lichfield, were opened. The building, which will accommodate forty boys, has cost 425*l.*, and has been erected by Mr. G. Moody, builder, Whittington, from designs supplied by Mr. Ewan Christian.

Oswestry.—The Oswestry Grammar School has been undergoing renovation, and a new wing has been added, which was opened on the 7th inst. by the Earl of Powis. The old school building consisted of a school-room, 50 ft. by 20 ft.; a class-room, 20 ft. by 14 ft.; a dining-room for the boarders, 27 ft. by 20 ft. (which was also used as a class-room), a dormitory over, known as the barracks, 40 ft. by 20 ft.; and a small room adjoining, the height being 6 ft. 9 in. at the lowest, and 9 ft. at the highest part. The other dormitories were at the top of the head-master's house, and were only 7 ft. high. These have now been raised to a height of 9 ft. 6 in., and one of them is turned into a sick-room, with nursing appliances adjoining, so that a boy showing any symptoms of illness can be immediately isolated. The new school buildings consist of the boarders' day and dining-room, 27 ft. by 20 ft.; of the four class-rooms (three of which are made out of the old school-room) on the ground-floor, two 20 ft. by 14 ft., and two 20 ft. by 20 ft., and 14 ft. high, opening into a corridor 6 ft. wide, at the end of which is a stone staircase leading to the dormitories; a boot-room, a master's sitting room, and a schoolroom 49 ft. by 22 ft., divided in the centre by folding-doors, 15 ft. high. From this a passage leads to the laboratory, which is a new feature of the school. The total cost of the works was 4,184*l.* Mr. W. H. Spaull, of Oswestry, was the architect; Mr. R. Yates, of Shifnal, the general contractor;

and Messrs. Lewis, Brothers, of Oswestry, the painters and decorators. The schools now afford adequate accommodation for 150 boys, including 40 boarders.

SCHOOL BOARD SCHOOLS.

West Vale, Halifax.—New Board schools are being erected at West Vale, from the designs of Mr. Horsfall, of Halifax. The boys' school will accommodate 150, girls' school 150, and infants' 200. The cost is estimated at 6,270*l.*

Liverpool.—The new Harrington Board schools, in Stanhope-street, were opened on the 23rd ult. The schools are in three departments, on three separate floors. They consist of schools for infants, girls, and boys, and are calculated to accommodate 600 children. The boys' and girls' department are fitted with Reade's patent long desk, with adjustable form, the infants' department being provided with the ordinary dual desk. In the basement, the whole area under the school, excepting the space occupied by a committee-room, is devoted to a covered playground. The architect was Mr. T. Mellard Reade, C.E., the architect to the Board; the builders were Messrs. Alexander Rule & Son, of Liverpool; the clerk of the works, Mr. James Peers; the heating apparatus was supplied by Mr. Harlowe; and the ventilation carried out by Potts's Patent Cornice Ventilating Company.

Old Basford.—New Board schools at Old Basford have been opened by the Nottingham School Board. They are situate in North-street, and are slightly Gothic in character, the materials used externally being Bulwell, faced with Hollington, stone. The whole of the schools are ventilated on "Tobin's" system, Galton's stoves being used for heating. The architect was Mr. E. T. Ettwell, of West Bromwich; the contractor, Mr. Thomas McCulloch, of Bulwell; and the clerk of the works, Mr. Bunting. The cost of the buildings is estimated at between 6,000*l.* and 7,000*l.*, but with the purchase of the land the cost will be 10,000*l.*

Newtown.—On the 30th ult. the Newtown schools of the Gelligaer School Board were opened. The contract was undertaken and carried out by Mr. William Bevan, Deri, for 490*l.* The architect was Mr. John Williams, Merthyr Tydfil. The schools are built to accommodate 108 children.

The Bridgwater School Board have accepted an amended and reduced tender of Messrs. Chedzoy & Son, of Bridgwater, amounting to 3,224*l.* 9*s.* 3*d.*, for the erection of their new schools in Albert-street for 700 children. Mr. J. Parker, borough surveyor, is the architect, the cost per head being 4*l.* 12*s.*

Miscellanea.

The Right Hon. A. S. Ayrton, whilom First Commissioner of Works, is now wooing the electors of Northampton, and in a speech he made there last week he said:—

"When I accepted that office I at once asserted my opinion that the duty of the Commissioner was not to embark in all sorts of fantastical ideas about art, and spend the public money as if he were a millionaire, or as if he were disposing of it according to his own ideas, but was to spend it as a trustee for the people; to see that the right sort of people were employed, and, when they were employed, to exact from them a full and satisfactory discharge of their duty. Of course, I gave great offence, and unfortunately I found that this department had hitherto been conducted on the singular principle that the great duty of the First Commissioner of Works was never to take upon himself any responsibility, but that he should pay some eminent persons acquainted with the sciences and arts, and put the responsibility upon them, so that the First Commissioner had nothing to do but refer to them when any question arose. I objected to that. I said, 'No; the responsibility rests with me, and I will perform my duty.'"

The Receipts at the Paris Exhibition.—The total amount received for admission to the Paris Exhibition during September was 108,424*l.*, or about 3,614*l.* per day, as against 58,929*l.*, or 1,964*l.* per day for the corresponding month at the Exhibition of 1867. The total receipts for the first six months at the Exhibition of 1867 were 311,744*l.*; whereas the receipts for the first five months this year amount to 390,638*l.*, or nearly 79,000*l.* more than was taken up to the end of September, 1867, when the Exhibition opened a month earlier than the present one.

Bethnal-green Improvement.—Messrs. Nowell & Robson have made a commencement with the works of the contract (lately undertaken by them for the sum of 19,490*l.*) for forming a new line of thoroughfare from High-street, Shoreditch, to Gibraltar-gardens.

Assyria and Babylonia.—Mr. Hormuzd Rassam is about to start upon a second and much extended tour of exploration. Mr. Rassam has succeeded in obtaining a series of sufficiently open permits to enable the new expedition to assume the nature of a roving exploring party. The new firman includes the whole of Mesopotamia, embracing the region around Mosul—that is, the sites of Nineveh, Kalakh, and the ancient city of Assur, the site of which is marked by the mounds of Kileh Shergat. Mr. Rassam will land at Alexandretta, and travel across country to Aleppo. Here he will make the necessary preparations for commencing explorations. The chief seat of these Syrian explorations will be on the mounds of Jerabolus, which mark the site of the ancient city of Carchemish, the Hittite capital. The mounds of Jerabolus as described by Maundrel, Pococke, and others who have visited them, appear to exhibit considerably more external evidence of buildings buried beneath them than is met with in the majority of the Assyrian ruins. The statements in the inscriptions of the Assyrian kings as to their having erected monuments in the Hittite capital, and the close trade and commercial connexion between Carchemish and the chief cities of Assyria, afford every reason for Assyriologists to expect the discovery of some bilingual key which will enable them to solve the mystery of the Hamathite inscriptions. Under the extensive privileges of the new firman explorations will be carried on in the districts of Southern Assyria as well as in Babylonia. The mound of Kileh Shergat, about forty miles south of Nimroud, which marks the site of the metropolis of the early Assyrian empire, the city of Assur, will be explored. The mounds of Kileh Shergat are larger and more lofty the those of Koyunjik or Nimroud, and evidently cover the sites of several important edifices. In Babylonia the explorations will be directed to a thorough examination of some of the temple sites, such as the Amran and Babel mounds. There is one very important point in Babylonian topography to the solution of which Mr. Rassam will direct particular attention: this is the site of the famous royal "record office" or "Babylonian Bank," where were discovered the large collection of trade and commercial tablets. These Babylonian tablets, which represent the monetary transactions of a firm trading in the name of Egibi & Sons, were discovered in 1875 by some Arabs, and already somewhat over 3,000 have found their way to this country. They represent every branch of commercial and fiscal transaction, and furnish every detail as to the corn produce of the "most fertile of lands." Their annals extend from the commencement of the reign of Nabupalassar until the end of the Persian empire—the latest record being a tablet dated in the reign of Artaxerxes. It is in Babylonia that the roving commission which this new expedition will assume will be of the greatest importance. For so numerous are the sites in this southern Mesopotamian district which are marked by sandy *tells* that slight excavations, recovering only a few of the inscribed bricks or terra-cotta cones, will suffice to identify some of the ancient cities or towns which were once scattered thickly over the plain. One of the sites, where it is to be hoped exploration will be made, is in the mounds of Tel Ibrahim—the site of the city of Kutha, the great sacred university of Babylon.

Dublin Sanitary Association.—The executive committee met on the 10th inst. A letter was read from the secretary of the Local Government Board, stating that it was not intended to take evidence as to the general sanitary condition of Dublin inquiry [now just commenced] into the application of the corporation for an alteration in the incidence of charge with reference to the expenditure for sanitary purposes in the city. Attention was directed to the death-rate in the city, which was 26·5 per 1,000, as compared with 19·8 in London, and 17·3 in Edinburgh.

Bradford.—The site of Christ Church, in Darley-street, Bradford, being required for street improvements, the site and the church have recently been purchased by the Bradford Corporation at the price of 10,000*l.* The church was built in 1815. A new site has been secured for Christ Church, at a distance of a quarter of a mile from the old site, and on Saturday afternoon the foundation-stone of the new church was laid by Mr. F. S. Powell. The estimated cost of the building, including the site, is about 11,000*l.*

Plaster of Paris.—M. Landrin has just communicated to the Academy of Sciences the results of long-continued studies relative to the different qualities of this substance, and (according to *Galignani*) he finds that the more or less rapid setting of the plaster is due to the mode in which it is burned. Its properties are very different when it is prepared in lumps or in powder. The former, when mixed with its own weight of water, sets in five minutes, while the latter, under similar conditions, takes twenty minutes. The reason probably is that plaster in powder is more easily burned than when it is in lumps, and what tends to prove that fact is that when the latter is exposed longer than usual to the action of fire it sets more slowly. Gypsum, from which the plaster is made, when prepared at a high temperature, loses more and more its affinity for water, retaining however its property of absorbing its water of crystallisation. Plaster heated to the red, and mixed in the ordinary manner, will no longer set; but if, instead of applying the ordinary quantity of liquid, the smallest possible portion is used, say one-third of its weight, it will set in ten or twelve hours, and then it is less porous, and becomes extremely hard. To prepare plaster for moulding it must be burned slowly for a long time, sufficiently to drive off all its water, and for its molecules to lose a part of their affinity for the liquid. M. Landrin stated that a similar result could be obtained by other means. If the plaster is exposed to the fire of the kiln for a time short enough to allow it to retain seven or eight per cent. of its water, it is useless, as it sets almost immediately. If, however, the burning is again resumed, the substance soon loses its moisture, and, if then exposed to the air, it very rapidly retakes its water of crystallisation, and then absorption continues more slowly. It can then be used; it sets slowly, but acquires great hardness.

Technical Education and the London Livery Companies.—At a recent meeting of the Court of Common Council a report was submitted by the General Purposes Committee, on the reference of the 6th of June last, to consider the letter of the joint honorary secretaries of the Committee of Livery Companies of London, and recommending that, whilst the Corporation should not commit itself to an approval of the details of the scheme, or to the amount and method of expenditure, as set out in the report of the Committee of the Livery Companies, it is desirable the Corporation should express its approval of the general outlines and objects involved in the report, and should identify itself with the Livery Companies in endeavouring to give effect thereto. Mr. Deputy Fry, in proposing the adoption of the report, said the committee were favourable to local trade schools, rather than a central institution. Persons attending the former would receive elementary instruction in the principles of science and art by teachers having a competent knowledge of the actual practice of those trades as well as of the scientific and artistic principles to be applied to them. As to the central institution, the committee felt that rather too much had been made of this point. In the central institution the studies were chiefly physics, chemistry, mechanics, and art, while in the local trade schools instruction would be given to students by means of lectures and evening classes, and the discussion of important discoveries in trade. It was contemplated to provide exhibitions for meritorious students to assist technical classes already established, and aid efforts made or to be made in special manufacture, and in furtherance of technical education; that prizes and premiums should be offered, and that the apprentices should be rewarded with fees. The report was adopted.

School Board Drawing Exhibition.—The drawing exhibition is to be held at the Saffron-hill Board School, Farringdon-road. The exhibition will be opened at ten o'clock in the morning of each day, and closed at half-past nine. The drawings for exhibition are to be delivered at the above school on Saturday, November 2nd. In exhibiting the drawings, those of pupil teachers are to be displayed separately from those of the children.

Cardiff Waterworks.—The Cardiff Town Council have decided to purchase the local waterworks for a sum of 300,000*l.*, and a committee has been formed to deal with the company as to the manner in which payment should be made.

The Builder.

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The Reply of the Conservators of the Thames to the Metropolitan Board of Works.

E mentioned in our last number that we had received, too late for full investigation at the moment, the replies made by the officers of the Thames Conservancy Board to the Reports of Messrs. Bazalgette, Law, and Chatterton, and of Messrs. Keates and Dupré, which were received and made public by the Metropolitan Board of Works in April last. The documents now printed by the Conservators of the Thames are, first, "Remarks" on the above-named Report, by Mr. Leach, Engineer to the Conservators; secondly, "Observations" on the same document by Captain Burstal, R.N., secretary to the same body; and thirdly, a "Rejoinder" by Captain Calver, R.N., F.R.S., to the same production, which, it will be remembered, was put forth as a reply to the first Report of Capt. Calver, dated 15th October, 1877. The vital importance of the general question to the health and welfare of the metropolis is such as to render it proper to go with some care into the main points now at issue.

Our readers may have observed that in our former observations on this subject, we have not undertaken either to support, to criticise, or to oppose the first statements of Captain Calver, or to anticipate what reply that officer might make to the attack made on his accuracy, from the point of view which the Conservators might be expected to take. Our calculations were our own; based on a wide experience, or on facts cited from documents and reports accessible to the public. We could not, in such a mode of inquiry, avoid pointing out the numerous understatements made, on the part of the Metropolitan Board, of the damage which they were certainly inflicting on the river. But what Captain Calver might say in reply we did not venture to anticipate. Though somewhat deliberate in their movements, the Thames Conservators have now made out, it will be seen, a very far stronger case than that which we indicated as sustainable.

Capt. Calver's first Report was illustrated by two maps of the River Thames. And we venture strongly to recommend to those of our readers who take a serious interest in the question to provide themselves with these, or with some other maps, and to fix the main points to be discussed in their minds by this means. The Appendix to the Report of the Engineer to the Metropolitan Board also contains maps. Of these, the first is a copy of the Admiralty Chart, No. 2184, of the River Thames from Victoria Docks to Purfleet, giving soundings, and dated in 1857. The second is a corresponding chart for 1871. The comparison of the two charts shows that out of a superficial low-water average of 2,696 acres of river, 622 acres on the first chart, and 1,206 acres in 1871, have a depth of 20 ft. or more at low water, while the area of less than 10 ft. depth at low-water had diminished, in the same time, from 679 to 405 acres. It is not very clear for what reason this piece of evidence has been put in by the Metropolitan Board. They can hardly intend to maintain that the turning of the sewage into the Thames has scoured the river and increased the tidal flow. That this effect has been produced by the dredging carried on under the Conservators, is stated by the engineer of that body; and the two plans described fully support that statement. It is, however, stated by Capt. Calver that the chart of 1857 is a tolerably close copy of Admiral Bullock's survey of the Thames in 1830-33; so that the considerable changes shown have occurred, not in fourteen, but in thirty-eight years. The connexion of the causes of this change with the case of the Metropolitan Board is not obvious. As it is, the comparison of the charts does not even go to support the view first hinted. Since 1863, Capt. Calver now states, there has been an increase of the area of the 20 ft. channel from 927 acres to 988 acres, or 3½ per cent., instead of the 78 per cent. stated by Sir Joseph Bazalgette. Assuming the accuracy of this statement as to fact, one is lost in wonder to decide whether the publication in the appendix was a sheer outcome of unacquaintance with so important a fact as the date of a chart, or an effort to hoodwink the public.

A series of longitudinal sections of the river Thames follows, showing the quantity of matter in suspension, and the proportion of organic matter in the surface water, in various parts of the river on the 15th of January, 1878. The outcome of these sections, if they are accepted as absolutely accurate, is to the effect that the exact part of the Thames in which, according to Capt. Calver's first report, the most foul and undiluted portion of sewage was present, actually contained the least amount of matter in suspension, as well as of organic matter. The logical result is that a full flow of crude sewage purifies river water, and renders it remarkably free from ordinary mud, as well as from any sensible marks of efflux from the sewers. This reasoning has, apparently, convinced the majority of the Metropolitan Board of Works. For persons whose object it is, not to bolster up a case, but to arrive at the truth, it will probably be unnecessary to say any more. Sir Joseph Bazalgette's mathematical studies do not seem to have acquainted him with that mode of demonstration, not unfrequently used by Euclid, the *reductio ad absurdum*, of which these sections furnish so remarkable an instance. The discrepancy, however, is explained by the following remark of Capt. Calver (p. 45),—"It happens that Sir Joseph Bazalgette's samples which he supplied to the chemists were all obtained on the 15th of January of the present year, when the river was *more than usually full of fresh water*." The standard level above the lower sills of Teddington lock is 9 ft. 9 in.; the flow of the river over the weir at that height being stated at 350,000,000 gallons in the twenty-four hours. On the 6th of January there was a heavy flood; the water rising to 15 ft. 6 in. above the sill. As this ran down it swept and purified the Thames, and on the 15th, when the samples were taken, the water was still from 3 ft. to 4 ft. 6 in. above the summer level. Thus the remarkable candour which led the engineer of the Metropolitan Board to select for the time of testing the purity of the Thames a season when the river, having just been swept out by a heavy flood, contained very much more than its usual proportion of fresh water, may be appreciated. It is amusing to find that this expedient has so far overproved the case against Capt. Calver as to arrive at the nature of the adverse mathematical proof above hinted at.

These memorable sections are followed by a plan of the river Thames, from Greenwich to Yantlet Creek, showing by a red tint "those portions of the banks which have been washed away." For it is a very remarkable fact that, while we are asked, on the authority of plates 1 and 2, to believe that the area of the 20 ft. channel of the Thames has increased 78 per cent. in eight years, or nearly 10 per cent. per annum, we are at the same time assured that Messrs. Bazalgette, Law, and Chatterton "have arrived at the conclusion that at least 1,000,000 tons of soil are washed into this part" (the lower reaches) "of the river every year, in addition to that which is brought down from above." "This is, in fact, the real source of the mud deposit on the banks of the river, which, as we have shown, Captain Calver has erroneously attributed to metropolitan sewage" (Report, p. 17). As to this Captain Calver rejoins (Rejoinder, p. 43), "The washed shores Sir Joseph thus refers to are shown by plate 18 of the appendix to be below the outfalls, but to obtain soil for the new banks he goes lower down still, and quote's from Lyell's 'Principles of Geology,' to show that some of the mud may possibly have come from the crumbling cliffs of Sheppey. It will not be forgotten that Sir Joseph has repeatedly denied that the flood stream bears upward and deposits sewage-mud of the specific gravity of 1·550, but in the face of this denial he credits the same stream with bringing up the Thames material of the specific gravity of 2·371 from a Kentish island some forty miles away. Of course Sir Joseph Bazalgette cannot be allowed to run with the hare and hunt with the hounds in this way." In spite of the irresistibly comic element which these adroit, but short-memoried shifts introduce into the discussion, we should almost feel too much pity for the three engineers who have allowed themselves to make such mutually destructive statements to proceed, were it not for the sense of the deep gravity of the question. The Metropolitan Board thought that they were firm in their seat, and that the best plan was to treat the representations of the Thames Conservators with ridicule. They cannot complain if the ridicule

returns, with a good deal more than cent. per cent. interest, on themselves.

It is the case, however, with regard to this annual deposit of a million of cubic yards, to provide which Sir J. Bazalgette has recourse to Higham Marsh and the Island of Sheppey, that the attempt to show that it is brought from the "Saltings" and river banks, is based on not only imperfect, but erroneous, data. Capt. Burstal, who, we believe, had the advantage of serving under Admiral, then Captain, Bullock, in the survey of the Thames in 1832-34, brings out very distinctly the facts at which we hinted on a previous occasion. The maps of the Tithe Commissioners are of various degrees of accuracy. Those which are called first-class maps are regarded as reliable. But such is not the case with what are called second-class maps. It is from these second-class maps that Sir Joseph Bazalgette has taken the outline which he has ascribed to the Thames in 1839-44. It is not, however, only a question of the unreliability of these maps. They can be checked by the survey of Capt. Bullock. And they are found, on comparison with this survey, to be wrong. Thus Capt. Burstal says (Observations, p. 34),—"By the little map (1840, second-class map) of the saltings in the parish of Stanford-le-Hope, in Mucking Bight, the shore-line of salting is, at most parts, at least 100 ft. further out in the river than it was by the Admiralty map 1834. By this it would appear that the shore had gained this distance on the river instead of being washed away." Again, at Higham, the second-class tithe maps show the saltings about 150 ft. in advance of the Admiralty survey. Capt. Burstal gives further details, to which we refer those who need more information. But we have said enough to show that it is not from the lower reaches of the river that that accretion of mud is derived which Sir Joseph Bazalgette, if he wishes to maintain even the semblance of consistency in his argument, tacitly admits to amount to a million of cubic yards per annum.

In that estimate, as a minimum, we have the satisfaction of agreeing with the engineer of the Metropolitan Board of Works. We are not about, now, to fatigue our readers by the discussion of grains of solid matter per gallon of sewage or of Thames water. We have gone fully into that subject before. Most of our readers will probably consider that, as a minimum quantity, we have placed the matter beyond controversy. To any one who doubts that fact, we recommend the attentive perusal of Captain Calver's pamphlet. There is always a great liability to err in working from very small to very large quantities. In chemical analysis this is signally the case: and we wish to point out that, in the present state of chemical science, the value of analysis depends, to a great extent, on matters altogether external to the laboratory. A good chemist can be relied on for an analysis of a fluid brought to him,—at least, when it is not a question of the more or less subtle combination in which the elements detected by his tests may have existed in the fluid examined. But the fair sampling of the fluid to be analysed is as important an element of accuracy as any part of the chemical process. We have seen that samples of the Thames water were taken on the 15th of January; no doubt they were duly analysed. But they were not fair or average samples. The analysis, therefore, is absolutely worthless. The detection of so remarkable an oversight,—to call the occurrence by the most complimentary term,—is enough to throw doubt on the fair character of other samples. Especially is this the case when we find that when the analysts of the Thames Conservators find fifty-five grains of solid matter in a gallon, those of the Metropolitan Board can only detect 23·06 grains in a gallon. Here again a knowledge of dates comes in with great significance. "We are not told," says Capt. Calver (Rejoinder, p. 35), "how this was done" (that is, how the sampling, giving 23·06 grains per gallon, was managed); "but from the times recorded against the samples in the table, it is plain enough that they were taken from inside the sluices instead of outside them, which ought to have been the case, and which would make all the difference." We leave the onus of this statement on the responsibility of the learned and gallant officer. It is clear that some explanation is required,—we might almost say that some dodge must have been practised,—to make any analyst come to the conclusion that the sewage of London is so extraordinarily diluted. Knowing, as we do, pretty nearly the quantity of water turned through the sewers, and knowing the number of human beings resident on the area sewered, it is very certain that if only 23·06 grains per gallon of solid matter run out into the Thames, a deposit of a very formidable nature must be taking place throughout the whole metropolitan system. Again we may ask,—Have we before us the professional reports of men anxious to emulate the fame of the great founders of the profession of civil engineers, or have we the shifts of a pettifogging cleverness, the successive arguments of defence on the pleas,—"1. The kettle was cracked when we received it; 2. The kettle was whole when we returned it; 3. We never had the kettle"?

Leaving, then, the argument from the microscope and the micrometric balance, let us for a moment call attention to a piece of straightforward evidence offered by Mr. Leach. It is not, of course, necessary to say a word by way of endorsing any statement made by the respectable engineer to the Thames Conservancy Board; but, as matter of fact, we have been for some time aware of the statistical fact cited in p. 5 of "Remarks." And we need hardly add that results taken in gross over a considerable period of time are at least as reliable as, and appeal much more directly to what we may call the jury common-sense of the English people than, those extracted from the laboratory of the most eminent chemist.

"The quantity of solid matter produced from the sewage of Birmingham, the area drained having a population of about 400,000, is found by measurement on the land on which it is placed to be about 450 cubic yards per day. The system of taking both house-drainage and rainfall into sewers, is the same here as in London. If the proportion of solids in the London sewage is the same, and it is reasonable to suppose that there is not much difference, upwards of 4,000 cubic yards of solid matter must pass into the Thames daily, the precipitation of the heavy particles of which is quite enough to account for the formation of shoals." Mr. Leach has, we observe, allowed for the lime used as a precipitant at Birmingham, which is from 15 to 20 cubic yards per diem. Making that allowance, and taking only the population of 3,808,174, which was supplied by the eight great water companies in 1877 (according to Dr. Meymott Tidy's figures in "The London Water Supply"), we arrive at 4,080 cubic yards of solid matter, which, one day with another, is either turned into the Thames at the outfalls or left to silt up the sewers of London.

With regard to the appearance of this deposit in the river, to which public attention has been called by the inquest on the sufferers on board the *Princess Alice*, some definite evidence is offered both by Mr. Leach and by Captain Calver. "In March, 1867," says the engineer to the Conservators, "a report was brought to this office that the ship *Kocria Mooria*, proceeding up the river in tow of a tug, grounded in mid-channel off the Crossness outfalls. An examination of the bed of the river was immediately made, in the expectation that only some local impediment would be found, but in doing this it was ascertained that where, in 1861, deep water and a gravel-bank had been met with, there was now an immense body of mud, thoroughly impregnated with sewage. Further surveys and examinations showed that the mud was not confined to that locality, but that it was to be met with in many other places, both higher up and lower down the river. Complaints came from wharfingers in the Pool representing the inconvenience to which they were subject owing to the enormous and unprecedented accumulations of mud in front of their wharfs. Similar deposits were noticed off Lambeth, near Waterloo Bridge, and elsewhere; whilst the bed formed in front of St. Thomas s Hospital caused great alarm to the authorities of that institution." Mr. Leach goes on to say,—we make the break because what has preceded is evidence, what follows is matter of opinion,—"It is only owing to the unusual quantity of land-water which has passed down the river during the last three or four years that these last-named evils have not recurred to so serious an extent."

Captain Burstal writes (Observations, p. 2), "The former deep-water channel immediately in front of the outfall works has silted up with black sewage mud, through which I have forced a pole 7 ft. before it touched the ground, which is the natural bed of the river; and this mud deposit is about three-quarters of a mile in length, and extends at least one-third of the way across the river." Captain Burstal can, no doubt, give dates and particulars of his soundings. They deserve careful attention, as the direct observations of a competent hydrographer and naval surveyor. How far this mudbank may shift, increasing in neaps and decreasing in springs, it is of primary importance to ascertain by continuous daily survey, kept up for at least a full lunation. Distinguishing, as we did in the case of Mr. Leach, the evidence from the opinions of the Secretary of the Thames Conservators, we cite the remarks:—"Had not the north part of the river in this reach been deepened by dredging, I have no hesitation in stating that the sewage mud on the southern side, and the shoals off Dagenham Reach on the northern side, would, together, have formed a bar over which no vessel drawing over 8 ft. or 9 ft. of water, could have passed at low water ordinary spring tides. From what I have stated respecting the silting up of the river with sewage mud on the southern half of this reach, I must come to the conclusion that the navigation of this part of the river has been seriously impeded by the mudbanks thus formed, so that vessels of more than 8 ft. or 9 ft. draught of water cannot now navigate where they used to." Without going further into the details of obstructions at various spots, as to which we suppose that full and definite evidence will be forthcoming when required, we repeat the words of Capt. Calver,—"It does seem strange that Sir Joseph Bazalgette ventures to deny the recent formation of foul and offensive accretions in the bed of the Thames, when he is so well aware of what resulted formerly from the draining of a much smaller quantity of sewage along the frontage of the City."

We pause here. Details are not agreeable. But they are needed. Enough will be found in the pages of the four works we have cited, the 1st and 2nd Reports of Captain Calver, and the Remarks and Observations of Mr. Leach and Captain Burstal, to remove the question of the alarming injury daily inflicted on the Thames by the works of the Metropolitan Board from the region of doubt. A little more or a little less does not matter much. If we say that the sewage of London is 30 per cent. more diluted than that of Birmingham, we only reduce the 1,489,200 yards of sludge which, according to the experience of the engineers of the latter town, is now thrown daily into the Thames, to the million of cubic yards with which Sir J. Bazalgette credits the waste of the Saltings and the degradation of the Isle of Sheppey. If we go one by one through the "Conclusions" proposed by Messrs. Bazalgette, Law, and Chatterton, on 15th April last, we find that they will have thus to be modified, in order to meet the facts of the case.

1. That there is ample evidence to prove that foul and offensive accretions have recently formed, and are continually increasing within the channel of the Thames, notwithstanding the steady improvement in the channel of that river which has been effected, and is in progress, owing to the care of the Conservators.

2. That while the water of the river above London Bridge is far purer than was the case when the sewers were turned directly into that part of the river, it is still polluted by sewage, and banks of sewage mud form, from time to time, on many portions of the shore and bottom of the river that lie out of the main scour of the water.

3. That analysis shows that this offensive mud is very chiefly composed of the elements of sewage; and that such mud very rapidly forms and deposits in mass where obstacles are interposed to the course of the current, as in the case of the recent wreck of the *Princess Alice*.

4. That the opinion expressed by Sir Joseph Bazalgette, before the Institution of Civil Engineers, in 1865, to the effect that sewage thrown into the river at high water works its way up, as the tide strengthens, to a distance of from seven to nine miles, is fully confirmed by the observations and reports of the engineer of the Conservators of the Thames, and of the two naval hydrographers consulted by that body.

5. That although the Metropolitan Board of Works, as succeeding to the rights and duties of various Commissioners of Sewers, have been advised by their own officer that the banks of the Thames, in many parts, are being rapidly washed away, a result of a neglect of duty which legislation imposed on the said Commissioners, no notice of the fact has been taken by the Board, except in so far as to ascribe to the Thames Conservators the neglect of a duty which is not theirs.

By making the slight changes above indicated in the draft "Conclusions" of April 15, 1878, Sir Joseph Bazalgette will have the advantage of putting his report in harmony, not only with those of Capt. Calver, Mr. Leach, and Capt. Burstal, but at the same time with indisputable fact.

It will then remain to be seen how far the Metropolitan Board of Works are guided by reference to facts and not to imagination. Our own anticipations on that head may be,—and we should rejoice to find it the case,—proved to be unfounded and unjust. But in expectation of what may occur, we cannot do better than cite, with full assent, the words in which Capt. Calver concludes his temperate and conclusive report:—"It is in such cases as this, and others of a cognate order, involving, it may be, interests of the very highest public and even national importance, that the want of a scientific court for ultimate appeal is peculiarly felt. As matters stand at present, whether the reference be to arbitration, to a committee, or to a commission, the decision of a case too frequently depends, not so much upon its merits as upon the accidents of the official selection of the temporary judges, and the character of the advocacy on either side."

We have only further to call attention to a fact new to ourselves, and of which the importance is new to Capt. Calver. At the northern outfall, after the sluices are closed, a stream of sewage, amounting to 120 cubic feet per hour continues from the time the sluices are closed till about an hour's flood, or six hours per day. It is clear from our former remarks that at high water spring-tides the influence of that pernicious dribblet will be felt at least twenty miles up the river above the outfall at Barking.

We may add that, while any complaint made by the Conservators of the Thames of obstructions will have to go before arbitrators, this is not the case with regard to complaints as to the nuisance of pollution.

HOW CAN STREET ARCHITECTURE BE BEST IMPROVED, WITH DUE REGARD TO ECONOMY?*

The subject of the improvement of street architecture came before the annual Congress of this Association two years ago, at the meeting held at Liverpool, when the section which undertakes to consider the artistic side of life was inaugurated. It might, perhaps, therefore, seem superfluous to bring it forward again at so short an interval; but I think there is sufficient reason for reopening the subject now, partly in the fact that the Local Committee of this Section expressed special interest in it; partly also that it is one of those subjects on which a great deal must be said, and said very often, before any appreciable effect is produced on the public mind; but more particularly because there is an essential distinction between the point of view from which the question was then considered and that from which I now propose to offer some suggestions,—a distinction which bears especially upon the social side of the subject.

The title of the subject proposed at the Liverpool meeting was "How Best to Secure the Improvement of Street Architecture, especially in Relation to Public Buildings." As a matter of fact, not much was said about public buildings, but this latter half of the sentence indicates the turn which the consideration of architectural improvement in houses almost always does take, that of the laying out and embellishment of the wealthier quarters of the city in the neighbourhood of, and in connexion with, its principal edifices. This tendency is the natural legacy of the past history of architecture, which has almost invariably been the plaything of the wealthiest and most powerful castes—religious, political, or social—of the community. We have had the architecture of temples and churches and palaces, of public buildings and of private mansions; we have had recently the street architecture of wealthy town residents and of successful tradesmen, and a very dreadful thing the latter often is in its glaring and costly self-assertion; but we have not in modern England realised any architectural beauty or expression for the many of lesser means who must live in crowded streets, and for whom anything that can be called noble or picturesque architecture seems to have been hitherto an impossibility. We have once had something like an architecture of the people, of which the remains are to be seen in picturesque country cottages in various localities, and in some of the old streets of such towns as Chester; but these are built in a style and in materials incompatible in many ways with the requirements of sanitary science and security from fire. But we are, as far as the present day is concerned, entirely without an architecture for the many; or, rather, our architecture for the many is only the negation of all architecture, the absence of anything which can give any grace or interest to the mass of buildings which the tendency to centralisation in towns renders yearly more formidable, but in regard to which it is at present matter for thankfulness if we can even get the most ordinary conditions of health observed; any attempt to render them beautiful or to diversify the monotony of their endless ranks seems to be regarded as out of the question.

Is it necessary to spend a word in urging that such an attempt is desirable? A few years ago it would not have been so; it would have been conceded on all hands that our average street architecture was grim and depressing in aspect, whatever might be thought as to the possibility of improving it. But it is one of the curious results of the manner in which recent criticism on these subjects has gone on reflecting, and turning everything inside out, that we seem to have arrived at a paradoxical faith which regards a building as the more artistic the less art there is in it. Having had two or three architectural revivals which have disappointed the hopes of their votaries, we are now asked to jump to the conclusion that all attempt at refined architectural embellishment is a mistake or a pretence, and that the perfection of architectural design is to do nothing at all. A worship of architectural commonplace has commenced. Great George-street, for instance, that brick avenue which is the paradise of engineers and Parliamentary lawyers, was adduced in my hearing the other day by an architect, as something which could not well be improved upon; and superior persons dwelling in Harley-street and other similar half-miles of Georgian brick tell me that nothing they see in modern architecture gives them such pure and lasting pleasure as the varied arrangements of the sash-bars in the fanlights over the street-doors; and I can testify that nothing seems to excite their indignation so much as the substitution of sheets of plate-glass for the old frames. It may be my phlegmatic temperament, but I am ashamed (or at least I obviously ought to be ashamed) to confess that these beauties of Georgian town architecture are thrown away upon me; that I can traverse Great George-street with no quickening of my architectural sympathies, save at the sight of Barry's clock-tower at the end of it; that the fan-lights of Harley-street and Gower-street leave me cold and unmoved. Fully concurring in the view which regards the revival of past architectural styles as essentially a mistake, I fail to see how we are to be bettered by reviving something which is no style at all. Looking at the fact that the Classic and Gothic revivals, whatever the mistakes and abuses inherent in such movements, have produced some really noble buildings and some graceful and picturesque domestic architecture, it is difficult to see that we are to gain anything by coming down to what common bricklayers and joiners could give us, by way of imparting reality to our modern architecture. If this were the only alternative, I would suggest that the old shams are better than the new realities. But I believe we are really in no such unhappy dilemma that we need lay aside all attempt to beautify our streets under the idea that it can only result in affectation. We have our own practical requirements, our own special economical problems, the solution of which in the best manner may furnish, as in other generations, the basis of our own architectural style; and as to the ornament and decoration, nature, the fountain-head of all decorative art, is as infinite and inexhaustible as ever.

Architecture, in short, has always had life and reality put into it when there was a new problem to solve. And here we have such a problem before us. We have to consider how we can, consistently with conditions of economy, bring architectural beauty and interest into those quarters of large towns in which it has hitherto been most neglected and most conspicuously absent, and to the dwellers in which it is of special importance. For the inhabitants of the less wealthy quarters of towns have little opportunity of change of scene in comparison with those who live in wealthier districts. The town furnishes the scenery of their life, and a miserable scenery it mostly is. It is taken as admitted that brick walls with square holes in them form the only order of architecture which is economically possible for buildings under a certain rental. And seeing how large a proportion numerically of the inhabitants of towns have to live among street-scenery such as this, if we can show that all this might be materially altered, that beauty and variety, colour and sentiment, might be brought into now dull and lifeless streets, without more expense than is at present bestowed upon miles of blank brick wall,—we should surely be showing the way to an architectural improvement as important in itself and in its influence on the greatest happiness of the greatest number, as the building of town-halls, law-courts, or even cathedrals.

It is, of course, an essential condition of any such attempt to introduce a more artistic element into every-day street architecture, that the change should not involve any material addition to the cost of building. As it is, there is considerable difficulty in building houses of the class we are referring to so as to be remunerative in respect of the rents which can be obtained for them; and it is probable that at present any change in our building methods would be more valued by the majority of those concerned, for promising a saving of expense, than for any improvement in architectural effect which it might realise. The idea that town-streets must necessarily be ugly and dull is tacitly accepted, and no one thinks of making a protest against what seems inevitable. If, however, it is once discovered that improvement in this respect is practically possible, we may soon see a very great increase of interest in the subject on the part of tenants and householders; for, after all, very few people are contented with ugliness when they can get anything better, or anything which they think is better.

Now there is no doubt that a certain degree of improvement might be made even in the regulation brick street-front, by the exercise of a little thought. It is not necessary that a quarter of a mile of houses should be built as if all were cut in the same mould, or rather as if they were made by machinery, in lengths of a few miles at a time, and slices cut off and put down where they might be wanted. It is not necessary that all the houses in such a row should have windows of just the same size, so many holes in the wall cut just alike. A little grouping and variation in the size and spacing of the windows would go far to break the oppressive monotony of a long street; and some further variety might be obtained by variations in the character and quality of the brickwork; for instance, by using what is called English bond for the ground story and the usual Flemish bond for the upper stories, or by constructing one portion of the heights with bricks of different tone from the rest, so as to get some variation of tint. So far an improvement could be made, a certain degree of character imparted, with hardly an iota of extra expense. Some further relief to the front may be given, at a cost little more than nominal, by the employment of a band of moulded or stamped terra-cotta, or (with a slightly increased but still insignificant expenditure) by a band of moulded or otherwise ornamented brickwork. It is needless to say that there is now, architecturally speaking, every facility for very varied and high-class decorative building in brickwork; but all this is expensive,—in its best form, as expensive as stonework; and, therefore, it cannot enter into our consideration now. A considerable improvement in regard to character as well as constructive truthfulness would be obtained if builders could be persuaded to build the windows and doors in a genuine arch form, even of a small segment, instead of the disagreeable and weak-looking camber arch, which is their great delight; or if a straight window-head is desired (and undoubtedly it is the most convenient form practically) a concrete lintel would give some variety of surface and be more constructively satisfactory than the flat arch. A great deal has often been said about the sky-line of our streets, and how much even the plainest brick streets might be relieved and improved if the houses were roofed with gables fronting to the street; and so they unques-

* By Mr. H. Heathcote Statham. Read at the Cheltenham Congress of the Social Science Association (Art Section) on Thursday, the 24th inst.

tionably would be, but this is a more expensive way of roofing a row of houses, and leads to increased difficulty in regard to carrying off the rainwater. We find, therefore, that although it is possible to make some improvement in the ordinary brick street, and to give some variation of character to it, we can get a very little way towards anything like decorative building,—we are soon hopelessly pulled up at the boundaries of possible expenditure, and if we are to get any further in our endeavour to beautify, we must seek for some material, or method of building, less expensive than brick. Now brick is a cheap material enough in itself; the major part of the expenditure consists in the skilled labour necessary for putting it together properly. If we can get a material in which this source of expense is greatly lessened,—in which there is no need for the cutting and fitting and calculating necessary for the proper putting together of even a plain brick wall with square openings in it, even though the said material be no more beautful or enlivening in itself than brickwork, we may then obtain a margin of funds which can be expended in purely decorative treatment. Now such a material does present itself to us in the shape of concrete building, a method of construction about which a great deal has been said and written during the last few years, but which architects and their clients seem very much averse to take up or to give a fair trial to, though it certainly presents more resources for developing a new architectural effect combined with economy, than anything that is before the public at present.

In the form in which it has hitherto been most used, the principle of concrete building, it need hardly be observed, consists in defining the thickness of the intended wall by a temporary boarding on either side, and filling in the space between with the materials while in a wet state and leaving them to set, when the boarding is moved a stage higher and the next layer of concrete laid: the wall being thus, in fact, cast in a mould, the windows and other openings left by the interception of the material by cross-boarding where required. Of course, it must be admitted at once that such a system is necessarily more stubborn to deal with, in regard to any variety or intricacy in the main architectural design, than is one in which the materials can be put together in almost any way we please and the design easily altered or modified (if desired) as the work proceeds; and this fact must, I think, prevent concrete from ever competing with brick or stone in cases where expense is no object. Such cases, however, form decidedly the minority in ordinary building. It is quite possible, however, that the process of construction may be so modified as almost entirely to remove this drawback, and render concrete building as unhampered in regard to form as any other method. Apart from this question of the process, it appears to me that the results of even plain concrete building may compare with plain stone or brick, at all events with brick, without disadvantage. Concrete being essentially rubble walling on a small scale, that is, with rubble in very small pieces, its natural finish is of course rather rough, but I saw recently some cottages left in this state which looked just as agreeable in tone and texture of surface as ordinary brick walls, perhaps more so; and when the concrete has received the cement face which is its usual finish in the better class of work, the appearance is at all events more cheerful and enlivening for a town street, and less calculated to hold dust and dirt, than a brick wall. The point, however, which we want to arrive at is the degree of saving which can be effected in the shell of the building, and which, as before observed, can be expended upon actual decoration without an increase of cost over the ordinary plain brick front.

Upon this question very various opinions have been expressed, coloured partly, no doubt, by the interest of persons practically concerned in one or another material, partly by the conditions of different localities. Where the materials for concrete are immediately at hand, the concrete is sure to be much the cheapest; where they have to undergo a considerable amount of carriage, or where brick is made close at hand, the relative cost will, of course, be very much modified. On the whole, it may be said that the relative cost in London is a fair test, the locality not favouring either material particularly; and that the statistics of cost there are in favour of concrete there can be no reason for doubt. The other day I was inspecting a very neatly-finished little house in one of the suburbs of London, of which the external walls, including the outer finish of cement, were executed for 4s. 9d. per superficial yard, as against about 10s. per superficial yard for 14-in. brickwork, pointed on the exterior; and the internal cross-walls, left unfinished for plastering, can be executed for 2s. 9d. per yard, as against about 6s. per yard for 9-in. brickwork unpointed. This, you see, is less than half; but a percentage must, no doubt, be allowed for the fact that the builder was working for himself in this case. But even allowing him the liberal profit of 20 per cent. (and though contractors are much better off than architects, I do not think they make that as a rule), the cost is considerably under two-thirds of brickwork. But to be quite reasonable in our expectations, we will say two-thirds. Now, if we calculate the difference upon a small street-house of the middle-class of dwelling, say about twelve yards above the ground by five yards and a half frontage by eleven yards in depth, with the average amount of internal cross walls: taking the saving on the front and back walls at 3s. 2d. per superficial yard, and that on the party-walls and cross-walls at 2s. per yard, including cellars; allowing also for a saving of about 6d. per yard over the whole interior (except cellars), by the dispensing with one coat of plaster, we get in round numbers a saving of about 100*l.* per house to make ducks and drakes with in the way of decoration. And now the question is, what to do with it,—how best to employ it?

It is easiest, in the first place, perhaps, to settle what not to do. The builders and the companies who are interested in promoting concrete building have taken that trouble off our hands; for if anything could render the system odious in the eyes of all people of artistic feeling, it would be the sight of the horrible things which these gentlemen erect as "handsome" houses, and of which they show you photographs which they seem to regard as sufficient at once to convert you to concrete building. If they knew their own interests they would keep the photographs of their neat and desirable residences carefully out of sight, for fear of creating a pardonable scare in regard to the new method of building. The air of vulgar respectability, if one may say so, which characterises them is partly due, no doubt, to the fact that they are usually the work of persons untrained in refinements of architectural detail and expression; either of the builder's own clerk, or of the kind of architect (or *h*architect) who is not unfrequently kept by a builder. With one exception, to be mentioned just now, I believe no architect of genius has allied himself with concrete in any shape, as yet; and though we are often told there is no architecture now, and that it is all imitation, yet there is a sort of distinction between the work of an educated and of an uneducated imitator. But the cause of failure really lies deeper than that; it lies in the want of perception that a special material, differing in character from those hitherto used, requires a special treatment. The only idea of the ordinary designer of a concrete house is to make it like a stone house, and to employ the usual features which are considered proper to respectable stone houses: pilasters, moulded capitals, panels, brackets, keystones, consoles, and all the rest of it; to treat it as if it were built up in pieces like stone, and to affix upon the surface of the walls imitations of stone detail. Nothing that is real—nothing that appeals to a genuine artistic sense, can be done in that way. The first point is to recognise the real nature of the material and the method of treatment to which it will lend itself. A concrete house on the usual method of construction is essentially monolithic. It is true that it is necessarily cast in stages, and I have thought that in the case of cottages built as cheaply as possible, and left rough, an agreeable effect might be produced by varying the materials so as to get a slightly varied tone in the alternate layers. But in a concrete house as finished for the better class of work, even this slight indication of horizontal layers disappears in the finishing, and the building becomes a uniform surface. Instead, therefore, of trying to make it a masonic design, and planting on the cement projections to be fashioned into the likeness of masonic detail, why not recognise the material for what it really is, namely, an admirable "vehicle" (to borrow a painter's expression) for surface decoration.

In considering what we can afford to do in this way, it must be remembered that in a street-house we have, architecturally, only the front and back walls to consider, and practically it comes, in most situations, chiefly to the front wall; for, though it is certainly a mistake, and under some circumstances even a vulgarity, to neglect entirely the decoration of a house and make a great show in front, on the other hand it is unquestionably part of the amenity of architecture, regarded in a social point of view, to turn its best face to the public; in other words, to develop its best beauties where the most people can see and enjoy them, just as we ourselves, or the better half of us at any rate, endeavour to put on our best appearance when we go to a public entertainment. Now, looking at it in this light, and concentrating our efforts on the street-front, the amount I have supposed to be saved on the shell of the house would enable us to cover half the front with original decorative design in such a material as Rust's mosaic, a material furnishing not only an indestructible design, but giving colour and texture of a very rich and harmonious description; or it would enable us to decorate the front with original design in *sgraffito*, a process which, though not affording colour, gives variety of tone, and has the merit of combining remarkably well, in regard to material and appearance, with concrete. Many more suggestions might be made for giving a varied decoration to the surface, some of them at much less expense than the processes just named. Coloured tile designs may be incorporated in the face of the walls; and terra-cotta, such as Doulton's, with its beautiful tones and rich surfaces, may be used to give an almost jewelled effect of colour and surface of the most permanent description. But stress is laid here upon the possibility of introducing such materials as mosaic and *sgraffito*, because they bring us clear of the system of mechanically-repeated ornament, and presuppose a design which varies with the individuality or the feeling of the designer in each case, and in which no saving is effected by mechanical reproduction and multiplication of the design.*

The importance of this last point can hardly be over-estimated; for those who would deprecate any attempt to ornament our streets have at least this to say on their side, that it is better to give up any pretence of it unless we are to have as decoration something that we really care for, and that is designed and put up for love of it, and not to look "handsome." And who in the world is the happier for cast ornamental brackets or keystones catalogued at 15s. 9d. a-piece, or nail-headed or toothed bricks at so much per foot run? There is something in a good moulding, for the play of light and shade which gives it effect comes from Nature herself, and varies with the varying atmosphere; and there are certain conventional architectural ornaments, chiefly Greek, the absolute purity of taste in which seems to keep them from ever getting antiquated; but these we seldom see in mechanically-produced work, and never executed with the refinement of modelling which they demand. What we do get are clumsy reminiscences of Classic detail (generally), hackneyed out of all endurableness by eternal repetition. The attempts which have been made to decorate the large stacks of model dwellings which are now becoming a feature in some of our towns, are simply deplorable in their weakness and vulgarity. In London, there are uncouth features, horrible panels with a lozenge-shaped hole in the middle, and weak-looking brackets ornamented with round holes cut on them, which have absolutely been multiplied by hundreds, not to say thousands, and put on to model dwellings to beautify them. Better the plainest and most dingy wall than this kind of trade decoration. What we want above all in the decorative treatment of town architecture, and more especially in the poorer and less inviting localities of large towns, is that some reminiscences or suggestion of the life and colour of Nature should brighten the walls. One of the most gifted of contemporary landscape-painters, who has the additional merit of being one of the most agreeably cynical of talkers, was stigmatising architecture to me as uninteresting the other day, when I asked him if there were no interest, at any rate, in architectural ornament?

* In regard to *sgraffito*, it is now even possible for the architect to draw the decoration on the material, with his own hands, in his studio, and then send it to be fixed in the building, as panels or pieces prepared for *sgraffito* can be fixed on a perfectly rigid framing incorporated with the plaster, and can thus be easily moved from place to place. This method of preparing *sgraffito* ground is due to Messrs. Trollope & Sons.

"Ah, yes," he said, "a great deal; it takes a landscape-painter to do that!" Now, without entirely adopting this view, is there not something significant in the remark? Do we not really want, in the decoration of town architecture, and of the poorer and less inviting quarters particularly, that kind of decoration of which it might be said that something of the landscape-painter is required to design it, at least some of that direct and living study from Nature, whereby something of her life and colour and infinite form should be brought to enliven the dead walls of our streets? And that can only be accomplished in materials which allow in each instance of individual thought and individual modelling. Nothing out of a pattern-book will do it. But with materials such as those named, and others which have the same kind of capabilities, why should not the front of even our smaller street-houses present examples of artistic beauty as original and real as any of those which are put into sketch-books to be "cribbed" from, and at least of more interest than the cut-brick festoons and ornamental pepper-boxes which are the staple of decoration in the revived brick style named after Queen Anne?

What is important also to note is that a fresh return to Nature for architectural ornament, and a means of carrying it out so as to exhibit the individuality of the worker, would be the best means of escape from the mistaken effort to secure the picturesque by taking up some former fashion of picturesque building,—a mistake especially to be guarded against in the treatment of new material. For example, a very pretty illustrated book has lately been put forth by a large contractor, Mr. Lascelles, who has patented a new process of building with cement slabs on timber framing; a very good and inexpensive process for country cottages, *not* for towns. He has secured the assistance of a most talented architect, of whom I would certainly say no word of disrespect, and felicitates himself on having made cement construction picturesque, which appears to mean that he has contrived to have the slabs of cement made and tinted so as to produce what a copyright lawyer would call a "colourable imitation" of a style of old cottage, common in some parts of the country. *That* is not the way to treat a new material. Produce the best effect you can with it by the readiest means, but do not try to make it mimic something else which you choose to consider picturesque. The picturesque, in the ordinary sense of the word, cannot be cooked; it is, in great part, a matter of time and age, and people who admire these old buildings, and immediately wish to do something like them, quite forget, apparently, that they were all new once.

I have made concrete-building the main object of these remarks, believing that it is a process with a future before it, and that it is more likely to afford a chance for economically improving middle and lower class street-architecture than anything which we have before us at present. Of course, where cost is of less importance, the same processes of decoration may be applied to a brick building, though I cannot help thinking they would, as a matter of appearance, blend even better with a concrete face. There is, however, a method of high-class decoration, terra-cotta modelling, which goes admirably with brickwork, and in which a frieze of figures, or other studies from nature, may be sketched out and fixed by the fire, so as to stereotype permanently the idea expressed in the clay, in all the freshness and freedom of the first impulse of designing.* Not a few amateurs of artistic talent are devoting their attention to this art; those who succeed could hardly turn their gift to better account than by bringing such decoration to neighbourhoods where there are no means of purchasing it; a kind of charity which "blesseth him that gives and him that takes" in a way that charity expressed in coin seldom does.

An important practical point, but which has also its æsthetic bearing, in regard to concrete, is its use in roofing. One of the first desiderata towards a complete and truly architectural style of building is the obtaining of a homogeneous character in walls and roof, as was done in the case of Gothic vaulting, where the roof is only the walls closing in and meeting overhead. No great building is really monumental in style unless this homogeneous construction is attained. As to the effect upon towns of having to put a timber covering on the top of the solid walls, and then to tile or slate over that, independently of the greatly added risk from fire, let any one who has entered any of our large towns on a railway viaduct over the tops of the houses recall the indescribable effect of higgledy-piggledy and lumber produced by this mass of roofs leaning and sagging against one another, and full of places out of repair in the roof or tile covering. Compare this mass of material, and all the rottenness and dirt and decay which it inevitably contains, with the effect as it would be with nothing but smooth cemented concrete roofs, absolutely permanent and unchangeable in form, with domed or arched surfaces of monolithic character, and capable, from their smooth and hard surface, of being washed clean by every rain, and some idea may be entertained of the desirable change which would result from the adoption of such material for roofing. There is another advantage, which also has its æsthetic as well as its practical side, in the facility with which flat roofs may be made perfectly impervious to wet, in concrete and cement. Now, flat roofs in a crowded town would in some points be a great advantage; they might afford either airing-space or drying-ground for linen, or, which would be a preferable use, an opportunity for getting more air than can be got below, and an outlook beyond the confines of the street, or they might even afford opportunity for gardens and conservatories. And another advantage which has often occurred to me in such a construction is this: that a single row of (say) two-storied houses may be built along a new street, and that when in process of time there came a demand for more house accommodation in the neighbourhood, a second set of tenements could be built on the top of the first, what was the roof of the lower set furnishing the ground-floor of the upper set; a method which would allow of leaving proportionably wider streets, and not crowding houses together so much on the ground. But the great advantage of the concrete roof is, after all, its permanent and solid character. Nowhere is it so important to avoid anything like rickety building as in crowded towns; and nowhere, at present, is there so much of it.

In regard to this same question of rickety buildings, there is one class of erection which is a special nuisance in our towns—the shop-front. It is a curious instance of the bearing of social habits upon architecture, that the desire on the part of tradesmen to cut one another out in the way of outward show and display leads to architectural treatment equally pretentious and unstable. A wide space for a display in the window is the first desideratum: consequently the whole of the superstructure is made to stand apparently on a sheet of plate-glass, and is in reality anything but sound architectural construction, since it involves a system of balancing the building on points on which a great pressure comes, while the supports are inadequate to resist properly the disturbing effect of unequal loading, or of any slight settlement in the foundations. Architecturally speaking, however, the more prominent fault in shop architecture consists in the almost universal addition of a species of joiner's scenery planted on round the window, with a wooden cornice and other supposed ornaments which are a mere excrescence on the real building, are of no use, cost a good deal of money, and absolutely preclude anything like dignified or solid architectural effect. No street can look otherwise than flimsy or tawdry in its effect when its base is lined by these useless pieces of painted show; but it would hardly be possible to legislate against them. Their abandonment must be left to the gradual influence of public taste, coupled (let us hope) with the gradual appreciation by the trading class of the fact that genuine excellence is better than show, and pays better in every way in the long run; under which faith the sham and the show of the shop-front would no longer be required. Among other minor causes of "complaining in our streets" may be named the chimneys and the rain-spouts. The disfigurement from the chimneys arises (like so many other ugly things in architecture) almost entirely from practical deficiency in construction, leading to bad draught, or down-draught, which has to be corrected as far as possible by the addition of grotesque spouts and cowls; otherwise the chimneys in street houses are usually pretty well out of sight, and only require a simple and unpretending treatment. In regard to the rain-spouts, it is curious that though we have for generations, if not for centuries, substituted these rain-conductors for the old contrivance of open spouts carrying the water out clear of the houses in a cataract, there has never yet been any attempt at providing for them in the architectural design of street houses, so as to make them appear as necessary portions of the architectural economy of the front. They are still hung against the wall as if no one had ever thought of them until the last minute of putting the roof on, and they had to be got in somehow. While we are speaking of details, it may be observed that, on the other hand, the entrance-doors of houses offer a very suitable opportunity for a little variety in character and colour, at present totally neglected in most street buildings; all the doors are made alike in a row of houses, as if cast in a mould, though as each is really a separately executed piece of work, it ought not to be difficult to vary them. Each entrance should, as far as possible, have a character of its own, so that the tenant may recognise his home by its own features, not merely by the fact of its being No. So-and-so in the row, even if there be no other distinctive decorative treatment. This kind of variety, as well as other distinctive character arising from varied decoration, may be attained without necessarily demanding that every house should be different in height from, and quite independent of, those contiguous to it. I confess I am not in entire sympathy with the denunciations that are sometimes made against the grouping of houses in a terrace in one design. If the houses were each built separately, by separate owners, it would be natural for each man to build as he himself wished, and the resulting variety in heights and details would be the natural architectural expression of the whole under the circumstances. But if the houses of a terrace, though separate tenements, are built at the same time by the same person, it would seem to me perfectly natural that he should build them with a general uniformity, and that to studiously vary the heights (for example) in each case, to make them assume the picturesque inequality of an old street in which the houses have grown up by degrees and at various periods, would be a piece of affectation. The details may and ought to be varied, as before observed, to prevent monotony and give a certain individual character to each tenement.

This latter consideration naturally suggests a word, before concluding, on the question of the relation between building legislation and architecture,—a question which is of some special interest just now, because it is pretty evident that the architecturally-minded portion of society will not put up with the average style of existing Building Acts much longer. The matter, however, so far as regards the artistic side of building, is really less complicated than some people seem to suppose. The improvements required in regard to this part of the subject are chiefly negative, and consist in letting well alone. At present there is no doubt whatever that street architecture in London and other large towns, suffers, as far as regards effect, from being too much governed. If we take a view of a picturesque street or building of old time, such as the modern architect or artist delights to sketch, and apply to it the provisions of (say) the Metropolitan Building Act, we shall find in most cases that nearly all which made the picturesque of it has disappeared. The effect of the average modern Building Act on street architecture is pretty much the same as would be the effect on the human countenance if it were decreed that all projections were to be cut off and the face kept flat. The Metropolitan Building Act actually does rule this, and though the real object is to prevent projections which may be suffered to be dangerous or injurious to the public, the regulations are often carried out in such a spirit of red tape that any one wishing to build out a projection of 2 in., in a manner perfectly harmless, but against the letter of the law, may find the prohibition enforced as rigorously as if life and limb were threatened by the irregularity. The consideration of architectural effect, in fact, does not enter into the legal or official mind. In the voluminous Blue-book of evidence taken by a Parliamentary Commission three or four years ago, when there was an attempt to get a new Building Act for London,

* The system of modelling in parget, which has been partially revived recently, allows of this advantage without the necessity of burning afterwards. The tone of the parget surface is not so rich as that of terra cotta, but the modeller has perhaps more absolute control over the effect.

I have not been able to find a single question out of the thousands asked, framed to elicit any opinion as to the effect of the proposed legislation on buildings architecturally. And it may be admitted that it is in no way desirable that any positive legislation on the subject should take place, and that those who build street-houses should be compelled to satisfy an official committee of taste with their designs, or should lie under the liability of having their drawings sent back to them to be made beautiful, All that we can reasonably ask of the law is, that it should leave the architect more untrammelled, and that it should forbear to place upon town architecture restrictions which must tend to rob it of half its life and character. Many things which are commonly forbidden by Building Acts are only really objectionable when they are badly carried out and of unscientific construction: the projection of an upper story of a building, for instance, beyond the lower, often a source both of convenience and of charming effect, is only dangerous or objectionable when badly carried out in regard to construction. To ensure a character of town-building at once safe and picturesque, what is wanted is not a stringent prohibitive legislation, repressing the life and character of street-architecture; but rather a legislation which would provide that the task should be undertaken by properly competent and conscientious persons; which would put a check on the iniquities of the "jerry builder" (who is the cause of the existence of nine-tenths of every Building Act), and at the same time leave the competent and conscientious constructor room to carry out his ideas without vexatious interference, and to indulge his fancy in regard to picturesque effect, in the confidence that such fancies would be carried out on the basis of a sound and scientific construction.

A MODEL BAVARIAN VILLAGE.

In the year 1865 a fire destroyed the larger part of the village of Oberstdorf. It may be well, first of all, to explain where this place lies. A main line of railway runs nearly west and east from the Lake of Constance to Munich. At Immenstadt, about a couple of hours from the lake, a small line branches off to the southward up the valley of the Iller to Sonthofen, and seven miles further up this valley, quite at its end, is Oberstdorf. It lies in fertile meadows, surrounded on the south by a semicircle of lofty and rugged mountains, the cluster of the Alps which we know as the Algauer Alps, whilst east and west the spurs of these high mountains close in the valley. It would be hard to find a place more strikingly or picturesquely situated, and it says a great deal for the railway progress on the Continent that it is now within so short a distance of a railway-station. In its own way it is an important place, for it forms the market town,—one may almost say the metropolis,—for the inhabitants of the various hamlets which are hidden within the pine-clad recesses of the neighbouring valleys.

Most of the houses which escaped the disastrous fire of 1865 are very old; some were built two and three hundred years ago, for almost every house has upon it the date at which it was erected. Indeed, it is no extraordinary thing to find in out-of-the-way Austrian and Bavarian villages among the Eastern Alps wood and iron work which, if offered for sale in Wardour-street, would be eagerly purchased by those who are in love with ancient buildings and furniture. Thus, to give the first example which comes to mind, there is a village in the Lech Thal, in Tyrol, where the Gasthaus zur Post possesses a room, on the curiously-carved woodwork of which is the date 1656, and this is only one instance among many. And there is no reason why a hundred years hence a traveller in those sequestered places should not find such a house in much the same state as does the traveller of to-day.

But to return to Oberstdorf. In consequence of the fire the village was to a great extent rebuilt, and it thus offers a very excellent example of a modern and model Bavarian village; for there is no doubt that among the mountains greater taste is shown in the adornment of the people's dwellings, and in the execution of the woodwork, than is seen in the more prosaic plains. The houses are to the extent of about three-fourths built wholly of wood, and are uniformly larger than in most of the surrounding villages. They are oblong in shape, measuring across the front on an average about 33 ft., and are in length about double that distance. They are two-storied as a rule, with generally some kind of attic in addition. Behind, and forming part of the same building, are the cart-shed, the cow-house, and the hay-loft, which, even when the whole or the lower part of the house is constructed of stone, are made wholly of wood. The rooms generally are large in size, and in some cases there is quite an entrance-hall. The roof overhangs the walls very considerably, and is generally constructed, if the paradox may be permitted, of wooden slates. The taste and the wealth,—if wealth can be considered to be found in these penurious places,—of the owner are shown in the carving and execution of his balconies, his doors, and the upper part of the front, which in many cases show great taste and very considerable labour. But seldom does one house contain one family only, for they are generally inhabited by two or three. But in any case the dwelling is one which the English peasant or the inhabitant of a small house in a back street in an English town would greatly envy. And with their bright green shutters, with the carnations and the geraniums gleaming over the balconies, or, in other cases, with the rich brown of their woodwork, they have a most bright and homely appearance. The peasant of the Eastern Alps is in many respects much to be pitied. He is born to a life of toil; he has to labour incessantly throughout the summer to bring in his crops of hay; and in the winter both he and his cattle can barely subsist until the May sun melts away the snow from the mountain pastures. But he is, on the other hand, well housed; he takes a pride in his dwelling, and, owning his own house, he seldom has a landlord who can dismiss him at a week's notice. All around is abundance of wood with which to add to, improve, or to repair his dwelling, and to serve as fuel for his fire; and his house is built, even though it be only of timber, so massively that it would outlast by many years the slight structures of more civilised districts or more wealthy lands. In Oberstdorf modern ideas are most prominently shown in the regularity with which the houses are built in streets, but, unlike streets in English villages, each house is some distance from the other, and is surrounded by a little plot of land, which is a piece of pasturage for the cows when not out on the mountain side, and in other cases forms a little garden or a bit of land for potatoes or oats, and the slightly-gabled roofs give a great picturesqueness to the general appearance of the village. Simplicity, solidity, and picturesqueness are the main features of the houses of Oberstdorf, and it would be well if the same could be said of villages in our own more wealthy country. Thus, though we may wander among the Alps to view Nature in her grandest forms, or to be strengthened by the invigorating air, it is quite certain that from such villages as that of Oberstdorf lessons may be learned and suggestions formed which would not be useless in regard to domestic architecture in England.

THE TENDENCY OF TRAVEL.

One of the most curious phases of railway travel is the continuous gravitation towards the lowest level or class. As the railway system is extended there is a continuous increase in the volume of passenger traffic, but the rate of increase is very different in the three classes of passengers; and whenever a season of trading dulness sets in the increase is almost entirely in the lowest class. In some districts and on some systems of railway, there is a variation from the general experience; but usually the falling off is most marked in the intermediate class, as may be shown by a few instances. Even on the southern lines, which have had their passenger traffic swollen by that to the Paris Exhibition, there is observable this tendency in travel. Over the London, Chatham, and Dover line, in six months, more than 12,000,000 passengers travel, and the great bulk of them travel third class, as may be seen by the comparison of the numbers for the first half of this year and the first half of last year, the numbers of the travellers and their classes being as under for the two periods of six months:—

	1877.		1878.
First class	1,158,174	...	1,148,164
Second class ...	1,325,162	...	1,372,910
Third class	8,952,039	...	9,759,179

There is on this line a falling off in the number of first-class passengers, a very small increase in the second class, and a large increase in the third-class passengers. Taking another line,—the South-Eastern,—we have a similar state of affairs, the numbers for the same two periods being:—

	1877.		1878.
First class	1,026,418	...	996,023
Second class ...	1,341,934	...	1,355,839
Third class	8,918,299	...	9,509,738

And on the Brighton line the result is the same, the traffic having gravitated downwards from the first class, slightly increased the number of second-class travellers, and having the great bulk deposited in the lowest level. In companies serving a different district, the testimony is similar; in proof of which the experience of the Manchester, Sheffield, and Lincolnshire Railway may be cited. On that railway the numbers of travellers for the two periods of six months previously referred to were as under:—

	1877.		1878.
First class	211,985	...	199,591
Second class ...	338,931	...	305,210
Third class	4,573,513	...	4,624,914

In this case there is a falling off in both the upper classes of travellers, and this is an experience that is by no means singular in the Northern and manufacturing districts; indeed, it is the second class which suffers most in these districts. Taking the North-Eastern Railway as the type of those which have felt the most keenly the trading dulness, we shall find one of the exceptional instances in which there is not only a fall in the two upper, but in all the three classes; but even here the rate of the declension is by far the greatest in the two upper classes. On the North-Eastern, for the same two half-years, the number of passengers and their classes were:—

	1877.		1878.
First class.....	549,640	...	501,191
Second class.....	843,621	...	739,765
Third class	11,795,042	...	11,686,454

And in the case of the greatest of our British railways, the London and North-Western, we have the following as its experience for the same two periods of six months:—

	1877.		1878.
First class	1,524,020	...	1,408,706
Second class.....	2,741,752	...	2,459,619
Third class	17,832,726	...	18,268,149

Here there is a small decrease in the first-class passengers; a much larger decrease, both actual and comparative, in the numbers of the second-class; and in the third-class there is a very considerable increase. Taking, again, another typical railway, the Great Northern, which is very largely a passenger line, we have a variation in the experience, the numbers being for the two half-years:—

	1877.		1878.
First class	509,833	...	526,121
Second class ...	1,108,895	...	1,199,680
Third class	6,838,121	...	7,281,384

This general increase is in part attributable to the opening out of new branches, and in part possibly to the traffic to the Paris Exhibition. Last, may be noticed the Midland Railway, which occupies a rather peculiar position, owing to its working its traffic with two classes only. Its numbers are:—

	1877.		1878.
First class ...	1,235,897	...	1,150,926
Third class ...	11,537,552	...	11,326,754

Generally speaking, it may be said that although numbers are only referred to in the above tabulations, yet the monetary receipts show the same gravitation towards the lowest level; that is to say, that an increasing portion of the gross receipts from ordinary passenger traffic is derived from the third class. Indeed, in this respect the change is frequently more marked, for the longer journeys are those which are travelled by the lowest classes, whilst for the highest class, the short journeys are most frequent. The whole tendency of the figures quoted, which represent the experience of most of the chief railways in England, is to prove that the value of the traffic is being reduced more than the volume; the new traffic brought on the opening out of fresh branches is chiefly of the third class, and this and the gravitation on the old traffic causes the rate of the descent to be greater than it was. It is too soon as yet to decide as to the final effect of this change; for a return to prosperity might check it; but unquestionably the deduction which might be most safely drawn at the present time is in favour of the supposition that, to lessen working expenses, there would be the abolition of one of the upper classes on other railways than the Midland.

METROPOLITAN WATER SUPPLY.

After a lively debate, in which the reasoning was on one side, and the dead silent weight of the majority on the other, the Metropolitan Board of Works have given directions for lodging Parliamentary notices for application next season for a Bill for the compulsory purchase of the works and property of the Metropolitan water companies.

Those persons who are most anxious for reform and amendment in the character of the Metropolitan water supply will be the first to condemn the random and headlong proceeding of the Board of Works. The Works Committee, to which the question had been referred for report, virtually recommended that nothing be done in the matter. Dr. Brewer expressed the sensible opinion that they were bound to adopt the report of the committee, a reference to which would otherwise prove to be a mere pretext. Mr. Reche, however, argued that as the committee had done nothing, "it was not for the Board to abdicate their functions." So far, however, from having done nothing, the committee had given their advice. How sound that advice was is evident from the motion of Mr. Runtz, who has hitherto been one of the foremost advocates of a bold and active policy, that "no action be taken by the Board towards obtaining power to acquire the undertakings of the Metropolitan water companies until the views of her Majesty's Government on the subject have been ascertained." It is admitted on all hands that the matter is not one that can be carried without the assent, and something more than the assent, of the Government. That such assent is more than doubtful is pretty clear from what took place last session. And one consideration renders it certain that the consent of the Government will not be surprised. That is, that one result of transferring the powers of the various water companies to the Metropolitan Board of Works would be to extend the jurisdiction of that body from an area of little more than 75,000 acres to an area of upwards of 340,000 acres. To go to the expense of notices for lodging a Bill, of which such a tremendous change is only one of the incidents, without taking the pains to ascertain how it is regarded by the Government, is a step which it is complimentary to call indiscreet. Mr. Leslie plainly called the proceeding "a sham." It is a costly sham for the ratepayers. If the water companies desired to escape from all notice, check, or control, they could not do better than encourage the proposal of raw, undigested, impossible schemes, full of sound and promise, and certain to collapse under the pressure of actual Parliamentary business. On the other hand, the ratepayers may view, with some indignation, the constant calls upon their pockets for the ventilation of schemes which may pay the promoters and officials very lucratively, but which seem to have no other recommendation. At all events, no argument in favour of the measure was offered by the members of the majority, who took this new occasion of showing that they were "not afraid of expense,"—if it only fell on the ratepayers. Those of us who happen to be ratepayers hardly admire this vicarious generosity.

GREEK ART.

On Saturday evening last, Mr. C. T. Newton, C.B., of the British Museum, resumed his lectures on Greek Art, at the College for Men and Women, Bloomsbury, taking for his subject "The Frieze of the Parthenon." The previous lectures have been reported in the *Builder*.

Mr. Newton commenced by saying that about a twelvemonth ago he gave a lecture, of which the present was in some sort a continuation, and he then expressed his regret that circumstances would prevent him going on with that course for some time to come. This hindrance having ceased, he hoped in the course of this winter to get a little further on in his subject. Some of them would remember something of that last lecture, in which he endeavoured to trace the history of Greek art onwards, from the earliest times down to the period of Phidias, and he had just got on the very threshold of that part of the subject of the age of Phidias when he was interrupted. He in that lecture described the Acropolis of Athens, and pointed out what were the more remarkable temples and other buildings on the Acropolis, drawing especial attention to the Parthenon, of which he also had to speak that evening. He would only just remind them that the Parthenon was a Doric temple, the ruins of which still stood on the Acropolis. It was remarkable, not only for the beauty of its architecture, but for the extraordinary richness and variety of its sculptural decorations, which were of several kinds. First, there was the famous statue to the goddess Athene herself, in gold and ivory, which stood in the interior of the temple; then there were the great sculptures in the round, one or two pediment sculptures, the remains of which were very much shattered, and were placed in the British Museum. The sculptures to which he would now draw attention were two great pedimental compositions on the east and on the west end of the Parthenon. Outside the building, immediately below were what were called metopes, which filled the spaces between the triglyphs on a Doric frieze. These were sculptures in the round. Originally there were ninety-two, but now he was afraid there were not more than twenty, and of these he would lecture upon on a future occasion.

What he had to deal with that evening was the frieze. The frieze in a Greek building might be described as that portion which intervened between the architrave and the cornice on the outside of the building, and which crowned the wall on the inside. In a Doric temple there was no frieze between the architrave and the cornice. As to the frieze of the Parthenon, he must tell them at the outset that he would have great difficulty in explaining it to them on account of the mutilated condition in which it had come down to them. In regard to the history of this frieze, there was a time, of course, in the Middle Ages, when the Parthenon was a Christian Church, when he supposed that this frieze was perfect—running all round. There might have been 600 ft. of it about that time; but about the year 1656 there happened a most disastrous event, viz., the siege of Athens in the time of the Venetians, when the Turks held the Acropolis as a fortress. The Venetians besieged it, and owing to the fall of a shell the powder-magazine exploded, causing the destruction of a great portion of the northern part of the building, which caused an irrecoverable loss of portions of the frieze. After Athens became known to travellers about the middle of the last century they visited this place, and he was sorry to say that they indulged in the propensity, not unknown to British and other tourists, of chipping off pieces of the frieze in order to carry them away, and consequently several slabs on the eastern side of the Parthenon had been nearly destroyed. That destruction was going on until the French ambassador carried away one piece of the frieze, and Lord Elgin, who was then acting as English ambassador, took away a good deal of the remainder. He left, however, the western frieze intact upon the building, where it was to this day. A great deal of the frieze was then underground, and was never discovered till the great clearing of the Acropolis about the year 1833. After the Greeks took possession of Athens, they removed all ruins of the Turkish fortress, and dug till they came to the rock, and in the course of their excavations they found pieces of the most beautiful frieze we had, besides a great number of fragments which remained little noticed for years. He (Mr. Newton) visited Athens in 1852, and in consequence of the representations he made, the Trustees of the British Museum were induced to have casts made of portions of these fragments which were sent over to England, but nothing more was done to identify the fragments on the frieze for many years. About five years ago Professor Michaelis, of Strasburg, published a work in connexion with the Parthenon, which showed the utmost learning, research, and admirable judgment, and that it was not better known was only a proof how little archæology was cultivated in this country. He (Mr. Newton) strongly recommended them to take the atlas of that work and confront it with the marbles themselves in the Elgin room, and they would find in that atlas a combination of the marvellous which they had in the British Museum, and of the marvellous which existed at Athens last year. These drawings were made before the explosion of the powder, magazine in 1656, and, slight and careless as they were, they were most precious, telling them in the first place of the component parts of this frieze, and of the order in which these pieces came. An entire view of the frieze was given, so far as it could be obtained from the combination of drawings. There were, however, a few fragments which were not identified, and he had made an examination at the British Museum, and had succeeded in finding places for several of the fragments. From time to time they had little windfalls in regard to the discovery of the fragments. A fragment was some time back discovered in Cheshire, and the owner generously gave it up, and it was fitted on to the frieze. Another fragment was given to the British Museum, many years ago, by the Dilettanti Society. He could not give them a complete illustrated account of the frieze, because the space on the wall for his drawings was not large enough, but he would give them a selection from each side of the frieze. As to the subject of the frieze, he thought they could have no manner of doubt that it was the Panathenaic procession, which was a festival held in honour of the goddess Athene, and every five years it was celebrated with all possible solemnity, with the usual accompaniments of contests,—gymnastics, horse-racing, chariot-racing, and music. Its principal feature was the procession to Athene, the goddess, to whom a veil was offered. The Greeks had an idea that their tutelary goddess would be very well pleased with a birthday present, and this veil was the birthday present of Athene, and upon that day this veil was carried in solemn procession all through the town up to the Acropolis, and finally offered to the goddess, not in the Parthenon, but in the older temple, the Erechtheum, where she had her own shrine conjointly with Erechtheus. This procession consisted of cavalry, chariots, old men who carried boughs, while others carried sacred vessels belonging to the treasury of the goddess. All these things they would find in the excellent remains of this frieze. It was not to be supposed that they had a literal transcription of the procession, but there was such a representation of it as served at once to recall it to the mind of the devout Athenian. In the original procession, the persons who were to take part assembled in the suburb of Athens, the veil was put upon a ship, and afterwards carried through the town up to the Acropolis. This feature would not be found in the frieze, for the ships and the sea were not appropriate to sculpture; but he was told that there was just such a custom at Palermo in the carrying of the veil. Great care was bestowed on the training of the horses that took part in the procession in honour of the goddess, they being taught to rear and curve,—to show themselves off,—as was represented on the frieze. In regard to the gods who were represented on the frieze, there were many theories extant as to who they were. After a long research, he had come to the conclusion that they represented the twelve gods of Olympus, and not the gods who were worshipped on the Acropolis, as many archæologists maintained. The object of Phidias was not to make a realistic idea of this procession, but to produce a certain religious feeling in regard to the faith of the people. There was a combination of real and ideal in the general scheme of the frieze, and not only in the general scheme, but in treatment running through it. There was, besides, contrast, which gave so much additional colour and additional distinctness to Greek art. The frieze had never been equalled for elegance of composition and the variety and gracefulness of its figures. It was executed in low relief, in order to adapt it to the light; for, placed within the colonnade, it received its light between the columns, and by reflection from the pavement below. Probably the ground of this frieze was blue, and the figures were picked out with different colours, the flesh of the men being painted a sort of dun colour; but no trace of colour remained on the frieze. In conclusion, the lecturer recommended his hearers not only to study the frieze itself at the British Museum, but the whole scheme of the composition, and they would find that the more they looked at it the more they would be struck by the wonderful life and energy of the beautiful contrasts to be found. Everything in the frieze was so rhythmical; and the whole of it was a great lyrical poem, and, what was more, it was the only example of a continuous composition which they could study at any great length through antiquity. He would advise the study of the frieze of the Parthenon as they would study the poems of Homer, for it was the most precious thing that had come down to them from Greek sculpture.

Mr. Storr, at the close of the lecture, proposed a vote of thanks.

Mr. Mundella, M.P., in seconding the resolu-

tion, paid a high tribute to the ability of Mr. Newton as a lecturer, and warmly thanked him for the rich intellectual treat that he had given them. He regretted that there was not a larger attendance, which he attributed to the fact that the meeting had not been advertised. While speaking on the subject of art, he could not help referring to the remarks of Mr. Gladstone with respect to the position that England would occupy in the future, as compared with America. He was sorry that he could not agree with the right honourable gentleman. Apart from the great material resources this country possessed, as a nation they were thoroughly cultivated, and had a just appreciation of art, and there was a vast demand for its industrial productions. The conditions of industry must altogether be changed before they came to the end of their coal supply, and it must be at so distant a period that it was hardly worth considering. He instanced the French as an illustration of what could be done by an artistic nation without having these material resources; for France had, he believed, little coal or iron as compared to England, and yet there was a world-wide demand for her productions, because of the artistic feeling introduced. He believed that England was developing, though slowly, in the appreciation of art, which, to their interests, was gradually making itself felt. With respect to its value, it was felt at this moment at the Paris Exhibition. He thought that some day or other would make England a great workshop of art productions to supply other parts of the world.

THE CHELTENHAM CONGRESS OF THE SOCIAL SCIENCE ASSOCIATION.

The Right Hon. Lord Norton, as president of the Congress, delivered his inaugural address in the Assembly-rooms, High-street, Cheltenham, on Wednesday evening last. Taking the five heads under which the discussions are grouped, Law, Education, Health, Economy, and Art as applicable to social improvements, the President gave brief attention to each. We print what he said as to Health and Art:—

"*Health.*—I will now pass from the educational conflict with internal causes to the sanitary fight with external causes of social corruption and disease. 'Sanitation' is certainly a new term for a science of late promotion. Our commonest maxims about health are taking to scientific phraseology. We have long said that 'cleanliness is next to godliness'; but we must now say that 'purity of skin is a factor in sanitation.' I have no cause to depreciate the exalted study, for the report of the Royal Sanitary Commission, over which I presided during 1869 and 1870, has been the quarry from which all subsequent legislation on the subject has been taken. The amalgamated Department of Health and Poor Law, as of *ordinary* and *eleemosynary* administration, has assumed the attractive name of Local Government. The constitution of urban and rural sanitary authorities followed. The Act of 1871 consolidated offices before confused. Definite powers were given them to deal with the supply and pollution of water, overcrowding or unhealthiness of dwellings, offensive trades, and epidemic diseases, by the subsequent Acts of 1872, 1874, and 1875. In 1871 I brought in a Bill for consolidating all the twenty or thirty sanitary Acts then in the statute-book; and I had a digest made of them, which, with an elaborate index, has been almost as useful as consolidation. On the whole, in review of what has been done, I think a great step has been taken from former negligence, I hope not swerving towards too much officialism. No doubt there is that danger, and for an instance of its occurrence already I think the appointment of permanent medical officers over the whole kingdom has duplicated much of the work which might be sufficiently and even better done by good nuisance inspectors, and has thrown into a perfunctory routine the special assistance which on emergencies would be much better obtained from the best professional advice to be got as the occasion required. But much is still wanted to complete the sanitary reform begun. Areas have to be adjusted, county action provided for, and, above all, consolidation and arrangement of the law. The powers of local authorities on various subjects want clearer definition, and in some respects widening. In Birmingham, the want of clearness in the law has allowed too wide an exercise of powers given against overcrowded and unhealthy dwellings, so as to embrace grand schemes of town embellishment, involving great town taxation and debt, and town speculation in the property taken in hand for sanitary improvement only. In defence against nuisances, on the other hand, local powers want widening. I am specially interested in guarding from pollution the supply of water. My solitary defence of a whole valley from what Birmingham thought to be its natural use as a washpot for the town, has given the precedent for the rural *tuum* against the urban *meum* in this respect. The towns have learnt and taught a great lesson in the struggle,—that there is no such thing as refuse to be cast out upon a neighbour or anywhere; but that a real valuable use may be found for everything, if people will take the trouble, or can be forced, to find it out. No more important record could be published than that of things which have been treated as refuse and discovered to be capable of profitable application. Rivers have been poisoned with chemicals which the poisoners were at the same time buying at a large price in another shape, and citizens ruined in lawsuits trying to get rid of materials which, applied to adjoining land, have for the first time shown what a lavish return the earth will give for an enlightened application. The sole remaining problem in arriving at a lucrative application of sewage to land,—the only proper application,—in the difficult case of large towns, is how to separate storm-water from the sewers, admitting only enough of ordinary rainfall to flush them. This remaining problem solved, and even the sewage of London may fertilise the hungry neighbourhood without mischievously making sandbanks in the Thames, or adding the poisoned to the black list of the drowned in its polluted waters. Our chief business in the Department of Health is to enlighten a blind self-interest how its own advancement may take part in the common good, and certainly the first sanitary social duty is to keep the common property of air and water pure. . . . .

Art.—In conclusion, I will say one word only on the new department of our discussions, that of art. Its introduction has rightly asserted the essential association of beauty with convenience and utility, and the refining influence of its study on the commercial spirit. Surely it is the ignorance resulting from its long-neglected study that has allowed the notion to spring up that beauty is something separate from fitness, something to be added as ornament, and not consisting, as it does, in cultivated adaptation. Has not this error led our architects and manufacturers to borrow incongruous features from other conceptions, or, at best, to seek beauty for their own works abstractedly from their use and purpose? There is essential beauty, no doubt, in form, and essential ugliness, too. It is not for me to conjecture why swans contrast with geese. They certainly express each its own idea, whatever may be the purpose of forms expressing ugliness. But talking of art as to its application in social science, one is simply considering its usefulness in adding beauty to utility, and that addition must chiefly consist in the expression of fitness and truth. Too many even think for beauty's sake to make things look like something different from what they are; an engine-house like a church, a smoke-shaft like a campanile, a pair of tongs like a Gothic arch, and, in this idea, to conceal features which properly belong to the design, as instead of making chimneys honestly and gracefully to fulfil their part, twisting them into buttresses. It is thought a beauty to make china look like gold or bronze, and house decorations as various counterfeits and imitations, such as wall-paper as embossed leather. This is jugglery, not art,—or certainly not art giving beauty to utility. To make a building commend itself to the eye as admirably suited to its purpose, to depend for beauty on proportion, to dare to leave large breadth of space unornamented in reliance on its fitness speaking for itself, to eschew unmeaning features, sham windows, and superfluous detail, to imitate Nature in truth and in appropriate effect, to embellish forms without a masquerade of colours as a savage tattooing his skin, such are true aims for art, taking beauty as its ingredient, and not as an adjunct. We go beyond asserting that a general diffusion of a sound artistic spirit would be a social good, to consider in what that soundness must consist. We shall overhaul our street architects for making chimneys that will not draw, and so inartistically as to entail on all our streets the horror of sky-lines of zinc piping; or for the carelessness which gives us crumbling walls, or the cheat of windows looking colossal outside and cut in half for use within, or the inadaptation of reception-rooms that require temporary verandahs to be added whenever they receive,—all losing more and more of beauty as they sacrifice its essence to its false idolatry. Beauty will follow the designs of those who work in its full spirit, who seek neither beauty apart from utility, nor, on the other hand, utility apart from beauty. About this latter error, let me quote the noble words of Mr. Gladstone, the expression of one of the finest, and richest, if too impulsive, spirits in this country:—"Beauty is not an accident of things; it pertains to their essence. Reject the false philosophy which asks what does it matter, provided a thing be useful, whether it be beautiful or not? Nothing is more striking than the profuseness with which the Almighty has shed over His works an endless and boundless beauty. To this the mind of man still answers from within. Man's nature craves for some sign of what is beautiful. This makes the Spitalfields weaver, in the murky districts of London, train canaries and bullfinches to sing to him at his work. This fills the windows of the poorest with flowers. This, in a loftier region, taught the early masters of the fine arts to present the objects of our faith in the noblest forms of beauty their minds could conceive."

On Thursday morning the President of the Economy and Trade Department, Professor Bonamy Price, delivered his address. The Professor summed up thus:—

"To resume, in conclusion. The critical point with reference to the loss of authority caused by the method adopted by eminent economical writers is not so much whether political economy is in some sense a science, as whether the rigorous scientific treatment they pursue is necessary or desirable. Science is a vague word; and the limitation of its definition most difficult. There are reasonings carried on by every one on the commonest subjects, which, if minutely scrutinised, must be held to involve science. But economists proceed far beyond such modes of proving. Their aim is to build up a regular scientific structure, a systematic development of co-ordinated knowledge. They proclaim economical laws. In pursuing this method they ignore the nature of their subject, and the world which they are called to address. Their function is to explain industrial and trading processes practised by all. The discussions they conduct, and the conclusions they reach, are understood at once by natural sagacity. It immediately perceives that this is exactly what intelligent men do. The persons addressed are every class in the nation. They are incessantly speaking on economical topics in one way or another; much of what the economists write they have themselves said often. They will not listen to talk about laws on such matters. They are willing to be told of laws of chemistry and hydrostatics. They are conscious that, not having studied them, they know nothing of such subjects. They are willing to be informed that, in these regions, certain effects take place in a regular way, and the word 'law' only expresses this fact to their minds. But on the operations which occupy their lives they refuse to be silenced by the announcement of laws by persons who claim to be learned. They feel that they are often thinking, to a large extent, the very same things that the economists write,—that they argue as well, indeed with more familiar acquaintance with the subject. If they are to be convinced of error it can be done only by the teacher speaking their language; they will listen to nothing else. This is the true world in which political economy is called to spend its life; if it chooses to dwell in a temple of science, it will find few listeners. Its influence, when it is thus handled, inevitably decays, and to make it a part of sociology, so that its truths shall be studied and its teaching proclaimed only in sociological writing, will be to extinguish it for its one real audience,—the mass of mankind."

At the close of the address, the work was commenced in the various departments, and will be noticed by us hereafter.

We print elsewhere one of the papers read on Thursday morning in the Art Section.

Ludlow.—The Shropshire and West Midland Horse and Carriage Repository, just erected for Messrs. Millward & Urwick, is situated in Corve-street. The architect is Mr. Herbert Evans, and the builder is Mr. James Hine.

TESTIMONIAL TO MR. STANLEY G. BIRD.

The presentation of the testimonial given by the Central Association of Master Builders to Mr. Stanley G. Bird, took place on the 16th Inst., at the Freemasons' Tavern, Great Queen-street, when between thirty and forty gentlemen sat down to dinner, under the presidency of Mr. G. F. Trollope, who was supported by Messrs. T. H., G., M. G., & F. Adamson, Anderson, Burt, jun., F. J. & H. C. Dove, C. Fish, J. Freeman, Freeman, jun., J. Greenwood, B. Hannen, S. T. Holland, W. S. Horner, Horner, jun., H. & E. Kelley, H. Lea, A. Lown, A. Mansfield, T. Patrick, G. Plucknett, Prime, Rider, Robinson, Stirling, A. Thorne, G. H. Trollope, Wall, Williams, &c. &c. Letters regretting non-attendance were received from Messrs. Colls, Conder, Lucas, Waller, &c.

The testimonial, which consisted of a silver salver, tea and coffee service, dessert-stand, and salt-cellars, accompanied by an illuminated album containing an address signed by the whole of the subscribers, was presented to the guest of the evening by the chairman, who, after thanking Mr. Bird for the energy and courtesy he had displayed as honorary secretary of the Association from its commencement, congratulated the members that, although losing that gentleman's services in an official capacity, they would still have the benefit of his counsel and advice on the committee, and asked them to drink to the "Long life and happiness of Mr. S. G. Bird and Family."

This was done with the greatest cordiality, and Mr. Bird, in responding, acknowledged his indebtedness to the assistance rendered him by Mr. S. T. Holland. Some few other toasts having been honoured, a very pleasant evening came to a close.

AFRICA AS A FIELD FOR BRITISH COMMERCE.

Mr. James Bradshaw, of Urmston, near Manchester, writes to direct attention to "Our Second India," as Africa has been called, as a market for British commerce. He refers to the great depreciation of property in Lancashire resulting from the rivalry of the cotton-mills of America, India, Brazil, and other countries,—remarking, *en passant*, that "new mills with the most modern appliances can now be bought in Oldham for half their prime cost,"—and then proceeds to discuss the means to be taken not only to avoid its further retrogression, but to restore to its former activity and progression the cotton-trade of Lancashire, the ramifications of which, as he says, are so widely-spread that every trade in the kingdom is directly or indirectly affected by them, and notably the coal and iron trades. Commercial treaties; abolition of Indian import duties; abandonment of Free Trade and return to Protection; short time; and lower wages, have been suggested as panaceas, but they appear to Mr. Bradshaw only to deal with the fringe of the difficulty, and to be, at best, only calculated to afford temporary relief. The only effective remedy, he thinks, is to be found in thoroughly opening up Africa to British commerce. Africa, he remarks, with its two hundred millions of inhabitants, is a land of mighty lakes and rivers, forming natural highways for commerce, and it overflows with animal, vegetable, and mineral resources hitherto unutilised by man. As a collateral result of intimate and widely-diffused commercial relations with Africa, the traffic in slaves, with all its horrors, would be, in Mr. Bradshaw's opinion, driven out of the country in a few years. As to the application of the remedy, Mr. Bradshaw says:—

"The work can only be done speedily and effectually by a sort of modified East India Corporation, possessing the power to protect its persons and property in every part of Africa, and with the financial strength to remove difficulties which are beyond the power of individual enterprise to cope with. From whatever point of view this subject be regarded, religiously, philanthropically, or commercially, no Englishman can say,—'It does not concern me'; for Lancashire in particular, from the Earl of Derby, whose great land revenue has been created chiefly by the local industry, to the humblest scavenger in the cotton-mill, this question of Africa as our future field of commercial enterprise is paramount."

The Pathway through St. Alban's Abbey.—At the Herts Quarter Sessions, last week, Mr. J. Lydekker applied to the Court for a certificate to stop up the old footway through the Abbey. It being stated that the new way had been properly made, the Court granted the order.

THE CAPITAL OF CYPRUS.

The place now generally described as the capital of Cyprus, and where the Turkish governor used to dream away his life, Lefkosia (called also, some say incorrectly, Nikosia), lies in the interior of the island, in the centre of a large plain on the Pidias (Pedieus). It is a mystery why this town was selected as the capital, both Famagosta and Larnaka, on the east and south coasts respectively, being of far more importance commercially. The town offers a fine view, enhanced by small palm forests surrounding it, from outside. The fortifications are the old Venetian. The guns still standing in them are adorned by the lion of St. Mark, and the coat of arms of the Adriatic republic may yet be seen on the walls of the Pasha's konak. The interior of the town is—filthy. We see miserable, tumble-down houses, and walk in narrow, reeking streets; as in most Cyprian towns, wherever we tread there are dirt and vermin. Lefkosia, in short, is another Augean stable more for us to clean out. This much as a general estimate of the town.

The stranger now visiting Lefkosia, if he will take the trouble of turning round as he is entering the town by one of its three gates, will be at once struck by a reform following in the train of the English occupation. Should he come from Famagosta, riding through the gate of that name, he will read in large letters, "The Channel Squadron Gate." In a similar manner, the Baffo Kapu has been patriotically altered to "The Minotaur Gate," the Kerinyé Gate being reformed into "The Invincible Gate." This change has a deep signification. It means that England owes this increase of her empire to her ironclad fleet, which for the last eight months has been carrying on determinate, if silent, war in the Sea of Marmora against the Russians. Well, the three gates, according to their former names, lead to Famagosta, Baffo, and Kerinyé respectively, consequently towards east, south-west, and north. Under Turkish rule, they were closed at sunset, in order not to disturb the sentinels in their sleep; and the hapless traveller who had the misfortune of arriving before the walls of Lefkosia after sunset had to chew the end of patience until sunrise, unless a special order of the pasha released him. All this has also been reformed off the face of Cyprus. Anybody is at liberty now to enter the town at any hour. He may also walk to his heart's content on the ramparts, may look at the Venetian guns without apprehension of being driven away by Turkish soldiers with such expletives as "Giaour!" "Kyafir!" or "Köpek!" (dog). The walk on the ramparts is one of the most delightful strolls in the world; and if once an avenue of trees has been planted there, there is no further need for Lefkosia to lay out other grounds.

The circumference of Lefkosia is about three miles. The eleven bastions, all heart-shaped with blunt points, jut out of the circle at equal distances, and impart to the works the character of a star fortress. The two excellent water-conduits of Lefkosia run part of their course along the town walls. The best of the two has its origin at Istrovilo, not far from the town, and is called Arale Ahmed Pasha. The second water-conduit comes from Siliftar, half an hour distant, runs underneath the town-wall as far as the Mansa Kapu, whence the Archbishop has conducted it in iron pipes into his *malhallé* (quarter of the town). The remaining pipes (*künks*) are all of clay, made in Lefkosia itself at about 3d. a foot. Lefkosia is thus clasped by a fine belt of water, which now feeds a fountain, now supplies a drinking-place, and finally disperses itself in a thousand threads throughout the town, distributing health and coolness. Considering the great drought throughout the year here, this is a real blessing, for not a drop of water is to be found in the bed of the Pidias, which runs past the town, except during the rainy season. Then that river rises to a tremendous height; and should the Baffo-gate not be closed early enough, it pours its waters into the town, carrying destruction in its path. At the present day there is still to be seen the bed which the torrent burrowed for itself at a former inundation.

It is difficult to find one's way in the labyrinth formed by the streets of Lefkosia, for names of streets are scarce. There is as yet no Metropolitan Board of Works to look after such little matters. The Christians divide the town into "esorias," the Turks into "mahallés," and people find their way by them. There are about 3,000 houses; the number of inhabitants is fixed by everybody as he pleases, a census being here, as everywhere else in Turkey, considered an article of luxury.

Lefkosia possessed formerly hundreds of churches and chapels. Chroniclers mention no less than 250. A great number of them are still preserved; they serve, with the exception of a Maronite church and an Armenian one, all for orthodox worship. There are not many features of beauty about any of them; they are mostly awkward buildings, to which since about twenty years belfries have been added (formerly the ringing of bells was not permitted), the slender elegance of which is little suited to the heavy nave. The interior generally is overloaded with very ugly pictures of saints, in the well-known orthodox style, on a gold ground. They are exhibited especially on holidays and saints' days; and as the Cypriote Greeks are great fanatics in religious matters, the papas make a good thing of it.

In Cyprus every saint's picture, every Madonna, has a particular power and special merits, known to every believer. The first rank is occupied by the Panhagia of Chiko, a monastery north-west of Olympus. The monastery being too far distant from the various towns, the Madonna is sometimes taken the round of the country; it is alleged that she is enclosed in a shrine; the orthodox must not see her, because instant death would follow were they to get a glimpse of her. It is therefore only permitted to kiss reverently a small opening of glass, from which it has been inferred by liberal-minded monastics that the shrine is empty.

The oldest church in Lefkosia is the Tripiotis, after a new building has taken the place of the Phaneromeni. The Catholic monastery of St. Croce is occupied by Italian and Spanish monks. All those churches, without exception, possess rooms for strangers, which travellers may have for the asking, though they are expected to leave a trifle when departing.

The pearl among the churches of Lefkosia has been appropriated by the Turks, the Aga Sofia. It lies in the centre of the town, not far from the Bazaar, seen far and wide, the landmark of Lefkosia. Its history leads us back to the times of the chivalrous Lusignans, whose figures in armour may still be seen on the floor of the church. Now Aga Sofia is old and dilapidated, a handsome widow in the mourning of four centuries. Its towers have been thrown down; its finials have been lopped off; its columns have been coated with execrable colours; its floor has been scraped everywhere, so that no trace of the Christian inscriptions remain; in its side chapels weeds grow, filth is accumulating. Everything points to poverty and neglect. The mats on the floor are in rags, and mouldy; it is hardly worth while to raise them, that the foot of the Giaour should not defile them. It is reported that the church contains several chapels still perfectly preserved. Thus a few years ago Mehmed Ali Effendi, the chief engineer of Cyprus, who was ordered to repair the church, discovered a Gothic arch under the light coating of colour of the nave, which probably had been walled up before the capture by the Turks. The nave is lighted by five large lancet windows. The church not lying in the prescribed direction towards Mecca, the Moslem arrangements of a mosque, desks, &c., had to be fixed from right to left, which causes a most comical impression.

The bazaars of Lefkosia deserve some mention, because they are the largest in the island; they extend from the Aga Sofia in all directions for some distance. Of course, they cannot be compared with those of Constantinople. But one asks, on wandering about them taking notes, what might have become of this industrious and clever Greek race if its development had not been so violently interrupted? One need only look at the silk stuffs which are made of native yarn; so simple, so pretty, so full of colour, so soft, and—so cheap! A beautiful silk pocket-handkerchief may be bought for a shilling. The whole female portion of the Greek population understands this industry; it is its own entirely. Though the Greek women of Lefkosia are not pretty, they are clever. The Turkish women are far behind them in this respect. There is a bazaar here expressly for women's work, where they (the women) offer embroideries and kerchiefs, purses, tobacco-pouches, takkis (crocheted linings for the fez), &c., which they make themselves. Though the Koran and its interpretation expressly forbids women to trade, in Lefkosia

this seems to have been forgotten long ago. The male Turks are said to understand, besides drinking coffee and smoking the nargileh, the trade of dyeing. The method pursued is very primitive, but the colours are said to be lasting.

The principal day for all bazaars is Friday. The peasantry round the town come from all directions, bringing for sale everything the island produces. There is, in the first place, the cattle-market (Haivan Bazaar), on the Seraglio Place. Turks and Christians come riding into the town, crying out, one louder than the other, "Kanmassin!" ("Take care!"), which is a curious expression, being corrupted from *tokanmassin*, "do not touch." The corn-market, held in front of the Buyuk Han, built by Mustapha, is still more crowded. There the peasants stand in a row, closely wedged together, trying to get hold of the "Mültezim." This person is the farmer of the scales, for which he pays a rent three times a year to the Government. He has altogether four or five of them, and all the corn brought into Lefkosia must be weighed on them, 10 para being charged for 100 okka, not quite a farthing per cwt. Unfortunately that number does not at all suffice for Friday's market; and thus there is a constant chorus of "Ben evel geldim!" ("I was here earlier"), "Nebet benim dir!" ("It is my turn"). The uproar is beyond description, ending very often in free fights. Between the cattle and corn markets is the Iplik Bazaar (cotton-market). The cotton is weighed at haphazard, on a beam without tongue, used for weighing straw; stones of different sizes, the burthen of which is only known to the seller, forming the weights. There is also a Balyk Bazaar (fish-market), but unfortunately fish is scarce. Timber is sold outside the town, at the Baffo Gate, and is derived from the Solia Forest, near Lefka, in the west. It is dragged down the mountains by oxen, and then laden on two-wheeled carts. Charcoal, straw, and potatoes are generally brought into the town on camels. There is no coal. A seam of this valuable material was discovered a few years ago in the sloping bank of a river near Piskopi, but there the matter rested.

Besides the above bazaars, there are a number of others, where the various trades have their booths, such as shoemakers', tailors', and coppersmiths' bazaars. An article much sold is the changar, a large boot, which is made there. One of them weighs up to 3 lb.; the soles are from 5 in. to 6 in. thick; the heels have tips; the price being up to 70 piastres (about 10s.) per pair. They are an efficient protection in mountainous districts against serpents.*

THE LARGEST COVERED RESERVOIR IN THE KINGDOM.

There has just been completed at Widnes, in Lancashire, what is believed to be the largest covered reservoir in the kingdom. It has occupied two years and a half in construction, having been begun on the 16th of April, 1876. The total cost, including the mains attached to it, amounts to over 30,000*l*.

Widnes is a manufacturing town of about 22,000 inhabitants, and the water supply is under the control of the Local Board of Health. A very large quantity of water is required for manufacturing purposes. The supply is exclusively from wells, known as Stock's Well, Netherley, and Belle Vale,—the latter having only recently been purchased by the Local Board. These are calculated to meet the domestic and manufacturing requirements, not only of the neighbourhood itself, but of a district contiguous of considerable extent.

The object of the new reservoir, which is situated at Pex Hill, is the storage of the water pumped at Netherley and Stock's Well. It is upon a lower level than the old reservoir adjoining it, the new one being intended to supply the town and the lower parts of the district, while the old one will be reserved for the higher portions. Separate leading mains have been laid with this object in view. The water can be delivered into the new reservoir direct from the engine pumps, or through the overflow from the old one, as may be necessary.

The following are the particulars of the new construction. To support the covering arches there are 352 piers or columns. The arches are 9 in. thick, and are covered with ballast and earth. Under the brick flooring there is a layer of asphalte over the whole area, $\frac{3}{4}$ in. thick. This is jointed to a lining of asphalte, $1\frac{1}{4}$ in. thick, in the side walls. The asphalte is to prevent the water leaking or filtering through the walls, or through the red rock underneath the floor. The channels formed in the floor are to admit of its being thoroughly emptied and washed out, the cleansing pipe being taken from the bottom of the visible well, and then carried under the reservoir floor, the side wall, and clear of the embankment upon the old reservoir side. The outlet to the town is 24 in. in diameter; the inlet (which falls into the large basin) is 18 in. in diameter. The overflow-pipe is in the same line of arch or bay as the cleansing wall, and goes into the same line of pipe under the floor, any overflow falling into the quarry upon the hill.

The length of the reservoir is 330 ft.; the width, 240 ft.; the depth at time of overflow, 22 ft. 3 in. It will contain 10,000,000 gallons of water when full; the old one held only 1,250,000 gallons. The lower terrace and banks at the west end have been formed with the waste material from the excavation. The masonry of the piers and walls has been obtained from the site of the reservoir. It is said that while this work has cost 3*l*. for every million gallons it will contain, the average cost throughout the country is 5*l*. per million gallons.

Mr. John Taylor, of Widnes, was the contractor; Mr. Henry Roberts having drawn the plans.

A COMPREHENSIVE DRAINAGE SCHEME.

The Corporation of the City of Exeter have at present under their consideration a very comprehensive scheme for the main drainage of Exeter and the district for several miles around. The project contemplates drainage works extending from Tiverton to Exmouth, a distance of twenty-five miles. The proposal is to form one large drainage area down the whole valley of the Exe, and to construct a sewer which shall receive the drainage of Tiverton, Collumpton, and Crediton, and after taking up the sewage of Exeter it shall receive that of Topsham, Lympstone, and Exmouth, and finally discharge the whole into the sea at Straight Point, Exmouth. The estimated cost is formidable, being no less than 200,000*l*., but it appears to be generally thought by the Exeter municipal authorities that this large outlay would be well spent, as it is believed that it would finally settle the sewage difficulty of the district. The Town Council are about to hold a special meeting in order to discuss the whole question.

ST. MARTIN'S IN THE FIELDS.

Improvements have, for some time past, been in progress at the Church of St. Martin-in-the-Fields, Trafalgar-square. The several flights of steps at the west and north and south sides, leading to the portico, have been taken up and redressed, and in several instances entirely new steps have replaced those worn out. The columns supporting the portico have likewise been cleaned, whilst the whole of the floor of the portico has been relaid in Purbeck stone, of the uniform dimensions of 2 ft. square. The floors of the five porches leading into the body of the edifice have likewise been relaid in Purbeck, in a similar manner to that of the portico floor. The panels forming the ceiling of the portico have also been cleaned and decorated. All the doors of the five entrances to the church are of English oak; but for many years past this material has been obscured by successive coats of paint. The paint has just been removed (which involved a considerable amount of labour), and the finely-grained oak restored to view; and where the faces of the doors have been polished, which is intended, they will present a greatly improved appearance. It is a noteworthy fact that, when the paint was removed from the doors at the west end of the church, it was discovered that they were largely dotted with shot pellets, indicating their having received the contents of firearms during some riots or other disturbances in former days. The organ has been entirely taken to pieces, and cleaned and rebuilt, by Messrs. Hill & Co.

The works have been carried out under the direction of Mr. Penrose, architect at St. Paul's Cathedral, Mr. Shaw, of King Edward-street, City, being the contractor.

ART-WORKMEN AS JUDGES OF THEIR OWN ART-WORK.

In contemplating the plan now in course of working out, by the Society of Arts, for more thoroughly utilising and comprehending the scope and meaning of the great art display at Paris, and in finding out the part which the workman has played in it, and the results of that work, several considerations suggest themselves. The idea is, as is known, to elicit from the workmen themselves their own estimate of the specimens of their own sort of work. All must need wish success to the plan, as we do.

It would be equally difficult to overrate the import of such a mode of inquiry as this, for who, it may well be asked, can judge so well of the special character, and goodness or badness, of any work, as it comes from the hands of the workmen, as those who belong to, and have themselves practised, the very same craft and produced the like work? It would seem, at first sight, to be all but the same thing as though the Royal Academy had sent a deputation of their ablest to the French Show, to report on the character and value of the paintings exhibited, and to pronounce judgment on "methods of work," and on the goodness or badness of the materials employed. We think it must have struck all in this fair light, and we can but hope that the final result of this bold experiment will justify such very reasonable expectations. It seems at first sight all of it so easy and simple a task, and all but obvious, but it is in reality not so. On the contrary, it is of the last order of difficulty, and perplexity, indeed, consequent on the difference in the mode of work in the past and the present. In the past the matter was simple enough; its elements were individual, and in each case single, but now all this simplicity is changed, and has gradually, if truth must be told, disappeared all but totally.

To make the matter as simple as may be, let us take a single example. There can be no sort of doubt that before the modern improvement of the division of labour, as it is termed, came into active operation, whereby any special work is the result of a passing successively through the hands of a succession of workmen, all as able as you will, the simple plan was to put any certain work into the hands of a single artisan, and he then, whether well or ill, executed, quickly or slowly, the whole of it, from first to last; indeed, just as at the present hour most Eastern work and art are done. We have now before us a small common earthenware jar from Morocco, and it is as evidently in idea, form, manipulation, and "ornament,"—what there is of it,—the production of one man, the finger-and-thumb work and soul work of one workman, as any one thing can possibly be. And here it is that we may ask, and ask fairly, what sort of workman is the author of such a vase or cup as this, and what his art-power and status, and what may we expect of him in the future; and what is he as compared with those artist-workmen of old who produced the vases and cups and amphoræ in the Museum from ancient Etruria? There, and then, at least, they understood the art and mystery of the potter's trade and vocation. It is this individualised work that we presume the Society is in search of.

Now, the question, therefore, to be put in the Paris show, as far as the *art*-workman is concerned, is this,—Can any and what single work or works be thus referred to a single author, each one of them not only as an example of workmanship, and manipulative power of action, but in thought and idea? Has the workman here, as evidenced in his work, a "head" as well as hands and skilful and ever-ready fingers,—we are confining ourselves to art-work, be it recollected,—or is each individual workman merely one item of many, all working together, and one after another, or interchangeably? And more than all, perhaps, is he with others working out an idea or artistic thought drawn out for him by another artist, he being merely one of the tools used in its production, and the final result a good one? It is this which is the real question at the Paris Show, and it is this that, as we take it, the Society of Arts meant when they sent this workmen's deputation to Paris to report. But we cannot help asking, with some curiosity, and perhaps a little doubt, are those who have gone to Paris to find all this out, and to minutely examine the art display and its infinite variety of details, fully qualified to do this, knowing so little of any other mode of work?

* We are indebted for some of the materials of this sketch to the letters of the special correspondent of the *Kölnische Zeitung* in Cyprus. Information respecting our latest acquisition, from an impartial pen, will doubtless be welcome to many of our readers.

We can hardly think this. Looking to what our workmen are, and at what they are expected to do, *i.e.*, to be always ready at a moment's notice, and to be able, as the phrase is, to put each man his hands to anything—as, for example, the stone-carvers are expected to do,—we can hardly expect them to go into the character of art-work in this special way, or with an eye to the individualities of the art-power at work, as evidenced in any particular art-work. They must need look upon the whole as a final result, and as more or less the result of a tradesman-like way of producing it, as smart and finished work simply, and as thoroughly and obviously produced intelligible work. We are not complaining of this, as far as it goes, but is there not a something more than this, and a something infinitely higher and more to be sought after? There must be, or the older art of the past, and the antique art from the great Classic times, come to nothing. If mere mechanism, or the mere working, as machines, can accomplish all that is needed, then does the individual man and artist disappear, and he is at once lost in the mere fact of this mechanical action, and in the very combination and division of labour now everywhere prevailing, and which has, indeed, it must be confessed, made the modern world, as far as art is concerned, what it is. That there are advantages in it but few will deny, but at what a sacrifice!

We could here, by going into details, afford not a few instances of this, and quite sure we are that such would convince the most sceptical, and would prove of interest to all who care for such matters. Let us, by way of illustration, cite but a single instance. It is close at hand, and may be seen by all; and he who runs may read. We refer to the carving, or sculptured forms, on the four angles of the base of the Monument, Fish-street-hill. These capital stone carvings have not had the notice they so well merit. Perhaps they are too familiar. They were the work of one Edward Pierce, jun., and they cost, it is of interest to add, 50*l.* each. These dragons are really admirably wrought and conceived, and are evidently the invention of, and thinking out, as well as the work of the young sculptor who executed them, from first to last. They were not done, as such work would be nowadays, by two or three workmen, each man doing the very best, but none of them being able to claim the work as his. If those who are interested would see what is meant by artist work, why, here they may see it. Happily, they have been left alone. They are a good deal broken in divers places, but are not a wit the worse for all that. How different this from the new mode of work, say at the Law Courts, where, carefully as the work is executed, and this is really noteworthy, it seems to matter but little who does the work, or how many take it up by turns.

We have named but one single instance of this individualised art work, but could go on to almost any length citing example after example, each of them to the full as much to the purpose. But it may suffice to call the attention of the Society of Arts to what is really needed while there is yet time, before the close of the Exhibition. What is needed is a new system of work, and a closer look at things. No one doubts the zeal and capacity of those who have contributed to, and done the work of, the Paris display of art-work; but to know all about it, to judge of its precise value, and to give praise where it is really and truly due, we must need see who individually does the work, and who has thought it out, just as in a picture. We must know the painter, and see into his thoughts, and look at his *bonâ-fide* handwork,—at the individual impression he makes on the dead materials, both mentally and manually; for it is this which, indeed, constitutes artist's work, as distinguished from mere machine-made work. And it is here, too, that the work of the past,—of the antique,—is still *per se*.

The Woods and Forests.—The Fifty-sixth Report of the Commissioners of Her Majesty's Woods, Forests, and Land Revenues has been issued. Mr. Gore, the Commissioner in charge of the land revenues, reports that the total receipts on the property in his charge during the year ended March 31st last amounted to 348,711*l.* The outlay incurred during the past year upon the property in question in the drainage and reclamation of land, in building and repairing farmhouses and homesteads and cottages for labourers, &c., amounted to 24,670*l.*

ON THE FUTURE OF ENGLISH ART.

Sir,—*Le Roi est mort. Vive le Roi!* A reign has just ended, and now the realm of the Fine Arts looks forward with expectancy and hopefulness to another. There is happily no difference of opinion as to the rightful heir to the throne. And that he of all our art kings since Reynolds will not only be capable of wearing the ermine, but also of ruling. In the interregnum one breathes more freely, and is tempted to give utterance to opinions which hitherto would have been useless to express.

What reams upon reams of paper have been blotted, and what breath has been wasted upon the duty of inculcating taste, and the necessity of establishing galleries, museums, &c., for this purpose. In no country has so much been written upon and talked about art, and in none has so little been theoretically and practically accomplished in its true interests. Art criticism is for the most part but the expression of "whims," which will be standing records of the defective mental grip of the age, and art performance itself is in the main without any national aim, incomplete and fragmentary. Pictures, it is true, have been painted by the thousand. We have a museum containing the magnificent remains of the works of Phidias, and there is a National Gallery containing fine works of the old masters. And yet what evidences do our painting and sculpture show of our vast art educational appliances, as these are generally supposed to be? Do we see any tendency in our art towards high thought, towards a national art of an epic and monumental character? Can we place the great majority of our painters and sculptors, either in genius or in technical skill, on a level with the third-rate men of the great art epochs? Nay, can we in the main place the art of the day upon a level with that of Hogarth, Reynolds, Gainsborough, Copley, Stothard, Flaxman, Banks, and Bacon? Of what value, then, have all our recent acquisitions of ancient art-treasures, and the institution of all our art-schools, been? Have the results been anything like an equivalent for the vast expenditure of public money? Instead of spending our money as common-sense nations did in employing artists, we go on spending money in increasing our collection of examples. In fact, we persist in taking every means but the right for encouraging art. We go to Paris and see the French painters, sculptors, and designers excelling in every department of the fine arts; and yet we persist in lauding our own art eccentricities and in hugging ourselves in the belief that the whole world is envious, and is endeavouring to follow our example. But when some useless scheme of art-education is to be promoted, different tactics are used. We are then told that we are behind other nations in all æsthetic and technical matters. Is life worth living? is a question which has been recently discussed. We will vary the question and ask if art-life is worth living, if we are for ever to be behind the past? Is it any equivalent for our vast amount of talking, writing, and expenditure that the art-schools are filled with male and female students whose aim will never be beyond that of smart sketching, and "clever bits"; and who, for the most part, will find out, after a little while, that they have been seduced to join a crowd of students which is out of all proportion to the demand, and who will have to join in that miserable chorus of "We've got no work to do"? All our splendid art-collections, both public and private, and all the lecturing upon the history of art, have as yet failed to teach us the one great common-sense principle that the progressive development of art is certain to attend on a continuous public demand for high effort. We try to breed Raffaelles and Michelangelos who will die without ever finding historic chapels or Vaticans to embellish.

"Upon what does good taste depend? It depends upon perfectly-constructed senses and a correct judgment,—upon a nature so attuned that it is in unison with everything that is beautiful and right. And this can only be brought about by correcting the entire substratum of mal-organisation, intellectual and physical." Do you expect to gather art from thorns, or taste from thistles? Go to! You are very absurdities yourselves, who need to go to school. The only direct road to good taste is, as an able correspondent of yours has forcibly pointed out, through general education. Every step higher in this direction will bring the nation nearer to good taste, and to the appreciation of excellence in art. The same writer has also pointed out that it would be as vain to expect a flower to bloom in space without root and stem as to expect fine art and good taste to come of ignorance, or to flourish grafted upon ignorance, and yet this is precisely the fallacy to which our wrong-headed art-reformers persist in clinging. It was with the growth of the leading intellects that art was developed both in Greece and in Italy. "Art is the flower, not the root of civilisation." Our art-reformers expect to succeed by an inverse process,—by planting upside down.

We have to shake ourselves free from the "craze" that art can be "crammed" into the soul. Art is the evidence either of the intellect's distance from or approximation to maturity. If the study of art example could create taste, to quote our previous authority, Europe had that example for centuries, for a period longer than it took Greece and Italy to create all that we profess so much to admire, and yet these art-treasures are still unrivalled." In short, I myself firmly believe that the constant presence and citation of these examples is rather prejudicial than instructive. It interferes with a natural and progressive development, for the art of music, which was not over-shadowed by ancient precedent, has during the same period taken root and developed into Classic excellence.

One of the first manifestations of a sound education is the love of simplicity, order, and proportion. These are qualities upon which we can reasonably descant; for it is in the power of the poorest to, in some measure, conform his surroundings to these primal elements of good taste; and even when works of art, in their very cheapest form, would be unattainable. Moreover, the tendency to crowd walls with prints and pictures should be discouraged, for it is anything but a sign of good taste. A wall swarmed with pictures and picture-frames is a dustbin, and oppresses one with the overcrowding, and the hustling together without any fitness of juxtaposition. Art should not be the workaday, but the holiday, entertainment of the eye. A thing of beauty placed here and there with judgment is a much greater evidence of good taste than any ostentatious display of a crowd of art-treasures. This is what we English have yet to learn. We have no sense of repose. That there should be blank spaces in decoration as well as jewelled spaces. Art, according to the art-maniacs, should be everywhere,—in every cottage, workhouse, and hospital, and all over them. They will have art! art! art! and nothing but art.

Then our self-constituted guides, who often, I fancy, must have some misgivings, some compunctions of ignorance, fancy they may, at least, safely exhort the student to study "Nature," as if there were anything else to study, as if Nature were not responsible for ugliness as well as beauty,—for the porcupine, the hippopotamus, the baboon, &c., as well as the human form. There must be contrariety, or even beauty would pall upon the sense. There must be plain spaces as well as ornament; moments when art should be present to us, and moments when it should be absent. But to all these important truths your would-be taste-reformer is totally oblivious, and in being oblivious shows that he himself is wanting in taste.

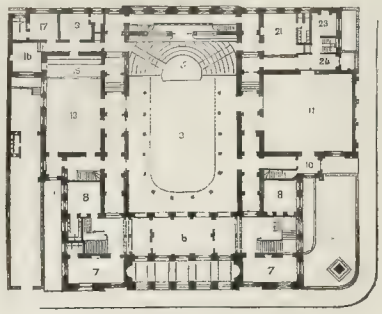
All our art projects are at present wheels and pinions without a mainspring,—a prime motor. The people in general know quite as much about art as your average art-reformer, and it would be much better to leave them alone in these matters, and to the growth of common sense. Good taste with good education would come in time as a matter of course. The better would it be if those who aspire to direct the public would show in their surroundings that they themselves possess good taste.

Meter.

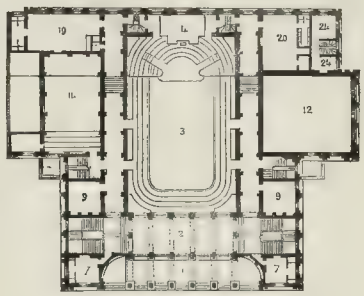
THE GILBERT SCOTT MEMORIAL.

The committee appointed at the public meeting held in the Westminster Chapter-house in June last to erect a memorial and found an Art Workmen's Teachership in honour of Sir Gilbert Scott, have published a fourth list of donations, and earnestly invite further help. A sum of nearly 900*l.* has been raised. The personal memorial, as we have said, will take the form of a brass over the grave in Westminster Abbey. It is to be hoped that those who feel inclined to aid will come forward at once, for the committee are evidently spending money in advertisements which should not now be necessary.

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GROUND PLAN



FIRST FLOOR PLAN

SCALE OF FEET

1. Loggia.
2. Promenade.
3. Central hall.
4. Organ.
5. Orchestra platform.
6. Entrance-hall.
7. Ladies' cloak-room.
8. Gentlemen's cloak-room.
9. Committee-room.
10. Porch.
11. Reading-room.
12. Upper part of reading-room.
13. Minor hall.
14. Upper part, minor hall.
15. Platform.
16. Green-room.
17. Solo ladies' retiring-room.
18. Solo gentlemen's retiring-room.
19 and 20. Chorus retiring-rooms.
21. Band retiring-room.
22. Entrance for performers.
23 and 24. Caretaker's house.

THE CLARK HALL, PAISLEY.

THE NEW CLARK HALL, PAISLEY.

These buildings are estimated to cost 40,000*l.*, and the site 10,000*l.* The large hall occupies the centre of the block, and is 130 ft. long. The ground-floor space, exclusive of orchestra, is about 80 ft. by 60 ft., and may be approached not only from a front portico, but from north and south porches. The front or principal entrance doors, three in number, open into a spacious entrance-hall, which may be divided by doors or screens, so as to separate different classes of ticket-holders when necessary. The cloak-rooms are on each side of the entrance-hall, from which access is obtained to the corridors and staircases on either side of the large hall. A balcony will run round three sides of the hall, which will be about 11 ft. in width, and will be raised about 11 ft. from the floor level. It will be entered at different points from the upper corridors, which are approached by separate staircases leading from the several entrances. In addition to the balcony a space on the same level, 60 ft. by 20 ft., over the entrance-hall may be used as a promenade, and in fine weather could be thrown open to the loggia or front portico. Accommodation is provided for 2,000 persons in the large hall,—1,200 being seated on the ground-floor, 400 in the balcony or lower gallery, and 400 in an upper gallery, with orchestra and promenade in addition. The orchestra is placed at the west end of the hall, and underneath is a space which may be used as a serving-room in connexion with public dinners, or for storage of seats, &c. Two dinner-lifts from the kitchen department in the basement flat are here arranged. Proper retiring-rooms are provided in connexion with the orchestra, each having every comfort and convenience. The minor hall will be on the north side of the large hall, and will be entered from Smithhills-street. In size it will be 53 ft. by 30 ft., including a platform 12 ft. wide, and will accommodate an auditory of about 300 persons. It is divided from the large hall by a corridor, but will have doors of communication opposite to each other between the corridor and the two halls. The reading-room and smoking-room, 49 ft. by 42 ft., is placed on the south side, next the U. P. Church, and will be entered from the south portico, and in connexion with it are lavatories, &c. The officer's residence, which consists of seven rooms, is placed at the north-west angle adjoining the bridge over the river, and is conveniently placed for communicating with all parts of the building.

It is the intention of Mrs. Clark, of Gateside, the respected mother of the deceased donor of the hall, to place a large organ in the hall; and it is also proposed that in an unoccupied space at the north-east angle of the site there shall be erected a statue of the late Mr. George A. Clark.

Mr. Lynn is the architect.

NEW SYNAGOGUE, STOCKHOLM.

This synagogue, of which we present an exterior view, is one of the most noticeable edifices of the Swedish capital. It is the work of the architect, F. W. Scholander, who may well be satisfied with his creation.

The exterior view speaks for itself, but we may add a few particulars respecting the details of the interior. Entering the vestibule through the principal entrance at the western end of the synagogue, and ascending the broad staircase, the eye is attracted by the tabernacle, the holy of holies, and the niche where the Pentateuch is kept, and above them a large rose window.

The synagogue is constructed internally of wood, and divided by pillars into a nave and two aisles. It has at the western end two tiers of galleries, of which the upper one contains the organ; the lower one, as well as the side galleries, being reserved for the women, while the men worship in the body of the church. The seats nearest the choir are for the chiefs and elders, and from the open space, "El Mimmar," between those rows of seats, the Commandments are read.

The choir is raised five steps above the floor of the church. The pulpit and the stairs leading to the niche where the parchment rolls containing the five books of Moses are kept are raised another five steps, and are hidden by a gold embroidered velvet curtain, in the centre of which is the inscription, "Thoraskrona" (the Crown of the Law). Above run several extracts from Deuteronomy and the Proverbs, inscribed in gold letters on a blue ground. On both sides of the niche containing the Pentateuch are the Tables of the Law, the holy candlestick being on one side, while above hangs the ever-burning lamp, presented by King Gustavus III., and first lighted on the day of consecration.

The interior of the synagogue is richly adorned, cedar wood, ebony, and ivory alternating with bronze, gilding, colour, &c., in the style of the ancient examples. We know from the Biblical description of the Temple of Jerusalem that slabs of gold, silver, and gilt bronze used to play a great part in the decoration of palaces and places of worship, the cedar panelling of the walls of the Jerusalem Temple being covered by plates of gold. These not being obtainable here, the walls have been tinted a greyish green, with borders of many colours, and in patterns consistent with the ornamentation of the interior in general.

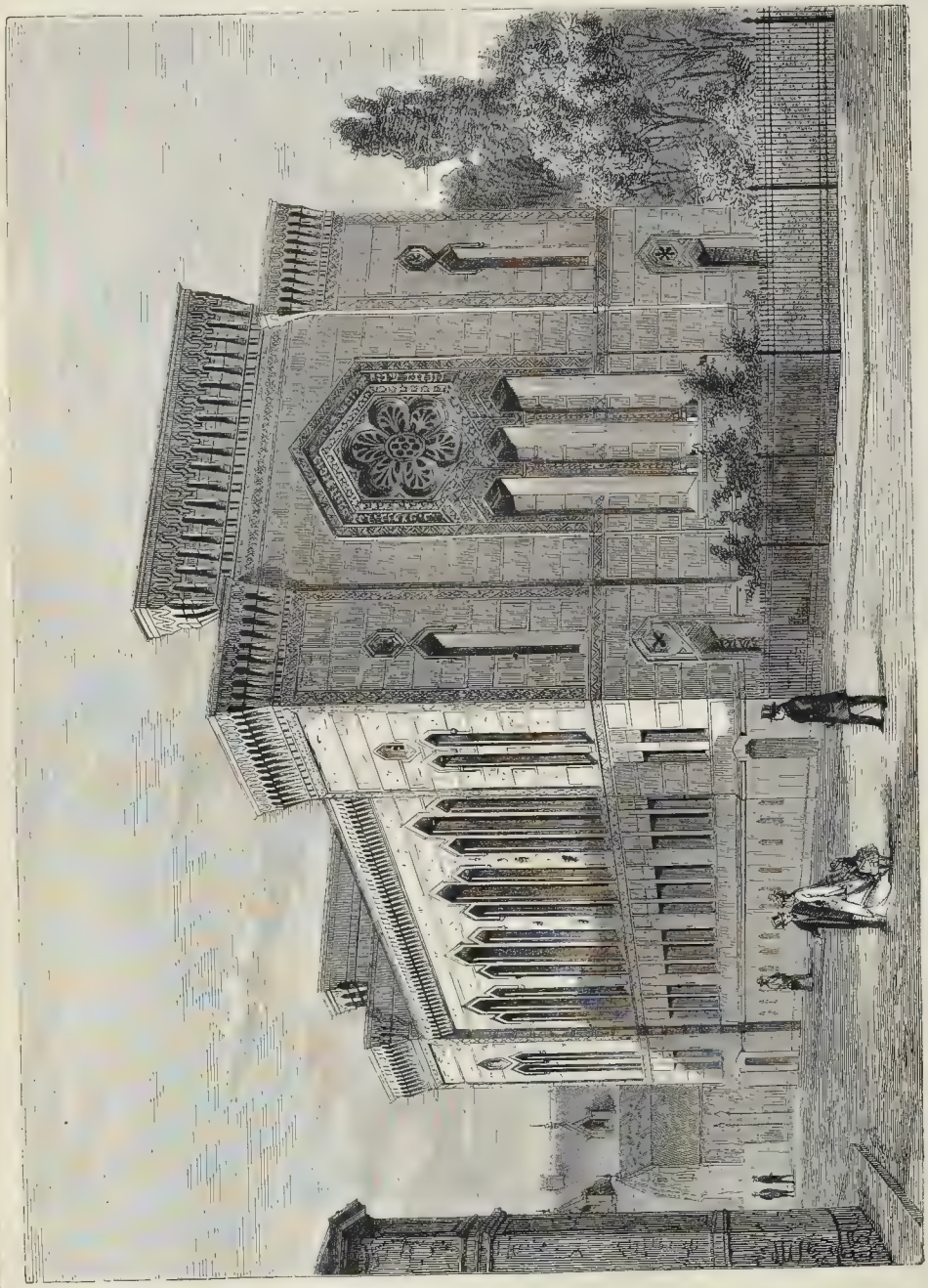
The ceiling has received a light colouring, reminding one of woollen counterpanes stretched across rafters. In the nave, the surface of the ceiling rises into tent-shaped cupolas, which serve three purposes. They remind of the Tabernacle during the wanderings in the Wilderness; they improve the acoustic properties of the building; and, finally, should the synagogue ever be surrounded by buildings higher than itself, they are so constructed as to admit light.

COMPETITIONS.

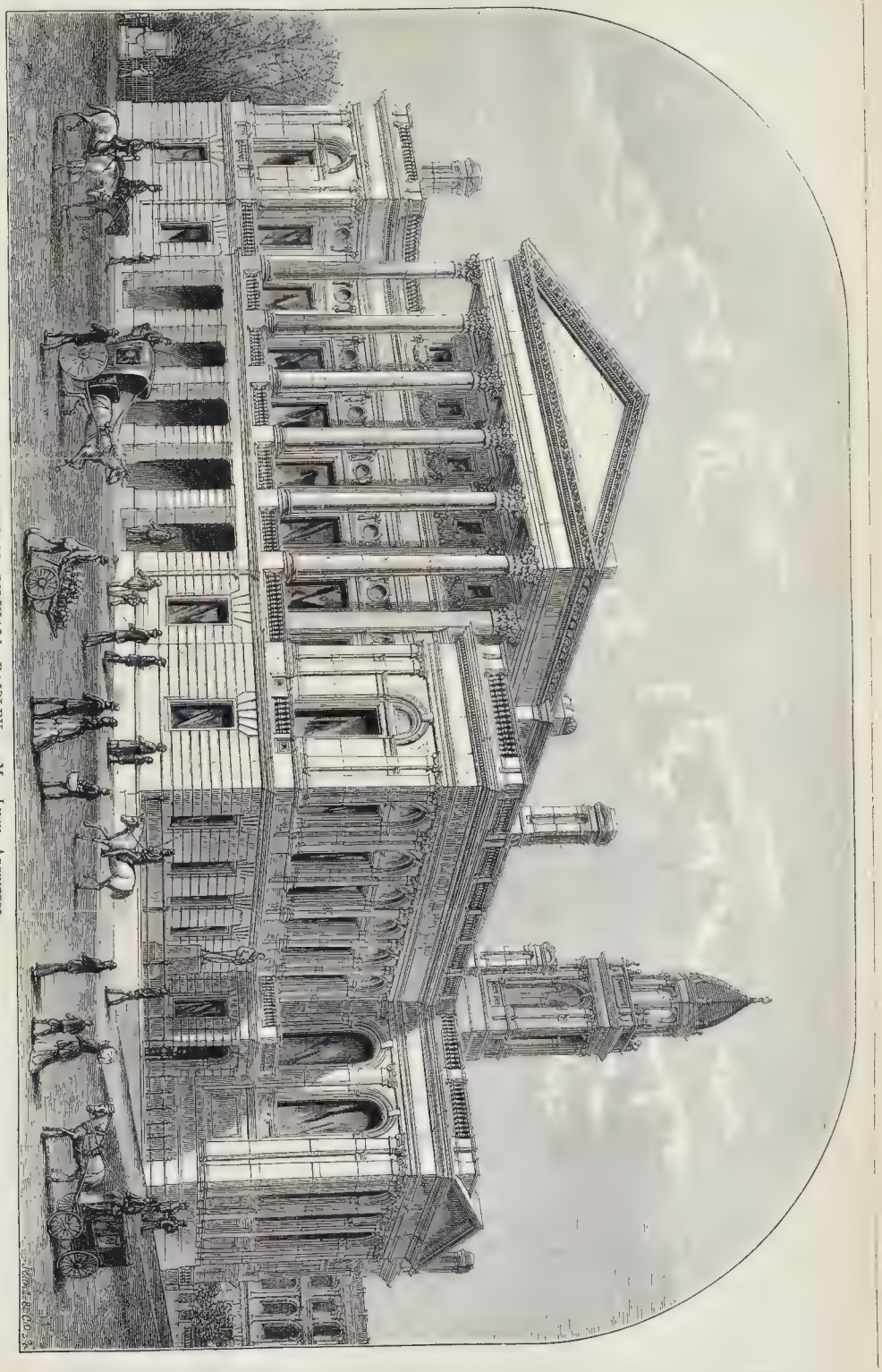
Forest of Dean School Board.—Previously to the last monthly meeting of the Forest of Dean School Board, held at the town-hall, Cinderford, a special committee met for the purpose of considering the question of plans for the Soudley schools. Nineteen architects were in competition, and these having been reduced to half a dozen, the committee resolved to recommend the plans of Mr. Moore, of Gloucester, subject, however, to a condition that a builder could be found to carry out the work not in excess by 10 per cent. of his estimates. As an alternative, the plans of Messrs. Haddon Brothers, of Hereford, architects, were approved. At the general meeting the recommendations of the committee were adopted.

Norwood Schools.—At the last meeting of the Lambeth Board of Guardians, the clerk reported that six architects had sent in plans and drawings, in answer to advertisement, for the rearrangement and partial rebuilding of the Norwood schools. Mr. Smith suggested that an architect of eminence should be employed to assist the Board in deciding which of the plans they would accept. Mr. Mills strongly deprecated any such course of action. He thought there were men at the Board having plenty of practical knowledge, and, in addition, knew exactly what they wanted done, and "therefore far more fit to judge than an architect, who might follow the rule of his profession, and go in for effect more than practical utility." Mr. Hearson suggested that if the members generally disagreed as to the plan to be selected, they should obtain the best professional assistance. It was resolved that this course should be adopted.

Public Works in Birmingham. — The Borough Surveyor, Mr. W. S. Till, has issued a report of works executed during the years 1874-7. The returns of new buildings of which plans have been submitted for approval show that in the year 1877 they numbered 3,053, as compared with 3,117 in 1876, 3,608 in 1875, and 1,788 in 1874.



NEW SYNAGOGUE IN STOCKHOLM.—Mr. F. W. Scholander, Architect.



THE NEW CLARK HALL, PAISLEY.—Mr. Lynn, Architect.

THE ELECTRIC LIGHT.

The Corporation of the City of London and the Metropolitan Board of Works are taking measures to test the practicability and utility of the electric light, and we may shortly expect to see the Holborn Viaduct and the Thames Embankment experimentally lighted up.

Mr. William Haywood, the Engineer and surveyor to the Commissioners of Sewers, has made a report to the Streets Committee of that body upon the electric light. Mr. Haywood describes at length the results of the experiments in Paris, glances at the character of the light, and deals with the cost of its application. He then passes to the consideration of using the electric light in the City, and upon this point he says:—

It will, firstly, be necessary to find situations for the steam engines and Grammes, and whether vacant ground, or the basements or vaults of premises be used, the accommodation will probably have to be paid for. The wires can be as readily laid beneath the footways, and the lamp-posts be as readily used here, as in Paris. It will have to be determined whether the electric lamps shall, as in Paris, be extinguished at midnight, and the gas-lamps be then lighted, or whether they shall be continued throughout the night. The climate of London and the habits of the people are different from those of Paris. It is not here customary to diminish the light after midnight, and there is not the margin of light to enable it to be done. If kept alight until midnight only, it is possible that one man can attend to each engine in a thoroughfare, and to the transfer of the electric current from time to time. I do not think he could do more, and it might not be safe to depend upon one man. It would be heavy work for one to attend to the lights if burning from sunset to sunrise during the long nights of winter. A workman during the day will have to replace the exhausted candles with fresh ones, and clean the lamps. It is said that in Paris they need scarcely any cleaning; in London, I think, they will want cleaning, for here the gas-lamps get much dirtier in a short space of time than they do in Paris. In Paris the chandeliers carry five Jablochkoff candles, which are sufficient for seven and a half hours' consumption. If the electric light be continued in London from sunset to sunrise during the winter, some arrangement must be made either for the chandelier to carry more candles, or for fresh candles to be introduced during the night into the chandelier, or for lamps to be used alternately. No doubt all this can be accomplished,—it is mentioned only to show what will have to be done. As comparison of cost will no doubt be the first point of consideration, it will have to be determined whether the streets shall have a much greater amount of light than is now given by the gas-lamps, or only sufficient electric light to give something more, say double the light from the gas. This would be the best way of arriving at a comparison of the cost of the lights, but not the best way of making a startling show of what the electric light can do. There are various points, therefore, to settle before a reliable estimate of the cost of lighting the public ways with the electric light or just comparison between its cost and that of gas can be arrived at. If the public ways are entirely lighted by electricity,—and I do not think any system will be permanently employed needing two different classes of light to be used nightly,—the possibility of an accident to a Gramme or steam-engine must be considered. In the event of this occurring, the whole of the lights dependent upon the inoperative apparatus would be extinguished, and the streets left in darkness. This contingency could only be obviated by having auxiliary engines ready, which would lead to considerable expense. It may be said that there is the chance of an accident occurring to a gas-holder, and of a whole district being placed in darkness, for such a thing has actually occurred, but experience has shown that the probability of such an occurrence is remote, whereas, out of a large number of motive engines and electrical machines, there is much probability of one or other going wrong at some period. Considering the facts placed before you, and that at present the electric fluid cannot be transmitted efficiently a greater distance from a station than about 1,000 yards, and considering the expense of providing stations, steam-engines, and electrical machines, with their attendants, it appears to me not probable that the electric light will compete in point of economy with gas for lighting the public ways. There are, however, places where the convenience of the large traffic might justify the expense of employing it during the busiest hours of darkness, such, for instance, as by King William's statue, at the space in front of the Mansion House, the circus at the foot of Ludgate-hill, Charing-cross, the circuses at the ends of Regent-street, the northern end of Westminster Bridge, and similar places where there is a great foot and carriage traffic during many hours after sunset. Using it on the Thames Embankment or in the centres of the parks, both of which places have been suggested, might no doubt make a brilliant and effective spectacle, but it would be waste of money, there being in neither place much traffic to benefit by the light. With regard to private establishments the conditions are different. In most large workshops and manufactories motive power, if not already existing, can be introduced, with possible advantage for other purposes, and worked relatively cheaper, than if employed only for public lighting, and there the electric light may, it is probable, even now be employed with economy. There also its superior hygienic qualities would be appreciated, and in many cases, but not in all, the absence of heat will be thought an advantage. In dwelling-houses, or in small workshops, where but few gas-lights are used, it will not, I think, be found economical. Such are the advantages which gas possesses in enabling any quantity of light to be obtained at the exact spot needed, and extinguished at once when done with, that until the electric light can be similarly divided and utilised it is not likely to supersede gas for limited consumption. Although I do not think that at present the electric light can compete with gas in point of economy for lighting the public ways, yet an ample experiment should be made to determine this point and to show its value for street illumination. There is no subject of recent years on which the public appears to entertain such great expectations as it does with regard to this new light, and, looking at the large interests which the Commission represents, I beg to recommend that as early as possible an ample experiment be made by lighting with it during the winter months one or more of the public thoroughfares within its jurisdiction. Queen Victoria-street and the Holborn Viaduct are both suitable for this purpose, each having subways. Queen Victoria-street is the longer of the two; but the Metropolitan Board of Works retains the subways under its control. The Commission would have to obtain permission to enter them, and inconvenience might arise owing to a divided jurisdiction. The Holborn Viaduct subways are under the control of the Commission, and I therefore recommend the Viaduct as a suitable place for making a trial of the electric light.

At a meeting of the Metropolitan Board of Works on the 18th inst., the Works and General Purposes Committee submitted the following report:—

"Your committee have proceeded upon the resolution of the Board of the 28th June last, referring it to them to consider and report as to the advisability of making an experiment with the electric light on the Victoria Embankment. In connexion with this reference, your committee have considered the letter referred by the Board on the 5th July last from Jules Gaudet, intimating his willingness to place before the Board all the information and details with regard to the mode of lighting the streets of London by electricity, as adopted by the Municipality of Paris. Your committee have also had before them communications from Mr. A. Apps, Mr. R. Applegarth, manager of the Electric Lighting Works, and Dr. R. Vassard, offering to supply information on the subject of the electric light. Your committee have conferred with your engineer and consulting chemist, and have received from those officers a report, in which they state that, having regard to the conflicting opinions which exist amongst those qualified to judge as to the present and future value and significance of the electric light, they consider it impossible to form a correct judgment as to its application, effects, and cost, without some considerable practical experience of its working. They, therefore, suggest that it would be desirable to make a large and continued experiment, and they propose that arrangements should be made to test the nature of the electric light along the whole length of the Victoria Embankment, a distance of about a mile and a quarter. They further suggest that if it were thought desirable, the experiment might be extended to Waterloo Bridge, and they submit with their report a letter received from M. Jules Gaudet, the agent in London of the Société Générale d'Électricité, offering to contribute to the experiment in the following manner:—

1. That a 20-light electric battery be placed at the service of the Metropolitan Board of Works on loan for a period of three months, to date from day of lighting up.
2. That twenty Jablochkoff lamps, commutators, globes, &c., be supplied in like manner for like period.
3. That an engineer and foreman of the Société Générale be appointed to superintend the erection and general organisation of the lighting apparatus.
4. That the Société Générale supply the necessary number of 'candles.'
5. That the Board of Works supply the motive power equal to 25-h.p., with driving-wheel, necessary bands, &c., all in first-rate working order.
6. That the Board of Works pay for all conductors (wires) and all standards for the lamps, materials, and labour for erection of same; also the travelling expenses, fees, and wages of the French engineer and foreman referred to for a period of fifteen days, a competent engineer and foreman of their own being engaged on the job from the first."

The report was adopted, two amendments in favour of postponement being negatived. It was incidentally stated by Mr. Richardson, who brought up the report, that the cost of the proposed experiments will be 600*l*.

UNIVERSITY AND CITY IMPROVEMENTS, OXFORD.

The *Oxford Journal* devotes considerable space to details of various new buildings and improvements which have been in progress during the past twelvemonths.

The University.—At Christ Church the walls of the new bell-tower have been completed. In Tom Quad the whole of the granite paving has been removed, the north-west corner, which was the last, having been lately finished, while the restoration of the stonework of the buildings is now completed, and gives the quadrangle quite a new appearance. The stone buttresses have all been erected around the quadrangle, the whole of the above work having been executed by Messrs. Symm & Co. Mr. G. Hill has executed the plumbing. Messrs. Wyatt have made considerable internal improvements in the residence of Archdeacon Palmer. New stone slating has been placed on the outbuildings of All Souls' College, and improvements have been effected in the butler's house and porter's lodge. Messrs. Wyatt have also erected a new wainscot oak screen, with ornamental lead and glass panels, carved work, &c., from the designs of Mr. H. J. Tollitt, architect. At Balliol College Messrs. Wyatt have placed new lead windows in the undergraduates' library. The new dining-hall and library at Keble College have been finished and opened. The hall is 127 ft. long by 35 ft. wide, and the library is 86 ft. long by 35 ft. wide; descriptions of both buildings were given at the time of opening. Messrs. Parnell, of Rugby, were the builders, and the architect was Mr. W. Butterfield. At University College, Messrs. Symm & Co. have inserted new stone in several of the windows in the large quadrangle, and similar work has been executed on the south side of the small quadrangle. The new house for the master is in course of erection in Logic-lane, Mr. Fitzwilliam being the clerk of the works here and at Christ Church. At Wadham College, Messrs. Wyatt have completed the alterations necessary for forming a new lecture-room, and have carried out new sanitary arrangements at the house of the Provost of Worcester College. At Oriel College, Westmoreland slates have replaced the Stonesfield, and the front of the college is being restored by Mr. Hobdell. At Merton College, Messrs. Fisher & Hobdell have carried out several works of restoration. At the University Museum, in the Parks, Messrs. Symm & Co. have erected a two-story building, as an addition to the chemical department. The style of the building, which is about 134 ft. in length by 24 ft. in depth, is in keeping with the rest of the Museum, and it has been erected from the designs of Mr. Dean, of Dublin. The addition is in a line with the front of the Museum, and is on the south side, and it is so near completion that it will be handed over to the curators in the course of a few weeks. A new lecture-room and library of Bath stone and Suffolk brick have been added to the Observatory in the Parks, erected in a style corresponding with the rest of the building. The astronomical department has also been extended. The builders are Messrs. Symm & Co. Extensive restorations are taking place at the Bodleian Library, the building being refaced and pinnacles reinstated. The work is being carried out by Messrs. Symm & Co. At the Radcliffe Library the same firm have made considerable improvements in the reading-room, in the shape of ventilation.

The Examination Schools for the University, on the site of the old Angel Hotel, in the High-street, have made considerable progress during the past twelve months. It will be remembered that Convocation twice rejected the plans submitted to them, but on the appointment of the third Delegacy a number of architects were invited to prepare designs, and that of Mr. T. G. Jackson having been chosen, the consent of Convocation was obtained, and about a year

has been spent in putting in the foundations. The plan consists of a quadrangle standing back from the High-street, surrounded by the examination buildings or "schools" on three sides, and open on the fourth side towards the east. Between the quadrangle and the High-street a block of buildings will be placed, containing a large hall, the offices for the clerk of the schools, rooms for examiners, and residence for a porter. By this arrangement the schools are completely shut out from the noise of the High-street. Nine *viva voce* schools, with some retiring-rooms for examiners, occupy the whole ground-floor round the quadrangle, from which all but one are lighted. Three large writing-schools and two *viva voce* schools occupy the first-floor, and are lighted from both sides. The writing-schools accommodate 200, 200, and 120 candidates respectively, seated at separate tables, and their area is so great as to make supervision by the examiner difficult, but this is met in some degree by the form of their construction. The great hall, towards High-street, will form a general vestibule, and, with two subsidiary halls, will form covered waiting-spaces for candidates, for which purpose also the quadrangle in fine weather will be available. There will also be entrances in Merton-street and King-street. The whole building will be artificially warmed and ventilated on Messrs. Haden's principle. The contract for the erection of the building has been taken by Mr. A. Estcourt, of Gloucester.

An important addition is now being made to the buildings of the Union Society. Owing to the present accommodation for the purposes of discussions being insufficient for the increasing numbers of the society, a new debating-hall was found necessary, and the foundation-stone of the building was laid by Sir Stafford Northcote on the 8th of May last. The dimensions of the hall are 70 ft. by 40 ft., with a height of 22 ft., and a gallery will be placed on all the four sides. The entrance is in the centre of one of the longest sides, and immediately facing the president's chair, the members' seats being placed in parallel rows facing the central gangway, and rising gradually towards each end of the room. The main entrance is approached by a vestibule 20 ft. in length by 9 ft. in width, and at the end of the vestibule is a projection on which rests the stone staircase leading to the gallery, and an arched recess over the vestibule will be filled with seats rising one above another, and facing the president's chair. The style of the building corresponds somewhat with the remainder of the premises, the material being red brick with terra-cotta dressings in the gallery. The ceiling will be "coved," with pitch-pine beams and mouldings, and the roof will be covered with Broseley tiles. Mr. A. Waterhouse is the architect, and Messrs. Parnell, of Rugby, the builders.

Among the *City* improvements we note that a range of buildings has been erected in Queen-street for Messrs. Hyde & Co., outfitters. The height from the foundation is 85 ft., divided into four stories, length 90 ft., and width 36 ft. The cost is between 8,000*l.* and 9,000*l.* The front throughout is formed of red Mansfield and Bath stone, the rear brick supplied by Oxford yards. Beneath is an extensive basement, and on the east side a spacious cart and wagon entrance for the wholesale department. Mr. F. Codd was the architect, and Messrs. Symm & Co. the builders.——Commodious warehouses of brick and Bath stone have been added to the establishment of Messrs. Grimbly, Hughes, & Dewe, Corn Market-street. They include a cellar, basement, warehouse, bacon-store, and smoke-room. Mr. Wilkinson was the architect, and Messrs. Symm & Co. the builders.——The new residence for Mr. A. G. V. Harcourt, Christ Church, at the bottom of Rose-place, Iffley-road, which is built in the Queen Anne style of architecture, is nearly completed. Mr. G. Castle is the builder.

The Liverpool Disaster.—Evidence as to the means of exit from the Colosseum Music-hall, Liverpool, the scene of the recent disaster, was given at the adjourned inquest on Wednesday. It was admitted that the broad staircase had been closed owing to differences between the lessee and the owners of the building, and that this was the best means of exit, and without it, according to the Liverpool Corporation surveyor, it would be the worst building to escape from he had ever seen. The inquiry was again adjourned.

OBITUARY.

Mr. T. A. Britton died suddenly on the 16th instant, after a protracted illness, at his residence, Lewisham. The deceased gentleman for many years filled the office of Surveyor to the Metropolitan Board of Works, having been appointed in the first year of the Board's existence, but having become incapacitated by severe attacks of rheumatic gout, he retired a few years back on a pension. Mr. Britton was an Associate of the Institute of Architects, and obtained the Institute silver medal for an essay on "Timber Trees." He was also the author of a "Treatise on Dry Rot in Timber," published by Messrs. Spon in 1875, and reviewed in these pages at the time of its appearance.

Rev. Canon Raines, F.S.A., died on the 17th inst., at Scarborough, in his seventy-fourth year. He was elected fellow of the Society of Antiquaries in 1843, and edited "Bishop Gastrell's Notitia Cestriensis," 1845 to 1850; "The Stanley Papers"; "Nicholas Apheton's Journal"; "Memoirs of James, seventh Earl of Derby"; "History of the Lancashire Chantries," &c.

Dr. David Laing, F.S.A. Scot., died at Edinburgh on the 19th inst., in his eighty-sixth year. More than fifty years ago (in 1826) he was a partner in the firm of William and David Laing, booksellers, South Bridge, having been elected two years previously fellow of the Scottish Society of Antiquaries. He served the Society in several important offices, acting for fifteen years as treasurer, and for two years as secretary; besides filling for more than one term the position of vice-president, and for upwards of twenty years in the capacity of foreign secretary, keeping Scottish archæology *en rapport* with the labours of Continental antiquaries. His papers are to be found in every volume of the Society's Transactions. During a great part of his connexion with the Society, Mr. Laing served as one of the permanent working members of the committee for editing the Transactions; and to him fell the lion's share of the labour of redacting the four volumes of the "Archæologia Scotica," containing the Society's proceedings from 1780 to 1852, when the present series of Transactions was commenced.

Mr. T. W. Wonfor, the curator of the Brighton Free Library and Museum, died on the 20th inst., after an illness of about a month.

ARCHÆOLOGICAL NEWS FROM GREECE.

The collection of Mycenæ antiquities at Athens, to which similar objects found in the sepulchre of Spata, near Athens, have been added, has received again an interesting addition in the ornaments of the jeweller's art and the pottery of the most ancient Greek style which have been discovered during the summer just passed, through the exertions of the Archæological Society, in the grottos near Nauplia, at the foot of the Palamidi. Those caverns, mentioned already by Strabo, the arrangement of which was ascribed to the time of the Cyclops, have now been recognised as rock burial-places, similar to those found at Spata. Thus the monuments giving us an illustration of the most ancient period of Greek culture, when it was still under the influence of Asia, have been fortunately increased.

A very curious discovery has just been made at Marathon also, as we learn from the *Kölnische Zeitung*. Marathon belonged to a union of four towns, the so-called Tetrapolis, of which we knew that it had preserved institutions singular in many respects. Now an inscription has been found (on which Dr. Lampros reports in the *Ephemeris* of September $\frac{14}{2}$) in which the inhabitants of the Tetrapolis dedicate an object to Dionysos as a distinct confederation with its own archon. We find the four towns of the Tetrapolis represented in the College of Four Providers of Victims. It is to be hoped that further discoveries will follow this find.

The topographical survey of Attica which the German Archæological Institute has undertaken, with the assistance of the German great general staff, will be resumed again with full energy this autumn. The first-fruit of this labour (an Atlas of Athens, in twelve sheets) is now completed; the second section (the harbours of Athens) is preparing.

The excavations at Olympia were commenced again on Oct. 14. The south front of the temple of Zeus will be taken in hand first, as there seems to be most prospect for the completion of the sculptures of the entablatures. The exhibition in the Campo Santo at Berlin of what has already been found at Olympia has been unavoidably delayed by the great difficulties attending the joining of the plaster casts. It is expected, however, that the work will be completed in a few weeks.

THE PARIS EXHIBITION AWARDS.

Although no official list of prize-gainers had been published, Mr. Cunliffe Owen had privately informed all who were in that position, so far as regarded the industrial sections. By some accident, however, up to Friday in last week, the architects to whom distinctions had been awarded were without any intimation of it beyond what we had been able, exclusively, to give them in our number for August 3; and we had more than one inquiry as the time drew close touching the correctness of our statement. We give the official list, and it will be seen that it agrees precisely with that we have already published:—

Third Section, Class 4.—Drawing and Architectural Models.—E. M. Barry, R.A., medal of honour; T. G. Jackson, honourable mention; Horace Jones, bronze medal; J. L. Pearson, A.R.A., gold medal; J. P. Seddon, bronze medal; Norman Shaw, A.R.A., silver medal; G. E. Street, R.A., gold medal; A. Waterhouse, Rappel of medal of honour; T. H. Wyatt, silver medal.

THE WATER SUPPLY OF THE METROPOLIS.

At the last meeting of the Metropolitan Board of Works, the Works and General Purposes Committee reported the proceedings of the Committee upon the resolution of the Board of the 4th inst., referring it to the committee to consider and report upon the advisability of preparing a Bill to be laid before Parliament providing for the acquisition by the Board of the interests of the several companies now supplying the metropolis with water. The Committee reported that they had been unable to come to any conclusion.

In relation to this matter, Mr. Richardson (acting for Mr. Selway) moved,—

"That it be referred to a Parliamentary Committee to prepare and lay before the Board a Bill for the compulsory purchase of the interests of the metropolitan water companies, with power to issue the necessary Parliamentary notices, and that the whole subject be referred to the Works and General Purposes Committee, with power to confer with her Majesty's Government, with a view to obtain their approval of the same."

Mr. Fell seconded the motion.

Mr. Runtz moved the following amendment,—

"That no action be taken by the Board towards obtaining power to acquire the undertakings of the metropolitan water companies until the views of her Majesty's Government on the subject have been ascertained; and that the Works and General Purposes Committee be authorised to communicate with the Government for the purpose of ascertaining their views accordingly."

After a long and exceedingly acrimonious discussion, in no way adding to the dignity of the Board, a division was taken, when 9 voted for the amendment and 14 against it.

Mr. Munro then moved as an amendment to Mr. Richardson's motion to insert the word "only" after the word "power," and to add to the motion the words "previously to any further expenditure being incurred," so that the motion might read as follows:—

"That it be referred to the Parliamentary Committee to prepare and lay before the Board a Bill for the compulsory purchase of the interests of the metropolitan water companies, with power only to issue the necessary Parliamentary notices, and that the whole subject be referred to the Works and General Purposes Committee, with power to confer with her Majesty's Government, with a view to obtain their approval of the same, previously to any further expenditure being incurred."

This amendment, having been seconded by Mr. Roche, was accepted by Mr. Richardson, and carried by 16 to 6.

CONDITION OF TENBY.

We have received a letter from Mr. W. Burns commenting on Mr. Morley's communication (p. 1023), but we decline to carry on the discussion. We cannot say that the borough surveyor's letter was entirely satisfactory, and we advise that gentleman and the other authorities to set themselves vigorously to work to bring about a better state of things than at present exists in beautiful Tenby.

ROMAN REMAINS AT IRCHESTER.

As briefly mentioned by us last week, the Rev. R. S. Baker read a paper at the recent meeting of the Architectural Society for the Archdeaconries of Northampton and Oakham, on "Excavations at Irchester Camp." The paper took the form of a report of a committee appointed by the Society for the purpose of conducting the excavations, and of which committee Mr. Baker has acted as hon. sec. and treasurer. The report says:—The primary motive for this exploration was the anticipated visit of the Royal Archæological Institute of Great Britain and Ireland. In answer to an appeal made within the county for funds for this purpose, a sum of nearly 100*l.* was readily subscribed. Digging was commenced at Irchester on the 3rd of June, and continued for seven weeks, by three navvies, under a responsible foreman, Mr. John Eldred, of Wellingborough, the secretary giving the work his daily supervision. The work of the first seven weeks was necessarily restricted to the exterior, as the area of the camp was under wheat. The sites of some extramural Roman buildings, 300 yards east of the camp, were, however, explored, and some trenches cut through a portion of the Roman cemetery on Mr. Arkwright's property, some 500 yards east of the camp. Here also was emptied a Roman well, found by the ironstone diggers. The Royal Archæological Institute paid their long-looked-for visit to the camp on the 1st of August, when about seven minutes was allowed to see and hear the result of seven weeks' hard work! So much for archæology at a gallop. Of course, much was left unseen by these pleasant but fugitive antiquaries. The second series of explorations was commenced as soon as the wheat was cut, and while the shocks were still standing, by the kind permission of Mr. Blott, the lessee of the farm. A staff of from six to eight men has been working six weeks up to last Saturday, within the camp. We began by prospecting about the field (fishing, as we call it) with iron bars, and wherever we found solid foundations, there we dug; and having found a wall, traced it out to its ramifications till it came to an end. We were surprised to find solid foundations within (in some places) 6 in. of the surface. In this way we have laid bare a network of buildings, roads, and causeways in the limited portion of the 20 acres we have been able to explore. Among these buildings were two circular ones,—one near the middle of the camp, 50 ft. in diameter; the other, close to the south-west corner, is 30 ft. in diameter, the latter with walls very much on the batter. We have bared these intramural walls to their lowest courses; they are generally well and squarely built, and often with a footing (sometimes more than one) at the bottom, generally with an intermixture of "herring bone" with horizontal courses; a few have as many as eight courses in depth, the generality not more than two or three. As a rule, they are built of the limestone of the near neighbourhood (the camp itself stands upon ironstone). In a few cases limestone and redstone are intermixed. We have had, within the last few days, the camp surveyed, with a view to map out all those intricate foundations and the exterior walls. Among this labyrinth of houses we found roads (of Macadamised gravel and pebbles) and causeways of limestone, either laid down roughly or pitched on edge, in both cases much worn by feet. Often we have found causeway over causeway, sometimes three deep, and foundations over foundations, all tending to the demonstration of its having been built and re-built upon age after age during Roman times. The coins found also prove its being inhabited during the whole time of the Roman Empire. We have dug pits on all the four boundaries in order to verify the line of the walls of the camp, and in most cases we have not been disappointed. But, as a rule, we have to go very deep, as the ruthless hand of the destroyer has taken out all but the three or four lower courses of the foundations, which are of limestone laid herring-bone wise, as a rule, and 9 ft. to 10 ft. wide. We have found enough of these foundations to map the line of the wall correctly almost of the entire camp. We have been fortunate enough to discover the fragmentary remains of two of the gateways—the west and the south. The foundations of the west gateway have been photographed, and they are in course of being accurately planned. They are extremely puzzling, and seem to indicate the ruins of the gate at some early period, and its hurried repair on different lines. The north gate we have not yet discovered; and the east we cannot explore owing to the present entrance of the field being at that very spot. We found a statue in stone about two-thirds full size of a male deity possibly—perhaps Apollo—minus head, arms, and legs; it had been degraded to the use of a building stone in a later Roman wall, reminding one of Horace's fig-tree deity. In close proximity to the statue we found (in the earth near the surface) a large heavy half-capital of rather good design and execution, but broken in its volutes. The diameter of its base is 2 ft. 6 in. This block of stone unfortunately had a shake, and it came in halves across the middle. A large circular stone, something of the form of a grindstone, 2 ft. 10 in. in diameter, was also turned up in another part. We thought it first a segment of a shaft of a column; but one side has been hollowed out, so as to give it the appearance of a fragment of a rude font. Not far from this was found the apparent foundation of the base of a column, 3 ft. 8 in. in diameter, surrounded by a much-worn pitched pavement; but although we have fished we have not found any more corresponding bases in its neighbourhood. We have found numbers of Collyweston slates cut of a diamond form, heavy and large as a rule, pierced with holes for hanging them, and with the iron nails often still *in situ*; also a few pieces of blue Welsh slate, the proper cleavage of which did not seem understood; also red roofing tiles, with flanges very heavy, but it is doubtful whether they were not flue-tiles. In proximity to some of the house-walls the earth is full of fragments of plaster with fresco painting upon it, but not sufficiently large to make out the design. The colours when washed came out brightly; the colours used are much like those of the Mediæval church artist. On one small piece of plain plaster are a few words in Greek characters, and a running hand scratched with a fine sharp point.

ART AND RELIGION.

The Bishop-Suffragan of Nottingham (Dr. Trollope), speaking at the Lincoln Diocesan Conference, held in Nottingham on the 10th inst., said:—Several reasons have led to the assemblage of our Diocesan Conference in this great town at the present time, instead of at Lincoln; but had there been no other reason, such an important event as the recent opening of the Castle Museum here by the Prince and Princess of Wales would have served to attract the members of the Conference to Nottingham. This event is a triumph of art, so that it may be asked, What has a religious body, such as our Conference is, or the Church of this diocese by representation, to do with it? The reply to which is, that art is one of the honoured handmaids of our Church at large, who has ever served her will, and is still doing so, whence we gladly hail her enthronement on the Castle Hill of Nottingham, and look forward with hopefulness to the great benefits she is likely to confer upon the multitudes around and beneath her through her inauguration there. It has been truly said that the growth of the civilisation of nations may be gauged by the corresponding character of their acts; but so also may the religious devotion of nations be, at least to a certain extent, tested by the use of their art-power, as well as fostered by its thoughtful and legitimate application. As art was employed by the divinely-instructed Moses in the construction of the ark of the tabernacle, and as this was extensively used by the wise Solomon in the erection of the temple, and the provision of its numerous gold and silver vessels, as an aid to the fulfilment of the old law, so also was it used by the fathers of the Christian Church as soon as they had risen from their first feebleness, and had acquired art-power, as is still touchingly exhibited by those symbols of their faith and hope carved or painted upon their sepulchral memorials, serving to confirm also the faith and hope of their children, and their children's children, as records in many cases of the blood shed by them and their forefathers as Christian martyrs, as well as the most precious blood of Christ lovingly offered for their salvation. These arts, thus early used, were ever after fostered by the Church as subordinate aids to devotion, as with skill in the application of metals and precious stones for the use and adornment of houses of God; and, no doubt, such arts have had a good influence, tending to promote devotional feelings in many hearts, although others are utterly insensible with respect to art; and the use of it even in the service of God and his Church on earth, has been abused, and is still liable to abuse. Time will not allow me to advert even shortly to examples of ancient art of a devotional character, and to its enduring influence for good; but unless unendued with any art appreciation, it would, I think, be difficult for most to look upon the paintings of the devout Fra Angelica, of Fiesole, without emotion, and especially as the holiness of their character may be attributed to the earnest prayer for a blessing upon his art, whenever he was about to practise it; such, for instance, as in his well-known painting of the Great Judgment Day, through the heavenly purity impressed upon the representations of the elect, or upon angels, which it was his delight to depict, as far as man can do so, through the Divine aid. So also, who that is thoughtful does not recognise the wisdom of using sculpture in the service of the Church, through the ancient example of that art extending along the west front of our great cathedral of Lincoln, although rudely executed, and now dislocated and mutilated by the hand of man, and scored and worn by the corroding work of six centuries of time; who does not appreciate the beauty of the later vigorous sculptures of its angel choir, and, after due study, is not also hence reminded of the blessed scheme of man's redemption; and who may not still gather up the value of the skilled use of metals, when, in the same almost matchless house he examines its ancient iron choir-gates, in common with coeval work still also remaining in the holy city of Jerusalem, although, unhappily, our cathedral treasury has long ago been robbed of its gold and silver work, enriched with pearls of great price and interest? Gladly, then, do we welcome a grand and new school of art that has now been founded under royal auspices at Nottingham, and has sprung up with strong fresh life on the very spot where a fearful fire once raged, and wilful destruction ensued through the temporary madness of the people. May this act of creation, indicative of a sense of peaceful security, and wrought for the benefit of all classes of this great populous town in which we are now assembled, and far beyond it, in some measure serve to expiate the evil of the past, and may Nottingham Castle henceforth be ever regarded as the seat of the fine arts, instead of an ancient stronghold of war or strife. In conclusion, I beg to move the following resolution:—

"That this Conference offers its cordial congratulations to the municipality and borough of Nottingham on the completion of their magnificent Museum of Art so auspiciously opened by their Royal Highnesses the Prince and Princess of Wales on July 3rd last, and begs leave to express its earnest hope that this noble institution may tend to promote the moral, intellectual, and spiritual welfare and happiness of all for whose benefit it is designed."

Canon Morse seconded the resolution, which was also supported by the Bishop of Lincoln, and carried unanimously.

THE NEW AGRICULTURAL MUSEUM, BERLIN.

The new Agricultural Museum building, which is now in course of erection in Berlin, is expected to be completed by the spring of the year 1880. The inaugural ceremony will take place at the same time as the opening of an international exhibition of all kinds of articles, apparatus, &c., having to do with fishing, fisheries, and pisciculture generally. The exhibition in question has been started under the auspices of the German Piscatorial Society, the patron of which, the Imperial Crown Prince of Germany, is warmly entering into the project.

Building Bye-laws for the Metropolis.—At the meeting of the Metropolitan Board of Works, on the 18th inst., the Building Act Committee was authorised to send the bye-laws, made under the 16th section of the Metropolis Management and Building Acts Amendment Act, 1878, with respect to the foundations and sites of buildings and other matters, to the District Surveyors' Association in order to ascertain their views with respect to such by-laws, before they are advertised and sent for confirmation to one of Her Majesty's Principal Secretaries of State, as required by the Act. As we reported last week (p. 1,099) the bye-laws are also to be submitted to the Royal Institute of British Architects and the Institution of Surveyors.

PRESSURE OF THE WIND ON STRUCTURES.

Mr. John Holden, architect, of Manchester, writes, with reference to the statement, "that the obelisk as it stands is already calculated to bear a pressure of 90 lb. to the square foot, whereas the force of no hurricane is believed to exceed 25 lb. to the foot,"—on the 7th day of February, 1868, the pressure registered at the Liverpool Observatory was over 60 lb. to the square foot. The instrument, in charge of Mr. Hartnup, only registered up to 60 lb., but his opinion (stated at the time in the papers) was that the pressure reached somewhere between 70 lb. and 80 lb. to the square foot.

At Liverpool, on the 27th of September, 1875, the pressure registered was 70 lb. to the square foot; and at the same place some time in April, 1867, the pressure was 45 lb.

At Sydney, Australia, on the 10th of September, 1876, the Government Astronomer reports "that the wind in some of the gusts lasting several minutes attained the extraordinary velocity of 153 miles an hour, equal to a pressure of 117 lb. to the square foot; and during twelve minutes between twelve and half-past the velocity of the wind was 112 miles per hour."—(See the *Australian Sketcher*, Melbourne, Sept. 30, 1876.) The question of the velocity and pressure of the wind is of great importance, especially in the manufacturing districts; and for many years the firm of which I am a member, in calculating the stability of factory chimneys, have assumed the pressure to be not less than 80 lb. to 90 lb. on the square foot.

LOCAL GOVERNMENT BOARD INQUIRIES.

Handsworth.—Major Tulloch, R.E., has been holding an inquiry at the Local Board Offices, Handsworth, with reference to an application which had been made to the Local Government Board by the Handsworth Local Board for sanction to borrow a sum of 100,000*l.* for works of sewerage, and 7,000*l.* for the completion of the Public Library and Local Board Offices. There was no opposition to the application. The question of the loan for the completion of the public buildings was first entered upon, and the clerk explained to the inspector that the Board had already received two loans of 9,000*l.* and 2,000*l.* respectively on account of the buildings. To carry out all that still remained to be done a further loan of 9,000*l.*,—and not 7,000*l.*, as had been stated by an inadvertence in the application to the Local Government Board,—would be required. The inspector then proceeded with the inquiry into the 100,000*l.* loan for sewerage works. The clerk stated that the joint sewers were to carry sewage from both Handsworth and Aston down to the Saltley works. The loan now proposed to be borrowed would be for the construction of sewers for the district of Handsworth, quite independent of any other authority. Mr. Humber, the engineer, explained the plans in connexion with the proposed works, and mentioned that the length of the sewers would be as follows:—No. 1, 2 miles 1,055 yards; 2, 2 miles 116 yards; 3, 2 miles 1,444 yards; and 4, 2 miles 34 yards; making a total length of 9 miles 878 yards. These were intercepting sewers only, and there would be in addition all the arterial drains in the district. The clerk stated that the Board did not purpose asking for more than 60,000*l.* or 70,000*l.* at present, because that amount would be sufficient to drain the part of the district that was populated.

Swinton. The Bridgewater Trustees having threatened to apply for an injunction against the Swinton Local Board of Health to abstain from polluting a stream called the Folly Brook, by discharging their sewage into it, the Board applied to the Local Government Board for an order declaring that the third section of the Rivers Pollution Prevention Act, 1876, shall not be in operation until the expiration of a certain period to be limited in the order, and Mr. John Thornhill Harrison, C.E., has attended at the offices of the Swinton Board to inquire into the matter. From what was stated in the course of the inquiry it appears that at present the sewerage of the Swinton Local Board district is very incomplete, and the works that already exist do not give satisfaction, inasmuch as part of the sewage finds its way into Folly Brook, part of which runs through the Barton Local Board district and through the property of the Bridgewater Trustees. A nuisance was caused thereby. The inspector, having heard the views of the three parties, said he should recommend that an order be made granting protection to the Swinton Board for three months from the date of the order upon the understanding that within the three months, and without any delay, the Board make application for sanction to carry out a sewerage scheme which would entirely divert the sewage from Folly Brook; and if they did this the Local Government Board would then extend the protection for nine months longer to give the Board time to complete the work.

Newton Heath.—On the 16th inst. Mr. Arnold Taylor opened an inquiry at the Town-hall, Newton Heath, relative to the application of the Newton Heath Local Board for the loan of 7,500*l.* for works of private street improvement. Mr. Taylor expressed surprise, on examining the priced specifications, that whilst the sewers were calculated to cost 902*l.*, the gullies and manholes were put down as 741*l.* He was of opinion that the expenditure might be approvingly curtailed by the adoption of fewer manholes in the plans. No opposition was offered to the Board's scheme.

Cambridge.—Major Tulloch held an inquiry at Cambridge on the 16th and 17th inst. in reference to the drainage of the town and the alleged pollution of the River Cam. The inquiry was held in consequence of a complaint made under the 299th Section of the Public Health Act. At the close of the inquiry the Inspector stated that he had visited the sewer outfalls and been rowed down to Baitsbite. The state of the stream at the outfalls was most disgusting. The Sanitary Authority could not expect a Bill of indemnity from the Local Government Board under the Rivers Pollution Prevention Act, as they had done nothing to render the sewage matter harmless before it entered the river. They were polluting the river, and, of course, came under the penalties of the Act. The Local Government Board had issued a report drawn by Mr. C. S. Read, M.P., and Mr. Rawlinson, showing that the best mode of dealing with sewage was by applying it to land, and this plan had been successfully adopted by many towns. There was nothing peculiar to Cambridge to prevent a move being made, and he advised the authorities not to wait until an injunction had been obtained against them. He recommended them to call in a competent engineer, and construct an intercepting sewer with as little delay as possible. That would be of service in whatever system was adopted for the treatment of the sewage. [At a meeting of the Cambridge Improvement Board on Tuesday, it was resolved that immediate steps be taken for diverting the sewage of the town from the river Cam, and that Sir Joseph Bazalgette be requested to advise the Board as to the best mode of doing so.]

Bewdley.—Mr. S. J. Smith, C.E., one of the inspectors under the Local Government Board, has held an inquiry at Bewdley relative to the proposal of the Council to obtain powers to sell sufficient Corporation stock to carry out a system of drainage along the two quays, and also to improve the quays. A sewer, the length of the two quays, was to be constructed, to intercept the present numerous small drains and outlets into the Severn, and to carry the sewage along the quays, emptying it into the Severn at one point, below Lax-lane. Mr. Knowles, the former surveyor of the borough, described the nature and condition of the present drains, all of which at present emptied into the Severn—not more than one-third of the houses draining into the sewers. Mr. Baker, C.E., of Kidderminster, having explained the nature of the alterations proposed, the inspector called attention to certain sections of the Rivers Pollution Act, which prohibited the construction of new channels emptying into the river, and also compelled those who emptied sewage into a river to take the best possible means to render it harmless. The Town Clerk replied that the Council were aware of the provisions of the Act, but urged that no more sewage would go into the Severn by the proposed scheme than at present. Mr. Willis-Bund said the Fishery Board were determined to oppose the formation of all new channels which emptied into the river, and he opposed the scheme on the ground that it proposed to carry out certain works which were illegal.

Southam.—Mr. Robert Morgan, C.E., has held an inquiry at Southam relative to an application made by the Rural Sanitary Authority for sanction to borrow 2,000*l.*, to enable them to carry out a scheme for the disposal of the sewage. Some time ago the sewage of Southam was taken out, at a cost of 1,000*l.*, to a point just below the workhouse, where, after settling in two tanks, the overflow was allowed to pass into a brook. In course of time this brook became much polluted and very offensive, and the adjoining landowner threatened to obtain a restraining injunction if the nuisance was not remedied. Mr. Pritchard, C.E., of Warwick, was called in, and in October, 1877, he submitted a report proposing to take the sewage to a three-acre field near Welshman's road, and there purify it by the intermittent downward filtration system. In reply to Mr. Morgan, the clerk stated that no arrangement had been entered into for acquiring the land, as the Sanitary Authority considered it would be the best course to obtain the approval of the Local Government Board to the scheme first, before they incurred expense in that direction. Mr. Morgan said the sanction would not be granted until some definite arrangement for the purchase or lease of the land was before him.

Leek.—Mr. J. Thornhill Harrison has held an inquiry at Leek relative to the application of the Leek Improvement Commissioners to borrow the sum of 12,000*l.* for gasworks and markets. There was a large attendance of commissioners and ratepayers. The Law Clerk said the sums the Board desired to borrow were 4,000*l.* for gasholder and tank, 465*l.* for extension of mains in new streets, 1,160*l.* for extension of retorts, 2,368*l.* for extension of cattle-market, 1,000*l.* to pay off mortgage on the same, 2,400*l.* for purchase of silk-mill and seven cottages, and 700*l.* for a weighing-machine and construction of offices. Opposition was offered to the markets scheme, especially to a proposal to erect slaughterhouses within the markets.

BUILDINGS FOR POOR LAW ADMINISTRATION.

Christchurch.—At a recent meeting of the Christchurch Guardians, Messrs. Creeke & Burton, architects, Bournemouth, attended and explained the modified plans of the new workhouse. It was decided to forward the plans to the Local Government Board for final approval.

Kensington.—On the 7th inst. the new casual-wards on the cellular system, which the Kensington Guardians have erected at Mary-place, Notting-hill, were opened for the reception of vagrants. They have been erected by Messrs. Lathey Brothers, at a cost of nearly 5,000*l.*, from the plans of Messrs. A. & C. Harston, architects.

Barrow-in-Furness.—Mrs. Schneider, wife of the Mayor of Barrow, has laid the foundation-stone of a new workhouse for the parish of Barrow, which is now in progress of erection at Roose. About two years ago Barrow parish was severed from the Ulverstone Union in order to promote a better administration of the poor-laws, and since then a temporary workhouse has been used. The new building is estimated to cost from 14,000*l.* to 15,000*l.*, the architect being Mr. J. G. Macintosh.

Kingston-upon-Thames.—Alterations and additions to the workhouse here are about to be carried out, according to plans prepared by Mr. Luck, architect.

Darenth.—At a recent meeting of the Metropolitan Asylums Board it was reported that the works at the new asylum at Darenth were progressing satisfactorily, and those relating to the engineering department were nearly completed, whilst the roofing on the chapel and dining-hall, as well as the building contract generally, was being pushed forward. The kitchen and laundry were nearly completed, and the school-fittings were in course of delivery. In reference to some comments which have been made with regard to an intended outlay of some 300 guineas for a clock to be placed in the tower of the school-building, the report suggested that the Local Government Board be informed that the clock alluded to is intended not only for the schools, but also for the Adult Imbecile Asylum shortly to be erected, and that the extra weight of bell which it has been found necessary to provide in order that the same could be heard over the entire premises will account in some measure for the cost incurred. Estimates had been received from the architects of 400*l.* for porter's lodge, with fittings; and for wrought-iron enclosures and gates to lobbies and covered-ways, 310*l.*

SHIRE-HALL, BEDFORD.

At the Bedfordshire Quarter Sessions last week, Mr. Waterhouse's plans for additions and alterations at the Shire-hall, Bedford, were approved, and instructions were given to obtain tenders. A detailed report was presented by Mr. Waterhouse, in which he said the plans showed that the existing buildings are to be left as much as possible in their present state. It is proposed to alter and enlarge the windows on the sides; and the court on the west side of the present Shire-hall is to be divided into two stories by a floor, each floor to be divided into three different offices. With regard to the new buildings, it is suggested that the Crown Court should be 46 ft. by 32 ft., and the Civil Court 46 ft. by 31 ft. The courts are to have each a long narrow gallery over a portion of the main corridor approached from the head of the principal stairs. The portion of the court devoted to the public will be so arranged as to be approached either from the Shire-hall or from the exterior of the building by the side entrance, while the judges can either approach the Bench by passing direct through the Shire-hall and their retiring-rooms, or by entering the building on the west side. On the corridor side of the court is placed the witness-box, half-way between the judge and the reporters, and immediately opposite the jury; also opposite a large window, so that the light shall be direct upon the face of the occupants of the box. Judges' retiring-rooms are arranged, and the barristers' room, looking out upon the river, adjoins the solicitors'. Jury retiring-rooms will be provided, which it is thought may also be used as jury waiting-rooms, as it is considered improbable two juries will retire at one time. There is an indictment office, and upstairs a grand jury-room, 44 ft. by 27 ft., with bay-windows looking up and down the river. A retiring-room is attached in the rear, and there is also a committee-room, 31 ft. by 23 ft. It should be observed that when the north front is rebuilt the last-mentioned room will take the place of the committee-room or council-chamber at present leading out of the Shire-hall. Opposite the door of the grand jury-room there will be a door leading into the grand jury gallery in the Crown Court. On the basement will be arranged two groups of cells,—thirteen in all, nine for males and four for females. There are besides on this floor the borough strong-room, police-room, and public conveniences. It is proposed to heat the court by hot-air and hot-water arrangements, such as have been employed in the Assize Court at Manchester, and other similar buildings, by Messrs. Haden, of Trowbridge, the foul air being carried by two bridge trunks from the roofs of the courts themselves into the foul-air shaft which surrounds the flue of the heating apparatus. Ample arrangements are made for lighting, and the various important rooms have lavatories, closets, &c., attached. The architect proposes that the building be constructed of red brick, with terra-cotta dressings, and be covered with Broseley tiles or with green Westmoreland slates.

CATHEDRAL ITEMS.

Edinburgh.—The *Scotsman* understands that, at a meeting of the Lord Provost's and Law Committees of the Edinburgh Town Council, held on the 18th inst., a deputation from the Restoration Committee of St. Giles's Cathedral, headed by Dr. William Chambers, was received. It would appear that technical objections have presented themselves to the Ecclesiastical Commissioners in regard to the giving up, without judicial or Parliamentary sanction, of the "custody" of parts of the edifice of St. Giles's, and that these stand in the way of the Restoration Committee proceeding with its work. In the course of the conference which took place, a general feeling was expressed in favour of having this difficulty, if possible, removed, in order that the old cathedral may be restored.

Chester.—Canon Ryle, preaching in Chester Cathedral recently, said that thirty-seven years had passed away since he was in the cathedral, and now everything was so much better and so much improved that he might well be excused for saying that he hardly remembered the old cathedral. The *Chester Chronicle*, commenting on the statement by a contemporary that the cathedral has been architecturally ruined by Dean Howson and Sir Gilbert Scott, at an expense of 90,000*l.*, and that "all that was really needed for the preservation of the old church in a genuine condition might have been done by an engineer for a tenth part of the 90,000*l.*," says:—"We have scarcely the patience to argue seriously with a writer who would put an engineer at work to restore a glorious old fane such as our cathedral just in the same way as he would an old bridge."

Winchester.—A new brass lectern, by Messrs. Hart, Son, Peard, & Co., has lately been placed in the nave of Winchester Cathedral as a memorial of the late Lieut.-Col. Williamson. It has a circular base, of a graduated character, resting on three lions.

SOUTHAMPTON.

Proposed New Public Offices.—The *Hampshire Advertiser* says that there are now in the Audit House plans, which have been prepared by Mr. J. Lemon, of the proposed new public offices. These are arranged on one side of the room, and on the opposite side are the plans which he has prepared for altering the Audit House buildings, and converting them into public offices. The latter plans have been approved by the Public Offices Committee, and, if adopted, the Council Chamber will remain as at present, but the buildings between that and Messrs. Oakley & Watling's premises will be pulled down, as well as the back premises, as far as the Green Market, and rebuilt, when office accommodation will be provided for the various Corporation officials, as well as a committee-room, the Mayor's parlour, and Mayor's reception room. The front of the new portion of the building will be uniform in style with the Audit House, and where the entrances to the market now are will be placed large windows. The total cost of these alterations is estimated at about 6,000*l.* By the adoption of the other plans the whole of the present building will be demolished, and an entirely new structure erected, the front of which will be of a much more showy character, with something of the Italian style. The same accommodation will be provided in this as in the other plan, but the Council chamber will be placed at the rear, so as to be out of the way of noise in the street, and the reception-room will take the place of the present Council chamber. The probable cost of the new building will be about 20,000*l.* The Council has yet to decide which plan shall be adopted.

The Bargate.—A correspondent of the same paper discusses the question "Is the Bargate to come down?" He says that the obstruction caused by it to the traffic is so intolerable "that neither the Board of Trade nor the public will put up with the grievance," and adds,—

"The only means of saving the ancient structure is, I think, to widen the middle passage to the extent of 4 ft. or 5 ft., so as to allow two vehicles to pass and repass at the same time. Whether this can be accomplished by means of iron columns or improved masonry is a matter for architects to determine; but as the arch at the northern side is in a state of decay, and needs repair, the question of economically combining utility with the preservation of our monuments ought not to be irreconcilable."

On the other hand, we note that "I. C. U.," the writer of the entertaining "Notes by the Way" in the *Hampshire Independent*, strongly protests against the removal of the gate, and suggests that if alteration be wanted, some of the adjoining properties should be purchased and removed, so as to allow of the formation of a carriage-road on both sides of the Bar, and of the restoration of its flanking towers.

New Sea Walls.—At a meeting of the Harbour Board, on the 13th inst., the Special and General Works Committee reported the receipt of the following tenders for the proposed new sea-walls at the Town Quay:—Mr. Richard Docwra, 9,975*l.*; Mr. Edward Pritchard, including cofferdam, 7,000*l.* 10s. 6d.; Joseph Bull & Sons, 5,400*l.*; Mr. John Crook, with arbitration clause, 4,993*l.* The committee recommended the acceptance of Messrs. Bull & Sons' tender, the committee declining to accede to Mr. Crook's application for an arbitration clause in the contract. The recommendation was adopted.

Testing Lightning Conductors.—Messrs. Gray & Son say, with regard to testing lightning-conductors, that they not only test the conductors, but the whole of the building, to assure themselves that the whole is under conduction. They urge the great importance of this, "since the mere testing of the conductors is no proof of the security of the building itself, and this very few are acquainted with."

MASTERS AND MEN.

Birmingham.—All doubt as to the issue of the dispute at Messrs. Chance's glassworks at Spon-lane was dispelled on Saturday, when immediately upon the men in each "house" leaving off work, all except two of the furnace fires were drawn, it being understood that as no arrangement had been entered into between Messrs. Chance and the men, and the notice for the introduction of the proposed tariff and the reduction in wages having expired, the strike would then have commenced. To the last the men were inexorable, notwithstanding that their employers desired them to give the proposed system a trial before taking so serious a step. In order to give an opportunity to any of the men who may desire to return to work, Messrs. Chance have decided to keep two of their furnaces on; but at present the men are unanimous in their determination not to work at the terms proposed. The number of men employed in the immediate manufacture of sheet-glass is 260, and the persons affected by the strike, viz., the sorters, cutters, and packers, number nearly 500, so that about 750 persons will be thrown out of employment in consequence of the dispute.

South Shields.—A notice which had been issued to the *employés* of the Tyne Plate Glass Company's Works at South Shields, to the effect that owing to the depression in trade there would be a considerable revision of the wages and working hours, expired last week. The proposed terms,—which involve a reduction in wages and an increase in the hours,—have been unconditionally accepted. The number of men affected by the notice is about 600.

Kirkcaldy.—A few days ago the operative masons in the Kirkcaldy district were informed by their employers that their wages would be reduced 1d. per hour, but on a deputation of the men waiting upon the masters, and offering to submit to a reduction of ½d. per hour, the compromise was accepted.

Greenock.—The Greenock joiners have agreed to a reduction of 1d. per hour, making their rate of wages 7d. per hour.

Aberdeen.—The Aberdeen carpenters' strike has terminated, the men having unanimously agreed to return to work at the employers' terms.

Edinburgh.—The operative masons in the employment of Edinburgh masters not connected with the Builders' Association have struck work, in consequence of the employers refusing to withdraw the notice of a reduction in the rate of wages from 8d. to 7d. per hour. The men employed by members of the Builders' Association will, however, remain at work till it has been ascertained whether the Association is willing to withdraw the circular issued with reference to a similar reduction, and the abolition of the operatives' bye-laws on and after the 25th inst. A number of the Edinburgh bricklayers have also struck work on account of a reduction of 1d. per hour in the rate of wages. The joiners have agreed to submit to a reduction of ½d. per hour.

Haddington.—The masons employed at the Knox Memorial Institute, Haddington, have struck work, in consequence of a proposed reduction in the wages of from 8d. to 7d. per hour. The men offered, until the dispute in Edinburgh was settled, to take 7½d. per hour, and to abide by the settlement arrived at in Edinburgh, but this was declined.

ITEMS FROM INDIA.

The Bombay Municipal Corporation have obtained permission to raise a loan of 27 lakhs of rupees (270,000*l.*), to proceed with the construction of new drainage works for the city.

The report of the acting chief engineer for irrigation in the Bombay Presidency, for 1877-8, shows that during the last three years the area of land under irrigation has been more than trebled. The total area irrigated in 1877-8 was 25,328 acres.

Major Mant has been appointed by the Bombay Government conservator of ancient buildings in the Bombay Presidency.

CALCULATION OF STRAINS.

Sir,—Will you kindly allow me to ask through your columns how to calculate the strains on a *curved* jib of a crane? I can work out the strains on a *straight* jib, but the curving of the jib makes the calculations of strains more complicated.

Perhaps some of your engineering subscribers will kindly notice this.

F. B.

STRATFORD-ON-AVON.

The Shakspeare Memorial.—The erection of the library and picture gallery connected with the Shakspeare memorial buildings at Stratford-on-Avon has been commenced. The contractor is Mr. W. H. Lascelles, of London, who is also engaged in the construction of the theatre portion of the memorial, which will be completed by the poet's birth-day next year, when an inaugural ceremony will take place.

The Parish Churchyard.—A few weeks ago an inquiry was held at Stratford-on-Avon by a gentleman sent down from the Home Office, who at the conclusion signified his intention of recommending to the Home Secretary that the churchyard be closed immediately. Official notice to that effect has now been received, and a new cemetery will have to be provided at once. Such a place was much needed, it having been authoritatively stated that no fewer than 100,000 persons had been buried in the present graveyard. The ground is but three acres in extent, and has been constantly used for upwards of 1,000 years. Scarcely a grave could be dug without disturbing human remains, and some sickening sights have been witnessed at funerals.

COWL EXPERIMENTS.

"All discord's harmony not understood,
All partial evil, universal good."

Sir,—The cowl-testing at Kew, generally considered useless, if not ridiculous, is the mother of all the seeming discord in this matter. The real object for which this farce was enacted has yet to be made public.

I am extremely sorry that I was ignorant until now of Mr. Weaver's letter, which appeared in your important journal of the 31st of August last,* in which I find he accuses me of having improperly obtained, and of having very improperly used, certain information in my favour of cowl tests made by the Metropolitan Board of Works. He has before now spoken of my "very ingenious cowl," yet in that letter he says, "speed alone is merely a factor; power, economy of cost, freedom from down-draught, capacity, permanence, and durability are features now generally recognised as not possessed by Mr. Banner's appliances." In proof that he is wrong in his last expression of opinion, I have made and sold during the last two years and a half nearly 3,000 cowls, and the demand for them is daily increasing.

When I wrote to you expressing a hope that some authoritative testing of cowls, as proposed by Mr. T. Blashill, would be made, I was ignorant of Mr. Weaver's very grave charges against me and my appliances, though practically it disposed of those against the latter. I say that, in my opinion, speed is power, and I maintain of the very first importance, and will decide his second merit, "economy of cost." As to freedom "from down-draught," Mr. Buchan gives my cowl an excellent character on that head, as he shows, or rather states, that it is only inferior to his own 4-in. fixed ventilator. Mr Buchan, in your issue of last week, says,—"I feel inclined to back up Mr. Banner's cowl against the 'Archimedean' ventilator in the proposed new contest," which is very kind of him. Is he prepared to back his own for 100 guineas against the Banner cowl for the general useful effect of proper ventilation?

Mr. Buchan asks for some further information than I gave to you in mine of the 24th of August, that of which Mr. Weaver complains, and the latter accuses me of not only having obtained the information I then furnished you with improperly, but also of having improperly manipulated the particulars to answer my own purpose.

The information which Mr. Buchan asks for I have obtained this morning only, and annex it, though as the different cowls tested at each date were all of the same size, and were all tested on the same shaft, the further particulars which I now give still seem to be unimportant.

The cowls tested on May 18, 1876, were 12 in., and from the sewer to the top of the shaft the distance was about 55 ft. The cowls tested at the other three dates were all 6 in. The shaft used on June 15 was about 3 ft. horizontal, and 20 ft. high. The shaft used on Dec. 7, 1877, and March 6, 1878, was about 30 ft. above the level of the roadway. I was present at the tests made on May 18, 1876, only.

Now, as regards the most important point, the accusations in Mr. Weaver's letter, I shall call upon you with this, and satisfy you by documentary proof that they are wholly without foundation. The Metropolitan Board of Works is always on the watch to discover any means of lessening the complaints so constantly made of the inconvenience and annoyance experienced from sewer-gas; and at about the date of Mr. Weaver's letter to you I received from the Metropolitan Board of Works, as I shall show you, a considerable order, being the fourth, for my cowls of different sizes; upon which order there is this further intimation,—"There will be some more experiments made in other sewers"; and I feel warranted in stating now that it has been intimated to me that the system I have suggested to the Metropolitan Board of Works is the only one which examination has encouraged the engineer of the Board to persevere with.

I did not ask permission of any one to publish the result of the tests which had been made, and which I attended by appointment made at the request of the engineer of a public Board, nor did I deem it necessary to do so. When I showed a statement which I had published, regret was expressed that I had done so, but not on the ground suggested, viz., "that the papers in question were confidential." It was at this time that I was informed that other tests had been made, in which the results obtained were still more favourable for my cowl. I asked for a copy of them. They were at once promised; they were subsequently furnished, and I published them. The tabular statement to which Mr. Weaver refers was not prepared by me. It is not deceptive, and was most certainly not garbled by me in any way, but is an exact copy of the statement I received. So far as I am concerned, I am most anxious that the truth should be arrived at, to whosesoever advantage it may lead, and I feel certain that the Metropolitan Board of Works will, in their own interests, help all comers to the same end.

For your fuller information I hand you herewith copies of my notes on the test at which I was present with the officers of the Board, who were directed to afford every facility in furtherance of the inquiry, and who have given me unhesitating.y, the more so, perhaps, from my having first introduced the subject to their notice, information thereupon as they acquired it, and in so doing they will hardly be suspected of exaggerating the results obtained.

In confirmation of the accuracy of the foregoing, allow me to annex, for your information, particulars of the currents of air obtained at Guy's Hospital, where fourteen cowls were fixed over two years ago; and to say that they continue to act perfectly, and that they have not been attended to even for oiling, altered or interfered with by any one in any way whatever, since they were first fixed.

There has been a determined effort made by some few persons to disparage the system, which, however, is nevertheless being steadily extended; and I may perhaps be allowed to add that at the suggestion of the late chairman of the City Lands Committee (Mr. Benjamin Coils), I am ventilating the Council Chamber, Guildhall: it is not yet quite completed, but last Thursday, when there were about 300 persons present for over four hours, the temperature inside the chamber was at no time more than 2° above the external temperature, which was 64°.

E. Gregson Banner.

*** Having seen the various papers referred to we have allowed Mr. Banner to reply to the statement objected to, notwithstanding the time that has elapsed since it was made. We must decline, however, inserting any rejoinder. We have no doubt whatever Mr. Weaver would be able to quote an apparent justification of his objection. There is a difference between what is known officially to the Board and what has been done by officers of the Board in their individual capacity.

* See p. 921, *ante*.

CUSTOMS IN MEASUREMENT.

PRICE *v.* WILLIAMS.

In the Abergavenny County Court, on the 11th inst., the judge (Mr. Herbert) and a jury of five were occupied some hours in hearing the case of John Price, builder, Blaenavon, *v.* John Williams, draper, Blaenavon. The Judge suggested that the case should be referred to arbitration, but the parties declined to consent. The claim was for 50*l.* balance of account for building a house for the defendant at Blaenavon.

It appeared that in April last the plaintiff signed a contract to erect a house for the defendant at Blaenavon, and after he had done a considerable portion of the work the defendant stopped him. The agreement specified "that the said John Price do undertake to do good work according to plans and specifications at 3*s.* 6*d.* per yard; all the walling in front of the building shall be of good rockwork, not rubble the same as the other walls, and the brick partitions to be 1*s.* per yard to the first scaffolding and 6*s.* per yard afterwards." The question was what was meant by the word "yard." At the time of the agreement the man who drew it asked the parties whether he was to put in the words "per cubic yard," and defendant replied, "you need not put it in, it will go with the rest." After the work was partly done plaintiff was stopped for want of material, and when fresh material arrived defendant put other men to finish the work. Plaintiff then sent in his bill to the defendant, and he disputed the amount, alleging that the work was to be done per cubic yard, not per superficial yard, as charged.

The Judge.—How can you measure by superficial measurement? There are three dimensions to every solid.

Mr. Morgan (for the plaintiff) said he should prove that all walling within 2 ft. thick was measured superficially. He called John Price, the plaintiff, who produced the signed contract. The walling was to be 3*s.* 6*d.* per yard, superficial measurement.

The Judge.—It will be for you to prove that. A superficial measurement was meant, and in order to do that you must prove that there is a custom established in the neighbourhood to that effect.

In reply to the Judge.—Any wall less than 2 ft. thick is measured superficially, and 2 ft. is fixed as the unit of thickness to begin to measure by cubic measure.

The Judge.—I must have it proved by a large number of witnesses that this is the custom at Blaenavon before I shall consider it an established custom.

John William Price said he was a contractor at Blaenavon.

The Judge. What is meant by a yard of walling?

Witness.—That would be a perch.

The Judge.—I did not say a perch,—what is meant by a yard of walling?

Witness.—A yard of walling is 9 ft.

The Judge. And how many feet thick?

Witness.—The same yard would be computed for a 9-in. wall as an 18-in. wall; it would be the same trouble to the builder to do it.

The Judge.—You mean that 9 superficial feet is a yard of walling no matter what the thickness?

Witness.—Yes.

The Judge.—What about a 2-ft. wall?

Witness.—It would then be a perch, and it would go as extras.

Mr. Walford (for the defendant).—Then you would not expect to be paid any more for a wall 9 ft. thick than for a wall 2 ft. thick?

Witness.—Well, according to the agreement. If I made an agreement I should stand to it.

Edwin Foster, sworn, said he was a builder, and had had considerable experience. A wall might be paid for per superficial yard, according to the thickness shown in the plan. I would take the measurement per superficial yard, and the plan would show the thickness. In the absence of a plan, we measure walling and calculate it as so much per superficial yard up to 18 in. in thickness and up to 2 ft., though from 18 in. to 2 ft. the work per yard is more expensive, but still it is a cubic yard; beyond 2 ft. in thickness walling is measured and charged for per cubic yard.

The plaintiff was then recalled to give his evidence in chief. He said he asked the defendant before the contract was signed if he need put "per superficial yard" in, and he said there was no need of it.

Henry Thomas, mason, Abergavenny, said he had always understood it to be the custom to measure walling per superficial yard, no matter what the thickness.

Joseph Bennett, master builder, in the employ of the Blaenavon Company, said he measured the work in question at defendant's request. His experience was that such work was always measured per cubic yard. The result of this measurement was 337½ cubic yards.

The Judge.—How much per superficial measurement?

Witness (after some calculation).—6110 superficial yards. He had only known of dressed walling being taken per superficial yard. The front of this house was hammer-dressed, but hammer-dressed work was measured cubically. When the solid yard is meant, the word perch is generally used.

For the defence, Mr. Chapman, Pontnewydd, builder, sworn, said that he had seen the agreement referred to and he was not aware of any custom as alleged by the plaintiff and his witnesses, but he had always considered that the custom was entirely the other way, and if he had been called to measure the work according to the agreement produced he should have decidedly taken cubic measurement. Referring to the price named in the agreement he considered 3*s.* 6*d.* per cubic yard a fair price, and that the defendant would be overcharged if paid at that rate per superficial yard.

Ellis Stephens, builder, Abergavenny, corroborated the last witness in every detail, both as to custom and price of work.

The Judge then summed up the case and pointed out that the evidence of the custom sought to be established was most contradictory, and that on the defendant's side there was evidence showing that, custom or no custom, if the plaintiff's method of measurement was taken he would be receiving too high a price for his work.

The jury, on returning into Court stated that they had unanimously agreed that upon the evidence given, the custom sought to be established by the plaintiff was not substantiated, and therefore they disallowed that part of the claim; they also disallowed a considerable number of the other items in the account, the result being a verdict for 2*l.* 10*s.*

ARCHITECTS' ACTIONS.

WILLIAMS *v.* WILLIAMS.

In this case, heard in the Abergavenny County Court, on the 11th inst., before Judge Herbert, Mr. J. F. Williams, architect and surveyor, Pontypool, was the plaintiff, and Mr. John Williams, draper, Blaenavon, the defendant.

The action was brought to recover 13*l.* 2*s.* 6*d.*, for professional services rendered to the defendant and his then solicitors (Messrs. Gibbs & Llewellyn, of Newport). It appeared that in August of last year a neighbour of the defendant's filed a bill in Chancery against him in a dispute over a party-wall in building some houses in Blaenavon. The dispute was referred to and settled by arbitration. Previously to the arbitration the plaintiff, who was at Weston-super-Mere, having a week's holyday, was telegraphed for by the defendant to come to Blaenavon at once, to measure the ground and prepare plans of the same, for the purpose of the suit, and for this he charged 3*l.* 3*s.* The other items were for other plans, for journeys to Newport to see the defendant's solicitors, &c., which were detailed in evidence.

The defence was that the plaintiff had received 8*l.* 8*s.* for all these services under the award, therefore he could not charge again.

Judgment was given for nine guineas and a half, with costs.

SAUNDERS *v.* MASON.

This action, tried in the County Court, Newport, Isle of Wight, on the 16th inst., was a jury case from Ventnor, in which the plaintiffs, Messrs. Saunders, architects, claimed 48*l.* 7*s.* for drawings and plans of proposed buildings at the Royal Hotel.

Mr. Theodore Ridley Saunders gave evidence that on the 6th of September, 1877, defendant consulted him as to a building he proposed to erect where the tap of the hotel stood. Defendant stated that he was pledged to some outlay in building under his lease. Witness recommended a kind of wing to the hotel, with restaurant, &c., and bar in front, with through communication to the road, and spoke of a proposed recreation-ground close by. Defendant said, "Capital idea. I shall be able to get rid of my cold meat." In reply to a question as to expenses, defendant said it was for witness to give his ideas and advice, and they could be cut down if he (defendant) found them too large. On the afternoon of the same day witness, with two assistants, proceeded to take a survey and levels of sections. He afterwards proceeded to prepare plans.

The Judge.—Don't you think it would have been fair to have given some idea as to price before you went into that elaborate plan?

Witness.—It was not usual with such clients. His instructions were to fill the land, and he did it. Defendant, when he showed him these plans, said, "You are for building a palace." On the 24th of September defendant called on him and spoke of the building, and that led to the plaintiff sending him another plan headed "Royal Hotel, proposed new Tap." Then they had an interview on the subject, and defendant said he was bound to spend only 200*l.*, but he proposed borrowing 400*l.* of the ground landlord, and that would make it 600*l.* for the building. The smaller set of plans was then drawn, and on the 13th of December defendant called to see them and took them away with him, witness telling him they were his own property. Defendant kept them five months, and then came and said the plans must be cut down one story.

Mr. Livesay, C.E., was called, and gave evidence which went to show that the charges for the work were reasonable.

Defendant was called, and denied the allegation that when he first consulted plaintiffs as to the building he declined to say anything definite as to cost, and left it to them to carry out their own idea.

The jury found for the plaintiffs, 5*l.* for the first plan, and 22*l.*, including the 5*l.* paid into Court, for the other items of the bill, and costs.

Royal Institute of British Architects. The opening meeting of Session 1878-79 is fixed for Monday, November 18th.

THE COTTAGE SYSTEM FOR TRAINING CHILDREN OF THE POOR.

A report by Dr. F. J. Mouat and the late Captain G. Bowly, on the home and cottage system of training and educating the children of the poor, recently published, will be found of value by those who interest themselves in this important subject. It includes plans of the Princess Mary's Village Home, Addlestone; the Home for Little Boys, Farningham; the Philanthropic Society's Farm School, Redhill; and many other institutions of the same character. During the last few years several Boards of Guardians have resolved to try the experiment of erecting schools upon the family system, and plans on that system have been approved of by the Local Government Board in six cases. At the date of the publication of the report, plans were under consideration for the Kensington and Chelsea school district, and these have since been sanctioned. It is to be regretted that Captain Bowly did not live to see the report published. He was obliged to go on sick leave early in the year, and died at Malta on the 31st of March last.

SANITATION IN DUBLIN.

Mr. W. P. O'Brien, local Government inspector, held an inquiry at Dublin, last week, as to the incidence of the sanitary expenditure in Dublin. In opening the proceedings, Mr. O'Brien said the expenditure of the Dublin urban district had been, up to the present time, a charge upon the borough fund or borough rate. It was so constituted under the Sanitary Act of 1866, continued under the Public Health Act of 1874 and the Public Health Act of 1878; but this Act contained an important provision in section 226, which provided that all expenses incurred by the urban sanitary authority in the execution of this Act, and not otherwise provided for, should be defrayed as follows,—that was to say, in the case of a council or a borough, out of the borough fund or borough rate. That provision was precisely analogous to the provisions contained in the previous Sanitary Acts; but there was this proviso at the close of the section,—

"Provided also that if application be made to the Local Government Board whereby it shall be alleged that it would be inequitable or inconvenient, in the district of any urban sanitary authority, that the said expenses shall be borne as last aforesaid, the said Board may, after inquiry by order under seal, alter the incidence of such charge, in respect of the whole or such part of the expenditure referred to, as to them shall appear to be fair and equitable."

And in section 227 there was a provision which existed in the previous Acts, to the effect that any limit imposed on or in respect of any rate by any Act of Parliament should not apply to any rate required to be levied for the purpose of defraying any expenses incurred by the sanitary authority of any urban sanitary district for sanitary purposes. Now, after the passing of that Act a letter was addressed, on August 20th, to the Local Government Board by the town clerk, inclosing a resolution passed by the corporation,—

"That representation be made to the Local Government Board under Section 226 of the Public Health Act (Ireland), 1878, alleging that it would be inequitable and inconvenient that the expense of carrying the said Act into execution in Dublin should be borne as provided in the said Act, and requesting that the Board may, as therein provided, after inquiry, alter the incidence of such charge in respect of the whole or such part of the expenditure referred to as to them shall appear to be fair and equitable."

Upon the receipt of the letter the Local Government Board wrote, asking for a more specific statement as to the grounds upon which it was alleged that change should take place, and they received a letter from Mr. Gray, as chairman of the committee, setting out these grounds at length. Mr. O'Brien having read this letter, said that the question being an entirely novel one, the Local Government Board sent a paper to their counsel, and Mr. Monahan's opinion being that the case was clearly within Section 226, had directed him to hold the inquiry.

Among the witnesses was Mr. James Boyle, chairman of the Public Health Committee. Examined by Mr. E. D. Gray, M.P., on behalf of the committee:—

"In your opinion, is the sanitary expenditure of Dublin sufficient for the requirements of the city?—Wholly insufficient. The Public Health Act of 1878 has cast new duties upon the sanitary authority; it has conferred additional powers and increased the duties very much. An increased staff is necessary in order to carry out the objects and provisions of the Act of 1878.

Do the public expect improvements in the sanitary condition of the city?—Yes.

Have the Public Health Committee been obliged to consider the propriety of a reduction of their expenditure on sanitary matters?—They have been obliged to reduce the sanitary staff below what is necessary for carrying out the public health business of the city. Officers have been dismissed, and expenses absolutely necessary, in my opinion, have been either curtailed or dispensed with.

Have you received communications from time to time from the City Treasurer, asking that the Public Health Committee should not make too heavy drafts upon the Borough Fund?—Repeatedly. I have been repeatedly obliged to withhold the payment of accounts, which there were no funds to meet. At the present moment it is so."

The result of inquiry will be made known in due course. In the meantime we notice that the Executive Committee of the Dublin Sanitary Association has been considering the question of organising popular lectures on sanitary science, to be delivered in various parts of the city, and has entrusted the duty of carrying out the necessary details to the secretaries.

STAINED GLASS.

Newbury.—The annual meeting of the St. Nicholas Stained-Glass Window Society, the object of which is to raise funds for placing stained glass windows in the parish church, was held on the 27th ult. The rector, the Rev. E. I. Gardiner presided, and in his opening remarks referred to the proposal that the windows which it was desired to have placed in the church should form a connected and unbroken series of subjects,—those in one aisle to represent our Lord's miracles; those in the other aisle our Lord's parables; and those in the clearstory, the Old Testament saints on one side, and the New Testament saints on the other. There were fifteen windows, and if they could raise 150*l.* a year they would be able to put in a window every year, so that the work would be completed in fifteen years. Mr. Hardman, of Birmingham, who had been invited to attend the meeting, gave some interesting particulars with reference to the project.

Eltham.—A new stained-glass window has been uncovered in the parish church, Eltham, Kent. The window is a four-light one, and contains eight scenes in the life of St. John the Baptist, and the wheel above represents six cherubim, with a dove in the centre. The work was executed by Messrs. Craven, Bourne, & Co.

Strathaven.—Messrs. W. & J. J. Kier, of Glasgow, have been commissioned by the Duke of Hamilton to execute a large heraldic stained-glass window, to be placed in Strathaven Church, near Hamilton.

Littleover.—A new stained-glass window has just been inserted in Littleover Church, in memory of the late Mr. Morley, a resident of the parish. The work has been undertaken and executed by Mr. Woodhouse, of Derby, the glass being supplied by Messrs. Hardman, of Birmingham. The window is in the south side of the church, and consists of three lights. The centre light has the figure of "The Nativity," that to the left "The Visit of the Shepherds," and that to the right "The Visit of the Wise Men offering their Gifts."

Basingstoke.—Another stained-glass window has been added to St. Michael's Church, Basingstoke. It is by Messrs. Lavers, Barraud, & Westlake, and represents the four writers of epistles, viz., St. Paul, St. Peter, St. James, and St. Jude, the figure of St. John being with the evangelists in another window.

Southampton.—For the east window of the chancel of the new church of St. Mary, Southampton, of which the Prince of Wales recently laid the foundation-stone, Mr. Street has prepared designs for the three lights of the window. The designs illustrate events from the Passion, and the Crucifixion will be the subject of the central light. The east window is to be a Confirmation memorial to Bishop Wilberforce.

Hempstead.—A stained-glass window has been fixed in Hempstead Church, in memory of the late Mr. and Mrs. Charles Walker, of Gloucester, by Messrs. Camm, of Birmingham.

Kingsbury.—A stained-glass window has just been completed for the north aisle of Kingsbury Church. The subject, "The Good Samaritan," occupies three lights. The window has been designed by and erected at the cost of Mr. Swaine Bourne, of Birmingham, in memory of his father.

Newcastle-on-Tyne.—One of the three-light windows in the north-aisle of St. Mary's R. C. Cathedral, Newcastle-on-Tyne, has just been filled with stained glass in memory of the late Mr. Stephen Quin, from a design by Mr. H. M. Barnett, of the Victoria Stained Glass Works, Newcastle.

Oxford.—A stained-glass six-light window has been placed in the new Wesleyan chapel at Oxford by Mr. T. Cox, of London. It is of a foliated design, representing the principal Scripture flowers and plants. It is given by the temperance societies of Oxford and district as a memorial of the late Rev. George Maunder. A rose-window over the pulpit has also been fixed, the gift of Mr. Nix, of Oxford, in which the rose and lily are introduced, also by Mr. Cox.

DISSENTING CHURCH-BUILDING NEWS.

London.—The memorial-stones of a new Wesleyan chapel in Stamford-street, Blackfriars, were laid on the 10th inst. The site selected is very circumscribed in size and shape, and has necessitated the placing of the Sunday School over a portion of the chapel, and the lighting of the larger part of the chapel by means of a skylight. The pews will be stepped, and the aisles made to radiate from the rostrum. The probable cost is 4,000*l.* The architect is Mr. James Weir, and the contractors Messrs. Rider & Son.

Churchstoke.—A new Wesleyan chapel is about to be built here, from plans prepared by Mr. R. Hurst, architect, Welshpool. Mr. John Pickstock, of Meifod, is the builder, the amount of his tender being 400*l.*

Bristol.—A new Congregational Chapel at Sneyd Park, Bristol, has been opened. The building is in the Early English style, and is cruciform in plan; the building being 94 ft. in length, while the extreme width across the transepts is 60 ft. The width of the nave and chancel is 22 ft.; but on either side of the former are ambulatories, 4 ft. wide, giving access to the end seats of the nave, the whole arrangement being carried so as to prevent any interruption to the view of the chancel and the minister. The transepts are slightly raised above the nave level, and have freestone parapets at the junction with the cross. Adjoining the church is a lecture-room, 34 ft. by 24 ft., with a raised platform. The chapel is intended to afford sittings for about 300 persons. Local sandstone of a yellow hue is used for the external facing of the walls, Bath stone being used for all tracery and moulded work. The whole of the work was executed from designs by Mr. Stuart Colman, architect, and the builders were Messrs. Cowlin & Son. The wood and stone carving was done by Mr. E. Sheppard, of Bristol.

Cotham.—A new Wesleyan Chapel has just been opened at Cotham. It is Early Decorated in style. The walls are of Pennant stone, from the Stapleton and Hanham quarries, with Westwood stone dressings. The interior dimensions are,—length, 66 ft. 3 in.; width, 45 ft. 3 in.; height, 48 ft. There are Sunday school premises and vestry attached. The chapel will accommodate 800 persons, and the school 450 children. The total cost of the building, including the site, has been about 9,000*l.* Mr. Curwen, jun., of Liverpool, is the architect.

Manchester.—A new Wesleyan Chapel, situated at the corner of Heslington-street and Raby-street, Moss-lane East, Moss-side, was opened on the 15th inst. The large room on the ground-floor, which for the present will be used as a chapel, will seat 300 persons, additional accommodation for about 150 people being provided in the gallery. Adjacent to the gallery is a room intended for ladies' sewing meetings. Contiguous to the chapel are seven class-rooms, four being at the front and three at the back, with yards and conveniences. Over the three class-rooms at the rear of the chapel is a room, measuring 56 ft. by 22 ft. On the basement is a kitchen, fitted with a hoist to each of the upper floors, together with the heating apparatus. The whole of the woodwork of the chapel is pitch-pine, stained and varnished. The roof principals are of hammer-beam construction, and the walls and roofs are plastered. Externally the building is faced with white headers, relieved with strings of stock brick and stone dressings. The entrances to the chapel are numerous. The cost of the building will be about 3,800*l.* The work has been executed by Mr. Wm. W. Harrison, builder, Greenheys, from the designs and under the superintendence of the architect, Mr. John Lowe, of Manchester.

Houghton-le-Spring.—On the 26th ult. the new Presbyterian Church at Houghton-le-Spring was opened for worship. It is built entirely of stone, the facing being sneck rubble, and the dressings chiselled. All the windows have traceried heads, label-moulds, and deep reveals, and are filled with stained glass by Messrs.

Wailes & Strang. The tower is temporarily roofed in, the funds at present not permitting the building of the spire, which is designed to reach a height of about 106 ft. The roof is open-timbered, and in one span of 36 ft. It is covered with green Westmoreland slates. The internal fittings are of pitch pine. The church is to be warmed by hot-water apparatus, supplied by Messrs. Walker & Emley. Messrs. Robson & Tremble, of Hetton-le-Hole, are the contractors for the work, the cost being about 3,000*l*. The accommodation is for 400. Mr. W. Lister Newcombe is the architect; and Mr. John Wilford has acted as clerk of works.

Oxford.—A new Wesleyan chapel has been opened in Oxford. It partially occupies the site of the old chapel, and is brought within a few feet of the street-line. The style adopted is the Decorated Gothic of the latter part of the fourteenth century. The front elevation to New Inn Hall-street consists of a centre gable, flanked by a tower and spire, about 130 ft. high, and on the other side by a gable entrance to one of the galleries. The entrance to the other gallery is by a tower doorway, which, as it is opposite Cornmarket-street, has been specially treated. The interior has nave and aisles, and the arcades are of stone. The roof is an open hammer-beam one, supported by polished shap granite columns, with carved stone capitals. The seats are open, and of selected red wood, and they afford accommodation for 850 persons. The wrought-iron railings and gates are by Messrs. Marshall, of Cheltenham; the gas-fittings by Mr. Gough, of Gloucester; and the carving by Mr. Frith, of Gloucester. The architect is Mr. Charles Bell, of London. The builders are Messrs. Symm & Co., of Oxford, and the total cost, including extra land, is about 10,000*l*.

Newry.—The new Presbyterian church in Sandys-street, Newry, was re-opened on the 20th inst., after alterations and additions. The old gallery has been removed, and a new one erected, with open-bench pews. A new pulpit has also been erected. The designs were made by Mr. W. J. Watson, C.E.; and Messrs. Whelan & Watson, builders, Newry, were the contractors. The entire cost of the works has been about 1,000*l*.

Fyvie.—The Free Church of Fyvie has been re-opened, after alterations and decoration. The work has been executed from the plans of Mr. R. Ewan, architect, Glasgow, and under his immediate supervision, the contractors being Messrs. Teunon, carpenter, Turriff; Fordyce & Sons, builders, Turriff; W. & C. Duthie, plumbers, Turriff; J. & A. Pirie, slaters, Fyvie; J. & J. Hutcheon, plasterers, Methlick; James Garvie & Sons, painters, Aberdeen; and William Shirras & Son, lamp manufacturers, Aberdeen. The cost has been upwards of 400*l*.

Edinburgh.—During the past twelve months there has been in process of building a place of worship for the accommodation of adherents of the Free Church resident in the Newington district. The church now advancing to completion formed part of the originally approved design for a group of joint buildings. Its site is at the north-west angle of St. Andrew's-terrace and West Mayfield. The ground-plan is cruciform, with a segmental apse at the east end of the nave. Both transepts are double, and are deeply recessed, while the nave has an aisle on each side. The nave is 88 ft. in length, by 42 ft. wide, including the aisles, each of the transepts receding about 18 ft. In the interior, the nave and aisles are separated by a series of dressed stone piers with moulded bases and carved capitals, from which spring mouldings forming pointed arches. At the intersection of the nave and transept roofs an ornamental *flèche* rises to the height of about 30 ft. from the roof-ridge, and is turned to account for purposes of ventilation. The church will be seated to accommodate upwards of 700 persons, the seating being in varnished pine, and of open-pew construction. The whole buildings have been carried out from designs furnished by Mr. Hippolyte J. Blanc, architect, the style adopted throughout being Early Gothic of French type.

New Private Chapel at Aske Hall, Richmond, Yorkshire.—On Tuesday, the 15th inst., the private chapel which has been erected for the Right Hon. the Earl of Zetland, from designs prepared by Mr. Thomas Oliver, architect, of Newcastle-on-Tyne, was opened by his Grace the Archbishop of York, assisted by the Rev. Mr. Hill, his lordship's chaplain.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Drogheda.—The new Dominican Church of St. Mary Magdalen has recently been dedicated. The church is cruciform in plan, and consists of nave, transepts, chancel, and side chapels. The total length inside is 111 ft., by a width of 30 ft. in the nave, and of 62 ft. across the transepts. The material used is the limestone of the locality, the walling being of pitched-faced work, relieved by bands of white limestone finely chiselled. The dressings of the windows and doorways are also of white limestone. The tower stands in the angle formed by the nave and south transept, and forms one of the entrances to the church. The entire height of the tower (which is surmounted by a gabled roof) is 90 ft. The internal height from floor to apex of ceiling is 45 ft., the roof being boarded and panelled in pitch-pine, and having arched principals at intervals. The nave roof is carried across the transepts on arcades of two pointed arches. The columns on which these arches rest are of Aberdeen granite, with carved Portland stone caps and bases. The arches between transepts and side chapels and the arched ribs of chancel ceiling rest on shafts of Caen stone, with carved caps. The chancel has a semi-octagonal termination, the centre face of the octagon having a three-light traceried window, and each of the two side faces an arcade of triplet windows, resting on detached shafts. These windows are filled in with stained glass by Mayer, of Munich. The subject of the centre window is the Crucifixion. The works have been carried out without a general contractor by local tradesmen. The architect is Mr. Geo. Ashlin, of Dublin. The boundary railings have been executed by Grendon & Co., of Drogheda. The cost has been about 8,000*l*.

Sheffield.—A new oratory has just been added to St. Marie's Roman Catholic Church, Sheffield. It has been erected from the designs of the architects of the church, Messrs. M. E. Hadfield & Son, and is situate in the eastern aisle of the south transept. It takes the form of an upper chapel, 10 ft. above the church floor-level, approached from the south transept by a spacious winding staircase of Hopton Wood stone. Externally it will form a part of the new sacristy and rectory buildings at the corner of Norfolk-row and Norfolk-street.

Culmullen.—A new Roman Catholic chapel has been opened at Culmullen, co. Meath. It is Early Gothic in style, the architect being Mr. W. Hague. The plan of the building comprises nave, 75 ft. long, by 28 ft. wide; chancel, 22 ft. by 17 ft.; sacristy, porch, and tower, with spire at the junction of the sacristy and chancel. The exterior faces of the walls are of hammered limestone ashlar, with limestone dressings to the quoins and buttresses, and white and coloured pressed bricks in the band-strings. The work has been carried out by Messrs. Hall & Son, builders. Messrs. Neill & Co. supplied the altar, and the stained-glass is by Messrs. Early & Powell.

Books Received.

Ure's Dictionary of Arts, Manufactures, and Mines; containing a clear Exposition of their Principles and Practice. By Robert Hunt, F.R.S. Vol. IV. supplementary to the Seventh Edition. Longmans, Green, & Co. 1878.

Science is tramping along at such a pace, and in so many directions at once, that it is difficult for the recorders to keep up with her. No sooner was the last edition of Ure's Dictionary of Arts, Manufactures, and Mines published than it was found that several of the articles in the earlier portions of the work required some additions, owing to the advances which had been made in the useful applications of science, and that new articles were necessary to record the progress of several examples of inventive ingenuity. To meet this necessity, it was determined to produce a supplementary volume, in which all the required additions should be made, and all improvements, and new applications of value, carefully recorded. This seems to have been completed in a satisfactory manner. This supplement will be found to include everything of interest relating to arts, manufactures, and mines which has claimed attention since the publication of the previous volumes, and the four volumes represent fairly the state of these divisions of human industry up to the commencement of the present year.

Several new articles by good hands have been introduced.

In his preface the able editor, Mr. Robert Hunt, acknowledges considerable obligations for information furnished,—in many cases at considerable personal labour,—and for the contribution of matter giving the results of original inquiries in connexion with sundry other articles,—to many leading men of science, manufacturers, and others. The new discoveries in respect of sound and late information as to the electric light are given.

COTTAGE BUILDING AT RUGBY, AND THE LOCAL GOVERNMENT BOARD.

The Rugby Local Board of Health have just submitted an interesting point to the Local Government Board with respect to the building of cottages within the township, and in reply the central Board in London have already given a decision of considerable importance as to the powers of local boards over dwellings of this character.

It appears that for some time past the Rugby local authorities have hesitated to pass plans for cottages having only two bedrooms, on moral as well as sanitary grounds. On the other hand, it is contended by the builders that where larger houses are built, mechanics take in lodgers in order to enable them to pay the rent, and some members of the Local Board consider that this is even more objectionable on sanitary grounds than the small cottages with two apartments only. The Local Government Board having been appealed to to determine the question, have decided that the Local Board have no power to refuse to pass such plans.

Miscellanea.

Sewer Ventilation at Eltham.—Last week the chairman and several members of the Ashford Local Board, with their clerk and surveyor, proceeded to Eltham, for the purpose of inspecting the system of sewer ventilation adopted there. On their arrival they were met by Mr. C. Haworth, the surveyor, who fully explained the entire system. The shaft or tower through which the sewer gas passes was erected in 1866, and is situated at the top of the High-street of Eltham. The shaft is 338 ft. above Trinity datum, and is built of brick with stone facings, and is about 65 ft. in height, and 19 ft. above the top of the principal sewer. The air from the sewer rises into a confined chamber in the base of the shaft, in which are four rings of ordinary coal gas-jets, kept continually burning. The inflammable air here ignites with the coal gas, and then passes through three other chambers, filled with charcoal, containing about 2½ bushels, and becoming free from offensive odour, ascends to the top of the shaft through apertures on each side, and is from thence carried away by the passing winds. There are at the present time nearly six miles of sewer connected with the shaft, and an additional three miles will very shortly be carried into it. The nearest grating or ventilator in the sewer is two miles distant from the shaft. The charcoal is changed about once in three months, and the estimated cost of the coal gas, including that supplied to the three ornamental lamps round the shaft, is under 10*l*. a year.

St. James's, Piccadilly.—This church has been re-opened. The interior, one of Wren's best works, has undergone renovation and some alterations. The marble and bronze enclosure of the altar-table has been raised and extended, and the pews at the east end have been cut down and converted into open seats. At the west end the central vestibule has been enclosed, paved with marble, and lighted with a window, and the marble font, the work of Grinling Gibbons, has been removed into it.

Vandalism in Ireland. — Mr. Patrick Traynor writes to a Dublin paper complaining of the mutilation of the cross of St. Boyne, at Monasterboice, co. Louth. He says that in one of the compartments, in which there is a sculptured group representing the Baptism of Christ, the figure of the stooped Christ was the one selected for destruction. Off this figure the destroyer has broken the left leg, and in doing so has laid bare the white marble ground of the body of the cross.

Liverpool Engineering Society. — This Society held its usual fortnightly meeting on Wednesday evening, at the Royal Institution, Colquitt-street. The attention of members was called to the "Stellar" code of day and night signals,—the invention of Captain Harrison, of London. A paper was read by Mr. W. W. Squire, Stud. Inst. C.E., on "Stone Masonry." The author pointed out the qualities characteristic of good stone for engineering purposes, and described the principal stones employed for such work. The red sandstone, near Liverpool, was shown to be remarkably hard and good; the strain required to crush this stone being, on the average of six experiments on small cubes, two tons and a half per square inch. The classes of masonry dealt with in the paper were ashlar and coursed rubble. The author condemned the use of ashlar in marine engineering work, where strength and durability are necessary. Coursed rubble backed with concrete, intermixed with large rough blocks of stone, seemed to him to be the most desirable method of building heavy retaining-walls, and large solid masses of masonry in general. A few remarks on stone-cutting, and plant for erecting stone masonry, concluded the paper.

Sanitary Matters at Westgate-on-Sea.—At the last meeting of the Isle of Thanet Rural Sanitary Authority, held at Minster, Dr. Robinson, the medical officer of health, drew the attention of the board to the want of proper drainage and building regulations at Westgate-on-Sea, which was, he said, a very growing place, with two miles of roads laid out for streets, and was frequented by numerous visitors for the benefit of their health. It was, therefore, highly necessary that its sanitary arrangements should be looked after. At present the houses were drained by cesspools, and there were no building regulations. If things were allowed to remain as at present, he thought the ultimate result would be the depreciation of the value of the property there, and the ruin of what might be a rising and prosperous place. He advised the Board to apply to the Local Government Board for urban sanitary powers for Westgate. Mr. Kennett said he had no doubt that Mr. Davis, the proprietor of the Westgate-on-Sea estate would support the Board in obtaining powers, as it would improve his property. It was decided that the necessary steps should be taken to obtain urban powers for Westgate.

Preston Hall, Aylesford.—The various additions and alterations to this mansion, one of the seats of Mr. H. A. Brassey, M.P., are now completed. The entire kitchen, offices, and servants' apartments have been remodelled, a still-room and pastry larder, and gun-room constructed, and all the larders and pantries provided with fittings of the most recent invention. Dormitories have also been built to accommodate the men-servants and visitors' valets. These alterations necessitated the removal of the old laundry, and the erection of a new building at some distance from the mansion, consisting of a large warehouse, laundry, drying closet, and residence for the laundry maids. There is a coachhouse capable of holding six carriages, a harness-room, and a room for grooms. These works were designed by Mr. Edward W. Stephens, architect, Maidstone, and carried out by Messrs. Wallis and Clements and Messrs. Cox Bros.

Municipal Hall, Birmingham. — The work of furnishing and fitting up the new Municipal Hall at Birmingham has been entrusted, after competition, to three local firms. Messrs. Manton, Sons, & Gilbert, of Birmingham, have been selected to furnish the Mayor's parlour, the Town Clerk's private room and offices, the retiring-rooms for the council, the committee-rooms, ante and cloak rooms, and clerks' offices; Messrs. Collier & Plucknett, of Warwick, the council-chamber; and Mr. S. Barber, of Birmingham, the rate department. The task assigned to Messrs. Manton, Sons, & Gilbert has just been completed. The furniture has been executed from designs by Mr. Yeoville Thomason, the architect of the hall.

Corn Exchange, Maidstone.—The work of decorating the Maidstone Corn Exchange is now nearly completed, from a design by Mr. E. W. Stephens, architect. The whole of the work has been executed by Mr. H. G. Brown, of Snodland. In order to afford greater safety to the audience in the event of the breaking out of a fire, or any false alarm, the doors of the Exchange and Concert-hall have been made to open outwards.

Restoration.—At the last meeting of the "Notes and Queries Society," Liverpool, Mr. Caine, in his inaugural address, referred to the work of the society in opposition to architectural restoration. After saying that Mr. Morris, the poet, had promised the society a paper, he sketched the progress of the defence of ancient buildings, which had resulted in the formation of the London association. After Mr. Ruskin, Mr. Samuel Huggins had, he thought, contributed most to sustain the agitation. He described the various fashions of restoration in vogue, and concluded by references to the restorations proceeding at Ormskirk and Chester. By and by we should awake to see what we had done; that we had destroyed the old England of Shakspeare, Cromwell, Hampden, and Milton, so far as mural association was concerned, and had set up a sham new England, with lies written in stone all over its face.

Birmingham Sanitary Supply Association. — The first ordinary meeting of this Association was held on the 16th inst. The directors' report stated that the depôt was opened for business on the 15th of August last, and arrangements had been made with several patentees and manufacturers for the exhibition and sale of sanitary apparatus and appliances. In order to further develop the business of the Association the directors proposed to retain an architect and a consulting engineer in addition to their present sanitary engineer and manager. The report went on to state that the upper and middle classes were exposed in their residences to dangers from which the poor were exempt, the poor being carefully looked after by health committees and local boards, while in many apparently well-appointed residences the sanitary arrangements were deplorably defective.

Treasure Trove.—In digging the foundations of a new shaft at the rear of premises in the occupation of Messrs. Morgan & Co, in Long-acre, a day or two ago, the workmen came upon a chest containing a large number of gold and silver coins of the reign of Henry VIII. in a good state of preservation. Besides a quantity of miscellaneous articles, the box contained about twenty pieces of church plate and ornaments. Among these were a massive chalice, a ciborium, and a monstrance, all set with precious stones; a crozier-head, a lapis lazuli crucifix, a pectoral cross and chain attached, and some other articles. The whole of the things comprised in the "find" are now in the possession of the Treasury, and we understand that they will shortly be on exhibition at South Kensington Museum.

Sketching Club Competition —The fifth annual competition between Metropolitan Schools of Art Sketching Clubs was held on Tuesday at the Dudley Gallery. The following clubs competed, viz.:—Gilbert, Lambeth, South Kensington (female), West London, and South Kensington (male). The judges were Mr. Pettie, R.A., and Mr. Peter Graham, A.R.A. The prizes were awarded as follows:—For Figure, to Mr. W. P. Cornish (Gilbert); for Landscape, to Mr. Nightingale (Lambeth); for Animals, to Mr. E. R. Breach (West London); for Design, a prize of 1*l.* each to Mr. Cornelius S. Reich (West London), Mr. L. Victor Reich (West London), and Miss E. Harrison (Lambeth); and for Sculpture, to Miss E. C. Billows (West London).

Fires.—On the 16th inst. the premises of Mr. R. Pearson, joiner, Rose-street, Hopwood-lane, Halifax, were destroyed by fire. A large quantity of finished work was destroyed, besides tools and machinery. The loss is estimated at 850*l.*——On the 18th inst. a fire broke out in the joinery department of the Gloucester Wagon Works, formerly belonging to Wm. Eassie & Co., and after burning for several hours ended in nearly the total destruction of the sheds, shops, and engine-house, comprised in what is called the Lower-yard, with their valuable contents, and a large quantity of timber lying contiguous. The loss is stated at 30,000*l.*

Liverpool.—The first tree of the Prince's-road Boulevard was planted on the 17th inst. by Mr. Alderman Hubback. The strip of land which is to form the boulevard, it will be remembered, was recently purchased by the Corporation, and when planted will form a fine promenade from near Upper Parliament-street to Prince's Park.——The Health Committee propose to obtain a steam hopper barge, for the purpose of conveying the sewage of the town away out to sea, where it will be deposited.

Metropolitan Board's Offices, Spring-gardens.—We announced some time ago that a new story was to be added to this building. The work is now in progress. The increased accommodation which the added story will give consists of twelve offices of large dimensions, together with three large strong rooms, and a corridor in the centre, 6 ft. wide, running the whole length of the building. In order to give increased facilities of access from the lower parts of the building to the upper floors, there will be a lift provided contiguous to the main staircase, by which the clerks and other officials can be taken to the top of the building, or to any floor to which they may wish to go. Mr. Vulliamy, the Superintending Architect to the Board, has furnished the designs. The cost of the enlargement will be 5,600*l.* Messrs Hook & Oldrey are the contractors.

Proposed Scotch Church on the Victoria Embankment.—At a recent meeting of the Brechin Presbytery, documents were laid on the table in connexion with the Scotch National Church proposed to be erected on the Thames Embankment, at an expense of 60,000*l.*, and asking the assistance of the Presbytery. Some of the members thought the sum might be better expended in the erection of half a dozen churches in different parts of London. It was agreed to recommend the movement to the favourable consideration of "the members within the bounds."

Riviere's Promenade Concerts. — The "Stabat Mater" drew an immense crowd to Covent Garden on the evening of the 18th; and its performance must have satisfied them. Madame Lemmens-Sherrington, in particular, sang the last air, "Inflammatus," superbly. In the second part, Mrs. Georgina Weldon did more than gratify a not altogether surprising curiosity: a thousand echoes said, unmistakably, "Well done!"

Fatal Scaffold Accident. — On Monday evening Mr. Langham held an inquest at Charing-cross Hospital on the body of Henry Hodges, a labourer. The evidence showed that deceased was assisting at a scaffold erected by Messrs. Styles, contractors, at 12, Regent-street, for the purpose of putting a new roof to the house, when he slipped and fell, sustaining shocking injuries. Verdict: "Accidental death."

TENDERS

For the erection of new premises, 15, Whitechapel-road, for Mr. Blomfield Burnell. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Reed	£3,495 0 0
Axford	3,125 0 0
Read & Son	2,978 0 0
Abrahams	2,929 0 0
Hosking Bros.	2,882 0 0
North Bros.	2,845 0 0
Page	2,792 0 0
Morter	2,789 0 0

For model dwelling-house, Duke's-mews, Kensington, for the trustees of the late Miss Cecil. Mr. W. J. Worthington, architect:

Williams & Son	£2,277 0 0
Cowland Bros.	2,268 0 0
Chivey	2,191 0 0
Outhwaite & Son	2,138 0 0
Clark & Bracey	2,098 0 0
Langmead & Way	2,090 0 0

For cleansing the three cold-water reservoirs at Abbey Mills Pumping Station for one year, for the Metropolitan Board of Works:—

Mowlem & Co.*	£225 0 0
Ford & Norris	225 0 0
Harris	160 0 0
Holloway (accepted)	158 10 0

* Or for three years, 210*l.* per annum.

For alterations and repairs in High-street, Thame, Oxon, for Mr. E. W. Reynolds. First contract. Mr. H. J. Heath, architect:—

Hobdell & Fisher (accepted).

For alterations and additions to the Old Bell, Kilburn, for Mr. W. Cossey:—

Marr (accepted)	£1,143 0 0

For the execution of general works in District B, for one, two, or three years, for the Metropolitan Board of Works:—

	1 year.	2 years.	3 years.
Per cent. above schedule of prices.			
Nowell & Robson	20	20	20
Hook & Oldrey	15	15	15
Mowlem & Co. (accepted)	—	—	2½
Per cent. below schedule of prices.			
Pearson	2½	3	3

For the erection of four detached villas, in Woodchurch-road, Kilburn. Mr. Banister Fletcher, architect:—

Bayes	£7,000 0 0
Prout	5,689 0 0
Castle	5,484 0 0
Butcher	5,450 0 0
Hobern	5,381 0 0
Whiteman (accepted)	5,140 0 0

For the erection of four detached villas, in Caufield-road, Kilburn, for Mr. Thomas Yeo. Mr. Banister Fletcher, architect:—

Whiteman (accepted)	£5,280 0 0

For additions to No. 36, Notting-hill-square. Mr. Banister Fletcher, architect:—

Lucas & Son	£502 0 0
Bayes	498 0 0
Whiteman	480 0 0
Hobern	426 0 0

For the erection of a block of model residences, in Rodney-street, Pentonville, for the Sanitary Dwellings Company (Limited). Mr. Banister Fletcher, architect:—

Prout (accepted)	£5,554 0 0

For new steam brewery (exclusive of engineer's works), at Horsell, Surrey, for Mr. Stedman. Mr. Henry Peak, architect. Quantities supplied:—

Steer	£1,300 0 0
Marriage	1,290 0 0
Garnett	1,172 0 0
Pearce & Clark	1,144 12 0
Strudwick	1,115 0 0
Mason	1,110 0 0
Goddard & Sons	1,060 0 0
Harris	997 5 0
Whiburn (accepted)	995 10 0

For new residence, near Woking Station, Surrey. Mr. Henry Peak, architect. Quantities supplied:—

Mitchell Bros.	£2,999 0 0
Pearce & Clark	2,989 0 0
Garnett	2,976 0 0
Goddard & Sons	2,853 0 0
Whiburn	2,640 10 0
Colls & Sons	2,630 0 0
Martin, Wells, & Co.	2,619 10 0
Moon	2,589 0 0
Harris (accepted)	2,333 10 0

For three pairs of cottages, on the Ashley Park Estate, Walton-on-Thames, Surrey. Mr. Henry Peak, architect. Quantities supplied:—

Alderton	£1,300 0 0
Knight & Sons	1,220 0 0
Rose & Annett	1,195 0 0
W. & A. Browa	1,193 0 0
Clark	1,170 0 0
Faulkner (accepted)	1,045 0 0

For pair of houses, on the Cholmeley Estate, Reading, Berks. Mr. Henry Peak, architect. Quantities supplied:—

Winter	£1,025 0 0
Filewood	988 0 0
Jenkins	960 0 0
Simonds	943 0 0
Weaver	910 0 0
Bishop	900 0 0
Godwin*	899 14 9
Goodey & Fulker	896 14 0
Bourton	769 0 0

* Accepted with additions.

For small detached house, Cooper-road, Guildford. Mr. Henry Peak, architect. Quantities not supplied:—

Swayne (accepted)	£310 0 0

For the construction of a bridge, retaining-walls, &c., for the Cannock Old Coppice Colliery Company (Limited). Messrs. T. C. & J. P. Sharp, engineers. Quantities supplied:—

Barton	£3,950 0 0
Moss	2,951 0 0
Cooper	2,818 0 0
Bell	2,659 0 0
Lovatt	2,500 0 0
Horseman & Co.	2,400 0 0
Hilton	2,349 0 0
Hartley (accepted)	2,189 0 0

For the erection of a house, offices, and boundary-wall, in the Parade, Epsom, Surrey, for Mr. Wm. Reader. Mr. J. Hatchard Smith, architect:—

Hooker (accepted)	£2,250 0 0

For rebuilding No. 4, Watney-street, St. George-in-the-East, for Mr. R. Hall. Mr. W. Bisiker, architect:—

Palmer	£565 0 0
Roper	500 0 0
Hollist & Son	480 0 0
Moyle & Son*	452 10 0

* Accepted, subject to sundry alterations. An error of 97*l.* 10*s.* was made in the Tender, the original being 355*l.*

For alterations and repairs to No. 62, Watling-street, City, for Messrs. Heywood, Higginbottom, & Co. Mr. W. Bisiker, architect:—

Palmer	£145 0 0
Calnau & Co. (accepted)	140 0 0

For the Town Hall, Museum, Free Library, and Schools of Science and Art, Reading. Mr. Thos. Lainson, architect. Quantities by Messrs. Fowler & Hugman, and Mr. C. Lansdown:—

Scrivener & Co.	£65,590 0 0
Browne & Robinson	64,612 0 0
Lucas Bros.	63,900 0 0
Bull & Sons	63,165 0 0
Holland & Hannen	62,875 0 0
Manley & Rogers	62,040 0 0
Chappell	59,987 0 0

For new schools for 1,020 children, and master's house, in the Mitcham-road, Croydon, for the Croydon School Board. Messrs. Rutley & Blackwell, architects:—

Hobbs	£11,726 0 0
Williams	10,247 0 0
Marriage	10,158 0 0
Jarrett	10,100 0 0
Smith	9,933 0 0
Legg	9,896 0 0
Taylor	9,853 0 0
Hearle	9,568 0 0
Ward (accepted)	9,313 0 0

For alterations [at the Jubilee Tavern, Nos. 2 and 3, Gee-street, Somers-town, for Mr. C. W. Harwood. Mr. J. R. Furniss, architect:—

White	£767 0 0
Bishop	719 0 0
Gould & Brand	689 0 0
Anley	680 0 0
Simpson	592 0 0
Arnold	590 13 0

For alterations and additions to new Board-room, &c., Broadway House, Hammersmith, for the Fulham District Board of Works. Mr. Alfred C. Bean, architect. Quantities supplied:—

Eyles	£7,480 0 0
Pickersgill	7,322 0 0
Braid & Co.	7,000 0 0
Crockett	7,000 0 0
Lathey Bros.	6,706 0 0
Mears	6,430 0 0
Parkinson	6,399 7 0
Brealy	6,360 0 0
Jones & Co.	6,281 0 0
Parker & Evans	6,040 0 0
Beale	6,027 0 0
Wagner	5,890 0 0
Scott (accepted)	5,671 0 0

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

The Builder.

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On the Desirability of Obtaining a National Theatre not wholly Controlled by Prevailing Popular Taste.



ABOUT seven years ago, the writer, when presiding at a public meeting whereat the lamented Dr. Doran had delivered an eloquent address, "For and Against Shakspeare," urged the want of a theatre not wholly controlled by the temporary predominant taste of the public, and commented on the unsatisfactory condition of things with regard to the education of actors. The establishment was called for of a theatre, subsidised by Government or by a public subscription, wherein plays of the highest character should be performed, and which should serve as a school for actors. These words evidently gave expression to the thoughts of many. The Nestor of English dramatists, Mr. J. R. Planché, Somerset Herald, taking them for a text, published a letter wherein he, too, called for "the *assured* existence of a theatre in which the masterpieces of our unrivalled dramatic authors should be constantly and worthily represented, where,—

'Thoughts that breathe, and words that burn,'

should be uttered by actors who can feel and express them to an audience 'fit,' however 'few,' without the fear that their salaries will not be forthcoming on the following Saturday, and that the manager, disheartened by the appearance of empty benches, will change the bill, discharge a company he has *jobbed* at a week's notice, and endeavour to outrival his competitors by pandering to the predominant taste of the public," and he said, with reason, "Is it not a just cause of complaint?—is it not, in fact, a national disgrace that there should not be one playhouse in this vast metropolis where those who can still enjoy the most sublime poetry, the most brilliant wit, and 'the pure well of *English*, undefiled,' may resort for an evening's rational and intellectual amusement afforded by a creditable representation of the masterpieces of our unrivalled British dramatists?" Persons of high rank, and men of large fortune, can be found to support establishments, the performances and performers at which it is not for me to criticise, and yet not one English nobleman, not one English merchant prince, steps forward to lend a hand to raise the drama from the dust and oblivion into which it has gradually fallen, until it is actually unknown to the rising generation, who become naturally inoculated with the predominant taste of the public.

Mr. Tom Taylor followed with a series of letters backing up the demand. First showing the changes that had taken place as to the stage in recent times. "The country theatres a few years ago," said he, "flourished as feeders of the London ones; and a York, Bath, or Norwich reputation, well assured, was the certain passport to a London position, reached often by way of Edinburgh or Dublin, but always the goal of a steadily followed and successful career. Once established at Drury Lane, Covent Garden, or the Haymarket, the actor was a personage, after his degree." "The actor and his work had, besides, their place in the world of art. Productions of new pieces were events in that world. Great critics were not above sitting in judgment on plays and players. Great painters were proud to paint, great statesmen to know them. The House of Commons paused once in debate to pay a formal compliment, by the eloquent lips of Burke, to Garrick, accidentally present in the Speaker's Gallery. We have only to read the critiques of the German Lichtenburg (written about 1775) on Garrick, Weston, Smith, and other actors of that time, to feel how immeasurably more intellectual an art acting then was, and in how incalculably more respectful and thoughtful a spirit it was viewed and judged then than seems even conceivable nowadays."

Another writer said,—What we want is a house in which plays of the highest class shall from time to time be presented, with the certainty that while public taste is being educated, the actor and the manager are not being ruined. "Such can only be obtained on the condition that there shall be a sum of money annually devoted to the support of the theatre whilst the experiment is attempted. Government undoubtedly ought to do this. Political economists of the modern English stamp would of course cry out 'waste' were such a scheme broached. But real thinkers know that the ameliorative influence of education in art gives good interest for money invested in its furtherance. Education is at once the safest and pleasantest way of reducing expenditure. No less sure, however, than we are that any Government which gave, under wise supervision, a moderate allowance to a theatre would act wisely, are we that no Government will attempt it. Will not, then, the art-patrons of England join together to supply us with the fund we want? Subscriptions, endowments, means of all kind should be tried. How many noble fortunes are spent in maintaining a theatre under every dishonouring and degrading influence and association? Is there no man who will do for the sake of the loveliest of all mistresses, art, what men do for frowsy harridans, or vulgar, insolent, and ignorant women, with whom all contact is degradation? How shall the start be made? Who will be first in furtherance of a scheme of the kind?"

Amongst other supporters came Lord Dufferin, who, at a dinner in aid of the General Theatrical Fund, said that next in importance to the education of the people was the amusement of the people; and it had occurred to him that if a national theatre could be established on a satisfactory footing, we might, by providing rational amusement and recreation, find an engine with which to encounter some of the many vicious attractions which abounded in large cities. State subventions to the encouragement of the drama existed in most other European countries, and perhaps the time might come when it would be the case in England.

Mr. E. L. Blanchard, Mr. Horne (the poet), Mr. Arthur Sketchley, Mr. Joseph Knight, and others who had good right to speak, supported the proposition, and a committee was formed which included some well-known men of letters and eminent actors. Several meetings were held; three or four distinct schemes were submitted to writing, but after an adjournment at the close of the season the committee was never called together again.

The movement had its effect, admittedly, on the bills of some of the theatres; the manager of the very Home of Burlesque ("The Strand"), for example, quoting a portion of one of the letters written, proceeded to revive some of our standard comedies. The spasm, however, soon came to an end.

Recently the vexed question of the present state and future prospects of the English stage has been examined and commented upon in various important quarters, with so much good sense and impartiality by writers evidently interested in the welfare of the stage, as one of the most valuable institutions for the advancement of education, and the encouragement of all the higher aspirations of the human mind, social, political, or simply literary, that if it were certain that what has been written would be everywhere read, the matter might be left where it is. It is necessary, however, to say the same thing again and again if we would have it known and acted on; and this must be my excuse for now bringing the subject forward. One of the most painful facts is the predominance of what Mr. Dion Boucicault has felicitously described as "commercial management." Any person, however incompetent to hold such a position, provided he has money of his own or of some one else's to risk in the speculation, may obtain the licence of the Lord Chamberlain to open and conduct a theatre, and consequently inflict upon the town any performances which he (the manager) considers most likely to bring money, no matter how destitute of literary merit,—how demoralising its tendency,—if it can only slip through the not too rigid scrutiny of the Examiner of Plays. Detrimental as this state of affairs must inevitably be to the drama, still we must, in justice, admit the blame does not attach itself to the manager or to those who

* By George Godwin. Read in the Art Department, at the Cheltenham Congress of the Social Science Association, October 25.

urnish the funds. It is a speculation perfectly legitimate as a matter of business, in which the only object of the persons concerned in it is to make money. If the *showman*, for such is an equally true designation of "the commercial manager," can increase his nightly receipts by ministering to the prevailing taste of the public, he will naturally do so; and the lower such taste may be, "the better," it has been truly observed, "is it for him, inasmuch as it can be more readily and cheaply gratified." He has also an additional incentive to such a course in the fact that his own standard of taste is as low as that of his audience, and that he honestly considers that the pabulum he provides for them is of the most delectable description. A booth at a fair or a "penny gaff" has the same *raison d'être*. Lamentable as this may be, there is a far greater evil of modern growth which has deteriorated and, at the same time, disgraced the stage of this country to a fearful extent, and which, to our shame be it spoken, does not and would not be allowed to exist on any other in the civilised world. It is a delicate subject to handle; but it is of too serious a nature to be ignored by those who would heartily aid in elevating the drama and supporting its professors, and I am, therefore, reluctantly compelled to speak out plainly on the subject. Much as we may regret that any theatre should be subject to the control of a person incompetent to appreciate the higher objects of the drama, and who only regards what should be a temple of the arts as a shop for the sale of any manufactures which may secure him the best return for the capital invested, with what feelings are we to contemplate a theatre avowedly directed, or notoriously known to be influenced by, an illiterate and disreputable *favorita*, possessing, beyond the charms of her person (which it is her pleasure lavishly to display to an admiring public), not the least qualification for her profession; not the remotest comprehension of the character, if perchance the part she has assumed has any character in it, or of the language, should it be innocent of coarse allusions, or contain a point more refined than the slang of the music-halls?

What class of drama worthy of the name can be expected to flourish under such circumstances? What a weapon is placed thereby in the hands of the enemies of the stage and the calumniators of actors and actresses. We are no purists. We consider that the green curtain that drops between the performers and the audience silently intimates that public criticism is limited to the scenes and actions it had been raised to exhibit, and has no right jurisdiction beyond the space they occupy. The playgoer who pays his money, but exercises his acknowledged privilege to hiss the heroine of the piece if in his opinion she acts badly or offends decorum, has no right to inquire whether she can produce her "marriage lines" without the walls of the theatre, or busy himself about her private life and associations. When, however, there is no talent to justify the *soi-disant* actress's intrusion on the stage, and the motive of her appearance is patent to the most careless spectator, it is an insult to the public which, if not resented by the audience, should be sternly reprobated by the Press,—not goodnaturedly glossed over, as we almost invariably find it. Such an exhibition would not be tolerated for a moment in any foreign theatre. Indifferent as a French *parterre* may be to the immorality of a *libretto*, complacently as it may contemplate the human (female) form divine, liberally developed by the fair performers in it, incapacity is an offence utterly unpardonable, and immediately visited with indignant sibillation. That such exhibitions have been too frequently witnessed in a London theatre is a fact as notorious as it is disgraceful. Happily, at the present moment London is relieved from such an exhibition; and the introduction of farcical and fantastical opera on our stage has also gradually ejected from it the silly and vulgar burlesques which recently infested nearly every theatrical establishment, and in which, as there was nothing to act, any young lady could gabble through her part, call attention to her bracelets, and be rewarded by a shower of bouquets at the fall of the curtain.

The *libretti* of Halévy and Meilhac and their *confrères*, or our own Gilbert and Albery, and the music of Offenbach, Lecocq, Hervé, Planquette, Sullivan, Clay, or Cellier, require artists for their interpretation and execution, and the demand creating the supply, we are daily gratified by the *début* of intelligent and educated aspirants to histrionic and vocal honours, who can speak English, and sing with taste and in tune. But another injury was done to the drama by the toleration of the press and the public of the above inanities. Actors of rare ability have been induced to prostitute their talents in attempts, frequently but too successful, to work up the sorry material into something that might give it popularity. It was distressing to see such thorough artists as Mr. Lionel Brough and Mr. Terry humiliated to the rank of clowns in a circus or the Merry Andrews that grin through a horse-collar; heartbreaking to think that Miss Ellen Farren, whose genius would enable her to rival Mrs. Abingdon or Mrs. Jordan, should be condemned to exhaust her animal spirits in galvanising the dry bones of a dreary burlesque. The darkest hour is said to be the nearest to dawn. There is hope that the darkest night of the drama has passed, and that a new day is awaking.

It is nonsense to talk of the decline of the drama. It has not declined,—it has simply been thrust aside by stupidity and cupidity. The English drama is like its greatest master, "Not for an age, but for all time." The threadbare worn quotation,—

> "The drama's laws the drama's patrons give,
> And those who live to please must please to live,"—

has been misinterpreted by theatrical showmen for their own purposes, and is still made the excuse for every desecration of the stage by many who know or ought to know better. Who are the drama's patrons? That large portion of the pleasure-seeking public who will go anywhere to see anything?—to whom a theatre is a theatre, and the one they prefer that in which they find themselves "pleased, they know not why, and care not wherefore"? Or are they the fast young men of rank and fashion, and their empty-headed imitators in the middle classes, who vote everything dull that is not meretricious, who occupy the stalls of any establishment where common sense is least respected, and decency most disregarded? or are they the more fastidious of "the Upper Ten," whose refined tastes lead them to frequent those theatres only wherein modern comedies, original or translated, faithfully reflecting the manners of the present day, are irreproachably acted and put upon the stage, with that attention to the minutest details of furniture and ornamentation which was formerly conspicuous by its absence? "*Chacun prend son plaisir où il le trouve*," and far be it from us to object to it; but I must again ask, are any of these the patrons of the drama?—of that drama which is the pride and glory of England?—the grandest drama in the world? Did it never occur to a manager that besides the masses we have enumerated, and whose special predilections are abundantly provided for, there are thousands, to speak moderately, who never willingly enter the doors of a theatre, and would eagerly patronise one in which they could enjoy the rare delight of witnessing the masterpieces of our great English dramatists adequately interpreted? It will be answered "Yes, it has occurred, and the experiment has been tried and failed." Shakspeare has been declared by an experienced London manager to spell "ruin," and Byron "bankruptcy." He invariably, however, flies to the "divine Williams" for assistance when his other resources fail him.

It is really pitiable to listen to such assertions, knowing, as we all do, the data on which they are founded, and painful to reflect that there are several clever public writers, themselves successful dramatists, who profess to hold such opinions, and that, too, in the face of facts of recent occurrence, which they cannot be ignorant of,—nay, which it may have been the duty of some of them to record as theatrical reporters. Can any instance be adduced by them of the revival of a great play, efficiently acted and artistically placed upon the stage, which has not been a financial success? Was "Hamlet" played at the Lyceum for upwards of one hundred successive nights to bare benches? Was "The School for Scandal" acted at "The Vaudeville" for four hundred nights to a "miserable account of empty boxes"? It is futile to contend that such successes were accidental, and their continuance could not be calculated upon,—that other revivals had been unproductive, &c. No sane person would venture to predict an uninterrupted course of success as the result of any management, and the only question is whether less money has been lost by the production of poor new plays than by the revival of sterling old ones.

Injudicious selection, unintellectual stage direction, incompetent exponents, must in these critical days entail failure, and deservedly so. It is sufficient for our argument that, as much loss, if not more, attends the failure of worthless modern productions, which have depended solely on spectacular effects for their attraction. Our antagonists, and there are amongst them authors of undoubted ability and considerable experience, have repeatedly expressed their firm conviction that the mission of the stage is to "hold the mirror up to nature" as nature appears to us in the present day. To

> "Shoot folly as it flies,
> And catch the manners *living as they rise*."

I do not deny that for a moment, and rejoice in the success that has attended many pieces which have been written on this principle. At the same time, the attention of its supporters should be called to the issue of its labours. Have they permanently enriched the English drama? How many standard plays have they added during the last fifty years to the grand catalogue of imperishable works bequeathed to us by the sublime poets and brilliant wits of the seventeenth and eighteenth centuries, and which, despite of fashion, prejudice, ignorance, and other disadvantages, are, and will continue to be, the staple of our stage as long as there is a stage? At the present moment I can recall but two, "London Assurance" and "Money," neither of them to be compared to the comedies already alluded to, but each possessing sufficient merit to ensure their vitality. But even the least laboured and most original of the two, "London Assurance," which so strictly and successfully fulfilled the conditions of exhibiting a faithful and vivid picture of the manners of the day, was subjected last year to revision by the author previously to its revival at the "Prince of Wales's." Since its production, wrenching off door-knockers and bell-handles have ceased to be the special amusement of young men about town, and rail and steam have superseded the then existing modes of travelling. The suppression of allusions to obsolete frolics, and the alteration of dialogue referring to locomotion, were considered necessary to render the comedy more acceptable by a modern fashionable audience. This was a great mistake. It eliminated one of the most interesting features of the play; destroyed the life-like picture of society at a particular period, which had been drawn with so much skill; while it was a proof of the consequences of the gifted author's own theory, which would necessitate the consequent re-writing and tinkering of a good play, every twenty or thirty years, to prevent it being consigned to the tomb of all the Capulets.

Hitherto only five-act comedies have been spoken of. Let us turn to the lighter class in three acts, which had their rise at "the little theatre" in the Haymarket, two of the best known of which are "Sweethearts and Wives," by Kenney, and "Paul Pry," by Poole. To this class many pleasant contributions have been made by Mr. Planché, Mr. Henry Byron, Mr. Albery, Mr. Tom Taylor, Mr. Gilbert, Mr. Frank Marshall, Mr. Burnand, and notably by the late Mr. Robertson, whose charming sketches of modern society have made the fortune of the well-managed little theatre wherein they were so perfectly mounted and so admirably acted. With curious inconsistency these fresh life-like productions have been sneered at by modern critics as the "tea-cup-and-saucer" school. What, in the name of patience, would they have? Here are the manners of the day, and the men and women of it, as truly represented as in a photograph; but how about the vitality of the works? How long will the best of them survive their lamented author? How many of the most popular pieces of this calibre, written in strict compliance with the rule propounded, will be in existence fifty years hence, or in any case ever take rank as part of our National drama? If we are to understand that sufficient for the day is the drama thereof, it is obvious that the drama of the day will be only the drama for the day, and that if the rising generation of playgoers can be infected with this opinion, we may bid a long adieu to "Hamlet" and "As You Like it," to "Julius Cæsar" and "A Midsummer Night's Dream"; even "The School for Scandal," and "The Rivals," those sheet-anchors of "the commercial manager," who, notwithstanding his contempt for them, flies to them in despair when rapidly drifting into Basinghall-street, will be consigned to oblivion as obsolete and unpardon-

able, as are the cocked hats and hoops of the time they were written in. Indeed, if my memory serves, there have been recently suggestions to that effect, and the dialogue of Sheridan has been denounced as indelicate by censors who saw nothing objectionable in the highly-coloured situations of Sardou. "The manners of the day?" Why all the greatest comedies that were ever written, from Aristotle down to George Colman the younger, reflect the manners of the day and country in which they were composed, and are consequently invaluable for educational purposes; and it may be asked, why, then, should not those of our present dramatists be destined to an equal celebrity and term of existence? The answer might not be considered complimentary, for it would suggest comparisons, and, to quote a still-existing comedy of some little reputation, "comparisons are odorous." I will content myself by asking where are all the comedies of Morton, Reynolds, and their contemporaries? Our present dramatists can scarcely be offended by being classed with the authors of "A Cure for the Heartache," "Speed the Plough," "Laugh when you can," "The Dramatist," and a score of other favourite pieces, which drew money in the time when "George the Fourth was king." They reflect the manners of their day, but with the exception of one or two which, cut down to the dimensions of a farce, have been ineffectually resuscitated under stress of weather, the stage knows them no more. I only call attention to the fact, and leave the critics to account for it. They would be compelled in fairness to admit that there are elements of vitality in the old comedies without which "the manners of their day" would not have made them still popular in ours.

It is foreign to my object to enter into a discussion respecting the sensational drama which has, to a certain extent, supplanted the old melo-drama of the English stage. It comprises many works of considerable power, well written, unobjectionable in subject, and affording excellent opportunities for scenic effect and good acting.

There is no desire to interfere with legitimate speculation, or to deprive any portion of the public of the entertainment most acceptable to them. On the contrary, our taste is so catholic that we can thoroughly enjoy any theatrical entertainment that is good of its kind, and rejoice that so much good of every kind is constantly being represented. My quarrel is with those who would prevent a large body of educated persons from enjoying an especial description of theatrical entertainment, which is undoubtedly of a higher order and requires artists of the greatest ability to interpret. We ask but for one theatre which, either by private subscription or Government subsidy, may be devoted to this object, and rendered independent of the caprices of fashion or the prevailing taste of the public. It must be a theatre in which the educated public can enjoy regularly, and not spasmodically, the best plays, acted with intelligence, and placed on the stage reverentially and artistically. This, the present system will not give. "Look at the results of the system as it is," says the writer of an excellent article in a new journal devoted to the stage,*—"Does private enterprise find itself equal to the task of presenting the noblest English dramas by thoroughly adequate companies all the year round? Can a manager, who necessarily has a keen eye for profit, be expected to avoid the long-run system, the 'star' system, and the system of discouraging all young playwrights and young players until their names are made? Can private enterprise found a school of acting, except in the limited sense in which a theatre, by cramping all its company to one style of piece, gives to its performances a characteristic manner of its own? The mere pecuniary difficulty in the way of securing such a company and such a *répertoire* as those of the Théâtre Français places the undertaking wholly beyond the reach of individual effort; nor, indeed, could it be overcome by any aid which was unable to compensate for comparative smallness of salary by offering *prestige*, permanent employment, leisure for study and pleasure, and the prospect of a pension in years to come. Now these advantages, which are at the very root of the success of the Parisian theatre, cannot, as it seems to us, be secured except by means of a subsidy paid in some way or other by the nation for that which we hold to be an incalculable national gain. If it be an advantage to possess, at least, one theatre which may be conducted without any necessity to look for hand-to-mouth profit, which may, to some extent, practise art for art's sake, and which may guide rather than follow public taste, then is that advantage one for which we should be prepared to pay."

My own conviction is strongly in favour of a State subvention,—a subsidised theatre where the glories of our past writers might be enjoyed and new poetical and thoughtful works fittingly brought forward. The chances for obtaining this have lately greatly increased, and opinions in its favour have been expressed in influential quarters. Mr. Gladstone, in the course of a letter to the editor of a theatrical paper already quoted, said, in reference to some articles which appeared in it a few months ago,—"I have already thought that there are strong arguments,—among them some which may be drawn from the existence of institutions like the Royal Academy,—to show that the Drama requires, in order to its prosperity, some great centre of attraction and of elevation." This must be regarded as a most important expression. From abroad, too, comes the report of a conversation between the King of Italy and Signor Rossi; in the course of which the King spoke of the low ebb to which the histrionic art had fallen in that country. "What we want," he said, "is a theatre like the Comédie Française. Your art is a powerful instrument of civilisation. That civilisation must emanate from Rome. My father loved and esteemed you, Signor Rossi, as well he might. You are an honourable remnant of most distinguished troupes. Halcyon days those in which they flourished! The art was then well represented, and I promise you those days shall return before long."

To obtain this subsidised theatre, however, in England, may be a work of time, and would probably require, as a first step, a properly organised and regulated company; whereas it is most desirable that such a theatre as we are looking for should be established at once. The question then is, how can the experiment best be tried? And I fall back on the plan which I have ventured before now to suggest for consideration,—that plan which gave us the Great Exhibition of 1851 and some of its successors,—a *list of guarantors*; a hundred persons, say, subscribing each a certain small sum for the first expenses, and giving their names for a larger sum in case of necessity; a small committee of the guarantors to supervise; and a proper and responsible manager. An existing theatre to be taken (pending the time when a model house should be provided), large pit, and moderate prices; no long runs; no short hirings of actors; a dramatic school attached; the advancement of the drama, and the healthful amusement and delight of the public to be considered the paramount object of the undertaking. Such a scheme properly brought forward, would, I am strongly disposed to believe, soon find the requisite number of supporters.

A few words now from others.

Being able to quote the opinion of statesmen and dramatists, I thought it desirable to obtain also the opinion of some eminent actors. Amongst others, I applied to Mr. Hermann Vezin, who justly enjoys a high reputation as an intellectual artist, and to Mr. Henry Irving, and append their replies:—

Mr. Vezin says,—"You ask me my opinion as to the advisability and possibility of establishing in London a theatre analogous to the Comédie Française in Paris, the Royal theatres in Berlin, Vienna, and other capitals of Europe.

I answer that it has always been my most ardent desire; that I believe, without such a theatre, the English drama will never stand upon the eminence it could and should attain, and that it is possible to establish such a theatre, either by Government subvention, or by the aid of subscriptions of the wealthy, or, in what I think the best plan of any, by a guild of actors themselves, without any exterior aid.

English theatres, being private speculations, their managers, even when gentlemen of high culture and artistic aspirations, *must* find their judgment unsteadied by the great pecuniary risks they run. If actors, they are tempted to sacrifice their theatres to their personal ambition; if merely tradesmen, to an unwise parsimony.

There are two theatres in London whose managers spare no expense, and make their interest as actors subservient to the interest of their theatres. But the example set by the Bancrofts and Mr. Hare does not seem likely to obtain many followers, nor should the welfare of the art depend upon the doubtful chance of a constant supply of such managers.

It has frequently been the case that a great actor, finding it impossible to attain his proper position under other managers, has found himself compelled to take a theatre, that he might have the opportunity of playing the parts for which he felt himself suited. Edmund Kean and George Frederick Cooke were about the only ones who attained greatness without the burden of management. Garrick, the Kembles, Macready, and Charles Kean, were all managers; but they all would have infinitely preferred to remain simply actors, if their proper ambition and artistic tastes could have been gratified in some one else's theatre.

The actor must deteriorate when burdened with the cares of management, and the manager cannot possibly attend to all his duties if he is an actor as well.

I am frequently applied to by young ladies and gentlemen, who wish to make the stage their profession, as to how they should proceed. It is impossible, in the present state of things to give them a satisfactory answer.

I should like to say, 'Go and enroll yourself on the books of "the English theatre." You will then be put through a course of training in elocution, singing, fencing, deportment, dancing, and so on. You will have to go on the stage as supernumeraries; be gradually entrusted with a few lines to speak, and meantime, at intervals, *matinées* shall be given, in which you and your fellow pupils shall play pieces selected by the teachers for the purpose, so you will get your practice; and, if capable, be gradually advanced to play such parts in the regular performances as may not be beyond your powers.'

I could tell some disheartening tales of weary waiting for opportunities that may never come, both with actors and authors.

But it must be confessed that, with all its disadvantages, the British drama is in a very healthy condition. All it wants is its opportunities. In brief, we want a theatre which shall be devoted to the cultivation and exercise of the dramatic art for its own sake; not to making money, not to promote the interest of any individual actor, not to the production of plays written down to the level of the lowest understanding.

The greed for money seems to me to be at the bottom of most of the evils complained of, and yet I believe that such a theatre as we wish to see established would make more money than any of those managed on existing principles.

HERMANN VEZIN."

Mr. Irving writes thus:—

"My dear Mr. Godwin,—The question of the establishment of a National Theatre is surrounded by so many difficulties, and has so many side issues, that the time at present at my disposal does not allow me to go properly into it. Still the broad idea is one on which a few suggestions, which are the outcome of my thought and experience, may be of service to you.

The two questions which must from the beginning be held in view are:—

Is a National Theatre desirable?

Is its establishment upon a permanent basis a possibility?

With regard to its desirability I have little, if any, doubt. In this country artistic perfection or a high ideal is not always the road to worldly prosperity; and so long as open competition exists there will always be found persons whose aim is monetary success rather than the achievement of good work. Thus mere spectacle, and, at times, even ribaldry, are employed to swell the pockets of managers at the expense of public taste. In order that the Stage may be of educational value, it is necessary that those who follow its art should have an ideal standard somewhat above the average of contemporary taste. This standard should be ever in advance, so that as the taste and education of the public progress the means for their further advancement should be ready. To effect this some security is necessary. In an age of competition men cannot afford to be idle. "Whilst the grass grows the steed starves," and to wait in patient inaction for the coming of better days is antagonistic to the spirit of artistic effort. In order that those who are capable of improving others, and who are willing for the purpose to sacrifice in a measure their personal wishes and desires, should not lose their power, some pro-

* The *Theatre*,—No. 1, New Series.

tection should be extended at such times as might be necessary. Of course, each individual may in his own time do much; but life is short, and when the individual withers all, or nearly all, the influence of a life of labour, which might, under proper system, have become solidified into a permanent good, passes away. If then the purifying and ennobling influence of the art is to be exercised in such a manner as to have a lasting power, it is necessary that the individual be replaced by something in the shape of a corporation, or by the working of some scheme by its nature fixed and permanent.

It would, I think, be at present unadvisable to touch upon the subject of State subsidy with reference to the British stage. The institutions of this country are so absolutely free that it would be dangerous,—if not destructive,—to a certain form of liberty to meddle with them. *Quid pro quo* is a maxim which holds good of State aids, and a time might come when an unscrupulous use might be made of the power of subsidy. Besides, in this country, the State would never grant monetary aid to individual enterprise under any guarantees whatsoever. As the State could not possibly of itself undertake establishment and management, the adoption of some corporate form would be necessary with reference to the stage before the question of subsidy could be raised with any possibility of success.

A 'National Theatre' implies an institution which, in its nature, is not either limited or fleeting. Such a scheme must be thorough, must rest upon a very secure basis, and must conform to the requirements of art, polity, and commerce. It must be something which, in the ordinary course of things, will, without losing any of its purpose or any of its individuality, follow with equal footsteps the changes of the age. In order to do this it must be large, elastic, and independent.

Let us consider these conditions.

Firstly, as to magnitude. As the national theatre must compete with private enterprise, and be with regard to its means of achieving prosperity weighted with a scrupulosity which might not belong to its rivals, it should be so strong as to be able to merge in its steady average gain temporary losses, either the actual loss of outlay upon unproductive pieces or the negative loss consequent upon political or commercial depression. Also its body should be sufficiently large to attempt and achieve success in every worthy branch of histrionic art. For this a great number of individuals would be necessary, so that suitable selection might in every case be made.

Secondly, the corporate body should be to a certain extent elastic. The production of talent in a country or an age is not always a fixed quantity; and whilst for the maintenance of a high standard of excellence no one manifestly under the mark of his fellows should be admitted, all those worthy of entrance should be absorbed. The evil consequent upon the accident of personal friendship, which so often works unfavourably amongst self-electing bodies, should be reduced to a minimum.

Thirdly, the National Theatre should be independent. Once established under proper guarantees, it should be allowed to work out its own ideas in its own way. Art can never suffer by the untrammelled and unshackled freedom of artists,—more especially when the idiosyncrasies of individuals, with the consequent possible extravagance, are controlled by the wisdom and calmness of confluent opinion. Such a body as the corporate members of a National Theatre would, to a certain extent, be a legislative assembly, dealing only with questions affecting the drama.

Thus we arrive at the conclusion that if in this age a National Theatre is to be established, it must partake of the nature of a corporation, large, elastic, and independent. It must spring originally from personal enterprise, and must depend for existence upon the exertions of itself as a body, and of its component members as individuals, till such time at least when good work done in the past, and a uniformly wholesome influence upon the education and morals of the public, have given it a claim to recognition as an institution worthy of a place in the machinery of the State.

Such a scheme once conceived, the next question is as to the possibility of carrying it into execution. In this country there is a great mass of talent scattered widely. It embraces every phase of thought and manner, and is composed of elements incongruous, and differing in value, in so far as the different individualities and their surroundings are concerned. To systematise and reduce to a harmonious whole this mass of heterogeneity would be a work of extraordinary difficulty. At the start the labour of organisation would be Herculean; and I cannot shut my eyes to the dangers or to the magnitude of the effort.

But if the difficulties of systematisation would be vast, the advantages would be vast also. The merits of the concentration of purpose of men following kindred pursuits have been tested already, and the benefits both to individuals and the bodies are known. Our art alone has as yet no local habitation, no official recognition, no political significance. Should the scheme of a National Theatre be carried out, great results might follow,—much good to the great body of aspirants to histrionic fame. Provision might, at a small expense to each individual, be made for the widow and the orphan. Old age would be divested of the terrors of want. A restraining influence would be exercised on unscrupulousness. A systematic school of teaching would arise; and the stage would acquire that influence and position which, whatever they may be in the present, are to be in the future great. HENRY IRVING."

I must now come to an end; add "a tag," and ring down the curtain, entreating, not your applause, but your aid in a good and important cause. What is asked for is the provision of one theatre not wholly controlled by the predominant taste of the public, — the assured establishment of one house in which the best works of our dramatic writers, living and dead, should be constantly and worthily presented.

MORE LIGHT WANTED.

THE daily papers are full, day after day, of a subject which unfortunately has touched the pockets of a respectable class of people, many of whom can ill afford to lose a third of their invested savings, more closely than failures in trade or fears of war. The foolish and mischievous panic in gas shares has inflicted great injury on many innocent people. We hope that it may not hereafter prove to have been excited, or increased, for purely selfish purposes, but there is only too much reason to fear that such is the case. One of our contemporaries, to which we have before referred, as almost alone in the daily press in its mode of dealing with engineering subjects, has just published an analysis of returns of the six Metropolitan Gas Companies, in the hope that "a clear understanding of the vast capital invested in gas will impress the necessity for avoiding panic, and for being very careful in the measures that may be taken affecting interests so important and widely ramifying." We quite agree with these views, and all the more so because on the 11th of August, 1877, we gave our readers an account of the position and territory of these companies at considerably greater length than the article to which we refer. By the attention which we called to the territorial distribution of London between these companies, we intimated, and probably led people's thoughts to dwell upon, the advisability of certain fusions of interest. On the 24th of August of the present year we had to call attention to the proposal of a fusion which, if it had not been originated in consequence, was certainly foreshadowed by our former article. And in that paper, written before the outbreak of the recent electric storm, we pointed out the grave probability of the application of electricity to some of the purposes of lighting, and suggested certain financial precautions as desirable to be taken in anticipation of such a contingency. As we have thus,—as we may confidently appeal to our readers to bear us out,—twice been so far beforehand in pointing out as likely to occur what subsequently did occur, with a suddenness startling to those to whom the subject is new,—so now let us urge upon all whom it concerns the advice never, unless actually compelled, to part with remunerative property under the influence of a scare.

Mr. Haywood's report to the City Commissioners of Sewers on the electric light, of which we gave some account in our last number, seems to be characterised by caution and by good sense. In the absence of details as to Mr. Edison's last inventions we are bound, like Mr. Haywood, to wait for further information. But we wish meantime to call attention to two points which, so far as we have formed an opinion, will hereafter prove to have a controlling influence on the matter. One relates to an important element of economy. We are not aware that any attempt has been made to discover how much of the result of the combustion of a given bulk of ordinary gas is thermometric, and how much calorific. We can not find, in the valuable treatise on gas by Mr. Richards, which we reviewed some time since, any information as to the heat developed by the combustion of gas, or even as to the exact chemical composition of ordinary coal gas. It would, of course, be easy to ascertain the amount of heat produced by burning 1,000 cubic feet of coal gas. Yet that amount, whatever it may be, is pure waste, when gas is used for lighting. The quantity of light yielded by any kind of gas is dependent on several conditions, independent of the chemical constituents of the gas itself. The pressure on the jet, the form of the burner, the temperature of the surrounding atmosphere, the quantity of atmospheric air supplied to the flame, all are influential as to the light given out. If an Argand burner be made with holes of such dimensions that a pressure of 40-10ths is required for the emission of 5 ft. per hour, the gas will give only a blue flame, like that of pure hydrogen, which is practically devoid of light. In the same way, if the pressure on a fish-tail burner, which is calculated for the consumption of 5 ft. per hour under ordinary circumstances, be increased, the illuminating power of the gas is diminished. The proper light would have been that of twelve candles. If the pressure is highly augmented, Mr. Richards says, a roaring flame is produced; and if as much as 22 ft. per hour is emitted, a peculiar coloured flame is obtained, yielding no appreciable light. As far as any other works within reach on the subject go, the quantity of light obtainable from gas under different circumstances has been made far more an object of study than that of heat. But there can be no doubt that a very considerable part, and, under some circumstances, the larger part of the force liberated by the consumption of gas takes the form of heat, rather than that of light. For illuminating purposes all this is lost. Unless, therefore, we can so regulate the consumption of gas as to burn it by different methods, when light and when heat are required, a great economic loss must always accompany the use of gas for lighting or for heating alone. The electric light is light and but little else. Apart, therefore, from the question of the present condition of the invention, the electric light has the element of a considerable economic advantage.

On the other hand, waste by conduction is in favour of gas. In the metropolitan gas-works from 4 or 5 to 7 or 8 per cent. of the gas produced is unaccounted for, and is supposed to be wasted by leakage. The richer gases, from cannel-coal, suffer more proportionately in that manner than the ordinary quality. The amount is large: it is probably capable of reduction by care in the fittings and pipes, but its maximum is known. As to electricity, the law of its transmission is, that it is in the exact inverse proportion of the resistance. Thus while it is indefinitely divisible, even apart from any new discovery of Mr. Edison's, there is a sharp limit to its conductivity. In the present state of our knowledge, suppose that a given current of electricity were so directed as to keep 100 burners alight; this, if difficult, is conceivable. If, then, five of these burners are extinguished, the whole amount of the light would be distributed between the remaining 95. This it would, indeed, be possible to obviate, but only at the cost of the inconvenience that the consumption of power would be the same for each burner (while the set was in operation), whether it were or were not actually giving light. Nor is this all. It is stated that coalesced streams of electricity give more total light than divided streams. Thus a flow of elictricity that would keep up two lights of 800 candles each would produce one light of 2,000 candles. It is possible that here may be found a compensation for the advantage secured by the absence of heat. But yet more serious is the difficulty that the resistance increases in a more rapid ratio with the length of the circuit. Mr. Heywood speaks of 1,000 yards as the limit for the length of the connexion; and with every increase in length must be introduced, in order to obviate the loss of light that would otherwise occur, a corresponding increase in the diameter of the conducting-wire, or in the power of the machinery. It is here that the shoe now pinches. We have no heard that Mr. Edison

has endeavoured to grapple with this difficulty. We more than doubt whether it is not insuperable. As long as we are driven to the expedient of erecting electric works and machines at every half-mile in order to light the metropolis, we may safely consider that it will be long before the consumption of gas is materially diminished in consequence of the introduction of the purer and more beautiful light.

The minds of so many inventive and intelligent men are now directed to the subject of electric lighting, that almost every day brings forth a piece of intelligence worthy of notice. Since the preceding lines were penned, a letter from Mr. St. George Lane Fox has been published in the *Times*, in which that thoroughly well-informed and successful electrican has stated, in terms proper to this science, very much the same thing that we have previously ventured to observe. He speaks experimentally, as well as theoretically, as to the rapid loss of power attending on the prolongation of a circuit, and evidently is of opinion that this is so far an inseparable attribute of electric conduction that it is not a matter with which ingenuity can cope. And in case of the current in an insulated wire being affected by induction from the electricity of the earth, we should apprehend that the more intense the current, the more intense, in proportion, would be the disturbance, and the greater the loss. This is a subject which it is for the specialist thoroughly to thrash out, and no doubt he is carefully doing so.

For us, we confess that for the moment the illuminating part of the question has less direct interest than the loss which is likely to be sustained by investors. Clergymen, widows, trustees, and the like, all are being frightened out of a valuable property. We fear that, if all were told, it might be found that some of those who are loudest in their prophecies as to the utter ruin of the gas companies, are only looking out for the lowest point of depression, caused by the panics they are augmenting, in order to buy. Those who write letters, full of dismal forebodings, should also be viewed with strong suspicion, if the fact turns up that their names are also coming before the public as directors of new companies, or vendors of new patents. There are some extremely sound and pertinent remarks on the gas panic, headed "Words of Caution and Advice," in the journal called *Money*, for 16th of October current. The writer enumerates twenty-eight gas companies, of which the capital amounts to nearly 12,000,000*l.*; and from the prices quoted for the shares of some of them six weeks ago, considers that the value of the capital thus given must then have been reckoned at nearly double the nominal amount. Twenty English companies form so small a part of the whole number of gas companies that this writer holds that an aggregate of a hundred millions sterling will not exceed the value of the stock of British enterprise of this kind, together with that of the shares of foreign gas companies held in this country. As to this, we may recall the fact that the capital of the Metropolitan Gas Companies alone was returned at a little over 12,500,000*l.* at the end of 1875, and that then 100*l.* shares of the principal of them, as the Gas Light and Coke Company, sold for 200*l.* These shares have fallen,—not in value, but in price,—by as much as 5*l.* per day in this foolish and mischievous panic.

Mr. Edison's application for an English patent has now been made, and appears in the records of the Patent Office under date of the 23rd of October. It is in the comprehensive language, "Method of and means for developing electric currents, and lighting by electricity." On the 14th of October a Frenchman, M. Antoine Arnaud, applied for a patent for "Indefinitely dividing electric currents," He must, in our humble opinion, have been ill-advised when he inserted the adverb, which may yet give some trouble in the rich harvest of law-suits which the gentry of the long robe already scent from afar. It may also be matter for legal wrangle how far Mr. Edison's letters will protect apparatus for the division of currents; while "lighting by electricity" is so vague that no doubt the grant of such a letter might be opposed by Mr. St. George Lane Fox, who has a method and means for lighting gas by electricity (which he thinks likely to be more generally useful for that purpose than electric light), which is quite another thing. The account which is given by the obviously very well-informed writer in the *Standard*, of experiments made by M. Arnaud, is of great interest, as pointing towards the counteraction, to a certain extent, of what we have spoken of as the most serious obstacle to the public use of the electric light, viz., the rapid enfeebling of the current by distance. According to the amount given by the writer in question, M. Arnaud has succeeded, not only in keeping up a number of lights on the same circuit, so arranged that if one or more are extinguished the others are not affected, but, further, in maintaining an equal intensity of current through the whole circuit. A galvanometer showed a deflection of 7 degrees at whatever part of the circuit it was placed; while on the same circuit, when the regulating apparatus of M. Arnaud was removed, the resistance was shown by a deflection of 12 degrees at the end nearest the battery, and only of 2 degrees at that furthest from it. A gain of this nature is not lightly to be spoken of. Still it is a gain in distribution alone. We should like to ask what would be the deflection of the galvanometer if a second 200 yards of wire, without any additional candles, were introduced into the circuit. As it is, the force of the current in one part is weakened as much as that in the other is increased,—the mean is the same. And it is the mean resistance caused by length of current of which we have spoken as the formidable obstacle to lengthened circuits. In the experiments in question 200 yards of copper wire are mentioned as the length of the current. What would have been the effect with a current of 2,000 yards? And if we are limited, as seems to be the case, to something like half-mile distances apart for the erection of generating machines, we think the owners of gas-shares will be a long time before they need be much alarmed as to the impending uselessness of their plant.

The title of the patent applied for by Mr. C. W. Siemens, on the 22nd of October, is for "Improved means and apparatus for electric illumination." A far keener and more practised knowledge of the danger of the verbal quibbles that beset the patentee is aimed at by Mr. Siemens than by either the French or the American inventor. We may regret that questions affecting large interests, brilliant discoveries, and the lucrative employment of large sums of money, should be debated on the narrow ground of the grammatical meaning of a sentence, of which the true meaning ought to be obvious to every one. But, however little we may relish it, such is the fact; and it is a fact that intending patentees cannot too forcibly keep before their minds. And not only is it a fact, but it is an unavoidable fact. When a question comes before a tribunal for decision, it is because it is disputed. If there were not two ways of looking at it the judge would not be called upon to decide. But no human judge, in a disputed question of magnitude, can be trusted to say, "The bargain, or the bequest, or the specification, probably, or obviously meant so-and-so." Justice can only say what is, not what was intended to be. The actual force of words must be taken by conclusion. From this there neither is nor ought to be any escape. The safety of property in civil cases, and of life and liberty in criminal cases, depends on the exact determination of fact; and fact is only determinable before a tribunal by the exact grammatical force of the language in which it is described. There is no time to go back to ask, "Did you mean so-and-so?" The procedures of justice are daily dragging out to a length which (like that of the electric circuit itself) promises, if much stretched, to render justice impossible in the country. Therefore, let inventors look to it. If they have clear ideas, let them use such words as shall cover their claim, without prematurely disclosing its nature, and do no more. If it does less, the patent will be invalid. If it does more, it lets in the opposition of a whole host of adversaries, who would have given no heed, very likely, to an application confined within reasonable terms. Thus, as we have observed, Mr. Edison's title would admit of an opposition which, though no doubt it would be overruled, would cause trouble and expense, because he says lighting by electricity, which might mean setting gas or anything else on fire by electricity. And then a question will no doubt be raised whether a claim for developing electric currents will hold good for a means of dividing electric currents. We offer no opinion on the subject, except that it is a point on which dispute is possible, and that the language is therefore ill-chosen. So, again, there may be an interminable debate on what is indefinite as to division of the electri current.

We may add a word in explanation of what was intended by our preceding remarks as to heat. It is, of course, not the case that the electric light is developed without heat. But it is true that the heat lost by radiation from this incandescence, in proportion to the light emitted, is enormously less than in the case of gas. When combustion is effected by the electric current, it is the combustion of carbon alone, as far as the apparatus supplies the charcoal burned. In the gas, the proportion of heat-giving hydrogen, of which the illuminating power is low, as compared to the light-giving carbon, has to be taken into account; and, as we have seen, much of the light actually obtained depends, not only on the elements, but on the *mode* of combustion.

We quite agree that the subject of electric lighting is one that most properly commands a great share of public attention. For many purposes it is fit that such should be the case. For lighthouses, as we have before hinted, we hold that electricity already supplies the proper method of illumination. For military and naval signals, for lighting men-of-war, and possibly all sailing vessels, and, most important of all, for lighting coal-mines, we trust that nothing will be found wanting, in order to render speedily available so safe and so brilliant a means of producing light. As to public places, churches, theatres, and halls, we reserve our opinion; there is yet much to learn. As to certain nuclei of public highways, we are content to wait the result of the experiments now being carried out before forming an opinion. Perhaps an experiment directed by the engineer of a public body may not be the best means of ascertaining what an invention is worth. It might be better to place a definite sum of money at the disposal of the inventor, and let him do his best. On the other hand, security may be gained by the mode adopted. The inventor may say, "If the metroplitan engineers make my light answer, it is evident that it must do so under any circumstances." That, however, may be a question hereafter to decide. As to the use of the light for domestic supply, we think the time must be, at all events, distant. For home use, we take it, in order to be safe and satisfactory, it must be home made. The supply is subject to too much doubt as yet for any person to cut off other sources of illumination in faith of the electric light. Then another difficulty comes in. How will it be in the case of a thunderstorm? We have had storms within the last few years in which the electric telegraph has refused to act for four or five hours. Only with great danger could the operators approach the instruments. Very often part of the coil of wire was fused. Now if, to the usual awe of a great storm, were added the plunging of the metropolis in darkness during its continuance, and for an hour or two after, how we should sigh for our exploded gasometers, supposing them,—which we do not,—to have been exploded. This is neither an imaginary nor an unlikely occurrence. Its bearing on the question has an importance which it is difficult to exaggerate.

Lastly,—to those who have sold foolishly,—we should say buy back while you can do so without buying yet more foolishly. Do not buy at 180 when you sold at 140. Yet that is what people rush to do. And for any persons who yet feel in doubt and hesitation we will give another piece of advice. Procure a copy of Mr. Haywood's report, and study it from beginning to end.

Memorial Chapel, Reedham Orphan Asylum.—The new chapel which has been "erected to commemorate thirty years' service of the Rev. Dr. Aveling as honorary secretary of the Reedham Orphan Asylum, and for the use of its inmates, but principally for the glory of God," has been opened. The foundation-stone was laid on November 1st, 1877, by Mrs. Spalding, of Ore-place, Hastings, daughter of the Rev. Dr. Reed, founder of the asylum. The church is placed close to the northern end of the asylum buildings, from which it is separated by the girls' playground. In style it is quite a contrast, being Gothic in design. The exterior walls are of Kentish rag and Bath stone. Internally it is divided into nave and aisles. The floor rises gradually from front to back, and there is at present seating accommodation for 350 children and 100 adults. The architect is Mr. John Sulman, and the builders were Messrs. L. H. & R. Roberts. The total cost was 3,800*l.*

WOODWORKING MACHINERY AT THE PARIS EXHIBITION.

BY M. POWIS BALE, M.E.

JAMES WATT once remarked that one of the greatest of all prerogatives was simplicity, more especially when applied to machinery. This seems to have been borne in mind by the greater number of the exhibitors of woodworking machinery at the present Exhibition in Paris, whose aim appears to have been of late devoted rather to the simplification of what is already in existence than to the production of anything new. This may in a measure be accounted for when we consider the giant strides made in this branch of engineering during the last twenty years, and the present long-continued depression in trade, which has affected and retarded its progress in a marked degree, rendering it necessary that the manufacturer should not incur outlay in the shape of trials and experiments other than are absolutely called for. In these days of high wages and restricted hours of labour, the maker of "labour-saving" tools has a somewhat difficult task before him,—viz., to produce, at a price that will find purchasers, a machine combining the minimum amount of complication with the maximum of productive efficiency: this has been accomplished by some engineers with considerable success and credit to themselves; but it has also been the occasion of flooding the market with so-called "cheap machinery,"—neither reflecting credit on the producer, nor giving satisfaction to the purchaser. As this matter is, however, at present slightly out of our province, we pass on to notice the machines exhibited at Paris, commencing with the British section.

This section contains a large selection of machines which, with few exceptions, combine in a marked degree excellence of design and workmanship,—two great essentials in the rapid and economical conversion of wood, owing to the high rate of speed at which it is necessary to operate. The castings of the main framings and the finish of the general details of the machines exhibited by several of the leading houses, deserve high praise, and afford an example that makers in some other sections would do well to imitate. Absolute novelties in this section there are none; but we purpose noticing briefly such improvements in the construction or mode of operating the machines as we may think of sufficient general interest.

Commencing at the northern end of the British Section, Messrs. A. Ransome & Co., of London, exhibit a large collection of tools. We noticed a well-designed and compact single deal-frame, adapted to cut deals 14 in. by 4 in., suitable for builders' purposes. The main frame is cast in two pieces, and the swing-frame works in phosphor-bronze bearings. It is fitted with vertical roller-feed, and speeded to cut at from 1 ft. to 8 ft. run per minute; a simple lever and toothed wheel arrangement is provided for adjusting the fence rollers. The trying-up machine exhibited is of the ordinary type; the cutter-block is of steel, revolving in plain bearings, which are lubricated from either end; a variable feed and quick return motion are arranged for travelling-table. Fitted to this machine, over the cutter-block, is a pneumatic arrangement for carrying away the shavings made; a 20-in. fan, running at some 2,000 revolutions per minute, performed its work sufficiently well, but the noise made in so doing was considerable.

The panel planing-machine shown was driven from both ends of the cutter-block spindle, which is an advantage when planing up very wide stuff. The general joiner carries a 30-in. saw, and the main framing is cast in one piece. The moulding and planing table is arranged to rise and fall, and a bottom revolving plane-iron fitted in a drawer first operates on the wood on the under side, thus leaving a flat surface for it to travel on. The side cutter-blocks are driven direct from the countershaft; the tenoning is performed from the ends of planing-machine spindles, and a vertical spindle is provided for working irregular mouldings up to 4 in. deep. It is altogether a well-arranged machine of its class. A Richards' patent mortising-machine, speeded to make 600 strokes per minute, was shown, also a set of machines for making powder-barrels. We noticed a neat little band-saw setting machine; it was worked by hand, and made adjustable to depth, pitch, and set of saw.

Messrs. Reynolds & Co., London, exhibit an assortment of the lighter class of wood-working machines, including a new form of hand mortising machine. This machine has two separate vertical slides (one holding mortise-chisel, and the other the core-driver), fitted to the main standard of the machine. These are worked by two separate hand-levers, attached to which are two rocking side rods, which allow the chisel to have a greatly-increased stroke, thus obviating the necessity of rising and falling the table to suit different thicknesses of stuff. The chisel has a stroke of 11 in., and this plan should be found advantageous when mortising right through a piece of wood; but when a mortise is to be made only half-way through, the ordinary form of machine is preferable. The planing arrangement of the general joiner shown is fitted with a powerful feed-motion adapted for feeding wet timber. It consists of two plain and two fluted rollers, all driven by toothed gearing, and the rate of feed can be varied as required. The saw-bench attached is fitted with a self-acting feed-motion, and the counter-shafts necessary are driven at long centres, which is a favourable contrast to some other plans in vogue. The workmanship, however, in this machine would bear improvement.

Messrs. Charles Powis & Co., of London, exhibit, amongst other tools, a powerful trying-up machine, fitted with side cutters driven from a countershaft attached to the end of the machine, and an additional roller feed for ordinary floor-board planing, which can be fixed or detached at will. We noticed the main spindle of the general joiner shown was divided in the centre. The planing-block is arranged at one end, and the circular saw at the other. The moulding and planing table is fitted with an efficient self-acting feed. Tenoning is performed by means of discs, and a tenon can be cut complete at one operation. The different classes of work can be performed independently of each other. A combined hand or steam-power machine, specially suitable for cabinet or other light work, is well deserving of notice. It is fitted with a saw-bench, with rising and falling spindle, a band and fret saw and boring apparatus. The fret-cutting arrangement has lately been added. It is driven by an eccentric direct from the saw spindle, and will cut up to 4 in. deep. The table of the large band-saw machine is canted by means of a modified form of a ball-and-socket arrangement, which should answer well. A variety of Messrs. Powis's well-known hand-power machines completes the display.

Messrs. Samuel Worssam & Co., of London, exhibit a number of well-designed machines, including a specimen of their patent general joiner. The side-cutter spindles on this machine are attached to the planing-table, which is arranged to rise and fall. The various operations of sawing, moulding, tenoning, &c., can be worked separately, or in conjunction, without change of appliances. The tenoning spindles, which are fitted with saws or cutter blocks, as preferred, are driven from the main saw spindle, and the tenoning clamp for holding wood has a convenient gauging arrangement. The slot mortising apparatus is compact, and the mortising-table, which has a lateral and transverse movement, is fitted with stops, which regulate the length and depth of the mortises. The general arrangement of this machine is, on the whole, more simple than others of the same class, and reflects considerable credit on its designers. In the trying-up machine shown the pressure-rollers, usually placed before and behind the cutter-block slide, are here both brought in front, thus securing a greater and more uniform pressure at the point where the cutter strikes the wood, which is an improvement. The cutter-block spindle runs in centres, but this plan can hardly be commended for the heavier class of machines. The travelling-table is fitted with double-rack gear, thus securing always an adequate bearing for the teeth of the driving pinion. We noticed a compact deal and flitch frame, adapted to cut a single deal, 1 ft. 6 in. by 6 in.; it was fitted with rack and spur feed-gearing, with quick-return motion and lateral and vertical adjustable pressure-rollers, the latter fitted with spiral springs so as to allow them to adapt themselves to any inequalities in the timber. The saw-wheel spindles of the band-saw exhibited were arranged to run in double gun-metal bearings, in preference to allowing the wheels to revolve on a stud, as is the practice of some makers. A handy outside-cutter moulding machine for small work was in operation, and turned out mouldings of superior finish.

Messrs. Robinson & Son, of Rochdale, display a large assortment of machines. A horizontal single-blade board-cutting machine, adapted for cutting coach panels and other thin stuff, was in operation, and turned out very satisfactory work. It is driven by a connecting-rod from a crank which is arranged to rise and fall on a countershaft. This machine is fitted with Robinson & Smith's patent swivel and butting slide, which enables the frame carrying the saw to be driven at a high rate of speed, as, no matter what angle the connecting-rod is at, owing to the swivelling arrangement, there is no undue strain on the saw-frame or bearings; the table carrying the log is worked by rack-gear, and is fitted with "dogs." The saw is made to cut both ways of the traverse at a speed of from 3 ft. to 5 ft. per minute in 24 in. logs. We also noticed a compact little thin-stuff planing machine, adapted to plane wood, ⅛ in. thick, up to 60 ft. run per minute, but the feed could be varied according to circumstances. The wood is fed by means of six plain rollers, driven by toothed gearing, which force it over a fixed iron fitted into a movable drawer. We were shown a combined slot, mortise, and planing machine, designed for small establishments; the planing-table is arranged to rise and fall, and the wood is passed over the cutting iron; the slot mortising arrangement is very handy, and the wood is brought rapidly up to the cutting-tool by a quick-threaded screw. The table of the band-saw is canted by means of a worm wheel and toothed quadrant, and the saw is started gradually by a screw-motion, which is an improvement Messrs. Robinson have introduced into others of their machines. A self-acting roller-feed saw-bench, especially adapted for sawing deals and battens; and a sample of Armstrong's patent dovetailer, were among their other exhibits.

Messrs. Western & Co., of London, display an excellent selection of machines; they are, however, not in motion. We especially noticed the novel mode of driving and reversing a small single-spindle vertical shaping-machine, enabling the workman at all times to cut *with* the grain of the wood, whilst using one spindle only. This is secured by the use of two friction discs, which drive the cutter-spindle, each of which causes the spindle to rotate in opposite directions. The action of these discs is instantly reversed by means of a lever under the immediate control of the operator. The top of the spindle carrying the cutter-block is turned slightly eccentric, allowing the block a small amount of play, thus withdrawing from the wood the cutter not in use. The main frame of the machine is circular, and cast in one piece. The table is fitted with fence, binding-rollers, and springs for "sticking" straight mouldings, and the machine is altogether exceedingly well designed. The patent four-cutter moulding-machine exhibited is a very complete tool, combining in a great degree the advantages of what is known as an outside cutter and also those of a centre-feed machine. The four cutter-spindles are driven from the main counter-shaft. The top cutter-block is arranged to rise and fall, and the side cutter-spindles to angle in either direction. The whole of the feed-rollers are geared, and the top rollers are made to overhang the main framing of the machine, and are easily removed, thus allowing conical rollers to be substituted, which are more suitable for feeding wood already sawn somewhat near the size of the required moulding. The rate of feed, which can be varied from 5 ft. to 50 ft. per minute, is regulated by an ingenious frictional disc arrangement. The cutters are very accessible for removal or sharpening. One of the band-saw machines exhibited is fitted with a special arrangement for canting the upper saw-pulley, for bevel sawing, thus leaving the table in a horizontal position, which is an advantage when working heavy timber. In the Industrial Annexe, adjoining the main building, Messrs. Western & Co. exhibit, in operation, a stone-moulding and planing machine. The cutters are fixed in a simple manner, in six tool-boxes, each pair of boxes being so set that the cutters, which can be arranged to any profile, operate on the stone in succession. The cutters are brought to the work by a hand-wheel and screw. After the moulding is roughed out, it is finished smooth by means of a scraper. The table carrying the cutters is arranged to cant, for working under cut mouldings.

In the same Annexe Messrs. Brunton & Trier show their patent stone-dressing machine in operation. This machine consists briefly of a large cast-iron hollow revolving disc, with suit-

able toothed gearing fitted in its interior for rotating a number of circular cutters made of chilled cast iron, which revolve on its exterior face near the periphery, forming a circle of some 3 ft. radius. The stone to be dressed is placed on a travelling-table with screw feed, the rate of which can be varied. The inventors claim that this machine is capable of dressing stone of any degree of hardness.

In the American Section the exhibits of wood-working machinery are confined to two houses, Messrs. J. A. Fay & Co., of Cincinnati, and Messrs. C. B. Rogers & Co., of Norwich, Connecticut. Messrs. Fay exhibit by far the greatest number of the few absolute novelties in the Exhibition. Foremost among these is a new patent dovetailing machine (Stengel's patent). It is simple in its construction, and will cut a dovetail in any kind of wood up to 1¼-in. thick and 14 in. wide, cutting both side and front at the same time. The cutter-spindles revolve at high speeds, and can be adjusted laterally to suit depth of cut. The cutters are simple, are turned in a lathe, and always sharpened from the centre; and provision is made to compensate for wear. A countershaft, fitted with cone pulleys, fixed underneath the machine drives the cutter-spindles. The cutter-spindle frames are stationary; the wood is fixed on a vertical and horizontal plate, and held fast by camb rollers; the male dovetail is cut on the horizontal table, and the female on the vertical table. A hand-lever moved up and down performs the operation, the slide moving forward at each alternate motion of the lever. The guides are so constructed that, after being started, it cannot be moved backwards at all, nor forwards more than the distance arranged. The failure of previous dovetailing machines worked with this class of cutters has arisen from the cutting-tools varying in their wear, thus causing the dovetails cut to vary in size, and be in consequence misfits. The exhibitors claim that any variation of this kind is, in their machine, easily adjusted. If it proves itself capable of standing constant and heavy work, it is a machine that is much needed, and will be of the utmost value to cabinetmakers and others. The patent combined hand and power feed surface planing machine shown by this firm is a valuable tool. The main frame of the machine is cast in one piece; the planing-bed consists of three separate tables,—the centre one has vertical adjustment to suit different thicknesses of timber; the end tables have both lateral and vertical adjustment. The self-acting feed consists of powerfully geared rollers, and when required to be in use, the tables are lowered below the cutter-block, and the wood fed under the cutters in the usual manner. When it is desired to plane by hand feed, the bonnet and pressure-bar are removed, and the end tables are raised above the cutter block; and these tables having lateral adjustment, the size of the opening over the block can be regulated. The bearings of the cutter-block are stationary. The block is fitted with three planing cutters, and is furnished with steel lips. The tables are so arranged that the cutting edges of the knives project slightly above their surface, and the wood is passed over them by hand, for the guiding of which a fence is provided. The machine will plane long or short stuff up to 24 in. wide from ⅛ in. in thickness, and will surface straight or tapering work, make glue joints, and will bevel, chamfer, &c. The timber can be fed from either end of the machine, and the depth of cut is regulated by a gauge and pointer. The cutter-block is speeded to make 4,000 revolutions per minute.

SOCIAL SCIENCE CONGRESS, CHELTENHAM.

The general proceedings having been reported in many quarters, we have preferred to give some of the papers in full, and shall print others next week.

Manchester Architectural Association. The third annual *conversazione* of this Association was held last week at the Memorial Hall, Albert-square. There was a large attendance of the members and their friends, and the company was received by Mr. T. Worthington, the president of the Society. The evening was devoted mainly to the inspection of an extensive and interesting collection of drawings by Manchester architects, and other works lent by members of the Association.

WOOD-CARVING IN BAVARIA.

It is quite difficult to appreciate the vast supply of wood which is obtainable in Bavaria. Any one who has not spent some little time among the Eastern Alps will scarcely, unless he has visited the backwoods of America, apprehend the extent of forests which cover the mountains of Bavaria. Naturally wood is much wasted; thus, in one length of fence sufficient timber is put to make three times the necessary protection, and it is used without stint as fuel and as building material. Considering, therefore, how cheap it is as a material, which may be used in all sorts of ways, it is obviously the right policy for the Government of Bavaria to give every kind of encouragement to the utilisation of it, for it is equally clear that, if it can be properly worked, very many articles may be made in the mountain villages of Bavaria which are of considerable value, or not a little sought after in more populous places. With this view, nine years ago,—that is in 1869,—three schools of carving in wood were founded,—"Schnitz-schule," as they are called in Germany,—namely, at Regensburg, at Berchtesgaden, and at Partenkirchen. A short time ago we had the satisfaction of inspecting that at Partenkirchen, a picturesque and flourishing village at the foot of the wooded Eckenberg, and facing the grand mass of the Wetterstein group of the Alps, which rise in rugged precipices across the green level valley of the Loisach.

In this school there are about thirty-two pupils varying from thirteen to seventeen years of age, several of whom, by their delicate faces or by some physical infirmity, showed that they were unable to follow the laborious life of the ordinary Bavarian peasant. The school itself is situated a little outside the town, or rather village, and consists of two ordinary-looking white houses. In the one is the chief workshop, where the different pupils are assembled busy with various kinds of work; one at a photograph frame, another at a chair-back, and another, it may be, at a piece of a bookcase. The various articles are drawn by the several pupils from plaster models, which are constructed in the large room of the opposite house. This modelling-school, so to say, has to be worked in for two days each week by the pupils, who either construct new models in place of old ones, or make new ones after the designs of Herr Professor von Kramer, who is the intellectual spirit of the place. When an article has been made it is either sold at the shop in Partenkirchen, which is a branch of the school, or is forwarded to buyers in Munich or some other large town. Each pupil shares in the produce of his work in an ascending ratio; thus, the first year he would only receive about one-third of the price which each article he makes fetches. In the second year, when he is a more experienced workman, he will receive one-half the price; and, in the third year, when he has almost ceased to be a pupil, the whole amount is his own. But, as profit is a secondary consideration in the sale of the produce of the Schnitz-schule, it is not surprising that excellent examples of the art of wood-carving may be procured in Partenkirchen at a much lower rate than in Switzerland, or the parts of Germany more frequented by English and Americans. Every kind of work in wood is executed at the school, from tiny penholders costing a mark (1s.) each to oak bookcases worth 800 marks.

As we have already said, the Professor designs the various works, but whether it is advisable to leave this part of the work to one man may be doubted, though, considering the school is an academy of wood-carving, it would not be easy to give a wide scope to individual creations. But the designs for the more important works, such as bookcases and sideboards, were florid and heavy in character, of a late Italian style, and wanting, as it appeared to us, simplicity and beauty. Then, in the larger works, but not those of so important a character, there appeared to be a considerable sameness and want of boldness and strength of design; for the valleys and mountains of the Alps afford innumerable natural objects in their animals and their flora for abundant designs, without keeping the carver continually at work upon some such hackneyed design as a chamois or an acorn. For however much it may be necessary to cultivate technical execution, it is clear that the mind of the worker in the creation of designs should be vigorously cultivated, if Bavarian wood-carving is to take the place which is certainly open to it as a European industry. No more successful trade has been developed,—partly through the energy of the people themselves, and partly through the careful fostering in latter days of the Government of Baden, than that of the clockmakers of the Black Forest; for, from Mediæval times, they have been known throughout Europe for their skill and ingenuity, and their trade is at this moment more flourishing than ever. But both energy, in labouring and quickness of conception have characterised the ingenious natives of the Black Forest, and the same qualities must be developed among the pupils who leave the wood-carving schools of Bavaria, if their art is to become as important as it should. There is scope in the works which are and may be executed by the wood-workers of Bavaria for a never-ending ingenuity and skill, and it would be a benefit, not only to the highlanders of Bavaria themselves, but to Europe generally, if wood-carving should become a flourishing industry in the valleys of the Eastern Alps, for communication with all parts of Europe is now so easy that there is no reason why we in England should not have in our houses the use of the skill of the Bavarian woodworker, whose work can without difficulty be conveyed from one end of Europe to the other. There can be no doubt of the admirable manner in which many of the works sent out from the school at Partenkirchen are executed, but, speaking generally, wood-carving has not in times past taken any considerable hold of the peasants who dwell among the Alps of Bavaria, except for the purpose of the external decoration of their houses, and in some valleys for the carving of the door-panels, which at times show remarkable skill and taste. Nor as yet does there seem, in the Bavarian villages at least, to be any increasing trade in small articles, though naturally these are sent as much as possible to the large towns. But, be that as it may, no one can visit the Schnitz-schule at Partenkirchen, or Berchtesgaden, without admiring much of the work which may be seen there, nor without feeling a strong interest in and hope for the success of the beautiful and useful art of wood-carving in Bavaria.

THE ADDRESS ON HEALTH AT CHELTENHAM.

Mr. W. H. Michael, Q.C., as President of the Health Department at the Social Science Congress, delivered on Saturday last a comprehensive and valuable address. We print the concluding passages, which discuss some questions of current interest:—

The really difficult matter in any remodelling of our sanitary system is the question of the incidence and amount of rating. The consolidation of offices and officers, all serving one local authority, collecting rates for all purposes, and therefore making but one consolidated rate, collected at fixed periods, would of necessity ensure considerable economy, and in many places at present well governed under the old system, a very large saving would accrue; but in others now suffering from past neglect, it would inevitably follow that the necessity would arise for further taxation. The true principle, no doubt, in levying moneys for public local purposes is, that every one shall contribute in proportion as property is benefited by the money expended. But to determine this is a subtle indeterminate equation, which in many cases defies solution, and the more attention we give to the subject, the more shall we become convinced that all exemptions are vicious and misleading, and that the only safe and equitable guide is to take rateable value as the basis of rateability, and to treat every one alike. It is impossible to say where any person or property is not indirectly, if not directly, benefited by works executed in any district. In the works to be carried out by a Conservancy of Rivers Board, none would be more beneficial than those executed for the prevention of floods, a work which it would be impossible to carry out thoroughly and extensively without an entire representation of all the various interests concerned within the whole watershed area of a river. One short example of an apparent exemption may show how wrong it is to carry such exemptions into practice. Those persons owning property on the upland portions would strongly urge that they should not be rated, as they could derive no benefit from the works, but it is on account of the position of their property, and the relief they get by a rapid transmission

of the water which falls on their ground to the low-lying parts of the area, that the difficulties arise, to remove the liability of which the money has to be expended. Here, however, we are again met by obstacles interposed by our past legislation. The Public Health Act, 1848, and the Acts subsequently passed, have rated agricultural lands, market gardens, water, and railways at but one-fourth of their rateable value, and the great railway companies, wise in their generation, have been careful, whenever a special Act of Parliament has been passed for the improvement of a town or district, to get clauses inserted containing for their protection the same exemptions contained in the general Acts. But a closer examination of the subject will show that it is these great companies, lands yielding produce, and the like, which derive the greatest amount of benefit from the improvement of a district, and if they take their fair share of the benefit and profit, they should, in like manner, be prepared to bear their equal quota of the burdens which improvements entail.

Great apprehensions have been expressed both in and out of Parliament at the very large increase of indebtedness of local authorities, but a little examination will tend to dispel any fear on this account. The great body of the expenditure has been incurred in the purchase from companies of their gas and water undertakings, and for the money thus expended there is a commercial and adequate annual return, equal at least to the interest which has to be paid for the money borrowed, and in many cases bringing in a large amount of profit. Judging from the events of the last few years, the time does not appear to be far distant when every prosperous undertaking paying a good dividend on the money invested in the enterprise will have passed into the hands of the local authority of the district in which it is situated. This is hardly a consummation devoutly to be wished. Interference with private enterprise and stoppage of outlets for investment of small sums in secure ways is contrary to public policy, and every additional dealing with public moneys for trade purposes is to be regretted as a step in the wrong direction. Happily, the Legislature has, as yet, determinedly opposed any using of moneys raised by rates in competition with the action of trading companies. After very considerable inquiry and experience, I have not been able to satisfy myself that any advantage can accrue to communities from such transfers. What a local authority could or would do, would certainly be done in its own interest by a gas or water company having Parliamentary powers of supply, for the interests of the company and of the consumer, whether of gas or water, are indissolubly bound up together; and Parliament has surrounded these supplies with such safeguards as to make it less than ever desirable that so much of valuable private enterprise as is represented by these companies should be destroyed. The limitation of dividends, the sale of shares by auction, the adoption of a sliding-scale, in which dividends are directly proportionate to the cheapness of the supply, the care taken to ensure pure water and pure gas being provided by companies, and the means provided by the Legislature for enforcing this, with the other financial safeguards named, make it less than ever necessary to increase the number of these transfers. There is no further power of supply, no greater aid given to the local authority to enforce use of water, and, so far as I have been able to judge, no saving to the community. It is true that in the case of water there is the power in the local authority to take its mains, if necessary, through private lands, a privilege not granted to a company; but the occasions for the exercise of this power are so rare as to make it practically worthless. Of course, it will be argued that the great profits now earned by the companies are transferred to the consumers; but is this so? In the case of either gas or water supply, if compulsory power should be granted to acquire an undertaking,—and this, as yet, has only been done in one single case of a water company, and never in the case of gas,—Parliament will require the full value of the going concern to be paid for, estimated at twenty-five years' purchase, money being supposed to be worth 4 per cent., and the local authority will also be called on to pay a sum to represent prospective value and compulsory sale. When the sale is by agreement, the company fixes its own price; we may therefore assume the undertaking is not parted with below its real value. The only profit to be earned is that arising from the raising of new capital, and as now every gas undertaking must sell its shares in the open market for what they are worth, which, in every case, is close upon the current value of money, and all in premium obtained goes into the capital, without carrying a dividend, and by these means the price of the commodity sold is reduced, there is practically little advantage on this score. Moreover it cannot be right in principle to make large profits at the expense of one class of ratepayers for the benefit of others. When a sanitary authority becomes possessed of a gas undertaking, it can only rightly do so because it has to provide means of public lighting, certainly a very important element among sanitary and social requirements. Private lighting is to be considered under these circumstances as merely subsidiary to this public supply, and gas should be supplied at cost price to consumers who are ratepayers and who take their share of the risk as to the capital sum invested and have to pay their share of the principal and interest year by year. That is, the undertaking should be carried on to give cheap gas, not to make profits out of which to build town-halls or to provide street improvements. In another view the change of supply to the hands of public authorities is likely to be disadvantageous. At the present time effective checks to the supply of gas containing any impurity or of less than standard illuminating power, can be and are imposed by the Legislature. For every day in which such gas is supplied a fine is imposed which can be so arranged as to be a real payment out of the pockets of shareholders, it being levied and paid out of the dividend of the ensuing half-year, which is by so much diminished in amount. But it is useless on the part of ratepayers to seek to impose such fines when the undertaking is in the hands of the local authority. Public authorities as yet are only men, and possibly sometimes, when managing gas and water undertakings, may be found in default as to quantity and quality of supply of gas or water. To impose a fine is to punish the sufferer, as it is a payment which would have to be found out of rates paid by the complainant himself. With respect to water-rates, there is no object in charging more than the actual cost of repayment of the proportion of principal and interest required year by year, because all persons use, or ought to, or might use, the water supplied, and it matters little whether the money be raised by a rent charged for the supply or a rate charged over the whole district supplied. Where the supply is not universally used, it is often necessary that a rate in aid should be levied to make up the deficiency of the annual charges. There are no doubt in this way great inequalities, but it would be a national disaster in any case to attempt to pay for water like gas, according to the quantity supplied, for that would be to limit the use of a necessary to health, which every one interested in a community wishes should be as large as possible without incurring waste; and rateable value, in this case also must continue to be the true measurer of payment. Great relief has been given to local authorities by the extension of time for the repayment of the moneys borrowed for the purposes of gas and water supply, town improvements, and the like,—the money now being spread over a period of 70, 80, 90, or even 100 years, repayable by annual instalments or a sinking-fund. This enables many works to be executed which were before impossible, and without hardship will, at the end of the periods of payment, transfer to posterity gas undertakings, if gas be then used for lighting purposes, and water undertakings, if water be then a necessary of life, without burdens, and as a valuable property to the district. To acquire these undertakings when assented to by all parties interested, to acquire lands for sewage outfall purposes, to effectuate street improvements, to carry out the Artisans and Labourers' Dwellings Act, to provide further powers for such dwellings being erected, and generally for the execution of permanent works, greater facilities are required by local authorities, and an amendment of the provisional order system, now open to very grave objections, would inevitably follow an amendment of the administration of Public Health. Never before has so much public attention been directed to these subjects, never so largely as to-day have they received such careful and systematic inquiry, and never has progress been so great as at the present time. We may, then, with the greatest confidence, look forward to the future of our country. An improved standard of national health will lead to higher and better intellectual and moral development, for it is useless to cultivate the brain while the lungs are neglected, and physical improvement must precede mental advance. When our sympathies are enlisted for the poor, the suffering, and the destitute, when we devise better means for their aid, by living among them and showing them how best to obey the law, we elevate while we assist them. We may remember that our sympathy brings its own reward. We take the best step to diminish pauperism when we improve the cottage and surroundings of the labourer.

ON A CIRCULAR SYSTEM OF HOSPITAL WARDS.*

The chief aim of the successive efforts which have been made to improve the construction of hospitals has been the convenient realisation of certain well-understood sanitary conditions; but the views and requirements of modern hygienic science have advanced so rapidly, that principles and recommendations of comparatively recent date have often been speedily superseded. In the elaborate American Reports on Hospital Construction, edited by Joseph Billings for the building committee of the John Hopkins Hospital, in Baltimore (1876), probably the latest opinions on this subject are embodied; and to these, as fairly representative standards of authority, reference is made in the following remarks.

Besides the important questions to be determined in the erection of a hospital, as to the suitability of situation, soil, and aspect, it is evident that the essential considerations in the construction of the hospital itself are those which relate to frontage, exposure to air and light, the wall space and floor space allotted to each bed, the cubic ward space per patient, the number of patients under one roof, the ventilation and warming of the wards, the isolation of the wards from each other, the severance of the cooking-places, sculleries, bath-rooms, lavatories, and water-closets from the wards, and, lastly, the detachment of the administrative from the sick department.

In order to satisfy the conditions demanded under these several heads, the pavilion system has been devised, in which oblong wards are disposed in separate pavilions. The parallelograms formed by such wards are recommended to be from 24 ft. to 30 ft. in width, whilst their length should range from twice to four times their width.

What I now venture to propose is the adoption of a circular form for the wards, instead of that of a parallelogram. I do not find that the circular form has been employed in any existing hospital, nor am I aware that it has ever been suggested. Separate canvas tents or wooden huts have been arranged in circles as military field hospitals (Hammond Hospital, Chesapeake Bay), and an octagonal ward exists in the Bristol General Hospital; but I believe that the idea of a circular system of hospital wards is novel. I propose here to set forth its pretensions, and invite discussion concerning them.

(*a*) As regards freedom of frontage to all quarters of the compass, a circular ward would be uniformly free, except at some small part connecting it, by means of an open, or partially open, corridor with other circular wards, or with the necessary offices and administrative buildings.

(*b*) As regards the access of light and air, a circular ward cannot be surpassed. It is strongly insisted on by Professor Jones (Billings' Reports) that "an unlimited supply of air" to a ward "is the cardinal consideration"; and, again, it is elsewhere stated (Oppert), that "the worst wards are those where least air and light are provided," and that "a closed court with wards around it is the worst arrangement." A circular ward is obviously the inverse of this last-named plan; and, moreover, having no blank ends like an oblong ward, its uniformly rounded exterior, receding from all adjacent buildings, would receive light, air, and wind from every direction.

(*c*) The amount of wall space, floor space and cubic space, for each patient in a ward of

* From a paper by Mr. John Marshall, F.R.S.; with remarks and illustrations by Mr. Percival Gordon Smith, architect. Read at the Cheltenham Congress of the Social Science Association.

any shape, may of course be regulated by adapting the number of beds to the dimensions of any given ward; but it will be found that a circular ward, unless it be a small one, offers decided advantages in each of these respects. To illustrate this, I will take, as an example, a ward circular in shape, and having an internal diameter of 61 ft. Such a ward would give 191 linear feet 6 in. of internal wall surface, which would afford 8 ft. of wall space for each of twenty-four beds, and 9 ft. 6 in. for each of twenty beds. To obtain space for access to the ward, however, two beds must in either case be deducted, so that the accommodation would be reduced to twenty-two or to eighteen beds. Nevertheless, as regards available wall surface, the circular ward has the advantage; for to accommodate twenty-two beds in a parallelogram 30 ft. in width, giving to each bed a wall space of 8 ft., would require 236 ft. run of wall; whilst for eighteen beds, with 9 ft. 6 in. of wall space to each, 231 ft. of wall would be required, instead of 191 ft. 6 in., as in the proposed circular ward. This is explained by there being no available places for beds at the ends of an oblong ward.

The total floor space in a circular ward 61 ft. in diameter is 2,922 square feet, and this of course exceeds the space capable of being enclosed by an equal run of boundary wall arranged in any other regular or irregular figure. It would yield, for twenty-two beds, about 133 square feet of floor-space for each, and for eighteen beds, 162 superficial feet for each. The floor space per bed in any oblong pavilion ward 30 ft. wide, in which a wall-space of 8 ft. is allowed for each bed, is only 120 ft.; so that the advantage of the circle is clearly obvious. A few years since, 84 superficial feet were regarded as an ample allowance for each bed; but according to Stephen Smith (Billings' Reports), 120 square feet are now demanded, and for certain special hospitals a still larger space is desirable. The circular ward system affords the most economical mode of securing such a space, so far as linear extent of wall is concerned.

The amount of cubical air-space for each patient necessarily follows the same rule, and would be relatively greater in the circular than in the oblong ward here supposed. Thus, the oblong ward, with 120 square feet to each bed, would give 1,800 cubic feet per patient, for a height of 15 ft.; whilst the circular ward would afford, with the same height, either 1,995 cubic feet for each of twenty-two patients, or 2,443 cubic feet for each of eighteen patients. In special hospitals, any required amount of cubical air-space could of course be obtained, either by an increase of height beyond 15 ft., or by diminishing the number of beds. In reference to the last point, it may here be observed that all authorities agree that the number of patients in a pavilion ward should never exceed thirty. Stephen Smith (Billings' Reports) would restrict the number to twenty. The alternative numbers proposed in the above-described circular ward are eighteen or twenty-two.

(*d*) In reference to ventilation, I venture to suggest that a circular ward would offer highly favourable conditions for the complete attainment of this "cardinal consideration." In contact with the air on all sides, save for about one-twentieth part of its circumference, where it would be united with its corridor or offices, and having its windows disposed at regular intervals around it, it would form a sort of *fac-simile* of the circular tent, so efficaciously sanitary, because so completely detached and aërated. Horizontal currents of air would sweep more readily and uniformly around the external surface of a circular than an oblong building. For the purpose of natural ventilation, every such horizontal movement of the outer air would become available, from whatsoever quarter or side it came. Proper openings systematically arranged in windows or walls, and acting as inlets or outlets as the case might be, would admit air or allow it to escape on every side, the fresh air being conducted beneath, above, or between the beds. For artificial ventilation, a shaft or shafts would find a suitable place in the centre of the ward, and therefore equidistant from the circumferential inlets; such shafts might be easily and conveniently made to work by some central heating apparatus, or by some central mechanical agency. The difficulties attendant upon ventilating a long ward would disappear. Sharp draughts across the ward, down draughts on the walls opposite and relatively near to open windows, deficiency of movement of the air with certain winds, and the unequal or opposing extracting power of two or more fireplaces, would not exist.

(*f*) The isolation of circular wards from each other, on the horizontal plane, would be accomplished readily by long and narrow connecting corridors, exposed to the air on both sides, and open or closed, as might be preferred in particular cases. The number and the mode of connexion of the circular wards themselves would also vary in different instances.

Mr. Gordon Smith, who supplied plans for comparison, in the course of his observations, says the site of a hospital involves other considerations than the mere position of the buildings upon a given area. Questions of aspect, of relation to air and sun, and also of neighbours' rights to light and air, have frequently to be solved by the architect. With ordinary longitudinal wards he is often tempted by considerations of site economy to place a ward-side full against a prevalent wind, of course making corresponding difficulty in equable ventilation; or to admit an excess of sunlight on one side while the other side gets none. With a circular ward there can be no questions of this sort. Subject to obvious ward management, the maximum possible equability is secured for the several parts of the ward; and wind from any single point of the compass, instead of ever impinging upon a single side, can only strike full face at some single point in the circumference. So again, as regards possible interference with adjacent rights, the circular form would appear certain to have advantages over the longitudinal form, since it would recede, not along a straight line, but along a curve from a point of closest proximity to other premises.

I do not think it would be either economical or convenient to make a circular ward for less than about eight beds. In such a ward it would probably be necessary to give each bed at least 10 ft. of wall space. This, with the requisite space for the entrance-doorway and the doorway to the w.c. projection, would require a diameter of 31 ft., giving a circumference of 97 ft., which would afford 80 ft. for the eight beds and 17 ft. for the two doorways. Possibly a ward for six beds might be feasible,—the diameter being 25 ft. 6 in. would give a circumference of about 80 ft., and this would afford fully 60 ft. for the six beds. The average floor area per bed in the 31-ft. ward (for eight beds) would be 94 ft., and in the 25-ft. 6-in. ward (for six beds) only 85 ft. superficial. But to pass to the greater limit,—I understand this to be an affair not only of construction, but of what is best in ward administration, and I find authorities speaking of thirty beds as the number which had better not be exceeded in a single ward. I need, therefore, not refer to wards larger than this, but propose to examine simply the adaptability of a circular ward to thirty beds. Let 8 ft. be the amount of wall space which it is desired to assign to each bed, and it will be found that a diameter of 84 ft. would suffice to give this amount to each one of thirty beds, besides 24 ft. additional for the necessary doorways. With such a diameter there would be not only the thorough separation between the feet of opposite beds gained by the circular system, but a quite unnecessary amount of central space. This suggests to the architect the advantage of utilising the centre for purposes of support, and also for purposes of access upwards and downwards, and of subsidiary ventilation. I do not think there would be any objection to the middle of the wards being occupied by a block, say about 20 ft. diameter, containing a central air-shaft, surrounded by a staircase giving access to the roof. The floor area of such a ward would then be 5,541 ft.; less, for the central block (20 ft. diameter), 314 ft.; leaving the net area of ward 5,227 ft.; and this would give an average of 174 square feet of floor-space to each bed. But while I have taken eight beds and thirty beds as the minimum and maximum limits for circular wards, I should very much prefer the size and number of beds to which Professor Marshall has referred in the ward he has described.

Upon the question of cost of construction of circular ward blocks there is much to be said. The quantity of walling in a circular ward is (as has been shown by Professor Marshall) less than in a parallelogram-shaped ward for a corresponding number of beds; and although its circular form might perhaps make the actual cost of construction slightly more than that of straight walls, there would on the whole be a saving in this respect. The quantity of flooring in a circular ward being greater than in a corresponding parallelogram-shaped ward, would involve some additional cost; while the construction of the floor of a circular room of large diameter would be more complicated, and therefore somewhat more costly than that of an ordinarily-shaped ward. In the same way the cost of roofing a circular ward would be greater than that of the simple span roof of a parallelogram building. Wards of ordinary shape are usually about 24 ft. wide, rarely exceeding 30 ft. in width, and hence it is always possible to frame a roof or a floor of such bearing in a simple manner; but when the space to be roofed or floored is circular, and of considerable diameter, it would be expedient to introduce intermediate bearings. This might be done to a certain extent by utilising the central chimney-stack as a means of support; and in the case of the largest size circular wards, iron columns might be needed between the external wall and such central support. By the use of iron girders radiating either from the central chimney-stack or from columns as supports at one end to the external wall at the other end, with rolled iron joists and Dennet (concrete) arching between them, an excellent and incombustible floor would be formed, on which an oak or other wood surface could be provided.

THE NON-PROFESSIONAL STUDY OF ARCHITECTURE.

THERE is an old proverb that the cobbler should stick to his last, and it is one which, if followed universally, would save a great number of persons much annoyance and a large amount of money. In modern times, when every profession and occupation has become so technical in its character, it is the veriest folly for one ignorant of some particular trade or profession to endeavour to do some kind of work connected with it, instead of employing persons qualified by their education to undertake it thoroughly. It is constantly the case that those who are not lawyers seek to do lawyers' work, and thus lay up for themselves all sorts of future troubles; the amateur architect, too, is generally an equally unfortunate person.

But these facts are no argument against the unprofessional study of architecture, a study which is now, with some few exceptions, greatly and unwisely neglected. Let us consider why the study of architecture is one which is deserving of study by those who may have either plenty of leisure time, or who are of sufficient intelligence to seek for amusement in an interesting and useful pursuit. There is no object of greater importance than the buildings in which we live. In these days we, no doubt, hear a good deal more bout healthy houses, but we hear a great deal about food and exercise, and such like matters; but whilst every one seeks to know something about his own body, in some way or other, comparatively few persons seek to understand the construction of their own houses and the principles of utility or beauty which are applicable to them. One consequence of this is that there is much less of an incentive to architects to introduce improvements in the construction of houses, or to design beautiful edifices. We are not now speaking of the highest kind of architectural work, such as public offices, town-halls, and courts of law, which naturally cause architects to do all that their talent or education will enable them to perform. Nor, on the other hand, are we depreciating the way in which architects perform the work which they have to do: all we are pointing out is that there is no incentive to improve work when those for whom it is supplied have none of the training which will enable them to appreciate better work. Architecture is an essentially progressive profession, but the rate of its progression depends to a large extent upon the pressure from outside, and to throw pearls before swine is an occupation which is both a waste of time and money, and a singularly disheartening performance into the bargain. Again, there are good and bad men in every profession, but the good men are much sooner recognised and much more highly appreciated by an instructed than by an ignorant public. Again, there is also this drawback to the neglect of architectural studies as at all a general pursuit, viz., that when there is an exception to the rule, the exception may be a most superficial one, but yet the person who forms it will almost

inevitably consider himself equal if not superior to a Scott or a Waterhouse. There must certainly be large numbers of our readers who, in the course of their professional experience, have come across the kind of person we mean, who, on a committee of selection for a church or a municipal building, lays down all the laws of taste, is absolutely domineering with his superficial but superior knowledge, which a very slight amount of instruction on the part of the other laymen would quickly cause to subside, and thus permit the professional architect a fair and impartial hearing.

But there is also a stronger ground on which the non-professional study of architecture may be recommended. Indeed, it is the strongest ground for such study, because in all matters of difficulty or size the professional architect should be always employed. But modern Europe is a continent of cities, and our modern days are days of unlimited travelling. It is true that Switzerland has been called by a well-known writer "the playground of Europe," but, as a matter of fact, the number of tourists who spend their time in cities is greater than those who seek it exclusively in the valleys or on the heights of the Alps. To put this in plainer language, we may say that the aggregate amount of time spent by the whole body of tourists in the course of the year in viewing towns is considerably greater than the amount which is passed in the country. Consider those who flock to Rome and the other cities of Italy in the winter, and those who view churches and cathedrals in the towns of France and Germany, and also those who spend a few summer months in Switzerland or the Tyrol, and we venture to think that our assertion, broadly speaking, is true.

But how much time have one-tenth of those who spend hours among the churches of Rouen, gazing at the quaint houses of Nuremberg, or wandering among the palaces of Venice, given previously to the study of architecture? For the study of architecture has a threefold consequence. It trains the eye so that the beauties of a building are both more quickly seized and more keenly appreciated. The unsophisticated rustic feels little or no pleasure in the mellow splendour of the woods in autumn; the eye of the artist, cultured by the study of colour, rejoices in the varying tints of the foliage, and perceives charms almost impossible of appreciation by the ignorant peasant. It is just the same with the study of architecture; because by the study of architecture we do not mean simply a perusal of Rickman or Parker, from one end to the other, as of Macaulay or Grote; but also an exemplification of the contents of the pages by the study of illustrations and actual buildings. Again, there is the historical aspect of the question. The study of architecture necessarily must be pursued historically; that is, as regards the history of buildings and the general history of which they form a part. Now, much of the interest to be found in many buildings arises from their relation to the times in which they were erected, to other buildings differing or resembling them in character, and lastly, from their relation to personages or events of historical interest. What a vista of the past does Oxford open before us! The Saxon Alfred and the lordly Wolsey appear before us; what stirring events and what changing aspects of our country are written in the stones of that "fair city." The biography of great men has been said to form history; but it is equally true that the stones of our towns, our castles, and our churches, embrace both the history of our country and the lives of our greatest men. But the actual history of buildings is that which has the most strict relation with the study of architecture, and we have no hesitation in saying that those who have once commenced the study will find their field enlarging itself every day that they obtain some new information.

It is quite certain, too, that nine-tenths of those who gaze now at celebrated buildings do not appreciate them as buildings, and are oftentimes exceedingly wearied by such observation. An elementary study of architecture would throw new interest into foreign tours, and render attractive many places at home which have hitherto been wearisome. Indeed, it seems difficult to overrate the advantages, purely pleasurable, wholly without drawback, which may be obtained by the non-professional study of architecture.

But, except by some few persons, and by those who intend to make it their profession, this tudy is wholly neglected. Thus we imbue our boys from their first entry at a public school to the last day on which they reside at a university with classical knowledge. But whilst they are filled to overflowing with the literature and the history of the Greeks and Romans, is a single thought, except in the most cursory fashion, given to the architecture of those ancient times, to its character, its relation to the people by whom it was used, to its consequences for future generations? It is quite neglected; there is no attempt made to give a knowledge of its principles; there is, in fact, in most of our educational centres, no one even who is capable of giving that knowledge among the tutorial staff. We lecture our students upon the Mediæval history of England, but we give little or no attention to some of the chief achievements of our ancestors, in the shape of buildings which exist to this day, when the political or social systems, — those little systems which "have their day and cease to be,"—are as much things of the past as the men who moved within them. Thus any person who has arrived at years of discretion, with professional duties, and no intention of becoming an architect, but who wishes, for his own profit and pleasure, to give some study to the subject, must begin from the very commencement, without any directing influence gained in his educational days. But, except by way of books, there are, even for those of maturer years, who are not architects by profession, hardly any opportunities of gaining this knowledge. Of course, there are societies for those who have attained a certain proficiency in, and knowledge of, the subject. But do we ever hear of popular architectural lectures, as we do of popular science lectures? Popular science is very desirable, but popular architectural lectures would give much pleasure and more practical profit. Our space will not permit us to follow out these observations to a greater length, and, true as they are, they are necessarily rather suggestive than exhaustive. They will, however, put before our readers three positions, which are,—that the non-professional study of architecture is desirable from the point of view of utility, and from that of pleasure, and that at the present time any non-professional study is almost wholly neglected, and that, speaking generally, there are few opportunities, if any, available for such study.

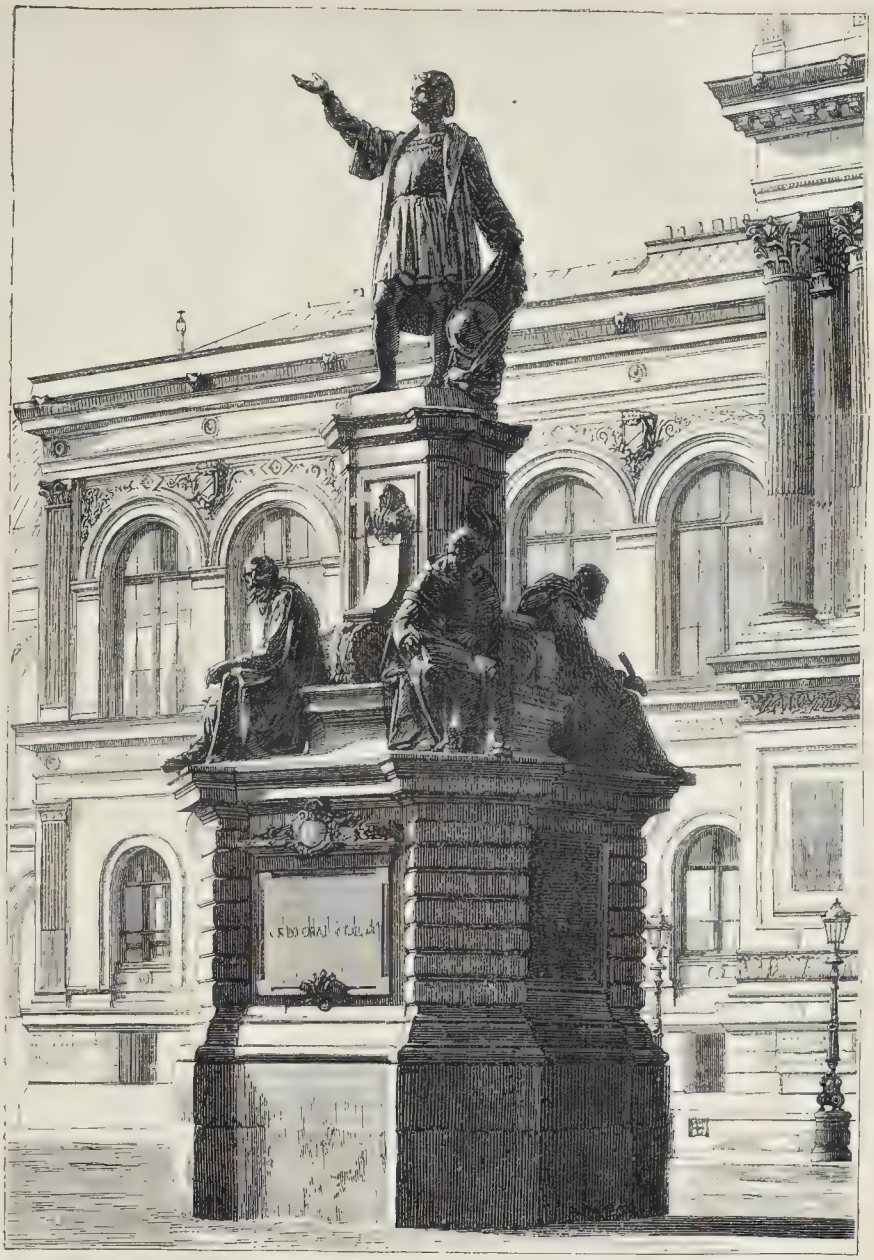
OUR COLONIAL PROGRESS.

THE progress of our colonies is a subject which at the present time is of the utmost importance to Great Britain, for whilst in some directions the trade we do with foreign nations is being seriously limited, our colonial trade exhibits at the present time a considerable and most gratifying improvement. In part this may be made apparent by the increased shipments through the stimulus given by lower prices, but unquestionably the source is traceable to the improvement in the financial condition of many of our colonies, and the development of their material resources. The publication, therefore, of the official "Statistical Abstract" for the "Colonial and other Possessions of the United Kingdom" comes in most opportunely,—presenting as it does reliable facts showing the position and shadowing the prospects of some of our most important possessions. The first of its tables is that of population, which is incomplete; but it may be remarked that one of the tables presented,—that of Australia,—shows a very considerable increase,—from 1,924,770 in 1871 to 2,401,715 in 1876. The table of the gross public revenue shows a very material and general advance,—that of India having added 700,000*l.* to the revenue of 1875; and Australia having added to its 14,000,000*l.* nearly 2,000,000*l.*, —the most of the increase having accrued in New South Wales and New Zealand. Natal shows a fair enlargement, but Canada is stationary of late years; the Cape of Good Hope is increased in a good degree; and the only other noteworthy change is the continuance of the increase of Malta. But these increases are almost invariably accompanied by enlarged public expenditure,—at least in equal ratio. The public debt of India is swollen much of late years; that of Australia has increased from 41,000,000*l.* to 59,380,000*l.* in five years; and that of the Dominion of Canada from 17,120,000*l.* to 25,900,000*l.* in the same time.

The shipping trade, as marked by entrances and clearances of vessels, has been enlarged generally, almost universally of late years, and, except in the case of the West Indian islands, an increasing proportion is in British vessels, in more than one instance the tonnage of foreign vessels entering and clearing being less now than it was four years ago, although the totals are increased. The value of the total imports shows in several instances a falling off in the last two or three years, due to the lower prices for goods that have prevailed, and the same declension in value is at times noticeable in the exports from the colonies to Great Britain. Coming to the tables devoted to special industries, it is noticeable that the quantity of wool sent out by the colonies is very materially more—the total having grown from 126,945,229 lb. in 1862 to 412,934,878 lb. in 1876. This wonderful increase arises largely from India, which has doubled its contribution, but chiefly from Australia, which sends fourfold now what it did fifteen years ago, and the increase is further traceable in detail in considerable degree to New South Wales. Of raw sugar from the chief British possessions there were sent out in 1862 about 7,300,000 cwt., and in 1876 the quantity had only risen to 7,877,955 cwt.

In imports into the colonies, as far as India is concerned, she has taken much less railway materials, sugar, and tea; and much more coal and coke, provisions, and cotton manufactures; whilst she has sent out greater quantities, specially of coffee, grain, raw jute, opium, and sugar. The trade of Australia has shown a tolerably general increase, both in imports and exports, but New Zealand shows a marked fall in the value of her imports of live stock. Canada had last year an increase, especially in the grain imported, and in the exportation of preserved meats, but in none of the others is there special call for remark. It is very noticeable that there has been an increase in the banking facilities, and in the banking business done; the total liabilities of the banks in New South Wales, for instance, have risen from 11,500,000*l.* to 16,250,000*l.* in four years, and those of Queensland in an even larger degree,—the assets in each case having increased more than equally.

In the length of railways, there has been a considerable addition in the half-dozen years over which the table extends, — in Australia, in a shorter period to a duplicating extent,—the mileage having risen from 1,499 in 1873 to 2,782 in 1876. Natal still possesses its five miles; the Cape of Good Hope has raised its mileage from 64 to 208 in four years, and there is a considerable addition to that of the dominion of Canada. The statistics in relation to land are not so interesting, nor do they show so much progress, except that there is very much more under wheat in Australia than there was. The live cattle figures are confined to the Australian colonies, and it appears that the number of horses is much greater there than it was, whilst the horned cattle have risen in number from 4,035,839 to 7,232,132 in ten years, and the larger number of sheep has been increased in a similar proportion, as has also that of pigs. As to population statistics, the births in Australia rose from 52,349 in 1861 to 85,429 in 1876, but the proportion to the population was less. The deaths were considerably more actually, but relatively to the population they were about the same; whilst the marriages increased numerically, but decreased in the proportion. A very interesting and useful meteorological table follows, but it is not of a nature to bear condensing. One tabulating the rainfall is next given, from which it seems that in the latest year given the rainfall was greatest at Hong Kong, and least in South Australia. A series of tables of the import and export duties levied on various articles in the different colonies concludes the volume, and they show that whatever our colonies have gained, they yet need in many instances to take to heart the lessons of free trade which the mother country has set before them. Apart from this, however, there is in the volume, brought down to the latest date for which statistics could be tabulated for distant parts, a very cheering testimony to the growth of our colonial empire, and material which lays the groundwork for hopes of the future. It is at once evident from many of the facts which have been summarised that there has now been a very considerable, if not full, recovery from the depression which in some of our colonies preceded and contributed to the depression at home; and though it may be some time before we have authentic figures showing it, there is no doubt that that process of recuperation has gone on during the present year in a quicker ratio, helped by generally plentiful harvests.



THE CHRISTOPHER COLUMBUS MONUMENT, MEXICO.—M. Charles Cordier, Sculptor.
Presented to the City of Mexico by Don Antonio Escandon.

The effect is already seen in part in increased trade with our colonies this year, but it will be much more evident in the future. More and more England is trading with her colonies to mutual benefit, and the growth of that trade, and the intercommunication and better understanding resultant, are especially to be desired. There is need, as has been pointed out, of an application of the principles of free trade, and this would conduce to the end aimed at in no small degree.

MONUMENT TO CHRISTOPHER COLUMBUS, MEXICO.

The beautiful capital of the Mexican Republic numbers amongst its many attractions a handsome monument to Christopher Columbus, of which we give an illustration in this number.

The origin of this monument may be stated in a few words. In 1872, when in Paris, Señor Antonio Escandon, a rich Mexican, was struck with the equestrian statue of Ibrahim Pasha, designed and executed by M. Charles Cordier, and placed by him in front of the Palais de l'Industrie. He suggested to the sculptor the idea of erecting a monument to the immortal Genoese in the city of Mexico. Within the space of ten days, M. Cordier presented a model, and Señor Escandon, who approved the design, placed at the disposal of the artist the respectable sum of 8,000*l.*, in order to supply funds for the necessary works. The monument was unveiled at the latter end of 1875.

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The total height of the monument is 45 ft. The statue of the navigator is 12 ft. in height. He is represented in the attitude of raising the veil which enshrouds half the globe, at the same time directing his gaze to heaven, as an action of gratitude for the happy realisation of his great undertaking. Four statues in bronze, and measuring 10 ft. in height, one of which represents Las Casas, the apostle of the American Indians, are placed at the corners of the monument. In the front of the basement supporting these statues is placed the votive inscription, in a framework, also in bronze, while behind is reproduced, literally, a letter written by Columbus to Isabella, in the centre of a rich corona of palm and laurel leaves. The whole architectural arrangement was designed and executed under the direction of M. Rossigneux.

It may be remembered that in the same year (1875) another handsome monument in honour of Columbus, executed in white Milan marble, and erected at the expense of the Italian residents in the State of Pennsylvania, was unveiled in Fairmount Park, Philadelphia.

THE FRENCH GALLERY.

There must certainly be a fall in the prestige of the gallery in Pall-mall, or some exceptional difficulty in getting pictures together, to account for the presence of some of the works to be found in the Twenty-sixth Annual Exhibition of the Works of British and Foreign Artists, opened this week. Some little time since no one would have believed that works so much below the mark would have been placed in this usually very select collection, as are some of those now to be seen there. It would hardly serve any purpose to go through the invidious task of naming them particularly. We can only regret the fact that Mr. Wallis's gallery seems to be no longer a place of escape from commonplace and mediocre work.

There is, however, one picture which would be worth going in to see, if all the other works in the room were "pot-boilers." This is De Neuville's latest battle-piece, the scene in the street at Le Bourget after a gallant remnant of defenders who had taken up a final stand in the village church had been with difficulty overpowered and forced to surrender. In the absolute reality of the scene, in the mingling of the prose with the heroism of war, we hardly remember to have seen anything like this; and remarkable as have been the painter's previous achievements of this class, we may say that here he has fairly out-done himself. The picture shows in the foreground the open space in front of the church, which is to the spectator's left, and we look beyond, on the right, down the principal street of the place. The windows of the houses near the church are filled with German soldiers who had taken up that position in order to fire through the windows of the church on its defenders inside, and who now crowd to the window-sill to see the remnant of the French party come out as prisoners: one of them, a typical, fat, round-faced German lout, sits with one leg hanging outside the window, and surveys his late adversaries with an air of impudent and coarse triumph. Below, a group is formed on each side of the church-door, conspicuous among which is the captain of the French party, standing swordless and with a pathetic air of resignation to the inevitable. The painter has, with a pardonable patriotism, made a fine point of contrast between this heroic though sad and worn figure (who, like two other of the French officers, is a portrait) and the beefy-looking Prussian soldier, who stands by, holding the sword of one of the prisoners. Through the church-door a young French officer, seriously wounded, is carried out on a chair by two of his late foes, apparently fainting, and looked upon with sympathising interest by one or two of the Germans nearest the door. On the right the fieldpiece with which the church-door has been blown in, its muzzle blackened by the recent firing, is wheeled back again into the centre of the street, two men putting their shoulders to the wheels to help it on to the crown of the roadway; the artillery team are in progress down the street; the driver of the leading pair half turns on his horse to check the others from driving right over the body of a French soldier, who lies slain or wounded in the middle of the road, whom they can afford to think of now that the fight is over. On the other side of the gun a German officer gives an order quietly and is answered by the rider of one of the horses, who touches his helmet in as orderly a manner as if on parade. Not a detail in the realisation of the scene is forgotten; yet there is no exaggerated finish; the whole is painted in a thoroughly broad and artist-like style. If any one wishes to feel as if he had really been in a sharp skirmish, and to realise the feelings of victors and vanquished in a thoroughly military group, let him go and look at M. de Neuville's picture.

The opposite picture to this, Mr. Muller's "Encampment in the Desert" (150) is a large group of Arabs, we suppose (but they are darker-skinned people than we generally suppose Arabs to be), with two or three camels; very forcibly drawn, the camels especially, but heavily painted and deficient in lighting, so that the various figures hardly detach themselves sufficiently from the mass. The third centre place is occupied by a picture by Mr. Burgess representing a benign priest examining some Spanish girls in the "Church Catechism" (19); the picture hardly calls for remark. In the fourth place of honour is a very Creswicky Creswick, put there one knows not why, in an exhibition professedly of works of living artists. We may notice, too, that Gerome's little picture of "An Eastern Woman" was hung in the gallery, and in nearly the same position, not very long ago. In short, the collection seems to have been got together as it could be, in a very miscellaneous kind of way.

Among things that are, however, worth attention, may be mentioned the rather large work of Miss Hilda Montalba, the best thing we have yet seen from this very clever lady, "The Return from the Rialto" (161), a boat with two or three Italian peasants gliding over a broad lagune at evening; the picture is not only very broad and calm in feeling as a landscape, but in the combined character of the figures and scene there is a semi-pathetic expression which makes one think of Jules Breton. Miss Hilda Montalba is less of a mannerist than her sister, whose works had the start of her, but whom she seems likely, judging from this picture, to surpass. Herr Spring's picture of the "Gamblers" (105) is much less disagreeable, but also less powerful than one or two other rather similar subjects we have seen here from his hand. Exactly the contrary may be said of Herr Kauffmann's "An Intermezzo," wonderfully clever, but repulsive to a degree. Ostade's boors are refined creatures compared with this painter's specimens of human degradation. A bit of low life of a more pleasing type is pleasantly given in M. Moreau's "Sunday Morning" (11); M. Jimenez is clever in his representation of "An Expert at Pen-making" (3), which, however, would never have been painted but for Meissonier, just as M. Sadee's "Gossip on the Seashore" (29) would never have been painted but for Israels. MM. Duverger, Pasini, Chevilliard, and one or two other usual contributors, are fairly represented. Mr. Weber's "Fishing off Calais" (10) is a fine forcible sea-painting, better than the larger work by the same artist; M. Ruinart's "Study in the Port of Naples" (14) is a masterly little thing, and two or three very diminutive landscapes by Herr Heffner are worth notice.

CHIMNEY-PIECES.

NUTFIELD PRIORY, RED HILL, SURREY.

We published a short time ago a view and plan of this mansion, the residence of Mr. Joshua Fielden, M.P., when a detailed description of the buildings was given.

The illustration we now add shows the chimney-piece and surmounting glass in the drawing-room, with a profile and plans above and below the shelf. The frame to the silvered glass is richly carved and inlaid with different woods. The marble work below is also inlaid, various coloured materials being used.

The chimney-piece and glass with its enclosure in Mrs. Fielden's room are also shown. Several descriptions of marble have been employed for these, which, as will be seen, are also enriched by carving and inlay.

The profile and plans of this, above and below the shelf, are also given. The whole of the work was carried out by Messrs. William Cubitt & Co., from the designs and under the superintendence of Mr. John Gibson, of Westminster.

Southend-on-Sea.—It is proposed to erect an aquarium here. The site will be close to high-water mark. Mr. W. Paice is the architect.

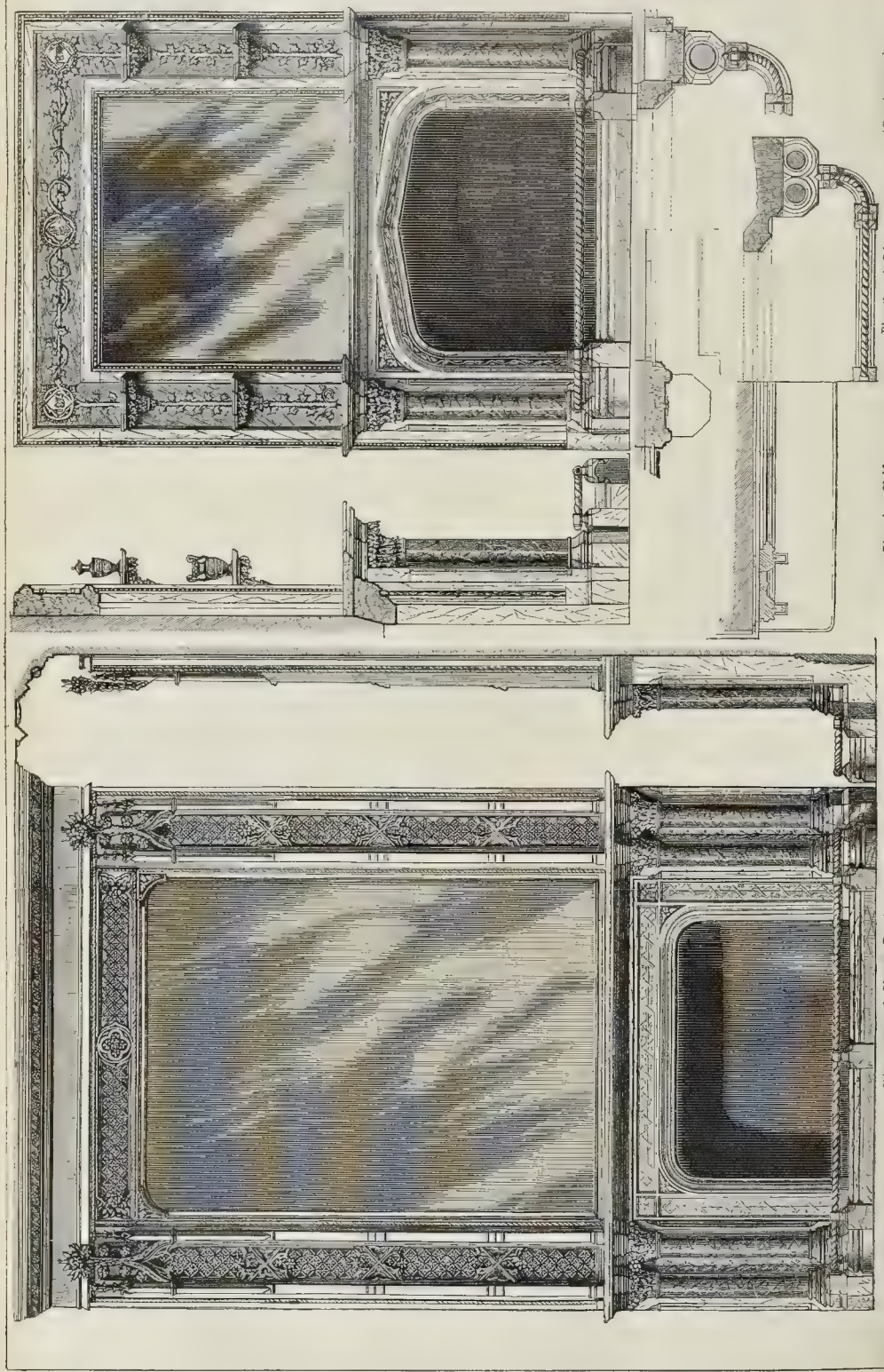
REREDOS, TRINITY CHURCH, NEW YORK.

This reredos has been erected as a memorial of the late Mr. William B. Astor by his two sons in Trinity Church. It occupies nearly the whole width (35 ft.) of the chancel, and is carried up as high as the sill of the large seven-light window, which is about 20 ft. from the floor.

The communion-table is 11 ft. long, and is constructed of white statuary marble, with shafts of Lisbon red marble supporting capitals carved in natural foliage dividing the front and side into panels. In the centre panel, which is carved with passion-flowers, is a Maltese cross in mosaic, set with cameos, a head of Our Lord being in the centre, and the symbols of the Evangelists at the extremities of the four arms; this panel is flanked by two kneeling angels, the one in adoration and the other in prayer. The other panels in front, which are carved with ears of wheat, are also in mosaic, and contain the "Pelican" and the "Agnus Dei," and those at the side the sacred monograms. The white marble slab is set on a cornice composed of grape-vines, and is inlaid with five crosses of red marble. The super-altar is of red Lisbon marble, with the words "Holy, Holy, Holy," inlaid in mosaics on its face, and its shelf is continued on each side the whole length of the reredos for the reception of flowers at festivals.

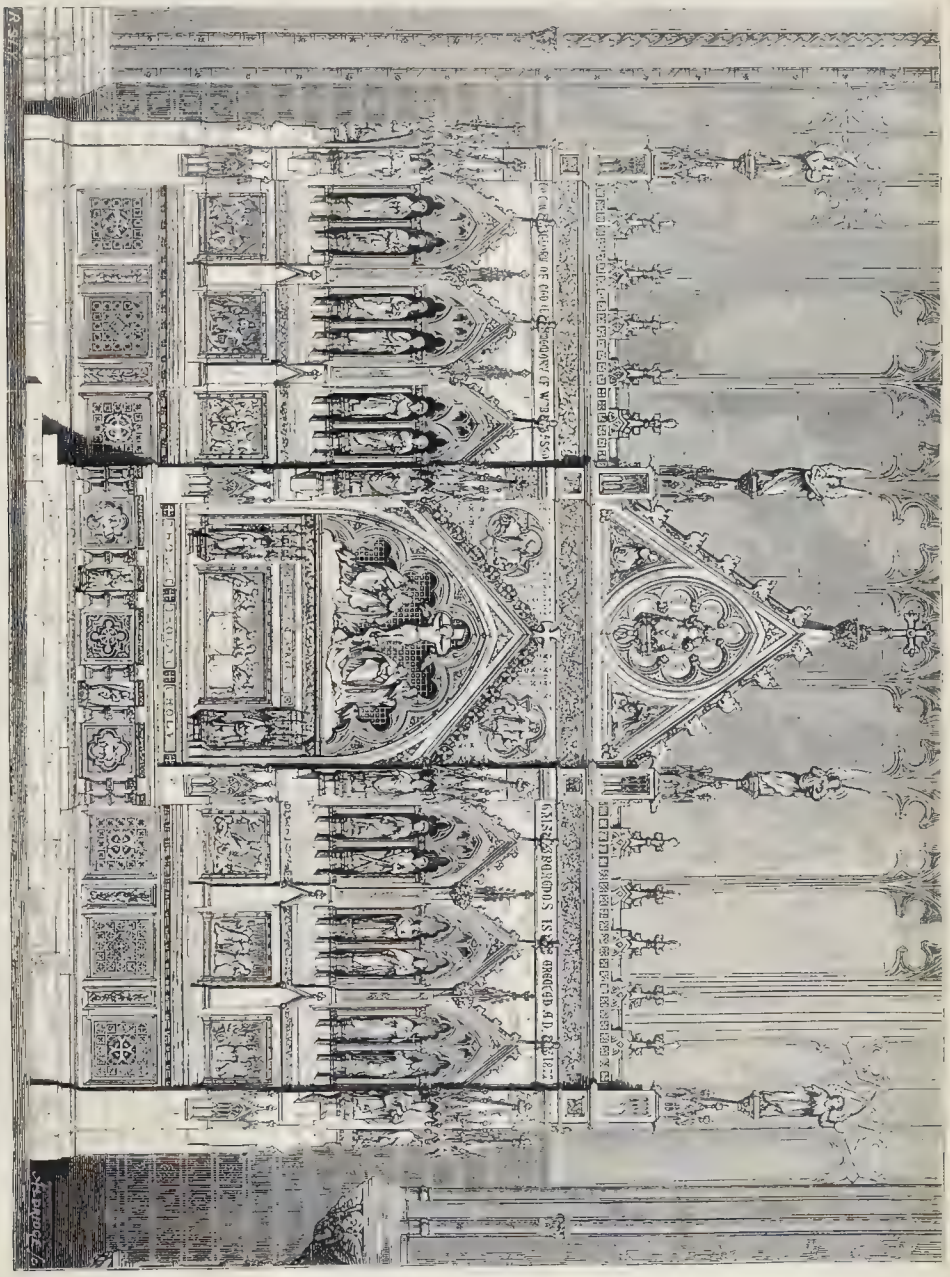
The reredos is in the Perpendicular style, so as to be in keeping with that of the church. It is constructed of Caen stone, elaborately carved, a great deal of the carving being after natural foliage. In the lower portion on each side of the altar are three square panels filled with coloured mosaics in geometrical patterns. Above the line of the super-altar are seven panels of white marble, sculptured in alto-relievo, representing incidents in the life of our Blessed Lord immediately preceding and subsequent to the Last Supper; this is modelled after the celebrated picture by Leonardo da Vinci, and fills the centre panel over the altar; underneath this appears in raised letters the words, "Having loved His own which were in the world, He loved them unto the end." On the right of this panel, under a canopied niche, stands a white marble statuette of St. Raphael with a flaming sword in his hand, and on the left St. Gabriel holding a bunch of lilies and a scroll. On the extreme right of the reredos, in the other panels:—(1) St. Mary Magdalene pouring ointment on the feet of our Lord, inscribed underneath with the words, "She hath done what she could"; (2) The Triumphal Entry into Jerusalem, with the words, "Hosanna to the son of David"; (3) Our Lord washing the disciples' feet, with "I am among you as He that serveth." On the left, in continuation, is:—(5) The Agony in the Garden, with the words, "On Him was laid the iniquity of us all"; (6) The Betrayal, inscribed with, "This is your hour and the power of darkness"; and (7) Our Lord before Pilate, who is in the act of saying, "I find no fault in this man."

The reredos is divided into three bays by buttresses, which contain under canopies on their face, four Doctors of the Church:—(1) St. Jerome, represented in the act of translating the Bible, accompanied by the lion endeavouring to show his gratitude for taking the thorn out of his foot; (2) St. Ambrose, in bishop's costume, in the attitude of delivering a discourse, with the beehive, his characteristic emblem, on his left; (3) St. Augustine, in same costume as St. Ambrose, in the act of giving the benediction; and (4) St. Gregory, in the act of writing his Homilies. In the centre bay, under a large multifoiled arch, forming a baldachino, is represented the Crucifixion in high relief. On the right of the Cross stand SS. John and Mary the mother of our Lord; St. Mary Magdalene kneeling embraces the feet which brought such mercy to her; and on the left are the other Mary and the Centurion. This subject is supported on an elaborately-carved cornice composed of passion-flowers, and underneath are the words, "Behold the Lamb of God." Ranged on either side in the two other bays are statuettes of the Twelve Apostles, 2 ft. 6 in. high, each with his characteristic attribute:—(1) St. Jude carrying a book and a club, the weapon with which he was killed; (2) St. Bartholomew carrying a large knife, the instrument of his martyrdom; (3) St. Thomas with a builder's rule; (4) St. Matthew, who was a tax-gatherer, with a money-box in his left hand, indicative of his calling; (5) St. John holding a chalice with a serpent issuing from it; (6) St. James Minor, first Bishop of Jerusalem, with



CHIMNEY PIECES, NUTFIELD PRIORY, REDHILL, SURREY: THE RESIDENCE OF MR. JOSHUA FIELDEN, M.P.

Chimneypiece and Glass in Drawing-room. *Plan above Shelf.* *Plan through Columns.* (*Drawing-room.*)



REREDOS, TRINITY CHURCH, NEW YORK, U.S.—Mr. F. Clarke Withers, Architect.

pen and book, and the fuller's club, the instrument with which he was beaten to death; (7) St. Peter with the keys in his right hand and a book in his left; (8) St. Andrew with a transverse cross, similar in shape to that on which he was crucified; (9) St. Simon with a saw, the instrument with which he was sawn asunder; (10) St. Matthias with a book, and an axe, as he was beheaded for his preaching; (11) St. Philip holding a tall staff with a Latin cross at the top; (12) St. James Major bearing a pilgrim's staff, to which a wallet is suspended, and with a scallop-shell on his flapped hat.

These statuettes are placed in niches, with traceried heads, carried by polished Bay of Fundy red granite shafts, with the background carved in diaper and gilded. On the extreme ends of this line, facing north and south, are the figures of SS. Michael and George, under canopies similar to those over the doctors.

In the centre bay, above the Crucifixion, are sculptured in panels set in diaper work, the Resurrection and the Ascension. In the gablet which surmounts it, and inclosed in a vesica piscis, is represented Our Lord in His Majesty, holding the globe in his left hand, and blessing with his right; and on either side, and filling the spandrels, are sculptured angels kneeling in adoration. Underneath the main cornice of the side bays, and forming part of it, is inscribed in raised letters, "To the Glory of God, in memory of Wm. B. Astor, this Reredos is erected A.D. 1877."

Angels, playing on musical instruments, emblematic of the Church triumphant, crown the four buttresses.

The statuary was executed by Mr. Robert Smith, of Lambeth-road, London; the mosaics by Mr. Daniel Bell, also of London; and the whole of the carving, Caen stonework of reredos, and marble work of altar, including the setting up, has been done by Messrs. Ellin & Kitson, of New York. Mr. Frederick Clarke Withers was the architect.

POTTERY IN THE EAST, AND ASIATIC ARTIST-WORKMEN.

It would seem to be now all but certain that foreign labour,—artistic and skilled labour,—is to be imported systematically into this country, as well as into other communities of English growth, wherein it has already obtained a somewhat firm foothold. Whatever may be thought of this as a development of "Free Trade," and whatever its ultimate effect on the "labour market" may be, it is quite certain that the subject in itself, and as an experimental effort at a something new, is of the very utmost interest and importance. We know as it is, indeed, but little of the capacities of other and distant nationalities, or of their special modes of work, in detail. We see only as in a glass darkly final and accomplished results, better it may be, or not so good as our own. Not only do we need to know the full value of such results, but we need to know as well how and in what special way they have been produced,—under circumstances so different from those all round and about us. And this not only in the actual present, but in the past. Let any one sufficiently interested but go into the Antiquity Galleries of the British Museum, and ask himself how and by what sort of workman or workmen the hieroglyphics on the Egyptian monuments were cut, particularly those of which casts in plaster have but recently been open to public view, and he will soon find a not a little puzzling problem before him, simple as it may seem to be.

It is quite certain that, whatever the special method of work might then have been, it was, and needs must have been, different from ours now-a-days all about us, and by our art-workmen. Much attention is just now being excited by this question of "art-labour," and various causes have been cited to account for our present deficiencies. Want of due study, trade unions, the existence of which are thought by many to be so prejudicial, intemperance, and thoughtless extravagance, idleness, and not a few other bad and sombre influences; and comparisons are at times drawn between the English and the foreign workman, not a little to the disadvantage of John Bull. We cannot know too much, and the coming here of workmen from Japan, distant as that place is, and mysterious as it is, and has been, must needs throw no small light on the "labour question," as to how work is there done, the *tools* in use, and the whole of the *modus operandi*. A right curious meeting together of two things so opposite,—our own methodised and mechanical modes of work, rivalling machinery itself; and one in which art feeling more or less *must* form an element, as each man, as it would seem, works by himself, and exercises *thought*, while in the act of working. What sort of thought, asks the reader, and how far does it extend? and where does it begin? This we may perhaps get a glimpse of.

But leaving Japan for the present, let us glance for a moment at another, and all but as distant and strange, a place.

Samarkand, far off as it is, and beyond all school influences, is famous for its pottery, and supplies not only itself, but the surrounding country and villages more or less with "clay" ware; the traders in it making annual tours through the country, as do the Samarkand artists themselves, who, working in the clay as found on the spot where they happen to be at the time, there do, which is somewhat curious, what is wanted of them, being all ready prepared with their "designs" and patterns in their heads, and working from them as from a pattern-book! What a curious, and Old World-famous process and mode of work! Artist-workmen these, if there be anywhere any such. The antique Etruscan worked in this same way, so that it is after all nothing new; but it typifies a mode of work the very opposite of our own. What would our labour unions say to it? What would the great capitalist pottery manufacturer think of a workman who should present himself at the factory-door not only with tools in his hand, and a strong and willing arm, and flexible fingers, but with "designs," not on paper by another hand, but with these in his head and in his mind's eye? Here, this is simply impossible, and well-nigh inconceivable, in spite of our multitude of "schools" and art-teaching appliances; but in distant Samarkand, at the extremities of Asia, it is an actuality, and as real as it must have been in old Etruria.

The shops of the dealers in china and earthenware are everywhere, all the world over, attractive, and here more especially, from the character displayed, the work being hand-made, and every piece different in design. Those, therefore, fond of pottery may here revel as in a curiosity-shop. The ware for the most part is coarse, and is more often than not rudely, and as it were carelessly, made; but that is made up for by the novelty and freshness and individuality displayed in it; and more than all, and this is indeed the real secret,—by the evidences inherent in it of artistic hand-work, and ever-present mental watchfulness. In harmony of colour, where there are designs and patterns, whatever such designs may be, and in that instinctive balancing and blending of tints, it is equally noteworthy; but, perhaps in more than all, is it remarkable when quite plain and unornamented, and we see nought but the form with simple ground-colour and glaze. It is in sight of such simply-made ware that the mind is compelled to wander back in time to the doings of the antique Etruscans and Greeks, and then to our own time, so dead in method of work, though amid so many enlightened and school-filled surroundings. It is curious thus to find in active operation the selfsame method of work as obtained in the days of Phidias, though in so distant and out-of-the-way a spot as this far-off Asiatic city.

There may be interest in the nature and kind of materials used in this primitive pottery, so different from our own. For the special ware called "tchini," a white felspathic clay is used, found in the mountain districts between Tashkand and Khokand; quartz, also, got from the mountains in the shape of pebbles from the gravelly banks of the river near Samarkand. The lime and soda are derived from the ashes of a species of salicornia. The glaze is made of a mixture of "ishkar," with oxide of lead, and to these is at times added an admixture of tin, and it is this which gives that peculiar iridescence so marked and attractive in Moorish ware; and if a greenish hue or tint is required a little verdigris is added. When the vase or cup is intended to be enriched with ornament the colours are mixed with water and gum, and are then laid with a goat's-hair brush on to the dry surface of the glaze before firing. Blue is produced by lapis lazuli, violet by manganese, yellow by ochre, and green by verdigris. It will thus be seen how simple and primitive the materials are which are in use in this far-off locality, and how the condition of things common all over the world at one time, still exists. It would be most curious and of no small interest to ascertain in detail the precise particulars of this primitive work.

The colours most usually employed in the designs are blue and white, with occasionally a bluish-green tinge for the ground, and at times yellow or dark violet is, though more sparingly, used. But, truth to tell, it is not, as is so often thought, the special colour that attracts, but the method of laying on, the painting, indeed, the handwork, that gives the charm, just as it is found to do in a master's painting. No matter what the colours, whether dark or light, thickly or thinly laid on, with or without attempt at design or pattern,—the result to the eye is the same. We are not looking at mere china ware, as in our shops, but at a picture, more or less, just indeed as we might and must look at, and feel interest in, a painted jar or bowl in one of Titian's, or Rembrandt's, or Millais's pictures. The roughness and even rudeness of the object is nothing; it is the evidence in it of artistic power, even if humble in kind, that we regard and admire. A lesson, indeed, is to be found here, and might be made right good use of by our schools of design,—so called,—if not by our manufacturers of ceramic ware. It would be curious to note, were it possible, the price put by the acute vendors of "curiosities" on a vase, even of rough ware, if painted on by a popular artist. It is hardly to be guessed at.

It may be all but needless to say that the tools and apparatus used by these ingenious artist-workmen are of the very simplest and most primitive sort, consisting mainly of turning spindles, and reels, and other small implements. A lathe set in motion by a bowstring is common, with chisels and spatulas to work and mark the clay. But it is with his simple and flexible finger-ends that he chiefly works, and guided by his instinctive knowledge of *form* and *proportion*, and with an ever-conscious knowledge of the *use* to which the object he is moulding is to be put, that the final result is accomplished.

Thus, the materials in use, the tools employed in the work, the *modus operandi*, and the way of life of those who execute it, are all quite new to us, and are altogether different from such things here. Might not the vast organisation at work in the great French Exhibition do something towards making us better acquainted with it? All know what that grand display in the main consists of, and that all that modern appliances, and mechanical helps, and new materials, and short roads to given results, find in it ample illustration, and not a little public notice; but the art of the *workman, as an artist*, is it not lost sight of in the general blending together of every man's work when working as part of a machine?

THE NEW UNIVERSITY BUILDING OF STRASBURG.

The *Imperial Gazette* of Germany publishes the result of the competition for the prizes awarded to the best designs for the above edifice. The first prize was awarded to the design by Herr Warth, architect, of Carlsruhe; the second to Eggert, of Strasburg; the third to the firm of Hossfeld & Hinkeldeyn, of Berlin; the fourth to Mylius & Bluntschli, of Frankfort-on-the-Maine; and the fifth to O. Sommer, also of the last-mentioned city. There were considerably over 100 designs sent in, and they will all be exhibited in Berlin at the end of the present month. The sum which the Prussian Government contemplates spending on the erection of the new University buildings slightly exceeds 500,000*l*.

Finds in the City.—Advantage is being taken of the pulling down of some old buildings belonging to the Corporation of the City of London and the Stationers' Company, in Wood-street, to widen that street on the south side of Gresham-street, and the Corporation site has been leased for eighty years at an annual ground-rent of 2,500*l*., to D. Dewar, Son, & Sons (Limited). It may be interesting to note that the buildings taken down formed remnants of the old Wood-street Compter Prison, which was rebuilt in 1535. During the recent excavations several objects of interest have been discovered, viz., the old prison gates (embedded in a wall); some old pottery of Roman, Samian, and old English ware, Early English smoking-pipes, silver coins, a pair of candlesticks, a silver salver, &c.

THE OPENING CONVERSAZIONE OF THE ARCHITECTURAL ASSOCIATION.

THE Architectural Association's opening *conversazione* for Session 1878-79 was held on Friday evening in last week, and must have been attended by at least 500 ladies and gentlemen. The large galleries were exceedingly crowded, notwithstanding the fact that the meeting-room and library of the Royal Institute of British Architects were, by the permission of the Council, allotted to the use of the Association for the evening. The Association continues to grow apace, numbering, as it does at the commencement of the session, 820 members, which number will be increased to more than 850 at the next meeting, when thirty-seven new members are to be elected. Two commendable innovations were made in the conduct of the proceedings,—firstly, the meeting-room of the Institute was set apart for the distribution of prizes, and for the subsequent speechmaking, leaving the large lower gallery unencumbered with the hundreds of chairs which in other years have impeded the free circulation of the company; and secondly, the refreshment department was not rendered tantalisingly inaccessible by being located amidst that crowded collection of samples and models of building materials and contrivances known as the Museum of Building Appliances, but was located in the Association's usual meeting-room. The Entertainments Sub-Committee, however, apparently wished to impress upon a large number of their guests that there is no such thing as unalloyed happiness in this world, not even at an architectural *conversazione*. At any rate, they certainly succeeded in effectually impressing this lesson upon the minds of a great many ladies and gentlemen. To be definite, the arrangements, or rather the absence of arrangements, in the gentlemen's cloak-room, were execrable, and ended in utter breakdown and confusion as the guests wanted to leave. The little room on the staircase, hardly larger than a rabbit-hutch or a band-box, which does duty as the cloak-room for the Institute, is totally inadequate to the requirements of so many visitors as attend the Association's *conversazione*. Things would not have been so bad had arrangements been made by the erection of a barrier and the stationing of the hall-porter or a policeman at the door of the cloak-room, so that people could have filed in at one side of the door, and, having got their hats and coats, could have filed out at the other side, in a continuous stream. As it was, there was a crowd of people trying to push in, blocking up the doorway, and impeding the exit of those who had miraculously managed to obtain their "lots." The battle was to the young and stalwart, and the elderly and diminutive had to wait as patiently as they could on the cold and draughty staircase,—a situation which, after the sweltering heat of the rooms, was eminently provocative of catarrh and bronchial affections. Some gentlemen had to wait for more than an hour, and when they did at length succeed in obtaining admission into the cloak-room, they had the utmost difficulty in procuring what belonged to them; for the Babel of voices and confusion of clothing that prevailed would beggar description. Hats, coats, and umbrellas were thrown over the heads of the crowd higgledy-piggledy, reaching their owners, perhaps, or else falling under foot. While the gentlemen were engaged in this undignified struggle, the ladies, who had accompanied some of them, were shivering in the hall, within sight and hearing of the proceedings. Altogether the scene was highly discreditable to those who were responsible for the arrangements, and we feel it to be our duty to say so. But to return to the *conversazione*. In the meeting-room of the Institute were hung the drawings of the successful competitors for the prizes offered by or through the Association, and in the lower galleries there was a large and interesting loan exhibition of cabinets, lent by Messrs. Trollope, Messrs. Gillows, and others; paperhangings, by Messrs. Jeffrey & Co.; a quantity of Japanese carved work, now being supplied by Messrs. Trollope for one of the Cunard steamers; a valuable and extensive collection of diamonds and other precious stones, lent by Mr. E. W. Streeter, of Bond-street; and a large number of water-colour and other drawings. The band of the Second Life Guards, under the direction of Mr. W. Winterbottom, was in attendance. Shortly after nine o'clock the formal proceedings of the evening were commenced by the distribution of prizes, the meeting-room of the Institute being more crowded than we have ever seen it.

Mr. Henry Louis Florence, A.R.I.B.A., president, took the chair, and distributed the prizes (which consisted of books to the value named) as follows:—

Essay Prize of two guineas and a half, for a *resumé* of "Vaulting" by M. Viollet-le-Duc: Awarded to Mr. R. E. Crossland. (Motto, "Arches on Arches.")

Architectural Union Company's Prize of 5*l.*, for the best series of measured drawings of existing buildings in England, or of portions of buildings, erected previously to the eighteenth century: Awarded to Mr. A. B. Plummer, for drawings of Waltham Abbey. (Motto, "Quis.")

Class of Design Prizes (three guineas and two guineas), for the best and second-best series of sketches contributed in the class during the past session: Awarded, First, to Mr. A. W. Hennings; Second, to Mr. J. W. Fisher, of Birmingham. (Honourable Mention of Mr. F. R. Farrow.)

Elementary Class of Design Prizes (two guineas and one guinea), for the best and second-best series of studies submitted during the Session: Awarded, First, to Mr. Burrows; Second, to Mr. Eden Smith, of Birmingham. (Honourable Mention of Messrs. R. G. Davis and H. C. Nixon.)

Class of Construction Prizes (two guineas and a half and one guinea and a half), for the best and second-best series of papers submitted at the meetings of the class: Awarded, First, to Mr. R. E. Crossland; Second to Mr. B. J. Capell. (Honourable Mention of Mr. F. R. Farrow.)

The President then delivered a brief address, in the course of which he said:—It must always be remembered that this is purely a students' society,—that its entire aim and object is educational, and that while ever on the watch for opportunities of aiding and assisting the progress of the student in the earlier stages of his career, the care of all questions relating to professional practice, and the task of maintaining the dignity and independence of the profession, are left to the older and more powerful body, the Royal Institute of British Architects. As, however, the Institute is very largely recruited from the Association, the interests of the two societies are the same. Both labour for the same object,—the advancement of our art, and with this end in view, we are enabled to carry on our work without rivalry, and with a mutual freedom and esteem, conducive to the best interests of each. To any one outside the profession, it must appear strange that a society numbering more than 800 members should exist solely for the purposes of education, and that this work, more or less complete in its character, should be carried on without any approach to academical teaching or system. To a foreigner or stranger visiting our classes, the absence of any teacher, paid or unpaid, would be simply marvellous. And when we consider that we carry on with success no fewer than six separate classes; that we have established a lending library of two thousand volumes (the only one in the profession); that we issue a yearly volume of the "Sketch-book" and organise an annual sketching excursion of a week's duration; besides the amount of work done in the preparation of papers, lectures, visits to buildings, class and prize drawings, &c., I think we may say we are doing a good and necessary work. Our influence even extends into the provinces, and, as forerunners of recent politics, we have instituted a protectorate over the important Birmingham Architectural Association, by which means the members of that body are enabled to avail themselves of our classes and our library, and with such good results that some of their members are among our prize-winners. During the past year we have not merely maintained, but advanced, our position. Firstly, in the important matter of numbers, no fewer than 106 new students have joined the Association, and we have at the present time a strength of 820 members. The classes have all been carried on successfully, especially the Elementary Class of Design and the Class of Construction,—two of the most valuable which we possess. Others which have not so well responded to our expectations will probably during the session (owing to new arrangements) obtain a larger share of support. But upon all the points connected with the internal organisation of the Association, I reserve my remarks until my opening address on the 8th of November. It will be seen on looking at our syllabus* for the new session how many and how varied are the subjects which an architect is called upon to study, and a certain proficiency in each is indispensable to him in practice. He may almost be said to be like Cerberus, three gentlemen at once. He has to be the builder or man of science, the man of business, and an artist. It may, then, be fairly asked if it is found that the education here imparted is sufficient for this end, and to this I must frankly answer, it is not. This or a kindred society is an excellent adjunct to the every-day training of an architect's office, where the pupil sees for himself the ever-varying difficulties of practice and the method of conducting business, but is left with but little help in the more scientific and artistic branches where he has no special inducement for application to work, and no spur of emulation. Here the Association steps in, offers him companionship, gives opportunities for mutual study, tests him by comparing his work with that of others, enlarges his ideas and mind by continual exercise in design and construction, and thus far is invaluable. But surely the training of the architect should not be carried on in this imperfect sort of way! He whose work is to affect the life, customs, and tastes of his own and of future generations should not be left, if he wishes for instruction, to the help of his fellow-students alone; and further, when he, by unwearied work and patience, has attained a degree of knowledge and skill sufficient to warrant him to assume the title of architect, should he not be protected from those who take an equal rank and title with him, not in virtue of their knowledge, art, or skill, but by the easy process of inscribing it upon a brass plate? Can we suppose that the public, carefully sensitive as to the qualifications of the physician, or the lawyer, will not expect some equal sign of distinction from the young architect?—the more so as technical knowledge is becoming more generally diffused, and subjects directly concerning our art are now studied in the universities and higher schools. I do not by this advocate the granting of a diploma; the existing machinery of Fellows and Associates of the Institute is sufficient for the purpose. But let it be indeed the fact that the Institute comprises the entire strength and talent of the profession, and let the title of "Associate" only be gained as the result of examination. The Institute will then be national instead of local, the demand for the training necessary for its examination will lead to efforts being made for its supply; and it will then attract to itself all those who desire the right to call themselves architects. If in these few remarks I have dwelt more upon the future than upon the past, it is because I look forward with confidence to a revival of interest in architecture. None can have failed to perceive the new impulse given to the cultivation of the arts accessorial to architecture, and the far greater consistency and harmony between the interiors and exteriors of our houses. Far from being discouraged by the criticism which our architects have undergone from sundry self-sufficient and self-admiring critics, I regard it as a healthy symptom that such criticisms are read and examined, not only by those whom they directly concern, but by the general press and the public. The year now drawing to its close has witnessed another international exhibition of the arts of peace, and also more than one conference. More modest than that of Berlin, the Congress of Architects assembled in Paris (which I had the honour of attending as representing this Association) concerned itself solely with international affairs,—to questions relating to the condition of our art, and to endeavours to promote an international feeling of sympathy and unity among its professors. As, however, our delegate, Mr. R. Phené Spiers, will, during the session, read a paper upon the proceedings of this Congress, I will not detain you by further allusion to it. A biennial Conference of Architects was also held in London, which attracted a large number of our provincial brethren, the importance and extent of whose work is not, perhaps, sufficiently recognised in London. Beyond this, it cannot be said to have had any very distinctive character, and it may perhaps be suggested that an interval of five years between these conferences would be found preferable to one of two years. Entering upon a new session with enlarged means, and an earnest desire to increase the efficiency of the Association, we feel sure that the goodwill of our friends will attend us in our efforts, and we count upon their aid and encouragement so long as we endeavour to carry out the spirit of the motto under which we work, to "Design with Beauty" and to "Build in Truth."

Mr. J. Douglass Mathews, past president, having said a few words expressive of his pleasure in the prosperity of the Association,

Mr. Thomas Blashill, another past president, remarked upon the great increase of membership with satisfaction, although he observed with regret that the prize-winners were fewer in

* Published in the *Builder*, p. 1104, *ante*.

number than usual. This was a somewhat remarkable conjunction of circumstances. He happened this year to be one of the judges for the Essay prize, and he was extremely surprised and sorry to find that there was only one competitor for it, although it was true that the essay sent in would probably have taken the prize among a large number. He thought that the apparent dearth of interest taken in some of the competitions was due to the over-diffidence or bashfulness of the members, but they ought not to be deterred from competing by such a consideration, but ought to feel that on becoming members of the Association they were equals in the race, and that they were thoroughly welcome to the brotherhood and fellowship of the Association. In conclusion, Mr. Blashill congratulated Mr. Florence on the position he had attained as President, after many years of diligent attendance and hard work in promoting the welfare of the Association.

Mr. R. Phené Spiers made a few remarks, joining issue with the deprecatory remarks made by Mr. Blashill.

Professor Kerr, in response to a call from the Chair, said he observed with interest that the complaint made by Mr. Blashill as to the difficulty of inducing the members to compete for the Essay prize was precisely the same complaint made by the Institute. He certainly did think that it would be well for young architects if they would cultivate the use of the pen as well as the pencil. Of course, he knew that the great reason to be assigned for their backwardness with the use of the pen was that they were so very much occupied in the more important study of drawing. Every time he visited the Association he had reason to be more than satisfied with the progress of draughtsmanship exhibited in the drawings hung up. He thought that the draughtsmanship of the young architects of England in the present day was something upon which they deserved to be congratulated most sincerely, and encouraged in to the utmost. Before sitting down he would endeavour to say a few words which he hoped might encourage the younger men of the Association to take correct views of their functions as architectural students, and more particularly with reference to that which would always be their favourite study, viz., drawing. There were two great schools of living architecture in Europe at the present moment, and these two schools of art corresponded very closely with the division of races in the civilisation of the world. There was a very marked distinction between the art of the Latin races and the art of the Teutonic races. Latin art was represented admirably by the French and Italians; Teutonic art was represented equally admirably by the English, and, following them in merit, by the Germans. There was an essential distinction of genius between the two races, which was shown in everything. In their architecture the French genius evinced extreme refinement, delicacy, neatness, and universal *finesse;* the English genius, on the other hand, showed itself in energy, earnestness, masculinity, and vigour. It was not necessary to suppose that on either side of the line the whole of the qualifications of the other side were absent, but the line of demarcation was nevertheless perfectly clear. Now French draughtsmanship was essentially and most notably of a delicate, refined order as compared with English draughtsmanship, which was muscular, vigorous, and earnest rather than refined or delicate, or even elegant. In other words, the characteristics of the draughtsmanship passed into the executed design, proving that the study of drawing was, in fact, the study of architecture. The acquisition of the power of draughtsmanship was not only the acquisition of the language of architecture, but, when practised by the hand of a master, it told him what to design. By way of educing a moral from this, he would say that in architecture, as in everything else, increasing refinement was the order of the age, and the suggestion he had to make was that our young men should endeavour to introduce into their style of draughtsmanship,—and then it would be introduced presently into their style of artistic composition,—a little more of that elegance and *finesse* so characteristic of the French, without dropping any of their own native muscularity. Not ceasing to be earnest, energetic, and vigorous, they should endeavour, as far as they could, to employ those finer qualities of elegance and piquancy, so as to avoid, further than they at present avoided, the tendency to be somewhat clumsy and coarse in design, at the same time not becoming too finicking and effeminate. He should be pleased if at any future time he saw occasion to think that these remarks had tended towards the advancement in refinement which was so essential in the architectural world at the present day. With regard to the Queen Anne style, the present circumstances of that style illustrated exactly what he had been endeavouring to point out. The name of "Queen Anne" was as good as any other: it suggested nothing in particular. The style which was practised at the present moment, and which was becoming increasingly fashionable, was in reality Classic architecture, for the sake of a change, developed under those principles of the picturesque which were the essence of our recent Gothic practice. Why, then, had they chosen that peculiar style? He said for the sake of a change, but he was beginning to think that they would not attain to the more refined Classic of the French. They had to avoid in the present fashion mere quaintness and frivolity. There was a good deal of the latter, but that was not the end and object of architecture. Comicality was not at all in its place on the architect's drawing-board or in architectural illustrations; but there was a good deal of architectural design published nowadays which was absolutely comical, and would be laughed at in the course of a few years. Let architects be sober in their design, and one way of testing whether a drawing was sober or not was to let it be made so as to represent the building as the building would be when it was built, eschewing all those tricks and peculiarities of draughtsmanship which were so charming in a picture or an etching; then, if the building were bad in design, it would appear bad in the drawing. A great deal of bad architectural work at the present time was to be attributed to nothing more than the self-deception of the designer by his draughtsmanship.

Mr. James Fowler, of Louth, said a few words as to the advantages gained by those who took part in the annual excursions of the Association, and expressed a hope that in future years arrangements might be made to increase the number of excursionists.

POISONOUS AND NON-POISONOUS PAINTS AND WALL-PAPERS.*

Until the autumn of last year, I was unable to form any accurate idea of the frequency of cases of severe illness occasioned by poisonous paints and wall-papers. I had, it is true, within my own professional experience, known of several fearful outbreaks of lead-poisoning among the workpeople employed in white-lead works, and among painters and others working in an atmosphere heavily laden with the saturnine vapours given off in the process of applying such paint or during its drying. I had also been consulted in a great many instances respecting wall-papers which were suspected of being coloured with arsenic, in consequence of illnesses of the type recognised as arising from these sources. But, when I was requested by Mr. Jabez Hogg, the well-known surgeon and microscopist, to furnish some particulars of the more striking cases I had investigated, to be laid before Government, I was astonished to find that during the last eleven years I have traced back no less than one hundred and twenty-three cases of illness attributable either to the diffusion of carbonate of lead (common white paint) or to arsenical or antimonial colouring matters in paint or on wall-papers. Others have been working in the same field of observation, and of those who have witnessed the danger of permitting the use of poisonous pigments and wall-papers, I could mention the testimony of eminent medical men, analytical chemists, and others who have recently protested against the employment of such deleterious substances.

Perhaps less trouble will be found in procuring an absolute prohibition against the use of arsenical pigments, than we can hope to obtain by Parliamentary enactment against other poisonous paints. But this should only render the necessity the more apparent that the widest possible publicity should be given to the direful effects of all domestic poisons, and also to point out how they can be avoided.

Supposing arsenic to be abolished from all dress fabrics, curtains, and paper-hangings, it will only require one more step in advance to banish salts of copper, lead, and antimony from the matters with which these materials are dyed or coloured.

We have still the Schweinfurth green paint, almost universally applied to the ordinary green Venetian blinds, which dries in the sun, until clouds of arsenical dust are thrown off every time the blinds are sharply pulled up or let down. And we have, worse than all, the poisonous white-lead pigment, which has more to answer for in the total category of ailments which afflict civilised humanity than has ever yet been appreciated.

In previous papers I have quoted the dismal train of painful symptoms induced by being subjected to an atmosphere impregnated with the emanations from carbonate of lead. I have given the reports of the medical officers of some of our largest Government dockyards, and I have adduced official testimony as to the deadly nature of the injury to constitution which follows upon a lengthened exposure to this pernicious influence. I will now suggest that for the interior of dwellings, no more white-lead shall be used as the basis of oil paint.

The only substitute for white-lead until lately offered has been zinc oxide. Many technical objections have been taken to its use. Among the rest, its want of body and poverty of covering have rendered the oxide of zinc white expensive in requiring several more coats to be laid on than are necessary with white-lead paint. The fine brilliant white and unchangeable permanence of this preparation, together with the non-poisonous character it has borne, have conduced to procure for it a good reputation, notwithstanding the expense of its application, and other defects. The same difficulty has been found in attempting to work up some of the beautiful chemical combinations of silicic acid with zinc, calcium and magnesium, which have also the pearly whiteness of zinc oxide, and with an even more decided want of opacity when mixed with a sufficiency of oil. I must here mention a peculiarity in the paint, formed by grinding white-lead in oil, which affords the first temptation to its most detrimental use. I allude to the fact, not so well known as it ought to be, that carbonate of lead always contains a certain proportion of lead oxide. This forms a true soap with the oil combining with the latter, and giving for a considerable period a fictitious body which makes it appear to completely cover a larger surface than it is really competent to effect.

Now, soap is not formed without a partial hydration of the oil, and a small increment of the element of water thus worked up with the paint, emulsifying another portion of the oil in which the lead carbonate is ground. How long it takes to work out of the paint and to evaporate when thinly spread on hard surfaces, has not yet been ascertained; but for a long time after the paint has become apparently dry, this process undoubtedly continues. As affording some indication by which to judge when this drying-out has terminated, I may remark that by the time the oleic acid has driven out its equivalent of the carbonic acid from the lead carbonate, and re-combined as oleate of lead, there is no longer that density of covering body, and the coating becomes so much thinner and less opaque as to allow whatever was underneath to dimly appear through it. During this giving off of matter which impregnates the surrounding air, we have a right to assume by experience that an injurious influence is exercised on the health of those affected by it.

Working with a view to produce a substitute which shall be harmless in its preparation, application, and throughout its use, several chemists of repute have pushed forward their experiments with other salts of zinc. It was left, however, to Mr. Thomas Griffiths, of the Silicate Paint Company, Liverpool, to bring out a satisfactory commercial article, which, while it obviates all the objections urged against oxide of zinc paint by the painters and decorators, complies with the sanitary condition of being perfectly free from poisonous effects upon the workmen who prepare it, the painters who apply it, and upon the people who reside where it is used.

I have reason to believe that other persons have thought of pure sulphide of zinc as being probably the best suited to form the dense white basis of our domestic oil paints. But the natural sulphide of zinc (blend) is commonly rather translucent and various in colour, from a dingy white to a stone-colour, shading off to a reddish-brown, sometimes appearing opaque

* From a paper by Dr. H. C. Bartlett, read at the Cheltenham Congress of the Social Science Association.

with yellow, green, or black tinges—not very encouraging to the paint manufacturer. The excellence of the chemically-pure white sulphide, however, induced a lengthened series of experiments to be tried to carry out artificially the chemical process of making zinc sulphide of the purest white, and, as I shall explain, with almost unexpected success.

My investigation of zinc sulphide, or rather of the oxy-sulphide, to render the nomenclature more accurate, has been mainly undertaken with sanitary objects in view. I find that its physiological effect upon animal and vegetable tissues is decidedly antiseptic. It has, therefore, a highly preservative action in protecting wood, &c., from decay, and it unites with the fibres with which it comes in contact, forming permanent bodies with them.

The peculiarly small affinity which zinc has for combining with carbonic acid prevents, to a great extent, the formation of carbonates, and also arrests the saponification of the oil long before the reactions I have described as occurring with carbonate of lead can take place. This is an invaluable property in its application to iron and other metals. . . . .

In suggesting that white-lead paints should be banished from the category of those permissible for use in the interior of our dwellings, I have thought I should do more to accomplish that most desirous result by describing the new zinc paint, than by harrowing the feelings in the endeavour to adequately represent the nature of the evils attendant upon the paints now in vogue.

I have only to add, that Griffiths's patent white is at least as economical as lead, is as dense, and covers even a larger surface; and being of a more perfect snow-white than any lead pigment, it will remain for years unchanged in colour. No fear need now be entertained of severe illness from a newly-painted house. No need to postpone the evil day when the painters take possession of our domiciles, on the ground that some one of the family is very susceptible for a long time to the bad influence of paint.

No occasion can be made to attach an undue importance to a comparatively new invention. But if a few thousand painters and paint-grinders can be saved from the tortures inflicted by the use of white-lead, and a few more thousands are prevented from experiencing the lesser nausea and other recognisable consequences of breathing a lead-laden atmosphere, oxy-sulphide of zinc will not have been introduced as a domestic paint in vain.

WILHELMSHAVEN.

Now that the extensive harbour works at this greatest of German naval establishments have been completed, we are enabled to take a general view of them. The details supplied are highly interesting. The harbour is a so-called tidal one. Ships entering it have to pass through a first sluice into an outer harbour, 650 ft. long and 390 ft. wide, and next, through a second sluice, into a canal nearly 3,500 ft. long, which leads to the war harbour proper. At the head of the latter are three dry-docks and two slips. This harbour is a little over 1,300 ft. long, and rather more than half that width. Its sides are built of clinkers, and faced with ashlar; the walls, besides having to resist the usual lateral pressure, are made strong enough for supporting powerful turn-stile cranes. One of its longest sides is not provided with a stone quay, but, like the canal, has only a batter of stone above water-level, to facilitate a future extension of the harbour. The depth of water in all the basins is 36 ft.; consequently, they are all available for the largest ships. The docks have an upper average breadth of 26 ft., and are 466 ft. long, so that they may be used for the most ponderous iron-clads yet constructed. They are closed by means of iron pontoons.

At the present moment works are proceeding on the south side of the canal, for new mercantile docks. These will be connected with the war harbour, and thus a second outlet will be provided for the latter. The naval yards and depôts lie around the war harbour. As far as the fortications on the land side and the coast defences are concerned, there is no *enceinte*. Three detached forts, placed at such a distance from the war harbour as to protect it against a bombardment, close the ground on the land side. All the works are very spacious, well equipped, and support each other in a most efficient manner. Besides this front of fortifications facing inland, at present almost completed, there are coast defences protecting the town of Wilhelmshaven in an eastern and north-eastern direction. All the works are connected by telegraph with the central station; there are also observatories along the coast, used for announcing the approach of hostile vessels, which may be blown up by torpedoes fired from the land at the moment vessels are over them, their exact position being indicated by means of Siemens and Halske's instruments for measuring distances.

Leaving out of the question the fact that, considering the precarious state of German trade and industry for the last few years, the treasure lavished on the above and other works might have been more beneficially employed elsewhere, if not entirely saved to the over-burdened taxpayer, it is generally admitted that the large sums required for the gigantic works now completed have been well laid out. The Germans consider that they have here one of the finest naval stations in the world.

THE BRITISH WORKMAN AND HIS RIVALS.

The article on the Lancashire Cotton strike in the last number of the *Quarterly Review* is a patient chronicle of serious and menacing facts. We pointed out at the time of the strike, that the true need of both parties, but especially of the working people, was accurate knowledge of the state of the cotton business, both as to production, cost of production, and consumption, in the great factories and markets of the world. This has been supplied more fully by the writer of the paper in question than by any one who has yet taken up the pen in this country. It would be mischievous to disguise, and hard to exaggerate, the importance of the statistical returns which he has brought together. For the spinners, weavers, and other working men of England the information is of the utmost moment. It is far more to them than is the price of corn, or the ruling rate of wages, this year or the next. It shows what is the actual movement of the cotton trade, and how that movement is being diverted from Lancashire by the efficient agency of short time and uncertainty as to the supply of labour. And it is full of menace for the future, unless we retrace our steps in these matters.

From 1840 to 1870 the consumption of cotton in Great Britain, the Continent of Europe, and the United States advanced with signal rapidity. The consumption, in thousands of bales, was as follows:—

	1842.	1852.	1860.	1870.
Great Britain	1,372	1,877	2,635	2,760
Continent of Europe	816	1,158	1,776	1,772
United States	376	684	843	928

It may aid the reader to understand this great issue more fully if we represent the above figures proportionately, as in the following table:—

	1842.	1852.	1860.	1870.
Great Britain.....	4·2	5·7	8·0	8·5
Continent of Europe	2·5	3·5	5·4	5·4
United States.....	1·0	2·0	2·6	2·9
Total.....	7·7	11·2	16·0	16·8

For the first twenty years the consumption more than doubled, the advance being slightly more rapid abroad than at home; in the third decade the advance was comparatively trifling, But from 1870 to 1871 there was a leap to 3,132,000 bales in Great Britain, 2,327,000 on the Continent, and 1,140,000 in the United States, or to 9·3, 7·1, and 3·5, or to 19·9 in all; hard upon three times the consumption of 1842. Here, however, the British consumption halted. The ups and downs are within 200,000 bales a year, allowing a maximum of 3,335,000 in 1873, sinking to a minimum of 3,017,000 in 1876, and reaching, in 1877, 3,149,000, or 73,000 less than in 1871. The consumption of the Continent followed a very similar course, amounting in 1877 to 2,283,000 against the 2,327,000 of 1871. But the United States consumption, though sinking to 1,067,000 in 1872, then rose, with one exception, year by year, being 1,439,000 in 1877. To these have to be added, for that year, 237,000 bales for India, which in 1860 took only 6·5. This makes the total consumption for 1877 amount to 7,108,000 bales, or 21·8 compared with 7·7 in 1842. And while the share of Great Britain has advanced from 4·2 to 9·6, that of the United States has advanced from 1 to 4·4, that is to say, the progress of America has been just double as fast as our own.

The competition of the United States is thus assuming a serious importance. They now actually export a certain class of goods into England. Their imports of cotton goods have declined from 227,000,000 yards in 1860 to 61,000,000 yards in 1877, while their exports have increased from 480,000*l.* of value in 1872 to 2,132,000*l.* in 1877. India is making strides that are no less significant. The consumption of cotton has increased from 65,000 bales in 1871, to 237,000 in 1877, and the exports from India of Indian-made cotton goods have risen from 8,048,939 yards in 1870 to 15,544,168 in 1876-7. The exports of Indian-made yarns have increased, in the same time, from 1,200,958 lb. to 7,926,710 lb., or nearly sevenfold. As to this, it is remarkable that while the total export of English cotton goods in 1877 was between four-and-a-half and five times the amount in 1840, the export of yarns had not quite doubled in that time.

The upshot of a mass of detail which the cotton-workers of England will do well to study, is that our export of cotton no longer grows at its former rate. Thus, other countries are making more rapid strides than is the case with ourselves. And thus both the United States and India, from being customers for our goods, are becoming competitive manufacturers and exporters, meeting us in the supply of neutral markets. The convenient mode of throwing the blame on our manufacturers for "overproduction" is unsupported by the facts, which show that we are losing our markets by excessive cost of production, caused mainly by the reduction of the hours of work.

The figures cited prove that the British cotton trade has been stationary for seven years, during which the consumption of the Continent and of the United States has increased by half a million of bales, or by 12½ per cent. in annual amount. The expedient of short time only means "hold back till all the stock in hand is sold, and then purchasers will be found to come forward, and you can go on as before." But England cannot go on as before while her sons are content to work 56 hours against 60 or 70 or 80 hours on the part of the foreign workmen. England will not force a market by holding back her supplies so long as the American manufacturer can obtain labour at 30 per cent. less cost than the English manufacturer. What will be the case with the Indian manufacturer who has raw material at hand, market at hand, and labour at one-sixteenth of the English price (per man that is), when he applies, as he is daily doing, English machinery, and, if needed, English capital, is but too certain. It is the case, we are proud to believe, that the English workman has a physique and a mental vigour which will enable him to give great odds to most of his competitors. But we must remember what terrible odds the hare could afford to give the tortoise. Yet the tortoise won. And we do not consider that the English workman can afford unnecessary odds, as against either the American, the Frenchman, the Belgian, or the Indian. The cotton operative may learn a most instructive lesson from the price at which the East Indian Railway works its great and increasing traffic. With Indian coal, and with, to a great extent, Indian labour, it works at from 40 to 50 per cent. less cost than the best English railways. What is done under our very eyes in the case of a railway, which demands labour of a very high class, can be done, there is no possible question, in the matter of textile manufactures, which take labour of a much less skilled order. For every day that the English workman waits, or strikes, or works short time, he is giving a start in the race to rivals who are much closer on his heels than he imagines; and who, in a few years more, will tax his most strenuous exertions, for the whole time formerly devoted to daily labour, to compete with them on a fair field.

Mr. John Buik, the contractor for the widening and deepening of St. Andrew's Harbour, was killed a few days ago on the new line between Leuchars Junction and the Tay Bridge. The deceased had left St. Andrew's by the 1.25 train, and on arriving at Leuchars had set out along the line with the intention of proceeding to Dundee. While doing so he was run down by a passing train, and killed instantly.

ON THE FUTURE OF ENGLISH ART.

Having, in my letter of last Saturday (p. 1117), glanced at some of the anomalies existing in English notions upon art, I will now endeavour to give some systematic exposition of what is really needed in this country to turn its wealth and resources to account in the true interests of the fine arts. In the first place, then, we require the properly-constituted sense of vision; in the second, an intelligent policy of encouragement; and, thirdly, a properly-organised system of art-education.

1. *The properly-constituted Sense of Vision.*—As we find in some individuals and in some races a constitution of the perceptive faculties more favourable to good taste than in others, it must be clear that our efforts to correct either individual or national deficiency of tasteful perception must be directed to promote that development, that organisation, that sensuous constitution, possessed by the more favoured individual and race; and that any system of art-education which leaves this radical defect uncorrected will be but superficial and ineffective "cramming." An education must, therefore, be devised which will attack this radical defect if we ever hope to have a public with properly-constituted senses,—senses fitted to appreciate excellence in art. But the most favourable constitution of the sense of vision in the interests of art must clearly be that which would exist in a perfectly-developed human being. Our educational efforts should, therefore, be primarily directed to the discovery of such a system of general education as would develope the human constitution towards perfectness. If there be such a system propounded, we should immediately adopt it. From this our first need, then, we pass to the second.

2. *An Intelligent Policy of Art Encouragement.*—That we have not one, is doubtless consequent on the national defect to which we have just alluded, a defective culture, a defective organisation, an imperfect constitution of the perceptive faculties. For in Greece and in Italy the tasteful predilections of the ruling classes moved art and artists. This has always been the true motor to great art-achievement. They did not, as we do, leave artists to make themselves if they can, and to chance occupation. The ruling classes felt that art was one of the great glories of a nation, and that art is one of the most lasting monuments and best evidences of a people's place in the scale of civilisation; for we never find a grand demonstration of art, but one of a more or less imperfect kind, during a people's progress to intellectual completeness. History teaches us that a refined taste grows up with intellectual progress. Art does not produce refinement, but comes of refinement, though upside-down theorists would endeavour to teach the reverse. The advanced intellects in antiquity and in the Middle Ages, therefore, opened out grand fields of employment for the painter and the sculptor upon grand national and monumental edifices. They called forth all the genius of the artist to meet the greatness of the occasion.

The magnitude of the works on which the artist of old times was employed compelled him to seek aid in carrying out these great works, and thus the most effective system of art-training was inaugurated,—the system of scholarships and the private *atelier*. But on this point we will presently enlarge. Our present system of manufacturing artists by hundreds and by thousands, without having any special demand for them, is socially and professionally mischievous. A policy of national encouragement on a grand scale is that mainspring needed to put all branches of the fine arts in this country into gear and working order. All our boasted art-development is the production of an army of copyists, who are employed in reproducing the works of the ancients and of a nearer past. We are now more immediately referring to decorative art. Of any national aim in art and in the art-manufactures there is not the slightest evidence. Whim courses through all the differentiations of style from Greek to Chinese. There is at the present time much less evidence of a concentric aim than there was three quarters of a century since.

3. *A properly-organised System of Art Education.*—The most extraordinary feature in our English art arrangements is the diffusion of our forces and the scattering of our art-treasures. It would seem natural that the Royal Academy, which had had the art-teaching of the country in its hands for three-quarters of a century, should retain its headship and continue in command, instead of which a Government Art Department was instituted, having rival interests and clashing with it. And as regards the scattering of ancient art examples, we have our modern masters at South Kensington, our old masters at the National Gallery, and our ancient sculpture at the British Museum. The Royal Academy was compelled to remove its exhibitions and its schools from their proximity to the National Gallery, which contained those treasures which it is the fashion to consider so all-important to the education of the art-student. And the collections of the National Gallery and of the British Museum, which, consistently with English views on art-education, ought to be our chief art-training schools, have, from the time of their institution until now, had no professors appointed to them to direct the students' studies. There is an inconsistency about all we do in these matters.

Whether, under its new president, the Royal Academy will be able to re-assert its claim to dominate the art-education of the country, remains to be seen. It would appear to me that the functions of South Kensington ought to be restricted to preparing art-teachers for colleges and schools, to the supervision of art-training with reference to its place in general education, whilst art, pictorial, sculptural, and architectural, should be the province of the Academy. The provincial art-schools of the Department should be mitigated in their art-pretensions, and converted into science and art schools, where science and art of an elementary character should be taught at moderate fees, and where popular lectures should be periodically delivered.

One of the first reforms which the Royal Academy should effect in its own educational arrangements, if it desire to have a more important influence upon the arts of the country, would be the establishment of Schools of Composition. Three large rooms might be set apart for this purpose, each under the direction of an Academician, *en permanence*. Into these, students of a certain standing might be admitted to carry out their early works. They should be admitted on their own free choice, and with the concurrence of the director of the class. This would be a first and important step towards the establishment of the private *atelier*,—an institution which is at the root of French excellence in the arts and in the art-manufactures. The *atelier* is the modern substitute for the ancient system,—that system of scholarship which was necessitated by the demand for great mural works. It is only by the enlistment of men educated for the higher departments of art in the service of the manufactures that decorative art will take a high place. It was so in Italy; it is so in France; and, if we desire to make our mark, it must be so in England.

We hear a great deal of Wedgwood, but it was not Wedgwood himself who endowed his wares with excellence, but the great artists whom he employed. To Wedgwood only belongs the merit of foresight and business tact,—the wit to perceive that his wares would only become famous by employing first-rate talent in their production. Wedgwood was but to Etruria what Boulton was to Soho,—the business factor, not the genius. But the manufacturer of the present day has not Wedgwood and Boulton's courage and foresight to venture upon the cost of first-rate talent. He makes shift with journeyman ability, and the reproduction of copies. There is, consequently, no progress. The same old things are continually being turned out, and they remain behind when they might go in and win by several lengths.

There is a fourth point which I omitted to mention, and which deserves serious consideration, and that is a reform in the tone and character of our art literature, our art criticism. It is too loose, whimsical, and illogical. It is therefore, demoralising rather than bracing and inspiriting to high endeavours. It is destitute of logical force, and therefore of strength and manliness. It too often impresses one as the effusion of dyspeptic taste. Art discussion ought to be carried on with as much temper and circumspection as argument upon scientific questions. If art is to be founded on unreason, it were better that we had no art. How can that have any claim to be called "divine" which is conformed to nonsensical rhapsody? "Order is Heaven's first law," and no art which is not founded and established in wisdom can ever be excellent and enduring. The stump oratory of amateurs ought to be suppressed. Why should anybody without qualification by long study, be permitted to discourse nonsense upon art any more than upon any other professional topic, especially in England, where there is such crass ignorance upon all that relates to it? Is it for this reason that we hold out the premium of academicianship to foreigners who will come and settle here? There is a provision for foreign talent as "Foreign Members," there is liberty of exhibition, &c. Why, then, should there be a malversation of trust in electing foreigners who have not been trained in our schools, and when the number of members and associates has been considered too small for home needs? What the verdict of all reasonable patriots and of the future will be on this point there cannot be a shadow of a doubt.

Meter.

LONDON WATER-SUPPLY.

The magnitude of the extra responsibilities that would devolve upon the Metropolitan Board of Works in taking over the property of the water companies may be inferred, in part, from some of the figures in the report of Colonel Frank Bolton, water examiner under the Metropolis Water Act of 1871. At present, the eight metropolitan companies give an average daily supply of 137,389,525 gallons; they serve 549,267 houses, and a population of 3,924,837 persons; they have storage reservoirs for 130,687,000 gallons of filtered water in covered reservoirs; they have 128 pumping-engines, with an aggregate of 14,461-horse power; they have 3,165¼ miles of main pipes, 716 miles constantly charged, and 4,653 hydrants; and they have 79 acres of filter-beds.

Colonel Bolton reports favourably as to the diligence shown by the companies to improve their works and the quality of the water supplied. The Southwark and Vauxhall and Grand Junction Companies have arranged for the construction of suitable storage reservoirs and other works at Hampton. The New River Company are progressing with the sinking of a well at Turnford, and are constructing new works at Hornsey, that include five filter-beds, with a united area of 3½ acres; the company have put down four powerful new engines, and have constructed a high-service reservoir on Crouch-hill. They have also laid about 13 miles of large mains for communication with the works referred to, and for connexions with the existing pipes. The East London Company have already provided constant supply in a large part of their district, the whole of which is being brought under constant service as quickly as is consistent with a regular and increasing supply. The company have commenced the construction of additional filters at Lea Bridge of about four acres of filtering area, and the erection of a pair of compound engines of 100-horse power each, and are also laying enlarged and additional mains with the object of giving a better supply to their rapidly increasing district east of the Lea. A new high-service tank at Buckhurst Hill will be ready for use in the course of a few weeks. The West Middlesex Company, which already gives constant supply to a number of houses on the application of the owners, requires the proprietors of all new estates and buildings to take constant supply as required under the Metropolis Water Act and Regulations, and, accordingly, the whole of the Queen's Park estate in the Harrow-road, South Kensington, and Earl's Court estates, are under such constant supply. When all new services are laid down constant supply is made compulsory by the company. Colonel Bolton reports favourably also on the works of the Grand Junction and Lambeth Companies, and states that the Kent, New River, East London, West Middlesex, Lambeth, and Chelsea companies, are all moving actively in the matter of extending constant supply. Attention is directed by the Examiner to the Regulation 14 of 1872 relative to waste-pipes. He makes the important note on the regulation,—"The object of the regulation is to prevent waste of water, but if the overflow-pipe is brought outside the house and the end left exposed to the air, instead of being carried into the drain as is often the case, it will effect an object of far greater importance by getting rid of the poisonous effluvia and gases from the drains which would otherwise ascend through the pipe, and not only be partly absorbed by the water in the cistern but be partly mixed with the air in the houses, thereby becoming a cause of fever and disease." The Examiner holds

that Government supervision tends materially to the effectual filtration and delivery of good water by the companies, but he judiciously adds that the quality of the water frequently deteriorates after its delivery by the companies in consequence of the connexion of the house-drains and water-pipes, and the foul condition of the cisterns. To these local circumstances and faults Col. Bolton wisely directs attention.

It may be presumed that Colonel Bolton does not include chemical impurities in his report on the "appearance of water." Last month, it may be noticed, his report contains for each day of the thirty, and for each of the eight companies, the letter "C," indicating "clear." There is not even a single entry "S. T.," or "slightly turbid." The Lambeth Company's water is credited with "C" in each of the thirty columns, and the margin has the note concerning the daily samples "clear, bright, and effectually filtered." Turning to Professor Frankland's report for the same month, we find him saying that "the water abstracted from the Thames by five out of the eight companies supplying the inner circle, was again of inferior quality, and that delivered by the Lambeth Company was turbid and yellow, and containing moving organisms." "Who shall decide when doctors disagree?"

GREAT SALE OF NEW RIVER SHARES.

The largest sale of shares in the New River Company which has occurred for many years past took place at the Auction Mart, Token-house-yard, on Thursday, when Messrs. Fox & Bousfield disposed of no fewer than twelve one-fiftieth parts of a king's share, and eighteen one-hundredth parts of the same class of share; also five one-sixtieth parts, and five 120th parts of adventurers' shares, together with fifty 100*l.* new shares, fully paid up. The auctioneer, in introducing the property, adverted to the Wimbledon and Hornsey Gas shares which he had immediately before offered, observing that, unlike the article of gas, they were now dealing with a product which no ingenuity or invention could make artificial. Dwelling upon the enormous and unprecedented annual increase in the value of New River shares and the yearly income, he stated that the company's income for 1877 amounted to the grand total of 398,629*l.*, being 15,600*l.* more than for 1876, and that in sixteen years the dividends on the shares had increased 144 per cent., and that, in addition, two bonuses, respectively of 1,400*l.* on the king's shares, and 1,008*l.* on the adventurers' shares, and 4*l.* 5s. 6d. per cent. on the new shares, were declared in 1866 and 1874, and that the dividend on the king's and adventurers' shares, for the present year ending at Midsummer, was at the rate of 2,200*l.*

The twelve one-fiftieth parts of the king's shares were the first lots offered, and were readily sold at prices ranging from 1,760*l.* to 1,790*l.*, being at the rate of about 88,000*l.* per full share, or 300 per cent. premium, the nominal value of these shares, as fixed by Act of Parliament, being 22,000*l.* The twelve lots realised 21,340*l.* The next portions of the property offered were eighteen one-hundredth parts of the same class of share, all of which were sold at a similar rate as the foregoing, realising in the aggregate 14,960*l.* The next lots submitted were the adventurers' shares, which are of the same nominal value as the king's shares. The five sixtieths realised 1,510*l.* each, and the five one-hundred-and-twentieths from 750*l.* to 760*l.* each, total 11,325*l.*; the aggregate sum realised by the king's and adventurers' shares being 47,625*l.* The fifty 100*l.* new shares were next sold, the competition being very active. They were sold in lots of one, two, and three shares each, the average prices realised being 340*l.* per share, or between 200 and 300 per cent. premium. The entire proceeds of the day's sale amounted to 64,625*l.*

Mr. and Mrs. German Reed's Entertainment.—On Tuesday evening next, November 5, will be produced a New Vaudeville, entitled "A Tremendous Mystery," written by F. C. Burnand, the music composed by King Hall, and new scenery by Messrs. Gordon and Harford. The programme will conclude with a New Entertainment, by Mr. Arthur Sketchley, entitled "Mrs. Brown's Home and Foreign Policy."

AN IDLER IN PARIS AND ITS SHOW.

After much weariness and vexation of spirit, no doubt, to M. Krantz, and the difficulties he had to contend with in carrying his point as to deferring the ceremony of the distribution of prizes, the all-important day has come and gone;—very well managed as regards the ceremonial part of the affair, but necessarily causing very mixed feelings of exultation and dissatisfaction amongst the exhibitors. Otherwise the Exhibition, ushered in with so much pomp and excitement, seems like the month of March, to have "come in like a lion and is going out like a lamb." Even the very balls and festivities seem to suffer from the long-continued strain on republican hospitality, as was woefully exemplified in the grandest fiasco of modern times in the way of a ministerial *fête* in the long-looked-for, long-talked-of entertainment at Versailles, and which, owing to the good temper and good conduct of the vast crowd of invited ones, turned what might have become a sad tragedy into a most comical affair; and the various tales that kept flying about Paris for a few days of some of the incidents that took place gave rise to much laughter. We were amongst the more comparatively fortunate ones; for we left Paris at eight with some friends, and the carriage drove into the great courtyard of Louis XIV. at half-past ten; the fireworks were then going off, and as some horses near us began to rear, and windows to smash, we felt glad to be near the door of our entrance, and were borne up by the "Gulf Stream," as the *Figaro* calls it, of guests, and, as that paper says, "No one seemed to go up, no one seemed to come down, but by some extraordinary laws of mechanism hitherto unknown, one found oneself transported into the first drawing-room." We stayed there quietly, finding it impossible to traverse for some two hours the splendid *galerie des glaces*, which was certainly very magnificent, and get near the windows that looked over the gardens; and when we did reach them nearly all the electric light was over, and a violent gale of wind had extinguished the lamps. However, as the crowd thinned and melted away, we could admire the beauty of the scene, and as we drove back to Paris at six in the morning, we considered it very lucky in not having got into the tremendous crowd that made the staircase for some time a barrier of human beings. Some people, after waiting outside all night, never got in at all. One gentleman had put four horses to his carriage to arrive quicker, and he got back to Paris late in the morning, without nearing the palace gates. Confusion reigned everywhere. The Prince of Sweden came up with the crowd, instead of up the diplomatic staircase, and the Princess of Denmark was the only one who had the courage to come down the long "*galerie des glaces*," on the Marshal's arm, and after the fireworks were over. Madame de Mac-Mahon left Versailles by train in the middle of the night to attend the funeral of Monseigneur Dupanloup, at Orleans. As the morning broke, we were back in Paris; but leaving numbers who could find neither carriage nor cloak. However, the ball at the Ministry for Foreign Affairs, two days later, was perfection, the comfort of the guests being studied in every way. The Princess of Wales looked perfectly beautiful; and one heard on all sides expressions of admiration. The Prince has won golden opinions from all men for the energy with which he has worked to help insure the success of the British department here. I think that, on the whole, and notwithstanding some cavillers, the Exhibition has proved a success. For the mere sightseer, there was brought together under the vast building of the Champs de Mars the most entire and perfect collection of all that the world can produce in the way of science and art; and to the student and worker in every department tangible objects from all climes were brought, such as they had only read of in their books. To the philanthropist, also, the spectacle of the various nations, whose inhabitants have here commingled in fellowship, will have given pleasure, and certainly many old prejudices and dislikes will have been rubbed away; and it is more especially among the Americans that this feeling is to be noticed, for their pride in the great success of the "Mother country" seems unbounded. It is quite evident that between England and France the ties of amity are drawn closer. To France itself the Exhibition has given the opportunity to show the world what wealth and what vast resources a thrifty and economical people, like the French, have at their command, and how they have been able to rise elastic from their great disasters; and it has given them also the chance, whilst teaching much, to learn much. They keep as the memento of this great "show" the Trocadéro, which some are now proposing should be maintained as a vast conservatory for the very magnificent Tropical plants and trees belonging not only to the town of Paris, but to the various palaces.

Little by little, after a few last looks at the Exhibition, people are drifting homewards, and weary exhibitors will soon begin to pack up. Even the monster balloon, which has hovered so long over Paris, is to change hands; it is ceded by M. Giffard, and will soon be on its way to London.—Vale.

ST. ALBAN'S ABBEY.

THE NEW ROOF,—A SUGGESTION.

Sir,—Will you find me space for a few words at this stage? Perhaps they should have reached you before in order to stand a chance of being practically useful; but I have been hoping against hope that the last step might, after all, not be taken, and that the low roof might not be really superseded. The acceptance of the builder's tender seems to have suddenly changed the situation.

1. Is it absolutely—beyond all modification—settled that the high roof must run from the tower to the west wall? Why should it not be carried from the tower as far as the junction pier between the Early English and the Decorated work, and stop there? A low roof, not visible from below, would then cover Trumpington's five bays. The distance from the tower to the west face of the west wall is 284 ft. 6 in. This would be the enormous length of the great grey wall which may in a few months make a fresh aspect for St. Alban's Abbey. If about 114 ft. could be cut off in the way suggested, 170 ft. of high-pitched roof would be left,—which ought to be enough to satisfy the most exacting advocate for novelties.

2. It is agreed by this time that the high-pitched roof is to rest on a conclusion which rests on nothing,—but is still good enough in its way if applied within due limits;—thus, "we claim the right to deal with such buildings as we like, because we are a building committee." The old meaning of the word restoration may be considered superseded. It used to seem to mean,—putting back a building, as well as we could, into the state in which it probably was at one time;—a good deal of pains being taken to get to know what it had been or was likely to have been; and to have put back anything that was tolerably certain not to have existed aforetime would have been as painful as such a recital of the process to any one except a stage Irishman. We have changed all that, and now have only to do what we think right.

3. The advantages of the suggested arrangement seem to be obvious. The inordinate length would be got rid of. The puzzling problem of dealing with the great gable wall brought into existence at the west end by the long roof would never arise. There would be an opportunity for really original design in the western inclosure of the high roof;—not a wall of masonry,—but a construction of timber, which would require a special treatment to prevent its being thin and to secure its being grand and sober, and as well suited to the stone architecture around as the fourteenth-century architects would have made it, if they had thought right to deal in that way with the part of the nave. Restoration would in that case not have such a very bad signification. It would only mean putting on to old work something that, if the old men had been as skilful as we have shown ourselves, they would certainly not have omitted.

4. Everybody, when the conflict was hot, was so eager to hit his adversary that the building would have been absolutely forgotten in the shindy if from time to time peacefully-minded outsiders had not exasperated everybody by interference with the authorised combatants. Let it be taken that bygones are bygones, and that the Babel is to be entirely forgotten. Cannot victors and conquered join in securing a compromise, which shall avert some of the evil fate from the building they both admire? A becoming consideration for the scruples of the weak-kneed would allow one, for instance, to admit that the Normans probably put a high-pitched roof to their nave, and that we must do the same,—for some part of it at any rate,—as it has been

decided on and ordered. Will not the new restorationists be benevolent in return, and allow a bit of low roof somewhere in the length? As it would be wrong to ask once again for such a roof over the Decorated bays (which I fully believe never had any other at any time), might I ask this boon for the unfortunate bays further to the westward? S. F. C.

THE PRESENT POSITION OF THE CABMEN'S SHELTER MOVEMENT.

In previous numbers of this journal we have given special information as to the various places in which shelters have been erected.* We are now enabled, with much pains and care, to bring the account up to the present moment, but before doing so we desire to thank the various gentlemen, including clergymen, magistrates, merchants, and others, who have kindly given either the desired information or have obtained it for us. Without such assistance, it would not have been possible to gather together the materials from so many different localities for this general report. Two results of an indirect nature have been suggested by a correspondent, in connexion with this movement, viz.:—1. That the public should, without delay, demand some kind of shelter for themselves when waiting for (or leaving) cars or busses; and 2. That the Legislature should be asked to compel the various authorities and companies to make provision for these shelters, and also for all others required by persons exposed to the weather whilst waiting for the convenience of the public in streets or railway yards.

The information given in this series of general reports shows that these desirable reforms are attainable:—*e.g.*, in Cardiff, Bristol, and Great Eastern Railway Terminus in London, the railway companies have done something for the cabmen; but what more is wanted is, that the public should attend first to themselves,—not a great hardship, as they are great sufferers at present,—and then take measures to secure the aid of the Legislature.

Leeds (supplementary notice). — There are three shelters in Leeds at the railway stations, viz., one at the North-Eastern, another at the Midland, and the third at the Great Northern, for the accommodation of which rests the drivers pay a weekly subscription. The Midland shelter was formerly placed on vacant land opposite the town-hall, in Calverley-street, but on account of the building of new municipal offices on this site, the committee had to find another site, which, by the kind permission of the Midland Railway Company, has been obtained at their yard. The three shelters are being painted and repaired by Messrs. B. Steill & Son, painters, Leeds. Unavoidable difficulties of considerable magnitude have thus interfered with the movement in Leeds, as also, as will be seen, in Bradford.

Bradford, Yorkshire (supplementary notice).—There are two shelters here; one at the Lancashire and Yorkshire, and the other at the Midland, Railway Stations. The former was that which was originally at Christ Church, Darley-street, then at Manor-row, and lastly, at Old Market-place, the corporation ordering it to be thus moved on account of the narrowness of the streets; but there is no wish to blame the corporation for ordering these unpleasant removals, so damaging to the success of the movement. That at Midland-yard cost 100*l.*, and is smaller than the other, but, if anything, is a neater-looking erection. Its breadth is only 2 in. wider than the extreme width of a cab. Mr. Arthur Priestman, of Manningham Lodge, Bradford, is the hon. secretary. Applications from other stands have been made for shelters, but until the difficulty as to placing them is obviated, nothing seemingly can be done to erect any more at present. The two shelters are very much appreciated by the drivers, who each pay 4d. a week for the use of them.

Wakefield.—There is one shelter here, placed at the principal cabstand in the borough, at the top of Westgate. Mr. W. Hartley Lee, J.P., of Wakefield, presented the shelter (as a memorial of his wife) to the Tradesmen's Association, vesting it in three or four members of its committee, they undertaking the management and keeping it in repair. The shelter has, we believe, been much valued by the men.

Coventry has one cabmen's shelter placed in the centre of the city in a wide open space called Broadgate. It was opened in November, 1875, and cost in all about 60*l.*, provided by voluntary contributions. It is maintained by the cabmen who use it, one of them acting as secretary. The movement may be regarded as successful, and unquestionably effective in preventing drunkenness among cab-drivers. The shelter is octagonal, 15 ft. by 8 ft., with gas-stove for cooking purposes, &c. It is mounted on four low iron wheels. Mr. William G. Tretton F.S.A., of Coventry (editor of the *Old Cross*, a quarterly journal), has given us information on the subject of the shelter movement.

Wolverhampton has three shelters, near the principal cabstands. Two of them were the result of a collection made by two ladies; the other shelter was the gift of a lady. The cost of each was 75*l.* The origin of the movement was a desire to improve the condition of the cabmen. The shelters were handed over to the corporation, but amongst the promoters in Wolverhampton it is an open question whether this plan is so good as the Birmingham method, which consists in managing the shelters by a private local committee. Gas and water are laid on, and the subscriptions are sufficient to defray expenses.

Walsall has one shelter, which was given by Mr. J. Brewer, of that town, timber merchant. It cost about 40*l.* Its size is about 8 ft., and is placed near the railway station. It is managed by the cabdrivers, and is self-supporting. It is considered to have reduced drunkenness. There is no prospect of extending the movement in Walsall.

Worcester has one shelter, which cost about 89*l.*, exclusive of stove and fittings. It is placed in front of the Shire Hall, Tything-street, and is managed by the drivers. They fill the windows, we are told, with flowers, which add much to its appearance, making it a really handsome and pleasant retreat. The City Council supply the gas gratis. The shelter is certainly a great success; but there has been, in some quarters, a feeling against the erection of shelters in the highways. The drivers of this city are a very steady and respectable body of men. The Sheriff of Worcester (Mr. Walter Holland) was the generous donor of the shelter.

Leicester has four shelters, the first of which was established in the station-yard, it is said, by the Midland Railway Company. The other three are placed respectively—one at Humberton-gate, another near the Free Library, and the third behind the Town-hall. That near the Free Library was presented by Mr. John Whitmore, of Leicester.

Ryde (*Isle of Wight*) has one shelter on the Esplanade. It is octagonal in shape, and ornamented; and contains a cooking-stove, the men keeping it clean. Mr. W. Jacobs, of Ryde, was one of the principal promoters. It cost about 160*l.* The honorary architect was Mr. Thos. Dashwood. The shelter is expected to be self-supporting.

Portsmouth has four shelters, viz., at Edinburgh-road, The Hard, Kent-road, and the Esplanade. They are handsome wooden erections; with coke stoves, &c. They are self-supporting, and are managed by a committee, of which Mr. Holbrook, Queen-street, Portsea, is the secretary. They have a tendency to reduce drunkenness, and are considered to have been successful.

Oxford had in June, 1878, one shelter, which originated with Mr. W. Ward, of Oxford, who had some difficulty in persuading the Local Board to allow it to be placed in St. Giles's,—one of the principal streets of the city. It cost about 70*l.*; and is fitted with gas-stove, water, &c.; the gas and water being supplied free by the companies. Mr. M. Mowbray was the architect, and Mr. Brucker the builder. The stand is noticeable as being one where the majority of the drivers are teetotalers. The shelter is much appreciated by the men, nineteen of whom use it regularly. It was opened in April, 1877. Mr. G. W. Norton, of 9, Woodstock-road, Oxford, is the hon. secretary. Amongst the subscribers was the Bishop of Oxford.

Bristol in 1875 had only five shelters, now it has the following number:—Fourteen wooden shelters, and one brick structure for the cabmen, and three wooden erections for the Bath-chairmen; with two new cabmen's shelters waiting to be placed in position by the City Council.

The shelter movement in Bristol has been very successful, being self-supporting. The shelters are managed by the drivers themselves, but assisted by Mr. G. Darling, who has been for twenty-two years connected with them in mission work. Drunkenness and sickness have greatly diminished since the introduction of the shelters, and not a single instance, we understand, has been known of a cab-driver who has conducted himself so as to need the interference of the authorities of the borough. It may be interesting to note that twelve years ago the Great Western Railway Company gave the cabmen of Bristol, at the instance of Mr. Darling, a room at their station formed out of one of the arches. The company fitted it up with a gas-stove and table, &c., the men paying a subscription. It is pleasing to add that no complaint has ever been made to the Great Western Railway Company as to the conduct of the drivers at this station. We have reasons for concluding that this archway shelter was one of the first of its kind used for cabmen in England. It is still a controverted question as to which town had the honour of inaugurating the movement. Another interesting feature worth mentioning is that at this station there is a covered shelter for the horses. It is enclosed on three sides, and has plenty of room beneath for the cabs and horses. We cannot be far out in saying that there are very few places in the United Kingdom that have any provision for the shelter of horses so complete as that which is covered on three sides at Bristol. Eight of the Bristol shelters for cabmen were given by private munificence, amongst the donors being Mr. Henry Taylor, of Clifton, who gave the first shelter, and Mr. Hodgson, M.P. for the city, who gave another. The others were erected by subscription. The size of the shelters varies. Some can accommodate six; others twenty-four person. The cost ranges from 50*l.* to 90*l.* Most of the shelters have gas-stoves, water, &c.

Newport (*Monmouthshire*). — There is one shelter here, near the railway station, which was opened in December, 1875, and was presented to the Corporation by Mr. Cordes, M.P. for the borough. It cost about 100*l.*, and is furnished with a gas-stove, &c. The weekly subscriptions from the cabmen are more than sufficient to defray all expenses. The shelter is much appreciated by the men, whose habits have decidedly improved since its erection. Mr. H. Collier, oil-merchant, Newport, is still the indefatigable hon. secretary.

Cardiff.—Besides the two shelters noticed in the *Builder* of January 5th, 1878, there has been this summer another erected in Cardiff. It has been built by the Great Western Railway Company, Mr. T. J. Allen, superintendent at Cardiff, deserving praise for his exertions in recommending its erection to the directors. It is a very comfortable shelter, with an office,—apart from the drivers,—for the cab-inspector. It has gas and water supplied free by the directors. The men pay a weekly subscription. The shelter is expected to be a success in many ways. It is hoped that the example of this company will be imitated by others. Up to the present very few instances are known of companies introducing shelters in their yards, as just mentioned.

SCOTLAND.

Edinburgh.—In 1873 there were six shelters in this city; now there are sixteen. The first was established in 1859. They have been successful, and have added much to the comfort of the drivers, who manage the shelters themselves. The shelters generally are neat structures, but they have been objected to by some residents in the neighbourhood of some of the stands, as spoiling the appearance of the streets. The success of the movement in Edinburgh reminds us that Dean Ramsay spoke, in 1866, of the respectable position maintained by the cab-drivers of that city. If the date of the erection of the first Edinburgh shelter be as given above (1859), then this city was one of the first to have shelters in the United Kingdom.

IRELAND.

In the *Builder* of April 13th last we alluded to a useful movement set on foot at *Dublin*, organised by the Cabmen's Shelter and Temperance Associations, for the purpose of providing the public with coffee-stands in the streets of the city. We understand that there is something of the same kind in operation at *Belfast*, but we have not yet succeeded in obtaining accurate information, though it has been promised.

* See *Builder* of January 5 and April 13, 1878, for the articles containing notices of movements in the following places,—London, Cardiff, Bradford, Scarborough, Halifax, Liverpool, Manchester, Leeds, Birmingham, Hull, York, Huddersfield, Sheffield, Bath, Guernsey, Glasgow, Dundee, and Dublin.

OLD LONDON.

SIR,—In the *Builder*, No. 1703, vol. xxxiii., I described some ancient buildings then or lately extant in the metropolis. The vicinity of Chancery-lane is assuming a new architectural aspect, not only with reference to the new Law Courts, but otherwise.

The new building described and engraved recently in the *Builder*, and the new buildings which are now in course of erection on the site of the houses known as Old-square, denote that the ancient houses are becoming extinct. In Holborn also, and in Chancery-lane, new and high houses now occupy the sites of plainer buildings which have been removed. It appears from Spilsbury's useful description of Lincoln's Inn, which requires a ground-plan to elucidate the text, that in the twenty-second year of Queen Elizabeth the Society of Lincoln's Inn became possessed of the property, which they retain; and the old buildings were erected between the reigns of Henry VIII. and James I., having as the eastern limit New-street, now Chancery-lane, not paved until 1542. The gate-house was erected in the reign of Henry VIII.; and the oaken doors now or lately extant were placed there in 1564. The old hall was erected A.D. 1506, and the louvre for carrying off the smoke was placed on the ridge of the roof in 1552. The arcade, being a connecting corridor to the Vice-Chancellor's Court, was built in 1819, when this Court was added to the west of this hall; and in 1841, the buildings westward of the gateway were built, for the two Vice-Chancellors, Bruce and Wigram. One of the chambers in the vicinity, No. 13, belonged to Thurloe, the secretary of State to Oliver Cromwell, and Lords Mansfield and Campbell occupied rooms in this ancient gateway, as law students. In the years 1625, 1652, 1706, and 1819, alterations were made in this hall, and it was lengthened some 10 ft. It was until lately divided by a partition, so as to form two courts. The hall contains the late Sir R. Westmacott's admired statue of Lord Erskine. The new hall and library, 1844, have superseded the old hall, but the legal associations connected with the latter cannot be effaced. The chapel was erected and consecrated in the year 1623; the foundation-stone having been deposited in 1621 by Dr. John Donne. Inigo Jones was the architect probably, and, according to the Harleian MSS., No. 5,900, he built it "after the Gothick manner, in imitation of that of St. Stephen's at Westminster." Pepys, in his "Journal," mentions his visit to the new garden at Lincoln's Inn, and to the chapel, to walk under it, then a common practice. The buildings known as New-square were erected upon land known as the Coneygarth or Cotterell Garden, being eleven houses of brick, built by Mr. Henry Serle, of Lincoln's Inn, with an elliptical arched way, about 18 yards long, the average depth of the houses, and it is about 9 ft. wide. Two of these houses have been consumed by fire, and other buildings occupy the sites, viz., No. 2 in 1849, and No. 10 in 1752. The column with its sundial in the centre of the square have been removed, and in 1845 the space was enclosed by railings. The east wall of No. 11 (1691), the north wall of No. 11 (1694), and the north wall of No. 1 have stone tablets, with inscriptions. These are contained in Spilsbury's volume. Stone-buildings, near the Old Buildings, was erected originally in 1780, by Sir Robert Taylor, being an instalment of a larger design which was abandoned. In 1845, Mr. Hardwick in the southern wing is stated to have followed the original design, so that the two wings conform with each other. In the year 1819 it was intended to build a chapel at the east side of Lincoln's-inn-fields, but the idea was not carried out. In 1844 the new Hall and Library were completed, and the extent of the garden was curtailed.

In the time of Queen Mary a walk was made in the Coneygarth or Cotterell-garden, described in Mr. Parton's "History of St. Giles's," &c., 1822. The garden was enlarged and improved in 1663, as is mentioned in Pepys's "Journal" for 27th June, 1663. In the erection of the original garden-wall, Ben Jonson may have been employed as a labourer, assisting his father-in-law as a bricklayer or as a mason. The maps in Parton's volume denote the sites of the houses in Lincoln's-inn-fields and New-square. The former were erected generally about the middle and towards the end of the seventeenth century. Inigo Jones is credited as the architect of several of the houses on the west side, north of the archway, and this row was erected before the north and south rows, named Holborn and Portugal rows, respectively. I have seen a petition, dated in 1656, complaining that one William Newton interfered with the rights of the people by his erections in Lincoln's-inn-fields, and which prayed that he might be prevented from building. I deem it to be probable that the houses Nos. 34, 44, and 46, are the original houses in Portugal-row. The houses were completed in the seventeenth century; but the square was not enclosed until 1735. Lady Cowper, in her diary, alludes to her seeing persons crossing this area, on the night when the aurora borealis was visible, 1715; and, later still, Sir J. Jekyl, Master of the Rolls, was injured by a horse while crossing this area. It appears from an advertisement that Orator Henley's Chapel was situated at the south-west corner of this area, formerly Fickett's Fields or Croft, and which extended for some distance southward. The mansion, &c., of the Earl of Lincoln extended from the south end of Stone-buildings to the south end of Old-square, Chancery-lane being the boundary eastward. The mansion, &c., of the Bishops of Chichester extended from the end of Old-square towards the south-east, as far as the ground now named Chichester-rents. In Holborn, De Chesney, Bishop of Lincoln, A.D. 1147, erected a palace, which subsequently was named Southampton House. It was near the Old Temple, in Holborn. The plans in Parton's volume explain these sites respectively. In the *St. James's Chronicle*,—June 6 to 9, 1761,—it is stated,—"A plan for a new street, from the end of Serle-street to Temple Bar, is concerting, a thing long wanted, as the avenues to Lincoln's-inn-fields are bad. It is also said, that to make it complete, Turnstile will be widened, so as to admit of carriages passing." Early in the reign of Charles I., two persons, named Williams and Dixon, endeavoured to obtain an official permission to build an amphitheatre in Lincoln's-inn-fields, for the exercise of martial discipline, but the permission was refused, as it had been in the reign of King James I. In *Notes and Queries*, s. 5, v. 4, the large house at the north-west end of Lincoln's-inn-fields is described, formerly the residence of the Dukes of Newcastle, erected A.D. 1686, and occupied by Lord Somers, &c. (Strype, book iv., p. 75). Another lord chancellor (Northington) resided here until 1766, when four peers resided in these fields. Since then, Sir W. Blackstone, Lord Kenyon, Mr. Justice Chambers, Mr. Spencer Perceval, and the late Baron Gurney have resided here. During the Regency, several houses in the south row were removed to make way for the College of Surgeons. Northouck states, A.D. 1773 (Hist. of London, p. 151), "several of the buildings round the square, originally constructed by Inigo Jones, still remain, on the south and west sides, as also on the south side of Great Queen-street."

In 1659, Messrs. Cooper, Henley, and Finch, with other owners of "certain parcels of grounds in Lincoln's-inn-fields," were licensed to build "on three sides of the same fields," subject "to the payment of one year's value for every such house, and that the residue might be conveyed to the Society of Lincoln's Inn, for laying the same into walks, &c." But the area does not appear to have been inclosed until A.D. 1735, and during the Regency this inclosure was improved considerably, according to its present state.

Knight's "London," vol. v., p. 385, contains an engraving of an ancient house extant A.D. 1799, at the corner of Fleet-street and Chancery-lane, built in the reign of Edward VI., and engraved in Smith's "Antiquities of London." In vol. iv. of Knight's "London," Lincoln's Inn Hall (1843) and the Gateway, and Gray's Inn Hall, are engraved.

The Rolls Chapel, in Chancery-lane, originally was erected by King Henry III. on a Jew's house, forfeited to him in A.D. 1233. When the Jews were banished, the Master of the Rolls possessed this house and its chapel by patent. The Public Records were kept here formerly,—accrued since the reign of Richard III. inclusive; and it appears that then,—1773,—"at the north-west angle of this chapel was a bench where the Master of the Rolls heard causes in Chancery, and the court business was then transacted in the chapel." In Boyle's "Chronology," p. 273, is this paragraph, viz., on the 27th of October, 1776, "the new Chancery Courts were opened in Chancery-lane." This paragraph appears to refer to the buildings in the Rolls-gardens. Mr. Northouck, in A.D. 1773 stated that the house of the Master of the Rolls had been lately rebuilt at the public expense. The chapel contains at the east end the handsome monument of Dr. Young, Master of the Rolls A.D. 1516. According to this work, this chapel, built "of brick, pebbles, and freestone is 60 ft. long and 34 ft. in breadth, the doors and windows are Gothic, and the roof is covered with slate." The inscriptions upon some of the monuments require to be recut, or they will be effaced ere long so as to be illegible.

C. C.

THE CROSSING OF THE THAMES AND THE CONTINUANCE OF THE COAL AND WINE DUTIES.

WE reproduce with pleasure the announcement that the Metropolitan Board of Works have put themselves in communication with the City authorities as to the plan of a new bridge over the Thames. The considerations which we adduced as to the impropriety of independent and adverse action in this matter will be remembered. We further hope that nothing will be done in undue haste. The sum of money which it is proposed to expend is serious. It is essential that the design adopted shall be manifestly shown to be the best, before such a sum is laid out. But at the present moment we are only beginning to collect statistics on the subject. The opening of Waterloo Bridge has already doubled the traffic over that line; foot-passengers having increased from 94,635 to 194,023, and vehicles from 26,046 to 46,600. This is as might have been expected. But we want also to know what has been the effect of the change on the traffic of the bridges east of Waterloo.

After reading Mr. Barlow's little pamphlet, we made a careful inspection of the sites, and came to the same conclusion with the writer that there is no appearance of much probable traffic in the locality. The lines of transport do not tend to such a concentration as to appear to call for a bridge near the Tower. We must remember that two tunnels have been failures, as far as traffic is concerned, though each of them was a great triumph in an engineering sense of the word; and we hear little of the steam ferry, the opening of which was announced some time ago with so much *éclat*. Can anybody tell us anything about it? What is, in our opinion, the proper thing to do, is to ask for a report from an entirely independent engineer as to the demand for a bridge, and the best locality for the same. If that report be favourable, the question of the kind of bridge should then be inquired into, and an architect should be associated with any reporter on that subject. We repeat that we speak without having been yet able to form a definite opinion on any point but one, and that is, that the proposed spiral ascent has not as yet had any case made out in its behalf. It is not too much to say that if, having given some considerable degree of attention to the matter, we feel that as yet the controlling facts have to be collected and brought out in evidence, it is quite impossible that any public body can be in a position to give a sound decision on the matter as yet. We want traffic returns of a very complete kind. We want returns illustrating the history of the various attempts made,—in the case of the Thames Tunnel, the Tower Tunnel, and the steam ferry, to divert traffic. Why did these fail? or what did they effect? Then we want to see what change is actually produced in the trans-river traffic by the opening of Waterloo Bridge. It will take months to collect this evidence. It is a most valuable source of information, and available at the very moment when it is most wanted. It would be folly to attempt to legislate without procuring and digesting this information. We are quite disposed to believe that a new bridge over the Thames is desirable. But we are quite sure that the information which would allow any competent engineer to give a decided opinion as to, first, the advisability, secondly, the locality, and thirdly, the nature, of the new crossing, has yet to be collected. We only trust that the bridge will not be built by way of experiment, which seems to be what is at present proposed. Purses after all have bottoms,—public purses as well as private.

THE OAK OF THE BIBLE.

SIR,—Will you allow me to ask what tree the oak of the Bible was? Writers appear to differ as to its botanical name or class.

STUDENT.

COWL EXPERIMENTS.

The proprietors of cowls, and their friends, would have us fill half our pages with their statements, but we must, of course, decline. Mr. Buchan writes again to accept Mr. Banner's challenge for a trial, but for a smaller stake. These gentlemen, if they wish to bring the trial about, must manage it for themselves.—— Several persons, notably Messrs. Colls & Sons, have sent us testimonials in favour of Mr. Banner's system. We cannot insert them.—— A long letter from Mr. James Howorth, in reply to Mr. Buchan's letter of the 12th ult., also includes testimonials to the merits of the Archimedean ventilator. In this case, as in the others, we must give the same reply.

DUKE STREET U.P. CHURCH, GLASGOW.

Contracts have been entered into for the erection of a new church for Duke-street congregation. The new building, which has been designed by Mr. Honeyman, will occupy the east side of a new square, near the cathedral, recently formed by the City Improvement Commissioners, clearing away a large number of old dwellings of the worst description.

It may be interesting, as indicating the unsettled state of the building trade, to mention that the highest tender (for mason's work only) was 9,741*l.*, and the next 9,266*l.*, while the lowest two, made on the same quantities, were 6,916*l.* and 6,498*l.*

FRAUDULENT "TIME-SHEETS."

At the Surrey Sessions, last week, Richard Williamson, William Baldry, and Frederick Knight were indicted for conspiring by divers false pretences to defraud Benjamin Ebenezer Nightingale. On other counts they were indicted for attempting jointly and severally to obtain money from the prosecutor by false pretences.

On being first arraigned Williamson pleaded not guilty, but subsequently withdrew his plea and put in a plea of guilty. The other prisoners pleaded not guilty.

Mr. Lyon stated the case for the prosecution. He said the prosecutor was a builder carrying on business on the Albert Embankment, and the prisoners were in his employment: Williamson acted as foreman of a job in Westminster Bridge-road, and the two other prisoners worked under him as carpenters. It was Williamson's duty to prepare a sheet every week showing the time of each man under him. On the 27th of September he prepared a sheet in which the prisoners Baldry and Knight were represented as having worked sixty hours and a half, and he gave them tickets on the pay-clerk entitling them to 2*l.* 5*s.* 4½*d.* for their week's wages. On presenting their tickets next day they were given into custody, the prosecutor having discovered that they had not been at work for him at all that week, but had worked for another employer. Subsequently the prisoner Williamson was given into custody for conspiring with the other two to defraud his employer.

Evidence having been given in support of counsel's statement,

Mr. Lilley addressed the jury for the defence. He contended that the prisoners Baldry and Knight, having acted under the authority of their foreman, who had lent them to another firm, and not having been discharged from Mr. Nightingale's employment, and having done the work allotted to them, they were perfectly entitled to demand their wages, and they had committed no offence in doing so.

At this stage the jury stopped Mr. Lilley, and said they were unanimous in the opinion that the prisoners were not guilty.

The prisoners were then discharged, and the prisoner Williamson was then directed to stand forward.

Mr. Lilley addressed the court in mitigation of punishment, and called witnesses as to previous good character.

The Court sentenced him to twelve months' imprisonment with hard labour.

At the Thames Police-court, on Saturday, Dunken Redford, formerly a foreman in the service of John Johnson, a builder, of St. Ann's Wharf, Limehouse, and William Constable, a journeyman carpenter, in the same service, were charged on remand with conspiring to defraud their employer of certain sums of money, alleged to have been earned as wages, but which were not gained by *bonâ-fide* labour.

Noxious Effluvia in Southwark.—Messrs. William Potter & Son, Green-street, Friar-street, Blackfriars-road, have been summoned before Mr. Partridge, at Southwark Police Court, by Mr. Ross, an inspector in the service of the Metropolitan Board of Works, for causing a nuisance by not using proper and efficient means to prevent the escape of noxious smells in carrying on their business of bone-boilers. They were fined 20*l.* and costs. Mrs. Ellen Hurst, carrying on business in the same locality, has been summoned, at the instance of the St. George's Vestry, for a like offence, and fined 5*l.* and costs.

THE HIGH-LEVEL BRIDGE QUESTION.

Sir,—Your correspondent, "Cocker," wishes to know why I reckon the additional strain of 20 lb. for what he calls the "slight inconvenience" of drawing a ton upon a spiral curve of 1 in 40, instead of upon a straight hill of the same gradient. Let me remind "Cocker" that 20 lb. so added is only 1·8 per cent. additional to Mr. Matheson's calculation of straight hill strain. And Mr. Matheson goes on in his letter of the 21st ult. to confirm what I said in my letter in the *Builder* of September 14. He says,—"Horses cannot pull their best when climbing on a curve; the haulage force would have to be increased even in a greater proportion than that above mentioned." I have no better reasons to offer for my reckoning than what I stated in the letter of Sept. 14. I think that an objector (especially one rejoicing in the *nom de plume* of "Cocker") should meet figures by figures, and not indefinite terms, by which he negatives the positions of others without taking one himself. Unless "Cocker" puts his "slight inconveniences" into avoirdupois pounds, ounces, drams, or grains, I do not see how the relative quantities of "water" that our "arguments" "hold" can ever be determined. I would suggest to "Cocker" to state the amount he believes in as being nearer correct than 106 lb. total, or 20 lb. additional; and then leave the question, until decided by experiment, or more conclusively established evidence than either of us seems to possess.

There are two or three points of this spiral curve inquiry which, I think, require mentioning as a part of a full debate of it. In reference to experiment or known facts, I would observe that the trial for comparison must be upon a spiral road and straight hill; the difference of drawing upon a level circle and straight upon level ground would not represent the case. In reference to my addition of 20 lb., I wish to explain that I intended to apply it only to carriages of four wheels; in two-wheel carriages, being shorter, the difference would probably be about the rate of 12 lb. The third point I beg to notice is, that it is not at all clear what Sir J. Bazalgette means by 1 in 40. If he means 1 in 40 along the centre of the spiral roadway, Mr. Matheson's estimate represents the case. But if he (Sir J. B.) means that the outer-edge gradient would be 1 in 40, and the spiral curve road has a total width of 60 ft., like the bridge itself, the centre or mean road gradient would be 1 in 32. If the spiral path is 36 ft. wide, with carriage roadway only, the mean gradient would be 1 in 35·8. And the mean strain (reckoning per centage proportion) would be, upon Mr. Matheson's calculation, for 60 ft. wide road,—straight hill, 107½ lb.; total, 129 lb. For 36-ft. road only,—straight hill, 100 lb.; total, 120 lb.

"Cocker" also wishes to know what I mean by the "multiplied force of three and a half." My reply is, that calculation is founded upon the elementary truth in mechanics, "that what is gained in power is lost in distance. I multiply the supposed actual length of the spiral road by *three and a half*, because its resistance is reckoned at that amount compared *to one* on a level road.

Now, a few words on the height of the Tower bridge. It is an axiom of philosophy, that of two evils or difficulties "we should choose the least." But in this case it is probably true that the least evil is on the side of the greatest difficulty. I think with Mr. Matheson that the great inconvenience of a high-level bridge to the thousands of human beings and horses for whose benefit it is to be made, outweighs the disadvantage to wharfingers and those connected with the shipping interests; and it can hardly too often be pressed on attention that if the Tower bridge is not tolerably convenient it will not be used, and London Bridge will *not* be relieved. C. G.

CONCRETE AT CLARE COLLEGE LODGE, CAMBRIDGE.

The *Cambridge University Reporter* (published by authority) for October 24th, 1878 (No. 258), contains an important and serious correspondence on the subject of the failure of parts of a concrete roof and floors at Clare College Lodge, built by Messrs. Bell, under the superintendence of Mr. Fawcett, architect. Mr. Blomfield and Mr. Rickman first reported, with great moderation, as to the defects in the construction, but Mr. Fawcett, demurring to parts of their report, called in Mr. Baldwin Latham, and the ultimate result (opinion seems to have strengthened as the examinations went on) is, we are sorry to learn, that the roof and all the concrete floors above the ground-floor are to be removed and replaced by wood. The serious question has arisen as to the respective liabilities of the architect and the University, and this has been referred by agreement to the President of the Royal Institute of Architects (Mr. Chas. Barry), who had not reported when the correspondence was published. In reading the paper another question certainly presents itself,—the liability of the contractors; but this would probably have to be settled separately, as between them and the architect, afterwards.

A Sewerage Scheme for Wigan.—The Wigan Town Council have adopted a scheme, prepared by Mr. Brindell, C.E., for the disposal of the sewage of the town by irrigation. At present the sewage is turned into the river Douglas, and the Local Government Board have granted a further order, protecting the town for three months from the 17th Oct., from the provisions of the Rivers Pollution Prevention Act, 1876. To carry out the scheme arrangements have been concluded with the Earl of Derby for a sewage farm at Dewburgh, seven miles distant from the present outfall. The total cost of carrying out the scheme is set down at 62,544*l.*

IS A BRICKLAYER AN ARTISAN?

Sir,—In a leading article which appeared in the *Daily Telegraph* of the 17th ult., occur these words:—"An English artisan, or a bricklayer." Now, sir, I fail to see why a bricklayer is not an artisan. I assume that all skilled workmen in the building trade generally would, as a body, be called artisans, and that the fact of this body being divided into separate branches does not necessarily deprive either of those branches of the right to be called artisans.

True, in years gone by, the rather questionable habits of not a small number of the craft brought down upon the bricklaying branch generally a certain amount of disrepute, and people, in consequence, were too prone to look upon a bricklayer as outside the pale of respectability; and although happily that has all changed (at least the causes have disappeared), there are still some who cannot help thinking that a bricklayer must of necessity be a blackguard. But even were it so, that can have nothing to do with his skill as a workman; consequently, he would be an artisan all the same.

Moreover, in the present day, brickwork has become one of the most important, and, in cases not a few, the leading feature in building construction; and although the fact may not, perhaps, be so widely known, it is nevertheless true, that a largely increasing number of builders,—ay, and some architects too,—willingly avail themselves of the services of bricklayers in whom to confide the chief superintendence of their works.

Then, surely, they at least are not unworthy the name of artisans. J. W.

NEW HOSPITALS.

Peterborough.—At a recent meeting of the Peterborough Town Council, Mr. J. W. Walshaw, the surveyor, produced plans for a two-storied hospital to be erected at Dogsthorpe. After some discussion, it was decided that the surveyor should prepare estimates and specifications on the plan produced, and also for a building with a ground-floor only.

Lincoln.—The new Lincoln County Hospital was opened on the 1st ult. The group of buildings of which the institution consists comprises (according to the *Lincolnshire Chronicle*) a central or administrative block and two pavilions,—all being connected by a corridor, 10 ft. 6 in. wide. The back portions of the wings or pavilions are not yet built to their complete design, but they can be added to at any time to meet the requirements of an increasing population, without interfering with the parts already finished, or requiring any enlargement or alteration of the administrative offices. As at present constructed, the hospital provides accommodation for about 110 in-patients, but after the pavilions are completed there will be ward accommodation for about 180 patients. The central block consists of five stories, a half-basement story sunk about 6 ft. below the surface, and resting on the solid rock, and four stories above. The pavilions east and west of it are only two stories in height, but in consequence of the slope of the ground are raised 6 ft. above the surface at their lower ends. The central block contains, besides spacious entrance-hall, porter's and receiving rooms, surgery, and examination-room, a medical officers' consulting-room (to be used as a library), an accident receiving-room, with private apartments for the resident surgeon. In the rear is an operating-room. The first story contains matron's room, linenry, nurses' day-room, chaplain's room, and a chapel. This chapel is 44 ft. by 24 ft., and the chancel 11 ft. by 11 ft. On the second-floor are separate dormitories for nineteen nurses and probationers; whilst the third consists, for the most part, of a series of wards for children, with nurses' rooms attached. The basement comprises culinary offices, detached boiler-rooms, and cellarage. The pavilion on the east side, appropriated to male patients, consists at present of two wards, 88 ft. long by 26 ft. 6 in. wide, and two wards, 23 ft. by 15 ft., accommodating in all fifty beds. A nurses' room and scullery are attached to the large wards, with inspection windows commanding all the beds. At the extreme ends of the large wards are octagonal turrets, measuring 10 ft. internally each way, and these are cut off from the wards by lobbies, 5 ft. square, and provided with double doors and a window on each side to secure constant cross-ventilation,

The beds in the large wards are arranged in pairs between the windows, and are symmetrically placed along each wall, the width between each bed being 4 ft., and between each pair of beds 5 ft. 6 in. The west pavilion, appropriated on the upper story for female patients, is arranged in a similar manner to the east pavilion, the only difference being that the lower story is devoted to out-patients. This department is, however, distinct from the hospital proper. There are food-lifts, supplied by Waygood, in each block, and a separate coal-lift in the centre one. The warming of wards, rooms, and offices throughout is by means of Boyd's patent stoves, with descending flues; and of the corridors, staircases, and chapel, by Bacon's hot-water tubes. The baths and sinks are supplied by Boyd. The external walls are built hollow, being 1ft. 8 in. thick, with a clear space of 2 in., tied together at regular intervals with wrought-iron ties at every fourth course of brick. The roofs are covered with green slates. The Ancaster stone dressings were obtained from Thompson's quarries, and the terra-cotta panels from Blashfield's. The bricks were supplied by Messrs. Swan & Bourne. The outbuildings to this complete establishment consist at present only of a mortuary and *post-mortem* room. The laundry and washhouse, and entrance-lodge are yet to be provided. The architect is Mr. Alexander Graham, of London. The contractors for the work were Messrs. Barnes & Wright, builders, of Lincoln. The total cost of the hospital will be 30,000*l*.

Eccles.—At a joint meeting of members of the Barton Local Board and Rural Sanitary Authority, held recently, the clerk reported that the Local Government Board had approved of the plans, without alteration, prepared by Mr. L. Booth, architect, Manchester, for a hospital for infectious diseases at Peel-green, for Eccles and district, at a cost of 3,000*l*. The hospital will be erected conjointly by the above urban and rural sanitary authorities; it will consist of two wings and an administrative block, and will find accommodation for twenty beds when complete; but for the present it is only proposed to erect one wing and the necessary offices. The clerk was instructed to ask permission from the Local Government Board to advertise for tenders for the erection of the hospital, prior to one of their inspectors holding an inquiry into the matter.

Shrewsbury.—The plans of Mr. C. O. Ellison, architect, Liverpool, have been selected by the building committee for the new Eye, Ear, and Throat Hospital, at Shrewsbury. The new Hospital will be in Murivance, and the principal front will face the proposed new bridge road, the committee having secured to themselves certain powers in regard to that land in the probable event of the bridge not being erected. The institution itself will consist of two divisions,—one for the outdoor patients and the other for the indoor patients. The proposed outlay is 6,000*l*.

Salford. The Guardians of the Poor for the Salford Union are intending to erect permanent hospitals and infirmaries for 600 patients, together with all the necessary outbuildings and accessories on the new site at Hope, near Eccles. The Board have unanimously appointed Mr. L. Booth of Manchester, as their architect to design and carry out the whole of the intended works.

CHURCH-BUILDING NEWS.

Aldershott.—On the 14th ult. the Bishop of Winchester consecrated the new church at Aldershott. The church is dedicated to the Holy Trinity, and comprises on plan,—nave and chancel, 112 ft. 6 in. long, the width across nave and aisles being 57 ft. The height from floor to apex of roof in the nave is 57 ft.; height of chancel, 48 ft. The style is Early English. The materials are Bargate stone facings and Bath stone dressings. The total cost is 6,300*l*. Sittings are provided for 700 persons. The architect is Mr. Sidney Stapley, of Farnham, and the contractors Messrs. Martin, Wells, & Co., of Aldershott.

Morwenstow.—An appeal is being made for funds for the restoration of the interesting Norman church of Morwenstow, on the Cornish coast. The church consists of nave, chancel, north and south aisles, and a lofty tower with battlements and pinnacles. The nave stands in much need of restoration, for the mullions of many of the windows are either much damaged or altogether gone, and some of the windows are half blocked up with bricks. The piscina, of simple Norman work, is on the south side of the chancel, and stands on a semicircular arch in the wall, which had been blocked up and plastered over until it was opened and restored by the late vicar, Mr. Hawker. The interior of the church is actually green, and in some places slimy, with damp. The flooring of the seats is much broken away and very rotten, although the finely-carved ends are well preserved. The oak screen which separates the chancel from the nave belongs to the same period as the seats, and is perfect, with the exception of the old gallery-loft. Lord Clinton, as lay rector, has undertaken to restore the chancel.

Portswood.—The chancel just added to Christ Church, Highfield, Portswood, was consecrated on the 25th ult. It extends 28 ft. clear eastward of the old building, with a width of 48 ft. There is a row of arches on each side, supported by clustered columns, with carved foliated capitals; the columns supporting the main chancel arches are square, and also have carved capitals. Besides the building of the chancel, the old pews have been removed, and the church re-seated, under an arrangement which provides a centre aisle, with benches of pitch pine; the heating arrangements have also undergone revision, the pipes being now laid in channels instead of above ground as formerly. The aisles, which were originally laid with Purbeck stone, have been re-paved with Architectural Pottery Company's tiles from Poole, but Minton's tiles have been used in the chancel. The organ has been removed from under the tower to the chancel north aisle, the space thus gained being appropriated to sittings; the pulpit stands at the end of the centre aisle. The various works have been carried out from the designs of Mr. Colson, the diocesan architect, Winchester, by Mr. W. H. Chapman, of Woolston; the heating and gas fittings being entrusted to Messrs. Lankester & Son. The total cost has been close upon 4,000*l*.

Dunston.—The Bishop of Lichfield has consecrated a new church at Dunston, near Penkridge, erected at the sole cost of Captain Perry and his sisters in memory of their father. It replaces an older church, and consists of nave, chancel, and transepts, and at the western end is a tower surmounted by a spire, the style adopted being that of the Decorated period of English Gothic architecture. From the high road the church is approached by a terrace and flight of steps, and entrance is obtained under the tower. There are a considerable number of carvings in the church, which are the work of Mr. Catby, of London. All the windows are of grisaille glass, and are variously traceried. Mr. W. Dalton Griffin, architect, Wolverhampton, prepared the plans; and the work has been carried out under the personal supervision of Mr. F. C. Perry, by workmen whom he engaged.

SCHOOL BOARD SCHOOLS.

Rugby.—Two new Board schools have recently been completed near Rugby,—one at Newbold-upon-Avon, and the other at Long Lawford. They each possess the same amount of accommodation, viz., for 130 children, with a schoolmaster's house attached. The school is a mixed one, 42 ft. 6 in. by 18 ft., with open-timbered roof, and an infants' school, 19 ft. by 15 ft., which can be used also as a class-room. There are separate entrances for boys and girls. The whole is fitted up with lavatories and earth-closets, provided by Messrs. Moule, of London. The schools are heated by Gill stoves and Galton grates, and ventilated on Tobin's principle. The house contains living-room, kitchen, offices, and three bed-rooms. The whole, including boundary walls, playgrounds, and all complete, has cost about 1,700*l*. for each school, and has been carried out by Mr. W. B. Heap, builder, of Dunchurch, near Rugby. Mr. James N. Crofts, of Liverpool, was the architect.

Horsham.—New Board schools at Horsham were opened on the 26th ult. They were commenced in August last year, the architect being Mr. Livvock, London, and the builder, Mr. Rowland, Horsham. Over 4,000*l*. has already been expended in the erection, exclusive of a new house for the master now being constructed at an additional cost of 500*l*. The schools are situated at a convenient point where the East Parade becomes a continuation of the Brighton-road. The style is Gothic, the walls being of red brick with stone facings. The rooms include the boys' school, which is 60 ft. by 20 ft.; the girls' school, 40 ft. by 20 ft.; the infant school same size; and several class-rooms, 20 ft square.

STAINED GLASS.

Surbiton.—The new house of Mr. Wilberforce Bryant, at Surbiton, has been filled with stained glass, from the suggestions of Mr. Rowland Plumbe, architect, comprising selections from Ovid's "Metamorphosis," sonnets, events o local history, such as the Coronation of King Athelstane at Kingston, events from the life o Robert Bruce, &c. Messrs. Gibbs & Howard were the artists.

Babbacombe.—A stained-glass window has been placed in the boudoir of Cliff Villa, illustrating "The Adventures of Alice in Wonderland." The tale is told in ten separate lights each containing an adventure. The work has been done for the Right Hon. Cowper Temple, M.P., under the personal superintendence of his architect. Messrs. Gibbs & Howard were the artists.

MASTERS AND MEN.

Edinburgh.—The strike among the operative masons of Edinburgh has now closed, the masters not connected with the Master Builders' Association having on Monday conceded the 7½d. per hour. Operations have, accordingly, been resumed at the New Medical School and other new buildings which were affected by the strike. Since the month of May the wages of masons in Edinburgh have been reduced 1½d. per hour.

Leith. — On the 24th ult. Messrs. Scott & Best, contractors for the new dock works, informed a deputation of workmen that they were perfectly willing to accept any decision which the Masters' Union might come to on the question of wages. The firm further promised their workmen that if they resumed work at the rate of 7d. per hour they would be repaid any sum which might be due to them if the decision in favour of the payment of a higher rate was given. The men refused these conditions, and came out on strike.

Perth.—The Perth masons commenced work on Monday at a further reduction of ½d. per hour, the present wages being 7d. and 7½d. per hour.

Liverpool.—The Liverpool Master Builders' Association have found it necessary to discuss and revise their rules with the *employés*. This was done at a meeting held last week, when it was decided that that part of the mutual code with the operatives providing that any notice of alteration should expire at a certain season of the year, should be expunged. It is understood now, therefore, that notice of alteration in the arrangements with the men can be given at any time. At the same meeting the advisability of readjusting the scale of wages, &c., with the operatives, was talked of, it being thought that the depression of trade that had arisen within the last few weeks, and was not likely to soon disappear, necessitated that course. The various departments of the building trade were called together in consequence of this, and the following results arrived at:—*Masons*, a reduction of a penny per hour, and an increase in the number of working hours from 49½ to 55 per week; *bricklayers*, a reduction from 9d. to 8d. per hour, the hours to remain as at present; *plasterers*, a reduction of a penny per hour, and an increase of hours from 49½ to 55 per week; *joiners*, a reduction from 8¼d. to 7¼d. per hour, the hours to remain the same; *plumbers*, a reduction of wages from 8½d. in summer, and 9d. in winter, to 8d. all the year round, hours to remain the same. The *painters'* rules having been recently revised, no alteration was made in them. It is said that the building trade is so bad in Liverpool that workmen are offering themselves for less than the standard rate of wages.

A New Clock, the gift of Mrs. Clark, has just been placed in Stoke Fleming Church, near Dartmouth. It was manufactured by Mr. J. W. Benson, of Ludgate-hill. The bed or frame is so arranged that any part may be removed without disturbing the remainder. It shows time on a 5 ft. dial, but the movement is so made that at any future time it can be altered so as to show the time on two or four dials without difficulty; the wheels and bearings are of hard brass, the diameter of the main wheels being 14 in.: it chimes the quarters on two bells, and strikes the hours on a 16-cwt. tenor bell.

SURVEYORSHIP ITEMS.

Manchester.—At a meeting of the Manchester City Council, on Wednesday last, it was resolved, on the recommendation of the general purposes committee, that the salary of Mr. G. H. Moyes, improvement surveyor, should be increased to 250*l.*, and that of Mr. Henry Courtney, general surveyor, to 208*l.* per annum.

Denbigh.—For some time past the Denbigh Corporation and their surveyor have been in collision as to the latter's duties in connexion with the new drainage and Smithfield works, and the dispute was brought to a climax last week by the surveyor (Mr. R. Clough) being dismissed from office. The surveyor holds the plans, &c., which are now wanted for the contractor, and the former is ordered to give them up. The matter is likely to end in a lawsuit.

Chelsea.—At the last meeting of the Chelsea vestry, a letter was read from Mr. Stayton, the surveyor, asking the Board to vary the terms of his appointment, so that he should have liberty to undertake private practice. If the permission were granted, he undertook not to take any business which would in any way clash or be prejudicial to the interests of the vestry. Mr. Lawrence moved that the permission be granted, and pointed out that the privilege asked for was allowed to the surveyors of nineteen metropolitan parishes, and the principal officers of the Metropolitan Board. Mr. Cuthbertson seconded the motion, thinking the concession would be an advantage to the ratepayers, as it would prevent an increase of salary being asked for. After a discussion lasting more than three hours, the motion was lost by 30 votes to 14.

Miscellanea.

Wilton Hospital Competition, Salford. At a meeting of the Salford Town Council, on Wednesday, Mr. Alderman M'Kerrow moved,—"That the minutes of the proceedings of the general health committee, including a joint report by Mr. J. A. Bostock, C.B., deputy-surgeon-general and chairman of Stockwell and Fulham Hospital committees and Metropolitan Asylum Board; and Dr. F. de Chaumont, Professor of Hygiene, Army Medical School, Netley, on the competitive designs for the extension of the Wilton Hospital, and the report by the borough engineer upon the selected design, be entered upon the minutes; also that the recommendation of the committee, that, subject to the approval of the Local Government Board, the design marked 'Au Bon Droit' of Mr. Stephen Salter, London, be accepted; that the second premium of 50*l.* be awarded to the design marked 'M. D.' of Messrs. Pennington & Bridgen, Manchester; and the third premium of 25*l.* to the design marked 'August' by Mr. W. R. Corson, Manchester, be approved and adopted." Mr. Alderman Lee seconded the resolution. Mr. Mandley proposed as an amendment, "That the portion of the proceedings of the general health committee, recommending that the third premium be given to the design marked 'August,' be referred back to the committee." The amendment was rejected by 23 to 18, and the minutes of the committee were passed.

Fall of an Arch at Ryde.—By the falling in of an arch forming part of the sluice between Monkton Marshes and the Esplanade at Ryde, I.W., a man named John Langford was killed. The coroner's jury returned the following verdict:—

"That the said John Langford, on the 1st day of October, in the year aforesaid, at the parish aforesaid, in the Isle aforesaid, died from the effects of injuries then and there received by him from the accidental falling in of a certain arch, forming a sluice, which was then and there being constructed, and that such falling in was caused by the improper materials which had been used in making the same; and the jurors aforesaid, on their oaths aforesaid, do say that William Groves, the contractor engaged in constructing the said sluice, was guilty of gross negligence in using such materials, and that he did not use sufficient precaution before removing the centres; and the jurors also consider that great negligence was displayed by Francis Newman, the surveyor, and William Gregory, the clerk of works, in allowing improper materials to be used in the construction of the said arch.

The coroner censured the parties named in the verdict, and added that the jury were disputing for some time as to whether a verdict of manslaughter should not have been returned,—at least in the case of one or more of the persons named.

The Overcrowding of Theatres. — A meeting was held in Wandsworth Hall last week to consider the necessary steps to be taken for the better preservation of life and limb in the case of an alarm of fire in a theatre or music-hall. Mr. Thomas Grant presided, and there was a large attendance of the tradesmen and inhabitants of the neighbourhood. The Chairman, in opening the proceedings, said that the time had arrived when the safety of the public, more especially that portion which nightly crowded the pits and galleries of our theatres and music-halls, should be promptly and properly looked after by those in authority. It would be most unfair to pick out by name any one or more of the theatres where the evils were more than ordinarily safe, but he could not help saying that he knew of four large theatres in London where, in the event of a sudden panic, it would be impossible to save more than half a crowded audience in the event of a fire or a panic. The Chairman then moved the following resolution:—"That this meeting unanimously expresses its opinion that the Home Secretary, the Lord Chamberlain, and the district surveyors should at once take the necessary steps to ascertain officially the capacity of every place of amusement in the metropolis, with the means at hand for safely disposing of the audience in case of fire or other panic; that instant action should be taken to compel theatrical managers to provide fitting egress for their customers forthwith, and that looking at the near approach of the Christmas holidays, when the theatres will be overflowing with human beings for some three months, the least delay in the action, either of the authorities or the managers, may, and in all probability will, be fatal." The resolution was seconded and unanimously adopted, and the meeting closed with a vote of thanks to the chairman.

Builders' "Sand."—A correspondent of the *Times* says that for some days past carts have been engaged in the neighbourhood of Lewisham during the small hours of the night in carting so-called "builders' sand" from the low-level sewer at Deptford, and depositing it on a plot of ground at the north-west corner of the Breakspear and Harefield roads, on the Wickham Park Estate, and within 20 yards of inhabited dwellings. He complains of the extremely foul and unwholesome effluvia emitted from these deposits, and quotes the opinion of a medical man to the effect that they are highly prejudicial to the health of the inhabitants, and likely to induce fever. He appends a copy of a letter received by him from Dr. Pink, the medical officer of health to the Greenwich District Board of Works, who says,—"I have inspected the ground which formed the subject of complaint, and I have also consulted the solicitor to the Board on the matter, and we are of opinion that it does not fall under or come within the Nuisances Removal Act, which is the only Act on which proceedings can be taken."

Royal Hibernian Academy of Arts —At the annual meeting of the Royal Hibernian Academy, held on the 18th ult., the following officers were elected for the year 1878-9, which elections have since received the approval of the Lord Lieutenant:—President, Mr. T. A. Jones; secretary, Mr. B. Colles Watkins; treasurer, Mr. Thomas Farrell; keeper and librarian, Mr. P. Vincent Duffy. Visitors, living model school, Messrs. P. Vincent Duffy, T. Farrell, Alfred Grey, and William Osborne; visitor, day painting school, Mr. A. Burke; professor of painting, Mr. A. Burke; professor of sculpture, Mr. J. R. Kirk; professor of architecture, Mr. J. J. McCarthy; professor of anatomy, Mr. W. Thornley Stoker, M.D.; professor of history, Mr. W. J. Fitzpatrick; professor of antiquities, Mr. J. T. Gilbert, LL.D. Trustees, Messrs. T. A. Jones, B. Colles Watkins, and Wm. Osborne; auditors, Messrs. A. J. Mayne and Thomas Drew; council in 1878-9, Messrs. James H. Owen, M.A., Augustus Burke, Thomas Drew, H. E. Doyle, P. V. Duffy, and T. N. Deane.

Egress from Places of Amusement.—The Birmingham watch committee have passed a resolution instructing the borough surveyor and an experienced engineer to examine the places of amusement in that town, as to the means of egress and of extinguishing fire.

Engineering Appointment.—Mr. Gibbons, who was assistant-engineer of the St. Ives Railway, has been appointed to succeed the late Mr. Gandy Cole as engineer of the new Moorswater Viaduct, St. Ives, Cornwall.

Headington-hill Hall, near Oxford.—It is only twenty-five years since old Headington-hill Hall was taken down and the present mansion built by the late Mr. James Morrell; but arrangements made a quarter of a century ago are now far from meeting the requirements of sanitary science. Recognising this, Mr. G. Herbert Morrell sought the advice of Professor Corfield, who condemned the old brick-drains and pipe-drains running under the house, the socketed lead and iron soil-pipes, the whole of the D-traps, and the want of ventilation to both sewers and closets. A new system throughout was accordingly planned by him, and the work has been done from drawings by and under the personal direction of Mr. Mark H. Judge.

The Sunday Society at Cheltenham. — A conference of members of the Sunday Society, and others favourable to the opening of museums on Sundays, was held during the Social Science Congress at Cheltenham; Mr. James Heywood, F.R.S., presiding. It was resolved,—"That this Conference, believing that the opening of museums, art-galleries, libraries, and gardens on Sundays will tend to foster the formation of such institutions where none now exist, heartily approves the objects of the Sunday Society, and rejoices in the progress made in Sunday reform during the past year, as proved by the recent opening on Sunday of the art-galleries in London, the museums at Maidstone, and the free public libraries at Manchester and Wigan."

The Colosseum Calamity, Liverpool.—The inquest on the bodies of the thirty-seven persons who lost their lives through the panic in the Colosseum Theatre or Music-hall, Liverpool, has terminated. The jury, after an hour's deliberation, returned the following verdict:—

"That the deceased persons were suffocated and crushed to death during a panic in the Colosseum Music-hall on the 11th inst., caused by false alarms of 'Fire' and of the 'Gallery falling.' The jury think, with the borough engineer, that the means of exit, as at present arranged, especially without the staircase leading to School-lane, are insufficient. They also think the principal cause of the numerous deaths arose from the barricade at the bottom of the gallery-stairs being fixed and the exit door fastened. They would like to see the engineers' suggestions carried out. They also suggest that the services of a policeman, if required by the proprietors of places of amusement, should be granted, and that all such places should be under the control of the local authorities."

The Brickmaking Trade —Brickmaking in the district of which Sittingbourne and Faversham are the centres is now finished. It is estimated that upwards of 300,000,000 of bricks were made in the district during the past season, of which Messrs. Smeed, Dean, & Co., said to be the largest brickmakers in the kingdom, alone made over 60,000,000.

Liverpool Art Club.—This club has opened a competition for amateur painting on porcelain and pottery; not confined to members of the club, or residents of Liverpool, but open to all amateurs. Two prizes will be given,—a Venetian glass mirror, and a jar, probably of Hungarian manufacture.

TENDERS

For additions to premises in Mare-street, Hackney, for Messrs. Eley & Wilmer. Messrs. Lee & Smith, architects:—

Sargeant	£1,270	0	0
Forrest	1,237	0	0
Hayworth	1,225	0	0
Chapman	1,175	0	0
Stamp & Bowle (accepted)	1,063	0	0

For painting two houses in Gower's-walk, Whitechapel, for Mr. John Wagener. Messrs. H. M. & W. Grellier, architects:—

Mansfield & Son	£630	0	0
Bull	5[illegible]5	0	0
Went & Perkins	535	0	0
Wyard	485	0	0

For the erection of two lock-up shops at Chesterfield, for Mr. Joseph Lowe. Messrs. Rollinson & Son, architects:—

Stott	£425	10	0
Heathcote & Son	382	0	0
Wright	351	16	0
Madin	330	10	0
Brailsford & Brown	350	0	0
Wright & Margerrison	329	10	0
Broomhead & Tomlinson (accepted)	322	4	0

Accepted for additions and alterations to the Hydropathic Establishment, Ashover, Derbyshire. Messrs. Rollinson & Son, architects:—

Hopkinson (excavator, mason, and waller)	£635	4	0
Mellor Bros. (carpenters, joiners, and painters)	442	0	0
Chadwick (slater and plasterer)	220	0	0
Dudley & Co. (plumbers, painters, and smiths)	217	0	0

For the erection of eight houses, fence walls, and conveniences, at Chesterfield, for Mr. George Smith. Messrs. Rollinson & Son, architects :—

Gough & Brailsford (accepted)	£1,880	0	0

For works at Sussex-place. Mr. Lewis Solomon, architect :—

Longmire & Burge	£525	0	0
Patman & Fotheringham	475	0	0

For works at Maddox-street. Mr. Lewis Solomon, architect : –

Sayer	£405	0	0
Cox	390	0	0
Davey	348	0	0

For sewers, gullies, &c., Oldfield estate, Holloway. Mr. Wm. Paice, surveyor :—
Killingback, accepted.

For rebuilding 165, Drury-lane, for Mr. J. Isaacs. Mr. Wm. Paice, architect :—
Snowball, accepted.

For erecting a new wing to, and various alterations at the Royal Arms Hotel, Silvertown, for Mr. Ball. Mr. E. Taylor, architect :—

Roddam (accepted)	£1,072	0	0

For the continuation of Goodrich-road, on the British Land Company's estate at Dulwich. Mr. Henry B. Michell, surveyor :—

Keeble	£1,066	0	0
Thompson & Son	1,047	0	0
Pizzey	985	12	0
Jackson	944	0	0
Harris (accepted)	894	0	0

For alterations at New-cross Station, for the London, Brighton, and South Coast Railway Company. Mr. R. Walker, architect. Quantities by Mr. Stonor :—
Sawyer, accepted.

For house at Putney, for Mr. Alton. Mr. Robert Walker, architect. Quantities by Mr. Stonor :—

Pain	£4,159	0	0
Adamson	4,155	0	0
Aviss	4,058	0	0
Hobson	4,049	0	0
Sawyer	3,990	0	0
Sewell & Son	3,978	0	0

For rebuilding No. 29, Queen-street, and No. 8, Great St. Thomas Apostle. Messrs. Tress & Innes, architects. Quantities by Mr. Henry Lovegrove. (Stone staircase and marble columns to windows extra) :—

Fish	£5,500	0	0
Sewell & Son	5,184	0	0
Braid & Co.	5,134	0	0
Bangs & Co.	4,890	0	0
Conder	4,829	0	0
Ashby Bros.	4,745	0	0
Rider & Son	4,718	0	0
Brass	4,683	0	0
Browne & Robinson	4,550	0	0
Higgs & Hill	4,540	0	0

For new sewerage works, Cannock. (Four contracts.) Mr. C. R. Walker, engineer :—

Dodd	£19,500	0	0
Moss	16,646	14	10
Fawkes & Sons	15,137	11	6
Meats Bros.	14,583	18	6
Dawson & Bradney	13,857	19	3
Walker	13,632	2	7
Downer & Quesnel	13,306	3	0
J. & G. Tomlinson	12,831	14	9
Hill Bros.	12,821	7	7
Smith & Son	12,681	0	2
Mason & Sons	11,993	3	5
Clarke	11,944	15	2
G. Bell	11,693	9	2
Mackay	11,346	9	2
Holmes & Franks	11,233	9	11
Pickthall & Sons	11,132	9	1
Currall & Lewis	11,093	17	10
Drewitt & Pickering	10,819	3	1¼
Hughes & Dakin	9,009	0	3 *
Roberts	7,262	16	9 *
Young & Co.	7,030	4	0 †
J. Bell	6,559	0	7 ‡
Lea	5,894	5	8 ‖
White	2,518	6	10 §

* Except Contract No. 1.
† For Contracts Nos. 2 and 3.
‡ For Contracts Nos. 2 and 4.
‖ For Contracts Nos. 1 and 2.
§ For Contract No. 2 only.

For boundary walls, gates, and gardener's cottage, at Cudham, Kent. Messrs. Tress & Innes, architects :—

Arnaud	£1,685	0	0
Dartnell	1,655	0	0
Payne & Balding	1,644	0	0

For house and farm-buildings, &c., for Col. Frazer, Fagate, near Horsham, Sussex :—

Burton	£3,250	0	0 !
Snewin	2,800	0	0
Longley	2,400	0	0
Smart	2,300	0	0
Charlswood Bros.	2,273	0	0
Groome	1,893	0	0
Redford (accepted)	1,725	15	0 !

For new class-room and mistress's residence, &c., to Kensington schools, Church-court, Kensington. Mr. Gordon M. Hills, architect. Quantities supplied :—

Langdale & Gwynne	£2,185	0	0
Hockley (too late)	1,980	0	0
Jarvis	1,815	0	0
Dove Bros.	1,745	0	0
Manley	1,704	0	0
Cox	1,688	0	0
Hobson	1,673	0	0
Knight	1,592	7	0

For the erection of Cottage Hospital, Norfolk Park, Maidenhead. Messrs. Henry Cooper & Sons, architects :—

	Central Block.	Central Block and East Wing.	Central Block and E. and W. Wings.
Taylor	£1,193	£1,572	£1,950
Keefe	1,170	1,559	1,949
Hobern	1,100	1,475	1,800
Kempsall	1,088	1,476	1,864
Cox	1,059	1,429	1,799
Selby	1,060	1,423	1,796
Langmead & Way	1,047	1,425	1,798
Lovell	1,049	1,390	1,740
West Bros.	1,040	1,380	1,720
Sim	1,019	1,367	1,715
Woodbridge	1,000	1,350	1,700
Reavell	986	1,369	1,744
Stevens & Bastow	986	1,339	1,676
Jones & Co.	967	1,290	1,620
Bebbington	945	1,279	1,613

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VOL. XXXVI. No. 1866. SATURDAY, NOVEMBER 9, 1878.

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Syrian Archæology.

ONE by one the unsolved problems which half a century ago faced the students of philology and archæology are yielding before the labours of *savants* and explorers of the present day. The picturesque hieroglyphics of the land of the many-mouthed Nile, which for centuries held silent guard over the religious and secular annals of their authors, now yield up freely heir hidden stories to such scholars as Dr. Birch, Lepsius, Renouf, and others; and the histories, both private and public, of the rulers of Thebes and Memphis are better known to the students of Oriental history than the annals of many of the early monarchs of the British Empire. But Egypt is not the only field where inductive logic has proved the talisman to caves of literary treasure, long hidden from the student. The strange, unshapely cuneiform characters which seemed, as it were, to nail up the door of the record-house of the descendants of Ninus and Semiramis have, one by one, been forced to yield, and each made to lisp its syllable in the story of the kings of nations. But a few years ago, the only material which the student of archæology had upon which to found his theories respecting the construction and decoration of the great temples and palaces of Nineveh and Babylon were the few meagre notices in the later books of the Old Testament, and the florid, semi-mythic accounts of the Greek writers. Now all is changed, and the art of ancient Assyria may be studied in most periods of its development, extending over a lapse of some nine or ten centuries. The palaces and temples, once only known from the pages of the writers above mentioned, have now been uncovered, explored, and planned, and the sculptures which decorated the walls, the huge winged bulls, the majestic guardians of the portals, are now to be studied by every student of art in the galleries of our National Museum. The inscriptions on wall and tile, on bronze and marble, which recorded the great and mighty deeds of the rulers of Assyria, record also the lavish gifts to the temples, and the wealth and riches consumed in the construction of these "abodes of royalty." Gold, silver, and precious stones,—bronze and ivory,—with precious cedar-wood, the "produce of the groves of Lebanon,"—all were used by the great king in the construction of the house wherein he dwelt, and in his temples, the homes of the "gods his protectors." Thirty years of research in the twin-fields of archæology and philology, and the palaces of Nineveh, the queen city of Western Asia, are no longer to be studied in the scanty records of Hebrew or Greek writers. Now their own annals furnish to the student the very specification to which they were built, and copious monuments from the walls and corridors of these ancient fanes now guide the eye in the reconstructive work.

The discoveries made by General Di Cesnola in the tombs and treasuries of Cyprus, show how rich and rare were the gifts which the loving worshippers poured into the home of Aphrodite. Cyprus was "the half-way house" on the path of culture from East to West. Here met the triad of the human race,—Hamitic Egypt, Semitic Phœnicia, and Aryan Greek,—each ruling in turn in this "land of the sea," and each carrying away to his own shore some new form, some new conception to blend in his own ideal of beauty.

The discoveries of Dr. Schliemann in Troy and "Golden Mycenæ" testify to the Oriental influence thus felt by the early Greeks, and Egypt, though bound by the iron conservatism of the priestly guardians of science and art, did not escape uninfluenced from her contact with her brother nations.

The disentombment of Ancient Nineveh, by Sir A. H. Layard, Mr. Rassam, and other explorers, brought before the critical notice of the archæologists of the present century a new art, and a totally unknown factor in the progress of art-development. Here were seen the very forms whose presence in Greek decoration had been hitherto inexplicable; here were earlier and simpler examples of forms and subjects more highly developed in the art of the schools of Athens.

The question at once arose where are the connecting links which bound together the studies of the metropolis of Western Asia and of the capital of the fair-haired Greeks? The discoverers of the last few years in Western Asia and Cyprus have supplied the links in the chain, and enable the student to trace, almost step by step, the path of progress from East to West. Herodotus states that Assyrian wares were vended in the marts of Greece in heroic times, being brought there by the Phœnicians, and the statements in both the "Iliad" and "Odyssey" bear this out, as regards the trading of Phœnicians with Greece. These people of the "Land of the setting Sun," as they are called in the Assyrian inscriptions, were long the missionaries of art and culture. Strange as it may seem, this enterprising race, the "cunning Phœnicians," who, in their "black ships" bore to Greece her alphabet, and schooled her in the early paths of art,—these hardy navigators, whose ships passed by the bounding pillars of Hercules, and who, returning, carried back with them the wealth of many lands, leaving behind them colonies whose influence may be felt to the present day,—have bequeathed to us no distinctive art remains, no purely national style of architecture. They seem to have borrowed, copied, modified, transmitted, but never to have invented. It was this hardy race who carried the teaching of the schools of Nineveh, the art, the myths, and legends taught in the schools of the temples, and spread the learning and wisdom of the Chaldees over the shores of the Mediterranean.

As Cyprus was the maritime meeting-place of the triad of the human race, so was there a meeting-place on the main land, where Phœnician, Egyptian, and Assyrian came in contact, and an interchange of ideas took place. It is to the acumen of the late George Smith that we owe the identification of the site of a city which played a most important part in the westward transmission of culture.

On the west bank of the Euphrates, midway between the mouth of the Sagur river and the town of Birejek, are situated a range of mounds known to the Arabs by the name of Yerabolus, and presenting every appearance of being the site of some important city. Maundrel, who visited the site in 1699, and Pococke, who examined the ruins about forty years later, both describe them as marking the site of an extensive and regularly-built city. The topography of the ruins of the city of Carchemish, of which Yerabolus marks the site, resembles in a marked degree that of Nineveh, as represented by the mounds of Koyunjik and Nebby-Yumis, opposite Mosul. The site is inclosed on the north, south, and west sides by a line of ramparts, broken in the centre of each wall by an opening, which marks the site of the city gates. The circumference of the walls was about 8,000 ft., and the shape an oblong. On the east side, on the river's edge, were three large mounds, marking the ruins of ancient palaces or temples, which, like those of Nineveh and Kalakh, had towered high above the river, and found an imposing group of edifices when viewed from the opposite bank of the Euphrates. Scattered over the surface of these mounds are fragments of sculpture, of pottery, and glass, but all of a comparatively late epoch, the majority being of the Greek or Roman periods.

In 1875, Mr. George Smith, when staying with Mr. Skene, the English consul, at Aleppo, was told by him of some sculptures which had been discovered upon the site of Yerabolus, and being about to cross the country on his route to Baghdad, Mr. Smith determined to visit the mounds and see these sculptures. The chief of the monuments unearthed was a fine monolith with a sculpture of a human figure on one side, and on the other a long inscription in the curious hieroglyphic characters known as the Hamathite. This interesting monument stands at present, the upper portion being broken away, 5 ft. 6 in. high, and the sculpture is enclosed in a framework. When perfect, the monument was probably about 8 ft. high, and resembled in character the memorial tablets obtained from Kurkh, at the mouth of the Khabour, and from

Kalakh, which record the victories of Assurnazirpal and Shalmanesar III., kings of the middle Assyrian empire (B.C. 885-800). The sculpture on the obverse of this memorial tablet, however, differs in several points from those of the Assyrian kings; and although evidently copied in arrangement and decoration from the tablets erected by the kings of the early and middle Assyrian empire, it exhibits certain peculiarities which render it an interesting link in the chain of art connexions between East and West. The figure of the royal or priestly dignitary, unlike those of the Assyrian sculptors, is represented in full front, and not in profile, while the feet are turned towards the spectator, and not contorted as in the styles of either Egypt or Assyria. The figure wears a long robe reaching to the ankles, and but slightly decorated by a band of embroidery down the centre. The hem is not fringed, as in the Nineveh examples. Over the shoulders is thrown a long square cloak, reaching nearly to the feet, the edges of which are richly decorated by embroidery and fringe. The pattern here adopted in the bordering is the arrangement of squares, so common in Greek art. The sleeves of the under-robe are fastened at the wrists with plain bands, the arms being folded on the chest. In the left hand the figure holds a curious bunch of fruit, much resembling a head of Indian maize-corn.

In the Hamathite inscriptions this peculiar emblem, which appears to symbolise power or rank, is frequently met with. In several of the other sculptures found at Yerabolus this bunch of fruit or corn is found in the hands of one of the personages represented. On the breast of the figure is a rich ornamentation composed of circles of embroidery, and terminating in a pendent row of globular objects which appear to represent jewels. Placed as this rich object is, on the breast of the figure,—a part of the body always most richly decorated in the sculptures of Assyria,—it calls to mind the breastplate worn by the Jewish high priests. Interesting as this sculpture is, both on its own account as a monument of the art of the Hittite capital and on account of the inscription which it bears,—which will, when deciphered, no doubt furnish interesting historic details,—it is not so important as some of the fragments of bas-reliefs found along with it, which show far more clearly the marked characteristics of Hittite or Syrian art.

The sculptures discovered at Yerabolus may be divided into two classes, according as the Assyrian or Egyptian influences appear to be most dominant in the representation. On a large block of marble, about 6 ft. in length, is sculptured a figure of a winged lion in high relief, and the treatment of this subject exhibits a most interesting fusion between the art of Egypt and that of Assyria. The lion is represented with large wings extending over the haunches, and with all the details of the feathers treated with the minute care of an Assyrian artist. Unlike any of the Ninevite examples, the animal is represented with the tail bushy and erect, giving the hind-quarters rather a strong resemblance to a horse. The head is turned towards the spectator, and is treated in a purely Egyptian style, the animal wearing, in the place of the conventional curls found on the Assyrian example, the *pshent*, or Egyptian head-dress, and a slightly-broken but projecting fragment on the crown of the head would seem to indicate that the head had been decorated with the *uræus*, the Egyptian emblem of royalty. In another large slab, about 8 ft. long, there is represented a scene of a very Assyrian character,—a priest offering the fir-cone to the winged circle. The extremely mutilated nature of the centre portion of this sculpture is much to be regretted, as it would have been interesting to find the sacred tree as an object of adoration among these Syrian nations. In a fine bas-relief, of which, unfortunately, only the upper portion remains, there are represented two figures,—the one a warrior, the other a deity or winged priest, and in this example we begin to see some of the characteristics of the Hittite art. The deity or priest is represented as several times larger than the attendant worshipper. The figure, of which only the upper portion remains, is treated according to the Egyptian canon, the face being in profile, while the body is represented as full front. The face, as far as can be gauged from the drawing in our possession, is long, with high cheekbones, and the hair, unlike that of the Assyrians, is lank and straight. The whole appearance of the face resembles much that of the statue found by Mr. G. Smith, at Zerghul, a drawing of which appears in his "History of Babylonia." The figure has a pair of wings attached to the shoulders, but differs from the Assyrian examples in their not being double. The most marked feature in the costume of this personage is the head-dress, which differs entirely from anything yet found in Western Asiatic art. The helmet which covers the head of the larger of the two figures is conical in shape; instead, however, of terminating in a pointed apex, at about three-quarters of its height it assumes a globular shape. From this round termination a pair of long curved horns project, giving to the whole the appearance of being surmounted by a large crescent moon. The brim of the helmet is also continued upwards, so as to form two horn-like terminals. These horn-shaped decorations seem to be a distinctive characteristic of the Syrian helmet, and in all the examples found at Carchemish, as well as in the bas-relief at Ibreez in Karmania, they appear. In some of the examples the horns attached to the globular termination of the helmet are omitted, and placed so as to project from the body of the conical portion. In the example represented in the bas-relief at Ibreez (Transactions of the Society of Biblical Archæology, vol. iv.) several pairs of horns project, both before and behind, and give to the headpiece the appearance of serpents coiled about it. It is extremely curious to find these horns assuming so prominent a part in the national head-decoration of the Khitta or Hittites, as represented by these monuments, because it is evidently these appendages that are referred to in the passage in I Kings xxii. 11, *et seq.*, which records the scene taking place in the gate of the city of Samaria, the horns of iron here mentioned evidently being made as a play upon the national head-dress of the Syrian or Hittite people, against whom Ahab was going to fight at Ramoth-Gilead.

There is one other stone slab bearing a bas-relief which is of interest, and in which we see somewhat more of the Assyrian art dominant. In this we have represented a deity or warrior wearing a helmet of the type described above, the horns in this case projecting from the cone. In one hand he holds a short-handled battle-axe; the arm is raised, as if in the act of smiting the enemy. In the left hand the figure is represented as holding a bow. This portion of the bas-relief is very much broken, all the lower and right side being lost. Standing behind this warrior is a personage who resembles in dress and features most strongly the eunuchs attendant upon the Assyrian king. In one hand he holds a short sceptre with a plain round metal top, and in the other the bunch of corn, the emblem of his office. The hair is treated in a much more Assyrian style than in any of the previous examples, and the figure seems to be a reproduction of one of the figures from the palace of Assurnazirpal at Kalakh (Nimroud). The close resemblance of the monolith and of the Assyrian portions of the sculptures to the slabs and ornaments obtained from the palaces of Assurnazirpal at Nimrond can leave but little doubt that we may place the date of these interesting antiquities in the early part of the ninth century before the Christian era. At that period in the history of Western Asia, Assyria was just rising, phœnix-like, from the ashes of the early empire. The Hittite kingdom had ruled over all the head-waters of the Euphrates, extending its frontiers from the banks of the Euphrates into Lydia, and from the heights of Lebanon and the sources of the Orontes as far south as the borders of the Arabian desert.

It is, therefore, to this period, when Carchemiah was the capital of Northern Syria, that we must assign the monuments discovered by Messrs. Skene and Smith. In our next notice of this subject we shall show how this new link in the chain became connected with the others, and how by this means the arts of Egypt and Assyria were spread throughout Asia Minor and Greece.

Old Trafford Bridge.—The new bridge over the River Irwell, at Throstle Nest, was publicly opened by the Mayor of Salford (Mr. Alderman Walmsley), on Thursday last, November 7th. The bridge, which is on the bow-string lattice principle, has been erected from the designs of Mr. Fowler, late borough engineer of Salford, and is about 140 ft. span and 64 ft. in width.

RESULTS OF THE CHELTENHAM CONGRESS.

When writing a few preliminary remarks the other day in regard to the subjects for discussion at the meeting of the Social Science Congress at Cheltenham, we observed that it would be interesting to note the manner in which the meeting and its objects were practically regarded in a town very different in character from those in which these congresses had mostly been held. And having accordingly taken due note of the affair from this point of view, we must add another syllable to our adjective, and record that the manner of Cheltenham towards the Congress was, for the most part, exceedingly *un*interesting. The meeting is recorded as a success by the organising officers, who judge by the statistics of tickets sold, and other such practical data; but we imagine most of those who kept their eyes open must have come to the conclusion that the Association had met in a place which cared little or nothing about Social Science, so far, at least, as the special society of the place was concerned. The Mayor of Cheltenham, Baron de Ferrières, was, indeed, conspicuous in attention and hospitality, and must have won the hearts of every one by his courtesy and geniality; but in the main, there can be no doubt that the Congress was supported by the tradespeople rather than by the society of Cheltenham, to whom the subjects discussed, we suppose, are matters of indifference. It is true that the Vicar of Cheltenham took the trouble to write to the *Times* to express his disgust at having read in the papers that at one of the meetings of the Art Section the opening of picture-galleries on Sunday had been strongly advocated, and to say that if he had known the question was to be discussed he and other clergymen would have been there to oppose it; that is to say, that the reverend gentleman knew and cared nothing about what was going on, and that the only thing that would have drawn him out would have been the opportunity of opposing a movement for giving the masses a chance of intellectual recreation on Sunday. This is really delightful. There were a few spirits in Cheltenham of different calibre from this, but certainly the visitors brought with them nearly all the life of the Congress, and this was the more felt owing to the strong contrast in this respect with the meeting at Aberdeen last year, where the most talented and energetic of the visitors found themselves met half-way by men as able in head and willing in heart as the best among themselves. The moral is, that for future meetings the Association should keep, as it has usually done, to active manufacturing or trading towns, where the business of life is being carried on energetically, and where, accordingly, people are really interested in finding out how best to improve the social machine, and do not think it vulgar to show their interest.

Cheltenham is, in fact, essentially a town of the "watering-place" class, a character fully borne out in its architectural appearance, which illustrates the curious and not easily accountable tendency of places of the same social character, even far apart from each other, to fall into the same architectural physiognomy. We all know the style of house and street architecture which grows up in such towns,—the rows of not well-built, neat, respectable, cemented residences, all with the same air of imperturbable primness and respectability. Cheltenham is truly a town offering a fine field for improvement in street architecture, but not, we fear, much opening for carrying it out at present. House property of this kind and in this sort of quiet place lasts long, in spite of often flimsy construction. What is being done in the way of new building is in special public institutions; a new, or recently new, club, very square and staring, and a new winter garden adjoining it. The Town-hall has yet to be built: the town is only in the first year of its incorporate state. When it is built it is to be hoped that it will include a room in which speeches or lectures can be heard. The chief available room for this purpose now, the Montpelier Rotunda, formed a sad experience to those who had to try to make themselves heard in it. It is a circular room, with an open dome and a window in the top, a sort of small Pantheon, and with the sides lined with hard plaster and scagliola. The result of any attempt to speak may be imagined by those who have given attention to acoustic properties of rooms. Wires have been stretched across at the springing of the dome, and, of course, one could not tell how

much worse it might have been without them; but the receipt for breaking up echo did not seem to answer in this case, at all events. The draping of a large flag, sounding-board fashion, over the temporary platform made matters better. The best thing in the aspect of Cheltenham is the presence of trees so extensively in the streets, down the middle of the roadway in the wider roads, just as we have suggested for Portland-place. This gives a very pretty aspect to some parts of the town, and goes far to redeem the dulness of the house architecture.

Perhaps in making one or two *ex post facto* remarks in regard to the congress and its results, many of which suggest themselves, we could not do anything more practical than to say a word in regard to the Art Section, the objects and reasonableness of which seem to be persistently misunderstood and misrepresented in many quarters; a misrepresentation to some extent arising, we are sorry to have to think, from a very narrow and unworthy feeling of jealousy on the part of persons who take a leading place in other departments, who know nothing and care nothing about art, and regard the new section as robbing them of some of their auditors. This latter notion, we may say parenthetically, we believe to be a mistake, and that a majority of those who attend the Art Section meetings are those who would not take tickets at all except for the object of attending that department, which has created a new interest in the meetings and drawn in a new class of subscribers. The feeling we refer to is unfortunately hardly surprising when we notice what is the state of mind and of information upon artistic subjects among many of the able practical men who form the backbone of the other sections. When we hear an eminent engineer say roundly that he cannot conceive what artists want with copyright in their works, or a leading member of a committee, finding himself by accident in the art-room, ask quite blandly and innocently, "Oh, by the way,—what *is* art?" and pause for a reply on the spot, or hear a group of eminent sanitary authorities ridiculing the idea of the possibility or desirability of popular musical education, and find on inquiry that all of them are totally ignorant of music and are arguing on a notion of facts exactly the reverse of the true one (and these are little typical incidents "taken from life"),—of course, when one sees this kind of thing going on, one is not surprised that persons with such hazy notions on artistic subjects are exceedingly puzzled to know what an art-section is for. It is, of course, impossible to argue with people who are talking about what they know nothing about; all one can do is to recommend them to learn a little more about it before they pronounce such decided opinions. The same recommendation might be given, *à fortiori*, to some of the leading journals which undertake to echo the kind of criticism we have referred to, in articles which one would probably not be far wrong in tracing to the direct inspiration of some of the malcontents in question. One leading journal said no one could tell why such a section should exist at all. People who know more about the doings of the Social Science Congress than the writer in question know better than this; and certainly the testimony of the able and practical President of the Council, Mr. Hastings, than whom there could hardly be a more capable or more impartial witness on the matter, would be taken by most reasonable people as pretty conclusive in regard to the relative importance of the part which this department has sustained at the Congress of the Association.

We must admit, however, that the President for this year did not altogether make the most of the matter, and it is partly on this ground that we devote a few words to putting it in the proper light. Mr. Gambier Parry is a most accomplished amateur artist, to whom, indeed, the expression "amateur" is to be applied in a social rather than in an artistic sense; but, like many another artist, he does not seem so successful in dealing with words as with form and colour, and his remarks consisted to a great extent of reflections with which most people would agree, and which were put into agreeable language, but could hardly be said to embody anything very new. In fact, the most definite expression of opinion which could be gathered from the discourse was a negative one, and amounted to a lament that English art was dead 300 years ago; which was, at all events, hardly a view of the matter calculated to awaken enthusiasm on behalf of the Art Section.

The philosophy of the matter, in regard to the establishment of this particular section of the Association, we take to be this. The Association is concerned with "social science"; a sufficiently broad phrase, which may be taken to indicate the consideration of all questions which bear upon the improvement of the conditions of social life, and the knowledge (science) as to the best means of improving these conditions. Now, up to the last two or three years we have had a section dealing with the amendment of law, another devoted to the consideration of national education, another to practical conditions of health, and another to the economical aspects of life mainly in regard to trade and commerce. The whole object of all the discussions and deliberations may be expressed in one sentence,—that of making life happier and more comfortable and better worth having for society generally. It was suggested two years ago that a very important element in the attainment of these ends had been overlooked. The best laws, the most systematic education, could not impart to life the picturesque charm, the element of beauty, without which it was a dull business after all. People could not be made happy, though they might be made more healthy, merely by good drainage; and it has been found too often, by painful experience, that even the most systematic and admirable training in the subjects that may be rudely classed under the old heading of "the three R's," does not necessarily educate that class of perceptions which we indicate in the words "taste" and "feeling." It was felt that, among us, as a nation, these perceptions were in a very dormant state, and that it would be a perfectly legitimate object of "social science" to take into consideration the means whereby they might be fostered and given fair play, and the conditions under which, in satisfaction of the impulses thus fostered, the development of art and the production of works of art might be best helped and encouraged in the right direction. To argue that this is a matter of some importance to the well-being and happiness of the community would almost be waste of time: those who are not already of that mind must be in all probability beyond the reach of argument on the subject, and it is quite certain that in no other of the previously-existing sections could this class of subjects have been rightly considered. It might be an open question whether some of the subjects that have already been treated of in the Art Section might be equally well suited for discussion in the Education Section; but, as a matter of fact, it would be found that this was not the case. It was suggested, for example, that the paper on Musical Education read by Mr. Hullah would have been more rightly placed in the Education Section; but the fact is, that it is exactly by those who are most interested in education in England that the study of music has been worst treated, and reduced to an absurdity,—not through wrong intention, but through absolute ignorance. For some reason persons who are actively interested in education questions are almost always the reverse of æsthetic in their perceptions, and no adequate consideration of subjects of this class is to be expected from them. Of other subjects treated in the Art Section up to the present date, it would probably puzzle any one to say in which of the other sections such questions as the improvement of street architecture, the restoration of ancient buildings, the improvement of the drama, and others that may be named, could be logically treated, and we presume no one will say these are subjects of no importance in the science of life. And the fact is that both at this and the last Congress the Art Section has done more in coming to practical results of discussion than almost any other section. There are always a certain proportion of sentimental talkers collected around the discussion of subjects pertaining to art, but it may be permitted here to point out that at the recent Congress alone definite resolutions were come to in regard to musical education and the foundation of provincial art-museums; that the means for the establishment of a national theatre were distinctly pointed out, and even the first instalment of a subscription for it promised; that the paper on street architecture for the poorer quarters of towns contained what has been admitted to be a new suggestion, which has been at least very widely discussed; and that the paper which the original founder of the Art Section had the courage to bring forward (for it required a little courage in a mixed assembly) in regard to the undraped figure in modern art, probably gave to many among a large and attentive audience (the majority ladies) their first clear and logical idea as to the vital importance to art of a study so much ignored or misunderstood in England, outside of specially artistic circles.

We should be glad, when next the time of annual meeting approaches, to see a definite effort made to silence once for all the sidelong criticism, or rather misrepresentation, to which this section has been subjected on the part both of adversaries in the camp, and of the press in some quarters; and as one means toward that end we may suggest that the selection of a president of the department, with sufficient knowledge of art to understand the subjects treated of, and at the same time sufficient breadth of culture and sympathy to take a comprehensive survey of such subjects in their relation to the conduct of life generally, would be a very important assistance to this end. Artists are apt, when in such a position, to take somewhat narrow and technical views of the subjects included under the section, and this should be avoided. The Art Section of the Social Science Association was never intended to be a school for the delivery of lectures on artistic technique, but an opportunity for extending the influence of art and developing in every possible way the opportunities for rendering life beautiful as well as healthy.

Before dismissing the Social Science Congress for the year, we cannot but remark upon the great injustice done to many excellent papers and addresses by the inadequacy and incorrectness of the press reporting. As regards the local press of Cheltenham, the reporting was peculiarly insufficient, and this has an influence beyond the neighbourhood, as many London papers depend a good deal for details on the reports of the local journals. It might really be worth considering whether some arrangement could be entered into on future occasions with the local press of whatever town the meeting was at, for giving extra space and providing an extra staff so as to ensure something like a full report of each day's proceedings. A still more satisfactory way as regards results would be the publication of a Congress Journal every day during the sitting, so that every one interested in the general results could see at a glance all that had been gone through on the previous day. This would be expensive, but it might be possible to enter into engagements with the proprietors of local papers to supply plant and printers and working space for the week, without extravagant outlay.

We would give a word of praise to Mr. Nelson, the honorary secretary, for his continuous attention to the duties of his office, and to Mr. Jas. Robinson, the assistant secretary.

WOODWORKING MACHINERY AT THE PARIS EXHIBITION.*

BY M. POWIS BALE, M.E.

Messrs. J. A. Fay & Co., of Cincinnati, also exhibit an ingenious combined rip and cross-cut saw-bench, especially useful in establishments where many changes are made in the work. The machine shown carried two saws of 14 in. diameter,—one a rip and the other a cross-cut. The saws are fitted on two spindles fixed in a revolving frame, which will bring into use either saw as desired. The saws are worked by friction discs, which are regulated by the spindle frame coming in contact with a circular guide placed beneath the table; this guide is so aranged that when both saws are below the table, they are at a standstill, but when the saw spindle frame is moved round—which is done by means of a hand-wheel and worm gearing,—so that either saw projects through the top of the table, the saw so projecting is set in motion. A convenient form of bevelling fence is supplied, and arrangements are made for cross-cutting and mitreing.

The band-saw machine differs so considerably in some points of its construction, from English practice, that we think it deserves more than a passing notice. The main framing of the machine is a flanged casting in one piece,—a considerable space is allowed between the saw and the framing for manipulating the work. The top saw wheel is constructed with a cast-iron centre, wrought-iron arms, and a steel rim without flanges. It is made as light as possible, and

* See p. 1138, *ante*.

possesses elasticity in a very great degree, and, being covered with india-rubber, the breakage of saws is much lessened. The saw wheel spindles are of steel, and revolve in self-lubricating adjustable bearings. The table is canted for bevel sawing by a modified ball-and-socket arrangement. The saw is fitted with three metallic friction guide-wheels to receive the back thrust, and also wooden side guides; the top saw wheel can be set to angle. The vertical guide-bar placed in front of the machine is fitted with a retracting spring, by means of which it is instantly adjusted to suit any thickness of timber. The machine is also fitted with patent brake and striking gear, which allows the saw to be stopped and started gradually. A small brush is provided, which keeps the wheels free from sawdust; it is found of considerable utility when sawing gummy woods, &c. Altogether, this is a very efficient and complete tool, and reflects great credit on the makers.

We also noticed a compact little band-saw setting machine, which gives to the teeth of the saw a blow similar to that given by the workman's hammer, instead of a pressure as is usual in most machines for this purpose; it is capable of vertical and lateral adjustment, according to depths and width of teeth and gauge of saw. The amount of set is varied by means of an adjustable steel pointer bevelled at the bottom to the maximum set. The saw is set two teeth at a time, and fed forward by a pawl and lever adjusted to the pitch of the teeth.

A suspended fret-saw contained several features of interest, including an arrangement of differential cone and springs, which keeps the saw at nearly the same tension at all parts of the stroke. It is also fitted with combined striking gear and brake worked by the foot, and is speeded to make 1,100 strokes per minute.

Our attention was directed to Streit's patent bevel flange loose pulleys, used on the machines exhibited. We do not think the idea is novel, but possibly the mode of manufacture may be. The loose pulley is made smaller in radius than the tight, and has a bevelled flange on the side nearest the tight pulley, we presume to guide the belt from one to the other. Thus the loose pulley being of less diameter, the belt is relieved from all strain when running on it, and has time to recover its elasticity, and consequently wears longer.

Among Messrs. Fay's other machines may be mentioned their Climer & Riley's patent universal wood-worker, on which they claim to be able to perform twenty-two different kinds of work. Our space, however, forbids more than a passing notice.

Messrs. O. B. Rogers & Co., of Norwich, Connecticut, exhibit three machines only. The band-saw machine carries 36 in. saw-wheels; the spindles are of steel, and run in double bearings fixed on an adjustable column fitted into the main framing of the machine, and resting on a thick india rubber roller or washer fixed in a second tube, thus giving to the saw considerable elasticity when in work, and allowing for its expansion and contraction. A small rotating disc of steel is used to receive the back thrust of the saw, which runs on india-rubber countersunk into the wheels. The table is made of wood, glued together in strips to prevent warping. The top bearings have screw adjustments, and the machine is fitted with guards. A fret-saw shown has a light iron straining frame adjustable for varying lengths of saws, and has on either side of the frame a hard-wood spring, with adjustable tension connected by straps with the saw. The saw is held by a simple hook and pin at each end, thus allowing it to be rapidly changed, and it is speeded to make 1,400 strokes per minute. We noticed that in the American machines exhibited, most of the bearings used were made of Babbit or some similar composition of white metal, in preference to gun metal or phosphor bronze, as is used by the English makers.

In the Swedish section, Messrs. Bollinder, of Stockholm, exhibit a strong roller-feed timber-frame; the bottom feed-rollers are constructed with sharp tooth-like projections; the top rollers are plain. The timber-frame is fitted with extra long crank and double connecting-rods. The teeth of the saws are of an extremely coarse pitch, adapted, we presume, for sawing sappy timber. We also noticed a double saw-bench for edging deals, with horizontal plain roller feed; part of the top of the bench and one saw were adjustable, by means of a hand-lever, to the width of the deal. These machines were not in motion.

Messrs. Gibson & Son, of Jonsered, Sweden, exhibit planing and other machines that have attracted some attention. The planing-machine seems to have been constructed more or less after American models. The feed consists of geared-fluted rollers adjusted by spiral springs and a distributing lever. The wood is first attacked by a revolving under-cutter, and then passes over a fixed knife fitted in a drawer and between the two side cutters, and finally beneath the top cutter. An additional cutter-block is fitted for matching, &c. We noticed the cutter-blocks in this machine are made movable. The side spindles are adjustable, and the cutters are made in sections and fixed in mortise slots. This machine is very light in its general construction when compared with English models; but the work we saw turned out was satisfactory. Messrs. Gibson & Son show also a steam mortising-machine, but of no special novelty. A sand-papering machine, fitted with fan for clearing away dust, and a well-arranged tenoning machine, were constructed with wooden framings, a plan once much in vogue in America and elsewhere, but now for the general range of machines almost extinct. The advantage or disadvantage of wooden-framed machines was at one time the subject of much discussion, it was urged in their favour that they absorbed the vibration of the cutters when running at high speeds to a much greater extent than iron-framed ones.

In the Norse Section Messrs. Jensen & Dahl exhibit one of their ordinary pattern-planing machines, which have attained considerable celebrity in the North of Europe, but possess no special feature of novelity; we are, however, at a loss to see the object of constructing the spindle pulleys of so large a diameter, thus causing unnecessary friction to the driving-belts, &c.

In the Swiss section the Werkzeug and Maschinen fabrik of Oerlikon bei Zürich exhibit a band-saw machine, with which is combined and fixed on the main column a planing and boring arrangement for light work, suitable for cabinet-makers, &c. We saw also a small machine for sawing out wooden cogs: the wood is fixed in a vice, fitted on a circular revolving-table, and is operated on by two circular fine-toothed saws, running vertically and horizontally; when the tooth is cut on one side the circular table is made to revolve, and the other side is served in the same manner.

In the Austrian section, the Ateliers de Construction of Budapest exhibit a well-designed and powerful timber-frame, fitted with roller feed, which is adjustable by a simple rack and pinion arrangement. The feed rollers are geared, and the swing-frame is driven by double connecting rods placed within the main framing. The workmanship is decidedly good.

In the French section, on the opposite side of the Exhibition building a large collection of wood-working machines is displayed; some of these show considerable improvement in their general design: but the castings of more than one firm are of a very inferior description as compared with those of some other nations.

Messrs. Perin, Panhard, et Cie., of Paris, exhibit a number of machines consisting chiefly of the different forms of band-saws with which their name has been associated for many years. The framings of their machines have latterly been more assimilated to the English designs, which is a decided improvement over their old models. There is nothing new in the construction of the band-saw machines; in fact, the generality of the French machines of this class may be said to be considerably behind some of those in other sections in general arrangement and effectiveness. The saws are arranged to run on flanged wheels covered with india-rubber, but no spring, weighted lever, or other plan is adopted to allow for the expansion and contraction of the blades. The top saw-spindles are turned taper, to secure lightness, we presume, and are fitted with phosphor bronze bearings. On some of the larger machines the front guide is raised and lowered by a rack and pinion. A band-saw for cutting iron, driven at a slow speed, was in operation, and turned out very satisfactory work. This, we think, must be attributed chiefly to the high quality of the saw-blades used, for the manufacture of which Messrs. Perin & Co. are justly celebrated.

We noticed a compact combined wheel-stock mortising and boring machine working horizontally. The stock is fixed on centres placed transversely in the centre of the main framing, on a table having circular and lateral movement; at one end of the machine is arranged the mortising and at the other the boring apparatus. The stroke of the mortising tool is adjustable, and is worked from a crank. The boring tool is made to traverse horizontally in a slide by means of a hand-lever. The shaping machine was fitted with a self-acting chain-feed, with moveable "dogs"; this form of feed appears to be somewhat popular amongst the French makers. A planing-machine, with rising and falling centre-table and roller-feed, the pressure of which is adjusted by india-rubber springs, was well constructed.

Mr. F. Arbey, of Paris, has a large display of machines, some showing considerable ingenuity, but inferior castings mar their general appearance. A set of machines for making *sabots*, or wooden shoes, as used by the peasantry of France, Germany, and other countries, attracted some attention. A modification of a multiple copying or spoke-lathe, shaped from a model the outline desired at the rate of some seven shoes per minute. The interior of the shoe was afterwards hollowed out by a machine which was ingeniously arranged with a rocking motion. The details of some turning-lathes for ornamental and twisted work were somewhat novel, and the work produced was satisfactory. We noticed a handy pendulum cross-cut saw-bench especially designed for cutting barrel-staves. The stave to be sawn is beat under a powerful spring placed on a swivelling-frame, which can be set to any desired angle. The pendulum saw is brought over by hand, and one side of the stave is sawn; the swivelling-frame is then set over the width of the stave, and the saw performs the same operation on the other side. The mode of "packing" circular saws adopted by M. Arbey is worthy of notice. On either side of the saw, and let into the top of the bench, are fitted four set screws adjustable to the gauge of the saw. Into the centre of each of these screws is fitted a piece of hard wood, which, when the screws are tightened up, presses against and guides the blade. The trying-up machine shown is fitted with Mareschal & Godeau's patent spiral or twisted cutters. The advantage claimed for this form of knife is, that the pitch of the knives is so arranged that the end of one comes opposite to the beginning of the other, thus giving a continuous cut during the whole revolution of the cutter-block. As part only of the whole length of the knives strikes the wood at the same time, the vibration is considerably lessened, and as they always present the same cutting angle to the wood, cross-grained and knotty stuff can be worked. The knives used are very light, being from one to two millimètres in thickness; they are, however, somewhat more difficult to manage than the straight knives, but an arrangement is fitted to this machine where, by means of a revolving emery-wheel, they can be sharpened in their places. The machine is furnished with a chain feed, and the wood is secured on the travelling-table by longitudinal "dogs." Several forms of band-saw machines are exhibited on this stand, and also in the adjoining French Annexe; one fitted with self-acting travelling-table for heavy logs, a hand-power chain reversing gear and a lateral movement for bringing the timber to the saw. On one of the smaller machines, a simple movable hand-rest for light bevel-sawing was used. In the timber and deal frames, the swing-frame is fitted on the face of the main framings, instead of the centre, as is usual in this country, and are generally driven by double wooden connecting-rods and fly-wheels placed on either side of the uprights. A tenoning-machine working with circular saws, the spindles of which were arranged for slot-mortising, and a machine for surfacing up small stuff, consisting of a fixed plane-iron fitted in a reciprocating slide driven by a long throw-crank wheel, were amongst the other exhibits.

Messrs. Gérard, of Paris, exhibit a multiple copying-machine, in which the cutters are fastened directly on to the spindle, without any block or other provision being made; a simple arrangement is also provided for centreing the spokes or other work. A panel planing-machine to work 80 centimètres wide is fitted with plain adjustable pressure rollers. Instead of using two long planing-irons extending the whole width, eight short ones are arranged in succession, two on each side of the cutter-block; this plan, although causing a little more trouble in

adjusting the irons, simplifies very much the operation of sharpening, as considerable difficulty is often experienced in keeping irons of very great width in satisfactory condition.

A band-saw machine shown is fitted with a self-acting feed, and an arrangement for setting over the top saw-pulley, but it must be admitted that most of the French machines of this class exhibited are crude in their construction, and far behind those in the English and American sections in general completeness of design and detail. Several of the saw-benches are fitted with Ganne's Patent Saw-Guard and Guide. This consists of a narrow cast-iron box, made in the form of a half circle, inside which the top of the saw runs; this box or chamber is suspended over the saw from an arm fitted to one side of the bench, is made adjustable to sizes of saws, and is furnished on either side with set screws, which act as guides. One of the benches exhibited should be very useful for the lightest class of work. It is driven by the foot, and part of the top of the table outside the saw is made to angle for mitre-cutting, and the whole table-top is arranged to cant endways for rabbeting and grooving. We noticed the shaping-machine was fitted with a chain feed, which could be worked either by steam or hand, and a rounding machine had a neat arrangement, worked by the foot, for turning down and rounding off the ends of broom-handles, &c.

Adjoining this stand Martinier's patent band-saw sharpening machine, one of the novelties of the Exhibition, was in motion. It is ingenious; but whether it will stand the test of time remains to be proved. The saw is placed round two drums, and is sharpened by a small revolving disc of steel, which is bevelled on the one edge and serrated. The saw is brought forward a tooth at a time by means of an automatic feed, and held in position by a spring, which is released as each tooth is sharpened, when another is advanced. A stop-piece is fitted to the saw, which throws the machine out of gear when the sharpening is completed. The whole arrangement is slightly complex, and cannot well be described without drawings. The machine shown is the first one made, and Mr. Martinier informs us that his new patterns will be improved. As it stands at present, however, the inventor deserves every credit for his ingenuity.

M. Quétel-Tremois, of Paris, displays a substantially designed set of parquet machinery. The cutter-blocks and spindles are made of larger section than is usually the practice.

Recently patented and fitted to a band-saw machine is a new form of saw-guide. It is constructed of gun-metal, and consists of three small square oil-boxes, one placed on either side of the saw, and one at the back. The side of each of these boxes nearest the saw is made movable and adjustable to gauge of saw by set screws. These movable plates are made of steel, or other metal, and a number of very small holes are drilled in them, through which the oil percolates. In addition, at the back of the saw is placed a small revolving steel wheel, which receives the back thrust.

Mr. J. Fau, of Bordeaux, exhibits a band-saw machine, to which is attached an arrangement for planing and moulding. He constructs his band-saw wheels solid, and of wood, by which he claims to drive with less power, as, being without arms, the wheels have less air-resistance to overcome. Driving this machine, and fitted directly to the bottom saw-wheel spindle, is one of P. Martin's patent rotative engines.

M. Guilliet-Perreau, of Auxerre (Yonne), exhibits, in various machines, his patented system of steel-cutters for working wood. A vertical spindle shaping-machine was in operation, and turned out excellently-finished work. In this machine the cutter is circular, and is made in one piece; in form it is somewhat like a deep saucer, the periphery is shaped to the profile of the desired moulding, and has six openings, which are sharpened towards the centre, and present as many cutting edges to the wood. The advantages claimed for this form of cutter are, that when the profile of the moulding is once formed it is unalterable, no matter how badly the sharpening may be done, that it will make a cleaner cut, and that it is less liable to accident. The cutters on the tenoning machine consist of two solid steel discs, 32 centimètres wide, with eight openings in each. A very complete combined machine for turning, boring, and mortising wheel-stocks, shaping table-legs, &c., was also shown, it is so arranged that when the timber for making the wheel-stock is once fixed, the stock is completed without removal. Included in this display is a set of machines for shaping and dressing spokes, sabots, gun-stocks, &c.

M. A Tiersot, of Paris, exhibits a series of nicely-constructed fret-saw machines, but they do not possess any special feature of novelty.

THE BELLS OF ST. PAUL'S.

THE one great cathedral built in England for the Protestant rite has broken the silence of two centuries. Silence, that is, as to the external world, and silence not absolute. The great bell of St. Paul's has tolled for kings of England, for bishops of London, and for deans of the cathedral, for 170 years, the deep tones issuing from its mouth, of 6·7 ft. in diameter, having been heard as far as Windsor. And the hours and the quarter hours have rung out from the clock tower with unfailing regularity for many a year. But as the evening of All Saints' Day, 1878, was deepening into gloom, the music of a peal of twelve new bells for the first time rang out over London. Thirteen of the ancient College Youth bell-ringers, under the command of the well-known organist, Dr. Stainer, and in presence of the Bishop of London, and a large choir of clergy, assembled in the ringing-chamber, to set the sheathed ropes in motion; the great tenor bell requiring a pair of ringers. The first round of nearly a thousand changes was greeted with expressions of delight from those assembled within the cathedral. Without, in the Church-yard, up Ludgate-hill, along Cheapside, and the more modern thoroughfare of Cannon-street, through all the quaint lanes, courts, and alleys named from portions of the service of the church,—Paternoster-row, Creed-lane, Ave Maria-lane, and Amen-corner,—or from the Chancerian vicinity of Godliman-street and Knight Rider-street,—on by St. Martin's to the north, and echoing to the Abbey and collegiate towers of Westminster and of Southwark, rang the new sweet music. Persons walking along Fleet-street and the Strand, or along the noble quay road of the Embankment, halted as the unwonted sounds fell on their ear. London gladly welcomed the musical voice uttered by her great metropolitan church.

A church without a peal of bells is almost as shorn of its true power and influence as a church without an organ. The last quarter of a century has witnessed an extraordinary improvement in the inner music of our churches. We trust that the example of the metropolis will be imitated throughout the country. To impose silence on the jangling, "panny" bells that make Sundays and saints' days odious to the ear in so many of our country towns and villages would be a good work. To replace the importunate din with the sweet sequence of musical chime or peal would be far better.

A sort of Irish echo of the bells of St. Paul's anticipated their first audible peal. A musical amateur, not unknown by his writings, described, in the columns of a morning contemporary, a visit of six hours which he had paid to the bell-turret, during which he seems to have relied enough on the accuracy of his own ear to attempt the testing of the bells with a muffled hammer, but unprovided with a tuning-fork. The criticism of Mr. Haweis called forth a reply from Sir E. Beckett, briefly to the effect,—"I know nothing of musical tones or half-tones, but the peal is a good peal."

The practical lesson to be drawn from this preliminary discord we take to be the advisability of a scientific exposition of the normal laws of bell-founding. As to these Mr. Haweis tells us no more than his opponent. His remarks are purely critical, not suggestive. Indeed, he speaks of the secret of the immortal bell-smiths, Hemorny, Damery, and Van den Gheyn. But that secret has been committed to the faithful keeping of the bells cast by those masters. Severin Van Aerschodt, of Louvain, we are told, "has fortunately preserved the art of casting true bells in tune." But to design a true bell is not only a matter of art, but one of science. It would do far more towards making the English steeples musical to bring out the main principles which regulate the tone of bells than to recommend us to go to Belgium for peals cast by those who have preserved some undivulged secret.

As to this,—not having the last edition of the "Encyclopædia Britannica" at hand,—we find a plentiful lack of information in the works that treat upon "Bells." We can learn their weights, and, in some instances, their diameter. The Great Bell of Moscow, cast by order of the Empress Anne in 1734, was 21 ft. high, and weighed 19 tons. It was broken in 1737. St. Ivan's Bell, hung on the Ivan Tower on the Kremlin, weight 127,830 lb. The great bell of the Temple of Amapoora, in Burmah, weighs 260,000 lb. At Pekin there is a bell of exactly half that weight. But the champion bell of the world is at Jeddo. Though only 17 ft. 6 in. in height, it is said to weigh 1,700,000 lb., an estimate of which we should be glad to have a verification. That weight is nearly four times that of the great Moscow bell, and fifty-six times that of Big Ben at Westminster, rated at 30,324 lb. At Vienna is a bell 9·8 ft. diameter. At Sens one of 8·6. The great bell of Notre Dame, Paris, is of the same diameter as that of Sens. But while the latter weighs 34,000 lb., the Parisian bell only weighs 28,672 lb. Great Peter, at York, 8·3 ft. in diameter, weighs 10¾ tons. Great Tom, at Oxford, 7·1 ft. in diameter, weighs 18,000 lb. Great Tom, at Lincoln, 6·8 ft. in diameter, weighs 5½ tons. The great bell of St. Paul's, cast in 1709, weighs 11,470 lb., and is 6·7 ft. in diameter.

Mere details of size and weight, however, tell us little. As far as they go they seem to indicate that the rule of the bellfounder has been the rule of thumb. We should like to know the difference in the distribution of metal in the two bells of Sens and of Paris, which, with the same diameter of mouth, differ by 1,328 lb. in weight. Above all we should like to have an account of the musical tone, definitely stated in vibrations, of each of those giant instruments. The rule of the German bell-founders is said to be this. Assuming the thickness of the thickest part of the bell, that which is struck by the clapper, and known as the sound-bow, as unity, the diameter at the mouth of the bell should be 15, that at the top 7½, the height 12, and the weight of the clapper 1·40th of that of the bell. To this Mr. Haweis adds that when struck two-thirds up the bell should give the third, and near the top the fifth, to the dominant note.

Two points require investigation in the first place, and we shall be extremely glad if our remarks lead to any elucidation of the subject. The tone of a bell must depend to some extent on size, to some extent on shape, and of course greatly on the purity of the metal. Shape would seem to be the first consideration. We should conclude, subject to the correction of experts in the matter, that the circumference of the sound-bow of the bell would act much in the same manner as the length of pipe of an organ, or string of a piano. The lowest C of a grand piano, according to writers on acoustics, is produced by an open pipe (for an organ) 16 ft. long, the vibrations being 64 per second. On the hypothesis above ventured, the corresponding diameter of the sound-bow of a bell would be 5·09 ft. The question then arises should this be the interior, the exterior, or the mean diameter? and is the fifteenth of this diameter the best thickness of metal to produce the purest tone? We note that according to this rule, "Great Tom" of Lincoln should give a very true G, and the Exeter bell, of the same weight, an equally accurate A.

Again, we know that by taking off one-ninth of the length of pipe or string we produce the note D, by taking off one-fifth we produce E, and so on. Should the diameter of the bell contract in this proportion? and if so, in what relation to its height? Again, what will be the best musical thickness at each part of the bell?

If any of our readers who combine musical with mechanical or mathematical science will give, or will endeavour to acquire, any positive information on the relation existing between the shape, the weight, and the tone of bells, it will do far more service to the open-air music of the country than any amount of learned criticism. At all events, we congratulate our fellow-citizens on the new music of St. Paul's.

Edinburgh Architectural Society.—On Saturday afternoon last, the members of the Edinburgh Architectural Society assembled at the new St. Mary's Cathedral for the purpose of inspecting and having explained to them the characteristic features of the building. The meeting had been arranged for with Mr. Scott, son of the late Sir Gilbert Scott, under whose supervision the work is now being carried forward; and the visitors were conducted over the building by Mr. Morgan, the clerk of works.

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THE HOME OF THE LAST QUEEN OF CYPRUS.

When, some years ago, before Metropolitan improvements were in vogue, we saw in old Northumberland House the famous picture by Titian of the Cornaro family, which John Evelyn saw hanging in the same place more than two centuries previously, we little suspected that one of the ladies there represented we might again see in Paris, sitting on the left hand of the King of Barbary, in the august position of the Queen of Cyprus, or still less that we should ever be induced to feel for her majesty any additional interest on the score of allegiance we owe to the present Queen of that island.

Whether or not we are right in our surmise that in the famous Titian we may find the beautiful Caterina Cornaro, one fact is certain, that that lady married Jacopo Lusignan, king of Cyprus, who, having desired to enter into alliance with the Venetian Republic, had asked in marriage from the senator a wife of patrician family. Caterina, the daughter of Marco Cornaro* and one of the most beautiful women of her time, was chosen, and thus became queen of Cyprus. Two years later her husband died, and the Venetian Republic took upon itself the government of the island, the queen receiving homage from her subjects: at a later period, in accordance with the desire of the Senate, Caterina retired to Venice, and there, at this gorgeous period of the Republic, resided in all the splendour of a monarch.

It was an age of magnificent display, and it is no surprise to hear that on the return of the Emperor Maximilian from Milan to Germany, in all the pomp which Hans Burgkmair has so nobly preserved for us, and Coin of Mechlin even more nobly sculptured, not a few Venetian patricians should wish to see the triumphal march. Among the number was the queen of Cyprus, who, in the course of her journey, rested at the then small town and fortress of Asolo, situated in the mountains some ten miles to the north of Giorgione's gentle Castelfranco. Enchanted with the extraordinary situation of Asolo, Catherine determined on making her future home the little mountain town, with its antique history, and from the platform of whose fortress she could see on the blue horizon of the great plain at her feet the towers of her own beloved Venice and the glittering line of the Adriatic Sea, and in the distance Padua, Vicenza, and Treviso; on the extreme limit Verona; at her feet, Castelfranco and Citadella, with many another antique town; and behind her, and far out to the right, the blue towering mountains, with their highest peaks tipped with snow, their southern slopes dotted with many a pleasant Italian village clustering round its square-towered church,—lovely spots, where then stood nothing but the peasant's hut, but where since have risen many a patrician and bourgeois villa.

More than once, on the lovely autumn evenings, from the quaint ramparts of the town from which we are writing, we had been able to discover in the blue distance the picturesquely-situated castle of Asolo, with its dark background of mountains,—the mountains described so ably by Sir Roderick Murchison, and of which in late years we have heard so much as the "Dolomites," whose extraordinary form and colour we see so often and so faithfully represented in the background of Titian and his numerous contemporaries and successors.

But the lovely effects of cloud and sunset on the sombre mountains, which stretch for many a mile inland, dividing naturally Austria and Italy, the old masters, even if they appreciated, appear never to have painted; superb masses of clouds seem always to rest in the upper valleys, clouds which at sunset take all imaginable colours, adding a grandeur to the deep purplish blue of those portions thrown into shadow, and bringing out into sharp relief the saw-like edge of those peculiar ranges which Giorgione in his youth so often studied. Turner seems to have been the only artist of modern days whose appreciative power was able satisfactorily to grapple with the grandeur of Nature's effects in the mountains.

Hidden often from the ramparts of this town by blue mists, at other times, like the magic isle of St. Brandan, distinctly visible, Asolo is the ideal home of romance. On our late visit to the graceful mediæval town of Castelfranco, when the statue of Giorgione was unveiled on the occasion of the fourth centenary of his birth, and when in the evening the little town in the mountains, with its protecting fortress, shone out in the distance, lighted up by the setting sun, the romance which hovered round the home of the last queen of Cyprus seemed carried to the full.

Its approach is no less ideal. Brought to Castelfranco by the useful, if prosaic, railway (which has only invaded this industrious corner of the province within, comparatively speaking, a few months), a diligence,—a genuine old-fashioned diligence,—with its merry chinkle of bells, carries one soon out of sight of the ivy-covered walls of Giorgione's birthplace, with all its memories of family feuds and painters' reveries, along a well-made road leading directly up the mountains to Asolo.

Passing on the way peasants toiling in to Castelfranco, and many a handsome *contadina*, unchanged in costume and appearance since Titian's day, in more than one of whose pictures they may be seen,—the women of these parts are famous: Paul Veronese chose a wife from Castelfranco,—we catch through the distant trees every now and then a peep of the distant town of Asolo, with its castle perched high on the *rocca Cornaro*,—for so the driver terms the mountain. On the road this driver gives us a sad account of the town we are so rapidly approaching, which he, to his own immense amusement, and somewhat ungallantly, though in a thoroughly Italian manner, likens to a *bella-donna* whom one has admired at the window, but whom, when we meet her at the door, we find how to translate it!—*senza dente*. With a chuckle at the comparison he has probably made to more than one of the few strangers who visit this part, we rapidly ascend a road embowered in lovely trees, as green in the middle of October (when the London "book of nature," as Hood puts it, is usually very "short of leaves") as in early spring, and in another moment the superb plain, the level of which we so shortly before left, stretches out before our eyes,—a scene which the imagination of even Horizonti never rivalled.

It is this superb view, over which the castle and town of Asolo look, which so justly enchanted the queen of Cyprus; and there, though sadly battered by time and man, stands the home where the beautiful Caterina spent, in the midst of such splendour and elegance, so many years of her life.

From its position alone, Asolo bears evidence of having existed at an early period; indeed, it was a town of some importance when many of the cities on which it now looks down were not even formed. Ptolemy and Pliny make mention of it, and numerous are the Roman remains which exist and have been discovered in its neighbourhood, among others an aqueduct (in one portion of the town may be seen a broken Roman sarcophagus used as a drain) and the traces of a public bath, while inserted in the walls of more than one house are specimens of Roman art of no mean merit (one bas-relief, which may have suggested to Canova, whose birthplace is not far from here, his famous "Hebe") specimens reaching from the best period down to the third and fourth centuries, showing how long a time the Romans resided here.

The castle recalls the finest work of the Middle Ages, with its tale of restoration by the famous tyrant Ezelino da Romana (whose castle once stood not far from Asolo), the still more famous Scaligers of Verona, and the Carraresi family, the fourteenth-century possessors of Padua; indeed, the person who has learnt the truth that instructive sermons can be preached by stones can read the history of the town in its interesting remains.

But the epoch the most full of pride for Asolo, the period that possesses the richest store of recollections, is that of the splendid court of Caterina Cornaro, the last queen of Cyprus, when Italy was the model of refinement and good taste to the world at large, and the Italians were considered as masters in the elegant arts. It is to this period that belong the brilliant frescoes which adorn the exterior of the houses of Asolo, and which here, apparently more than in any other town, seem to have resisted the ravages of time; indeed, it requires but the smallest effort of imagination, so characteristic is the town, to mentally restore the complete appearance which it presented at the time when the beautiful queen of Cyprus held here her court, when the streets of Asolo were peopled with her gay and distinguished visitors.

The queen, on her arrival in the town, was received under a superb baldacchino of cloth of gold, and, in the midst of universal acclamation, one Taddeo Bavolino welcomed her with a lengthy speech, "O happy country of Asolo!" he exclaimed, "O happy flocks! since you will be tended by a shepherdess so just, so beautiful." The ideal of the epoch, it must be remembered, was the idyll. It is sad to think how far the ideal, or indeed the idyll, is banished now except in imagination from Asolo; perhaps, only perhaps, after all, our driver was right in his comparison with the "*bella donna a la finestra.*"

Then, however, a very different state of society reigned (though even cynical *vetturini* existed); an accomplished joyous community displayed all its enthusiasm for art and academic literature, encouraging the ruling taste by publicly honouring culture, "while in other parts of Europe," writes Sismondi, "the nobility made it a point of honour not to know how to read or write, there was not a prince, not a captain, not a great citizen of Italy, who had not received a literary education, who had not studied with fervour the classics; the scholars who revived the platonic philosophy, the poets who called to life the Italian muse, entered the councils of princes or in those of the republics, and obtained in the government of their country an influence such as letters have rarely attained."

The splendour of the court of Lorenzo de' Medici, the generous and enlightened protection which he accorded to art and letters, contributed to the revival of good taste. The last Visconti and the first Sforza welcomed nobly those scholars and artists who were attracted to their courts. The councils of Alphonzo and the court of Naples discussed learning and politics. The courts of Ferrara and of Mantua followed this example, the Montefeltro at Urbino and the Malatesta at Rimini changed, so to speak, their palaces into academies.

Nor was the court of the queen of Cyprus at Asolo behindhand in this fashion of the day. Civilisation had diffused intellectual culture, increasing the pleasures of life and developing the delicate sentiment of the beautiful, as the splendid monuments which Italy erected at this time fully attest. Fêtes, jousts, hunting, and music formed the pleasures of the great, who led a life of luxurious elegance.

With such a learned and artistic society, how delightful Asolo must have been at this period! Accomplished and graceful women offered rare attractions to the youth which came to Asolo, invited to the queen's court, where they met with the flower of the Venetian nobility, the *literati*, the poets, and the painters of the day, with the princes who visited the queen, with Navagero, Pietro Bembo (whose portrait by Titian has only lately been discovered at Naples), Tulba d'Aragona, the Marchesa di Mantova, Pandolfe Malatesta (lord of Rimini), with many others, among them, the queen's own kinsman, young Ludovico Cornaro, little resembling the sober centenarian of later years, who, in the course of his long life, saw one after another the old faces of his youth pass rapidly away, and the old enemies of the Cornaro family disappear. For all, Catherine's existence was not happy: her father had seen himself exiled from his home, nor was it till her proposed marriage with the king of Cyprus that the senate revoked their sentence and accepted the young Catherine as the "Daughter of St. Mark": in later times, when her husband died, after a reign of fourteen prosperous years, this same senate claimed her kingdom and commanded her return to Venice; then it was this quasi-royal prisoner retired to Asolo, which was her home for twenty pleasant years, till, in fact, her death, which occurred there in 1510. Desirous of enjoying all the pleasures of the country, the queen caused to be built, at some little distance from Asolo, a magnificent dwelling surrounded with a park, planted thick with trees, and vines, and fruits, adorned with the choicest flowers, well stocked with the rarest game from Persia and the Black Forest; through this park ran a rivulet of the purest water, obtained from the slopes of the mountains, from the spot known at the present day as the "*fontana della regina*," where, under the sand was found a stone the inscription on which was dictated by Bembo, since preserved in the *loggia* of the town-hall at Asolo.

The reader who opens now a chronicle of this time with a description of the pleasant

* To this same noble family belongs Louis Cornaro, the centenarian, mentioned in the *Spectator*, and the value of whose now well-known treatise on the means of attaining long life, "the late Venetian ambassador, who was of the same family, attested more than once in conversation, when he resided in England."—*Letter* 195 (1711).

occupations of this court, will come upon a rich mine of interest, while what is deficient must be filled in by the imagination, guided by a knowledge of the period and the guests invited by the queen.

On the occasion of the marriage of one of her maids of honour, the queen invited all the noblest knights of Italy, gave a great *fête*, with sumptuous banquets, music, games, and representations, in which was celebrated love in various guises. These rejoicings, to the beauty of which Catherine's lovely residence and park greatly added, inspired Pietro Bembo to write his book, "Degli Asolani," in which he speaks of Asolo and the garden of the queen of Cyprus as of "marvellous beauty."

He describes the *pergolati* or trellises of vines, and the alleys of laurel, "thick, and formed in a regular, exact manner, so that not one leaf is out of its place or order." The remains of these may still be seen, as also some of the old orange and lemon trees in their quaint pots.

The folly of cutting shrubs to reduce their picturesque leaves to the monotony of a wall, and submitting them to all sorts of strange forms, was a weakness of a time in which affectation was often preferred to nature; however, in the queen's park, nature, free and undisturbed, had reserved to her a corner, and there the plants were left untortured.

Bembo goes on to tell us that the garden ended in a meadow "of the greenest grass, covered with all imaginable beautiful flowers, and at the extremity of which grew a forest of laurels, *untouched*"; and here especially were remarkable two arbours, "darkened by shadow, and full of poetic solitude." Who on reading this can help recalling the pleachèd bower, "where honeysuckles, ripened by the sun, forbid the sun to enter," in which Shakspeare places Beatrice?

This was the portion of the garden abandoned to itself and the free course of nature, and which resembled exactly what are abroad so erroneously called "English gardens." Italy had them before we in England, and Tasso, in one of his letters, confesses that in describing the garden of Armida, a thoroughly natural park, he had before his mind the garden planted near Turin, by order of Emanuele Filiberto, the duke of Savoy.

This portion of the queen of Cyprus's park, cultivated without the aid of art, however much it seemed in opposition to the taste of the period, appears to have been the most favourite with Bembo; for this dark wood, shaded by the thickly matted leaves, and "full of poetic solitude," formed a becoming contrast to the lovely women who sat there, such as the painters of the time admired, and such as we see represented in our own Titian at the National Gallery.

And here it was that Bembo drew in the inspirations of his amorous pages, which were read in his time with avidity by his friends and admirers; such women as the Queen of Cyprus, Lucrezia Borgia, Lisabetta Gonzaga, Veronica Gambara, Vittoria Colonna, and so many others, ladies cultivated and noble, who formed a splendid society, sensual, elegant, and sceptical, and with it superstitious. It was the flower of an epoch glorious in the history of art, an epoch, however, which, as might have been expected, ended sadly.

Italy, independent until about the end of the fifteenth century, was then invaded by the French, the Swiss, the Spaniards, and the Germans, who bore before them misery and grief into lands where reigned peace and prosperity,—a terrible example to the future and to our descendants, that they should not abandon themselves to a life too luxurious and self-indulgent. The liberty conquered in the twelfth century was corrupted in the fifteenth, Italy, which had lost (for the second time) its old vigour, knew no longer how to resist the greed of the invader; the country suffered for more than half a century from the horrors of a war which deprived it of its old independence, and condemned it to three centuries of degradation and decadence.

In the course of so many vicissitudes many monuments and glories disappeared, and now, when one clambers up the *rocca Cornaro* to seek the traces of the gallant court of the queen of Cyprus, all one finds to tell the tale is a council-room serving as a theatre, the lower floor transformed into a prison, the rest destroyed and desecrated; there alone stand a magnificent tower, a few tottering walls, and picturesquely-shaped and overgrown heaps of stones.

The town, devastated by wars, by fire, and by time, and pillaged by successive hunters after antiquity, still preserves not a few splendid fragments of its past, and one beauty still remains unaltered, uninjured by time or man, the beauty of nature, which smiles alike over mountain and valley, and embowers each spring in green the now deserted home of the last queen of Cyprus.

Treviso.

SKETCHES ON THE ROAD TO SPAIN.

A JOURNEY to Spain is as useful a mode of education as any one could prescribe. Indeed, many French architects make a point of carefully visiting that country and studying its historial monuments and inspiring themselves with its *souvenirs*, in stone, bricks, and mortar. Though behind is neighbours in many points, to the architect, at least, Spain opens a broad field of research. Nor is the journey fraught with any of the grave inconveniences which used to beset travellers a few years ago. The principal towns are accessible by rail, and now more patience than courage is required to perform the journey. Of course, if the traveller has unlimited time, and is not satisfied with the great towns, but wishes to pierce unfrequented districts, he must trust himself to the muleteer, and then he may experience some of the adventures and hardships described by the travellers of a former generation; but this is in nowise necessary to the accomplishment of a careful study of Spanish and Moorish architecture. As a rule, the tourist will prefer travelling to Paris, where a day or two can always be agreeably employed. Thence, the journey to the base of the Pyrenees is quite long enough for one stage, and Bordeaux or Bayonne naturally suggests itself as good halting-ground. From Paris to Bordeaux the country is remarkably flat, and nothing will be lost if the journey is performed at night. The broad horizon suggests the sea rather than the land; but it is only a dull uninteresting sea, unrelieved by the sparkle of the waters, the dance and music of the waves. The brown ploughed fields, the grass grey with dust or burnt with exposure, offer no rest to the eye. Here and there the vine-fields, — some a faint green with autumn yellow, and others a dark blood-red colour,—are agreeable at first, and it is something to know that we are actually passing by the very grapes that produce the far-famed clarets of Bordeaux, the Médocs, St. Emilions, and the great *crûs* which are unequalled in any other country. This very thought will probably tempt the visitor to stop at Bordeaux and verify on the spot itself, the excellence of these wines. If so, he will find no difficulty in satisfying his taste, and may improve the occasion by visiting many interesting monuments on the banks of the Garonne, beginning with the bridge, 519 yards long, which spans this noble river. It was constructed in obedience to a special decree given by Napoleon I., in 1808, and was completed in 1821 by a private company. It is supported by no less than seventeen arches, the seven central arches being the largest. They measure 26½ mètres in diameter. The width of the bridge is nearly 15 mètres. Nevertheless, and notwithstanding these magnificent proportions, the bridge does not seem to correspond with the grandeur of the river. It appears to sit too low down on its waters, and suggests itself as a most practical and useful work, rather than an object the contemplation of which is exceptionally imposing. The iron railway bridge, resting on seven piers, is also worth a visit as a triumph of engineering skill; but among the constructions, not ancient though less modern, the theatre is undoubtedly the chief attraction of Bordeaux.

The Grand Théâtre is the well-known *chef d'œuvre* of the architect Louis. It cost 120,000*l.*, and was completed in 1780 after five years' labour. Its external appearance is scarcely suggestive of a theatre; it stands, in style and degree of grandeur and ornamentation, somewhere about half-way between the Paris Madeleine and the Paris Bourse. The twelve Corinthian columns which form the façade are each surmounted by a colossal statue, and the sides are also ornamented by pillars of the Corinthian order. The general effect is greatly enhanced by the admirable site, and the surrounding open space. We were, however, more particularly impressed with the internal appearance of the theatre itself. The style was entirely different to anything we are in the habit of seeing; and, for this reason, perhaps, we may be tempted to exaggerate its charms. We were totally relieved from the contemplation of the traditional galleries. The sides of the theatre were ornamented by noble Corinthian pillars which reached to the vaulted roof. Between these pillars small and graceful balconies, each containing about twenty seats, replaced the ordinary galleries. Thus it seemed as a magnificent hall with persons placed here and there, enjoying an ample view free from all crushing; instead of those huge circles of human beings huddled together and entirely concealing the walls who constitute the audience of an ordinary theatre. Of course the theatre holds but few persons in comparison to its size, and is consequently a most luxurious and agreeable lounge.

Among the modern constructions we should specially recommend, as of practical importance and interest, the Marché des Grands Hommes, recently reconstructed according to the plans and under the direction of M. Charles Burguet, the official architect of the town. It is principally built with iron and glass, the metal weighing in all 90,000 kilogrammes. As a rule, these modern markets have been condemned on the ground that they did away with the picturesque aspect of the ancient stalls and variegated sunshades, which look so well in paintings and at a distance. In this case, however, much of the picturesque has been preserved, and this is one of the peculiarities of the market in question. It is circular in shape, and composed of a double row of galleries, each ten yards wide, and traversed by broad passages, which run like the spokes of a wheel towards the centre, where there is a polygon pavilion. The outer circle is entirely devoted to the sale of fruit and vegetables. These are piled up to a great height, and come falling down in artistic confusion over the stalls, so that the circular market seems like a gigantic "horn of abundance," overflowing with all the brightest and most beautiful fruits of the earth. The neatness of the marketwomen, the general cleanliness of the place, and the pleasant, animated buzz of human voices, all tend to augment the favourable impression produced. Underground, there are sellers corresponding with the size of the market, where the goods can be locked up and preserved in a fresh atmosphere after market hours. The Grand Marché is larger and more elaborately built, but it is not so peculiar; it is more like the well-known markets of Paris.

To Englishmen the magnificence of the public gardens will seem a great luxury for a provincial town. In former years they had been much neglected, but in 1855 they were laid out as at present. The work took four years to accomplish, and cost 35,800*l.*, of which about a third was expended in the building of hothouses, where the rarest plants are preserved. The maintenance of these gardens costs the town annually from 1,400*l.* to 1,600*l.* Here the inhabitants of Bordeaux, irrespectively of rank or of dress, may enjoy a saunter under the exquisite foliage of the trees, or contemplate the leaves dipping into the lake, the ducks and swans besporting themselves, and listen the while to the military music. Here, also, are situated the museums of painting, with pictures by Jordaens and P. Veronese; of natural history and anthropology, with rare collections which never fail to inspire enthusiastic authors of guide-books. The liberality and consideration shown for public enjoyment, and the facilities afforded here for the improvement of public taste, are worthy of the warmest commendation; and in thus grouping together the wonders of the museums with the beauties of nature and the soothing influence of music, the municipality of Bordeaux has set a great and good example.

We cannot pause to describe the cathedral, the ancient churches, and other and various old buildings. We are on the road to Spain, and, if we did not draw a line somewhere, we should never reach our destination. It is well known that Bordeaux is rich in such curiosities, and its ancient gateways are peculiarly remarkable. St. Croix, the Byzantine Church of St. Seurin, the bell-tower of Pey Berland, and various houses and public edifices, will all interest the architect and amateur. But these have existed for years, and are well known to all travellers.

From Bordeaux to Bayonne the train crosses the Landes, those marshy districts where the inhabitants walk on stilts, so as to avoid sinking in the mire. On all sides, however, attempts to reclaim the soil will be noticed, and pine-trees waft their wholesome scent into the trains as the traveller hurries forward to reach the in

habited portions of the province. At Bayonne he will find himself at once in the presence of the picturesque, and will see a town unlike anything to which we are accustomed in the north and centre of France, or in England. The streets, narrow and winding, ascend towards the ramparts. The shutters are all open, and standing out at angles from the houses, painted in bright and different colours. They give the street a gay and checkered appearance, which is at least novel. The houses, also, are washed in colours, but of more subdued tones. To the appearance of the dwellings we must add that of the Basque inhabitants, fine, handsome men, wearing the traditional *berret*, or slouching cloth cap, the women with their glossy black hair neatly tied up in a brilliant silk handkerchief, and both remarkable by the cleanliness both of their persons and of their linen. The poorest agricultural labourer has at least half a dozen changes of linen, all in excellent repair. While many are poor, none are plunged in absolute misery and want. However slender their earnings, these people know how to husband their resources, and provide against the proverbial rainy-day.

For building, there is none attempted at Bayonne. All is wrapped in a dead calm, and commerce is at a standstill. At Biarritz, however, the case is very different. The increasing popularity of this sea-side resort has created a great demand for villas, and cottages in the immediate vicinity. It is clear also that the inhabitants anticipate that the town is destined to grow very considerably. Fields on the outskirts are advertised for sale on building leases, &c., and here and there a scaffolding denotes that builder and architect are actually at work. As there is ample space, and no necessity to maintain a uniform appearance, great liberty of action is allowed to the architects, and consequently the designs and plans executed are very often original. The houses are agreeably different one from another, and there are some actual *chefs d'œuvre*, of delicate taste and elegance. We, who in England are so much the slaves of one or two conventional styles, would greatly profit by a visit to the environs of Biarritz, particularly as the villas are many of them very modest residences, which, nevertheless possess considerable architectural merits. But these triumphs of art pall and become insignificant when the beach is reached. Here at the very point in the angle of the Bay of Biscay, we contemplate the great waves rolling slowly into the shore. There is not a breath of wind, the sky is of the serenest blue, yet these monster billows, which have travelled from a more turbulent latitude, approach one after another with regular, slow, and dignified deliberation, till they break into the most perfect foam, mixing cream-white spray and foam with the darkest of blue waters. At another point the tide has reached the very basis of the huge worn rugged rocks; the waves roll heavily into the subterranean caverns, compress the air, burst against the vaulted roof, shake the whole cliff, and come hissing out again, disturbing the still air with a roar as of thunder. This majestic sight is not broken up by a background of wretched terraces and crescents and esplanades. There are a few houses to be seen, but they are scattered, and not so offensive to the view. We have, however, neither time nor desire to look at them; the sun falls straight before us into the bed of the ocean; its last and lurid rays bring into sublime relief the purple peaks of the Pyrenees, skirting the sea along the north coast of Spain. There, among them, rest the bones of English heroes fallen at St. Sebastian; still further, in the rising mist, Santander and Bilbao, the virgin port the Carlists never captured, offer shelter to ships that dot the ocean. We return to our hotel enthralled with the grandeur of nature, humiliated by the comparative smallness of human achievements.

Value of Land in Melbourne.—A large and handsome building is about to be erected for the Union Bank of Australia in Collins-street West, on the site formerly occupied by the Criterion Hotel. This site, which has a frontage of 66 ft. to that thoroughfare, and runs back to Flinders-lane, a distance of nearly 320 ft., was bought from the Crown in the early days of Melbourne by the late Mr. Michael Pender for 16*l*. It remained in his possession until his death, and his heirs sold it a short time since to he Union Bank for 33,000*l*.—*Argus*.

GIORGIONE'S HOUSE IN VENICE.

It is not here in this simple country, where happiness is bounded in the minds of so many by the prospect of an ample harvest of "good wine and good chestnuts," both of which here in Treviso are abundant in primitive perfection, that events succeed each other with a rapidity destructive of even the expression of surprise; nor is it among a people whose vintage exactly resembles that of their ancestors 2,000 years ago that any unusual incident is soon forgotten.

The fourth anniversary of Giorgione's birth, celebrated at Castelfranco with such ceremony on the 5th ult., and of which we spoke two or three weeks ago, has not yet disappeared from the minds of appreciative Venetians, and a proposition has only lately been made that a commemorative stone should, by public subscription, be placed on the house which Giorgione made his home during the short years that he passed at Venice.

That the requisite funds for so praiseworthy an object will soon be collected there can be but little doubt; but with regard to the residence of the painter in Venice, much uncertainty exists, and thoroughly to the point is a little pamphlet (to which we have already referred), a very little pamphlet of some five pages, by Signor Urbani de Gheltof on the house of Giorgione at Venice.

When the young painter came to settle down in the capital to take a place in the great art world which centred there in the fifteenth century, it is generally believed that he occupied portion of a palace situated in the Contrada S. Silvestro, on the Riva dell' Olio. At no great distance from this spot rises the Palazzo Valier, where a further tradition states that Giorgione died in 1511, at least so tells us Selvatico, in his *Guida di Venezia*.

It is an impressive building, in the noble style of the first years of the sixteenth century, a century that has stamped with such a character the whole of Venetia. On the portion of the façade preserved by the projecting cornice may still be seen some fresco work representing a dance of children, which possesses in its mutilated state the evidences of all but perfect beauty. "In the interior of this palace, a portion of which still remains in the hands of the Valier family," we quote from Sr. de Gheltof's work, "are absolutely wanting any proofs by which can be ascertained the date of its construction, only we know that after 1565 the palazzo was purchased by a Valier, figuring in the *Estimo* of that year as Dolfin Valier, the head of the house. From the end of the sixteenth century till 1849, the palace was entirely in the hands of this family, remaining at the beginning of this century the property of two brothers, to pay off a debt of one of whom it was at a later date sold.

None of these facts, however, serve in any way to prove the assertion that Giorgione lived in the Palazzo Valier. Ridolfi, in his *Maraviglie dell' Arte* (1648), the only one who speaks of the residence of Giorgione in Venice, tells us how the painter established himself in the city, and had taken a house in the Campo di San Silvestro, and here he exercised his art in the company of numerous appreciative friends, delighting in the sound of his lute, and where he gained great reputation as an agreeable spirit; indeed, he appears to have been an exceedingly *clubbable* man.

It would appear, then, from this opinion of Ridolfi, that Giorgione did not live on the Riva dell' Olio, but in the Campo di San Silvestro, although the paintings in fresco which remain on the façade of this latter would tend to prove the contrary. Ridolfi further states how Giorgione painted the house which he had taken to serve as an incitement to those who would employ him, representing great pomps and other fantasies, and groups of children in chiaroscuro."

Of the groups of children painted on the Palazzo Valier, Signor de Gheltof gives a meritoriously faithful zincograph reproduction; such renderings as these are what all lovers of truth must esteem highly, misstatements of facts being quite as criminal in art as they are in political or social life.

It may not be out of place here in speaking of Giorgione's powers of working in fresco, to refer to Vasari, who tells us how in 1504 the old Rialto of Venice being burnt down, on its being re-built, Giorgione was employed to decorate it with frescoes, which, Vasari remarks, were afterwards celebrated throughout Venice; some slight remains of these may still be traced by the diligent searcher, and the designs may be found in Zanetti's valuable work on fresco painting.

But independently of the frescoes on the Palazzo Valier, which are still preserved, we continue to quote Signor de Ghettof,—"Another question comes up; Giorgione, according to Ridolfi, opened in his house a *bottega*, or establishment for painting wardrobes and coffers of various sizes, keeping a house or portion of a house larger and richer than that occupied by Titian, his rival." During his early years at Venice, it would appear that Titian lived with the famous Barbarigo, not far from the Chiesa dei Miracoli. But the house where so many of the princely originals of his noble portraits came to visit him, and which he occupied from 1531 till his death, in 1576, was situated near San Canciano, and from his pleasant windows overlooking the island of Murano he could see in the distance his beloved blue hills, the Cadore mountains, among which he was born.

"With the fact of the *bottega* mentioned by Ridolfi, and especially his further assertion with regard to the position of the house, we are convinced that the house of Giorgione must have been, not in the Palazzo Valier, but in a house more adapted to the condition of the painter, such as the one traditionally stated to be his in the Campo di San Silvestro at the existing numbers 1087 to 1089.

Built, as it appears, towards the end of the fifteenth century, this house is divided into two stories, but preserves, however, very little trace of the time when it was erected; only in the upper portion a *stemma*, or coat of arms, recalling the fifteenth century, probably of the family of Mula, who built the house. In the interior and on the façade are still visibly to be traced frescoes, painted certainly at an early period. The house, at present in the possession of Signor Buvoli, and let out by him to various lodgers, is the only one in the Campo St. Silvestro which possesses sufficient character to warrant the belief of its once having been the resting-place of so great a painter as Giorgione."

It is to be hoped that further search will lead to complete proofs; but, truth to tell, little more accurate information is likely to be found on a subject so obscure, unless, perchance, some happy hunter on the Rivo del Vino, or the Quai Voltaire, or, perhaps, in our own Holywell-street, light upon some unimpeachable document which will place for ever at rest the at present somewhat doubtful question of the house of Giorgione in Venice.

THE PROPERTY IN "CONTRACTORS'" PLANT.

It is a matter of common knowledge that many of the class of persons technically known as "contractors" contract liabilities which they are unable to fulfil. This is not to be wondered at. For if a contract is entered into to do certain work, to be spread over some length of time, wages may be altered, strikes may ensue, and many other things may happen during its continuance, which can scarcely be foreseen at the beginning. It may, therefore, be of use to some of the readers of the *Builder* if their attention is shortly directed to certain rights and liabilities which may arise in case of the bankruptcy of "contractors," or in case of disputes arising between the "contractors" and those with whom they have entered into agreements, and their rights as connected with the plant which is to be used in the execution of the appointed works.

The contract as regards the plant, generally seems somewhat as follows:—"All steam-engines, pumps, machinery, material, implements, tackle, timber for piling, shoring, poling, and strutting, tools, &c., brought by the contractor on to the works, shall be deemed the property of [the commissioners, Board, or whoever the other contracting party may be] for the time being, and shall not be removed during the progress of the work without the written order of the [architect, engineer, as the case may be], and in case of suspension of the work by the [architect or engineer] for any act or default of the contractor, or of the work being taken out of the contractor's hand, the same shall be subject to be used as shall be ordered by [the architect or engineer], in and about the completion of the said work."

Under such a contract as this we will assume that the contractor becomes bankrupt, and a debt is due from him to the other party to the

contract, or an ascertained debt becomes due without bankruptcy from the contractors. We will take the case of a bankruptcy first. The contractor is also a defaulter under the contract, and a large debt is due from him to, we will say, the Improvement Commissioners. Under the above contract does the plant in question belong absolutely to the Commissioners so as to go in liquidation of their debt, or does it vest in the bankrupt's trustee, so that the Commissioners only can take a rateable proportion of it *pari passu* with the other creditors? This it is obvious is an important question, because if the plant were the property of the Commissioners, or if they can be considered as forming part of a "mutual dealing," which comes to the same thing, it is clear that the Commissioners' Board, or whoever the other parties to the contract may be, have to some extent a substantial security so far as it goes for debts due to them by the contractor. This was the point that has been recently settled by a decision of the Chief Judge in Bankruptcy on appeal from the judgment of the County Court judge at Liverpool, whose decision was reversed by Sir James Bacon. This latter judge very pointedly laid it down that the plant was the property of the contractor, and that it was only to be deemed for the purposes of the contract the property of the Commissioners, and that in effect they had only a limited right to use it if necessary when a new contractor came upon the work. Such was the result of the case of "*in re* Winter," 47 *Law Journal* Reports, Bankruptcy, 52, and which is worthy of notice, because it settles an important point definitely, and one which a careful lawyer like the judge of the Liverpool County Court decided wrongly. Neither does such a contract form "mutual dealings," so as to allow the value of the plant to be set off against the debt, as is the case supposing a landlord breaks a covenant and a tenant owes him rent. Under such circumstances the damages for the breach of covenant fall within the proviso as to "mutual dealings," contained in section 39 of the Bankruptcy Act of 1869, and are the property of the tenant, so that they become his property and not that of the trustee in bankruptcy of the landlord.

Then, again, as to the second point, it is clear that if there were only a debt due from the contractor, and the plant ceased to be his property, it would be the property of the Commissioners, so that, properly speaking, they should have their debt paid over and above the value of the plant. But what we chiefly wished to call attention to was the right to the plant in case of the bankruptcy of the contractor, because from the fact that in the case referred to the Llandudno Improvement Commissioners seemed to consider themselves legally entitled to the bankrupt contractor's plant, it is probable that some such notion has got abroad. Such an idea is calculated to give rise to false notions of security, very likely to costly litigation, and the waste of money raised from ratepayers and the public for purposes other than defending or carrying on law-suits.

A CHINESE HISTORY OF CHINESE PORCELAIN.

It has always been a question at what date may be fixed the creation of the porcelain manufacture in China. The Chinese authors who have undertaken its history do not claim that the invention took place more than two centuries before the Christian era, though they admit that certain fragments have been discovered of the kinds called "sea-green" and "blue of heaven after rain," which would suggest a higher antiquity. Thence, the progress was rapid to artificial jade, surfaces "brilliant as mirrors, thin as paper, sonorous as bells, and coloured to perfection," whether in light or shaded blue, the "imitation of fish-eggs," olive green, or rose, or of dazzling whiteness, varied by a sort of cinnabar red, sprinkled with points of silver. It is extremely interesting to have this historical account from Chinese pens of a fabric for which China is celebrated beyond all other countries in the world, and which is so incomparably prized in every region of Europe. A valuable addition to it is the treatise on, as we should term them, trade-marks, by which the Imperial reign during which a particular work was produced, with the establishment whence it came, may be distinguished by the connoisseur. These are capable of being forged, no doubt, but they afford a certain degree of protection, nevertheless, to collectors who are not purely and simply amateurs. Some of these distinctive signs are peculiar, as, for example, a jujube cup, a bamboo leaf, a dancing-girl, or a fighting-cock. Of the eighteen great provinces, we are told, into which the Empire has been immemorially divided, thirteen only yield the pure porcelain clay, and of these in no more than five is the fabrication a very abundant or prominent one. Each of them possesses its speciality; one for the pure white qualities, usually compared with silver or snow; another for the red, violet, and black; a third for the highly-prized blue "which is the empress of all porcelains," according to our Chinese authority; a fourth for a rare kind, never manufactured except for the Imperial palaces, and so on. With respect to the Imperial demand, we are informed that it is enormous,—in one year, for instance, 31,000 flowered plates, 16 000 white plates decorated with blue dragons, 18,000 wine-cups, with floral ornaments encircling a dragon, from whose jaws issues the legend "Good luck! Long life!" and so forth, in proportion. There must be a mighty annual breakage at Pekin, or who could calculate its treasures in this respect? The history consists of seven books, with an index, a preface, and an appendix, and is written by an official who visited the manufactories in disguise, taking notes wherever he went, and opens with a treatise upon ancient porcelain. Many of his passing notes, apart from the general text, are very curious. Thus, he says, "the yellow sort gives a brown colour to tea, and is, therefore, unfit for it"; "the blue is the best for that purpose"; "there are porcelains of no colour at all, or of a colour which is concealed." And his list of shades and tints is very remarkable, including, among the more antique and precious classes, copper, iron, rice, Japanese pear-blossom, prune, horse-eye, snake yellow, serpent skin,—though this is somewhat vague,—oil yellow, moonlight white, and gold and silver. Many of these, he declares, never find their way into the foreign market, while, on the other hand, nearly every manufacture has its department entitled "European Taste." Summed up, the result of the work, which is not easy to read, on account of the perpetual reference to dynasties, and still more incessant repetition of native names, is, to begin with, that the genuine porcelain fabric of China is still imperfectly understood in the West, although several Chinese treatises upon it have already found their way to Europe, and that all European imitators of it have failed to penetrate the secret of the manufacture, which, as a matter of course, is not disclosed here. In vain do the Italians and the French prepare a transparent paste, a brilliant and durable glaze, and a solid substance; the issue of all this art may be porcelain, but is not porcelain of China, with its inimitable limpidity and opalline changes of hue. Speculators have purchased, in the region itself, every known material used, reduced them to an almost impalpable powder, bought information by bribery, employed spies to watch the process, and returned home to learn that they had no more discovered the last secret, so to speak, than they had found the Philosopher's Stone. Nor has the Chinese author afforded them the least assistance in this respect.

Following the historical retrospect, we have a minute account of the technical processes, mechanical and chemical, employed, yet which does not distinguish the point at which the two arts,—for arts they may assuredly be termed,—separate. The European, like the Chinese, composes his porcelain of two materials,—the one fusible, the other not,—the former producing transparency, the latter solidity; this being, in both cases, the substance known as *kaolin*. The material which renders this beautiful branch of pottery almost translucent, is called *pétuisé*, or, Chinese author, *pétun*. The Europeans, says our authority, fancied some years ago that they had hit upon our hidden method by trying *pétun* without *kaolin*: "they might as well have attempted to make a body of flesh without bones." It is clear, from his description, that the dust off certain rocks, and various kinds of sand unknown to travellers from the West, are used to mingle, as he puts it, glass with china, so that it may be, after all, less in the process than in the material that the difference consists; and this would be more likely to elude the utmost vigilance of the observer than anything in the mechanism of the manufacture itself. Kaolin itself appears to be merely a decomposition of granite, such as is known to enter into the composition of Sèvres. The substances being thus far similar, though the Chinese employ eight elements, as it were, while the Europeans employ only six, our Chinaman proceeds to indicate such differences as, in his view, exist between the two, as far as the preparation of the paste is concerned; but here he becomes rather too technical to follow, and so with reference to the furnaces, which, with the methods of burning, are very dissimilar in the east and the west of the globe. He distinguishes between colours requiring the "great," and those requiring only the "little," heat, among the former being blue,—the clear blue-green, known as celadon,—a tint not hitherto produced by the European manufacturer, though intensely sought after by amateurs,—deep red, orange, and violet. It is admitted, however, that some of these wonderful combinations have been due to accident, and that the Chinese themselves have not always been able to overtake and capture the secret of their own unexpected success. Thus, upon one occasion, the furnace gave forth vases so closely resembling bronzes as to be mistaken for them in the market, but all the perseverance conceivable could not bring about an exactly-identical result,—there was either too much red, or too much green, in all the new examples brought forth. They tried, among other materials, iron rust, not artificially produced, but bodily scraped off old fragments, and the issue was, when mixed with other substances, a rich blood red. Again, when they tried gold, it turned, under the same conditions, to a delicate rose tint. As to the figures and groups painted on their porcelain, the Chinese admit that they are altogether different from those drawn by European artists, but they urge, with no small reason, that they have ancient traditions to maintain, that our art is not theirs, that they care nothing for perspective, and that, when foreigners, and Englishmen especially, buy in their market, they generally choose the—according to them—most grotesque and hideous specimens. "Besides," they add, "these secrets have descended to us from the holy men of ancient days, with their ideas also, and it is not possible that we should improve upon them." It may be added that, in a series of plates, it is shown how primitive still are the implements essential to this industry, and in what wild regions and simple workshops it is carried on.

TRÈVES.

Trèves, or Trier, as it should more properly be called, since it is essentially a German town, lies somewhat out of the direct route of travellers to Switzerland, the Rhine, and the parts of the Continent most frequented by Englishmen. Thus comparatively few of our countrymen spend even a few hours in what is the most unique city of Western Europe. Other towns may possess more magnificent cathedrals, more beautiful churches, more remarkable Mediæval remains, Strasburg, Rouen, and Nuremberg surpass it in each of these particulars. But, on the other hand, Trèves stands alone as the city where the remains of Roman buildings of large extent and of wonderful solidity still exist in such a state of preservation as to recall to the mind of the beholder the days when Rome was mistress of the world. Thus, at any rate, for two classes of people Trèves is a place of surpassing interest, for the student of history and the student of architecture will each find materials for much pondering. And,—to enter for a moment into matters of pounds, shillings, and pence,—the expense of reaching Trèves is very small; by the admirable new Dutch mail route from Queenborough to Flushing it is possible to get a first-class return ticket from London to Antwerp for a couple of pounds, and the fare from Antwerp to Trèves by way of Brussels is no more than 18s., so that the ancient city on the banks of the Moselle forms an excellent point for the traveller who wishes to take an inexpensive and a pleasant holiday across the Channel.

We have said that Trèves is unique, and there can scarcely be a doubt that such is the case. In itself, it was, in the days when Rome ruled Europe from the Adriatic to the Rhine, the most important of the provincial cities; it was, in fact, an imperial city, the residence for long periods of the emperors of the West. But in addition to this, it possesses what no other city this side the Alps does, large remains of its ancient glory. Thus, even if we were to banish from our minds all thoughts of the great place which it holds in the annals of the Roman empire, these tangible

ruins would claim for it a place distinct from that of all other cities of Western Europe. We make no mention of its considerable place in Mediæval history, the part which the Electors played in German history, or of the Gothic buildings which it possesses,—other cities have a history even greater, buildings much more imposing; it is as the evidence of the political and material power and greatness of the Romans that Trèves stands unapproached and unapproachable.

The chief Roman monuments of the city are four. There is first of all the Basilica of Constantine, then the so-called Baths or Palace, the Amphitheatre a little without the city, and the magnificent Porta Nigra, or Black Gate, a building which it is probable is of a more recent date than those which have been first mentioned. The first four buildings are of Roman brick, the latter of a dark stone, and in addition to these there is also the cathedral, in which traces of Roman work are still visible, but which to the cursory observer is entirely a Gothic building. The original basilica of Trèves stands almost perfect with its lofty walls restored by modern workmen. It has been quite recently roofed in, and now forms the Protestant Church. But still, to quote from a well-known historian, "the enormous height of the massive walls, the vast semicircle of its apse—the apse which held the judgment-seat of Constantine—are all worthy of a power which deemed itself eternal, and which, on this spot at least, has shown itself eternal in its works, if not in its dominion. Strange has been its fate. Embedded in the vast pile of the ecclesiastical palace, the home of archbishops, who were also Electors of the empire and arch-chancellors of Gaul, it has seen the modern palace sink into a barrack; but itself stands lifting its mighty mass on high, a basilica which, after so many ages, has shared the fate of so many of its fellows in early times, which not the fourth century but the nineteenth has first consecrated to the uses of a Christian church.*

Externally, then, the basilica has lost none of its ancient significance; but internally, fitted up as it is with rows of pews, its modern appendages have taken away much of the feeling of the antique.

The vast ruins of the baths, as they are called, but more properly the palace, are interesting rather by their suggestiveness than their actual state. They show very completely the ground-plan of this once large edifice, but only in one portion are the walls and arches remaining to any considerable height above the ground. In this one part, however, they are large, and serve to bring before the observer's mind what must have been the state of the remaining portions of this great pile. The cicerone would hurry the visitor over the ground, but no one who considers this building thoughtfully and leisurely can fail to be struck with the evidences of the greatness of the Romans, who, stationed like sentinels among hostile barbarians, yet found means to erect this vast and age-enduring pile.

Of the amphitheatre, it is enough to say that it is equally suggestive, but it is not cared for as is the palace. It is overgrown with weeds, grass, and shrubs, which might be removed at a very small cost, so that the ruins as they now exist might be clearly discernible. Through the centre there runs a public road; but there is no reason why the arena should not be emptied of the soil which has been accumulating for centuries, and the road still allowed to pass through on the same level as at present,—raised on an embankment, as it were, above the bottom of the arena. It is too much to hope that the owners of the neighbouring vineyards, whose cultivated slopes now cover what were probably at one time the highest seats, would give them up for the sake of the architectural and the historical student. But it would, one would think, be possible for those who take an interest in this matter in Germany, to raise sufficient money to buy some of the surrounding slopes, so that this remarkable structure might, in this nineteenth century, be nearly in the same state, so far as is possible, as when the multitudes of the captives of Constantine fought with the wild beasts till the animals were satiated with the blood of their victims. But from the nature of the building it has suffered less than most of those which formed the glory of the Augusta Treverorum of the Romans; yet it is the one of the ruins which, at the present day, is most overgrown and hidden.

But certainly the most remarkable of the ancient buildings is the great northern gate, the Porta Martis or Porta Nigra. Unlike the other buildings of Trèves, it is composed of immense blocks of stone, and unlike them, too, no mortar or cement was used in its construction; but the stones were joined by bolts of iron. The actual date of the structure remains in doubt, and we should be sorry in a sketch such as this to endeavour to decide what is, more or less, a reasonable matter of controversy. The probabilities point to its being a building of the latest period of the Roman supremacy, but certain writers have brought forward arguments of some weight to show that this is not the case. But to whatever period it may belong, and whoever may have been its builder, it remains, with its huge stones, its massive archways, and its strong pillars, a most enduring monument of the practical greatness of the Romans. It is in truth, too, the only one of the Roman remains which possesses any architectural beauty; its massiveness and its simplicity give it a grand and sober beauty. Unlike the amphitheatre, it has received great care at the hands of the moderns. Turned in 1047, by Poppo, Bishop of Trèves, into a church, it ceased to be a gate, for, as a matter of fact, its two upper stories were turned into two churches, and the arches were completely blocked up, and it was surrounded by modern additions. But, first, by Napoleon I., and more recently by the Prussian Government, all the excrescences have been removed, and it stands now almost as it did nearly 1,800 years ago, except that the ground has risen considerably round it. It is this rising of the ground which no doubt still hides many most interesting traces of the dominion of the Romans, but yet enough remains to make Trèves in this respect the most remarkable city this side the Alps.

We might also point to the massive piles of the bridge, which are undoubted Roman work, and to the interesting monument in the village of Igel, erected by some of the members of the family Secundinus to their parents. It stands 70 ft. high, and is a square column surmounted by the remnants of the Roman eagle, which with extended wings once overlooked the fertile valley and the Moselle flowing past. Bas-reliefs adorned the sides, but they are now very indistinct, though portions are apparent of portrait medallions and of reliefs typical of the commercial power of the family of Secundinus. Even now on the north side the bas-relief shows, with some little breaks, the horses drawing the heavy cart in which is laden a large bale of merchandise. It is remarkable not so much for admirable workmanship as for its suggestiveness, for it was a work of art erected in a barbarous country, and even now looks almost out of place among the cowhouses and the orchards which surround it. Thus it is evident that no student of history or of architecture can fail to find Trèves in some respects the most suggestive and in certain particulars the most remarkable town of Western Europe.

* From an able historical sketch, signed "E. A. F.," "Augusta Treverorum," *British Quarterly Review*, July, 1875, p. 1.

MATTERS OF ART TREATED OF IN CHELTENHAM.

In the Art Section, a paper was read by Mr. P. H. Rathbone, of Liverpool, on "The Mission of the Undraped Figure in Art." As our readers know, Mr. Alma Tadema's painting, "The Sculptor's Model," first exhibited at the Royal Academy, has been included in the Autumn Art Exhibition at Liverpool, and has induced an explosion of indignation from, as Mr. Rathbone put it, the offended fathers, sisters, and grandmothers of the town. To their remonstrances and criticisms published in the Liverpool press, Mr. Rathbone's paper was a reply. He treated the subject boldly, and seemed to carry his audience entirely with him. He said when coward Europe suffered the unclean Turk to soil the sacred shores of Greece by his polluting presence, civilisation and morality received a blow from which they have never entirely recovered, and the trail of the serpent has been over European art and European society ever since. The Turk regarded and regards women as animals without souls, toys to be played with or broken at pleasure, and to be hidden, partly from shame, but chiefly for the purpose of stimulating exhausted passion. Such is the unholy origin of the objection to the nude as a fit subject for art. It is purely Asiatic, and, though not introduced for the first time in the fifteenth century, is yet to be traced to the source of all impurity—the East. Unhappily, there is no country in which Asiatic ideas have taken deeper root than in certain classes of the less educated portions of the English nation. They consider women as chattels, and treat them with more brutality than they do their dogs and horses; nor would it be possible to find in any European capital so revolting and disgraceful a scene as the top of the Haymarket at midnight. These facts explain why in England it is necessary to undertake the humiliating task of defending the nude human figure, male or female, as not only a fit subject for art, but as the noblest and most elevating of all subjects that art can treat. To say that the crown and glory of creation is an improper subject for art is to accuse the Creator of obscenity. In the earliest Christian art known, the painting of the Catacombs, Jonah is represented under his gourd perfectly nude, and in Greek art only the Asiatic Diana was represented otherwise than as a simple human form. In those days true reverence was shown by the complete representation, not by the concealment, of the human form. As art declined, the power of representing the nude declined also, until it was revived in the church of the Carmine at Florence, when it was complained that Michelangelo had represented men and women in the nakedness in which they were born. The answer of Michelangelo may be read in the right-hand lowest corner of the picture, where he has placed the portrait of the objector in the lowest depths of hell, with asses' ears, and the serpent, the type and symbol of sensual corruption, coiled around his unseemly carcass. Although the source of prejudice against the nude is thoroughly unhealthy and impure, yet it is now shared by many pure-minded and honest but somewhat uneducated people; but he was prepared to maintain that it is necessary for the future of English art and of English morality that the right of the nude to a place in our galleries should be boldly asserted. But it must be the nude as represented by thoroughly trained artists. The human form, male and female, is the type and standard of all beauty of form and proportion, and it is necessary to be thoroughly familiar with it in order safely to judge of all beauty which consists of form and proportion. To women it is most necessary that they should become thoroughly imbued with the knowledge of the ideal female form, in order that they should recognise the perfection of it at once and without effort, so far as possible avoiding deviations from the ideal. Had this been the case in times past we should not have had to deplore the distortions effected by tight-lacing, which destroyed the figure and ruined the health of so many of the last generation; nor should we have had the scandalous dresses alike of society and the stage, the extreme development of the low dresses which obtained some years ago, when the stays crushed up the breasts into suggestive prominence. This would surely have been checked had the eye of the public been properly educated by familiarity with the exquisite beauty and the lines of a well-shaped bust. I might (continued Mr. Rathbone) show how a thorough acquaintance with the ideal and nude foot would probably have much modified the foot-torturing boots and high heels, which wring the foot out of all beauty of line, and throw the body forward into an awkward and ungainly attitude. It is argued that the effect of nude representations of women upon young men is unwholesome, but it would not be so if such works were admitted without question into our galleries and became thoroughly familiar to them. On the contrary, it would do much to clear away from healthy-hearted lads one of their sorest trials,—that prurient curiosity which is bred of prudish concealment. Where there is mystery there is the suggestion of evil, and to go to a theatre where you have only to look at the stalls to see one half of the female form, and to the stage to see the other half, undraped, is far more pregnant with evil imaginings than the least objectionable of totally undraped figures. Mr. Rathbone went on to admit that in French art there had been questionable nude figures exhibited, but the fault was not that they were nude, but that they were portraits of ugly, immodest women. In conclusion, after remarks on the connexion between beauty and morality, Mr. Rathbone said this paper had been suggested by an occurrence at Liverpool, which shows how thin is still

the varnish of our boasted civilisation. Mr. Tadema's beautiful picture of "The Sculptor's Model," which most of you will remember as having hung in the Academy for three months without observation, is hung in the autumn exhibition of that town. The papers were flooded with letters by offended fathers, offended sisters, and offended grandmothers. Some of these were couched in language which betrayed a foul-mindedness perfectly horrible. These I will not refer to; but one of them, an offended father, appealed as to the mischief it was likely to do young men. Now, I am a father, and have healthy sons growing up with the temptations to which healthy, high-spirited lads are liable who are going forth to meet the dangers of the world, not unwarned, and determined, I hope, successfully to resist those temptations and carry through life that reverent love of womanhood and untainted delight in womanly beauty which is the bloom and flower of manhood and the crowning reward of a pure and innocent life. I fearlessly assert that Mr. Tadema's picture is not a temptation to youth, nor suggestive of one. I should be ashamed if it were so. It is lamentable that it should have been so regarded by some men of perverted instincts; but, if so, the mischief is done, and we cannot for their sakes arrest the course of human progress, but rather let the culture and chivalry of the land stand shoulder to shoulder, and, raising once more the old cry of "St. George for Merrie England," go forth to do fierce battle in defence of womanly beauty and womanly purity against the fell Eastern dragon of prudish pruriency.

An interesting discussion followed, there being a general feeling of concurrence in the principle contended for by the reader of the paper.

Mr. H. H. Statham said they were much indebted to Mr. Rathbone for his treatment of a subject which it needed some courage to bring forward, and upon which great misapprehension existed in England. He confessed that he did not quite share Mr. Rathbone's admiration of "The Sculptor's Model," which appeared to him to be merely a very able realistic study of a by no means beautiful figure; and he should doubt there being any connexion between the study of the figure by the Greeks and the adoption by them of the curves of optical correction in architecture: the origin of those curves was scientific rather than artistic. Fully concurring, however, with the main feeling of the paper, he would touch on one point which had not been directly mentioned in it,—on the question which might be, and sometimes was, asked, Why we should have paintings of undraped figures in a country and a society where every one was clothed? And the answer was simply that the human figure, in its best form, was the finest medium of poetic expression available for the painter and sculptor, and the only one which was permanent and essential in human form and expression, costume being only a temporary and incidental thing, representing the fashion or caprice of the day. They might find in such a collection as that of Mulready's figure-studies at South Kensington, slight sketches, apparently the work of a few minutes, which were quite little poems of abstract human expression, the poetry of which would be at once spoiled by costume. An instance of the appreciation of this ideal value of the human figure was afforded in the case of Canova's statue of Napoleon, which was naked; a treatment which, they might depend upon it, was not adopted without the sanction of Napoleon, who no doubt felt, what every man of strong intellect must feel, what a far nobler thing it was for sculpture to represent the actual Man, than to trouble itself with overcoats and topboots. Another consideration in regard to the *morale* of the subject was suggested to him by a remark he had heard from a clergyman who was much interested in the educational advancement of "the masses," and who observed that he would familiarise the lower orders with pictures including good representations of the figure, because, even if they did not appreciate the abstract meaning of the subject of the picture, the knowledge how fine a thing the human figure in its best development is would teach them to think more of their own bodies, and to endeavour to keep them up to the best standard of development and "condition" that the circumstances of their lives admitted of. That was a very good suggestion on the moral and practical side of the subject; but still the real argument from the artistic point of view was that already referred to, that the figure was the medium for the highest ideal expression. There was, of course, a very large field for art, of the greatest interest, lying in the representation of every-day life and character, in which costume was necessarily an element; but whenever the highest and most ideal form of artistic creation was the object, art must deal with the essential and get rid of the accidental.

Mr. Hastings said the real question, and it was well to put it straight, was whether it was improper or indelicate to portray the human form naked. The answer must depend on the idea of the artist, and how he gave form to it. The embodiment of the coarsest and worst instincts of mankind in palpable form must of necessity tend to debase and demoralise the human imagination. When the Queen visited years ago one of the Paris exhibitions, it was well known that she shrank back from the sight of an indelicate statue, with the exclamation, "How shocking!" If there was anything which could increase the reverence and loyalty with which he regarded the Queen, it would be the pure and womanly feeling she thus showed. But it was notorious that she was ridiculed for the incident in the base society of the Second Empire, and lampooned in the Parisian theatres, as he could personally testify. He had made the observation at the time that a society so morally rotten could never endure; and beyond question it was the coarse immorality which prevailed that more than anything else brought down the Second Empire with a crash. This was the bad side of the nude in art, but surely there was another side. If instead of reproducing some common model the artist showed us what the human form ought to be in its ideal beauty and the poetry of shape and motion, surely the nude would then tend only to elevate the imagination and the taste. What human being worthy of the name could attach impropriety to the form of the immortal statue of Apollo? The answer to the question then was, propriety or impropriety depended on the idea of the artist and his execution of the work. If that section did anything, and he trusted it would do much, to encourage pure taste in that direction, it would deserve the thanks of the whole people.

OPENING MUSEUMS ON SUNDAYS.

Mr. T. C. Horsfall, of Manchester, read a paper to a large audience upon "The Opening of Museums on Sundays." He said to bring art within the reach of the people generally people must be permitted to give part of Sunday to the study of pictures and the lessons taught by them. Some picture-galleries were already open on Sundays; others that now remain closed should be opened at once. Each picture should have attached to it a few clearly-printed lines of explanation. Good music should be provided in the galleries on Sunday afternoons. Such galleries as these, if open when the several classes of the community would be able to visit them together, would bring about a kindly fellowship between rich and poor, which would do more for religion than lessons in Scripture, history, and geography. If people refused to use these means, and termed them a desecration of Sunday, then it was to be feared that it would be fruitless to attempt, by any means, to bring good examples of art within reach of the English people.

A second paper was read on the subject by Colonel Blair, who strongly supported the opening of art galleries on Sundays, as also did the following, who took part in the discussion:—Mr. Mark H. Judge, Mr. James Heywood, F.R.S., Mr. Philip Rathbone, and the Rev. John Robberds, of Cheltenham.

The Chairman, Mr. Gambier Parry, in summing up the discussion, expressed his surprise that there should have been a unanimous feeling in so large a meeting. They seemed to be proof against divergence, for when a layman proposed the opening of museums and art galleries on Sundays, a clergyman came forward to say how cordially he approved such a measure.

SCULPTURE.

Mr. H. P. MacCarthy read a paper on the present position of sculptural art in this country, calling attention to the existence of a want of a more general taste and encouragement of the plastic art, both for the erection of ideal groups and fountains upon suitable sites in our large cities, public places, parks and gardens, which would raise them in dignity and attractiveness, and for architectural decoration, external and internal. He showed that by a larger patronage of this, the only art which embodies in its entirety and perfection the "human form divine," and represents energy, sentiment, and passion that are noble and emulative, it would not only embellish the cities, and more duly reward its professors, and develope the genius of the "plastic hand" of the student to bring forth works worthy of this empire, which has excelled in all other arts, but it would prove an important art education for the people. He also showed that subjects for representation need not be confined to the classic, and if extended to the drama of the "life we live," and works of fiction of modern date, whose heroes and heroines are household words, and are known to the masses, such as Dickens, Sir Walter Scott, Thackeray, Moore, Bulwer, and Tennyson, they would be both intellectually and morally better instructors, and prove more lasting "Sermons in Stone," than many of the tracts, precepts, and sermons, which they neither read nor listen to. Further, that the effect of our climatic influence should not prevent the external use of the art, considering that for this purpose excellence of form and composition is the main essential, and not the colour of the object represented. Moreover, that genius does exist in our native artists for execution of works equal to those of any other nation, and only requires proper encouragement. Finally, he appealed to H.R.H. the Prince of Wales, as heir apparent and leader of fashion, by his influence and example, to aid with the Government, the architects, and all true art-lovers, to give this most beautiful, joy-giving, civilising, and pre-eminent grand art its proper place with her sister arts, and not forgetting that philanthropic body which fathers all public good, and without whose aid no good can be done—the Press of England.

THE RELATION OF FINE ART TO SOCIAL SCIENCE.

Under this heading, Mr. Gambier Parry, as president of the Art Section at Cheltenham, delivered an address. Our national arts, he said, had flourished once, but they were wrecked above 300 years ago. Since then, the demand for any sort of art at all, for many long years, came only from the wealthy few, and mainly for their vanity's sake. The things which surrounded the daily life of our people gradually lost all that could give a colour of blitheness or artistic sense to it. The national character which had marked the architecture of their cities, and had given them the interest of home-endearment, gradually disappeared. The old narrow street, with its pleasant outline of overhanging roofs and gables, quaint dormers, and angle turrets, with its spires of shining shingle,—carved woodwork, and painted panelling, and all the cheery sense of friendship, warmth, and comfort that they gave,—the deep chimney-corner, the pleasant open-porch, with all their associations of rest, of refreshment, and warm-hearted hospitality,—and all else that could nourish in our people the last and least sense of the poetry of common life, gave way before the desolating hand of social and political change. National taste and feeling became a blank. A foreign form of art in its most repulsive character of bleak unsuggestiveness came into vogue. Stiffness and meanness took the place of the old-fashioned pleasantness and elasticity. All fine art died away.

In the revival of art in our day we have difficulties to contend with unknown to other people. Our climate is destructive of all fine and delicate material exposed to it. Our daylight is not sufficient to bring out the intensity of colour and to make it an enthusiasm, as with the people of the South. Our hazy sunshine has never schooled our people's eyes by that crispness of light and shade which could make sculpture a passion and its works the objects of national delight. There are other obstructions also in our way not less strong, though less direct. The spiritual character of our Christian faith, although it sanctions and sanctifies the purity of beauty, whether in outward form or inward thought, can offer no impulse to the arts of design equal to those religions of old days which personified and deified every power in nature and every attribute in man, setting no bound or limit to principle or propriety, and using art as much for political power as for intellectual luxury.

But, short of that, Christianity is an inspiring

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power and a mine of wealth for every form of fine art. Christians, with heart and eyes open to its teaching powers, and above and beyond that, to the influence of its spiritual beauty, have loved it and used it for the happiness of individual souls, and for the benefit of the world. From earliest days till now they have embodied the thoughts of their hearts in every form of art to which their hands could lay themselves. Their sculpture, their painting, their architecture, and their music, were tuned together in one harmony of praise. By the plastic power of those poor tools and things of nature's finding and of human work they expressed their aspirations to that heavenly beauty which, in the discipline of their earthly life, their humble patience was content to read in the feeble language, sounds, and symbols of their arts. But to all such works as these, and such thoughts about them, our people now-a-days in this self-boasting age of civilisation and advancement, are as yet but little careful. We are told that we are much better than our fathers; but our inner consciousness of the hollow realities of modern social life, below the varnish of scientific catalogue and philosophical speculation, leaves very much to wish for, before that real elevation can be attained which is worth marking as a stage in human progress. As far as works of art are concerned, which are our present subject, some day, perhaps, they may conduce to a higher ideal of things and thoughts; but unfortunately the opposite is our first necessity, for it is a higher standard of life and motive that is needed to raise up our arts, for the arts are simply their embodiment and expression.

We human beings are the creatures of climate. It has made some people live out-of-door lives; others, like ourselves, it has made domestic; so all we English have or do has domesticity imprinted on it. I spoke just now of the ancient Greek. To him his whole country was his home. When far away he thought not of his household gods alone, but all the glory of his native land was in his heart's eyes. With us our home means our hearth, with our family around it. Climate is stamped on all national arts. It made the Egyptian temple in the hollow of a rock; it made the roofs of southern buildings flat, as sun-shades; it made our northern roofs high to shoot off the rain. And so with other arts. Our sight is not trained by clear and steady light to the refinements of form, so what sculpture we have has been in full relief, statues in niches, not merely to protect them from the ravage of storms, but to give them some power of light and shade which was not otherwise to be got. So, too, with our architecture; its mouldings were deep and its ornamental carving undercut. So, too, with our colouring; its common fault was in its violence of contrast, for want of light to satisfy the eyes with delicacy. And now, too, our discouragement in the development of national art comes much from the same cause. So long as the smoke of our cities remains unconsumed, the dull depression of a murky atmosphere must quench all enthusiasm for those works which adorn the cities of other countries. No one can care for that which dirt and darkness have disfigured. So long as these discouragements continue, all popular interest in national monumental art, whether in colour, sculpture, or architecture, must be but half-hearted. We are driven indoors. It has always been so with us. Our churches, our town-halls, our streets and castles, have rarely if ever had the elaboration of outside ornament comparable with those of other countries. How different to ours are the vast and fretted porticoes of their cathedrals, their houses overladen with profusion of carving, and their town-halls places on which all contemporary arts are concentrated? All such elaboration is unnatural to us. Its attempt is contrary to the laws which Nature has placed on our national art. All attempt at it will bear the evidence of a strain. It is contrary to our nature, our habits, and our needs.

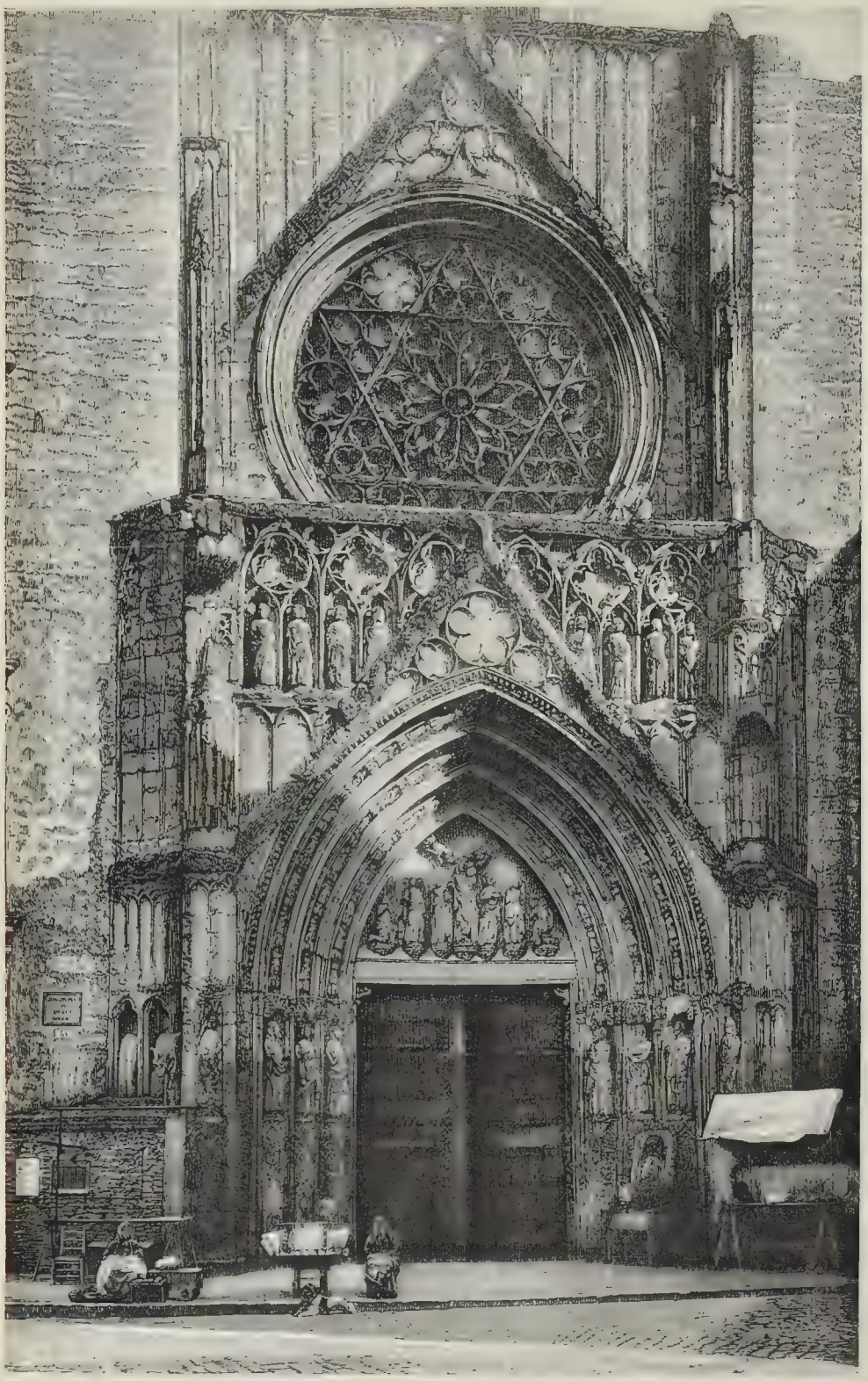
The object of ornament is happiness. Nothing is more painful than crippled beauty. I doubt, therefore, the propriety of exposing beauty to disfigurement. There are countless forms of beauty at the disposal of every art, and there are ways of applying it to our homes and cities that would be free from such a painful liability. The art of making our streets and cities beautiful must be rather that of breadth of feature than of delicacy of detail,—breaking the sky-line, relieving monotony, not as too often nowadays with all the fuss and disturbance of spots and scratchings and party-coloured devices which only vex and irritate good eyes, but broadly, as in streets and houses of old style, by every means consistent with good taste and that sense of civic pleasantness that would cheer and brighten the lives of the inhabitants. So long as the aphorism that "Every Englishman's house is his castle" holds good in its present sense, our cities can have but little hope of improvement. But if our Englishman still insists on retaining his aphorism and his castle, and would only be content that it should apply to his story, or flat, or floor, or whatever it might be called that would be equally sacred to himself, his pipe, and his penates, we might hope for handsome streets and squares, in place of that immeasurable plague of hideous brick hives, which make our suburbs a weariness and a reproach. In looking back to past time it is the art of our interiors that has always been the happiness and pride of our people. The exteriors of our national monuments have been marked by breadth and power, and by the grandeur of their simplicity; but all that love, refinement, and devotion could devise has made them beautiful within. The pleasure that art is intended to give us is a solace among this world's troubles, a profit and a happiness to eye-sense and to heart's poetry. If people would only remember that they are social beings with duties to their nation and their neighbours, and would repudiate the selfishness of a niggardly parsimony outside their houses, while indulgence reigned within, our national art would go forth fresh and free, and make our homes and cities a pride and a pleasure to us all.

It is dangerous indolence to be indifferent to futurity. A community that fails or cares not to rise to a sense of its responsibility to future generations is a shame to itself and to humanity. It would be a giant stride in the right direction if we could awaken our public to the feeling that national honour or disgrace is at all materially connected with the production of works of beauty or ugliness. Any such happy result of public opinion would drive many of our professional men to reconsider their ways, and many patrons and directors of art to trust less to the mere dilettanteism of intuitive taste. We should be saved from much of the shame and annoyance we now feel at the vulgar ignorance which is poisoning and misleading public taste, and marring what little chance there may be of beauty in our cities, if those architects of whom we justly complain would realise the necessity of a broader education and a deeper insight into those great principles which form the science of art, and, as such, lie at the very foundation of all art practice. An "architect," who would be worthy of his great title as the chief and master of all arts, should know them. It would be, indeed, a blessing to our time, and our safeguard from the contempt of futurity, if our pretended architects (I am not speaking of the many of whom we are proud) would at least master such simple elements as these, viz.: that the principles of taste are principles of order; reason is their base and educated sense their guide, that there is nothing unreasonable that is not in bad taste, and nothing perfectly reasonable that is not in good taste. The entire merit of architecture depends upon the excellence of its construction; all useless or exaggerated members stultify it; no ornament can remedy its abuse; but rather is it true that ornament only accentuates the vileness of bad construction, and makes it the more vile. Thus, perfect aptitude of material and its use is the key not only to all good architecture, but to everything that all the other arts clustering round it can combine to produce. But construction lies at the foundation of all art. Beauty is both mechanical and ideal. Perfect construction is one form of perfect beauty. Beauty is no partisan. There is one form of beauty in the construction of a perfect problem, another in manual skill, another in a perfect machine, and another in fine art. The former kinds may be calculated and explained, but the beauty of fine art cannot be defined. It is an ideal thing, apprehended but not comprehended by us. So architects, who must be artists or no architects at all, must rise to this ideal of constructive beauty; and all students must learn that architecture is a thing of intellect, heart, and soul, and not what many seem to think it, an affair of measurement by compasses, and ruler. . . .

Of all the vices which pollute the source and thwart the progress of fine art in our day and country, the striving after novelty is among the worst. No one versed in his art could be guilty of it. But it is no uncommon thing to hear complaints of the trammels of old principles and arguments are warm and numerous that it is a miserable slavery to be tied down to follow in the steps of generations whom we have altogether surpassed in intelligence and civilisation; that our ideas and habits of life are different; that we are capable of striking out new principles; and that art, like other things, must be changed to meet them. It is a pity that such superficial rubbish should have found not only advocates in argument, but in practice. They say that people are wearied with the everlasting sameness; that art, used on its old system, is used up. It is seriously advocated that art should make a fresh start; that it is infinite in its capabilities, as nature and the human mind are; that an entirely new standpoint should be taken; and that all trammels being removed, fresh ideas, fresh principles, fresh effects would rise, fresh, beautiful, and complete as Minerva from the head of Jove, or Aphrodite from the foam of the sea. But the delusions of enthusiastic superficiality cure themselves. Conceit is a form of insanity, and vanity a possession of the devil, as all must feel who have eyes capable of the knowledge of good and evil, and feelings discerning truth from lie. But all such are daily pained and offended by the evil deeds of evil spirits, possessing men who revel in the destruction of what all the truth and romance of human history has made sacred, and cover the world, in place of it, with their own offensive doings.

Originality is a dangerous talent. There is a good and a bad side of it, as with many worse and better things. The best is that which is ignorant of its own existence; the worst is that where genius is wrecked on the rocks of vanity. Original ideas are not got by looking for them. The most true and precious originality is that which so loves and venerates the old things and ways that human heart and poetry have consecrated, that, by the warmth and brilliancy of genius cast upon them, they break out anew; beauty is born afresh, and age revives in all the bloom of youth. This rule of reverence, which true genius always follows, is in no way superseded by the fact that the interest of antiquity may sometimes mislead our judgment. Its influence is inexpressible. It overrides all faults and excellencies. The associations it excites, the memories it stirs, affect the eyes no less than mind and heart, investing the relic with a charm that blinds the eyes and warps the judgment. The fascination of antiquity is irresistible, and often leads the captivated mind astray, to mistake the beauty of its own affections for beauty in the thing it loves. It is often as true of art as of external nature that distance of time as much as any other distance "gives enchantment to the view." Two works done with equal poetry of soul and delicacy of hand will often bear no comparison, because Time is in the balance; Time, that wonder-working paradox, that beautifies while it destroys, and overweights the old against the new. It needs the touch of supreme refinement to play with novelty. All that we poor mortals can do by mental labour is but little otherwise than that which is the sum total of the labour of our hands, the moving of old things into new places. The history of human genius is like the course of a river, at one time sleeping in the quietude of deep pools, losing all identity with a running stream, and reflecting all things in it except itself; at another time rushing, sparkling, and powerful, carrying all before it. Originality may turn the old river into a new channel, but it is only the channel that is new. The genius most precious to mankind is continuous; if not in itself, at least in the vitality it imparts to others, as trees which seed themselves. Originality that is sudden and spasmodic fascinates, but is of little use. Our own poet-artist, Blake, was one. He wrote and drew with marvellous genius, but I doubt whether any one has or would care to follow in his steps. Nature allows no break. The river's meandering course is the solution of all our riddle; and though enthusiasm may disturb, and aspiring youth may fret, Nature, whether that around us or that within us, has been and ever will be a ceaseless stream of living order.

If any nation ever had to begin its arts again it certainly was England. A few great names, like Inigo Jones and Wren, Hogarth, Reynolds, Gainsborough, Flaxman, Adams, Wedgwood, and others, seem to stand out like tops of mountains above the mist. Such names cast a flood of glory on their age, but the public was dead to it. If, some few hundred years ago, the fanatics and panoclasts of the country



THE DOOR OF THE APOSTLES, VALENCIA CATHEDRAL, SPAIN.



THE PRUDENTIAL ASSURANCE OFFICES, HOLBORN.—Mr. Alfred Waterhouse, Architect.

had been instructed to smash everything that was hideous, instead of destroying everything refined and beautiful that the care and intellect of ages had produced, we should still have in England models of national arts, such as other nations still possess to their incalculable advantage. In spite of that, Art has begun again in earnest in England; but with it has sprung up a new difficulty, not by the want but by the plethora of models, making the education of public taste almost hopeless. The confusion of all the styles of art of the habitable world, ancient and modern, has been cast before it like a flood, and public taste breaks down, like an overworked linguist, under the multitude of his languages, jumbling his words and idioms into nonsense.

THE DOOR OF THE APOSTLES, VALENCIA CATHEDRAL.

The metropolitan church of Valencia, the most important architectural monument of the beautiful city of Turia, is of venerable antiquity. On the same hallowed ground where it now stands, the Romans erected a sanctuary to Diana, the Goths constructed next the Church of San Salvador, the Saracens built a principal mosque, Rodrigo Diaz de Vivar and the band of valiant knights who accompanied him in the conquest of Valencia founded the Church of San Pedro, the patron saint of that heroic leader, and King Jaime I. the Conqueror, who finally took the place, consecrated anew the church in 1238, dedicating it to the Holy Virgin.

During the episcopate of Andres de Albalat, a Dominican, third Bishop of Valencia after the conquest, the old edifice was taken down, and in 1262 the construction of the present cathedral was commenced. A century afterwards, in 1381, the great tower was begun, named later the Micalet or Miguelete, after its famous bell of that name, and was not finished until the year 1525, under the direction of the two architects Juan Franc and N. Amorós, both of Valencia. In 1404 the works for the beautiful dome were begun; this was restored in the middle of the seventeenth century, and embellished anew in 1735.

There are three principal entrances to this magnificent church, to which a mere description would not render justice. The first is that under the great tower, the Miguelete, constructed in the first years of the last century; the second is called, after the archiepiscopal palace, which it faces, the Palau; the third, and principal, is the Door of the Apostles, opening on to the Plaza de la Constitucion, of which we give a view.

This door is perhaps the oldest part of the church, and has statues under canopies at the sides. Above the crown of the arch is a foliated arcade, containing also statues. The upper part ends in a handsome rose-window of no small diameter, similar to those of other Spanish cathedrals.

A custom connected with this Door of the Apostles deserves recording. Within its portal the Board of the Valencia Canal Commissioners, the origin of which dates back to the time of Saracen dominion, holds its meetings. Respected by King Jaime I. and his successors, the Board, with all its privileges, has withstood the vicissitudes of eight centuries, preserving all its patriarchal forms to the present day.

OBITUARY.

Mr. Kennett Macleay, miniature-painter, the last of the originators of the Royal Scottish Academy, died in Edinburgh on Sunday, at the age of 76.

Mr. Charles Summers, sculptor, of Rome, died recently at Neuilly. He left Rome at the end of August to proceed to England for the benefit of his health. On reaching Paris he was suddenly taken desperately worse with an acute *goître* in the throat, brought on, it is said, by drinking the *aqua marcia* in Rome. Mr. Summers was born in Somersetshire in 1828, and while a student at the Royal Academy, took the gold and silver medals for modelling. His father emigrating to Australia he proceeded to that colony, and at the time of the gold fever visited the diggings, whence, having worked for some time a claim unprofitably, he returned to Melbourne to resume his art studies.

Herr Nerly.—The death is announced of the German painter Nerly, who had been living in Italy since 1820.

THE PRUDENTIAL ASSURANCE OFFICES, HOLBORN.

To meet the requirements of this Society's greatly increasing business, new offices have been erected in Holborn, at the corner of Brooke-street, from the designs and under the superintendence of Mr. Waterhouse, A.R.A. The Holborn frontage is about 80 ft., and that next Brook-street 192 ft. The contractors were Messrs. Holland & Hannen. The principal material used is terra cotta, supplied by Messrs. Gibbs & Canning, and the result must be considered a highly successful piece of street architecture.*

HEALTH QUESTIONS AT THE CHELTENHAM CONGRESS.

Mr. F. W. Waller read a paper on the "Sanitary Condition of Houses." He said, "Except for some remarks on possible sanitary measures having a wider scope than any now in force, the subject of this paper is confined to practical suggestions for the improvement of dwellings, such as may be effected by an intelligent workman without other aid. Great additions have been made to our stock of sanitary knowledge of late, but one phase deserves much consideration, that of making existing houses as healthy as possible, a large proportion of this and many succeeding generations having to live in them. The public themselves must insist on sanitary precautions, and additional legislative action will probably be necessary to compel builders to adopt sanitary measures such as properly constituted authorities may deem requisite. An intending tenant can demand a lease of the house he proposes to occupy, to protect his pecuniary interests, why not also a document to protect health? such document certifying that a thoroughly competent man had inspected the premises, and was satisfied with their condition. Houses might be periodically inspected by properly-qualified men, having power to insist on necessary sanitary measures, and all houses, old and new, would come gradually under his jurisdiction. In every house, an adequate supply of fresh air should be admitted on a regular system, and not at haphazard. The invention of Sherringham's inlets, having a slanting lip inside, Tobin's tubes, glass louvres, air-chambered grates, and other expedients allow of this being done without a draught, if properly arranged. A simple method of admitting air at a sash-window without draught, is to fix a board an inch high on sill; the lower sash can then be lifted without admitting air at the sill, but air comes in at the meeting bars, which are separated. In removing vitiated air, it must be remembered that if foul air is to pass away, a supply of fresh must be introduced to take its place. Obtain ventilation flues near some constant source of heat if possible; the kitchen chimney, for instance,—if that cannot be done, Arnott's outlets placed in the chimneys are effective, or flues may be made at the sides of the chimney breasts, and carried up through the house,—or a flue be made in the chimney breast, the top open at ceiling, the bottom under the grate, the heat of the fire draws foul air down, and it passes up the chimney. For assisting in warming, air-chambered grates, properly fixed, are very effective, and may furnish a supply of warm air to the room where the fire is, or to the bedroom over, by means of a flue. A good grate is made by Bishop & Barnard, called the "Parson's grate," the bottom of firebrick, and the grate shallow from front to back. The kitchen range may be made to do much in the warming of a house if properly arranged. In the drainage of a house,—a most fruitful source of illness,—the most effective plan, where it can be done, is to cut all house-drains free from the sewer, and have a direct communication with the open air between them and the sewer. All traps are rendered useless at times by various causes. All drains should be carried outside the house at once and empty their contents on to a syphon lower down; both the top and bottom ends of the house-drains should be left open, the former being carried above all windows. There are several other expedients to meet special cases. Closets should be placed in an offshoot from the house, approached by a ventilation lobby. It will be found most useful to have permanent, and easily accessible inspection holes in the course of a drain; a plan of all the drains, flues, and pipes of a house ought to hang up in a conspicuous place in every house for reference, and all the pipes, drains, cisterns, &c., ought to be put in accessible positions. It is a very good arrangement to have the positions of all pipes in a house burnt in on the woodwork which conceals them, they are then recognised at once if wanted. Labour-saving appliances are much neglected in households. Hot and cold water service, hoists, speaking-tubes instead of bells, warming-apparatus, all save labour, and consequently fewer servants are needed. Possibly a central motive power may be hereafter adopted for all mechanical work, either applied to houses individually or collectively. Those whose task it is to design the houses of the future have a wide field before them. Ancient architecture forms a vast and inexhaustible store of knowledge from which to draw, but it is not by a mere reproduction of archæological precedents, and by quaint conceits in designing, that satisfactory modern dwellings will be obtained, but rather by a judicious combination of past with present knowledge, and by a careful adaptation of the results of modern science to our present requirements.

Mr. H. H. Collins said architects were attacked whenever the subject of unsanitary buildings was mentioned, although out of 100,000 houses built only 1,000 were built under the advice of architects. The evil rested with the public. The law provided that the authority could be called on to certify to the unsanitary condition of a house, but the people objected to the cost of these examinations. Hardly any of the new houses built in Cheltenham had been designed by architects.

Mr. Brydges (town clerk) denied that such a state of things existed in Cheltenham, or that the law, as stated by Mr. Collins, enabled the town authorities to deal with these questions.

Dr. Farr, F.R.S., read the following important paper on "Density or Proximity of Population, its Advantages and Disadvantages":—

Dr. Chervin, in a periodical of great merit, points out the fact that Cary Schaeffle and Herbert Spencer have not succeeded in applying statistics to their theory of sociology. In our social science we are more fortunate. It is true that in many branches of social science we have to forego the use of analysis; but to others analysis has been successfully applied. I propose to illustrate one of these applications to-day. The population is distributed over the face of the earth in town and country; and I will consider here some of the advantages and disadvantages of the two kinds of distribution. To do this we must for mathematical purposes use terms more precise than town and country; and usually density of population has been the term employed. For instance, the density of population in England (1860 to 1870) was 366 persons to a square mile. This implies that England is divided into 58,312 square miles, and that on each square mile there are 366 persons. The density of population on every square mile is different, but taken on the aggregate this is the mean density. We can conceive in 1871 the population of England (21,348,974) distributed over 37,319,221 acres, or 1 person to every 1·74 acre; then imagine the population distributed in the centre of circles, or rather hexagons, of the area of 1·74 acre, then every person must be a certain number of yards from each other; this distance from each other I propose to call the proximity. The proximity of the people of England, the nearness to each other, is now 93 yards. The advantages of residence in towns, of proximity of people to each other, is evident. Man is a sociable animal, and naturally in his workshop meets his fellow-man. It is perhaps impossible to enumerate all the ways in which men derive pleasure or benefits from frequent intercourse with each other, but it is possible to determine the sum of their gratifications by an economical test. What do they give per acre for the ground on which they live in country and town? You will find as from the country you approach the centre of the town the value of the land increases; thus it is 25*l.*, 50*l.*, 100*l.*, 200*l.*, 400*l.*, 800*l.*, and 1000*l.* per acre. Now, on what score are these additional sums demanded or given? Is it not that men derive advantage from living near to each other? There are counter vailing disadvantages to which I shall now invite your attention. The first disadvantage strikes every one that comes from the country. In the country you are surrounded by fields, by trees, in hill or vale; there the breezes coming from the

* Quite contrary to our intention and knowledge, we find that the engraving has been made from sketches on the spot, and without reference to the architect. It gives, however, a very fair representation of the building, and the irregularity, we may hope, will be excused by the architect.

seashore or mountain have free play. The atmosphere is redolent of ozone; in the town this is wanting. Dr. Angus Smith, by chemical tests, proves the air is different. You know that nitrogen and oxygen are everywhere nearly the same in proportion, but carbonic acid varies with the density of population, and there are exhalations of various kinds from dead matter as well as from living bodies. Every town has an atmosphere of its own; nay, every street has its own peculiar atmosphere. I was going to say every living being has its own atmosphere. Now this atmosphere becomes in certain proportions deleterious, and I will now proceed to show that as the population becomes more dense, within certain limits this deleteriousness is expressed by the mortality. For example, if we arrange the 619 districts of England and Wales in groups according to the rates of mortality, we find that the 18 groups follow this law. The rate of mortality increases as the density of population increases. Thus in the ten years, 1861-1870, at one end of the scale the deaths per 1,000 of population are 15, 16, 17; at the other end of the scale, 31, 33, 39; the acres to a person in the corresponding districts are 12, 4, and 3, and ·01, ·05, 1·01; the intermediate rates of mortality are 18, 19, 20, 21, 22, 23, 24, and 25; the acres to a person are 4·0, 3·3, 2·9, 2.1, 1·1, ·05, ·02. Now, excluding the London districts, about which there is some difficulty, we have seven groups of districts, where the mortality ranges thus:—17, 19, 22, 25, 28, 32, and 39. In the same districts the numbers of persons to a square mile are 166, 186, 379, 1,718, 4,499, 12,351, and 63,823. Thus, in Liverpool, the densest and unhealthiest district in England, there were 63,823 to an acre; of whom 39 per 1,000 died annually. This series of facts may be put in a different way; the nearer people live to each other the shorter their lives are. Thus proximity of people in 53 districts is 147 yards, the mean duration of life is 51 years; in 345 districts the proximity is 39 yards, and the mean duration of life is 45 years; in 137 districts the proximity is 97 yards, and the mean duration of life is 40 years; in 47 districts the proximity is 46 yards, and the mean duration of life is 35 years; in 9 districts the proximity is 28 yards, the mean duration of life is 32 years. In Manchester district the proximity is 17 yards, and the mean duration of life is 29 years; in Liverpool district the proximity is 7 yards, the mean duration of life is 26 years. This is a determined law, and the duration of life being given in one set of conditions, the duration of life in another set of conditions is determined from the proximities. We will now draw some inference from this law,—that proximity and shortness of life go together. (1.) The question is of the highest importance to England. Every town is surrounded by circles of new houses, and at every census villages are grown into new towns. Thus in the last three censuses town population was set down at 8,990,169, 10,960,998, and 14,041,404. To England and Wales two millions of people have been added since the census of 1871, the greater part of whom will be found in the towns. Now, according to our law, this should imply an increase of mortality, and no doubt such an increase would have been observed had there not been a countervailing law in operation. (2.) The mortality was at the annual rate per 1,000 in the last three decades of 22·36 in 1841–50, 22·26 in 1851–60, and 22·51 in 1860-70. In the last seven years 1871-77 the mortality was at the rate of 21·64, or ·87 per 1,000 less than in the previous decade. Thus we may hope that there is a reduced mortality in the last seven years, about 20,000 lives are saved annually. (3.) Thus, while the population has increased, the atmosphere has become purer, and this should encourage us to persevere in our efforts in the same direction. (4.) The law of proximity would lead us to lay down some standard, and to fix some invariable rule that beyond a certain density no future houses should be built on the town. Thus in twenty-three towns there are 38 persons to an acre, and if such was the standard, where would Liverpool be with its 102 persons to an acre, where would Glasgow be with its 94 persons to an acre, Manchester with its 84 persons, Plymouth with its 53 persons to an acre? (5.) It is certain that the most effective means of reducing the mortality is to thin the dwellings of the dense parts of the population; to abolish, under Mr. Cross's Act, all the rookeries, and not to rebuild them. (6.) Simultaneously to put a stop to much of the smoke, to the sewer gases which are poured into the air the population breathes. (7.) The law might enact for the future that squares and parks should be left in the care of every town, as these spaces are indispensably required for the health of the population, and for the present time the whole of the available land should not be built over, but spaces be appropriated for parks whenever they can be procured.

A long discussion arose on a paper on

PUBLIC PARKS AND GARDENS,

read by Miss Vernon.

The writer dwelt upon the importance in large towns of having adequate public parks and gardens, not only as a method of controlling the effects arising from density of population, but as providing places of health-giving recreation. The Legislature, she remarked, had already granted every facility to urban authorities to acquire land for such purposes. A similar power was vested in the Metropolitan Board of Works, and she recommended that an Act should be passed enabling owners of open spaces, —such as squares in towns,—to give them into the hands of the local authorities for certain periods, such as the months of August and September. In addition to parks, Miss Vernon held that great good would result from towns possessing small open spaces planted with hardy trees and flowers, and laid out with grass and gravel. Such places would enable the poor to enjoy the fresh air denied to them in their squalid homes, and would enable children to indulge in healthful play apart from the contamination of the streets.

These suggestions were cordially accepted with some modifications by the different speakers who followed, — Mr. Edwin Chadwick, Mr. Collins, Dr. Hardwicke, Dr. Wilson, and Miss Heaton. Paris, it was generally admitted, was better off than London, but that was due mainly to the difference of climate and of Government. The conclusion arrived at was that vast benefits might easily be conferred on London were more trees planted along the broad streets; were spaces, such as Lincoln's-inn-fields, utilised instead of being enclosed, and the old unused churchyards planted and thrown open.

The following resolution was adopted:—"That the Council of the Association be asked to consider what should be done for the better administration and care of the gardens and public places of the metropolis and large towns, so as to bring their administration and condition up to that displayed into the metropolis of France."

Another resolution, proposed by Mr. Collins, was also adopted, asking the Council of the Association to use its influence in procuring legislative inquiry into the working of the Public Health Act of 1872.

WHAT MEANS CAN BEST BE ADOPTED TO ENABLE AND INDUCE THE WAGE-EARNING CLASSES TO SECURE FOR THEMSELVES A DUE PROVISION FOR SICKNESS AND OLD AGE.*

Mr. Randell first invited inquiry as to how far the existing friendly societies meet the provident requirements of the wage-earning classes, and whether their stability is such as to render it safe for these classes to depend on them for relief in sickness and provision in old age. The returns sent to the Chief Registrar show the assets of a large number of the existing friendly societies to be ridiculously inadequate to the claims that are maturing against them, and that there are many that cannot be relied on to fulfil their engagements to their members.

In support of this statement, he gave the following extracts from the report of the Chief Registrar issued this year:—

The Chief Registrar states that he issued to the friendly societies of England and Wales 26,087 forms of returns, and he received 11,356 returns; of these 1,267 were received late, with imperfect descriptions or addresses; beyond these, the returns for England show a total of 9,183 societies, with 2,745,730 members, and a total accumulated fund of 7,969,985*l.*, being an average of 2*l.* 18s. 0¾d. per member accumulated capital, to meet the liabilities that are daily maturing.

From Wales he received returns from 925 societies, showing a total of 146,904 members, and an accumulated capital of 397,325*l.*, being an average of 2*l.* 14s. 1½d. per member.

That while a few societies show high averages, with the greater number the assets are less than 1*l.* per member, for there are,—in England, 1,524 societies, with 1,836,302 members, and in Wales, 134 societies, with 56,555 members, giving a total of 1,658 societies and 1,892,852 members, whose capital has dwindled down to below 1*l.* per member, and in some societies to below 1d. per member.

He urged that in cases where he had been able to compare the present with the reports of previous years, the continuous decrease of capital in many of the societies evidenced not only that the capital previously accumulated is being absorbed, but it further evidences that the subscriptions of the younger members, instead of *being invested for their future*, are being absorbed in paying the present claims; and he maintained that in these cases the societies must be drifting into insolvency. He also thought we might presume that the returns sent in to the Chief Registrar were from those societies that have the most confidence in their position; and these show a total of 2,892,634 members, 1,892,852 of whom are dependent on assets of less than 1*l.* per member. The writer asserted that unsatisfactory as is the position the returns evidence, he fears they would show much worse if returns were before us from the large number of friendly societies who regard silence as the more prudent course.

Mr. Randell proceeded to show that to enable and induce the wage-earning classes to secure for themselves a due provision for sickness and old age, we must open up to them an organisation for *readily* and *securely* assuring themselves against want. That for this purpose some easily accessible, and, beyond all doubt, secure assurance is necessary. That to cover the risks of early and middle life (the years of work before capital is accumulated) this assurance must be co-operative. That it should be national; that being the strongest co-operation, and the broadest, consequently the least fluctuating basis we can command. That the classification should be numerous, so as to include all varieties of age, and all degrees of health. That it should be tabled to meet the requirements of the highest as well as the lowest of the wage-earning classes, say from 1s. to 10s. per day. That the tables of payment should be such as to insure the society being self-supporting; and beyond this, the guarantee should be national (as in the case of the Post Office Savings Bank) so as to make it as secure as the English Funds. That with a reliable friendly society covering the kingdom, the test of "the house" could be more generally applied, and we might look forward with confidence to the present poor law in the course of a generation becoming inoperative, and to its being then regarded as an institution of the past. That the omnipresent establishment, the post-office, presents ready to hand the machinery for receiving weekly, monthly, or other periodical payments, and for handing over to members the sick pay that may from time to time be certified to be due to them. That when the Post-office Savings Bank Bill was introduced there were many who opposed it; and many predicted that the scheme would fail, that the people would be distrustful of the Government, and that the expense of management in the hands of the Government would be very great, and that it must result in a loss to the State. That the result has given a complete denial to these forebodings. That the balance due to depositors on the 31st of December, 1877, was 28,740,757*l.* 4s. 1d., and while the accounts show a growing tendency with the public to make use of the Post-office Savings Bank, the yearly balance-sheets show an increasing amount of profit to the department.

He then asked that a similar organisation be offered the working-man, in regard to his friendly society. He urged that to guard against the misapplication of sick relief cannot be less practical than to check the application of out-door poor relief, on which we disbursed in England alone, for the parochial year 1876, 2,760,804*l.* He urged that such an organisation would help to lead our wage-earning classes to self-reliance, to careful and provident habits, and that the receipt of parish pay would then soon be regarded as a position that every one with the least self-respect would provide against. That with such a system of assurance covering the kingdom we might look forward with confidence to out-door relief becoming more and more restricted, and by and by to the present poor-law becoming inoperative, and to its being regarded as an institution of the past. That the amount expended for the relief of the poor in England in the parochial year 1876, was 7,335,858*l.*; that to save a considerable portion of this amount to the ratepayers is desirable, but that it is far more important to deliver the wage-earning classes from their present temptations to improvidence, and to put within their reach the organisation for securing provision for sickness and old age, that by so

* From paper by Mr. James S. Randell. Read at the Cheltenham Congress of the Social Science Congress.

doing, their physical welfare, their intellectual and moral status, will each be served; and in many thousands of homes grateful thanks will arise for the blessings that will by its agency be brought to those homes.

Several speakers objected that it was doing too much for that class: it was encouraging them to lean on others instead of on themselves; that they should be left to manage their own affairs, &c.

To these Mr. Randell replied by asking if it was possible for the wage class to ascertain what societies were sound and what were unsound? Would any gentleman undertake to point out the sound societies? Then, if they could not, how was the working man to do it? Mr. Randell admitted that to do for that class what they could and ought to do for themselves would be demoralising; but in that which it was not possible for them to do for themselves assistance was legitimate and desirable.

ON THE FUTURE OF ENGLISH ART.

It is a common observation on the Continent that "English art, as a rule, has an amateur smack about it." There is no evidence in it of a severe and systematic training, or of a perfected *technique*. Every one follows his own devices. This is, in the main, due to the fact that it is not the fashion for our best painters to take pupils, much less to have an *atelier* full of scholars. An artist's education, in this country, is a perfunctory one; he picks it up as he best can. He has to find out a method for himself. He wastes years in maturing his practice, when by a better system he might be put in the right way, and benefit by the experience of those who have gone before him. Another source of slight and imperfect work is the too prevalent misconception that an artist can be made in an incredibly short space of time,—that native genius will accomplish everything by intuition. A notion exists that a few months in an art-school is a sufficient preparation to ensure a glorious career, and the realisation of that fabulous wealth which is thought to roll in upon and overwhelm the popular painter. Young ladies and young gentlemen, supposed to be possessed of that intuitive genius which is equal to all the difficulties of art, consider this short preparation amply sufficient. And you are astonished after a few months to find that tyros, whom you thought were going through the goose-step of art, are assuming the airs of staff officers. There are, at the present time, scarcely studios sufficient to meet the demand. They are occupied one after another as soon as they are built by picturesque youths in velvet coats, and are furnished with spurious old oak furniture, blue pots, canvasses, easels, pipes, cigars, &c.; or, if the tenant be of a still softer sex, by a lady wearing probably a shooting-jacket, and whose fair locks are parted on one side, in opposition to the gentle youths who part theirs in the centre. Specimens of eccentric taste, Chinese, Japanese, or what not, will be forced on the visitor's attention, who will be expected to fall in with the fair tenant's opinion that these quaint odds and ends are *awfully nice*. No wonder, then, that so much which goes under the name of British art bears the stamp of the haste, the feebleness, and the want of study of the amateur. The great artist was never manufactured in this hasty fashion. The greatest natural genius has had to go through years of thorough study and of technical experience. When we think of the great things that have been done, and by what means they were accomplished, we are perfectly appalled at the presumption and conceit of the art bantlings of the present day. If, then, we earnestly desire that the British School of Art should earn a different and more honourable position in the eyes of Europe, the kind of thing we have been inveighing against must be suppressed, together with those writers who by their ridiculous views encourage such vain pretensions. All who have power to influence the art-future of this country should therefore bend themselves to the work of reform, and, above all things, to inculcate thoroughness. Doubtless this loose kind of art, the slighter work we are alluding to, is encouraged by the low status of public taste. A well-informed ruling class or general public would not tolerate it.

The Royal Academy, if it be bent upon reform, will have to make provision for the systematic teaching of all that elementary knowledge which it is essential that the young artist should know. It must be a real college of the fine arts, and not an easy-going seminary. It would be better if all the ornamental lectures were suppressed, unless a course for *outsiders* should be thought desirable. The courses of lectures for art students must be given in close classes and at fixed hours throughout the year, and all the students without exception should be compelled to attend these lectures until they could pass an examination for proficiency. There ought to be a dissecting-room attached to the Academy, or close at hand, in which demonstrations should be given during certain months in the year. Some may think that a knowledge of anatomy, to this extent, is not needed in the present day, but the very toleration of smattering is mentally demoralising. Away with your anatomical books and pretence, if you do not mean to thoroughly study the subject. No students should be permitted to study architecture at the Royal Academy, but at the price of going through the same elementary curriculum of study as those of painting and sculpture.

Having briefly glanced at those reforms which we deem necessary for the thorough grounding of the student in his art, we now turn to the enumeration of those which we believe to be necessary with respect to his tuition in the principles of the fine arts. The lectures on painting, sculpture, and architecture were, doubtless, founded for this purpose. But these, too, have now too great a glare of the footlights upon them. The students require *close* classes, college classes, on these subjects, lectures in regular succession, and oftener. The lectures should never be permitted to run into rhapsodies, but to keep to all such matters as can be thoroughly reasoned out. We must endeavour to get rid of that confusion of ideas which reigns upon art topics. The student must be brought to have clearer notions concerning nature, beauty, &c. You will find artists and critics insisting that everything that Nature does is right and beautiful, and that the student cannot possibly go wrong if he follow her. These teachers never give it a thought that if this were the case no precepts would be needed, for nobody by any possibility would go wrong; for all that happens is in some course of nature. The word "beauty," too, is bandied about in a most unintelligible manner, and indiscriminately applied to all the aims of art, and when beauty is seldom or never in itself, and in these days, the leading purpose of the fine arts. The grand, the beautiful, and the pretty have to be discriminated as separate and distinct aims, having widely different characteristics.

The broadest principle upon which we can safely build in the fine arts is, perhaps, that of adaptation to purpose, for in "Great Creating Nature's" works that is the dominant one. But from this fact superficial thinkers are apt to point to the conclusion that everything that is adapted to its purpose must necessarily be beautiful, though their next visit to the Zoo, and on confronting the baboon, the hippopotamus, and a host of other uglinesses, ought to dispel that notion. A being may be adapted to its purpose and also beautiful, but it may also be perfectly adapted to its purpose and exceedingly ugly. The beautiful consists in a certain conformity to our sensuous constitution, but all creation does not bow to and exhibit this deferential conformity to ourselves. As Sir John Herschel once wrote me on this subject, "The Creator had other objects in view in creation than that of beauty." This conformity to our taste and also to a special purpose in creation are sometimes united,—the most completely so, of course, in the human form itself. But from this point of perfect coalescence of the useful and the beautiful in the human form, other being differentiates with less and less of the beautiful towards the extreme of ugliness. A good rule to be observed in artistic design is to allow a subject to take as much beauty as it will bear without forcing. There is an immense difference in animated nature, in the animal and vegetable kingdoms, in respect to beauty of form, though each being is admirably adapted to its purpose, for its purpose is its relation to the great scheme of nature, while its beauty or ugliness is only the relation of its outward form to human taste. But the nonsense discoursed from the platform on this subject is truly astounding.

We live in hopes, however, for judging from the general tendency of inquiry and progress, we may venture to predict that the principles of the fine arts will, during the next half-century, receive a more thorough investigation. The people will no longer be stultified by art nonsense.

METER.

ANOMALIES IN ARCHITECTS' PRACTICE.

QUANTITIES.

SIR,—You permitted me on p. 1021 to make some remarks about "extras," and on p. 1071 (October 12th) on "completing works at appointed times,"—two subjects suggested for discussion by Mr. T. Roger Smith in a letter on p. 941 (September 7th). The discussion has certainly not been very fierce; I should not be sorry if it should become a little less lukewarm before it ends. Mr. Smith's third subject, "Quantities," is certainly a tough one to put into any sort of shape in a paragraph or two. Let me take it for granted that we all know the facts and arguments, and then conclusions only need be stated. By facts I mean the existence of different kinds of practice as to supplying quantities. It seems pretty certain that these are respectively sanctioned by the nature of things, and although changes may eventually be made, and although one need not shrink on occasion from indicating those which should be made, it may be assumed that things will go on for some time much as they have been going on, for say, the last twenty years. The questions therefore are:—1. Shall the quantities be part of the contract when they are supplied by a surveyor named by the architect acting on behalf of the employer? The surveyor is in this case supposed to be working on his own responsibility, and, when there is a disposition to press the case, he must guarantee the quantities, or in other words, must pay for any work done at the building, in accordance with drawings and specification, which by mistake was not included in his quantities. The situation is intelligible and fair enough, but I fancy would be none the worse for being very much more decidedly and openly accepted by the surveyors of good position. Leaving things alone is always pleasant and easy, and responsibilities which are not precisely defined can be met by compromises that are like emanations from the spirit of equity, and it may not be a man's duty to point himself out as a mark to be shot at; but the distinction between moral and legal responsibility should not in this case be so frequently mentioned. It does not follow that every employer would consider it the course of duty to get somebody else to pay for valuable work and materials made part of his property. It does not follow that every architect would be bound, for self-preservation's sake, or for any other reason, to shut his eyes to the natural equities of any case likely to bring hardship on some one, or to do him wrong. But it appears quite clear that every employer who pays a quantity surveyor a liberal,—perhaps a very large,—sum for a piece of service, should have no doubt about the genuineness of that service. By express written stipulation or by recognised custom he should be made well aware that in return for solid money he will have solid service, and the means of seeing himself righted by law if he feels that he has been wronged, and is willing to seek for redress in that way. There is an awful dread in the mind of many architects that, supposing the quantity surveyor dead or not capable of meeting such liabilities, a contractor might proceed against the employer, and succeed in establishing his responsibility for the act of his agent, the surveyor. Such a case might result in flagrant wrong to the employer; and, of course (though that is not the question), be very prejudicial to the architect, and to architects generally. The law remains at present, it is true, hidden in the brains of judges; but it may be spun out from them before this term is at an end, and may prove that, without intending it, the parties in some cases make the quantities part of the contracts, simply by the way in which their preparation is managed.

2. The employment of two surveyors, one to look after the employer's interest, and the other to see right done for the contractor, is an arrangement a little amusing in practice; but if no one complains, we must take it that no one is hurt. A surveyors' clearing-house has been suggested, by which work actually done could be set against work done by somebody else, everybody obtaining, nevertheless, all the money he had legitimately earned. Employers and architects need not trouble themselves about the details of such arrangements, so long as the work actually done is carefully scrutinised

in their interest. The quantities thus produced are always, one would hope, nearly as good as they would have been if produced by one competent surveyor. That they could not by any legal ingenuity be made part of the contract seems pretty certain. Most probably if any sad and anxious contractor tried a case his brethren would be sufficiently unanimous against him in the witness-box to convince "the legal mind" of the existence of a custom.

3. When the quantities are prepared by the architect, and are thus supplied by the employer's agent, by the employer's direct authority, they most probably become part of the contract, unless distinct stipulations are made to the contrary. Should it then be left to the successful contractor to check the quantities before he signs the contract? and thereafter to accept them, correct or not, as representing to him the same thing as the drawings and specification? It does not seem particularly hard to ask the contractor to do this, till it comes to test of practice. Then the contractor must decide;—either to get his surveyor to give a perfunctory general look at things, to see that the work has been done according to the rules of the craft,—it may be to actually check some half-dozen of the larger items; or he must give orders for a very searching examination,—a testing of the quantities item by item, and a lot of little claims may consequently be tabulated. Perhaps he wishes he had not incurred the cost of the scrutiny when the employer, anxious to begin, has persuaded the next contractor in the list to accept the work at the amount of the lowest tender,—on the ground that, as it seems to him, the author of that tender is trying to get freed from it. Like things might be said to any extent,—unnecessary for those who have to do with practical work, and not quite understood by any one else. The manliest and best course is for the architect who acts as surveyor to shrink from nothing; to be as careful about his quantities as he has been about his drawings and specification, and to fight the whole matter through. No one need be blamed very much for not doing this, when the opinion of surveyors and of his brother architects is so hesitating about these matters. Surveyors who do not practise as architects have a natural tendency to sniff at any method of getting tenders that does not involve the employment of one of their profession. This need not be the subject of surprise or blame. But architects need not fail in duty to themselves in consequence. It is most frequently the best thing a young architect can do,—both for his employer, and for his work, and for himself,—to look at every detail with that special care which the preparation of quantities forces upon the "taker-off." At that stage of professional life the employment and the pay for it are of moment. Perhaps, in truth, good would result to the architectural profession in the eyes of the public,—of good, reasonable people,—if all the principal operations, involving any sort of direction about buildings, were commonly undertaken by one professional adviser. The profession is weakened, as few other professions are weakened, by the amount of specialism which is practised and advocated. But this is really another subject; and if much was said about it here, the discussion might by chance be led off to other fields, by tempting to controversies about art those for whom professional practice has but moderate charms.

That some advance towards customs universally accepted for the whole profession should be made, does not admit of doubt. There has been little change from the varied and individual practice expounded at length at the 1871 Conference, except that quantities are now more universally accepted as necessaries of existence for small as well as large works, and that more architects are disposed to do their share of the work than was the case at one time. As far as employers and contractors are concerned, the status of quantities is just as it was when Mr. Thomas Wyatt delivered his address more than seven years ago. C.

Memorial Fountain in Banff.—A memorial fountain has just been handed over to the town of Banff by the Rev. Professor W. G. Blaikie and Mrs. Blaikie, of Edinburgh. The fountain is sculptured, and has been designed and executed by Mr. John Rhind, of Edinburgh. It is in memory of the late Mr. and Mrs. Walter Biggar, for many years residents in Banff.

COFFEE TAVERNS.

A MOVEMENT the great benefit of which to the working-man will be the more appreciated the more widely it becomes known, received a fresh impulse on Saturday afternoon, October 26th, when a new tavern was opened in Goswell-road, close to the City boundary. The Coffee Tavern Company, the originators of this novel undertaking, have now thrown open altogether twelve taverns, and trust to have four more ready in a very short time. Should the scheme prosper, they hope to distribute over the metropolis about fifty of their establishments. Those that are now in full operation have been located in quarters where they are most wanted, either in poor, densely-populated neighbourhoods, or in parts where a large number of working-men are employed. The taverns have been eminently successful in Liverpool, as well as in provincial towns generally, where they have been promoted either by companies or private persons philanthropically disposed.

The premises Nos. 30 and 32, Goswell-road, situate almost opposite to St. Thomas's, Charterhouse, and close to the junction of Old-street and Goswell-road, have been arranged and fitted up by Mr. Ashwell, and are among the largest establishments the company possess, being capable of comfortably seating 500 persons. They are well fitted up, lofty, well lighted, and thoroughly ventilated, and provided with everything necessary for the refreshment of the customers.

The simple opening ceremony was presided over by Mr. H. M. R. Pope, the chairman of the Coffee Tavern Company, and there were present also other gentlemen, as well as several ladies, interested in the movement. The chairman, in the course of the few observations which he addressed to those present, alluded to the success which had attended the opening of the "palaces." Their character was strictly commercial; the object of the company was not to give, but to supply the public on reasonable terms with the best possible food, and refreshments of a non-intoxicating nature. The public fully appreciated the principle, as was evidenced by the steadily increasing patronage which the "palaces" gained. After this short preliminary ceremony, the doors were thrown open, and the interior was rapidly filled by persons of all classes, and all clamorous for the refreshments provided. The numerous customers were served without confusion, and were made acquainted with the prices of the different articles they demanded by consulting a tariff, which is conspicuously displayed on the walls.

Although the chairman claimed for the undertaking merely a strictly commercial character, there can be but little doubt that those taverns, if properly managed, will tend very much to draw working-men away from public-houses. Judging by a visit paid to the new establishment in Goswell-road, from which we departed amply refreshed and satisfied, we arrived at that conclusion. The articles sold are good, and—so cheap. The food partaken of consisted of a plate of capital corned beef, a roll of good bread, and a large cup of coffee (you must bring your own spoon), about the quality of which we were, however, doubtful,—certainly it is only 1d. a cup,—and was purchased at the moderate cost of 6d.! The bill of fare is at present scanty, but we were informed that it is proposed to supply hot joints. This would be very desirable; and should the quality and quantity of the food (after fasting for six hours we were hardly able to get through what was set before us) be kept up at its present standard, we feel sure that the novel establishments will prosper. We might suggest that the tables should be kept a little cleaner; being of marble, they might be wiped down again and again; but perhaps we are a little too fastidious. At any rate, the new taverns supply a long-felt want.

Taverns in London are no longer what they used to be, viz., hostelries where "meat" and drink were provided for man and beast. They have developed,—we cannot say improved,—into abortions, into gin-palaces, where drink may be had to any amount, but where only the very slightest regard is paid to "meat." Certainly we have in the City huge refreshment-bars; but they are expensive. The People's Café Company have provided a few establishments where clerks and other men of more moderate income may obtain a decent meal. But where are the places where the working-man can sit down and have a meal in comfort, and cheap? And this latter remark applies all the more strongly when we speak of London the metropolis. We know of public-houses where it is impossible to get even a crust of bread and cheese. "We don't keep it," or "We don't serve it," is the answer to such applications. Surely there is room for improvement; and we think the Coffee Tavern Company will effect it.

JOHN WAY, CARVER.

THE death is announced of John Way, wood-carver, who died on the 26th ult., in the village of Bicton, Devonshire, at the early age of twenty-nine. It may be worth while to mention a few incidents in his life. Of the humblest origin, he passed his earliest years in the St. Thomas's Union, Exeter, and was bound out as a parish apprentice when very young to a local cabinet-maker and carver. There he worked hard, and when out of his time, being anxious to better himself, he engaged as an "improver" to Mr. Hems, and after a year or two's experience, went to try his fortune in London. There he soon became attached to the permanent staff of Messrs. Farmer & Brindley, and by those well-known gentlemen was sent, oddly enough, to take charge of the carvers at the Cathedral of his native city. For several years he remained Messrs. Farmer & Brindley's trusted representative at Exeter Cathedral, and some of the most careful carving executed during the course of the restoration of the choir there came from the chisel of this humble workhouse lad, John Way. Way continued afterwards in Messrs. Farmer & Brindley's service, and has represented them on important works in various parts of England. Always delicate, however, weakness at length settled into consumption, and illness becoming confirmed, his native air was tried. All, however, was of no avail, and he has just passed away, leaving a young wife to mourn his loss.

THE SITE OF HORSEMONGER-LANE GAOL.

WE learn that there is every probability of Horsemonger-lane Gaol being very shortly demolished, and that the site will before long be covered with residential buildings of a varied class. The site is said to cover an area of about ten acres, and it is stated that there are several parties connected with building anxious to obtain possession of the property. Amongst others, Messrs. Sutton & Dudley, who for some years past have been largely engaged in erecting buildings in flats south of the Thames, more especially for the middle classes, have made an offer for the purchase of the property from the county authorities of Surrey, and it is said to be not improbable that the estate will ultimately fall into their hands. It transpired at the meeting of the Surrey magistrates the other day that the Home Secretary, under the Prisons Act, has agreed to re-convey the gaol and grounds to the county, and on the recommendation of the Gaols Committee of the magistrates to empower the Finance Committee to dispose of the buildings and land, immediately on the re-conveyance being completed, a certain portion of the land to be reserved for the purposes of the county. At the same meeting the magistrates finally determined to proceed with the erection of a new asylum for lunatics, on land which has been secured at Coulsdon, near Caterham. The new building will cost 186,071*l.*, and will accommodate 1,120 patients. Mr. C. H. Howell is the architect.

NEW STOCK EXCHANGE, DUBLIN.

THE new Dublin Stock Exchange, in Anglesea-street, is expected to be ready for business early in the coming year. Externally it is of white firebrick, with grey granite dressings. It has a frontage towards Anglesea-street of about 100 ft. There are three entrances in the face of the building; the first, with doors of massive carved oak, leads to the sets of offices, which, to the number of about thirty large rooms in all, occupy a considerable proportion of the building, and are intended for the accommodation of stockbrokers. The second entrance is an open-work iron gateway, affording access to the spacious store-rooms below the building. The third may be said to be the principal entrance. It has two sets of doors,—the outer of heavy oak, richly carved, the inner of plate-glass and mahogany. A broad stone staircase

12 ft. wide leads to the great room in which the monetary business of the city is to be transacted. This room is 48 ft. long by 38 ft. broad, and very lofty. The ceiling is of polished woodwork and glass. The walls are richly panelled in carved oak, inlaid with walnut. Four stacks of hotwater pipes, railed in with fancy metal-work, will be placed in the four corners to raise (when necessary) the temperature of the hall. The architects are Messrs. Millar & Sons, of Dublin; the builder is Mr. Meyers, and the clerk of the works, Mr. M'Gouran.

NEWMINSTER ABBEY, NEAR MORPETH.

INTERESTING DISCOVERIES.

Local archæologists, and some others who are interested in the architecture and arrangements of the Cistercians, have been for some time looking forward to further excavations at Newminster Abbey, in continuation of those which were begun in a tentative manner last May. Since that time, subscriptions have been collected, and Mrs. Blackett-Ord, the owner of the estate, and Mr. John Swan, the occupier, having given permission, the ground was again broken on Michaelmas Day, and the works have been continued since then under the personal direction of Mr. W. Woodman, the Rev. J. T. Fowler (of Durham), and Mr. Middlemiss (of Morpeth), the borough surveyor. The *Newcastle Courant* gives the following details:—

A trench having been dug along the supposed line of the west front of the Chapter-house, a few courses of ashlar work were found on either side of the doorway, of which only the lower portions of the jambs remain, with the bases of shafts indicating that the arch above has been one of four orders. An excavation begun at the east end of the Chapter-house has since been extended over its entire internal area, with very interesting results. The general plan may now be made out from portions of the four walls, and of three out of the four columns which supported the groining. The north and south walls afford some indications of there having been a raised platform or dais at the east end, as at Durham. The lower part of one of the north-east buttresses may be seen in its connexion with the east wall. Portions of the beautifully-moulded capital of one of the columns, including the entire moulding, have fortunately been found among the other fallen stones, and the three remaining bases are undisturbed. It seems not unlikely that this Chapter-house was destroyed by removing the keystones and abutments so as to let the groining fall in, the process employed at Durham about A.D. 1797. The whole space was filled up by a mass of fallen material, among which have been noted the following objects of interest:—(1.) Keystones of groining, with intersecting moulded ribs, but no bosses. (2.) Several cart-loads of moulded stones from the ribs of the groining; some of these retain several coats of cream-coloured wash, with indications of joints painted on in chocolate colour. (3.) Masses of fallen wall with ashlar facing, and of groining, the latter consisting of wedge-shaped stones, many loads of which have been taken out. (4.) Parts of window-heads and other worked stone. (5.) Foliated corner-brackets and other springers for groining (no indications of responds or half-columns have been seen); the foliation is of very well-marked Transitional character. (6.) At the floor-level, a great number of pavers, glazed black and yellow, and of various forms and sizes, some very small, and together indicating a pavement of elaborate geometrical design. (7.) Mortar-bedding with impressions of pavers as they had been laid, distinctly showing a portion of the design. (8.) Many fragments of much-decayed painted glass and of window-leading, with a little melted lead and melted glass. (9.) A hone or sharpening-stone, with a mason's mark on it, and a piece of black "marking-chalk." So far as we can at present tell, the Newminster Chapter-house was a finely vaulted apartment, with internal dimensions of about 50 ft. by 40 ft., its stone groining supported by four pillars, its eastern portion raised one or more steps, and with different mouldings in its groining, its floor paved in geometrical patterns, its windows,—the form of which is as yet uncertain,—supplied with painted glass, and its walls and groining colour-washed, and marked as ashlar with joints by chocolate and white lines. In the transept were found, shattered by fall of groining, &c., four early incised slabs, with crosses of simple design; one has only a cross, another has also a pair of shears, and the other two bear names,—namely, "Joh'es de la Vale" and "Tomas," with two or three letters of an unknown surname apparently ending in "san." Here, also, was found a painting, in distemper, representing a nimbed saint in a chasuble with orphrey, over a dalmatic and alb. It is executed in a rough but spirited manner, in lines of black and red, with a few touches of white, on three of the stones of a pier or pillar, which fit together, and were found lying nearly as they had fallen. The face is the best-preserved part.

NOTES FROM LIVERPOOL.

Thanks well earned.—The last meeting of the Library, Museum, and Arts Committee of the Liverpool Town Council, previously to the annual municipal elections, was held on the 24th ult. At the close of the business Mr. H. H. Higgins moved:—"That the best thanks of the committee be given to J. A. Picton, esq., for the very efficient manner in which he has discharged the duties of chairman during the past year." He said that circumstances which had lately occurred elsewhere only tended to strengthen their hearty and warm appreciation of Mr. Picton's most valuable services on the committee. Mr. T. Holder, in seconding the motion, said that no one in Liverpool had done more to promote the social and moral improvement of his fellow townsmen than their respected chairman. The motion having been carried by acclamation, Mr. Picton, in responding, said that during the twenty-seven years he had had the honour of presiding over that institution,—from its initiation to the present time,—their great object had been to improve the people in literature, in science, and in art; and he thought the institution did contribute very much to the intellectual improvement of the community in which they lived. His advancing years would not permit him to look forward to any very long connexion with that institution, but so long as life and health were spared to him he should wish to contribute what little he could, and in whatever capacity, to the progress and welfare of the great work in which they were engaged.

College for Girls, Grove-street.—This new building, which is a development of the Girls' Collegiate School in Bedford-street North, originated by the Dean of Chester when principal of Liverpool College, was opened on the 29th ult. The architect is Mr. John Johnson, of London, whose designs were selected in competition. The style is Perpendicular, and the materials used are local bricks, with white stone dressings. The assembly or dining room has a clear floor space of about 2,300 superficial feet, in which seats can be arranged for about 200 diners, and it is 14 ft. high. Part of the basement is devoted to the purposes of a gymnasium. The building is constructed for the accommodation of 360 pupils, but arrangements have been made for a further extension, when necessary, by which 240 more pupils may be received into the establishment, making a total of 600. Messrs. Brown & Backhouse were the builders.

Proposed New General Post Office.—The *Daily Post* says that the question of providing a site for a new and enlarged Post Office for Liverpool has been for some time under consideration. Conferences on the subject have taken place between the Post Office authorities and the Mayor and Town Clerk, as representing the Corporation. Several sites for the new Post Office have been under consideration, and although no site has as yet been determined upon, that of Commutation-row is one which, so far, is considered most eligible. For that purpose not only shops fronting Commutation-row would be required, but also property bounded by London-road on one side, and Islington on the other, and extending to Camden-street at the back, would be embraced in the scheme.

Liverpool as an Art-Centre.—Mr. Hubert Herkomer has been on a visit to Liverpool. On the 2nd inst. he delivered a lecture entitled "A Philosophical Ramble in search of True Art." On the 4th inst. he was entertained at dinner by the members of the Art Club, and afterwards attended a *conversazione*, at which he delivered an address, in the course of which he said that they had it in their power to make Liverpool a great centre of art, and he hoped that some day the student of art would have to choose between London and Liverpool. In order to bring this about, he suggested that the art-student should have the opportunity afforded him of seeing most of the painters at work, by having at a certain time of the year a painters' festival specially organised. This could be done by inviting all the leading painters to Liverpool for eight or ten days, and making the town as festive as possible. Let them have some well-lighted and spacious room, with all the necessary arrangements, for artists. Here, at certain hours during the day, the painters were to work from living models, beginning and finishing their studies in the eight or ten days. Advanced students were to be invited to attend, and were to have the enormous advantage of watching the painters at work. It would be an art congress, and he believed that the painters themselves would be greatly benefitted by it. Liverpool would have to bear the expense, but this would be nominal compared with the value of the works which would be left in their hands. In this way the art-student would learn more in ten days than he would in half a lifetime by his own work.

Tenders for Works.—At the last meeting of the Liverpool Town Council, the Health Committee recommended the acceptance of a number of tenders for the flagging of certain passages and foot-walks. Mr. Connolly asked if tenders were advertised for in the newspapers. The Mayor replied that tradesmen sent in applications to be placed on the list of persons willing to do the work. Mr. Connolly said that when the Markets Committee required eleven windows to be fixed at the Great Nelson-street side of the Haymarket extension, the surveyor estimated the cost at 143*l.* The committee, however, advertised in the public papers, and the result was that a contract had been signed for 58*l.* 10*s.* Mr. P. H. Rathbone said that even after contracts were advertised for and tenders were sent in, inquiries had to be made as to whether the persons tendering were competent to do the work. Sometimes they were found not to be competent; but every competent tradesman had a right to be placed on the list. The recommendations were then agreed to.

ARTIFICERS' PRICES AND CITY TRADESMEN.

At a meeting of the Court of Common Council on the 31st ult., a report was submitted by the General Purposes Committee on the reference of the 20th of June, 1878, to consider and report recommendations as to the matters comprised in the reference of 29th of June, 1876, to consider the whole subject of artificers' prices and the employment of City tradesmen, and with sundry recommendations in relation thereto; also recommending the appointment of a surveyor of works, at a salary of 300*l.* per annum.

Mr. Deputy Fry, in proposing the adoption of the report, observed that there had hitherto been absence of method and system in the employment of the City tradesmen. There had been no direct responsibility in the matter, hence a loose mode of transacting this particular part of their business had sprung up; and it had been the object of the committee to devote themselves especially to correct this defect. In a report brought up on a former occasion, the committee had stated that the money expended among city tradesmen over jobbing works had amounted in the year 1874 to no less a sum than 16,908*l.*, and in the year 1875 to no less than 13,276*l.* The Court ought to know that the person responsible for the proper management of these departments had been a Mr. Weekes, who was called the superintendent of City labourers. Mr. Weekes was scarcely fitted for the post, which, indeed, was a far more important one than the Court had seemed to imagine when they appointed him. He was not equal to the responsibilities of the position, and had certainly discharged his duties in a very imperfect manner. The committee's first recommendation, therefore was, that the Court should employ a surveyor of works, giving him a salary of 300*l.* a year. They considered that he should be a practical man, a man of knowledge and skill in this particular branch of labour. Another proposition was that works estimated to cost more than 10*l.* should not be executed until sanction had been given by the several committees having charge of the structures concerned, and, as a general rule, it was best that works should go out to tender. Wherever practicable, it would be well to have some competition thrown in. The surveyor was to have a discretionary power to order works under 10*l.* With regard to the schedule of prices, the present one appeared to him (the speaker) to be most ridiculous. Going over the sums charged in the past, he found that people had agreed to do work for 33 or 33½ per cent. under the schedule of prices, which proved that either the latter must be placed extremely high, or that there was something apparently inexplicable about the low rates at which people could afford to undertake the work. The committee now proposed that a new schedule of prices should be made, as near the cost price as possible.

Mr. Moore heartily approved of the recommendation of the committee, and believed that they would strike at the root of the evils of the present system. There were one or two matters of detail, however, which he thought were capable of improvement, and he would move as an amendment to omit the words (where the report stated that a surveyor of works should be appointed at a salary of 300*l.* per annum), "to be in no way connected with the Architect's department." He should include in his amendment

the requirement that works of an architectural or decorative character, or such as might affect structural security, should be performed under the directions of the Architect.

Mr. Beard seconded the amendment, and remarked that to carry the report as it stood would relieve the Architect of the best part of his duties.

After some remarks from Mr. Edmeston,

Mr. Waller pointed out what he considered the gross anomalies of the present system, and gave notice of the following amendment :—"To agree with the committee in their report that a surveyor of works should be appointed at a salary of 300*l.* per annum, and that this amount be deducted from the remuneration of the Architect and his assistants." This would leave the Architect the sum of 2,866*l.* 18s. 1d. with which to conduct his own business.

The debate was adjourned.

ALLEGED OVERCROWDING IN THE HOLBORN DISTRICT, AND THE METROPOLITAN BOARD OF WORKS.

At the last meeting of the Holborn District Board of Works a charge was made against the Metropolitan Board of Works, in connexion with the large open space in the neighbourhood of Liquorpond-street, where such a large number of houses have been cleared away. Mr. Cottrell, one of the members, complained that by the demolition of these houses the poor were the chief sufferers. Many hundreds of poor families formerly resided in the locality, and had been driven hither and thither into all parts of the metropolis. He thought some very strong representation ought to be made to the Metropolitan Board on the subject, so that it might be seen if the land could not be leased at a moderate rate. At the present moment there were as many as seven, eight, and even ten persons living and sleeping in one room. Such a state of things ought not to be permitted to exist, as it was a positive infringement of the laws of morality. Such overcrowding was productive of the worst results on the health of the people, and was the source of much disease. In the course of a discussion which followed, one of the members stated that he had been informed by one of the leading managers of the Peabody Fund that they would have taken the ground, but the price asked for it was excessive. It was explained by the surveyor that although at Spring-gardens he had seen the plans for laying out the land, the Metropolitan Board were considering a scheme for forming a new street from the corner of Liquorpond-street to the Angel at Islington, and that that was the reason why the land was not disposed of, but it was remarked that the Board of Works had determined not to go to Parliament next session for powers to make such street, and it was agreed to make a representation to the Metropolitan Board on the subject.

NEWCASTLE-ON-TYNE.

The Moot Hall Courts.—The important alterations in the interior of the Moot Hall Courts which have been in progress for the last eighteen months are now near completion. The works have been carried out from the plans and under the superintendence of Mr. Crozier, the Durham county surveyor. There have been no material structural alterations in the building, and the only changes in the general outline are an addition on the south side and an extension of the steps on the north front to the entire length of the building. But the change in the interior is great. The general plan very much resembles that of the Durham Assize Courts, by the same architect. While the two courts (Crown and Civil) have received special attention, the work of alteration and improvement has extended to every portion of the Moot Hall. The system of warming and ventilating is that of Messrs. G. N. Haden & Son, of Albert-square, Manchester, fitted up under the superintendence of Mr. Blake. The whole of the woodwork of the courts, staircase, balcony, vestibule, &c., is of oak and ash, and has been executed by Mr. Gradon, of Durham. The new ceilings and all the plastering were entrusted to Mr. Robson, Pine-street. The central sunlights, and the whole of the illuminating arrangements, as well as lavatories, &c., have been fitted up by Mr. Watson, High Bridge ; and the painting has been done by Mr. Robertson, of Newcastle and Alnwick. The works have from the beginning been carried out under the supervision of Mr. Robert Tweedy, as clerk of the works. The total cost of the alterations and furnishings will not exceed 9,000*l.*

The Free Library, and the Carliol or Weavers' Tower.—At the meeting of the Town Council on the 23rd ult., Mr. Young moved :—

"That the confirmation of the report of the Free Library Committee, recommending the adoption of the borough engineer's plan for the erection of a free library, &c., passed at the last meeting of the Council, be rescinded, and that the following resolution be adopted in lieu thereof, namely,—'That this Council approves of the proposed arrangement with the members of the Mechanics' Institution on the basis named in the report, and authorises the borough engineer to prepare forthwith an amended plan, showing what alterations and additions are required to the existing building, in order to make it fully suitable for the purposes of a central public library, with the estimated cost of the same, leaving the Carliol Tower intact. That any architect wishful to compete for the work shall be at liberty to send in a design, such design to be accompanied with an estimate of the cost, addressed to the town clerk, Townhall-buildings, Newcastle-on-Tyne, on or before the 31st of October, 1878, and that the Free Library Committee be instructed to consider any designs which may be sent in, and report thereon to the Council.'"

He said that the fact that there was a very strong opposition to the removal of the Weavers' Tower was sufficiently evident by the very influential meeting over which the Mayor presided.

Mr. Dobson seconded the motion.

Ald. Gregson described the Weavers' Tower as a miserable old remnant of a tower. If there was a handsome building behind it, it would be like a blotch upon a beautiful woman's face. He saw neither use nor beauty in it, and was in favour of its being swept away.

The motion was negatived by 29 to 12. It would seem, therefore, that Vandalism is to prevail.

The High-Level Bridge Approaches.—At the same meeting of the Town Council, Mr. Barkas moved,—

"That the Finance Committee examine the Corporation properties near the High Level Bridge, and report at an early meeting of the Council on the best means of utilising the ground for the purpose of completing the High Level Bridge approaches."

The motion was unanimously agreed to

Elswick Park, an open piece of ground in the west end of Newcastle, recently purchased by the Corporation of that borough, was, on the 31st ult., opened by the Mayor. The newly-acquired park contains eight acres and a half, together with a mansion house, containing works of art, from the studios of the late John Graham Lough and Matthew Noble, the celebrated sculptors, presented by the widows of those gentlemen to the Corporation, the price paid for the park and mansion being 14,000*l.*

"IRREGULARITIES" IN WAGES SHEETS.

To the cases of falsifying "time-sheets," lately chronicled in the *Builder*, we have to add that the Norwich Town Council met last week, for the purpose of receiving and considering a report presented by the city engineer to the executive committee, respecting the conduct of Mr. Henry Newman, the road inspector. The engineer's report was as follows :—

"I very much regret that it is my painful duty to call the attention of the committee to certain irregularities that have come to light in regard to the time-sheets and money paid to the men employed in Mr. Newman's department, inspector of roads.

It appears that for some time the weekly wages' sheets given in by Mr. Newman have contained fictitious statements as to his men's names and time. The consequence has been that more money has been paid to some men than was their due, while money has been drawn upon the names of men who were not, or had never been, in the employment of the Corporation. These moneys have been from time to time taken by Mr. Newman or his son, either from the men themselves who had been over-paid, or where the men were not in the employment of the Corporation, or their names fictitious, from the pay-clerk personally, or by the agency of others.

Mr. Newman and his son, upon being asked for an explanation of these irregularities, in the presence of the Town Clerk and Mr. Coleby, gave the same explanation, viz., that the money they had in this way become possessed of was used by them to pay men whom they had omitted or forgotten to return in the regular time-sheets. But neither of them up to the present moment has been able to produce the men to whom they have paid such money, or to remember their names."

The engineer's report then went on to cite particulars. After a long debate, which occupied two meetings of the Council, it was on the 1st inst. resolved to dismiss Mr. Newman from his office. His son, a lad of 16, holding a subordinate position, had previously been dismissed. The Town Council appear to have taken a very merciful view of their duty in this painful case. We regret to observe that such offences seem to be somewhat frequent.

Weymouth Pier.—Mr. H. Edwards, the Liberal member for Weymouth, having advanced 5,000*l.* to the Corporation at five per cent. interest for the extension of the outer pier, has written to the Mayor handing over the entire sum for the benefit of the poor of Weymouth.

COMPETITIONS.

Spalding School Board. — Fourteen sets of designs have had the attention of the Spalding School Board for some time (all being under motto). The number was gradually reduced to seven ; then to two ; and the plans under the motto "Bonâ Fide" were ultimately selected for adoption. The sealed envelope being opened, containing the author's name, these drawings were found to have been submitted by Messrs. Bellamy & Hardy, architects, Lincoln.

The Kenneth Murray Monument.—No fewer than thirty-six designs for a monument to the memory of the late Mr. Murray, of Geanies, to be erected at Tain, were submitted for approval of the committee to whom the selection was referred. That of Mr. Lawrence Beveridge, of Edinburgh, was chosen, and Mr. Beveridge has been entrusted with the erection of the monument.

The Norwood Schools.—In reference to this competition, already mentioned in the *Builder* (p. 1118, *ante*), the Clerk announced, at the last meeting of the Lambeth Board of Guardians, that in accordance with the instructions given at the last meeting, he had written to Mr. Currey, architect, and had received a reply from him, stating that he would undertake to examine the six plans submitted to the Board for the alterations and additions to the schools at Norwood, and decide which of them deserved the three premiums of 150*l.*, 100*l.*, and 50*l.* respectively.

SURVEYORSHIP ITEMS.

Maidenhead.—A committee of the Maidenhead Town Council met on the 31st ult. and appointed Mr. Ingram, of St. Alban's, to the office of surveyor. Mr. Ingram was one of five candidates who had been previously selected from fifteen.

Dublin.—At a meeting of the Dublin Corporation, on the 1st inst., Mr. Lawless was re-appointed deputy-surveyor for one year, at a salary of 300*l.* An amendment to make the appointment for one month only was lost by 15 to 8. This amendment appears to have been proposed in consequence of matters previously coming up at the same meeting of the Corporation. It was alleged that Mr. Lawless had refused to comply with the request of a committee to check and certify the correctness of measurements of paving work executed. Great laxity seems to have prevailed in this matter, and only a few weeks ago a paving measurer was dismissed "for gross neglect of duty." Councillor French, who supported the amendment, said that "in one place they discovered that 900 yards of paving were done, and 1,746 yards were paid for." In vindication of Mr. Lawless, however, Councillor E. D. Gray, M.P., said that the committee, after dismissing the measurer, passed a resolution, not that Mr. Lawless should be responsible for having measurements taken, but that he should see "personally" to the measurements. There was a resolution that he was to see "personally" to all the paving works going on, and now the committee wanted him to see personally to the measurements. He contended that Mr. Lawless would have been insane not to have refused to do a physical impossibility.

DILAPIDATIONS.

HUDSON AND ANOTHER *v.* WILLIAMS AND ANOTHER.

This case, which was before the Under-Sheriff for Surrey on the 24th ult., and occupied the whole day, presented some peculiar circumstances. It was an action in the Exchequer Division to recover a large amount for dilapidations to a number of houses in East-street, Walworth. The defendant had allowed judgment to go by default, and the only question was one of amount. The claim was for 1,500*l.*

It appears that a lease was granted in 1773 at 16*l.* a year for land at Walworth for building purposes. The term was for 98 years, which having expired, a claim was made in 1877 for dilapidations. The houses were described as "cottage property," and were built about fifty-six years ago. Since the expiration of the lease the property had been sold for a large amount, and much beyond the reserved price, and new houses were to be erected.

The evidence of the surveyors showed that, had proper repairs been done, which the lessees covenanted to perform, the expense would be about 1,200*l.*

On the other side, the houses were stated to be badly built, and some had fallen down.

Mr. Under-Sheriff Abbott told the jury that a lessee was bound to repair, and was liable notwithstanding the sale of the property.

The jury gave for some portion 400*l.*, and for another portion 900*l.*, as damages.

THE LATE MR. COCKERELL, ARCHITECT.

We insert the following letter, although it was addressed to us in a private capacity. It will be read by many with extreme sorrow :—

"I received only this morning (6th) the melancholy intelligence of the death, at Paris, of Mr. Cockerell, who has served so long and so honourably in the capacity of Honorary Secretary. Two hours before he started for the Continent he was engaged in a committee of Council on the Architectural Examination; and left with the avowed intention of devising a better means of correspondence with our French Honorary Members.

To-morrow the periodical Notice Paper, the List of Members, &c.,—the last that will bear his name,—must be issued to the members, and obviously it is too late to make any alteration, or, indeed, any announcement in them. I shall, therefore, be much obliged if you will explain the position in which the Council are placed, and thus remove the apparent contradiction of a notice dated the 7th inst., and signed by one who died three days before.

I am now starting for Paris to pay my homage of sincere respect to the most loyal, the most genial, of colleagues.

William H. White."

THE NICHOLLS HOSPITAL, MANCHESTER.

The work in connexion with the building of the hospital that is to be erected under the charitable foundation provided for in the will of the late Mr. Alderman Nicholls is commenced. The site at the corner of Summer-place, Hyde-road, was secured by the founder some years ago. It is about thirteen years since rough sketches for the institution were prepared for Mr. Nicholls by Mr. T. Worthington, architect, Manchester, and that gentleman has now drawn the plans necessary for carrying the work into execution. The term "hospital" has been chosen in its ancient sense, for, according to the terms of the testator's will, the institution is intended for the education and maintenance of 100 poor boys from Manchester and the immediate neighbourhood, who will be fed, clothed, and taught free of all expense. The institution will be under the administration of fourteen trustees, one-half of whom are members of the Church of England and the other half Nonconformists. The building will be Gothic in style, with square-headed windows, having stone mullions and transoms, and stone dormers on the top story, with gabled roofs at each end, and angle turrets. The material of the structure will be brick, with cavity walls, faced with best stocks, and having stone dressings and finishings from the Moor End quarries at Halifax. In the centre of the façade, above the oriel window, rises the tower, to a height of 130 ft., with overhanging parapet and angle turrets, and handsome stone dormers. It is expected that the foundations will be put in during the present autumn, and that the contractor (Mr. W. Southern, of Salford) will have the building completed by the end of next year.

WATER SUPPLY.

Henley.—An "indignation meeting" has been held at Henley to protest against the decision of the Local Board to provide a new water supply. The following resolution was carried:—"That this meeting protests against the resolution of the Local Board to construct and maintain waterworks at the cost of the ratepayers of the Henley Local Board district, on the ground that they are not necessary." The rector was in the chair, and spoke of the proposal of the Board as "a great wrong," inasmuch as in Henley they had at present "an abundant supply of good water, and he would say that no town in England had a better supply. A deal had been said about the wells, but he could bear testimony to the willingness on the part of owners of property where an impure well existed, to remove or remedy the evil." This allusion to the existence of impure wells seems to us to show that the Local Board has some ground for taking action. Local Boards are not, as a rule, too prone to incur needless expenditure.

Bedford.—A duplicate engine, rendered necessary through the increase in the number of houses supplied with the town water in consequence of the rapid growth of the town, has been provided at the Bedford Waterworks. It is a double-cylinder high and low pressure condensing engine of 45-horse power indicated, and is capable of delivering forty-three gallons of water per stroke, and it makes about twenty revolutions per minute, so that it pumps well on for 1,000 gallons of water per minute to the reservoir on Clapham Hill, which is 150 ft. higher. The makers are Messrs. Goddard & Massey, of Nottingham.

ART EXHIBITIONS.

Glasgow.—The first of a series of water-colour exhibitions, under the auspices of the Scottish Society of Painters in Water Colours, was opened last week in a gallery in West Nile-street, which has been specially fitted up for the purpose, under the supervision of Mr. Alexander Skirving, architect. The collection contains 172 drawings.

Stafford.—An exhibition of pictures, statuary, pottery, &c., was opened on Monday, in the Borough Hall, Stafford, in aid of the School of Art. The pictures, of which there are between 300 and 400, are, some of them, by artists of eminence, the catalogue including the names of Carravaggio, Sir Godfrey Kneller, Morland, Vandyke, West, Ansdell, Horsley, Teniers, Goodall, Leighton, Creswick, Calderon, Ruysdael, Webster, Gilbert, Etty, and E. Landseer.

MASTERS AND MEN.

Runcorn.—The bricklayers of Runcorn went out on strike on the 2nd inst. in consequence of a notice of reduction, given according to agreement six months ago, having expired. The proposal of the masters was that wages should stand at 32s. per week instead of 39s. 3d. as up to the expiration of the notice.

Ayr.—The Ayr master masons have agreed to reduce their men's wages from 8d. to 7½d. per hour. Although trade is dull, the new town-hall and academy will give work to a large number of men.

Forfar.—The journeymen masons employed in Forfar came out on strike on the 2nd instant, because the employers intimated that they intended to reduce the rate of wages from 7½d. per hour to 6½d. per hour, and also that wages would be henceforth paid fortnightly.——The master joiners have reduced the rate of wages paid to their journeymen ½d. per hour. The rate is now 6½d. per hour.

Kelso.—It has been agreed among the master joiners in Kelso to reduce the wages from 7d. per hour to 6½d., from the 2nd inst.

Glasgow.—The secretary of the Master Masons' Association, Glasgow, contradicts the report circulated by some of the men, that it had been agreed to make the reduction only ½d., but that it was resolved not to put the new rate into force until Monday next.

Dunse.—Mr. John Clazie, joiner, has given notice of a reduction of ½d. per hour on the rate of wages paid to his joiners, to take effect on the 11th of November. Messrs. Swan & Son's men have been working at the reduced rate since July last.

Greenock.—The operative joiners of Greenock, whilst protesting against the reduction of 1d. per hour, have agreed to continue work under the new conditions imposed by the masters.

Galashiels.—The master builders of Galashiels have given notice of a reduction of masons' wages from 8d. to 7½d. per hour, to take effect within a week; and joiners' wages from 7½d. to 7d., to come into operation three months hence.

Campbelton.—The journeymen masons of Campbelton struck work on Monday because the masters had reduced their wages 1d. per hour.

Old Plans of Cities.—The *World* says,—"On the initiative of the Municipal Council, the city of Paris is about to undertake the reproduction by means of photography of all the old plans of the capital to be found in public and private collections. According to the statistics of the Fine Arts Department of the Prefecture of the Seine, there exist no fewer than 1,800 of these plans, all interesting for some reason or other. The work has already begun, and twenty plans have been reproduced. The atlas, however, which will contain the whole series, with explanatory details, cannot be finished before the end of five years. Why should not the City Companies and the Metropolitan Board of Works, or, failing them, some enterprising publisher, do the same for London?"

NON-PROFESSIONAL STUDY OF ARCHITECTURE.

Sir,—I was much pleased with the article in your last number, under the above heading. Having received a classical education, I am, as you say, ignorant of the most elementary features of this art, as doubtless numbers of others are; it may, therefore, be interesting to many of your readers to know that the "Gresham Architectural and Archæological Society" in a measure compensates for this want, having for its study church architecture by amateurs. The inspection of the most worthy London and suburban churches on Saturday afternoons, conducted by well-known architects, forms its chief work, though occasional lectures are arranged. I shall have great pleasure in giving fuller particulars to any gentlemen, either non-professional or professional architects.

R. Howard-Wall.

18, *Little Britain.*

CLAIM FOR PROFESSIONAL SERVICES.

HAMAND *v.* LEEMAN.

This was an action tried in the Exchequer Division of the High Court of Justice, before Mr. Baron Pollock and a special jury. It was brought by a civil engineer, carrying on business in London and Birmingham, against Mr. Leeman, M.P. for York, vice-chairman of the North-Eastern Railway, and director of other railways, to recover a sum of 1,150*l.* in respect of professional charges made in connexion with a line of railway which was proposed to be made in the Cleveland iron district in 1872.

The defendant pleaded that he had not done or said anything to the plaintiff in respect of his work, except as a director of the Middlesbrough, Whitby, and Redcar Union Railway Company, and that he could not therefore be held personally liable.

Baron Pollock, during the opening of the defendant's case, suggested that it would be better that the case should go to a reference than that a verdict should be entered by the jury.

The learned counsel on both sides, after consultation, agreed that an arbitrator should be appointed, and a formal verdict was then entered for the plaintiff, subject to the result of the reference.

GAS JOTTINGS.

Inverness.—A new telescopic gasometer has just been completed at the Inverness Gasworks. The town has up till now been supplied from two gasometers, whose total holding capacity was 64,000 ft. The one now completed will hold 144,000 ft. The cost of the new gasometer is as follows:—For ironwork, Messrs. Ashmore & White, Stockton-upon-Tees, 2,970*l.*; excavations, Mr. Fraser, Drumsmittal, 545; total, 3,515*l.* The tank which forms the lower tier of the gasometer is an iron structure 72 ft. in diameter, capable of containing 500,000 gallons of water.

Sowerby Bridge.—On the 26th ult. Mr. Joseph Greenwood, chairman of the Gas Committee of the Sowerby Bridge Local Board, turned the gas into the new holder which has just been completed by Messrs. Newton, Chambers, & Co. The present storage capacity at the works is 380,000 cubic feet.

ST. SAVIOUR'S CHURCH, PADDINGTON.

St. Saviour's Church, Warwick-road, Paddington, was re-opened on Sunday last, after having been closed for two months. In the interim the church has been repaired, provided with arrangements for heating and ventilation, and decorated in colour internally, from the designs and under the superintendence of Mr. E. C. Robins, the architect who completed the tower and angle pinnacles of the nave two years ago. The church was originally designed by the late Mr. Little, in the Curvilinear phase of the Decorated style, and, like St. Mark's, Hamilton-terrace, has no arcade dividing the nave from the aisles, but is roofed in one span, without intermediate support, by a low-pitched and richly-moulded ornamental roof, of the queen-post type, with boarding fixed to the underside of intermediate rafters, disposed in rectangular panels by the introduction of moulded ribs, the whole being darkly stained. The lightening of the roof was the object to be attained. The trusses and moulded ribs forming the panels have been left as they were for the ground tints, and have been relieved in colour by lines of bateras in red, blue, and yellow. The panels themselves have been painted a warm

buff or pale orange ground, and upon this, conventional ornament has been laid in red, green, and brown, between lines forming a rectangular bordering. Diagonal broad bands, with large intersecting circles of ornament, divide each of the panels on the sloping sides of the roof. The central panels under the horizontal portion have no diagonal bands, but a circular ornamented composition occupies the centre of each bay, intersected by the moulded ribs of four adjacent panels, and pierced for ventilation. The wall-spaces between the stone dressings of the doors, windows, and arches are finished a very pale umber, with a band of running ornament, about 9 in. deep, under the roof-plate and over the gallery seat-backs next the wall. On the ground-floor the walls are surrounded with a chocolate dado, with band of running ornament in black and buff above it. The gallery fronts are lightened with yellow lines, and the panels have each a floral ornament painted on the stained woodwork to represent ivory inlay. The chancel walls are tinted a light murrey colour, and powdered with gilt monograms. The dado is chocolate, with band of ornament in line with the string of the reredos, which has the panels decorated with black and gold foliated ornament on a chocolate ground. The tablets for the Decalogue and Creed are chocolate, with gold lettering. The canopied stone reredos is relieved with gold only. The heating and ventilation are combined in the following manner:—Each of the eight circular panels perforated for ventilation in the centre of the roof communicates with the longitudinal shaft, about 4 ft. wide by 2 ft. high, which extends the whole length of the church above the collar, and communicates with a vertical shaft in the tower, 40 ft. in height. At the base of this shaft are coils of hot-water pipes. By this means an upward draught is obtained, sufficient to empty the church of foul air in less than two hours. For warming, there have been introduced small-bore hot-water pipes, which border the aisles, and form a step to the raised level of the pews, by the introduction of an angle iron, which is cast with a perforation 1 in. in diameter at every 18 in. in length, through which fresh air is admitted from the crypt below. Coils in suitable positions concentrate the heat about the various entrances. Messrs. Harland & Fisher did the decorative work, while Mr. Bacon undertook the heating and ventilation arrangements.

ACCIDENTS.

Dangerous Coal-plates.—On Monday evening Mr. Bedford held an inquest on the body of Mrs. Sarah Flower, of No. 41, Guilford-street, Russell-square. The deceased was walking along Guilford-street when she slipped through the coal-trap outside No. 43, in the occupation of Mr. Vinall, architect, the plate of which had been left unfastened. Mr. Vinall was called and disclaimed all knowledge of the insecurity of the plate, but admitted that three-fourths of the plates in the neighbourhood were unfastened. Verdict: "Accidental death."

Scaffold Accidents.—On Saturday Mr. Humphreys held an inquiry at the London Hospital, touching the death of Robert Lees, aged 57, a bricklayer. The unfortunate man was engaged on a scaffold at some new buildings in Leadenhall-street, when in shifting a board he slipped and fell among the bricks, so shockingly breaking his ankle that it was found necessary to amputate his leg, and he died shortly after the operation. Verdict: "Accidental death."——On the same day, Mr. J. Williams held an inquest in the town-hall, Ludlow, upon the body of George Church, who was killed by a fall of scaffolding at a Wesleyan chapel now in course of erection in that town. The evidence showed that the deceased was helping to carry a block of stone, when his foot slipped, and the stone dropped on a putlog, which gave way. The stonework and scaffolding fell to the ground, and a stone, weighing 3 cwt., rolled on to Church's neck. The jury returned a verdict of "Accidental Death," and exonerated the contractors from all blame, recommending, however, that the bearings of the scaffold should be shortened. ——An inquest has been held at Lincoln on the body of George Townhill, 26 years of age, who met his death by falling from a scaffolding, on which he was at work at Lincoln Minster. George Bramwell, a labourer, deposed that about a quarter past ten o'clock on the morning of the accident he was assisting the deceased in his work of finishing stones intended for the repair of the west front of the building. For this purpose a workshop is erected at a height of 35 ft. or 40 ft. from the ground, in which deceased, who was a mason, was at work at the time. After the stones were finished they were lowered through a trap-door to points in the face of the building below. The deceased was getting a stone, weighing about a cwt., ready for being lowered, and was in the act of pulling it round on its end at the edge of the open trap-door. Witness had gone to another part of the scaffolding to get the chain ready for lowering it, when his attention was called to the deceased, and he saw him in the act of falling backwards through the trap-door. He had approached too near the aperture in getting the stone to the edge, and his hand had slipped off the side of the stone, causing him thereby to lose his balance. Verdict: "Accidental Death."

A Man Buried Alive.—About five o'clock on the afternoon of the 1st inst., a number of workmen employed by Mr. Richard Ashworth, silk manufacturer, were putting a new drain in a stable belonging to that gentleman, situate in Tonge-lane, Middleton. The position in which the drain had to be placed was directly underneath the outside wall of the stable, and about 4 ft. of earth had been removed from underneath the wall, and while the men were placing the pipes this wall suddenly gave way and fell in, burying a man named Joseph Holt, a blacksmith. An hour and a half elapsed before he could be extricated, and he was then quite dead.

Books Received.

Post Office Directory of the Building Trades. London: Kelly & Co.

We have received from Messrs. Kelly & Co. a copy of the Post Office Directory of the Building Trades and Architectural Art, just issued. This is the third edition of the work (the first having been published in 1870), and an examination of the pages shows that the same amount of care has been bestowed upon the compilation of this edition of the work as distinguished the two former editions. It extends throughout England, Scotland, and Wales, and the principal towns in Ireland. A few figures given in the preface show the extreme importance of the interests dealt with. It is found that there are 5,672 architects, 3,097 surveyors, 23,129 builders, who employ amongst them 577,000 workmen; in addition to which there are 516,000 "general labourers" not particularised, but of whom considerable numbers are certainly employed in connexion with these trades. The book must be invaluable to a large number of persons.

Miscellanea.

Wind Pressure and the Obelisk.—Mr. John Dixon, in reference to a correspondence as to the capability of "Cleopatra's Needle" to weather the severest gales in its present position, writes,—"As to its stability there need be no fear,—130 lb. of wind-pressure will not upset it. Eighty pounds of wind-pressure! What does it mean? The structure supporting any instrument that fairly registered such must have been strong enough to withstand itself such a strain, and as a practical engineer I unhesitatingly say no modern building exists in England that will bear anything like it,—certainly not the Bidston Observatory. Twenty-eight pounds pressure per square foot of surface would send a man flying through the air; it would sweep from the rails any passenger train. Seventeen pounds pressure would level the Charing-cross Station. What fraction of this would obliterate the Crystal Palace, a Lancashire cotton-mill, the Houses of Parliament, the dome of St. Paul's, or an ordinary house, I have not taken the trouble to inquire; but it would be a figure to alarm the theorists of such high pressures as have been mentioned. The windows of a building certainly have to bear an equal strain with the walls, and I suppose it would be immaterial to the glass whether it were placed vertically or horizontally. No obelisk has ever been overturned by the wind,—ours never will be. Revolution, communism, or natural convulsion can alone upset it. From such calamities, for the sake of my country, I trust it will ever be spared, long to remain on that pedestal upon which we have placed it in peace and with honour."

Proposed Low-Level Bridge near the Tower.—At a meeting of the Court of Common Council, on the 31st ult., a long report was submitted by the Special Bridge or Subway Committee, on the reference to consider and report as to the source or sources whence the funds for the construction of a low-level bridge across the Thames, east of London Bridge, and the approaches thereto, are obtainable; and recommending the construction of a Bascule bridge, commencing at the east end of Tower-street, and terminating on the Surrey side at or about Stanton's or Symonds's Wharf; and that the necessary steps be taken for obtaining the authority of Parliament to raise upon the credit of the Bridge House Estates the sum of 500,000*l*., and the continuation and appropriation of the coal and wine dues to the extent of the required balance (estimated at 250,000*l*.), for the construction of the proposed bridge and approaches. On the suggestion of Mr. Isaacs, it was agreed that the report of the committee should be printed and circulated, and the consideration thereof adjourned. It will thus be seen that whereas the Metropolitan Board of Works proposes to erect a *high*-level bridge just to the eastward of the Tower, this Committee of the Corporation are in favour of a *low*-level bridge, somewhat nearer London Bridge, and just westward of the Tower.

The Paris Exhibition Building.—The Council-General of the Seine has passed the following resolution against the demolition of the Exhibition Building in the Champ de Mars:—

"The Council, considering that Paris has no Winter Garden; that the idea of a creation of this nature preoccupies the public mind now that the fate of the Exhibition Building is to be decided; that a Winter Garden, installed in the Champ de Mars, with the adjuncts of games, concerts, and spectacles of all sorts adapted to the locality, would make it an exceptional promenade and one of the wonders of the capital; that moreover, great popular *fêtes* being now more and more customary among Parisian democracy, it is most desirable, with a view to the future, to preserve a building the disappearance of which might be regretted; expresses the desire that the Champ de Mars may become a municipal property to be affected to uses in harmony with the requirements of the population; and, in consequence, requests the Prefect of the Seine to negotiate with the State the exchange of the Champ de Mars for a piece of ground for manœuvres outside the city walls."

St. Peter's, Broad Hinton, Wilts.—Some help is needed by the rector towards the repairs of the chancel of this church. It has some interesting points. Within the sanctuary is a mural tablet, to the memory of Sir John Glanvill, elected Speaker of the House of Commons A.D. 1640, over which is suspended his helmet, sword, and escutcheon. On the north side of the chancel is an altar-tomb of the Wroughton family, and a niche containing a life-sized alabaster figure of Colonel Francis Glanvill, who was killed at the siege of Bridgewater, A.D. 1645, surrounded by a long Latin inscription. The floor, like that in the nave, is in many places green, from contact with the wet soil, and needs to be excavated and repaved.

Wincanton Town-hall.—The new Town-hall at Wincanton was formally opened last week. The new building is erected on the site of the old hall, which was burnt down about a year ago. Both the tower and main building are of brick, with freestone dressings, and the former is fitted up with a clock which is to be illuminated at night. The façade and interior of the large hall are designed in the style of Queen Anne's period, and a dormer in the centre of the roof has been presented by Captain Festing. The whole of the work has been carried out by Mr. Bird, builder, of Writhlington, from the designs of Messrs. Wilson, Willcox, & Wilson, architects, Bath.

Southend.—With reference to a paragraph in our last week's impression we learn that an aquarium has been proposed for Southend for some time, designed by Mr. C. F. Hayward, F.S.A., and its execution is only in abeyance. The design was complete in 1875, and we have a copy showing the new end to pier and other waterside arrangements in connexion with the proposed baths and aquarium.

More of the Romans.—Within the last few days the cope stone of a Roman tomb, of pure white Italian marble, and of about the date of the fourth century, has been discovered on the north side of the churchyard of St. Helen's, Bishopsgate, about 4 ft. below the surface. Within this structure there is a place for a cinerary urn, and near to it a Roman coin was found. It is said this relic will be presented to the Guildhall Museum.

Chipping Norton.—The parish church of Chipping Norton was re-opened on the 31st ult., after being partially restored at the hands of Mr. Cooper, of Aylesbury, and Messrs. Hobbs, of Chipping Norton, under the direction of Mr. Bruton, the diocesan architect. The restoration has been in progress during the last three years, the work having commenced with the restoration of the clearstory windows. The church is an unusual one in plan; it has a western tower, a lofty nave, a chancel, and north chancel aisle, with one south and two north aisles, with a fine south porch of two stories. It mainly belongs to the Middle-Pointed period. Until the work now in progress was commenced, it was supposed that the fifteenth-century tower, pulled down half a century ago, and shown in Skelton's "Oxfordshire," was the original one; but the discovery of a western arch of fourteenth-century character goes a long way to prove that there also existed a tower of that period. The principle adopted in the restoration of the masonry was that of removing all the repairs that had been executed in cement, and to restore the missing members or parts thereof in stone. This led to the discovery that the moulded respond at the east end of the northern arcade of the nave was wholly of cement, which when removed disclosed a mass of rubble masonry; this was cleared away, and disclosed a shrine of three niches, which being restored, forms now the back of the new pulpit, which has been erected in stone. The whole of the plastering has been removed from the walls. The western wall appeared when plastered to have no opening towards the tower; its removal showed,—first, the doorway of the fifteenth-century tower; and, secondly, the jambs of the fourteenth-century arch, which the builders of the later tower did not wholly remove. This arch it is intended to restore. In the restoration of the beautifully-groined porch the floor has been lowered some 18 in., and the old stone steps which led to the gallery removed; an ancient staircase to the room over the porch having been discovered from the inside of the church, and restored. The incised slabs, brasses, and tombstones have been carefully preserved, and many of them will be re-laid with the tiling. The seating has been executed by Mr. Cooper, the masonry by Mr. Hobbs, the glazing by Mr. Bunting, and the gasfittings by Mr. Rowell.

Concrete in Portugal.—During a recent visit to Lisbon, says the *Engineer*, we were much struck with the Portuguese manner of building concrete walls. If the mode followed in the alterations now being made to the river walls, some little distance to the west of the Hôtel Centrale, may be considered as a fair sample, we should imagine that speed in execution is not considered of consequence. Lines are stretched and the wall is built to them with as much accuracy both back and front as is usually considered necessary in house brickwork in this country; in fact, it is quite touching to see with what care the workman takes small stones between his finger and thumb and inserts them in the soft mortar in which the large stones are laid, each time looking along the line to see that they do not project the smallest fraction of an inch. The method of building a large sewer in connexion with this work is novel, and might possibly be adopted with advantage in this country in localities where flagstones are to be procured at a cheap rate. The section adopted is an approximation to the egg-shape, which is arrived at in the following manner. The invert is cut out of blocks of stones of varying lengths, the sides are each made by a flag, and the top consists of three pieces of the same class of flags cut with radiating joints, so that when put together they form three sides of a hexagon, the whole being kept in position by a mass of concrete built around it.

Powder Magazines on the Thames.—It is stated that further precautions are about to be taken in the storage and carriage of Government gunpowder. The crowded magazines at Purfleet, which have been described as a menace to London, and the corresponding magazine at Upnor, on the Medway, are to be partially relieved by a new and extensive storehouse at Hoo, some distance inland below Gravesend. The building is to be erected by convicts, for whom barracks are provided. The new magazine will be connected by a tramway with Upnor, and another tramway will run in the opposite direction to a jetty, which will stand on the banks of the Thames in the Lower Hope reach.

Parracombe (Devon).—The new church at this out-of-the-way little place was consecrated by the Bishop of Exeter on the 19th ult. The building is in the Early Decorated style of architecture, and has been erected from the designs of Mr. William C. Oliver, architect, of Barnstaple, the contractors for the work being Messrs. Bevan & Sons, of the same town. Accommodation is provided for 190 persons, and the plan consists of nave, north aisle, west-end tower, and chancel. The nave is 43 ft. long and 18 ft. wide, the aisle being the same length by 12 ft. wide. The chancel is 24 ft. by 15 ft., and the nave is divided from its aisles by a good arcade of three bays. All the details are plain, and the walling consists of stone quarried from the glebe close by. The east window has three painted lights, representing the Resurrection, and this and the other stained glass is by Mr. Dixon, of London. The ordinary geometrical glazing is by Mr. S. Bourne, of Birmingham. The tower is 60 ft. high, and opens by a massive arch into the nave. There is a large new clock, with two dials, by Mr. G. Gaydon, of Barnstaple. Externally, all the dressings are of Ham-hill stone, which tones nicely. A pretty-looking stone, from Sir Arthur Chichester's Gormon's Down Quarry, at Shiavell, in the neighbourhood, has been used with good effect for the quoins and other dressed stonework. The internal dressings are Corsham stone, and the walls internally are stuccoed, finished with a warm tint. The encaustic tiles are by Messrs. Maw & Co., and the warming apparatus is by Mr. Porrett, of Bolton. The roofs are of open-timbered work, and are uncommonly massive. The stone carving is by Mr. Harry Hems. Over the altar is a plain stone reredos, with three divisions. The pulpit is stone. The font is the one formerly in the old church. The tower is to have a new set of bells. The entire cost has been about 3,000*l.* The old church has been left standing, and will be utilised as a mortuary-chapel.

Society of Biblical Archæology. — On Tuesday evening the new session of the Society of Biblical Archæology was opened at Conduit-street,—the president, Dr. Samuel Birch, in the chair. Thirty new candidates were nominated for election by the council, and Mr. Robert Cust reported on the recent Oriental Congress at Florence, whose sittings he attended as a delegate from the society. Preliminary matters having been disposed of, Mr. Theophilus G. Pinches, the late Mr. George Smith's successor at the British Museum, read a paper "Upon the Bronze Gates of Shalmaneser III.," lately discovered by Mr. Rassam, at Balawat. These gates are each about 22 ft. high by 6 ft. wide. They were originally made of wood (probably cedar) 3 in. in thickness, and turned upon pivots fixed to the base of cylindrical posts, about 1 ft. in diameter. Plates of bronze were nailed across each door horizontally, extending right round the above-mentioned posts. The remains of fourteen plates of bronze have been discovered, but it is probable that the original number was greater. Each plate of bronze contains, in two bands, representations of battles, sieges, triumphs, sacrifices, &c., drawn in the usual Assyrian style, and accompanied by short inscriptions explaining each scene.

The Proposed New Town-hall, &c., Reading.—It is feared that the project for erecting a new town-hall, free library, &c., at Reading, will have to be abandoned, owing to a difficulty which confronts the Building Committee. Seven tenders were submitted, the highest 65,000*l.*, and the lowest 60,000*l.* Only 23,000*l.* have been promised. The Committee first advertised for plans for buildings to cost 25,000*l.*, and three plans were selected and awarded a premium of 100*l.* each, but they did not please the Committee sufficiently to be adopted. Mr. T. Lainson, of Brighton, to whom the plans were referred, was commissioned to prepare drawings embodying the ideas of the Committee and the best points of the rejected plans. His estimate of the cost of the buildings was 38,000*l.* Unless the Committee will be content with a less ambitious scheme it is likely that the project will fall through.

Builders' Benevolent Institution.—The annual dinner was held on Thursday evening at the Freemasons' Tavern, Mr. Edward Conder, president, in the chair. The subscription lists reached a total of nearly 600*l.*, including donations of 52*l.* 10*s.* by the Chairman, and 50*l.* by the Builders' Society. We must defer our report until next week.

Exeter.—A new chancel has just been erected to St. James's Church, Exeter, from the designs of Mr. R. Medley Fulford, architect, of that city, and has been consecrated. The completed work consists of chancel with north and south aisles, and choir and priests' vestry, and the accommodation is for forty members of the choir and ninety worshippers in the aisles. The chancel is 31 ft. 3 in. by 19 ft. 3 in. The walling stone used is a local one known as Pocombe, and the dressings are of Ham Hill stone. The chancel arch is carried by Mansfield columns. The chancel arcades are each of two bays, supported by Mansfield columns. The clearstory windows are cinquefoiled in a circle. The east window is a triple light, the shafts being of red Mansfield. It is filled in by a painted glass window by Messrs. Clayton & Bell, of London, and has been erected as a memorial to the late rector (Rev. A. Buckeridge, brother of the late well-known architect of that name). It represents the Crucifixion, with figures of the Blessed Virgin and St. John; below is the "Agony in the Garden," the "Bearing of the Cross," and "Ecce Homo." In a wheel-window above is St. James; and the inscription runs:—"In loving memory of Alfred Buckeridge, for seventeen years incumbent and rector of this church; deceased September 2, 1873. This window is erected by parishioners and others. 1878." The roof is of pitch pine, boarded and panelled in six angles. There is a doorway in the south aisle, and a north porch as well. The choir seats and low screen were formerly in the nave of Exeter Cathedral. The glazing generally, in geometrical designs, and tinted glass, is by Mr. Drake, of Exeter. The lectern is of carved oak, and has been made by Mr. Harry Hems; and the wrought-iron work is by Mr. Rice, of St. Sidwell's, Exeter. The walls will be decorated with "sgraffito" work at some future time. Mr. Style, of Exeter, was the contractor for the works generally.

State Aid to the Theatre in France.—According to the *Times*, the Budget Committee has been busy with a report by M. Antonin Proust on the fine arts estimates, the subsidies to the national theatres being the chief subject of discussion. The Opéra receives annually from the national treasury 800,000 francs, and the lease of M. Halanzier, the present manager, expiring next year, M. Proust proposed that the respective merits of subsidising and directly administering the Opéra should be discussed before renewing the vote. The other subsidised theatres,—the Français, Opéra Comique, Odéon, and Lyrique,—were all passed in review. The subsidy of 240,000 francs to the Français was agreed to without comment. The Opéra Comique receives 140,000 francs. An additional sum had been voted for increasing the furniture of the theatre, in expectation of a rush to it during the Exhibition; but comic operas do not appear to have proved such an attraction to the foreign visitors as it was thought they would be, and the sum has not been employed, and now returns to the Treasury. The Odéon does not give so much satisfaction as the Français. The committee proposes the suspension of its subsidy of 60,000 francs. There are complaints against the present director.

New Regulations for Bakehouses.—By the Act of last session, 40 Vict. cap. 16, some new and more stringent provisions are made, in addition to those contained in the Bakehouses Regulations Act, in relation to all bakehouses, except in places with a less population than 5,000 inhabitants at the last census, the washing of the interiors where painted, and their lime-washing where unpainted, being required to be renewed every six months. A penalty of 1*l.* for the first, and 5*l.* for every subsequent offence on the occupation of the sleeping-places near bakehouses, if such sleeping-places are on the same level with the bakehouses, and form part of the same building, unless they are effectually separated from the bakehouses by a partition extending from the floor to the ceiling, and unless there be an external glazed window of at least 9 superficial feet in area, of which at least 4½ ft. are made open to ventilation.

The Frauds by a Local Official.—Edward Clarke, the Poor-law guardian and member of the Tottenham Local Board, whose frauds upon the ratepayers were described in the *Builder* for August 31 (p. 923), has been convicted at the Central Criminal Court, and sentenced to five years' penal servitude. The frauds were in connexion with the purchase of timber, drain-pipes, &c., for public purposes.

Sewage Purification.—It was found some time ago that sewage could be purified by pouring into it a small quantity of muriatic acid; the animalculæ were all killed, and lay in a darkened mass at the bottom of the vessel, while "the supernatant water was changed from a deep green colour to be perfectly clear." Mr. Watson, in a communication to the Newcastle-on-Tyne Chemical Society, attributes the comparative absence of foulness in the Tyne to the effect of the weak hydrochloric acid which flows into the stream from the factories on the banks. It is also worth remark that "the Tyne fisheries have been increasing in value at an amazing rate," and that the salmon bred in the upper reaches of the river go back thither in the breeding season. These are facts which will have to be further verified; but that they have an important bearing on the subjects of pollution of rivers and utilisation of sewage cannot be doubted.—*Chambers's Journal.*

Arbroath Abbey Church.—Scotch papers report that some "important structural changes" are in progress at Arbroath Abbey Church, and they further say that "externally the improvements do not enhance the beauty of the building, though they certainly add to the comfort and convenience of the congregation." Formerly the stairs leading to the gallery were inside the walls, now they are outside, but enclosed in a brick erection in front, having a stair on each side, and spacious lobby between, with one main door. Internally, the pulpit has been changed from the front to the back of the church, the gallery also having been reversed to suit. New windows have been struck out where required, while some of the front ones have "necessarily" been closed up. A new flat panelled ceiling has been put up, and a thorough heating apparatus introduced.

Builders and the Highway Act.—The various local Boards of Guardians throughout the country have received a notice from the Local Government Board that whereas they have the power, under the Act passed in the last session, to charge builders for repairs of roads, rendered necessary by their carting heavy material during the construction of new buildings or repairs of old ones,—by which the road service provided for the public is sometimes abused by individuals for their private purposes,—that it is important to remember that any person from whom these expenses may be recoverable may enter into an agreement with the Highway Authority for the payment of a composition in respect to the damage done, and that the Local Highway Board may itself perform such repairs.

Stabling.—With refrrence to a recent notice of Headington Hill Hall, we are asked to mention the newly-erected extensive stable buildings belonging to the present proprietor, Mr. J. H. Morrell, and do so willingly. The interior of the stables has been fitted up by Mr. James Barton, of 370, Oxford-street, in the most complete manner, and is well worthy of attention. We take this opportunity of mentioning that Mr. Barton is in the habit of fitting up very large stabling establishments, in various parts of the country.

Institution of Surveyors.—The first ordinary general meeting of the session will be held on Monday, November 11th, 1878, when the president, Mr. William Sturge, will open the session with an address.

Constructive and Ornamental Ironwork.—Messrs. Cottam & Co., of Winsley-street, Oxford-street, have become so widely and well known in connexion with "stable fittings," that they fear the public will forget that they possess large stocks of general and ornamental ironwork: so they have issued a new catalogue of their patterns and sections. It includes spandrels, porches, and verandahs. The Gothic feeling does not prevail, and for some of the patterns we cannot profess any admiration, but there are plenty of them that are very good, and the book will be found useful by architects and builders.

Fire at Maynooth College.—On the morning of the 1st inst. a fire broke out at Maynooth College, near Dublin, and after burning about six hours, the building, for a length of more than 200 ft., was a smouldering ruin. An investigation of the remains is said to show that the fire occurred in a corner of the new quadrangle to the rear, and was confined to a portion of each of the west and south sides. Of these premises there is nothing left standing but the walls. About 70 yards of the west wing is entirely destroyed. The damage is estimated at 30,000*l.*

New Street at the East End.—A great clearance of house property is taking place in the East End, whereby a population of from 1,500 to 2,000 will be displaced. The materials of 140 dwellings, in seventeen different streets, were last week sold by auction by Messrs. Stuart Barker & Son, by order of the Metropolitan Board of Works, for the purpose of constructing a main thoroughfare between the City-road end of Worship-street and Sun-street into Bishopsgate-street. A second sale of property took place on Wednesday last.

Belfast has five coffee-stands in successful operation, under the Irish Temperance League, frequented by carmen, ship-carpenters, and others. The cost of the stands and fittings averages about 120*l.* each. The Ferry-steps stand is kept open night and day, except Sundays. Four of them pay working expenses. The League has also opened a large first-class *restaurant* in Lombard-street, which is elegantly fitted up. The coffee-urns are manufactured by Messrs. Riddell & Co., of Belfast. Mr. J. Malone, of Corporation-street, Belfast, is one of the promoters of the movement.

Drawing in Board Schools.—An exhibition of drawings by scholars and pupil-teachers attending the Board Schools in London was opened on Wednesday last, at the Saffron-hill Board School, Cross-street, Farringdon-road, and continues open for the remainder of the week.

A Gymnasium for Paddington.—The large swimming-bath of the Paddington Baths and Washhouses, erected three or four years ago from the plans of Mr. Lewis H. Isaacs, architect, has been converted into a gymnasium during the winter months.

TENDERS

For steam-engines, laundry machinery, and fittings, at the workhouse, Bethnal-green. Messrs. A. & C. Harston, architects:—

Clements & Co. (accepted)	£2,505 10 0

For steam-boilers, &c., at the same place:—

Fraser, Brothers	£970 0 0

For the completion of three unfinished houses, in Woodbury Park, for the Tunbridge Wells Freehold Land and Benefit Building Society. Chimneypieces and kitcheners not included. Mr. W. Hopper, architect:—

Besching	£1,990 0 0
Stephens	1,950 0 0
Judd & Young	1,945 0 0
Willicome & Oakley	1,916 0 0
Elwig	1,897 0 0
Brewer	1,713 14 0
Oxenden	1,698 7 6
Thorogood	1,544 0 0
Stott (accepted)	1,522 18 8

For building two houses, at Barking, for Mr. Coates, Mr. E. J. Dawson, architect. Quantities not supplied:—

Handford & Co.	£348 0 0
James	740 0 0
Howe	698 10 0

For forming portion of road and footpath upon the Sidcup Park Estate, Kent, for Mr. Robert Upperton. Messrs. Walter Graves & Hulbert, surveyors:—

Pound	£187 0 0
Neave	135 0 0
Tubey	119 15 0

For alterations to Nos. 103 and 104, Wood-street, Cheapside, for the London Warehouse Company, Limited. Mr. Wimble, architect:—

Judd (accepted)	£302 10 0

For crossings, Eastbourne, for the Eastbourne Local Board, at per yard run. Mr. C. Tomes, surveyor:—

	Stone.	Wood.
Gabriel	31s. 8d.	25s. 0d.
Booth & Wheeler	33s., 28s., 27s.	—
Hewitt	30s.	—
Mace	—	47s. 9d.
Asphaltic Wood Co.	—	34s. 0d.
Lloyd & Co.	—	27s. 6d.
Improved Wood Co.	—	24s. 0d.
Hayward *	23s. 7d., 22s. 10d.	42s. 7d.

* Accepted for stone at 23s. 7d.

For 1,200 ft. of 3 ft. by 2 ft. half-brick sewer, in Blomfield-road, Hammersmith, for the Fulham District Board of Works. Mr. A. C. Bean, engineer:—

Williams, Son, & Wallington	£1,250 0 0
Mears	1,237 0 0
Rowley	1,185 0 0
Keeble & Co.	1,136 0 0
Neave	1,005 0 0
Taylor	1,035 0 0
Hale	1,105 0 0
Strachan & Co.	991 0 0
Thompson & Son	887 0 0
Aldred	958 0 0
Cout	950 0 0
Ford & Norris	906 0 0
Serff	893 0 0
Matthews	885 0 0
Hancock, jun.	815 0 0

For rebuilding the Old Red Lion, Old Cavendish-street, for Mrs. Prested. Mr. A. E. Hughes, architect:—

Simpson & Son	£3,337 0 0
Waters	3,325 0 0
Patrick & Son	3,322 0 0
Williams & Son	3,260 0 0
Adamson & Son	3,240 0 0
Patman & Fotheringham	3,145 0 0
Grimwoods	3,098 0 0
Shapley	3,075 0 0
Perkins	2,993 0 0

For the erection of twenty-one houses, on the Grove Estate, Leytonstone:—

Hughes, accepted.

For the completion of a pair of villa residences, Mornington-road, Leytonstone, for Mr. T. J. Steel:—

Hughes (accepted)	£520 0 0

For new offices, for the Sub-marine Telegraph Company, Throgmorton-avenue. Mr. John Norton, architect. Quantities by Mr. S. J. Thacker:—

		Saving, if ordinary flooring.
Bywaters & Sons	£19,760	£710
Trollope & Sons	19,370	1,000
Lucas, Brothers	19,240	875
Holland & Hannen	18,958	890
Braid & Co.	18,324	1,013
Peto, Brothers	17,792	1,047

For sundry repairs, painting, and decorating, at 13, High-street, Thame, Oxon, for Mr. W. R. Sutton. Mr. H. J. Heath, architect:—

Barton, accepted.

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The Builder.

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The Use of Artificial Objects as Ornament.

ONE of the most telling of the brilliant "hits" in Mr. Ruskin's writings is the passage in which he draws a contrast between the Hindoo, — superstitious, treacherous, and cruel, but possessed of a most refined faculty of artistic design and execution, — and the Highland soldier, the soul of honour and courage, though destitute of almost anything that could be called artistic faculty of any kind; and answers the argument which might be hence drawn against the refining and humanising influence of art by pointing out that the art of the Hindoo is founded, not upon Nature, but upon grotesque and abnormal inventions, hundred-armed deities with monstrous countenances, &c., while the Highlander, though without art, is penetrated by a love of Nature and of his native scenery which influence his whole character and tone of feeling. The contrast is an extreme one, and proceeds on the assumption of ignoring a great many other influences, nearly, if not quite, as important as those alluded to; but the general conclusion deduced from it in regard to the superior value of decorative art which is directly based on Nature over that which is artificial in its origin, is little open to question in the main. We cannot feel the same interest in ornament which merely imitates (however cleverly) artificial objects with which we are familiar, as in that which reproduces (however conventionally) the forms and the life of Nature; partly because the former are of incidental and partial interest in themselves; partly because, even if beautiful in form, their beauty has direct reference to utility, and has no meaning, or very little meaning, apart from that use. An Etruscan or Greek vase is a thing of beautiful lines in itself, and we have a satisfaction in seeing an object of practical use made to look beautiful in so simple and suitable a manner; but when the same vase is represented in bas-relief as part of the ornament of a frieze, or in the round as a finial at the angle of a cornice, we feel that the special form of the object has no reference to its position, and that if we were seeking beauty and expression by means of delicately contoured curves, we might just as well be rid of the limitations which the form of the artificial object necessarily binds us to, and employ curvatures in a more abstract and less specialised and prosaic form.

The fact, however, remains, and it is one of some interest to the student of decorative design, that in a considerable portion of the architecture which has been designed or built, artificial objects have been included in the decoration, and have sometimes even formed the main part of it; we might say the whole of it, if we include under the term "artificial" not only separate objects complete in themselves, but combinations of objects, natural and artificial, which have no real relation to one another. A great deal of this kind of ornament is being revived in recent domestic buildings, and at the Government central school of art it seems to be regarded with so much favour that in one of their instruction books a list is given (and a very fearful list it is) of the objects of artificial manufacture which may, according to the most respectable precedent, be introduced into architecture and decoration. There is, however, a better and a worse, if we cannot altogether say a right and a wrong, in the use of this kind of decoration, and the consideration of the manner in which it has been used and abused in different styles is not without its instructive side.

There may be said to be three types of artificial ornament: that in which combinations are used which are unnatural and purely arbitrary, such as human heads and trunks ending in scrolls of foliage instead of limbs; that in which purely artificial objects are used obviously because they are admired in themselves and are regarded as a fitting artistic finish to the detail; and that in which they are used merely for symbolism, like a sign of trade over a shop-door. In many cases it will be evident, on investigating the matter, that instances of the second class have originally belonged to the third; that objects now used for no apparent purpose but their supposed beauty or elegance had originally a meaning which has dropped out and disappeared. This fact has an important bearing on the question of good or bad taste in the introduction of artificial objects as ornament.

The employment of such objects as architectural ornament is usually attributed entirely to the influence of Roman architecture: not, however, quite justly or correctly. It is true the Romans had that practical and business turn of mind which led them to seek ornament in the most direct manner, and with the most definite meaning to it, by the repetition on their friezes of adjuncts of sacerdotal or municipal ceremonial; and in this respect they showed evidence of the national deficiency in regard to artistic feeling which has been recognised by modern criticism as peculiarly characteristic of them. Innate taste for ornament is not driven to these shifts, and produces work founded on something more general and less incidental. We see this even in the ornament of savage people. Such ornament is not usually founded on imitation of anything made by themselves for practical purposes,—indeed, it may be said that people who are in a state of barbarism have few such objects to introduce into ornament; nor is it generally founded directly on objects in nature in the animal or vegetable world, but rather on combinations of lines and spaces which are based upon innate though uncomprehended ideas as to proportions of spaces and curves to one another, often including what is really a very rude and rudimentary geometry. The genesis of this barbaric phase of ornament is happily indicated by Browning in his "Caliban upon Setebos," where the half-brutish tenant of Prospero's island says that he finds no finer joy in the world,—

> "When he wants little, hungers, aches not much,
> Than trying what to do with wit and strength.
> Falls to make something: piled yon pile of turfs,
> And squared and stuck there squares of soft white chalk,
> And with a flsh-tooth scratch'd a moon on each,
> And set up endways certain spikes of tree,
> And crown'd the whole with a sloth's skull a-top
> Found dead in the woods, too hard for one to kill.
> No use at all in the work, for work's sole sake;
> Shall some day knock it down again."

The "sloth's skull a-top" might perhaps be quoted as the precursor of the Roman architect's ox-skull decoration, but in reality it has no affinity with that,—it is put up merely because it was the readiest thing to hand to make what to the savage seemed an ornamental finish, and had no ceremonial meaning of any kind—"no use at all in the work"; and if Caliban had had any such word as "art" in his vocabulary, instead of "for work's sole sake" he might have said "for art's sole sake," for that was precisely the head under which his attempt, however rude, would really have to be classed. And so it has been with all that can be called spontaneous decorative art: it is an attempt to evolve something beautiful because it is beautiful. The hieroglyphics of Egypt hardly come strictly under the title of decoration, they are rather to be regarded as inscriptions; and the real decorative features of Egyptian architecture are either founded on nature or (like the winged globe) purely abstract. It need hardly be added that this is almost entirely the case with Greek ornament also, which presents hardly any direct imitation of nature nor of artificial objects; indeed so abstract is Greek ornament generally that it is difficult to say positively in regard to such features as the anthemion, for example, whether they are really founded on nature or not.

There are, however, to be found in Grecian ornament the first suggestions of nearly all the artificial features which the Romans subsequently used so much more prominently, though it must be admitted they hardly come into the best or purest Greek work, at least as part of the architecture. Altars we know were decorated with heads of animals, and garlands, and sacrificial implements; masks or grotesque faces found place on the cornices; and as there is no doubt that the temples were decorated externally by shields, &c., hung up as trophies, the first step towards the use of armour and arms as decorative incidents may be said to have been furnished by the Greeks. The winged griffin with claw extended in a formal attitude, so well known in Roman friezes, is also traceable to Late Greek work, and is a part of our

subject, as a specimen of what we have called artificial and unnatural combinations of forms having no essential relation to one another. Canina, in his illustrations of Greek architecture and detail, gives an engraving of a cornice said to have been found near the Temple of Ceres at Eleusis, which is decorated with ritualistic accessories and implements as frankly displayed as they could be found in any Roman cornice,—tripods, ox-heads, platters, jugs, and fir-cones, dotted along in regular series, just as the "instruments of the passion" were used in Mediæval decoration. The comparison suggests in itself the reason why such decoration might be found in a specially prominent form at Eleusis, which was a great centre of the superstition and ritual of the day, and where accordingly one might expect to find the instruments of ritual regarded with unusual veneration. Canina himself seems to have been so far impressed with the tendency of Greek taste towards artificial decoration, that he has actually restored the beautiful finial of the monument of Lysicrates with a kind of hour-glass (it looks more like that than anything else), rising from the upper leaves of the foliated finial which we know so well, the top of which has certainly been broken and damaged, and thus left room for conjecture in restoration, ever since it was known to modern students, but which we may surely safely assume was never completed in such a way as this by the Greeks. The suggestion seems to be the emanation of a taste somewhat vitiated by that constant study of Roman work which was the great object of Canina's life.

When we come to Roman work, we find the use of artificial decoration much more developed, and carried out in many instances in a spirit anything but artistic. We find friezes decorated with skulls, hatchets, augurs' hooks, and other properties of the sacrificial staff of the temple, sometimes scattered almost indifferently and *ad libitum* on the walls, and with hardly even the attempt to arrange them so as to produce a really decorative effect. This exceedingly materialistic kind of decoration results from the double fact that the Romans were not by nature ornamentists, and that they were by nature, or rather on principle, disposed to attach much importance to religious ritual. Hence the natural desire for an easy road to the production of ornament without expending any thought upon it was satisfied in the importance attached to the utensils of religious ceremonial, which rendered them a perfectly respectable and an easily intelligible decoration when carved on the outsides of the buildings. The skull of the ox with the sacrificial fillet drooping from it was probably a representation of what had at some time or other actually been hung up on the walls of the temple, but which it became now the fashion permanently to represent in sculpture. The origin of our friend the griffin it is less easy to understand: it is probable that the Romans and later Greeks believed in the existence of some such animal, and may have thought it peculiarly suitable for a temple decoration as representing the most mysterious form of life they could imagine, and which if it existed at all must have been regarded as a sort of link between the natural and the supernatural. The festoons of flowers and fruit which became also so common may be regarded as artificial ornaments also, since they are fruit and flowers done up into artificial forms, and this form, rather than the natural details of which it is composed, is the object of the decoration, which in this instance is manifestly a permanent representation of what had been formerly merely hung on the walls. Nothing could be more prosaic than some of these elements of decoration, yet it must be borne in mind that in their own day they had a meaning, and that their *rationale* in an ancient Roman temple is quite different from what it is when they are copied, as they so often have been, on modern imitations of Roman architecture. In the latter case the ox-heads and garlands and tripods seem to be adopted with an idea that they are really beautiful in themselves, and on that ground fitting objects to use up again in modern decoration. But there is no real similarity between the modern and the original use of such decorative adjuncts. To the Roman they were the signboards, so to speak, of a temple and its ritual, and had, therefore, a definite and appropriate meaning, which to us they have not. We should do the same thing if in building a music-hall we decorated the frieze with representations of the actual instruments in use in the orchestra, or if in building a theatre we sculptured wigs and property dresses on the outside, or if in building a war-office we decorated it with Armstrong guns and crossed Snider rifles in bas-relief. We should consider this very prosaic; but this is precisely how the matter must have stood to the Roman architects: their ox-heads and garlands, their torches and *fasces* and axes (which also all come into their decorative scheme) were all attributes of their every-day life, and had a directly illustrative meaning. In a certain way we imitate them; we do represent musical and dramatic and military properties and utensils outside buildings for the respective purposes named; but then we are careful not to do it too literally: we carve outside our music-hall a harp with half-a-dozen strings, upon which no music could be made that any one would care for now; we decorate our theatre with masks which are no longer of any use or import in the modern drama,* and our military buildings with shields and spears which no modern soldier would find of any service in a fight. Whether these antique decorations are altogether without meaning or not is another question, which may be touched upon presently. But the ox-heads and garlands, when repeated in modern ornament, are altogether without meaning, at all events: they refer to something which has no relation to modern life in any way, direct or indirect.

But, after all, as we have half hinted already, the Roman architect was not the most reckless or profuse employer of artificial decoration which the history of the art has to show. The most elaborate use of this source of ornament arose in the period of the Renaissance, and is in part connected with the names of some of the greatest of artists. That of Raffaelle, in particular, is associated with a school of ornamental design which might furnish a fertile occasion of satire on the part of a cynical and uncompromising critic. The painter of "The Transfiguration, it is true, has plenty of brother artists of name and fame to keep him in countenance; and certainly the museum of curiosities which this Italian school of decorators, and still more its pendant, the French school, brought into use in their ornamental inventions, forms material for a catalogue fearful and wonderful in its nature, and quite distancing the school of Pompeii, itself a great advance on the practice of Rome. In the painted decorations of the Classic villas of the Cinque-cento period, as well as in Roman and Florentine palaces, we find a system of decoration pressing into its service all kinds of heterogeneous and ill-assorted objects,—spheres, caskets, scrolls, ribbons, cornucopiæ, lamps, shields, tassels, necklaces, bundles of fruit, hour-glasses, angle ornaments resembling open fans, and many others, all strung together (in general) by a system of artificial foliage, which curls and twists through them all. The revival of this school of decoration, with such great extension of its caprices, took place in Italy but a comparatively short time after architectural ornaments had begun to grow out of the reminiscences of this tendency in Roman art. In the painted decoration at Assisi we find traces of the artificial ornament of the Roman period, traces sufficiently clear, but showing, nevertheless, a gradual and certain submerging of these artificial elements of ornament under a new and living school of decorative art of what we now know as the Gothic type;† but in Italy, before this latter had time to become properly developed, its enemy, the Renaissance, came in like a flood, and a fresh era of entirely artificial and conventional ornament set in again. One of the most objectionable features in this school of decoration was the manner in which the human figure was dismembered and made to appear only as something to be cut up into bits and fitted into the puzzle. Faces and busts were stuck on to anything; female figures ended in long scrolls turning over their own heads; and the climax of absurdity is reached in such decorations as those designed by no less a hand than that of Bramante in the Castle of St. Angelo, where we may find for instance a face between two extended horizontal rods draped with curtains festooned from them, with ribbons hanging from the ends of each, while in the centre immediately below the human face, hangs a brooch with pendants; the whole suggesting the idea that a gentle feminine malefactor had been decapitated, and the head gibbeted along with the personal adornments of the deceased, as an awful warning to the beholders. Cupids,—*amorini*,—become so completely a piece of decorative furniture that they also, although they are really representations of little boys, and therefore so far natural ornament, become almost conventionalities, and are quite so in the manner in which they are treated and combined. In one of Raffaelle's designs (that for the Cardinal Bibbiena's bath-room in the Vatican) these little figures are perched on festoons stretched across between the posts of conventional canopies, reminding one of nothing so much as four-post bedsteads turned into ornament; the Cupids posing like singing-birds on the perch of their cage. Possibly, after all, this was the idea intended to be conveyed, and embodied a noble symbolism, though one which ought to have been rather tantalising, one might suppose, to a member of a celibate priesthood.

But with all this absurd conglomeration of objects mostly having little meaning or beauty in themselves, there is in the Renaissance school of arabesque ornament with which the name of Raffaelle has been so much associated, a redeeming feature, in the grace and even (strange as the expression may seem) the logical sequence with which it is put together. The ornamentists of the Cinque-cento were, in short, really artists; and though allowing themselves, in their admiration for antiquity, to play with some very absurd toys in the way of ornamental motives, they were never content to put these together in the careless and jumbling fashion with which the more prosaic of the ancient Roman artists were content. It may be said, indeed, that the objects made use of had changed their value; from being to the ancient Roman representations or symbols of sacred and ceremonial things, to the Cinque-cento artist they had become nothing but mere ornament. But the latter, while making use of them, and adding to them many new objects from his own fertile fancy, saw instinctively the necessity for combining them into a connected whole; and this he effected by means of a light and elegant system of conventional foliage, springing from some of the objects, entwining or supporting others, and making it almost appear as if all this *bizarre* collection of curiosities were the natural outgrowth of a central idea, to which they were all in some way related. Stems grew out of platters and out of lamps, and out of tripods, and out of all sorts of things, and upon their freely and gracefully turning scrolls hung all kinds of articles, as on the twigs of some conventionalised Christmas-tree. Nothing could be more utterly conventional, nothing more unlike Nature, in any of her details, than this arabesque foliage; but it had this merit, besides its real and often exquisite grace of line and balance of curvature, that it represented, at all events, a principle of nature, —that of growth and development from a central stem by a gradual division and subdivision of lines parting from the main generating line of the ornament, as the branches part from the trunk. And this recognition of Nature (though afar off) in the main governing motive of the Renaissance arabesque ornament raises it above mere artificial imitative ornament, and gives it a life and vivacity to which antique Roman ornament could seldom, if ever, lay claim. This result is instructive, for it shows how much real interest and beauty may be evolved even out of prosaic, and in many respects unsuitable, details in ornament, if only the method of generation and development of the ornament is founded on and in accordance with natural law and natural life. Thus we come back indirectly to a conclusion in favour of the criticism quoted in our first paragraph; since we find that amid all the fanciful and utterly arbitrary use of artificial objects in the Italian arabesque ornament, the one quality after all which gives any real life to it is that which is derived more or less from Nature.

But we must break off here, and defer to another number the notice of some of the characteristics of artificial ornament in France and England, as well as the general consideration of the degree of value attaching to decoration of this class, and the extent to which it is or is not compatible with a pure taste in decorative design.

* Though the recollection of them in connexion with the theatre still survives in the expression "*dramatis personæ*," some of the "persons" among our readers may not remember that the very word "person" is derived from the antique stage, and means "a mask": that through which, or from behind which (*per—sono*), the sound of the actor's voice is heard.

† The border ornament of Ghiberti's gates illustrates the same mingling of styles: the floral ornament springs from vases like those so familiar in the full Renaissance period, but the foliage itself is nearly naturalistic in its forms and grouping.

THE CORPORATION, THE BOARD OF WORKS, AND THE BRIDGES.

We have been somewhat premature in our congratulations on the peace and amity established between the City authorities and the Metropolitan Board of Works. It is true that the published accounts of the proceedings of the latter body were such as to lead to the conclusion that a good understanding had been arrived at as to the proposed eastern bridge over the Thames. How it could have been represented that the Corporation would apply the proceeds of the coal and wine duties to pay for the high-level bridge of the Board, at the very time that they were proposing a low-level bridge of their own, it is not for us to guess. Like other procedures in Spring-gardens, such as the application of public funds to Parliamentary expenses without sequence, this must remain, if not inexplicable, unexplained. But it seems that as there are two parties at the Board of Works, so are there two parties in the City, and a long debate in the Court of Common Council on the 7th inst. only resulted in a drawn battle.

Our first and steady aim in this matter is to do all within our power to prevent the demolition of London Bridge. We regret to find, by the passing of the "previous question" at the Court of Common Council, that even on this point there is as yet no certain decision obtained. We use the word demolition advisedly. On architectural considerations alone we should extremely regret any such interference with the elevation of one of our noblest national monuments as is proposed by those who have the control, or the partial control, of the bridge. At the same time, we are not prepared to urge that a manifest convenience to London should be forbidden, if the question of taste were all that stood in the way. But as the case actually comes before the public, the convenience is more than doubtful. It is as clearly known as anything of the kind can well be, that to widen London Bridge would in no way relieve the City traffic, unless the approaches were widened in a corresponding degree. This would involve an expense which no one has ventured to propose. Therefore, on the ground of the surveyor's view of the case, it is clear that the proposal to widen is an ill-considered one. It would be a bit of tinkering, doing no good. In addition, moreover, to the objections which, first, the architect, and, secondly, the surveyor, must oppose to this plan of tinkering the bridge, those of the engineer are absolutely fatal. We have shown, from the statement of Sir John Rennie himself, that portions of the bridge were in a most precarious position at the time of the striking of the centres. Actual movement took place, and that of a very menacing description. The cause of this motion was precisely the same as that which now threatens the stability of the structure. The Corporation overruled the engineer. They made him put the bridge in the wrong place. They escaped a total wreck rather by good fortune than by any sagacity on their own part; and they now seem determined,—at least, a party does,—to complete the mischief commenced in 1830.

With reference to the mode of relieving the bridge, it cannot be pretended that enough information has yet been collected. The question of site is undetermined. The question of level is undetermined. The Corporation are for a low-level bridge, with a *bascule*, or semi-drawbridge arrangement for allowing vessels to pass. This plan has just been set aside for the present session. The Board of Works propose a high-level bridge, under which 80 or 90 per cent. of the vessels ascending the Thames could pass without impediment. The *per contra* to this scheme, which is one that has much to recommend it, is the doubt whether any one would use the bridge if built. A spiral ascent of one in forty is so serious a barrier that to incur the expenditure of more than a million on a mere guess would be little more than childish. Again we have to ask for information as to the results of the outlay already incurred, in this part of London, for the crossing of the river. A statistical account of the two tunnels, and of the steam ferry, is the first requirement for forming an opinion. That no such account has been prepared, or, as far as we can tell, even asked for, by the Metropolitan Board, is a sign that, as on former occasions, they are gaily attempting a prodigious leap in the dark. It is melancholy to see a subject of such metropolitan and national importance as the crossing the Thames in London, instead of being settled on the true principles of art and of science by a commission of competent experts, made the subject of squabbles between board men and councillors who, however respectable in their several callings, are profoundly ignorant of what is required for the decision of any question of an architectural or engineering nature.

We must add that the result of the handing over of the Waterloo and Charing-cross Bridges to the Metropolitan Board of Works has hitherto been anything but satisfactory as far as the cleanliness and good order of the road and pathways is concerned. The Board of Works seem to have thought that all that they had to do was to pull down the toll-bars. The look of squalor that a few days' neglect has been enough to produce is incredible. Complaints of great vigour as to the filthy state of the Charing-cross footbridge have filled the papers. As to Waterloo Bridge, not only is an adequate service for its maintenance and clearing requisite, but the removal of the toll-houses, now their *raison d'être* has ceased, should not be delayed. The verandah roofs were convenient enough for those who had to feel in their pockets for a halfpenny; but they are now simple excrescences, —we question whether they were even part of the original design of the toll-houses. The noble effect of the approach to the bridge is spoiled by these vile little cabins. The bridge has been bought cheap; and on its presentation to the public it should be allowed to assume its proper character, not of a mere expedient for crossing the Thames, but of a noble architectural monument.

THE ARCHITECTURAL BILLS OF FARE, 1878-9,

The two lists of papers proposed to be read, and of subjects to be discussed, in the upper and lower houses, as we may call them, in Conduit-street, are before us, and promise, we must say, a more than usual amount of novelty and specialty of interest.

Taking the Institute selection first, it would seem that the Sessional Papers Committee has been remarkably successful in its efforts to obtain promises for the ordinary meetings, for we hardly ever remember to have seen so full a list issued at the very commencement of the session. There appear to be, in fact, more papers than room can well be found for; but this is a discrepancy in the right direction, as there are generally one or two disappointments or postponements in the course of the session, and some of the papers named may not take up the whole of an evening.

Some of the most interesting among the papers promised seem likely to be those contributed by gentlemen outside the profession of architecture. Among these we notice with pleasure the name of Captain Burton, the indefatigable traveller and observer in so many parts of the world, who is to communicate the result of observations on the remains of buildings in Midian,—a ground seldom traversed by English architects. Foreign architectural subjects are, in fact, rather largely represented in the programme, —"The Vaulting and Stalactites of Persia," by Mr. Purdon Clarke, and "The Haram at Jerusalem," by Lieut. Conder, R.E., being two prominent subjects. The latter is one of the papers we have already referred to as contributed from non-architectural sources, and is one which is, at least, sure to evoke a warm discussion, touching as it does upon questions of archæology which have been so greatly debated by able and eminent men with very opposite views. Lieut. Conder, though he writes "R.E." after his name, is, in fact, no mean architectural critic, and has an established right to speak upon the subject. We may perhaps consider Irish church architecture as a "foreign" subject (it is certain that not a few men who know the Continent well have never been in the Green Island); at all events, Mr. Newenham Deane will probably have something to say in regard to it which is not familiar to architects dwelling in London. Another of the non-professional contributors is Mr. John Pennethorne, whose elaborate work on the "Geometry and Optics of Ancient Architecture" has been very fully noticed in these columns. As our readers are aware, we are not prepared to accept the views of Mr. Pennethorne in regard to a good many of the points dealt with in his book; but it will be a matter of considerable interest to hear his own statement in regard to a question to which he has given so many years of his life; and the request on the part of the Institute that he would do so was a fitting compliment both to the author of so remarkable a work and the bearer of a name so esteemed and respected among recent English architects. Two subjects among the practical ones (which we are glad to see are duly represented) have a certain special interest,—that by the City Architect, on "Lighting by Electricity," and that by Mr. Verity on "The Modern Restaurant." The former, in fact, is one of the most important subjects before the public at present, and we are very glad to see the Institute of Architects recognising the practical relation of such a subject to the duties of the architectural profession, and offering to consider it from an architect's point of view. The subject of the *restaurant* is less fascinating; indeed, we are not sure whether the *restaurant*-keeper may not reasonably be regarded as a kind of bogey or ogre to the present generation, who is gradually swallowing up everything and getting into his hands the strings of all kinds of important concerns not the least necessarily connected with the supply of eating and drinking commodities. But there is no doubt that, partly owing to this encroaching power of the *buffet*, the restaurant forms a special feature in the architectural work of this day, and it will be well indeed if the consideration of the subject at the Institute should lead to any improvement on the style and manner in which establishments of this class are usually designed and decorated, and to a substitution of something like refinement and good taste for tawdriness and glitter; if so, the paper will not be thrown away. Mr. Verity is well up to the work. Mr. Penrose has something new to tell us (we presume) in the course of some notes "On St. Paul's Cathedral"; and another of the practical subjects is that of "Bills of Quantities and their Relation to the Contract," to be treated of by Mr. Honeyman, of Glasgow, and concerning which we opine that there is really very little to be said, and that little very obvious and easily disposed of by any clear-headed person; but, of course, all will have their say on a matter about which there seems to be a difference of opinion and of practice which to ourselves is quite incomprehensible.

Before quitting the subject of the Institute programme, we cannot but give a word of hearty recognition in regard to the manner in which the work appears to be carried out by the present secretary. The pamphlet containing the usual annual list of members, donations, and other current information, at once struck us as exhibiting a completeness of editing in every particular which speaks well for the manner in which this portion of the work of the Institute will in future be carried on.

In the programme of the Architectural Association, the most really important subject, considering that the society is one largely attended by young men in their pupilage, is the discussion which is to be opened by Mr. A. Payne on the question, "Architect, or Architect and Surveyor?" It was an excellent idea, whoever originated it, to propose the consideration before such a society of this question, upon which really turns the view which the rising generation are to take of their profession, and the course of the studies by which they are to aim at success in it. We will not offer a pre-discussion of the subject, which could not be gone into in the course of a running commentary of this kind, but we will allow ourselves just to express the hope that the turn of the discussion will be in favour of giving full weight to the practical side of the architect's profession, which has been too often of late entirely lost sight of amid a haze of glorious aspirations after an ideal profession, in which every member should be equally master of all forms of artistic production. The paper immediately to follow this, on "Party-walls: the Law and the Practice," has also a wholesome practical tendency, and no one is likely to be better able to throw useful light on this complicated subject of so many disputes and heart-burnings than Mr. Blashill. Mr. Aston Webb has something to say about "Windows,"—a very fertile subject for architectural fancy and suggestion; and "Organs and their Treatment" is to form the subject of a paper from Mr. Somers Clarke, jun., a practical organist himself, and therefore the better able to do justice, both from an architectural and a musical point of view, to a matter on which architects have certainly something to learn. It is worth

remark that the subject of "Restaurants" (combined with "Hotels") comes into this programme as well as into that of the Institute. Mr. Neale contributes some notes on the measurement of old buildings, and Mr. R. P. Spiers a paper on the "International Congress of Architects at Paris." In each case the writer of the paper is known to be specially qualified to treat the subject. Other papers of more or less interest combine to fill up a good and useful programme, of which we have noted the salient points only.

THE NORTHERN IRON TRADE.

After some years of depression, there is a change in the condition of the iron trade of the North of England, although it at first is as a mere shaking of what may be compared to the dry bones that remain of a once full trade. It is true that it is not brought about entirely by favourable cause, for it has been in part contributed to by a reduction in the output of iron; but this was necessary, and the change is one which is a matter of congratulation. In the height of prosperity a few years ago there was a very great increase in the production; and though at the time the consumption was as great, yet when only a normal height in the demand was registered, the production was in excess, and large stocks accumulated. There were to be dealt with the difficulties of price and of excessive output. The first was the most easily dealt with; for, as the stocks were very large and increasing, and as the output was above the requirements, the market became dull, and a continuous fall in prices brought rates down to the level from which they rose seven or eight years ago. But it was not so easy to adjust the production to the requirements; for there were difficulties in the way, such as contracts for materials long in advance, &c., and there has been for some time a growth in the average production of crude iron which led to a further enlargement of the output. But when rates became so low that in some instances they were unremunerative, it soon altered that condition, and some makers whose works were not situated advantageously for producing cheaply found that it was the least of two evils to close them. There has been thus a very considerable diminution of the output, and a readjustment of the balance between supply and demand.

Whilst this has been in progress, stocks of both crude and manufactured iron—the former especially—in the hands of the makers, have grown very greatly. In part, this is traceable to the long-continued enlargement of the output, and in part to the declension in the demand. By a more economical working of the furnaces, and by the blowing out of some of the older and less productive furnaces, the average output has been considerably increased, and thus the step which was ultimately taken of reducing the production was lessened in its operation by the enlargement of the average amount made. But as the result of friendly arrangement, about a dozen furnaces were put out, and a few were transferred from the manufacture of Cleveland pig-iron to that of iron from ore imported into the district, the result being that there is a very considerable reduction in the output of the first-named class of iron. At the present time, too, the demand usually rises, a large quantity of iron being shipped out of the country, more especially to Germany and Belgium, in the autumn months. This increase is now known, and with the reduction of the output there is inevitable effect of a reduction of the stocks in the hands of the makers to an extent which must be a considerable relief. However it is brought about, —and it must be acknowledged that it is not brought about by the most pleasant or profitable means, so far as the factor is a reduction of the output,—there is now a sounder base for the trade of the North, that of one the output of which is even below the demand. In addition to the low amount of iron made in comparison with what was known a year ago, there is also a very considerable reduction in the price, which reduces the value more than proportionately; but this is in a great degree compensated for to the producers by the continued reductions in the price of raw materials and the lower rates now ruling for wages, and in the lowness of price there is one of the most hopeful signs for the future. About one-half of the whole of the pig-iron produced in the north-east of England is sent elsewhere for manufacture, and it is evident that unless iron could be produced as cheaply there, and even cheaper, than elsewhere, so large an export trade would be impossible. During the period of high prices the amount of crude iron sent out of the district was in a much lower proportion; but as the price has fallen, there has been a gradual and large growth.

Bearing in mind the causes of this improved condition of the iron trade of the North, it is tolerably easy to observe that there are all the signs of a continuance of that improvement. A low price is assured, because there is a very large reserve of smelting plant now idle, which would be brought into operation were there any large increase in the prices, and the effect would be to glut the market with a production in excess of its requirements. That low price, thus practically assured, should not only further stimulate the demand for crude iron from other manufacturing centres which have not facilities for as cheap production of pig iron, but it should also stimulate the local demand for iron for foundry purposes and the malleable iron manufacture. The former of these is now in a slight degree recovered from the depression it also knew; and though the same cannot be said of the latter, yet it is unlikely that it will long remain at its present low estate. Although the prevailing tendency at present on established railways is towards the use, almost exclusively, of steel rails, yet (overlooking the possibility of the use of Cleveland iron for that purpose) there is not to the full that preference in foreign parts, and to the possible construction of new lines in the East and in some of our colonies, the manufacturers of iron rails may look with some hope. The shipping trade is depressed, but the low price of iron is stimulating the building of vessels, and giving an impetus to the plate and angle-iron manufactures; and though the other chief branch of the iron manufacture is at a low ebb, it is certain to revive with any commencement of large constructional works, which, at any rate, is nearer than it was. It is on these probabilities that the iron trade of the North has to base its hopes, and a production no larger than its requirements and low prices should enable it early to feel a beneficial impulse from a rising trade tide. In the North, the iron trade is the controlling industry, and as its depression has had very marked effects on the constructional industries, it is to be hoped that the breath of the revival may speedily make its influence felt through these. In no district, perhaps, has the general dulness in the mineral trade been more marked than in the North-east in this manner; and as the great industry of the North begins to recover tone, the anticipation may be allowed that the effect of the revival will be as markedly beneficial as the dulness was markedly adverse.

THE RECENT HALF-YEARLY RAILWAY MEETINGS.

CONTINUED PROGRESS OF NEW WORKS.

The meetings of the railway companies for the half-year ending with June, which have just been brought to a close, show that, as regards many of the great lines, large extensions, and a very heavy outlay of capital in the construction of new works, are still going forward. A notable feature in the reports of many of the leading companies is the great falling off in the traffic during the half-year, owing to depression in trade. This falling off specially applies to the London and North-Western and to the North-Eastern Companies, the great depression in the iron trade having very seriously affected the revenue of the last-named company.

The report of the *London and North-Western Company* shows that, although the receipts from passenger traffic have been maintained, and show a slight increase as compared with the corresponding period of 1877, there was a heavy falling off in the merchandise and mineral traffic, the decrease being no less than 35,177*l.* as compared with 1877. Notwithstanding this decrease, however, the previous dividend, at the rate of 6 per cent. per annum, was declared, the chairman observing at the meeting that they were getting the advantage of a large reduction in working expenses, which was due in a great measure to the reduced price of iron, coal, copper, and other materials. A large portion of the reduction in their working expenses was, however, due to the better working of the line consequent upon the additional accommodation at stations, and the doubling of parts of the line. In the course of his remarks, the chairman incidentally stated that they had now laid 1,600 miles of steel rails, extending nearly the whole length of the main lines of the company. They would, therefore, now continue to have the advantage from the use of those steel rails, if the makers would continue to keep up the quality; but he was always afraid of some process coming into play which would have a similar effect on steel as the hot blast had in the manufacture of iron, since which no good iron had been made. They had, therefore, always to fear with steel that with the price going down the makers would reduce the quality. Adverting to the unproductive capital, which he said was 2,000,000*l.*, the chairman expressed a hope that during the next spring half-year, not only the Nottinghamshire lines, which the contractors were under contract to complete by Christmas, but several other lines in progress, would come into profitable earning. The meeting sanctioned the addition to the capital of the company of the sum of 2,842,437*l.* under the Act of 1878, authorising the construction of new lines in Lancashire, Yorkshire, and other places; also a further addition of 401,174*l.* including 116,000*l.* for completion of the Holyhead harbour; 55,500*l.* for cottages, additional sidings, and other works at Willesden; 9,600*l.* for goods accommodation at Dewsbury; 134,539*l.* for additional siding and other accommodation at different parts of the line; and 85,535*l.* for additional land and minerals. The capital of this great corporation authorised up to the present time is 81,884,701*l.*, of which sum 75,475,800*l.* had been created and expended up to the end of June last.

The report of the *Great Western Company* showed that there was an increase in the passenger and merchandise traffic receipts during the half-year of 11,502*l.*, but a decrease of 19,269*l.* from minerals, being a net decrease of 7,767*l.* On the other hand there was a decrease in the expenditure of 28,789*l.* The report stated that the alterations in the Paddington Station, in connexion with the widening of the line between London and Slough, were in active operation, and that great convenience had already been experienced in the working of the traffic in the Paddington Station by the alterations which had been effected in the roads and platforms on the arrival side. The new lines and subway between the Westbourne Park and Bishop's-road Stations were also now completed. Adverting to the works of the Severn tunnel, the report stated that the heading had now been driven to a length of a mile and three furlongs under the Severn, leaving a distance of seven furlongs still to be driven to finish this portion of the work. The material through which the heading had passed continued to be of the same favourable character as before. The three additional shafts required for the construction of the in-shore portion of the tunnel were in progress. Amongst other statements made at the meeting, it transpired that the company are about to construct a branch line to Princetown, extending to the convict prison at Dartmoor, and that the Government have agreed to find 5,000*l.* of the capital. A vote of 290,000*l.* was granted by the proprietors for new works, including 40,000*l.* for new lines at Paddington, between Bishop's-road and Westbourne-park Stations; 20,000*l.* for the enlargement of the Paddington Station; 50,000*l.* for doubling the line between Paddington and Slough; 20,000*l.* for new stations at Cardiff, Neath, and Swansea; and 75,000*l.* for extensions and other works at the Birkenhead Station. In the course of the proceedings, the chairman observed that whereas in 1861 they had 122 trains in and out of Paddington Station daily, they had now 426 trains. In point of capital, the Great Western Company is at the head of the English railways, with the exception of the London and North-Western Company and the Midland Company. Its authorised capital at the end of June was 64,507,477*l.*, of which 63,703,727*l.* had been created and expended to the same date. Although the London and North-Western Company has a larger capital than the Great Western by more than 20,000,000*l.*, it is not unworthy of remark that the mileage of the latter is much greater than that of the North-Western Company, which is 1,653¼ miles, whereas that of the Great Western Company is 2,139½ miles, with 33½ miles in course of construction.

The report of the *Midland Company* submitted to the shareholders showed that, as compared with the half-year ending June, 1877, there was an increase in the traffic receipts, both as regards passengers, merchandise, minerals, and

cattle. The capital expenditure during the half-year had been 1,178,602*l.*, of which 13,600*l.* was for additional expenditure on the Whitecross-street warehouses, and 65,000*l.* for the purchase of land and property in London. On lines in course of construction 433,431*l.* had been expended in the course of the half-year, and 332,980*l.* on lines open for traffic. The chairman stated at the meeting that the total further estimated expenditure to complete all their works was 3,554,000*l.*, 627,000*l.* of which was to be expended on lines open for traffic, 1,620,000*l.* on lines in course of construction, 437,000*l.* on joint lines, in which the company had an interest, and 868,000*l.* on lines not yet commenced. Adverting to the new branch line and dock which the company are constructing at Poplar, he stated that nearly one-third of the piles were driven for the coffer-dam for the river-wall, and the excavation for the dock-wall was being proceeded with. A resolution was passed at the meeting authorising the creation of further capital amounting to 2,050,000*l.* for the several works in progress and to be commenced. The present authorised capital of the company amounts to 66,646,562*l.*, of which 63,913,502*l.* have been created and are in course of expenditure. The new lines now in course of construction by the company are 158¼ miles in length, which, when completed, will make the entire length of the Midland Company's system 1,566¾ miles.

The *Great Northern Company's* traffic receipts showed a marked increase as compared with the corresponding period in 1877, the excess for the half-year ending June last being 30,000*l.*, whilst the expenditure was nearly 20,000*l.* less than in 1877. During the half-year 666,000*l.* was expended on capital in new lines and other works, 402,000*l.* of which was on lines open for traffic, including 36,812*l.* on account of the new tunnels at King's-cross Station. The passenger traffic to King's-cross Station now passed through these tunnels, whilst the old tunnels were used for the goods traffic. On lines in course of construction 89,000*l.* had been spent within the half-year, in addition to 237,000*l.* as the subscription of the Great Northern towards new lines which they were making jointly with the Midland and the Manchester and Sheffield companies. They had likewise spent within the same period 26,111*l.* upon the block system and locking apparatus, the total expenditure of the company which had now been incurred on this system alone being 359,124*l.* Referring to the further expenditure of capital on additional works, the Chairman said it was absolutely necessary for the purposes of the traffic. Apart from the new lines and other works in progress, the directors proposed to expend 150,000*l.* Of this sum 17,000*l.* was proposed to be spent on the extension of the Farringdon-street goods warehouses. They were originally constructed with a view to the handling of something like 100,000 tons of goods during the year, but this had been vastly extended, and the goods with which they had to deal there amounted to 150,000 tons, which was still increasing, so that an addition to the goods warehouses at Farringdon-street was absolutely essential in the interests of the company. They likewise proposed to expend 36,000*l.* on the repairing-shops at Doncaster, which could no longer be delayed, as the wagons were now repaired without any covering whatever, the men working in the open air, and that entailed a very great deal of loss to the company. There were also several other items, including 7,240*l.* for additional sidings at Finsbury Park and Hornsey; and 33,000*l.* for further carrying out the block system. For these purposes the meeting sanctioned an additional outlay on capital account of 152,142*l.* Under an Act of Parliament passed last session the Great Northern and the Great Eastern companies jointly are about to construct a new line from Spalding to Lincoln, at an estimated cost of 1,106,000*l.* The present length of the Great Northern Company's system is 754 miles, and in addition they are constructing 110½ miles of new railway. Their authorised capital on the 30th of June was 32,828,050*l.*, of which 31,205,450*l.* had been created.

The report of the *Great Eastern Company* stated that the gross revenue for the half-year was 1,327,606*l.*, against a gross revenue of 1,294,770*l.* in the corresponding half-year of 1877. The chairman, in his address to the shareholders, dwelt at considerable length on the large expenditure which had been incurred in the improvement of the permanent way, and the laying down of steel rails. During the half-year 94,000*l.* had been expended, and at the end of the half-year they had 350 miles of steel rails laid down on the line. Experiments had been made with reference to the endurance, or, as it was called, the life of a steel rail compared with an iron rail, with the result of showing that the duration of a steel rail, which had been put at thirty years, had been confirmed. On some parts of the line they had been laid down and in use four years, and it had been proved that whereas iron rails would last only three years, steel rails would stand for thirty years. The great value, therefore, of steel rails in the future permanent expense of maintaining the railway, would very soon be materially felt. In the course of the next three years they would probably lay down an average of seventy miles with steel rails, so that in three years from the present time there would be 560 miles of steel rails laid down on their system, which would comprise the greater part of the main line. They had in stock a very large amount of steel rails at their present low price, and they had a quantity ordered at the same rate. Adverting to prospective capital expenditure, he said they could not hope, for a very long time to come, to diminish very materially their capital expenditure. They had got to finish several works, among others the Bishopsgate station for goods, and they were just completing the Chingford line into the Forest, and the line to the Alexandra Palace. The estimate of the capital expenditure for the current half-year was 150,000*l.* The company would have to contribute 500,000*l.* towards the making of the Spalding and Lincoln line. The present authorised capital of the company is 34,616,869*l.*, of which 32,322,941*l.* have been created, the number of miles of railway constructed being 789, and 12¼ miles in course of construction.

The traffic receipts of the *London and South Western* line show a slight increase as compared with June, 1877. The report stated that station improvements to a considerable extent have been carried out in various parts of the line, including the raising of platforms to conform to the recommendations of the Board of Trade. It also states that the Waterloo Station improvements and enlargements have sufficiently advanced to enable a portion of the new sheds and platforms to be soon available for traffic. The diversion near Vauxhall of all the main lines is now completed, whereby a large additional space has been appropriated for goods traffic purposes. Amongst the new lines and other works in progress is the doubling of the line between Sampford Courtney and Okehampton; a large new station at Salisbury; and a junction of the Ascot and Woking line with the Aldershott line. The authorised length of the company's lines is 722¼ miles, of which 717 miles have been constructed. The capital authorised to the end of June last is 23,230,291*l.*, of which 22,191,890*l.* have been created and expended.

The traffic receipts on the *South Eastern* line for the half-year showed a very large increase over the receipts of the corresponding half-year in 1877, the increase amounting to between four and five per cent. The report referred to the Dover and Deal line, which is being constructed at the joint cost of the South Eastern and the Chatham and Dover companies. It also stated that a new steamer was in course of construction for the traffic between Folkestone and Boulogne. The report likewise referred to a decision of the Railway Commissioners in proceedings taken against the company at the suit of the Town Council of Hastings. The Commissioners had delivered judgment in favour of the Town Council, and ordered the company to carry out many works at Hastings and St. Leonards, involving new expenditure to a considerable amount. The effect of this decision, if confirmed, would practically transfer the expenditure of the capital of the shareholders to the control of the Railway Commissioners, and the directors had therefore taken steps to test the validity of the enormous powers claimed. This company, whose lines are at present 332¼ miles in length, are constructing additional lines 22 miles long. The created capital to June last was 20,635,974*l.*

The increase of traffic on the *London and Brighton* line appeared by the report to be very great, the excess amounting to more than 8 per cent. over the receipts of the corresponding period in 1877. On this great increase the chairman stated at the meeting that he did not attribute it to the Paris Exhibition, which did not at all assist them until June. Considering the period of depression, it had surprised both the directors and himself. It had arisen, he believed, from building, and the population going on increasing. The capital expenditure of the company during the half-year was 221,548*l.*, of which 35,651*l.* was for the enlargement of the London Bridge Station now in progress, and 19,970*l.* for the purchase of the freehold of the Terminus Hotel. The sum of 50,134*l.* had also been expended on the Tunbridge Wells and Eastbourne line, now in course of construction. A special grant was made at the meeting of 150,000*l.* towards the construction of the works about to be commenced at Newhaven Harbour. The company's created capital up to the end of June was 20,025,808*l.*, whilst the number of miles already constructed is 360½, and 70 miles of new railways are at present in course of construction.

The exceptional depression in the iron trade, which has for so long a period affected the district which the *North-Eastern* line intersects, has had a very serious effect on the traffic of this company. The decrease, as compared with the half-year ending June, 1877, is no less than 143,676*l.*, and applies to every description of traffic,—passengers, goods, and minerals, but the falling off in the latter is about two-thirds of the total diminution, the decrease in passenger traffic being 14,786*l.*; in goods, 37,000*l.*; whilst in minerals the falling off amounts to 95,304*l.* As regards capital, the outlay during the half-year has been 407,000*l.*, of which 239,278*l.* had been expended on new lines now making, and 168,000*l.* on lines already opened for traffic. The company's present mileage is 1,446 miles, whilst 77¼ miles of new railway are in course of construction. The authorised capital amounts to 58,895,994*l.*, of which 55,652,697*l.* have been created.

The report presented at the meeting of the *London, Chatham, and Dover* shareholders showed that there had been a large increase in the traffic receipts during the half-year. A feature in the report was the purchase by the company, from the Channel Steam Ship Company, of the steam-ship *Calais-Douvres*, which had been placed on the station between Dover and Calais.

The *North London* line displays a remarkable vitality, both as regards traffic and the enterprise of its promoters in the construction of works. The line, though a short one, is yet one of the most important in the metropolis. At the recent half-yearly meeting, the chairman stated that in the corresponding half-year of 1877 they were able to pay only 6½ per cent., but now they declared a dividend at the rate of 7¼ per cent. The company had passed through most of its difficulties, and he believed they would have few more to contend with. When they had completed all the works now ordered and engaged to be executed for the convenience of the Great Western, the North-Western, and the Great Northern Companies, they would have a revenue from them amounting to six per cent. on the outlay, in addition to which they would have the traffic of those companies over their system. During the half-year 35,000*l.* had been expended on those works, and 59,000*l.* more had yet to be expended. They were also about to construct a new station at Mildmay Park. The whole neighbourhood had been built upon, and covered with good residences, and he had every confidence that the station there, when erected, would pay a large interest on the outlay. The estimated cost of the station was 6,000*l.* Turning to the revenue account, he said that for the half-year the number of passengers carried had amounted to 15,306,072, against 14,668,316 in the corresponding period, the increase in money having been 3,776*l.* They had a capital somewhat under 4,000,000*l.*, and twelve miles of railway, and upon the amount expended the shareholders were getting a dividend that day of 7¼ per cent. The report stated that possession had been given to the Great Western Company of the warehouses and offices constructed for them at Poplar, and the Great Northern Company would shortly enter into possession of the new premises constructed for them at that station. The increased dock accommodation and facilities for dealing with the shipping traffic, would, it was expected, result in a large accession of traffic at the Poplar goods station.

The receipts on the *Lancashire and Yorkshire* line showed a considerable falling off as compared with June, 1877, which was attributed to depression in trade. At the meeting the chairman stated that the expenditure on the new lines in course of construction was still heavy.

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The length of these new lines is 41¾ miles, the number of miles already opened being 452¼.

The *Manchester and Sheffield Company's* receipts for the half-year were slightly in excess of the preceding half-year. The number of miles already open is 455¾, and in addition the company are constructing 48¾ of new railways.

The chief feature of interest in the reports and proceedings of the *Metropolitan* and *Metropolitan District Companies* had reference to the Inner Circle Completion line. The two companies have agreed to promote a Bill in Parliament, next session, for completing the line *viâ* Tower-hill, with power to construct a junction with the East London line, near Whitechapel.

The leading Scotch lines all show a great falling off in traffic. The falling off in the traffic of the *Caledonian Company* is very marked, applying to both passengers, merchandise, and minerals. As regards the latter the chairman observed at the meeting that the decline of building operations in the city and suburbs of Glasgow had told considerably against them, as they accommodated some of the best stone quarries in the country. The *Glasgow and South-Western* and the *North British Companies* both participate in the falling off, more particularly the former company, the report stating that the mineral receipts had not been so low since the half-year ending July, 1874.

EDINBURGH'S ONE STREET.

The days and hours of the antiquary or archæologist, as far as the world knows, pass pleasantly away. When summer and autumn are in the full bloom of their beauty, he wanders over the land in the companionship of like-minded enthusiastic brother and sister students. For the time being he heeds not the stream that dimples along the valley; his eyes are open only for barrows and *tumuli* and other "*monumenta vetusta*": he climbs the mountain-side to gaze upon a cairn or a vitrified fort, and when the sun is westering, he and his companions seat themselves on the heather or the grass, and pic-nic in a thoroughly unantiquarian fashion, within, it may be, a circle of grey stones, the dumb memorials of a people of whom they know nothing. When the leaves fall and "the wind whistles cold o'er the snowy wold," what recks the archæologist of the season's inclemency? The fire in his grate burns warmly and brightly; on his table lie the tomes of Dugdale or Gough, Fergusson or Lubbock; and in such like goodly company, the months roll away till blue skies and pearly clouds come again.

As we write these lines, we have before us a store of ancient history,—half a dozen quartos, written in an almost dead language, giving us vivid glimpses of civic life in "the grey metropolis of the north" from 300 to 400 years ago. From the pages of Arnot, but especially from those of Maitland, much may be gleaned of the early history of Edinburgh; but, placing these aside, there is a vast fund of information to be gathered from the records of the city, which, till lately, have been hidden from all but a few privileged eyes.

In those days Edinburgh consisted of one street, the High-street or Hie-gait, from either side of which narrow and steep alleys, named closes or wynds, sloped to the north and south. There is a tradition that this street,—side-walks there were none,—was first paved by a Frenchman named Marlin,—but certain it is that on the 18th of June, 1532, the provost, bailies, and council contracted with "Jhonne Mayser and Bartrahame Foliot, Franchemen," to make and build the causeway of the town. The Frenchmen were to quarry, dress, and lay the stones; the town to furnish the carriage of the stones and the sand; the price of the work was at the rate of thirty shillings Scots per rood. Previously to this the street had been partially paved in a rude fashion with cobble stones. This one and only street was, nay still is, a source of anxiety to the civic authorities. In 1486, complaint having been made of the "open-air merchants" (their kindred are to be seen daily in Leather-lane and the New-cut) it was decreed that no manner of person, freeman or unfree, should hold or use any crames (stalls) or boards upon the street or beneath the outside stairs, under heavy penalties culminating in the loss of freedom if free, and banishment from the city for a year and a day. Daily and sometimes nightly the street and the closes were promenaded by gangs of swine in search of offal and unconsidered trifles, and to stop the nuisance the lockman was to seize and keep the errant pigs till their owners redeemed them with a fine. In 1505 Thomas Glendunwyne was appointed head scavenger. The said Thomas was to have "a horse with a close-cart, and two servants daily, when need is [when was it not?] for purgeing and clenging of the Hie Streitt of all manner of muck, filth of fish and flesh, and rubbish wet and dry, and remove the same to a certain place, and appropriate the same to his own profit and use." To assist the cleaning a small tax was levied on booth-keepers, hucksters, and those who carried on business in the front basement of their houses. Thomas, who was also town-crier, passes from the scene, and Thomas Johnstoune and John Brown succeed to his bell and broom. Their cleansing capabilities are greatly increased. The number of servants, horses, and close carts is doubled, and wheel-barrows, for the first time, are added to the plant, along with other "needful instruments." Candle-makers were forbidden to melt tallow in front of their houses; skinners and furriers were not permitted to hang their skins on the fore-stairs, nor throw them on the Hie-gait; nor could cloth dampers and dyers dry their cloths outside their houses. In 1525, the "gait-dichting" (street cleansing) is let, "if death or war do not interfere,"—it was a stormy period then for Scotland, and more especialy for its capital, because "our natural enemies, the English," were either crossing the Border or threatening to do so,—"to Alexander Pennycuke, for the sum of 23*l.* Scots." In 1543 the Hie-gait is "up," for Morris Crawford has contracted to lay the entire causeway. In 1547 the magistrates published a statute which might well apply to London and other towns at the present day: "All manner of persons within this burgh that has any cairns [heaps of stones], building-tackle, or other stuff, on the Hie-gait, that has completed their work, or are not prepared to begin immediately, that they remove the same, under the penalty of forty shillings." In the following year middens were ordered to be removed from the street, and every "nichtbour" on every Saturday evening had to cleanse the portion of the street in front of his house, under a penalty of 8*s.* Scots each time he "failed."

The 16th of November, 1554, was a great day, and also a great night, for Edinburgh; for on that day it was ordained by the Provost and Council that "in consequence of the rogues and vagabonds that go about in the dark hours stealing and plundering," the city should, until the 24th of February "nextocum," be lighted up from five in the evening until two a.m.; and this is how the illumination was to be accomplished:—Every barber, candlemaker, baker, cook-shop keeper, apothecary, and tavern-keeper was to show a light in front of his booth and tavern; so also were the brewers in the closes, and the inhabitants of the close were each in turn to hang out a lantern; and, legislating for probabilities and possibilities, it was also ordained,—"When it happens two candle-makers, barbers, apothecaries, taverners, bakers, and cooks dwell together, the magistrates shall put one of the two lanterns to such other place as they shall please devise."

Over and over again is the Hie-gait up, and the cares of magistrates are increasing apace, for the Cow-gait lying in the hollow to the south is (1563) in process of being paved. In that year we find the city treasurer ordering that 3*l.* 16*s.* Scots be paid to the causeway-makers for 2 roods 4 ells of causeway laid down before "the Cardinal's lodging in the Cow-gait." This lodging was best known afterwards as Cardinal Beaton's Palace, the corner tower of which was the quaintest remnant of ancient domestic architecture in Edinburgh, so quaint and so picturesque that the beholder was carried back in imagination to the Paris of the Middle Ages. This gem of antiquity was, shall it be said, ruthlessly swept away less than a score of years ago. Professor Daniel Wilson, of Toronto, in his book on ancient Edinburgh, gives a drawing and a concise description of the palace.

One of the many street nuisances that had to be treated with a high hand was the tribe of roughs who abounded then as now. One of their favourite pastimes was a "bikker," or stone-throwing battle, in which they pelted each other, and occasionally the peacefully-disposed inhabitants, sometimes to the death. In 1567 it was decreed and ordained that those who indulged in such cruel pastime should, if they were of age, be hanged, and, if under age, should be scourged. Yet, in spite of all the severe enactments against "bikkering," the rough sport lasted until the school days of Sir Walter Scott, and had nearly died out about forty years ago, when a bikker between the boys of the High School and the Canongate "keelies" (roughs) was a weekly event. In Lockhart's Life of Sir Walter Scott particular mention is made of "Green Breeks," a leader and captain of the "bikkeraris."

It is an axiom that no sanitary work can be carried on without an abundant supply of fresh water. In these days the supply of this element was somewhat deficient in Edinburgh. The inhabitants were dependent on the draw-wells, and these were continually getting out of order, so much so that we find ever and again the magistrates issuing orders of the following pattern:—"Alexander Park, treasurer, is, with all diligence possible, to put to (?) workmen for the building of the Moose well and cleaning of the new well, flagging and mending of the causeways before them." On the north side of the town was a collection of water called the Nor' Loch, but so polluted with sewage as to be unfit for domestic purposes; and on the south, but nearly a mile distant, was the Burgh Loch, which was inconvenient, and in war-time unavailable as a water-supply. In consequence of the increase of the numbers of the inhabitants, the brewers were forbidden to use the well-water, and so betook themselves to the Burgh Loch. This loch greatly exercised the magistrates, especially on the 17th of January, 1555, when "the provost, bailies, and council ordains for causes and considerations moving them . . . . . the Borrow Loch to be let forth, and the dyke thereof sloped, so that it may run where it ran before until the Feast of Pasche next to come, and then" ("There is much virtue in an 'if,'" says Shakspeare,—but in a *then*),—"and then" (to resume the quotation) "ordains new consideration to be taken whether the same be let forth or held in as it is now." What could have been the "causes and considerations" that prompted such a decree? This loch lay in the hollow of the Burgh Moor, where, among other notable things, the Scottish army mustered before its march to Flodden. The waters were not "let forth," for in 1583 a proposal is made to and accepted by the town council for supplying the Cowgate with water from the Burgh Loch. A street named Windmill-street memorialises the machinery used in raising the water. In after-years, however, its waters were "let forth" for good and all, and the hollow they occupied is now known as the Meadows, the most delightful of the tree-shaded promenades of Edinburgh.

Not having an abundant supply of water, the authorities did as best they could; but they only saw half-way. The skinners and cloth dampers were continually using water, and such water having done its duty was not to be emptied into the street or close until after daylight, and not until after daylight was the cleaner of tripe and other "intestinal arrangements" permitted to pour his liquid abominations into the street. Why should the atmosphere of night have been loaded with unsavoury perfumes? The only thing approaching to an explanation of the question is that even up to the present time there are spots in Edinburgh which, after dark, are, for nasal reasons, impassable.

Many local Acts were passed regarding the drains and closets. One will stand as a sample for all. The spelling is slightly modernised. "Item, it is statute and ordanit that all personis that has scheildis [drains] clenge the same or ever they be full, so that they break not forth and run into the streit, under the penalty of 18*s.* to be taken of them to whom the scheildis pertanis; and, attour [moreover] if any personis happens to open their closets in a greit weit [heavy downfall of rain], so that their scheildis run alongst the street, the *tenement* shall be poindit [distrained] to the amount of 18*s.* And no persons shall hold their closets open, leaking and running furth, but honestly covered, under said penalty of 18*s.* And when any scheildis is clenged that the same clenger carry the same honestly and quietly in the night, and leave nothing to pollute the street therewith."

The magistrates exercised a strict jurisdiction over food. Very heavy were the penalties imposed on those who gave short weight or measure, heavier still the punishment inflicted on the brewer who adulterated his ale, and still more heavy that which befel the dealer in unwholesome flesh or fish. It must be here stated that in those days all traders were craftsmen and members of companies. So far

back as 1488 it was enacted "that the dekyn (Dean of Guild) and the best of the craft search the craft if any of them either buys, sells, or slays any infected flesh or fish, or keeps diseased or starved cattle, or sells the flesh of cattle that have died of disease, or 'poor' fish or flesh, he shall be deprived of his freedom, his goods shall be sold for the benefit of the sick, and he himself BANISHED FROM THE TOWN FOR EVERMORE." Tell not this in Smithfield; whisper it not in the fields of Copenhagen, or the stalls of Billingsgate!

The business of the Dean of Guild Court in those days may be likened to the Board of Works and the Commissioners of Sewers rolled into one. All their work had to be done personally, and their appointments were the reverse of sinecures.

THE SELF-EDUCATION OF THE YOUNG ARCHITECT.

PRESIDENT'S ADDRESS, ARCHITECTURAL ASSOCIATION.

THE inaugural address given by Mr. H. L. Florence, the president of the Architectural Association, at the first general meeting of the session held on the 8th inst., dealt almost exclusively with the means available by the young architect, more especially in London, for self-education. In an interesting auto-biographical sketch, he showed how the facilities afforded by the Association might be taken advantage of to a much greater extent than is general amongst its members, and after dwelling upon matters strictly pertaining to the internal economy of the Association, he went on to say:—

If we, one and all, are to take our part and share in the great object of raising and supporting the dignity of our profession, there must be a common bond and tie between us, and in this I do not allude to what we so often hear of as "*esprit de corps*," but rather to that great and general principle, that the architect, before all and in all, must be an artist. In this lies the pleasure in his work which he should feel, and without which it will be dull and lifeless. In this ever-striving towards an ideal excellence, in this ceaseless struggle with material obstacles, there is no room for apathy, indifference, or sloth. Each will recognise his fellow-student as his brother in art, and be ready to aid him should he slacken or falter, to encourage him should he fail, and to rejoice with him in his success. In no other motive can we find that pleasure in our work which preserves it from the formality of custom, and by no other claim will its reputation survive us. Sooner or later that is the standard by which we must be judged, and even from a worldly point of view it has proved often the most successful. It must also be considered that it is this quality of art alone which defines the architect. He may be skilled in science and construction, able in business, he may even have taste and judgment; but it is the presence of art in his work which gives it that indefinable charm by which we recognise it as an architect's. If, then, this quality in our work is to be our object, it is evident that the standard of the work done here must be raised, for the quality will only come by study. Genius has been well said to be the capacity for taking pains, and there is much truth in this remark. We shall find that a comparatively simple design will, on examination, show far more thought in proportion, refinement of detail, and just balance of ornament, than a showy conventional drawing in which neither the mind nor the heart of the designer has had any share. Thus by thoughtful rather than by brilliant work you will not only raise the general standard of merit in this Association, but also develope that faculty of fitness and reticence which will be invaluable in after-life. Do not think that in thus bringing the quality of art before you as a practical means to a definite end I am encouraging what I may term the art "cant," the fashion of the day. It is easy to talk art, to preach the gospel of red brick, blue china, new furniture, and old embroidery,—an art which luxuriates in cut festoons and turned posts on the ground floor, and reaches its climax in a tile-hung upper story. All these things are signs of "taste," of fancy, or of fashion; but art is of no period, is independent of all fashions, and, in truth, does not consist in outward adornment, but rather in the living presence of the designer's thought. If I have succeeded in expressing myself clearly, you will have seen that I have impressed upon you the duty of serving the Association in three separate forms,—by study in the classes, by taking part in the management and discussions, and by cultivation of the artistic instinct, which broadly includes draughtsmanship. It is not by accident or chance that I have made this division. In my remarks* on the evening of our *conversazione*, I pointed out that the architect had to work in three capacities,—as a man of science and a constructor (corresponding with our classes), as a man of business (linked with the management and discussions of our society), and thirdly, as an artist. Thus the three great lines along which an architect has to travel in practice are precisely those which the teaching and system of this Association best prepare him for. An architect's education cannot, however, be entirely carried on within these rooms. He has sufficient opportunities, in the office in which he is articled, to attain a certain proficiency in draughtsmanship and a general knowledge of at least the rudiments of construction and archæology. There is one danger into which a student at this stage of his career is very prone to fall. He has naturally but little experience, and therefore is only too ready to criticise rashly the works of others, and to despise the long and laborious course of study recommended for his future. He will be regardless of the discipline obtained by the careful study of the antique, and but too ready to believe that originality will result from his own experiments rather than develope from his slowly-increasing knowledge. We may here take a lesson from our fellow-students in America. My friend Mr. Longfellow, the editor of the *American Architect*, writes upon this subject:—

"It is safe to say that as a rule the men who have been most successful in originality have been those who have been most studious of precedent and most rigorously trained, because thus they have gained the sureness of hand which has saved them both from timidity and from disaster when they were at their own guidance. This is true in a greater degree of nations. The architects who in this century have shown the most original power are unquestionably the most systematic, the most academic, in training,—the French. It is because they have acquired their power by the best means of discipline the world now affords architects, and the discipline of the most formal being based entirely on study of the antique. It is particularly noticeable that they have been bolder, more characteristic and straightforward, less conventional, and more successful artistically, than any others in the handling of the untried material, iron. The unconventional American has thus far found nothing better to do with his iron than to work it into clumsy and shame-faced imitations of stone and wood. The Frenchman, slave of his schools and his precedents, develops it into forms unseen before, and clearly expressive of its exceptional qualities. In like manner, it is not the engineer or the mechanic, when he undertakes to add decoration to his work, untrammelled as he is by artistic prejudice, who shows most originality or straightforwardness in ornamental treatment, to say nothing of other excellences. It is the well-trained designer, and this because he only has acquired by discipline the artistic sense of fitness which can show him the incongruity of old forms in new materials, and teach him to modify or replace them for new conditions. We can see no reason, then, why Americans should feel concerned about originality. It is one of the qualities which always disappoint a direct pursuit. From a disciplined hand it comes without direct effort, if it comes at all; from the undisciplined, it is too likely to mean only the fantastic."

Bearing this in mind, he must, then, endeavour to reach a higher degree of excellence in drawing, to take up the study of literature,—not only that referring to our art, but also in subjects of wider interest,—and to perfect himself in the acquisition of a foreign tongue, French being the most generally useful to him. In regard to the first subject, drawing, I well remember Mr. Roger Smith, in one of the first papers I heard at this Association, paraphrase the language of Demosthenes as to action in oratory by saying the three essentials of an architect were: firstly, drawing; secondly, drawing; and thirdly, drawing. If I cannot go quite so far as this, there is no doubt that it is a necessity that an architect should be able to draw freely and well. But the acquisition of this power demands time and practice, and often the aid of some stimulus to exertion. I know of no easier means of obtaining this desirable result than the frequent practice of sketching, measuring, and drawing-out existing buildings. This teaches at once proportion, exactitude, and manual dexterity. The use of the brush conjointly with the pen or pencil will do much to counteract any disposition to mannerism, in addition to its value as an artistic form of expression. Another excellent aid in this respect is the preparation of drawings to be submitted in competition for the prizes offered by this or other societies, and I may here refer to what I hope will be one of the most successful features of this session, the founding of the Association Medal, to be awarded every year, in conjunction with a prize value five guineas, in books, to the author of the best design for a given subject chosen by the committee. The unprecedented lack of interest shown by members, as evidenced by the fact that only one design was sent in in response to the invitations of our prize list, has been the means of attracting special attention to this point, and it has been felt that a medal, at once an honour to receive and a lasting memorial of success, would be the best means of rousing a more lively spirit of emulation. As it is most probable that the honour of obtaining the first medal given by this Association will attract a large number of competitors, and that many designs will present features of special excellence, I shall have the pleasure of adding an additional prize, to be awarded to the design placed by the judges second in order of merit. The prizes given by the Association and the Architectural Union Company for measured drawings have always hitherto proved most attractive, and the works themselves have been of great assistance to the Sketch Book Committee. A similar accident, it may be supposed, led to a comparatively small number of the London members joining the annual excursion. . . . . In mentioning drawing to you just now, I named with it the study of literature, not merely architectural, but general, in order that you may be sufficiently instructed in the various branches of science, art, history, and topics referring to the passing interests of the day. You will have to meet, in your clients, and at all stages of your professional life, many with whom you must be something more than the man of business, or even the artist, and a want of general culture will tell fatally against you if you are found deficient. I cannot better illustrate my meaning than by a reference to the life of one whose loss I, as a friend and pupil, most deeply deplore,—I mean the late Frederick Pepys Cockerell, who so consistently carried out his father's precept to be "an artist among gentlemen, and a gentleman among artists." A habit of reading will prove of the greatest advantage to you in this respect, and be a relief from your other studies. In regard to the choice of books, much must be left to the taste of the reader, but it may be suggested that it is not advisable to try and kill two birds with one stone. Thus, an attempt to study the spoken French of everyday life by reading the "Dictionnaire" of Viollet-le-Duc, admirably written as it is, would prove a delusion; a good novel would suit your purpose much better, while the endeavour to make books serve the purposes of actual inspection of buildings would cause you great difficulties when you come to execute works of your own. But in regard to your reading, I may quote the words of Bacon:

"Read not to contradict or confute; nor to believe and take for granted; nor to find talk and discourse, but to weigh and consider. Some books are to be tasted, others to be swallowed, and some few to be chewed and digested."

It is for our members to exercise an influence for good or for evil upon our future, and unless the tie of a common interest and share in the duties which each assumes in joining is felt by all, our strength will prove our weakness, and we, losing our cohesion and our unity, may break and fall. It is this view that I take which prompts me to hope that the session may be one which will settle more surely the foundations of the Association upon their ancient lines,—one which will remedy defects and imperfections, rather than launch out into new enterprises and ventures, and this, not from opposition to new ideas or concession to prejudices, but with the intent that should the need for such change arise we may be prepared to meet it without fear, that our well-tested strength may incorporate the new to widen and extend the boundaries of the old,—when, to parody Tennyson,

"Freedom broadens slowly down,
From President to President."

* Reported in *Builder*, p. 1160, *ante*.

Church-building.—The Rev. C. A. Belli, who was for fifty-three years vicar of South Weald, near Brentwood, and who resigned the living a short time ago, has given a sum of 12,000*l.* towards the building of a church and its endowment, and for the erection of a parsonage-house, at Bentley, an outlying district of South Weald parish. Mr. O. E. Coope, M.P., who resides in the neighbourhood, has subscribed 2,000*l.* for the same objects, and a site for the buildings has been presented by Mr. C. J. Hume Tower.

THE ARCHITECTURAL ASSOCIATION.

THE first ordinary general meeting of this Association for the session 1878-79 was held on the 8th inst. in the meeting-room of the Royal Institute of British Architects, Conduit-street, Mr. H. L. Florence, president, in the chair. Upwards of sixty new members were nominated for election.

Votes of thanks were given to Messrs. Gillow, Jeffrey, Streeter, and the other gentlemen who had lent objects for exhibition at the opening *conversazione* of the Association; also to the Entertainments Sub-committee, though not without reference to the break-down of the cloak-room arrangements.

The *Annual Report of the Association* for the past session, which was unanimously adopted, contains the following passages:—

"During the past session no less than 106 new members were enrolled, and many of these gentlemen entered actively into the work of the session.

The financial position of the Association is highly satisfactory.

The classes have generally been well attended, but the committee would urge upon the younger members the necessity of interesting themselves in this branch of the Association's work. The committee would remind members that the great principle of the Association is *mutual help*, and that it is not by the attendance at the ordinary meetings only that this principle can be fully carried out.

The library has been used by as large a number of members as in any former session, and several additions have been made. The committee, however, cannot but remark the diminution in the number of donations, and would remind members of this excellent means of disposing of their surplus copies.

The Saturday afternoon visits have, on the whole, been well attended.

The annual excursion, under the direction of Mr. Fowler, of Louth, took place this year in the South-East portion of Yorkshire,—a district selected by the late Mr. Sharpe. A very pleasant and instructive week was spent, and the success of the excursion was mainly due to the exertions of Mr. Fowler and the sub committee.

The Birmingham branch has had a successful session, and its members have participated to a considerable extent in the work of the classes, whilst they have not been unmindful of the advantages of the library.

The Architects' Benevolent Society has need of further support, and the committee feel that it is only necessary to mention the fact to secure the attention of members."

Mr. J. Douglass Mathews, the treasurer, moved the adoption of the balance-sheet, together with a vote of thanks to the auditors, Messrs. T. E. Mundy and F. Hennings. The total receipts (including a balance of 88*l.* 18s. 4d. remaining in hand at the end of the previous session) amounted to 534*l.* 13s. 4d., and the total expenditure to 429*l.* 9s. 2d., leaving a balance in the treasurer's hands of 105*l.* 4s. 2d.

The *Librarian*, Mr. R. E. Pownall, submitted the report of the library sub-committee, who state that the use made of the library during the past session has been greater than during previous ones, the average number of works taken out on each of the thirty-three occasions on which it was open being forty-five, and the total number of individual borrowers being between 120 and 130. Eight country members have availed themselves of the regulations made in their behalf. The total number of works in the library is now upwards of 600, in nearly 900 volumes. The total receipts, including a grant of 25*l.* by the Committee of the Association, and a balance of 14*l.* 14s. 6d. brought forward from last year's account amounted to 44*l.* 6s. 6d., and the expenditure (including 30*l.* 8s. 3d. for new books) was 37*l.* 1s., leaving a balance of 7*l.* 5s. 6d. in the hands of the librarian.

The *Class of Design* report was by no means a favourable one:—

"Great care was taken in the preparation of the syllabus, very attractive and useful subjects being chosen, and at the first three meetings it seemed as though the efforts made were to be successful. But before the present year was reached the attendance of members and the number of designs submitted were considerably reduced. A comparison of the first and fourth meetings will show how much this was the case:—First meeting, fourteen sets of designs; fourth meeting, seven sets. Thus the work of the class was reduced by one-half in the short period of six weeks. The class was continued to the end of the session with extreme difficulty and a constant diminution of work and attendance. Under these circumstances the majority of those present at the concluding meeting considered that it would be absurd to make any arrangements for the ensuing session unless a greater amount of interest was evinced, and they decided not to elect any officers, the president remarking that if, during the recess, a sufficient number of gentlemen chose to start the class afresh, they would have every assistance in so doing."

The *Elementary Class of Design*, on the contrary, presented a very satisfactory report; for, while the average (attendance at the meetings during session 1876-77 was 10, during the past session it was 21, the average number of drawings submitted at each meeting during the same two sessions being 8 and 17 respectively.

The report of the *Class for the Study of Colour Decoration* stated that there were eight meetings held at alternate intervals of a month and a fortnight, at which 59 members attended, contributing 26 sketches, and several papers were read, some being illustrated by colour sketches.

The *Class for the Study of Architectural Science* presented a report stating that its work during the past session was not altogether successful. Eight papers were read and discussed.

The secretaries of the *Class of Construction and Practice* reported that the work of the class for the past session compared favourably with that of the two previous ones in all respects.

The President then proceeded to deliver his inaugural address, of which we give some portions on another page.

A brief discussion ensued, in the course of which Mr. J. S. Quilter, honorary secretary to the Sharpe Memorial Committee, reported progress. The reports of the various classes, &c., were adopted, and a vote of thanks was accorded to the President for his address.

FREDERICK PEPYS COCKERELL.

THE late Honorary Secretary of the Royal Institute of British Architects, whose sudden and premature death occurred in Paris on the 4th inst., was the son of Professor Charles Robert Cockerell, the distinguished architect and Royal Academician who was the first professional president of the Royal Institute of British Architects, succeeding in that post the late Earl de Grey, about the time when the society went into new head-quarters in Conduit-street. Descended on his father's side from Paulina, sister of Samuel Pepys, the excellent Secretary to the Admiralty under Charles II., Frederick Cockerell was, through his mother, a grandson of Sir John Rennie, who, in 1831, finished the present London Bridge. A pupil of Mr. Philip Hardwick, he left that gentleman's office in 1835 in order to continue his education on the Continent, and his studies in Paris exercised a ruling influence in the composition of his future designs and executed works. Making as he did the grand tour at a time when the world was not overwhelmed with photographic reproductions, his sketches and finished drawings of the ancient masterpieces accumulated with a will and to some purpose. Not long after his return to England he read a paper at the Institute on the "Architectural Accessories of Monumental Sculpture," — a paper which evinced learning and refinement, and at the same time offered practical suggestions, such as English sculptors are tardily adopting. In the discussion upon it, Professor Donaldson and the conductor of this journal joined in merited congratulations to its author. Mr. Cockerell's practice, never considerable, but always good, and largely composed of business executed for his personal friends, began about this period. One of his earliest works is the Freemasons' Hall, the façade of which in Great Queen-street possesses originality and refinement. A view and description, with a plan of the principal floor, was published in the *Builder*. We pointed out then the elegance of the details, and can now only repeat our regret, that the present exterior of the Freemasons' Hall should have been erected when its many beauties were neither appreciated nor understood. This successful achievement in Great Queen-street so recommended him to the notice of the Grand Lodge that he was invited to fulfil Masonic duties of a congenial character. He was made "Grand Superintendent of Works,"—an officer of the Grand Lodge who has to advise on all plans of buildings undertaken by the Grand Lodge, and to report periodically on the state of the different edifices belonging to them. This office was filled by him until his death, although it is one involving annual election, and at the best usually held for only a few years. At the beginning of 1867 Mr. Cockerell prepared designs for a new National Gallery, which were submitted in competition with those of some of his elder professional brethren.

We are enabled to append a list of some of the buildings executed from his designs and under his immediate superintendence. Photographs and drawings of some of them formed part of the English Exhibition (just closed) of Architecture on the Champ de Mars; nor were they the least remarked in a room which, during the last few months, has attracted the admiration and praise of more than one celebrated European architect. The following necessarily imperfect catalogue of buildings and monuments includes works both of alteration and addition; all, however, are of comparatively recent execution, viz.:—

Freemasons' Hall and Tavern;* Crayley-Court, near Winchester (Mr. Adam Kennard); Down Hall, Harlow, Essex (Sir H. Selwin-Ibbetson, bart.); Ballards, Croydon; Foxholes, Christchurch, Hants (Mr. H. Reeves); Lythehill, Haslemere, Surrey (Mr. Stewart Hodgson); Woodcote Hall, Newport, Salop (Mr. C. C. Cotes, M.P.); Clonalis, Roscommon, Ireland (The O'Conor Don, M.P.); Burgate, Godalming, Surrey (Mr. J. Godman); Kidbrooke Park, East Grinstead (Mr. Freshfield); Condover Hall, Shrewsbury (Mr. R. Cholmondeley); Langley Park, Slough (Sir R. B. Harvey, M.P.); St. John's Church, Hampstead; Vicar's Hill, Lymington (Mr. E.H. Pember); Cranesden, Mayfield, Sussex (Mr. T. Woolner, R.A.); Little Holland House, Kensington (Mr. G. F. Watts, R.A.); Castle Hill, Cerne Abbas, Dorset (Sir G. Clay, bart.); Memorial Column at Langley Park, Slough; Tablet in memory of Professor Cockerell at St. Paul's; Schools and Chapel at Highgate (Sir R. Cholmondeley); Façade of the Society of Painters in Water Colours†; Carlisle Memorial Column, Castle Howard,‡ &c.

Mr. Cockerell was a trustee of Sir John Soane's Museum, and he had been lately chosen assessor for the Spa Buildings belonging to the Scarborough Cliff Bridge Company. He was engaged at the time of his death upon several designs and works of importance, of which it is unnecessary to speak.

Though he never interfered in what may be called the polemics of art, never writing in the professional journals, and, indeed, seldom reading any of them, he took a quiet interest in passing events, and in none more than those which have occurred within the fabric of St. Paul's. The vexed question of the decoration of our metropolitan cathedral, and the still more vexed manner in which it was debated, he passed over in silence; but the report of a sub-committee published some six months ago in the *Times* drew from him a letter, which appeared in that journal on the 21st of July last, and which introduced an argument against the introduction of brilliant mosaics in the dome. The sub-committee urged that, as the dome of St. Paul's was badly lighted, it was necessary to use gold grounds and bright colours in order that people below might be able to see the decoration. Mr. Cockerell, who doubtless had often wandered with his father through the cheerless building, replied that the sub-committee, while assuming the existence of a defect, proposed to produce a real defect of a radical and destructive kind. His words are well worth repeating, and are likely to be read with more attention now that their author is dead:—"We are so accustomed," said he, "to abuse the atmosphere of London that we have come to overlook the cardinal merit it possesses of lending by its haze an artificial distance, and thereby conferring on such a building as St. Paul's an apparent size which it does not in reality possess. Those who have long frequented and loved St. Paul's will painfully remember the disastrous sensation of loss of space which they experienced on first seeing the restored paintings of Sir James Thornhill some twenty-five years ago. If even a monochrome (perhaps a little hot in tone) produced such an effect, what may be expected of the bright colours which, by piercing the friendly haze, will rob the dome of half its space? It is worth considering whether a sufficiently decorative effect may not be obtained without loss of scale by the use of aërial tints, even of a monochrome, for which the grey-blue treatment of the Limoges enamels (with perhaps an increased proportion of gold) might offer valuable suggestions."

Cockerell's last days were attended with circumstances in which some of his French colleagues had a melancholy share. Invited for the very day of his death to a dinner party at the house of M. Duc, the architect in chief to the new Palais de Justice, his host waited long only to receive the shock of the sad news; and the "Fabs," a well-known and exclusive club, were to have dined at Cockerell's house on the very night that sorrowful friends were journeying to Paris to attend his funeral, which was solemnised in Paris at a small English church in the Avenue Marbœuf, off the Champs Elysées, and not far from the Arc de Triomphe. The interment took place at Auteuil, a suburb of Paris, and the body was followed by—besides several members

* See *Builder*, 1866, pp. 611—613.
† See *Builder*, 1875, p. 371.
‡ See *Builder*, 1870, p. 347.

of the family and two representatives of the Royal Institute of British Architects,—M. Duc, M. Lefuel, M. Hardy, M. Pellechet, M. Daumet, and M. Vaudremer, colleagues and friends, with two English architects who happened to be staying in Paris at the time.

The coffin, lowered in the grave, was covered with wreaths, bouquets, and single flowers,—the last sent by his children; most of the flowers were brought over from England for the purpose. A widow and six young children remain to deplore his untimely loss.

Fred. P. Cockerell, as his name has been so often printed in our pages, was elected an Associate of the Royal Institute of British Architects in 1860, and a Fellow on the 30th of May, 1864. He was made the honorary secretary in 1871, and during the years that he served no man ever did less to court or encourage the popularity he enjoyed. A would-be opponent of his might wage political battle at a distance; immediate contact with him sufficed to disarm opposition. A colleague was attracted by the irresistible charm of a presence thoroughly natural, and of an expression perfectly sincere. The incorporated society, which proposes to ensure professional integrity and to enjoin uniformity of professional practice, was fittingly represented by one who, though he took apparently little part in the business of the secretaries' duties, made his constant presence at meetings of the Council, especially during the last session, a cause of satisfaction and confidence. Indeed, latterly he took more than ordinary interest in the organisation of Institute business, feeling convinced that all such work should emanate from the office in Conduit-street, for which purpose he arranged to attend there at other times than during the Council meetings. It will be difficult to find a successor, we may say almost impossible to immediately obtain another man combining the same qualities. As far as it is useful to judge at present, the next honorary secretary of the Institute must be either an architect of independent position, not wholly occupied in business, well known in the art-world, and an accomplished host, a traveller and a linguist; or he must be one of strict business habits, able to devote time to visiting scattered honorary members on the Continent, collecting valuable information from them, and willing to assist in the increasing business of the secretariat. In the latter case the right man may, with the exercise of discrimination, be found; in the former it will be necessary to look far and wide, and to wait long, before choosing a successor to the high-minded gentleman that is gone.

Assyrian Bronzes.—The remarkable objects in bronze discovered by Mr. Rassam at Balawat, and now in the British Museum, and which have been hitherto described as trophies, have been identified as belonging to two pairs of gates. The merit of the identification belongs to Mr. Ready, the skilled artificer attached to the British Museum department, to whose province it belonged to cleanse the bronze fragments, to piece them together, and to nail them with the original nails upon wood of the same thickness as had been used for the purpose when this unique monument was first set up about twenty-eight centuries ago. He then began to see that the larger set of bronze plates formed the coverings of a pair of enormous folding-doors rectangularly shaped. Each leaf was about 22 ft. long and 6 ft. broad. They had evidently turned on pivots, which had actually reached the Museum, although the sockets in which they moved had unfortunately been left behind. At the top they were supported by strong rings fixed in the masonry. The body of the door was of wood 3 in. in thickness, as measured by the nails used by the Assyrians to nail the plates of bronze on the wood; for these nails were clinched just one-sixteenth of an inch, which is the thickness of the plates themselves, over and above 3 in. from their heads. Each door turned on a circular post about 1 ft. thick. Around the doorpost the bronze plates, 8 ft. long in all, lapped to the extent of 2 ft, leaving 6 ft. as the width of each door between its post and its "style." This style was also edged with bronze, the vertical inscription furnishing the text, to which the designs in *repoussé* work on the horizontal plates, representing Shalmaneser's battles, sieges, triumphal processions, the cruelties inflicted on his foes, and his worship of the gods, supplied the illustrative scenes. The inscription leaves no doubt as to the monarch whose history is recorded.

ON THE FUTURE OF ENGLISH ART.

From treating on knowledge and principle, we pass to the *technique* of the Fine Arts, more especially to that of painting. No one can compare modern pictures with those by the old masters without being struck with the totally different methods of execution. In those by the old masters you are scarcely conscious of paint; you do not see how their work was done; but modern pictures are unmistakably paint, and of the paint painty. There they are, for the most part groaning under flake-white freely plastered all over them. A rough wall and a gravel walk are the textures, the ideal surfaces, which your modern painter swears by, and which he endeavours to imitate from the exuberance of his paint-pot. In the works of the old masters you may, it is true, now and then see the high lights emphasised, by being embossed in paint, but in the picturesque Dutch, rather than in the great schools of design, and even then within well-defined limits, and with the greatest possible care and skill. White is not, even in the preparatory painting of the old masters, indiscriminately trowelled on with brush and palette-knife, and all over the canvas. We knew a painter, a very prodigal of paint, who wasted this substance in riotous painting, and who was once quizzically asked by a sly critic, "if he threw his brushes at the canvas." To soften the impertinence, however, the interlocutor immediately added, "because if you did you hit it in the right places." We knew that these complimentary words were but salve for the piercing ones, and that the brushes which were assumed to be thrown at the canvas were anything but unerring. The skilful old masters did sometimes, as we have said, *hit* their pictures here and there with a full brush, and in the right places. When they did indulge in thick painting, however, it will be found that there was gradation from the peaks of extreme emboss into the vales and depths of transparent shade. But even these special and emphatic touches, in *impasti*, do not savour of flake-white as in the modern picture. For long experience had taught the old masters that brilliancy in oil-painting was not to be attained by mixing colours with opaque lead white, and by plastering such masses of spoiled pigments on canvasses. They had learnt that the painter's opaque white was his only and very poor substitute for light, and that to mix a beautiful pigment with this white was to destroy and corrupt it into a leaden gray. They had observed that some of the richest and most brilliant colours could not by any possibility be approached by mixing pigments with white. They saw, too, especially in Venice, that the rich jewelry of colour of gems and of painted glass was the most brilliant, and from this they reasoned that that brilliancy and richness which they so much admired in gems and in glass was due to the light passing through the transparent pigment. From this conclusion they hypotheticated a process of painting in which their white pigment should stand to their oil colours in the same relation as light itself does in the colour effects of gems and of glass. They had discerned that it should not be mixed with their pigments, but that it should shine through these if they desired to obtain the greatest splendour of effect. To the practice founded upon this hypothesis is due the greater brilliancy, richness, and unpaintiness of the works of the old masters, as compared with those of the moderns. The traditions of the *technique* of the old times were gradually lost, and we have again to work out this important method for ourselves.

The first impulse of the student on apprehending the force of the foregoing reasoning is, that he will, for the future, altogether discard flake-white. This, however, would not answer, for the transparent colours are too intractable when used pure over a white ground; they cannot thus be solidly and effectively worked. We cannot discard the opaque white pigment; it must form our ground, and, to a certain extent, our *vehicle* and our modelling material. But whilst we are enforcing the adoption of the ancient method of painting, we are perfectly well aware that it is a slow process; it is not a process by which a *picture* can be dashed off. It is, therefore, ill adapted to the drive and hurry-scurry of the painters of the present day. But, perhaps, this is one great reason why its adoption should be moved, for the process might tend to correct the vicious haste we are condemning.

White, then, cannot be altogether dispensed with in painting, if we desire to obtain an entirely satisfactory result. A picture painted wholly in transparent colour is apt to look leathery and flat, though great richness of colour may be obtained. We must, in the first place, use the white for our ground. This ground must be in the main the illuminating power of the picture; it must shine through the greater portion of the picture. It is this shining through of the ground which constitutes transparency in painting. A light colour over a darker colour produces opacity; a dark colour over a lighter produces transparency. In the first case the light is reflected from the surface of the painting; in the second it shines through from the ground. One most important precept to be observed in practising the method of the old masters is that painting one colour over another, that is to say, a lighter over a darker, to obliterate and in order to correct an under painting, is a most pernicious and destructive device. The relative gradations of colour must be laid at once in their proper places, that the ground may shine through them without let or hindrance of intervening mistakes. The necessity which there is in this method that the colours shall be at once laid in their proper places led to the preparation either of cartoons or to the modelling up of a composition, or of a portrait on the canvas, either in a light key or in monochrome, before proceeding to colour. Those emphatic touches of high light, of embosses, to which we have alluded, were given in this preparatory painting. This was the method of Rubens, Vandyke, Rembrandt, &c. It was not, we say, till after the whole design had been worked up in this way in monochrome or in very light greys that richness of colour was attempted. The pigments, as we have stated, are not to be used absolutely pure over this preparatory painting, but worked into a thin film of white first spread over the portion to be painted. The pure pigments can be worked with greater evenness, and can be more easily blended with this film as a vehicle. White mixed in small quantities with the pigments will not mar their transparency or shut out the light of the ground. In the depths of shade a pigment may sometimes, of course, be used perfectly pure. Vermilion, yellow ochre, Naples yellow, emerald green, &c., should be regarded as opaque colours, and therefore be used with as much caution as white itself.

It will be noticed that every step in this method of painting requires to be taken with due deliberation. The painter has to look to the composition, the whiteness, and the dryness of the ground. He must study and complete his design either in a cartoon or upon the canvas before proceeding to colour, and he must be careful to wash every coat of colour before painting over it. We must not, however, be misunderstood. Although we have cautioned the student against *painting out* with a lighter colour, for the purpose of erasure and correction, we do not mean to imply that the same space may not be painted over several times; but, in this case, each painting must be deeper in tone than the preceding. *The progress of this method is from a lighter key to a deeper and a richer one.* For if the superposition of a lighter painting over a darker be attempted, except with the intention of producing opacity, it will immediately nullify the beauty, the transparency, and luminous quality of the process.

The same want of thoroughness of study which we have noticed in respect to painting is as apparent in English sculpture. Drapery is as yet an untried study. As a rule, it is simply abominable, both in our painting and in our sculpture. The only man who understands it finished his education in Munich. The improved course of study we have recommended would effect a reformation in both.

The Royal Academy has very judiciously established a professorship of the Chemistry of the Fine Arts. The permanence of the different pigments requires looking into. The old masters' scale of colours was very much more limited than ours. They were fortunately bound to the most enduring ones, and they made the most of them. But with these we are now incorporating new-fangled hues, not yet sufficiently tested, and which may bring some modern works, wherein they have been recklessly used, to unmitigated destruction.

In proposing that halls of composition should be established in the Royal Academy, we ought also to have suggested that there should be a sculptors' and an architects' hall of composition. The rudiments for such an expansion at present exist; they only require further development to

meet the requirements of the future. It is upon the more thorough education of the artist and of the public that all good things await.

We have now briefly run over those reforms which are needed to render our national art more satisfactory and glorious than it has been. We might have touched upon the *débris* of styles which tend to confuse the designer and the public, but we must leave that to some opportunity in the near future.

METER.

PURE AIR IN THE STABLE.

A CONTRIBUTOR to the *North British Agriculturist*, writing on the importance of pure air in the stable, says that many animals, otherwise tolerably well cared for, are housed in a minimum of cubic space, and in stables, byres, and boxes in which there is no adequate renovation or circulation of air. Alike in town and country, valuable horses, instead of enjoying 1,100 or 1,200 feet of cubic space,—the lowest amount consistent with good health,—are restricted to about one-half this cubic area. The stables connected with many gentlemen's houses do not give more than 700 cubic feet per horse; in many second-rate cab establishments the unfortunate, hard-worked animals are still worse off. In low-roofed urban cowhouses, 200 cubic feet was, a few years ago, the space allotted to each beast, but this cruel overcrowding has recently been considerably abated, by proper inspection, and by the condemnation and pulling down of some of the worst of such hovels.

In building houses for animals, healthful construction does not entail much extra expense, and it invariably saves much sickness and mortality. Even old buildings, when faulty and insufficient, may often be made greatly more healthful by a very moderate, intelligent outlay. There are many farm stables which, when containing their full complement of horses, are found in the morning to be rank and noisome, where the animals suffer from colds, influenza, and weed,—where the colts, when first stabled, are long dull and thriftless. The horses invariably do better when turned to grass or allowed to run, during the summer, in the empty cattle-yards. The mischief is usually found to consist in overcrowding and insufficient ventilation. The stable is probably narrow, usually with a loft overhead; the ceiling is low; any doors or windows are along one side,—there is, hence, no facility for a thorough current of healthful, invigorating air. The obvious remedy is,—at the head of each pair of horses to make an opening in the wall of about 18 in. by 9 in. deep, just underneath the ceiling. It is seldom necessary that such air-holes require to be protected, either by spars, louvre-boards, or iron bars. In winterly weather a wisp of straw prevents the entrance of rain or snow, or of very tempestuous winds. In a large, crowded, low-roofed stable, where doors and windows—as is too commonly the case—are only along one side of the building, it may further be desirable to make an opening (about 9 in. by 4 in.) in the wall underneath the manger, and about 12 in. or 15 in. from the floor, so that it shall not be blocked by the litter.

Capital lofty stables have, in many places, been made underneath the arches of railway stations and viaducts; but from their being closed along one side, and preventing a through current of air and ingress of light, some of them being objectionably dark, they proved decidedly unhealthy. The inmates farthest from the doors were frequently on the sick list; occasionally farcy and even glanders appeared; fresh animals placed in the farther arches soon failed in health. The cause was not difficult to discover. The foul air from the lungs, skin, and excretions of the horses gradually was driven towards the farther recesses; but, having no sufficient exit, it accumulated, causing a damp, pestiferous atmosphere. Openings through the arches farthest from the doors, or air-shafts carried through the roofs, removed the obvious and sufficient remedy. In a few cases where serious disease has persisted for some time, coke fires—on which sulphur and carbolic acid were occasionally thrown,—were kept burning for several days, so as to dry the damp walls and floors, destroy germs of disease, and generally purify the atmosphere.

Still another illustration may be given of the direful effects of impure air on the health of horses. In a populous city, where space was valuable, a large cab proprietor, finding under his premises a bed of sand, made a very good thing by excavating and selling it. The cleared space he subsequently converted into a stable for thirty horses. But owing to the low level of the place effectual drainage was impossible; the urine was collected in a tank at one end of the stable, and was not emptied as frequently as it should have been. Surrounded, and in part overtopped, by other buildings, thorough ventilation was difficult, and was very insufficient. The horses placed in this dark cellar of a stable speedily contributed largely to the sick list; influenza, farcy, and glanders became permanent pests; a good many horses, owing to the darkness and foul air, became blind; two lots of horses died off within three years; when, profiting by dear-bought experience, the premises were converted into storerooms for goods which did not need the renovating supplies of fresh air so essential for living animals.

Facts such as these, and they might be multiplied indefinitely, indicate the need of more intelligent care than is even now disposed on the construction of the dwellings of animals. In building stables, 1,200 cubic feet should be the minimum for each horse. If lofts or rooms overhead cannot be dispensed with, the floor joists should not be put on until the wall is raised 7 ft. 6 in. or 8 ft. from the floor; continuous ventilation should be provided by air shafts of about 2 ft. in diameter, lined with zinc, carried up through the loft or rooms, and surmounted by a cowl, or by louvre boards. In towns, where other property often prevents openings being made in the back walls of the stables, ventilation must depend mainly on these air-shafts, of which one is required for every three horses. In the country, however, abundance of ventilation is usually securable by introducing above the horses' heads, immediately under the ceiling, a window of about 2 ft. by 3 ft. In the better class of stables such windows should be made to open and shut, swinging on a swivel; in farm stables the lower half of the opening is better filled with strong glass, and the upper part with perforated zinc, which, remaining always pervious, is more effectual in allowing egress of foul air than the window, which is too apt to be kept scrupulously closed. In stone walls, immediately underneath the ceiling, intermediate between each window, should also be placed gratings of about 1 ft. by 6 in., the opening protected by a few iron rods. In brick walls a course of perforated bricks should be introduced above the horses' heads, 6 ft. or 7 ft. from the floor; whilst another such course is advantageously placed underneath the manger, 1 ft. or 1 ft. 3 in. from the ground. Objection is sometimes senselessly made to the introduction of light and air in front of horses. It is urged that light annoys horses, and prevents their resting, and that draughts blow down and give colds. But such objections are quite illusory. Horses, and, indeed, all animals, like fresh air. In a box with the half-door open, whether in summer or winter, horses constantly stand or lie with their heads to the opening, luxuriating in the purest, coolest air they can get. They also enjoy a reasonable amount of light; and dark stables, besides being a cloak for dirt, are also a fruitful source of blindness. By introducing fresh air from doors and windows placed in the opposite walls, by gratings distributed above and below, and by perforated walls, the air of stables may be easily kept sweet and pure without draught, and without reducing the temperature below 55 degrees, about which grooms like to keep it.

DOXFORD HALL, NORTHUMBERLAND.

FOR the last eighteen months 100 men have been daily employed in additions and enrichments to Doxford Hall, in the parish of Ellingham, Northumberland. This is the seat of Major Browne, J.P., whose portrait as Master of the Northumberland Foxhounds, in a hunting piece by Mr. Lutjens in this year's exhibition at the Royal Academy, will be fresh in the memory of many of our readers. It is built of white stone, with a Doric portico, and stands on a terrace, partly belted by trees, and situated in a pastoral district, with the sea in the distance on the one hand, and the Cheviot hills on the other, and villages and seats dotted about on the nearer landscape. The extensions now approaching completion consist of various additional features to the house, and accommodation for twenty horses and their grooms in the rear of it. It was, previously, a large substantially-built house, but these additions have quadrupled the area that it covered. On the south front, and before three of the drawing-room windows, a conservatory, orchid-house, and fernery have been erected. On the west front, a billiard-room has been added, 25 ft. by 20 ft., with a bow-window, and additionally lighted from the open-timbered roof, and approached by a corridor about 40 ft. long and 19 ft. wide, furnished with a lavatory and a lobby that gives access to the grounds. The east front has been lengthened northwards by a one-storied wing of kitchens, built with open-timbered roofs, and furnished with hydraulic ranges; and adjoining these are a dairy, dairy-scullery, game-larder, plucking-room, and bakery, paved with cement, and channelled and ventilated; and, departing from the corridor communicating with them is another corridor, at right angles with it, which gives access to the servants' hall and offices of every description; and, beyond these, to a wash-house and laundry, all furnished with every convenience and appliance to save labour and ensure comfort. The story above furnishes twenty new bedrooms. At the end of this receding wing commences the parallelogram, including the stable-yard, which is surrounded by grooms' day-rooms and dormitories, loose-boxes and stalls for twenty horses, a coach-house, 50 ft. long and 28 ft. wide, with a porch before it, saddle and harness rooms, and, at the entrance from the outer gates, a two-storied house for the stud-groom, commanding a view of the whole of the quadrangle. Close by are two outdoor servants' cottages, and a large aviary or chicken-house; and another external feature is a gas-house, from which all the rooms and corridors in the establishment, including the stables, are lighted by gas made according to the patent of the Sun Gas Company, Southwark.

All the chief rooms have been enriched with costly marble mantelpieces and coloured decorations. The approaches have been improved by lowering a rise in the highway, and all the external arrangements carefully considered. The difficulty generally experienced with dealing with sewage has been vanquished by the adoption of two sets of sewers, one for storm-waters, which discharges into a burn, and the other for the sewage, which is conveyed to a tank at a distance to be utilised.

The varied works have been carried out under the direction of the clerk of the works, Mr. John Gray. The masons' work has been executed by Messrs. Gibson, Browniesde; the joiners' work by Messrs. Robertson & Son, Alnwick; the painters' work by Messrs. Adam Robertson & Son, Alnwick and Newcastle; the slating and plastering by Messrs. Thompson & Wright, Alnwick; the plumbing by Messrs. Wilkin & Dickman, Alnwick; and Messrs. Walker & Emley, Newcastle, have furnished the chimneypieces, the hydraulic jack and ranges, the electric bellwork, and the baths. Mr. James Kerr, Alnwick, executed the drainage and sewerage works. Mr. Gray, Chelsea, supplied the conservatories and hot-water apparatus. The cement-floors have been laid down by Messrs. Wilkinson & Co., Newcastle; and the bakery-oven is by Mr. Harris, of Newcastle. The architect is Mr. F. R. Wilson, Alnwick.

THE INSTITUTION OF CIVIL ENGINEERS' PRIZES.

THE council of the Institution of Civil Engineers invite communications, of a complete and comprehensive character, on any of a number of subjects in a published list, as well as on other analogous questions. For approved original communications, the council will be prepared to award premiums, arising out of special funds bequeathed for the purpose. These funds are now large.

Drawing in the Board Schools.—The exhibition of drawings by scholars and pupil-teachers attending the Board schools in London, which has been held in the Saffron-hill Board School, Cross-street, Farringdon-road, was not very exhilarating, including grotesque hares, impossible bridges, and niggling absurdities in every direction. We strongly suspect the mode of teaching adopted, and advise the Board to obtain a report on the subject at once from some thoroughly competent person, so that time may not be lost. We so thoroughly agree with the Board in making drawing part of their scheme of teaching that we are anxious the endeavour should be successful.

PLAN OF THE COLOSSEUM THEATRE, LIVERPOOL.

For the private information of a high official, a plan has been made of the Colosseum Theatre, Liverpool (where during a groundless panic so many lives were recently sacrificed), together with a report by Mr. Thomas Verity, architect. It cannot be other than useful to publish them, and we shall be glad if doing so should lead the owners and occupiers of similar places of public resort throughout the country to consider seriously the facilities for destruction which may exist in their own buildings and the best means of removing them. The briefest examination of the plan and the particulars accompanying it will serve to show all who have given such matters consideration that the "accident" was bound to happen, and that, reasoning on probabilities, it ought to have occurred long before it did.

The house is situated at the corner of Paradise-street and School-lane. It is a large building, octagonal in shape, and consists of pit and two balconies, together capable of holding about 4,000 persons.

The upper balcony is divided into three parts. There are no separate staircases from this to the street, but the occupants pass by three short staircases to the back portion of the lower balcony; these staircases are respectively 2 ft., 1 ft. 4 in., and 1 ft. 10½ in. wide, and the floor on which they land is divided into shallow steps. The only way out for two-thirds of the occupants of the upper balcony, and about half of the lower balcony on the right side (looking towards the stage) is through the bar at the back of the house, with a passageway 12 ft. wide, leading to a doorway, 2 ft. 11 in. wide, immediately at the top of the staircase, where they are met by the people from the other side of the house, who pass through a doorway 3 ft. 4½ in. wide. This staircase is 4 ft. 6 in. wide, and is in two flights, with winders at the turn. So far there are no doors except the dwarf doors in the divisions of the balcony.

An extra exit might be obtained from the bar-room for the people on the right-hand side of the house by a short ascending flight of stairs, leading to a doorway, giving access to a large open well-staircase, in connexion with some billiard and dancing-rooms, but it was understood that it was always fastened, as the premises are not leased with the theatre.

The pit is entered at two points: one from the principal entrance immediately behind the pay-box, A, by a flight of six steps down, along a passage (partly blocked by old iron railings, removed from some part of the house, being stored in it), and up a flight of seven steps to the centre of the pit through dwarf doors, 3 ft. 3½ in. wide, opening outwards. The second entrance, B, which appears to be for the back of the pit, is from the side street (School-lane) by a large double door, only one leaf of which will open, and that inwards, giving an opening of 2 ft. 9 in. to a passage 5 ft. wide, with a flight of five steps up to the pit level at the end.

The usual exit from the pit is by a pair of folding doors, C, opening inwards, in the side-wall adjoining School-lane, on the left side of the house, directly into the street, by a flight of three steps. Inside these doors there has been an enclosed lobby, but the doors have been removed, and the openings left,—four in number,—are respectively 2 ft. 11 in., 2 ft. 2 in., 2 ft. 3 in., and 2 ft. 6 in.

The other exits are by what I have called the second entrance, B, either through the folding doors, D, opening outwards, or from the bar-room at the back of the pit, and by the principal entrance either through the dive, A, under the back part of the pit, or through the bar by an opening 1 ft. 10 in. wide, E.

This opening leads to a lobby about 9 ft. by 7 ft., having two small doors, both opening inwards, F and G, and with steps down leading to each. The door F is 1 ft. 7 in. wide, and leads to the space directly opposite the bottom of the gallery-stairs, from which it is separated by the barrier H, in front of the pay-box, where the disaster occurred. The door G is 2 ft. 2 in. wide, and is just at the top of the stairs from the dive.

The width of the passage at this dive, at the side of the pay-box, is only 2 ft. 9 in., which is further reduced by two of the gallery stairs projecting into the footway 1 ft. 7½ in., leaving a floor-space of 1 ft. 1½ in. The space between the foot of the gallery strirs and the barrier H in front is 2 ft. 2½ in., and the width of the doors on either side of the barrier is, J, 2 ft. 3½ in., and K, 2 ft. 7 in. These doors opened outwards, but only one, K, now remains; no proper provision was made for fastening them back.

At a distance of 4 ft. from these doors there are three steps down to a vestibule, 15 ft. long and 10 ft. wide, with gates at the end opening inwards the full width.

There are also other possible exits by a passage 2 ft. 10 in. wide outside the wall on the right-hand side of the house, L, from the bar, also by a door close to the stage, M; and to the stage entrance, by passing under the stage to the steps leading to the stage-door, but the way is too circuitous to be of much use, and is besides dark and very dangerous by reason of broken steps and flooring.

There is also another passage behind the bar, marked N, 2 ft. 10 in. wide, leading into the vestibule just outside the door J, immediately at the top of the outer steps in the principal entrance.

There is generally throughout the house an absence of proper fastenings to the doors, or, indeed, of any precautions for the public safety, and the whole building is full of pitfalls, differences of level, and unprotected steps. But it will be understood, from the foregoing description, that the main danger was at the bottom of the balcony stairs, where, in fact, the accident occurred; and although it was pointed out by the borough surveyor that the barrier was dangerous to the public (and the event proved him to be right), I found that it had been reinstated precisely as it was before the accident.

THE COLUMN OF FUENTENOVILLA.

In the province of Guadalajara and the judicial district of Pastrana, situate about two miles from the river Tajuña, and at the edge of a plateau, lies the old Spanish town of Fuentenovilla. It is recorded of it that it was partly burnt down in 1712 by the soldiers of the Archduke Charles of Austria, the conflagration consuming the archives, containing many valuable documents relating to the history and the ancient privileges of the town. Most of the old landmarks of the place were levelled on that occasion, but three still remain. They are the parish church, the public fountain, and a column in the market-place (the subject of our illustration), which has puzzled the brains of a good many antiquaries.

The column in question has an elevation of 34 ft., without reckoning the cross at its top, which measures 3 ft. The bottom step is 46 ft. in circumference by 1 ft. 6 in. high. The lower part of the column is much damaged, and has also suffered greatly from the tooth of time. Its shaft measures 21 ft., and is divided at one-third of its height into two parts by a small round moulding, a fascia with triglyphs, and a fillet from which springs an ogee moulding on which rests a kind of collar of leaves. The remaining portion of the shaft to the capital is fluted.

From the ogee moulding of the powerful capital, leaves sprout out, interrupted by four human-headed monsters, forming its angles, and which, representing the lower part of the human trunk, finally end in architectonic scrolls. Two of the figures have the breast covered with feathers, and are possessed of wings, in place of arms, which, with the arms of the other two figures, serve to support three straight fillets. The latter carry a balcony of small balusters, and short pedestals at the four corners, which are surmounted again by vases adorned with festoons, and carrying balls.

Upon the balcony rises a pyramid twice truncated by an ogee fluting and fasciæ, with the effect of presenting to the view three pyramids superposed upon each other. Crowning all, a slight cross of iron with a fane terminates this curious monument, of the origin and object of which no certain information exists.

From the position which the column occupies within the town, and from the fact that it does not present any indication of chains or rings of iron ever having been attached to it, it is believed that it was constructed to mark its jurisdiction; but there is a tradition preserved among the inhabitants that in olden times it was used as a gallows, and that it was usual to suspend condemned criminals from the heads of the human figures which form the principal ornament of the capital. On that account it was attempted, not so very long ago, by some rioters, to pull down the column.

THE NEW TOWN HALL FOR LIMEHOUSE.

The Limehouse Vestry have finally decided to erect a new town-hall upon a site within the parish which has been specially purchased for the purpose. The estimated cost of the building is between 8,000*l.* and 9,000*l.* The subject was discussed at a meeting of the Vestry held last week, when the comparative cost of similar buildings in the East End was referred to. It appears that the cost of the Poplar Board of Works Hall was 7,330*l.*; the Poplar Town-hall 7,500*l.*; and the Limehouse Board of Works Hall 5,172*l.* Mr. Potts, one of the members, said he was thoroughly in favour of building an adequate hall for parochial uses, because a revenue would accrue from it as a place of public assembly, and as the sum required could be borrowed and spread over a long period no intelligent ratepayer would object to the outlay. The Local Government Board having had the plans of the building submitted to them, have approved the same, and sanctioned the borrowing the money from the Metropolitan Board of Works for the erection of the building.

THE GRAND THEATRE AND OPERA HOUSE, LEEDS.

When the old Theatre Royal in Hunslet-lane, which had existed there for over 100 years, was destroyed by fire, Leeds, with its population of 300,000, was left with only one theatre.

Some doubt for a time was felt by playgoers whether the old Theatre Royal would be rebuilt; but when it was known that the site was sold for street improvements, all chance of a second theatre seemed to disappear. However, about February, 1876, a meeting of influential gentlemen, who had felt the want deeply, was held at the office of Messrs. Nelson & Barr, solicitors, when it was determined to form a company to build a really first-class theatre upon a central site. Previously to the scheme being brought before the public, a fire swept away the old Amphitheatre, and left Leeds for a time without a dramatic place of amusement.

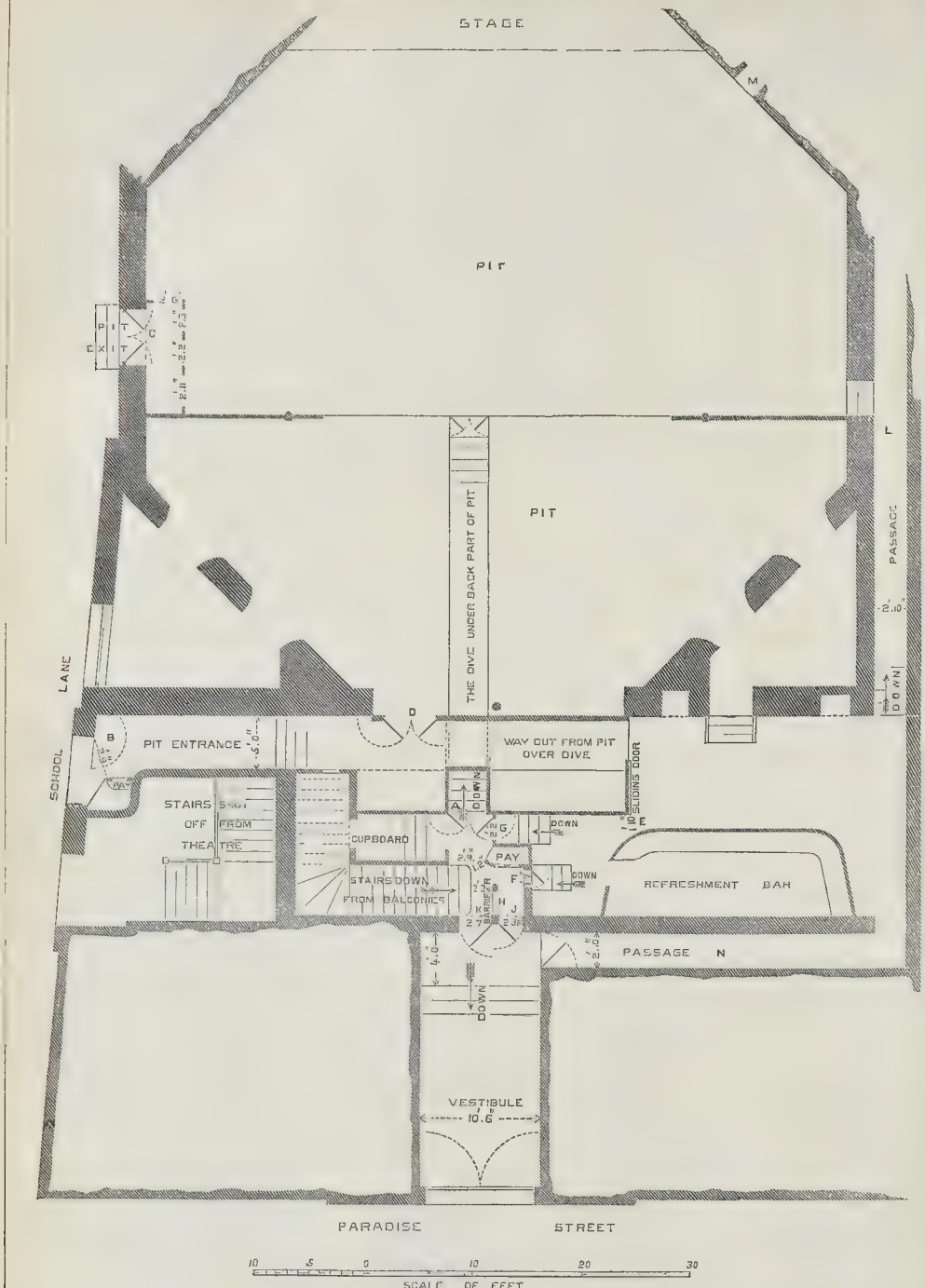
Considerable delay was experienced in obtaining possession of the site for the new theatre by reason of the non-expiration of the tenancies, and progress had also been made with the plans, in which were incorporated shops and other business premises; but a strong wish was expressed from many quarters that an assembly-room should also be incorporated with the scheme. This entailed an entirely fresh set of plans, and a further period of delay. The plans, however, in the autumn of last year, were approved of, and submitted for tenders, the excavations having, in the meanwhile, been completed. The works were commenced about the middle of October last year, and now, after the lapse of thirteen months, the theatre is ready for opening.

It was determined, in the construction of the building, the public should have every accommodation given to them in the shape of cloak-rooms, with lavatories and other conveniences attached. It was also determined that the scheme should be upon a sound financial basis. The site, which is in New Briggate, covers an area of nearly three-quarters of an acre, adjoins Harrison-street, and was purchased at an average price of 6*l.* 10*s.* per yard; and the tenders being sent in during a depression of trade, the directors obtained contracts at very reasonable rates.

In addition to the rental which will accrue from the theatre, there are six commodious shops, an assembly-room capable of accommodating 1,200 persons, with supper-room, retiring-rooms, cloak-rooms, and lavatories, with kitchen above; and underneath the entrances of the theatre are large fireproof cellars for wine-merchants or storage purposes, with separate access. This assembly-room is over the shops.

The accommodation of the theatre is divided into pit and pit-stalls, dress-circle, upper circle, amphitheatre circle, gallery, six stage-boxes, eight family boxes, eight upper private boxes, and six amphitheatre boxes; the whole giving seating accommodation for about 2,600 persons, in addition to which standing room is provided for 200 more.

The height from the cellar to the level of the stage will be 30 ft., which would enable a good-sized castle or ship to be sent up from the regions below. From the stage-level to the gridiron, or floor over the stage, there is a height



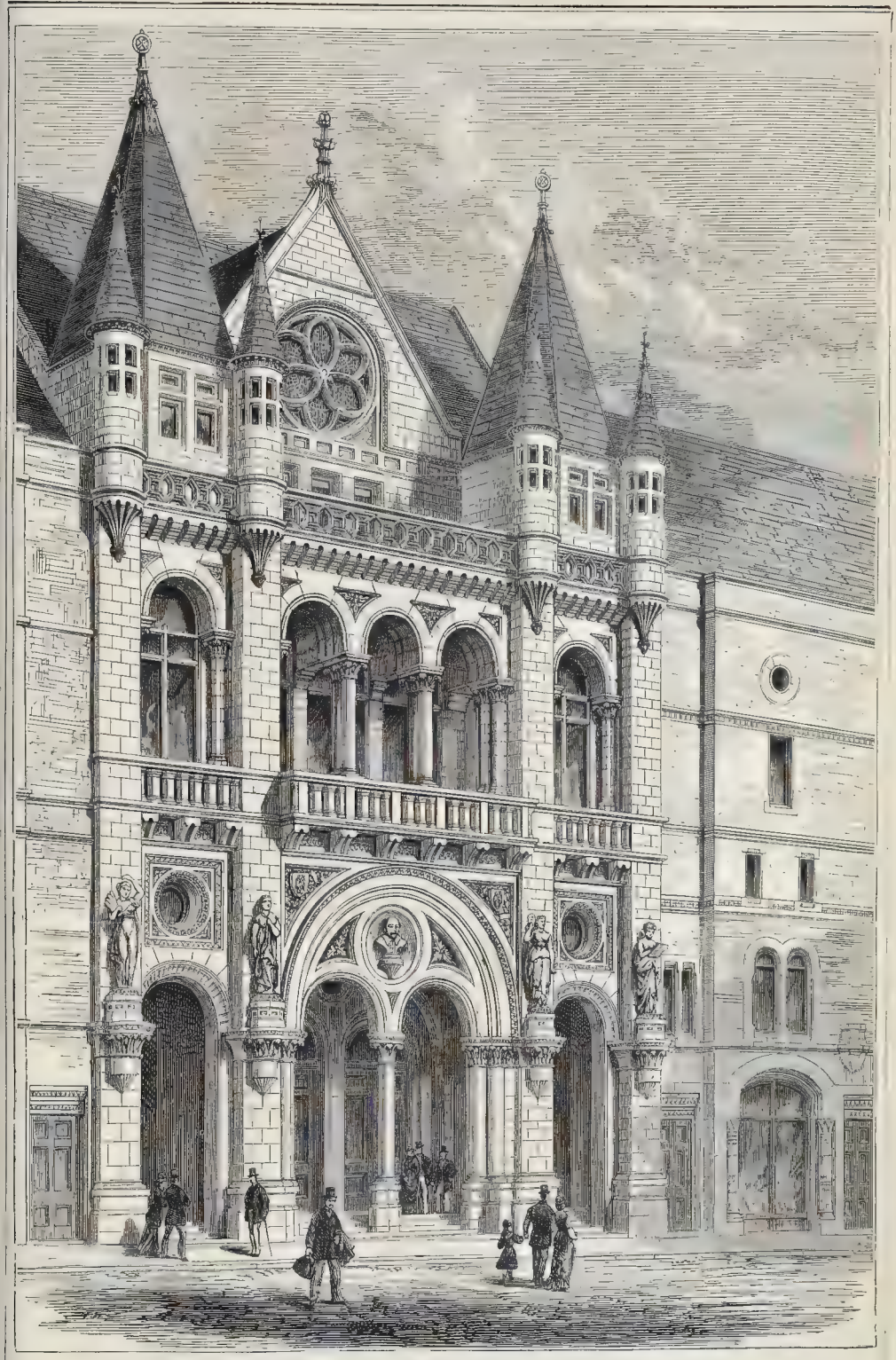
PLAN OF THE COLOSSEUM THEATRE, LIVERPOOL.—*The Scene of the Recent Disaster.*

of 70 ft.; and from the gridiron to the apex of the roof over, a further height of 18 ft.; the total height from the cellar-floor to the apex of the stage-roof being 118 ft. From the footlights to the back wall there is a distance of 75 ft.; and between the walls of the stage a width of 72 ft.; but, as the main walls of the stage are pierced with openings opposite the stage entrances, and as the stage itself is surrounded by a corridor 6 ft. 6 in. in width, the full 72 ft. of stage can be occupied with a set-scene, and the stage entrances and access be still preserved.

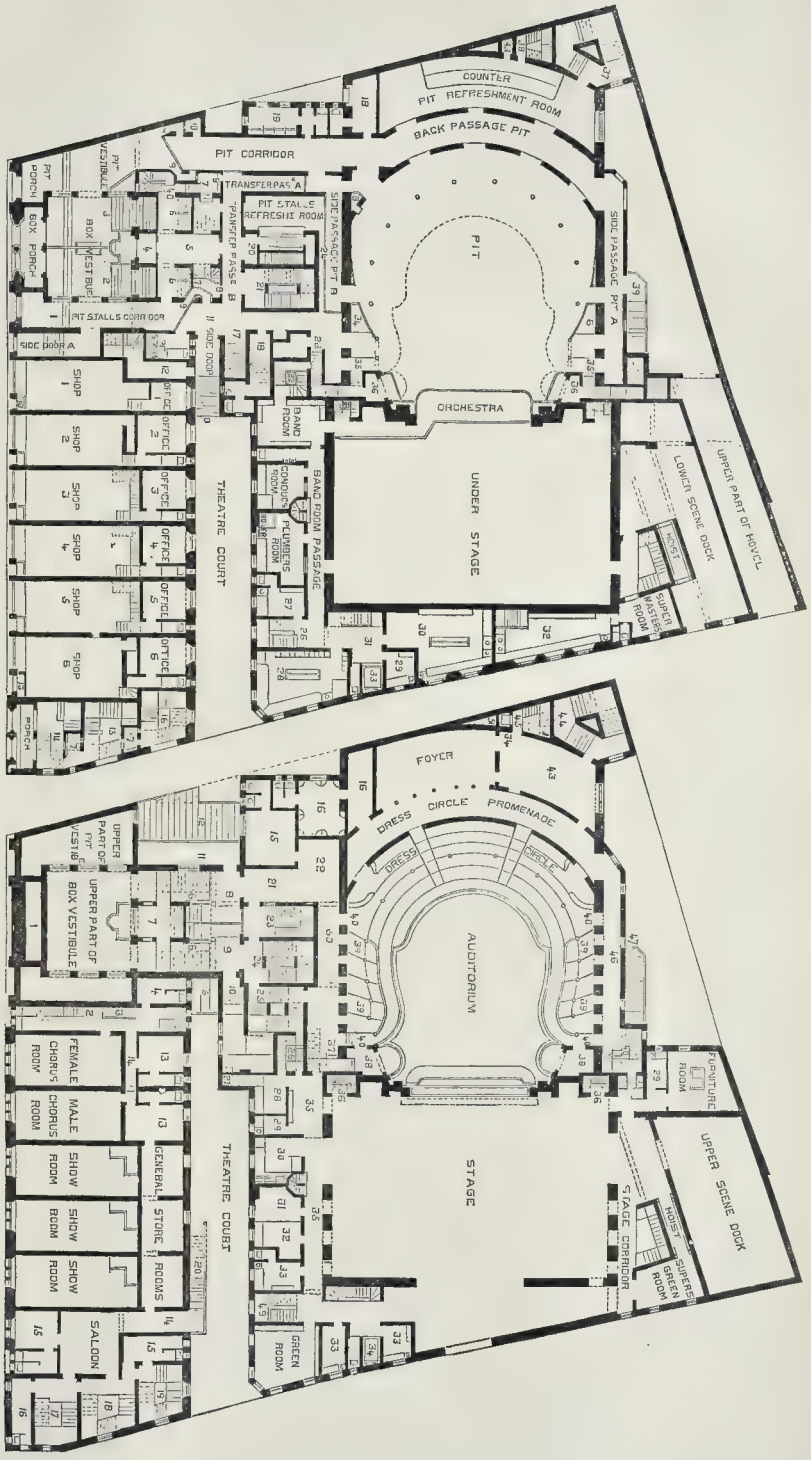
Surrounding the stage-corridors are rooms for the use of the stage and gas men, hand property room, stage-manager's office, furniture storage rooms; large scene-dock, two green-rooms, the principal one being at the corner of the stage block of buildings, and commanding a pleasant outlook upon Briggate. On the stage-level are five "star" dressing-rooms; and on the other



THE COLUMN OF FUENTENOVILLA, SPAIN.



THE LEEDS THEATRE AND OPERA HOUSE.—Mr. G. Corson, Architect.



THE LEEDS THEATRE AND OPERA HOUSE.—*Plans.*

floor levels, both below and above the stage, further dressing accommodation is provided for the actors and actresses, ballet, extras, chorus, boys, girls, and supers., every one of these rooms having direct daylight, and being supplied with hot and cold water. Owing to the fall of the ground, the stage-level is considerably above Harrison-street, and all the rooms are above the ground. Advantage has also been taken of the difference of the level, to obtain another scene-dock level with the street. In addition to the accommodation described, there are two bath-rooms,—one for ladies and another for gentlemen; property work-rooms, modelling-room, carpenters' shop, band-room, conductor's room, bill-inspector's office, plumbers' shop, smiths' shop, engine-room, armoury, wardrobe and sewing rooms, manager's private room and waiting-room, gasfitters' workshop, rehearsal and ballet-practice rooms, and large general storerooms. Under the court between the theatre and assembly-room buildings are fire-proof cellars, in which the gas-meters, lime-light apparatus, and other sources of danger are placed.

To guard against the spread of fire, the various departments are placed in blocks, a large portion of the site adjoining Briggate being occupied with the various entrances and staircases, cloak-rooms, lavatories, &c. The auditorium and stage have their axis lying parallel with Briggate. On the right hand, or prompt side of the stage, are the dressing-rooms, wardrobe, and manager's offices; and on the left side the scene-docks, rehearsal-rooms, store-rooms, and carpenters' shop. At the back of the stage, but on a level above, is the painting-room, fitted up with four painting-frames, two 48 ft. by 31 ft., and two 30 ft. by 18 ft. At the back of the auditorium are the refreshment and smoking rooms, drawing-room, and promenades; no workshops or storerooms of any description connected with the theatre being placed under or over the stage or auditorium. Thick solid walls separate all the blocks, while all the floors of the corridors, refreshment-rooms, and work-rooms, are composed of fireproof materials. The whole of the steps used in the building are formed of concrete made of Portland cement and slag from the Aire Side Works.

There are three tiers of working flies on each side, and in addition, under the first tier of flies, there are lime-light flies in which the gas arrangements are placed for the battens. The gridiron extends over the whole of the stage. In the cellar there are two mezzanine floors, and the cellar occupies the entire width of the stage.

In order to obtain a thoroughly strong and satisfactory stage, iron has been used for the under construction. There are twenty-three cuts in all, five of them being bridges, each of which is 37 ft. long and 3 ft. 6 in. wide; in front of each bridge there is a narrow gas cut by which the stage is strengthened laterally, so as to prevent its racking forward. The drawings for the stage were made by Mr. J. R. Watson, and the work was carried out by Messrs. Cooper & Dawson. Mr. Robert Wade has superintended the laying of the stage skin, and also the fitting of the scenery.

All the enrichments of the interior have been specially modelled from detail drawings. The proscenium, and work generally, by Mr. Good; the ceiling, by Mr. Appleyard; stage-boxes, by Mr. Paler; and caps, box-divisions, and fronts, by Mr. Hammond.

In the construction of the walls of the auditorium, corridors, and staircases glazed bricks and tiles are largely used, thus contributing greatly to the light and appearance of what are usually dismal appurtenances in theatres.

The works have been satisfactorily carried out by the following contractors:—bricklayer, mason, carpenter, and joiner's work, by Mr. J. Wood; slater's work, by Messrs. Watson & Wormald; plumbing, glazing, gasfitting, and sunlight work, by Mr. Joe Lindley; ventilating cones, by Messrs. Calvert & Briggs; plastering work, concrete steps, and carton pierre decorations, by Mr. John Franks; concrete floors, general wrought-iron work, and wrought-iron roofs, by Messrs. Cooper & Dawson; ironfounders' work, by Messrs. Grayson & Hardisty, Mr. Joseph Bedford, and Mr. Samuel Dawson; painting and decorating, by Messrs. J. T. Pollard and F. Jackson & Co.; stair railings, by Messrs. Exley & Son; and the furnishing and upholstery, by Messrs. Pearson Bros., all of Leeds. Locks and fittings, by Messrs. Smith & Son, of Birmingham; gas battens, by Mr. G. L. Smith, Birmingham; statuary and busts, by Messrs. D. Brucciani and L. Brucciolli, London; limelight apparatus, by Mr. D. Purves, London. Mr. Wm. Telbin has painted the act-drop, which is a view of Kirkstall Abbey, and the proscenium wings and border. The stock scenery has been painted by Mr. Charles Fox, of her Majesty's Theatre; Mr. John Galt, of St. James's and Vaudeville Theatres; Mr. Hall, of the Adelphi Theatre; and Mr. Lister Sutcliffe. Messrs. William Aivey and Mr. Robert Kirkby have acted as general foremen for the builder during the erection of the building.

The cost of the whole, including site, amounts to close upon 60,000*l.*

The architect of the building is Mr. G. Corson, of Leeds, ably seconded by Mr. J. R. Watson, whose knowledge of the working and detailed arrangements of theatres, both behind and before the scenes, has been of the greatest service in the preparation of the plans and in carrying out the works.

REFERENCE TO PLAN.

Ground Plan.

1. Pit stalls, amphitheatre.
2. Upper box stairs.
3. Box stairs.
4. Pay-places.
5. Treasury and office.
6. Store-place.
7. Pit-pay.
8. Transfer.
9. Queue.
10. Extra pay-place.
11. Side entrance B.
12. Professional entrance to music-room.
13. Porch.
14. Principal entrance to music-hall above.
15. Staircase, second seats.
16. Gallery stairs.
17. Stairs to amphitheatre.
18. Ladies' cloak room.
19. Gentlemen's lavatory, &c.
20. Transfer stairs.
21. Gallery inlet stairs.
22. Manager's stairs.
23. Stalls vestibule.
24. Pit-stalls refreshment passage.
25. Pantry A.
26. Gentlemen's stairs.
27. Star dressing-room.
28. Ballet dressing-room.
29. Ballet mistress.
30. Extra dressing-room.
31. Ladies' passage and stairs.
32. Super. dressing-room.
33. Hoist.
34. Store-place for chairs, &c.
35. Orchestra-stalls stairs.
36. Stage box.
37. Gallery exit stairs.
38. Refreshment-room stairs.
39. Back exit pit.
40. Acting manager's stairs.

Upper Plan.

1. Upper part of open porch.
2. Stairs up to music-hall.
3. Stairs from below.
4. Urinals.
5. Glass roof over side entrance.
6. Box stairs.
7. Carriage waiting-room.
8. Box lavatory.
9. Upper box landing.
10. Lift to library.
11. Acting-manager's office.
12. Glass roof over portion of pit corridor.
13. Principal's room.
14. Passage.
15. Ladies' cloak room.
16. Gentlemen's cloak-room.
17. Front seat staircase.
18. Second seat staircase.
19. Gallery staircase.
20. Stairs up to front seats.
21. Ante-vestibule.
22. Usher's vestibule.
23. Transfer stairs.
24. Gallery inlet-stairs.
25. Augustus staircase.
26. Manager's private stairs.
27. Up to library.
28. Stage Manager's office.
29. Stage dressing-room.
30. Hand property-room.
31. Carpenter's room.
32. Gas-man's room.
33. Star dressing-room.
34. Hoist
35. Stage corridor, prompter's side.
36. Stage stairs.
37. Upper box stairs.
38. Stage box.
39. Family boxes.
40. Gangway.
41. Top over sunk orchestra.
42. Floats.
43. Box refreshment-room.
44. Gallery outlet-stairs.
45. Refreshment-room staircase.
46. Private box corridor, O. P. side.
47. Glass roof over back exit pit.
48. Upper box stairs.
49. Gentlemen's stairs.
50. Private box corridor, P. side.
51. Air-shaft.

A NEW PLANING TABLE.

Under the somewhat ambitious title of "Sanday's Patent Universal Planing Table," Messrs. Abbott & Co., of Newark-on-Trent, are introducing what will probably be found to be a very useful appliance where perfect accuracy of work is essential. By the kindness of Mr. W. Walker, the well-known cabinet manufacturer, of Bunhill-row, the table was shown at his works on the 4th inst., and it appeared to us to deserve all that is claimed for it, barring its title of "universal,"—if that adjective is to be taken to mean that it will do all kinds of planing,—for it will not plane wide surfaces. For the use of cabinet-makers, joiners, model-makers, plane and rule makers, and for parquetry work especially, it will, we should say, be found very serviceable, for there seems to be no reason why the most accurate work should not be turned out by its aid, even by unskilled workmen. It is, in fact, a purely mechanical aid to trueness of hand-planing, and insures perfectly straight lines. It is claimed for it that all the planes now in use, such as match-planes, rabbeting and moulding planes, hollows and rounds, &c., can be used upon the table, and fixed with the greatest rapidity. The table is, in all essential respects, merely an ordinary carpenter's bench, fitted on one side with an angle-iron of the required size planed perfectly true at its outer edge, against which the plane works. This angle iron can be raised or lowered at one end as required. In order to hold work to be wrought at any convenient part of the table, special lever clamps, of novel and convenient construction, are provided, and these can be fixed in any required position, nuts let into the table being furnished for the purpose. A jaw worked by a screw, in connexion with an ordinary bench stop, is provided for holding work end-ways, and there are holes in the table to enable the bench stop to be adjusted to any length of work. A similar jaw is provided with a movable cap made of wood for holding finished work. Parallel guides, set true with the edge of the angle iron, ensure perfect parallelism. A special contrivance is made to act as a stop against which the work is placed when angles are to be planed, and is fitted with two small thumb-screw clamps for holding delicate work. A further arrangement is supplied in connexion with this, for ensuring absolute exactness in the length of any number of pieces, as in parquetry work, &c. For bevel-planing, a specially constructed plane, adjustable to any angle by being made to pivot and work in quadrants, is provided. As an example of what can be done with the aid of the table, we were shown a piece of parquetry, 7½ in. square, containing 145 pieces, with a total of 496 sides.

TOWN DRAINAGE IN THE WEST RIDING.

On Wednesday, November 6th, the drainage committee of the Heckmondwike Local Board, in the West Riding of Yorkshire, visited the sewerage and sewage works at Ossett and Castleford, accompanied by the engineer, Mr. M. Paterson, of Dewsbury. The former have just been completed at a cost of 25,000*l.*, and nearly the whole of the sewage of a very extensive and straggling district is delivered at two outfalls, one at Ossett Spa and one at Healey. The sewage at each outfall is treated alike, flowing by gravitation over a small under-shot wheel, which by working an agitator mixes the lime effectually and discharges the mixture into the stream of sewage, precisely as it strikes the bucket of the wheel. The sewage then flows into and through three settling-tanks, and so on to areas repectively two acres and one acre and a half in extent, carefully prepared as natural filter-beds. The sewage to be treated is of the most difficult kind, being chiefly,—at present,—manufacturing refuse from woollen-mills, including dye wares of all colours, so that sometimes in the course of an hour the discharge will present three distinct hues. The total population contributing to the sewers, when all connexions are made, will be about 9,000, two-thirds of which are drained by the eastern and one-third by the southern or Healey outfall.

The works at Castleford are nearly completed, and consist of a complete system of sewers, and a partial system of top water drains laid about 5 ft. below the surface, the complement of this system being made up by the existing sewers; a storage-tank sewer containing 375,000 gallons, a pumping-station, and twelve acres and a half of land. Castleford lies at the confluence of the Aire and Calder rivers, the margin whereof is very flat and liable to floods. Hence, the main intercepting river is constructed below ordinary river level, and much difficulty has been met with from water. All the difficulties have, however, been successfully overcome, and the quantity of water making its way into the whole of the main sewers has been gauged to be not more than 15,000 gallons per twenty-four hours. The engines have 16-in. cylinders and 20-in. pumps delivering into a 16-in. rising main 1,200 yards long. The engines, pumps, and boilers are in duplicate, and interchangeable in working. The rising main was tested by hydraulic pressure after jointing and before covering. It delivers on the summit of the sewage land into a gauge basin, by means of which the working of the pumps may be checked at any moment. The land is a piece of rising ground with a subsoil of fine rich loam 3 ft. to 6 ft. thick, with a substratum of clay, and is well adapted for sewage treatment. The sewage will pass on to this area without settlement in tanks, and will be caught by subsoil drainage and conducted into a shallow settling-pond constructed on a corner of the land liable to flooding, about half an acre in extent, over the sill of which it will discharge through an outlet gauge basin and 2-ft. fireclay conduit into an adjacent watercourse. All these works are now carried out, and the Local Board are pushing forward with the connexions and

private street drainage, which also has been designed by Mr. Paterson. The cost of the whole of the above works, including a cottage for the engineman, and land, &c., has been about 25,000*l.*, and the private drainage will entail a further outlay of 9,000*l.*

ST. ALBAN'S ABBEY.

THE NEW ROOF TO THE NAVE.

SIR,—I am anxious not to let the opportunity pass of making a remark on this subject, following up the letter of "S. F. C.," on p. 1154 of the *Builder*. The suggestion there made (to put a high-pitched roof only to some portion of the nave) has the merit of novelty, and other merits as well; and might deserve serious consideration if we had only to decide how little injury should be done to the building. But I must confess myself unwilling to discuss the question of limiting the damage while there is a chance of preventing it altogether. If I rightly understand, there is still a chance of the question of the roof being re-opened. The Society of Antiquaries and the other societies will now be in session, and so considerable a matter must form part of their work at the very earliest moment. Circumstances have made me acquainted with a very large number of people who look upon everything belonging to St. Alban's with especial interest. It would be possible for me to tell you the very small proportion of the whole number who look with satisfaction on what the building committee now proposes. It would also be possible to describe the indignation and regret felt by very many. It is felt that the decision was come to in the dark, under circumstances of excitement, and under something approaching to strong personal dictation. I do not know how true this may be, but subscribers to the works have put it to me forcibly in that way. The *Builder* has led the way,—as it was well entitled to do,—in strong protest against the high-pitched roof; and other journals, the *Times*, for instance, have lent less well-informed, but still powerful support. I hope, as the case is in many ways a test-case, that some permanent record of the advice and protest of the great bodies of architects and antiquaries, and lovers of our great national buildings, may yet be made.

You are aware that I did not despair of the old roof, and that I still think it might have been retained after reparation. I am quite willing not to re-open that part of the question, so long as it is not allowed to prejudice the decision on the more important one. The importance is really very great, to all who have or hope to have the care of old buildings. It is probably the first important case in which the anti-restorationists have made a strong impression, and have driven home to the minds of many people the conviction that letting things alone ought to be more largely practised, I mean in the sense of not improving old buildings according to our notions, but only helping them to endure a long time as they came down to us,—unaltered in feature. I do not call the long nave of St. Alban's as it stands perfect work, but I regard every part of it with affectionate interest, and cannot contemplate calmly as yet the radical change in its expression which is, so mistakenly as I feel, likely to be made,—in the vain endeavour to improve it.

Absence from London hinders me from referring to memoranda by which I should have liked to support the opinion of "S. F. C." as to the antiquity of the low roof over the "Decorated Bays." I am as convinced as he is that there is absolutely no evidence that a high-pitched roof ever existed over that portion of the building. I will, with your permission, take a future opportunity of dealing with this, which is worth consideration on its own account, and with comparisons drawn from other buildings, to elucidate the practice of the latter half of the fourteenth century in respect of the pitch of roofs. It will be considered by me still more deserving of some careful labour if it should prove the means of reaching many for whom the old meaning of "restoration" has still a charm; those who would never knowingly countenance interference with the original design of an ancient building. JAMES NEALE, F.S.A.

Loughborough.—Messrs. Hodson, Price, & Hodson, of Loughborough, have been appointed architects for the erection of new schools for the School Boaod of Loughborough.

ROADS.

AT the last meeting of the Liverpool Engineering Society, Mr. Robinson Souttar in the chair, Mr. George Biddle read a paper on "The Materials, Cost, and Construction of Roads." The author, while dealing with various forms of street pavement, directed the attention of the members chiefly to the consideration of macadamised and sett-paved roads. In deciding as to the material and form of construction to be adopted many things had to be taken into consideration, not only the first cost of the material and labour in laying the road, but also the subsequent cost of maintenance and scavenging. The latter of these items formed a very important element in the cost of a street. Impervious pavements were being much used in many large towns at present, and were giving most satisfactory results, though the theory that they were best was open to question. It was found that granite pavement lasted the longest of any, twenty years being the life of a first-class impervious sett-pavement. As regards the comparative safety of granite and wood, it has been found from actual observation that a horse can travel without falling three times as far on the latter as on the former. An interesting and animated discussion followed the reading of the paper, and the meeting concluded with a cordial vote of thanks to the author.

BUILDERS' BENEVOLENT INSTITUTION.

ANNIVERSARY DINNER.

THE thirty-first anniversary festival in aid of the funds of the Builders' Benevolent Institution was held on Thursday evening, the 7th inst., at the Freemasons' Tavern, Mr. Edward Conder, president, in the chair, supported by about 220 of the friends and subscribers to the charity.

The usual loyal and patriotic toasts were duly honoured, the chairman, in proposing "The Prince and Princess of Wales," referring in eulogistic terms to the services rendered by his Royal Highness in connexion with the Paris Exhibition,—services which could not but result in cementing the English and French nations still closer together in the bonds of unity and peace. Major Brutton responded for "The Army and Navy," and Captain Bird, of the First Surrey Rifles, for "The Reserve Forces."

The Chairman, in proposing the toast of the evening, "Prosperity to the Builders' Benevolent Institution," said:—Thirty-one years ago this Institution was founded by the late Mr. Cozens, and from that time to the present it has done an immense amount of good in alleviating distress, and in helping many a poor person who has seen better days. Some of those who have been our pensioners were once in affluent circumstances. I find that there are on the list of pensioners at the present time twenty-four men receiving 30*l.* a year, and twenty-three women receiving 24*l.* a year, and in a few days an election will take place for two more men and two more women. Thirty pounds a year is really but a very small sum for a person who has seen better days to live upon, and I would that it could be increased, but there are so many applicants for the benefits of this Institution that we really cannot increase it. It has, indeed, only lately been increased from 24*l.* to 30*l.* There is no doubt that the trade of the builder has more vicissitudes than almost any other trade in the metropolis. It is liable to losses from various causes, sometimes through no fault of the builder. As a case in point, I recollect that some years ago the fact of a brick falling down from one of my scaffolds cost me 800*l.* In its descent it struck against something and rebounded, and in falling it seriously hurt some one. An action was entered against me for 1,500*l.*, and I was very glad to settle the matter for 800*l.* Now such a calamity as that would cripple many men, particularly if they were only just commencing business. Those who are able to escape such calamities should be thankful that they are able to help those who are in misfortune. Again, many master builders, through being overtaken by ill-health, are not able to look after their work as they ought to do, and we all know that unless we look sharply after our work it is impossible to make it pay. Others, again, are unfortunate in their contracts, either through strikes, or from some combination of unfavourable circumstances. Some, again, seem never to do well, and almost seem destined to be unfortunate. However, for all, we do the best we can in this Institution. I must say I am very sorry to observe that the increase in the funds of this society has not been commensurate with the increase of the population of London, and with the increase of the London building trade. I find, on turning to the "Directory" for 1852 that there were then 746 builders in London, and I also find that the subscriptions and donations to this Institution for that year amounted to 1,223*l.* On turning to the "Directory" for 1878, I find the names of 1,355 builders in London, nearly double the number of those in 1852, but I am sorry to say that the subscriptions and donations for last year only amounted to 1,440*l.*, only about 200*l.* more than they were in 1852. Now this is a state of things not creditable to a great trade like ours, for undoubtedly we are the largest trade in London, and I do urge upon you and upon every member of this association to endeavour, before our next annual meeting, to obtain new subscribers to the Institution. I am quite aware that many of the larger builders, and of those connected with the building trade as merchants and manufacturers, have given liberally, and we have to thank them very much for their liberality in past times, as, I have no doubt, we shall have to thank them in the future. But when I look at the "Directory," and find that out of the 1,355 builders there specified, only about one-third of their names appear in our subscription-list, I say that there is an ample field for all zealous friends of the Institution to endeavour to obtain new subscribers to its funds. It is not always, perhaps, a very pleasant thing to be begging for subscriptions; but when we are trying to do good to our poorer brethren, it is our duty to put our personal feelings aside. Many a non-subscriber might, by a little well-directed persuasion, be induced to give a guinea to the funds of the Institution, and he will never miss it in the year's income. I am sure that if all the builders of London could see, as I have seen since I became its president, the working of this society, we should have a much larger subscription list. The committee and our very good treasurer, Mr. Plucknett, work hard in looking after the interests of the charity, and in seeing that the persons who apply to become pensioners are the right sort of people,—that they really have been builders. I can, therefore, with confidence ask you to do your utmost to aid the Institution. As builders it is our bounden duty to assist those of our trade who are in distress, and who have lost their all by misfortune and from causes beyond their control. If additional help be accorded to the Institution, the committee will be only too glad to extend the area of its operations. I, therefore, ask you to drink "Prosperity to the Builders' Benevolent Institution."

The toast was enthusiastically received.

Mr. Thomas Robinson, in felicitous terms, proposed the health of the chairman, who briefly responded.

The Chairman next proposed "The Vice-Presidents and Trustees," a body of gentlemen, he observed, who had done good suit and service for the Institution. They had given largely to its funds, and had all of them been members of the Institution for some years, or they would not be vice-presidents and trustees. With the toast was coupled the name of Mr. Freeman, who appropriately responded.

Mr. W. Higgs said it was his great pleasure and privilege to propose the health of the worthy treasurer of the Institution, Mr. George Plucknett, whose many acts of kindness and good works were known to them all. In looking after the affairs of the Institution he devoted a great deal of time and trouble, and they all wished him long life, health, and happiness.

Mr. Plucknett, who was warmly received, said the chairman, in his able and heartfelt appeal for aid in carrying on the work of the Institution, had not mentioned that the society had a capital, if he might so call it, which rendered it one of the great charitable institutions of the metropolis. It had an accumulated capital of upwards of 20,000*l.* The Institution was a perpetual charity. Its managers had entered into certain engagements which they were bound to fulfil. He cordially seconded the chairman's appeal to the members to obtain new subscribers, and he felt sure that all who felt a lively interest in the prosperity of the Institution would respond most heartily to that appeal.

The Secretary, Major Brutton, then announced

a list of subscriptions and donations, amounting in the aggregate to nearly 600*l.*, including donations of 52*l.* 10s. by the chairman, and 50*l.* by the Builders' Society.

Mr. Thomas Rider, in appropriate terms, proposed "The Architects and Surveyors," coupled with the names of Messrs. New and Franklin.

Mr. New, in responding on behalf of "The Architects," spoke of the desirability of the maintenance of harmonious relations between architects and builders, and said he should very much like to see greater interest manifested by the architectural profession in the welfare of the Builders' Benevolent Institution.

Mr. Franklin, replying for "The Surveyors," said it was not only desirable that harmony should subsist between architects and builders, but between architects, builders, and surveyors also.

The remaining toasts were "The Committee and Stewards," coupled with the name of Mr. Simpson, and "The Ladies," on whose behalf Major Brutton returned thanks in a humorous speech, and the proceedings were brought to a close at an unusually and commendably early hour,—ten o'clock.

PUBLIC OFFICES, ISLINGTON.

Additions being needed to the hall built for the Vestry in Upper-street by the late Thomas Allom over twenty years ago, it was finally decided to write to Mr. Arthur Allom, architect, to report to the committee upon the whole scheme; whose report and plans were finally adopted by the Vestry. The result is seen in a building recently erected, consisting of a large and well-proportioned public office on the ground floor, with a pay-office for roadmen; muniment-rooms, strong room, and stores beneath. The site—which is irregular in form—is about 60 ft. long by about 40 ft. in the widest part. There are no intermediate columns or supports to interfere with the view or the convenience of the public. There are lantern lights; and artificial light is obtained by two sun-burners by Strode & Co. The warming arrangements consist of four hot-water coils, combined with three open fireplaces fitted on the slow-combustion principle, much adopted in Worcestershire.

The contractors, Messrs. John Dears & Co., have just completed, under the architect's directions, the division of the offices into the various departments by means of framed partitions of pitch-pine and mahogany, 6 ft. 6 in. high, the upper panels being fitted with plate-glass, so that perfect supervision is obtained throughout.

NEW BUILDING REGULATIONS FOR GLASGOW.

The proposed new building regulations for Glasgow formed the subject of a public inquiry ordered by Mr. Cross, the Home Secretary, before Mr. Clarke, the Sheriff Principal of Lanarkshire, in the County Buildings, Glasgow, on the 31st ult.

The parties interested were represented as follows:—Mr. J. Lang, Clerk to the Police Commissioners, for that body; Mr. D. Watt, writer, for the faculty of Procurators; Mr. W. Borland, writer, for the Landlords' Association; and Mr. G. Smith, for the Factors' Association.

Mr. Lang, in opening the inquiry, explained that the regulations were intended to control the erection and alteration of buildings in the city, by providing sufficient air and light spaces and the like. The local authorities, he continued, having failed in their attempt to procure an imperial measure on the subject, had been obliged to have recourse to this form of legislation, by which the new regulations were embodied in the Provisional Order. He said that since 1844 the sanitary condition of the city, especially in relation to the dwellings of the working classes, had engaged the attention of the authorities. Prior to 1862 the statutory powers for regulating such matters were of a very limited description; indeed, they were merely those vested in the Dean of Guild Court at common law. The enactment passed in that year led to a great improvement in the construction of houses, but as the terms of the measure had been to some extent misconstrued, additional powers were still wanted, and these had been expressed in the new regulations. In conclusion, he argued that the necessity for these was evidenced by the fact that over-building was everywhere attended by a proportionately high death-rate.

Mr. Watt stated that while in favour of a general Act, he must condemn the regulations as containing powers which were of too sweeping a character to be entrusted to the Dean of Guild Court, and he urged that even if they were passed they should apply only to buildings to be erected, while he argued that compensation should be given for any existing edifices which they might affect.

Mr. Borland contended that if the desired improvements were essential they should be dealt with by a general Act, which would certainly award compensation to those whose vested interests might be impaired, and if they were merely expedient, the burden of carrying them into effect should not be placed on those whose property was affected, but on the community at large. It was a mistake to attribute the high death-rate in certain districts to over-building, especially when they were aware of the fact that the excess was due to infant mortality, which seemed to point to want of proper care of the young as the cause. The suburbs should in justice have been brought under the regulations.

Mr. Smith concurred in the whole of the objections stated by his learned friends.

The Sheriff Principal, thinking it best that these statements should be submitted to him in writing, adjourned the inquiry for a fortnight for that purpose.

MINIATURE MUSEUMS.

Mr. Tito Pagliardini read a paper at the Cheltenham Congress, on "The Desirableness and Possibility of Attaching a Rural Scholastic Museum to every Board School." He contended that now Great Britain had decreed "quantity" in education, it became necessary to look to the "quality"; that reading, writing, and arithmetic were only the keys to knowledge, not the treasure itself. Education must fit all classes for the world they live in, but mere book-teaching cannot attain this end. That the teaching of "things" should precede the teaching of "words"; the concrete prepare the way for the instructive. Mr. Pagliardini, therefore, proposes to attach to every village Board school a miniature local museum containing classified specimens of all the products, natural and industrial, of the neighbourhood,—the only expense this would entail on the ratepayers would be the addition of a wing to the school-buildings. For the furnishing the museum with specimens illustrative of the geology, flora, and fauna of the locality he trusts to the numerous amateur collectors, ladies and gentlemen, to be found in good families among the country nobility and gentry. Then the teachers will find means of giving instructive practical lessons on agriculture, gardening, industry, domestic economy, &c., as will even enrol children as contributors to "their own museum," with a museum under municipal responsibility. Mr. Pagliardini trusts confidently that the gentry of the neighbourhood will occasionally lend some of the *chefs-d'œuvre* of art with which their country seats abound, and thus bring the refining influences of art to bear upon the juvenile minds, and perhaps call forth the latent spark of some unknown Giotto, or at least to improve the children's taste through the medium of the eye, that they shall later become competent and tasteful workmen and workwomen.

PORTLAND CEMENT: THE WEIGHTS AND MEASURES ACT, 1878.

Sir,—Will you allow us, through the medium of your paper, to call the attention of cement manufacturers and merchants to the above-named Act, and to suggest that now is the proper time for a uniform standard to be adopted throughout the trade with regard to Portland cement. Hitherto, this cement has been sold to the consumer at a price per bushel, or rather a supposed bushel, it having been the custom to call 100 lb. weight a bushel, whereas the actual weight per imperial bushel should be not less than 112 lb., and in many cases when the cement is heavily burnt it weighs from 120 lb. to 130 lb. per bushel. We would, therefore, suggest that all cement should in future be sold by actual weight, and the word bushel discarded, consumers would then know exactly the value they were getting for their money, and all manufacturers and merchants would then be on the same footing, and unfair competition avoided.

John C. Gostling & Co.

HARBOUR BARS.

At a meeting of the Society of Engineers held on Monday the 4th inst., Mr. R. P. Spice, president, in the chair, a paper on "Harbour Bars, their Formation and Removal," by Mr. Henry F. Knapp, of New York, was read. After some observations upon the importance of every port having an adequate outlet for its commerce, the author proceeded to observe that bars had been divided into three classes chiefly, viz., delta, drift, and wave. He maintained that all bars and shoals in broken or rough water should be treated in reference to wave action, as that was the sole cause of their formation. Engineers had lately accepted the theory of narrowing the channel of a delta-forming river by jetties, as the great cure of bar formation in its entrance. That theory, to the author's mind, had no feasibility to recommend it. He observed that the amount of wave action of water depended on two causes, viz., wind and depth of water, both of which modified it from the extreme of smooth water to that of mountainous billows; and as engineers could not control the winds from causing wave action, they must modify wave action itself, so as to deepen bars and prevent bar formation. To carry this theory into practice for the prevention of the formation of harbour bars, as well as to remove those already formed, which the author does on the theory of interference to wave action, he proposes to construct a barrier directly across the mouth of a river or harbour on the outside of its bar, in a depth of 50 ft. or 60 ft. of water, and having a height of from 20 ft. to 30 ft. above the bed. As the height of this barrier is the only quality necessary to produce the required interference to wave action, the thickness need only be measured by the solidity necessary to withstand the force that it is intended to detract from the waves. This barrier, according to the author, will not offer any impediment to the free discharge of the waters of the river, but on the contrary will protect and facilitate that discharge. Neither would it offer any impediment to vessels passing in and out at all times, as its top would be lower than that of the bar. Its sole use would be to destroy the building-up power of the waves, leaving unimpaired the full force of the river to cut out the bar.

COVERHAM CHURCH, YORKSHIRE.

This church has been restored and in a great measure rebuilt, from the designs and under the superintendence of Mr. C. G. Wray, architect, of London, at considerable cost. The tower, nave arcade, north side of chancel, north aisle and porch, which are all ancient, and possess much interest, have been preserved and restored according to their original character. The entrance-door from the porch is Norman, and the north side of the chancel possesses two Early English windows, the best being all early Perpendicular; several of these windows are filled in with stained glass.

The nave arcade has double splayed arches springing from octagon shafts without intervening capitals. A curious Jacobean three-light window has been removed from the east end of the chancel (which has had to be pulled down) to the west end of the north aisle, and an ancient cross, probably from Coverham Abbey adjoining, which was placed on the gable, has now been fixed over the porch. The north side of the church, which had been destroyed and rebuilt in very bad taste, apparently about a hundred years ago, lessening the width of the nave considerably, has been pulled down, and a new north side, a new east end, and a new richly-moulded chancel arch and piers, as also a new vestry and organ-chamber, have been erected in West Whitton stone.

The buttresses of the nave have been designed in conformity with an original one, which happily had been preserved adjoining the tower at the destruction of the north side.

The new windows are flowing Decorated in character, and of original and elaborate design. The chancel buttresses and the gable crosses are also of ornate description.

The church has been entirely reroofed in pitch pine, open-timbered, and covered with Westmoreland slates. It has been reseated throughout with open benches, and moulded and cut bench ends, all in pitch pine, and the seats are fitted with a novel contrivance for holding hats.

The pulpit, prayer-desk, chancel stalls, con-

munion-rails, and table are also new, and of handsome and original design. A new font, of Caen stone, designed by the architect, is the gift of the contractors.

The nave and aisle are paved with patent polished concrete, margined with glazed encaustic tiles. The chancel is paved with encaustic tiles, presented by the patron of the church, Mr. Thomas Topham, who has also given a new stained-glass window (by Messrs. Wailes, of Newcastle) for the east end of the aisle, and (with his family) one by Messrs. Hardman & Co., of Birmingham, for the east window of the chancel, as also reredos of majolica tiles (executed by Messrs. Maw & Co., of Broseley) for the east end of the north aisle.

Another tile reredos (supplied by Messrs. Minton & Co.) has been erected at the east end of the chancel, at the cost of Mr. Christopher Other, of Coverham Abbey.

The heating of the church is effected by hot-water pipes, the boiler being in an apparatus-room under the vestry, and has been executed by Messrs. Jones & Son, of Bankside, London.

The whole of the building works, including the seats and fittings, have been executed by Messrs. Jones & Sons, of Leyburn, Yorkshire. Mr. McWillie, of Leyburn, has been the clerk of the works.

The church was to be opened by the Bishop of Ripon on the 14th inst.

DRAINAGE ITEMS.

Maidstone.—Mr. J. T. Harrison, C.E., has held an inquiry at Maidstone relative to an application by the Town Council for permission to borrow 20,000*l.* for works of sewerage to be carried out under the direction of Mr. Lewis Angell, C.E. Mr. Angell said his original estimate for the work was 25,704*l.*, or with 651*l.* for Fant sewerage, the sum was 26,335*l.* Including engineers' costs, clerk of the work's salary, &c., the estimate was given at about 30,000*l.* The work was divided into three contracts. No. 1 contract comprised the main outfall sewer, and the amount was 12,363*l.* 9s. The work of this contract was practically finished. The contractors had made an extra claim of 3,206*l.*, on the ground that the foundations were bad, and that, instead of the ordinary sized sewers, they were obliged to make them larger and use much more cement in going through the old river bed. The second contract, which was for the tanks, amounted to 4,119*l.* A great deal of cement had had to be put in to strengthen the tanks. There was an estimated extra cost of 500*l.* for iron girders, &c., to further strengthen the tanks, but it had not yet been found necessary to use them. This would make the total cost of the tanks to be 4,619*l.*, or 1,619*l.* in excess of the original estimate, which was 3,000*l.* The third contract, which was for the drainage of the town, was let for 21,450*l.*, or some 9,000*l.* more than the estimate. The extra cost was accounted for by the increase in the contractors' prices, caused by the difficult character of the ground. A great deal of rock was found in the ground, and this, of course, increased the difficulty of the work. A sewer 7,630 ft. in length had been made to the Barming Heath Lunatic Asylum, which was not at first contemplated. The estimated cost of the Tovil sewerage was 2,000*l.*, and this had been contracted for. It had, however, since been proposed to carry out a different scheme. Lord Romney's agents, who were laying out land for building purposes, wanted the sewer to be laid up a new road which was to be constructed; and if this were done the cost would be 3,000*l.* If the original plan were carried out the total cost would be about 2,500*l.*, as 500*l.* would have to be paid as compensation. Lord Romney's agents had, however, now suggested another plan by which the cost would be made about the same, but the matter was still in abeyance. The cost, no doubt, would be about 2,500*l.* A sum of about 1,500*l.* was required for the piling of the sewage-tanks for a distance of 300 ft.; certain machinery necessary for the mixing of lime with the sewage would cost 500*l.*; a cottage at the tanks would cost 300*l.*; and 500*l.* would be the expense of inserting ventilating shafts in the old sewers. Including these items with the amount of the three contracts (37,932*l.*) and the sum required for extra works (5,500*l.*) this would make a total of 48,732*l.* for the work of drainage. Mr. Hoar, clerk to the Maidstone Local Board, said the remaining expenses were:—Engineering expenses (5 per cent. on the outlay), about 2,400*l.*; clerk of the works (two years), 200*l.*; additional inspector for six months, 75*l.*; six acres of land, 1,000*l.*; cost of purchase, 250*l.*; compensation, 2,000*l.*; his (Mr. Hoar's) law expenses, 1,000*l.*; advertising and printing, 60*l.*; and arbitrators, 50*l.* The inspector said this would make a grand total of 56,45*l.* for the works. The Town Council had already borrowed 30,000*l.* He asked the Town Council to reconsider the amount for which they had applied for drainage purposes, as it was evidently insufficient.

Acomb.—The Great Ouseburn Local Board propose to expend 1,000*l.* for works of sewerage and sewage disposal for the township of Acomb, where there are about 300 houses, the flow of sewage being 10,000 gallons per day. The works are to be carried out under the direction of Mr. Hornsey, the surveyor to the Board, and application has been made to the Local Government Board for permission to borrow the money required.

UTILISATION OF SEWAGE.

Dantzic.—Mr. Alexander Aird, who has successfully utilised the sewage of Dantzic for seven years, sends us a glowing account of the crops grown on what was once a barren sand. He has has also just contracted with the Municipality of Breslau (260,000 inhabitants) to utilise for twelve years, on 3,000 acres, the whole of the sewage of that city. He says that in Berlin the sewage irrigation system has already proved a great success, and that all the larger towns in Germany are preparing to carry out the same system. The Dantzic sewaged lands have this year produced crops of all kinds, exceeding those on the good lands—potatoes, 16½ tons per acre; white carrots, 14½ tons per acre. We shall give some particulars before long.

Kidderminster.—The new engines for pumping the sewage of Kidderminster were formally "inaugurated" on the 30th ult. Hitherto, the sewage has been received in tanks, and pumped thence about three miles to the sewage-farm of the Corporation near Stourport. By the use of the new pumping machinery the sewage will be pumped direct to the sewage-farm. The new system also makes special provision for dealing with the storm water. The outlay upon the work is 4,000*l.* The works have been carried out under the direction of the borough engineer, Mr. Comber.

COTTAGE HOSPITALS.

Mold.—A new cottage hospital has been erected at Mold, just beyond the Bailey-hill, on a very suitable site, at a cost of about 1,200*l.* Furnishing will cost about 600*l.* The hospital contains accommodation for eight patients, and has been erected from the designs of Mr. J. Douglas, architect, Chester.

Walsall.—The new cottage hospital at Walsall was opened on the 4th inst. It consists of three main buildings, with out-patients' department and other appurtenances, the wards being capable of complete isolation. The three chief buildings front the Wednesbury-road, and have an out-patient room on the Vicarage-place, and mortuary, *post-mortem* room, and other out-buildings in the rear. In the centre is the entrance-hall leading to the main corridor. Right and left of the entrance-hall are rooms for the sister-in-charge, the surgeon, board-room, &c. The left wing contains the female wards, —one called the Sister Dora Ward and the other the Forster Ward. The former is for eight beds, and is 33 ft. long by 25 ft. wide, with nurses' room and a day-room for patients attached. The Forster Ward is for four beds, and is 15 ft. by 26 ft. In this wing also is situated the operating-room, with its necessary adjuncts. The right wing is considerably larger than that on the left. It contains five wards, named the Bradford, the Hatherton, the Lyon, the Barnett, and the Foresters'. The Barnett and Lyon wards are for eight beds each, their dimensions being 33 ft. by 23 ft. The Bradford and Hatherton wards are each 15 ft. by 13 ft., and are to accommodate two beds each. The Foresters' ward is 26 ft. by 15 ft., and is for four beds. To each ward is attached nurses' room, bath-room, closets, day-rooms, and every convenience. The whole are connected by glazed corridors heated with hot water. Beneath the Sister Dora Ward a large room has been made for the accommodation of the Coroner and his jury at inquests, or for meetings of the subscribers, &c. The wards are heated with coal fires, with Shillito & Shorland's Manchester grates. The total number of beds is thirty-six, and each patient has a space of 36 ft. superficial area, with 1,000 cubic feet of air. The buildings have been erected by Mr. D. Moore, of Walsall.

DARLINGTON.

Mechanics' Hall.—The Darlington Mechanics' Hall has been re-opened, after decoration from designs by Mr. Pritchett, architect. Four of Watson's "double-current ventilating turrets" have been erected. The joiner work has been carried out by Mr. J. C. Martin; the brick work and plasterers' work by Mr. Robinson; heating apparatus by Messrs. Richardson & Co.; smiths' work, Mr. Ridley; gasfitters' and glaziers' work by Mr. Johnson. The painting and decorative work has been done by Messrs. Mossom & Son.

Closing of Ironworks.—The *Darlington and Stockton Times* announces that the Whessoe Ironworks will shortly be closed. They were commenced about eleven years ago as a co-operative concern under the name of the Drinkfield Works. As a co-operative concern they were unsuccessful, and after changes and attempts at reconstruction they passed into the hands of Messrs. Vaughan & Co., but after a very short period of work they stopped, and have lain idle for five or six years. The trustees of the late owners have now resolved to dismantle the works, and to sell the whole of the fixed plant, boilers, and furnaces, by auction. The works include forty puddling-furnaces and one rolling-mill, and the value might have once been set down at from 30,000*l.* to 40,000*l.*——The Darlington Iron Company's works, which for a long time have only been employing a small number of men, have already been closed, and the remaining workmen paid off. During the prosperous period of the iron trade which prevailed some years ago, the company at their two works employed 2,000 men, but for a considerable period only about 100 men had been at work there.

NEW PARKS.

Longton.—The Duke of Sutherland has intimated his intention of giving a park to the people of Longton. The land forms a portion of his estate near Trentham, and is known as Cocknage Wood. The plans are already being prepared, and the land will shortly be laid out.

Paddington.—On the 28th ult. a meeting of the inhabitants of Paddington was held at the Vestry-hall, for the purpose of urging the desirability of securing an open space of ground in the north-west portion of Paddington, situated between Portsdown-road, Shirland-road, Kilburn Park-road, and Sutherland-gardens, as a place of recreation for the population of the adjacent neighbourhood, which consists of about 100,000 persons, chiefly of the working-classes. Resolutions were passed declaring the necessity for open spaces, and memorialising the Metropolitan Board of Works for assistance in securing the spot referred to, which has been advertised to be let for building purposes.

ARBROATH ABBEY CHURCH.

SIR,—As the architects of the alterations on Arbroath Abbey Church, referred to in a somewhat ambiguous paragraph in your last week's issue, permit us to state that the church operated upon is a comparatively recent building.

It has been found necessary to increase the accommodation, and in so doing the pews have been reversed and the gallery staircases placed outside the original building and enclosed by temporary brick walls.

When funds permit, these walls will be removed and stone substituted.

In the meantime, any attempt at architectural effect is confined to the interior. MACLAREN & AITKEN.

Roman Catholic School Chapel, Mansfield, Notts.—A new school chapel, to accommodate about 250 sittings and children respectively, has been erected adjoining the convent of Sisters of Mercy, the Manor House, Mansfield, from the design of Mr. C. G. Wray, architect, and has been recently opened. The school is built of red bricks, with Mansfield stone bands and dressings, and the front has an ornamental belfry surmounting the gable. The roof internally is open to the collars. Mr. W. A. Vallance, of Mansfield, was the contractor.

ARCHITECTURE POPULARISED.

SIR,—It is a lamentable fact in connexion with the architectural profession that every petty builder may dub himself an architect, and practise as such without fear of restraint, although devoid of all necessary qualifications.

On scientific and sanitary grounds this is to be deplored. Artistically, these usurpers soon find their level, and sink into comparative insignificance. Although debarred from practising in the higher walks of the profession, they still largely monopolise that architectural field where a popular appreciation for art should have its roots, viz., in the houses of the people. It will be difficult to popularise architecture whilst the great bulk of the middle-class dwellings are devoid of architectural pretensions. One great advantage would accrue to the profession if architecture could be rendered popular as a study amongst the people, viz., these usurpers of architectural honours would soon disappear before the criticism of an appreciative and enlightened public. Many architects would no doubt deprecate the notion of popularising the study of their art, prompted by a fear that the amateur would ultimately excel the professor. In some this would not be a groundless fear. That such a feeling should disquiet and drive to desperation all those who play at architecture is no cause for wonderment when we remember that one of the greatest of modern sculptors and artists was himself troubled at a proposal to popularise art. The Earl of Elgin, in one of his letters, says,—"I have never failed to entertain, and to express on every suitable occasion, a very strong conviction that the remains of Athenian sculpture, now in the British Museum, ought to be removed to a situation of more general resort, chiefly on the principle, so applicable to the circumstances of society in England, of the advantage, or indeed necessity, of elevating the taste of the employers, if it is attempted to improve the style and productions of art with us." . . . . "I well remember Flaxman's objections to my views, which originated, it afterwards appeared, in the very natural apprehension, that were the style of the Parthenon decorations admitted as the guide at that time, his own eminence would run some risk from it."

Architecture, to become a popular study, must be presented as an art devoid of technicalities, and without too much science. So soon as the populace could discriminate between the good and the bad in architecture, we might then hope to see the ranks of the profession number only such as were excellent. All architects would then consider the attainment of perfection in their art as "no honour to have it, but a dishonour not to have it." Our architecture would be purer, and aim at greater consistency from having to undergo more crucial tests and critical comparisons. It has been truly said that "that art which challenges criticism must always be superior to that which shuns it." Architecture popularised would tend to foster a commendable national pride for the acquisition of the best that the art could produce. Public opinion would then decide as to the merits of contemplated national structures, and we should not have the mortification of again seeing talent compelled to prostitute itself to the whimsical demands of individual caprice. Another advantage to be gained from a popular appreciation of architecture would be the stamping out of that baneful "utilitarianism" so prejudicial to the true interests of art. To look at the great bulk of our dwellings, it could almost be conceived that a royal mandate had gone forth through the land ordering all houses to be stamped with the broad arrow of "utilitarianism." Popularising architecture would eradicate the quacks, and at the same time augment the ranks of the profession with real and genuine art-workers. This would cheapen good art, but we should have a greater and ever-increasing demand for all such works as were consistent and beautiful.

The intention, when popularising architecture or the sister arts, is not to make every individual an architect, painter, or sculptor, but to create in the minds of the populace an appreciation and reverence for the best artistic productions; to cherish, in fact, a national feeling similar to that ascribed by Ruskin to the Mediævals when he says that "nothing is more notable than the confidence of the builders in the respect of the people for their work. A great school of architecture cannot exist when this respect cannot be calculated upon, as it would be vain to put fine sculpture within the reach of a population whose only pleasure would be in defacing it."

The study of archæology might have been made a potent auxiliary in aiding the advancement of art-culture, whereas it has done little more than instil into the minds of its votaries a slavish adoration for all that possesses the questionable merit of being *old*. Things are not sought after because of their intrinsic beauty or superior excellence, but merely in consequence of their age. In cases where modern superiority is self-evident, it is conceded with reluctance by the veteran archæologist. The study of architecture archæologically is inseparably connected with history. It remains a question, however, whether, when popularising this study, it should not take the form of a systematic course of general artistic instruction, devoid of particular local associations. The mere curiosities of architecture arising from accidental causes, such as locality, general and particular historical associations, are readily accessible to the public through the medium of guide-books; but visitors to Salisbury and Amiens Cathedrals have no standard of excellence whereby to compare the artistic merits of the two edifices, or to discover wherein consists artistically the superiority of either.

I could conceive it possible to teach architecture as an art in a popular way by means of a series of well and carefully selected parallels. It is not sufficient that you teach the people what is good in art, but you must likewise familiarise them with that which is bad, and thus enable them to avoid error. By a series of parallels, the beauties of buildings of acknowledged merit and standards of excellence could be clearly defined and compared with other structures where deviations had been made resulting in other and varied combinations, or in actual blemishes. Where architecture is to be studied scientifically, and as a profession, it is well to begin early; but in cases where an insight into its artistic capabilities is alone required, with a view to increasing the appreciation and zest for architectural embellishment, it were well to wait until the understanding be matured before entering upon the study. The study of art, to be accompanied with pleasure, should be voluntary and not forced, and for this reason the introduction of architectural studies at school is of questionable advantage. The interests of art would not suffer by this arrangement; for, as a rule, it is not the youthful portion of the population that encourages and patronises art. As already stated, it is not required to teach architecture to the masses as a professed science, "but what ought to be taught, are the first principles of design as the groundwork of taste and feeling in art, and a familiarity with the best productions of antiquity, their peculiar characteristics and attributes, and the principles, whether moral or physical, on which the ancients cultivated the fine arts in such endless profusion and variety of material, and in all attained an equal degree of perfection." The notion of dinning artistic precepts into the youthful mind is somewhat reprehensible, and should not be attempted until the understanding is sufficiently awakened to comprehend the deeper significance of art.

Many of the beauties of ancient and modern classics are lost upon the man, owing to the youthful mind having been satiated with them at college or school. "The youth has lost all feeling for the real beauties of the books he reads, because they are only put into his hands to teach him a knowledge of words, of long and short syllables, of accents, and the varieties of dialects." From this cause Byron contracted a great abhorrence for Horace. How many of the sublimest passages of Shakspeare pall upon the appetite from too early familiarity?

A correspondent of the *Builder* has recently shown the absurdity of preaching too much art, as it will ultimately satiate with too much familiarity. There exists, however, around the study of architecture a peculiar charm apart from any theories of art. As an archæological study it constitutes one of the most fascinating inquiries, and whether we trace its progress through ancient or modern times, it is so inseparably connected with all that is remarkable in the world's history that every man of liberal education should count a knowledge of architecture as necessary as the acquisition of two or three dead languages.

I trust that you, sir, will not flag in your endeavours to popularise architecture, which all would study could they but conceive how it "embraces all that is beautiful in art," whilst it "refines and regulates our perception of beauty."

JAMES GEO. BUCKLE.

THE LONDON TRAMWAYS COMPANY.

RELAYING THE TRAMWAYS.

THE London Tramways Company have resolved upon following the example of the great railway companies, by relaying the whole of their lines on the south side of the Thames with steel rails, at an outlay, it is stated, of upwards of 30,000*l*. The first section of the work is now in progress, and comprises the relaying of the road between Westminster Bridge-road and Kennington Park, a distance of about two miles in length. This roadway is being reconstructed with steel rails and new granite pitching, of a very superior quality, the law placing upon the company the work of repairing the roads travelled by the tram-cars. The work is being carried forward without the traffic being interfered with, temporary sidings and shunting-points having been laid down at different parts of the road. About one half of the work has already been completed, and when finished the relaying of those portions of the company's system, between Kennington Church and Water-lane, Brixton, and Clapham-common, will be entered upon, and likewise in succession the several routes between Blackfriars and Walworth and Camberwell roads, Peckham-road to New-cross and Greenwich, and also between the Elephant and Castle and New and Old Kent roads. We understand that the company have determined to abandon altogether the asphalte pavement and adopt granite exclusively, as being more substantial and durable. Messrs. Mowlem, Burt, & Co. are the contractors, and have a large number of men employed upon the works. Although the first outlay will involve a heavy expenditure, the directors calculate that there will ultimately be a great saving and other advantages in the duration of steel as compared with iron rails, the several railway companies having found from experience that steel will last ten times as long as iron. The company are likewise expending a considerable sum in new depôts and stabling at different points along their lines. They have bought ground and are building a depôt at Bowles-road, off the Old Kent-road, which will accommodate 26 cars and 160 horses. Additional stables and fittings are also being erected at the railway-arches at Peckham. At a meeting of the company recently held, the chairman stated that the estimated expenditure on the permanent way and renewals during the next three years was 27,000*l*. The renewals on the Brixton-road would cost 11,000*l*.; the Kensington-road, 7,400*l*.; and the Walworth and Camberwell roads about 10,000*l*.; but they were not afraid to meet such an outlay spread over that time, and he felt that even with their present earnings they would be able to give the shareholders a 9 per cent. dividend in February next, making 6 per cent. for the year.

THE DRAINAGE OF THE THAMES VALLEY.

THE scheme of Mr. Haywood, engineer and surveyor to the Commissioners of Sewers, for the drainage of the Thames valley, which has been accepted by the Drainage Board, is one of twenty-five plans which was submitted to the Board. Four of the schemes contemplated carrying away the sewage to the sea; twelve proposed a system of irrigation; three of the schemes involved the precipitation and filtration principle; and two the precipitation principle only. Mr. Haywood's scheme, which the Drainage Board have decided to carry out, involves the irrigation system, and its estimated cost is 268,000*l*. Mr. Haywood's plans contemplate the purchase of 700 acres of land situated on the banks of the Mole and the Ember, about a mile from the river Thames. On a portion of the land so to be purchased pumping-engines and tanks will be erected, and into these tanks the sewage will be raised, the solid and fibrous matter being allowed to deposit. The sewage will then be purified by distributing it over the ground, which will be prepared to receive it by deep drainage. No chemical process with the sewage is contemplated. The main sewer for the district will be on the Surrey side of the Thames, and will pass through the several parishes of Thames Ditton, Long Ditton, Surbiton, Kingston, Ham, Petersham, Richmond, and Mortlake to Barnes. In addition to the main pumping-engine and station above named, there will also be two other smaller

pumping-stations—one at Ham Fields, and the other at Mortlake, near the Richmond Gas Works. There will be seven branch sewers from the main sewer, at the following places respectively, viz.:—East and West Moulsey and Hampton; Esher; Long Ditton, Kingston-common, and Hook; New Malden, Hampton Wick, and Teddington; Heston and Isleworth; and Kew. The sewers will be of such sizes that Twickenham can be included if desired.

THREATENED DESTRUCTION.

SIR,—I am sure that you and most of your readers will be astonished to hear that there is a proposal to pull down the beautiful little church of Penton-Mewsey, Hants. Can nothing be done to call the attention of the art-loving public to this wanton act of destruction? Penton-Mewsey church is simply the most perfect little fourteenth-century village church in England. It has been very carefully illustrated in "Weale's Architectural Papers," from drawings made by Mr. Street. H. W. BREWER.

BRIGHT BUOYS.

SIR,—Permit me to make a suggestion through the medium of your widely-circulating journal,—a suggestion which concerns the Trinity House, electricians, and all seafarers. It appears to me that the time has come when every buoy, along our rivers, channels, and coasts should be "lights." They might possibly be made self-illuminating if a pile of the proper kind were placed in their "holds." Will Mr. Edison, or some of our own physicists, both in the interests of humanity and of property, take this matter in hand? W. C. T.

SHORT TIME IN WINTER.

SIR,—It is devoutly to be hoped that the present depression in trade will enforce on all (employers and workmen) a better regard to economy, not only in their expenditure, but in the cost of production. There is a matter in the building trade especially which I think should be immediately altered. I mean as to the great loss arising from the pretence of carrying on building works without light. The hours of work on buildings and in open sheds are from seven a.m. to five p.m. in winter, with a deduction of one hour and a half for meals. It is perfectly obvious to every one that, from Christmas-day to nearly the end of January there is no daylight before eight a.m., and it becomes dark soon after four p.m. I am perfectly confident that, during these short days, there is a daily loss of from one hour to two hours by men merely pretending to work, or something like 5*l.* per day for every hundred men employed.

I therefore suggest that, from Christmas-day to the last Saturday in January, the hours of work should be from 8 a.m. to 4·30 p.m., allowing half an hour for dinner, so that the men would work (including Saturdays) forty-four hours per week, which is all the time they could possibly see. I think there would be an advantage to the workmen in the alteration, because the public would feel that they would only pay for the actual time worked, whereas under the present system, knowing that they will have to pay for hours not worked at all, every work possible is postponed until February.

A RETIRED BUILDER.

COFFEE TAVERNS.

SIR,—Your known advocacy of a vast range of movements tending to improve social life and order encourages me, while I see on my desk your account of the opening of a new coffee tavern to write in the hope that I may induce you to join in urging legislation on this subject, which shall require all licensed houses to supply their customers with coffee, cocoa, and other unintoxicating drinks and refreshment, in addition to the intoxicating drinks for the sale of which they are licensed.

We are all professionally familiar with the great commercial value a licence gives a house, at times trebling, quadrupling, or still more largely multiplying its previous value. Such a gift of the Legislature, therefore, as a licence should make the imposition of a requirement to furnish unintoxicating drinks of a good quality, in cups, at a reasonable price, together with the further supervision the requirement might involve, not burdensome; while the immediate scattering all over the country, not only beside the publichouses, but within their very walls, of a means of procuring unintoxicating drinks and refreshment, would, in my opinion, surpass in its good effects the results of the unaided efforts of the Coffee Tavern Company, if carried on for a century.

An old man, a foreman of works and a teetotaller, relating to me his efforts to preserve his weaker brethren from drink, told me that a sobriety of three or four months' duration, or longer, if broken down, was almost invariably so broken down by the social desire inspired by the less abstemious to drink and give "a glass." In such cases of temptation of how little avail would a coffee-tavern be; but if, besides the glass of beer or gin, tea, coffee, and cocoa could be as readily procured, there would be yet a chance of preserving the lately-acquired habit of the abstemious man. And in the bare name of right and justice we should surely not ask less of him who, to his own great gain, is licensed to sell that the drinking of which so easily becomes a social pest, than to supply every one with equal readiness the drink and food which will slake thirst and stimulate life without the dreaded danger to the community.

HORACE FIELD.

THE EXHIBITIONS OF THE SANITARY INSTITUTE.

SIR,—Previously to the Exhibition at Leamington last year I received a communication from Mr. Robinson to the effect that it was not the intention of the Council of the Social Science Association to hold an Exhibition at Aberdeen. Mr. Robinson at the same time recommended to us the gentleman who had assisted him in getting up his former Exhibitions, and very kindly offered to place at the disposal of the Institute any information in his possession. Again, before the recent Exhibition was opened at Stafford, in reply to an inquiry as to whether there would be an Exhibition in connection with the meeting of the Social Science at Cheltenham, I received a circular from the local secretaries informing me that there would be no Exhibition.

The chief work of the Sanitary Institute consists in the examination and granting of certificates of competence to local surveyors and inspectors of nuisances, and in investigating and reporting upon sanitary appliances and inventions. This part of the work of the Institute is of great public importance, and does not come within the scope of any other society with which I am acquainted.

I feel it necessary to make these few additional observations in the hope that I may remove any wrong impression that your article may have created as to the object which the Institute has in view. The just importance which is attached to anything that appears in your valuable journal will, I hope be a sufficient apology for my asking you to find a space in your next issue for this communication.

LOAY MARSH, M.D.

RAILWAY FARES.

SIR,—In a recent number you had an article on railway traffic returns: if you would allow me to say a few words on the subject in your columns it would oblige. I have for some years spent a fair amount in travelling, almost entirely for pleasure, and, as my means increased, I had a desire to travel second instead of third class, and finding that for return-tickets in day excursions the difference was trifling, I did so. However, the first time I had to undertake a long journey I was most effectually deterred going second class. I found that the third-class fare was 10*s.* 1*d.*, the second was 18*s.* Such a difference seemed to me utterly monstrous in its absurdity. I feel confident that were there only a sensible and reasonable difference between second and third class fare, say from 10 to 15 per cent., or even as high as 20, second class would be patronised to so much greater an extent that the railways would earn hundreds of thousands more per annum than they do now. I find on looking over the "A, B, C," that the normal difference between these two classes is from 50 to 80 per cent. A TRAVELLER.

IMPERFECT VENTILATION.

A QUESTION.

SIR,—Will you kindly, through the medium of your valuable journal, oblige me with giving publicity to the facts of the following case, in the hope that it may elicit from some of your readers some practical suggestions for remedying the evil.

The building was erected for public worship in 1876, and will seat about 1,000 to 1,100 persons. Soon after it was opened, it was discovered that a very strong draught swept round the gallery, and was slightly felt in the body of the chapel. This draught is seldom felt until the place is filled with people. It appears as if the air rushed into the building and was unable to find an exit; even the opening of the windows is of no avail, but, if anything, tends to increase the draught. The only ventilation at the ceiling is under the gallery, where a number of ventilators are fixed in the walls.

The architect's idea apparently was that the sun-burners in the ceiling would act as ventilators (as there is between the ceiling and roof ventilation provided by openings in each gable); but it is very evident that, for that purpose, they are absolutely useless. It has been suggested that a large ventilator should be fixed in the centre of the ceiling between the sun-burners, or that ventilators should be placed in the walls close to the ceiling; but the trustees are unwilling to expend money simply on experiments, and they would like to know, before they attempt an alteration, if it is likely to succeed. I should, therefore, esteem it a great favour if some of your numerous readers would kindly suggest something which would remedy the very bad ventilation of this building.

M. J. W. CHAMBERLAIN.

ARCHITECTS' ACTIONS.

LAWRENCE *v.* CRANCH.

THIS was an action brought in the Newport County Court by Mr. B. Lawrence, architect, to recover 40*l.* from Mr. R. L. Cranch, book-keeper at the Old Bank, Monmouth, the amount agreed upon for plans and specification which the plaintiff had prepared at defendant's request.

In the month of December last the plaintiff went to Monmouth, at defendant's request, to confer with him about building a new house in the Old Hereford-road. Defendant said he was ready to spend about 800*l.*, and plaintiff agreed to do the usual work of an architect, making plans and specification, and superintending the work,—for 40*l.*, whether the building cost 800*l.* or more. Defendant gave plaintiff a sketch of his own ideas as to what he required, and plaintiff prepared plans and specification, which he sent to the defendant. Various alterations and additions were made by the defendant, who required more expensive work, and when the plans were altered and tenders obtained, the cost was more than double the sum which the defendant in the first instance said he was prepared to spend. Then the defendant used the plans which were of no use to him, to build a house, and he asked the plaintiff for compensation for the loss of time which he (the defendant) had sustained in meeting the plaintiff so many times.

After the plaintiff had been examined, Messrs. G. Jones, H. B. Sketch, C. Miles, and J. Linton, builders, Newport, were examined as to the carrying out of the work. The first set of plans, they said, might have been carried out for between 800*l.* and 900*l.*, and the altered plans for between 1,300*l.* and 1,400*l.*

Mr. Carter said the defence was that the defendant had received no benefit from the plans, and the plaintiff had no right to recover. The defendant was examined, and stated that he told the plaintiff he wanted a house built for 800*l.* He asked plaintiff what his commission would be, and he said he would do the work for 40*l.* Plaintiff never said there would be any additional cost. When the plans were finally agreed upon, defendant advertised for tenders, and received three—the lowest being 1,785*l.*

His Honour said he was of opinion that the defendant had failed to show that the house as first planned could not have been built for 800*l.* Defendant must have been aware that the alterations ordered would add very much to the cost of the house, and, therefore, although it would have been right and prudent for the plaintiff to have warned him as to the additional cost, he could not think that defendant was entitled to judgment. His Honour, therefore, held that the plaintiff was entitled to judgment, and he thought there was sufficient to justify him in giving the plaintiff 20*l.*, half the original sum for plans and half for superintendence, and he thought the plaintiff should have sued for that amount and no more. Judgment for 20*l.* and the usual costs.

FALSE TIME-SHEETS.

AT Worship-street, Michael Hickey, 53, of D'Eynsford-road, Camberwell, was engaged before Mr. Ruseny with falsifying documents with intent to defraud. Mr. Besley, barrister, appeared for the prosecution; Mr. H. M. Ogle, solicitor, defended. The evidence showed that the prisoner was in the employment of Messrs. Colls & Son, builders, of Moorgate-street and Camberwell. They were executing work in Great Eastern-street, Shoreditch, and the prisoner was engaged under contract to look after the men there. The documents he was charged with forging were "time-sheets" of men under him. The "time-sheets" were forms supplied to the men by the prosecutors, and were filled up by the men with the number of hours each day they worked. They were then handed to the prisoner, who presented them at the office, where, after they had been examined, he received the money. Two men named Taylor and Jennett deposed that they were engaged by the prisoner at 8*d.* an hour. The "time-sheets" put in by the prosecutors showed that the prisoner, on the 4th, 11th, 18th, and 25th of October, had charged 9*l.* 1*s.* for a man named Taylor, putting the difference between what he received and what he paid—a total of 1*l.* 11*s.* 11*d.*—into his own pocket. The prisoner was fully committed for trial to the Central Criminal Court.

IMPORTANT TO OWNERS OF HOUSE PROPERTY.

THE VESTRY OF SHOREDITCH *v.* COOK.

AT the Worship-street Police Court, on the 7th inst., Mr Robert Charles Cook, a builder, of 32, Norton-folgate, was summoned before Mr. Bushby by the Vestry of the parish of St. Leonard, Shoreditch, for having neglected to pay the sum of 67*l.* 11*s.* 9*d.*, moneys expended by the vestry in executing certain works on houses belonging to Mr. Cook, which the defendant had neglected to do when required.

Mr. Besley, barrister, instructed by Mr. Walker, vestry clerk, supported the summons; and Mr. Horace Smith defended, the case being fought on a contention by the defendant that the Vestry had improperly interfered.

The facts were shortly these:—

The defendant had bought, in August, 1877, a block of twenty houses in Pointer's-buildings and Norfolk-gardens, Shoreditch. The houses were in a very bad condition, and for some time previously the Vestry had been serving notices to have certain works done upon them. Mr. Cook admitted that he knew this at the time of his purchase. Subsequently, the Vestry served a number of notices, pointing out the work required, particularly with reference to the removal of four cesspools upon the property, and the drainage of the houses into the sewer, the state of the houses being a nuisance and injurious to health. Matters went on until February last, very little having been done by three men who had been set to work, and that work done unsatisfactorily, a cesspool having been partly emptied and left open till the next day. In February, the Vestry, fearing the consequences to the surrounding neighbourhood, entered into a contract for the necessary work, and then, in pursuance of several notices given to the defendant,

sent a gang of men on to the premises and did the work required, the cost amounting to 67*l.* 11s. 9d.

Mr. Horace Smith contended that the work was not such as was contemplated by the Building Act, and therefore that the Vestry were not empowered to act as they had done, but Mr. Bushby overruled the objection.

Evidence was offered, for the defence, that the work had been commenced by the defendant; but after hearing several witnesses *pro* and *con.*, Mr. Bushby said that the whole case involved only one point,—whether the defendant had with reasonable despatch carried out the work required by the Vestry, and whether such work was necessary to be done. As to the latter he had not the least doubt. It was shown that there was one cesspool to four houses, and no connexion with the main sewer, that the soil of twenty years had accumulated there, and the pipes for surface-drainage ran into those cesspools. Mr. Bushby thought the Vestry were not wrong in coming to the conclusion that the work was not being done with reasonable despatch, and that they were quite within their powers in entering the premises and doing the work themselves. He gave judgment for the Vestry, and ordered the defendant to pay the amount claimed, which, it should be stated, the Vestry proved they had actually expended, and also allowed 5*l.* 5s. costs.

ENGINEERS' CERTIFICATES.

RANKIN *v.* THE NEW BRIGHTON AQUARIUM CO.

THE plaintiffs in this case (tried at the Liverpool Assizes on the 7th inst., before Mr. Justice Manisty and a common jury) were Messrs. Rankin, ironfounders and contractors, Liverpool, and they sought to recover 659*l.* 15s., alleged to be due under a contract made with the defendants, to carry out certain work in the construction of an aquarium, baths, and hotel, at New Brighton. Two sums of 785*l.* 15s. and 659*l.* 15s. respectively had become due under the contract, and had been certified for by Mr. Lynde, the engineer of the company. The plaintiffs under a writ obtained payment of the first-mentioned sum by a judge's order, and leave was given to the company to defend the action with respect to the 659*l.* 15s. on the payment of 500*l.* into court.

The defendants pleaded that their engineer had no right to give certificates so as to bind the company, and they also made a counter claim against the plaintiffs for damages consequent upon alleged negligence in carrying out the work. The contract made with Messrs. Rankin was for 4,845*l.* 2s. 9d., but originally it was for a larger amount, and was reduced upon the company resolving not to carry out such extensive works as they at first had decided upon.

After the case had been opened, it was agreed that all matters in difference should be referred to an arbitrator, the defendants agreeing to pay a further sum of 250*l.* into court, and admitting their liability to pay a fair value for the work already done.

BREACH OF CONTRACT.

CARTER *v.* STRANEY.

IN this case, which came before Mr. Justice Fry and a common jury, at the Liverpool Assizes, on Tuesday, the plaintiff sought to recover 140*l.* alleged to be due by the defendant on a contract to deliver and put up a certain engine and mortar-mill for the plaintiff. There was a counter claim by the defendant for breach of contract. The plaintiff, William Carter, carries on business as a builder's ironmonger in Birmingham, and the defendant, James Straney, is a builder at West Derby.

The plaintiff's case was to the effect that the defendant agreed to purchase for him an engine and mortar-mill for 140*l.*, the machinery to be fitted up in Liverpool. A contract was signed, but the defendant afterwards declined to accept the machinery, on the ground that a tank and shafts were not supplied, and that the wheels were defective.

The plaintiff, on the other hand, denied that there was any agreement to provide a tank and shafts, and brought his action for the recovery of the amount agreed upon.

The jury gave a verdict for the plaintiff for the amount claimed.

GLASGOW INSTITUTE OF ARCHITECTS AND THE PROPOSED BUILDING REGULATIONS.

THE Glasgow Institute of Architects have intimated a number of objections to the proposed Provisional Order by the Police Board for the regulation of buildings. They object, first, to any alteration of the Police Act in this direction, because they are unanimously of opinion that the question can only be satisfactorily dealt with by a comprehensive Building Act, clearly defining what may be justly demanded for the public good, and so altering the constitution as well as the jurisdiction of the Dean of Guild Court as to afford some reasonable assurance that its efficiency, or, what they would prefer, transferring its functions to a new and proper judicial court; and on the general ground that the alterations proposed are in most points deficient in precision, leaving matters of great importance to the discretion of the Master of Works for the time being. In particular they object to the clause making the ceilings not less than 10 ft. high, because it is unnecessary, and would interfere with the price of ground by restricting the number of dwellings which might, with all proper regard to hygienic requirements, be erected on it; that the specified widths of passages and stairs would in many cases be excessive; and to the "depth of the foundation," because it would be impracticable. They are of opinion that the words "exclusively belonging to and connected with the land or heritage in which each such apartment is situated," ought to be deleted. They approve of the alterations in the relative position of tenements intended to be secured by this clause, but they strongly condemn any attempt to gain such ends by confiscation. The objections stated were to be laid before Sheriff Clark on Thursday, when the subject of the provisional order was to come before him.

MASTERS AND MEN.

Glasgow.—The Glasgow masons, who number about 1,500, struck work on Monday against a proposed reduction of 1d. per hour.

Manchester.—Notice has been given that at the end of the present week the wages of the operative bricklayers of Manchester and Salford will be reduced 1d. per hour (from 10d. to 9d.), and of builders' labourers ½d. per hour.

Bolton.—The operative stonemasons of Bolton have received notice of a reduction in their wages of 1d. per hour, equal to 3s. 6d. per week, and also to work extra hours per week.

Hawick.—The master joiners of Hawick have intimated to their men that on and after the 1st of December their wages will be reduced from 7½d. to 7d. per hour.

Banbury.—At a meeting of the master builders of Banbury and neighbourhood, Mr. A. Kimberley in the chair, it has been unanimously agreed that, owing to the depressed and stagnant state of the building trade, a reduction of 1d. per hour should be made upon the carpenters' and joiners' wages, and also a corresponding reduction upon all other mechanical branches of the trade. It was also further agreed that a reduction of ½d. per hour should be made upon the labourers' wages. The reductions are to come into operation not later than the 30th inst.

Aberdeen.—At a meeting of the Aberdeen Master Masons' Association, on the 8th inst., it was unanimously resolved, in consequence of the continued depressed trade, to reduce the standard rate of wages to 6d. per hour on and after 8th February next.

Forfar.—In the case of the masons' strike at Forfar, an arrangement has been come to, the men accepting ½d. of a reduction, making the wages 7d. per hour, with weekly payments. The proposal of the employers was to reduce the wages to 6½d. per hour.

Crieff.—The master joiners of Crieff have again reduced the wages of the operatives 0½d. per hour, the rate now paid being 6d. per hour.

Partick.—The Partick masons, to the number of about 200, struck work on Monday, against the reduction of 1d. per hour sought to be imposed by the masters. It is stated that some of the masters offered "to split the difference" by giving 7½d., but this was not accepted by the men.

The Welsh Slate Quarries.—At the Penrhyn, Llanberis, and other large quarries in North Wales, the "bargains" or contracts taken by the workmen, were, on the 8th inst., let at a reduction averaging from 20 to 25 per cent. The reduction is stated to have been necessary owing to the accumulation of stocks and the dulness of the trade, which, it is said, is in some degree traceable to the importation of American slates, and the North Wales Quarrymen's Union advised its adoption by the men, who were in favour of shortening the hours of labour. At the Rhos quarry, Bettws-y-Coed, the strike has now extended over fifteen weeks.

Shrewsbury New Brigade Depot.—These buildings are now rapidly approaching completion, and will shortly be ready for occupation. The works have been visited by General Sir J. Lintorne A. Simmons, K.C.B., Inspector-General of Fortifications and Works, Colonel P. Ravenhill, C.B., Deputy-Director of Barracks, and other officers. After completing the inspection, Sir Lintorne addressed the contractor (Mr. Treasure), expressing his approval of the way in which the work had been done. The buildings have cost about 50,000*l.*

STAINED GLASS.

Sandringham.—The Prince of Wales has caused a painted window to be inserted in the north wall of the chancel of Sandringham Church, in memory of the late rector of the parish and chaplain of the royal household. The window consists of a single light, the subject being Christ stilling the Waters. On the south wall of the chancel, within the communion-rails, has also been fixed a brass tablet bearing the following inscription:—"In memory of William Lake Onslow, M.A., rector of Sandringham, chaplain to their Royal Highnesses the Prince of Wales and the Duke of Edinburgh, Chaplain and Naval Instructor, R.N., who departed this life 30th August, 1877, aged 57 years. This tablet is placed by his friends afloat and ashore, to record their high esteem and affection for one who, while faithfully discharging his various duties, endeared himself to all by his kind and gentle disposition." In the south wall is another painted window, in memory of the Prince's late Equerry, Colonel Grey, the subject in this case being David slaying Goliath.

Maidenhead.—Two lights of the east window of St. Mark's Church, Maidenhead, have been filled with stained glass by Messrs. Clayton & Bell, in memory of the late Mrs. Malyon, who for twenty-nine years discharged the duties of matron of the union workhouse. The subjects represented in the first light are the Baptism and the Nativity of our Lord; and in the second light the Crucifixion and Presentation in the Temple.

Stoke d'Abernon.—A new stained-glass window has just been uncovered at the parish church, Stoke d'Abernon, Surrey. It is in memory of the late Mr. W. H. Cooper, and has been designed by Mr. N. H. J. Westlake, F.S.A., of the firm of Lavers, Barraud, & Westlake. The subject is the Resurrection of the Just.

Fulham.—Messrs. W. M. Pepper & Co., of the Euston-road, have just completed nine stained-glass windows for St. James's Church, Fulham. Three of the windows contain figure-subjects, representing respectively "The Good Shepherd," "Raising the Widow's Son," and "Raising Jairus's Daughter."

CHURCH-BUILDING NEWS.

Dumfries.—St. Mary's parish church, Dumfries, has been re-opened, after alterations and re-seating. The works were designed and carried out under the superintendence of Messrs. Crombie Brothers, and the tradesmen who executed the work were Mr. Tweedie, Annan, joiner work; Mr. M'Teer, Dumfries, painting; and Mr. Gregan, Dumfries, upholstery.

Whilton.—The new chancel at Whilton Church was consecrated by the Bishop of Peterborough on the 30th ult. The work has been carried out by Mr. Gee, of Daventry, according to the plans of Mr. St. Aubyn, architect. In place of the former unsightly projection, — some "improvers" having destroyed all the original architecture,—there is now presented to view a chancel 25 ft. long by 16 ft. wide; there are an organ-chamber and vestry on the north, and an aisle on the south. The roof is of pitch-pine; and the choir-seats are of the same material. The east window has three lights, and the one on the south two lights. The altar-table, lectern, and pulpit are all of oak; the last mentioned having a Bath stone base, and Robin Hood steps. The chancel is paved with Godwin's tiles; and the roof is covered with Broseley tiles. The south chancel aisle is 12 ft. long and 6 ft. wide, and the vestry 16 ft. by 7 ft. The cost of the work already performed is about 1,300*l.*; but it is intended to proceed in the spring with the restoration of the nave and aisles. Rimington's heating apparatus is to be used.

Woodford Halse.—The parish church of Woodford Halse was re-opened on the 29th ult., after restoration, under the direction of Mr. A. Hartshorne, architect. The oldest part of the church, consisting of the north aisle and chancel, is of the early part of the fourteenth century, but the north aisle was so dilapidated, and leaning so much, that, with its arcade, it had to be pulled down and rebuilt. The entire clearstory has also been rebuilt. The tower was in a ruinous state, and it has now given place to a new one, somewhat larger. A large western arch has been added, with a new window and doorway in the tower, corresponding with the style of the north aisle. The roofs of the whole church are new, that of the nave being raised to its original pitch. A new porch to the south aisle has been

built, and also a new vestry and organ-chamber on the north of the chancel. The carved panel tracery of the old oak seats has all been preserved, and used again as far as possible. A recumbent effigy of a lady was found, buried at a short distance underground, when clearing the ground for the new vestry. This has been placed, at Mr. Hart-horne's expense, in a recess in the chancel. It is of about the date of Edward II., and is in very good preservation, with the exception of the feet, which have been broken off. The total cost of the restoration was about 3,500*l*. Messrs. Wall & Hook, of Brinscombe, Stroud, were the builders, and Mr. Hayward was clerk of works.

Cambridge.—The memorial stone of the nave of St. Barnabas Church, Mill-road, Cambridge, was laid on the 26th ult., by the Earl of Hardwicke. Mr. W. Smith is the architect, and Mr. F. Thoday is the builder.

Chastleton.—St. Mary's Church, Chastleton, was re-opened by the Bishop of Oxford on the 31st ult., after restoration. The church, which dates from Norman times, contains a tablet to the memory of Sir Richard Westmacott, the sculptor, who is buried in the churchyard, and to his son Horatio, a rector of the parish. The works now carried out include the entire removal of the gallery and of the old pews, the latter being replaced by comfortable low oak seats. A stained-glass window representing the four Evangelists has been put in the south chantry by Miss Whitmore Jones, in memory of her father, the late Mr. Whitmore Jones, the glass being supplied by Mr. J. T. Carter, of London. New oak panelling has also been put in the south chantry by Miss Jones. A new panelled oak roof has also been placed in the south chantry, in the carved bosses of which the arms of the various owners of the demesne are represented. In taking up an old pew in this chantry a piscina was discovered by the builders, while in one corner the rood-loft door was also discovered. The lectern is the present of the villagers. The old pulpit, which is Jacobean, and bears the date of 1625, has been re-erected on a new stone base. Under some of the old pews and in the gangways a number of old tiles were found, and have been replaced, according to their respective patterns in a part where they will not be much trodden upon. A new piscina has been placed in the chancel, the gift of the rural dean (Rev. W. E. D. Carter). This, with the cleaning, &c., of the masonry, constitutes the extent of the restoration, the work having been carried out (under the supervision of the architect, Mr. C. E. Powell, of London) by Messrs. Groves, of Milton, the estimated cost being 900*l*.

Feltham.—The foundation-stone of the new church of St. Catherine, in the parish of St. Dunstan, was laid on the 8th inst. by Archdeacon Hessey (archdeacon of Middlesex). The architects are Messrs. Carpenter & Ingelow, and the builder is Mr. C. F. Kearley, Uxbridge.

Ipswich.—The new organ-chamber in St. Stephen's Church, Ipswich, has been completed. It is 13 ft. by 7 ft., internal dimensions, and has been erected on the north side of the chancel, with a stone arch and shafts, corresponding in position and detail with the arches of the present chancel aisle. The floor is raised 6 ft. above the present chancel floor, and the interior of the chamber is boarded. On each side of the arch, and fixed to one of the shafts, are carved memorial brasses, bearing an inscription stating that the work was executed at the cost of Mr. Alexander Francis Nicholson, in memory of his three daughters. The brasses are the work of Messrs. Hart, Son, Peard, & Co., and were executed from special designs supplied by the architect, Mr. E. F. Bisshopp. Internally, the walls are faced with small whole flints, and the roof tiled. Messrs. J. B. & F. Bennett were the general contractors, Mr. Chinnock doing the stonemason work, and Mr. Coe the hot-water work. A new organ is being built by Mr. A. Hunter, of London.

Halkyn.—The new parish church for Halkyn was consecrated on the 29th ult. It is dedicated to St. Mary the Virgin, and has been erected at the sole cost of the Duke of Westminster. The style of the new building is Early Geometrical. The plan of the church, which provides accommodation for about 300 people, consists of nave, north aisle, chancel, and tower, which is placed at the north-east end of the building. The general work, both inside and out, is executed in local stone, and white stone from the Talacre quarries is used for the finer portions. The tower is square on plan, 26 ft. each way, and about 65 ft. high to the battlements, from which a slated roof rises to a further height of about 16 ft. All the roofs are covered with small Westmoreland slates. Internally the nave is divided from the aisle by means of an arcade of circular shafts and moulded arches. The shafts are of polished Halkyn limestone, or Halkyn marble, as it is generally called. The vestry and organ-chamber are placed under the tower, the walls of which are pierced with large arches towards the chancel and the end of the aisle. For the nave and aisle windows rather an unusual treatment has been adopted. All the windows contain figure subjects, but instead of being carried out in different colours, the prevailing tone is a quiet brown, most of the work being executed in this tint on a white ground, bright colours being very sparingly introduced. The windows in the nave have subjects illustrating the life of our Lord, and the side windows in the chancel contain representations of the twelve Apostles. The different tradesmen who have been employed upon the work are as follow:—The whole of the masons' and wallers' work, Messrs. Edwards and Thomas, Halkyn; joiners' work, Messrs. Parry & Aidney, Halkyn; slating, Mr. Lee, Chester; plumbing, Mr. Isaac Williams, Chester; lighting, &c., Messrs. Hart, Son, Peard, & Co., London; heating, Messrs. Bennett, Liverpool; wrought-iron railings, &c., Messrs. D. Williams & Son, Chester; general wood carving, Mr. Brown, Chester; carving of reredos and stonework, Mr. M'Arthy, London; painted glass and decoration, Messrs. Heaton, Butler, & Bayne, London; clock and bells, Mr. Joyce, Whitchurch; organ, Mr. Whiteley, Chester; the tiling of the aisles and chancel floor, the Campbell Brick and Tile Company. Mr. Robert Pritchard has been clerk of the works from the commencement. All the works have been carried out from designs by and under the superintendence of Mr. Douglas, architect, Chester.

Mold.—The foundation-stone of the new Church of St. John the Evangelist, Mold, was laid on the 30th ult. by the Duke of Westminster. The architect is Mr. John Douglas, of Chester. As at present proposed to be carried out, the church consists of a nave, chancel, and organ-chamber. A tower and spire, placed at the north-east end of the building, form the remainder of the scheme, but at the present it is only intended to build the tower to the height of one story. This will serve as a vestry, and will be covered with a temporary roof, and be completed as soon as funds for the purpose are raised. The nave is 61 ft. 6 in. long and 28 ft. 6 in. wide, the chancel 27 ft. long and 19 ft. wide, and accommodation is provided for about 290 people. The style is Early Pointed, and the materials to be used are local stone in random courses for the exterior walling, red Helsby stone for the dressed work, and buff pressed bricks for the interior walls and arches. The total height of the tower and spire would be about 90 ft. The roof will be covered with red roofing tiles, with ridges of the same material. The contract has been let to Mr. Chas. Holland, of Chester, and the sum to be expended at present is about 2,000*l*.

Rushall.—The parish church of Rushall, near Harleston, was re-opened on the 29th ult., after restoration. It has now an entirely new roof of open timber and pitch pine, covered with green slates. The whole of the walls have been picked off and pointed back, and new buttresses placed to the chancel. The tower has been partly restored, new crosses and copings placed on the roof, and all the stonework renewed. Three new windows have been added to the chancel, and the whole of the windows glazed with cathedral glass. The inside walls have been plastered and stuccoed, and the floors laid with Minton's tiles. The building is warmed with Gedney's improved heating apparatus. Mr. George Grimwood, of Weybread, was the sole contractor; the stonework was done by Mr. Nursery, of Bungay; and the glazing by Mr. Gibson, of Fressingfield. The chancel has been restored at the expense of the Master and Fellows of Emmanuel College, Cambridge, and the remainder of the work has cost 760*l*.

Society of Engineers.—At the last monthly meeting of the Society of Engineers, the following gentlemen were balloted for and duly elected members of the society, viz., Mr. Charles John Alford, Mr. Patrick Doyle, Mr. Isidore Spielmann, Mr. John Greaves Hawkins, and Mr. John Price.

DISSENTING CHURCH-BUILDING NEWS.

Huntingdon.—A new Wesleyan chapel at Huntingdon was opened on the 18th ult. The building occupies the site of the old chapel, and is Gothic in style. The front walls are of Clipsham rough stone, with Bath and Ketton stone dressings, buttresses, and pinnacles. The building will seat 500 persons. At the back are class-rooms, and a spacious schoolroom. The contractor was Mr. G. Thackray, and the architect Mr. R. Hutchinson. The cost has been 2,350*l*.

Stornoway.—The new church erected for the Free English congregation at Stornoway has been opened for worship. The building is situated at the corner of Francis and Kenneth streets, with frontages to both, and has been erected in accordance with designs furnished by Mr. R. A. Bryden, architect, Glasgow. The style is Early English. The principal front of the building is towards Kenneth-street, and the gable is in height about 60 ft., having for its main feature a large and four-light traceried window filled with stained glass. On one side the gable is flanked by a projecting wing containing the staircase to the gallery, and on the other by a tower and spire, the tower only being built at present. The tower rises to a height of 47 ft., and it is proposed to carry the spire to an additional height of 35 ft. The walls are faced with freestone brought from Lochbroom, brownish in colour, and with white Glasgow stone dressings. The plan is oblong, 70 ft. by 50 ft., and sittings are provided in the area for 400, and in the gallery for 230, persons. There is a vestry behind the church. The interior of the building shows a nave and side aisles, with galleries in the latter. The ceiling of the nave is in the form of a lofty arch, and is divided from the aisles by longitudinal groined arches, supported by columns with ornamental capitals. The works have been carried out by local tradesmen—the wright work by Mr. John Baxter, of Glasgow; the plaster work by Mr. A. W. Paterson, Dunoon; and the glazier work by Messrs. C. & J. Malloch, Glasgow.

Guernsey.—A new Wesleyan chapel was opened recently by Dr. Pope. The plan of this chapel is cruciform, having an inside width of 45 ft., the length being 72 ft. The style of the building is Early Gothic. All the windows are of coloured glass. The orchestra and organ-loft are recessed under a Gothic arch at the extremity of the nave. Accommodation is provided for nearly 800 persons. The tower and spire are 112 ft. high. The architects are Messrs. Wilson, Willcox, & Wilson, of Bath. Mr. D. C. Jones, of Gloucester, was the contractor.

SCHOOL BOARD SCHOOLS.

Widnes.—On the 1st inst. new Board schools were opened at Simms Cross, Widnes. They have been erected at a cost of about 9,000*l*., from designs by Messrs. Francis & George, architects, Liverpool.

Gloucester.—On the 24th ult. the first schools erected by the Gloucester School Board were opened. They have been erected by Mr. James Clutterbuck, from designs by Messrs. Medland & Son, architects. Accommodation is provided for 254 infants, 203 boys, and 203 girls. The schools are arranged in two detached blocks, that for the boys (one story high) lying nearest to and parallel with Widdin-street, and that for the girls and infants (two stories high, infants below and girls above) lying nearest to and parallel with Napier-street. Each school-room is 62 ft. 6 in. long by 20 ft. wide, and each class-room 22 ft. by 18 ft. The playground to each block lies on the south-west side. The buildings, which are Italian in character, are constructed with red bricks, relieved by Bath stone dressings. They have cost 3,231*l*.

SCHOOL BUILDING NEWS.

Thetford.—New grammar-schools are being erected here, from the designs of Mr. E. Boardman, architect, Norwich. Mr. Hubbard is the contractor, his foreman being Mr. E. Stafford. Messrs. Peck & Sons have undertaken a large share of the stone work.

Oundle.—The Sunday school in connexion with the Independent chapel at Oundle has been enlarged, at a cost of 450*l*. Mr. Sykes was the architect, and the work was done by Mr. Binder, of Oundle

VARIORUM.

"Metals and their Chief Industrial Applications," by Charles R. Alder Wright, D.Sc. (Macmillan & Co.), is a larger book than it looks; free from all verbiage, it gives in pithy form a very large amount of really good information in a small compass. The book is founded on a course of lectures delivered by Dr. Wright at the Royal Institution last year. It is a very good introduction to the study of which it treats. ——We have intended for some time past to mention that a second edition had been published of "The Parks and Gardens of Paris," By W. Robinson, F.L.S. (Macmillan & Co.), and will not delay longer, though it must be done in a few lines. We reviewed this work at some length on its first appearance, and prognosticated for it the good reception which was accorded it. It is an admirable and beautiful book. It is full of information and suggestion, of which use has not even yet been made. Much of its value depends on this, that in describing the Paris Gardens, Mr. Robinson always keeps in view their relation to the wants of other cities, and of public and private gardens. In showing that the French in their turn may learn from us, the author mentions as a curious fact that rhubarb and seakale have yet to be introduced into France.——"Common Mind Troubles," by J. Mortimer Granville (Hardwicke & Bogue) is a curious little book, the key-note of which is the presumption that there is often, if not generally, a stage of conscious embarrassment preceding mental derangement or mind weakness, which the sufferer may grapple with and overcome if he take it in time. It is quite unnecessary, however, that those who are troubled with "defects of memory," "confusions of thought," or "low spirits," should fancy they are on their way to a mad-house.——The new serial work just now commenced by Messrs. Cassell, Petter, & Galpin, in monthly parts, entitled "Our Own Country," is to be an illustrated, geographical, and historical description of the chief places of interest in Great Britain. The first part includes a steel engraving of Liverpool.——The number of *L'Art* for November 10th contains the concluding portion of M. Viollet-le-Duc's account of the buildings for the Paris International Exhibition. The number is an excellent one.

Miscellanea.

Concrete Drain-pipes at Bournemouth. Reference was made in the *Builder* a month ago (p. 1,027, *ante*) to the alleged failure of a number of concrete drain-pipes at Bournemouth. The local *Observer* states that at a meeting of the Improvement Commissioners, on the 15th ult., a report of the Sanitary Committee was read, stating that Messrs. Donaldson & Ponton's reports on the concrete pipes had been received and read. The committee recommended, amongst other things, that no more concrete pipes be used in the sewers, and that the consulting surveyor be instructed to give the contractor orders to remove all the concrete pipes now on the ground, at once. Mr. Donaldson, in his report, details experiments made by him, the results of which, he says, show that:—

"The quality of these pipes varies between very wide limits. The best specimen of pipes are well able to sustain all the strains to which they would be subjected in ordinary sewer trenches, but the inferior qualities are clearly, by the ascertained results of the Knyveton-road, failures, utterly unfit for use under any circumstances. Unless, therefore, the inferior pipes can be easily distinguished from the pipes of strong material, I feel that I am compelled to advise you not to purchase any more of these pipes. With regard to those you have already purchased, I advise you to subject them to a fair percussive test."

Mr. Ponton, in his report, says:—

"In my opinion, the cause of the failure of the concrete pipes is owing to their weakness to resist transverse strains; and the pipes were fractured in the manner they are now found when the load of the filling in was first applied. I cannot recommend concrete as a suitable material for drainage purposes in this district, because from my experience all concrete exposed to the action of running land-water in Bournemouth perishes in a very few years. I attribute this circumstance to the fact that Bournemouth land-water holds no lime in solution, and, in consequence, this water is at its maximum strength for dissolving out of the concrete the more soluble salts of lime, such as hydrate and the carbonate. Unless, therefore, the concrete used in your drainage scheme can be protected from percolating or running land-water, my advice is to discontinue its use."

Proposed Theatre for Aston, Birmingham.—Mr. Durland proposes to build a theatre at Aston, at a cost of 3,500*l*. The theatre is to hold 1,500 people.

Newington Churchyard is being laid out as a public garden and recreation-ground. The space enclosed is of considerable extent, notwithstanding the slice cut off for the widening of Newington Butts. The paths are being covered with tar-paving by Messrs. Wright & Charlton. A clock-tower, erected at the cost of the late Mr. R. S. Faulconer, marks the spot whereon the parish church formerly stood. The wall which has been erected in red brick broadside of the house which bounds the ground at its north-east corner, is one of the ugliest specimens of builders' "Gothic" to be met with in a day's march. It is altogether out of character with the old house of which it forms the side. This house is a mere brick-box of the Georgian period, and has a nearly flat roof; yet the "Gothic" side-wall is carried up above the roof with two high-pointed gable-ends towards the churchyard, with nothing behind them. Who is responsible for this abortion I do not know. It is described by a local paper as having an "ecclesiastical cut" about it, but it certainly does not harmonise, either in form or colour, with the neighbouring red-brick church of St. Gabriel.—L. J. D.

Edinburgh and Leith Engineers' Society. The first meeting of this society for the session was held on the 6th inst., Mr. Robert C. Reid, president, in the chair. The opening address was given by Mr. Alexander Clark, C.E. He dwelt upon the desirability of the society appointing investigation committees to inquire into the construction of engineering works and into the nature of the materials used, and to report upon the suitability of different competing machines for doing various kinds of work. It would be well to have the merits of all patents as they came out thoroughly examined and reported upon by selected members of the society, and he suggested that it would be a great improvement if by some means it could be made allowable by the patent law to combine into one all the good points of several patent machines for doing the same work. Hand labour was sure, in future engineering works, to be, even still more than at present, superseded by machinery, as there was almost no kind of work which the latter could not do better and more cheaply.

Skegness Pier Company.—A meeting of the Pier Company was held on the 8th of October, at Hildred Hotel, to examine the plans that were sent in in reply to the advertisement inviting engineers to compete, a prize of 50*l*. being offered for the best plan. There were forty-four competitors. The directors selected the following five as being most suitable, viz, Mr. T. Claxton Fidler, Westminster; Messrs. Page & Harwood, Cardiff; Messrs. Clarke & Pickwell, Hull; Mr. T. W. Smith, London; Messrs. Head, Wrightson, & Co., Stockton-on-Tees. The meeting was then adjourned until the 22nd ult., when the plans prepared by Messrs. Clarke & Pickwell, of Hull, were unanimously selected as being best adapted for the requirements of Skegness, and were adopted accordingly, Messrs. Clarke & Pickwell being requested to prepare the necessary particulars for the Board of Trade. Its total length will be 1,842 ft., with seats the full length of each side having ornamental sun and wind arbours at intervals. The head is very extensive. The estimated total cost is 18,000*l*.

Deserved Honour.—We hear with extreme pleasure, on both personal and public grounds, that the Queen has been graciously pleased to signify her Majesty's intention of conferring on Mr. B. Thomas Brandreth Gibbs, vice-president of the Royal Agricultural Society, and general superintendent of the Agricultural Division of the British Section of the Paris Exhibition, of 1878, the honour of knighthood. Mr. Gibbs has long given valuable time to the service of the public. He contributes some useful Notes on British Agricultural Machinery, &c., at the Paris Exhibition, which have not yet received the attention they deserve.* We understand Mr. Gibbs has received a graceful autograph letter from H.R.H. the Prince of Wales.

Cottage School-Homes at Withington. The Chorlton Board of Guardians, on the 8th inst., adopted the plans and specifications submitted by Messrs. Mangnall & Littlewoods, architects, of Manchester, for the proposed new children's schools and homes at Withington. The total estimated cost is 14,470*l*., and accommodation is to be provided for 300 children.

* Paris Exhibition; Catalogue of the British Section. Part II.

The Proposed Colonial Museum and the Royal Horticultural Society.—Acting upon a suggestion made by the colonial representatives to the Prince of Wales, a short time since, at the British Embassy in Paris, that a colonial museum should be established in London, the Royal Horticultural Society, on the suggestion of one of the fellows, is about to call a meeting of the Society, to consider the advisability of allocating as a site for the proposed colonial museum the lower or south end of the gardens at South Kensington, in which the Society might have a space set apart for the transaction of their business, and for holding their flower and fruit shows, and steps are now being taken to effect an amalgamation of the existing site committee with the Commissioners for the Colonial Museum. In this way it is hoped that the termination of the Horticultural Society's tenancy of the gardens at South Kensington may be avoided.

Value of Land in the City.—Messrs. Debenham, Tewson, & Farmer have let by auction on building lease, No. 20, Bucklersbury, the premises of Messrs. Horner & Co., the wholesale druggists, in whose occupation the premises appear to have been for so many generations that Shakspeare may have referred to them as emitting the "scent of Bucklersbury." After a spirited competition, the property was declared to be let for eighty years, the first six months at a peppercorn, and afterwards at 1,200*l*. a year. The area on the ground-floor is 2,580 square feet.

New Military Offices, York.—The military and Royal Engineer staff of the Northern District have now removed from their old headquarters at Manchester to a commodious suite of offices in York. These have recently been erected by Mr. Weatherley, builder, York, under the direction of Major Malcolm, R.E.; and we understand that all the locks and door furniture (which are of a special make) have been supplied, according to the War Department specification, by Mr. James Hill, of London. We may add that other large military works are now in progress in York, where it is intended to form one of the largest depôt centres in the kingdom.

Wiltshire Archæological Society.—The annual general meeting of the Wiltshire Archæological and Natural History Society was held on the 6th inst., in the Society's Museum, at Devizes, the Rev. Canon Jackson presiding. The annual report states that the number of members is 375. Regret is expressed at the death of, amongst others, Mr. William Blackmore, one of the vice-presidents of the society, and the "munificent founder of the Blackmore Museum at Salisbury,—a museum of prehistoric archæology," says the report, "second to none in the world." Mention is also made of the death of Mr. Edward Stevens, secretary of the society.

Afghanistan.—It need scarcely be said that Mr. Wyld has issued a map of Afghanistan and the north-west frontier of India. It shows the whole course of the river Indus, Cabul, Herat, Candahar, Quettah, Khelat, with the mountain passes and military positions, and the adjoining military stations in India. It has the aspect of closer surveying than we should have expected.

Walwyn's Castle Church, Pembrokeshire.—This church, which is one of the finest in the county of Pembroke, was re-opened on the 25th ult. by the Lord Bishop of St. David's, the work of restoration, or rather rebuilding, having taken nearly ten years. The architect at first was Mr. F. Wehnert, who at his death was succeeded by Mr. E. H. Lingen-Barker.

The Parkes Museum of Hygiene.—Mr. Mark H. Judge has been appointed curator of the Parkes Museum of Hygiene, University College, London, the arrangements in connexion with which are so far completed as to make it probable that the museum will be opened early in the new year.

Lowestoft.—At a meeting of the Lowestoft Improvement Commissioners and Urban Sanitary Authority, held on the 14th ult., instructions were given to Mr. R. H. Inch, C.E., town surveyor, to prepare plans, &c., for a complete system of sewerage for the whole district.

The New President of the Royal Academy.—We mention with great gratification that at a general assembly of Academicians, held on Wednesday evening, Mr. Frederick Leighton, R.A., was elected President, in the room of the late Sir Francis Grant.

The Builder.

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Architecture, Art, and Social Life in Roman Times.

MUCH new and unexpected light has been thrown on the architecture, the other art, and the social life of Italy, in Roman times, by the recent systematic explorations at Pompeii and at Ostia, as well as by discoveries in other parts of Italy, that the account given by M. Gaston Boissier, in a recent number of the *Revue des Deux Mondes*, possesses unusual interest. Personal knowledge of the scenes, of the explorers, or of the special studies which have been directed to the localities, enable us to endorse or to supplement what we are glad to cite from a long and able article on the subject.

It is now 130 years since, on the 1st of April, 1748, excavation was commenced at Pompeii. The main object of the operations was to enrich the noble museum, which, under different names of Borbonico, Reale, Nationale, and what not, has long formed the great art-treasury of Naples, and competes with the unrivalled beauty of the scenery in attracting visitors to that noisy but fascinating city. The digging was accordingly carried on at hap-hazard, — commenced wherever the indication of a building of importance might be found, or suspected, pursued as far as seemed likely to ensure the detection of any important fresco, or sculpture, or mosaic, and then dropped. Nor was this all, the objects found were deprived of half their value,—if not indeed entirely destroyed,—by being taken at once from their proper sites to the Museum. The buildings uncovered were thus devastated by a new barbarism, after their 2,000 years' slumber beneath the ashes of Vesuvius, and not only so, but the materials from new excavations were often thrown carelessly into the old ones. Thus, while Pompeii, even twenty years ago, was something unique, it yet bore as much testimony to the greedy barbarism of modern Neapolitans as it did to the skill, the taste, and the active and not altogether ignoble life of the citizens of that lovely sojourn in the year 78 of the Christian era.

With the appointment of the Chevalier Fiorelli, a gentleman, a scholar, and a man of taste, to the supreme direction of the *scavi* of Pompeii, in 1863, all this was happily changed. Signor Fiorelli had the courage and the perseverance to work for Italy, and for civilisation, rather than for effect, or for sensational discoveries. At the same time he introduced a method the prosecution of which has brought the ancient life, or, more properly speaking, the sudden death, of Pompeii before the senses in a more startling and impressive way than all else that has been written, or collected, or discovered, from the time of the Younger Pliny to our own days, put together. The dark, silent, drifting storm of volcanic ashes which destroyed Pompeii,—for it was not, as in the case of Herculaneum, a flow of lava which overwhelmed the city,—filled up houses and public buildings as well as streets and open places. The sentry who stood at his post, the infant in his cradle, the feeble, the gentle, and the infirm, who were unable to seek safety in flight, were snowed up, as it were, by that drifting mass. We have seen, of recent date, how it falls. Perfect blackness fills the air, except for the lurid under-glow from the volcano, which pulses and swells like a mighty furnace. Small pellets of black or grey ash fall rapidly and perpendicularly from the sky. If you try to shelter yourself by an umbrella, you become aware of a fall much softer than that of rain, with a peculiar muffled sound. Each of those little pellets, about the size of a pea, as we have observed them, breaks and spreads on falling, so that any motionless object is soon covered with a coat of fine grey, or red, or white ash. In the course of two or three hours as many inches will have fallen; and men have to be sent on to the flat roofs of the *palazzi* and larger houses to throw off the ash, as we throw off snow in these northern countries, lest in time it should crush the roof. By the continuance of this falling shower for an unusual period the whole of Pompeii was buried at one continuous operation. And all human or animal beings within it were enclosed in a tight-fitting mould, which by degrees solidified into the substance known as tufa, or something very closely approaching that volcanic rock.

Enclosed in this mould, which did not, like lava, at once shut in and preserve from all further action any moisture that was not at once disintegrated by its heat, the animal and vegetable elements of the buried subjects decomposed, while the bones, the armour, and the more solid parts remained. Thus when the explorers came on what had been a human being, there was generally a hollow containing bones. Signor Fiorelli adopted the method, wherever such a hollow was met with, of at once running it full of plaster of Paris. When the surrounding tufa was then removed, a plaster cast of the perished object met the eye. And very ghastly some of these objects are. We may mention as illustrative of the information thus gained that the dog, as represented on the well-known mosaic, "Cave Canem," is unlike any living dog, English or Italian. The general idea has been, that the dog of the mosaics or of the *fresci* was what we call conventionalised. Not so, however. Signor Fiorelli has reproduced the house-dog of the first century from his ashen cast. Such as he is shown on the mosaic, he actually was. The modification of the canine type by human care is thus most conspicuously brought into evidence. No such change, however, seems to have been produced in the human type.

Signor Fiorelli laid down for the guidance of his work a new and simple canon, the value of which will at once become apparent on reflection. The chief object of interest to be recovered by the excavators of Pompeii, he considered, was Pompeii itself! This admitted, it became evident that the old method of relic-snatching must be at once abandoned. The object of discovery was not a fresco, a bronze, or a cameo, but a Roman city as it formerly existed. To understand the full, active, busy life of Pompeii, it was not one or two great houses, or temples, that would suffice. No corner but might tell its tale. The houses of the poorer Pompeians, with their cheap utensils, and their vulgar, but perfectly intelligible, caricatures on the walls, were as valuable, from this point of view, as the larger abodes of the rich, adorned with marble, and enriched with fresco. Thus, Signor Fiorelli decided, before opening any new quarter of the buried city, to cleanse, to repair, and to protect that which had already been partly exposed to view. Quietly reviewing the scrambling work of his predecessors, he propped and restored the tottering walls, raised those which had fallen, protected from the weather and the visitors the *fresci* and mosaics, and completed the excavation of the opened parts of the town, removing the rubbish from the area. The task required all the more patience, because it did not afford the daily excitement on which, for upwards of a century, Pompeii had lived; or, at least, by which the works for its discovery were supported. The true value of this mode of proceeding it took a dozen years to prove. It is now apparent. The gaps have been filled up, the blocks removed. The explored part of Pompeii is now disembarrassed of the secular veil of tufa. It is brought out into the full light of the nineteenth century, not only with its forum and its theatres, but with its narrow alleys, its smallest houses, its humblest shops. The fullest and most correct idea of Italian life 1,800 years ago may be obtained by a ramble through the cleared streets of this wonderful city of the dead.

This patient, conscientious, masterly work has led, in some instances, to unexpected results. It is now for the first time that we learn that the Pompeii of 78, brought freshly before our eyes, was comparatively a modern town. In the year 63 it was almost entirely destroyed by an earthquake. With the usual busy activity native to the soil it was rebuilt in a few years, and it is the Pompeii of 63-79 with which, and with which alone, we have till very recently made acquaintance. But what is new to us is the discovery,—fully accordant as it is with the actual habits of the people of the neighbouring towns and cities,—that the new buildings were

reared on more ancient foundations. The brick, the stucco, or the marble of the houses reared in haste in the time of Nero, rest on solid basements which had resisted the earthquake of 63. Under the Pompeii of the first century Signor Fiorelli has found at least two cities of more ancient date. The oldest goes back as far as the sixth century before the Christian era, when a wall of enormous blocks was reared round an area extending from the Sarno to the sea, and the space was filled with homesteads more in the fashion of those mentioned as existing within the circuit of Babylon than resembling the dense piles of habitations in modern cities. The houses, of which the foundations yet exist, each consisted in a covered court, around which the apartments were grouped. Each habitation was in the centre of its own plot of land, the *hæredium*, which the family cultivated under the protection of the great common wall. This is a mode of life of which it is not easy to cite existing examples. We are familiar with the idea of its ancient prevalence from Herodotus and other old authors; but it is new to have it brought so near to us as Campania Felix.

Two hundred years later came the Samnites, a civilised, intelligent people, cultivated with the culture of Greece. They built a new town, of which some of the monuments and inscriptions have been recovered. Such are the temples of Venus and of Isis, and a portico in which Signor Fiorelli recognises a *hecatonstylon*. They also repaired the city walls, placing ashlar work of Nocera stone above the larger blocks of their predecessors. The Samnite town was finally reduced to obedience under Sylla, who sent thither three cohorts of veterans, with their families, and made it a Roman colony, under the name of his family, *Colonia Cornelia*. From that time, until its destruction, Pompeii remained, such as we have hitherto regarded it,—a town of pleasure, where the charms of scenery and of climate made of life one long bright holiday.

The regularity of the design of the town has now become apparent. The tracing the plan of a city among the old Italians was not left, as with ourselves, to the choice made by cattle of their paths. It was a religious affair. A horse and an ox harnessed together drew the plough which marked the *enceinte* of the city, the share being lifted where a gate or road was to be left. A straight line from north to south, known as the *cardo*, was drawn as the backbone of the plan, intersected by another main road, the *decumana*, from east to west. Other streets debouched on these two main lines. Thus Pompeii appears to have been divided into nine quarters, or, as the Romans term them, regions. Of these nine regions three are now entirely uncovered. Three are untouched, and but a faint knowledge has yet been attained of the remaining three.

With this reconstruction of the stratigraphy of Pompeii, Signor Fiorelli has combined the introduction of a new system of nomenclature. Hitherto houses have been usually named by the accident of the visit of some royal or otherwise important person about the time of their excavation,—as the house of the grand duke, that of the Russian prince, or the like. In other cases they have been named from some fresco, mosaic, or work of art which they contained,—as the house of the forum, of the *clausus*, or the like. Sometimes they have been named no one seems to know why or wherefore,—as the house of Pansa, for which the genius of Bulwer has supplied inmates and an owner. As to this very house, which is of large dimensions, Signor Fiorelli has had the good fortune to discover an inscription, which gives the name of its real owner. "To let," it runs, "for the calends of July, shops, with their terraces, cabinets, &c. Address, Primus, slave of Cnoius Alleius Nigidius Maius." Thus, the house of the imaginary Pansa is the house of Nigidius. The inscriptions of a complimentary or gallant nature found on some of the walls are fresh utterances of the gay life led by the Pompeians of the Christian era. "Terentio feliciter!" "Good luck to Terence!" "Gemellus to Cæsernina, wife of L. Monisius, health!"—an *ave* left by friend or lover, eighteen centuries ago, on the walls, no doubt, of the husband of Cæsernina.

Among the discoveries lighted on, as it were, by accident in the course of works directed rather to lay open the whole area of the buried city than to pick out its most tempting morsels, three deserve especial mention. These are the fresco of Orpheus, the fuller's house, or *fullonica*, and the books of the banker Jucundus

Of these, the first was found in the peristyle of a house remarkable in no other way; indeed, the interest attaching to the fresco itself, which covers about 2½ mètres of wall, has in no slight degree depended on the resemblance which it bears to a well-known fresco in the Christian Catacombs of Rome, in which the figure of Orpheus has undergone the same kind of transformation as that in virtue of which an ancient statue of Jupiter now receives the kisses of the orthodox under the borrowed name of St. Peter. Orpheus is represented seated. A light *chlamys* descends from his shoulders, and he strikes with a *plectrum* a seven-stringed cithara. At his feet lies a group of different animals,—a lion, a panther, a tiger, a boar, a stag, a hare. A little farther, the rocks and trees bow to his song, and a brook stops in its course to listen to it. In the Christian fresco the wild animals are replaced by a couple of sheep; but the figure of Orpheus has been reproduced, without the smallest scruple, as that of the Good Shepherd. M. Boissier adds in a note that the more he studies the paintings of Pompeii the more he is struck with their resemblance to those of the Catacombs, and he thinks that enough attention has not been given to those personages of the colour of bistre, with ardent eyes, who are so frequently represented in both,—the genii of Paganism reappearing as the angels of Christianity.

The *fullonica*, or fuller's shop, which has been discovered in face of the house of the banker Jucundus, is by no means the first of those establishments brought to light at Pompeii. On one,—as will be remembered by those who possess the works of Sir William Gell, or almost any other illustrated book on Pompeii,—was found a *fresco* representing in detail all the operations of the trade. On the wall of the portico of the new *fullonica* was represented the festival of Minerva, the patron deity of the fullers. Dancing and sports, not unmixed with quarrels and with blows, are here depicted with much comic effect; and the freedom of some of the motives is of a thoroughly unrestrained nature. The working-room of the *fullonica* in question is in unusually good preservation. The work might have only just terminated. The basins in which the linen was placed are untouched, and the taps which admitted the water of the Sarno are in their places. In one corner is an urn full of that chalky mixture which had been prepared, on the eve of the eruption, for use on the following day. Close to this workshop is the apartment of the master, where no doubt he received his customers. It is ornamented with graceful paintings in *fresco*. One of them represents the toilette of Venus. The goddess is arranging her hair, and glancing at a mirror, while a Cupid near holds a box of perfumes. A class of work which we should have expected to find only in houses of the highest order is here shown to be carried out in the abodes of the industrious classes. The idea that we thus are led to form of the facility of touch common to so many artists, and of the demand for their skilled and graceful services, is enough to show to what an extent the taste for art was prevalent in the Roman world in the first century of our era.

The house of the banker L. Cæcilius Jucundus has a different title to our regard. The discovery of books, or rather calcined rolls, at Herculaneum, and the patient and skilful toil by which these ancient writings have been unsolved and read, are well known. It has been a matter both of surprise and of disappointment that Pompeii should have hitherto proved to be so entirely destitute of books. In the untouched portions of the city, it is true, libraries may at any moment be discovered; and there is every reason to hope, if such should be the case, that the task of decipherment will be far more easy than in the case of rolls of parchment or papyrus baked and charred by the heat of lava. The house of Jucundus is in a small street, and of modest exterior. On entering the house, however, the easy circumstances of the owner became apparent. The hall of reception is ornamented with mythological paintings: a great hunt is painted on the peristyle. Concealed in a corner of the front of the house was found, in a sort of niche over a door, a coffer containing that rare treasure, the books of a Roman banker.

The documents in question consisted of those tablets of thin plates of wood, covered with a thin coating of wax, on which the Romans were accustomed to write with an iron stylus, or pencil. That any of these objects should have remained undestroyed for eighteen centuries may, no doubt, be attributed wholly or in part to the conservative nature of the wax. When the coffer was first opened, and the contents exposed to the light, the utmost care was needed to prevent the tablets from crumbling at once into dust. The precautions taken are not specified. In the case of bronze vessels, plunging them immediately into boiling water was the method adopted by H. R. H. the late Count of Syracuse; but this, of course, would not answer for waxen tablets. The treasure was conveyed to Naples, and placed under the care of the learned director of the Museum, Signor Petra, in the rooms set apart for unrolling the Herculaneum MSS. An unusual degree of success attended the endeavours to read them.

The coffer contained 132 quittances signed by the banker Jucundus, 127 of which have been deciphered in whole or in part. Most of them related to sales by auction, being a sort of list or account of the result of each sale. A small number of documents were signed by the treasurer of the city, and show that the banker took charge of the revenues of the community. We learn hence the prices paid for pasture, the rent of a field which belonged to the corporation, and that of a fuller's shop, which was again underlet. An active, minute, industrious life is thus shown to have been that of the Roman banker, unlike that of his successor in our days in detail, but no less filling up its proper place in the great order of social life.

The houses of the petty traders have been found abundantly in Pompeii, and the love of art is visible in them all. Sometimes a single fresco; a bronze or marble statue; sometimes arabesques and interlaced flowers; everywhere something to relieve the architecture, and to suggest to the mind the charms of nature or the delights of life. But what is strange is, that there are no houses of the poor. Although Naples is the home of that special product of the climate, the lazzarone,—a man whose entire belongings consist at times in a shirt, a pair of drawers, a red cap, and a basket, in which, when not otherwise engaged, he sleeps in the sun,—yet the absence of any pauper class is a remarkable feature of great districts of the ancient kingdom of Naples. Along a vast stretch of the Adriatic coast, every labourer is said not only to keep his dog, but to ride to his work on his own donkey. And that there was a great deal of truth in this,—from Foggia to Bari, and from Bari to Brindisi, twenty years ago, is certain. But, as yet, no very poor houses have been found at Pompeii. It is possible that the garrets and upper rooms of the larger houses, all of which have perished, were let for sleeping-rooms. It is possible that some unopened region of the city was the special home of the poor. All that is yet known on the subject is the existence of a poor class of tavern or drinking-shop. At the entrance of the town were those frequented by the peasants from the country. Small rooms were therein occupied as sleeping-apartments, and the visitors have at times scrawled their names and remarks upon the walls. There are found memorials of a Prætorian soldier on furlough, of a group of pantomimists, of an inhabitant of Pozzuoli who wished good luck to his native town, *Coloniæ Claudiæ Veronensi Puteolanæ feliciter*, and of *Vibius Restitutus*, who records that *hic solus dormivit, et Urbanam suam desiderabat*.

The inner life of this gay city or town, little by little, being recovered from its long buried walls, it is matter of congratulation to Signor Fiorelli that, while he has been chiefly occupied in repairing the mischief done by his predecessors, he has added so much to our definite knowledge of Pompeii. What may ensue when he carries before him the work into hitherto unopened regions of the town, it is impossible even to guess. But while Egypt and Assyria are yielding these long-buried secrets, we may well hope to receive, any day, news of startling interest from beneath the ashes of Pompeii.

The Albert Hall.—On Monday evening the members of the Royal Albert Hall Choral Society presented their conductor, Mr. Barnby, with a service of plate of the value of 200*l.*, on the occasion of his marriage. The service consists of an epergne, a dessert-service, four candlesticks, and a tea and coffee service. Mr. Barnby, briefly returning thanks for the present, spoke of the kindly relations existing between himself and the choir, and of his desire to keep pace with the public appreciation of new or comparatively little-known classical compositions.

THE USE OF ARTIFICIAL OBJECTS AS ORNAMENT.

In some remarks on this subject in a previous number (see page 1187, *ante*) we commented on the strange variety of objects to be found in artificial combination in the arabesques of the Cinquecento period in Italian ornament, and the nevertheless artistic spirit in which they were often combined more or less into one apparently connected design by the use of a conventional foliage ornament running through the whole and giving sequence and connexion. It was not always, however, that even this secondary relationship between the objects used as decoration was established, and it would be possible to quote instances from this otherwise great period of Italian art, in which an incongruous medley, absolutely indefensible upon any grounds of good taste or common sense, was indulged in under the name of ornament. An instance that may be mentioned before quitting this portion of the subject is one which, curiously enough, is given as a leading example in the first plate devoted to Italian ornament in Owen Jones's great work. This is a narrow upright panel, apparently the decoration of a pilaster. At the foot of the composition is an altar, and upon this is a trophy of arms. Above the trophy, and partly supported by it, rises a circular temple with an open colonnade of very attenuated columns, and a statue of a goddess on a pedestal in the centre. On the centre finial of the temple (the general shape of which seems suggested by the monument of Lysicrates) is perched a large white bird, apparently from its action meant for the typical pelican, though this may not be the intention, as this symbol is more a Mediæval than a Renaissance property. On each side of this bird stand two Cupids holding strings, from the ends of which insects dangle, and from the extreme edges of the temple cornice rise two objects like candlesticks with owls sitting upon them. In the next stage the central object is an old bearded head between horizontally-projecting rods like the arms of a semaphore, but festooned with drapery, while on the centre of each rod an infant's head is stuck. Above this arrangement come a couple of our old friends the winged griffins, each with claw gingerly stretched out as if in compliment to one another; over these come a couple of faun figures, terminating in long scrolls; next comes a bas-relief of a small figure in a painted oval frame, the shape of the *vesica piscis* in Mediæval art; then a casket, on the top of which two naked youths are posed in opposition to one another; next a circular patera, with a bas-relief of figures; and, finally, a crest on another oddly-shaped patera, with symbolical supporters. The artifice by which a certain sort of continuity is imparted to this extravagant collection of objects is certainly ingenious, but it is assuredly a very misapplied ingenuity.

The peculiarly conventional way in which ornament was regarded in Italian Renaissance architecture is oddly instanced in Albertolli's "Corso elementare di Ornamenti Architettonici." This book, which consists of progressive studies in freehand outline drawing, commences in a perfectly logical manner with simple studies of leaves and flowers in outline, or of curves and designs founded on leaves and flowers, but mostly more or less natural, and these proceed in increasing elaboration till near the end of the book, when we find we jump suddenly from these refined and really beautiful designs in free line to the ox-skull and garland. This is put at the close of the course as the most difficult and highest achievement, the culmination of all the previous studies. One can hardly conceive anything more absurd than this sudden return, after a progressive study of real ornament, to a conventionally accepted thing of no beauty and no meaning, to which this important place is given in a course of ornamental drawing, merely because it once had a symbolical or illustrative meaning to people of antiquity. Another work of Albertolli's, "Alcune Decorazione di nobili Sale," is of some interest in connexion with our subject, as it illustrates the employment of some of the furniture of Italian ornament, with a more direct attempt at special meaning than is generally found in such ornament. We have, for instance, panels representing "the fine arts," "science," "pastoral life," &c., consisting each of a collection of objects symbolical of the subject treated, grouped together not in a very artificial or artistic manner certainly, but with a certain definite interest, and in a manner reminding one somewhat of the treatment Grinling Gibbons gave to panels of a similar kind in English work; only that Gibbons's designs had generally more brilliancy and freedom of execution, and less decided meaning. In Albertolli's panel of the "Belle Arti" we find combined masks, brushes, crayon-holders, compasses, and pan-pipes: a curious jumble of the realistic and the typical, since pan-pipes, as representing music, could only be accepted as a typical object consecrated by its associations with Classic fable, whereas the porte-crayon in the design is completely real and practical. The "Pastorale" is symbolised by a sickle, rake, pruning-hook, flowers, a shepherd's pipe, and a shepherd's *bundle;* for this latter object (reminding one of "the Hon. Mr. Dowlass's luggage, all tied up in the Hon. Mr. Dowlass's pocket-handkerchief") seems to have been considered, both in Italian and French ornament, a necessary part of the properties of any rural design, and is perhaps about the very oddest thing to choose for an ornamental accessory that one could well come across. But if the reader wish to see to what point of extravagance the taste for artificial ornament can be carried by a designer of real ability, when once fairly indulged, let him turn over the powerfully-engraved designs in Piranesi's "Diverse Maniere d' adornare i cammini." This consists of a series of original designs for chimney-pieces, in which the author seems to have aimed at turning to the utmost account the suggestions derived from a long study of Roman architectural detail, and showing to how great a length the hints thence derived can carry an enthusiastic student of this school of design. One of the first objects we see is a face carved in relief in the middle of a winged shell, as a centre-piece to one of the designs; on either side of this, carved drinking-cups or drinking-horns, with the part to be grasped formed by horse and deer heads,—articles which even in their real form would be conventional conceits, and which are here carved at second-hand as *bas-relief* ornaments. In another the frieze over the fireplace opening has a plate and a garlanded ox-skull in the centre, then lamps of an antique flat-candlestick type, then cups connected with the rest of the design by a scroll of artificial foliage twined through the handles; the jambs of the fireplace are ornamented with women's heads and breasts, developing below into a long scroll or console reaching to the level of the plinth, and terminating there in a small dolphin's head. In the next design the jambs are formed each by a lyre, with strings consisting of the bead-and-reel ornament familiar to us in Greek and Roman cornice decoration, and the framework of the lyre is formed by a scroll which rises from a human helmeted head at the base, is first a floral wreath with spiral band, then develops into a reeded or fluted scroll, which twists round and ends in a horse's head. In another design we have sculptured coins of colossal size, hung by sculptured chains or strings; in another the phœnix sculptured in the middle of a shell, surrounded by winged serpents, the rest of the frieze being made up of a collection of bits of antique armour closely packed together as if rammed in by accident; in another a conglomeration of masks, wreaths, quivers, and arrows, ox-skulls, and winged angels. Strange to say, absurd as the catalogue must sound to every one, it is difficult to turn over the pages without becoming gradually inured to the absurdity and betrayed into admiring the author's ability, invention, and draughtsmanship, which were certainly remarkable, and it is surprising to find how soon one may, in such cases, become accustomed to a theory of design which at first sight seems so senseless, and arrive at a kind of admiration for the cleverness of the designer, and even sympathy with his ingenuity in devices, although in a style which our sounder critical judgment must entirely disapprove.

When the Renaissance style assumed in France the special characteristics peculiar to its development in that country, a form of decoration was evolved which, though as artificial as anything could possibly be in one sense, was anything could possibly be in one sense, was free, in great measure, from the extravagant fancy of the Italian school, and far more logical and consistent in its forms and combinations. The ornament of the Louis XIII. period, though it introduces pretty frequently masks and ropes or ribbons, and the eternal festoon (which seems to meet us wherever we turn in post-Renaissance decoration) is still, in great measure, a purely abstract decoration, not very refined or very interesting; not referring to Nature in any shape or way; but also, it may be added, not in general abusing or misrepresenting her by grotesque and impossible combinations. In the Louis Quatorze period we come on the prevalence of these kind of fancies again; a skull and cross-bones figure as the centre of a design, and cloths tied in knots are draped on either side; terminal figures (female especially) abound, and masks are introduced in an unmeaning manner. For example, in one instance, figured by L. Adams in his "Décorations et Meubles Louis XIII. et XIV.," a half-length female figure on a terminal pedestal appears to lift the drapery with her hand, and beneath it is seen a grotesque mask affixed to the terminal, with what idea on the part of the designer, if any, it is impossible to imagine. Still, even in this and the Louis XV. period, a large proportion of the ornament is abstract, and quite legitimate in principle, though, it must be admitted, very dull and uninteresting in character. It may be noticed, by the way, that the use of an imitation vase as a terminal on a cornice, so characteristic of much Renaissance architecture, especially in our own country, seems to have received its chief impulse in the first instance from French work. In the Renaissance period, however, the "pot" is usually represented with something intended to convey the notion of a flame issuing from its mouth, as if its origin was from some idea either of a lamp or of a censer; the fact of the occasional substitution of a candlestick and candle in almost realistic shape, in French cabinet work, seems to point to the former idea as the real origin of this much-abused architectural accessory. Among curiosities in connexion with our subject it may be noticed that in the South Kensington Museum there is a French carved cabinet (date 1560), in which the main panel is filled with a military trophy, where a figure in Roman soldier's costume sits on or leans against a heap of arms behind, consisting of antique shields and spears combined with two cannon, of a make very different from any we have known in our time, but still obviously cannon: the barrels of the pieces are fluted in the same manner as the shaft of a column, and the breeches adorned with conventional foliage of a classical type. Some of the French fancies into which the decoration of this epoch developed are well illustrated in Queverdo's book of "Décorations Intérieures, Époque Louis XV.," consisting principally of panels and "*attributs*," as they are termed. In these we have such things as panels representing the seasons, or various passions or "attributes," just as we noticed in speaking of Albertolli's designs; we have "Printemps," for example, with the same typical accessories of the shepherd's hat, pipe, crook, and his inevitable bundle, and artificial flowers springing from a vase, and Venus on the top of the composition reclining on clouds, from the underside of which a number of little darts are directed vertically downward; but whether these represent the darts of love, or whether they are only a conventional representation of the raindrops of the spring shower, does not clearly appear. The designer, however, seems to have love in his eye in a general way; for in the panel representing "L'Hiver" we find the main incidentis a canopied bed, on which a very amorous-looking couple are about to recline. Among the curiosities of the book is a page of wall-decoration, intended for a "Kiosque à la Turque," with the centre panel occupied by a knot of scimitars, bows and arrows, and two long Turkish pipes crossed: the only instance we remember to have noticed of tobacco-pipes introduced as decoration. Pfnor's "Ornement Usuelle," of the time of Louis XVI., gives good specimens of the same type of ornament,—among others, some panels illustrating the elements, with some fancy, though with an employment of attributes the suitability of which might be questioned.

With these two last-named works may be compared a curious and rather scarce work containing illustrations of the development by the German mind of the same artificial type of ornament derived from the Italian Renaissance in the first instance, but coloured, in a much more marked degree than in the case of French ornament, with the artistic idiosyncracy of the national mind. This is the work by Baldus entitled "Recueil d'Ornements," and consisting of ornamental designs for panels and other pieces of decoration. Like the Italian decoration, this German work has occupied the genius of some of the greatest painters of the time and country, and the names of Holbein and Lucas van Leyden are attached to some of the

most characteristic of the designs. The difference between this German ornament and that of the corresponding school in Italy is remarkable, and very significant of the distinction between the artistic feeling of the two nations when considered collectively. In force of expression and breadth of style the German work is far superior, far more masculine and bold in character. Instead of the thin delicate scrolls of the artificial foliage of the Italian designers, we have designs which, with almost the same freedom of line, fill up the ground almost entirely, in close thick involved folds, sometimes heavy, but at all times rich in effect. The use of artificial objects, or still more the artificial and monstrous combination of things having no relation to one another, is carried out with a wild and almost barbaric fancy, which throws the Italian oddities into the shade. In a panel by Aldegráver, for instance (who lived 1502-1558), we find artificial foliage not, as in the Italian designs, growing out of a vase, or the suggestion of a vase (which has, at least, reference to reality), but growing out of the neck of a headless torso, half clad in armour; above, on the stem of the foliage, hangs the skull of a deer. In another design by the same hand the foliage grows from between the thighs of a satyr, whose hoofed legs, bent each way, form the base of the design; the torso is nowhere apparent, but the satyr's head is hung on the stem of the foliage a little higher up, about where it would come if the whole body were introduced. This "motive" of the satyr's legs with the foliage ornament springing from them is apparently a favourite one; the ostentatious grossness of these designs in certain particulars is extraordinary, and could only have proceeded from, or been accepted by, a society very coarse in its tastes. Some of the best and also some of the most eccentric in the book are by Hans Beham, of whose works a very interesting collection was exhibited at the Burlington Club some little time since. There is one representing a tragic mask, with great masses of foliage issuing from and encircling it, which is grand in its way, and shows that it is possible with this class of ornament to produce something much more impressive and more full of meaning than was attained in the Italian arabesques. One of the most singular of Beham's is that in which a cock crowing is represented in the upper part of the design, with a near approach to realism, while below is shown the sculptured effigy of the same bird in the same attitude in bas-relief on a concave tablet, the difference between the representation of the real bird and of the sculptured one being carefully brought out in the drawing: the ground is filled up with artificial foliage, but the space between the two birds is partly filled up by the body or breastplate of a suit of armour, as if hung on the stem of the foliage. A wilder design than any bears the name of Lucas van Leyden, in which are introduced figures with the head and breasts of a woman, but with a long curved neck like a swan's, and with goose-wings, cloven-hoofed feet, tails that expand into scrolls of foliage, and a torso which developes in front into a great flap of artificial scroll-work, looking as if cut off from the belly of the figure and left to hang loose in front like an apron. The extreme of monstrosity seems to be reached in such a design as this, which, clever as the drawing is, produces only a feeling of disgust. One other thing in the collection that may be mentioned is a strange design for a cup, attributed to Holbein, the stem or rather pedestal of which is formed by three satyrs' legs (the hoofs forming the points of a triangle) and three satyrs' heads with long swan-necks, while between the legs and heads comes a moulding, where the bodies should be if the figures were carried out. These coarse and extravagant fancies are very interesting as illustrative of the taste of the day, but it is certain they leave an unpleasant and repelling effect on the mind.

The employment of representations of architecture as decoration is very frequent in German design, and is the resource generally of an art of comparatively naïve and childlike character, which German Mediæval and Early Renaissance art essentially is. In the choir-screen of Hildesheim we see a good example in the decoration of the spandrels between the arches, with castles, towers, and other buildings in low relief, which form a kind of symbolical accessory to the statues of saints which constitute the salient portion of the design. In the collection of ivories and reproductions of ivories at South Kensington, this use of architecture in a rude semi-symbolical form is constantly to be observed; but it may, perhaps, be questioned whether some of this comes properly under the head of decoration, and whether it is not rather to be regarded as,—in intention, at all events,—pictorial rather than decorative. The use of architectural features in Mediæval stained-glass design, and in its modern imitations, is a marked instance of the artificial employment of structural architectural details as decoration; it has been often done, often called in question, defended and condemned; and, without putting too fine a point upon the matter, we must say that we think the condemnation is right. We may observe, also, that the best stained-glass designers among us are giving practical adherence to this view, and are substituting in most cases abstract or natural ornamental detail for canopies and arches.

It is hardly necessary to say that in Oriental art in general we find little or no use of artificial objects in anything like the manner which Roman and Renaissance ornament has rendered us familiar with. Where the Japanese artists introduce dragons and certain impossible birds, they are invariably symbolical, and represent something in which the designer believes either as existing or as typical of some important idea, religious or philosophical. Beyond this the ornament of the Japanese artist is almost purely abstract, though suggested for the most part by reminiscences of floral and vegetable forms, highly conventionalised. The actual introduction of real animals into the design is always pictorial, and carried out with the utmost realism possible to the artist, which in many cases reaches a perfection hardly attained in any other work of any nation. A great deal of the Chinese ornament, and all the best of it, is also abstract; but there is also, as we all know, a very frequent use of representations of bridges, kiosks, pagodas, and other native architecture familiar to the artists. In regard to these, however, there is the same question as in regard to the architecture on the German ivory carvings, whether it is not really to be regarded as a pictorial effort, as far as the intent and ability of the designers could make it so, rather than as subsidiary decoration. It is worth notice that in the elaborate carving of a wooden miniature-frame in Admiral Keppel's collection (at present at the South Kensington Museum) there occurs prominently the amorous symbol, so well known in European decoration, of a heart pierced by an arrow. It would be interesting to know whether this detail of the ornament is of Chinese origin as well as workmanship, or whether it was introduced to suit the taste of a European customer.

Although, as has been observed, there is little of artificial ornament in Japanese work, it is curious that some of the *old* bronze Japanese vases, of which there are several specimens at Kensington, exhibit a greater affinity with classic work in their style and detail than we are accustomed to associate with anything Oriental; they exhibit a slight and not very prominent but still unmistakable use of artificial objects, such as cords and masks, as ornament. In the same inexhaustible collection may be found two large stoneware jars, professedly imitation of old Satsuma ware, the surfaces of which are entirely modelled in imitation of basket work, being then ultimately decorated with paintings of realistic flowers in colour, put on over the basket-work modelling, and with no reference to its design. The whole result is curious and unusual, but can hardly be said to be in very good taste.

The use of grotesque figures in Indian ornament was referred to at the commencement of these remarks in our last number. These grotesques are as artificial and nearly as wild in character as those of the German renaissance decorators, but with this difference, that they are symbolical (or perhaps are regarded as real) representations of various deities, and consequently have an explicit meaning which the grotesques of Aldegräver and Van Leyden are quite destitute of. Apart from these, there is little in Indian ornament that is artificial in our present sense. We may, however, recal the notable instance of the Sanchi Tope fence, carved in stone in imitation of the wooden railings previously used, and ornamented at the intersection of the bars with ornaments suggested by the nail-heads forming the original fastenings. There is another incident in Indian ornament, of occasional occurrence, which has not been much noted, and which is rather significant in its bearing on the possible relations between Asiatic and European ornamental art, and on the genesis of ornament generally. In a splendid specimen of worked Indian ornament, shown in No. 6 of the Indian plates in Owen Jones's book, the greater part of the design, which is of the most elaborate and flowing character of very conventionalised foliage, emanates from a representation of a vase in the centre, nearly Classic in outline, but enriched on the whole surface with very minute diaper ornament, in two shades, in a manner quite different from anything in Classic work; still, the Classic type of thing is there, though so covered with rich detail that it does not stand out very prominently; and at first one is inclined to think it a too exceptional incident in Indian design to be suitable for a book of typical standards of ornament. But in the architectural room at Kensington are two casts of columns from a temple near Delhi, on the richly-worked faces of which we discern again this feature; the vase from which the ornament springs being again much less prominent than in Renaissance ornament, but still an integral part of the design. In this Indian example it may be observed that the vase is not treated as a bas-relief on the surface of the ground, but rather as an object carved in the round, or nearly so, but of which only a portion is seen, the rest rounding off into the background, and being hidden behind the other freer portions of the design. It is remarkable in how many often unexpected places we meet this idea of the vase or basket, or other receptacle, from which the foliage ornament is made to spring. It would seem to be an idea almost inherently connected with ornamental design.

Mediæval ornament is more free from the introduction of incongruous artificial objects than perhaps any other school in existence, unless it be the Saracenic, the most abstract of all. The only sense in which it can be said that Mediæval ornament used artificial objects (unless in most rare and exceptional instances), was in the use of what were called the "Instruments of the Passion," which were symbolical, though representations of known objects, and in the use of architectural forms of constructive design in miniature, as the decoration of woodwork and in stained-glass windows. It is only in the case of the windows that this use of architectural detail becomes (as already observed) clearly unsuitable; in the case of rood-screens and other such objects, in which arches and buttresses are used, the fact is that the whole thing is a miniature architecture complete in itself; not an application of architectural forms as decoration.

The post-Gothic period in England followed mainly the lead of Italy and France in regard to decoration, with, on the whole, more soberness and logic than either, so far as ornament is concerned. The vases and others of the commoner objects of Italian decoration are as frequent in English work, but the extravagances of much of the Italian ornamental design are hardly to be found to the same extent in English design. One of the places where English taste appears to least advantage in regard to these matters is Westminster Abbey, where the monuments certainly show an extraordinary museum of accessory objects; but it must in justice be remembered that these are mostly introduced as symbolical, and as having some reference to the life and doings of the subject of the monument, and not from an idea that they are ornamental *per se*, or at least not from that idea only. English Renaissance architecture made much of the vase or "pot" terminal for exterior work, more perhaps than anywhere else, and later on the stone ball seemed to be regarded as the happiest of finishes for a gable or a gate-post. The festoon of flowers tied up in a knot or ribbon was also looked upon with great favour, and we have now witnessed the revival of this very unmeaning and stale piece of decoration, which may be traced back to the habit of decorating animals for sacrifice with garlands in times of Pagan antiquity, but which has no meaning at all for us now. Even ribbons have come in again, and are carefully cut in brickwork along with the sausage-looking festoons, and offered up to an admiring public as architectural decoration.

The classic details which the modern French and German architects work up are mainly highly respectable and well-worn abstract features, scrolls, keystones, &c.; only one may note that the eternal festoon seems to come in everywhere. The most exuberant and really often ridiculous use of the festoon or garland

occurs, and that frequently, in French monumental designs, such as are illustrated as choice examples, in Daly's "Architecture Funéraire." In these designs for tombs and memorials, great podgy-looking wreaths, sculptured in imitation of *immortelle* wreaths, but of Brobdingnagian proportions, are laboriously carved in stone or marble as if hung over the corner of the tombstone. The taste displayed in this way is altogether very bad, more conspicuously so on the part of people who make so much pretension to be the leaders and arbiters of taste* among modern Europeans. Other and more symbolic funeral ornaments are sometimes rather happily introduced in French designs of this class, and some which look rather odd though not unmeaning, such as a large globe duly marked with "countries" and meridians, on the top of a stele over the grave of some one who had travelled over great part of the original article; or a hemisphere globe in *bas-relief*, with a square and compasses, over the tomb of a mathematician and geometrician. These, however, are all symbolical; it may be admitted at the same time that they are not very ornamental. French taste in painted and furniture decoration is far more open to criticism in its use of inapplicable artificial objects and devices. A peculiarly flagrant instance which we recall is that of a timepiece fixed in the centre of the upper portion of a large mirror over a fireplace, with two narrow bars carved as chains descending obliquely from the two upper angles of the mirror-frame to the timepiece, the object being to convey the idea that the latter was suspended in mid-air in the centre of an open space. It would be difficult to realise or imagine anything worse in taste than this. The decorations of the French Opera-house show, on the other hand, some original and very able treatment of artificial symbolical ornament; the harp form being introduced, for instance, into the capitals in one part of the building in such a manner as to convey the idea or suggestion of a harp with its associations, while the object is kept quite as a subordinate item of architectural detail.

Looking through some of the examples of the manner in which artificial objects have at different times been made into decoration, what conclusion are we led to in regard to the real value and suitability of such decoration? On the whole, we must come to the conclusion that those critics are in the right who place such decoration as inferior to that which is based upon nature either physically or metaphysically; that is to say, either on the geometrical and quantitative relations, or on the actual forms of nature. To render any artificial objects at all satisfactory as ornament, they must be used where they have a meaning, and there only; and even then they will not rise to the rank of ornament unless they are in themselves beautiful and symmetrical in line and form; otherwise they are merely symbols, not ornaments. Under this latter head we should class the Roman ornament of the ox-skull, so often referred to in the course of our remarks, which no one would, we believe, ever have thought an ornamental addition to a building except for ceremonial reasons in ancient architecture, and from habit and association in modern architecture. To the friezes where these were used a certain grace was imparted by the introduction of garlands sculptured festoonwise, and which derived their charm, so far as it was a charm, from nature, simply because the curve in which they were hung was imitated from that due to natural forces, and almost all forms generated in that manner are pleasing to the eye; but the charm arises from the form of the curve and not from the materials of which the festoon is composed: it is exactly what gives the same charm to the lines of a suspension bridge. This is the only value the festoon ornament, so constantly repeated on the fronts of our houses, really has; the tying up of sculptured flowers and fruit in that artificial manner is really an absolute loss of beauty, as it destroys what is the true source of beauty in natural growths, the life and up-springing expression of all the parts from the root and the central stem. Yet not only is this ornament repeated so profusely in the form in which at least it is in accordance with nature as far as it goes, but in both English and French decoration the festoon is designed, with a taste which can only be called barbarous, on the horizontal surfaces of ceilings, so that the one charm of the festoon form is destroyed by the absurdity of a thing hanging *horizontally* in a curve, such as is really the expression and the result of gravitation acting vertically. Indeed, to call it "barbarous" is unfair to the barbarians, for no unsophisticated savage ornament contains so absurd a feature. It is, indeed, a curious fact in connexion with the subject we have been speaking of, that the use of these artificial forms and combinations, though unquestionably not in the highest artistic taste, seems to be nearly always an accompaniment of the greatest civilisation, so far as we regard civilisation as meaning the greatest refinement of manners and of luxurious living. It is the decoration of a life which is far removed from nature, and does not wish to be troubled with nature, or with anything beyond a conventional glitter and prettiness.

On the other hand, there is no doubt that by a judicious addition of objects, the symbolic meaning of which is generally understood and sympathised with, an additional interest may be created in ornamental design without the exclusion of the highest abstract attributes of beauty in decoration. To do this well, however, is a matter for very refined taste and very careful treatment, which one feels obliged to admit is not often bestowed on work of this kind. Those who introduce artificial and symbolical objects into decoration too often do so merely in a save-trouble spirit; they must put *something*, and have no cue or motive to give the start to their fancy, and so they get hold of an object of which it can at once be said, "this means so-and-so," and is, therefore, appropriate to the uses of this particular building or piece of furniture; or it was thought to mean this once, and therefore may be used in the same sense now. Thus the labour of thought and of design is saved, and an ostensibly appropriate ornament is manufactured as easily as that suggested by Tennyson for the tombstone of the "plump head-waiter at the Cock," which may stand as a type of this class of decorative design:—

> "And when Death calls, and thou shalt cease
> To pace the gritted floor,
> And, laying down an unctuous lease
> Of life, shalt earn no more;
> No carved cross-bones, the types of death,
> Shall show thee pass'd to Heaven,
> But carved cross-pipes, and underneath
> A pint-pot, neatly graven."

* A pretence, however, which the recent Exhibition has done much to dissipate and break down, as our neighbours themselves, or the best critics among them, have admitted.

EUROPEAN POTTERY AT THE FRENCH EXHIBITION.

However adequately the various other industries and branches of art may be shown in the Paris Exhibition, none could well be more fully illustrated than is the present state of the art-industry of the potter, as developed in different countries and in different directions of application. With the exception of Germany, no European country that has gained a name in art pottery is unrepresented, and though German manufacturers and artists have themselves withheld from contributing, the traditions of Germany are seen in the works from the fabriques of other countries which equally with those of the Germany of to-day reproduce or continue the more renowned older German styles. Countries, too, which have no traditional reputation for art pottery, have sent examples of what they are now making, and though they of necessity stand at a disadvantage in comparison with countries which have for long fostered the art, there are many hopeful signs of progress. Among these there are many instances of early and modern classical styles reproduced with strict fidelity, and besides those cases where fidelity is itself the chief merit, there are some few where there is shown originality of treatment in the adaptation of any style that has commended itself as a type model. This collection from so many countries, besides its interest to professional and amateur artists, has a special interest to those who possess a knowledge of the process and difficulties of production, as it illustrates the amenability of the natural products of different countries to the potter's and artist's wants, though the value of this is somewhat lessened by the fact that some countries obtain their material from other countries, as, for example, English clay is largely exported to Spain and Holland. All the various directions in which pottery is applied, both in common use and for decorative purposes, are illustrated with apparently no exception, for whatever common use may be noted as not shown, either some annexe or unexpected building in the grounds is afterwards found to contain examples. No such cosmopolitan idea of the present development of pottery could be gained as by an inspection of the collection now in the Exhibition.

The present remarks are confined to European pottery, and, as far as possible, to progress made since the Exhibition of 1862. The collections from Mexico, India, China, and Japan would demand a separate notice; and of British colonies there is nothing to say, for although they are largely represented in the Exhibition, none of them show any pottery.

With the enamels on porcelain are associated a few on metals, and, as the process of production is so analogous, they can hardly be excluded from a notice of European pottery, for, though they do not strictly come under the head of pottery, the artists who exhibit have elected to show in this section rather than in others which were open for their choice. In marked contrast to former exhibitions there is evidence that the idea uppermost in the minds of producers has been to give decorative pottery a character likely to harmonise with the deep-toned decoration of rooms now so much appreciated, instead of, as formerly, making pieces which from their bright colouring at once arrest attention to themselves.

Looking at the exhibition of pottery collectively, it is at once apparent that France and England are so far in advance of other countries that any idea of rivalry with them is quite out of the question. Between France and England themselves, however, there is the keenest competition. Within the last few years England, which has always largely imported from France, has also exported pottery to France, so that from the commercial point of view the English and French markets are almost one. In considering the vast collection of productions brought together from the two countries, it is astonishing, when realised, to think of the large amount of thought and energy that is devoted to pottery. The different conditions under which the work is produced in the two countries is brought very forcibly into prominence. The English firms to whom progress in art pottery is due are but some half-dozen, and these are all old-established and enjoying now a European reputation. The output of the least considerable of these amounts in value to many thousands a year. In England it is the firm that decides what line of art shall be pursued, and it secures the services of artists that are capable of carrying out its wants. Not a few of these artists are French. In France everything is very different. Firms are numerous; those showing at the Exhibition are some ten times as many as the English. The output of each *fabrique* is small, and very few make their own pottery. The firms are mostly artists who themselves decorate the wares they sell, and require but little paid assistance.

While in England each of the great firms has a completely distinctive style of its own, in France a large proportion follow Sèvres, or are content to imitate each other's styles.

Owing partly to the influence of the State-supported manufactory of Sèvres, which, from its organisation, is constantly seeking not only new styles of art but new processes of manufacture, and partly to the multiplicity of independent workers, this art-industry in France is still in advance of that of England in all important particulars, though in domestic pottery England has unmistakably maintained its supremacy. For the first time at an international exhibition a new element comes into competition, as the works of amateurs and of schools of art are shown side by side with those of commercial houses. It is becoming difficult in England to define the line that separates amateurs from professionals in the matter of pottery decoration; but in this case, where amateurs' work is admitted for its merit's sake, that need not be a trouble. Most of the amateurs are ladies, and they are principally French, English, and Austrian.

In the French court, Madame C. Moreau, a daughter of the well-known Dr. Nélaton, exhibits twenty-two specimens of painting on vases and plaques. All are characterised by broad treatment and a most happy blending of rich and subdued tones. They have an individuality of their own which marks them off from everything else. As a specimen of delicate painting *en grisaille* it is difficult to imagine anything more perfect than the Aphrodite of Madame Bellion, painted after Cabanal.

A very interesting exhibit is that of the

"Atelier d'Application d'École des Beaux Arts de Limoges." It has been originated since the war by M. Dubouché. Free teaching and free material are provided at M. Dubouché's expense, and there is a museum, with models of choice workmanship from different countries. The pupils originate their own designs, and carry them out themselves. The money that arises from the sale of the objects produced is thrown into a general fund, from which prizes are distributed. The system thus fosters excellence, and does not give encouragement to mediocrity.

Among the objects sent by the Austrian Government are a few pieces of pottery and enamel, executed by the professors and students at the École des Arts Industrielles of Vienna. This educational establishment, founded in 1864, is on a similar basis to that at South Kensington, and receives the highest possible patronage. Standing as these pieces do among other works, there is nothing in them, however, to attract particular attention, except from the circumstances under which they are produced. The English amateur work is almost entirely shown by Howell & James, and English people are already familiar with it.

The scale on which pottery is now used for architectural decoration is one of the first features that impresses itself at the Exhibition. It never has been employed in such grand dimensions in Europe since the days of the Moors in Spain, of della Robbia in Italy, and the Middle Ages in Germany. The colour effects of the tile decorations on the front of the building itself have been unfavourably criticised, but due allowance must be made for the colouring of their surroudings, the slate colour of the iron work, the blue of the glass, and the many flags, shields, and "trophies" around them. They form panels on flat columns, on which a pattern in high relief of conventionalised flowers is at intervals repeated. On the external wall of one of the pavilions devoted to the beaux arts are two examples of mural decoration. One is by Deck, of Paris, the other by Boulanger, of Cloisy-le-roi. Each is within the frame of an arch, and forms a picture with sea, sky, and landscape,—that of Deck composed of over 1,000 tiles, 10 in. square, and representing a rocky landscape, somewhat after the style of N. Poussin.

Boulanger's is of equally grand scale, though different in tone of colour. Both have naturally been the subject of much comment, and Deck's production is generally more admired. Doulton and Minton also show specimens of mural decoration. The reputation of Minton's name draws the attention of visitors to the large majolica fountain in the gardens, but it is difficult to surmise on what grounds this can be supposed to be any advance on the previous works this firm has produced. On the Trocadéro the Pavillon de l Algérie shows, around the entrance, tiles by Parvillée, in turquoise, green and yellow, and there are many other buildings with decorations of similar character.

In the French Court, Collinet shows, in a kind of temple formed at the intersection of two avenues, several specimens of architectural pottery, among them some very fine examples in relief in Persian style. One of these, intended for a bath-room, with walls and fittings complete, *en suite*, is well worth attention. Round the temple are columns in blue and green, and several framed specimens of wall *carreaux*.

In the Spanish Court are several specimens of interlaced tiles in Hispano-Moresque style. Other tiles, encaustic and painted, are manufactured at Seville, purely Spanish in style, and their general character is good.

The objects exhibited by the Government Manufactory of Sèvres are shown in the main hall, which faces the Trocadéro, around a sort of pavilion, an illustration of which was given in the *Builder*, June 15th, erected in three sections, with pillars, cornice, and recesses for the display of Beauvais and Gobelins tapestry. Some of the vases are placed on pedestals, and a large number are on two semi-circular stands which terminate the pavilion at each end, while the smaller objects are in glazed cases. The great gain to a vase from being placed by itself instead of being crowded up by others could not be better illustrated than it is here where the effect of those isolated on pedestals can be contrasted with those placed together on stands, but the selection of those to be isolated seems to have been made on some other principle than that of choosing those of highest merit.

Before speaking of particular pieces, there are some few points that may be referred to generally with respect to the Sèvres productions. The most striking is the remarkable increase in the number of objects of large size. The large blue vase that now surmounts the group at the western end of the Pavilion is 10 ft. 6 in. high. It was *cast* in three pieces,—foot, body, and neck separately; that is, the paste entered the moulds by the aid of M. Régnault's process of exhausting and rarefying the air. It gives at first sight the idea that it is of enamelled faïence, but it is not. It is porcelain, and is the largest piece of any kind in that material that has been made in Europe. Too little is known of Chinese productions to say that it is the largest ever produced.

The increase in the number of colours and tones of colour is remarkable, and bears witness to the activity of research in the Chemical Laboratory attached to the establishment. Sèvres does not, however, stand alone in this respect, for other *fabriques*, notably the English, to which reference will be presently made, also show very marked progress in this direction.

There are two new processes of quite recent invention at Sèvres which place in the hands of artists a power of manipulation they had not before. One of them, of which there are several examples, was a process first tried experimentally ten years ago, and which was so successful that it has since been somewhat extensively employed.

The late M. Fr. Richard ascertained that a great number of enamel colours would bear exposure to a temperature as high as 600° C., which is one-third that of the *grand feu*. It is now technically known as the *demi-grand-feu*. This temperature is just high enough to soften the glaze, and thus enables new glaze applied to fuse with the edges of the old, and unite in an even surface without showing any trace of join. The advantages gained by it are, first that the colours and glaze unite and exactly produce all that softness so much admired in *pâte tendre*, that even experts have a difficulty in distinguishing the difference by sight alone. Secondly, that a vase which has been damaged in the firing can be repaired, a good example of which is seen in the "kingfisher" vase, to be presently mentioned.

Another new process is that for gilding with various tints and degrees of transparency, so that the colour underneath may show through. The process is this: the body of the vase is coloured with oxide of cobalt, which in the *grand feu* firing comes out *gros bleu*. The design to be gilded is then traced in chloride of gold, and *demi-grand-feu* firing brings about a chemical decomposition which makes the surface a suitable one for gilding. Its colour then is a rich reddish brown, which is either left, or on this is tinted the colour which it is wished to have showing through. The ordinary gilding is then put on either so thin as to be transparent, or the effect may be produced by partly removing it. It is then fired at a temperature of about 200 degrees C. It is a singular fact that no other ground known permits of transparent gilding to the same degree. In addition to the effects of light and shadow, the colour of the golds is modified by admixture with aluminium or other metal. The invention, due to M. Réjoux, gives an effect difficult to describe, but recalling objects inlaid with gold and fine tortoise-shell.

The value and artistic effect of most of the larger vases are greatly enhanced by the use of metal mountings. Within the last few years a special staff of artists has been attached to the manufactory exclusively to design and produce this metal work. So great an amount of well-directed skill is given to it that it is artistically no less remarkable than the more renowned porcelain itself.

It is often objected that Sèvres has an undue advantage over other *fabriques* from the subvention by which it is, to a considerable extent, maintained. This subvention may, perhaps, and no doubt does, very materially encourage the development of art-pottery in a way that private enterprise could hardly follow. The conditions under which a private *fabrique* can continue its existence in competition with others demand that the money value of the time devoted to the production of any piece shall be recouped in the market. Therefore, the more rapidly a piece is produced the better for the owner of the *fabrique*. At Sèvres, so far from there being any inducement for an artist to finish designs rapidly, the arrangements are calculated to encourage the bestowal of much time. The artists attached to the establishment are paid according to what they do; but none of them are allowed to undertake more than will bring them 140*l.* a year.

It is obvious this system has its drawbacks, although in practice it has been generally found that the *prestige* of being attached to the manufactory outweighs the consideration of the far larger salaries that can be so easily obtained elsewhere. There are two other influences always present, and perhaps stronger. The charming village of Sèvres, with its steep hills sloping down to the Seine, its sunny fragrant gardens and its shady woods, the free unrestrained mode of living, the companionship of brother artists, and the general *entourage*, are attractions from which an artist would not readily sever himself. It is well known, for example, how large a sum was offered by Minton to M. Solon to induce him to come to England. The artists hold that if a *confrère* leaves his country, or even goes into the provinces, he loses his touch. As regards competition. It can hardly be said, indeed, that Sèvres does enter into competition with private *fabriques*, for the results arrived at are open in the freest manner to all who ask for them. Moulds in plaster of any of the forms can be had for the cost of taking them, and any new materials or combinations of them can be had at cost price, with directions for their use. The manufactory is a truly national one for the development of progress in art-pottery. The small extent to which it practically comes in competition with private *fabriques* is seen from the fact that while the annual value of French pottery spread over 102 factories is, on official data, forty-two million francs, Sèvres sells no more than from 110,000 f. to 120,000 f. as a maximum. In any comparisons that may be made between the excellence of Sèvres productions and those elsewhere, the fact of the subvention should, in justice to the enterprise of private firms, be recollected.

In referring to the objects shown by Sèvres it will be convenient to begin with the vases on separate pedestals around the pavilion. They were subsequently frequently re-arranged, but are referred to here as if in the positions in which they stood throughout the greater part of the Exhibition.

The first is a fine *gros bleu* undecorated vase with aluminium gilt mountings. The metal handles represent Cupids holding a cable between them, which rests in a graceful curve on the vase. The effect is most pleasing, and the harmony of the whole is perfect; at least, it would be interesting and instructive to hear what adverse criticism could be raised against it. A pair of vases by Derischweiler come next, decorated in Renaissance style by the new gilding process. The colour of the ground seen through the gilding is in this instance blue, so that it appears as if the gilding were laid directly on the *gros bleu* ground of the vase itself. The next pedestal supports a vase with a design of grapes and wisteria, the delicate tinting of which is due to the *demi-grand-feu* process. Continuing along this side, without going into the cross passage, the next vase is a large blue one decorated with the new gilding process by the inventor himself, M. Réjoux, who has in this case left the brown colour to show itself through the gilding untinted. The softest in appearance of all the large vases, not even excepting those in *pâte tendre*, has been produced by the *demi-grand-feu* process. The painting on white ground by Madame Apoil is of surprising grace and delicacy, with an absence of all strong colouring except on the neck and foot. The perfect sinking of the colour into the glaze gives the utmost softness, and the vase is probably the finest piece of glazing ever produced on true porcelain. Following this is a vase by Adolphe Schildt, which has a blue ground, and a subject painted on a medallion, "La Triomphe de la Vérité." It is in the old Sèvres style, which Schildt alone is said to have kept up. Then follows a remarkable vase of the shape known as "Vase de Neptune." The body is of a pale milky grey, and the decoration around the neck is the work of M. Larne, "sculpteur." It will be noticed that all the Sèvres artists in *pâte-sur-pâte* sign "sculpsit," not "pinxit." The subject is a *cortège* after the antique, in *pâte blanche* on a coloured ground, the figures being surrounded by very hard lines, which give a not very pleasing effect. In the adjoining recess are a pair of vases, by Rousseil, with allegorical subjects, which are beautiful

examples of delicate painting. The vase at the following pillar, by Ch. Laban, is another example of gilding by the new process, and with tinted golds. The subjects of the decoration are groups of chrysanthemums and woodbine. Crossing the passage, the next vase is bold in shape and design, and interesting as being one of the first rescued from destruction by the *demi-grand-feu* process. The ground is a pale celadon, except the space left in front for a water scene, which is painted in *pâte-dure* colours. To conceal the result of accidents which happened to the glaze, the ground has been profusely covered with wisteria on trellis-work, and a pair of kingfishers are added in the richest blues and greens, produced by the *demi-grand-feu*. In the next recess are a pair of vases in *pâte-sur-pâte*, with handles. The ground is celadon, and the subjects are in white, which, as is usual in the Sèvres *pâte blanche*, are of remarkable transparency. The drawing by Ferdinand Regnier, by no means faultless, is after the style of the procession of the Elgin marbles.

The next single vase, of large, deep, mottled blue, is the last on the south-east side of the pavilion. It is a grand vase, with metal mountings, in parts bronzed, gilt, or coated with platinum. Acanthus-leaves enter into the design.

Passing now to the north side, it will be at once noticed that the works of greater excellence are those already referred to. At the north-east corner is a blue and white vase by Ficquenet, a good example of vermiculated ground. Massive, well-proportioned handles in metal are formed of goats' heads, with their horns, which are long, and curved backwards. Passing over the recess to the next column, there is a vase intended to decorate a picture-gallery of the Louvre. Its beauty depends upon its form, as it is of one subdued bluish colour, and there is a complete absence of all subject. The aim has been, that it shall not distract attention from the pictures among which it is to be placed. Two other single vases on this side have metal mountings, one with and one without handles. That with handles is a remarkable study in various tints of blue, with blue peonies and blue-tinted rocks, and the effect is slightly heightened with gold; and that without handles is a free treatment of a study of mallows, painted in *pâte-sur-pâte*, the colour of which is rich, the rose-colour on the mallows not having been produced before. The large vase in marbled blue at the western end, in addition to the metal mountings, has handles in white biscuit, formed of Cupids, but with unharmonious effect. The artist is M. Fulvy.

In the two cross-passages that divide the pavilion into three portions there are six single vases and three pairs. The eastern passage contains a very good vase without handles, and has a free treatment in decoration, in which a stork is the principal object, and a pair highly decorated in blue, green, and gold. Opposite is a yellow vase, of some importance from the clearness of its colour. In the other passage are two Perso-Indian bowls; one, of intricate *cloisonné* workmanship, is of self-coloured *pâte*, incised and filled in with *pâte dure* and coloured clays. The decorating by incision and filling in gives a sharpness of outline not otherwise obtainable. There is also a vase with Iris and raven decoration on a purplish ground, which, besides being of interest as a work of art, is important, as it was the first specimen produced with the high glaze of the *demi-grand-feu*. Two good examples of *pâte colorée* are also shown in this cross-passage.

At the semicircular stand at the western end are several examples of enamel on copper after the well-known Limoges style. They are of exceptionally large size, admitted to be of the highest artistic merit, and are so highly prized at the manufactory that very large sums have been refused for them. For the last three years none have been made; the artists at the manufactory having proved themselves able to execute works of the finest character on enamel, have since devoted themselves to what they regard as their more legitimate work, painting on porcelain. At this end as well as at the other are shown a number of important vases, which, though the body is made of *pâte tendre*, are equally true enamels. The enamel colours are laid on as adhesive powder, and fused at a low temperature. The colours produced in this way are of greater depth and brilliancy than if applied by any ordinary methods. The decorations are mostly arabesque or scroll-like patterns, the prevailing colours being a deep turquoise, purple, white, and green, and they are profusely decorated.

Besides all the foregoing, there are a number of vases placed on pedestals apart from the pavilion. Among them are the following:—A large vase, called the "Vase des Éléments," including, however, only air and water, has been designed and executed by M. Gobert. The ground is grey, the decoration in *pâte blanche*, and the effects of light and shadow depend on the greater or less relief of the ornament, and on the transparency of the *pâte* allowing the ground colour to show through. The design is a close grouping of allegorical figures, in two tiers, those in the upper representing air, and those in the lower, water. The lower figures form, relatively, the foreground, being in strong relief; the upper figures, being much more transparent, give the effect of height and distance. The lower figures are in comparative repose; the upper figures, represented in full action, convey the idea of rapid motion. For delicacy and transparency of effect this vase has been probably never surpassed. Another *pâte-sur-pâte* vase, of much the same general character, is by Lemeire, the subjects introduced, which are arranged round the neck and on the body, representing the labours of Hercules. They are of extremely fine workmanship, and are very transparent. The ground of the vase is deep sea-green, and the decoration is enriched with borders introducing peculiar shades of red, chocolate, blue, and gold. Another distinct process of decoration is used in the production of a vase by Lambert, known as the "Vase de Vendange." The colour of the ground is *pâte-changeante*, produced *au grand feu*. The spaces to be occupied by decoration were removed to a slight depth, and filled in with clay tinted with colours used in the *demi-grand-feu*. The delicate yellows and pinks of the *demi-grand-feu* in combination with the peculiar grey only obtained by the *grand feu* has a delightful effect not producible by any other process. There is a "Vase de Neptune" *en camaïeu* representing the "Triumph of Bacchus" by M. Brunel-Rocque. The figures are beautifully and vigorously painted in brown and gold on a grey ground. A second vase of the same form, representing "L'Amour Vainqueur" and "L'Amour vaincu," by Derischweiler, is a fine example of modelling and incising in gold and silver.

An important work is the "Vase de Nîmes." The general tone of colour is pale, the ground being light yellow, and the prevailing tints upon it are lavender. "Loves" seated on arums, minutely examining with glasses, and dissecting flowers and butterflies, are intended to represent Study; bees are introduced to represent Work; and olive-branches, wheat-ears, and other allegorical symbols represent Peace and Plenty.

There is a very handsome "Vase de Paris," designed by Madame Escallier, executed by M. Célos by the *demi-grand-feu* firing. Through a border, giving the idea of a window trellised and overgrown with honeysuckle and other flowers, is seen a distant view of Paris. The view is thrown to a distance by the introduction of life-sized pigeons in the immediate foreground. The delicate colouring and gloss of their plumage form a remarkable feature in the vase. On the sides are the richly-coloured and gilded arms of the city of Paris. There are also many other vases deserving scarcely less attention than those already mentioned. Among the artists of these are Ficquenet, Richard, Bonnuit, and Caban.

Regarding the Sèvres Exhibition as a whole, it maintains fully the traditional position of supremacy of the manufactory, and gives all those indications of progress which might fairly be expected from the resources at its command.

We shall continue these remarks in our next.

BIFRONS.

Considerable alterations and additions have been carried on during the past and present years to the mansion, offices, and stables at Bifrons, near Canterbury, in the county of Kent, for the Marquis Conyngham, from the designs of Mr. David Brandon, F.S.A.

Upon the completion of the works, and in commemoration of the coming of age of his lordship's eldest son, Lord Mount-Charles, entertainments were given to the tenants and other persons employed on the estate, and a sum of money was divided amongst the workmen.

Messrs. Simpson & Son, of Paddington-street, were the builders employed.

THE REPAIR OF CHURCHES.

The recent litigation between the Metropolitan Board of Works and the Incumbent of All Saints' Church, Lambeth, though highly interesting to lawyers and the general public, is not a very edifying spectacle for the friends of the Established Church. For it would naturally have been supposed that rather than let the sight be presented to the world of an incumbent of a metropolitan church being worried in the Law Courts by a powerful public body, because he personally was too poor to pay for the repairs of the church, those enthusiastic Churchmen, of whom we are assured there are now so many, would have come forward and subscribed the necessary sum. However, the question of the liability to repair churches has been raised, and therefore it will be not inopportune if we devote a short space to this matter.

And first of all, as regards the case of the Metropolitan Board of Works *v.* The Rev. F. G. Lee, which came before the Queen's Bench Division on the 11th of November, and which contains in itself one distinct part of the entire subject. The Church of All Saints, Lambeth, had been built under a Church Building Act. By the first and chief of these Acts, which was passed in the year 1818, 58 Geo. III., c. 45, it was enacted (section 70) "That the repairs of all such district churches or chapels shall be made by the districts to which they respectively belong, by rates to be raised within the district in like manner as in the case of repairs of churches by parishes, and every such district shall be deemed in law a separate and distinct parish for that purpose; and the repairs of all chapels not made district churches shall be made by the parish in or for which the chapels shall be built." Here, therefore, we have, to a large extent, the policy and procedure connected with churches which should be built after the year 1818: they were to be repaired out of the church-rates raised from the parishioners. By some of the subsequent Church-Building Acts provision was made for the establishment, in some cases, of a repair fund as part of the endowment of new churches. Such, for example, is the statute passed in 1831, viz., 1 & 2 William IV., c. 38, the second section of which states, among other things, "where the intention shall be declared of providing a fund for the repairs of the church equal in amount to 5*l.* upon every 100*l.* of the original cost," then that the building shall be consecrated, and so forth. Therefore, so far as regards modern churches, they should, in some cases, be repaired out of the church-rates, in other cases out of a repair fund. But it will, of course, be remembered that in 1868 compulsory church-rates were abolished, and the difficulty arose in the case of All Saints', Lambeth, that there were no rates out of which to repair the structure of the church, although they are, as we have said above, the legal fund for the repair of modern churches. Accordingly, the Metropolitan Board of Works set in motion their powers under the Metropolitan Buildings Act, 1855 (18 & 19 Vict., c. 122) (not the Metropolitan *Management* Act, as reported in the *Times*). They considered All Saints' a "dangerous structure," they repaired it, they decided that the incumbent was the owner, and they attempted, under the 73rd section, to make him repay to them the cost of the repairs. This section enacts that "all expenses incurred by the said Commissioners in respect of any dangerous structure shall be paid by the owner of such structure." The metropolitan police magistrate would not, however, issue a distress warrant against Dr. Lee for the sum in question. Hence arose what was practically an appeal to the Queen's Bench Division, which tribunal decided that the incumbent of a church was not the owner of a building within the meaning of the Act in question, and consequently was not liable to pay the cost of the repairs. The result of this decision, with which we do not by any means quarrel, either in point of law or abstract justice, is that where there is no Repair Fund, or an inadequate fund, there is no means of obtaining the money to repair a church except by voluntary contributions. It would clearly be most flagrantly unjust that the incumbent of a church, who merely ministers to the wants of a congregation, should be held liable for the repair of a structure which is primarily for the use, not of himself, but of his congregation. It may be said that this decision may cause some practical [illegible] parishes and districts, but

the obvious answer is that if the well-to-do churchmen do not care to come forward to the relief of their poorer brethren, clearly the National Church rests on no firm or lasting foundation. What is worth having is worth paying for, and therefore it is to be hoped that so long as the Established Church exists in England we shall not see many more such unseemly disputes as this upon which we have been commenting.

But the question of the more ancient churches is one even now of some interest and importance, and is distinct from that having to do with edifices erected under the Church Building Acts. Anciently the bishop had the whole tithes of the diocese, and a fourth part of these had to be applied to the repair of the church; but when this interest was released to the rectors the bishops were consequently acquitted of the repairs of the churches. Then the general rule sprang up that the parson was bound to repair the chancel, and the parishioners the body of the church. This rule, again, was varied in some instances, — especially in the City of London, — by custom which obliged the parishioners to bear the cost of repairing the whole of the church. This custom was also found in other places besides the metropolis, and in some instances it varied as by obliging the estate of some particular person to repair the chancel, and the parishioners the nave. Thus in the year 1833 a considerable litigation arose between the churchwardens of Clare, in the diocese of Norwich, and the Bishop of Ely, as impropriator of the great tithes, to compel the latter to repair the chancel of Clare Church. The bishop replied that from time immemorial the parishioners had repaired the chancel. The case was fought both before the Court of Common Pleas and before the Arches Court of Canterbury on appeal from the Episcopal Court of Norwich, and in both instances the bishop beat the churchwardens. This was an instance of the exception to the usual rule, and the parishioners were bound to repair the whole of the structure. Moreover, in those days the censure and sentence of the Courts Ecclesiastical could be invoked against parishioners and parties who failed to keep their churches in proper repair. Now, however, it is obvious, both from the case of the Metropolitan Board of Works *v.* Lee, and from the effect of the abolition of church-rates as regards the more ancient edifices, that the repairs of the churches in England must depend on voluntary efforts. Parishioners cannot now be compelled to pay money in the form of church-rates, and such being the case, there exist no funds from which the cost of repairing churches can be defrayed, except such as may be raised by gift. And it is clear, moreover, from the recent case which we have noticed, that the incumbent of a church is under no personal liability in the matter, even within the jurisdiction of the Metropolitan Board of Works.

THE KENSINGTON NEW VESTRY-HALL.

There is to be a considerable amount of ceremony at the laying of the foundation-stone of the new vestry-hall, which is about to be erected in the parish. In the first instance the vestry were anxious that the Prince of Wales should perform the ceremony, and at a recent meeting the chairman (the Hon. and Rev. Mr. Glyn, vicar of Kensington) was desired to place himself in communication with the Prince. At the meeting of the vestry last week, however, it was announced that Lord Kensington had consented to lay the foundation-stone, and the committee recommended that Thursday, the 28th of December, be appointed for the ceremony to take place, and that afterwards a dinner be held at Bayley's Hotel, South Kensington, the tickets to be one guinea each, and that the borough and county members, and such other gentlemen connected with metropolitan and parochial business as the committee may determine, be invited. Some objection was taken to Lord Kensington having been invited to lay the stone, on the ground that he was an outsider, one of the members observing that Major-General Boileau, who had spent so much time to further the interests of the parish, was the proper person. Major-General Boileau, however, said that, as chairman of the committee, he had asked Lord Kensington. The recommendation of the committee was affirmed, and the 28th of December fixed as the day for the ceremony. The estimated cost of the building is about 30,000*l.*, and it will be a large and prominent addition to the public buildings in the parish.

OPENING ADDRESS AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the opening address of the session, on Monday evening last,

Mr. Charles Barry, F.S.A., president, said,— For the third and last time it has become my duty and privilege as your president to welcome you to the commencement of another session of professional intercourse, no less pleasing to us all personally than useful, as I hope, in furthering the very worthy objects for which we are corporately united. At the same time, having in my two former annual addresses dealt with very many of the subjects of prominent interest to professional men, whether as artists or as men of business, I feel some difficulty in now offering to you observations sufficiently worthy of your regard. Not, indeed, from any lack of matters of deep interest to us all which are continually, year by year, coming forward and claiming notice, but in consequence of my want of sufficient time to consider them all as they deserve, no less than from lack of sufficient ability to deal with them exhaustively, and to deduce from their consideration all the advantage which they might perhaps be made to render to us. However, knowing that I may count on your indulgence and consideration, I will address myself as best I may to the task that lies before me; and in doing so I think that perhaps I cannot do better, after placing before you, as is customary, some memoranda of a statistical nature connected with the Institute in its last year's life, and after asking you to remember with me the friends who have passed away from among us since this season last year, to take a review of the comparative position of the Institute and its members in 1876, when you first called me to this chair, and its position at the present time,—in other words, to render an account of my stewardship.

With regard to the number of our members, in my address of 1876 I was able to point to a considerable increase of members in the year then last past (viz., 27 new members) as being beyond the average of the preceding years. I am now able, even starting from the vantage-ground of 1876, to announce a considerable further growth. Taking first for examination the class of our strictly professional members,— far from diminishing, they have increased during the above two years from 615 to 649; and as within that period 15 have died, the real increase is 49, or about 8 per cent. When we add to these the classes of our non-professional members, viz., honorary fellows and honorary associates (and notwithstanding the abolition of the class of contributing visitors), we find that the total number of members in 1876 was 636, while at the present time it is 744, an increase of 108, or about 17 per cent.

Once more, when we compare the roll of our non-metropolitan members then and now, we meet with no less gratifying results. Some few,—very few,—have left us since the subscription was raised, but, taking those who are with us still, and including those who have presented themselves for election since, all of whom willingly pay the full subscription, we find this result: In 1876 we had 272 non-metropolitan members; in the interval 6 have died, and we have now 290, showing, therefore, an actual increase of 24, or 9 per cent., in that class of members only. That much larger increases in our numbers may take place I sincerely hope, and, without being too sanguine, I think I may fully expect.

I congratulate our members also on the satisfactory state of our finances. Some among us feared, I know, that in carrying out the changes of the last two years our funds would suffer much fluctuation and possibly ultimate loss. It is not so, as a few figures will make abundantly evident to you. In 1876 our income (exclusive of all trust-moneys) was 2,153*l.*, while in 1878 it is 2,417*l.*, up to the present time, showing an increase of annual income of no less than 254*l.*, or nearly 12 per cent., and I see no reason why this increase shall not continue. I may further mention that our invested capital at the present time (exclusive of the trust investments) is 5,512*l.*; and I name this in reference to the expenditure which may be temporarily necessary for our better accommodation, pending the gradual, but I hope, certain, increase of members' subscriptions for these purposes, when the money so taken can be gradually repaid, and after which our investments will, I hope, soon considerably exceed their present amount.

The Library.

During the two years, from 1876 to 1878, our already valuable library has largely increased, for in 1876 it contained about 3,000 vols., and now there are 3,500 vols. (exclusive in both cases of periodicals); about 380 vols. having been purchased or presented to us since last year. This has been greatly due to the augmentation of the purchasing fund from the entrance donations of our Honorary Associates, but, even independently of that, we have a good store of cash in hand,—the fund in 1876 being 89*l.*, whereas, notwithstanding the expenditure on books of 85*l.* in the past year, it is now 156*l.*,—the money donations being nearly four times their amount in 1876, for in that year they were 53*l.*, and in the present year 198*l.* You will remember that one of the changes made by you, on the suggestion of the improvement committee, was to open the library in the evenings as well as by day: the result is shown when I mention that, in 1876, 268 readers in all made use of our collection, whereas in the past year we find no less than 596, nearly equally divided between day and evening students. Gratifying as this is, I do not yet think the enormous and varied fund of professional information we possess is used as fully as might be by our members, especially by our younger members. As you are aware, the council are doing all in their power to afford facilities of access by special reading-tickets, at a nominal charge, which are given to students in the offices of our own members, to members of the Architectural Association, and to the pupils of the Architectural Classes at King's College and the University of London. Many presentations of valuable books have been made, both by our professional members and by our honorary associates, while we are also indebted to several of our honorary and corresponding members,— at Berlin (Professor Gropius), at Amsterdam (Messrs. Cuypers), at Copenhagen (Prof. Meldahl), and at Paris (M. Vaudremer), for special donations illustrative of works in their several cities; and last, not least, we are to be possessed of the valuable library of our late friend, Mr. Nelson, consisting of 249 vols., many of them of much value.

Let me (at the risk of seeming importunate) again appeal to our members to add, whenever they can do so, to our lately-started collection of drawings of those old buildings which may have been entrusted to them for restoration; and while I ask you to thank Messrs. Carpenter, Tarver, and Withers, who have sent us contributions to this collection, again ask in your name for similar favours at the hands of many of our members, who undoubtedly must be able to enrich our store. Our new members, for instance, the two sons of the late Sir G. Gilbert Scott, will doubtless find it in their power to aid us in this respect when they have had time fully to examine the numberless drawings which their late father must have left behind him, from his special practice as a restorer. And there are, of course, many others of our living members who notably have had and are having great opportunities in the same direction. One of our members has kindly presented to us a very interesting series of engravings of our old City churches, and any addition to this series will be very gladly received, especially when we remember that under the action of the "Union of Benefices Act," and in consequence of the large metropolitan improvements now in progress, and likely to be undertaken, many of this class of buildings will ere long disappear.

I have also again to appeal to those of you who may happen to have duplicate copies of professional works to remember our "Lending Library." Although as yet of modest extent, it has been found most useful, and there can be no doubt that, with its growth, will increase the demands made upon it.

The Premises of the Institute.

We find ourselves still in our accustomed rooms, though the Council feel with you that they are no longer suitable or spacious enough for our needs and increasing numbers. Much care and thought has been given to the subject by the Council since we last met. I will not anticipate the special report which they will shortly lay before you, further than to express my personal hope that, whether we remain here or find a new home elsewhere, the

general body of members will take a broad and comprehensive view of the matter, not contenting themselves with small treatment of the matter, which would lead to present waste of money, and ere long need to be re-considered, but will look rather to the Institute of the near future,—as it ought to be,—as it may be,—and, with united action on the part of all, as it will be. It may, perhaps, be our wisest course for the present to content ourselves with temporary expedients for our greater comfort until we feel ourselves in a position to obtain a really permanent home for the Institute of sufficient size and sufficient dignity to deserve that name.

[Under the heading, *Obituary of the Past Year*, the President then gave some particulars of the members who had passed away during the preceding year, but as nearly all these have been already noticed in our pages, we omit this portion of the address.]

Turning now to some of the important events which have marked the past year, I think the most important in its interest and possible effects for this Institute is

The Paris Exposition.

Organised on a far larger scale and with a more perfect completeness than any former ones, architecture found, of course, its due place there, and the Institute will with pleasure remember the gracious letter of his Royal Highness the Prince of Wales, as president of the British section in that Exposition, asking the members of this Institute to aid him in the great work he had undertaken, so far as architecture was concerned, and the high compliment he paid the Institute, by nominating their president (for the time being) a member of the Royal Commission. I need not tell you with what anxiety I undertook, in your name, the important duties of this office. I was powerfully aided by a committee appointed by your Council, consisting of the most influential and distinguished members of the profession, so selected that on it should be found representatives of every school of architectural taste and thought among us. On the announcement by me to my brother Royal Commissioners in the section of Fine Arts, who were charged generally with the arrangements for painting, sculpture, architecture, and engraving, of the appointment of this committee, they at once agreed to leave the whole arrangement of collection and selection of the representative architectural works which were to be sent to Paris to them. How well they discharged their duty will be evident when I tell you that 171 works, by sixty-four different exhibitors, were presented by our committee to the Fine Arts section, and forwarded by them to Paris; and that, had space been at our disposal, this number could easily have been doubled. Mainly by the personal exertions of his Royal Highness the Prince of Wales, additional space was obtained for the British fine-art exhibit as a whole, in which extra space architecture shared to a moderate extent, consequently all these works so sent were enabled to be exhibited, and that they were well and carefully exhibited on the rather limited space, after all, at disposal, is due to the care and energy of our member, Mr. Roger Smith, who kindly undertook the difficult and delicate task of arranging and hanging them, and did his work, as far as I have heard, to the general satisfaction of the exhibitors. An international jury, consisting of ten members, whose names will be found in the note below,* was then appointed by the Superior Commission in France. Of these, five were distinguished French architects, who are honorary and corresponding members of this Institute, and by all I was welcomed with the utmost cordiality; each of the following nations was represented by one member of jury to each, viz.,—Austria, Italy, the Low Countries, Egypt, and England. I had the honour of representing England on this occasion. The duties to be discharged by this jury were very laborious, and demanded no little judgment and tact, and it will be interesting to our members to learn that more than a fortnight was devoted to carefully inspecting and considering each one of the very numerous works sent in by all nations, amounting in all to no less than 863 drawings, sent by nineteen different nations. A preliminary examination took place, with the object of distinguishing those works which were of sufficient merit to require further and closer examination, and, in passing through this ordeal, the English exhibit, consisting in all of 171 works, by sixty-four authors, had 126 works, by forty-four authors, reserved for such further consideration,—a considerably larger proportion than was obtained by the exhibits of any other country,—including even the French division itself. It will be remembered that, having in view the small space available for the British Architectural Exhibition, our committee confined their selection rigidly to works *actually* executed within the last ten years, or still in process of execution. On the other hand, the French architects having at their disposal about six times the space allotted to us, did not so confine themselves, but out of the 369 works sent by them, only 183 represented works executed or in progress,—a contribution very little, in fact, more numerous than our own,—while the exhibitors were not even as many as in our case.

It was a matter of regret to me that many English architects were inadequately represented, or not at all, and that the known extensive and important architectural works going on in our various colonies were also practically unrepresented. In answer to my inquiries on this head of the Colonial Commissioners, I could only obtain twenty-one drawings, sent in by four exhibitors, to submit to the judgment of the jury as representing the Colonial architecture of the British Empire.

The final report of the jury has now been made public, and you will note with pardonable pride that, in the award of prizes, English architects have been adjudged a larger number than any other country, except France, the number of whose exhibits (many of rare excellence) amounted to nearly half of the total number sent by all other nations combined. I see that a writer in one of our professional journals, when the names of English recipients of prizes for architecture was informally made known some time ago, was so good and so ingenious as to suggest or concoct a supposed system he thought was probably adopted by the jury in making the awards. Whether such a mode of making the awards would have commended itself to the judgment of the jury, had it been suggested earlier, I cannot say. It would certainly have abridged their labours very materially, but it will be more satisfactory to you to learn (and perhaps also to the writer) that no such rough-and-ready mode was adopted, but that repeated scrutiny and repeated votes were needed exhaustively to reduce the number of meritorious works to the comparatively small number of prizes at the disposal of the jury. That no small difficulty was thus experienced by them is shown in a very gratifying form to you by the formal resolution, spontaneously and unanimously passed by the whole jury, which has already been read to you, testifying their high appreciation of the merit of the English exhibit, and their regret that the limited number of prizes at their disposal alone prevented their rewarding it as it deserved, and requesting me as your representative to convey these their sentiments to my colleagues here; and, further, by the courteous letter enclosing that resolution, forwarded to me by the vice-president of the jury, M. Lefuel, at the request of the president, Herr Ferstel, who was obliged to return to Vienna directly our labours were over. Having once again visited Paris, to assist at the distribution of prizes, on the 21st of October last, I was much gratified to receive an invitation from the five French members of our jury, to accept from them a "dinner of honour" they desired to give to their colleagues from other countries. The Belgian member of the jury, M. De Stuers, was able with me to accept this invitation; we were most warmly welcomed, and their former felicitations on the success of English architects were repeated. I subjoin a tabular statement which will be of permanent interest to place on record, showing the number of works sent in by each nation, the number which passed the first scrutiny, and the number and quality of the rewards finally adjudged. I feel it only due to his Royal Highness the Prince of Wales, the honoured patron of this Institute, to tell you that, in the section of architecture, he took as lively an interest as he indeed did in all the sections of British exhibits; that he took the trouble to go with me carefully through our architectural room before the opening of the Exposition on the 1st of May, spending a considerable time there, examining nearly each drawing, and making remarks on many of them which evidenced not only his interest in but his knowledge of the subjects, and of the members of our profession. He has since desired his secretary, writing from Scotland, to express to me his great satisfaction at the honourable position obtained by English architects in this competition of the world. In the consideration of the awards, I ought to inform you that, although several members of the jury, both French and foreign, were also exhibitors, they naturally withdrew their names from the list of competitors, having to act in a judicial capacity. For myself I have seen with no small satisfaction that the choice of prizemen for England has been received without any disapproval by my own countrymen and professional colleagues. I am sure you will join with me in real satisfaction at the position taken, as regards our loved profession, by English architects in presence of their competition with their foreign brethren.

Synopsis of the Architectural Section of the Paris Exposition of 1878: Awards by the Jury.

Country.	Number of Exhibitors	Number of Exhibits Received for second scrutiny.	Medals of Honour.	First Medals.	Second Medals.	Third Medals.	Totals.	
France	146	369	125	2	4	6	6	18
England	64	170	126	1	2	2	2	7
Austria	20	80	65	1	2	2	1	6
Switzerland ..	49	102	10	—	—	—	1	1
Hungary	24	28	4	—	—	—	1	1
Italy	14	20	10	—	—	1	1	2
Russia	8	11	2	—	—	—	—	—
Spain	11	14	None	—	—	—	—	—
Belgium	6	10	8	—	—	—	1	1
Pays Bas	4	4	2	—	—	1	—	1
Australia	2	7	None.	—	—	—	—	—
Canada	2	14	None.	—	—	—	—	—
Uruguay	2	2	None.	—	—	—	—	—
Luxembourg .	1	4	None.	—	—	—	—	—
Greece	1	4	None.	—	—	—	—	—
Portugal	1	11	None.	—	—	—	—	—
Sweden	1	1	None.	—	—	—	—	—
Denmark	1	1	None.	—	—	—	—	—
Tunis	1	1	None	—	—	—	—	—

(Or only 37 medals for architects of all nations.)

In addition to the above, "Honourable Mention" was awarded to works as follows: seven to France, two to Austria, and one each to England, Italy, Hungary, and Switzerland; while in the cases of one English architect and one Austrian architect, who had in 1867 received Gold Medals, a "Rappel de Médaille" was recorded.

"Metropolis Management and Building Acts Amendment Act, 1878."

During the past year the Metropolis Management and Building Acts Amendment Act, promoted by the Metropolitan Board of Works, has become law, after a very searching consideration by an influential Committee of Parliament. In preparing their Bill the Metropolitan Board sought the assistance and advice of the Institute, and a committee of our members gave much anxious thought to a series of memoranda for the consideration of the Board, and their co-operation was very courteously acknowledged. Before the Parliamentary Committee several of our members gave valuable evidence, notably our esteemed vice-president, Mr. Whichcord. In the event the Institute has been informed, on his authority, that the views of their Committee in all essential points commended themselves to the Committee of Parliament, and are practically embodied in the Act which has been passed. That on so large and difficult a matter there is still room for useful alterations and new enactments will be readily believed, and when an opportunity again presents itself of considering effectually this most important subject, I hope and believe the advice of the Institute will again be sought in the preliminary stages of any Bill which may then be proposed.

The Egyptian Obelisk.

Am I to congratulate you that the "illustrious stranger," the Egyptian (now British) obelisk, has at length quietly settled among us? On the whole, I suppose I may, but it is with no unmixed feeling. A public, professional and lay, tired out with giving "unheeded" suggestions,—at last left to those immediately interested the decision of the question as to site and treatment in which the public would, if more permitted, have taken even a deeper interest.

* Names and countries of the jury:—France,—MM. Ballu, Lefuel, Duc, Bœswillwald, and Vaudremer; Austria, —Herr Ferstel; Italy,—Commander Basile, of Palermo; England,—Mr. Charles Barry; Pays Bas,—M. de Stuers; Egypt, Mariette Bey;—from whom Herr Ferstel was nominated president by the French Superior Commission. M. Lefuel, vice-president, and M. Vaudremer, secretary and reporter, were chosen by the other members of the jury itself.

The result is before us, and the weary wanderer is at rest. But how? Quietly buried (I mean erected) in this great Babylon among houses and buildings that overtop it; squeezed into an unpretending nook obtained with difficulty from our corporate Ædiles. A monolith of unknown age,—a witness of a period past so remote as to be realised with difficulty,—a mass of 200 tons in weight, evidencing a labour and probable sacrifice of human life at its birth which must be left to the imagination,—finds itself upreared on a pedestal composed of small stones (old materials in fact) instead of on a monolithic mass worthy of itself; pushed into a waste corner of our river wall, central with nothing around, and lastly, on a low level instead of on such an elevation as might add to its importance in place of lessening it. How differently, and with how much dignity and taste, our French neighbours have treated their Obelisk in the Place de la Concorde we must all be too painfully aware. In deploring the result, which I think could hardly occur in any other European metropolis than our own, be it fully understood that I do not detract a jot from the well-merited praise and sympathy due to the zealous private citizen and the talented engineer, who with so many unexampled difficulties, have yet brought to us this relic of the past. But what I deplore is that our national, or our hardly less powerful municipal, Government did not take the matter into their own hands so far as regards a suitable site and a dignified treatment of the monument as to its substructure, and did not undertake to secure the best and most impressive surroundings for such an addition to the interest of this metropolis.

Competitions.

The question of architectural competition seems next to demand a word from me. A vexed question this among ourselves and among outsiders. A condition of things created and maintained entirely by ourselves, and, as I think, an unhappy condition of things for all parties, wherein we are placed in the position of "touting" for work which should come to us as a right and a compliment. Heartburnings, disappointment, and jealousy are the children of the system; while the specious suggestion, that by this means alone, or chiefly, true merit is to be unearthed and recompensed, emanates surely from some malicious sprite who joys in our distress and divisions. The mistaken public view of competitions is, of course, largely due to our young and zealous architects who desire sometimes to run before they can walk, and rush into attempts, repeated to their sorrow again and again, which, alas! bring only occasional success against enormous disappointment. They would really gain, if they could only think so, by doing patient, quiet, and even unknown good works, bringing no disappointment and only delay in recognition of their power, which then becomes by experience greater day by day. Such quiet labours, such gradually developed talents, would bring them under the eye and judgment of their seniors, and would surely bring to real merit its due reward; in due proportion to that merit would those of real genius become separated from the ranks, and without the heart faintness arising from frequent failure, without the loss of time and money which can oftentimes be ill afforded, that belong to the present system. No other profession than our own is placed systematically in this position, yet the "men of mark" arise from their respective ranks in each profession as they have the right and title to do. Why should we alone induce the public to hold us cheap by cheapening,—I had almost said,—obliterating ourselves?

An occurrence within my own knowledge during the past year has led me into these remarks, and may have some interest for you. In March last the Commissioners of Hove, in Sussex, desirous of obtaining a design for their proposed Town Hall, inquired of me, as for the time being president of the Institute, whether in my opinion, "with a view of avoiding the unseemly discussions that have recently taken place with regard to open competitions, an open competition for such a work would be desirable in all respects, or whether it would not be better to limit the competition to eight or nine well-known men of ability." To this I replied that, in my opinion, an open competition was the worst course possible; that a limited competition was only less bad; and that, in my humble opinion, the *best course* was not to choose from *plans*, but to choose a *man* "as carefully as they could, whether by vote or otherwise, in a committee (as they would, indeed, choose a solicitor or a physician), and having chosen him, to put themselves in confidential communication with him from the outset, "and thus save time, money, and temper"; while disappointed competitors would be spared "that feeling of soreness which arises against a system which requires many men (earning their living by hand and head work) to give a client many designs while he will actually only pay for one."

The Town Council took my advice, and decided not to ask for plans, but to consider six names which presented themselves to them, and you will feel with me, I think, they will have no reason to regret the course I advocated when I tell you that their choice fell on Mr. Waterhouse, who will, I doubt not, produce a design in the credit of which we, his brethren, may feel some reflected share, though, of course, the full measure will be his own. I have reason to believe that this is not a solitary instance of "a man" being chosen by competition in place of the present system of "a plan in competition." I trust the habit may grow, and I feel sure that in the end architects as a body would rejoice in the change." *

THE LORD MAYOR'S SHOW, PAST AND FUTURE.

The Lord Mayor's Show is, at first sight at least, so uniformly monotonous a thing, and is so well and familiarly known to both great and small, that it would seem more could hardly be said about it in addition to what has hundreds and hundreds of times been already said. But this is hardly the fact; the "Show" is not quite the dull and dead repetition of the same thing it looks. There is always a something a little *new* about it, and a something to mark it off from the last year's display; and still more emphatically, if we but go back in thought to the "Shows" as they must needs have been in the Middle Ages, or in the days of good Queen Bess, of such famous memory. We have many times thought of how great the interest would be in the sight, however dimly, of a true pictured representation, in detail, of the show as it *at first* fell into order, and wended its way through the then quaint and narrow streets and ways of London town. We can, nowadays, no more picture such to ourselves than the men, women, and children of that day could have imagined *our* show as it was a fortnight ago, with its surroundings, and with the Embankment and modern London, with all its new things, steam-driven as they are. All and every thing has changed, not always and in every way for the best, perhaps. And we may well ask, with some curiosity,—Has the Lord Mayor's Show changed from what it was for the best?

It is, it must be confessed, well-nigh impossible, in seriously glancing at this "Show" at all, to avoid contrasting it with those which did and must have gone before it so many times. We must not indulge in too lengthy a survey, but it will make the matter clearer if we consider this procession as passing through at least three quite distinct eras of art-surroundings and influences. There were the purely Gothic influences, and forms, and details, as in the days of the Edwards. There was the "Elizabethan," quite as marked in its special way, in the days of Elizabeth; and there is now the strictly of to-day, and modern, phase of it. These three were and are, as distinct and individualised, and new in their generation, as would be a Greek procession through our modern streets. In the days of the Edwards, all and everything, streets, houses, buildings, costumes, shop-window shows and displays, could have had but one all-prevailing art character. The style of the day was Gothic, it matters but little of what phase. It was Gothic every bit of it, and could convey to the mind's eye but one art-impression, and could speak but one language. It is, even after all that has been done in the so-called revival of Gothic forms and ideas, but dimly that this Gothic of past days can be imagined, or its all-surrounding influence understood, for it was not alone in architectural forms that it made itself ever and always present, but in everything. The whole life of the time was Gothic. How can we nowadays realise this?

And then, again, there was what was quite as quaint and individualised as the pure Gothic itself, that style of art and art influence which has been called Elizabethan. The Gothic died a hard death, and before the "Classic" could take full possession of the Gothic-formed mind of the public, the quaintness of the Elizabethan days held rule, and contained in itself not a little of the Gothic feeling which made it so familiar and so attractive. It is much easier in London, certainly, to get hold of a mental impression of the show as it was in the days of Queen Bess, than it is to get an insight into that of the Second Edward. Not only is it nearer to us, but its forms and ways of life are closer and more intelligible. Indeed, might we not ask, in passing, are we so far in advance of that queen's days as so many seem to fancy we are? It would be hard to imagine anything more picturesque, quaint, and pictorially attractive than must have been the Lord Mayor's progress in the days of Queen Elizabeth, whatever course it took, and however it was composed. But however made up, it must needs have been attractive, not only as a moving show, but the street-ways, all harmonising with it, must have made of it a complete and harmonious picture, of which we have and can have but little, if any, definite idea. We see it at times in pictured representations on the walls of academies and galleries, but there only.

But how both these individualised art impressions differ from that which nowadays, and but yesterday, forced itself on the notice of the public, who so filled the streets, and lined the way, and in numbers so far outnumbering what could then have been possible. In a former day, all that was,—as far as fine art is concerned, and this Lord Mayor's Show is in truth a fine-art matter,—was, as we say, a harmonious whole, and a unity; but as things are, it is all of it the reverse. What incongruities; how little, if any, harmony strikes the eye of the spectator; how little there is, after all, to indicate the immediate present of things; how little to show that the City of London has anything to do specially with it; nay, to come to the most emphatic of all, how little is there in the Lord Mayor's Show of to-day, and of yesterday, to indicate outwardly to the show-loving public the all but boundless wealth of the mighty London City and its citizens! With the sole exception of my Lord Mayor's coach itself, there is all but nought of gold or even of gilded work to be seen. Most of the carriages which in old days must have made so striking a feature in the procession's length were but of the usual, and everyday, and commonplace pattern, and wholly without any special decorative or ornamental feature, thus to compel a sort of harmony between them and the stately coach itself. We say nothing of the moving boat on wheels, filled with men typifying life-boat experiences!

It must, too, be borne in mind, that in days gone by, perhaps not to return, when shows and processions were of so much greater meaning and import than they now are, or can be, the street-ways through which they passed were in full harmony with them in artistic expression. And not only so, but efforts, and special efforts, were at all times made to add to this by "decorations" of divers kinds. We have now before us a quaint print of a street-way in Queen Elizabeth's time where this is shown in a very marked way, and the good citizens would seem to have evidently vied with each other in their efforts to do all they could to add to the gala and festive nature of the "show" by the decoration of their house-fronts and windows. As all know, this is done to a certain extent as it is, but more out of necessity and accident than otherwise, and but a very rare sight indeed it is to see any kind of art-display visible, or anything which would compel the belief that the spectators of the show, as well as those who take part in it, had any real concern or interest in it, or thought it worth while to expend a farthing upon it. And yet it is surely worth this if worth anything, or worth preserving, and yearly repetition. This yearly City display ought to do some good, and be made to typify a something, and to evidence to those outside the City walls what can be thought of, and done by, those who live and trade within them.

We are not here in search of defects, or wishing for opportunities to make disparaging comparisons between the past and the present, but rather to suggest a thought or two for *future* consideration. If the Lord Mayor's Show is worth its cost,—and it costs a good deal,—and if it be worth preservation and yearly record, then we would say it is worth the doing well, and

* The remainder in our next.

taking some thought over. It is artistically, and as a living and moving picture, that it is deficient. Would it not be worth while to begin again, and harmonise all its parts, and design it anew, everything being made and thought out specially for it, and to be in use for it, and it alone? We say all to be harmonised: thus to revive, not the mere letter of the past shows, but the spirit of them. Now all is incongruous and discordant, but all might be pictorially harmonious, and the several parts and details of it made to fit into each other, worthy of its purpose, and of the great and rich City which it in part symbolises.

A most curious question indeed is involved in this show, for the tendency of the time is doubtless to look down upon things of the kind as remnants of a past state of things, and to consider them as evidences of the absence of what is now thought advanced civilisation. Shows are useless, and involve both waste of time and of material that might be more profitably and usefully employed. But it must be remembered that even if this be so, the sacrifice is for a something. All the great art of past days, and to which we owe so much even of our material wealth, was originally inspired by the sight and contemplation of such art realities in life and action. We need not even to name them. The resultant art, great and wonderful as it at times was, came from the living art all round and about those who so ably utilised and copied it. The oldest art we have record of, the whole range of the antique, and the Gothic, to use a general and descriptive term, all of them alike evidence this. The Greek Parthenon, with its famous frieze and metopes, is all sufficient evidence of this. Much good might come of it, if carefully thought out, in many ways. It is worth a little talk to know how best to accomplish such work as this without any direct copying of past art forms, but at the same time not to neglect the fine hints it affords.

WARMING AND VENTILATION AT THE PARIS EXPOSITION.

SIR,—It has been several years since I have written to you; and if my long silence has led you to the conclusion that, like most enthusiasts in ventilation, my struggles with the air currents to make them go where they ought to go instead of persisting in going the wrong way, had completely worn out my patience and silenced me in my advanced age, please allow me to dispel such erroneous impressions.

Perhaps I ought to preface my remarks, however, by the acknowledgment that I was compelled to succumb to the waywardness of those air currents and "draughts," and had to make a compromise with them; they agreeing on their part to let me alone in my warming arrangements if I would let them alone in their frolicking, gambolling, erratic motions, or, in more serious mechanical language, I had to abandon the attempt to make the air-currents the burden-bearers for the heat, and to confine the heating to the floors, walls, or solid objects in the room: thus warming the persons in the room by contact with the warmed floor, or by direct radiation from the heated surfaces in the room, and leaving the air cool and invigorating for breathing, and at liberty to go out or in, or wherever it pleased to go. Since then we have worked together very satisfactorily, and have had much peace and solid comfort.

Yes, I was obliged to entirely abandon the work of half a lifetime, acknowledge that all my patents in America and Europe for hot-water apparatus for warming occupied apartments by circulating hot air were worthless,—that the whole system was erroneous.

Since I have entirely abandoned air-warming and adopted *direct radiation only*, I have been so successful, and the work has given so much satisfaction that it has kept me so constantly occupied, and I have scarcely had time to write even to the *Builder*, which journal I regard as the great pioneer in all valuable sanitary reforms.

Perhaps, since my conversion to direct radiation, and my entire abandonment of all air-warming contrivances, I am like the reformed toper, much more enthusiastic in the advocacy of the new principles than one who had not been led so far astray.

I have been two or three weeks examining the great Exposition in Paris, and of course nothing that looked like a warming apparatus, or a diagram or photograph of any building in which any hint might be given of the methods employed for warming and ventilation, passed unscanned. Russia displayed a number of her immense porcelain ovens or stoves; Norway and Sweden did the same; and, in fact, nearly all the European Continental nations did. This being the old and almost universal method of heating for so many centuries, the great effort seems to be to make an apparatus occupying so large a portion of the room as ornamental or as little offensive as possible.

So far as such heating apparatus are used as direct radiators, the principle is physiologically correct, but in practice they are usually placed on the inner or warm side of the room, and are often so high that a large portion of the heated surface is above the heads of the occupants, instead of below them. All the fresh air entering at the cracks and crevices must flow across the floor to the warming oven, thus giving that distressing feeling of cold draughts on the feet, with all the heat concentrating towards the ceiling or around the head.

Ornamental as these are, and in some respects so good, the objections to them quite outweigh the advantages. We, therefore, find each nation endeavouring to find some substitute that will give all the advantages without the disadvantages.

The first attempt at ventilation is almost certain to be met with the cry of "cold draughts." To obviate this the reasoning is very simple. Warm the draughts. And here the trouble begins. The warmed air will not stay at the floor, where it is needed; and the next thing is to stop up all openings at the top to prevent the escape of the warmed air, and then you soon feel all the discomfort and oppression of being in a diving-bell under water. Another practical difficulty is that as soon as a door or window is opened above, the hot air escapes there and leaves no heat below. Innumerable contrivances have been adopted to overcome these difficulties, but none have yet been satisfactory.

In his desperation, the engineer resorts to the steam-engine and fan to make the air go where he wants it. The principle, however, being radically wrong, this is only an extravagent waste of money, and aggravates rather than comforts the unhappy victim who is earnestly seeking for that great desideratum,—a comfortably-warmed and well-ventilated apartment.

The old Romans solved this question very correctly in a practical way, by warming their marble floors; and yet is it not strange that this important point has become so nearly one of the lost arts, that in the magnificent drawings for the restoration of some of those splendid old Roman buildings (which line several rooms at the Exposition) this point of floor-warming is quite or entirely overlooked by the modern architects? And not in these ideal buildings only, but in the real ones as well, which are scattered over all the country.

But to return to our examination of the Exposition, we find the contrivances for air-warming on every hand.

Russia displays very ingenious devices for extending the air-heating surfaces of her new hot-air furnaces. Sweden and Norway have elegant stoves, all calculated to prevent the radiation in the lower part of the room where the heat is needed, and save it to be sent in the warmed air to the ceiling, where it is not wanted. Belgium follows suit. At Brussels the plans for their magnificent new building for law-courts show that it is to be warmed by hot-air currents, and I think it is already done. Austria gets a gold medal for an enormous hot-air furnace,—larger than anything I ever saw in the United States, the very hot-bed of the "Vesuviuses" and the "Ætnas," and all that tribe of health-destroyers that have well nigh dried the very flesh off the bones of the Americans.

France, too, has caught the air-heating fever; in fact, has it badly. She must even disgrace the glorious open fire by attempting to make it do duty also as a miserable air-warmer. To be sure, they are so economical in the supply of fresh air behind the fire that it does not amount to much, but I detest the principle.

Fortunately for England's credit, I think, she did not show an out-and-out vicious hot-air warmer in all her exhibits. She has a sort of leaning that way, however, in attempting to compromise the matter on some of her open fire-places. I noticed in one exhibit the disposition of small pipes around the room, to be used probably for circulating hot water. This is very good if let alone. But in the exhibit great care seems to have been exercised to show that the pipes were covered by a perforated base-board. This spoils it. There are two objections to covering the pipes,—one is its obstruction to the direct radiation, and another, it allows of the collection of dust and prevents frequent cleansing. The warming-apparatus should be as carefully cleaned every morning as the vessels from which we drink, or dishes from which we eat. I have given great attention recently to arranging all heating surfaces so as to be readily cleaned.

It is to be hoped that England will cling to her old open fires, defective and troublesome as they are in many respects, until some better method of warming can be devised than any of the air-heating contrivances that seem to be having full sway now all over the Continent.

When you see air-warming so universally used,—air-warming in schools, air-warming in churches, air-warming in dwellings, air-warming in public and private buildings of all classes, from Russia to Italy,—air-warming to the right of you, and air-warming to the left, and air-warming everywhere,—one almost hesitates to believe his own convictions, and has to stop and ask,—Is all the world insane on this subject, and is he alone sane and clothed in his right mind? But, fortunately, there are already many thoughtful persons who have carefully studied this subject, and make very intelligent converts to the direct-radiation theory; and the number of such is increasing very rapidly. These are the bright rays of light seen in the horizon which begin to dispel the gloom of the dark night of the air-heating fallacy, and cheer us, and enable us to hope that we may still live to see the full knowledge of the inestimable blessing of direct radiation spread over the earth, and dispelling those fallacies that now darken the minds of the people as the rays of the bright clear sun dispel the morning clouds.

LEWIS W. LEEDS (of New York.)

ENGINEERS IN INDIA.

THE public works of India are in some respects the most important of the matters with which the Government of India has to deal, since they include not only the means whereby communication is kept up within this vast province, but even those which tend to the sustenance of the people and the stability of English rule, for all the works connected with roads and with irrigation fall within this class.

It is of the highest importance, therefore, that those public servants who have charge of this department should be highly educated and energetic men. It was with this view that some years ago the Secretary of State for India established, as our readers know, an Engineering College at Cooper's Hill, near Chertsey, and it is this establishment which has caused a good deal of discussion among the witnesses who were examined last session before the Committee of the House of Commons appointed to inquire into the East India Public Works.

The fact that such a college exists necessarily causes a larger and more constant stream of young engineers to be turned annually into the India Public Works Department. It is also plain that this causes to some extent a less demand for native engineers, at least, in the higher places, because the Government necessarily have first of all to find places for the English engineers whom they have educated and prepared specially for this work. From the evidence of the several Indian officials who were examined before the Committee there seems to be no doubt at all that a student from Cooper's Hill has a better chance of employment than a native, for instance, from the College at Roorkee. The consequence of this is that there is a difference of opinion among the highest authorities, whether the old system of native engineers and English engineers selected from the Royal Engineers and private civil engineers was not better than the new one which is gradually being perfected, namely, native engineers and engineers drafted from Cooper's Hill. There is a clear consensus of opinion that the native engineers are well fitted for subordinate posts, but that they prefer to be placed high in office at once. Thus, Lord Napier and Ettrick remarked before the Committee, "I have heard of officers employed upon the Godavery Works state that they have had native subordinates who exhibited the greatest natural ability for practical work." On the other hand, with respect to the appointment of natives in the highest offices,

he adds, "I perfectly agree that the great majority of the public functionaries in India, of the higher class, in the Public Works Department, as in all the departments of the Government, ought to be Englishmen." There is, in fact, a difference of opinion, one which would not be easily solved, whether the natives of India, generally speaking, have a real aptitude for the kind of work which is required of them in the Public Works Department; yet there is no doubt that, apart from this, not a little of the uncertainty in dealing with the question of utilising natives in this department arises from the difficulty of reconciling the supremacy of the British with the subjection of the natives. That is to say, we educate, and we endeavour to raise the mental and bodily tone of the natives, to interest them in our rule, and to obtain their assistance in our practical dealings with their country; but, on the other hand, we have to keep our rule supreme, to employ our highly educated young men, and as there are, after all, only a certain number of the higher posts, it is very difficult for both the native and the British elements to be properly amalgamated, and both the objects which we have mentioned properly carried out. And there seems a good deal of reason to expect that the establishment of Cooper's Hill will tend by degrees to prevent this amalgamation, and that the English will overcome the native element. Thus, Colonel Fife, a man of very great experience in the Public Works Department, says,—"Undoubtedly, if a number of engineers are sent out regularly from Cooper's Hill every year, it necessitates the keeping up of a permanent establishment to a certain figure," and in answer to Mr. Fawcett's question, "So that the evil of having a large and expensive Public Works Department may be rather intensified by the system?" Colonel Fife replies, "If the supply is entirely from the College, I think it may." Now there can be no doubt that every possible economy will be more and more practised in India, as the English people more and more look into the government of our Eastern dependency, and it is therefore quite certain that unnecessary officials will not be allowed to remain or to be appointed in the Public Works Department, and it seems equally clear that the officials to go will not be the students from Cooper's Hill, but the native engineers. This, indeed, seems to be a result which can hardly be avoided, because when you have admitted a young man into a special college with the understanding that he shall have special appointments in India, it is impossible to turn round and say that his services are not required. On the other hand, it is very difficult to regulate the number of admissions so as to equalise them to the wants of India three years after. Yet it is quite obvious that Cooper's Hill College presents many advantages. As Sir George Campbell says, "I am very strongly of opinion that an institution of this kind is beneficial and calculated to promote the best interests of India; for this reason, that as far as I have been able to learn, it has always been remarked that, among our English engineers, although there has been an excellent practical education, although very many of them have, or most of them have, by a rule-of-thumb sort of practice, come to be very good and efficient men in their profession, still they are deficient sometimes in general education, and almost always deficient in the theoretical education which is afforded by the engineering schools of many Continental counties. I believe that there exists no school in the country equipped with every necessary for turning out young engineers, except Cooper's Hill. At the same time, I do feel that, cut off as they are from what is going on in Europe, there is a great danger that our limited and exclusive services may run too much in one groove." It would not be difficult to quote a number of other opinions expressed by equally able and capable persons, and there can be no doubt at all, when the committee publish a report at the end of next session, that their judgment on this point will have a marked influence on the career of the Indian engineers of the future. We do not propose to anticipate that decision by any judgment of our own, but it is obvious that it will be unwise to choke off native engineers entirely, which will be the case if all the higher posts are held by Englishmen; it is equally certain that the danger of narrowness which Sir George Campbell points out must be avoided, if possible, and yet it is equally certain that the system of continual drafts of able young engineers, animated by an *esprit de corps*, is most advisable. So far as we can see from the voluminous evidence before us, there will be not a little difficulty in reconciling all these somewhat conflicting objects, but that it may be possible to do so is greatly to be hoped.

QUICKLIME A PRESERVATIVE OF WOOD.

M. Lostal, a French railway contractor, recommends quicklime as a preservative for timber. He puts the sleepers into pits, and covers them with quicklime, which is slowly slaked with water. Timber for mines must be left for eight days before it is completely impregnated. It becomes extremely hard and tough, and is said never to rot. Beech-wood prepared in the same manner has been used in several ironworks for hammers and other tools, and is reputed to be as hard as iron, without losing the elasticity peculiar to it.

According to the *Kurze Berichte*, lime slaked in a solution of chloride of calcium is used at Strassburg as a fireproof and weatherproof coating for wood.

THE NEW VIENNA EXCHANGE.

The new Exchange of Vienna was opened for the first time in March, 1876. The provisional *Börse*, by the bye, which had served for several years the purposes of the disciples of Mercury, has now expiated to the full the errors of its ways. But a short span of grace was accorded to the old building; no stone remains upon the other,—foundations it never had,—and new buildings, intended for private dwelling-houses, have been reared in its place. This block of new buildings is opposite, in an oblique direction, to the new Exchange in the Schottenring.

We have already given some particulars respecting the exterior with the view we published in a former number, but it will be convenient to recall to mind a few of them. The Exchange was erected at an expense of five million florins; and it is reported that the architect, Herr Hansen, asked for three millions more, in order to use, in place of the brick with which the outside is partly covered, red marble, and, instead of stucco and paint, more expensive products of the plastic arts. But the five millions were the length to which the managing committee,—the requisite money being raised on preference stock in Vienna financial circles,—were inclined to go.

The outside, it is considered, cannot be taken, on the whole, to be a successful garb for an exchange. From the open terrace behind the façade of columns, several arches admit into the vestibule. We obtain a view through the latter, filled with glass, into the interior of the large hall (the subject of our illustration). It is at present the largest for public purposes in Vienna. It occupies the whole centre portion of the building up to the roof, and extends through its entire length, excepting a not very large ante and staircase hall. The great hall is 188 ft. long, 86 ft. wide, and 76 ft. high. At the height of the first story a gallery runs all round, and above this are the windows. There is an aisle on both sides of the great hall on the ground-floor, which opens on to it by round-headed arches. The prevailing colour of the hall is the lustrous grey marble, the columns supporting the arches being of red marble. Those large monoliths are embedded one-third of their bulk in the wall. The ceiling is flat, and is supported by a second row of columns (Corinthian) resting on the gallery. It is painted, and divided into white panels, with blue ground, from which, again, whitish-grey mythical figures appear to rise. The considerable height of the apartment favours the illusion of painting, the plastic forms being hardly missed. The large arches of the narrow sides are filled with glass. It would have been far more effective to have hidden the door-frames in the iron framing, instead of inserting heavy door-posts of wood, with pediment, and leaving this bulky door-framing standing seemingly free and unsupported, as well as interrupting the light. Curiously enough, the architect has filled all his spandrels with Centaurs, Naïads,—in other words, half human, half animal creatures,—in accordance with Greek taste. The native wit of Vienna, never slow, and whose sparkling satire is as proverbial as it is pungent, has already seized upon this extravagance of decoration for its wicked purposes.

When the rich gold lustres and wall candelabra (on festive evenings also a wreath of jets round the gallery) send forth their light, which is reflected in the variegated marble, an imposing effect, a view of rare luxurious grandeur, is produced.

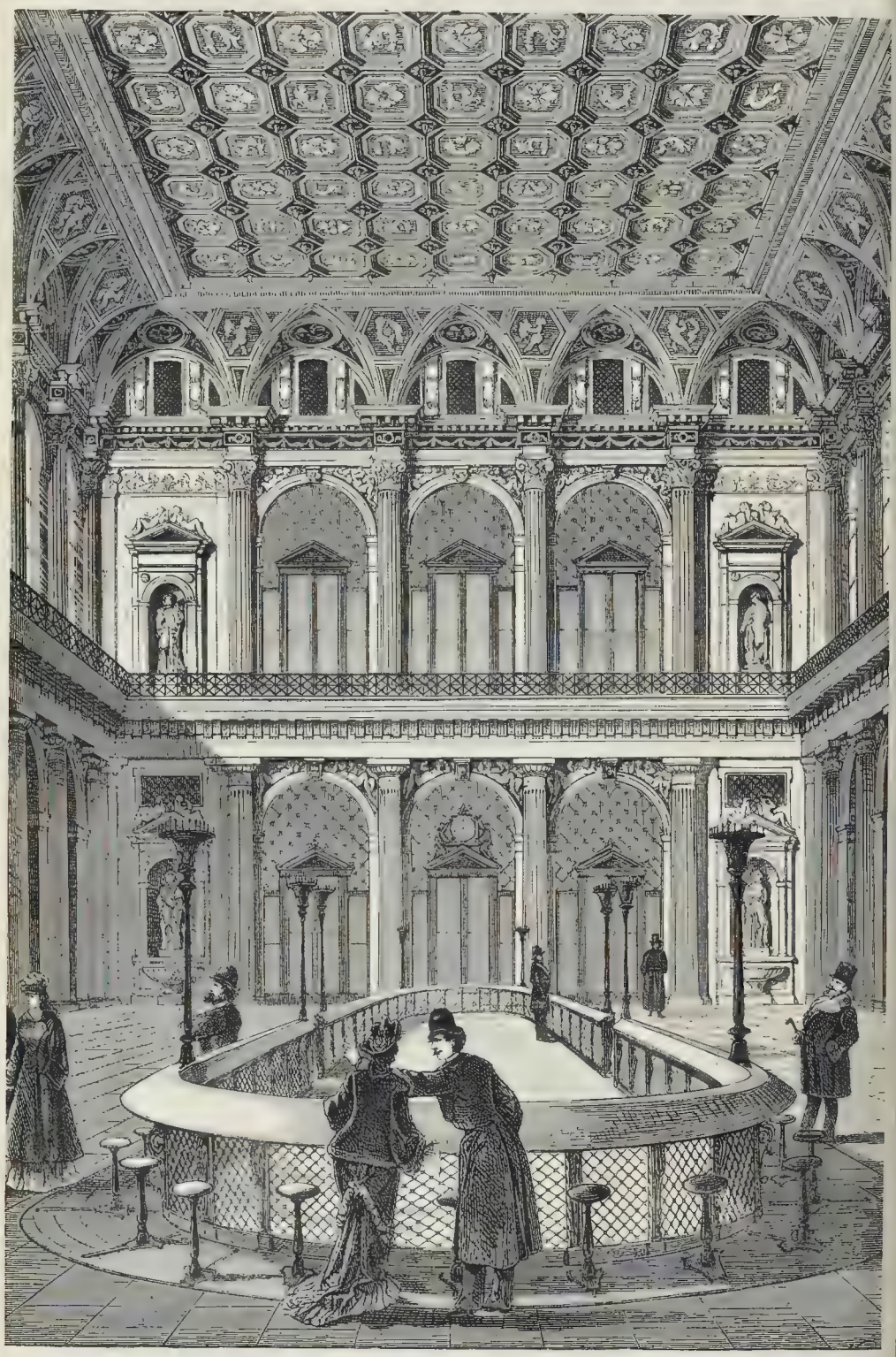
Doors lead from the aisles and gallery into the numerous offices. In the basement are the Produce Exchange and the refreshment-rooms. In the centre of the great hall, in the shape of a narrow oblong, is the "bar" of the sworn brokers. Only the latter are permitted into this sanctum. On their word and their note-book, as we know, depend millions and destinies. Round the "bar" runs a wide step, on which are placed the tabourets or seats (*Stockerl*, a witty Viennese expression for a little stick, perhaps equal to our English "perch") reserved for bankers and other frequenters of the Exchange who pay for them. Those seats may be moved, on the step only, backwards and forwards on a rail. The name of the renter of the seat is fixed in a plate on the writing-desk of the "bar," which much facilitates the transaction of business. There are gas candelabra also on the "bar," increasing the amount of light in the evening.

The eyes are better off in this room than the ears. We know what business hours are on our own Stock Exchange; but the noise on the Vienna Exchange is increased in acuteness by the very Babel of tongues there heard. The bell, which rings at intervals, brings out the acoustic properties of the hall still more strongly. Any one in quest of a "leading paper" finds its place of sale marked by tablets on the wall. Should he be speculating in various shares, he must have good legs, for he will find, with the large dimensions of the hall, plenty of room for exercise; and his nether limbs must be steady, for the floor being of large sandstone flags, he might slip and—come to grief.

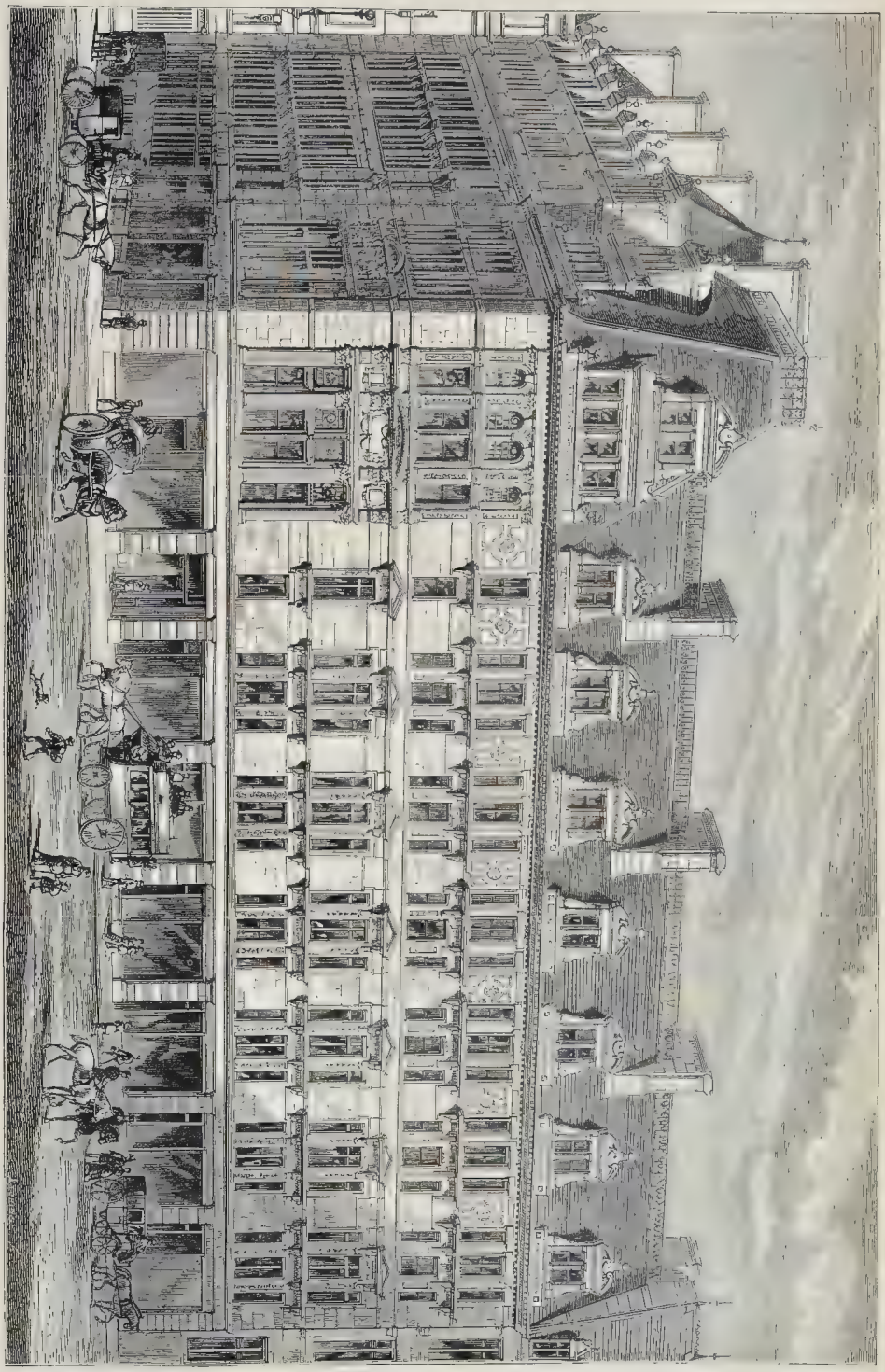
"MURALIS."

The walls of a room in Berners-street, Oxford-street, have been hung with various specimens of a new linoleum product called by its inventor, Mr. Frederick Walton, "Muralis," and which would seem to be a very useful material. It is a mixture of oxidised linseed oil and fibre, and on this, ornamentation in relief is stamped by machinery with the greatest clearness and sharpness of diversified outline. The use of colour in addition is optional, and the patterns may, if desired, be tooled after the first stamping. The effect produced is, according to the will of the designer, like that of carved wood, of embossed leather, of terra-cotta or plaster ornamentation; or, better still, the work may be allowed to assume a character of its own as a subdued and graceful style of ornamentation. Its capacity for resisting blows and abrasions is remarkable. Pieces can, indeed, be cut off from it, with the knife or chisel, and its toughness and freedom from liability to splinter render it peculiarly suitable for any amount of elaboration and improvement by artists after it has once been stamped. But a blow or a cut produces, on the elastic surface, no lasting impression. If it is struck with the sharp end of a hammer-head, a slight indentation will at first be produced; but in half an hour the elastic substance fills up the gap. A piece of "Muralis" has just been taken out of the water after three months' immersion, and is as perfect and sound as when first put in. It would supply a waterproof shield to wood, iron, or other building materials, and afford lasting and beautiful ornament to the structure. For the interior decoration of houses, its warm and comfortable surface makes it peculiarly applicable. As regards price, a handsome dado, 2 ft. high, is sold at the price of 3s. a yard. The pieces for walls are usually about 20 in. wide, and sold at 2s. 8d. a yard. The designs produced on the material depend, of course, on the taste of the manufacturer; those at present exhibited, we are glad to be able to say, are very satisfactory and appropriate.

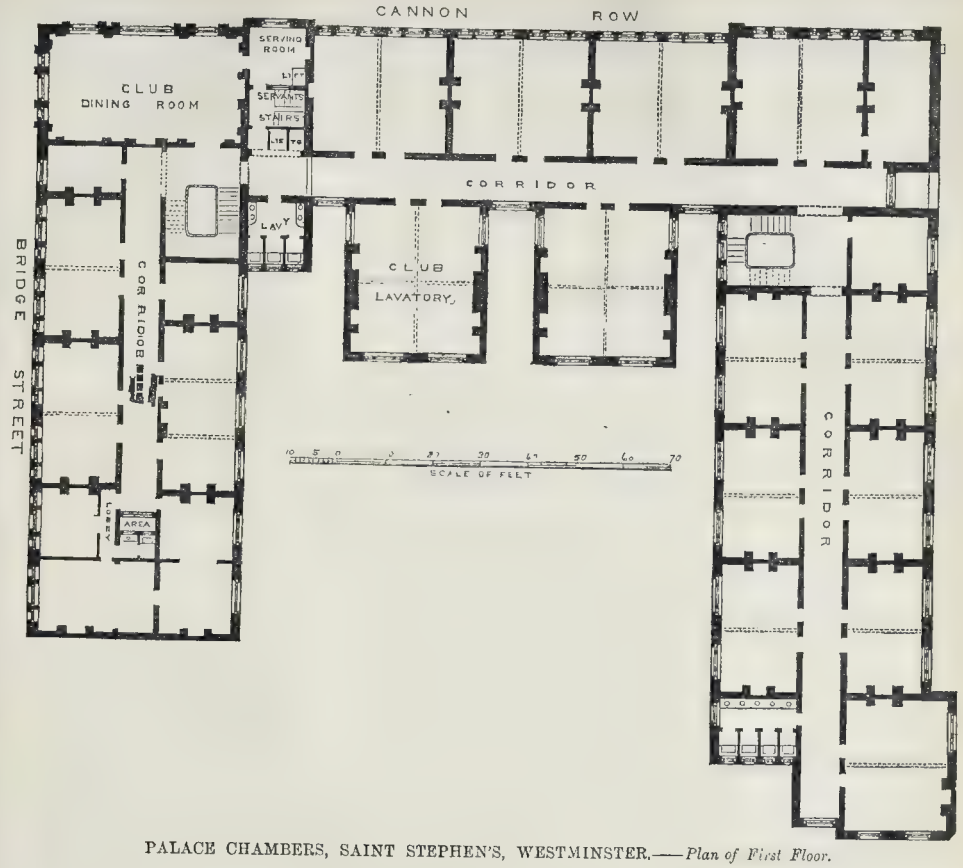
Tit-tat-to by Machinery.—At a recent meeting of the Franklin Institute, U.S., Mr. F. T. Freeland presented and described a machine, designed and constructed by himself, for playing the game of tit-tat-to. The machine is so designed that the move made by the person playing against it determines that next made by the machine, the latter being accomplished by the simple movement back and forward of two levers, and the most skilful player is unable to win any one of the vast number of variations of which this simple game is susceptible.



THE GREAT HALL OF THE VIENNA EXCHANGE.—HERR TH. RITTER VON HANSEN, ARCHITECT.



PALACE CHAMBERS, SAINT STEPHEN'S, WESTMINSTER.—MR. RICHARD ATKINSON, ARCHITECT.



PALACE CHAMBERS, SAINT STEPHEN'S, WESTMINSTER.—*Plan of First Floor.*

PALACE CHAMBERS, ST. STEPHEN'S, WESTMINSTER.

In our present number we give to our readers a view of a block of buildings raised by Major John Frederick Wieland, who has, within the last seven years, built seven blocks for trade and office purposes within the City of London, some of which we have already illustrated, and these have involved an expenditure, we understand, including the one now the subject of our engraving, of not less than 600,000*l.*

Palace Chambers has been built from the designs and under the superintendence of Mr. Richard Almond, architect, London. It forms the angle of Bridge-street and Cannon-row, Westminster, and has a frontage to the former of 130 ft., and to the latter street of over 200 ft.

The building, as will be seen, is in the Renaissance style, freely treated. The frontages are of stone, the mouldings and carving being kept flat and delicate. The combination of purposes for which this building is intended is novel and the construction peculiar, and we think our readers will be interested in a description.

As to construction, the great portion of the building facing Bridge-street is carried on gigantic box-girders, which span the Metropolitan District Railway. It may be noted that when these girders were placed in position, they were arched to the extent of 1½ in.; the enormous weight subsequently placed upon them has only deflected them to the extent of ¼ in.

The foundations in Cannon-row are at a depth of 30 ft. from the ground level, and in some parts of the land a depth of 43 ft. had to be excavated, and pumps throwing 1,200 gallons per minute were kept constantly at work, night and day, for five months. The whole surface is now one solid bed of concrete, 9 ft. thick, and the superstructure is composed of hard Burham bricks, except the stone parts before mentioned.

The cellars are arched and constructed perfectly fire-proof, as it is the intention to use them as depositories for valuables, and the proprietor reckons that he will be able to give a perfectly fire-proof room, about 5 ft. square and 9 ft. high, for about 5*l.* a year. These rooms will be heated with hot-water pipes, and ventilated into the corridor, where watchmen will be constantly on guard. Thus any one for the small payment of 5*l.* per annum will be able to secure a fire and burglar-proof room, large enough to hold pictures, books, plate, &c., for an ordinary establishment. The revenue to the proprietor from this source will be considerable.

The ground-floor in Bridge-street is devoted to shops, which are now nearly all occupied. The back portions of this floor will be devoted to office purposes. Part of this is already occupied by the Westinghouse Brake Company, who have in operation, on a full-size railway carriage, their continuous brake, which is worked by compressed air, and is open to the inspection of the public at these chambers.

The greater portion of the next four floors is intended for offices, and we notice the Church Defence Institution, the Bilbao Iron Ore Company, Sir Charles Dilke, M.P., and several other influential persons are among the tenants.

A novel feature on the first-floor is a club dining-room, 21 ft. high, and above it a smoking-room, elaborately decorated in gold and colours. These two rooms, commanding a view of the Houses of Parliament, the Abbey, and Victoria-street are carefully finished, the former being in the Doric, and the latter in the Corinthian style of architecture, the dados, doors, &c., being executed in polished walnut-wood, relieved by ebony mouldings. These club-rooms, together with kitchens above, and subsidiary rooms and cellars, are intended for the use of a proprietary club, of moderate pretensions as to subscriptions, but they will be principally useful to the residents in the building, for it is the proprietor's intention to let about 200 rooms on the upper floors for bachelors' residential chambers, at the rate of 50*l.* per room; this, with a small charge for cleaning, valeting, gas, coal, &c., will enable any gentleman to have a West End residence, with the luxurious accessories of a club, including hot baths, at a moderate cost.

There are two lifts, or elevators, rising to each floor; these are worked by steam-power, and are so arranged that if the attendant neglected his duty no accident could happen.

The entire height of the building in Cannon-row is 120 ft. from the foundations, and consists of ten floors.

The corridors, fireproof in construction, are upwards of half a mile in length, of a uniform width of 8 ft., and are laid with encaustic tiles of various designs.

There are pneumatic bells fitted to each room, with speaking-tubes thence to the porter's box and domestic offices. The gas-pipes and speaking-tubes in the whole building are nearly five miles in length.

We congratulate the spirited proprietor, Major Wieland, who is by profession a military engineer (and who has been his own contractor), that no accident to life or limb has occurred at this or any other of his buildings, considering that as many as 1,000 men had been employed at a time, such immunity from accident being mainly due to the excellence of the plant and careful supervision.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

OPENING MEETING, SESSION 1878-79.

THE first ordinary general meeting of the Royal Institute of British Architects for Session 1878-79 was held on Monday evening, in Conduit-street, Mr. Charles Barry, president, in the chair. The minutes of the last ordinary general meeting of Session 1877-78, held on the 3rd of June last, were read and confirmed.

Candidates for Membership.—A long list of candidates for membership was read. The list included seven applications to be admitted to the rank of Fellow, ten to that of Associate, and eighteen to that of Honorary Associate.

New Members.—Mr. George Richmond, R.A., and Mr. L. Alma-Tadema, A.R.A., were introduced to the President, on their attending for the first time since their election as Honorary Associates; and the following gentlemen were balloted for and declared duly elected, viz., as Associate, Mr. F. S. Pilleau, of Buckingham-street, Strand; and as Honorary Associates, Mr. William Calder Marshall, R.A., and Sir Richard Wallace, bart., M.P.

The Library.—The secretary announced a number of donations to the library, including a bequest of upwards of two hundred volumes by the late Mr. C. C. Nelson. A vote of thanks was accorded to the several donors.

The Late Honorary Secretary.—The President said he regretted to have to announce to the members officially the great loss which the Institute had sustained by the death of their friend Mr. Cockerell, who had the happiness which some persons desired of dying in harness, perfectly useful up to the very last moment of his life, and truly beloved by all who knew him. He died quite suddenly, in the midst of a short holiday he was permitting himself to take in Paris, after having been somewhat out of health, although at the time of his death he was apparently in perfect health. In five minutes he was summoned into eternity. His funeral took place in Paris, and the Institute would be glad to know that it was not wholly unrepresented. He died on Monday, the 4th inst., and the information of his death reached London on the morning of Wednesday, the 6th inst. Their zealous secretary endeavoured to find him (the President) and some of the members of the Council, but they were all dispersed. With praiseworthy promptitude, however, Mr. White started alone by the next mail to Paris, in order to attend the funeral of their poor friend, which took place on the following day. Happily, three other members of the Institute were in Paris at the time, and, hearing of the sad event, assisted in representing the Institute at the funeral. Therefore, notwithstanding the suddenness of the event, and the brevity of the interval which elapsed before the funeral took place, the Institute was not unrepresented, or they would all have grieved beyond expression. The genial disposition of their late friend made him numerous friends abroad as well as at home. In the Institute every member was his friend, and abroad, in all societies which he entered, it was the same thing,—certainly it was so in Paris. Some of the most distinguished architects in Paris followed his remains to the grave, testifying thereby their sympathy with the Institute in its loss and their esteem for him personally. M. Duc, the Gold Medallist of the Institute, M. Lefuel, and several other distinguished French architects attended the funeral, and had written to express their sympathy with the Institute.

Professor Donaldson said they had all been touched by the president's allusion to the death of one whom they honoured and loved so much as the late Mr. Cockerell. Their deceased friend inherited a great name. The son of a man of many virtues and high attainments, he worthily maintained the name he bore. By his genial manners and his artistic talent, and by the way in which he carried out the various works he was called upon to execute, he had attracted to himself the esteem of all who knew him. The members of the Institute had also been much touched by the kindly sympathy shown by French architects in attending their late friend's funeral, and he begged to move a resolution to the following effect:—"That the Royal Institute of British Architects has learned with extreme gratification of the courtesy of M. Duc and MM. Lefuel and Vaudremer, honorary and corresponding members of this Institute, in attending the recent funeral of its lamented foreign correspondent, Frederick Pepys Cockerell, esq., in Paris, and desires to record its appreciation of this act of kindness and sympathetic regard for his memory."

Mr. William White, F.S.A., said that as one who had been privileged to be present at Mr. Cockerell's funeral, he begged to second the motion.

On being put, the motion was carried unanimously.

Architecture at the Paris Exhibition.—The secretary then read the report of the Institute Committee on the Paris Exhibition, with its appendix,—a very interesting document.

Professor Donaldson, in reference to the letter of M. Lefuel contained in the appendix, said he thought the Institute ought to recognise so very complimentary a public document emanating from their professional brethren in Paris. It was impossible for English architects to receive such an expression of good will on the part of their professional brethren in Paris without being conscious of the cordiality with which they had been met, and without recognising the desire of French architects to render honour to the art of this country. This cordiality had been manifested by French architects not only in the discharge of their public duties, but in private and social intercourse, and he, therefore, begged to move a resolution to the following effect:—"The Royal Institute of British Architects begs to offer to its French *confrères* of the international jury a cordial acknowledgment of the reception with which they honoured personally the English architects who visited Paris, and to thank them for the ample justice done to English architectural productions, which were exhibited under the most favourable circumstances possible."

Mr. Whichcord seconded the motion, and it was carried *nem. con.*

The President's Address.—The President then proceeded to deliver his opening address, which we print *in extenso* on other pages.

The reading of the address concluded,

Mr. T. H. Wyatt said: As one of your predecessors in that chair, sir, I must ask you to allow me to propose a vote of thanks to you for the remarkably interesting and industrious address which you have just read to us. You have pointed out some of the difficulties that have been encountered in the administration of the Institute during your presidency, and I venture to think that you have, by your zeal and industry, conquered those difficulties in a remarkable manner. In passing, I would stop for one moment to suggest that as in future our presidents will only occupy the chair for two years, it might be well, perhaps, for each of them to give one long address, such as you have read to us this evening, at the commencement of his term of office, and at the close of that term to give a brief summary of the events that have happened during his occupancy of the chair. Doubtless the increase of members has been satisfactory. I attach immense importance to the accession of our Honorary Associates, and I am sure that the benefit we shall ultimately derive from their knowledge, influence, and presence will be very great. You said, sir, and I think very wisely, that it would be inexpedient to attempt any elaborate architectural alterations in these premises. I think that is a feeling which will be very generally shared. Let us hope that before long we may be able to get a larger amount of possession of these premises, or else obtain premises better suited to the increased prosperity and enlarged necessities of the Institute. You have given us a most melancholy list of deaths. We have lost some honoured names,—Scott, Smirke, Nelson, and last, not least, Cockerell. That Mr. Cockerell should have passed away so suddenly and so unexpectedly is a particularly painful circumstance. He was, as Professor Donaldson has said, the son of a most honoured member,—our first professional president, who was a man of great knowledge and refinement, and his son never for one instant did dishonour to that name. On the contrary, it was known to us all how valued he was, and comparatively young as he was he had secured the confidence, regard, and even the affection of his clients. As to the Paris Exhibition, I think there is no one here, sir, who does not feel the value of your services. How great the sacrifice of time, and how great your labours have been, will be appreciated by all, but especially by those who have been engaged in similar duties. We owe a deep debt of gratitude to you. On the subject of competitions and conferences, I most cordially concur in your remarks. They accord most fully with my own feelings. As to your hopes for the prosperity of the Institute, it is hardly necessary for me to say one word. There is no professional man here who does not share those hopes, and there is no class of Associates so illiberal and ungenerous as to refuse to re-echo your sentiments. I beg to move that a cordial vote of thanks be given to the President for his interesting and able address, with our best wishes for his prosperity when he leaves the Chair of the Institute.

Mr. F. Leighton, President-elect of the Royal Academy, who was very warmly cheered, said:—Mr. President,—The members of the class to which I have the honour to belong, viz., the Honorary Associates, will, I am sure, esteem it a very great honour that one of their number has been called upon to second the motion of my friend Mr. Wyatt, that the thanks of the meeting should be offered to you for your most remarkable address. I feel myself very much honoured that the command to do so should have been laid upon me, and I will perform the duty with the utmost brevity, partly because of the lateness of the hour, and partly, and chiefly, because I feel that in the lucidity of its statements and in the breadth and elevation of the views which it embodies, and especially also in the extremely satisfactory nature of its general tenour, your address stands self-recommended, and will be accepted with gratitude and thanks without my advocacy. You have unfolded before us, sir, a picture of prosperity, of growth, of vitality, of beneficent and enlightened influences at work, which must be highly gratifying to all the members of this Institute, and I would beg them to believe that it is also a very highly gratifying picture to all who look on at the working of this Institute with interest and sympathy from the outer precincts, as I do myself. But the picture you have drawn has not been unchequered: it has its dark shadows and contrasts, and in the too-long roll of the obituary you have recorded there are several names which I personally cannot hear without emotion. There are the names of two honoured members of the Academy to which it is my chief pride to belong, and the name of one of the dearest and truest friends I ever had,—a man who had the rare gift of winning, and the yet rarer gift of retaining always the affections of all those who had the privilege of knowing him, and whose loss will be irreparable to those to whom he was dear. It would be impertinent in me if I were to attempt to touch on any portions of the address which deal with the special workings of the Institute and with its own peculiar interests; but, sir, you touched upon one or two points of general interest, upon which you may, perhaps, allow me to say a word. You alluded to the ancient obelisk which has lately been erected,—I had almost said "mislaid,"—on the parapet of the Thames Embankment, and I embrace with joy the opportunity of expressing my hearty concurrence with your concern at its latest vicissitude. That venerable monolith is an old friend of mine. I have had the privilege of seeing it on more than one occasion slumbering in the sands of Egypt by the margin of waters bluer than are those of Father Thames. I saw it again, cased in the *Cleopatra*, ploughing the blue waters off the coast of Morocco, and I have seen it again, alas! seeking for the sun in vain in its last home, showing, to ages to come, what may be done by British munificence and patriotism, and by the energy, resources, and skill of British engineering; and showing also how a monument may be placed in such a manner as to defy and set aside all the eternal fitnesses of things æsthetic,—adorning nothing, emphasising nothing and by nothing emphasised, placed, as it were, parenthetically between two highways, perhaps the finest of their kind in the world, but neither of them leading up to it, but rather hurrying past it. You alluded, sir, to competitions. I am in harmony with you also as to that subject. I share your very grave doubts as to whether a competition is the best means of ascertaining the person to whom one should entrust, and from whom we should expect, a work of art,—whether, in fact, competitions always result in "the survival of the fittest." In your address, sir, there is one point as to which I have something to add beyond what you have told us, viz., as to the Exhibition in Paris,—an exhibition in which, by the ungrudging consent of the European artistic public, British art won no common meed of honour and distinction. You have dwelt with most justifiable pride on the large share of that honour which justly accrued

to British architecture, but you have not told this Institute of the golden opinions and high esteem which you, sir, won in the discharge of your duties on that occasion. I have had the honour, gentlemen, of serving with your President on the Royal Commission for the Paris Exhibition, and I have had the gratification in Paris of hearing M. Ferstel, president of the international jury on architecture, speak in high terms of Mr. Barry's services, and I am in a position to testify to the untiring zeal, to the genial catholicity, and to the admirable tact which made him so valuable and so influential a member of the jury, and which, if I may be permitted to judge from what I have heard, have made him so admirable a president of this Institute. My sense of these qualities of your president very naturally greatly enhances the pleasure with which I venture to second the vote of thanks to him for his address, moved by your former president, Mr. Wyatt.

The motion was put to the meeting by Mr. Wyatt, and heartily agreed to.

Mr. Barry briefly replied, and announced that the next meeting would be held on Monday, December 2, when Lieut. Conder, R.E., will read a paper on "The High Sanctuary at Jerusalem."

"THE GAIETY" RESTAURANT, STRAND.

After having been closed for a long time for re-construction, the Gaiety Restaurant has been re-opened. A detailed description of the extensive structural alterations which were in progress appeared in the *Builder* several months ago, but it may be added that a handsome new entrance has been formed in the Strand, which serves as the principal approach to the ground-floor portion of the restaurant, as well as to the boxes and stalls of the Gaiety theatre. Thd mosaic pavement in this entrance was laid by Messrs. Burke & Co., of Newman-street. The three fine apartments in the restaurant forming the basement, and the ground and first floors, are of uniform size, being 100 ft. in length by 33 ft. in width, with an uninterrupted view from one end to the other, columns being altogether dispensed with, and the several floors supported by iron girders thrown across the entire width of the respective apartments.

The interior fittings and decorations are of an elaborate character, and have been carried out by Messrs. Simpson & Sons, of the St. Martin's-lane Works, from designs furnished by Mr. Verity, the architect engaged. The ornamentation includes a considerable surface of their tiles. These tiles are distinguished by their inventors, or rather sole makers, as "art" tiles, not because any claim is laid to superior artistic excellence, but in contradistinction to encaustic, majolica, and other tiles, which are merely produced by mechanical processes, whilst those here used are painted by hand. It must also be mentioned that an important feature in these tiles is that they are done under glaze, and in many instances their effect is heightened by subsequent enamel painting. It is hardly necessary to eulogise the luminousness, depth, and brilliancy which result from this process, as every-one who has been enabled to inspect its results at the Criterion, the Mansion House, the Holborn Viaduct Restaurants, and elsewhere, will already be well acquainted with their merits. In modern times, Messrs. Simpson & Sons have been the first to manufacture tile paintings on a large scale for surface decoration, and in so doing they have not only followed an example which dates back into the remotest antiquity, but they have revived a species of ornament more in harmony with the strictest principles of art than any other species of wall decoration extant. In rendering it possible for the ordinary middle-man to decorate his house with tile paintings on the same scale that those well endowed with this world's goods may ornament their halls and saloons with expensive frescoes, they realised a dream of Della Robbia. The walls of the buffet,—a handsome and imposing room,—have been covered at intervals with tile paintings. The somewhat severe character of much of the execution harmonises thoroughly with the architectural characteristics of the room, which are in the style of the Italian Renaissance. This is especially the case with the larger paintings ornamenting the upper part of the room. These represent various operations in connexion with agriculture, and some of the subjects merit high praise. The ceiling is also the work of Messrs. Simpson & Sons. The *motif* of the design bears evidence of its having been inspired by associations belonging to the locality, and refers to their histrionic as well as to their gastronomic character, for we find figures with scrolls, bearing quotations from Shakspeare, and tablets, inscribed with the names of dramatic authors and renowned actors, in combination with representations of fish, flesh, and fowl, and other details purely ornamental. The ceiling is executed in what is called Kalsomine painting, a species of distemper which possesses the advantage of being washable. The stained-glass window screens also come from the works in St. Martin's-lane. The main dining-room, on the first floor, is very artistically painted and decorated, and does Mr. Verity credit.

The artist employed here and elsewhere is Mr. Edwin P. Turner.

The entire outlay, including the structural alterations, fittings, and decorations, is estimated at something like 25,000*l*. The general contractors are Messrs. G. Smith & Co., of Pimlico.

LIFTS AT "THE GAIETY" RESTAURANT.

A very complete system of lifts has been fitted up by Messrs. Archibald Smith & Stevens, of Leicester-square (whose firm, we believe, has been established as engineers nearly a century), comprising a hydraulic passenger and goods lift, a continuous lift for food and kitchen service, four hand-lifts, for distribution of food and wine throughout the building, and one small special lift for carrying two wine-bottles only. The most deserving of attention is the first-named, which has in connexion with it a small pumping-engine, which forces water into an accumulator, or loaded reservoir, under a heavy pressure.

Beneath the lift is fixed a horizontal cylinder of great strength, containing a sliding-ram, carrying at its head four wheels, ranged side by side; at the back of the cylinder are four similar wheels, and round the whole system is wound, in a similar manner to a rope in pulley-blocks, a chain, which is continued up the lift-shaft over a pulley at the top, down, and finally attached to the cage. When the cage is down the ram is "home" in the cylinder. To make an ascent, water from the loaded reservoir is admitted to the horizontal cylinder, and forces out the ram, the action of which is to lengthen each coil of chain at the expense of the portion between the head wheel and the cage, the result being the ascent of the latter.

The control of the flow of water is held by the cage itself, and it automatically stops at either limit of its journey, and does not, therefore, depend for safety upon the attention of the man in charge. A further safeguard is provided in the shape of a device by which, should the chain or any of the suspending gear break, strong springs attached to the cage are released, and thrust forward arms, which, by engaging with suitable recesses in the guides, suspend the cage at any point.

The automatic action of the pumping-engine is very beautiful; it continues pumping until the reservoir is full, and then stops without attention; the moment any water is withdrawn and the load commences to drop, the engine as promptly recommences pumping, and works until the accumulator is again full.

The "Continuous Lift," which has been popularly, though not reverentially, called "Jacob's Ladder," consists primarily of two endless chains, with long links passing over wheels at top and bottom of the lift-shaft, and carrying between them a number of cages for the reception of luggage; the wheels at the top, and consequently the chains, are caused to revolve by means of a "West" six-cylinder engine; the cages are thus kept continuously travelling down the front and up the back of the shaft, and are so speeded as to allow of their being loaded or unloaded while passing between the two floors. The small "West" engine used as a motive power is a prodigy among steam-engines; it stands on the top of a 14-in. wall, measures only 18-in. by 12-in., but develops three horses' power.

Builders' Benevolent Institution.—An election of pensioners on the funds of this charity will take place at Willis's Rooms, St. James's, on Thursday next, the 28th instant. There are vacancies for two men and two women, there being three candidates of each sex.

NEW BUILDING BYE-LAWS FOR LONDON, UNDER 41 & 42 VICT., CH. 32.

Sir,—I am sure you will encourage expression of opinion as to the new Building Bye-Laws. By the provisions of the Act passed last Session, two months are given to non-official persons in which to make themselves heard. It is, therefore, everybody's plain duty to say what he has to say at once. We have no reason to fear that the spirit of Hadrian has descended to the members and officers of the Spring-gardens Parliament. We may, without exordium, or apology, or dread of the fate of Appollodorus, start discussion at once. You may, perhaps, be willing to direct the use of paste and scissors, and to send a neat collection of the correspondence to the principal Secretary of State who is to confirm the bye-laws, or (as I presume) to doctor them if he does not like them, before they will be valid. It is desirable that they should express an irreducible minimum,—in terms concise, unambiguous, and sufficient; and the able official document which has been printed is very near one's ideal. But frequent tinkering is properly sniffed at by all public bodies, and much disliked by practical people. Let us, therefore, take heed how we, either with unconcern or without debate, allow burdens to be bound upon us grievous to be borne, or weakly shrink from sustaining the Board in grappling with evils which it is now authorised to control. The principle of making the provisions of the bye-laws an irreducible minimum will, however, be pretty generally accepted. Few people consider it desirable that any public authority should help proprietors to obtain superior work. To prevent the worst class of building from going below a certain point is all that can wisely be aimed at. Precision in the limitations of the bye-laws, so as to leave very little to the discretion of any one, will also fall in with the wishes of many people. The discretion of that admirable body of public servants, the district surveyors of the metropolis, in interpreting and enforcing building-laws, should meet with due honour. Let it be understood that district surveyors might in many cases be made uncontrolled despots, and prove very good specimens of the order. But in practice most of us would be better satisfied to give despots and district surveyors very definite instructions, and to let everybody else know what those instructions are; and probably the class best of all satisfied with such an arrangement will be the district surveyors themselves.

As to Foundations and Sites of Buildings.

Paragraph I. of the suggested Bye-laws:—"No house, building, or other erection shall be erected upon any site or portion of any site which shall have been filled up or covered with any material impregnated or mixed with any fœcal, animal, or vegetable matter, or which shall have been filled up or covered with dust, or slop, or other refuse, or in or upon which any such matter or refuse may have been deposited, unless and until such matter or refuse shall have been properly removed, by excavation or otherwise, from such site. Any holes caused by such excavation may be filled in with hard brick rubbish, or other similar material."

a. "Site" is defined in the 14th section of the Act in such a way that the bye-laws cannot control anything outside the area of the building. This was, no doubt, intentional, and may have been prudent; but it will apparently make it impossible to compel people to clear away foul rubbish from the spaces round about buildings. Therefore, instead of "shall be erected upon any site or portion of any site," &c., must we not read "upon any site, any portion of which shall have been filled up," &c.? Some regret will perhaps be felt that it will often be impossible to compel the removal of any considerable depth of foul matter within the area enclosed by the walls of a house, building, or other erection; for the lowest level of a site is by section 14 "the level of the bottom of the foundations," and the bye-laws can only deal with sites, and not with the ground below them.

b. Is not "vegetable matter" too general and too vague? Would fagots used in making a temporary road, would the straw from a mass of old tile roofs, &c., call for the "proper removal by excavation or otherwise" of the material with which they had been mixed? Ought not the clause to specify that matter must be injurious in some way beyond the mere fact of its belonging to the vegetable kingdom?

c. Why is "dust" an unfit material for filling up a hollow site,—dust, pure and simple; for

what is commonly known as dust is described under "slop or other refuse"? Because particles of matter happen to be fine and dry, must they necessarily be deleterious? No one must overlook the fact that roads are frequently several feet above the surfaces of sites, and that filling them up is an anxious matter for small owners of property, so that the temptation to make ground "a shoot" is very strong. Why corrupt them by supplying to *Mephistopheles*,—in the shape of an injudicious speculating builder,—words in the bye-laws fit for being carped at?

d. Why not simply, "removed from such site"? Is not "by excavation or otherwise" superfluous?

e. Why stipulate for the filling in of "holes caused by such excavation with hard brick rubbish, or other similar material"? Would not material as good as the natural surface of the site be good enough? Or why not, in strict logic, stipulate for all hollow sites being filled up with hard brick rubbish, or other similar material, which would be going a very long way in settling on a minimum?

f. Indeed, a deficiency in the tone of this paragraph seems to be that "filling-up" is treated a little cavalierly. Hollow sites ought certainly to be considered objectionable, and filling-up to be considered a desirable thing. No considerable dead space should be left under the wood floor of any dwelling-room. Such a space is probably more or less damp, a reservoir for bad and cold air, a dirty, dusty hole, and a source of danger when timbers begin to fail, and life and limb may be menaced. It might have been desirable to provide that no greater distance than 2 ft. should be left between the finished surface of any wood floor and the top of the concrete layer; but it seems doubtful whether this could be done under the powers given by the Act, for a "site" terminates at the level of the base of the walls, which, by Sec. 3 of the 1855 Act, means the course immediately above the footings.

Paragraph II.—"The site of every house or building shall be covered with a layer of good concrete, at least 9 in. thick, and smoothed on the upper surface:"

a. Nine inches seems a great deal as a minimum thickness. The intention of the layer is to seal down emanations from the subsoil, to make the space under floors neat and dry, and to give a good bed for sleeper-piers and for pavements. In very good work, a 6-in. layer has frequently answered the purpose, and a 4-in. layer has been substituted on occasion. How would it be to make 5 in. the minimum?

b. This layer might be a little superfluous, where a hollow site was covered with brick or stone arching, or heavy flags supported on walls or piers. Of course, however, it would do no harm.

c. Why not "house, building, or other erection" here and in the next paragraph, as in sections 14 and 16 of the Act, and elsewhere in the bye-laws?

Paragraph III. "The footings of the walls of every house or building shall be laid on a bed of good concrete, not less than 12 in. thick, and projecting 6 in. on each side of the lowest course of footings of such walls."

a. This provision should be steadily debated. Is lime concrete so much better than a bed of good gravel, that the gravel must necessarily be cut out in order to put the concrete in its place? Is a 12-in. layer of lime concrete sufficient for the lightest walls of dwellings (9 in. in thickness for a height of 25 ft.)? On shaky subsoils it would obviously be too little, and, unfortunately, no one concerned in erecting the lowest class of buildings has interest enough in his work, to go a step beyond what the law compels; so that this provision will frequently be a less effective weapon in the hands of a district surveyor than 1st schedule, Preliminary, Rule I. of the 1855 Act. By that rule the efficiency of "foundations" is settled by the judgment of the district surveyor in each case. Besides, is not something more elaborate than the suggested bye-law required? Thus,—Except in cases where the laying of footings on the solid ground shall be approved by the district surveyor, and except where special foundations are used,—the footings, &c. (much as in the suggested bye-law); such concrete to be — in. thick for walls — ft. high; — in. thick for walls — ft. high, &c. (giving thicknesses for different heights). Where piles have been driven, and proper pains taken in forming special foundations, the concrete might be worse than useless.

As to Paragraph IV., dealing with the manufacture of concrete, something might be said about proportions, and about "hard materials" being approved by the district surveyor instead of by "the Board," &c.; but I must not do it in this number. With your permission I will say something about the other bye-laws at another time. C.

ANOMALIES IN ARCHITECTS' PRACTICE.

QUANTITIES.

Sir,—The law with respect to Quantities is not so ill-defined as "C.," by his rather vaguely-worded letter, would lead us to believe.

Any person who does work for, or in expectation of, fee or reward, is bound in the performance of that work to use ordinary skill and care, and is responsible to those who pay him, or from whom he has proper expectation of payment, for any loss incurred by them, being the direct consequence of want of proper skill or care on his part.

Now, who is responsible for the payment of the quantity surveyor's fee? Upon the answer depends the reply to the question, To whom is the surveyor responsible for lack of skill?

It may be premised that an architect is *primâ facie* not a principal, and in the absence of any express agreement or circumstances to show to the contrary, he is, in the matter of the employment of a quantity surveyor, only the agent of the owner.

When an architect is employed, and is empowered to obtain tenders for a building operation of any considerable magnitude, he is impliedly authorised to contract, as agent for his employer, with a surveyor to take out the quantities. On the contract thus made with the quantity surveyor the employer is liable. But if a tender be made and accepted, and the works proceeded with, the liability will shift, and the contract will then be taken to subsist between the builder and the surveyor. In these cases the surveyor is not at any time the agent of the owner; he is, firstly, the owner's servant, and afterwards the builder's.

But in some cases, as of public Boards, the owners expressly agree with the quantity surveyor that they will themselves pay him for his services. He is then the owners' servant only, and does not at any time become directly responsible to the builder, unless he has so expressly agreed with his employers. In this case, if the owners issue the quantities themselves, or through their architect or other agent, without express repudiation of a guarantee of their correctness, they, no doubt, become liable to the builder for inaccuracies; but they have their remedy against the quantity surveyor if his want of skill should have caused them any loss. But when owners adopt this exceptional course of directly employing a quantity surveyor themselves, and paying him whether a tender is accepted or not, they sometimes stipulate that the surveyor shall enter into a bond to become responsible for errors of omission to any builder whose tender they may accept, and, on the other hand, there is no doubt that he is responsible to his employers for loss incurred by them in consequence of errors in the opposite direction.

When the architect acts in a double capacity, and takes out the quantities himself instead of employing a separate quantity-surveyor, the responsibilities are still well defined. He cannot, in the absence of express agreement, recover his fee for quantities against the owner: he is then architect for the owner and quantity-taker for the builder,—the servant of both. If by express agreement the owner is to pay the architect for the quantities, the owner (unless he stipulates expressly to the contrary) becomes liable to the builder for loss in consequence of errors therein, and the architect in his turn is responsible to his employer; but upon the owner being sued, he could make the gentleman who acted as his architect and quantity-surveyor co-defendant.

Our authorities for the above are "A Legal Handbook for Architects" (Jenkins & Raymond), reviewed in your 1874 volume; Moon *v.* The Guardians of Witney Union (3 Bing., N.C., 814,—cited in Gwyther *v.* Gaze, Queen's Bench, Nisi Prius, 1875); Scrivener *v.* Pask (L.R., 1 C.P., 715); Waghorn *v.* Wimbledon Board of Health (Queen's Bench Div., Nisi Prius, 1877). See also *Law Times* on "Agency," 22nd April, 1876, and Hill *v.* Reynolds (County Court case, *Builder*, p. 300, March, 1877).

A. & C. Harston.

THE PROFESSION OF THE SURVEYOR, AND RECENT LEGISLATION.

INSTITUTION OF SURVEYORS.*

One very interesting event has occurred during the recess of your sessional year. I allude to the invitation extended by the President of the Central Committee of the Surveyors (Géomètres) of France to send representatives to the International Congress of Surveyors to be held in Paris in July last. The Council accepted this invitation, and appointed a deputation, who attended the Congress accordingly. A report of the proceedings of the Congress having been printed for circulation among our members, it would be superfluous for me to refer to them in detail. I will, however, make a few remarks on one or two important subjects discussed. One was the expediency of establishing a permanent International Congress or Committee of Surveyors, with a view to develope and spread the knowledge of geodesy, and the best methods of surveying and valuing landed property. The Council will, doubtless, consider this proposal in all its bearings, and report to a future meeting the course which it may recommend the Institution to pursue. Another subject was whether it is expedient that the Government of each country should enact that surveyors should hold diplomas of competency. This gave rise to much discussion, and a resolution affirming the principle was carried unanimously. It will be seen that the question bears upon that to which I have already alluded, of an examination for membership in this Institution. An official examination by the Government is one thing, and a test examination for membership in this Institution is another; and whilst I doubt whether the former is practicable, or even desirable in this country, I think the latter is worthy of attainment both in the interests of the profession and the public. As some recognition of the cordial and courteous reception accorded by the Central Committee of French Géomètres to the deputation, the Council has asked you to confer upon the president and vice-president, MM. Lefevre and Ducaille, the honorary membership of this Institution.

The legislation of the last session of Parliament was productive of several measures affecting the agricultural interest.

Of these I will first refer to "The Highways and Locomotives (Amendment) Act, 1878." Section 7 of this Act enacts that, after the 25th of March, 1879, the expenses of keeping in repair the highways of each parish within their district shall be deemed to have been incurred for the common use or benefit of the several parishes within their district, and shall be charged on the district fund. The Highway Board may, however, with the consent of the county authority, modify this provision in certain specified exceptional cases. The maintenance of the highways by a highway district, instead of by individual parishes, appears to me to be a measure calculated to promote efficiency, economy, equality of cost, and simplicity in management. The 13th and 15th sections make an exceptional provision for the maintenance of "main roads,"—that is, turnpike-roads which have been "disturnpiked" since the 31st of December, 1870; and roads which are a medium of communication between great towns, or a thoroughfare to a railway station, or otherwise. In these cases, with the approval of the county authority, one-half of the expense of maintenance may be charged upon the county rate. The 23rd section provides for what is called "extraordinary traffic," and enacts that where, by a certificate of their surveyor, it appears to the authority liable to repair any highway or main road that, having regard to the average expense of repairing highways in the neighbourhood, extraordinary expenses have been incurred by such authority in repairing such highway, by reason of the damage caused by excessive weight passing along the same, or extraordinary traffic thereon, such authority may recover in a summary manner from any person by whose order such weight or traffic has been conducted the amount of such expenses as may be proved, to the satisfaction of the Court having cognisance of the case, to have been incurred by such authority by reason of the damage arising from such weight or traffic. This provision appears to introduce a new principle into the incidence

* From the opening address by Mr. William Sturge, president, at the ordinary general meeting held on Monday, November 11th.

of local taxation. Hitherto the measure of contribution by each individual has been the rateable value of the property in his occupation. Now he will be liable to pay in addition for any extraordinary traffic he may bring upon the roads. The landowner who builds a mansion or a homestead, or who has a fall of timber; the speculator, who covers a suburban district with villas, and thus increases the wealth and prosperity of the neighbourhood; the contractor for public works, will be liable to pay large amounts for excess over average traffic on the certificate of the surveyor. I cannot but think this provision calculated to check expenditure in improvement, to be fruitful of litigation, and to be of doubtful expediency.

I have next to refer to the Public Health (Water) Act, 1878. Section 3 provides that it shall be the duty of every rural sanitary authority to see that every occupied dwelling-house in their district has, within a reasonable distance, an available supply of wholesome water, sufficient for consumption and domestic use. When it appears to the rural sanitary authority, on the report of their inspector of nuisances, that any occupied dwelling-house has not such supply, and that the same can be provided at a reasonable cost, not exceeding a capital sum the interest on which, at five per cent., would amount to 2d. or 3d. per week, and that the expense of providing the supply should be paid by the owner, the authority may take proceedings to compel the owner to afford such supply. Section 4 gives the owner power of appeal on certain specified grounds. Sec. 6 forbids the occupation of houses until the owner has received from the sanitary authority a certificate that an available supply of wholesome water has been provided within a reasonable distance. Section 7 gives the sanitary authority and their officers right of entry on any dwelling which they have reasonable ground for believing has not a proper supply of water. These very summary powers are doubtless necessary to ensure in all cases the blessing of a pure and wholesome supply of water. In many districts the carrying them into effect will be attended with great difficulty; and the satisfactory working of the Act will mainly depend on the judgment and discretion of the medical officers and inspectors appointed by the sanitary authority. Whenever practicable, I think the supply of water to villages and small towns should be undertaken by the sanitary authority, rather than be left to individuals, except in cases where the town or village principally belongs to one owner who can deal with the question in a comprehensive way.

And here I would make a few remarks on the practical working of the Sanitary Acts. Admitting to the full the necessity of very summary powers for the protection of the public health and the abatement of nuisances, I must protest against the manner in which the Acts are in some instances carried out by the inspector of nuisances. Some of these officials appear disposed to perform their duties in a harassing way, and to be utterly regardless of the expense to which they put owners of property; and I could mention several cases in which a disposition has been shown to strain the powers of the Acts beyond their legitimate object. Although it is true that the owner may complain to the sanitary authority and afterwards appeal to quarter sessions against any order made upon him, yet appeals entail so much trouble and expense that the remedy is almost as bad as the disease.

After briefly referring to "The Weights and Measures Act, 1878," Mr. Sturge went on to discuss recent legislation in its bearings upon agriculture, the principal measure commented upon being "The Contagious Diseases (Animals) Act, 1878." He quoted the Board of Trade returns to show that during the last ten years, whether from cattle disease, or from drought, or from demand overtaking supply, or, as is probably the case, from a combination of these causes, the number of cattle and sheep has not kept pace with the increase of the population, and up to the end of 1877 the foreign supply had barely made good the deficiency. He then proceeded to review the present position and prospects of agriculture in reference to foreign competition, incidentally remarking that although the construction of railways and other public works proceeds on a much smaller scale than it did some years ago, yet the maintenance of way of existing railways absorbs large numbers of men who would otherwise be employed in agriculture, and helps to maintain the rate of wages. These facts point to the necessity of an extended use of labour-saving apparatus, the steam thrashing-machine, the reaping-machine, the mowing-machine, the elevator, and the steam plough. Brain must, as far as possible, supply the place of sinew, in order to enable us to cope with foreign competition by reducing the cost of production. Mr. Sturge went on to say that the combined effect of the succession of adverse seasons, of the price of labour, and of the increasing supplies of food from abroad, has been to cause great depression among agriculturists, and farms which would have readily commanded tenants a few years ago are now let with difficulty, and are even left on hand. What hope is there of an end to this state of things, and how is British agriculture to surmount its present difficulties? I fear that I can say little that is new in answer to these questions. The laying down of inferior arable lands to pasture will probably be more extensively carried out. The extent to which this change has progressed in the nine years from 1869 to 1877 is shown by the Board of Trade returns. During that period the land cultivated with cereal crops in Great Britain decreased from 9,758,000 acres to 9,210,000 acres, or about five per cent.; and in Ireland from 2,218,000 acres to 1,862,000 acres, or about 15 per cent. The extent of land under green crops did not materially vary; but the extent of permanent pasture apparently increased in a greater ratio than the decrease in cereals,—a discrepancy probably due to defective returns. Another resource, especially in the great corn-growing districts, is high farming by the aid of the increased consumption of feeding stuffs and the use of artificial manures; and at the same time of labour-saving apparatus, with the view of increasing the gross produce of the soil relatively to the cost of labour, for it is well known that the expense of labour is smaller in proportion to a large than to a small produce. . . . . For an improvement in the seasons we can but trust in Providence. Cycles of good and bad seasons have ever recurred, from the time of the seven plenteous years and the seven years of famine in Egypt until now. So also has it been with commercial prosperity and adversity. We have recently experienced an unusual succession of adverse seasons and a protracted time of commercial depression. But,—

"The darkest day,
Live till to-morrow, will have pass'd away;"

and let us hope that, according to all past experience, brighter days are in store for us.

But, at all events, agriculture, like other undertakings, must be progressive. Commerce requires from time to time new fields, and Manufacture new products, improved machinery, and new markets. So it is with agriculture. Be it our endeavour, as land-agents, carefully to watch the signs of the times, and to promote such improvements and such practical measures as may conduce to the welfare of all interested in the ownership and occupation of the soil.

I will conclude by mentioning some of the subjects on which papers will probably be read during the session, viz.:—The Use of Sewage by Farmers; Hopgrowing; the Rating of Railways; Contributive Value; Dilapidations; the Disposal of the Sewage of Paris; Land Tax. I need hardly impress upon all connected with the Institution,—our members especially,—the great importance of keeping up, session after session, the supply of well-prepared papers on subjects of interest to the profession.

Mr. Squarey moved a vote of thanks to Mr. Sturge for his address.

Mr. Philbrick, Q.C., in seconding the motion, said he had been struck by the President's allusion to the comparatively small number of students attached to the Institution. He trusted that the present year would see a large addition to the number of their students. The President had referred to the difficulty of finding technical education and instruction in the days when he was a student, but probably one reason why some of the men now at the head of the surveyor's profession were so "strong" in their vocation was to be found in the fact that they were "self-made men,"—men who had had to rely mainly upon their own exertions. Still, he could not help thinking that had those men been able to avail themselves of the advantages now available to those entering the profession, their career would have been considerably eased to them, and the profession as a whole, and the public generally, would have been greatly benefited. He rejoiced in the prosperity of the Institution, to which it should be the pride of all who called themselves surveyors to belong.

The motion having been put to the meeting, and carried,

Mr. R. C. Driver said,—We are all familiar, I think, with the fact that twenty years' user of land without disturbance,—twenty years' occupation without payment of rent,—has hitherto held good as against any owner; but you may not all be aware that that period has been limited, by an Act which will come into operation next year, to twelve years. It is very important that those of us who have not read the Act should do so, and then make it our business to go round the various estates for which we are interested, in order to see that no encroachments exist, or otherwise pieces of land may be lost. There are other limitations in the Act which it is important for us to be cognisant of.

Mr. Philbrick said the Act in question was called "The Property Limitation Act," and was passed in 1874.

TECHNICAL EDUCATION.

BY J. C. BUCKMASTER.

The Paris Exhibition of 1867 gave rise to a general demand for Technical Education. The report of the British Commissioners and the working men sent over by the Society of Arts were full of lamentations on the superiority of all foreign work which involved a knowledge of art. The subject is again before the public. Committees, City companies, and newspapers are at work, and it is hoped their deliberations will result in something permanent and practical. At present there appears no common basis of either action or agreement; no two persons are of the same opinion as to what is wanted to remedy the defect. The Principal of the Artisans' Institute thinks he is doing a great work by encouraging a little *dilettante* modelling and carpenter's work in a garret in St. Martin's-lane, and some of the City companies and private individuals have given liberal donations to this work. Occasionally we hear of the technical education of bricklayers and masons, but what is meant by this technical education is not quite so clear to the outside public. Opinions differ very widely, not only as to what is meant, but what is wanted, and the definitions which have from time to time appeared only add to the general bewilderment. One says, a knowledge useful to men in their work; another, an intelligent appreciation of natural laws in their application to the industrial arts; another, the teaching of mathematics and drawing in their relationship to various trades and handicrafts; and Professor Huxley, in a recent address, regards technical education not as the teaching of technicalities, but as the best training for enabling the pupil to learn them himself; and this training appears to be the training of a good science and art school.

The vagueness of these definitions arises from men not making a sufficient distinction between the science and practice of an industrial art. The union of science with practice is at present an impossibility, because it is difficult except in very rare cases to unite the two qualifications in the same person. To learn the practical work of mining, a man must go to work in a mine; but the theory of the Davy lamp, of ventilation, the best methods of getting, transporting, and raising material, can be taught in a schoolroom. In the same way a carpenter, to learn the practical part of his work, must engage in the work of the shop; but to understand the scientific principles involved in the construction of a roof, so as to use his wood to the best advantage in resisting the various forces acting upon the roof, he must know some geometry, mechanics, and mathematics. In 1820, Baron Charles Dupin began teaching the apprentices and workmen of Paris geometry and mechanics in their application to the manufacturing arts. Several professors and engineers, animated by a generous desire to promote this instruction, commenced courses of lessons to the apprentices and workmen in nearly all the manufacturing towns of France. This instruction was gratuitous; and in 1825, Baron Dupin says, thanks to the general and effectual assistance of a great number of municipal councils, mayors, prefects, and sub-prefects, friends to useful knowledge, ninety-eight towns are endeavouring to rival each other in their zeal for imparting this new instruction to the working classes; and I can assert, because I have indis-

putable authority, there are workmen who, since the opening of these classes, have improved their tools and instruments, and have constructed others more perfect,—workmen who have carried into their trades and occupations that geometrical and mechanical spirit which has simplified their proceedings, and which leads to that accuracy, economy, and precision, without which the arts cannot produce anything either good or beautiful. There is no difficulty in understanding what is meant by an apprenticeship to the trade of a carpenter: the lad in a certain number of years, dependent on his aptitude and the willingness of the men to teach him, learns the names and uses of tools. In time he becomes a journeyman; if he be a careful, painstaking lad, able to set out his work, sparing no pains or labour in keeping his tools in order, and planing up his wood so that the stiles and different parts of his frame-work are out of twist, the tenons accurately cut, and the mortises carefully made so that every part fits tightly and compactly together, he is regarded by his fellows and his master as a good workman. And if he take pleasure in his work, striving to do everything as perfectly as possible, there is nothing in the trade of a carpenter to which such a man may not succeed. Now this perfection in the older industrial arts may be attained, and often has been attained, by men who could neither read nor write, but it would have been attained more easily and readily by men who could read and write. With a system of bargain and contracts, which often encourage loose slovenly work, it is difficult to make good workmen. For every workman taking an interest in his work, and striving to do it thoroughly, except in some of the more artistic industries, there are hundreds, perhaps thousands of workmen, who never in their whole life did a piece of honest, good work. The men are not entirely to blame for this wide-spread demoralisation. The master, who used to work with his men, is seldom seen, and in companies there is no master. Between the workman and his employer there are a number of men who never did a day's work, either on the scaffold or in the shop. The foreman of a large engineering and fitting firm, employing a large number of apprentices, said to me:—"When they go out of the yard we have nothing more to do with them until they come in again, and then it is our business to look after them and see that they do their work." A large railway company, employing some thousands of skilled workmen and apprentices, used very properly to select their apprentices from the sons of workmen. Lads who wished to be taken on had to appear between nine and ten on Monday mornings, and the interview was something after this fashion: "What's your name? What shop does your father work in? How long has he worked for the company? How many brothers have you? Are you the eldest? What's your age? Go to No. 6 shed and tell the foreman to set you on." No question about education, or his school life, or his attendance at drawing or science classes,—these are matters in which large firms and companies take little or no interest. If the boy is liked in the shop he is kept on, and in time rises to be an average workman. If he is a troublesome, careless lad, against whom the men or foreman have taken a dislike, he is turned out, and has to seek some other less skilled employment. If these companies required the sixth standard and the certificate of the Science and Art Department in drawing and mathematics or mechanics before taking a lad into their service, and then provided schools or classes for more advanced drawing in those sciences which bear on their particular industries, and if attendance a certain number of hours at these classes were made compulsory during the first four or five years of their employment, there would soon be a more intelligent class of workmen; and the time spent at these classes ought to be considered as time spent in the service of their employers. All attempts to unite the theory of an art with its practice, except under similar favourable circumstances, will be a failure. In looking over the list of science and night classes, it will be found that very few exist in connexion with private firms or companies. There are a few noble exceptions, but in most cases employers have either discouraged any effort to establish night-classes, or declined to give any assistance. More help and encouragement have been given by the clergy than any other body, and but for their friendly co-operation the work of the Science and Art Department in many places would have been a failure; but the clergy can only have an indirect interest in the extension of science and art instruction. They are certainly not animated with the idea that more drawing and more science will enable us to compete more successfully with other countries, but with the higher and older faith of St. Augustine, that every increase of knowledge has a spiritual significance and relationship to God's will and providence in this world.

The great want of working men is not technical schools, such as some have described, but more general and scientific education; a wider development, by means of prizes, exhibitions, and scholarships, of the classes and schools of the Science and Art Department; a better training in drawing, in mathematics, and mechanics; which will enable men to regard their labour, not as the instinctive toils of animals, but as a matter upon which they can daily exercise their faculties. It is to a large extent the defective elementary education of lads which prevents their attendance at science and art night classes.

The great aim of all technical education should be, in the first instance, a training in drawing and mathematics; and to attempt the higher education of working men without this training is to begin building with the roof instead of the foundation. All attempts to turn a school into a workshop, or a workshop into a school, will certainly fail in the future as they have in the past. When a lad knows his geometry and mechanics, he has no difficulty in bringing this knowledge to bear on his daily work. The various scientific principles involved in the constructive arts will never be learnt in the workshop, nor can the practical application of this knowledge ever be acquired in a schoolroom. The future workman or mechanic generally leaves school before he reaches the fourth or fifth standard; it is, therefore, almost impossible to teach him any of those sciences which relate to the industrial arts, and the so-called education of the working man is at an end. He now devotes his leisure to newspapers, politics, and trade questions; these require no intellectual effort, and he sinks to the level of an ordinary working man. There is no direction in which the wealth of many of the City Companies could be more usefully employed than in helping deserving lads to local scholarships and exhibitions. There should be a closer connexion between the elementary schools and the Science and Art night classes, so that lads pass from one to the other with as little interval as possible. There should also be in every moderate-sized town a graded or secondary school, to which the clever boys from the elementary schools should be promoted by examinations, and exhibitions, and scholarships. The organisation for this secondary scientific education already exists. For more than twenty years the Science and Art Department has encouraged the teaching of drawing and science in schools and night-classes; but managers, committees, school boards, and mechanics' institutes are slow to move. City companies and private individuals might render great service by increasing the number of scholarships and exhibitions awarded by the Department. In many places these opportunities are lost, because there is not sufficient local interest to raise the 5*l.* required by the Department. The great use of more scientific teaching is not to be estimated entirely by its practical and material value, but for the higher purpose of developing the intelligence, making men more thoughtful and self-reliant, and giving them something to occupy their minds with as a relief from daily work. To make practical results the direct aim of all science and art teaching is to impede the very results for which we are working. The more general diffusion of scientific knowledge among working men and others will bring countless blessings and benefits to mankind; but to teach science solely for the sake of these benefits is to injure the science and lessen the benefits. There may, perhaps, be good reasons why education should be directed to secure material results; but this is not the spirit in which the education of the working classes should be directed.

A Church Tower destroyed by Lightning.—For (it is stated) the third time within thirty years the tower of the Parish Church of Week St. Mary, North Cornwall, was, on the 9th inst., struck by lightning and destroyed. It would be interesting to know whether any lightning-conductor was ever fixed to the tower.

ELECTRIC LIGHTS.

Messrs. Hodson, Price, & Hodson, architects, having been requested to set forth, for the information of the Lighting Committee of the Loughborough Local Board of Health, their views upon the question of lighting some of the open spaces of Loughborough, more particularly the market-place, by means of the electric light, have addressed an interesting report to the Board, in which they first describe succinctly the various systems at present known. We print the concluding portion of the report, which includes a suggestion as to obtaining power which may be useful to other towns.

Science has placed at our service a grand means of illumination, surpassing even the dreams of our ancestors; but at present it can only be economically applied to lighting up large spaces, such as market-places, workshops, factories, and great centres of traffic, but the public, and possibly the gas companies, must bear in mind that we are only just passing the threshold of the mysteries of electricity, and that a few further steps in advance may bring within our reach methods of generating and storing up electricity as gas is now stored in holders and power stored in an hydraulic accumulator, and reconducting it throughout circuits of sufficient capacity to bear subdivision, so that it may be applied to the purposes of ordinary life. Even now the Jablochkoff, Lontin, and other systems subdivide electricity; but they only subdivide it as generated, and the step between this method and the manufacture of electricity to keep in store and to be drawn upon from its reservoir as required, may only be a question of a few years, perhaps only a few weeks, and when that is done the public anticipations may be realised, but it must of necessity always be at large cost, the elements of which are, the power necessary to generate electricity, and the apparatus required for its distribution. In many publications we have lately seen the most ridiculous means have been taken to delude the public. The cost has been stated at 3d. per hour, or 6d. per hour, as the case may be, which is merely the cost of the sticks of carbon consumed, and the real element of cost, *i.e.* that of the motor and apparatus, has been designedly omitted.

The principal source of cost after provision of the apparatus is the expenditure for motive power to drive the generating machines, and for a long time we have had the idea that Loughborough, like the majority of other towns having a supply of water by gravitation, had, during six months of the year at least, and those six months the period when the lighting was most required, an ample supply of water at high pressure, capable of generating power sufficient to drive several motors, of sufficient force to provide light; and that this supply, owing to incapacity of reservoir space, was absolutely wasted. The reservoir, when once filled up by the autumnal rains, is kept full throughout the winter, all flood waters and excess of rainfall being permitted to flow away down the bye-wash, and become lost for all useful purposes, when every facility exists for converting its power into light, and, after its power is recovered, using it for flushing the public sewers, the waste in Loughborough in the driest season being equivalent to 35 billions of pounds, raised 1 ft. high, and in an average season nearly double that amount.

We have seen in previous paragraphs that the Siemens lights can be maintained, according to intensity, at an expenditure respectively of two, four, and seven horse-power, the smallest power being ample for the full illumination of the Market-place, being equal, if increased, to about eighty-five of the ordinary gas-lamps, and that Jablochkoff lights can be maintained at an expenditure of about one horse-power per light, each light being equivalent to 600 candles. The smallest machine now made is capable of supporting four of these lights, and absorbing four horse-power.

Acting upon these data, we have carefully calculated the power available, and find that a 3-in. pipe connected to a 6-in. main, discharging its full capacity, will develop a theoretical power equal to 9·21 horse-power, about 8 horse-power indicated, the expenditure of water being 70 cubic feet per minute, and that this amount of power can be obtained in any part of the town where a main pipe 4 in. in diameter exists.

The only requirements, therefore, for establishing electric lighting for, say, the Market-

place, Loughborough, will be the provision of one of Ramsbottom's or Bailey's water motors, together with the requisite shafting, pulleys, and belts to acquire the proper speed, and a Gramme, Siemens, or Wallace-Farmer dynamo-electric machine of a size proportionate to the number of lights required, and to lay on water to the motor, and connect the waste to the sewers. . . . .

The gross outlay for providing all requisite apparatus would be probably from 200*l.* to 400*l.*, equivalent to, say, a charge of 20*l.* per annum; but this apparatus would continue year after year to afford light, requiring only the cost of carbons and trifling outlay for attendance, and would be capable of generating light equivalent to over 400 gas-lamps, although, unfortunately, the light must of necessity, with our present knowledge, be diffused from a few points in unnecessary volumes. But this objection, on economical grounds, will disappear when Edison or some other inventor determines a method by which subdivision of the currents can be carried to a further degree than is practicable at present.

We have dwelt upon the subject at greater length than we intended at the outset, because the subject itself is peculiarly interesting to us, and because, in order to secure its adoption, it is necessary that the public should understand the difficulties in the way as well as the advantages to be derived. We do not, however, anticipate that the matter will at once be taken up; but, in course of time, when manufacturers and quarry-owners having spare power at their disposal, and landowners having sources of power at their doors, by falls of water on their estates, clearly appreciate its benefits, we have no doubt the system will be universally introduced.

What we wish to point attention to is the fact that year by year, throughout the dark winter months, every river in England is capable of producing light sufficient to illuminate large areas of towns and villages. At every mill on our own Soar sufficient power is wasted in the waste water allowed to escape to light up in a glorious manner every village along its banks. Thus town authorities having the control of gravitation water-supplies have a means of economic lighting in their hands which can be developed at but trifling outlay.

CHURCH ARCHITECTURE: ITS PROPER RELATION TO SIMPLE CHRISTIAN WORSHIP.

At the Church Association Conference, held at Derby on the 6th inst., a discussion on this subject was opened by Mr. Alfred R. Pite, architect, who read a paper in the course of which he expressed his anxiety, in leaving the beaten track of ecclesiology, that we should discover what principles were in danger from the Ritualistic encroachments of the day, and take counsel how to act in the emergency. For thirty years Mediævalism, under the specious garb of a Gothic revival in architecture, has been moulding the minds of the clergy and laity alike for the reception of certain Romanistic forms of design and structure now said to be popular. This tendency had gradually spread like a fretting leprosy over a large ecclesiastical surface. Not only had it imposed upon church buildings, fittings, furniture, and vestments a Romish character, but an affected gorgeous ceremonial has, in many cases, taken the place of simple Christian worship. By a veiled and stealthy sapping, the pulpit,—the platform of God's herald,—has been undermined, and the altar of sacerdotalism substituted as the central object of attraction. Over-decorated structures of pseudo-Mediæval design, but carried out in detailed subservience to modern conventionalities, are introduced to covertly favour Popish formularies, and to serve as stepping-stones to the ornate ceremonial of a sensuous religion, whose chilling influences and bondage to ordinances stamp it as antagonistic to the Scriptural injunction that we should "attend upon the Lord without distraction." Against this parody of religion and this obtrusiveness of worship, permitted alas, by the Latitudinarian tendencies of the day, "*the* stones cry out of the wall, and the beam out of the timber shall answer it" that the walls are "daubed with untempered mortar." Coming to the inquiry, How can architecture consistently represent the principles and usage of the Church of England, and thus in a subsidiary way contribute to simplicity and reality in Christian worship? Let their buildings and ornamentations reflect, in design and execution, the pure light of New Testament Scripture, where no sacerdotal acts were performed by the ministry, but where they were appointed the evangels of the Gospel, to teach and exhort the people as ambassadors of the Most High. Simplicity of plan should, therefore, characterise all our ecclesiastical structures; and where means and inclination combine to produce a building of imposing proportions and striking beauty, all the resources and expedients of the arts might be worthily employed in harmonious rivalry for legitimate effect. The architect should cultivate his great art with all its accessories for the service of the Lord of Hosts, so as to assist and not hinder the worshipper, realising the responsibility attaching to his most honourable employ as a servant of Jesus Christ.

The Rev. Canon Ryle, after referring to the vast importance of the subject, said they were all agreed on this, that it was not the place, the building, or the architecture which made the worship acceptable to God; but still, in view of the great tendency which existed in the present day to build and restore churches and cathedrals, it behoved them to look this question boldly in the face. What they ought to aim at was, churches in which usefulness and beauty should go hand in hand, and be harmoniously combined together.

Dr. Ogle said that this was a layman's subject, and, as a layman, he contended for great care in the construction of our churches, especially with regard to the chancels, in which all questionable adjuncts of divine worship should be avoided.

The Rev. Paul M. Walker (Edensor) contended that there was no analogy between the worship of the Temple and that of the Christian Church, and that the buildings, therefore, ought not to be assimilated. The Christian Church was the reproduction of the synagogue, and the architectural arrangements ought to be similar.

The Rev. S. D. C. Douglas urged upon his reverend brethren that their great object should be to keep their people in spiritual worship, and to provide them with a place where they could sit down comfortably, and see and hear everything. Above all, they should rid themselves entirely of the idea of symbolism, with which they had nothing to do.

The Rev. J. W. Johnson (Leamington) said the opinion of the branch of the Church Association at that place was that careful supervision should be exercised over architects in the erection of churches, so that they might be erected in accordance with the judicial decisions of the law courts with regard to the worship of the Church of England, as opposed to that of the Roman Catholic Church.

Mr. Stokes (Bath) advocated the abolition of all adjuncts of Mediæval worship, which were inconsistent with the worship and doctrines of our Reformed Protestant Church.

THE NON-PROFESSIONAL STUDY OF ARCHITECTURE.

Sir,—My attention has been directed to your interesting article of the 2nd inst. on "The Non-Professional Study of Architecture." Some recent experiences of my own in relation to the question you so ably discuss may perhaps be of interest, as illustrating the surprising apathy with which this branch of study yet appears to be regarded in England.

A few years ago, while resident in Canada, I was asked by the Montreal Ladies' Association to give a course of lectures on architecture, as viewed from the historical and descriptive standpoints. To this request I readily acceded, and a class of about a hundred came to hear what I had to say. At the end of the course an examination took place, and several papers, remarkable for diligent appreciation and grasp of the subject with which I had dealt, were sent in.

Such was my colonial experience. Now for the contrast.

During the early part of the present year, in a lecture I had the honour of giving before the Philosophical and Literary Society of this town (Leeds), I again pleaded, as you have done, for the recognition of the study of architecture, in its historical aspect, in our systems of general education; and what I then said appeared to be received with approval. Being wishful to follow the matter up, and thinking that what had not been unacceptable in Canada might possibly be useful at home, and in a town not undistinguished for its educational activity, I proposed, with the sanction of our governing body, to give, during the winter, a similar course of lectures to that previously given in Montreal. In order to see whether a class could be got together, and as, moreover, the subject was somewhat new and not within the regular curriculum, special notices were issued in the summer, and names of intending students requested to be sent in by a certain date.

The current of old ideas has, however, shown itself to be still too strong, for up to the 8th of October,—the first day of our session,—one name only had been entered. I need scarcely add that, under these circumstances, it has not, for the present at least, been thought worth while to pursue the matter further.

G. F. Armstrong,
Professor of Civil and Mechanical Engineering, and sometime Professor in McGill University, Montreal.

CREWKERNE GRAMMAR SCHOOL COMPETITION.

We have received several letters pointing out objectionable clauses in the "Instructions." It would be useless, however, to print them. Intending competitors must use their own judgment and act accordingly. One of the writers ends his letter thus:—

"To any one who knows anything about the cost of building in the present day, it is quite evident that no building, however plain, can be built with the required accommodation for the sum mentioned; as, after deducting architect's commission, clerk of work's salary, and a sufficient sum to cover contingencies, there will barely be 5,500*l.* left for the buildings themselves. I think that I have said quite enough to convince all thinking men that it would be absurd to compete under such conditions and instructions."

NEW BANKING PREMISES, KETTERING, NORTHAMPTONSHIRE.

The new banking premises for the Leicestershire Banking Company in the High-street have been opened for public business. The building, which is in the Italian style, has a frontage to the street of about 60 ft., and the bank occupies about half the remainder, comprising the manager's residence. The front is built of Bath stone, with native stone ashlar, and the contrast is good. The banking-room, which is 28 ft. high, is simply lighted by windows on the east and west, and at the back are a commodious fireproof strong-room and private room, lavatories, &c. The bank fittings are in polished pitch pine; and the bank and rooms adjoining are heated with hot water. The manager's residence comprises dining, drawing, and breakfast rooms, and the usual offices and bedrooms. The floor of the entrance-hall, lobbies, and part of the bank are of encaustic tiles from the works of the Coalville Company. Messrs. Grinson & Co., of Leicester, supplied the hot-water apparatus. The bath-room is fitted with one of Finch's patent porcelain baths, with Tyler's bath boiler attached. The works have been carried out by Messrs. J. & G. Henson, builders, of Kettering, from the designs and under the superintendence of Mr. R. W. Johnson, architect, of Melton and Kettering. Mr. Clifton was clerk of the works.

PROPOSED NEW BRIDGE ACROSS THE THAMES AT CHELSEA.

A movement has been commenced for the erection of another new bridge across the Thames between Chelsea and Battersea. At the last meeting of the Chelsea Vestry a letter was read from the Chelsea Parochial Protection Society, recommending the Vestry to urge upon the Metropolitan Board of Works the desirability of applying to Parliament for the necessary powers to construct a bridge across the river from a point opposite the entrance to the late Cremorne Gardens to High-street, Battersea, and also to extend the Chelsea Embankment from its present abrupt termination at Battersea Bridge to its natural ending at the foot of the proposed new bridge. The suggestion in the letter was favourably received by the Vestry, and the subject was referred to the Western Embankment Committee, with power to act.

WARNING TO ARCHITECTS.

HUNT *v.* THE WIMBLEDON LOCAL BOARD.

THIS was a case (tried in the Court of Appeal) of importance to those who have dealings with corporate bodies. At the trial before Mr. Justice Lindley, at Westminster, last Hilary Sittings, it appeared that the defendants, who are the "Urban Sanitary Authority" for Wimbledon, having resolved to erect new offices for the use of the Board, directed their surveyor to employ the plaintiff, an architect, to prepare plans and drawings for the buildings they intended to erect.

The plans were drawn, and were submitted to the defendants, who approved them, and directed quantities to be taken out in accordance with them, and advertised for tenders and specifications for the building. The proposed plan being found to be too expensive, none of the tenders were accepted, and in the end new plans of a less expensive nature were obtained, and offices built in accordance with them. The plaintiff then brought his action for work and labour in preparing the plans he had furnished. The defence relied upon by the Board was that by the Public Health Act, 1875, sec. 174, they, as a corporate body, were only authorised to contract by writing under their corporate seal in all cases where the subject-matter of the contract was of greater value than 50*l*. The jury found that the Board authorised the surveyor to procure the plans, and ratified his act, that the new offices were necessary for the purposes of the Local Board, and the plans necessary for the erection of the offices. In spite of these findings, Mr. Justice Lindley, who reserved the point, and had it argued after trial, decided that the plaintiff could not recover, as his contract with the defendants was not under seal.

The plaintiff now appealed.

After hearing arguments at considerable length, their Lordships unanimously affirmed Mr. Justice Lindley's decision, holding that the words of the statute were clear on the subject.

Lord Justice Bramwell, in the course of his judgment, remarked that though in a former case Mr. Justice Blackburn had said that in certain cases justice and convenience appeared to be in favour of holding a corporation liable though the contract was not under seal, he himself was not by any means clear upon that point. It was by no means clear that it was not desirable that in dealing with bodies who had not their own interests at stake, but those of the public, persons should take care that the transaction was carried out in accordance with law; and if careless and slovenly people chose to act otherwise they must take the consequences. In the present case, if more solemnity had been used in the transaction, probably those who gave the order would have cautioned the architect not to make the plans for too expensive a building. It was a dangerous thing to fritter away the provisions of statutes in order to do supposed justice in particular cases.

So far as can be judged from the report of the case, a more contemptible and discreditable plea was never raised by a public body. Architects should bear the Wimbledon Local Board in mind.

FOUNDATIONS WITHIN THE METROPOLITAN AREA.

DR. WHITMORE, in his "Annual Report on the Health of Marylebone," recently published, directs attention to the additional powers now possessed by district surveyors, and although these have been already pointed out in our pages, it may be useful to repeat what he says,—

"During the past session a Bill, prepared and brought into the House of Commons by Sir James McGarel Hogg, Sir Charles Russell, and Mr. Rodwell, and entitled the "Metropolis Management and Building Acts Amendment Bill,"* has received the sanction of the Legislature. This Bill contains some important clauses "relative to the making, filling up, and preparation of the foundations and sites of houses and buildings to be erected within the metropolis, and with respect to the quality of the substances to be used in the formation or construction of the sites, foundations, and walls of such houses and buildings, with a view to the stability of the same, the prevention of fires, and for purposes of health." With reference to that part of the Bill more directly concerning the public health, I gave evidence, in conjunction with Dr. Tripe, the Medical Officer of Health for Hackney, before a Select Committee of the House; and our evidence went to show that, in many instances, entire streets and other large blocks of houses had been, and were still being, constructed upon sites and foundations made up of substances of a most polluted and unwholesome character, and that the materials used in the construction of those houses were, for a similar reason, hardly less objectionable. We were in a position to state that many sites were made up of slop and road scrapings, mixed up with sewage matter, together with a large amount of decomposing animal and vegetable refuse, the effect of which was to impair very materially the health of persons occupying the houses erected on those sites; and I was enabled to refer to a particular locality in which there had been for many years a large death-rate from fever and other infectious diseases, which diseases were traceable to the infected and polluted character of the sites and foundations on which the houses in that locality stood. The 16th clause of this Act provides that 'In case any house, building, or other erection begun to be constructed after the passing of this Act, is constructed, or begun to be constructed, upon any foundations or site, or with any substances, which have not been made, filled up, and prepared, or which are not in description and quality in accordance with the provisions of the Bye-laws relating thereto, made under the authority of this Act, or in accordance with the terms and conditions subject to which the Board may have dispensed with the observance of any such provisions, the district surveyor may forthwith, by notice to be served on the occupier of such house, building, or other erection, or on the builder, owner, or other person engaged in constructing any such house, &c., require him to alter, pull down, or remove such house, &c., or any part thereof, as he may think proper'; and in case of non-compliance, such owner shall be liable to a penalty of not less than 10*s*., or more than 40*s*., for every day from the time of the service of such order until the requirements of such order are fully complied with, power being given, in Clause 17, to the owner to appeal, within seven days, against such order."

* The power to carry out this Act is vested in the Metropolitan Board of Works.

WHAT IS THE "ELEVATION" OF A BUILDING?

A TRIAL of some novelty in connexion with building came on last week at the Liverpool Assizes.

Mr. Nathaniel Proctor, a builder and file manufacturer, of Liverpool, sued Mr. William Williams, a chemist, for an infringement of proprietary rights in respect of some freehold houses in Crown-street, in that town. The plaintiff's counsel said that this was a case which, although the importance involved from a pecuniary point of view was not very great, had excited a good deal of feeling between the parties. The plaintiff was the owner of some ten or eleven of a terrace of some sixteen houses, which were retired back from the thoroughfare, with a garden or plot in front. The dwellings were all built at the same time, and the defendant became the proprietor of a single house between those belonging to the plaintiff. To preserve their uniformity, it was stipulated in the title-deeds that the elevations of any of the erections should not be altered without consent and approval. The plaintiff's case was that the defendant wrongfully raised his house, and in doing so built upon the party-walls separating it from the plaintiff's houses, thus improving his own property and injuring that of his neighbour.

Mr. Aspinall, Q.C., who appeared for the defendant, at this stage of the case, interposed, and said:—"We deny that we have built upon any portion of his party-wall; and we say, in the second place, that we have not altered the elevation."

Justice Manisty.—But, according to the plan shown, you have made your house higher than the others.

Mr. Aspinall.—"Elevation" is an architectectural term, and has a particular meaning. We deny having altered the elevation.

The Judge suggested that the parties should come to some arrangement, and that the dispute between them was for an architect to decide.

After a consultation between the counsel it was announced that they had consented to a nominal verdict for the plaintiff, subject to a reference to Mr. Ellis, an architect, who should have power to decide the point.

DAMAGES FOR NEGLIGENCE.

PARK *v.* KER.

THIS was an action raised in the Dumfries Sheriff Court by William Park, plasterer, Annan, against Hugh Ker & Son, joiners and builders, Annan, claiming the sum of 1,000*l*. as loss and damages sustained by him through the culpable neglect and fault of the defenders on the occasion of the erection of the new town-hall, Annan.

The pursuer, while fulfilling a contract for the plaster work of the new town-hall at Annan, had been precipitated to the floor, along with his son Robert, and James Hopper, labourer, by the scaffolding giving way, the distance of the fall being about 16 ft. Petitioner's leg was broken, and he sustained other injuries, in consequence of which he was disabled for some months, and is now permanently lame.

Sheriff Hope issued an interlocutor in which he finds in law (1) That upon a fair construction of the clause in the specifications quoted the responsibility of making the plasterer's scaffolding sufficient as regards stability rested on the defenders; and (2) that as the accident to the petitioner happened in consequence of the scaffolding proving to be insufficient for the purpose, the defenders are liable in damages to him in respect of the injuries and losses he sustained. He therefore repels the defences, assesses the damages at 200*l*., for which sum decerns against the defenders with interest as libelled, and finds them liable in expenses.

Architectural Restoration.—Public meetings are fixed to be held of "Notes and Queries Society," Royal Institution, Liverpool, Dec. 9th and 16th, to forward the views of the Society for the Protection of Ancient Buildings. Brief papers by Mr. William Morris, Mr. J. J. Stevenson, Mr. James Bromley, and Mr. Samuel Huggins. Speakers:—Mr. J. A. Picton, Mr. J. A. Noble, Mr. J. M. Hay, Rev. W. Binns, Mr. William Swainson, Mr. Charles Dyall, Mr. W. Tirebuck, Mr. P. H. Rathbone, Mr. F. Kempster, M.A., and Mr. R. R. Douglas.

THE STORAGE OF PETROLEUM.

IT is not generally known that petroleum deteriorates by being kept in vessels of certain metals. Thus it is said that, if stored in a leaden vessel for one week, petroleum becomes so impure that the wick must be cleaned several times during the evening; if the surface of the lead is metallically pure, the oil will spoil after storage in the vessel for one day. An iron receptacle does not lower the illuminating power of petroleum, but the latter assumes a darker colour, and precipitates rust-coloured sediment. Zinc and inferior zinc alloys spoil petroleum. Metal petroleum vessels ought to be of tin, copper, or tinned copper, and should not be soldered with alloys containing lead; such vessels scarcely affect the oil; only a storage of several months' duration will slightly deteriorate it. According to the *Hannoversches Gewerbeblatt*, our authority for the above, vessels of stoneware or slate are to be preferred to all metal receptacles for the preservation of petroleum.

"HOARDING."

SIR,—I wish to ask you, and any of your readers whose knowledge as men of business enables them to speak in the matter, what authority there is for the word "hoarding," as used to describe a place closed in for any purpose such as erecting new buildings, making alterations, &c., public or private. I believe there is none; and that it is a corruption which has gradually crept in of the old word "boarding" used to express it in my young days, and that appropriately. SENEX.

*** In Gwilt's "Encyclopædia of Architecture" the derivation of the word "Hoard" ("a timber enclosure round a building in course of erection or repairs"), is given as from the Saxon of "to keep."

ELECTRIC LIGHT.

SIR,—Having had some experience in the matter of electric lighting, perhaps I may be allowed space for a few remarks.

Some twenty years ago, whilst new Westminster Bridge was being built, I was asked by Dr. Watson, of the Electric Light and Colour Company, to construct a suitable reflector for the diffusion of the electric light obtained by his patent lamps. A report of the experiments appeared in the *Times* of that period.

After much trouble, I succeeded in producing a reflector, which distributed the light over a considerable portion of the Thames.

It is my opinion that in many cases where the electric light has to illuminate a very large space, a combination of several lights, centrally placed, and assisted by several special reflectors, would accomplish the desired object more effectually than the opal globes now used in Paris. Further, it is essential that the electric light should be placed at a much greater altitude, thereby disposing in a great measure of the objection to "strong glare."

I was in Paris some weeks ago, where, having had frequent opportunities of observing electric lighting in various places, I formed my opinion as to what, I venture to submit, would be the best mode of applying the electric light.

P. E. CHAPPUIS.

SPIDERS IN BREWERIES.

SIR,—Will any of your readers help me to extirpate the spiders in the fermenting and tun rooms of a brewery? In an astonishingly short space of time after clearing them away the whole place has been festooned with heavy webs. The clearing away is an awkward process, as the webs fall at times, notwithstanding all the care taken, into the open vessels. Is there any non-poisonous wash offensive to spiders which can be mixed with limewhite? It might be useful in other places, as well as breweries. AN ARCHITECT.

CONCRETE PIPES.

SIR,—Lest silence should be taken as admission of assent to the reports which you have published of Messrs. Donaldson & Ponton on the above subject, will you allow us briefly to say that we impugn the accuracy both of the statements made and the conclusions drawn? Not with such haste, but in due time, we shall submit, in place of assertion and theoretical calculations, evidence and facts sufficient to destroy what possible value those reports may have had in the eyes of some who have been in such a hurry for their production. THE MANUFACTURERS.

MASTERS AND MEN.

Birmingham.—After a strike of about a month's duration, the glass-makers employed by Messrs. Chance, Brothers, at Spon-lane, near Birmingham, have agreed to accede to the repeated request of the masters and give the proposed new system of working a trial. The flatteners have not yet arrived at a final decision, but there is thought to be no doubt that they will follow the course of their fellow-workmen.

Banbury.—The master-builders of Banbury having stated their determination to abide by their decision to reduce the wages of carpenters, joiners, and mechanics engaged in building trades a penny per hour, the workmen struck work on the 16th inst., some of them taking away their tools. They did not ask for their back time, so that it is thought they expect that some arrangement may be come to after a few more meetings have been held.

Inverness.—At a meeting of the carpenter-contractors of Inverness on the 13th inst., it was resolved to intimate to the workmen a reduction of wages by one penny per hour, and some modifications of the existing bye-laws. These changes, it is proposed, are to take effect three months hence.

Kilsyth.—The master-masons of Kilsyth have intimated to the men in their employment a reduction of wages to the extent of ½d. per hour.

Irvine.—The masons of Irvine have resumed work on the masters' terms, 1d. per hour reduction.

Motherwell.—On the 16th inst. it was intimated to the joiners in the Motherwell district that their wages would in future be reduced from 7d. to 6½d. per hour.

Jedburgh.—The wages of the journeymen masons of Jedburgh have been reduced ½d. per hour. The wages now are, for those working in the country, 7½d., and for those working in the town, 7d. per hour.

Crieff.—Some of the master painters of Crieff have reduced the wages of the journeymen 1d. per hour, the rate now paid being 6d. per hour.

Dunfermline.—Masons' wages in Dunfermline have been reduced from 8d. to 7d. per hour.

Arbroath.—The master joiners of Arbroath have agreed to reduce the wages of their workmen from 7d. to 6d. per hour, the reduction to take effect from the 22nd inst.

Dumbarton.—The master house-joiners in Dumbarton have resolved to reduce the wages of the workmen from this date by 1d. per hour. This will make the rate of wages 7d. per hour, the same rate as is current in Glasgow. The men will agree to the reduction.

Hawick.—The master-masons have given notice to the workmen of a reduction of wages from 8d. to 7d. per hour after the 25th inst., and to the labourers of a substitution of a wage of 5d. per hour instead of the fixed weekly wage now paid.

Dundee.—The Dundee joiners on the 16th inst. agreed to a reduction of wages from 7½d. to 7d. per hour under protest.

Edinburgh.—At a numerously-attended meeting of the master-joiners of Edinburgh on the 14th inst., it was, the *Scotsman* believes, unanimously agreed to reduce the wages of the "competent workmen" from 7½d. to 7d. per hour on and after the 2nd of December.

Glasgow.—At a meeting of the Central Lodge of the Glasgow Masons' Society, held on the 15th inst., it was stated that a large number of workmen had left the city in search of employment, and that the strike roll had become greatly reduced. It was also reported that aid from different quarters of the country was expected. On the 18th inst. the masons on strike, to the number of about 1,000, held a meeting in the Albion Halls, College-street. It was stated that one of the largest employers in the city had given in. After considering the position, the meeting agreed to continue to hold out. The Central Committee of the Operatives' Society have, it is stated, issued a circular to the various "lodges" throughout Scotland, pointing out that in view of the funds of the Society being "locked up" in the City of Glasgow Bank, it will be necessary, if the strike in Glasgow is continued, to make a weekly levy on the working members, and asking the different branches to vote on the question whether or not the strike should be prolonged.

Montrose.—The masons employed at Montrose have struck work, on account of a reduction of ½d. per hour on their wages being intimated.

Miscellanea.

The Value of Land in Relation to Metropolitan Improvements.—Messrs. Fuller & Fuller sold by auction, on Tuesday, November 5th, three freehold houses in St. John's-square, Clerkenwell, covering an area of 2,660 superficial feet for 2,580*l.*, being about 1*l.* a foot. The auctioneer mentioned that the property in question was the remaining portion not taken by the Board of Works under their Act of 1872, as they only served a notice to treat for the four adjoining houses, covering 5,095 *ft.* Land has very much risen in value within the last five years, as shown by the evidence of the Board's witnesses in November, 1873 (exactly five years ago), when the matter was referred to the late Mr. F. J. Clark (Farebrother, Clark & Co.). The following opinions were then given:—For the 5,095 ft. required without adding the usual compulsory sale, Mr. Robert Vigers, 2,574*l.*; Mr. Charles Stephenson, 2,528*l.*; and Mr. Robert Reid, 2,504*l.*, or about 10s. a foot, so that if this sale is to be taken as evidence of value, the rise in the last five years must have been about 100 per cent. Mr. Fuller, Mr. H. E. Murrell, and Mr. Fletcher all put it, in 1873, at 1*l.* per foot, and the umpire awarded 4,202*l.*, or exactly 15s. a foot, including 10 per cent. for compulsory sale, so that it would seem claimants do not necessarily reap that advantage from having their property taken compulsorily, as has been generally supposed, but may suffer a loss.

The Colosseum Theatre, Liverpool.—On Wednesday last, Mr. Goodman, the lessee of the Colosseum, and the executors of the late Mr. Heath, who are the owners of the premises, were summoned at the Police-court by the Liverpool Health Committee for not taking down or securing the roof of the building after it had been pronounced to be in a dangerous state. Mr. Deacon, the Borough Engineer, gave the most alarming evidence as to the insecurity of the roof, and said he believed that 6 in. of snow, or a little extra vibration from high wind, might bring it down, and occasion fearful loss of life. Mr. Raffles said that if he could order the place to be closed, he would; but the Deputy Town-clerk stated that the magistrate had no such power. Mr. Raffles asked the lessee to undertake to close the place for performance until the roof had been made secure. Mr. Goodman declined to give this promise, but said he would prop the roof up. Mr. Raffles warned him that if lives were lost through the roof falling, he would be committed for manslaughter. Mr. Goodman was ultimately ordered to pull down the roof or make it secure within fourteen days. The information against the owners was dismissed. The usual entertainment was given in the building on Wednesday night.

Liverpool Master Builders' Association. The annual dinner in connexion with this Association was held on Tuesday evening, Mr. John Wells, president, in the chair. The chairman proposed "The National Association of Master Builders of Great Britain," to which Mr. T. Clay and Mr. S. G. Bird responded. Mr. Clay said they were determined to stop the extreme demands of the men in the building trade. They would not take any unfair advantage of them, but they would not have a false value put on labour in the future. Mr. R. Neill, jun., then gave "The Liverpool Master Builders' Association and its Branches," which was responded to by Mr. Litt. Mr. Pendleton said that, until this year, the action of the Association had been in the direction of defence; but in the present year, owing to the deep depression of trade, they had been compelled to ask their workmen to accept a reduction of wages.

Solid Parquet Flooring.—We willingly mention that in several buildings illustrated or alluded to in our pages lately, A. J. Arrowsmith & Co.'s solid parquet flooring has been used successfully, the Prudential Assurance Offices, Holborn, for example, and the New Stock Exchange, Dublin. It is an excellent material, and so generally used now that it scarcely needs our commendation. The Municipal Buildings, Birmingham, the Midland Land Corporation Buildings in the same town, and H.R.H. the Duke of Connaught's House, Bagshot Park (of all of which we have given views), likewise include specimens of the flooring; and some of their carved oak chimneypieces and dados, to which this same firm are now giving particular attention.

The Superintending Architect, Metropolitan Board of Works.—At the meeting of the Board on the 15th inst., the Works and General Purposes Committee submitted a report recommending that the salary of Mr. George Vulliamy, the Superintending Architect, be increased from 1,500*l.* to 1,750*l.* per annum. Mr. Dresser-Rogers, in proposing the adoption of the report, observed that the duties of the Superintending Architect had been largely increased by recent legislation. He had been in the service of the Board for many years, and, in the opinion of the committee, the very efficient manner in which he had discharged the duties of his position, and the high esteem in which he was held by the Board, both for his talent as an architect and for his general high character, entitled him to the increase now recommended. The motion was carried unanimously.

St. Saviour's, South Hampstead.—The Church Mission-room, Sunday school, and Parish-room, was opened by the Lord Bishop of London on Saturday, the 9th inst. The new buildings consist of a mission-room, 51 ft. long by 24 ft. wide, and 21 ft. high to the plaster ceiling; class-room, and entrace lobby. The style adopted is a very plain one, the facings being of Luton and bright stock bricks; the copings and cross are of Portland stone. The builders were Messrs. Manley & Rogers, of Regent's Park; and the architects Messrs. Batterbury & Huxley, of Great James-street, Bedford-row.

The Society of Arts.—On Wednesday evening the first meeting of the present session was held. Lord Alfred Churchill, chairman of the Council, delivered an address, in the course of which he said that, acting on the letter from the Prince of Wales, addressed to the Council in January last, suggesting the co-operation of the Society with the Royal Commissioners for the Paris Exhibition, the Council had been enabled to assist 206 selected artisans to visit and study the Exhibition, representing over forty different branches of industry, and the reports of these men would be published shortly.

The "Grand Theatre," Leeds."—The new theatre in Leeds, illustrated in our last issue, was opened with considerable *éclat* on Monday night last, the play being "Much Ado about Nothing." Mr. Wilson Barrett, the manager; Sir Andrew Fairbairn, the chairman of the company; and the Mayor of Leeds addressed the audience in the course of the evening, and great praise was given to the architects for their successful work.

Mr. Sam Bough, R.S.A., who was born in Carlisle in 1822, died at Edinburgh on Tuesday. He began his artistic career as a theatrical scene-painter, became an Associate of the Royal Scottish Academy in 1857, and was advanced to the degree of Academician in 1875.

TENDERS

For new Asylum for Imbeciles, Darenth, Kent, for the Managers of the Metropolitan Asylums District. Messrs. A. & C. Harston, architects. Quantities by Mr. C. Poland:—

Naylor	£76,800	0	0
Downs & Co.	75,000	0	0
Perry & Co.	72,500	0	0
Vernon & Ewen	71,169	0	0
Lovatt	69,956	0	0
Stephenson	69,760	0	0
Cox	69,565	0	0
Crockett	69,000	0	0
Wagner	68,000	0	0
Baker & Co.	67,383	0	0
Wheeler & Co.	67,032	0	0
Priddle	61,494	0	0
Braid & Co. (accepted)	60,000	0	0

For iron railings, bells, &c., at the School for Imbecile Children, Darenth, Kent, for the Managers of the Metropolitan Asylums District. Messrs. A. & C. Harston, architects:—

Iron Railings, &c.

Johnson, Bros. & Co. (accepted)	£760	0	0

Electric Bells.

Sax (accepted)	234	0	0

For the erection of a house and shop at No. 331, Euston-road, for Mr. C. J. Cottere l. Mr. James Robert Furniss, architect:—

Smerdon	£1,467	0	0
Bishop	1,231	0	0
White	1,055	0	0
Howe	1,050	0	0
Gould & Brand	1,040	0	0
Anley (accepted)	1,020	0	0

For alterations to the Ship Tavern, Anthony-street, Commercial-road, for Mr. Drake. Mr. Charles A. Legg, architect:—

Judd	£168	0	0
T. & W. Harper	168	0	0
Lusk	159	0	0
Moyle & Son	155	0	0
Sampson & Parrish	154	0	0

For thirteen quarters for married soldiers, opposite Stoughton Barracks, near Guildford. Mr. Henry Peak, architect. Quantities not supplied:—

Pink	£2,154	0	0
Pearce & Clark	2,120	0	0
Garnett	2,053	0	0
Wood	1,877	0	0
Martin, Wells, & Co.	1,754	18	0
Swayne	1,462	10	0

For an addition to coach factory, Spital-street, Guildford, for Messrs. May & Jacobs (exclusive of ironwork). Mr. Henry Peak, architect. Quantities supplied:—

W. Swayne	£1,080	11	3
Mason	1,048	0	0
Mitchell, Brothers	1,036	8	3
Strudwicke	1,026	0	0
Nye	1,004	0	0
T. Swayne	995	10	0
Colls & Sons	887	0	0
Goddard & Sons	866	0	0
Smith & Sons	862	10	0
Garnett	840	7	0
Pearce & Clark	820	0	0
Moon (accepted)	819	16	9

For building two houses at Barking Railway Station, for Mr. Coates. Mr. J. E. Dawson, architect. Quantities not supplied:—

Blandford & Co.	£848	0	0
Barnes	740	0	0
Howe (accepted)	698	10	0

For alterations and fittings at the "Cow and Calf," Eastcheap, for Mr. Charles Pearce:—

Andrews	£340	0	0
Axford	298	0	0
Gritten (accepted)	290	0	0

For repairs, painting, and replastering the front of the Belle Vue Hotel, Folkestone, for Messrs. Langton & Co. Mr. Burgess J. Reeve, architect:—

Prebble	£143	0	0
Slade	85	0	0
Hood	80	0	0
Petts & Son (accepted)	79	0	0

For the erection of a house on the Canterbury-road, Folkestone, for Mr. J. Sharp. Mr. Burgess J. Reeve, architect. Quantities supplied:—

Jenner	£510	0	0
Slade	460	0	0
Keason (accepted)	420	0	0
Payne (withdrawn)	320	0	0

For alterations, repairs, and decorations at Farleigh House, Sandgate, for Mr. J. R. Daniel Tyssen. Mr. Burgess J. Reeve, architect:—

Hood	£1,560	0	0
Webster	1,499	0	0
Holden (accepted)	1,205	10	0

For rebuilding the Coburg Warehouse, at Lower Pickle Herring Wharf, Southwark, for Messrs. Hicks, Nash, & Co. Mr. S. Brookes, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Hobbs	£2,730	13	2
Mason & Bristy	2,669	0	0
Perry & Co.	2,649	0	0
Stevens	2,416	0	0
Parsons	2,395	0	0
Jarrett	2,354	0	0
Morter	2,345	0	0
Greenwood	2,339	0	0
Cowland Bros.	2,330	0	0
Legg	2,318	0	0
Taylor (accepted)	2,165	0	0

For erecting the Waddon Station Hotel, near Croydon, for Mr. S. N. Rowland. Mr. S. Brookes, architect:—

Mutch	£2,446	0	0
Dotterill	2,335	10	0
Coles	2,179	0	0
Mason & Bristy	1,925	0	0

For alterations to No. 34, High-street, Croydon, for Messrs. Redgrove & Finlay. Mr. S. Brookes, architect:—

Hyde	£235	0	0
Cox	198	10	0
Loe	190	0	0
Taylor	181	10	0

For dwelling-house, office, &c., at No. 13, Spicer-street, Spitalfields, for Messrs. Field. Mr. R. Decker, architect:—

Bangs & Co.	£1,310	0	0
Read	1,251	10	0
Gregory	1,125	0	0
Thompson	1,098	0	0
Forrest	1,083	0	0
Loveday	1,025	0	0

For alterations and repairs at No. 19, High-street, Islington:—

Nind	£615	0	0
Batchelder	497	0	0
Higgs	335	17	0

For alterations to the house "Coppins," and erection of entrance-lodge at Iver, near Uxbridge, for Mr. J. E. Taylor. Messrs. Tarring & Wilkinson, architects:—

	House.	Lodge.
Langridge & Sons	£9,138	807
Kearley	6,800	718
Adamson & Sons	6,767	738
Fassnidge & Son	6,275	625

For additions, &c., to West Dene, Hollington Park, Hastings. Mr. W. L. Vernon, architect:—

Eldridge	£785	0	0
Shortell	777	10	0
Vidler	756	0	0
Hughes	707	0	0
Parks	670	0	0

For the erection of five houses and shops, boundary-walls, &c., at Herbert-road, Plumstead, for Mr. Robert Webb. Mr. E. Taylor, architect:—

Cattell	£4,175	0	0
Lonergan & Sons	3,900	0	0
Johnson	3,895	0	0
Niblett	3,873	0	0
Jones & Co.	3,607	0	0
Hobern	3,600	0	0
Shapley	3,589	0	0
Taylor & Co.	3,587	0	0
Prout (too late)	3,575	0	0
Warr	3,354	0	0
Parker & Evans	3,350	0	0
Smith	2,320	0	0

For Board schools, Daybrook, Notts. Mr. Robert C. Clarke, architect:—

Slight	£1,827	0	0
Young	1,700	0	0
Stevenson	1,684	0	0
Tutin	1,669	0	0
Donnelly & Coxon	1,638	0	0
McMullock	1,620	0	0
Vickers	1,595	0	0
Wheatley & Maule	1,581	0	0
Wayte	1,580	0	0
F. & A. Slim	1,575	0	0
Hodson & Facon	1,571	0	0
White	1,566	0	0
Clarke	1,546	0	0
Roberts & Perkins	1,540	0	0
Smith & Greaves (accepted)	1,505	0	0
Doughty	1,500	0	0
Key	1,498	0	0
Wilson	1,476	0	0
J. & L. Green	1,418	0	0

For the erection of bank premises and chambers, Victoria-street, Westminster, for Mr. G. C. T. Bartley. Messrs. Charles Henman & William Harrison, architects. Quantities by Mr. Charles Fitzroy Doll:—

Aitchison & Walker (accepted)	£7,636	0	0

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The Builder.

Vol. XXXVI. No. 1869. Saturday, November 30, 1878.

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St. Alban's to the Rescue!

BEFORE a senseless and costly freak of archæological dilettantism is really played upon a building which is an object of national interest, we wish to call public attention once more to the nature of the operation which it is proposed to carry out at St. Alban's Abbey, by a few gentlemen who have, through circumstances, got the thing apparently into their hands, and in opposition to the convictions of nearly all persons who have any right to an opinion on such a subject. It is the more necessary to do this because the "restoring" party at St. Alban's seem to have taken advantage of a side question that has been raised in regard to the material with which the roof is to be covered, and under shelter of the debate that has been raised on this subject in the public papers seem tacitly to assume that the main question has been settled, and that they are to be allowed to do as they please upon it without further protest. But this will not pass with those who can realise what it is which is proposed, what it really means, and under what influences it is projected. It is all very well for those concerned to go off at a tangent on the question of a lead or a copper covering for the roof; and, no doubt, the astute people who are desirous to work their own will on St. Alban's Abbey are laughing in their sleeves at seeing the real merits of the case ignored and put aside under the excitement of a newspaper correspondence about the copper-covered spire of Battersea Church; but the main point is not to be shelved in that way, and we must again urge it upon the attention of those who regard the treatment of a great monumental building as a matter of public interest, not to be carried on in a hole-and-corner manner by a clique of dilettanti, or (which we suspect is nearer the truth of the matter) by the will of one able and crotchety member.

The plain fact is this: the committee for the so-called restoration of St. Alban's are determined, unless public opinion is exerted to stop them, to place a high-pitched roof over the whole length of the nave of St. Alban's, under the pretext that there was once a high-pitched roof there, no one knows when, and that they are therefore justified in placing a new one there. The first obvious answer to this is, that as no one can possibly know what such original high-pitched roof was like, even if it ever existed, their proposed roof will not even have the excuse that it is a reproduction of an original design. If the committee were taking down a Mediæval roof that had become too rotten to stand, there would be reason in replacing it by a new edition of the same. There would be reason in replacing the pitch, at all events, because it would preserve the external proportions and appearance by which the building had previously been characterised, and prevent the disagreeable result of destroying all the old associations connected with it, and making it appear as a new building.

This latter, however, is what the persons who are active in pulling St. Alban's about intend to do if they are not prevented. The long low roof which has been known for so many generations, not to say centuries, is to be replaced by a high one which will utterly alter, to begin with, the character so long associated with the venerable structure. This consideration will not appeal, very likely, to any perception which the members of the St. Alban's committee possess in regard to the reverence due to old association, for they appear from their actions and expressions to be constituted without any such perceptions. All the world, however, are not equally hardened to this consideration, and many would regret the change in the aspect of the building on grounds of sentiment, even if assured that the change would be architecturally an advantage. Without here going into the question whether or in what cases architectural or archæological claims should have the preference, we may at once say positively that in the present case there is no pretext for placing them in opposition to one another. The proposed change is, considering the whole present state and conditions of the building, as undesirable on architectural as on archæological, or what are sometimes called (by way of stigma) sentimental grounds.

We have some claim to be regarded as dispassionate and unprejudiced witnesses on this point, because we have taken no side, and so far from opposing the doings of the committee unconditionally, we supported them previously when they were attacked by the "anti-restoration society" for intending to put a new roof of any kind, and when members of that society who had never inspected the roof were ready to vouch for its good and safe condition. We related plainly the facts about it, and we are glad to see that our correspondent, Mr. James Neale, has admitted that he was hardly justified in recommending the attempt to repair the old roof; a recommendation which certainly astonished us as coming from one who knows the building so well, and which very much weakened his own case. That point apart, Mr. Neale is one who has attained a right to speak in regard to the building; and both he and our previous correspondent "S. F. C.," who also has had peculiar opportunities for becoming well acquainted with St. Alban's, have given it as their judgment that there never was a high-pitched roof over the greater part of the nave, and we, at least, go so far with them as to agree that there is no positive evidence of it. The pretext of restoring what was there before, or something like it, stands on a very shaky foundation at the best. But that is not the point on which the present question ought to turn. The new roof will have no archæological value, and as far as regards effect it will, we believe, be found very detrimental. So long a mass of high roof will be by no means picturesque, it will give a heavy effect, and will cost a great deal more than it can possibly be worth, and it will, even in itself and if nothing more were done, materially and unnecessarily alter a building which has been in its present form a landmark for many generations. But there is more than this. What we wish to make people understand is that if the high roof is put on, the work of alteration cannot possibly stop there. As we pointed out before, the high-pitched roof to the nave will render similar roofs to the two transepts absolutely necessary; and what is still more serious, it will render the erection of a new west front necessary, in order to assimilate the design of the front to the high-pitched roof. No one need suppose that the committee are unaware of this. It is what they are driving at, as any one must conclude who has taken notice of the spirit of the proceedings, and knows anything about the gentlemen who are prominent in supporting this line of action on the committee. It is very well known that they want to rebuild the west front, and this is the first step towards it; and if they are allowed to put this proposed roof, the next thing the public will hear of it will be an appeal for further funds to carry out a restored west front, on the plea that the design cannot be complete or consistent without. We do not believe that all this tampering with the building can be carried out in the face of a strong expression of public opinion; but there is a difficulty in obtaining this expression, because most people who are at all interested in the matter are not aware of the real object of the proposal as stated to them. They think the question of a high or a low pitched roof is not of much consequence; but it is right they should clearly understand that the question does not rest there; that the roof is only the first step in a scheme of restoration which would go far to make St. Alban's a new building,—a scheme which, if carried out, will result in robbing one of our most historically interesting buildings of half its value and nearly all its picturesque and venerable character.

A GERMAN AND ITALIAN VIEW OF SOME EXHIBITS AT PARIS.

Among the interesting results of such an Exhibition as that which has now closed its many doors, after having admitted an extraordinary proportion of the intelligent inhabitants of the globe, must undoubtedly be classed the various reports furnished either by foreign Governments, reports which are not likely to be published yet for some little time, and the current criticisms of the press of the two continents.

Of these latter reports, too little seems to be made when the momentary instruction they afford is laid aside, and thus rendered to the general public difficult of future reference. A conscientious and careful collection of the views of our neighbours on our own success or failure, or their own deficiencies and progress, would be unquestionably worth more than the many columns of praise or criticism sent home by correspondents biassed, as they cannot fail to be, against or in favour of their own countrymen, or in their views of "foreigners."

At any period it would by no means be difficult to make a collection of such reports, should the need be felt, nor could the result fail to be attractive, the information supplied being essentially of that "popular" nature which it seems the endeavour of the present day to bring to such perfection in science and art, while for the more weighty criticisms might be quoted the serious journals published in each country.

That these great "temples of shopdom," as the *Saturday Review* not long since stigmatised international exhibitions, are a source to too many of merely idle amusement, while to too many others are they a "bore," is a mere truism that is by no means untrue at present to state, but that to large numbers of visitors they afford valuable information, that to many foreign nations they afford valuable lessons, is none the less true.

In more than one country this has been felt to be the case, and bodies of intelligent workmen, artisans, mechanics, and manufacturers have visited the Exhibition, returning home to furnish verbal and written reports, the fruits of which the future will reap. In Italy, public subscriptions raised a large sum to enable a number of artisans to go to Paris,—an example of patriotic shrewdness which deserves recognition. In these columns, several months before the opening of the Exhibition, we expressed a hope that some such movement might be conscientiously carried out in England, as also that these practical critics should each be called upon to furnish a detailed report on the subject in which they might be severally interested.

Our own Government have, as is known, made investigations into the cause of the existing prosperity of France; and before the session closed a Blue-book was published, containing much valuable information on the subject. Not long since the German press reviewed this report, regarding the question as interesting to themselves in their present sad financial condition.

Referring to the extraordinary prosperity of France within the short period of eight years after one of the most crushing of invasions that ever visited a country, a writer in the *Allgemeine Anzeiger* of Cologne has drawn the comparison between the state of Germany and that of the nation she had conquered. Even England herself, remarks the writer, has been obliged to express her surprise at the manner in which the plan of the Paris Exhibition, announced so short a time since, has been carried out.

The writer further speaks of the habits of the French workmen, and his undoubtedly superior diligence to the German; if he does not receive high wages, he contrives to make better use of his smaller income, both in the matter of food and clothing. The French workman and his wife understand as a rule how to cook well, while in France and Belgium meat is but little used in comparison with England or Germany, what little is cooked being made to go much further. The French and Belgian workman is temperate in what he drinks, and if he takes anything it is chiefly cheap wine, more suited to his purse and health than the strong beer drunk in Germany, and spirits too frequently drunk in England. The blue *blouse* is the universal costume of the French and Belgian workman,—cheap, and, at the same time, useful; a costume the writer might have added, that many a French gentleman is not ashamed to wear.

The greater part of Belgian and French workmen are small capitalists, or own plots of land, and it is chiefly in the hands of this portion of the community that the National Debt lies, while it is a well-known fact that the number of English holders of the consolidated funds barely amounts to a quarter of a million.

Such facts the Germans have considered, and seen the importance of, but they feel the want in their country of some judicious leader of the state who might, so to speak, train up the nation in home and household management, without leaving the people to want, not alone money, but work, as at the present moment. For our foreign policy, writes the Cologne *Anzeiger*, we have a Bismarck, and for our military leader a Moltke, but for our home policy a genius is wanting, a genius we are sorely in need of, who shall possess, as in France, the spirit of the first Napoleon, whose economical policy still exists to show us a people triumphing even over the loss of milliards and of provinces.

We could imagine that it would be hardly with pleasure that Mr. Cross, or future right honourable Secretaries for Home Affairs, would take upon themselves such an additional responsibility, one in reality sufficiently great to place upon the shoulders of a separate department of the cabinet.

Published at Düsseldorf, one of the chief towns of the great manufacturing district of Germany, a series of letters on the Paris Exhibition may be considered as the expression of an experienced writer and observer. The series at present is appearing in the *Düsseldorfer Anzeiger*, from whose pages we extract the following remarks, on one of the most important branches of industry exhibited on the Champ de Mars, the department of furniture.

The observations of the writer on the exhibits sent by England will be read with interest by some, as also those on the works sent by Austria, Italy, and Belgium.

Passing by his preliminary comments on the somewhat puzzling arrangement of the Exhibition, the critic continues:—"That the French furniture trade would be creditably represented might be inferred from their triumphs in previous years. Both from an artistic and technical point of view the palm rests with the French, although in many individual cases the English, Italians, Austrians, Belgians, and Swiss rival them. The artistic productions of the Austrian Trade Museum, in its revival of models of the German Renaissance, place their best work on a par with what the French so far have created in the reproductions of the art-labour of each epoch. It is true that the progress of the Austrian furniture industry is limited to the works of the Austrian Trade Museum, which has now been in existence some fifteen years, consisting chiefly of wood-carving, and from this point of view their work cannot stand comparison with the wealth of design displayed in the French section. However, to be able to enter into the general European competition, what Austria most needs are good models of the industry of the past, in addition to, for a time, an active patronage from the State, a large supply of cheap workmen, and, what is of the greatest importance, a varied and plentiful provision of raw material, especially wood. But Austria, in her newly-acquired Turkish provinces,—a rich timber-producing country,—will be able, doubtless, soon to supply these deficiencies.

In the great show made this year by the furniture trade at the Paris Exhibition, it is not to be passed over without notice that the art of marquetry and incrustation is exercised by the Italian *ebanista* with as much skill as by the masters of the French workshops, and in this section is plainly evident the fact that this old Italian art-industry finds again its worthy representatives. It cannot, however, be conceded that a *bahut*, a secretaire, and a coffer of Italian manufacture are worthy equivalents to the products of the French school; in elegance, in beauty, and symmetry of form, in lightness and finish, the Italians must give place decidedly to the French.

But this was till now still more the case with the English furniture of the more costly description, which was really more solidly made, and in regard to comfort especially answered all English wants, but which, owing to their massive forms, showed in former Exhibitions that the study of the Renaissance had allured the English artistic industry into unfamiliar paths.

This has, however, within a few years been well understood by the English artistic cabinet-makers, and with individual exceptions we see the English working in their own characteristic and national style. This has been found in their Middle Ages, in which they have gone back, in some cases, to the old Saxon and Norman models, which with their numerous niches, galleries, columns, and coloured medallions, bear a half-feudal, half-ecclesiastical stamp.

Thoroughly estimable and authoritatively important models of artistic work, one must not, however, expect to find, and a Renaissance coffer from some one of the eminent Parisian firms interests the lover in an entirely different manner to modernised antiquity of the time of Queen Anne or earlier periods. The difference is as great between the two as exists between the pleasant, elegant *salon* of an art-loving Parisian and the seclusion of an old English nobleman's house.

The fittings of a room, as they are exhibited by some London firms, with the quaint credence-tables, the olive-coloured hangings, the dark wood panels, and the antique form of the window-panes, seem to answer the aristocratic taste of the English who like the historic in their comfort, but with all this, is also demonstrated their limited importance.

In the Renaissance, the English have sought but little this time to try new experiments, but where this has been done their productions are much more remarkable from their novelty and the extraordinary progress exhibited of technical skill, than by their artistic design or originality of form.

Among many examples, we notice with interest a perfect piece of marquetry work exhibited by a London firm. To such fineness and exactness of execution as are here presented, decorated with faultless and suitable ornamentation, and at the same time of the strongest workmanship, it would be difficult to find a rival.

Notwithstanding the undoubted artistic and technical progress of the English manufacturers, and the practical utility of the solid English household furniture, we cannot help considering the productions of the Belgian and Swiss furniture trade in general superior to the English, from the point of view both of their artistic merit and their tastefulness of execution.

The Belgians especially show great originality of form in everything appertaining to the decoration of the household, and, we might add, of the church also. Their wood-carving is evidently inspired by their famous old examples, of which influence a magnificent testimonial is furnished in a pulpit destined for a church at Louvain; while that their work amply meets the practical needs of every-day life is shown in a staircase executed for the Comte de Flandres, as well as by numerous pieces of household furniture.

The Swiss have in one single cabinet most happily combined, seemingly, specimens of all that their industries of wood-carving, joinery, decorative art, especially in glass-painting and ceiling-painting, ceramics, and lock-making, have contributed to the increase of domestic comfort and to the beauty of household decoration.

Even the unimportant kingdom of Greece has known how to insure for itself praise for a certain originality,—in the staircase which leads to the bureau of the commission. By the simple addition of the two sphinxes they have solved the riddle of artistic industry in successfully showing how by a single thought an artistic grace may be added to a staircase.

In the Italian section, and among the specimens of the furniture of the more costly design, is especially worthy of note a coffer, or more correctly a sort of gigantic ornament, whose exterior panels are decorated in rare marquetry, with scenes from Roman history. The work is on a foundation of oak, and executed with rare skill, resembling the minute mosaic work of the Roman or Venetian and Florentine workshops which fill so many rooms of the Exhibition.

When one considers the extraordinary multiplicity of all these varied works, chiefly executed in wood, and the labour which has been bestowed on these pieces of furniture, parquets, ceilings, chimney, door, and window ornaments, these inlaid works and wood carvings, it is impossible not to ask oneself the question whether all these can have been produced by hand,—if machinery also has not taken a considerable share.

One has alone to visit the department of machinery to have such a question answered, to see that its aid is daily more and more indispensable in the workshops, while handwork is

being devoted more to artistic details. The workman regards machinery more and more as an indispensable aid in his occupation, and if it is to be found even in the workshops of small joiners and turners, it may easily be understood how it is employed in all great establishments.

Countless improvements and new inventions have been with this object made and exhibited since the last two exhibitions; new machines for planing, for sawing, and grooving; new lathes, machines for fluting in curves; for slotting, dovetailing, chiselling, and incising furniture, &c.

That in this manner, and with such aids, the larger establishments will soon surpass the smaller, is only too plain, especially when they are able to employ such machines as are here exhibited, and particularly such extraordinary saws.

To what perfection in this branch the machine trade has grown, how it has improved within the last few years, is shown among others by the exhibits of the well-known Parisian establishment of F. Arbey (Cours de Vincennes), whose products have already met with recognition at Vienna and Philadelphia. M. Arbey, who sends his products to every part of the globe, has here arranged in classes 51 and 59 an exhibition of these pattern machines.

One portion, including agricultural and forest-sawing machines, is a complete arsenal of peaceful weapons, such as would admirably suit the Austrians in bringing about the true conquest of their newly acquired and forest-covered province of Bosnia. The other portion includes a large number of interesting implements, with whose help the minutest work can be carried out, a self-acting apparatus for cutting out wooden squares for parquetry, for their arrangement, &c., a machine which, with unfailing accuracy, shapes out from a piece of rough timber a gun-stock, whilst a neighbouring instrument assiduously manufactures wooden sabre-hilts.

A little further on the attention is riveted by a compendium of machines, the object of which is to cut out of oak trunks staves for barrels, smooth them, bend them; in short, so far prepare them, that the work of the cooper is confined alone to the putting together of the cask. One might, indeed, write a long article if he wished simply to give an approximative account of the progress made in machines for the fashioning of wood which M. Arbey has brought before the public.

Especially noteworthy are the endless saws which come from his establishment, and which, before the eyes of the spectator, cut out curves and sections in wood, which in exactness and tasteful design answer the most exacting demands. The circular saws which come from the workshops of M. Arbey are put in motion by various motive powers, steam, hydraulic pressure, hand, wind, and treadles, while for the mending and re-setting of old and worn-out saws M. Arbey has not neglected to exhibit some valuable and interesting machines.

These, with many thousand other useful inventions, may be seen on the Champ de Mars, —a show which, to the workman of even a generation ago, might appear somewhat astonishing."

It will be seen from this lengthy criticism and review that it is with no small amount of eagerness that the practical German critic looks upon the development of the aid which machinery is able to give to the manufacturer, in the true sense of that at present much-abused word, and this eagerness in such a cause is thoroughly characteristic of his countrymen, who, unfortunately, seemed to have availed themselves thus far of the undoubtedly valuable aid of machinery, not in the genuine spirit, but rather to produce cheap imitations of the studied productions of other countries for whose work the world has shown its just admiration.

In a very different spirit to the Germans do the Italians look upon the success of the French, and the Italian centres of industry answered cordially the invitation to exhibit at Paris their wares, and we see once again the familiar objects for which literally for centuries Italy has been famous; the beautiful productions of Venice and Murano carried almost to the limit of perfection; from Florence, furniture decorated with mosaic and alabaster work; from Rome and Naples, jewelry and filigree work, chiefly *objets de luxe*; the spinning and weaving of fabrics, chiefly left to the other nations, or alone represented by the manufactures of Piedmont, or the beautiful silk of Como and Milan.

In great part satisfied—that is, the manufacturing classes—with the steady progress Italy has made since the accomplishment of their dearest wish, the unity of their country, Italian criticisms on the Exhibition are difficult to find, the press chiefly contenting itself with a careful analysis of the wonders of the Champ de Mars and the Trocadéro, and this spirit of contentment is even more shown in the tardy way in which even such accounts appear.

It is unnecessary at this date to reproduce the catalogued praises of the Italian journals, impressed as we are with that "lively sense of the utter vanity and wearisomeness of eulogies of exhibitions in general," which a contemporary very recently expressed.* It will be sufficient to extract one or two criticisms to illustrate the Italian view of some exhibits at Paris.

We have given the opinion of a German critic on the productions exhibited by our English manufacturers in the section of furniture. As an entire confirmation of this opinion, we extract the following from an Italian periodical:—"In the English section, rich in valuable exhibits, are especially remarkable several pieces of costly furniture, noticeable for their ornamental character. It is true the art shown in their design is not gay, nor the inspiration joyous; rather it is grave and thoughtful. As an example of this may be cited the exhibit of a well-known Edinburgh firm, which revives in the decoration of a dining-room the style of the period of Mary Queen of Scots, ornamented with emblems and medallions suitable to the time and subject." (?)

"Every country," writes another Italian critic, "appears to have wished to compete for the prize in the department of furniture, and certainly, even after attentive examination, it would be difficult, even embarrassing, to give judgment. If France, in its magnificent Exhibition, ranks above other countries in the good taste, design, and selection of woods, England takes a foremost place in its lightness of form and simplicity of style; Italy, again, for its superiority in intaglio work and incrustation, and Japan for its richness and vivacity of colour and quality of lacquer. It is, however, undoubtedly the fact that the furniture produced by France is of such taste in every style, that general admiration is centred in their exhibits."

The number of English exhibitors, we quote from a journal of later date, according to the official catalogue, is 1,500, of whom London alone, including its suburbs, sends 700. Some of the classes are numerously represented, others are deficient, while many again contain no English exhibits. From every point of view, examined as a whole, the English exhibition holds certainly the first place after the French section, as might be expected. Especially varied is the show of tissues and stuffs, of which those from Bradford and the south of Scotland prove that in her system of manufacture England possesses no rivals. Goldsmith's and silversmith's work is most luxuriously represented, and with true wealth of design; particularly beautiful is the show of glass, though the eye of the critic cannot fail to find many designs which are far from elegant in form. Superior to that of all other competitors is the show of cutlery from Sheffield, so long famous for its work. As a curiosity of their manufacture, a set of twelve pairs of scissors, barely weighing five grains, has been much admired by the visitors. Three English peers,—Lord Dudley, the Marquis of Londonderry, and Earl Granville,—have exhibited the products of their mines, which form so large a part of their enormous riches. . . . . The façade of the English section has met with general admiration, and the masterly contrast of the Gothic of the twelfth century with the style of the seventeenth. Of an agreeably picturesque air is the specimen of the country-house so often seen by the side of the richest castles of the English nobility."

It cannot be said of the foreign critics of our exhibits at this year's Exhibition that they have shown any undue partiality; and from the remarks that have been made by the foreign press, England may rest confident that she will henceforth stand higher in the estimation of the world from a point of view worthy of being proud of, and which our manufacturers, if they have not till now sufficiently appreciated, must from this time admit be a vital one to England's prosperity,—the artistic point of view, the discussion of which seems in so many "classes" to engender positive impatience.

There is little need of despair, however, on our part when the importance of the question is thoroughly understood,—indeed, when such an extract as the following can be made from the letter of a "Railway Signalman, Exwick, Exeter," (a letter we willingly reproduce in these columns, read as they are by many thousands interested in a matter of such importance):—"I think the trade of this country is falling off to some extent from the want of culture in the working-classes. However able the working-classes are to produce, they lack the beauty of artistic taste. . . . . No man can see nature in its rudest form without being benefited, — how much more so when it is adorned with science! No doubt education is making vast improvement in the working-classes since the passing of the Education Act, but I fear that this will not be sufficient to enable the rising generation to fairly compete with the foreigner: the foreigner has the advantage already in his refined intelligence. Will he wait in the race of competition? No, he will still improve. Then it behoves our authorities to open to the working-classes all sources of culture. Give the working-classes every inducement to obtain knowledge, and assist them to evade the allurements that are held out to embrace vice, and that which is good they will most assuredly seek, and, I think, be able to hold their own in competition with the world.' *

Such opinions as these more widely spread among the working portion of this at present much-suffering community, would go far to render the future prospect of England's prosperity certain. The check that England has at present received, and the alarming predictions that we daily read of and see confirmed, should only determine us to rouse ourselves to action, and should a period of economy and poverty visit this country, it is to be hoped that our renascence will be one of its beneficial results; it will be remembered how the people of Gadara in classic times honoured poverty with veneration, regarding it as the mother not alone of industry, but of the arts. It was a period of this economy (no less venerated in France) which worked out the difficulties of the French Republic.

It is in the possession of cultured workmen that our neighbour stands so unquestionably above the rest of the world, and of whose intelligence and zeal our readers in these columns have seen an example in the valuable report supplied by M. Lepine on the wood-carving trade in France;† such reports must be considered among the most valuable results of great international exhibitions, which it is at present too much the fashion to decry.

Were we in England to commence by teaching our workmen we might soon reconquer our old supremacy; already on the part of many of our great manufacturers efforts have been made in the right direction, whether with thorough success or not opinions differ, but certainly England may rest content with her progress, if we may judge from the undoubtedly favourable views of our foreign critics, who, with Archidamus in the "Winter's Tale," though they cannot praise us, as little accuse us.

* *Spectator*, October 26.

* See *Public Opinion*, Sept. 28, 1878.
† See *Builder*, May 4, 1878.

NOTES FROM THE SPANISH FRONTIER.

BAYONNE has so many marked Spanish characteristics that but few persons, having travelled so far, could refrain from attempting one stage more so as to see the Spaniards in their own country. The first glimpse, though easily obtained, would, however, scarcely prove gratifying. After a very short ride from Bayonne, the train passes St. Jean de Luz and Hendaye, where the Carlists so often sought refuge, and slowly rumbles over the Bidassoa Bridge, and enters the Irun Railway Station. Hardly a minute elapsed since we have passed the last French sentinel, and already we have caught a glimpse at scenes of devastation. An empty, roofless house, with but four walls standing; a farmstead gutted, the outer walls riddled with shot, may be noticed on either side of the line; and, where the houses and huts are not actually destroyed, they seem in such a ruined and forlorn condition that it requires but mere effort of time to bring them to the ground. In strange contrast with this scene of misery a bevy of officers crowd round the railway carriages, flaunting proudly gold lace, stars, and innumer-

able decorations. Their splendid uniforms, their lordly attitude, seem painfully out of place in such a country. The enormous number of soldiers and officers who are here, and have absolutely nothing to do, suggests a waste of national resources, when the shattered walls around, the denuded fields, the ragged beggarly peasantry, seem to cry aloud for help. There was not a mason to be seen; builders have left the district in despair; it is with difficulty that a plank can be raised to stop the crumbling stone wall of a peasant's hut.

From the station we strolled into the town of Irun, where a great portion of the wax lucifer-matches, universally consumed in Spain, are manufactured. Here, at least, we expected to find some signs of business being done, and improvements accomplished; but, though there were several ruins within a stone's throw of the centre of the town, there was no attempt at reparation, much less reconstruction. Yet there were some signs of animation, and men of magnificent physique were all striding with slow dignity in one direction. Following the current, we soon found ourselves involved in a crowd seeking to gain entrance into an oblong arena, where a "gran partido de Pelota" was about to be played. We will not attempt to describe this great national game, but simply allude to it as a good opportunity of studying the magnificent physique of the frontier population. This contemplation will in itself suffice to inspire some hope in the future of Spain. It seems impossible to believe that men so perfect in feature and in limb, so superior in this respect to their happier neighbours, the French, should continue for ever to hold an inferior and humiliating position among nations. The blighting influence which has kept this people back must sooner or later be removed by some great convulsion, or by the slower process of gradual reform, and we shall then find in the strength of the people, the fertility of the soil, the mineral wealth of the mountains, the soundest elements of a great and prosperous nation.

In spite of these reflections, the journey from Bayonne is entertaining. The traveller will first be surprised at the insignificant proportions of the Cathedral at St. Jean de Luz, which he was led to infer must be a magnificent structure, since it was within its walls that the Roi Soleil, Louis XIV., was married to Maria Theresa, daughter of Philip IV. of Spain. But then, on the other hand, the glimpses caught of Fuentarrabia, nestled between the Bidassoa and the Pyrenees, its old crumbling ramparts, its quaint and thoroughly Spanish houses, will prove ample compensation for this little disappointment. At Irun we visit the first Spanish church we have an opportunity of examining. It is built in the Renaissance style, and its high windowless walls, the dirty yellow of the sandstone, the overladen gaudiness of the altar-piece, all seem in very bad taste, and devoid of any real artistic sense. The outer walls are further disfigured by huge inscriptions, by which the faithful are warned that if caught playing at ball against the church-walls they will be fined 4 reals; which did not prevent four or five persons from indulging within our presence in an amateur partido de Pelota against the sides of the sacred edifice. Some persons, also, might think that a fine of 4 reals, or 10d., if caught, a very problematical contingency in Spain, was not too much to pay for a good game of fives, assisted by an excellent and smooth wall.

Now that we had fairly entered Spain, though France was still in sight, our thoughts naturally turned back to the many books in which the dangers and hardships of travelling in Spain have been described. Were the mountains overhead peopled with brigands, and the unpleasant inns of Irun mere pest-houses,—or had civilisation, in spite of the surrounding ruins, extended its beneficent influence to Spain? In any case we had not been assailed by any of those unfortunate individuals who trade on the known difficulties of a journey. Théophile Gautier describes very graphically how he was tormented with all sorts of recommendations when he approached the frontier. Men rushed after him, urging him to buy some red belts to sustain his body, to arm himself with blunderbusses, with combs, and bottles of water to kill insects. "Take," they continued, "some biscuits and other provisions: the Spaniards breakfast on a spoonful of chocolate, dine on a piece of garlic washed down with a little water, and sup on a paper cigar. You ought also to take a mattress and a saucepan, to serve as your bed and make your soup." The gloomy prospects these suggestions prognosticated were, according to Théophile Gautier, confirmed by a book of French and Spanish dialogues compiled for the use of travellers:—"Under the head of 'A Traveller at an Inn,' we read the following frightful conversation:—'I should like to take something.' 'Take a chair,' replies the landlord. 'With pleasure; but I should prefer something more nutritious.' 'What have you brought?' replies the master of the *posada*. 'Nothing,' says the traveller, sadly. 'Then how can you suppose I can give you anything to eat? The butcher lives yonder, the baker a little further on. Go and get some meat and bread, and my wife, who is something of a cook, will prepare your provisions.' The traveller, in a fury, begins creating a most frightful disturbance, and the host calmly puts into his bill,—'disturbance, six reals'!"

In spite of these *souvenirs*, on the whole probably accurate, of Spain some thirty years ago, the modern traveller need not fear starvation if he follows the railway track. At Irun we found a French hostess, who provided us with a somewhat questionable imitation of a French *déjeûner à la fourchette*, and at St. Sebastian a very clean hotel, where we had a pretentious but inferior French dinner. Now and then the traveller will be offered a dish somewhat too Spanish in its flavour and cooking, but, as there are so many courses at each meal, he can very well miss one out of the number and yet dine heartily.

St. Sebastian, though not offering anything of great interest to the student of architecture, can at least boast of a great many modern houses, of broad modern streets, planted with trees, which may grow, if the dust will let them. There is not much, if any building at present, but the town is evidently taking a new lease of existence, and seeks to become a fashionable resort. Its baths are proudly entitled the "pearls of the ocean," a simile which is somewhat far-fetched, inasmuch as the bathers swim not in the ocean, but in the port; and, at the very best, there must be some considerable difference between a bath and a pearl. St. Sebastian has evidently a good future in store. It is reached as easily as any of the Southern bathing resorts of France, and offers an opportunity of studying the Spanish language, manners, and people. A good opening might be found here for any one who had the capital to build, either an hotel or some houses or villas for the accommodation of the increasing number of visitors. With judicious management there might be two seasons organised,—one in the summer for the Spanish and French visitors, another beginning at the end of autumn for those of our countrymen who dread the English winter. An English architect who would build according to English notions of ventilation and drainage, would find himself almost without competition, and would meet a real demand. These sanitary details in the building of a house are, we need scarcely point out, of more than usual importance in these watering-places, as the numerous invalids and delicate persons who frequent them are, by sad necessity, compelled to study all that tends to the preservation of health, and are consequently more than usually particular. On the other hand, as the Spaniards are more than usually indifferent to all such considerations, there should evidently be a good opening for an English initiative.

Already the best Spanish society from Madrid frequent St. Sebastian. A casino has been organised with, we regret to say, a gaming-table. Numerous excursion-trains run to Biarritz during the summer, and there are two clubs. Apart from these social attractions, a great number of excursions can be made in the neighbourhood; while, close at hand, and of lasting interest to Englishmen, the old castle towers above the Bay of Biscay. The hill on which it is built is 380 ft. high, and forms almost an island. The walk up the old rock cannot fail to excite the profoundest admiration. The road winds gradually round this time-worn bulwark, disclosing at one moment a view of the town lying below,—a confused mass of white and yellow houses, with many narrow, dark streets, and here and there an enormous new square with colonnades, which shelter from sun and rain, and further increase the temptation to pause and look at the shops. Then another turn, and the river Urumea is at our feet, and we note where its waters join the waves and surf of the sea. Beyond, the coasts of France stretch out towards Biarritz. From above and below, huge stones are crumbling down into the water. Here and there a battery or trench has been poised like a giant eagle's nest on the crest of a short rock. Finally, these stones seem to assume a definite shape, and we discover that they have been carved, that they bear inscriptions,—familiar inscriptions,—in the English language, and we stand uncovered on the graves of brave fellow-countrymen who died in the Peninsular war. No spot could be better selected for a soldier's grave. Cannons frown above, the sea roars below, there is a wild desolation in the aspect of the decaying rocks, and around, the immensity of space spreads over the ocean till earth and heaven seem to meet in the horizon,—a link which, perhaps, death may establish. On the other side of the rock the port of St. Sebastian and the Spanish coast, with its background of mountains, looks almost equally sublime and solemn as the sun sets over the ocean, colouring the scene with many and intense shades. The murmur of the waves, a bugle-call, and the cry of a sea-bird alone disturb the mysterious quiet of the evening; and this solitary contemplation commanding so vast a space and such great works of nature is an excellent introduction to the study of what has been accomplished by the hand of man.

The chill of the evening makes us hasten down into the town again. Here we were startled by a guardian of the peace, dressed precisely in the same uniform and helmet as an English policeman, walking by houses built in the Parisian style, and watching a group of Spanish children dancing the *cachuca*. This contrast was very typical of a frontier town, and the inhabitants of St. Sebastian are not a little proud of their original idea in the matter of their police uniform. They perhaps hope, by thus adopting the fashions of various nations, to attract with greater certainty an international concourse of wealthy pleasure-seekers whose money will help to enrich the town.

St. Sebastian.

THE DUDLEY GALLERY.

The twelfth Winter Exhibition of Cabinet Pictures in Oil cannot be said to contain very much of interest. There are hardly any figure-subjects worth special remark, but one or two fine works of the class in which figures are combined with, or subordinate to, landscape. Among these, one by Mr. Napier Hemy, "Fishing for Smelts" (174) is pre-eminent, and is one of the finest works of his that we have seen lately: the centre of the painting is occupied by the boat, in which the fisher is spreading his net preparatory to lowering it, and a remarkable effect is produced by the use which is made of the spread net in filling up and giving breadth to the composition. Another fine work, which is the more interesting as bearing a comparatively new name, is Mr. Colin Hunter's "In Search of Sea-drift" (256),—a bleak shore and a cold grey sea, by the margin of which rides a figure on the look-out for the spoil indicated in the title. The treatment of the sky is very fine, and the unity of tone and feeling on the whole shows a truly artistic spirit: this work has rightly been given a place of honour in the room, and promises much in future from the artist. A small work in a kindred spirit, which might have been better hung, is Mr. James Hill's "Study on a Tidal River" (302), which is out of the common way in its truth of tone and breadth of style. Near this a remarkable though most unostentatious little landscape and cattle picture (309), by Mr. Mark Fisher, deserves special notice. Mr. F. A. Hopkins has made some clever but rather theatrical studies of special effects in light and atmosphere (268, 316), which are interesting as clever experiments. Mr. Boughton's "Nutbrown Maids" (289) shows some of his peculiar genius to advantage in a slight way, and is very original in tone. Mr. Morris, whose subjects and talents are of somewhat a kindred order, is not shown to much advantage in the works he has sent; and what Mr. J. D. Watson has been thinking of to paint "Engagements" (169), and why it should be so advantageously hung except for its size or for the artist's name, it would be difficult to say. Mr. G. F. Watts sends a study of what there is no doubt he would make a fine painting of in one sense, though hardly one which would be very interesting; it is called in the catalogue merely "Design for a Picture" (79), but a rough inscription at the foot tells us that it illustrates

the adage "when poverty comes in at the door love flies out at the window"; the point of the picture lies in the contrast between the squalid figure of poverty skulking in from one side and the bright and radiant-winged youth on the other side with one leg doubled up on the window-sill as if immediately about to spring away. In spite, however, of the motto, the interest of the picture, if it comes to be painted, will lie in the two figures, as figure-studies, rather than in the idea of the work. Mr. Hodgson's "Court Poet" (62) in the agonies of composition has a good deal of humour. Mr. H. Macallum's "Meadow Hay" and Miss Gertrude Martineau's "Water Lilies" (35,36) are two very good studies of very different aspects of landscape which make an interesting contrast. Among other things may be noticed two good works by M. Leon Lhermitte, who, however, does not so powerfully impress us in colour as in black and white. Mr. T. Graham's study of a very original-looking little girl under the title "Spring" (96) has individuality. Mr. Hetherington's "Road to the Village" (50), Mr. Val. Davis's "Covert Side" (213), a very bright thing full of air; Mr. Leslie's "Angel Hotel, Henley-on-Thames" (226), Mr. Walter Field's study of flowers "in the chalk" (227), and Mr. Ditchfield's two admirable little views of "Hatfield House," admirable both artistically and topographically, are among bits of landscapes which redeem a collection containing a considerable proportion of works that are up to a certain mark, of course, but which no one minds very much.

EUROPEAN POTTERY AT THE FRENCH EXHIBITION.*

Without attempting to assign a relative order of merit, it is convenient to refer next to the exhibitions by Minton and the Royal Worcester Manufactory, and then to other English manufacturers. The Minton and Worcester exhibitions are close together in the English Section, and the display is so extensive that each forms a small court by itself. The walls of the Minton court are, in parts, lined with unglazed tiles in two shades of celadon. The objects exhibited are principally the works of Solon, Moussel, and Pillsbury. There is not that prominence given to majolica which has been a feature with this firm at previous exhibitions. Moussel's high faïence vases, from their position, attract attention first, placed as they are one at each corner of the square stand in the middle of the court. The two nearer the entrance have a celadon ground, one decorated with nelumbium and the other with foliage and grapes. The others, which are more exactly a pair, are of fine glazed terra-cotta, producing a red ground, which is decorated with flowers and storks. All four are remarkable for the boldness of the design and for treatment of details, and the subdued tone of the general effect of the colouring. To the right are two vases, also by Moussel, rectangular and smaller than the others, but worth attention for their colouring. Three plaques of olive-green, painted with sea-weed, fish, and shells, are remarkably true to nature, the effect of the nacre being most exactly given. A remarkable pair of vases with cockatoos by this artist, as well as some pieces by Solon, and many other productions of this firm, are shown in Daniel's stall, which is close by. Solon's works in Minton's court are disposed in cases around the walls. The two green plaques with the subjects in *pâte-sur-pâte*, one representing a girl rejoicing over a cage full of Cupids or "loves," and the other her lament over the cage from which they have escaped, are, perhaps, his best efforts shown here; for though the "Cupid lecturing" is a fine example of manipulation, and the *pâte* has come out with excellent clearness, the drawing and perspective are not good, and it requires explanation that Cupid is supposed to be in the middle of an amphitheatre. In several other examples a subdued effect is produced by the *pâte* being tinted instead of left white. There are two vases which introduce all the colours produced at this manufactory, some of which are not made elsewhere. Of these the red and black are frequently used.

Solon has often been referred to as an instance of the way in which a ceramic artist leaving the country loses his touch. He has, however, not lost the art, in which he stands unrivalled, of throwing individual expression into each face he produces. In the French Court, at Roussel's stall, are some of Solon's works before he left France. Whatever may be the opinion arrived at after a comparison of his earlier with his later works, one thing seems to be undoubted, that in England he has had to work with a less manageable paste. In front of the "Cupid lecturing" are three *tête-à-tête* tea-sets: one in olive-green with *pâte-sur-pâte*, one in turquoise, decorated in Watteau style, and one in Rose-du-Barry, painted after Coleman. All three are of more than average excellence. There is a vase of unusual kind from a design by Moir Smith, of Etruscan character, in white porcelain, with a pattern in red and blue, and much gold with a Pyrrhic dance round the body. The effect is very bright; it is a work to attract attention to itself rather than to help in the general effect of a room. Pillsbury's work is shown in a small *jardinière*.

Some plates in metallic lustre, by Wise, have this interest, that they are the first of the kind made by this firm. There is a large Henri Deux *jardinière*, which is *stated* to be produced by adherence to the custom of incising and filling in with coloured clay, like other smaller pieces are. Some of the vases exhibited, have handles, rims, or bases in imitation of gold or silver; that is to say, the pottery is moulded to represent the form of a metal mounting, and is then gilt or silvered. As examples of this kind of work, these are, though extremely unsatisfactory, no doubt as good as any that have been anywhere produced, and from the potter's view alone they are great successes. Only a few minutes' walk, however, separates them from the metal-mounted vases of Sèvres already mentioned, and a good opportunity is thus afforded of forming an opinion from the wider art point of view as to the value of the idea that the perfection of pottery is that it shall be independent of other material. The glazes on earthenware, especially the turquoise, the bright yellow, and the plum colour, which is new, are very decorative and excellent colours.

The style of work exhibited from the Worcester Royal Manufactory is very different from Minton's. Old as well as modern Worcester style is illustrated, for there is a dessert set made from old Worcester moulds which were lent for reproduction by Lord Coventry. The more important of the modern introductions at this manufactory, is the method of painting in coloured clay under the glaze. Some of the work produced in this way is in imitation of *cloisonné*, in which the body is cut away, and the coloured clay is filled in. Another process shown for the first time is that for producing several gradations of relief in gold, by putting on ordinary gold pigment, and then removing the thickness by tooling it down. The *pâte-sur-pâte* painting in blue on buff ground is full of promise, although the examples shown are, perhaps, not so artistic as some of the French productions. The style is called Japanesque, and has astonished the Japanese at the Exhibition. There is shown by this firm as much activity in striking out new lines as anywhere in the Exhibition. No doubt many new processes have been tried which have not been thought worth representing, and it cannot be expected that all new ideas should be equally successful. But the activity itself is to be commended, for it is only thus progress can be attained. There are two vases not intended as examples of vases, but merely as a medium for showing the amount of relief that may be obtained in decoration. These, in their shape, approach nearly that of the type of pilgrims' flasks. They are of ivory ware, enriched with gold. The front and back of the vase are deeply hollowed out, and represent in such very high relief as to be almost sculpture, the following four subjects: the studio of Michelangelo, the studio of Raffaelle, and the *ateliers* of Lucca della Robbia and Maestro Giorgio, respectively intended as emblematical of the work of the sculptor, the painter, the modeller, and the potter. The effect is clumsy, the artistic skill displayed is lost entirely, and the workmanship might, perhaps, have been more satisfactorily shown on plaques forming sides to a casket or panels. The pierced work for which this manufactory has been for a long while known is also represented. There are many plaques, vases, and other objects in blue decorations ornamented with gold in Japanesque style.

In Wedgwood's exhibit nearly all the important pieces are by Allen. They are accurate in drawing mostly in blue and white; exceptions are "the four elements" which are in black and white. All these are clever compositions introducing a number of figures. There are many specimens of brown glazed ware, with patterns etched on them by acid in the same way that glass is etched,—a comparatively new invention, to which they have given the name of Vigornian ware. There is also another ware to which the name Tremblay has been given, which is essentially a dark-green glaze on cream-coloured body, the ornament being impressed, and the shadows produced by the relative thickness of the glaze. Many of the subjects are after Bartolozzi.

Messrs. Doulton's excellent wares have so often already been noticed and commended in this journal, including their exhibit here, that it is unnecessary to allude to it again just now.

Brown-Westhead's most prominent object is a group of tigers, noteworthy principally from the fact that they are moulded in one piece. Another large piece is a candelabrum 9 ft. 6 in. high, somewhat heavy in design. Among the smaller objects is a plate, with a gilt border of a geometrical pattern, done by hand with wonderful accuracy; and many of the pieces at this stall are above average excellence, though not specially striking. Pedderson's views on plates have an essentially homely air characteristic of English rustic life. Copeland has a comparatively small show; the objects being principally white and blue vases, outlined with gold.

Among the stalls of other English exhibitors there is nothing noteworthy in art pottery, except, perhaps, the group of vases at Gardner's stand in imitation of old blue *pot-pourri* jars, which have been adapted as filters on Major Crease's principle. In domestic pottery Gardner shows a large quantity of ware made by celebrated manufacturers, such as Ashworth and Dimmock, who are not themselves exhibiting. A novel and not altogether pleasing manner of showing the ware has been adopted, as there are two tall obelisks covered with it. The principal object, however, is attained, which is to draw attention to the contrast between England and other countries in the relative care paid to designs and to comparative cost.

Ten years ago a new style of pottery-painting was brought out by M. Laurin, a manufacturer of Bourg-la-Reine. Its characteristic is that thickly-mixed coloured clays are used, which are painted on with a brush, much as oil colours are, and consequently very high relief can be given wherever it is wanted. The artist paints from a palette, on which his coloured clays are arranged, and the only subsequent process to which his work is subjected is the glazing, which, when successful, no more modifies or interferes with it than does varnishing on an oil painting. The style is, therefore, specially adapted for free and bold treatments, and readily lends itself to preserving the individuality of touch of different artists. The ware that has so far been generally used for it is buff or fawn-coloured terra-cotta or faïence, in the shape of vases or plaques, but it is not necessarily limited to these. The subjects shown in this Exhibition are all naturally treated,—the entire absence of conventionality being a marked feature in the style. Where foliage or flowers are painted, it is generally a single plant, as naturally growing, that furnishes the entire subject, and birds and butterflies are sometimes introduced.

The landscapes on the plaques are in very broad treatment and rich, with the greens of the foliage fresh and bright and the shadows deep. Rich browns, deep green, greenish blues, and yellows, are the prevailing colours employed. The style, which was shown on a small scale at Vienna, has become so popular that many manufacturers have taken it up, though wherever it is produced it is known as Bourg-la-Reine. There is a very extensive show of it at many of the stalls. Haviland, in addition to some very bold and vigorous examples, shows a departure from what has been hitherto done in the style by the introduction of rich brown and gold decoration, and by the innovation of figures in high relief with the flesh-coloured tints left unglazed. Some plaques, unusually large, and representing hunting scenes, are shown by Gien, and there are many examples of Schopin's productions.

A striking contrast to the originality of the Bourg-la-Reine style is the large display of the imitation of old styles still made in the towns where they were first developed, such as Rouen, Moustiers, Strasburg, Quimper, Nancy, and Marseilles. They are strictly imitations, and not adaptations, of the style modified by the individual taste of the reproducer. Alfred Beau and A. Porquier, of Quimper, exhibit violins, violincellos, horns, serpents, and bugles in faïence. It is said that the wind-instruments, especially the bugles, are good in tone, but they

* See p. 1217, *ante*

are exhibited not as instruments so much as illustrations of pottery. There is, perhaps, no country where to so large an extent the old manufacturing pottery towns are still producing pottery as France. In England, Wedgwood's is almost the only house where the old traditions are kept up. There is a fairly representative exhibition of Blois ware, a style not very extensively known, although the manufactories were commenced some twenty years ago. It is in fifteenth-century Italian style, with French ornamentation, and may, indeed, be almost regarded as an illustration of what might have been produced in France in the fifteenth century had the potters of that time been on the same footing with the Italians. There are four exhibitors of this Blois ware, of which Ulysse and Tertat have produced lustred ware with soft tones of colour, and Thiboit shows more decided colour without lustre.

Except Bourg-la-Reine, perhaps the most attractive style, from the brilliancy of its colouring and the number of makers who are exhibiting it, is the faïence with raised enamelled Franco-Persian decoration, sometimes known as Longwy ware. The largest exhibition of this kind is that of Viellard, of Bordeaux. Some of the objects are large vases and garden-seats, and the prevailing colours are turquoise blue, crimson, bright green, yellow, and white. In this ware none of the ground is seen, but the whole is coated with enamels, on which a *cloisonné* effect is produced by dividing up the surface with black lines. Huayt, of Longwy, exhibits some brilliant colouring in red and blue.

There are, as is usual in exhibitions of ceramics, a great number of imitations and reproductions of Palissy ware. The display most important from the size of the objects is that of Barbizet. More numerous, if perhaps less artistic, are the objects displayed by Sergent. The designs, which are plentiful, and not at all pleasing, are by no means faithful reproductions, while the colouring is poor. Close by this stall is the exhibit of G. Pull, who prides himself so much on the strict fidelity with which he follows both the designs and the process of the genuine Palissy ware, that, like Palissy himself, he does the work with his own hands. His raised objects are really raised from the back of the plate, and are not solid moulds stuck on, as is generally the case in modern Palissy ware. In Pull's work, as in the old Palissy ware, marine objects are never employed, and all the shells introduced are either land shells or the fossils found in the *calcaire grossière* in the neighbourhood of Palissy's house.

Reference has been made to the *pâte-sur-pâte* process in speaking of Sèvres. As might be expected from the fact of its being a purely French discovery, and the native clays being of great fineness and peculiarly suitable, a number of French potters have devoted themselves to its production. Among those who exhibit, the display of Gibus is wholly of *pâte-sur-pâte*. The majority of the objects are vases of celadon, green, *pâte-changeante*, and undecided shades of drab, grey, and rose. The figures, which are the principal kind of decoration, are executed with the greatest care, and are graceful and beautifully transparent. It has been objected that the amount of care bestowed on them has given them a precision which conveys the idea of formality. They certainly do rather produce the effect of cameos. While most are *pâte-blanche*, the effect of some is heightened by the judicious use of delicate tinting. Damouse, using the same materials, affords a contrast by the free and careless treatment of his figures, which are preferred by many as more artistic. Rousseau, among other objects, exhibits two vases by Solon, before he left Paris to go to Minton, where the difference between them and the examples shown in Minton's court is markedly seen in the greater thinness of the *pâte* which these have.

There are very few examples which rely for their beauty on form alone, and it happens that the makers of pottery and porcelain who do not decorate are mostly represented in the special annexe devoted to ceramics. Pouyat, of Limoges, however, occupies a prominent place in the French Court. His porcelain is lighter and more delicate than any made in England, and, like all that is manufactured in France, is made without bone. The kaolin is obtained from quarries belonging to the establishment, and it produces a china which is harder than any English china, and is brilliantly white and very transparent. The forms of some large covered pieces, made for dinner use, are very beautiful, pierced work, filled in with glaze, being largely employed as a means of decoration. Another maker of white is A. Thomas, who exhibits some large vases in cobalt blue, with the spaces for decoration left white; for there are not many decorators who possess the means of obtaining a heat to produce this body colour, and these have to paint on vases prepared for them, as mentioned before.

Gosse, of Bayeux, contributes a small but important display of articles for chemists and for kitchen use. The ware is a particular mixture, which will stand fire well. There is, too, in the Ceramic annexe, a show of the commoner undecorated or roughly decorated ware, for domestic and sanitary appliances. It may be mentioned here that in this same annexe are specimens of kaolin in different stages of preparation from different parts of France.

In the various pottery courts are several glazed cases containing objects which are not strictly ceramic,—the enamels on copper, gold, and silver in the style of the celebrated Limoges enamel produced in the reign of Henri II., and the succeeding reign. It is gratifying to find that a process so truly artistic and applicable to so wide a range of decoration, and so imperishable, is receiving so much attention, and from such large numbers of independent artists. Besides the important objects shown from Sèvres (already mentioned), there are some dozen exhibitors in various parts of the pottery section alone, while many others are exhibiting in other classes. Where almost all demand attention, it is difficult to select any names for special mention; but objects of such exquisite finish as the *buire* of Soyer, and some of his small plaques are unusually good examples of the state of perfection to which the revived art has attained. There are, too, splendid examples of colouring,—probably never surpassed in the older pieces,—shown in the small framed pictures in the case belonging to Poiret Vidaric; one of them showing blue on a dame's dress, red on a boy's dress, and green on the wall, is exceptionally brilliant. Large examples of less delicacy of execution, but of great richness of colour, are shown by Dalpayrat & Lot. Among them are two woodland scenes on panels. Although Limoges enamels are not produced solely at Limoges, yet the town, which has been the principal seat of the art of enamelling from the most remote times, is still the home of many of the artists.

The familiar *pâte tendre*, in the Vieux Sèvres styles, turquoise, Rose du Barry, Bleu Royal, are still jewelled and painted with much the same subjects as in previous exhibitions, and the makers are the same whose displays have been known for so many years. No change or progress is discernible. Of the less numerously represented of the older styles are imitations by Aviseau of the encaustic ware of the fourteenth and fifteenth centuries, a large vase in Egyptian style, and Mediæval *poêles* of Loebnitz, and imitations of Satsuma ware scattered over several stalls. Samson's stall is of more than average interest, as it contains fac-similes of the old productions of Sèvres and Dresden, China and Japan, and almost fac-similes of Limoges and Japanese enamels; but in France Samson is well known for the pride he takes in the imitation of any style of old pottery or metal work mounting he may be asked to do. From his *atelier* has come a very large proportion of "old and valuable china," which unscrupulous dealers in London have so often palmed off on the unwary and the bargain-hunters.

A branch of porcelain work which has not been cultivated in any other country than France is the manufacture of artificial flowers. From the number of manufacturers exhibiting, it is evident the trade is large, though the extreme fragility of the articles is against their being sent any long distances. In most cases the flowers are produced with wonderful accuracy, and so delicate are the petals that it is difficult to realise they are not living. The leaves and stems, on the contrary, are always clumsy and badly coloured. A few makers, recognising this defect, mount their flowers on natural stems, and surround them with dried grass. Determerman has the largest show, which includes some important pieces; in particular, a large centre-piece, in celadon colour, with a fairy-like arrangement of trailing flowers in pure white china.

The styles so far mentioned can be found on many stalls in the French Court, and are not likely to be overlooked. There are the stalls of two manufacturers, however, Deck and Pillivuyt, that must be specially mentioned, for in them are found productions of a kind not to be seen elsewhere in the exhibition. Deck's are all faïence, while Pillivuyt produces both porcelain and faïence. In the front of Deck's stall are arranged a number of vases, showing the great range of styles which this *fabrique* can produce. Among them are many vases which are remarkable for the combination of unusual forms with exceptionally good glaze, as the olive green, purple, turquoise, and jade on Japanesque forms. The jade is one of the peculiarities that will not be seen elsewhere. On the wall are a great number of plaques. One of these, by Raffaelle Collin, is on a gold back-ground, the gold, as well as the painting being under glaze, and is the only instance in which the gilding has successfully stood the glazing process. The richness and vigour of the painting of some of these plaques, and the striking character of their borders, make them almost a style of themselves. The subjects are heads, either historic portraits or in some characteristic costume, the effect being much enhanced by the bright yellow border which serves as a frame, and throws up the portrait. One which is very successful is a head of Charlotte Corday with blue drapery. In other plaques, of arabesque design the judicious use of a turquoise glaze, which gives a light blue where put on thinly, and a dark green where put on thickly, yields gradations of blue and green of surprisingly rich blending of colours. In the centre of an adjoining court is a nearly life-size, coloured and glazed, statue of Henry of Navarre in faïence. The tiles which form an important part of Deck's exhibition have been already referred to in speaking of the architectural pottery. Pillivuyt's stall contains a large assortment of objects of various styles, but throughout them all there is a uniform harmony of colour. The predominant effect of the entire stall is a grouping of rich blues, greens, and browns, and the distinguishing style is that the majority of the objects are decorated in *pâte-sur-pâte*, with conventional or arabesque designs without the introduction of figures. Especially worthy of remark are a large vase of deep green and brown, covered with arabesque, a *buire* and stand, a pair of vases, in peacock green, with sunk panels of arabesque ornamentation, a circular hollow dish, in green, gold, and brown, a Persian *jardinière* of pierced work, filled in with glaze of light green, with white and gold.

In the following notes on the pottery exhibited by other countries besides England and France, the order in which they are mentioned is not intended to have any reference to their relative merit.

In the Italian Pottery Court are exhibited the works from a large number of *fabriques* which exist in Italy, in localities some of which were celebrated of old for their pottery. Naples, Florence, Rome, Bologna, Gubbio, Turin, Pesaro, Faenza, &c., are the places from which exhibits are sent. Of the many exhibitors, all have followed the old lines, showing that till quite recently, just as in literature and in other branches of art, progress in Italy has been stifled. It is very difficult to point to any single object that is really original. Most of the productions are near imitations of the style of pottery made in Italy from the fifteenth to the seventeenth centuries, some making exact copies, even to reproducing defects with great fidelity. A few makers reproduce facsimiles of the Etruscan vases. Englishmen who have studied the older Italian styles recognise the difference in the productions of various *fabriques*, but now the reproductions of the Italian exhibitors are made under the general term "Urbino." The principal object shown is a large vase in the middle line of the court, 7 ft. high, decorated with a Bacchanalian subject in high relief, and is from the *fabrique* of Angelo Minghetti, of Bologna. This same *fabrique* sends a bust of Silvester de Medici, which is a good example of their best productions. The material mostly used in Italy is not good, as it is generally a clay which is the result of the disintegration of the granitic rocks of the Alps, but mixed with much alluvial matter. There is a good example of pottery on a large scale, a vase 6 ft. high, intended as the base of a candelabrum. All the exhibits in this court, even the best of them, though fairly successful as reproductions, do not exceed the ancient ware in beauty, and in some respects are even inferior. In the lustre ware shown, it is seen there are few manufacturers

who have approached the old maestros in excellency. Only one, except the Ginori manufactory presently mentioned, has succeeded in properly reproducing the ruby lustre, Farini, of Faenza. Considering the great importance formerly attached to Della Robbia ware, the show of this is but small. The only specimen at all out of the common is a white glazed equestrian figure of Joan of Arc, about three-quarter size. The figure is in high relief and in the usual white glaze, with light blue background. The defects of it are that the joins of the different pieces in which it has been moulded are by no means carefully concealed, and the costume is not historically correct. As exceptions to the few pieces that are not reproduced, there are a number of pretty little terra-cotta statuettes, by Torelli, of Florence, worth notice. The Estruscan reproductions are made of materials so naturally rough that they are nearer reproductions than are those of England or Denmark, which fail in this respect from too great fineness of material, as well as in too great delicacy in drawing. At the corner of the Italian Court, facing a cross avenue, is the interesting exhibition of the Ginori manufactory, which was founded in 1735 by the Marquis Carlo Ginori, who was at the time regarded as an eccentric man. He started at Doccia, near Florence, a *fabrique* in which he hoped to revive the ancient ceramic glory of his country, and for this purpose he despatched a vessel to China to bring examples of the material used in making porcelain. The *fabrique*, thanks to the sacrifices made by the Marquis, flourished, and has descended in direct line to the present marquis. The father of the present owners, who died, but in February last, added in 1818 two new styles to those previously cultivated; one of these was the production of porcelain in relief and coloured; the other which inaugurated a new period in the history of the *fabrique*, was the imitation of the ancient Italian faïence. The exhibition contributed includes both porcelain and majolica. The porcelain is almost wholly fashioned from the ancient Capo di Monte moulds, and the colouring, and even the *marque de fabrique* are kept up. The right to use the mark was acquired by the Marquis at the time the Royal Neapolitan Manufactory was abandoned, and was disposed of to him, together with the moulds and plant. The attempts to adapt an old style to objects for which it was never formerly used are conspicuously unsuccessful. The majolica is almost entirely a series of reproductions of the older Italian styles. There are some specimens of Hispano-Moresque and lustred ware, the ruby being very successfully imitated, but the most interesting objects are a few pieces of original design, though faithfully preserving the Italian character, which have been much appreciated. There is also a treatment of terra-cotta in the Della Robbia style, but with the faces left unglazed so that the delicacy of the artist's touch is not obliterated by subsequent glazing.

In the Monarco Pavilion, in the grounds, is a large collection of the peculiar basket-work majolica with raised flowers, for which the principality has become celebrated. A few pieces are artistic, but the majority are somewhat clumsy. The few attempts at painting on plaques are not entirely successful.

Switzerland has struck out a line for itself in the "*nouvelle fabrique de céramique artistique*." This attempt was originated two years ago, and has already met with so much patronage that its prices have, in this short time, been trebled. The style is a sort of Persian called Majolica de Heimberg (Canton Berne), and is usually on a black or sometimes cream-coloured ground. The pottery is coarse, the shapes are somewhat clumsy, and though the decoration is at present not remarkably successful, the circumstances under which the manufactory is supported give hope of progress. Another smaller *fabrique* at Geneva (MM. Perrot & Meyar) shows a few historical subjects on tiles, with portraits and costumes of Swiss type, heads of dogs, &c. Everything that has yet been produced here is shown. The *fabrique* has been in existence but six months, and is under high and extensive patronage. Its object is to give employment to enamellers and painters on watches, thrown out of work, as the industry is now dying out. The movement is regarded with much interest, as it is the first attempt at the revival of the little-known Swiss *fabriques* of the Middle Ages.

Denmark does not show anything that is an advance on previous exhibitions, nor anything with which the English public is not already familiar, through the London dealers, who are agents for Danish manufacturers. One set of plates, however, is very curious, as there are reproduced on them *fac-similes* of drawings from a botanical work in which not only the plants but the enlarged dissections of flowers and the fruits are given. If they are intended for educational purposes they may commend themselves to boarding-school proprietors.

There is a considerable show of Belgian pottery, principally reproductions of old delft. The most important pieces are two gigantic blue vases, about 7 ft. 6 in. high. Some dozen exhibitors show painted faïence in Italian and Dutch style, &c., but they do not appear to advantage when compared with the best productions of France.

The Belgian exhibits are quite distinct from the French, being Dutch in colouring and shape. Holland shows inferior delft, interesting chiefly from the cheapness with which it is produced. V. de Boch, a firm of eminence of Villeroi, besides showing some unglazed *cloisonné* plaques of good design and sober colour, have contributed plaques in *terre cuite* and faïence. There is a large collection of domestic brown ware called "*atlant au feu*," which is very hard. Although it does not strictly fall under the head to which this notice is devoted, its importance is a sufficient reason for mentioning it. It is well worth the attention of those who have the direction of schools of cookery.

Although the Russian pottery does not as a whole show much individuality, there are exceptions in the case of the works of Egeroff, who exhibits some plaques, the subjects on which are Russian in character. There are several stoves which, perhaps, best illustrate that which is generally accepted as uninfluenced native taste. All the other productions are imitations of Dresden, Palissy, and Majolica, a large collection of which is sent from the manufactory of Helsingfors. There is nothing among them to arrest the attention of an artist. A case of incised bright-coloured enamels on silver and gilt cups and chalices shows the progress that this branch of art has made in Russia, and when as much attention has been paid to pottery, originality of design may be looked for in it.

In the centre of the Austrian exhibit is a "trophy" erected to contain several works of Austrian production, the most prominent of which is a fountain of Pompeiian design, executed in the manner of the old Della Robbia ware. Among other large examples of pottery are stoves in dark green glaze, and an open fireplace in decorated tiles of grey tone. The most important manufactory is that of Rädler & Pilz, who acquired the old Government moulds in 1862, at the time the Government factory was given up. The principal objects shown are from these moulds, and the old traditions of decorations are kept up in that heavy and decorated style so much in vogue and manufactured in Austria at the beginning of this century, the old Viennese Imperial Factory style. The subjects, which are mostly classic, are painted with the care of miniatures.

The Bohemian work, when seen, as it is here in juxtaposition with the productions of other countries, seems fully fifty years behind, and the decorations are by comparison overloaded with colour. One exception should be mentioned,—a dinner-set in deep blue and gold. This want of progress is all the more remarkable, as some of the Bohemian glass is of the greatest excellence. Alois Klemmerth, of Znaim, exhibits some copies of the old *Stein-gut*, and Franz Slowak has a stand of blue and white *grès*, which, unlike the old *grès*, has flat instead of raised decoration, and there is a well-modelled brown glazed *poêle*.

The Hungarian pottery fills a large court, the greater part being in imitation of Dresden. One manufactory, at Pesecth, to the south of Pesth, exhibits an ivory opaque porcelain, with a raised Persian kind of decoration, carefully coloured and very pleasing. This factory, which gives the greatest indication of activity, commenced as a simple brick yard, but, as with Doulton, in England, went on to make the coarser earthenware, then *grès*, and now is stated to employ 150 persons in producing artistic work.

The Swedish exhibition is mainly from the manufactories of Rostrand and Gustavsberg. There was formerly a Government manufactory at Marieberg, but it was discontinued, and Rostrand and Gustavsberg, subsequently founded, now receive a nearly equally divided Government patronage.

The productions of the greatest individuality are in the style they call the Vikinga-saga, in which are represented the idealised attributes of the Vikings, and the conventional ornament is of early Norse character. There are also some large stoves, or rather open fire-places, for which Rostrand has now become celebrated. The designs and the glaze in some are very good, but in one case, at least, one coloured in salmon and lavender is so badly glazed that it looks like painted wood. Most of the Swedish pottery is a simple imitation of that of other countries, and in the few cases in which more ambitious designs have been attempted, it is evident native art has not made much advance. An example which, from its conspicuous position and pretentious size and colouring challenges criticism, may be examined as probably some of the best work they can produce. The subject is a procession of groups of figures showing national costumes, the colour of the ground being dark-blue. There are also two pairs of high candelabra, one in turquoise and gold, the other in majolica, but they are noteworthy only on account of their size.

Spain shows very little, except the tiles mentioned in alluding to the architectural pottery. There is an interesting show of the coarse native pottery, but where newer and original designs have been attempted, they are not successful. At a Carthagena factory very exact copies of English ware and patterns are being produced, but probably the clay, as well as the designs, are from England. The marked inferiority of the pottery is strange when there is shown such very good Damascene work.

Portugal exhibits both porcelain and earthenware, the porcelain being indifferent in quality, and entirely copied in shape and decoration from the commoner French pottery made a few years ago; the earthenware showing more originality, but the few drawings with which it has been attempted to decorate it are badly executed. A favourite ware seems to be one that is a kind of majolica, in which the most original designs are taken from cabbages, associated with snakes, from which tea-pots, &c., are fashioned. There are, too, some quaint jugs, of Moorish design, with long spouts. Some attempts have been made to imitate faïence in subjects similar to some shown in the French court,—fiddles, &c.,—but they cannot be compared with them.

A SHRINE IN THE NEW FOREST.

Not long since, the *Times*, in a justly encomiastic article on the election of Mr. Leighton to the presidency of the Royal Academy, referred, in a few words that must have appeared strange to many readers, to a certain "shrine" existing in the New Forest. This shrine, which the writer in the *Times* probably knew well, and had visited often, he conceived was as well known to others as it was to himself, but, in fact, although there may be many of a small circle in English society who are familiar with this New Forest shrine, it cannot be said to be yet as familiar as are those of St. Thomas à-Becket at Canterbury, or of Edward the Confessor at Westminster.

We have, indeed, in this country too few shrines of the kind referred to by the *Times* so thoroughly deserving a pilgrimage as that in question; yet few of the many eager sight-seers, or of the growing devotees to art, who either reside in, or yearly visit London, are aware that within three hours' rail and comfortable drive from the capital may be seen a church, decorated with a painting by Sir Frederick Leighton, the beauty and worth of which can scarcely be over-estimated.

The church of Lyndhurst, situated a mile or so from the quiet Lyndhurst-road Railway Station, will be found at the outskirts, scarcely in the heart, but in an exceedingly picturesque portion of the memorably historic New Forest. In this church the new President has painted with a love and affection which are shown in every figure, an altar-piece. The subject of this work, the five wise and five foolish virgins, has been painted in a method with which he is familiar, resembling ordinary fresco merely in appearance, or having at first inspection the look of encaustic painting, and judging by the condition of the picture when last we saw it, there has been no change or deterioration of the tints since the day, some years ago, when the work was executed; thus holding out promise of its preservation, as well as beauty.

In the church of Lyndhurst, the work is of the

purest kind; it cannot be said to be of the purest *a fresco* process, for that method the artist, we believe, does not consider perfectly adapted either to our climate or to the methods of instruction that our painters are early enured to.

It is not a little instructive to compare this work in the New Forest, the all but perfect revival of the very best period of, we may safely say, classic times, with the dry and mannered but conscientious misconceptions of the many wall-paintings to be seen in Germany, but especially at Munich.

In Masaccio's work in the church of the Carmelites at Florence, evidently an early love of Leighton's, may be found every aid to the designer of wall-decoration, and we doubt whether any more fitting teachers could be named for those to study than the early Florentine painters. In addition to the familiar sources at Rome, Sienna, Assisi, the *Cambio* at Perugia,—in the Church of St. Germain des Près in Paris may be seen much of the conscientious work of Flandrin, which is far surpassed, however, in every element of greatness by the work at Lyndhurst,—in Venetia, in many of the interesting towns, in Bassano, in Treviso, in Udine, Conegliano, Castelfranco, and in many of the villas of the old Venetians on *terra firma*, may be found admirable remains to guide those who desire proficiency in an art that there appears some hope of regenerating.

This hope, however, has but little chance of realisation, for, notwithstanding the all but limitless expenditure in which our people seem disposed to indulge in the decoration of their homes, our manufacturers of trade decorations are so industrious and so clever, that they contrive to satisfy those fortunate people who are able to indulge in their tastes, with means readier at hand to make their homes beautiful than the employment of skilled painters, and as to our governing bodies they care nothing for art or artists.

THE REFORM CLUB.

During the recess, extensive works of reparation and decoration have been carried out here, under the direction of Mr. Edward M. Barry, R.A. The works consist of general repairs, rearrangement of kitchen, with new fittings, a new system of ventilation, and the decoration of the saloon and chief rooms of the club.

In designing the decoration, the architect has desired to subordinate it to the general architecture of the building, and to adopt such a mode of treatment as he felt would have been desired by the original architect of the Club-house, his father, Sir Charles Barry.

Looking first at the *saloon* and *entrance*, it is found that the columns and pilasters of Scagliola, resembling Sienna marble, have been repaired, renewed, and repolished. The portions of the entablature, formerly painted as imitation marble, have been repainted, but all imitation, whether of painted marble in the saloon, or grained woodwork in the various rooms, has been eschewed, and plain tints substituted, with enrichments relieved by gilding. Portions of the walls, which were plastered in a manner to represent veined marble, have been painted dark red, with the intended result of throwing back the walls, so as to increase the apparent size of the saloon, and to form a harmonious background of rich tone for the Sienna columns. The entablatures, formerly made to imitate marble, are now painted in plain colours of grey and brown, with ornaments gilt upon grounds of blue in the upper frieze, and red for the lower order. The ceiling has panels of light blue, with gilded enriched margins. In the centre is a sun-light, with leaves surrounding it, the leaves being outlined with gold. The effect aimed at is a subdued richness, to be obtained by a harmonious mixture of colours contrasting pleasantly with each other, without undue display, and, but for a slight preponderance of red, we should say it had been fully attained.

The *staircase* has been cleaned and repolished. To obtain extra light the ceiling has been painted in panels of light blue, with darker margins. Here, as elsewhere, the imposts and other parts which had been painted as marble are now in plain colours of brown and bronze, with parts gilded.

The *coffee-room* is divided into three parts by projections, with groups of three-quarter columns, which are painted in two shades of brown. The dado is red and black, the woodwork generally brown. The walls are green, with red margins. The ceilings stone colour, with margins of brown and red, with painted panels and gilded enrichments to the cornices. The effect arrived at in this room is coolness and quietness, with sufficient decoration to satisfy, but not to startle.

The *strangers' dining-room* recalls the coffee-room, but with simpler decoration; the same colours are employed.

The *lower library*, on the ground floor, is decorated in brown as a general tint. The ceiling is painted in shades of green and light brown, with panels of blue and gilt enrichments. Over the bookcases, a frieze of basrelief copied from the sculpture of the Parthenon is relieved by a red background. The cove and cornice are partly gilt, and the effect is good.

The *upper library*, on the first floor, resembles the last room, and is situated immediately over it. The same general treatment has been carried out, but with lighter tints in the ceiling, which is light brown, blue, and gold. General effect the same as below.

The *card-room*, a small apartment having its walls covered with rich-looking leather paper, with gold pattern on gilt ground and with gilt mouldings, has a handsome and comfortable effect.

The *large library* over the coffee-room is a very fine room overlooking the garden, and is the whole length of the club-house. It is placed exactly over the coffee-room, and, like that, is divided into three parts by columns and pilasters. The walls are lined with bookcases, separated by pilasters. The whole is richly decorated, the groundwork adopted being light green bronze colour. The flutes of the columns and pilasters are beaded, and the beads, capitals, and part of the bases are gilded. Gold is also used for the enrichments of the cornices and ceiling, and the cove, which is composed of a trellis pattern with rosettes, has the latter also gilded. Subdued tints of red and green are used in the margins of the ceiling, and the dado of the bookcases is painted in dark shades of brown. This is, altogether, one of the handsomest apartments of the club.

The *smoking-room*, somewhat small, is decorated after the Pompeiian manner. The dado is dark red, with panels of black, enriched with classic ornaments. Above the dado are arcades with light pilasters and columns. The arched panels are painted light blue, as if open to the air. The ceiling has canted sides in lieu of a cove, and a large centre panel. The canted parts are painted with a trellis and green leaves and flowers, while the central panel is treated as a velarium stretched from trellis to trellis. The execution in this room is somewhat less satisfactory than the design.

With a view to complete *ventilation*, vertical pipes conveying fresh air are placed in the various rooms, in the thickness of the walls, so that they do not attract attention. At the foot of each pipe is placed Mr. Verity's patented apparatus, which we have previously described, consisting of a small circular fan, moved by the action of minute jets of water, the effect of which is to force fresh air into the rooms at any rate of velocity which may be required. A similar fan is used above the ceiling in some of the rooms where smoking is customary, to extract the vitiated air.

Amongst the *general works* performed, the kitchen has been refitted, and lined with white tiles, and ventilation has been applied to it. Baths have been removed, and the offices generally put in order.

For the general works, Messrs. Perry & Co. have been the contractors. The decoration has been carried out under the architect's direction by Mr. Schmidt; the scagliola-work, by Messrs. Bellman & Ivey; the ventilation, by Mr. Verity; and the kitchen fittings by Messrs. Feetham.

The works have occupied about three months, and the clubhouse will be opened to the members on December 1st.

Mr. Edgar has been the clerk of works. Something under 3,000*l.*, we understand, has been spent on the decoration proper.

American Society of Civil Engineers.—At the recent annual meeting, the following persons were elected officers of the American Society of Civil Engineers for the year beginning November 6th, 1878:—President, W. Milnor Roberts; vice-presidents, Albert Fink, James B. Francis; secretary, John Bogart; treasurer, J. J. R. Croes; directors, George S. Greene, William H. Paine, C. Vandervoort Smith, Thos. C. Clarke, and Theodore G. Ellis.

WINDOWS.*

The subject of windows is one so necessarily interwoven with the very first principles of design, that I venture to think it needs no apology from me for bringing it before you. I do not propose to notice windows employed in ecclesiastical or public buildings, neither do I propose to trace their introduction and use from the Ark downwards, but rather to endeavour to consider their treatment for modern domestic purposes, more especially as adapted to town houses.

That windows are, or should be, an all-important element in modern design no one can question, and their use at once marks a great point of departure between our modern architecture and that of the ancients. The architecture of the Egyptians and of the Greeks may be said practically to have been windowless, as far as the examples remaining to us bear testimony, and it was not till the art spread further northwards, towards our more uncongenial clime, that windows came to be a necessary feature in design, and naturally asserted themselves, so that the ancient Greek types had gradually to be abandoned; and it is this necessity of windows that has proved one of the greatest sources of failure in the endeavour to implant these styles in our country in the present day. That the stately portico of the British Museum, for instance, should screen several stories of windows lighting offices, lavatories, and cloak-rooms, can hardly seem satisfactory to any of us, and where, as in this climate, light and cheerfulness are the great *desiderata*, it can surely not be open to doubt that windows should play a leading part in the external elevations of our buildings. I propose, as far as possible, to consider the treatment of windows, apart from any particular style, aiming simply to arrive at their requirements, and the best way of meeting them.

It seems a self-evident proposition, yet it is one that is continually disregarded, that the size of the windows must be regulated by the size of the rooms that they are intended to light; but nothing is more common than to find cases where three windows, all of the same size, "to preserve the uniformity of the elevation," as the speculating builder says, light three rooms of totally different sizes, the result being, say, that one bedroom is fairly lighted, the other is very dark, while the dressing-room is so light that you hardly dare dress in it without the blind being drawn down, as you seem to be quite out in the open air.

It is extremely difficult to lay down any law giving exact rules as to the proportion of lighting-space necessary for a given room. Much depends, for instance, on the position of the light. In the well-known example of the Pantheon at Rome, the building is amply lighted by a small circular opening in the roof. The contents of this building are given at 1,934,460 cubic feet, and the area of the circular opening is only 527 ft., or about one-third of the amount required had the lighting been from the side. The rule said to have been adopted by Sir William Chambers is to add the depth and height of the room together, and an eighth of the result will give the width of the window. Gwilt gives as a general rule 1 ft. super. of light in a vertical wall to every 100 cubic feet in the room. Robert Morris says that the superficial area of the window should equal the square root of the cubical contents of the room. This, however, though no doubt approximately true, must evidently be open to large variations, according to the width of the street, and especially according to the aspect and the climate, and the exact size of certain windows to suit certain shaped rooms can only be learnt by observation and experience. The matter is one of the greatest importance, and cannot be too carefully considered. It should also be borne in mind that certain rooms will require more lighting than others,—a drawing-room more than a dining-room, a dressing-room rather more than a bedroom, and so on; and if this is carefully attended to (and, of course, taste and discrimination used), the elevation will be at least an honest and truthful one, and you will not find the principal windows on the ground-floor lighting, as is often the case, a cloak-room or a water-closet.

Assuming now that you have settled the amount of glass area that will be required to pleasantly light the room according to one of

* From a paper read before the Architectural Association on the 22nd inst., by Mr. Aston Webb, vice-president.

these rules, the next question is the proportion or masses in which this shall be arranged; and here at once, in the case of dwelling-houses, we are met by two very definite rules,—first, that the sill must be from 2 ft. 6 in. to 3 ft. from the floor; and, secondly, that the head of the window should be as near the ceiling as possible. This, though not always attended to, is of immense importance to the cheerfulness and good lighting of a room. This, therefore, determines within a very small margin the height of your window, and it then remains for the architect to decide on the distribution of this space,—whether it shall be in one mass, or in two, three, or four; and here, of course, rules cease to guide, and taste, judgment, and experience step in.

Though, however, there are no actual rules to guide us in this all-important question of the distribution of the lighting area, there are many reasons which may affect our arrangements, and as this is the most important part of my subject, I will go into it a little more at length. The main objects to be aimed at are two in number,—firstly, the effect of the arrangement as seen from the room; and secondly, the effect on the external elevation; and it is the judicious application of the window to suit both the internal and external requirements that calls forth some of the highest qualities of the architect. I have placed the internal effect first as being the most important, though, of course, no design can be considered satisfactory which does not meet both requirements. The first axiom that may be laid down under this head is that wherever a room is so large that one well-proportioned window will not properly light it, then that room (assuming the light is from one side only) must have *three* windows, not necessarily of equal size, for it may have one large and two small; but it should on no account have an even number of windows in one side. No doubt most of you have noticed, on going into a room lighted with two windows in one side, that there is something unsatisfactory about it,—the room strikes you as gloomy, because there is a pier where there should be a window: yet hundreds of town houses are built entirely ignoring this first principle, and generally, again, "to preserve the uniformity of the elevation," which is usually divided into three bays. Thus the ground-floor has an entrance-door and two windows, and the remaining floors three windows each. The result is that the dining-room strikes you as gloomy, with its large central pier between its two windows. The drawing-room is usually well lighted, and the best room in the house, having a centre window; but above this, again, the window over the porch in each floor lights a small room, sometimes a dressing-room; and the principal bed-rooms, again, have a pier in the centre, with the same gloomy result noticed in the dining-room,—the disadvantage here being largely increased by the difficulty of properly arranging the furniture, a matter which should always be considered in the design of a room and the disposition of its windows. In this case the dressing-table must either stand between the windows, where the light will be very bad, or it must stand under one of the windows, when, being one of the principal pieces of furniture in the room, it will give the whole room a one-sided appearance. The windows are all double-hung sashes, with the exception, perhaps, of some which are fixed, and usually the head of the window is some distance below the ceiling, in order to allow an elaborate cornice, full of builders' stock enrichments, to run its headlong course over the top of it, and often also there intervenes a little bit of wall space which the paperhanger finds is not large enough for one pattern on the paper, and so leaves it altogether, hoping the curtains will hide it, as they often do, for there are no arrangements made for these or for the blinds, or, indeed, for anything. This is an unexaggerated description of the windows of the houses run up by speculating builders, in which nine-tenths of us Londoners and others dwelling in large towns are doomed to live. Any idea of ventilation by means of them, except through the ill-fitted sash, does not seem to have troubled the builders. This is a very common instance of the sacrifice of internal comfort for external uniformity of appearance, for it is true of the outside as of the inside that a void should fill the centre of the wall; but there are many ways of combining the two advantages, and, as in all cases where design is made subsidiary to the internal requirements, the external effect is much improved. Uniformity with builders takes the place of design, and perhaps it is better it is so.

[Mr. Webb here exhibited a sketch showing an alternative treatment of the same frontage. In this alternative sketch large triplet windows were shown in the centre of the principal rooms in ground, second, and third floors, and in the drawing-room three windows so disposed as to present what was characterised by Mr. S. F. Clarkson as "the disadvantage of a central pier which was not in the centre." This disposition of the windows, Mr. Webb urged, possessed a variety of form which lent itself well to the various uses of the drawing-room, and externally the effect was better than the other arrangement, and if repeated down a street *ad infinitum* it at least presented some breaks and variations to relieve the eye. Possibly, in the case of a speculating builder, the unlovely uniformity of Gower-street or Wimpole-street was preferable to the variety at which he sometimes aimed. Another advantage of such an arrangement of the windows was that it marked the principal rooms, and gave some clue to the general arrangement.]

I have already mentioned that it is as important not to have a central pier externally as internally, and this is a rule more generally observed than the others. Speculating builders, even, seem to have an idea that they ought to get a window in the centre externally if possible. The importance of this can be well appreciated by looking at the Army and Navy Club in Pall-mall, where the entrance elevation has a centre bay, the elevation towards Pall-mall having a central pier, and the dignity the one has over the other is seen at once. The arrangement of the Thatched House Club, in St. James's-street, is good in this particular. On the ground-floor you have the entrance-door and three large windows lighting the reading-room. This arrangement gives a central pier externally, but to avoid this on the floors above, a bay-window is thrown out, being to my mind a very satisfactory solution of that particular difficulty. One other building in Pall-mall I will notice, as, though satisfactory in some respects, and well-detailed in many, it strikes me as an example of what is to be avoided in the way of the arrangement of windows. Taking the ground-floor you have the old arrangement of two windows and entrance-door already noticed; and as if to make matters still worse, each of these windows is divided in the centre by a centre mullion, and on looking in at the door you will see even this, again, has a centre pier opposite to you.

But to return to the general question of the disposition of windows. This, of course, varies somewhat with the style which may be adopted by the designer; but here, again, there are certain rules which never vary in any well-considered and well-balanced design. Sir Charles Barry is generally admitted to have been a master in this disposition and balance of wall and window-space. The elevation of Bridgwater House towards the street is a good example of this balance and proportion, and the Reform and Travellers' Clubs are two other well-known examples. At the same time, in these Italian examples, though there is so much to admire, on examination of the plan we are often compelled to admit that too much is sacrificed to the elevation. Sometimes we find a dummy window (and I think the least fastidious about truth in architecture would find it difficult to justify this), or sometimes we find that one of these large well-proportioned windows lights a w.c., or that part of the first and second floor windows lights one large room, no indication whatever of which exists externally.

As to the proportion of voids to solids in an elevation, I venture myself to think that the only true law that should guide us in the designing of modern buildings for modern purposes is that of the necessities of the internal arrangements. The Metropolitan Building Act stipulates that the area of voids shall not exceed the area of solids, but this is with a view to solidity more than architectural effect, and is relaxed if sufficient stability can be otherwise shown. I would say that in designing a warehouse where light is the great desideratum, the windows should be, as they often are, the main feature of the design. You may hear people say that a building only "looks like a huge warehouse," and if it is one this is great praise. If the building to be designed is a prison, then the stone walls should be the most prominent, and the openings towards the streets, if any, should be small. A prison might be actually just as safe if the external walls had tiers of well-proportioned dummy windows, but it would not look so to the eye, and would be universally condemned. The same, therefore, should hold good in buildings generally between these two extremes. Depend upon it, it is this external expression of the use of a building that we should rely on more than anything for the development of a style distinctive of the nineteenth century. Take, for instance, the windows of an ordinary country-house. Nothing is more charming to the eye than the windows of old Kentish, Sussex, or Worcestershire houses of 150 years ago, with their quaint, long, low, many-divisioned windows and white frames flush with the outer face of the wall. But in rebuilding such a house, these long, low windows become impracticable, and they are therefore not to be attempted in any way. It seems rather hard to give them up, they are so quaint and pretty, but it is the only thing to be done, unless you want to build a little imitation cottage, in which the farmer will curse the architect through all his tenancy. Modern requirements must be met if architecture is to live, and there are many signs abroad that we have studied the requirements of our ancestors long enough, and must now think more of the requirements of our clients. I do not mean we must give up our picturesqueness,—there is plenty of room still for that; but we must adopt modern forms and express modern requirements, and make our houses look as if they were inhabited by modern men and women, and, aiming at this, we shall, without doubt, arrive at a modern style.

And now, having settled the number and proportion of our openings, I come to the much-vexed question as to with what they shall be filled; here at once the question of modern requirements arises and asks for a practical solution. It is a question beset with many difficulties, the introduction of large sheets of plate-glass being the disputed point. And here it is no good looking to the public for light, for while some will say, "You must avail yourself of this modern material," "I will have all my windows filled with it, and will use nothing else," "I like to see the view unobstructed," &c.; others say, "If I must have plate-glass, let me have as little as possible,—it is so vulgar, and I don't want to make my house look like a shop or a club," &c. Well, like most other questions, there is something to be said on both sides, and our object should be to look at the matter from both sides, and endeavour to combine the two as far as possible. From an artistic point of view, the great difficulty in dealing with plate-glass is the bare, bald appearance it gives to the elevation externally, which makes it in many cases extremely difficult to use it successfully. We may summarise roughly the two modes of overcoming this as, first, by dividing the window-opening by transomes and mullions; and, secondly, by dividing the glass itself by sash-bars, &c. Plate-glass, when used in the small sheets required for a mullioned window, is comparatively easy of application. The sheets are so reduced in size that the baldness does not become apparent, and much may, therefore, be said in favour of mullioned windows, by which method a room may be as well lighted with an ample glass surface, although that surface may be separated by mullions. Still there are many people who resolutely decline to have mullioned windows, even though the sashes or casements are filled with plate. They consider that mullions, if they do not obstruct the light, obstruct the view, and, therefore, they will not have them at any price, and the real difficulty of the treatment of plate-glass then begins. And here I would say that no doubt the Italian styles lend themselves more readily to the introduction of large sheets than do the English Gothic styles. To refer again to Sir Charles Barry's Bridgwater House, although the panes are there divided by sash-bars, the bars are so slight that they hardly have an appreciable effect, at a little distance, on the general design; but the same architect did not venture to employ the large sheets at the Houses of Parliament, showing that he considered at least that the one style lent itself more readily to this modern improvement than the other.*

Exhibitions.—The private view at the Society of British Artists (9, Conduit-street), and the Water Colour Society takes place (this) Saturday, November 30th. The Institute of Painters in Water Colours have their private view next Saturday, December 7th.

* To be concluded in our next.

A FAMILIAR ADDRESS TO THE GREAT PYRAMID.*

"Stone walls have ears."

NOAH of structures! vast eternal pile!
Meet burden for the banks of solemn Nile!
Heirloom of long-forgotten generations!
Oldest and most renown'd of Art's creations!

A being under six feet high, in race
Kindred to those you notice round your base,
Spying and measuring, and creeping up your side,
Would fain address you: spurn him not in pride,
Though creature of a day, born but to gleam,
To die, and be forgotten as a dream.

Being prose yourself, you, perhaps, are quite averse
To poetry, as to a sort of crime;
And may not like to be address'd in verse;
If so, I tell you this is only rhyme;
Of this be sure, for I am not a poet;
I've written pieces that will clearly show it.
And I should else incur a curtain lecture
From my good lady, Madam Architecture.

Stone walls have ears, so cautious Wisdom calls,
And you are form'd of four triangled walls;
And if you've ears, then surely you have eyes;
The great Napoleon bears me out thus much;
Not that I greatly prize his word as such,
But that it squares with reason, which ne'er lies:
You must have open'd wide enough your lids
To view his "Battle of the Pyramids."

And if, as Scripture says, the fields be glad,
And all the widespread realms of earth rejoice;
If hills are said to skip as they were mad,
I may attribute to you reason's voice,
Memory, imagination, passion, more,
You're perhaps, like Moses, learn'd in Egypt's lore.

Say not you cannot see o'er Alpine height:
Your eyes must be proportion'd to your date;
Time, though some valued faculties he blight,
Should have conferr'd on you a second sight;
And, if not time, your native land of wonder,
Where magic and philosophy both wander.
Besides, the Muse cares not for straight precision,
But gives the power of curvilinear vision.

Ere Abraham had left his Chaldæan home,
Ere the Pelasgi first had lived in Greece,
Ere rose of Babylon one tow'r or dome,
Or Argonauts had won the Golden Fleece,
Ere Miriam had sung her song of joy,
And many an age before the Siege of Troy,

Ere fall of Thebes, return of Heraclidæ,
Ere Nineveh or Sicyon saw high day,
Ere rose of languages confused the buz,
Or lived and suffer'd the brave Man of Uz,
Ere wolf had Romulus and Remus suckled,
Or wight o'er Aristophanes had chuckled,
Ere Socrates had quaff'd the fatal bowl
That robb'd Athenæ of her greatest soul,
You soar'd august above the Nile's rich slime;
Alas, how inundated since by crime,
To you, a thought to make both heart and tongue stir,
To you, the Eternal City is a youngster!

You rose upon the morning of this earth,
Before the Muse of History had birth:
How dreary then was Nile's mysterious vale,
Ere [illegible] quail,
Or obelisk or labyrinth told its tale,
Or [illegible] had dream'd!
Or Karnack's hall or Luxor's name had dream'd.

Fain would I fancy what must rise to view
Karnack's great temple, like some solemn abbey,
Gathering in cold and hieroglyphics new?
'T would make your sides, I ween, look somewhat shabby.
I've scann'd it through some score of colour'd volumes:
What a tremendous place that Hall of Columns!

Were you not angry when, in quick succession,
Fresh feats of art were all around you strewn,
Temples and pyramids taking possession
Of the rich valley that was once your own?
Felt you no anger? Nay, do not deny it,
We Christians feel it when we seem most quiet.

What thought you of those many startling things,
At which all ages of the world have wonder'd,
Which art and science both have gravely ponder'd,
Combined achievements of your priests and kings,
Sublimest ornaments of earth's fair zone,
With eloquence and wisdom overgrown?
I mean the fanes just mention'd, the Memnonium,
On which I need not here bestow encomium,
With shrines of Vulcan, Serapis, and Isis
(Rich in high Art's rare emblems and devices),
Of Apis, too, and the colossal Sphinx,
Mountain of rock that looks at you and thinks,
Temples of Medeenet and Aboo-Simbel,
Forms of eternity itself the symbol!
And those fair piles which watchful beauty keeps
At Philæ, where the great Osiris sleeps;
The splendid obelisks of Heliopolis,
The famous Labyrinth and Thebes' Necropolis.

You'll not be quite aware of their relations
To modern structures: though they seem the tomb
Of ancient art, and lore, they were the womb
Whence sprang the architecture of the nations.

The pretty little things, Mahommed's mosques
You'd scarce distinguish from the cool kiosks:
Their rows of domes beside your granite symbols
Would look to you like several rows of thimbles.

Oh, felt you not some sorrowful sensations
When King Cambyses led his fanatic host
Through your revered land,—then fortune-toss'd?
Maze of such architectural creations,
Land by philosophy and art adored!
Why crush'd you not the fire-worshipping horde,
And saved your soil from desecration foul,
Worse than when Greece first drank of thraldom's bowl?

Now, can you solve me one or two enigmas
In your art-practice which to some seem stigmas?
Why did you twist your plans from the symmetrical,
And turn your back on axioms geometrical,
As shown at Luxor's forecourt and at Philæ?
Was the obliquity a symbol, highly
Illustrative of twist in your mythology,
Or feature recondite of your ontology,
All our wise rules and principles reversing?
Perhaps you heard the architects conversing.

To come to more historic, public things:
Who were those fearful men the shepherd kings,
If men they were, which history does not tell,
But shakes her head and shudders? Had they wings?
Or were they sires of Rome's scourge, the Huns?
Were they the Israelites' task-masters' sons?
What might was his who quell'd the demons fell,
Thothmes, and drove them to their native hell?
Perhaps, should you converse, as 't would be well,
With your anthropomorphic friend, the Sphinx,
It would be pleased to tell us what it thinks.
These matters strange could either of you show them,
We and posterity would like to know them.

Were those long dynasties successive kings,
Or but contemporaneous? Tell me, too,
Is your Manetho right? How old are you?
There's great uncertainty about these things.
Sure Eratosthenes right annals drew.
Did Ethiopia's monarchs lay the lash on?
Did Meroe rival Thebes in wealth and fashion?

How liked you the first Ptolemaic prince?
Evergetes, and Philadelphus since?
Sure, under their just rule and kind, longwhile
Egypt once more would lift her head and smile.
Did Cleopatra's glances make you wince?
I beg your pardon, you were doubtless free
To rival Cæsar and Mark Antony.

Had Nile's close valley, almost without rain,
The population stated, did it contain
Some twenty thousand cities high and dry?
I don't believe it,—surely *that's* a lie.
But tell me truly, from the best opinions,
How could so wise a race bow down to onions?

Remember you the Grecian sire of history,
Herodotus, who did your priests consult,
At Memphis, as you know, and the result?
Did they instruct him truly in their mystery,
Or did they his credulity insult?
He does not seem quite sure himself of this;
But perhaps his ignorance therein was bliss.

Knew you their lore and mysteries yourself?
Have we progress'd in mind as some have thought?
Is our philosophy advanced in aught
That's great, or only in what leads to pelf?
Were not some recent theories, quite bold,
The protoplasmic for example, taught
By your wise priests to Greeks for love or gold;
To wise Leucippus or Democritus,
From whom they've quietly come down to us?

Did not those philosophic priests first teach
The Babylonian sages their high reach?
You saw the latter watch the starry sky:
Which nation taught astronomy to fly?

Since you first rose above the abode of gods,
And crocodiles and sage magician's rods,
Did not I fear to ask, from earth o'erwrought,—
A light,—a peculiar morning glory pass
With the great Amunoph, Psammeticus,
Or Necho, or the sages who first taught
Pythagoras and Plato how to climb
Those heights of thought on which they dwelt sublime?

Have you a taste for beauty, look you down
With pleasure on the Vale's sequester'd haunts,
And the rich Delta deck'd with palms and plants,
And architecture's flowers all overgrown?

What cities you have seen in their first prime,
Memphis and hundred-gated Thebes sublime,
In pride of art and hieroglyphics glowing!
And Sais' gardens were as known to you
As Cairo's streets, and Alexandria's (new):
Familiar to you as the Nile's o'erflowing.

You've gazed upon the "hanging garden's" glory,
Bright as those fabled regions to the West,
Where Phœbus lingers ere he sinks to rest.
The marbles rich in old Assyrian story;
Where dwelt perhaps the rival queens, to wit,
Vashti and Esther, named in Holy Writ.
Those wing'd and human-headed bulls now hoary
(We've got them here, admired by Whig and Tory).

How glow'd those cities in their colour'd light!
Why! Babylon was large as London quite!
You've seen the great Carthage, a glorious nest,
Rome's murder'd sister, vanish'd like a jest.
The Olympian Thunderer on the Capitol,
Ere pride and luxury did sap it all;
You view'd Mycenæ, Tyre, Damascus too,
And great Diana's city: blest are you.

The Eternal City at its fortune's flood,
What time fell treason shed great Cæsar's blood,
And Athens the blue-eyed Maiden's care and pride,
Fairer, I deem, than the Adriatic's bride,
Crown'd by the Parthenon, Athena's shrine,
Art's master-piece, and Architecture's hope,
Destined ere long to guide her footsteps up,
In all its pristine majesty divine,
A pearl (fit dwelling for the sacred Nine),
By Fate cast out for ages before swine,
Were studied well by you. O'er Pompeii
And Herculaneum, you'd scarce cast your eye,
Except when they were buried, when perchance
You'd give each heap of cinders a last glance.

Blest with experience of such vast extent,
You could direct and guide those wise explorers
Into past times, the enthusiast earth-borers,
Which late have stray'd from home on such intent:—
You could direct them where to pitch their tent.
With buried towns and monuments in view;
And Sir A. Layard should have consulted you.

Do you remember Joseph, Egypt's lord
(Oh, what emotions follow that same word!),
When Egypt was the granary of the nations,
And Joseph's eleven brethren, with donations,
Came there, each man with ass and empty sack,—
To him they wisdom sold for spite or pelf;
And Joseph to them making known himself,
And weeping on his brother Benjamin's neck?

Saw you that wandering sacerdotal troop
Escaped from Goshen, when great Pharaoh's host,
Chariot and horse, did 'neath the Red Sea droop,
Startling the nations, e'en to the Syrian coast,
By its dread Guide, and o'er the Jordan wade,
To dwell for ever 'neath the Almighty's shade?

Saw you them next, by their dread Guide forsaken,—
For grievous sins, and toss'd on Fortune's billows,
With stricken hearts, and yet a faith unshaken,
Sit down beside proud Babylonia's rivers;
Weeping when they remember'd Salem's wrongs;

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* I have assumed the date of the Great Pyramid to be that which I have assigned it in my "Chart of the History of Architecture," viz., about 3240 B.C., which I well remember we arrived at after carefully consulting and comparing the highest chronological authorities on the subject. The piece, though [illegible] architectural, [illegible] the cause of architecture to suggest [illegible] vast [illegible] associations [illegible] attach to her works. [illegible] of the rhyme are intentional, and I consider need no apology. I have given no heed to the Latin or Greek genders of the Pyramid and obelisks.

S. H.

Hanging their harps upon the mournful willows,
When the oppressors,—the ungodly livers,—
Said, sing us one of Zion's holy songs?

If born at Chios, the immortal Homer,
May oft have come to Theban schools to study:
Oh! did you see the blind illustrious roamer,
And hear him sing his wondrous song of Troy?
Did you not think the Iliad rather bloody,
And great Achilles a great brutal boy?
And wish the gods and goddesses that came
To Ida's top to meddle with the game,
Had each and all found more God-like employ?

Your gaze o'er high Olympus oft would roam,
When Jupiter and Juno were at home;
Parnassus and Mount Helicon 't would follow
When haunted by the Muses and Apollo,
Or deem'd so; ere the Pythia retired,
And bards were still by Castaly inspired.
Did you not grieve that this divine mythology
Should owe to Virtue such entire apology?

You could not fail to note those boasts of time
At Marathon and other spots sublime,
By heroes trod, and dyed by heroes' blood,
When Greeks against world-whelming lances stood.
Oh! what deep voices from Thermopylæ
(A talisman to all the brave and free),
Would reach your ears! and the expiring groan
Of brave Leonidas would thrill your stone.

You saw the world's foremost man,—a man sublime,—
Great Cæsar, politician, general prime,
Historian, speaker, first in Wisdom's train,
Ablest to heal its wounds, and fix the reign
Of peace and justice to all future time,
Letters and arts, the height of glory gain,
And power; and then by patriot daggers slain!

But I forgot those amazons serene,
Who ruled or fought,—the great Semiramis,
Zenobia, Boadicea, Britain's queen,
And many others you'd scarce like to kiss.
Did not these ladies, given to strife and slaughter,
Seem very like to fish exiled from water?

The lady, Sappho, you would more admire,
For she would charm you with her wond'rous lyre,
Or (friend of Pericles) the wise Aspasia,
Or the most learn'd and beautiful Hypatia,
Glory of woman. Her unwonted fate
Did you not mourn, and blush the while all o'er?
Humanity will mourn till time shall be no more.

Saw you the sages guided by the star
To the mysterious Babe, a virgin giveth?
Heard ye that voice from out the desert far
(Through the still air fraught but with sounds of mirth,
For universal peace was then on earth)
Telling to man that his Redeemer lived.?
Still heard through centuries of woe and strife,
"I am the resurrection and the life!"

Had you presentiments of that convulsion,
That strode o'er Europe's frame, nor her's alone,
When the barbaric storm with dire propulsion
Swept, o'er the Roman world, and crush'd its throne,
And quench'd in tears and blood its ancient light,
And spread for ages Error's starless night?
Did the last Roman's groan disturb your mood?
I mean of great Boethius, wise and good?

Have you not, too, some recollection
Of revolution in a new direction,
Two centuries later, by the Arab wolf
Whose maw did all Christ's eastern fold engulph?

Heard you that preternatural commotion,
When Europe's hordes were set in eastward motion,—
With lance and sword fair Asia's face to mar,
And light the flame of universal war?
'Twas for the glory of the Prince of Peace,
Who came on earth to bid war's tocsin cease!

Saw you our conquering Plantagenets
At Cressy, Poictiers, Agincourt,
Routing Gaul's hosts on Gaul's own vine-clad shore?

Events which rarely Englishman forgets?
Not that I'm sure, while history of them prattles,
She should be very proud of these same battles.

The sights on which you'd better like to dwell,
Are deeds of Wallace or of William Tell,
Of Bolivar or Kosciusco, well
You'd like to see the maiden Joan of Arc,
Saviour of France in France's hour most dark,
Her army's van like an archangel leading
To victory's goal through England's hosts receding.

Her cruel fate I'm sure would stir your wrath;
But, oh! be sure you tell it not in Gath!

Of other modern things I've made a note,
On which, before we part, I'll take your vote:
Saw you Columbus track the Western main,
To give new empire to ungrateful Spain?
Did not your wither'd cheeks turn very wan
When Luther bold defied the Vatican?
And when you saw art's ancient lamp re-burning,
Did it not seem like youthful days returning?
But these are all events so very recent,
That naming them to you is scarcely decent.
Yet they've done more for this rude world's conversion,—
Than ere was wrought by Roman, Mede, or Persian;—
Along with Printing: strange no Grecian brain
Had long ago found out a thing so plain!

Is not the world around you beauteous
E'en as God's garden?—know a world there is
All hid from you, imagination's scene,
An inner universe of mind serene,
In whose ethereal atmosphere of light
The noblest intellects may find delight.
And there's the mathematic realm unseen
By sense, composed of pure intelligence,
Which in this world of sorrow takes men hence.

Hid from you, too, is the irradiation
That art and genius kindle o'er the earth:
You cannot see the new divine creation
To which they give a bright immortal birth;
Save what is form'd by architecture's creatures
Whichadd to nature's realm harmonious features.

Yet still you may be thankful for your lot,
Exempt from ills which years for us increase;
For our worst sorrows you care not one jot:
You know no Laura, no cold Beatrice,
No "maid of Athens," no coy Heloise:
But possibly in this I run some risk,
Perhaps you love some cruel obelisk;
And, without any wish at all to wheedle,
It may be our sweet Cleopatra's Needle.

You cannot see the shadow of the tomb
That dims yon sky and quenches summer's bloom;
You cannot hear the low prophetic breath
That murmurs from those catacombs of death;
Nor envy us the beauty, love, and hope,
That bear our spirit through the darkness up.

Are you ambitious, love you to look down
On awe-struck visitors, some moved to tears?
And are the echoes of your long renown
Like music's cadence to your aged ears?
Blush not to own it should you feel the flame;
Our sweetest notes are from the trump of Fame.

Yet be not puff'd with pride, O royal shrine,
Nor vaunt yourself a Pyramid divine,
Like Nebuchadnezzar, swoll'n with thoughts undue,
While I upon your loftiness look up;
An Eye that slumbers not looks down on you,
He is your builder's Builder, your sole prop;
In His all-seeing gaze your years, though vast,
Are like a night watch, or an hour that's past!

You've seen the mightiest changes earth has shown,—
Empires, like fleeting shadows, come and pass;
Greece, Persia, Babylonia, Rome, alas!
Chasing each other to the dark unknown:
Oh, tell me who so well as you can know
The vanity of all things here below.
Have you not cause to ope some morn your lid,
A sadder and a wiser Pyramid?

Farewell, and long retain your ancient vigour,
And be the pride and joy of your adorers;
And, that you may, be sure you treat with rigour
Those "architects of ruin" called restorers:
Upon their heads throw down some upper stones,
Should they come nigh you to disturb your bones.

SAMUEL HUGGINS.

Richmond, Yorkshire. — Great improvements have been effected of late upon Lord Zetland's estate at Aske, near Richmond, in Yorkshire, and also upon the property belonging to Lord Zetland in Richmond itself. The old King's Head Hotel in the Market-place at Richmond has been transformed into a modern hotel. At Aske Lord Zetland has replaced his old stables by a large block for about 100 horses. We noticed recently that the private chapel at the hall was opened. His lordship has also been extensively rebuilding his Richmond property. Mr. T. Oliver, of Newcastle-on-Tyne, is the architect who has carried out thee works.

NEW BUILDING BYE-LAWS FOR LONDON, UNDER 41 & 42 VICT., CH. 32.

It would be well to facilitate reference to the bye-laws by numbering every part of them, *e.g.*, Section No. 2, Bye-law No. 3, &c. I will not just now say more about the last paragraph of Section No. 1,—as to concrete for foundations. That subject may be left as put on page 1232 of last Saturday's *Builder*, until the whole subject of concrete is treated of in remarking on page 5 of the suggested bye-laws, Section No. 2.

Description and Quality of the Substances of Walls.

Paragraph I. [of the suggested Bye-laws]:—"The inclosing walls of every house, building, or other erection, shall be constructed of good, square, hard, sound, and well-burnt bricks, or of stone properly bonded and solidly put together with good mortar or good cement."

Paragraph II.—"Similar bricks shall be used in portions of party and cross walls below the surface or level of the ground, and above the roof. Cutters or malms may be used in arches over recesses and openings in external walls."

Paragraph III.—"Stone used in walls must be of a weight not less than 110 lb. per cubic foot. The stone must be free from vents, cracks, and sand-holes."

a. The new bye-laws might be so drawn up as to supersede in practice the 1st Schedule, Preliminary, Rules 1, 2, and 3; Part I., Rules 1 and 7; Part II., Rules 2 and 7; Miscellaneous, Rule 2,—of the 1855 Act. In place of giving any new provisions by themselves, it would be quite feasible, and not very difficult either, to extract all those parts of the 1855 Act, and to incorporate the new provisions with them. The framers of the suggested bye-laws have apparently decided on using the powers given them to make bye-laws "for securing stability, the prevention of fires, and for purposes of health," to secure the following results:—(1) Bricks in external walls not to be chuffy; (2) stone to be of very good quality; (3) mortar to be a mixture of lime and sand; (4) cement to be good; (5) damp courses to be put; (6), copings to be put. To express these provisions with the necessary amount of amplification, and no more, seems like the path of ease. No one, knowing the difficulties in the way of doing anything thoroughly in and by a public body, doubts that the easy path, although the public may suffer severely by its being taken, is usually the safe path for official persons to take. Still many people will feel regret that all the general regulations affecting the substances of walls cannot be brought together in an orderly way on one page. Great numbers of copies of the bye-laws will no doubt be printed by the direction of the Board, and sold at a merely nominal rate. The bye-laws will thus reach many who will always remain strangers to the different Acts. Is it really impossible to carry through such a thorough bit of work, which would save hundreds of people, including perhaps some magistrates, from perplexities every year?

b. However this may be decided, the exact force of the bye-laws should be distinctly considered and stated. The grasp of bye-laws as to walls should be prefaced with,—"These bye-laws are in no case to supersede any of the provisions of [cite the parts of the 1855 Act], but are to be construed together with those provisions;" or the prefatory note should be,—"The following provisions as to walls include, for convenience of reference, the various provisions of 18 & 19 Vict., ch. 122, on the same subject."

c. We will suppose,—protest or appeal notwithstanding,—it is determined that the bye-laws are to follow the course marked out at present. Then Paragraph I. must be turned round and become,—"The bricks used in the inclosing walls, and in the portions of party and other walls below the damp course hereinafter described, and above the roof of any house, building, or other erection, shall be hard, sound, well-burnt, and whole." The bye-law officially suggested does not limit itself to preventing bad bricks being exposed to the weather. It goes far beyond that. As much further, one must suppose, than its framers intended. It would stop the use of the "other hard and incombustible substances," allowed by 1st Schedule, Preliminary, Rule I. "Square" is equivalent to "well-made," when used of bricks by experts, and, therefore, seems a shade too precise, when we are only aiming at a minimum. It might be taken by some odd person,—some impossible district surveyor,—to mean that rectangular paral-

lelopipedons are to do all the work, to the exclusion of obtuse or acute angled materials; and, of course, to the exclusion of all shapes contained by a circle or part of a circle. In such a case, "the legal mind" would pretty certainly proclaim this absurdity to be the law. "Good" would either be taken to mean something beyond "hard, sound, well-burnt, and whole,"—introducing a mischievous element of doubt,—or it would be taken to mean nothing. In either case it might be parted with unregretfully. "Soft bricks may be used in arches," is a necessary concession to the custom of the times, though it sounds like a sentence out of a farce. It might be useful to argue against allowing rubbish to take the place of bricks in internal walls, but it is perhaps best to look on this also as a bad custom, in the inferior class of building, too well settled to be meddled with at present. Might not "stone" be left without further description?

d. By Schedule 1, Preliminary, Rule 2 of the 1855 Act, "Every wall . . . shall be properly bonded, and solidly put together." Therefore, unless we are to have everything in the bye-laws, nothing will be gained by putting those words into them.

e. Expectations have been disappointed by the suggested bye-laws not settling the shed and summerhouse question. It seems dubious whether the 1878 Act would warrant a clause, prescribing that,—"Every house, building, or *other erection* shall be enclosed with walls." In clause 2 of section 16 of the Act, the mention of house, building, or other erection is avoided. If there is the power, and a disposition to make use of it, there will be no more excited discussions, as to the legality of sheds, supported on combustible posts, and improperly enclosed. Then it may be someone's duty to define when an erection becomes so trifling that the law ought not to be set in motion about it. One hundred cubic feet (about 5 ft. by 7 ft. by 3 ft.) might mark this point. Any separate erection, standing on the ground in the rear of any building, and not exceeding that dimension, might be exempted from the control of the district surveyor.

Paragraph IV.—"The mortar to be used must be composed of good lime and clean sharp sand which shall have been properly washed, or grit, in the proportion of one of lime to three of sand or grit."

Paragraph V.—"The cement to be used must be Portland cement, weighing not less than 112 lb. to the struck bushel, and capable of maintaining a breaking weight of 350 lb. per square inch, after being made in a mould and immersed in water during the interval of seven days."

a. The shortest way of putting queries as to paragraph IV. will be to imply them by suggesting a new form for the paragraph, thus,—"The mortar used in the construction of walls shall be composed of good lime, mixed with clean sharp sand, or clean sharp grit, or other material approved by the district surveyor. The proportions to be one part of lime, and not more than three parts of sand, grit, or other material."

b. The amount of detail in the description of cement seems to be out of proportion with that suggested for other materials. Lime is simply to be "good lime." Might not cement be simply "good cement"? It is, of course, not intended to proscribe all cements except Portland. I conceive the intention of the framers of the bye-laws to have been to say,—"When Portland cement is used, it is to be, &c." But to be logical, it would be necessary to prescribe tests for other cements as well, which would make the bye-laws a document curious in its kind. Would it do to turn the flank of the difficulties thus?—"The materials of which walls are constructed may be put together with good cement, mixed with clean sharp sand, or clean sharp grit, or other material approved by the district surveyor. The proportions to be one part of cement to not more than four parts of sand, grit, or other material."

Perhaps I had better break off at this point. Preventing access of damp to walls, from the earth below them, and through their exposed upper surfaces, is a subject which may be treated by itself. The claims of hollow walls, or protective coatings, where earth is in contact with the walls of dwelling-rooms, ought not to be neglected. Much more frequently than is now the case, earth might be kept away from such walls entirely, if it was somebody's duty to see that something was done.

The result of examination of the other suggested bye-laws should, I suppose, be stated; but a moderate amount of this subject at one time will, I fancy, best suit the taste of the gentle reader. C.

RESERVED SEATS IN ANCIENT THEATRES, AND THEIR CLAIMANTS.

"Social Politics" is the somewhat pleonastic title, brief though it be, of a work by Mr. Arthur Arnold, which has just appeared, and very full it is of matter for thought and worthy of very serious consideration. Let not any one, therefore, be turned back hastily, because, as early as at page 12, he finds himself provoked to a smile, or even an audible demonstration of surprise and amusement. "There has been a time," says the author,—he is dissertating on the contingencies of disestablishments past, and possible,—"There has been a time in the history of many nations when the clergy occupied all the higher offices of State, and held a large personal share of influence in every assembly. Any one who with competent knowledge examines the ruins of the ancient Theatre of Dionysius, beside the Acropolis of Athens, will note that in Byzantine days the first circle of seats was allotted to ecclesiastics. If we may judge from the inscriptions upon those ruined chairs of white marble, the chief seats belonged almost exclusively to hierarchs, and it was pretty much the same in England." There are casts of these interesting marble chairs in the Elgin Room at the British Museum, and, doubtless, one of them is inscribed with the title of a hierarch. But knowledge that need not be very extensive, to be competent for all the exigencies of the occasion, reveals that the official seat on the most favourable level was that of the priest of the god of the theatre, of Dionysus (Bacchus that is), the companion seat being that of the strategus, or general. So far, perhaps, Mr. Arnold's illustration of the ancient proportion of the privileged "peers temporal and spiritual" may hold good; but there is nothing Byzantine in the case, and nothing that we now understand by "ecclesiastical." Upon this chair sat that priest of Dionysus Eleutherius, who looked on at the representation of the "Frogs of Aristophanes," in which Dionysus himself presents so undignified a figure. To descend to the realms of Pluto with more security, he has disguised himself like Hercules, who had frightened the under-world when he went to fetch Cerberus; but, thrown into alarm by visions of monsters, he is fain to call out for help to his priest on the chair in the orchestra,—"Oh, my priest, help and preserve me, your fellow-toper as I am" (v. 297).

So for the Byzantine ecclesiastic we must be allowed to restore the Pagan priest to his seat,—his seat, appropriately, for him, carved with grape-vines and satyrs at the back, and on each arm with a graceful Cupid busy in setting on a quail to fight,—typical, it may be, of the competitive exhibitions of the dramatic authors. There are votaries of the drama,—not, perhaps, the least intelligent and the least worthy,—who would gladly meet ecclesiastics of our own day in the stalls, prepared to sympathise with exhibitions on a par in genius and attractiveness too with those of Aristophanes, and more free,—quite free,—from so much that not only ecclesiastics but all the rest of us would willingly discourage and dispense with.

As to the mistake of the politician and political economist and social analyst, it is to be feared that in the absence of competent knowledge, he in some way confused Dionysus and the Acropolis with Dionysius the Areopagite, and carried down either the Athenian dicasteries or the dramatic contests of the Dionysia to Byzantine times.

Sewage Utilisation and the Pollution of the Thames.—At the Institution of Surveyors, on Monday evening last, an important discussion on these questions took place. We shall give a full report next week. The discussion arose out of the paper read before the Institution last session by Mr. R. W. Peregrine Birch, C.E., on "The Use of Sewage by Farmers, or Fifty Instances of Profitable Sewage Irrigation." We published the substance of this paper at the time (see p. 544, *ante*). The principal speakers on Monday evening last were Colonel Jones, of Wrexham, Mr. Mechi, and Colonel Haywood, Engineer to the City Commissioners of Sewers.

THE PHŒNIX GAS COMPANY AND THE IMPROVEMENT OF STREET LIGHTING.

The electric light agitation appears to have had the effect, amongst other things, of inducing the Phœnix Gas Company to make experiments for the improvement of street lighting. At last week's meeting of the Lambeth Vestry, a letter was read from the secretary of the Phœnix Company, stating that the board of directors desired an opportunity of testing some improved burners of considerable power, for purposes of street-lighting, and their engineer suggested that Waterloo-road, where it is intersected by York-road and Stamford-street, would be a suitable position. He, therefore, asked the Vestry to permit the necessary work to be carried out, and at the same time to add to the number of lights from the bridge to the railway station, and also to re-arrange them. The directors would do the work, and continue the lighting to the end of March next, free of charge. The letter stated that the alterations would be put in hand at once if the Vestry gave their consent. The request was unanimously complied with, the Vestry being of opinion that at the present time, more especially when the electric light question was so prominently before the public, they should give every facility for new inventions.

NEW POST-OFFICE, GOTTENBURG.

Our engraving represents the post-office which has been erected in Gottenburg from the designs of Herr Westerberg, architect. Mr. Westerberg himself tells us that, after having studied the arrangements of post-offices on the Continent, he paid a short visit to England in 1868, and finding that in Germany post-offices seemed chiefly arranged for the comfort of the officials, and in England for the benefit of the public, he made the following arrangements to meet the local requirements.

There are three distinct branches of postal-work, viz.,—1. The letter-receiving branch; 2. The delivery; and 3. Parcel-delivery and receiving of parcels, coaches going and coming.

In the present building the receiving branch is provided for in the flat upstairs, and consists of a large room, where the letters are handed over the counter and weighed and stamped, and then they are pitched into another large room, where they are stamped again, to spoil the stamps for further use, and then the sorting and packing up in bags and cases are done here. There are, also, three or four rooms for night-watch director, waiter, and reviser, safes, and lavatories; and, further, there is a room meant for the convenience of strangers, where they can sit down and write a letter, and get requisites at a low price. This, however, it seems, is nearly always empty.

Downstairs, as you enter, a large hall with pillars, and the staircase, form the centre part of the building, and the hall is intended to contain the eager throng of young clerks from the chief offices of business, who wait for the right-hand door to open and let them in to the counter, after the different posts by morning train have been sorted, which sorting is carried on behind shut doors. The size of that hall seems very large during the day, but in the morning it is crowded,—and such a crowd! Most of the units in that crowd are called "post-asses" (young clerks carrying out the function of fetching letters), whether because they bray so loudly on account of the slow progress inside the shut door, or for some other reasons few can tell; but there are many mysteries belonging to large governmental concerns. That said right-hand door is the centre of attraction for everybody; for inside it the delivery of letters takes place; and here also the letter-carriers,—a recent institution,—have their allotted space as well as the other officials. Now, after all the hurry and scurry of this scene, it is quite refreshing to turn to No. 3, the parcel and coaches department, where passengers and parcels may be accommodated and locomoted at the rate of seven miles an hour. This separate institution has its place to the left, and includes a few shed coach-houses adjoining to it. In the basement the heating apparatuses (Reinhard system) have their place; and rooms for coals, wood, &c., fill up the rest.

Mr. Westerberg wishes us to express his thanks to Mr. James Williams, of her Majesty's Office of Works, for kind services and assistance during his visit to England.



THE POST OFFICE, GOTTENBURG.—Herr J. A. Westerberg, Architect.



TOWN HALL, SYDNEY, NEW SOUTH WALES.—Mr. James Barnet, Architect.

TOWN-HALL, SYDNEY, NEW SOUTH WALES.

THE new Town-hall here illustrated is at the corner of George-street and Druitt-street.

The extreme length of the building east and west is 245 ft., the width of the principal front north and south 153 ft.; the ground floor, in one uniform level, is elevated 8 ft. above the pavement level in George-street. The portion of basement appropriated to offices for the subordinate officers of the Corporation is fireproof, including record-rooms, office-keeper's quarters, cellars, and storerooms, and has a clear height of 14 ft. The position assigned to a banqueting-hall has a clear height of 18 feet, and covers, in connexion with the corridors on either side, an area of 9,180 superficial feet. On the principal, or George-street front, a massive flight of granite steps conducts to a portico on the ground-floor level, at the northern end of which a vestibule opens directly upon the principal staircase, communicating with the first floor and basement. The central or principal entrance, which will be used only on particular occasions, opens on a hall 20 ft. clear diameter (enriched with columns entablature, niches for sculpture, &c.), and leading to the grand vestibule, which, when thrown open, attains the dimensions of 62 ft. by 42 ft., and is 41 ft. in height. It is lighted by an elliptical dome with twelve divisions of stained glass, each containing an allegorical figure. Beyond this is the great hall, or concert-room, 132 ft. by 62 ft., and 50 ft. in height, which if opened *en suite* with the vestibule (for which arrangement suitable provision has been made), commands an entire length of 174 ft. An open colonnade, 10 ft. in width, flanks the great hall throughout on either side and end, from which descend broad flights of steps to the ground. Ample means are provided in the hall for the immediate egress of a crowded assembly in the event of a panic. The ground floor in addition contains a spacious apartment for the aldermen, offices for the city engineer, town clerk, city treasurer, city surveyor, city solicitor, health officer, and subordinate officers. The first floor on the north flank comprises the council-chamber, 42 ft. by 31 ft. 6 in., with public gallery; municipal library *en suite*, 38 ft. by 22 ft. 6 in.; mayor's room, 26 ft. by 22 ft., and ante-room. The south flank is devoted to a proposed public library and reading-room, 101 ft. by 31 ft. 6 in.; the library will have a separate entrance and staircase on the cathedral side of the building, which can be devoted entirely to its use without interfering with any other portion of the building. The drawing offices, two in number, each 42 ft. by 22 ft. 6 in., are situated above the grand vestibule. The great hall is surrounded by an internal gallery, 5 ft. in width on the sides, and 10 ft. at either end; orchestras are provided at a lower level on either side, each capable of accommodating a full military band. The architecture is of the Renaissance period of Italian architecture, in combination with Venetian details; the orders, Ionic and Composite, superimposed and surmounted by balustrade parapet, the whole suitably ornamented. The clock-tower is 26 ft. by 26 ft. at the base, rising to 190 ft. in height above the pavement. The general building, from ground level to parapet, is 57 ft. in height.

The foundation-stone of this building was laid by his Royal Highness the Duke of Edinburgh on the 4th of April, 1868, Mr. Chas. Moore being at the time mayor of Sydney. Mr. James Barnet was the architect.

Breach of Building Regulations.—Evan Pritchard, builder, residing in Moscow-drive, appeared in the county magistrates' court at Liverpool, to answer an information preferred by the West Derby Local Board, charging him with having erected a building without giving fourteen days' notice, and without having deposited plans, as required by the bye-laws. Mr. Radcliffe appeared on behalf of the Local Board, and said that the offences with which the defendant was charged were becoming so common that the Local Board deemed it right that a stop should be put to them. Mr. E. H. Allies, the surveyor of the Board, stated that the defendant had proceeded with the erection of a coach-house and stable in Osborne-road, and had not given notice of such erection, nor deposited plans. The defendant, who said that he did not know he was doing wrong, was fined 20s. and costs.

OPENING ADDRESS AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.*

Masons' Strike of 1878.

THIS year has witnessed another of those distressing disorganisations of trade and good will —"The Masons' Strike." It was, indeed, nominally confined to the masons' trade; but it is within the experience of us all that when one important trade is in a state of hostility to the conditions of its labour, other trades are also seriously affected. True it is, happily, that in these days strikes have lost that ferocity which once disgraced them; that they are conducted more calmly, and even with kindly personal feeling. But unhappily we see as yet none of that spirit we would hope for to submit disputes—arising frequently in misunderstandings only—to independent, and therefore impartial arbitration. Earnest effort was, as I know, made on this occasion with that object; and I do not believe its failure is to be ascribed only to the workmen. Exhaustion on their part, which this year appeared to be the sole reason for their ultimate submission, gives, alas! no guarantee against the recurrence of strikes under circumstances possibly less peaceful in their result.

General Conference of 1878.

In the first year of my becoming your president, *i.e.*, in 1876, a General Conference was held; and again this year. At both of these, but especially at the last, a very large number of our brethren from all parts of the country attended; and this year the "Société Centrale des Architectes" of France delegated one of their members to represent French architects by our side. I hope that the organisation of these conferences will be carried out with increasing care for their successful issue. It is my conviction that, while it may not be possible to describe or measure in precise terms their results, yet they have results for good and are fruitful in benefit to our profession; and that this is a wide-spread conviction is clear, from the fact that each year the numbers attending have been larger. At the dinner which enlivened the gathering this year, we had the pleasure of seeing, in goodly numbers, representatives of each class of our members, and not a few distinguished guests. Indeed, I am informed that a larger number than ever before attended did so on this occasion,—an evidence, I hope, of the increasing regard in which our Institute is held; and I am sure you will not forget the gracious letter from His Royal Highness the Prince of Wales, expressive of his sympathy with us, and his regret that he could not on this occasion, at least, have been with us. While on this subject, I ought not to omit to notice the Congress of Architects which has just been held in Paris, to which we received an official invitation. It unfortunately happened to be held when neither your president, nor any of your vice-presidents, could attend, but English architects were not unrepresented there, some well-known members of the Institute having attended, and having duly spoken on behalf of their brethren here.

Archæology.

I have not this year many such triumphs of archæological research and discovery to record as in my last address. We now probably know all that Dr. Schliemann is likely to be able to teach us as to Mycenæ. With a noble restlessness he has been exploring and excavating in Ithaca, but has unearthed no antiquities, and has made up his mind that none are to be found, and that he must fain content himself with having, as he believes, identified the sites of places made classical by Homer; but he returns to his labours in the Troad under more favourable circumstances than before, and with renewed hope and enthusiasm. At Olympia, German explorers have been perseveringly continuing in their work, but unfortunately they have not, I believe, been rewarded by any important discovery. The site of ancient "Dodona" has been further identified by Mr. Carpanos, who has found a number of works in bronze, which, though of a low style of art, have nevertheless much interest archæologically, and have been useful to him in sustaining his identification of the city. He has, however, discovered no architectural remains and but few sculptures, and those of small interest. In Italy, indeed, we are told of an interesting discovery near Monte Gargano in Apulia, viz., of the city of "Sipontum" mentioned by Strabo and Livy, which seems during some of the volcanic earthquakes, of which traces are everywhere to be seen in that locality, to have subsided and been bodily swallowed up while the earth closed upon it. Its buildings (of course, overthrown and ruined, but still *in situ*), are upwards of 20 ft. below the present soil. The authorities of the locality and also the Italian Government are taking steps on a liberal scale to pursue the excavations. Porticos and temples have already been laid bare, while many stones with inscriptions of various value have been sent to the National Museum at Naples, and will engage the attention of classical students and archæologists. Doubtless, ere very long, detailed descriptions will be forthcoming. Meanwhile, I would only record the fact that, in the year 1877, a second Pompeii has been laid open to us.

I will not quit this part of my subject without referring, as in former addresses, to that land of all lands interesting to us, from associations of art history, but above all of faith in our religion—Palestine. Much has been done there, as you know, and the zealous committee who are directing the operations, or rather collecting the means for the operations, having completed a thoroughly reliable survey of the country west of Jordan, are now proposing to follow the "excavating" examples set them by other discoverers; to search out *under ground* and identify the sites or remains of buildings, the history of which appeals to our highest and holiest feelings, because they have, it may be, been actually sanctified by the bodily presence of Our Saviour while on earth. Around the Sea of Galilee they propose to work, and most of you have no doubt already received, with their appeal for funds, a statement of their intended operations, which must awaken extraordinary feeling even by the bare recital. The modest sum they need is, they say, only 2,500*l.*, and they have, I am sure, our hearty wish that they may readily obtain it. It might not be, perhaps, deemed inappropriate if some moderate subscription were made by this Institute, if only as evidence how truly we wish them success. While, however, sympathising most cordially with them, we architects have a right, I think, to complain of a most singular imperfection in the composition of their proposed exploring staff, which is to consist of Royal Engineers, of a geologist, a naturalist, and an Arabic scholar, *but no architect*. When the first objects of their quest are to be for the sites and remains of ancient buildings, to be without an architect with them seems to me like attempting to read history without having learnt to read. This, surely, only needs to be mentioned for the Committee to supply the omission, because many earnest and competent men among us would, I am sure, readily volunteer for the work on payment of their actual expenses only. If I may be allowed to say so above a whisper, I would suggest that one of the Royal Engineers could better be spared than that the party should be without an architect to take an intelligent record of plans and arrangements of unearthed buildings, to make reliable drawings of mouldings or sculptures that may be found,—in short, to import to the undertaking that peculiar kind of power which an architect's special training gives him, and without which aid the results of the expedition are likely to be only half satisfactory.

Session and Papers.

I must resist the temptation to consider with you many other subjects of professional interest to all, and to architects in particular, which have been ventilated during the past year: such as the great subject of technical education for our artisans,—the electric lighting of our cities and public and private buildings,—the adequate supply of pure water to this huge metropolis,—the hitherto extraordinary delay in carrying out the intended beneficial operation of "The Artisans' Dwellings Act,"—the many important street improvements in progress and projected,—the annihilation of the Thames as a barrier to circulation between North and South London, by the gradual and early abolition of all bridge tolls. Want of time and space, and regard for your patience, warn me that I must only allude to these interesting subjects, some or all of which may perhaps form the subject of papers to be read in this room. Equally, I can only barely refer to the very valuable and instructive papers read before you during the last session, and the frequently prolonged discussions which took place on them. I ask, however, while on this subject, to be permitted to urge on our

* By the President, Mr. Charles Barry. See p. 1220, *ante*.

members that, to secure a really practical interest in our meetings, we ought to take up courageously the challenge so frequently made to us, and to discuss among ourselves,—with that special knowledge we ought to possess and which many of our members do possess,—technical questions affecting the life and happiness of those whose houses we are called upon to design and arrange. It ought to be impossible to allege with truth, as is so often done, that architects care only for the æsthetical, and delegate to subordinates the vital questions of ventilation, warming, lighting, sanitary arrangements, and cognate matters.

And now to turn for one minute to the subject with which I propose to conclude my address, viz., "The Past and the Future of our Institute."

In referring to the past of our corporate life, let me render a heartfelt tribute of gratitude to those who founded the Institute, and who, through so many painful and even discouraging years, watched over its infancy and struggles into greater strength. They began their labour when the appreciation of art as such in architecture was, if not forgotten, yet peculiar to a very few, and utterly neglected by the large body of the public. They have some of them lived to see the time when art-study, and hence art-knowledge, has become recognised as a necessity to all ranks, from the pupil at a Board school, part of whose compulsory education is now to learn to draw, passing on through the public schools of science and art, gradually establishing themselves throughout the length and breadth of the lad, and spreading art-knowledge, refinement in taste and appreciation of the beautiful among all the middle classes; then reaching upwards to higher social ranks of society, among some of the members of which higher class it was once thought rather a mark of distinction to profess ostentatiously a contemptuous indifference to any study so unimportant as that to which artists devote their lives, but where now it is happily deemed a mark of ignorance to be unable to enjoy intelligently, and to discuss with knowledge, artistic questions as they may arise from time to time,—questions which are now even of sufficient importance occasionally to agitate society. Those early members of our Institute laboured on with their good work, and with a faith and prescience that does them infinite credit, and can never be too much appreciated by us, their successors. They laid the foundation of the society of brethren they were endeavouring to form, on,—firstly, a more and more careful study of the refinements, the hidden beauty (to be revealed only to the earnest and intelligent student), and the grand scope of architecture taken as a fine art; and, secondly (and no less), on strict integrity of practice in discharge of the manifold duties of a profession where the architect must be, as it were, a trustee for his client, while he must be absolutely just to those who are employed under his direction. That the structure of our Institute has well and nobly stood on these solid foundations, and that they are still deemed essential to its vigour and usefulness, let the gradually-increasing roll of names on the list of members, and the fearless position we have gradually become able to take before the public, be the reply. It remains now with us, and, for the future, with those who succeed us, to lose not an inch of the ground that has been won; and to encourage us we may remember that the effort to keep up motion is small indeed compared with the force originally necessary to overcome inertia and give a momentum for the first time.

In my last address I was only able to refer in terms of hope, indeed, to my own expectation that the changes in the constitution and in the position of members of our body would work well and prove beneficial. Now, happily, I am able to point to the success of those changes as a fact. So far from any diminution in our numbers having taken place,—as some faint-hearted ones did prophesy,—you have heard already the increase that has taken place since 1876 (the year of our changes), in our professional members; and that, I am pleased to say, in due proportion between metropolitan and non-metropolitan members.

With regard particularly to our non-metropolitan members, I desire to say a few special words. I dared to express my belief last year that these gentlemen, deservedly honoured, trusted, and, for the most part, fully engaged in important works in the several localities where they were settled, could and would show that they had ideas of professional brotherhood and professional action not limited to a locality, but that they would recognise the Institute as their centre of professional thought and organised action; while labouring earnestly and usefully in their own spheres of action respectively, they would feel that the central body was deserving of their regard and support, and would be also anxious that their works and doings far away from London should be known to and approved by their brethren here. This has been, I see, sometimes called "Centralisation,"—using that term not as indicating, as it should do, a medium of strength and vitality radiating from a centre to all distant members of a body corporate, and receiving back strength and vigour from them; but as a term of reproach, inferring that a centre and a centre only shall exist, to the maintenance and importance of which all distant organisations were to be ministers only. Doubtless such a state of things must have a speedy end in the exhaustion of the extremities, and the ultimate consequent paralysis of the centre left without circulation and nourishment to be derived from them. The word I would use would be circulation in place of centralisation. Our distant brethren, I believe, regard the Institute and membership with it in the light of an insurance for professional aims, objects, interests, and, if need be, defence, and not only as a medium for study and information; for though these, no doubt, are of grave importance, they are not the only objects we all have at heart.

Such morbid centralisation, however, I am most thankful to say is not existing with us, as we have seen. The extremities of our organisation are no less vigorous and growing than our central body, and I am sure I speak not only for myself but for all the members of the council, and for all London members of this Institute, when I say that any sort of means that can be suggested and is capable of being practically worked out, which shall cause or conduce to greater intercourse with and amongst our scattered constituency, will be received with the most hearty welcome and the most sincere co-operation by us all. In the excellent address made last July to the Society of Architects of Manchester by their new president, Mr. Waterhouse, it is I see suggested, that our conferences ought not always to be held in London, but occasionally in some of our important provincial cities. I concur with him in thinking this well worthy of consideration, though there are obvious difficulties (chiefly financial ones), which would have in some way to be met. But let me, in the name of all our members, as I am sure I may do, repudiate in the strongest language I can use the idea lately broached by an irresponsible writer, that London architects as a body so far forget themselves as to hold their provincial brethren cheap, and to assume arrogantly an attitude of superiority to them when attending our conferences or our meetings here, quite unjustified by the comparative importance and excellence of their professional works, as we shall be forward to admit. How widely different from this is our feeling the large majority of our distant brethren well know; the cordial welcome and general hospitality invariably extended by them to the representatives for the time being of this Institute, whenever they visit any of our important cities, is sufficient evidence that those who have affected thus to speak in their name are unauthorised to do so, and ignorant of the true sentiments of their self-constituted clients.

It has been my happy privilege since this time last year to visit our professional brethren (at their earnest and cordial invitation) in more than one important city, and last, not least, in Dublin, where I found Irish architects most keenly alive to our action, and whence several new members have expressed their intention to enrol themselves; while our members in Scotland also are increasing each year, no less than the architects of our chief provincial cities. I should, indeed, be ungrateful and insensible if I did not take this opportunity of making known to you that the warmth and consideration with which I have been received by our professional brethren in all parts, as representing you, cannot be exceeded, and deserves your cordial acknowledgment; and that the universal wish in every place I have so visited is to enjoy closer connexion with the Institute, which I have always found regarded with respect and sympathy, and never with jealousy.

It is my earnest hope that during the coming year some scheme of mutual systematic working together for professional objects throughout Great Britain and Ireland shall be brought about by the Council, whether in the mode indicated in my last year's address, and embodied by the Council in a paper sent to all known organised societies in the kingdom, or in some better way. This communication has as yet only been very partially responded to, but this seems to me the natural and necessary sequel to the work of the last two years. That it is full of difficulty is true, but that any difficulty, fairly faced and grappled with, need be deemed insurmountable, I am loath to believe.

And now, leaving consideration of our professional members, whether in or out of London, may I not ask you to rejoice with me at the very great success of our invitations to lovers of art and science outside our profession to join our ranks? Fully as I believed that a sympathy with us did exist among men of intellect and education, which only did not express itself from want of opportunity and knowledge of our aim, objects, and principles of professional life, I confess I am no less surprised than gratified to mark the list of names of those who have been pleased to join us in less than two years as Honorary Associates,—numbering as they now do no less than seventy-seven. You will see among them the names of men of the highest social and intellectual rank; artists of the highest position and universally acknowledged power; engineers recognised as being some of the masters of science of our day; Church dignitaries, who have recognised how inseparably bound up are the deepest feelings of religious faith with the art that has ever delighted to symbolise and adorn the glorious fabrics which are everywhere the external evidences of that faith; Members of Parliament, who are among us with the object, we cannot doubt, of becoming if possible more able in their places in Parliament or elsewhere to speak with more knowledge, and therefore with a greater sense of responsibility than before, on questions of architectural art and architectural practice; antiquaries, who thus testify to that great function of architecture which makes her works the most reliable, while the most enduring, witnesses of the history of bygone ages; amateurs and dilettanti, who have come hither in the hope (not I trust to be disappointed) that they will add some further items to the knowledge they already possess, and be enabled further to value those architectural efforts of past time which they with us have already learned to admire. That the class of Honorary Associates is a growing one, you have had evidence in the list of new recommendations you have heard read this evening, and I for one have no fear, in spite of the Cassandra-like predictions of some of our dear despairers or candid friends, that this class is only a novelty to last a short space and disappear. I confidently look forward to its large increase. Nor have I any fear that the strictly professional objects and proceedings of this Institute can ever suffer, or become less important, by being conducted in the presence and under the useful criticism of such a public as the class of our Honorary Associates must, I am glad to think, for the future always afford us. I have reason to know that the existence of such a class, composed of such members as are to be found of it, has already had important influence for good to architects in the highest quarters; while we have had already evidence of the satisfaction of some of its members with their new position, in the valuable and interesting papers they have read before our ordinary meetings.

In concluding this somewhat lengthy address, a thought is in my mind begetting one question I desire to put to you on this the last opportunity I shall have of thus addressing you. My thought and question is: Shall our Institute henceforward be an active or a passive body? For all the early years of its existence it was necessarily more or less passive,—rarely coming into public notice, rarely exercising either towards the public, or towards or on behalf of its members, the powers with which its organisation really invests it, and which its earnest members have always so much desired. Its transactions, no doubt, have always had much interest for its members, but it exercised so little influence on the great world in which we live, that its very existence as an organised and still less as a corporate body has hardly been known to the public till lately, and was still less heeded by them. During the last few years, however, it has entered into a more "active" phase of

existence. Its finances, its earnestness, its diligence, and, therefore, its powers, have largely increased. Its labours have been extended into new fields of action. Its opinion and its assistance have been solicited as they never before have been. Its Council has been more and more frequently called on to decide questions arising on professional practice, and to arrange difficulties between professional brethren, and between architects and their clients. It has become, in fact, more known; has interfered with some effect in public affairs; and has enrolled among its members a larger average annually of professional men in all parts of the kingdom than formerly. It has further enrolled in the new class of Honorary Associates a number of that outside public to whom previously its existence was unknown and uncared for, and these have testified their sympathy with it by attending its meetings, joining in its discussions, and, as I have said, even contributing papers to its Transactions. Now I ask our members which of these two conditions of its existence is more satisfactory to them?

There is, surely, evidence of a state of vitality and energy, as distinguished from one of torpidity, and one for which I can claim only my share of credit or discredit; for, be it remembered, no president of yours could organise or maintain such a state of life without the assent and continued support of his colleagues on the Council and of the members generally,—support that has been given, and which I can hardly find words duly to acknowledge. Such a state of vitality involves, no doubt, on the part of those who have the conduct of your affairs, zeal and vigilance as to matters daily occurring around us of interest to the profession, as well as a large devotion of time and thought.

It is for you, the members at large of our body, to say whether in their actions your representatives have correctly interpreted your wishes; and if they have done so, you will, I am sure, afford them in the future, as you have indeed done in the past, your hearty and cordial encouragement. There is not a member of the present Council who is not ready ungrudgingly to give his time and best efforts to maintain and strengthen the position we have attained, and who will not be fully content to find as his reward that he is encouraged and loyally supported by you. I dare to be confident on which side your verdict will be given, and to anticipate for our Institute a growing and still-growing importance and usefulness, feeling sure, as I do, that in its active life benefits will accrue to the public at large in equal proportion as they accrue to ourselves.

With a sincere hope that the session now opening before us will be in every way pleasant, useful, and lastingly effective, I thank you for the patience with which you have listened to me.

THE LIGHT OF THE FUTURE.

In the comparative lull in the matter of the electric light,—not the lull which precedes a storm, but that which may usher in the advent of "a grand means of illumination, surpassing even the dreams of our ancestors,"—it may be well that we should keep our readers informed as to the progress of the new agent.

Inventors have been busily at work. We may dismiss from consideration Mr Edison's light until the time when the vague rumours now flying about concerning his invention have been replaced by more definitive information as to the nature of his proposed application. While speaking of the Edison light, a report respecting it may be mentioned, to the effect that the cost of Edison's system is apparently of a threatening kind, even should the enormous practical difficulties be overcome. As to the cost of the electric light in general, however, it is satisfactory to hear that it was stated at a recent meeting of the Chemical Society that the invention had been so far perfected that a five-horse power gas-engine, consuming only one cubic metre (34 cubic feet English) of gas in an hour, is supplying a light equal to 3,000 candles.

An important practical step in the division of the electric current is said to have been made by Mr. Werdermann's important invention for lighting with a divided electric current. This inventor, who is already well known in connexion with the production of electric light for the illumination of large areas, has lately (and successfully) directed his investigations to adapting electricity for lighting purposes to the requirements of ordinary life, by producing many independent lights from one current. In the public trial which recently took place, the current was generated by the Gramme machine, and conducted along a cable serving to light two large lamps, each of a stated illuminating power of 300 candles. The light was described as steady, soft, and sunlike, and causing no discomfort to the eyes, though it was not shaded. The two lamps being extinguished, ten smaller ones, fed by the same current, were next exhibited. From the cable, which might be said to represent a gas-main, a wire, answering a service-pipe, ascended to the positive electrode of each light, an upright rod of carbon touching the centre of the underside of a disc of carbon (the negative electrode). A balance suspended from the apparatus served to keep the positive electrode in its place as the carbon is being consumed. Another cable and a special wire united all the negative electrodes, the current going to earth at the last lamp. On the connexion being made, the ten lamps were at once lighted, each light being of about forty-candle power. In order to demonstrate that the ten lamps can be independently lighted, burned, and extinguished, one current only being employed, first one of the ten lights was extinguished, then a second. The effect on the other eight was the same as with gas under similar circumstances; they became slightly more brilliant. It was explained that this would not really be the case, as there will be an arrangement by which, on the extinction of a light, the current would be directed along a supplementary wire, and thus neutralised. It was elicited at the trial that the proportion of horse-power absorbed by each light will be less as the number of lights is greater. The longer the distance traversed by the current the larger must be the electromotive power. Mr. Werdermann thinks that he can carry one circuit a length of from two to three miles.*

Another light which has recently been brought prominently before the public is that of M. Rapieff, a Russian engineer, whose name is associated with improvements in electric lighting, and whose system is already too well known to need describing. M. Rapieff's system is in full operation already in the machine-room of the *Times*, and the proprietors of that paper are so highly satisfied with its working that the necessary preparations are almost completed for applying it to the composing-room and other departments of their establishment. It may consequently be asserted that M. Rapieff's light is an established fact; for it has passed from the experimental stage into that of an illuminating agency in actual nightly use. It is admitted by all who have observed it that it is remarkably free from those fluctuations which form such a serious drawback to some other systems. M. Rapieff's lamps, though working upon one circuit, may be extinguished one after another without any apparent effect upon the lights still remaining. Another essential feature of his system is that every lamp is rendered independent of any mischance that might happen to the next one. The machine generally used by M. Rapieff is a Gramme dynamo-electric machine, producing alternating currents, but a single-current machine may also be employed. It is calculated that one horse-power is capable of maintaining a light equal to 100 gas jets, each jet equivalent to twelve standard candles. Carbons costing at present 10d. a yard (it is expected that they will be much cheaper by and by), and the consumption being at the rate of 8 in. per hour, the cost per hour for carbon would be 2½d. for an illuminating power equal to 1,200 candles. In establishments employing steam-power largely the extra power required for driving electric machines might add but a trifle to the working expenses of steam-engines, but this would depend on circumstances.

The light produced by means of the Farmer-Wallace dynamo-electric machine and lamp, which machine Mr. Edison prefers for obtaining his supply of electricity, has also been lately tried. This machine is duplex, and can be used as two machines giving two separate circuits, each circuit producing from one to five lights at the same time. But it is the lamp of Mr. Wallace which excites the greatest interest. It is called a carbon-plate lamp. Its use dispenses with the clockwork arrangement of French inventors, as well as the insulating substance of M. Jablochkoff, a simple continuous electric current being all that is required. The "lamp" is formed by two plates of carbon from ¼ in. to ½ in. thick, one of which is placed horizontally above the other. They correspond to the positive and negative rods of the ordinary lamps, with this difference, that, instead of being fixed at a point, the light moves continually along the line of separation. The two plates having come together, and thus completed the circuit, they separate immediately by a simple automatic contrivance for about ¼ in., and the brilliant light instantly bursts forth. As the carbon is gradually consumed where it burns, the interval there necessarily increases, and the light always tending to concentrate where the interval between the two poles is at a minimum, it will be seen that it is always shifting. When thus a length is to a certain extent eaten away, the upper plate drops, and the action already described is instantly repeated. As many as five lights have been obtained on one circuit. The economy of this system is probably its strongest point. The carbons are said to cost 2s. 6d. a piece, and a pair in each lamp will burn for 100 hours. The light, it is stated, causes no unpleasant effect to the eyes.

Besides those comparative experiments of different systems that have taken place, the electric light has been tried in the erecting-shop in Portsmouth Dockyard. The machine used was one of the Wilde machines, intended for service on board the *Iris*. The lamp was placed near the roof of the building, the carbon points being adjusted by hand. The whole shop was lighted up, though the shadows were opaque. Two lights, it is believed, would be sufficient for practical purposes. After the light had been tested nakedly, it was tried under a dull glass globe, but the result was not satisfactory. Trials have also been carried on at the Royal Arsenal, Woolwich, where a new carpenters' shop, pending its provision with gasfittings, has been experimently lighted by an electric lamp, hung from the roof. It has been found that the lamp furnishes a good light to work for 50 ft. in every direction, and that for workshops where the roof is high and the space unobstructed the electric light is suitable and pleasant. The cost of this one lamp has been 8d. per hour, and it supplies a light equal to from forty to fifty gas-jets. The steam power for generating the electricity is supplied without charge from the main factory adjacent, and nothing is calculated for wear and tear of the apparatus. The light, though always brilliant, is somewhat intermittent, consequent upon the ever-varying pressure upon the machinery, which drives more than 500 lathes, and the small limit between the minimum and maximum number of revolutions required for the electric light is thought to render the employment of standing machinery in most cases unsuitable.

A practical and satisfactory trial of the electric light is reported from Essen, where, in the factory of Herr Krupp, a lamp patented by him has been tested. At present the factory, with the dimensions of which the readers of the *Builder* were not long ago made acquainted, is lighted by gas made on the premises, at a cost equal to the price charged for the article in London. The motive power required for driving the dynamo-electric machine has hitherto been so small in comparison with the steam-power employed in the factory that the extra demand has not been perceptible. Under these circumstances the cost of the electric light has been calculated to be one-third less than that of gas, and Herr Krupp is about to adopt the new system more extensively in his large establishment. It is intended to use the naked light, and to place it so high as not to dazzle the eyes of the workmen.

Lectures bearing upon the subject have been delivered in various parts of the country, the public halls used for the purpose being in all cases brilliantly illuminated with the various forms of the light. At the recent election in Peterborough an open-air meeting was held in the market-place, the square being lighted up by the electric light.

The grand trial of the electric light on the

* In reference to the probable economy of the new burners which are to give light equivalent to ordinary gas-burners, the following results, based with a mean of what we may call the King type, are highly suggestive. They are given in a paper on the Electric Light, by Dr. Henry Morton, in a new American periodical, *The Plumber and Sanitary Engineer*:—"A given battery power being used on one lamp gave a light equal to that of nine gas-burners; but being divided to supply five burners, yielded only the light of two and a half gas-burners from each, or of five gas-burners from the two; applied to three electric lamps, each one yielded only one-third the light of a gas-burner, or the three lamps together only yielded the light of one gas burner. Numberless other experiments all showed the same characteristic of loss by division; and if this prove to be a law of action, as it may well be, it is evident that no judgment as to the economy of small electric lights can be based on that of large ones, which are the only kind which have been tested in this respect thus far."

Victoria Embankment has not yet come off, but the preparations are being pushed forward as rapidly as possible. The system to be tried will be the Jablochkoff candle, twenty of which will be placed at distances forty yards apart. The main circuit will be laid in the subway, and branch wires will be conveyed up inside the existing lamp-posts, which are to be surmounted by the electric light. There will be thus no visible evidence as to the presence of the wires, and those lamp-posts which will be selected for the experiment will simply appear with an electric light at their summit instead of a gas-light. The steam engine which is to drive the Gramme machine for generating the immense amount of electricity required will be supplied by Messrs. Ransome.

The intended experiments at the Royal Exchange and the Mansion House, as well as on the Holborn Viaduct, have been postponed, notwithstanding the general desire in the City to see them carried out. The arrangements for lighting up Billingsgate Market with the Jablochkoff candle have at last been completed, and the light was exhibited for the first time on Monday evening, November 25. It has been considered that sufficient light would be obtained from sixteen lamps, each reckoned equal to 1,000 sperm candles if not veiled by the opalescent globe. Nine of these globes were distributed over the ground-floor, an area of nearly 40,000 square feet; two threw a bright light over the river, and the remainder were reserved for the upper story,—the dried-fish market,—and the Thames-street side of the building. It became at once apparent that the greatest strength of the new light lay in the largest space, the two lights on the wharf illuminating it and a large area of the river almost *a giorno*.

Little fault was found with the effect of the Jablochkoff light, so far as purity and diffusion were concerned; but either from the remote position of the burners, or the smallness of their number, their particular application to the necessities of the great fish-market was eagerly disputed. There is no doubt that the salesmen of Billingsgate prefer a close, if coarse, light to soft radiance, resembling bright moonlight, diffused generally over the building; but this circumstance militates in no way against the employment of the electric light for the illumination of large areas. The cost of the light employed in Billingsgate Market is stated to be about equivalent to that of the gas hitherto used (800*l.* per annum), no very large sum for the lighting of an immense building. Whether the avowedly costly Jablochkoff will compare favourably as to cost with the Rapieff, or the Werdermann system, stated to be more economical, remains to be decided. At any rate, it is sufficient to state that it is now on its trial on a large scale in London, as it is intended to light Billingsgate Market with it for some time to come.

Preparations are likewise being made for lighting up two of the passenger platforms of the Liverpool-street Station by electricity, and a very practical test of the value of the light will thus be afforded. Six electric lights, supplied by a Farmer-Wallace machine, will be placed, the railway company supplying the motive power. The lamps used will be "plate lamps," each light being equal to 800 candles. They will be placed 20 ft. high, in a lantern of clear glass.

The negotiations which the Birmingham Cattle Show Council some time ago entered into for the purpose of having Bingley Hall illuminated with the electric light, on the occasion of the approaching cattle show, have been successful. The lighting will be carried out by the Siemens process.

The Corporation of Liverpool has decided to apply to Parliament for powers to enable it to supply electric lighting to the town for use, both in the thoroughfares and in public buildings and private houses.

The Pontefract Corporation is in communication with the London agents of the Edison Light Company, with a view to the electric light being introduced into the borough for lighting the streets and public buildings.

Perhaps the most important suggestion yet made in connexion with the electric light is that advanced by Messrs. Hodson, Price, & Hodson, from whose interesting report to the Loughborough Local Board of Health, upon the question of lighting some of the open spaces of that town with the electric light, we quoted extensively last week. Their views upon the matter are of such a logical and practical kind that they will no doubt be largely acted upon, at least wherever practicable, more particularly as they deal with the question of expense in a highly satisfactory manner; proposing, as they do, to make the power kindly and gratuitously furnished by Mother Nature, and hitherto ignorantly wasted by her children, serve in supplying us with inexhaustible means for illuminating our towns and villages.

WHISTLER *v.* RUSKIN.

Those who were looking for the development of a *cause célèbre* out of the action between an artist and a critic, each remarkable for very decided individuality of character, let us say, must have been disappointed by the results from their point of view. A good deal of unnecessary and unreasonable curiosity had been excited about the case, and we believe some people had an undefined expectation that the artist and the critic would each conduct his own case, cross-examine each other, and indulge in mutual recriminatory philippics before an admiring and wondering court. The case, however, really went off in a very quiet and matter-of-fact manner. The only objectionable feature in it was the adoption of the ordinary barrister's style of contemptuous treatment of an adverse witness, which the Attorney-General thought it becoming to adopt in cross-examining the plaintiff. Otherwise, we must say that in reading the report of the case we were struck by the reasonable spirit in which the subject seemed to be regarded by many of these concerned, and the moderate and sensible language in which other artists who were called gave their evidence in regard to matters on which it would have been easy to digress into high-flown language and irrelevant theorising, and in regard to which there seems with many people to be such an irresistible temptation to that kind of indulgence. This moderation of tone was more particularly to be noted in the evidence of the artists called for the defendant, Mr. Burne Jones and Mr. Frith R.A., especially, whose rational and logical argument and phraseology might afford not a bad lesson to some of the gushing critics of the day, if they would profit by it; and the lesson is the more significant from the fact that the two artists belong to such utterly opposite schools. But both concurred in emphasising the view that art is essentially a matter of finish of execution and not of mere feeling and impression, and it is to be hoped that some of those who have raved about Mr. Whistler's "Nocturnes" and "Symphonies" in a very inconsiderate and ecstatic manner will duly weigh this part of the evidence in the case.

At the same time we must say that our sympathies are considerably with the plaintiff so far as the circumstances attending the conduct of the case are concerned. The fact that some of the evidence on his side appears less logical than the opposite evidence, partly arises from the fact that what it was endeavoured to establish was exactly what is not properly capable of proof or even of being expressed in words. The kind of value which there really is even in some of the most shadowy of Mr. Whistler's poems in pigments, is exactly that which is to be felt rather than analysed. And we must say that the spectacle of an artist of very rare gifts and of imaginative genius being put into a witness-box and having to explain the kind of merit of his works to an audience probably the very last that would be able to understand his remarks, viz., an average jury, is a somewhat lamentable one. It may be said that the artist brought himself into the position; but he is, at all events, not answerable for the tone and manner of the questions put by the defendant's counsel, who endeavoured to disparage him, and show that the price obtained was disproportionate to the time expended. In replying that the price was paid for the experience and ability which enabled him to produce the work, and not for the time it occupied, Mr. Whistler made a hit which was not the less to the point because it is not a new one, and which was at all events appreciated by the public in the court. It appeared to be considered a very good joke by the legal mind that Mr. Whistler designed his own frames in a way that had reference to the scheme: we can only say that we wish artists in general paid the same kind of attention to the harmony between the picture and its setting.

We have said before that we thought Mr. Whistler had carried out, to an undue excess, the idea, which was a pretty and original one in itself, of making abstract harmonies of colour, and that he had worked this vein quite enough. But there is a beauty in many of these productions, and one which it is impossible to lay in a legal definition before a jury, and the artist was quite justified in his answer to the stupid questions of the Attorney-General,—"It is as impossible for me to explain to you the beauty of the picture as it is for a musician to explain the beauty of the harmony in a musical composition," the only answer that possibly could be given. In the criticisms which have been passed upon the case in the daily papers, the artist also has been done much injustice to in the assumption, by people who knew no better, that he cannot draw correctly; that, in short, the peculiarly vague style of his art is assumed as a cloak of his technical incapacity. No one who had seen the collection of Mr. Whistler's small life-studies which were in M. Deschampe's gallery two or three years ago can for a moment hold such an opinion; and any one who knew much of the matter would recognise the evidence of unusual power of draughtmanship, even in the apparently roughly-executed portraits which have been the subject of so much question, some of which exhibit, as we have observed from time to time in our notices of picture exhibitions, a quite unusual force of draughtmanship, though displayed in an unnecessarily eccentric and incomplete form.

The moral of the case is, that it is better for artists and art-critics to keep out of court. They bring to the lawyers questions which the lawyers are generally not competent to decide, or even to understand the merits of, and in the present case a verdict has been given which is a practical rebuke to both sides. Mr. Whistler gave as a definite ground for the action that he could no longer sell his "Nocturnes" at anything like the old price since Mr. Ruskin passed condemnation on them. The principal deduction we should draw from this is, what blockheads the public who are the purchasers of pictures must be, who have no judgment of their own, who are ready to give a high price for a certain class of works because the artist says they are worth that, and to refuse the price when Mr. Ruskin says they are not. It may be well if the consideration of this view of the matter inclines people to go on their own real liking and disliking a little, instead of taking as gospel what the last person with any name tells them; and Mr. Whistler may have reason not to regret the affair, though he hardly showed good judgment in entering upon it, if it should force on him the conviction that he is not doing justice to his own genius, and that eccentricity in art affords a very unstable basis of reputation.

A "NEW DEPARTURE,"—AND WHAT IT LED TO,—AT THE ARCHITECTURAL ASSOCIATION.

At the ordinary general meeting of this Association on Friday, the 22nd inst., Mr. H. L. Florence, president, in the chair, the first business after the minutes had been read, was the election of members, which took more than an hour, as the ballot was demanded, and there were no fewer than sixty-three candidates, nineteen of whom were "black-balled." Whatever reason there may have been for departing from the usual procedure * must be looked for in the remarks of the gentleman who felt constrained to demand a ballot.

Mr. W. Scott said:—At the conclusion of last session I gave formal notice to our secretaries that, at the commencement of this session, I should, on the first occasion on which we proceeded to the election of members, demand a ballot. In taking this step I wish to accept for myself the fullest responsibility that can attach to such an act. At the same time it is only fair to myself and to those who agree with me that I should tell you that I have not taken this step without the fullest consultation with a very large number of my fellow-members. We are of opinion that the time has arrived when this Association can afford to be not only particularly careful as to the qualifications of those who may be admitted as members, but can afford to make it somewhat more difficult, and consequently somewhat more of an honour, to obtain admission into our ranks. Personally, I hope that the time will soon arrive when we shall be accustomed to see the election of members conducted

* The members are usually elected by show of hands, but Rule 10 says that the voting is "to be by ballot, if demanded."

usually by means of the ballot instead of only occasionally, and I hope that some of our future members will learn to consider it a special privilege and compliment to be exempted from the ordeal of the ballot. I propose, with your permission, to suggest one such exemption this evening. In the list of candidates there occurs the name of a gentleman so well known to you, and of such high standing in our profession, that I feel sure that you will agree with me that there cannot be two opinions as to the desirability of his election. I have only to mention that I refer to Mr. Lynn, of Belfast, who is a member of the Royal Hibernian Academy, and an architect who is well known, and whose position in the profession is no longer merely that of a student, but that of one in large and extensive practice. I am quite sure that you will all agree with me, and that you will be extremely delighted to see Mr. Lynn's name on our list of members. I hope, therefore, you will allow his name to be put from the chair. In the case of each of the other candidates coming before the Association this evening I formally demand a ballot.

Mr. Lynn's election was put from the chair, and carried by acclamation, and the meeting proceeded to ballot for the remaining sixty-two candidates, in batches of ten at a time, there being only ten ballot-boxes available. In the first batch, one candidate was rejected; in the second, three; in the third, three; in the fourth, four; in the fifth, three; in the sixth, five; making a total of nineteen rejected. Only about thirty of the members present, out of a total of from 120 to 130, voted, and, as far as we can learn, there was no valid reason why any of the nineteen gentlemen should have been thus ignominiously rejected. Their proposers and seconders were for the most part well-known members and office-bearers in the Association, and the only way in which the result can be accounted for would seem to be that a few * of the members voting "blackballed" candidates simply because they were not personally known to them, instead of merely refraining from voting at all, or voting "Yes," on the strength of the proposers' and seconders' names. Evidently some of the members of the Association have a little to learn as to the use of the ballot, and perhaps the *fiasco* which we have chronicled may teach them a useful lesson. We say "*fiasco*" advisedly, for it is impossible to conceive that such an abnormally large proportion as nineteen out of sixty-two candidates, or nearly one-third, should be unworthy, for any reason or combination of reasons, to be elected members of the Association.

Mr. Aston Webb then proceeded to read a paper on "Windows," a portion of which we print elsewhere.

THE LATE MR. SAM BOUGH, R.S.A.

Mr. Sam Bough, R.S.A., died at his villa residence at Morningside, Edinburgh, on the 19th inst., in his fifty-seventh year, and in him Edinburgh loses one of its most prominent celebrities.

The stalwart figure of the artist, arrayed in the most careless, not to say slovenly, manner, accompanied by a large bulldog, pointed him out as one of the Bohemian brotherhood. And his manner in private was not governed by the conventionalities of society, but was brusque in the extreme. But withal Mr. Bough was good company, and had an extensive circle of acquaintances, who overlooked his eccentricities and submitted to his somewhat satirical remarks in consideration of his *bonhomie*, for he was very kindhearted, and was not unready to assist a friend in need either by advice or by more substantial help. For the first week or so after the opening of the Royal Scottish Academy Mr. Bough was as conspicuous in the rooms as his pictures, and his racy remarks upon some of the productions on the walls were a source of considerable amusement to his friends.

Mr. Bough was the son of a shoemaker in Carlisle. He exhibited an early predilection for drawing, notwithstanding which he was sent to a lawyer's office to get some insight into legal practice; but the desk was irksome to him, and two years' trial rendered it evident that the law was not his *forte*, and he turned his attention to what was his true vocation—art. The only drawing-class in Carlisle at the time was kept by a journeyman painter, and to that he went to acquire the rudiments of his art, sketching from nature when opportunity occurred. His Bohemian proclivities soon exhibited themselves, for after he had acquired a little cash, he provided himself with a cart and tent, and lived in true gipsy style so long as funds lasted. When about seventeen years old Mr. Bough visited London, and employed his time in the National Gallery, copying and studying from the works there, but he does not seem ever to have entered as a student at the Royal Academy, or to have received regular instruction from any other source. Upon his return to Carlisle the young artist showed great aptitude in producing scenery for amateur theatrical entertainments got up for the amusement of his family and friends, and some of these sketches having been submitted to the inspection of a theatrical manager in Manchester, procured him the situation of an assistant scene-painter in that city. In his new sphere Mr. Bough soon showed his superiority to his principal, and was promoted to his place. While in Manchester the artist exhibited some of his works at the Institute there, and for a water-colour of "Achan Mill on the Lowther" he was awarded the Haywood gold medal.

From Manchester, Mr. Bough proceeded to Glasgow, to fill the situation of principal scene-painter at the Theatre Royal there. Soon after this engagement he married Miss Taylor, a vocalist employed at the theatre, a step which led to a misunderstanding with the manager, and the termination of the engagement. From Glasgow, Mr. Bough proceeded to Edinburgh to fill the post of principal scene-painter at the Theatre Royal in that city, but by nature Mr. Bough was not fitted to serve any one, and this engagement soon terminated. He himself now saw that his best course was to adopt an independent line, and rely upon his paintings for a maintenance. After passing through various vicissitudes of fortune in different localities, he finally settled down in Edinburgh as a steady, laborious artist, and became the most popular landscape-painter in the city.

Mr. Bough, in the earlier period of his career, devoted himself principally to water-colour, and his works in that medium may safely be placed amongst his most successful efforts, although it is to his more ambitious labours in oil that we must attribute his popularity.

As a scene-painter, Mr. Bough had acquired that dangerous facility which leads the artist too frequently to attempt to arrive at results by the shortest possible means: we consequently find in the works of this artist a remarkable diversity of merit. He did not confine himself to one class of subject, but hill and dale, lake and farm, moor and morass, and common and hayfield, ships tossed in the open sea or lying quietly in harbour, all alike engaged his attention, and these he delineated with much spirit and with telling effect. But once upon a time Mr. Bough undertook, for a wager, to paint, within a very limited time, an historical picture which was exhibited in the cell of the Scottish Academy. The subject chosen was characteristic, exhibiting Frederick the Great at Sans Souci, in a fit of passion, kicking out his ministers from his drawing-room. The work could hardly be looked upon otherwise than as exceptional, and bore a decided stamp of caricature. In a recent work portraying the triumphant march of the Scottish army as it returned, during a thunderstorm, over the Solway sands, we cannot help thinking that the artist was indulging in silent satire upon the bumptiousness of those Scots who ventured to refer to the quotation in the Academy catalogue, which declared that during the expedition in question "twenty Englishmen fled at the sight of one Scotchman, such was the terror which their prowess had produced."

Mr. Bough was well read in British literature, and when in the vein delighted in quoting his favourite authors, of whom Burns was the chief, and this led him to enter with enthusiasm on the illustration of an edition of the poet's works now in course of publication.

Mr. Bough went through a vast amount of work, and exhibited great facility in the composition of the subjects he chose: he treasured up the impressions he received from nature, and these he threw upon the canvas in a broad and effective manner, adding figures where required to enhance the effect, but these were occasionally far from correct in drawing.

In 1856 Mr. Bough was elected an Associate of the Royal Scottish Academy, but although his name had often been brought forward amongst the list of proposed Academicians, from various causes he was unsuccessful in attaining that honour until 1875.

Besides the Haywood gold medal above referred to, he again obtained the same reward for a picture of "Dysart," in 1862. He also received the gold medal of the West of Scotland Academy of the Fine Arts in 1851, and in 1863 a prize of thirty guineas for a picture of "The Upper Part of the Thames."

* By the rule, one dissentient vote in five excludes.

THE CAMDEN TURKISH BATHS, CAMDEN-TOWN.

These buildings, opened on the 28th inst., occupy a triangular site in the rear of two rows of new houses and shops fronting High-street and Kentish-town road respectively, and the apex of which is opposite the Mother Red Cap, Camden-town.

The baths have a frontage to the Kentish-town-road of about 7 ft. only, and are approached through a corridor 45 ft. in length, and entered by a pair of wrought-iron ornamental gates, having the title of the baths and date of their erection in a circular panel. The upper part of the entrance consists of a perforated wrought-iron box, forming a Moorish arch, enclosed with coloured glass, with the crescent and star thereon, and inside of which are gas-burners for illuminating it. The iron arch-work rests upon two polished grey granite incised and gilded pilasters with carved stone caps, supporting a pair of stone shafts, from which springs the stone pediment above.

The corridor has its walls decorated with simple ornament in colour, and the dado is of Athenian marble, Egyptian green strings and necking, Irish red top-rail, Sienna die, and jasper flush panels and Bardilla plinth, and the floor is laid with coloured tiles. The same dado is continued round the hexagon-shaped hall, and up the stone staircase, the hall being covered with a lantern of the same shape resting on a coved ceiling and dentil cornice, the whole finished in Keen's cement, panelled and decorated in colours and gold. Two sides of the hexagon on the first-floor level are open, with semicircular arches overhead, supported by polished red granite columns and foliated stone caps. One arch leads to the baths, and out of the other projects a bay-window from the ante-room to the ladies' bath.

On entering the gentlemen's bath on the first floor are the office, ante-room, and an undressing-room, fitted with boxes around three of its walls, and lighted with stained-glass windows. A pitch-pine staircase leads to a similar undressing-room over it lighted by means of a lantern of pitch-pine and rolled glass. On descending another flight of pitch-pine stairs from the undressing-rooms to the ground-floor the hot-rooms are approached. No. 1, hot-room (*Tepidarium*) is 24 ft. by 20 ft., and 11 ft. high, fitted with marble slabs, on white-glazed brick risers, and also marble backs and turquoise brick-strings, above which the walls are stuccoed and decorated with floral and scroll ornament in panels. The ceiling is similarly decorated. The light to this room is obtained from the ceiling, and the floor is tiled. No. 2 hot room (*Caledarium*) is 16 ft. by 12 ft., fitted in a similar manner to No. 1 room; but the floor of this room is cemented, and the room lighted by a figured-glass window of three lights.

No. 3 hot-room (*Laconicum*) is 8 ft. by 7 ft., is lined throughout with white glazed bricks, with a tile ceiling, and is raised three steps above the level of the other rooms. In the floor is fixed a cast-iron grating, up through which rises the heat from the generating-room and furnace below (*Hypocaustum*), which in No. 3 room rises as high as 230°, the average temperature, but capable of rising considerably over 300°; the hot air passing through the door to No. 2 room heats the above room to about 180°, the average temperature, and then to No. 1 room, where the heat is reduced to 130°, and in some parts of the room it is only 110°.

The shampooing-room adjoins No. 1 room, and is 20 ft. by 15 ft., around which are Sicilian marble seats and marble backs to a height of 3 ft. 6 in. The turquoise brick string is also continued around this room, and above it the walls are lined with Athenian marble in panels of dove colour, and Irish red margios with a cornice of Sienna marble, the floor being laid with tiles. In this room are the necessary marble bowls fixed in the walls, with hot and cold water laid on to each; also, in a circular zinc inclosure against one side of this room are secretly fitted most of the special baths, viz.,

he shower, douche, spray, wave and rose, and ascending douche and spray, all of which have the hot and cold supply so arranged that they can be mingled, and any and every degree of temperature obtained. From this room is entered the swimming-bath, 30 ft. by 20 ft., and 17 ft. high, with tile platform to plunge from; the bath itself being lined with 6-in. square tiles of four colours, white, buff, blue, and chocolate, in pattern, and turquoise and chocolate strings, the baths being respectively 4 ft. and 5 ft. deep; a 3-ft. tile dado surrounds the bath. Above the dado the walls are finished in Keene's cement, and ornamented in panels and colour. There is a water-closet and urinal on the bath landing, also a platform overhanging one side of the bath, leading to a pitch-pine staircase at the further end for bathers who do not wish to plunge or swim through the bath. These stairs ascend from both sides of the bath and meet on a landing, and arrive at the centre flight, leading to the cooling-room above.

The cooling-room is 40 ft. long and 20 ft. wide, and about 20 ft. high to the lantern, which is 7 ft. wide, and extends the length of four bays out of the six which occupy each of the two sides of the room, the ends of the room occupying three bays each. This room is lined from the floor to the lantern with polished Athenian marble, of various colours. The dado is 2 ft. 3 in. high, the string of which is Egyptian green, the die jasper in the pilasters, and purple vein in the recesses, and the plinth of Bardilla. The pilasters are 8 ft. high, of Irish red marble, with sunk Galway green panels and black and white mouldings; the bases and caps are of Sienna marble, with black pateræ between the caps and neckings. The archivolts are in Irish red marble. The moulded cornice, at a height of 13 ft. from the floor, is of Brocatelle marble, the filling in being all of Sicilian marble, excepting the medallions in the sprandrels of the arches, which are in jasper and black and gold mouldings. Above the cornice a cove rises about 3 ft. 6 in., and the ceiling is panelled with Ecossais blue marble, within Irish red ribs and green panels, and black and gold mouldings, the architrave finish to the lantern being Irish red and white Sicilian marble. The whole of the marble work is picked out in gold, which gives a very pleasing effect. The recesses in the four walls are filled in with silvered plate-glass, with black and gold mouldings, the margin round the same being white marble, ground 9 in. wide, each plate of glass being 9 ft. by 3 ft. 6 in., with arched heads. A specially designed chimney-piece, of different coloured marbles, has been fixed in this room, with fender of the same material, and open stove and tile hearth; the sides of the stove are filled in with subject tiles. From the cooling-room there are two exits to the dressing-rooms, so that from entering the bath a complete circuit is made, and the different rooms have not to be re-traversed.

The ladies' baths are entirely on the first floor, and the provision made is smaller than that for gentlemen.

The glazing of the various partitions, sashes, and doors throughout the building is with tinted cathedral glass of various designs, both plain and ornamental. The ceiling lights of the ladies' dressing-rooms, and also of the ladies' and gentlemen's No. 1 hot-rooms, contain subjects painted on glass illustrating in figure and colour the various processes of the bath. Mr. James, of Camden-town, has carried out this part of the work.

As regards ventilating and heating the baths, the fresh air, by means of a vertical air-shaft, is conveyed into the apparatus, and heated in its passage thither, thereby effecting a saving of fuel, and two distinct systems are introduced, both for carrying off from the hot-rooms any vitiated air, and for admitting fresh air into the bath to regulate the temperature of the rooms, which can be sensibly affected in one minute. The cold air is admitted into the cooling-room by means of perforated panels in the sides of the lantern, with external flaps to regulate the same, and also by means of an appliance made purposely by Mr. Elsley, which from an adjoining room opens six panels or sashes all at once on the top of the lantern, and which can be nicely regulated. The heating-apparatus is by Mr. Thomas Whittaker, of Bolton, the principle being the convoluted stove. Several recent improvements have been made to his stove, one of which is the register for insuring an equable draught whatever excess of fire may be applied, and which readily detects the carelessness of the attendant or stoker. Mr. Whittaker has also fitted a boiler on the top of the heating-stove, which circulates with four warm-water tanks in the hot-rooms.

The bath fittings, including the special and private baths, have been carried out by Messrs. Smeaton & Sons, of Moorgate-street, but the other plumbing work generally has been done by the builder.

The marble work, with the exception of the shampooing-rooms, has been carried out by the Athenian Marble Company, and will doubtless prove a good advertisement for that company.

The tiling of the various floors, except that of the plunge-bath, has been done by Messrs. Harrison & Wood, of Cannon-street, with the Craven Dunnill tiles.

The decorations are by Mr. H. De Jong, of Kentish Town-road, and the furnishing throughout by Mr. Seaton, of Hampstead-road.

The water supply to the baths is by meter. The apparatus for making coffee and other hot drinks have been supplied by Mr. Picard, Strand. Both the hot-rooms are fitted with fountains and marble basins for cold water for drinking purposes.

On the ground floor are also fitted up private hot and cold water baths, enclosed separately for those wishing a private tepid bath instead of a Turkish bath; arrangements being also made for administering the electric bath, salt, and ozone baths.

All the joinery, including glazed partitions, doors, sashes, skylights, staircases, seats, &c., with but few exceptions, are of pitch-pine throughout.

The whole of the floors above and below the hot-rooms are constructed with iron and concrete to prevent expansion and contraction whilst subject to so great a heat, and to confine it the floors vary from 9 in. to 14 in. thick. Lead linings are laid underneath the tiles in the shampooing-room of the upper floor to prevent the chance of water percolating through the concrete.

Mr. J. R. Hunt, of Bow Common, is the contractor, the whole having been carried out under the personal superintendence of Mr. H. H. Bridgman, architect.

A NATIONAL THEATRE NOT WHOLLY CONTROLLED BY POPULAR TASTE.

THE proposals as set forth in the paper read at Cheltenham* appear to be gaining ground, if slowly. The eminent dramatic critic of the *Sunday Times* took the paper as the subject of his usual leader last week, and we have pleasure in reprinting some of his remarks:—

"How stanch advocates we have been of an academy of dramatic art, which would, of course, include a subventioned theatre, our readers know. This, moreover, is proved by the fact that in the very lecture now printed Mr. Godwin quotes our own words. Once more we enter the field as his ally, and back up with utmost sincerity the views he advocates.

In spite of the advance we have made during recent years, an advance the influence of which will only be fully perceptible when regarded by the next generation, we are still as a race lamentably behindhand in the appreciation of art. Mr. Matthew Arnold in his latest jeremiad complains of 'our stunted sense of beauty.' That we suffer from this no one who contemplates our theatrical entertainments will deny. In a few English theatres we may now see an effort after the best. Still we have far to travel, and it is doubtful whether, without such aid as Mr. Godwin entreats, we shall ever reach the requisite height. It is still possible to see on an English stage such things as are not seen elsewhere in Europe."

"Theatrical art, rightly understood and rightly conducted, is one of the most potent instruments of education the world possesses. We speak here, of course, of education in its highest sense. The Manchester school of politicians will not see this. To the kind of men who are content to accept as the typical Englishman, John Bull, — fat, comfortable, rubicund, commonplace, the type of ignorant self-content and prosaic well-being,—all art must seem rubbish. Statesmen, however, ought to know better. Some of them do know how potent an influence the theatre was with the Greeks, and are aware in their reserve thoughts how potent it might be with Englishmen. Still we are in truth devoted to the prosaic, to purely selfish and ignoble interests so thoroughly, that an educated minister even is afraid to trust to his own convictions when they would lead him off the customary track.

Gravely and justly regarded, Government is highly reprehensible for the present state of affairs. It may, however, be urged that while no man in either House of Representatives thinks it worth while to take any cognisance of theatrical matters and bring any question connected with theatres before Parliament, Government is justified in believing that absolute indifference prevails. Time will, however, show that indifference is more apparent than real, and the earth which now seems calm and serene will before very long show volcanic cleft and fissure.

It is chiefly as a means of educating actors that an institution such as Mr. Godwin advocates is needed. There should be first a theatre at which classic plays are presented on given nights,—not on the principle of mounting one play for a run of hundreds of nights,—a system that would scarcely involve a gain to our stage, but on that of giving a constant change of pieces. A man should be able to look at the bill of the theatre a fortnight after he last visited it with the certainty that he will see a different performance. One week may be "As You Like It," the next "The School for Scandal," and the third "Pygmalion and Galatea," or "Donna Diana," for there is no reason why we should confine such a theatre to the masterpieces of past ages. It should be remembered that the best drama for a people is the drama of its own time, if it have such. Incidentally, however, the subventioned theatre would encourage dramatic art, since it would be an honour so signal to write for a theatre like this, our best authors would bid for this distinction. Then there would be a training school for actors, and our stage would be supplied with young actors who knew their art and had not to learn it before the public. Right along the line an advance would thus be made. Oh! for a Government that could see the importance of this as a matter of national culture."

* See p. 1133, *ante*.

THE LATE MR. ADAMSON, BUILDER.

A VERY sad and fatal accident occurred on Saturday last to Mr. Adamson, the senior of the three brothers who have long been known under the firm of Adamson & Sons, of Putney.

Mr. Adamson had been up to the Sandall-road Schools, now in course of erection, under the direction of Mr. E. C. Robins, for the trustees of the North London Collegiate School for Girls, Camden-road; and after paying the men, he went with the foreman on to the scaffolding to look round the works. Upon descending, one of the rungs of the ladder gave, and he fell some 12 ft. or 14 ft. He was taken up insensible, having fallen on his back across a beam, and was conveyed to the tavern close by. In the afternoon he recovered consciousness, and was attended by medical men, his brothers and his wife having arrived. But severe lock-jaw set in, under which he sank a little after eight on Monday morning, in the 53rd year of his age.

Mr. Adamson was a man of remarkable energy, and bore a high character for intelligence and integrity. His firm are at this moment executing a number of important works.

BELLS AND TOWERS.

OUR esteemed friend, the Rev. H. T. Ellacombe, writes,—In the course of threescore years and ten of a long life I have gone up some hundreds of towers, most of them being of Mediæval date. In many I noted the top timbers of bell-cages securely built into the walls, and no harm had come of it, though from early dates the bells had been swung up and down, and in pre-Reformation times they would have been rung daily,—*nane, mendre, et respect*, to 45 deg. with the dead-rope wheel, but no damage had occurred to the building, provided the walls were of substantial masonry and well buttressed; but where the walls of towers are flimsily and scampingly built, as most modern towers are, there, no doubt, damage may be expected to follow from the very bells themselves; for, do what you will, the cage will oscillate, and so will the tower, and if the two oscillations do not occur together the ringer will occasionally find his bell "drop." Tower and bells should oscillate steadily together; but this cannot be effected unless the cage is firmly secured against the walls, and then in a well-

built tower the whole will oscillate together steadily, like a pendulum, from the very foundation, and no harm will follow; but if there be an old split, caused by lightning, or settlement, or bad building, so as to damage the masonry of a tower, then the bells should not be rung at all, and that has been my advice when I have been occasionally consulted on the subject.

I have not seen St. Paul's bells, but, the tower being an engaged building, the cage may, without fear of damage, be firmly secured to the walls; for damage to accrue, it would be extended to the whole fabric, dome and all. A few years ago I was in the noble tower of L'Abbaye Aux Hommes, at Caen, during the swinging (I cannot call it ringing, the bells being worked by the foot without wheel and rope) of two heavy bells for service. The cage of massive timber was insulated, and the motion was so great as to produce the sensation of sea-sickness in one of my companions; and the oscillation of the lofty tower, with its glorious spire, was greater than I ever felt before, but there was no apparent danger, and it must have been going on daily for centuries. In flimsily-built modern towers, with affected lofty spires and small space within, there had better be no bells at all, but a single bell, dolefully to lament its position by solitary tollings, and standing as a dumb idol. In all such towers carillons might very safely and most effectively be set up.

TELEGRAPHY AND THE POST OFFICE.

At the opening meeting of the Society of Arts on the 20th inst., the chairman, Lord Alfred Churchill, said in the course of his address:—The last two or three years, indeed, I might say the last year, have been so fruitful in inventions and projects beyond all others, that I doubt not there will be found plentiful work to engage the Society's attention. The telephone came upon us like a miracle, followed by the phonograph and the microphone in quick succession. How far these two later inventions may or may not be brought to play a part in the practical affairs of every-day life is yet uncertain. If the telephone has not yet become in this country the household instrument which was anticipated, on the other side of the Atlantic, in the United States of America, its use is almost unlimited. Why there should be this difference I cannot pretend to say, but the fact is so; whether the monopoly of telegraphy in the hands of the Government has had an unintentional influence in producing this result in this country may fairly be matter of discussion. The monopoly, in reality, places no bar whatever to its private use by private individuals, whilst there is a widespread belief that there is some difficulty in the way on the part of the Post Office authorities. That telegraphy in the hands of the Post Office has flourished and been extended in its use beyond what any public companies would have given us in the same time is undoubted, and I, for one, have no desire to dispute this; but I am by no means clear that it is due to the monopoly of sending messages for hire throughout the kingdom; and I am inclined to think that, great as the extension of the telegraph system, both in public and private wires, has undoubtedly been in the hands of the Post Office, it would have been equally great without the monopoly, while a large addition in the way of private telegraphy would have taken place side by side with it, had the field been more free to mercantile enterprise as well. The latter would have acted as a stimulus to the former in the use of improvements, especially in the way of instruments, including the telephone. Take the private wires of the present day. It is true there is no real monopoly, either in the putting up or working such lines, except so far as the conveyance of intelligence for hire is concerned, but, for some reason or other, private wires are, as a rule, put up by the Post Office, and rarely by private individuals, and are worked on a rental system. The Post Office adopts the very admirable A B C instrument of Wheatstone, and supplies no other; the result is, that although there are several instruments at the present time of an improved character, printing the message in Roman characters, and so giving a permanent record of it, whilst the other is evanescent, the Wheatstone instrument is still retained. It is true that any one is at liberty to purchase and use such improved instruments in connexion with Post-office wires for his private purposes, but this involves an outlay, and deters many who, for the facility of a rental, and the dealing with one body only instead of two, are induced to take the more imperfect instrument. The Post Office very naturally objects either to change the system or to have several systems at work. Again, owing to the Post-office monopoly, claimed by the Post Office for the conveyance of intelligence for hire, whether by letter or by telegraph, individuals are checked in their endeavours to extend the use of the telegraph, while in America it is largely at work. There a central office connects itself with subscribers all over the area of a city. Telegrams, prices, and such like, are placed in a transmission instrument in the central office, which at once, by means of a receiving instrument on the premises of the individual subscriber, turns out the message, neatly printed on a slip of paper, into a basket. A fire-alarm, a messenger-call by telegraphy, is also in daily use there. A system on this principle is, under some very special arrangement with our Post Office, in use at our Stock Exchange in the City, where prices are telegraphed and delivered in print into the brokers' offices at frequent periods of the day. The privilege, however, is special, and confined to a very limited area, and has been obtained, doubtless, by powerful influence brought to bear on the Post Office. Is there any reason why so great an advantage should not be made general and open to any who might desire to bring such a system into general use? In Glasgow, an enterprising individual has, in conjunction with the merchants of that city, established an office at the Chamber of Commerce somewhat of this character. He is in connexion by wires, put up by himself, with a large number of subscribers, to each of whom he supplies mercantile information from time to time, price-lists and so on, and on receiving a signal he can at once place any two of his subscribers in direct telegraphic communication with each other, giving thus a great facility of communication between firms at a distance from each other, in the city or its suburbs. A system of fire-alarms also has just been commenced in Glasgow, and it is to be hoped that the above system may be extended to the metropolis, and to our large towns in the provinces. So far it may be said the Post Office does not interfere to check private enterprise, but there is an impression the other way, and in the uncertainty of what may or may not be legal little is attempted. These are matters I would commend to the consideration and enterprise of our members.

THE RESTORATIONS AT ST. SEPULCHRE'S CHURCH.

The progress of the works in connexion with the restoration and internal re-arrangement of St. Sepulchre's Church, Holborn Viaduct, which have now been going forward for some months past, is threatened with interference. An application has been made in the Consistory Court to Dr. Tristram, Chancellor of London, to restrain the further progress of the works, on the ground that the powers granted by the faculty have been exceeded. The parties to the application are the authorities of the City portion of the parish, and also two residents in the Middlesex portion,—Mr. Larkin, gentleman, and Mr. Collier, of St. John-street, Smithfield, licensed victualler,—represented by Mr. Robinson, the vestry clerk. After hearing the arguments, the Chancellor adjourned the case, in order to admit of another application being made for a faculty to carry out the plans, when the parties asking that the works may be restrained are to state the deviations of which they complain. It is said that the alleged infringement of the faculty has reference to certain decorations and ornaments about the chancel.

THE "GAIETY RESTAURANT."

Sir,—You have given rather too much credit in one direction. Messrs. Simpson certainly supplied and fixed the tile-work; but their first attempt to carry out Mr. Verity's intentions, especially in reference to the buffet, was a complete failure.

Messrs. Simpson also competed with others to decorate the buffet ceiling after George Smith & Co., the contractors, had executed the plastering and prepared it for decoration; their tender was accepted, and they carried it out under the direction of Mr. Turner, the artist engaged by Mr. Verity. One who Knows.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the first meeting, held on Wednesday last, it was announced that the memorial of the Council to the Corporation of South Shields for the preservation of the Roman station recently excavated at the Lawes had resulted in the safety of the remains. The subject had been warmly taken up by the local antiquaries, the Ecclesiastical Commission had given a part of the freehold site, and the Town Council had voted funds for enclosing the land thus acquired by the town.

In the course of the proceedings, which were interesting, Mr. R. Blair reported an important discovery on the site of what is probably the cemetery of the Roman station, South Shields. It is a sepulchral monument representing a seated female figure, beneath an arch and pediment, supported on pilasters with capitals. The whole is very well executed, and the figure is about life-size. Mr. De Grey Birch, F.R.S.L., described the peculiarities of the Latin inscription, which sets forth that the monument was erected in the second or third century by Barates, a Palmyrene, to the memory of Regina, a Catvallanian, first his freed woman, and then his wife, who died aged thirty. Interesting as this monument must be considered from the beauty of its design, and the evidence it affords of the presence of an Asiatic at the extremity of the Roman dominions, yet these are surpassed by the presence of a Palmyrene inscription beneath the Latin one, the first found in England. Professor Wright read this as "Regina, the freed woman of Barates. Alas!"

ILLEGAL COMMISSIONS.

Sir,—May I draw your attention to the following extract from the penultimate paragraph of an article on "The Scandal of Commissions," in this week's *World*?—

"The moral leprosy has already so spread that its ultimate limits are hardly to be predicted. *Architects, not contenting with the five per cent they obtain from their clients, are apt to take a sixth or larger allowance from the contractor to whom they may, now with their commands.* The offender submits to force, but he takes good care to recoup himself by skimping some of his work."

It seems difficult for outsiders, who have any knowledge of the commercial world, to understand the utter contempt with which architects, individually and collectively, look upon this sort of thing; and it is hard that they should be pilloried in this unhandsome way for a vice which entails *expulsion* from the ranks of the Institute on the member, be he great or small, to whom it is brought home. An architect's sense of the dignity of his profession is quite incomprehensible to the ordinary man of the world, who merely sees in him a hungry grasper at "commissions," and a "copyist of ancient examples." Every one in the profession knows that, so long as any quack may tack on to his string of trades the words "and architect," the stigma will not be removed, and architects will continue to be classed with the legal (and legally styled) "gentlemen entitled to wear swords," whose "sharp" practice, generation after generation, has made a byword of a profession which ought to be honoured as a necessity of civilisation, though not claiming the refinement of the successors of William of Sens, Erwin von Steinbach, and Michelangelo. Atticus.

Another correspondent, well known to us, offers "to place a cheque for 100*l.*, by the side of others, to try if this lying libel of a whole profession is not punishable."

HUNT *v.* WIMBLEDON LOCAL BOARD.

Sir, In commenting on this case in your issue of the 23rd inst., I am glad to see you preface your adverse criticism on the conduct of the defendants by the words, "so far as can be judged from the report of the case."

It may interest you to know that the Board were advised by Counsel to move for a new trial (if necessary) on the ground of the verdict being against the weight of evidence, but they had no occasion to do this, the judgment having been in their favour.

The evidence of the Board having authorised the employment of the plaintiff consisted of the statement of one witness, who was not directly contradicted by three witnesses on the part of the Board.

For the purpose of the legal argument, the verdict of the jury was, of course, taken as final: hence the report to which you refer.

Technical pleas do not always imply a want of "merits." They are frequently used to prevent or shorten litigation.

W. H. Whitfield, Defendants' Solicitor.

WARMING APPLIANCES.

SIR,—On reading Mr. Leeds's (of New York) strong attack on heating by warmed air in your paper of last week, accompanied by his advocacy of the continued use of the open fire of England, from which, however, he hungers to take that modern "disgrace" to the "glorious open fire," "the miserable air-warmer" so much in vogue at present, I cannot but lament that he does not tell us how he would supplement the open fire (which he admits to be "troublesome in many respects") so as to procure from it the warmth without draught needed for large rooms. I can quite suppose a hot-water tube or coil heated by a boiler behind the open fire, and placed at the opposite side of the room, and near the door or window, would be an admirable supplement, as indeed it proved in one, previously cold and unheatable room I know; but then the cost in this case was 50*l*. Now the air-chamber costs but 3*l*. or 4*l*., and if the above 50*l*. was extravagant, still 3*l*. or 4*l*. will far from cover the hot-water arrangement, while the hot-air chamber has proved beneficial in every case of its use I have known, and in one case, when specially prepared at a cost of 10*l*. or 12*l*., converted a large, ill-ventilated, and often partly crowded room, from a source of headache to one of ease and comfort. Rooms of admirable comfort may doubtless be heated and ventilated when they have warmed walls and warmed floors, but in few private rooms, at least, can the expense of such arrangements be incurred. Mr. Mechi is no doubt pointing out the advantages of a stove of special radiating power, but I can hardly think it can be in this direction Mr. Leeds would endeavour to remove the defects of the open fire; or, if so, he is not as familiar at New York as we are on this side the Channel with the attempts to overcome draughts by increased radiation in the open fire itself,—that attempt which roasts one side of the body while the other is cold, till we are like "an ill-roasted egg, all on one side,"—a condition which you will remember "Touchstone" likens to being among the damned. HORACE FIELD.

PORTLAND CEMENT.

SIR,—In Messrs. Gostling's letter to you last week, advocating a uniform standard for the sale of Portland cement, I would beg to take exception to a portion of the last paragraph. However much it may be desirable to alter the present mode of selling cement, I cannot certainly agree with the assertion, that if it were "sold by actual weight, and the word bushel discarded, consumers would know exactly the value they were getting for their money."

If cement is to be sold by actual weight only, manufacturers would use every endeavour to produce a heavy cement without increasing the present cost of production, and we know that weight alone is no test as to the quality of cement. And to substitute sale by weight instead of by measure, is merely offering a premium for placing a heavily-limed, badly-ground cement on the market, and the consumer would certainly *not* know the value he was getting for his money.

Surely, if the measure were used as a measure, and not an imaginary weight substituted for it, no such alteration as is suggested by the Messrs. Gostling would be needed. H. FAIJA.

A YARD OF LIME.

SIR,—Will some of your readers kindly inform me what "a yard" of lime is: that is, how many cubic feet or bushels it represents? I shall probably be told 27 cubic feet, or 21 bushels; but I wish to know if there is any generally recognised trade custom making a yard of lime differ from this standard. A CONTRACTOR.

EXTIRPATION OF SPIDERS.

SIR,—Your correspondent, "An Architect," is not the only one who would occasionally be glad to know how to get rid of these pests. The open rafter roofing of cloisters round Chichester Cathedral affords an example of perfect immunity from webs, where spiders might be expected to congregate in numbers. I have been assured the rafters are of Irish bog oak, and that no insects will attack this. The wood is light rather than dark, very different from the ordinary appearance of bog oak, but very old. F. H. M.

STAINS IN OAK.

SIR,—I am doing some work with old oak (old roof timbers), and where iron bolts or nails have been, the wood is stained black for some distance. If any of your readers could tell me what would remove this stain, I should be very much obliged to them. R. W.

TREES AND FOUNDATIONS.

A CURIOUS instance has lately come under my observation of the mischief to the foundations of buildings which may sometimes be caused by the roots of trees. In the case to which I refer attention had been drawn to an increasing settlement in the wall of an infant school (built some five years since). It was clear that something was wrong underneath, and so underpinning was determined upon. When the ample and well-executed footings and concrete had been examined it was discovered that the roots of a row of Ontario poplar-trees which stood in a neighbouring garden, some 20 ft. or 25 ft. distant, had worked their way down to the depth of some 5 ft. to 8 ft., and had completely disintegrated the concrete. The roots were mostly of very fine texture, some mere fibre of no greater substance than human hair, and a few larger ones as thick as a man's little finger, all entwined in the concrete. The soil was a cold clay, and an experienced horticulturist assures me that although the roots of poplars traverse strata which would repel other trees, yet they generally strike only to a shallow depth. In this instance the roots had devoured all the lime in the concrete in the lower part, which was crumbling away. The upper part (where no roots existed) was perfectly sound. Instances of strong roots throwing down walls are not uncommon, but I find on inquiring of experienced men that the insidious work of these distant trees is unusual.

The new foundations, &c., have all been executed in Portland cement concrete at a considerably greater depth than before, and warning given to the occupants of the adjoining garden. EDMUND B. FERREY.

THE REPAIRS OF CHURCHES.

SIR,—I find that some misapprehension exists on two collateral points connected with the case of All Saints Church, Lambeth; and as your excellent article under the above heading in the *Builder* of November 23 will be better understood if they are cleared up, I hope you will allow me to do so.

I find that some persons are under the impression that extensive works of *repair* as usually understood were carried out; and that others suppose the Metropolitan Board of Works *voluntarily* "set in motion their powers under the Metropolitan Buildings Act, 1855," as your article describes their action. Neither of these ideas is correct.

The building itself literally "set in motion" the proceedings. A decayed stone fell from the tower; a woman was injured by the stone. The police reported the matter, and there was no alternative possible but that the usual course should be taken as prescribed by the Act.

The work done consisted in the removal of decayed and decaying stones. Probably this is "repair" in a legal sense of the term; but it was very much the reverse from an architect's point of view. The stone proved to be frightfully decayed, and it was found necessary to take off the tops of four stone pinnacles at the angles of the tower, to remove almost all the shafts, and some of the arches from an arcade which enriched the upper part of the tower, and to remove some stones from the spire; and, to accomplish this, scaffold had to be carried up from the ground level.

THE DISTRICT SURVEYOR.

ROMAN FIGURES.

SIR,—I have read with great interest the article in last week's *Builder* on Pompeii: truth is strange, stranger than fiction.

Touching the discovery of the bankers' accounts at Pompeii, I hope they will throw some light upon the addition of Roman numerals; indeed, on the dealings with Roman figures generally.

Thus, to state two sums,—

19	.....	XIX
111	.....	CXI
95	.....	XCV
22	.....	XXII
247		

I can master the Arabic numerals, and I should be gratified if some of your learned readers would tell me how to add up the Roman. C. H.

A NEW MORTUARY AT ST. GEORGE-THE-MARTYR'S.

A NEW mortuary is about to be erected at the east end of St. George's Churchyard, High-street, in the Borough, which was recently laid out and planted. The plans and designs for the building have been prepared by Mr. Hiscocks, and the rector and churchwardens having offered no objections to the erection of the building, it was agreed at the last meeting of the Vestry to take the necessary steps for obtaining the faculty required before the erection of the building can be proceeded with. At the same meeting a resolution was moved to the effect that the surveyor be directed to prepare plans and estimates of the cost of setting back the steps to the entrance of St. George's Church, for the purpose of widening that part of the road and footway. It was urged that the widening of the thoroughfare at the spot indicated was very much required, and that it was, in fact, a very dangerous place.

MASTERS AND MEN.

Grangemouth.—Messrs. Charles Brand & Son, contractors for the new docks, Grangemouth, have intimated to their workmen the following reduction of wages—viz., masons, joiners, and carpenters, 1d. per hour; blacksmiths and hammermen, 2s. per week; and labourers, 1s. per week.

Lancaster.—The master-stonemasons of Lancaster have given notice to the men in their employment of their intention to adopt the system of payment by the hour, instead of by the day, as heretofore. This may materially affect the wages in winter, but it will not make any difference in summer. We hear that the building trade in Lancaster has not been known for many years past to be so bad as it is at present, and there are no jobs of any importance in prospect in the neighbourhood.

Books Received.

Foreign Architecture.

WE have received the first part of a serial publication, "New Works of Architecture at Frankfort-on-Maine" (*Neubauten Frankfurt-am-Main*), edited by Fr. Sauerwein, architect, the intention of which is to make known the many private and public buildings of some consequence which have been lately erected in that city. It seems that the selection has been made by the Society of Architects and Engineers at Frankfort, and that the views are reproduced by a recently-invented photographic method supposed to be permanent. Each part is to contain three views and three pages of plan. The agent for the sale of the work in Great Britain is Mr. Davis, of 201, Old Kent-road, who also has in hand another serial, "Classical Works of the Architecture of the Middle Age and the Renaissance Period in Germany." The first series will deal wholly with the Castle of Heidelberg.

From the same address comes intimation that the *Emulation*, a monthly publication of the Central Society of Architecture of Belgium, heretofore published abroad, is now to be circulated in England. It will be published monthly, and each issue will contain four folio plates, illustrating modern examples of Flemish architecture, selected from the best works, and executed in photo-lithography. Each number will contain a literary summary of doings on the Continent, and articles on subjects interesting to architects and engineers. With the first number will be given seven plates of the Paris Exhibition Prize Buildings of Belgium.

VARIORUM.

Nature, for November 21st, includes an illustrated account of the Carbon Telephone, by Mr. Barrett. The writer describes conversations carried on between Norwich and London, 115 miles, the voice of individual speakers being recognisable, and thinks it not impossible that before long, by means of this telephone, speeches in Parliament may be transmitted to the newspaper offices, and to the country, while members, if their articulation be distinct, are speaking from their places in the House.——"Workshop Management: a Manual for Masters and Men," by Frederic Smith (Wyman & Sons), is a sensible little book that might be usefully

placed in the hands of young workmen. Giving some suggestions to apprentices, the writer says justly:—"It is not enough that he shall know how to do his work—he must also know how to do it quickly. His ambition should be to be able to do as much work, and to do it as well, as any of the journeymen in the shop. To accomplish this he will find that brains are as important as muscles. If he notice the men who work beside him, he will find, curiously enough, as it will seem to him, that many of the best hands, both as regards the quantity and quality of their work, are by no means the men who *appear* to work the hardest; and if he watch these men closely, he will find them to possess good tools, kept in first-rate condition. Such workmen never take off two shavings where one is sufficient, never put the stuff twice through their hands when once will do; they have always something to do whilst their glue is drying; in short, *their hand is subservient to their brain.* These are the skilled workmen, the men who seldom have to seek employment,—especially if they are steady,—the men who can always secure the highest wages, and who, when trade is bad, are the last to be discharged by their employer. They alone are the examples for the apprentice to copy."——The current number of *L'Art* includes an effective etching of Mr. Millais's picture, "A Yeoman of the Guard."——The first tale in the *Belgravia Annual* for 1878 is "A Shocking Story," by Mr. Wilkie Collins, and is of itself worth the small cost of the number. Mr. Gerald Dixon, who is coming to the front, describes "A Literary Siren," with whom many of us have been acquainted.

Miscellanea.

Strains and Stresses in "Redundant" Structures.—At a meeting of the Edinburgh and Leith Engineers' Society, on the 20th inst., Mr. Robert C. Reid, C.E., president, in the chair, a paper was read by Mr. Robert H. Smith, formerly Professor of Engineering in the Imperial University of Tokio, Japan, on "The Calculation of the Strains and Stresses in Redundant Structures." He described a redundant structure as one in which the number of links was greater than the number of flexible joints, which was just sufficient to render the structure stiff. He explained that this latter number was always three less than twice the number of flexible joints. He pointed out that what was usually called a non-redundant structure became redundant when laid upon and fixed to its abutments, and that it was on this account that the horizontal components of the redundant reactions were usually said to be indeterminate. Mr. Smith then described in detail the graphic and other methods of calculating these horizontal components from the *moduli* of elasticity of the different members and of the abutments, treating separately link-work structures and massive arches, neither of which, he believed, had hitherto been completely investigated. After explaining the application of the general method in structures of any degree of redundancy, he concluded with some remarks upon the impossibility of profitably avoiding all redundancy in engineering structures.

Builders' Benevolent Institution.—The fiftieth election of pensioners on the funds of this Institution took place on Thursday, at Willis's Rooms, St. James's, Mr. George Dines in the chair. There were vacancies for two men and two women, and there were three candidates of each sex. The poll was closed at three o'clock, and shortly afterwards the scrutineers (Messrs. Thomas Stirling and F. W. Keeble) reported the result of the voting as follows:—G. E. Mercer, 2,388; Charles Buck, 1,700; Gregory Bartlett, 1,536; Sarah Few, 4,400; Eleanor Weston, 1,100; and Susan Gulson, 600. The Chairman accordingly declared the successful candidates to be G. E. Mercer, C. Buck, S. Few, and E. Weston. Votes of thanks to the chairman, scrutineers, &c., brought the proceedings to a close.

Epping Forest Claims.—The Committee have received already some 500 claims in respect of Epping Forest. They are to be examined forthwith, and, wherever practicable, disposed of by settlement with the parties. Those claims which the Committee are unable satisfactorily to settle will be tried before the arbitrator at Westminster.—*City Press.*

Altar and Reredos, Nottingham.—A costly and elaborate altar and reredos, executed in pure white alabaster, the columns being of polished red marble, and the altar slab (which is in one piece) of white marble, have been erected in the Chapel of Our Lady's Convent of Mercy, Nottingham. The style adopted is the Decorated. The altar is provided with two wide *gradini*. The altar and reredos, as above, are detached from the wall, allowing a passage behind for access to the canopy. The reredos to this wall is formed by a continuation of the carved cornice and quatrefoil and battlemented parapet to the front reredos, to which it is attached by an arched opening under at each end of the passage, and in this parapet are placed carved brackets to carry figures of Our Lord and the Virgin, also carved in white alabaster, at each side of the large east window in the centre. The space below the parapet and between it, and a base corresponding to that of the altar, is filled in with majolica tiles of lavender and white colours. The steps to the altar are formed of red Mansfield stone moulded at the edges, and the dais is filled in under the altar with white faced tiles, and in front of it with red tiles and fretted margins. The work has been executed by Mr. R. L. Boulton, sculptor, of Cheltenham, from the designs of the architect, Mr. C. G. Wray, of London. Messrs. Hardman & Co. furnished the tabernacle safe and brass door; and Messrs. Dennett & Co., of Nottingham, have executed the engineers' and builders' work, under the direction of the architect.

Library Extension and Art Gallery, Birmingham.—At the meeting of the Birmingham Town Council, on the 9th inst., the Mayor read the report of the Free Libraries Committee, which stated that the committee had accepted the tender of Messrs. Horsley Brothers, contractors, Birmingham, for the execution of the library extensions and the erection of the new Art Gallery, for the sum of 16,056*l.* To this amount would have to be added the cost of additional works not referred to in the specification or shown in the plans upon which Messrs. Horsley's tender was based. The contract which had been entered into provided that the works should be completed to the satisfaction of the architects on or before the 31st December, 1879. In order to expedite the completion of the contract, the committee had consented to the whole of the works connected with the library extensions and the new Art Gallery being carried out simultaneously. This had rendered necessary the closing of the vestibule leading to the reading-room and the staircase leading to the Reference Library, but the contractors, at their own expense, had substituted a temporary wooden entrance and staircase from the Edmund-street side of the buildings. The contents of the Museum of Arms, and most of the contents of the Art Gallery, had been removed to Aston Hall, and were on exhibition there until the new buildings had been completed. The report was approved.

The Staffordshire Potteries.—The trade year in the Potteries, which has just closed, has been unsatisfactory. At the present time, though in special branches of the trade men are working nearly full time, not more than half the producing power of the district is in operation. The declared value of the goods exported in the first nine months of 1878 was 1,260,590*l.*, against 1,288,777*l.* in 1877, and 1,270,606*l.* in 1876. The value of the goods shipped for the United States in the same period was only 414,494*l.*, against 454,353 in 1877, and 425,806*l.* in 1876. The orders received from America have fluctuated month by month, and the value of the goods shipped in September dropped down to 36,000*l.*, which was little more than half the value of the business done in some of the other months. The goods made for the French market show a considerable improvement in value to those of previous years; but this is in no degree attributable to the Exhibition, which has been productive of very few orders for this district up to the present time. Germany has purchased less British pottery this year than usual, and we are assured that the German potters are greatly increasing their production of light hollow wares, and are driving English goods out of some markets.

Electric Lighting.—At a meeting of the Bilston Township Commissioners and Local Board of Health, held on the 20th inst., it was resolved to make inquiries in connexion with the electric light, with a view to its adoption in that town.

"Ignorant Building."—The *American Architect* usefully observes:—"Recent disasters teach that it is not merely careless building, though that is bad enough, but ignorant building that brings us into trouble. The latter fault is really the more dangerous, because while it is more insidious than the other, it is one great cause of it. The efforts of the people who are responsible for it to put it out of sight ought therefore to be strenuously resisted. The danger is the greater, because, while we are venturing on all sorts of new constructions, we have taken leave of the old-fashioned habits of solid building; and competition and the system of contract work are forcing the method of building down to the cheapest possible conditions. 'Practical' constructors are continually trying to do things they have not done before, and to do them in the quickest and most economical way possible, while they are as innocent as children of the scientific knowledge by which alone such experiments are made safe. In a generation which is covering the country with more important constructions than any before it, the greater part of the persons who are responsible for these constructions may be said not to know that such safe knowledge exists; and the mass of the people whose property and lives are risked by them are disposed for this reason to deride it as unpractical. It is an injury to the community, then, when complaint of the bad execution of a piece of work, especially if it be public work, is allowed to divert attention from the fact that it has been ignorantly and badly designed."

Edinburgh Architectural Association.—The usual fortnightly meeting of this society was held on the 20th inst., Mr. H. S. Blanc in the chair, when a paper was read by Mr. Leonard A. Wheatley on the history of architecture, tracing its source from the earliest period of the Egyptian, through the Assyrian, Persian, Greek, and Roman to modern times. A discussion ensued. The paper was illustrated by numerous drawings and diagrams.

Sowerby Bridge.—Messrs. Utley & Gray engineers, &c., Halifax, have been instructed by the Sowerby Bridge Local Board of Health to prepare plans for dealing with the sewage, an inquiry lately held by Mr. Harrison, C.E., on behalf of the Local Government Board, having shown the urgent need of intercepting the sewage from the river Calder and its tributaries.

Welsh Calvinists.—The memorial-stones of a new Welsh Calvinistic chapel, schools, and chapel-keeper's house, in course of erection in Broad-street, Pendleton, Salford, were laid on Saturday last. The buildings will cost between 5,000*l.* and 6,000*l.* Mr. William Dawes, of Manchester is the architect, and Messrs. Kewley, Jones, & Robertson are the architects.

Leadenhall Market.—The Corporation of London has decided to retain Leadenhall Market on its present site, but so to improve it as to render it more convenient and commodious.

The Leeds Architectural Association will hold a *conversazione* on the 3rd of December.

TENDERS

For the erection of school of art, Kidderminster. Mr. J. M. Gilling, architect. Quantities by same:—

Howard & Sons	£3,240	0	0
Baker & Son	2,900	0	0
Thompson	2,835	0	0
Cook	2,698	2	6
Toxall	2,660	0	0
Smith	2,630	0	0
Horton	2,568	0	0
Jones & Co.	2,529	0	0
Burman & Son	2,496	0	0
Guest (accepted)	2,340	0	0

For the erection of houses at Old Ford, for Mr. J. Long. Mr. R. P. Notley, architect:—

Fitzroy	£2,300	0	0
Sawyer	2,189	0	0
Wire	2,170	0	0
Greenwood	2,065	0	0
Prebble	2,065	0	0
Jarvis & Sons	2,000	0	0
Falkner	1,987	0	0
Stamp & Bowtle	1,930	0	0
Shetfield	1,887	0	0
Rudkin	1,797	0	0
Thomerson	1,735	0	0

For alterations and additions to 64, Grosvenor-street, Grosvenor-square, for Captain G. F. Talbot. Mr. Robert Keirle, architect:—

Clarke & Mannooch	£1,027	0	0
Eaton	860	0	0
Craske	730	0	0
Stephens (accepted)	688	0	0

For pulling down and rebuilding the infants' school, Queen-street, for the Hemel Hempstead School Board. Mr. George Low, architect. Quantities not supplied:—

Mann	£1,730 0 0
Julian & Co.	1,435 0 0
Cook	1,395 0 0
Willmott & Sons	1,258 0 0
Taylor & Sons	1,189 19 0
Monk	1,145 0 0
Snell	1,123 13 8
Allaway	1,110 0 0
J. Sear	1,018 18 6
W. Sear (accepted)	1,000 0 0
G. Sear	998 10 0

For rebuilding the Hare and Hounds Tavern, North End, Hampstead, for Mr. William Brett:—

Shepherd	£2,792 0 0
Stamp & Bowtle	2,379 0 0
Andrews	2,170 0 0
Jackson & Todd	2,100 0 0
Gas Fitters.	
Gardiner	100 0 0
Dodson	98 0 0

For works proposed to be done at 76 and 78, Charlotte-street, Fitzroy-square, for Mr. W. J. Holsworth. Mr. Sextus Dyball, architect. Quantities by Mr. W. E. Stoner:—

	No. 78.		No. 76.	
Morter	£2,230 0 0		£478	0 0
Brass	2,190 0 0		428	0 0
Merritt & Ashby	2,087 0 0		392	0 0
Taylor	1,946 0 0		353	0 0
Baugh	1,910 0 0		325	0 0
Croaker	1,845 0 0		320	0 0
Perkins	1,833 0 0		327	0 0
Rudkin	1,792 0 0		332	0 0
Kirk	1,637 0 0		315	0 0

For public hall, &c., Keynsham, Somerset. Messrs. Brown & Loe, architects. Quantities by Mr. C. G. Maylard:—

	Public Hall.		Committee Rooms, &c.	
Wilkins & Sons	£1,467 0 0		£607	0 0
Hatherley	1,407 10 0		567	0 0
Cowlin & Sons	1,380 0 0		568	7 0
Sheppard	1,289 10 0		480	0 0
Brock & Bruce	1,273 0 0		508	0 0
Stephens & Bastow	1,249 0 0		489	0 0
Veals (accepted)	1,174 0 0		545	0 0
Belsten (error)	970 0 0		450	0 0

For two semi-detached houses to be built at Daybrook, Notts., for Mr. John Robinson. Messrs. Herbert & Walker, architects. Quantities supplied:—

Mason	£912 13 0
Lynam	736 0 0
Duke	709 10 0
Clarke	700 0 0
Clayson & Marld	679 2 6
Scott	676 0 0
Cargill	669 0 0
Knowles	655 0 0
Tutin	630 0 0
Wayte	627 0 0
Green	623 0 0
Crookes & Foster	624 14 0
M'Culloch	619 10 0
Dudson & Parrish	606 0 0
Smith & Graves	590 0 0
Stamforth	540 4 0
Baines & Turton	575 0 0

TO CORRESPONDENTS.

Consideration of a number of communications must be deferred, and many already in type are necessarily postponed.—B. Z. (no).—T. N. L. (next week).—T. E. K. (ditto).—W. G. D. (ditto).—F. D. (some suggestions for the destruction of ants in houses have been given in former numbers of the *Builder*, but we know of no certain plan).—C. F. W. (we cannot refer).—M. W. S. (all in good time).—Competitions (several letters on the President of British Architects' observations on this point will have consideration next week).—F. H. M.—C. C. H.—E. W.—G. S. A.—E. H. B—H. W.—B. M.—W. T.—F. J. B.—T. R. S.—T. D. R.—J. N.—Dr. W.—E. B. F.—B. M. O.—A. A.—O. S.—T. S. W.—C. H.—W. P.—E. P.—F. B.—J. D.—S. F. C.—P.—S. G.—E. P.—U. & G.—E. H. L. B.—W. D.—F. S.—B. & L.—G. S. P.—C. G. -W. B.—J. G.—G. F. A.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c, must be accompanied by the name and address of the sender, not necessarily for publication.

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DEATH.

POTTS.—On the 16th instant, at Tabymera Bach, Fwlbell, Carnarvonshire, of fever, JOSEPH CHARLES POTTS, the much loved Eldest Son of William Potts, New Inn Hall, Handsworth, near Birmingham.

SKETCHES for COTTAGES, &c.
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Published by the Stationers' Company, Stationers' Hall Court, London.

NOTICE of REMOVAL,
District of EAST HACKNEY (South) and NORTH BOW.
On and after TUESDAY the 3rd of DECEMBER next, my District Office will be REMOVED from 64, Frampton Park-road, to No. 6, MEYNELL ROAD, Cassland road, Hackney Common, E.
C. A. GOULD, District Surveyor.
November, 1878.

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2nd "	21 prem. 4,000 "	"	100,000
3rd "	2 " 4,000 "	"	100,000
4th "	3 " 4,000 "	"	100,000
5th "	4 " 2 463 "	"	61,700
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The Builder.

VOL. XXXVI. No. 1870. SATURDAY, DECEMBER 7, 1

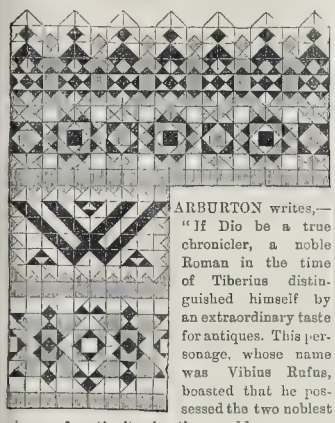
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Suggestive Furniture.



BARBURTON writes,—"If Dio be a true chronicler, a noble Roman in the time of Tiberius distinguished himself by an extraordinary taste for antiques. This personage, whose name was Vibius Rufus, boasted that he possessed the two noblest pieces of antiquity in the world; one was Cicero's widow, Terentia, whom he had married in her third widowhood, and who had arrived at the mature age of a hundred years; the other was the chair in which Cæsar was assassinated." Our readers will be ready to believe that we sympathise with this noble Roman in his taste, at least so far as the chair is concerned, and may remember that not long ago we took the liberty of placing before them representations of part of a collection, which we have gradually accumulated, of specimens of that article of furniture which had been the accustomed seats of distinguished individuals,—those of Gay, Theodore Hook, Bulwer-Lytton, and Shakspeare.* The account of these brought some amusing comments. One of our best and best-known novelists gave strong evidence as to their interest by saying, "Never ask me into your room of chairs: I should see all the men sitting in them!" The eminent author of "Palm Leaves" wrote, "We have often heard of talking tables; these are in truth speaking chairs," and an enthusiastic citizen of the United States, through Messrs. Trübner & Co., offered anything that might be named for the chair that had belonged to Shakspeare!

On the occasion of that first notice we promised to illustrate some of the many similar memorials in our hands, and having been good-naturedly reproached from a number of quarters at a number of times for not doing so, we now willingly supply the omission, and give a view of Lord Byron in the midst of a chat with Anna Bullen, Mrs. Siddons, and Lady Morgan. At any rate, it requires no very strong imagination to produce the picture, for here are the veritable chairs they habitually occupied.†

The fire-screen behind, let us say at starting, belonged to Dr. Johnson. It came to us from Dr. Hugh Diamond, F.S.A., and we will let him tell the history of it. "For some twenty years or more," says the Doctor, "I attended old Mr. William Walker, who kept Walker's Hotel, Dean-street, Soho, before called 'Jack's Coffee House.' [It was so named after John Roberts, one of the singers at Garrick's, Drury-lane.] A well-known club was held there. The screen was a portion of the furniture of the club-room. One day I was talking to Mr. Walker, as I often did, on the former state of the parish, and he said, 'When my uncle came here and I was a boy, none but nobility and gentry lived in the street, everybody kept his carriage, and some drove six horses. The gentleman that lived in Dr. Carpue's house, at the corner of Meard's-street, had six of the most beautiful black horses that were ever seen! But there was one man here who was a great blackguard, Mr. Jesse Foot, the surgeon.' My old instructor, Mr. Abernethy," adds Dr. Diamond, "used to speak of Jesse Foot as the jackass that kicked the dead lion, John Hunter, which excited me to ask about him. Walker told me he was 'that vulgar' that he would draw the table up to the fire, sit on the corner of it, and once took Dr. Johnson's fire-screen to prevent his knees being burnt. Asking him respecting Dr. Johnson's fire-screen, he told me it was brought from Dr. Johnson's house in the City by a member of the club, and given to his uncle for the club-room. His uncle told Jesse Foot, 'he valued that screen more than he did Foot's custom, and he would not have it destroyed'; and he said a great deal more about it which I need not repeat. I rather think it is engraved in Prior's 'Life of Goldsmith'; at any rate, Fairholt once showed me a woodcut containing it. I consider its authenticity beyond dispute. In 1858 Peter Cunningham asked me for the screen, and I should have given it to him but for an accident. Alas, poor Peter!"

And now as to the chairs. Anna Bullen's came out of Hever Castle about forty years ago; it was sold by the then owner when renovating, to make room for modern furniture all glare and glitter. It is of oak; the legs are fluted Doric columns. The front of the seat, which, by the way, is very low, is ornamented with a coarse sort of marquetry or *tarsiatura*. If made in this country it is probably one of the oldest English secular chairs to be found here. The Italians had improved in this sort of furniture so much in the sixteenth century that, as Labarte mentions, "Foreign princes ordered it from Italy." We may imagine, and without much fear of being wrong, that Anna Bullen, poor lady, often sat in it while King Henry VIII. made love to her.

The next to Anna Bullen's in the print was the favourite chair used by our great actress, Mrs. Siddons, when studying her theatrical characters at home, and is the identical one specially taken on many occasions to the theatre or her use upon the stage, particularly in the character of *Queen Katharine*. It was left with her furniture, wines, and the celebrated picture of the Kemble family by Harlow, to Miss Wilkinson, her companion and confidential friend, who lived with Mrs. Siddons many years, and up to the time of her death. Miss Wilkinson was the sister of the well-known Tate Wilkinson, the manager and owner of the York and Hull theatres, and Miss Wilkinson gave the chair, soon after the death of Mrs. Siddons, to the late Dr. Thomas Stevenson, F.S.A., from whom we had it. Dr. Stevenson said in the letter which accompanied it,—"As I dare say you know, Mrs. Siddons lived and died in her house at the top of Baker-street, near to the Regent's Park-gate, and was buried in St. John's Wood church. Miss Wilkinson died under my care a few years after Mrs. Siddons, and was laid either in the same vault or close to it. The picture by Harlow was given to the Kemble family."

The chair is made of bamboo, with cane bottom; very light, and the seat is as low as Anna Bullen's, 13 in. from the ground.

Sydney Owenson, after writing "The Wild Irish Girl," came into Fashion, and later on, when married to Sir Charles Morgan, became one of the queens of society. Her throne-like chair, velvet and gilt, precisely befits her memory: it always held the lady while she held her court. After the death of Lady Morgan, in 1859, it came into the possession of our much-esteemed friend, Mrs. S. C. Hall, to whom we are indebted for it. For how much pleasure and profit others are indebted to Mrs. Hall it would be impertinent to estimate here.

A niece of Lady Morgan, Sydney too, carries on the traditions of her *spirituelle* aunt, and gathers around her, in a bandbox of a house in Sloane-street, more clever men and women than are often to be found in larger rooms.

The story connected with the Byron chair is an odd one, and we are disposed to tell it as it was told to us by the former owner of the chair, the widow of one of our consuls, who served both in Europe and America.

In 1835, a gentleman distinguished as an associate of the Byron coterie of elegant men resided in Ostend. His name was Scrope Davies. He had been obliged to form a home on the smallest pittance. If asked, "*Who* was Scrope Davies?" the reply would be, "A gentleman with a university 'brevet.'" If asked *what* he was,—"*A wit.*" If, again, asked his profession, it might be added, "To be good company." Every town in Flanders possesses one or more squares where soldiers are formed for drill, and where markets are held twice a week. In such a square, over an entrance into a yard, was an apartment which had been a hayloft, to reach which a ladder was fixed to the ground with a ramp on both sides. Here Scrope Davies made his home. He had filled two rooms fashioned in the loft with relics from all the distinguished men he had known, and was visited by many eminent people as they passed Ostend to pay their respects to King Leopold at Brussels.

* See pp. 325, 327, *ante*. † See p. 1279.

When at Brussels himself Davies was honoured and fêted. In Ostend no dinner was given by the best English families without him, and when he entered the *salon* the host felt that the chief attraction of the party had arrived. Our hero of the loft had created for himself oddities which added to his great personal interest. The father of the lady who tells the story knew how to appreciate Davies, who, in return, invited him to the loft, where he found innumerable objects of interest. He was able, too, to serve Davies. This sympathy led to the gentleman one day carrying down the ladder the high-backed, old-fashioned chair made of oak-wood and crimson velvet, shown in the engraving. The four feet represent those of a cloven-footed animal. This chair came from Byron's ancestral mansion, where he used it in his library. Davies was of middle height, well proportioned, stooping slightly; for he was sliding down in years and strength. His features showed no change of expression while causing the greatest hilarity in others. His memory must have been prodigious!

Let us retrace his morning's occupation on a day when he would win all suffrages both during and after dinner. The families in Ostend contrived to give their parties on the market-days, for obvious reasons; and on those days every cook in the town was at the market dressed in her most picturesque habiliments. Scrope Davies comes upon the ground, and a general buzz ensues among the market-women. Some run up to him with poultry, others with fruit. Those who do not leave their seats scream and clap their hands to attract his notice. What is he stopping for and looking after? He dines to-day at the British consul's. He is looking after the consul's cook. Here she comes. Scrope smiles and follows her. "Well! what do you intend to buy?" (Speaking in French.) "What does monsieur recommend?" She follows him to a stand of poultry, where he points out the very best specimen, and, after a little parley, she makes the purchase he recommends. He acts in a similar way with all that is to be had. It was not wonderful that the market-women tried to propitiate him. Our lady informant, whose name we withhold simply because we have not her leave to publish it, adds,—"My father left me his relic, which he prized greatly. Since his death I have held it with care and reverence. It came into our possession about 1835. Alas! it is become infirm, though otherwise in good condition, and kept together by a slight band of metal, which is not visible. I heard of Davies when at Paris, and wrote to him, but he was unable to leave his bed. He died soon after, but I never heard the exact date of his death." Readers of Moore's "Life of Byron" will remember several entries wherein the name of Scrope Davies appears, and will grieve that a career which began so well should have ended so ignobly. Byron, who used to address him, "My dearest Davies," says in his journal, "One of the cleverest men I ever knew in conversation was Scrope Berdmore Davies." "Scrope was always ready and often witty"; and under date March 28th, 1814, appears this note,—"Paid Scrope Davies 4,800*l.*, a debt of some standing, and which I wished to have paid before." We recall one reply by Davies, which may serve to prove his readiness. BeauBrummell, when about to retire to France, obtained a grammar to study; and some one afterwards asking Scrope Davis what progress Brummell had made in French, he replied, that "Brummell had been stopped, like Bonaparte in Russia, by the elements." However we have nothing to do with Davies, excepting as the previous owner of Byron's chair, and we have said enough to show how it was that Byron gave it to him. Davies's appears to have been a wasted life, not without its moral, but we must trace it no further or we shall have our readers mentally calling us to order with the accustomed "Chair! chair!"

Ancient and Modern Views of London. At the suggestion of the authorities of the South Kensington Museum, Mr. J. G. Crace has deposited with them a considerable part of his remarkable collection of maps, plans, and views of London. They have been arranged in the West Galleries, where the Caxton Exhibition was held, and will be open to the public about Christmas; but as Mr. Crace is about to leave England for a time, a private view will be given on Tuesday next.

"ABOUT ETCHING."

The above laconic title forms the general heading of the *catalogue raisonnée* which Mr. Seymour Haden has compiled to accompany and illustrate the collection of etchings which he has lent for exhibition at the Fine-Art Society's Gallery in New Bond-street. The collection comprises a large number of exceptionally fine impressions of etchings by old masters, and a selection from those executed by Mr. Haden himself. Before commenting on some of the works themselves, we may bestow some notice on the remarks in regard to the art of etching, which are incorporated in the catalogue, or rather form an introduction to it.

When an artist or an amateur (whichever Mr. Haden prefers to be called) has made a decided success in any special branch of art, it is a matter of interest to know something of the light in which he regards it from his own point of view, and in this respect the pamphlet before us presents some suggestions decidedly original and independent. In the first place, the practical reason which induced the author to take up etching is stated to be his conviction that the cultivation of accuracy of observation and delicacy of hand attained by drawing or modelling from nature is of the greatest assistance in the profession of a surgeon, and he quotes his own recommendation on this point in a report upon appliances of modern surgery in connexion with the International Exhibition of 1862. This, we venture to think, must be taken *cum grano*: not that we have any doubt that Mr. Haden is speaking in good faith, but we surmise that the real fact is that he had a great natural artistic faculty and inclination, and that he has half-involuntarily excused himself to himself for what might seem a neglect of his profession, by seeing in his artistic work a means of supplementing professional training. We are very glad he finds it so, but we should look with some doubt on the idea of persuading surgical students or practitioners generally that it is good for them to etch or to sketch, whether they feel any impulse or talent for it or not. The idea is, in fact, in opposition to the very first sentence in the next section (Note III.), embodying Mr. Haden's own ideas on art in the shape of a letter which was published in the *Gazette des Beaux Arts*, in which he says, and truly, that "artistic faculties are innate and cannot be acquired: art is a moral and intellectual emanation which study may develope, but cannot create." There are other remarks in this letter which are of interest, and we notice that the writer expresses the opinion, not very popular at present, that technical superiority and minuteness of finish are of secondary importance in art:—"L'artiste doit se rendre maître du procédé au point de donner une belle forme à sa pensée. Qu'aille trop loin, et les moyens deviendront le but; les sentiments et la pensée, au lieu de dominer, seraient emportés par la facilité. Je ne fais aucun cas non plus d'un travail trop minutieux. L'élaboration d'un détail absorbe du temps. Dépenser trop de temps sur un tableau, c'est affaiblir sa conception," &c.; and Mr. Haden observes, in the course of the same letter, that he has always found that those of his own etchings that were not finished in one day seemed to want force and harmony. There are, however, two sides to this, as we shall have occasion to notice.

But what strikes us as of most interest in the ideas which are thrown out in Mr. Haden's notes, is the contrast which he draws between etching and engraving, and the relative value and capabilities of the two methods. We could wish that these remarks should be generally read beyond the circle of the comparatively limited number of persons who will purchase this catalogue. He points out first the distinction between the engraver as he is now generally known, the translator of the work of the painter into a form fitted for mechanical reproduction, and the class of engravers in the fifteenth century who were themselves painters of eminence and of genius, and reproduced their own works, with their own feeling and individuality of handling, by means of the graver, which they were content to use as the only tool of the kind known to them. "But the moment the possibility of acting upon the plate by an implement used like a pencil was shown to them, the burin fell from their hands and they became etchers, while the graver descended at once to a class of men who thenceforth undertook, by a slow and laborious process to which the instrument was not ill-adapted, to reproduce the works of the others," and who "proceeded at once to show how tones might be rendered by lozenge-shaped intervals with or without a dot in the centre of each, the bursting rain-cloud, by an arrangement of consecutive curves not unlike the engine-turning at the back of a modern watch, atmospheric backgrounds by a sort of tooling, having something of the effect of watered silk, and skies by a machine." The etching-needle is to the burin as the pen to the plough; and to illustrate "what infinite memoranda may be made by the point of the etching-needle while the burin is delving its conventional and inexpressive furrow," the author bids us consider Rembrandt's little portrait of his mother, a drawing about 2 in. square, and observe the extreme delicacy of the indications of anatomy and facial character made by such slight means in this consummate little work of art. That is the real distinction of value between etching and imitative engraving, which the general public have hardly a notion of at present,—the distinction between the free and individual handling of an original artist and that of a workman methodically producing a given effect by semi-mechanical means. The other side of the subject must not be forgotten, of course; it must be admitted that the capacity of etched plates for reproducing copies is much more limited, and depends on a much slower and more careful manipulation than is required in printing from an engraving, and that engravings have furnished to many a more or less passable representation of works of art of which they would have got no idea otherwise, because no reproductions by any other process would have been accessible to them; and for this let engraving have due credit, as a populariser of art up to a certain point. But the most minute and laboured works of this kind cannot for a moment rival in value the free and truly artistic work of the etcher.

"The properties of the etching line are, in fact, wholly mental,—those of the engraved line wholly, or almost wholly, mechanical." And this sentence gives the cue to what the author has to say in regard to the requisite faculties for producing good etching; and while we entirely agree with him, and have before expressed the opinion, that the true object in etching should be not high finish, but effect and expression produced by few lines, and that this theory of the art presupposes that there should be thought in every line, and that the etcher should know exactly what to include and what to leave out in order to produce his result, we nevertheless fail to see that this consideration leads to the conclusion that etching is essentially the form of art least of all suited to the amateur. As Mr. Haden works himself as an amateur, his persistency on this point is a little curious. There are, of course, amateurs and amateurs; but we are here considering the term as indicating a man of true artistic feeling, but not practising art as a profession, and not able to give up very much time to it. Now in this light it appears to us that the very qualities which Mr. Haden quotes as characteristic of the best etching, the very nature of its requirements, the fact that it demands no laborious manipulation, but does demand feeling and insight into the relations between nature and art, are exactly what make the art peculiarly suitable to the class of amateur whom we have mentioned, and who alone is worthy the name in its best sense. A man may have much natural artistic insight, and not a little artistic cultivation of mind and hand, yet have no time to master the technique of oil or water-colour painting. Etching presents him with a means of artistic expression which calls into play and demands the very mental qualities which we are supposing him to possess, but does not demand the time and the laborious manipulation which circumstances would prevent him from bestowing. True, that he must have the real spirit of an artist, or he will throw away the capabilities of his method by misusing it in a wrong and inartistic manner; but the very fact on which Mr. Haden insists, that the value of the etched line is really mental, and depends on the thought that goes into each touch, is exactly what is in favour of the amateur succeeding in producing a real work of art by this means better than by any other. The mental qualities he may possess, often does possess, to a marked degree; and etching affords him the means of making the best of them by a process which does not tax him disproportionately in regard to

time and labour,—in which the mental perception has higher value in proportion to manipulation than in any other form of artistic expression.

A few words now as to the nature of the very valuable and beautiful exhibition for which we are indebted to the liberality of Mr. Haden. To say all that might be said in regard to such a collection would occupy far more space than we could suitably bestow upon it: a few remarks upon its leading features must suffice. The etchings which are the work of "old masters" afford illustrations of nearly every variety of style and feeling except that which is peculiar to modern work, and of which Mr. Haden's own etchings afford brilliant examples. We can travel from the precise, minute, and realistic work of Hollar to the opposite extreme of imaginative power and freedom of handling in some of the most powerful productions of Rembrandt. One of the first things that strike us, however, is not an etching, but an engraving by Beham (portrait of the Emperor Charles V.), placed among the etchings in a spirit of impartiality, as exhibiting a triumph of expression and execution with the burin, and representing what we may take as the finest type of work which this instrument can produce in the hands of an original artist. Mr. Haden regards this also, and with good reason, as an interesting illustration of the attempt to escape from the comparative hardness and stiffness of the continuous engraved line by breaking and interrupting the lines, in a manner scarcely noticeable without very close examination, but sufficing to give a considerable softness of effect, more approaching to that of etching. In curious contrast to this are hung two works by Abraham Bosse, in which the endeavour has been to impart to etching the look of engraving, by the careful and laborious use of parallel shading lines by which the compositions (representing the interiors of a studio and a printing-room) are almost entirely modelled: not probably with the actual intention of imitating engraving, but because the practical mind of the worthy Abraham Bosse valued neatness before anything else. Except as curiosities, these works are of little value. Some works by Both and Canaletto are of interest as showing these artists through a different medium from that by which they are generally known: Both's work with the needle is fine and sympathetic; that of Canaletto we can find little admiration for, it is niggled and mechanical, and wanting in tone. Several Claude etchings that are near these are beautiful in their combined freedom, finish, and aërial effect, and the comparison of this work with his paintings cannot but raise our ideas as to the genius of the artist and the extent of his capabilities. In regard to Claude we are considerably interested by the suggestion made by Mr. Haden about the *Liber Veritatis*, to the effect that these famous and over-praised drawings were really meant as "pictorial memoranda" of the pictures which the artist had painted and the persons for whom they were painted, in order to defeat the impostures of his contemporary imitators. Mr. Haden has the boldness to say that it is a mistake to suppose that they are very precious in an art point of view; and those who think most of Claude will be most likely to agree with him. The soft landscape beauty of the Claude etchings, however, affords an almost tame enjoyment in comparison with that produced by the strong hand and over-mastering genius of Albert Dürer, in whose work we have the extraordinary combination of the most precise and hard finish with the wildest and most romantic feeling. It is unnecessary to say anything of these well-known works, except that some of the impressions here shown are peculiarly fine. Very interesting also it is to see some of the portrait etchings by Vandyke, in which the painter was to execute the head and other inferior artists to finish the work of adding background and accessories; it is needless to say that great value attaches to impressions taken before these additions were made, some of which are to be seen here.

Hollar is largely represented, and in despite of the absolutely prosaic turn of his art, interests one in the highest degree by his extraordinary and varied executive power and the thorough honesty of his art. His drawing of Antwerp Cathedral is a wonderful piece of solid and patiently accurate execution, yet remarkably deficient in regard to any feeling for the poetry of architecture. Yet when we turn from this to the little etching of "an English lady in a winter dress," the figure scarcely more than 2 in. high, and contemplate the minute delicacy of shading and modelling combined with really broad and forcible effect which this little work illustrates, we must form the very highest idea of Hollar's power of doing what he liked with his materials, and of being, when he chose, realistic without hardness. In his views of buildings the desire for rigid topographical accuracy appears to have stood in the way of artistic effect with him: this, of course, gives them a remarkable value as pictorial records; but the poetic element is at a minimum in his work, if it can be said to exist at all, and we certainly cannot, like Mr. Haden, see "everything" in Hollar, except in regard to mere technique. Nor can we share his enthusiasm about Karl du Jardin in the sense in which he expresses it; what strikes us, at all events, in the works exhibited here is not so much the tranquil or "tranquillising" feeling of which Mr. Haden speaks, as the supremely able drawing in such a work as "The Two Horses"; the animal lying down and foreshortened is a masterpiece: even Paul Potter's "Chevaux de Charrue," of which there is an impression on the opposite wall, must yield to this.

Of the etchings of Ostade and those of Rembrandt which are exhibited, it is hardly possible to speak here, because one feels that one must say so much if one says anything. The Ostades are only seven in number, but they are examples of perfect balance in composition and manipulation which it would be difficult to match from any other hand. In mentioning them in the same sentence with Rembrandt, however, we by no means intend to imply any possibility of comparison between these works of consummate art, but restricted subject and feeling, and the great world of Rembrandt's art. Forty of the etchings of Rembrandt are placed here, and the contemplation of them fills one with a sort of wonder. There may be no single work with precisely the balance of style of Ostade, for the well-known "Burgomaster Six" is *over*-finished, and so unlike the usual aim of Rembrandt that Mr. Haden suggests that it was a special treatment adopted by the artist to please his friend the sitter. But if we look from one to another of the works in which Rembrandt was expressing that which was really and inherently characteristic of his genius, the expression employed above does not appear too large: his productions fill a whole world of feeling in themselves. Looking at the delicacy of such works as his little portrait of himself (the head only) with a fur cap, and the portrait of his mother before mentioned; then at the curiously chivalresque and cavalier style of the better-known half-length of himself, with cloak and feathered hat, in which he almost seems to have beaten Rubens on his own ground; then at the rich sensuous fulness and ripeness of execution and feeling in that portrait of his wife Saskia, evidently executed in every sense *con amore*; and then pass to the tenderly pathetic sketch of "The dying Saskia"; and then come on a landscape ("The Three Trees") which even Turner has never surpassed,—and so on, through the list, we feel a sort of awe before the power and pathos of this marvellous self-educated genius, the culmination of whose power is fitly shown in that tremendous etching of "The Crucifixion,"—a thing which it is impossible to analyse, but which we feel is above all rules and criticisms of art, which Rembrandt only dared have done, and which no one after him could imitate with any chance of success.

Among the remaining etchings by deceased masters, there are none to be mentioned after Rembrandt's which can seem, in comparison, of any artistic importance; it is of interest to find two slight sketches by Wilkie in this medium, and one by Turner, an outline sketch of no great importance, however. Let us, in conclusion, look at the etchings by the exhibitor himself, which are in a separate apartment. Some few of these we have noticed before in another exhibition. There are eighty exhibited, and a very remarkable collection they are. Mr. Haden does not go largely into figure subjects, and hence is fortunately out of the way of direct comparison with many of the greatest works in the adjoining room. One figure sketch, however, called "The Assignation," a young woman about, shyly, and with downcast face, to enter the door she has just opened, is very sweet and graceful, and has much delicacy of execution. It is by landscape etching, however, that Mr. Haden will be estimated, and here it may be said that he has no need to be afraid of his company, and that in some of the highest qualities of the art he may stand in competition with almost anything that has been done in etching. There may not be any such subtle union of the qualities of painting and of etching combined as is to be found in Claude's "Le Bouvier," but in the artistic use of the capabilities most peculiar to etching his best works are unsurpassed except by Rembrandt, and there is in them a feeling which is peculiarly modern, and gives them an interest different from that of old work of similar excellence. "Kidwelly Town," for example, is a drawing which could hardly have been made except by an artist of the present generation; it embodies a peculiar kind of picturesque melancholy difficult to define, but a good deal illustrated in some of our most recent landscape-painters and idyllists, as they may be called. "The breaking-up of the Agamemnon" is in a much grander and more serious vein, it is such a work as might be ascribed to Turner; and another near this, "a river in Ireland," strikes us as one of the finest, and exhibits a touch and style very different from most of the others. In a general way, however, it may be said that the variety and absence of mannerism in these works is very remarkable: we have hardly any repetition of subject, and the extent of ground covered with regard to style and handling between such works as "Kensington Gardens" and the dry-point study called the "Mouth of a Brook" is certainly wide enough to convince any one that the artist is no picture-maker by rule, but is able to seize the feeling and character of each scene in turn, and derives his inspiration direct from Nature. The amount of light which seems to flood some of the scenes, as in that called "Battersea Reach," is to be noted, and the means by which it is attained, rather by a judicious abstinence from touches than by any positive effort at contrast: this and some other works furnish apt illustrations of what Mr. Haden himself says as to the necessity of the etcher knowing both what to do and what to leave undone. If we want an effect of chiaroscuro of an opposite kind, however, we have it in a beautiful form in "Mytton Hall," where the picture is all dark with trees, which only allow narrow strips of light to escape across the walk, and the old house gleams in the background with that delicate tone, so far removed from the dead white of the lights in engraving, which only belongs to copper etching. We could say much more in sympathetic admiration of these fine works, but must now recommend our readers to go and look for themselves, and also not to fail to procure Mr. Haden's catalogue, and take note of some of his original and suggestive criticisms on the subject of the art which he illustrates so well.

SEWAGE AND IRRIGATION WORKS IN GERMANY.

THE question of sewage irrigation, after having been allowed to recede somewhat into the background for some time, is again attracting public attention to a more than ordinary degree. It is a subject which has repeatedly given rise to lively controversy in England. On that account a reference to what other countries have been doing, and are still doing, in the matter will be of interest. The steps taken in Germany with that view especially will throw additional light on the knotty point whether sewage irrigation "pays." Authorities at home disagree on the financial aspect of such undertakings, but it has been proved that better crops can be grown with sewage alone than could be grown under tillage costing sometimes as much as from 2*l.* to 3*l.* per acre. It has also been shown that if the sewage can be delivered upon land by gravitation close to the sewage works, this mode of disposing of it is more profitable, as well as more consonant with the objects of sewering towns, than discharging it into rivers at some distance below them. Others, again, will have it that the most economical plan to dispose of town sewage is to carry it, if possible, bodily far enough into the open sea that there is no chance of its being brought back again by the tide. Whichever system may be preferred, or whichever may be the most practicable under varying conditions, we think it will be sufficient to show that if irrigation by sewage tends to decrease the expense of removing it from towns, it will be the more economical as well as the safer way of disposing of it. As we have said, and we might cite numerous cases in this country confirmatory of our view, so much

has been proved. For this reason we need not dwell any longer on the question as it affects England, but proceed at once to examine its aspect in Germany. And here again it will not be uninteresting to note that the Germans have taken a leaf out of our book: that they are introducing, or have introduced, a system of sewerage into some of their larger cities at least, partly by the help of British engineering and British capital; which is eminently true in the case of Danzig, at one time one of the most unhealthy cities of the Continent, and a city the purifying of which was a far more Herculean task than the celebrated cleansing of the Augean stable.

Although the Danzig contract itself was based upon the extravagant reports prevalent in England (about 1865 to 1870) as to financial results of sewage farming, we have it upon the best authority that experience there is such that similar undertakings, if properly arranged and conducted, may be confidently recommended for safe and satisfactory investments. Indeed, the Danzig undertaking has turned out so well, as we shall presently be able to show, that the municipal authorities of another large city, viz., Breslau, formerly also notorious for its insalubrious condition, with a population of 270,000 souls, have recently concluded a contract with Messrs. J. & A. Aird & Mare, the eminent Berlin firm of engineers, who completed the Danzig works, and have been working the sewage farm there for some time, for laying out the land and undertaking the management of the works and farming for twelve years. Moreover, Berlin, with over a million inhabitants, after having for several years made a most exhaustive series of trials of all the known or projected systems, has finally adopted the irrigation system. The chief engineer of the Berlin municipality, Herr Baurath Hobrecht, states the total cost of the irrigation arrangements, including purchase of the land, buildings, cost of mains from the pumping stations, laying out the lands, roads, &c., to be 260 thalers per morgen, or about 60*l.* per acre, the morgen being about six-tenths of an acre. The Berlin authorities are completely satisfied with the financial results.

After this general preliminary statement, let us consider the case of Danzig; and as the supply of water is closely connected with the removal of sewage, indeed the latter could not be thought of without, a few remarks on that point will be necessary. The municipality of Danzig resolved as early as 1863 to provide the city with pure drinking-water, and a complete system of sewerage. The Danzig waterworks, if a system of wooden pipes liable to pollution from external causes may be called by that name, dated from the time of the German Knights. They only supplied water for general use, however, and drinking-water was brought into the city on wagons, and was sold at a high rate. However, with the opening of the new waterworks in 1869, by which pure water was brought a distance of about fifteen miles from reservoirs *circa* 350 *ft.* above sea level, all this was changed. The daily supply, since the day of their opening, has varied between 245,000 and 400,000 cubic feet. The total cost for executing all the works connected with the undertaking has been not quite 550,000 thalers (82,000*l.*).

The draining system of the city was so defective that it would have been extremely injudicious to discharge into it an increased quantity of used and polluted water. The highly dangerous accumulation of filth of all descriptions in houses and courts, street gutters and cesspools, as well as in the public water reservoirs, called for urgent reform, by introducing a new system of drainage. When, therefore, the question of water supply was once determined, the carrying out of drainage works could be seriously thought of. A contract was concluded with Messrs. Aird for executing them, and detailed plans, on the project as submitted by Herr Baurath Wiebe of Berlin, were prepared by Mr. Baldwin Latham, C.E. The works were begun in August, 1869, and completed by the end of 1871, at a cost of 700,000 thalers (105,000*l.*).

There remains to consider the more important part of our subject, the disposal of the sewage for irrigation purposes in Danzig. In the absence of a more conveniently situated and better site, the dune district on the coast of the Baltic between Weichselmünde and Heubude, the property of the city of Danzig, has been selected as the ground for purifying the sewage and utilising it for agricultural purposes. The land in question was partly covered with firs; about 200 morgens were let for pasturage, at the low rent of 50 thalers.

By the contract of September 13, 1869, Mr. A. Aird acquired the right to use the sewage of Danzig, as well as a grant of 2,000 morgens for irrigation and farming purposes, for a term of thirty years, for which Mr. Aird undertook, for a like period, to keep in perfect repair and working order all the sewers and drains and the pumping-station. The expenses for this undertaking of Mr. Aird's may be estimated at from 8,000 to 10,000 thalers (1,500*l.*) per annum. At the end of the term, Mr. Aird has to give up possession of the land, with all improvements and plant, without claiming compensation for the capital laid out in the cultivation of the land. Any buildings erected by him he may take down and remove, unless the city of Danzig choose to purchase the same at a valuation. The contract was a risky undertaking, yet, as will be shown by and by, Mr. Aird has rendered by it a great servive not only to Danzig but also to other German cities which have undertaken similar works.

The plant at the pumping-station includes two steam engines, each sixty horse-power, of which one is at work, as a rule, only from fourteen to eighteen hours a day. During heavy rains, and from May to September, one engine is always at work. In the former case, from 350,000 to 390,000 cubic feet, in the latter, from 525,000 to 550,000 cubic feet,—of which about 175,000 cubic feet are water let in from the river Mottlau, as then the sewage alone would not be sufficient,—are daily taken to the area of irrigation. The channel into which the delivery-pipe empties itself lies at the highest point of the dune, feeding from here all the principal irrigation trenches. The latter branch off on both slopes, and give off again into smaller channels. The ground is levelled in accordance with the gradient, the irrigation being effected according as it is wanted, either by damming up or through furrows. Should there be any surplus sewage, this flows into the sea.

A few words as to the nature of the ground. The dune district in question, it should be stated, is by its nature very little suited for agricultural purposes, and for purifying sewage. The sterility of the dune sand is still further increased by being impregnated nearly everywhere with a fine red sand, so-called *Fuchssand* (a kind of red garden gravel). The hilly configuration of the ground, moreover, made the works of levelling rather expensive, the cost of the area brought under cultivation being 11*l.* 5*s.* per morgen (15*l.* 15*s.* per acre), but will be much less in the future. In consequence of the capillarity of the sand, the level of the ground water is very high, and this increases the difficulty of draining. The growth of the shooting and young plants is not unfrequently jeopardised by sand-drifts.

Although dune sand at first permits sewage water to run through it more quickly than is desirable, its power of absorption is still great enough to allow of the development even in the first year of a luxurious vegetation of the most exacting plants. In consequence of the property inherent in roots of plants, not only of appropriating substances contained in solution in the ground water, but also of dissolving and absorbing matter coming into contact with the finest root-fibres, luxuriousness of vegetation contributes no less to purifying of sewage water than does the power of absorption of the soil. But the latter also steadily and speedily increases, consequent upon the rapidly progressing formation of humus, to which the organic substances suspended in sewage water, and being deposited in the sand, as well as the decomposing remains of vegetable substance produced, contribute equally largely.

The filtrated water, if it does not come into contact with the red sand, and is not coloured reddish by it, is quite clear, free from smell, and tasteless. The purifying process has been complete. The filtrated water has been tested in vain by chemical analysis for the complicated chemical elements of a urinary or fœcal nature. They have, as far as they have not been absorbed by the soil or assimilated by the roots of plants, experienced a lasting change of substance, and have been oxydised to carbonic acid, nitric acid, ulmic acid, butyric acid, &c., by the oxygen of the air contained in the soil and continually replaced.

Of the dune area intended for agricultural purposes, there were in cultivation, in 1872, 30 morgens; in 1873, 120 morgens; in 1874, 250 morgens. Those operations had to some extent the character of experiments, which were to form sound foundations for future cultivation. There not being a market for fresh-cut grass, and haymaking interfering with the development of the after-growth, the cultivation of grass is considerably confined, and that of beetroot, turnips, maize, oil-seeds, cereals, vegetables, also tobacco, carried on. In 1876, 500 morgens were levelled and prepared for cultivation, and tilled as follows: 90 morgens with beets, 34 morgens with colza, 60 morgens (on which that year for the first time oats were grown) with rape-seed, 50 morgens with buckwheat, 12 morgens with barley, 12 morgens with tobacco and maize, 15 morgens (on which rape-seed and flax had stood) with late turnips, 1½ morgen with hemp, 1 morgen with caraway-seed, 50 morgens with Timothy grass and clover (sown end of June and beginning of August), 5 morgens with vegetables; 170 morgens of freshly levelled land were reserved the same year (1876) for planting next spring with beets and other summer crops.

The irrigation, as already stated, was begun on a small scale in 1872, after, at the end of 1871, the sewerage system had been completed. A beginning was made, as in England, with Italian rye-grass. An area of eight morgens, first laid out, was sown on May 1 with rye-grass; the first cut was taken, on June 12, of a length of 18½ in.; the second, on July 5, of 19¼ in.; the third, on July 30, of 20 in.; the fourth, on September 5, of 20½ in.; the fifth, on November 1, of 28½ in. The second area, of 6¼ morgens, was sown on June 7, and gave four harvests,—on July 8, August 7, September 23, and November 3,—of similar lengths. The third area, of 4 morgens, was sown on August 14, and gave in October a cut of 24 in. long. In 1872 the grass grew at the rate of 1 in. in twenty-four hours.

Those few figures show the extraordinary effect of sewage irrigation upon sterile sand; indeed, the growth of grass the following year was still greater. Although rye-grass is the best for irrigation, because it not only withdraws, by its fine roots, most surely the organic matter contained in sewage (according to recent observations even animal substances direct, like insectivorous plants), but also favours, by the intertwining of its roots, the filtration of water, it was found necessary to attempt also other products of the field, as no buyers could be found for the great quantity of grass obtained, and there was not a large stock of cattle in the neighbourhood. Mr. Aird had to decide whether he was to acquire a large farming stock and become a cattle-breeder, or whether he was to proceed to utilise the irrigated area in another way. Beets, wheat, rye, rapeseed, mustard, and tobacco were grown; next, vegetables were attempted; and, finally, also flowers,—the latter for their seeds. Besides the area under cultivation by him direct in 1876, 36 morgens were devoted to vegetables and flowers, and 244 morgens let out on leases. The farmers grew especially swedes, summer corn, and tobacco (18 morgens). The cultivation of the latter is said to be very remunerative, and the tobacco, if not a Havanna leaf, to be certainly of a good flavour.

But not only the dimensions of the area cultivated have increased, the yield has become better paying, even handsome. A proof of this is, that already half of the irrigation area is let. In 1876 from 15 to 20 thalers were paid per morgen; in 1877 the offers went up as high as 24 thalers per morgen, or about 5*l.* per acre, and this for soil formerly dune sand. Those rents are explained by looking over the yields as given in the table below:—

Cereals, &c.	Seed sown.	Yield of Corn.	Straw.
	Scheffel.	Scheffel.	Cwt.
Winter wheat	1·20	15¼	22½
Winter rye	1·10	12	29
Summer rye.....	1·35	9	12
Barley	1·40	11½	12
Oats	2·00	21½	16
Winter colza	1·40	13¼	—
Winter rapeseed	1·10	14	—
Summer rapeseed ...	1·60	9½	—

In 1876 from 200 cwt. to 320 cwt. of swedes, according to the age of the irrigated field, were obtained per morgen. Tobacco yielded about 13½ cwt. The cereals grown were good, partly excellent (rye, oats, summer rape), and sold

readily at market rates, as well as the straw, which was very healthy. Swedes fetched in 1876 from 10d. to 11d. per cwt.; tobacco 1*l.* 11s. 6d. per cwt. The yield of hay was in the second year (1873) in the area on which Timothy and clover were grown from 26 cwt. to 27 cwt. per morgen, and sold at 3s. 9d. to 4s. per cwt. The area planted with vegetables, and flowers for seed, yielded 110 thaler brutto per morgen. Mustard gave 5½ cwt. per morgen.

An important question arose as to how the irrigation system would work in winter. Danzig is much exposed to the tempering effect of the sea, but still the winters are very severe. But since the beginning of the irrigation, the latter has been carried on throughout the winter without difficulty. The sewage arrives on the field even if the cold weather is continuous; at most a thin ice crust is formed, below which it runs and sinks into the ground. As the growth is then at a standstill, even of rye-grass, it will not be frozen out. Newly prepared ground is principally irrigated in winter, so that it receives a thorough manuring then.

The consumption of sewage-water in summer is already so large that additional water is let into the drains from the river Mottlau. The large quantities of water which are thus daily brought on to the irrigation area must, of course, find a natural outflow. This is, in the first place, the ground-water, the level of which is from 3 ft. to 5 ft. under the surface. The filtrated water collects in small ditches, which lead into larger channels, emptying directly or indirectly into the Vistula.

Of course, we might give detailed statistics of the indirect benefit conferred by the drainage works on the health of Danzig. But this not being within the scope of the present inquiry, though an important consideration in all sewerage undertakings, we need only remark that they are most striking. To mention only one instance, frequently the cause of great mortality, that of typhus fever, generally the result of bad drainage. In 1868 the deaths from that disease were eighty-nine; in 1876 they were only twelve.

The above statement will give our readers a fair idea of the Danzig works, and the prospects of similar undertakings in Germany. We may, however, point to the case of Danzig as one in which the change from the formerly prevailing abominable system,—system is almost too good a word for a state of matters where everything was worse than chaos,—to a well-regulated arrangement of sewerage and sewage irrigation, coupled with a bountiful supply of pure water, has been most beneficial.

Altogether, the results have been astonishing. On the one hand, a desolate moving dune district has been changed, as if by the wand of an enchanter, into fertile fields and garden land. On the other, a city, formerly the permanent stronghold of filth and disease, the soil of which was reeking with unclean accumulations, to which additions were daily being made,—its inhabitants breathing the noxious effluvia which such a combination of nastiness produces, and drinking poisonous water,—has been transformed into a healthy city. What is more remarkable, the change has been effected at a comparatively moderate cost. Indeed, the expense must be looked upon as small when we consider what an immense amount of good has been done.

The subject concerns us so closely that we shall recur to it on a future occasion, when we propose to treat of the sewage and irrigation works of the larger German cities, especially its capital.

School of Wood-Carving.—With a view of encouraging the art of wood-carving in this country as a branch of the fine arts, the Council of the Society of Arts propose to apply to that object a grant placed at their disposal by the Drapers' Company for promoting technical education, as they are at present in a position to secure the services of an eminent Florentine artist, Signor Bulletti, to take charge of the classes. Messrs. Gillow & Co. have, with a view of aiding this national object, secured the use of a suitable house wherein to commence operations. They will also lend the necessary plant and models, and undertake to secure a sufficient amount of work for a year. On this basis it is hoped that a School of Art Wood-carving may be established. The Council will select and pay the fees for six months of four day-students, who must undertake to attend.

THE HIGH SANCTUARY AT JERUSALEM.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The object of the present paper is to give as concisely as possible an account of the principal results of various explorations in the area of the "High Sanctuary" at Jerusalem, which have been carried out during the last twelve years by professional engineers and architects. These explorations include the Ordnance Survey by Major Wilson in 1864, the explorations by Capt. Warren in 1867-8-9, the explorations by M. Clermont Ganneau and M. Le Comte in 1874, and my own work, including two or three discoveries during 1873-4-5. In addition to which the magnificent volumes of M. De Vogüé have, perhaps, almost exhausted the epigraphic and historical information connected with the subject.

Two questions entirely separate from one another are included in this inquiry. First, that of the Jewish buildings in the area and of their existing remains; secondly, that of the various Christian and Moslem erections dating later than the Christian era. These two subjects can hardly be made too distinct or independent.

The great enclosure called *Haram es Sherif* or "High Sanctuary," is an area partly founded on rock, partly formed by earth, which is supported on extensive vaults and banked up between retaining walls of magnificent masonry. The total extent is about 35 acres, one-sixth of the area of modern Jerusalem. The form of the enclosure is a trapezoid, having right angles at the south-west and north-east corners, and an angle of 92 deg. 30 min. at the south-east. A platform having an area of about 5 acres rises in the middle of the Sanctuary; its surface is paved, and, roughly speaking, level, being about 15 ft. above the exterior. The remainder of the Haram has an irregular surface, and is planted with olives and cypresses. The platform is a quadrangle, but none of its sides are equal, nor are any of its angles right angles. Flights of steps lead up to it on every side, and screens supported by slender columns stand on the top of the flights. The two principal buildings on the platform are the octagonal chapel called *Kubbet es Sakhrah*, "Dome of the Rock," and due east of this the smaller decagonal chapel called *Mahkamet Dâûd*, "Tribunal of David," better known as the "Dome of the Chain." Their position on the platform is not central, nor is their axis square to the east and west walls of the platform. Two smaller domes exist north-west of the main building, and on the north, south, and west small modern chambers are built against the sides of the platform. The mosque itself, called *Jamia el Aksa*, or "The remote meeting-house," is built against the south wall of the Haram, over a long vault running north and south, which is known to the Moslems as the "ancient Aksah." The other principal features of the Haram may be briefly enumerated. On the east wall is the fine double gate-house called *Bâb el Tôbe*, or by Christians, "The Golden Gate." In the south-east corner of the enclosure are the extensive vaults commonly called "Solomon's Stables." In the north-west angle is the minaret standing on a rock-scarp near the barracks. Cloisters surround the open area of the Haram on the north and west, and numerous ancient tanks and passages, some of which require special description, exist below the surface in all parts of the enclosure.

The rampart walls of the Haram first claim attention as being the most ancient of the existing remains. Captain Warren's excavations have shown them to be founded on the rock, and have proved that the ancient masonry now visible above the surface is *in situ* and identical with that existing beneath. The western, southern, and eastern walls of the Haram have been pretty thoroughly examined. Three kinds of masonry are found in them throughout: firstly, megalithic drafted masonry; secondly, large and well-wrought ashlar without a draft; thirdly, small masonry,—a patchwork of plain, chiselled, and drafted stones of various dimensions. The order of occurrence throughout the enclosure is the same. The first style occurs at the bottom, and is surmounted by the second, which, as will appear, belongs to the Byzantine period. The small masonry,—Crusading and Saracenic,—is found above the rest, and the battlements are the most modern part of the whole structure.

Of the ancient drafted masonry with which only we are at present concerned, three varieties have been found. The first kind is that of which the walls are principally built. The stones have an average height of about 3 ft. 6 in., but some of the courses nearest the top measure 3 ft. 10 in., while stones of 2 ft. 10 in. and 4 ft. 3 in. in height occur near the foot of the wall. The dressing is extremely fine, and in the best-preserved specimens the boss projects only ¼ in. The draft is generally about 3 in. wide on each side, but in cases where the wall has a set back or batter, the drafts at the top and bottom of each stone are of double width, by which means the effect of uniform width for each sunk plane was obtained. The stones vary considerably in length, the longest yet known, at the south-west angle, measures 38 ft. 9 in., and the second longest, on the north-east, is 23 ft. 8 in. The material is a fine limestone, from quarries under Jerusalem. The hard and soft veins have been used indiscriminately, and but little attention has been paid to the quarry bedding. Some of the stones show, by the trickling of the paint from the marks on their faces, that they have been turned upside down in the wall after leaving the quarry. Hence it results that the masonry has weathered in a very irregular manner, and that some of the stones have entirely crumbled, while others remain in good condition. The carelessness thus shown in the selection of material, in the proportions of the ashlar, and in the angular measurements of the building, contrasts curiously with the immense labour required in moving such large blocks, and with the wonderful fineness and accuracy of the jointing.

The tooling of the faces in the drafted stones is peculiar. After examining the dressing of stones in almost every large building in Palestine, I am able to say that this dressing only occurs, as far as has yet been found, in the masonry of the Jerusalem and Hebron Harams. The draft is dressed with a chisel having eight teeth to the inch, which was driven in two directions at right angles, so as to produce a regular criss cross pattern. The same dressing extends over a band, 3 in. wide round the four sides of the central boss. The rest of the boss is finely dressed with a point.

The second kind of drafted ashlar is found at the south-west corner of the Haram, extending for a distance of about 200 ft. along the south and west walls. The faces of the stones are bammer-dressed, and project some 6 in. or 10 in. beyond the draft. The third variety of drafted masonry consists of blocks yet more roughly finished, with faces projecting 18 in. to 25 in. It is found on the east wall near the north, and is distinguished by Captain Warren from the second style. There is evidence to show that the roughly-finished masonry was not visible above the surface at the time when the wall was built, and there are indications that it is of the same date with the smoothly-finished masonry. Both on the east and on the south-west a valley bed runs through the interior of the Haram, and the rough stones are employed to fill up the hollow; on the south-west the highest rough course is at the level of an ancient pavement, 20 ft. above the rock, while the courses above have the bosses of the stones finely dressed. At the south-east corner the smoothly-finished stones occur to the very foot of the wall, because the ground here falls sharply eastwards, and there was thus no hollow to be filled up, and the wall was originally, perhaps, visible to the very base. Smooth-dressed masonry is found standing on the rough, and smooth-dressed stones have been found in the rough courses, while rough stones occur among the smooth near the base of the wall on the south-east. The voussoirs of the great bridge stand on rough masonry, but have the criss-cross dressing found on the smoothly-finished stones. Thus there is apparently no reason to conclude that the roughly-dressed drafted masonry is of different date to the smoothly-finished drafted stones.

Starting from the north-west corner of the Haram, we may now glance at the special characteristics of the great walls, following them southwards, eastwards, and again northwards. The north-west angle is occupied by a block of rock scarped on the south, north, and east, measuring 350 ft. along the north wall of the Haram, and about 100 ft. north and south. The highest part is 40 ft. above the Haram court. The north scarp of this block of rock is visible in the Twin Pools, two parallel reservoirs which run at a level of 40 ft. below the present road. They are formed by roofing in part of an old fosse 165 ft. wide, which separated the

* By Claude R. Conder, Lieut, R.E. Read December 2.

Haram hill from the higher hill north of it. The northern scarp of the fosse has been traced for nearly 300 ft. The great block of rock above described is now occupied by a barrack, its exact boundary on the west has not yet been determined, because the top of the rock is covered in this part with modern buildings and with rubbish. The Twin Pools are certainly as old as the fourth century. They are described by many early writers under the name of Bethesda, and the wagon-vaulting of the roofs has the peculiar character which appears to belong to early Byzantine work. The fosse itself is, however, probably still older, and extended westwards for at least 200 ft. beyond the Pools.

From the south-west corner of the Twin Pools a magnificent rock-cut passage runs southwards for 200 ft. It is at first nearly 50 ft. high, but at the further end it is barely high enough for a man to stand in. The average width is about 4 ft. throughout, and the roof is of flat slabs. This gallery, which, from the dams built across it, was evidently once an aqueduct, was first discovered by Captain Warren in 1868, and in 1873 I also visited it, and reached the end, where it turns sharply round and is cut by the Haram wall, on the other side of which are two large and ancient cisterns, with which, perhaps, it originally communicated. The Haram wall is here visible, founded on the rock, and built of finely-dressed drafted masonry. During my visit we were also able to make a yet more interesting discovery by scrambling through the floor of a little modern chamber over the aqueduct. We found ourselves standing in this chamber about on a level with the interior of the Haram, which we could see through a window, and we found the ancient drafted masonry *in situ* reaching up this level. In no other part of the Haram has it yet been seen at such a height. The lintel over the window was of equal size with the rest of the large stones, and the opening appeared to be part of the original structure. It had long been suspected that the Jerusalem Haram, like that at Hebron, must have been adorned with buttresses projecting from the wall on the outside. It was, therefore, very interesting to find that the wall above the level of the interior surface of the Haram was set back with a bevel, leaving a buttress projecting 18 in. and 4 ft. 6 in. in width. Another buttress existed in the corner of the chamber, and the space between the two was 8 ft.

The west wall of the Haram is hidden throughout the greater part of its length behind modern buildings. It has, however, been explored immediately north of the Jews' Wailing Place, where a shaft was sunk through the floor of the Pool el Burak, reaching the rock about 100 ft. below the present top of the wall. The smooth-dressed stones here extend to the rock, but it appears almost certain that the original surface was 30 ft. above the rock, for a very ancient chamber was found at that level by Captain Warren, and part of a causeway supported by a pier of rude masonry. The roof of the Pool el Burak is spanned by a fine round arch, discovered by Major Wilson, R.E., which, from the character of its masonry, Captain Warren considers to be not earlier than the fifth century. A maze of vaults and arches of various dates, supporting the present road, exists west of this more ancient archway.

At the Jews' Wailing Place the masonry is well seen, the wall reaching up 40 ft. above the present surface outside. Immediately south of this place is an ancient gateway spanned by a magnificent lintel, 6 ft. 10 in. high, and about 25 ft. long. This gateway, known as the "Prophet's Gate," leads to a vault which runs in eastwards, and which communicates with the interior surface of the Haram by steps.

Another series of shafts was sunk by Captain Warren near the south end of the west wall, where the skewback of an ancient bridge was discovered by Dr. Robinson. The rock was here found 115 ft. below the top of the wall, and a pier supporting the west haunch of the arch was also examined and found to stand upon rock. One of the most striking discoveries made by Captain Warren relates to this bridge. He found the voussoirs fallen from the arch resting on a pavement 20 ft. above the rock; and sinking through the pavement, and through the *débris* on which it rested, he found a voussoir, belonging to a yet older bridge, jammed into a rock-cut drain at the foot of the wall. It was thus proved that two successive bridges must here have existed; and the later bridge, as shown by the dressing of the voussoirs, may be contemporary with the drafted masonry of the walls. The masonry beneath the pavement was here found to be more roughly dressed than that above. The drain beneath this bridge was traced, and led to two rock-cut cisterns; one of which was cut in half by the Sanctuary wall. North of this, again, the passage led in the direction of a large reservoir, called *Hammam esh Shefa*, with which it may probably have communicated.

The total length of the west wall is 1,600 ft. The south wall is at right angles to it, and measures 922 ft. outside. The rough masonry is found for about 200 ft. from the south-west angle to a point where the rock rises above the level of the pavement found under the great bridge. The rough wall is, roughly speaking, trisected by the two famous passages leading to the Double and Triple Gates, which have their sills on the same level with the Prophet's Gate, 60 ft. below the top of the wall. At the south-east corner of the Haram, the ancient masonry extends nearly to the top of the wall, and the total height is 160 ft.; of which height only half is now visible above the surface. Captain Warren discovered, on the south wall, a course of stone extending westwards for about 600 ft. from the corner, and having a height of no less than 6 ft. This *master course* also runs north from the south-east corner for about 25 ft., and seems to indicate that the walls throughout form one complete structure, although the high course has not as yet been observed west of the Double Gate.

The east wall of the Haram, 1,530 ft. in length, has been examined in five places. Near the south-east corner Captain Warren found the famous red painted letters, which, as a writer in the *Edinburgh Review* has remarked, show the courses to which the various stones were intended to belong. The character used is the Phœnician, or Aramaic. It does not, however, prove these stones to be of the time of Solomon, for the same character is found on the Maccabean coins, and was apparently in common use at a yet later period. The most remarkable discoveries on this side of the Sanctuary were,—first, the fact that the great wall runs past the present north-east corner of the Haram without any break; second, that the masonry north of the Golden Gate is of a distinct character, and much rougher than the rest of the wall; third, that a valley, 140 ft. deep, runs across the north-eastern part of the Haram inclosure. Captain Warren's shafts were here sunk more than 100 ft. below the surface before reaching the rock.

A few words are required with regard to the north wall of the Haram. There is as yet no evidence that this wall is of equal antiquity with the other three, and there are indications which seem to show that it may be later. The great reservoir, known as the Birket-Israil, is built against this wall on the outside, and occupies about one-third of the length. Various houses hide the exterior west of the Birket, and the western portion of the boundary, for 350 ft., is formed by the great rock scarp already noticed. All the four sides of the Birket have the same masonry of small and ill-cut stones, some being rudely drafted. The joints are several inches in width, and packed with smaller stones. In one place the stones have fallen out, and a second similar course is seen behind. Such masonry is found in other parts of Palestine, connected with buildings of the Byzantine period. The Birket-Israil is apparently not mentioned by Josephus. One doubtful reference to it has been found in the fourth century, but it is only in the twelfth century that it is first described clearly, and it forms a feature in the topography of the city from that time. The small masonry of its walls was once covered with cement. It seems unlikely that behind the two rows of stones lining the pool any of the old drafted masonry can exist, for the latter would surely have been better fitted for holding the water, and would thus scarcely have been faced with inferior work. In addition, it is found that the cisterns on the inside of the wall are not earlier than the twelfth century; they have groined vaults, like those used by the Crusaders, and pointed arches. No rock has been found in this part of the Haram, because of the valley, which, as before stated, runs across it.

Taking into consideration the change in the character of the drafted masonry on the east wall north of the Golden Gate, the fact that this wall does not terminate at the present north-east corner of the Haram, the character of the north wall of that inclosure, and that of the vaults within, it seems on the whole probable that the north-eastern part of the Haram did not originally form part of the great inclosure bounded by the ancient walls. Further examination of this corner is, however, highly desirable.

Turning next to the consideration of the original surface of the ground within the Sanctuary, our attention is first directed to the *Sakhrah*, or "rock," the top of which is the highest point of rock which exists within the inclosure, although the top of the great scarp at the north-west angle is about 20 ft. higher. The *Sakhrah* occupies the whole space under the dome of the *Kubbet es Sakhrah*, the highest part or crest being about 5 ft. above the floor of the chapel. Beneath it is a cave, about 25 ft. square and 7 ft. high, reached by a flight of steps on the south-east. A shaft is sunk from the surface of the *Sakhrah* through the roof of the cave, and a second shaft is said by the Moslems to exist in the cave-floor. This latter is the famous "Well of Souls," the exploration of which remains to be accomplished.

The general level of the rock, which falls in every direction from the *Sakhrah*, has been determined by seventy-five actual observations, and by the negative evidence which the present surface and the level of tanks not cut in rock afford. The observation of the rock-levels is a matter of primary importance. It is true that the rock may not have been visible throughout on the ancient surface, and, indeed, we know from Josephus that on the side of the city the valleys were filled up with earth, and we find that ancient pavements here actually exist 20 ft. above the rock, ancient gates leading out to a higher level than the rock, and ancient rough masonry once covered up with earth. Nevertheless, it is only by tracing the rock that we can feel sure of the original form of the hill, and of the depth of foundations required to support the massive buildings of the Temple.

The general result of the observations shows a spur of hill running from the north-western corner of the Haram. The ridge passes through the *Sakhrah*, and falls 60 ft. to the Triple Gate. The western slope is much steeper than the eastern, and in the north-west corner of the Haram the surface has been artificially lowered and levelled, having a vertical scarp 40 ft. high.

The rock is hidden beneath the platform, except towards the north-west; the platform is supported on vaults on the south and south-west. On the south-east a most interesting exploration remains to be accomplished. A doorway, flanked by two windows, all three being built up with modern masonry, here exists in the east retaining-wall of the platform. It clearly indicates a vault hitherto unexplored running under the platform.

Such, then, is a brief account of the ancient ramparts of the High Sanctuary, and of the area which they enclose. With the exception of an area of about six acres in the north-east corner, there seems no reason to conclude otherwise than that the ancient walls of the Haram are of one date, and form a single structure. The masonry is the same on the east, south, and west; and no break or straight joint has been discovered in any part of the walls where shafts have been sunk.

The question then arises: Is this area of the High Sanctuary to be identified with the Temple enclosure in its final condition, when enlarged and rebuilt by Herod? The various indications of date for the walls are as follow: First, the dressing of the masonry seems to show that it is of the date of the second or late bridge at the south-west corner, which cannot well be earlier than the time of Herod; second, the fact that three ancient rock-cut aqueducts were built across, and so rendered useless in constructing the Haram walls, indicates a comparatively late date for the drafted masonry of the west wall. It will, however, be shown that the drafted stones cannot be dated later than the time of Herod; for, in the subsequent rebuilding of the Haram, large undrafted masonry occurs in connexion with early Byzantine architecture above the drafted masonry.

It is generally agreed that the great bridge in the south-west angle of the Haram is that described by Josephus as leading to the royal cloister of Herod's Temple, discovered by Dr. Robinson and Captain Warren. The description given by the same author of the rock on which Antonia stood overlooking the Temple, and divided by a fosse from the Hill of Bezetha,

so fully agrees with the appearance of the rock in the north-west corner of the Haram that we can hardly hesitate to identify the two. At the south-east angle Captain Warren discovered an ancient wall running from the south to join that of the Haram. This answers to the Ophel wall, which Josephus describes as running from the south, to join the east cloister of the Temple, and this discovery serves to fix the south-east angle of the Haram as being the south-east angle of Herod's Temple.

It remains to determine the ancient north boundary of the Temple. This requires further exploration; but the change in the masonry near the Golden Gate perhaps indicates the ancient north-east corner, and it is interesting to note that Captain Warren discovered a row of rock-cut buttresses projecting from a scarp which runs east and west, and the line of which if produced cuts the point on the east wall where the change in masonry apparently occurs. These buttresses may be compared with those before described as adorning the west wall, near the north end. The line thus indicated is that of the north side of the present platform, and the east wall of Antonia may perhaps be defined by a line running south from the south-east angle of the great rock scarp. Further excavation in this direction is, however, much needed.*

ARCHITECTURE AT THE PARIS EXHIBITION.

FROM THE POINT OF VIEW OF AN ITALIAN ARCHITECT.

THE ninth and tenth numbers of the professional journal, *Il Politecnico*, of Milan, open with an account of architecture as represented at the Paris Exhibition, written by the Italian architect, Luigi Broggi, and which was read before the College of Engineers and Architects in Milan, at their meeting on the 1st of September last. In giving to our readers some account of this important paper, we must be understood as expressing the views of the writer, without, unless by direct reference, either endorsing or opposing them. Their interest is the more striking from the position held by modern, as well as by Mediæval and by Classical architecture, in Italy; and from the close organisation under which engineers and architects in that country carry out the works of the united professions.

Architecture has often been called, remarks Signor Broggi, the art of arts, as philosophy is the science of sciences; and it is correct to speak of architecture not so much as an art by itself, as a combination of all other arts. Thus, when we examine a noble edifice, or an architectural monument, we regard not the perspective outline of the elevation alone, but the decoration, and the harmony of the tints, or, in other words, the drawing, the sculpture, and the colouring.

From the more or less happy combination of these arts springs architecture, good or bad. When the combination is the conception of a truly superior genius, we have that complex, nameless, divine art, which may be called the daughter of Michelangelo, and the mother of all the noble monuments erected in Italy since his day.

Few persons, at the present day, regard architecture in this light. It is more common to find the beauties of ancient art crippled and profaned by their reproduction in detail, and in inappropriate circumstances. Hence arises that characterless and second-hand architecture which is the shame of the present day.

The architectural student, on a visit to Italy, struck with the colossal grandeur of the ancient edifices, laments that such work is now impossible. Such is not the true stand-point. Art demands progress, or, at all events, movement. Each age, ours like those which have gone before, has its special requirements. The fulfilment of those requirements is that which gives its special character to the architecture of each succeeding age. Thus Imperial Rome had her Colosseum; warlike ages reared their castles; religious ages founded churches, such as the Duomo of Milan, the Certosa of Pavia, St. Peter's at Rome; the epochs of artistic opulence produced the Vatican and the Ducal Palace of Venice.

The present age is an eminently practical one. The field of civil architecture becomes more vast. Commodity and economy are studied. Space is economised. The need of economising space has led to the vast architectural revolution ensuing on the use of iron as a building material.

The architectural type of our age, then, is the ordinary dwelling-house, the civil abode; characterised by the proportions and the style which are indicated by the properties of the new structural material.

But what is the ordinary practice? If we build houses, we use iron for structural purposes; we borrow a Greek, or Roman, or Lombard design for the ornamentation we cripple and impoverish our work. We borrow the model of a grand light from the Duomo of Milan to ornament a window measuring two yards by one!

This want of a characteristic architecture, fitted for the requirements of the day, and adapted to the construction proper to the use of the new material, has been most evident in those enormous buildings (which demanded such economy in their construction) which have been required for the International Exhibitions of the second half of the present century. The Crystal Palace at Sydenham is cited (by the Italian architect) as the first grand effort at the architectural employment of iron: an ingenious effort which has borne but little fruit. In fact, all the successive Exhibition buildings of Paris, Vienna, and Philadelphia have failed to signalise any progress in this special branch of construction, and have remained edifices without a shadow of character.

We pause here for a moment to remark that Signor Broggi has failed to take notice of one figure of novelty no less marked than the use of iron alone. We allude to the combination of iron and of brick, as in the case of the Alexandra Palace, and of not a few modern churches. Concrete, moreover, is now assuming great importance as a building material, and cannot fail to exert an influence on style. But that which must necessarily be unfamiliar to the Italian architect is the history of what we may call the genesis of our Crystal Palace, as to which we can speak with precision. The original idea was neither more nor less than the erection of a colossal greenhouse. When that idea was adopted, and the question of construction came to be discussed, it became evident that the utmost exertions would be needed to complete any building of the dimensions determined within the time proposed. For that reason mainly, as well as for economical reasons in the second place, it became necessary to adopt the utmost simplicity in the structural elements employed. Thus one column, and one girder, repeated over and over again, both in plan and in height, were adopted as the working unit. The same was the case with the gutters, ridge-plates, and sash-bars for the roof. The central arch, which was the chief beauty of the whole building, was the only exception to this rigid unity in the application of the simplest elements. In the ordinary acceptation of the word there was neither architect nor architecture in the original Crystal Palace. Sir Joseph Paxton's rough idea of a monster greenhouse was wrought out, bit by bit, by Sir Charles Fox and Charles Heard Wild, with the additional check of Sir W. Cubitt's opinion as to the strength, and the building was put together as a sort of carpenter's work in iron. With the sole exception of the circular roof, added by Sir C. Barry, the building, so to speak, determined its own plan and elevation; and the design of all similar edifices has thus been to a great extent controlled by the exigences of the foundry and of the forge. There was no time to design the Palace—it was built straight away.

The Exhibition building at Paris this year,—we now return to the report of Signor Broggi,—is perhaps the most unhappy of any of the series; since in addition to the common error of like constructions in applying to iron as a material a well-known style (which was not the case in 1851), there was the further misfortune of choosing the style of all others the least adapted to the material. The façade of the main edifice was heavy, distorted, and swollen, covered in the upper part with useless ornamentation; while the evident poverty of the lower part produced a horrible want of keeping. In the middle was a loggia of light iron work, supported by two corbels so colossal that it was impossible to form an idea how they themselves were supported; until one became aware that, instead of being iron castings, they were only made of wood, covered with plaster or with pasteboard,—a piece of sham work the more inconceivable the more we think of the thousand graceful forms which might have been given to really structural work in iron.

The centre of the façade was flanked by two wings, equally heavy and swollen above; narrow, mean, and disproportionate below; the main object of the architect appearing to have been to mask the iron girders which were the real constructive features of the building, by a continual application of false and useless additions, giving a constrained and laboured effect to the whole edifice, which was entirely destitute of artistic spontaneity.

The plan of the building formed an immense rectangle, 700 mètres long by 500 wide, entirely covered by building, divided longitudinally by ten alleys, intersected transversely, by ten others. Such an arrangement might have been made subservient to an orderly division of the regions allotted to the several nationalities. Nothing of the kind, however, was effected; and it took several days merely to become acquainted with the plan of the Exhibition. This want of arrangement was universally blamed.

The causes of the confusion were various, among which should be named the want of precision as to the relative space which would be occupied by the exhibitors of different countries. The broad alleys would naturally have divided great national regions. Nothing of the kind was carried out, as these alleys, instead of being kept open for the circulation of the visitors, were so crowded with stalls as to become nothing but galleries of exhibitors. The different nations were thus divided by arbitrary lines which it was difficult to detect; and the visitor was often looking at the productions of one country while he thought that he was in the region of another. Added to this the great number of annexes so complicated the plan, that immense fatigue was occasioned; and it became almost impossible to form any clear idea of the distribution of the entire Exhibition.

The Fine-Art Gallery was, perhaps, better disposed than any other; but it had the defect, in the eyes of the Italian critic, of being too much cut up into divisions of too little distinction. The series of small cabinets or chambers presented no *coup d'œil* to the visitor, who had to search about to become aware of their very existence.

The Fine-Art Gallery was interrupted in the midst by the special pavilion of the city of Paris, which was justly regarded by the mass of visitors as the gem of the entire exhibition. The admirable order which reigned here, and the extraordinary care which the city appeared to have taken to secure a becoming representation of the capital of France, rendered this the finest part of the Palace.

The Street of Nations was, perhaps, the only novelty in the Exhibition; but it could not be regarded altogether as a success. The *Rue des Nations* ought to have been the representation of the typical architecture of each country: such was not the case. Commencing with England, the first thing that struck the eye was, that with the place and area assigned to different countries it was an error to suppose that all the façades could be brought harmoniously into the same lines. Such might have been the case when the areas occupied were, if not to say equal to each other, yet, at all events, not disproportionately different. But what happened on the Champ de Mars? England had to fill 100 mètres of façade, while Persia, Turin, the Grand Duchy of Luxemburg, Monaco, and Morocco, all put together, had not more than 15 mètres, their products being crowded together behind an ill-conceived barrack like so many shops.

England met very satisfactorily the difficulty of her long line of façade, by dividing it into three separate buildings, of which one was the entrance to the section, another was the seat of the jury, and the third was the special pavilion of the Prince of Wales. The first gave an example of Old English architecture in the Anglo-Saxon style,—a complicated and heavy mixture of Gothic and Lombard elements. The second gave a beautiful example of a modern house. The third was a pattern of a truly princely pavilion, in that sober, simple style, of brickwork with stone dressings, which is special to English architecture. The interior was a miracle of elegance. Each chamber had its special physiognomy. The dining-room was in the old-fashioned style, having a high dado of unpolished wood, of a dark colour, with hangings of arras and old velvet. From this room

* The conclusion in our next.

was a passage into a drawing-room of thoroughly modern taste, opening on a grotto with a fountain of sparkling water. The other apartments all differed in their decorations, without there being the least want of keeping; and a thoroughly artistic taste was evident in every detail. The pavilion was a great success. The most celebrated tradesmen who supply the royal family had all done their best to adorn the pavilion of the Prince of Wales, and the result was all that is best in interior decoration.

Pursuing the *Rue des Nations*, the visitor came to the territory of the United States, where an uninteresting English façade presented no novelty whatever. Something quite fresh, however, was offered by the façade of Sweden and Norway (the two countries being combined), entirely constructed of wood, in which the natural colours of the timber were relieved by red ornaments, in admirable taste; unless it be thought that too highly architectural a form was given to the framing of the windows.

Of the Italian façade in the street of nations, Signor Broggi speaks with anything but satisfaction. He regards it as a mistake in every way. In other instances, the façade, however small, was that of a building intended to contain the necessary constituent parts of a house. Italy, on the contrary, presented a gigantic portico, without any meaning or object; and the Commission was lodged between four wooden divisions covered with paper, without air, without light, filled up with cases of minerals, so that it was difficult to make out what was intended. Signor Broggi heard many foreigners observe that the *locale* of the Italian Commission was a disgrace to Italy; a remark the justice of which was the more lamentable from the fact that a considerable sum of money had been devoted to the purposes of the Exhibition. Nor could it be said that convenience was sacrificed to appearance. The whole representation of the country was unsatisfactory.

The Italian façade either should have presented to the world the pure and elegant architecture of the Renaissance, in examples of which the country is so rich, or should have indicated the starting-point of the architecture of the future. In place of this, it represented nothing, and evinced no character whatever; neither grandeur, nor elegance, nor anything such as might have been naturally expected from the love of art natural to the country. A detailed criticism follows, wound up by a quotation from the *Figaro*, which speaks of the but little admired façade of the Italian section.

But one bit of good fortune relieved the illluck of Italy, and that was its vicinity to the Japanese section, of which the façade (perhaps too characteristic) was entirely incomprehensible, so that it was impossible to apply any criticism by which to judge of its merits.

Spain adopted the Moresque style, which is always one of extreme difficulty, and which looks very poor when it is not carried out with great richness of ornament. The Spanish façade had the effect of a booth at a fair.

Austro-Hungary aimed at a golden simplicity. It only presented a portico, of sober form, but not devoid of a certain modest elegance.

Russia presented a building of heavy timber, with crossed beams, ornamented with dark red and green, contrasting with the dark colour of the wood. It was a house full of local colouring, black, and cold, but not devoid of a sort of picturesque effect.

From Switzerland every one expected an elegant Châlet in modern style. Instead of this the Swiss façade was of that ancient style which is now rarely found in Switzerland, except at Berne, which is the city most faithful to the usages of antiquity. The building had that want of keeping which is invariably betrayed by the attempt to make new work look as if it were old.

The Belgian façade was so monumental, so beautiful, that no one could see it without regret that it should be destroyed. It had nothing of temporory work or sham, being solidly constructed in marble, stone, and brick. The design approached the English model, but was richer, more ornate, more admirably executed, with a solidity and luxuriance which impressed the imagination. The columns were of the purest marble, the colours of the stone harmonious. The wonder was how the Belgian Government could have gone to so much expense for a building which was to last only six months. It proved to be the case, however, that the stones and marbles were supplied by the proprietors and managers of different quarries, who took this admirable mode of advertising their several products,—a method which would have had a magnificent result if it had been adopted by a country as rich in noble building-stones as is the case with Italy. Belgium indisputably, says Signor Broggi, carried off the palm in the *Rue des Nations*.

The example of Belgium was followed, with less richness of detail, by the Government of Holland, which exhibited one of those buildings in pointed brickwork, with stone fillets and dressings, which are characteristic of the country. The ornamentation was too fanciful, and, as matter of architectural taste, far from admirable; but it had the merit of giving a very faithful representation of the most characteristic style of Dutch building.

As to Portugal, Tunis, Morocco, Luxembourg, Central and Southern America, Denmark, and Greece, Signor Broggi has thought it best to maintain a politic silence. The façades for these countries were either grouped for two or three nations together, or consisted in a row of houses with one window apiece, without any character,—either constructive or natural,—booths at a fair, and nothing more.

On the whole, while there has been something good in the *Rue des Nations*, the general want of keeping, which was perhaps inseparable from a too ambitious attempt, was painfully manifest; and, as a whole, this part of the Exhibition cannot be considered a success.

In addition to the great architectural effort of the *Rue des Nations* numerous architectural constructions have to be mentioned; which chiefly have taken the form of pavilions erected for special purposes. As to these there is very little to be said from an architectural standpoint, if we except an interesting series of pavilions for military ambulances, and of barracks for cheap hospitals, which deserve admiration for their simplicity of construction and their sanitary arrangements.

In the different *cafés* and *restaurants* there is nothing particular to mention. The object of these buildings has been to contain as many persons as possible. The arrangements have been at times ingenious, but without any artistic merit.

Passing the bridge, in the space opposite to the Palace of the Trocadéro, is a jumble of buildings of wood, of a cheapness almost affronting to the eye, from Persia, Tunis, Morocco, Egypt, and Japan, which have as much to do with architecture as the national concerts which are given in them have to do with music. In the midst of this desert of ugliness, the Swedish house forms an oasis. It is built of wood, with a finish and a provision against all atmospheric changes that are superior to those of the best Italian towns. Less architectural than the Swedish façade in the *Rue des Nations*, it is more simple, more practical, more characteristic.

Near this building, the châlet destined for the exhibition of forest products is the only châlet built with care and grace in the whole Exhibition. Everything in it is made of wood, and the value and importance of the material is there abundantly illustrated.

With regard to the colossal palace which Paris has erected on the Trocadéro for public festivities, its permanent character distinguishes it from the buildings proper to the Exhibition. The cascades at the side appear, when contrasted with examples in Italy, miserably deficient in water. The architecture of the building itself is monotonous,—the style a debased Lombard style, not easy to characterise. The hall is imposing by its size, and by the character of its illuminations. The stage is too small, the stalls and seats are uncomfortably narrow; the roof is spoiled by impossible caryatides. But what the result of a great concert to a full audience may be is another question, and one as to the reply to which high expectations may be justified.

Such is an Italian judgment on the architecture of the French Exhibition. It cannot be accused of want of frankness.

Honours from France.—We are glad to have occasion to say that Mr. Charles Barry, president of the Royal Institute of British Architects, has received a letter from the Marshal President of the French Republic, inclosing the riband and cross of an officer of the Légion d'Honneur. Mr. Barry, it will be remembered, was the English member of the International Jury for Architecture at the Paris Exhibition, and a member of the British Commission.

NAVE ROOF, ST. ALBAN'S ABBEY.

SOCIETY OF ANTIQUARIES.

At the first meeting of the Society of Antiquaries for Session 1878-79, held at Burlington House on Thursday evening in last week, Dr. W. Smith in the chair, the following letter from the President, the Earl of Carnarvon, dated "Greystoke Castle, Penrith, November 26th, 1878," was read:—

"Gentlemen,—I have to express my sincere and unqualified regret that I am obliged to address you on your first meeting for our winter session by letter instead of in person. But my absence, which is due to personal reasons of real importance, will not, I trust, prevent the full and fair discussion of a question in which I had much hoped to take part.

You will have laid before you on Thursday evening a letter,* which, as your president, I thought it right to address in the name of the Council and of the Society, to the Chairman of the St. Alban's Committee after the expiration of the session, and after the close of the council meetings I took this step after privately satisfying myself that I was fully confirmed in my views of the case by opinions of the highest weight and distinction, because time was of importance, and I was assured that it would be difficult, at that season of the year, to get together sufficient members of the Council to form a *quorum*. It would obviously be unreasonable to anticipate that on a question involving some difference of opinion, I have been so fortunate as to carry with me every single Fellow of the Society; but I hope you will at least give me credit for a desire to promote as courteously and temperately as I could those views which are embodied in a well-known circular on 'Restoration,' which conveyed the formal expression of the views of the Society, and to which my predecessor, Mr. Ouvry, adverted in felicitous language in his address for 1877. I trust therefore that the Society will see no cause to object to the course which I found myself compelled in my opinion to adopt.

At the time I wrote the letter in question, conveying as it did a protest against substituting a high-pitched roof on St. Alban's for one which has existed, as is believed, for upwards of 400 years, I was not aware that I might have availed myself of the authority of that most distinguished architect, Sir Gilbert Scott, to whose care St. Alban's was confided. In a letter addressed by his son, Mr. J. O. Scott, to the vicar of St. Alban's as recently as June 25th of the current year, he states that his father had minutely examined the roof and taken exact notes of the state of each of the main beams, and then adds these words, 'I need not say that my father's object was twofold, to preserve the old roof as an interesting portion of the abbey, and to render it sound and serviceable.' I have not overlooked the opinion which Sir G. Scott expressed in his report of 1871, that the removal of all the high-pitched roofs had detracted from the external aspect of the building. It will, however, be observed that the correction of the defect appeared to him even then to involve difficulties far too 'formidable' to allow him to propose such a change, and it is clear from the report of his son seven years later that subsequent reflection had only confirmed him in the belief that the restitution of a high-pitched roof was, under the circumstances, impracticable and unnecessary. Those who remember the glowing eulogium which was passed upon Sir Gilbert Scott in this room in the last anniversary address will understand the satisfaction I felt on finding that in urging the claims of the existing roof to preservation, I was, in fact, only endorsing the views of an eminent architect, and, if I may be allowed to say, of a personal friend.

I rejoice, however, not only to claim the authority of Sir Gilbert Scott, but to find myself agreeing with his son, Mr. John Oldrid Scott. In his letter, to which I have already referred, after stating that he had made himself 'fully acquainted,' that very day, 'with the condition of the roof,' he proceeds to enumerate various repairs, which he considers advisable. He calls them the 'usual amount of reparation,' and then adds, 'No doubt a sound roof would thus be obtained.'

In the face of such evidence as this,—evidence which I have reason to believe will be amply borne out in the communications made to the

* Quoted from and commented upon in the *Builder*, p. 828, *ante*.

Society on Thursday evening,—I confess to some difficulty in understanding the resolution passed by the St. Alban's Committee on the 10th of August,—'That the roof of the nave having become ruinous, it is desirable to restore it to the original pitch, indicated by the weathering on the tower, keeping so much of the painted and panelled ceiling as is in a sound condition, and restoring the rest in a similar style.'

I am indebted to a local paper for the words of this resolution, for the committee, either from oversight or unfamiliarity with the usual practice in these cases, returned no answer to my letter; but I am probably not wrong in assuming their correctness. If so, I can only commend to your impartial consideration the curious discrepancy between the resolution of the committee and the report of the architect, and shall leave it to others to furnish the explanation it seems to demand, and to draw the inferences it seems to suggest.

On the general question I think it right to refer you to my original letter of the 17th July, which the secretary will read to you. I could add little to what I then and there said, and though my letter provoked at the time considerable criticism,—some very fair and courteous, some more distinguished by vehemence of language than force of reasoning,—there was nothing, as far as I can remember, which specially calls for a reply from me. But I have thought it due to myself and the society, and even to the memory of Sir Gilbert Scott, to remind you that, in advocating, as I have done, the preservation of the low-pitched roof, I not only gave utterance to those principles which were formally put forth by this Society twenty-three years ago, and to which it has ever since endeavoured to give effect; but I also, without knowing it, recommended the very course to which both the past and present architects have (as far as I can understand) deliberately, and after minute and reiterated examination, set their seal.

I will only, in conclusion, express my confident expectation that, whatever discussion may take place on Thursday evening, will be carried on with that perfect courtesy and good feeling which, so far as I am able to judge, always characterises the meetings of the Society of Antiquaries. To all of us, as Englishmen, St. Alban's must ever be dear, associated, as it is, with some of the earliest memories of their church and nation. On such a subject acrimonious feeling and harsh words can only tend to defeat the object we have in view, namely, to ascertain whether the existing condition of the roof furnishes any justification or excuse for tampering with the truthfulness of a great historical monument, and for resorting to a so-called restoration, which, after all, may prove to be destitute of any just pretentions to fidelity as a reproduction of an earlier roof, and will thus perpetrate irreparable mischief, and give rise to unavailing regrets. CARNARVON."

Mr. James Neale, F.S.A., then read a paper on "The Old Roof over the Nave." We give portions of it:—

The ceiling-boarding, from the rood screen to the west end, is of the poorest kind; mostly, apparently in deal in 9 in. widths, and about ⅛ in. thick. The painting of the ceiling is not beautiful, either in form or colour. I have ventured in my volume to call the decoration "daubing." It may, however, be an unskilful copy of an earlier ceiling. Over the Decorated bays, the lower edges of some of the tie-beams are chamfered, and these beams still bear traces of the original painted decoration. All these features, and others which need not be recited here, are hidden by the ceiling-boarding which is placed below the tie-beams in the whole of the ten western bays of the nave. I think, however, there is in the roofs sufficient evidence to enable us to conclude that exposed beams and recessed panels, such as those of the present choir-ceiling, existed before the present ceiling was formed over the rest of the nave,—largely with the old timbers. Perhaps putting back the ceiling panels between the ancient timbers would approach more nearly the accepted ideal of restoration than the complete removal of all the ancient timbers themselves.

Timber has been very liberally used for all important timbers, and in principle of construction, though possessing no special scientific merit, the roof does not fall short of much genuine Mediæval work. Almost all the timbers are of oak,—some of it in very good condition, and likely to last a very long time; some of it decayed or damaged and needing to be replaced at once.*

Perhaps it may be useful to glance from the great tower to the west end, and note the principals, which are so evidently good or so evidently bad that amateurs might after a cursory glance speak in a decided way about them. The twelve principals next to the tower need but few words. The very beautiful ceiling under these principals, rightfully regarded as very precious by the late Sir G. G. Scott, was discovered in 1875. It was carefully restored with all the thoroughness which characterised the work of that great master, whose death we all so much lament. The decoration on the soffits of the visible beams forms a portion of the general scheme of the ceiling. I felt during my examination that I could pass less critically over this part of the roof; as artistic work of this value could never have been left by Sir G. G. Scott surmounted by a roof in any way inefficient, or likely to prove so in the course of a generation. There was not much decay of timbers, and as well as in the work over the Decorated bays, the construction was better than that of the roof over the Early English bays. The tie-beams at the western portion I classed in my notes as four bad (must be replaced), four middling (might be repaired), three good. A certain number of the rafters and other timbers in this portion of the roof are decayed in parts,—some seriously, others slightly. This is the worst part of the roof for several reasons. The outward movement of the south wall apparently displaced the gutter, and the tie-beams were probably exposed to the weather during a period of neglect. I omit further detail as to the principals.

To sum up the whole matter shortly: Out of thirty-two principals, the twelve next to the tower need not come into question, for the reasons stated above; twenty then remain. Suppose we put the thoroughly good principals at four,—at the lowest number that seems at all likely,—sixteen are then left. Allow that half of these would be better replaced (an extreme supposition) and eight repaired. It seems an extreme measure to pull down a roof 280 ft. long because 40 ft. to 70 ft. might be displaced during the substitution of new timbers in place of the worst of those now existing. I see no strong reason for doubting that the roof over the eastern portion of the nave represents the original roof erected after the completion of the stonework of the Decorated bays, about the middle of the fourteenth century. At St. Alban's, about the year 1350, a low-pitched roof was not a novelty. The roof of the ante-chapel of the lady-chapel erected about twenty-five years before has a pitch of only 21 degrees. The lady-chapel, completed shortly after the ante-chapel, is now covered with a modern roof, but the form of the east wall determines the original pitch, which was about 16 degrees. The nave roof, with 18 degrees of pitch, followed these precedents closely.

Let us examine some of the suggestions made to show that a high-pitched roof may have formerly existed. On the western face of the tower there are marks of inclined grooves having an inclination of about 50 degrees. The Norman roof very probably abutted at the level of the grooves. The pitch is the same as that of the transept roofs (50 degrees), and if the line of the grooves is prolonged to the outer face of the wall it reaches the same level as the corresponding grooves against which the transept roof abutted. With anything like the present arrangement of parapets and gutters no roof abutting against the groove could have been put over the nave. The parapets would have been about 2 ft. 6 in. higher than they are, and the tower walls clearly show that no such monstrously disproportionate parapet walls ever existed.

A good deal has been made of the *existence of mortise-holes* in different positions in some of the timbers. It has been suggested that these point to a re-adaptation of old timbers forming parts of a roof of high pitch. But in fact such mortise-holes occur so very infrequently and irregularly that nothing can be established by means of them. It may be that the timbers in which the mortises occur form part of the nave roof which was removed when the decorated bays were reconstructed.

I have limited this paper to showing what the existing roof is; what evidences there are of its date; and that it is in itself a piece of history of an interesting kind, which it would be a pity to destroy without good reason. I have also endeavoured to show that there is no good evidence that a high-pitched roof was ever put over the Decorated bays.

Mr. Street, in the course of a paper on the subject, said he had been appealed to by parties to both sides of the controversy to give an opinion in their favour, and when the secretary of the Society had written to him hinting that he seemed to shirk the question, he determined to go and examine the roof. He spoke of his intention at a recent meeting of the Institute of Architects' Committee for the Conservation of Ancient Monuments, and two of the members present, Mr. Ewan Christian and Mr. A. W. Blomfield, expressed their willingness to accompany him. On Tuesday in last week, therefore, by the courtesy of Mr. Scott, and of Mr. Chapple, the clerk of works, they went down to see for themselves, being absolutely free from prejudice on one side or the other. Before proceeding to state the conclusions at which he had arrived, he thought he ought to congratulate the Society on the extremely able and judicious letter which its noble president addressed to Lord Verulam in July last. Now, he wished to point out that what was proposed to be done, the substitution of a high-pitched roof for the present low-pitched one, was entirely antagonistic to the work which had previously been done by Sir Gilbert Scott in the restoration of the parapets, &c. If a high-pitched roof were to be put up the parapets must be sacrificed. The present roof had some merits of which many modern roofs were destitute, and if its gutters had been attended to it would still have been in good condition. At South Mimms there was a roof of precisely the same construction over the nave of the church, which he had just restored, and that, he thought, settled the question of date. He cordially agreed with Mr. John Scott when he said, in his letter to the Rev. Mr. Lawrance in July last, that the only portion of the roof which required extensive renewal was that over the four or five western bays. The advantages of not removing the present roof were many. It was impossible to suppose that the central tower would produce the same effect as at present if the ridge of the nave-roof were raised 20 ft., reducing the height of the tower from the roof from 72 ft. to 52 ft. Much as he admired Winchester, he should be sorry to see the tower of St. Alban's presenting the same dumpy appearance. Again, if the old roof were retained the old lead could be recast and relaid. The object of Sir Gilbert Scott was to restore the old roof, to which the parapet belonged. If, however, the Committee were seriously bent, as they seemed to be, on the erection of a steep-pitched roof, retaining the parapet, then their work would not be a restoration of anything that ever existed, for it would be impossible to attain the old pitch of the roof if the parapets and the gutters behind them were to be retained. The raising of the nave-roof would also render it necessary to deal in a similar manner with the transept-roofs at some future day. Further, unless he had been very much misinformed, the new roof was to be of fir, possessing no architectural character. What could be thought of such a proposal,—to substitute a comparatively slight fir roof for an oak roof which could be retained? His acquaintance with modern fir roofs obliged him to protest against such a thing being done. If the Committee could raise funds and restore the roof in its integrity in oak they would have a magnificent covering for their building, but they would require vastly more money than they at present proposed to expend. In conclusion, Mr. Street expressed a hope that the present architect to St. Alban's would pardon his seeming intrusion on his domain, for he (Mr. Street) had entered with diffidence upon the discussion, and with a desire to assist and strengthen the hands of the architect in his work. Mr. Christian and Mr. Blomfield concurred with him in all essentials, and he therefore hoped that the committee would reconsider their determination to erect a high-pitched roof. There was still time for amendment.

Mr. A. W. Blomfield said he had nothing to say further than to express his full concurrence in Mr. Street's conclusions. He believed it would be the greatest possible mistake to remove the present roof, which, as Mr. Street had said, was perfectly capable of repair.

Mr. Ewan Christian said he also quite agreed with Mr. Street. As regarded the question of the restoration of the roof, there

* The state of the case could not be better put than in the letter of Mr. John Oldrid Scott to the Rev. W. J. Lawrance, dated June 25th, 1878.

could be no doubt whatever that it needed restoring, for some of the timbers were far advanced in decay. As regarded the other portions of the roof, there could be no manner of doubt whatever that the whole of it could he satisfactorily restored. The timbers were perfectly sound at the ridge, and the principal rafters and kingposts were in as good condition as they had been in at any time during the last three or four hundred years, and they would last two or three centuries longer if allowed to remain. English oak timber, if of good quality and kept perfectly dry and properly attended to, was capable of lasting for six or seven hundred years, at the least, and it would be a monstrous shame to strip the nave of St. Alban's of its present oak roof, when quite two-thirds of it might be perfectly well restored, and that at no very great cost. The lead was not in anything like so bad a condition as that of many old roofs which had been restored, but even if it were taken off and recast it would not entail a very serious expense. There could be no doubt whatever that if the Committee were allowed to have their way,—if the present low-pitched roof were taken off, and a high-pitched roof put on,—the architect who carried out their behest would have to deal with the other difficulties which Mr. Street had referred to. The parapets must all go, and the whole aspect of the building would be changed. Mr. Street had properly said that to construct a high-pitched roof of such extent in English oak would entail an enormous expenditure, because it would require a forest of timber, and good English oak timber was exceedingly difficult to obtain in large quantities. As to substituting a high-pitched fir roof for the present oak one, and then to put under it a ceiling painted in the modern fashion in imitation of the old one, it would be as wrong and as absurd a thing as could possibly be done. If a high-pitched roof were to be erected, it would be far better to deal with the case completely, and show the roof internally. The only wise and prudent course to be followed under the circumstances was to take the old roof as it was, and restore it faithfully according to its present lines. He was certain that it could be so restored as to last for a century or two longer.

Mr. William White said he had that morning been down to St. Alban's independently, and his examination enabled him to entirely bear out what had been said by Mr. Street, Mr. Blomfield, and Mr. Christian.

The Rev. W. H. Lawrance, vicar of St. Alban's, said that Mr. Street had led the meeting to understand that the decision arrived at by the committee was in opposition to the opinion of their architect, but while Mr. Scott had stated that the old roof could be repaired and made sound, he had subsequently, at a meeting of the committee on the 16th of August, spoken distinctly in favour of a high-pitched roof.

Mr. John Evans, a member of the committee for the restoration of the Abbey, said he must say that it seemed as though Mr. Scott had deliberately eaten his words at the dictation of some members of the committee, for having given them a written report in one direction, he had turned round and advocated another course. As the local secretary of the Society of Antiquaries in Hertfordshire, he (Mr. Evans) had felt bound to bring the matter under the notice of the president, Lord Carnarvon, who, in the absence of any suggestion from the Council, wrote so admirable and timely a letter to Lord Verulam; but neither that letter nor the letter sent by the Society for the Protection of Ancient Buildings had been able to carry conviction to the majority of the committee, and the contract had been let for the erection of an ordinary deal roof with queen-posts, and it was now a question in the papers whether such roof was to be covered with tiles, slates, or copper,—in fact, the old historic abbey was likely to become a *corpus vile* on which to practise experiments in roof coverings. He maintained, in opposition to Mr. Scott, that there was no evidence of the existence of a high-pitched roof in the nave since the parapets were built. Any one tracing down the clear-story sides of the tower would see that a roof running in those lines would render gutters impossible with the existing parapets. He believed, however, that it was proposed to retain the parapets, and to get over the difficulty of making them fit a high-pitched roof by some system of "drops" at the sides. In adopting a high-pitched roof for the nave, the committee were not simply adopting such a roof for the nave, but for the transepts and aisles, and to put high-pitched roofs over the aisles would necessitate the stopping up of a number of the windows lighting the triforium, and it would generally lead to giving the abbey such an aspect as could never possibly have belonged to it. He only hoped that the strongly-expressed and decided opinions of such eminent architects as had spoken on the subject would lead to the rescinding of the contract for the new roof.

Mr. Charles Barry, president of the Royal Institute of British Architects, said he had listened with great attention to the exhaustive and logical argument which Mr. Street had maintained throughout his very interesting paper, and if logic and good advocacy could do it the proposed mistake would be averted. The Committee had, perhaps, acted a little hastily, and he ventured to hope that the opinion of Mr. Street, confirmed as it was by Mr. Blomfield and Mr. Christian, both of them excellent authorities of themselves, would go a great way in influencing the Committee. He regretted that Mr. Scott was not present, as he might have been able to reconcile the extraordinary discrepancy between his report of June last and his personal action some two or three months later, or might have been able to say what occult influence had caused him to alter his judgment. He (Mr. Barry) ventured to hope that in spite of the contract having been entered into, it was not too late to abandon the high-pitched roof. It crept out in the papers that there was a difference of opinion in the committee almost approaching the limits of personality. It was to be deprecated in the strongest manner that gentlemen charged as trustees over such noble fabrics as St. Alban's Abbey should indulge in personalities. Personal feeling ought to be entirely eliminated from discussions on art and antiquities, and some members of the committee should remember that they had a higher duty to perform to the public than to carry out their resolves by obtaining a catch victory over their co-committeemen at a time when it was almost impossible to get a full attendance. He sincerely hoped that the reconsideration of the matter was not yet impossible.

The Chairman having invited those who took an opposite view to speak,

Mr. J. T. Micklethwaite, F.S.A., said he by no means took up the championship either of the architect or of the committee, in whom he should be sorry to put unbounded confidence. It seemed to him, however, that a great deal of the argument which had been brought forward on both sides of the question was distinctly beside the mark. Here was a large ancient building dating from the eleventh century, and which had gone through a number of alterations from that time until the last century, and now further alterations were going on. The nave roof was out of repair, and required at least partial renewal. That roof, as most people would acknowledge, was not by any means a beautiful object. The effect of so flat a roof over so very long a nave was not beautiful, and to put a high-pitched roof would certainly, in his opinion, be an improvement to the appearance of the church. Could that be done without destroying the historic interest of the building? He thought so; for if it were agreed that a high-pitched roof would be an improvement, and that the present roof was of historical value, we should be satisfying our own ideas of propriety by raising a high roof if at the same time we could retain all that was historically valuable by leaving the existing roof as a ceiling under the new roof. Whether Sir Gilbert Scott contemplated doing that at St. Alban's he could not say, but five or six years ago he did precisely the same thing at Selby Abbey. The proposal to erect a high-pitched roof at St. Alban's must, if objected to at all, be combated on æsthetic and not upon historical grounds. What we in the present day had to do was to carry on the history of our own time; and while, in altering any ancient building, we were bound to keep everything of historical value, we were by no means pledged to the retention of every historical fact to the exclusion of æsthetic effect.

Mr. J. P. Seddon said he agreed with Mr. Micklethwaite to a very great extent. He denied altogether the assertion that St. Alban's Abbey was the better for not having the high roof which was originally intended for its long nave, and he could not see anything in the objection that the high-pitched roof would detract from the appearance of the tower, which, though picturesque in itself, surmounted a mangled building.

Mr. Street, in reply, said it was hardly necessary that he should give a serious reply to what had been said by the last two speakers. If they desired to "run amuck" at our old buildings he hoped they would not have the chance to do so. According to their view, it would no doubt be possible, on some high æsthetic ground, to prove that a glass roof would be the best thing. What he had endeavoured to show was that the existing roof could be repaired. What he understood the gentlemen on the other side to say was, "It does not matter if it can be; we want something better." But if the existing roof could be repaired and restored, that was the simplest and best course to take. In spite of what had been said, restoration meant reinstating. He thought there was yet time for the committee to rescind the contract, for he believed that the timber for the new roof had not been ordered.

Mr. Joseph Clarke said he regretted that he had been unable to accompany Mr. Street in an examination of the building. He begged to move: "That having heard the papers read by Mr. Neale and Mr. Street, and the discussion which followed, this meeting is of opinion that the existing roof over the nave of St. Alban's Abbey can be rendered sound and serviceable, and that the proposal to substitute a high-pitched roof is, under the circumstances, greatly to be deprecated, and opposed to the principles of all sound restoration."

This was carried *nem. con.*, as was also a resolution of thanks to Lord Carnarvon, Mr. Street, and the other gentlemen who had moved in the matter.

THE SOCIETY OF PAINTERS IN WATER-COLOURS.

The seventeenth winter exhibition contains a good many delightful little "bits," as well as some interesting work on a larger scale and in a more finished manner. Mr. Henry Wallis occupies the centre of the top of the room with a large work, which is, however, more or less of a sketch, called "a Sextett during the Terror" (90), the object of the title being to give excuse for the portrayal of figures in the special costume of the Revolution period, and perhaps to indicate the artist's wish to represent a certain type of character and physiognomy peculiarly prevalent in French society of that period; otherwise there is nothing in the feeling or expression of the group which emphasises such a contrast between grave events and a gay occupation as the title would lead to expect; nothing to indicate that the first violin is in danger of being guillotined the next day, or anything of that kind. Indeed, the party of high-cravatted gentlemen and their listeners seem as absorbed in the music and as oblivious of burning political questions as could be wished in the quietest epoch or country. Their bright-coloured costumes, reminding one of the dress of a certain personage in Coleridge's poem, have a rather harsh and inharmonious effect; but there is much character in the faces and persons, especially the tall staid-looking man with the bassoon, whom we should expect to be an "incorruptible" patriot; and the handsome imaginative youth, a sort of Camille Desmoulins, who plays second violin, and whose feelings are going with the music so completely. Another work by the same fine and gifted artist is a collection of figures "Awaiting the Distribution" of alms to the poor at Bruges; a smaller and much more harmonious work than the other, though with less character; the interest is rather in the composition as a whole, and the general impression which it conveys. Mr. Basil Bradley has been unusually successful in his large drawing of two St. Bernard dogs in a snowy Alpine landscape (112), which is, in fact, quite a finished work, and a very fine one of its kind. Mr. Marsh's large but more sketchy drawing, which balances it, "Tourists" (67), is not so successful; there is want of character in the figures, even for a sketch, considering the size of the drawing. Among the other figure-subjects to which less prominent places have been assigned, are some superior to any of the those mentioned, notably Mr. Walter Duncan's "A Story" (130), told in a guard-house among certain helmeted soldiers, very rich in colour and finely drawn, and full of force and expression; a single figure, called "One of Oliver's Soldiers" (140), by the same hand, is also well worth attention, as well as other smaller and

less important subjects, none of which, however, have the poetic interest and force which characterises some contributions to the gallery which we have had from Mr. Duncan in recent exhibitions. We look with great interest also on the contributions of Mr. Norman Tayler, who has developed a style and feeling of his own in various compositions, in which what used to be called "rustic figures" are combined with landscape, in a style broad yet truthful, and full of fine feeling; the best of these is "An Anxious Moment" (212), which ought to have been much better hung, but the persistency with which new and original artists are hung out of the way in this exhibition is remarkable and amusing, considering what things get on the line; nor can we the least understand why Mr. Tayler's "Greeting" (228) should get better measure in this way than the work previously mentioned, as it is certainly not the best of the two. Mr. Buckman's "A Son of the Soil" (216), shows force and directness of aim, but certainly the brown, or rather red, of the labourer's face and arms is overdone, and not like flesh in texture either. Mr. J. D. Watson sends a very cleverly-painted but not interesting group, called "Rivals" (247), the rivals being a court fool and a monkey: the attractiveness of the work consists mainly in its harmonious qualities as a study of colour, and the rich effect of the tapestry background. Some very good figure studies bear the name of J. Parker, not so familiar to us as the others that have been mentioned; "Saturday Night" (367), on one of the screens, is original and fine in colour.

Amongst landscapes, one of our greatest water-colour artists in this branch of the art, Mr. Alfred Hunt, exhibits only two or three small studies, not much for him to execute, but marked by the force and poetic feeling of which his work is never destitute. Of these "Carnedd Dafydd" and "Whitby" are the best: only in the latter we are inclined to suggest that there is a little discrepancy between the scale of the houses on the opposite cliff and the rest of the drawing: for their distance according to the aërial perspective they are surely rather large. Mr. Tom Lloyd has a very fine study of foliage on an "Autumn Morning" (221), in which the figures, however, are not equal to what he usually places in his rich and harmonious landscapes. Sir John Gilbert's works may count as landscapes, since their real interest lies more in the landscapes than the figures, in the best of his drawings at least; the "Return Home—Wind and Rain" (198) is a fine, free, windy sketch. The two Messrs. Fripp, George and Alfred, are rather in force, each in his well-known and always agreeable styles; Mr. Thorne Whaite contributes two or three sets of free, broad, open-air studies; Mr. Otto Weber's various studies of landscape and cattle (or rather cattle and landscape), from the neighbourhood of the Thames at Cookham, are quite perfect as far as they go, that is to say, as perfectly balanced and true realistic transcripts of nature; Mr. Albert Goodwin sends some fine studies (notably 19) from his favourite Dartmoor and other regions; Mr. Clarence Whaite, among several other things, a very fine study at "Tremadoc Marsh" (197); Mrs. Allingham a good many little works which go to show that landscape is not so much her forte as figures; Mr. J. J. Jenkins a slight study for what would make a very fine and impressive thing if worked out to its capabilities, "The Old Home" (129), with an evening sky behind it, and sunflowers in the foreground, and the names of Messrs. Powell, Naftel, Davidson, Dodgson, and others familiar to our ears, are to be found attached to various interesting though often slight sketches; and that of Mr. H. S. Marks to a good many small landscapes, one of which, "A Common" (328), is the best we have ever seen of his efforts in this way; but some of them lead one to ask whether an artist has a claim to have any landscape sketch hung that he may send, merely because he enjoys a high reputation as a figure-painter. However, to make amends, he sends one small figure study in his best style, a procession of mediævally-dressed personages "Going to Dinner" (361), which is full of humour and admirable in every way, and which we accidentally omitted to mention when speaking of the figure subjects before.

Mr. T. H. Hall Caine has been engaged by the Liverpool Library and Arts Committee to lecture at the Free Library, in January, on "Dante G. Rossetti, poet and painter."

THE CONDITION OF THE THAMES.

The Metropolitan Board of Works and some of its officers have been engaged, during the last two Saturdays, in endeavouring to convince the public that the discharge of the sewage of a city containing four millions of inhabitants into the Thames is not detrimental to that river, or only so to a very small extent. We cannot say that they have succeeded, although their zeal is testified by their spending two bitter wintry days on the deck of a steamboat, and making two journeys down the river nearly as far as Gravesend and back, stopping frequently to test the condition of the bed of the river and to collect samples of its water and of the mud on its banks. It has been objected that these little expeditions,—not by any means "pleasure excursions," as they have been called,—have extended over too limited a period of time and season to give much value to the observations made, and there is force in the objection. The ostensible object of the excursions was to prove to the public, as represented by the press, that the Board has the best of the argument in its controversy with the officers of the Thames Conservancy. On each occasion there have been present the chairman of the Board (Sir James McGarel Hogg), the engineer (Sir Joseph Bazalgette), Mr. Keates (the consulting chemist to the Board), Mr. Bramwell, C.E.; Mr. Chatterton, C.E.; Dr. Dupré, and other gentlemen who have been acting for or with the Board in the present controversy.

On Saturday, the 23rd inst., the visitors examined the river between Woolwich and Greenwich during the last of the flood and the first of the ebb tide, with the view of determining whether the condition of the water in what has been termed the "sewage zone" is offensive or detrimental to the health of the persons living on the banks of the river or navigating its channel, and whether there were any grounds for supposing that any of the unfortunate passengers in the ill-fated *Princess Alice* had their untimely end hastened by the contamination of the river by sewage. The trip was so timed that the boat started while the tide was rising, and arrived at the time of high tide at the northern outfall in the bend between Barking and Galleon's Reaches, whence it went down the river with the sewage, and returned against the ebbing tide, which was now laden with the full sewage outpour, the stream of which was distinctly traceable on the surface of the river. The boat arrived at the spot (about half a mile above the Barking Outfall) where the *Princess Alice* went down at the same stage of the tide as when the calamity occurred, viz., two hours and a half after flood tide. Specimens of the water, for inspection and analysis, were taken at numerous points on the downward journey, the water improving in appearance as the sewage outfalls were approached, all the samples taken being devoid of smell. When the stream of sewage from the outfalls was reached, however, the samples taken from the river exhibited particles of solid sewage matter, but they had no offensive smell.

On Saturday last the excursionists examined the same section of the river during the last of the ebb and the first of the flood tide, in order to complete the observations made on the previous occasion, but more particularly to note the condition of the banks, and (as far as possible) of the bed of the river. The samples of water taken presented but little, if any, difference in appearance to those taken at the same spots on the previous Saturday, and had no perceptible odour. Two or three enthusiasts tasted the water,—one, indeed, took copious draughts of most of the samples, and declared that it had no offensive taste. The boat arrived over the spot where the *Princess Alice* sank just as the tide was ceasing to ebb. There was then 20 ft. depth of water at that spot, and the bottom of the river was sounded in one or two places by means of a long pole shod with iron. The manner of sounding consisted in repeatedly and quickly raising this pole perpendicularly for 2 ft. or 3 ft., and then thrusting the iron-shod end sharply down against the bed of the river. The sound emitted at the points chosen for the experiments clearly indicated the existence of a hard and clean gravel bottom. It should be stated that Sir Joseph Bazalgette invited any one who was at all sceptical to choose his own spots for taking these soundings. A grapnel was twice lowered in this part of the river. The first time it brought up nothing, the second time only one well-worn and perfectly clean small flint, with no traces of mud about it. A sample of water was here taken on the surface, and a sample was also obtained from the bottom by an apparatus devised for the purpose, and which, though simple in principle, could not be got to act for some time. The sample from the bottom of the river was somewhat more turbid than that from the surface, and the suspended matter which it contained was darker in colour and seemed to be heavier than that contained in the sample from the surface. From the foreshore opposite the Beckton Gasworks, and beneath the iron pier used in unloading colliers, a sample of the mud, which here abounds in large masses, was taken. It was very offensive in appearance, and had a not very strong odour of gas-tar. It is alleged against the gas company that they discharge a large quantity of very offensive refuse into the river. Proceeding down the river for a short distance, soundings were taken off the Barking outfalls. Exactly opposite, and at a distance of about 10 yards from the bank, the bed of the river (the depth being 14 ft) appeared to be hard shingle. At about 100 ft. nearer the outfall arches, the depth of water was reduced to 5 ft. 9 in., and the bottom was a mixture of mud and sand. Nearer the outfall arches still the depth of water diminished to 2 ft. 9 in., a wooden pole thrust into the mud as far as it would go showing a deposit of 2 ft. 3 in. in thickness. The tide was now just beginning to flow, and the discharge of sewage had ceased some two or three hours previously. Proceeding a little further down the river, the boat arrived at the mouth of Barking Creek, an insalubrious spot, the manure-works at the entrance giving off very pungent and choking odours, and the creek itself discharging a quantity of very offensive tarry matter, called "blue-billy." This disagreeable-looking stuff was carried up the Thames in a broad, slimy-looking ribbon, which described a bold curve as it emerged from the creek. Here and at the gasworks at Beckton, Sir James McGarel Hogg and Sir Joseph Bazalgette, as was perhaps natural, made the most of such offensive matter, and of its effect on the river. The steamer then proceeded down the river until the southern outfalls at Crossness were reached. Here the specimens of water taken were very clear, and seemed to contain little suspended matter. Off Crossness pumping station, as close as the steamer could get to the shore, the depth of water was found to be 7 ft. 9 in, and the bottom seemed to be a clayey mud, somewhat dark in colour. Just in front of the main outfall, at some few feet distance, an iron tube was thrust into the bottom, and brought up a specimen of black-looking stuff of a clayey consistency, and having what appeared to be a perceptible odour of creosote. Off the Kentish bank of the river, at a point about 800 yards below the Crossness outfall, the boat hove-to while some men went ashore to obtain specimens of the apparently rapidly-eroding bank, which is of a loamy character. At this point of the river the iron tube was again sent down just at the edge of the water at about the level of low-water springs, and brought up a specimen of dark greyish-black deposit of about the consistency of putty, and quite as smooth to the touch in manipulating. There appeared to be, in the opinion of some of the gentlemen present, a faintly perceptible sewage smell about his specimen, which, with all the other specimens of water and mud taken during the two days' proceedings, will be analysed, and the results published. The steamer then proceeded down the river as far as Northfleet Hope, a short distance below Broadness Beacon, on the Kentish bank. On either side of this beacon the loamy bank of the Broadness salt-marshes for a mile or two is rapidly crumbling away, and it is obvious to the most casual observer that a great deal of earthy matter must be washed into the river from the bank at each rise of the tide. Large pieces of the bank, with the vegetation still upon them, lay strewn on the foreshore, to be washed and partially disintegrated by the next tide. Sir Joseph Bazalgette and Mr. Chatterton stated that further evidence of the rapid erosion of this bank was to be found in the fact that in Barstal and Bulleck's survey of the river, made in 1831-32, Broadness Beacon stood some 30 ft. from the edge of the river bank, whereas now it jutted out into the stream, and its base had had to be protected by stonework, while the river bank on either side had receded. Proceeding down the river till within a mile or so



THE ARTISTS' HOUSE, BUDA-PEST. —HERREN LANG AND KELER, ARCHITECTS.

of Gravesend, a specimen of the water was taken from near the Kentish bank, after which the steamer made straight across the river to Gray's Thurrock, on the Essex bank, where another sample was taken. These two samples did not materially differ. The boat then returned to London, picking up one or two samples of water on the way.

THE ARTISTS' HOUSE, BUDA-PEST.

THE Buda-Pest Society of Fine Arts was established nearly thirty years ago. From various causes, the principal of which was an absence of a general interest in the fine arts, and the want of countenance of the nobility of the country, which in Hungary, more than anywhere else perhaps, has to lead the way in everything connected with national progress, the society has hitherto not been able to stir up Hungarian art-life to any effort worth notice. Of course there have been honourable exceptions in the ranks of the aristocracy and the rich Hungarian clergy, and it is owing to these individual efforts that the hitherto sterile soil of Hungarian art is beginning slowly to bear fruit. Count Julius Andrassy, as president in 1863, finally shaped the constitution of the Society of the Fine Arts, within the bounds of which it has been able to labour much more successfully for the interest of art than before that date. This was fully demonstrated when it set about founding a home of its own in Buda-Pest for Hungarian art. Thanks to the initiatory efforts of the society, the Government, the twin-city, and the general public came promptly forward to assist in erecting a resting-place. The Artists' "House" of Buda-Pest (which we illustrate) was opened in November last year, by the Emperor Francis in person.

The handsome building is situate in the Radialstrasse, and is executed in ashlar stonework. Its façade is 96 ft. long, by 60 ft. in height. The lofty ground-story is surmounted by a balcony across the whole length of the façade. Two columns emphasise the principal entrance. The large round-arched windows of the upper story are adorned by Corinthian columns, and are not devoid of artistic decoration. A stone balustrade crowns the whole building, which projects somewhat at each end. The design is by the architect Herr Lang; its execution was superintended by the architect Herr Napoleon Keler. The interior of the house is of a much more decorative character than the exterior. Rich stucco work and tastefully decorative frescoes, marble, and porphyry have been lavished in order to perfect the interior arrangements. The frescoes have been painted by the Hungarian painter Lotz. The stairs are adorned by busts and statues executed by Herren Engel, Hussár, and Szász, all Hungarian sculptors.

The first exhibition of paintings, which was of an international character, and which took place in the autumn of last year, after the opening of the House, was of a most successful nature as far as Hungarian art was concerned. Though the works by native artists were limited, quality compensated for quantity, and augured well for the future.

THE NEW CITY THEATRE, AUGSBURG.

THE new theatre of Augsburg, of which we give an illustration, occupies architecturally such a prominent position among the modern theatres of Europe that we feel inclined to add a few particulars respecting this handsome building.

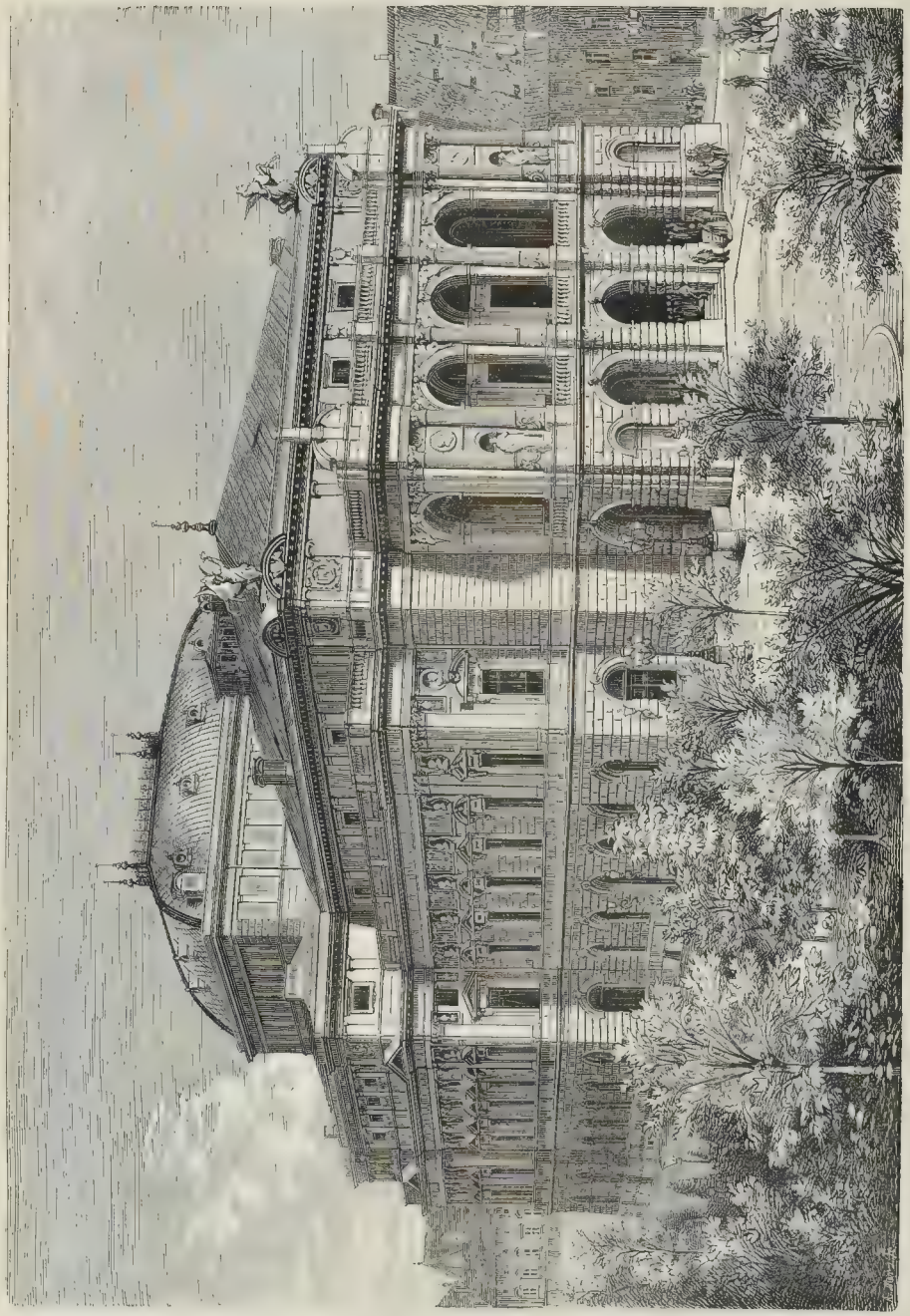
The new edifice rises at the end of the Fuggerstrasse. The architects are Herren Fellner and Helmer, of Vienna, and building operations were superintended by Herr Baurath L. Leybold and Herr A. Eysen. Works were commenced on May 1, 1876; the theatre was opened on November 26, 1877, though not quite finished in all its details.

The building stands free on all sides, its principal façade looking south, and facing the Fuggerstrasse. It rises upon a basement of heavy ashlar stone, and is in three stories. The main portion of the theatre is 324 ft. long, 135 ft. wide, and 66 ft. high, the stage rising into a cupola elevated another 27 ft., reckoning from the principal frieze below it. The façades are in the modern Renaissance style; niches have been formed over the windows of the first story, intended to receive the busts of eminent dramatic authors and composers. The building has been erected in brick, the façades being plastered with cement. The porch and loggia above it of the principal façade are entirely of stone. Grey Trent marble has been used for the smooth surfaces; the carving is in Arco limestone, the figures being sculptured in a finer stone, Medolino, from Pola, in Istria. The principal story is adorned by Corinthian columns, with carved shafts; in the centre are three large round-arched openings, separated by columns, a niche being left at either side for the reception of statues of Goethe and Schiller respectively.

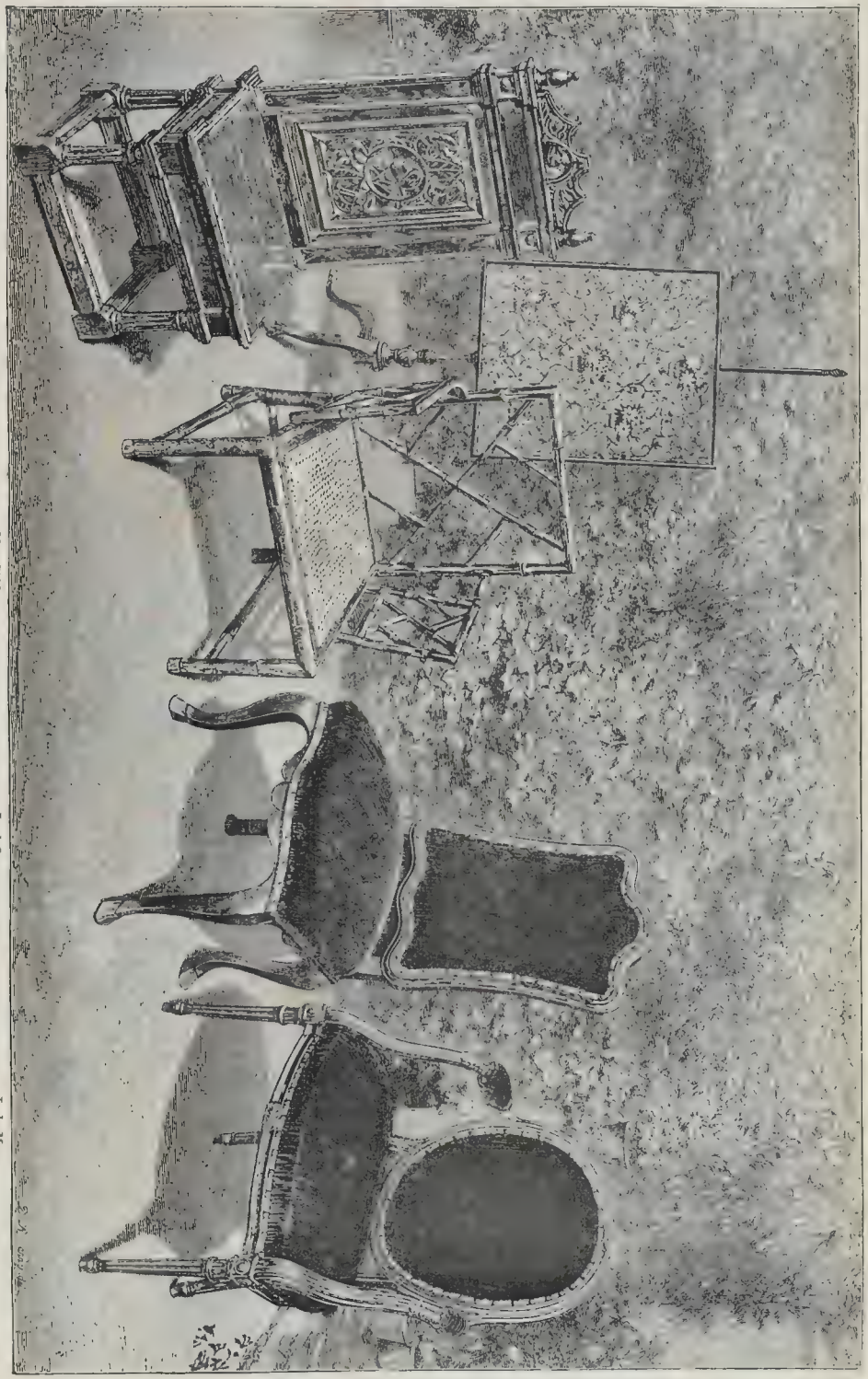
The principal vestibule is entered by the great door of the porch, various openings leading into the auditorium. This forms a hall exhibiting bold arches. It contains, besides the pit, only three tiers. The upper tier rises like an amphitheatre, and unites the gallery with the third tier. Arches separate the two, and support the richly-ornamented ceiling. This is divided into eight panels, containing, alternatively, four oval and as many square encaustic paintings on canvas, and executed by Herr Lefler, of Vienna. They represent, over the proscenium, the Birth of Beauty; after which follow, to the right, Comedy, Dancing, Tragedy (Medea), Poesy, Epos and Satire, Eloquence, and Music.

The prevailing colour of the house is yellow (chamois); ceiling, balconies, and arches, are richly gilt, the arches being changed into pleasant boudoirs by brilliant red silk drapery. The richly-gilt proscenium forms a handsome frame to the principal curtain, the subject, happily chosen, being "Æsop telling Fables."

The theatre holds 1,400 persons, and there is sitting-room in the stalls for 278, in the pit for 165, in twelve pit boxes for 58, in twenty-one first-tier boxes for 123, in twenty-one second-tier boxes for 99, in the third tier for 183, and in the gallery for 136 persons. The stairs throughout are of grey Trent marble. The vestibules, staircases, corridors, stage, and all the rooms in connexion with the stage are heated by hot-water apparatus. The warming and ventilation of the auditorium are effected by pulsation and aspiration. Two powerful ventilators suck in the fresh air from outside, and lead it over hot-water pipes to a reservoir under the pit, and through the ascending channels to the boxes and gallery. Eduction of the vitiated air is principally effected by the sun-burner. The total cost of the theatre, including fitting up, decorations, properties, &c., was 1,300,000 marks (65,000*l.*).



THE NEW CITY THEATRE, AUGSBURG.—Herren Fellner and Helmer, Architects.



Anna Bullen. *Dr. Johnson.* *Mrs. Siddons.* *Lord Byron.* *Lady Morgan.*

SUGGESTIVE FURNITURE.

(See page 1281, *ante*.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting held on Monday evening, Mr. Charles Barry, president, in the chair, a number of recommendations for membership were read, including that of Mr. J. E. Millais, R.A., as an Honorary Associate.

The following gentlemen were balloted for and declared duly elected, viz.:—As Fellows: Mr. James Williams, of her Majesty's Office of Works; and Mr. John Oldrid Scott. As Associate: Mr. Charles Edward Barry. As Honorary Associates: Mr. Francis Tagart, of Queen's Gate; Baron Seaton; Mr. Henry Andrewes Palmer, of Dulwich; Mr. Henry Simmonds, of Denmark-hill; and Mr. Charles Henman, of Croydon.

M. Gabriel J. A. Davioud, officer of the legion of honour, and architect of the Palais du Trocadéro, was then unanimously elected by show of hands as an Honorary and Corresponding Member.

With reference to St. Alban's Abbey, Mr. James Neale said it would be remembered that in July last a report was prepared stating that the ruinous and rotten condition of the roof timbers over the nave of the Abbey had been exaggerated, and that the present roof might be repaired and rendered perfectly sound and serviceable. These statements had been confirmed by Messrs. Street, Ewan Christian, Blomfield, and W. White, who last week made special visits to the building. A resolution had been passed by the Society of Antiquaries affirming, amongst other matters, "that the proposal to substitute a high-pitched roof is, under the circumstances, greatly to be deprecated, and opposed to the principles of all sound restoration." He wished to know what action the Council of the Institute had already taken in the matter, and what they were now prepared to do? If action were to be taken at all it should be immediate.

The President, in reply, stated that the matter was under consideration, and that the Council, in conjunction with the Committee for the Conservation of Ancient Monuments, would shortly take action in the matter.

Mr. Street added that the visit of himself and Mr. Ewan Christian and Mr. Blomfield was in reality the outcome of proceedings before the Institute's Committee for the Conservation of Ancient Monuments, although their account of the visit happened to be first brought before the Society of Antiquaries.

Lieut. Conder, R.E., then read a paper "On the High Sanctuary at Jerusalem," a portion of which we publish.

Mr. James Fergusson vigorously replied to some of the points raised by the author of the paper, the accuracy of whose conclusions, where they did not agree with those of Mr. Fergusson, was stoutly denied. Mr. Fergusson also complained that Lieut. Conder had altogether ignored the replies and explanations given in his (Mr. Fergusson's) work on the subject as to many of the contested points. However, the discussion was adjourned until the next meeting, when Mr. Fergusson will read a paper in reply to Lieut. Conder.

WINDOWS.*

DURING the last few years a much-disputed compromise has been largely used, viz., that of employing a large sheet in the lower sash and small squares in the upper one. I have employed this myself; I cannot say I think it wholly satisfactory. On one occasion I had to take plans for a small house before a well-known architect, and he said to me, "You don't mean to persecute your client with these small bars, I hope?" And when I said I did, he replied, "Why, when I look out of the window, it is generally through the upper pane, and I love to watch the sky and the ever-changing clouds, and I could never do this through your small panes!" And he seemed so in earnest about it that I have always since felt there is something in it; and when, on another and later occasion, a committee passed a resolution to omit the small panes in another small house of mine, I confess I did not feel quite so confident that I was all in the right, although I knew it would greatly damage the general external effect I had aimed at in the design, and so it did. Still, I thought a tenant might some day live there who also had a strong love for the sky, and he again would condemn the architect who had done so much to destroy his enjoyment of it. Some will say, "Oh! but we architects must do what we consider best, and not risk our reputations by trying to please everybody, or we shall probably be like the man with his donkey, and please nobody!" Still, we must remember that houses are built for men to live in, and their convenience should most undoubtedly be our first consideration. I confess, therefore, that I am still in some dilemma on the point myself; and though I certainly have not found out a way of employing large sheets of plate-glass satisfactorily, I feel there is some reason in the objections raised against small panes, though I do not share them as far as regards my own personal feelings. Mr. Robson, in his book on School Architecture, speaking on this subject, says:—

"In case of breakage, the danger to the children from falling glass is much slighter from moderately-sized pieces, while the ever-recurring glaziers' mending bill is in each case less. Now that modern science has succeeded in making sheets of glass larger than a dining-table, we are in danger of passing with too-rapid strides from the old-fashioned diamond quarries to the opposite extreme. There could hardly be a more complete mistake than to indulge in the taste (or want of taste) where a school is the subject."

Plate-glass we are all ready to use as a great improvement, on account partly of its great strength, and partly on account of its perfection in manufacture, so that we can see objects through it without distortion or obstruction of any kind. We all know the painful feeling of looking through "sheet"-glass, whereby objects are magnified and diminished in the most wonderful way, according to the different parts of the glass you look through; but surely the simple fact that plate-glass can be made in very large sheets does not lay on us the obligation of using it in the very largest sheets that our openings will allow.

One revolution made by the introduction of plate-glass should be mentioned, viz., the abolition of shutters; for if people could be only brought to believe it, plate-glass windows are far safer and more difficult to get through than the antiquated many-divisioned shutter, with its clumsy bar and bell, which nine times out of ten gives a warning falsely. Of course, if shutters are abolished great care must be taken to see that the sash-fastener is really what it pretends to be. Endless are the varieties brought out, each claiming to have some special advantage, and most having also some disadvantage, generally discovered only by the painful process of experience.

I will now take up a few points connected with windows internally, more especially as regards their fittings; and the first point is naturally the relative advantages and disadvantages of casements and hung sashes. Casements are the old fashion, hung sashes are the comparatively modern one, and, therefore, it is generally assumed that hung sashes must be preferable; but I doubt myself whether, in many cases, we should find them to be so, and whether we should not find that a combination of the two might not be advantageously used. The objections to casements of a large size are that they take up a great deal of room; if they open outwards they are apt to be broken by the wind; if inwards, they interfere with curtains, &c. Another objection to their opening inwards is the difficulty of keeping out the weather, unless an expensive water-bar is employed. The objections to a large hung sash are the weight of lifting and shutting, and the great difficulty of cleaning. The advantages of casements are their ease of opening, shutting, and cleaning, and, to my mind, their appearance. The advantages of hung sashes are their compactness, and their very great facilities for regulating the temperature of rooms, which is of much importance, and which certainly is not so satisfactory in a casement, unless a mullioned and transomed window is employed, when the upper portion may have sashes hung by the lower rail, and falling inwards, which probably is the most satisfactory arrangement for direct ventilation that can be. Tobin's mode of ventilation by inserting small vertical tubes with bell-shaped mouths in the lower rail of the upper sash is as good as any means for ventilation in the ordinary sash-window, and can be easily applied to existing windows. Currall's ventilator, inserted in the lower sash, is also effectual, though it might be improved in appearance. An invention worth notice in connexion with the sash-window has lately been brought out by Mr. Charles Brothers, a full-sized model of which may be seen in the Museum of Building Appliances, and a later one at Messrs. Trollope's Museum, Halkin-street. This arrangement mainly consists in hanging the whole of the sash-frame in the rebate of the window-opening, thus affording, when open, a very ready means for examination of the weights and sash-lines, &c., and also for cleaning, without any interference with the frame, as in the ordinary sash. The whole is locked when closed from the inside, and there is also an ingenious bolt in the hanging stile, which allows the window to be opened a certain way only. The top sash is also fitted with a means of ventilation through the top rail, also regulated at will. The inventor informs me that the additional cost is about 2s. a foot super. The frame is kept air-tight by an india-rubber tube fitted in the rebate of window. I have also a model here of Melville's patent lifting, lowering, and locking sash apparatus, by which the sashes are opened and shut by a small arrangement at the side, worked by a rack and pinion. This apparatus is intended more especially for large windows in basements or in nurseries, and in such other places where the window is often required to be left open a small distance and not moved by any one else. It has also the advantage of dispensing with all sash-lines, pulleys, fastenings, lifts, handles, &c. Another arrangement, invented by Mr. Abrahams, of Rosoman-street, has been brought to my notice. This, however, I have not been able to see in use. Its principle is that of the ordinary double-hung sash, in three divisions, with a centre portion opening inwards. This allows of the ingress of air, while the top sash being slightly lowered, allows of its egress. The centre portion falls down inwards flat against the lower sash, thus allowing all the glass to be cleaned from the inside.

With regard to the ordinary sash-window, the usual practice in drawing it is to take a pair of dividers and divide the window equally for the meeting-bars. I have always found it preferable to make the lower sash somewhat the larger, and in order, when open, to obtain the full advantage, to make the head of the frame differ slightly from the ordinary one, thus enabling the lower sash to go up into it and the window to open wider, and I have not found this to add at all to the expense of the frame.

Large sashes are occasionally hung on centres, as at Messrs. Tapling's warehouse in Gresham-street, but this mode is not generally convenient, and is unlikely to come into general use.

Lifts and pulls should always be used, sunk lifts being the best, and brass guards, fitted to the top rail of the lower sash will be found very useful where the Venetian blinds are placed (as is often the case where no preparation has been made for them) so that they fall on to the lower sash. Messrs. Meakin's arrangement for the opening and shutting of sash windows, though rather intricate, is often extremely useful, especially where, by reason of a large side-board, desk, or some other fixed piece of furniture, the window is not easily accessible. One other small matter in connexion with hung sashes is worth mention, viz., that it is a good plan to have the pulley stiles of the frame made in oak; it adds very little to the cost, and makes a great difference in the ease with which the sashes are moved. Another patent, by Messrs. Tonks, is worth notice for the improvement and ease of sash-lifting, besides an arrangement of lifts somewhat similar to Messrs. Meakin's. A brass guide is fixed to the pulley-stile, small wheels being fixed in the sash to run in same, which greatly facilitates the lifting of the sash. Stout unbleached hemp-cord is as good as anything for sashes of ordinary size, and this, and strong brass axle-pulleys, should always be carefully examined before any work is passed by the architect. Many metal sash-lines have been introduced, as well as numerous devices for fastening the same to sash and weights. It is advisable to connect the line with the sash about one-third from the top.

The window-opening having now been filled with sash and frame, we may briefly consider the architectural treatment of the window internally. And firstly, in passing, we may notice that splayed jambs are a modern innovation, so far as the general run of windows is concerned, and they are, moreover, a decided advantage, admitting more light. Box-shutters, one of the great difficulties in arranging the internal finishings of a window, are, as already mentioned, rapidly disappearing in face of the additional security given by plate-glass. The chief points to be kept in view in designing the internal

* From a paper read before the Architectural Association on the 22nd ult., by Mr. Aston Webb, vice-president. Concluded from p. 1216, *ante*.

finishings of the ordinary domestic window are, firstly, that they in no way interfere with the light admitted; secondly, that they are convenient for Venetian or roller-blinds; thirdly, that they are convenient for the curtains; and finally, that they do not interfere with the furniture generally. Firstly, as to light. It is important that the light should be as near the ceiling as possible. Wide architraves are, therefore, to be avoided, as, if they are continued over the head of the window, they necessarily bring down the head. Elaborate architraves also are, as a rule, only labour thrown away, for as soon as the curtains are up they are seen no more, except by the housemaids or a curious visitor. They should, of course, be in keeping with the general character of the room in which they are, but any elaborate enrichment, such as might be legitimately employed round the architrave of a door, is out of place round a window. The jamb-linings, on the other hand, which are always in strong light, might often have more attention and care bestowed upon their design than is usually the case. Secondly, as to the arrangements made for blinds. These, in the usual way, are entirely overlooked by the speculating builder. Architects often keep the soffit of the linings about 3 in. above the frame, which makes a fairly-convenient space for the blind, though it has the disadvantage of lowering the window-head. A better way is, I think, to form a box above the lining, which can receive either a roller or Venetian blind, which when pulled up would be out of sight, and obstruct no light. The usual way of hanging Venetians cuts off at least 6 in. of the most valuable light when they are drawn fully up, and when this is added to the architrave and cornice, it brings your window-head at least 2 ft. from the ceiling, which is more than it should be in a London dwelling-house, of which I am especially speaking. The third consideration in the arrangement of window-finishings internally is the hanging of curtains. One great improvement of recent years in this direction is the abolition of deep scalloped vallances, which many upholsterers will still induce your clients to have unless you keep a vigilant eye on them, not merely till the house is out of the builder's hands, but also till it is furnished; and I confess I cannot understand the feeling of those who seem to consider that the attention now paid by architects to this particular branch of their profession, viz., the furnishing of houses designed by them, is immaterial to them, for surely the internal decoration of a house has always been considered part of an architect's vocation, and a careful architect will design all his cornices, joinery, and mouldings with a view to their subsequent decoration; yet surely all this trouble is entirely thrown away if he has no voice in the furnishing. What becomes of all his carefully-selected contrasts and harmonies in paint and paper if the carpet and curtains are in discord with them? But to return to the more immediate subject before us. In place of a deep valance, cut and tortured into fantastic shapes, and imparting a funereal aspect to the room, we now use a plain brass rod or wooden pole, with solid turned ends, and on the rod brass or wood rings carry the curtains. These should be carefully selected to harmonise with the colours in the room, and should be of a length very slightly to exceed the height of the window. The old system of draping the curtains and spreading the ends over the floor tends very much to darken the room, and the curtains thus spread are inconvenient and, to my mind, unsightly. Extreme fulness in curtains is also a mistake. If they are made half as wide again as the space they have to cover when drawn they will be found quite full enough, and will not be so inconvenient when pulled back.

Window-seats are an old fashion which seems to have been almost wholly abandoned in the present day in favour of the modern window-back. No doubt the small increase of space has been the main object of this alteration, and in town houses it is still probably indispensable, but in sacrificing it we undoubtedly sacrifice one of the pleasantest seats in a room. A deep fixed seat in the window gives, too, an air of comfort to a room which hardly anything else can give.

When we consider how much the dignity and refinement in an elevation depends on the treatment of its windows, and how much the comfort, security, and health of the inmates also depend on the careful and scientific arrangement of the windows, we feel at once that it is one of the first subjects to which every student of architecture should turn his earnest attention. It is, in fact, the *summum bonum* of architecture, the one great leading feature which should bind together the elevation and plan; and, generally speaking, upon the measure of success with which this is done will depend the appreciation and merit of the design. It should be remembered that the first great use of a window is the admission of light,—full and sufficient. Gray speaks of "rich windows that exclude the light, and passages that lead to nothing." Modern architecture should not be open to this reproach. We read in the Bible that next after the creation of the world God said "Let there be light," and there was light, and after that record it is not for man to say there shall be darkness. Light and sunbeams mean life and health to all men, and he who excludes the one excludes the other. The second great use of a window is that we may look out of it and enjoy the prospect, whatever it be, and any arrangement which does not admit of this we may at once recognise as wrong (though there are, of course, cases where no look-out is preferable to the only one to be obtained). The third great use of a window is the admission of air and the ventilation of our rooms, without which we could none of us "live out half our days." Fourthly, and lastly, if we attempt fairly to carry out these three great cardinal points in the arrangement of our windows, we shall find that our elevations will become more truthful and representative of the spirit of our age, and the architecture of the nineteenth century may continue to be worthy of the title bestowed on it as "the printing-press of nations."

In the discussion which followed,

Mr. S. Flint Clarkson, in proposing a vote of thanks to Mr. Webb, said the paper was a thoroughly practical one, well thought out, and very frankly and pleasantly written. As to the proportion of window-space to the area or cubical contents of a room, in many cases it was not a matter of discretion, but one of legal enactment. Some of the bye-laws made by the Board of Works stipulated that the glass in the windows should be not less than one-tenth of the superficial area of the room. That was a rough-and-ready method of applying the rule given by Gwilt, and was approximately sufficient. Mr Webb had illustrated in a striking manner the difficulty of dealing satisfactorily with the fenestration of an ordinary London house, for in his anxiety to improve the lighting of some of his rooms he had incurred the disadvantage of spoiling his drawing-room by a central pier which was not in the centre. In fact, the difficulty of treating such a frontage satisfactorily could only be got over, as at the Thatched House Club, by the use of a bay window, or some such expedient. He could not agree with Mr. Webb that "sham" windows were to be eschewed under all circumstances, although he thought they ought to be avoided whenever possible. It was, however, easy to conceive circumstances under which their use would be necessary for the preservation of the dignity of a façade. One point worth considering in connexion with the subject of the paper was, how to treat circular-headed windows internally, so as to accommodate the blinds to the shape of the window. He thought that might be done by providing a box into which the blind should run at the head, only leaving exposed so much of the blind as accorded with the shape of the window-head.

Mr. T'Anson, jun., in seconding the vote of thanks, said he agreed in the general tenour of most of Mr. Webb's remarks, although he could not see that it would always be advisable to proclaim the existence of a water-closet, for instance, lighted from the main façade of a building, by the mere insignificance of the window.

Mr. C. P. Edwards suggested that as well as designing windows for being fitted with blinds, they should also be designed to provide for curtain-fittings. He had seen this done in one instance by forming a recess in the depth of the cornice into which the cornice-pole or rod could be fixed, the curtains hanging down clear without the cornice-pole being exposed. In most cases the cornice-pole was by no means an ornament, and it almost required a valance of some kind to conceal it.

Mr. W. Hilton Nash said he regretted that Mr. Aston Webb had not included some hints as to shop windows in his paper, for that was an exceedingly difficult and interesting part of the subject. As regarded window-reveals, the ordinary 4½-in. reveals were prescribed by the Building Act, and the hard-and-fast line thus laid down was productive of unsatisfactory result. To bring the wooden window-frames flush with the surface of the wall would, in some instances, be productive of a much better effect, while, on the other hand, a 9-in. reveal might sometimes be used with advantage.

The Chairman having put the motion to the meeting, it was carried unanimously.

Mr. Webb, in replying on the discussion, defended "the central pier which was not in the centre" of the drawing-room portion of his façade, on the ground that it was necessary to ensure a better effect in the other rooms, and that the drawing-room admitted of being more "cut up" in its arrangement than other rooms did. He did not think that the use of "sham" windows could be justified under any circumstances, and if a man could not make a good elevation without them, he should "leave it alone." He agreed with Mr. T'Anson's objections as to the undesirability of having a water-closet window in the main façade, but the best way would be not to locate the closet there at all, but to remove it to the side or back. He thought that Mr. Edwards's proposal to conceal the cornice-pole behind the architrave was in some respects a very good one, but it would have the disadvantage of not allowing the curtains to be pulled back clear of the window and beyond the reveal; in other words, some portion of the window must always be covered by the curtains. He had purposely omitted to refer to shop-windows, though in them also nothing was more important than the omission of central piers.

SEWAGE UTILISATION AND THE POLLUTION OF THE THAMES.

INSTITUTION OF SURVEYORS.

At the ordinary general meeting of this Institution, on Monday, the 25th ult., Mr. Edward Ryde, vice-president, in the chair, a discussion took place on the paper read last session* by Mr. R. W. Peregrine Birch, C.E., on "The Use of Sewage by Farmers, or Fifty Instances of Profitable Sewage Irrigation."

Colonel Jones, V.C. (Wrexham), said that going back for a few thousand years in the course of human history, there was an old chronicle which told us that mankind had a sudden fit of desire to build a great tower which should be so tall that its top should reach to the heavens. The chronicle told us that the builders of the tower took great care to select good, well-burnt bricks, but, it added, they used slime for mortar. The natural result of this was that there were cracks and settlements in the foundations, which led to all kinds of disputes and discussions among the builders, until at last no one builder knew what another meant. As the result of these contentions, the tower was never completed. But it was not to be supposed that all the good, well-burnt bricks had been wasted, and were unfitted to be used in other structures. No doubt they were, after being cleansed from the slime in which they had been embedded, largely used in other structures under better conditions. Now it would be remembered that ten or fifteen years ago there was a general feeling in this country that we ought to have a great sewage tower built to take us up to heaven,—the heaven of complete sanitary comfort in the towns and of immense manurial wealth in the fields all round about them. A number of enthusiastic people went to work to build this erection which was to do such wonders, and they availed themselves of good, well-burnt bricks in the shape of great facts like those as to the result of sewage as applied to the land in the Craigentinney meadows, at Edinburgh, and elsewhere. Well, the building was carried on most lavishly and recklessly as to the cost of the superstructure, but a few years subsequently there arose a perfect Babel of tongues as to the proper means to be adopted for the utilisation of sewage, and it absolutely came to be doubted whether the facts referred to were really facts at all,—whether they were "well-burnt bricks" that were being used for the erection of the great tower. Now he thought great credit was due to the author of the paper under discussion for cleansing the "well-burnt bricks" in question from the slime with which they had become associated in the erection of the great sewage-tower referred to, and so preparing them for future use. His (the speaker's)

* See *Builder*, p. 544, *ante*.

only excuse for troubling the meeting with his remarks was that he happened to be acquainted with a great many of the places instanced by Mr. Birch where farmers applied the sewage to the land, to their own profit and at the same time relieving the neighbouring towns of a nuisance. As far as his (the speaker's) knowledge went, Mr. Birch had stated his facts very fairly and truthfully, and he (Colonel Jones) agreed in the main with the whole of his conclusions. There was, however, one point in which he should be disposed to go further than the author of the paper, and that was with regard to what was known as "the separate system" of town sewerage, which, he thought, was at the root of the whole subject. The whole difficulty of dealing with sewage consisted in the unfortunate addition to it, as a rule, of the uncertain rainfall, and no man, whether farmer, chemist, or precipitationist of any kind, could possibly deal with an unlimited quantity of water. The sewage farmer's greatest difficulty was to be able to provide for the sewage coming down from the town in all weathers. If he knew he had a definite quantity,—which he might easily arrive at within reasonable limits, by the water-supply of the town,—he could provide accordingly; but if he had to provide for such an uncertain quantity as in this climate was due to the rainfall,—when he knew that a single inch of rainfall over an acre of ground meant 101 tons of water, and that consequently in a town of 100 acres there would be 10,000 tons of water from a single inch of rainfall,—he would inevitably fail in the attempt. He was glad to be able to say that he had influenced the authorities at Wrexham, and that they had resolved that all future drainage works should be done on the separate system, allowing the rainfall to pass away by a separate course from that taken by the sewage. It was often forgotten in discussions on this subject that sewerage and drainage were two separate matters. We drained agricultural land for agricultural purposes, and undrained land was never used as the sites of farm-steadings or dwellings for animals, but yet human beings were allowed to go and herd together in towns without any thought being taken for the drainage of the sites of their dwellings. When, after a time, the inhabitants of a town became alive to the advantages of a system of sewerage which should take away a great deal of their refuse matter, instead of it having to be carted away, the work was carried out, and the advantage to the health of the town was often very marked, and very rapidly showed itself. Why? Not only because of the system of sewerage, as such, but because the system of sewerage was often, at the same time, a system of land drainage, the subsoil water passing into the sewer-pipes at the joints, and being thence carried away. Salisbury, one of the first places to be provided with a system of sewerage, was a case in point. Previously to the laying of the sewers, the ground on which the city stood was a great deal waterlogged, but during the course of the execution of the sewerage works, and after their completion, the level of the subsoil water was greatly lowered, and the effect on the health of the inhabitants was very perceptible and satisfactory. Some sanitarians seized upon that fact as a great argument for sewerage works, but it was really an argument for drainage, properly so-called. We ought to make the land we live upon tolerably clean and dry, and the rainfall should be carried off by separate conduits. Sewage ought to be conducted in close-jointed pipes to places where it could be most readily utilised on the land. He knew from experience that even in dealing with sewage mixed up with a good deal of subsoil and surface water, he could and did make it pay, and he knew that other farmers made it pay. He also knew that his neighbours at Wrexham would be only too glad to get all the sewage he could spare for their farms. As a matter of fact, sewage was used for agricultural purposes much more extensively than was generally supposed, and when he was consulted by town authorities as to the selection of sites for sewage farms, he generally found that some one had been "cribbing" the sewage. In one instance of a town near Manchester it was found that a farmer had been tapping the sewer for years, unknown to the Corporation or the borough surveyor, and applying the sewage to his ground with the most satisfactory results, growing immense crops of grass, and making a very good thing of it. He thought such instances were by no means uncommon. He had invited Lord Norton to attend and take part in the discussion. His lordship, formerly known as Sir Charles Adderley, would be remembered as having opposed the ill-considered Bill which was some years ago promoted by the Corporation of Birmingham for enabling the town to get rid of its sewage. He was unable to attend, but wrote:—

"Lord Norton is unable to attend the meeting on Monday, but he hopes he has made his own opinion well known,—that the right application of sewage is to re-fertilise the land, and that the one thing now to be done to render its application, even from the largest towns, practicable and profitable, is the separation of the storm water from the sewage drains. There is a perverse opposition to this final step being taken, though the cost would be repaid tenfold, and a valuable manure would be made proper use of instead of being mischievously wasted and turned into a nuisance."

That went to the root of the whole matter. It was no new idea, but had been advocated to his knowledge ever since the year 1849, but, strange to say, engineers seemed to have had a horror and a dread of putting foul water into a sewer without putting the rainfall on the top of it, on the plea that the sewers needed flushing. They forgot that the great bulk of the rainfall did not come when the sewers most wanted flushing, i.e., in the hot weather. The fact was that if sewers were to be flushed at all they ought to be flushed by artificial means, but he contended they would not need so much flushing if they were used only for sewage, because they could be made smaller, and the sewage would cease to be a mere trickle in the invert of a large pipe, but would become a tolerably even flow in a much smaller pipe. The storm-water being excluded, road *detritus*,—which was deposited in the sewers by the storm water in large quantities, forming *nuclei* for the deposit of fecal matter, which decomposed and gave off sewer-gas,—would also be kept out, and we should have cleaner sewers, which, if well ventilated, would leave scarcely any necessity for the costly valve and trap closets, many of which only served to pump sewer-gas into our houses. He was very glad to have had the privilege of attending and addressing the meeting, for it was the first opportunity he had had of giving his experience of sewage farming before a body of gentlemen professionally concerned in dealing with the question.

Mr. J. J. Mechi, of Tiptree Hall, said the question under discussion was most interesting and important, because it was really a question of our food. If anybody doubted that he ought to be prepared to advocate the doing away with the manurial system of English agriculture altogether, and then see what sort of crops we should get. It was beyond all question that that which we took from the land should go back to the land after we had used it, and the only question at issue was how that could be satisfactorily done so as to meet the requirements of large towns as well as those of the country. He believed that towns would always find a difficulty in dealing with the question, as they had a tendency to accumulate all the good things of the earth in a very small compass. The question of the distribution of town sewage for purposes of irrigation was really only one of providing a pipe to convey it and of finding land to receive it, and had been very satisfactorily solved by our practical friends the Germans. The whole city of Berlin had been sewered by English engineers, Messrs. Aird, with the result, as he (the speaker) had stated in the *Times* recently, in a short letter, that it only cost 60*l.* an acre to buy land and provide pipes and working plant. It really was a severe comment upon the wealth and the power of Great Britain to find that the Prussians should be so far in advance of us that not only was their metropolis better supplied with water, but that its sewage was utilised while we were only talking about doing it. At Dantzig, again, Mr. Aird had for over seven years been utilising the sewage of the town by irrigation, and he had just contracted with the town of Breslau, with 260,000 inhabitants, to receive its sewage and put it upon the land as a profitable investment. Mr. Aird informed him that the German towns generally were coming to the conclusion that they must shortly utilise their sewage. The Germans certainly possessed one advantage in the fact that the land was poor and sandy, and could be purchased at a low price, but the fact remained that sewage could be profitably disposed of by irrigation, the crops on the sewage-irrigated poor land being much larger and better than the crops obtained on the richest land without sewage. A great deal had been said of the difficulty of dealing with the sewage of our great metropolis, but he had no hesitation in saying that engineers and scientific men would make child's-play of taking the sewage of London and diffusing it over the surrounding country, only give them the money. As compared with the vast sums of money which had been raised for great railway constructions, the money required for carrying out the works necessary for profitably applying the sewage to the land was a mere "fleabite," and it surprised him that so much discussion had been wasted upon it of late years. The Metropolitan Board of Works, some years ago, let the whole of the sewage north of the Thames to a company for fifty years, and the works necessary for applying it to the land were to be completed within nine years from the date of the agreement. As some evidence of good faith, the company lodged 25,000*l.* with the Board, and the Board still retained the money, because the company was unable to fulfil its engagements, which were perfectly practicable, though the public appeared to think differently, and refused to subscribe the necessary two millions of capital. Since the completion of the Metropolitan Main Drainage system, the voidances of four millions of people had not only been lost to the country, but they had gone to obstruct and poison the Thames. It was not possible to discharge into any reasonable river the riddances of four millions of people without causing a great nuisance, and even if it were possible to do so, the sewage would be wasted and misapplied. It had been abundantly proved, over and over again, that when sewage was applied to the land under proper conditions, the results were all that could be desired. For many years he had himself utilised the sewage of his house and farm-buildings, distributing it over the land by means of irrigation, and it was astonishing to find what could be done with the sewage of even a single house. Advocates of the "separate" system, and many farmers, had objected that, under ordinary circumstances, they got too much water with their sewage, owing to the rain or storm-waters not being separated from the sewage strictly so called, but he (the speaker) should be able to show that such an objection was not well founded. Naturally, the manurial power of Great Britain was equal to about two sheep per acre per annum. Reduced to sheep, taking bullocks, pigs, and so on, it would represent 94,000,000 of sheep, or two to the acre. Now it was complained that the London sewage was too much diluted; but how much more water was mixed with the voidances of the two sheep per acre of the country would be seen when he stated that we had a rainfall in this country of 26 in., or 2,600 tons per acre. On the other hand, each human being residing in a town (and for manurial purposes a sheep was about equal to a man) had only about 60 tons of water per annum mixed with his sewage, independently of the storm water, and as Mr. Hayward had shown, we did not have more than about twenty-one severe storms in a year. At all events, the quantity of water following the voidances of two individuals in a town was infinitely smaller than that which accrued to the voidances of two sheep on a farm. As to the execution of the necessary works, he thought that it was the duty of municipal authorities to take care that the sewage of their towns went back to the land, and that if they failed to fulfil that duty the Government should, by Act of Parliament, compel them to fulfil it. There had hitherto been too much indifference as to the question. In London itself it seemed as though the Metropolitan Board of Works was afraid to meet the question. No doubt a great initial mistake had been made in casting the sewage into the river, but it was believed at the time, and no doubt honestly believed, that it would be carried down to the sea, no more to return, but the result had proved that the upward flow was stronger than the downward flow. The Board had lately been down the river and taken samples of the water, which, it was stated, had no offensive smell, and was very clear, even in the neighbourhood of the sewage outfalls. Such tests were worth nothing, for it was impossible that the water which received the manurial voidances of four millions of people in the course of twenty-four hours could fail to be laden with impurity. He regretted the money loss which the waste of sewage for so many years had entailed, and he also regretted the unwillingness of people to discuss the subject, for undue reticence in discussion had hindered progress. He was of opinion with the Chinese, that the first lesson a child should be taught, when he could under-

stand anything at all, was that on his care in the application of his voidances to the soil depended his future existence. The Chinese people had long ago learned that lesson, and the consequence was that a population of four hundred millions of people contrived to maintain themselves without any foreign importations, either of food or manure. Some people were old enough to recollect that at one time, after twelve o'clock at night in London, there were certain unpleasant smells now and again observable, caused by the operations of "nightmen," who emptied the cesspools then in use, and carefully carried their contents to the land,—the proper place for the disposal of all such refuse. It was a remarkable and significant fact, that since London had been sewered, and everything carried into the river, the production of the land of the surrounding country had greatly diminished. His late friend, Baron Liebig, considered it an act of insanity, almost amounting to suicide, to waste our night-soil by throwing it into the river, and then to go to Peru and buy birds' excrement to put upon our land. He hoped that the good sense of the people would remedy this state of things. Practically there was no difficulty in profitably utilising sewage. If the land received the sewage, it must be improved in annual value and rental, and it very often was so to the extent sometimes of 200 or 300 per cent. Mr. Birch had contributed a very able and valuable paper to the "Transactions" of the Institution.

Colonel Haywood, Engineer to the City Commissioners of Sewers, said that many years ago he had some share, in a subordinate capacity, in the preparation of the scheme for the main drainage of the northern part of the metropolis, but since that time he had had nothing to do with the treatment of the sewage of the metropolis in its larger sense, although he had had a great deal of the detail of sewerage works constantly before him. When the present metropolitan main drainage and interception scheme was planned, it had but one object,—how to get rid of a nuisance then existing in the midst of the metropolis, and to cast it forth elsewhere, he would not say regardless of consequences, but leaving the consequences to those who were to be the recipients of the sewage. At that time the population of London was not much more than half of what it was at present. He did not wish to cast a single stone at a work in which he had himself participated, and he was not sure that, in the then-existing state of knowledge with regard to the subject, the Metropolitan Board of Works did not do a wise thing in relieving the heart of the metropolis of the sewage. But the population of the metropolis had nearly doubled since then, and he was afraid that the results showed that even by casting the sewage into the river as low down as Barking, the state of the river would get worse and worse as the metropolis continued to increase. The rate of increase in the population of the metropolis since 1801 had been such that if it continued the population would double itself in thirty-nine years and a half from the present time,—say in forty years. Now, the quantity of water coming down from the upper Thames forty years hence would not, he thought, be materially increased, but, on the other hand, the quantity of sewage would be doubled. If, therefore, the casting of the sewage into the river was now felt to be an evil, what would it be forty years hence? Apart from the food aspect of the question, he looked upon it as one of getting rid of a nuisance, and he came to the conclusion that although the Metropolitan Board of Works might have been wise twenty years ago,—as wise as they could have been expected to be in their generation,—the time had come when their work would have to be reconsidered and different provision made for dealing with the sewage of the metropolis. He did not believe that the metropolis would go on increasing indefinitely, and doubling itself every forty years, but whether or not, the time would come when those who dwelt on the Thames below London would not submit to have the sewage of the great city cast into the river. The sewerage system now in vogue had engaged his study and attention for the last thirty-three years. Full twenty years ago he came to the conclusion that the whole system was an error, and he thought so still. Wherever the water-closet system had prevailed, there arose the difficulty of the pollution of the streams, and where that had been avoided by precipitation, or irrigation it had been alleged that the works were a nuisance. He was of opinion that we must go back to elementary principles, and restore to the land that which had been taken from it. In other words, the sewage must go upon the land. Whether it should go upon the land in the shape in which it left the human animal, or whether it should be diluted with thirty pails of water, was a question. For his own part he believed the whole water-closet system to be wrong, and he thought the time would come when the chemist, coming to the aid of the engineer and the sanitarian, would find a means of deodorising and rendering perfectly innocuous that which was now carried away by the water-closet system, without destroying its fertilising elements, and therefore without destroying its value to the agriculturist. Wherever the water-closet system was in operation, the human excreta were mixed with thirty pails of water per head, and the question was how to get rid of such a large quantity of sewage. By almost a concensus of opinion among the local authorities who had dealt with the question, the bestowal of the sewage upon the land was the most approved method, but it was quite possible to render sewage harmless by means of precipitation, provided chemicals of sufficient value were used, and then to turn it into the nearest watercourse, although even then it would be necessary to let the effluent pass over land before entering the stream.

Mr. Alderman Kempson, of Leicester, said that in that town the sewage difficulty had engaged the attention of the authorities for many years, and it was not yet solved. They had, however, lately resolved to lay down a complete system of storm-water sewers. Hitherto the storm-waters had always passed into the sewers, and as the outfall was considerably below the bed of the river, great difficulties had at times occurred. The storm-water being eliminated, the sewage was of course considerably diminished in quantity, and, consequently, there was less difficulty in utilising it upon the land. Much less land would be required, and that was an especial advantage in some districts, where land was exceedingly valuable. Mr. Mechi had argued that the mixing of the storm-waters with the sewage would not be so prejudicial in diluting the sewage as was sometimes supposed; but the figures he had quoted embraced the whole area of the country. Of course, if the whole of the sewage of the country could be distributed over the whole surface of the country, the question would wear a different aspect. At present, the sewage of a large town had to be provided for within a limited area. Farmers were glad to have the sewage if they could have it when they wanted it, and in the quantities they required. As to the management of sewage farms, they must be conducted on commercial principles, and as a rule corporations and local boards could not manage them so as to yield a profit. To make them succeed they required very close and keen personal management.

Mr. Sedgwick said that in Watford the sewage question had been satisfactorily solved, chiefly, he believed, because the storm-water was separated from the sewage, and the sewage put upon the land by irrigation over thirty acres of land; and, last year, the loss on the working of the farm, after paying expenses of management, interest on loan, &c., was only 100*l*. That was not much to pay by a town of 8,000 inhabitants.

Mr. Bailey Denton, jun., said that at Hitchin, where the storm-waters were mixed with the sewage, the sewage-farm was a failure; while at Abingdon, where the storm-waters were separated almost entirely from the real sewage, the farm was a success.

Mr. McKie, of Carlisle, said that perhaps the oldest irrigation works were those at Edinburgh, but he was not aware that the separate system was in operation there. He did not mean to say that the separate system was not a good thing in itself, but how was it to be carried out? The water that came off many of our streets was charged with manurial matter, and was as much sewage as that which came from the houses, and, therefore, he contended that street drainage should go into the sewers. In Carlisle for fifteen years past the sewage of the town had been put upon sixty acres of land. There was no separate system there. The sewage and storm-water all went on to the land. Certainly there could be no better land in the kingdom for the purpose,—it was a beautiful loamy subsoil, well drained, with gravel under it. There had never been any complaint of a nuisance, and the value of the land had been doubled. No "fermenting pots" in the shape of storage tanks were used. Such things were to be strongly deprecated. The sewage should pass direct from the sewers on to the land.

Mr. Birch, in replying upon the discussion, said that Col. Jones had hinted that he (the speaker) did not "go in" for the "separate" system with sufficient enthusiasm, but he thought engineers ought to be very guarded in condemning the combined system. He agreed with Mr. Mechi in thinking that the extent to which sewage was diluted by storm-water was not excessive, and that such dilution would not prevent farmers from using the sewage. In Devonshire, Dorsetshire, Hampshire, and perhaps in some other counties, water which did not contain any impurity was largely used by farmers for irrigation. The great difficulty caused by admitting the storm-waters into the sewers was the irregularity in the quantity. Col. Haywood had referred to the people who alleged that sewage-farms were nuisances, but they were few in number, if any. The real opponents and obstructives were the people who said "You are going to cause a nuisance," and who thus often prevented works from being carried into execution. As to street-water, even if it were possible to keep the whole of it out of the sewers, it would be exceedingly undesirable to do so. On the other hand, it was a very common objection to the separate system to say that it involved double the cost of the ordinary system, but that was not the case, nor anything like it, for in most places where the combined system was in operation a mile or two of large and costly outfall sewer was necessary in order to take the storm-water away.

The Chairman, in closing the discussion, said that it was gratifying to see that the sewage question, though it moved slowly, was moving in a settled direction. There now seemed to be perfect unanimity that the proper way in which to dispose of sewage was to put it upon the land. There were, of course, differences as to details, but these would to a great extent be self-adjusting. Mr. Haywood had referred to the quantity of water likely to be found in the upper Thames forty years hence. Unless the London water companies did something before then, there would be little or no water left in the Thames at Richmond, Brentford, and other places.

FIRE AND PANIC PROOF BUILDING CONSTRUCTION, FOR THEATRES AND PUBLIC BUILDINGS.

The following is a short description of an invention to render theatres fire and panic proof, submitted to the Lord Chamberlain, with sketches, by Mr. T. C. Ebdy, architect. It is, at any rate, suggestive:—

Suggestions for a Theatre or other Building to be Proof against Fire, and afford easy Escape from Galleries, Boxes, and Pit, without Danger in Case of Panic.

The whole of the walls and piers to be built of brick, concrete, or stone. Boxes, galleries, and roof to be supported upon iron columns, and the roof formed with box-iron girders, and the floors with rolled joists.

The roof to be flat, with intermediate rolled-iron joists and hoop-iron, and rendered in one mass with Portland cement concrete, so as to form a tank to contain a depth of 2 ft. of water over the entire area of the building. This water to have free circulation through all the iron framing of the roof, and flow and return from the roof to the pit-floor through the supporting iron columns and stand-pipes; the water to be used as a motive power for raising or lowering the pit-floor every day for cleaning the house, by this means the water would be continually circulated from roof to floor, and so kept fresh (or run off and replaced when necessary).

I propose to construct the pit-floor upon an incline with the end adjoining the lobby entrance, to rise 5 ft. 6 in. from the orchestra to the front end of the boxes, the whole of the floor to be constructed upon truss beams, and rolled iron joists, and so framed as to be fixed or hung at the stage end, and be raised by water-power from the roof at the lobby end when the house is empty, the audience being admitted in the usual way. In case of panic, the floor could be lowered in a few seconds to the level of the lobby-floor, having a clear headway under the boxes of 5 ft. 6 in. or

5 ft. 10 in., the full width of the end of the house, and the same motion would open all the front doors in coil the same width, so that the audience could pass out *en masse* with ease and comfort.

To relieve the galleries and box staircases from crowding on each side of the house, the full length between the ceiling and the roof (out of sight), and the full width of the end of the house over the galleries, I propose to introduce revolving cylinders, with wire-rope ladders coiled round the cylinders, say, every 6 ft. in the length of each side and end, having a continuous guy-rope attached to each ladder throughout, and properly weighted.

Balanced guide-ropes to pass down the sides of the galleries and boxes; and in case of panic the audience could, by pulling these ropes, unroll the ladders throughout the house, the guide-ropes being continuous, and roll upon the cylinders, and so secure the bottom of the ladders at the floor-level, thus giving a temporary stair every 6 ft. to the galleries and boxes in all parts of the house to pit floor-level: by this means the house could be cleared without danger in a few minutes by descending the ladders. In existing houses, where the cylinders could not be constructed for want of space, between the ceiling and roof wire-ropes could be attached over the galleries and boxes in the same way, at short distances, and suspended to the centre of the ceiling with a slip-ring to be used in case of need from the side of the stage. These ropes or ladders would fall against the front of the galleries, &c., in every part of the house at one time, being kept clear of the floor, say 6 ft., to pass over the heads of the people in the pit, would form an easy means of descent.

The ropes, if gilded and crossed, would form a decorative feature. The ceiling to be composed of iron or copper-wire gauze stretched upon frames, and fit between the box-girders, having a free ventilating space between the ceiling and the roof (or water-cistern), formed in patterns or panels and decorated with colours mixed with liquid glue (no oil or spirits being used): this ceiling would look solid under such treatment.

The front of galleries and boxes being covered with similar material upon iron frames.

The drop-scene to be made of wire-gauze or steel ribbons, and let down in a fold to form a fire-door, and the wings and sets to be of the same material. Should plaster be used in any part, to be rendered upon wire netting.

The seats to be made of enamelled iron in colours burnt in. All curtains and cushions made of fireproof fabric.

The weight of water in the roof-tank and a hydraulic pump would raise the pit-floor by the power of one man to the required height, the pipe-valves being self-closing; it only remains to turn a valve-cock or lever, and the water would pass through the stand-pipes and return to the roof, the floor falling to the level of the lobby by its own weight.

The whole of the iron construction to be prepared by the dry steam process, so as to be impervious to rust.

The valve-cock or motor might be placed in front of the drop-scene under the control of the stage-carpenter or actors, or by the audience, in case of panic, by getting on the stage from the pit or boxes. A second handle or lever above the last being released from a catch would set the cylinders in motion and uncoil or let down the panic-ladders or ropes extending from ceiling to floor within easy reach of front of gallery and elevated sittings.

A house so constructed could not be set on fire under any circumstances.

Iron, when subject to heat, expands, and in case of intense fire distorts, fractures, and becomes useless as a constructive material; but when filled with water, as in this case, becomes an undamageable constructive substance of infinite value. On the principle, if a kettle be placed on a fire without water, it becomes a total wreck upon superheating,—filled with water, indestructible, and may be taken from the fire at boiling-point and placed upon the naked hand without burning or being uncomfortable to handle, which at once proves that iron unprotected by water is useless as a constructive element,—filled with water, proof against fire in any mass or form. Timber should not be use in any part of the construction, or any other unprotected combustible.

All floors to be executed in concrete or other similar material.

NEW BUILDING BYE-LAWS FOR LONDON,

UNDER 41 AND 42 VICT., CH. 32.*

PARAGRAPH VI. [of section No. 2, of the suggested bye-laws]:—"Every wall of a house or building shall have a damp course throughout its whole thickness, of asphalte, or other material impervious to moisture, at a height of 1 ft. above the base of such wall where there is no basement story, and at a height of 1 ft. above the level of the ground where there is a basement or half-basement story."

a. It would seem desirable to insert a paragraph before No. 6, dealing with the walls of rooms which are situated, wholly or in part, below the surfaces of the footways of streets, or below the general ground level. By section 103 of the Metropolitan Local Management Act (1855), underground dwelling-rooms must have "an area not less than 3 ft. wide in every part, from 6 in. below the floor of such room or cellar to the surface or level of the ground adjoining to the front, back, or external side thereof, and extending the full length of such side"; and the City of London Sewers Act (1851) stipulates for the same kind of area, with one or two trifling differences,—"outside or adjoining the same vault or cellar, and extending along the entire frontage thereof." But there is no power given to any one as yet, which would help to keep walls,—other than front walls,—dry. How would such a clause as this work? "Underground dwelling-rooms shall have the walls, with which earth is in contact, protected against damp by the application (either to the external or the internal surfaces, or within the substance of the walls) of asphalte, or other efficient protective coating; or such walls may be built in two thicknesses with a cavity between them, the two thicknesses being tied together in a manner approved by the district surveyor." The bye-law is to be made (sec. 16 of the Act) "to serve purposes of health." It will hardly do so to any good purpose if underground dwelling-rooms, which deserve a good deal of control, are not improved for the future.

b. If such a provision as this were made, it would then be sufficient to provide that the damp course shall not be placed *above* the level of the lowest floor. It would be quite in the discretion of any one, who had no underground rooms, to drop the damp-course to a lower level if he chose.

Paragraph 6 would thus be:—"Every wall of a house or building shall have a damp-course throughout its whole thickness. The damp-course shall be of some material impervious to moisture, and shall not be placed above the floor-level of the lowest story of such house or building."

Paragraph VII.—"The top of every party-wall and parapet-wall shall be finished with one course of hard, well-burnt bricks set on edge, in cement, or by a coping of any other waterproof and fire-resisting material, properly secured."

A. Is not the word "waterproof" new, used in reference to building materials? If so, it is undesirable for that reason alone; besides the purpose of its insertion can be secured in another way. "Fire-resisting" seems a still worse word, for it is in use and is coming still more into use for hard woods, and all materials which, though not incombustible, do not readily take fire. Let other doubts be implied by a suggested paragraph:—"The top of every party-wall, and the top of every parapet, shall be finished with a coping of seme hard and incombustible substance, properly secured. The coping shall project on each side from the face of the wall, and be throated on each side; or a creasing laid in cement shall be put under the coping." A coping is "the highest and covering course of masonry *or brickwork* in a wall."—Gwilt and common use.

Might not the heading of section 2 follow with advantage the form of the heading of section 1? It might be shortened also, and thus consist of the simple words,—"As to walls." The heading as it stands,—"Description and quality of the substances of walls,"—in the suggested bye-laws, has been copied from clause 2 of the 16th section of the 1878 Act. Still it is anything but happy in wording now; and would be still less so if all the provisions as to walls should be set out together, as suggested on page 1249.

The heading of section 1, "As to foundations and sites of buildings," might, by-the-bye, deserve reconsideration also. The "of buildings" at the end is not desirable. It is incorrect; as a distinction is made throughout the bye-laws between houses, buildings, and other erections.

C.

* See pp, 1231, 1249, *ante*.

HEALTHY HOUSES.

At the Working Men's College, Great Ormond-street, which was founded by the late Rev. F. D. Maurice, a series of free popular lectures are now being given to men and women, and they are well attended. Professor Tyndall presided at the fourth of the series, which was delivered on Thursday, the 28th ult., the lecturer being Dr. Corfield, Professor of Hygiene at the University College, who took for his subject "Healthy Houses." The lecturer gave very useful advice on several points, but nothing that our readers have not heard fifty times.

Professor Tyndall, who was warmly received, proposed a vote of thanks to the lecturer, remarking that the lecture had been interesting, straightforward, and practical, and was certainly calculated to instruct those who were interested in such matters. In the first place, Professor Corfield spoke of the necessity of having a dry basement, and then went on to consider the state of the air, and gave them many valuable hints in regard to the supply of pure air for the benefit of health. In all his remarks he (Professor Tyndall) heartily concurred. In respect to the communication between the cistern and the waste-pipe, that was a question of extreme importance. Bad-smelling air, which, however, was not always the most dangerous, was an indication that air was coming into the house from a dangerous source, and in that sense the bad smell was a good thing. The poison of typhoid fever was mechanically suspended in the air of the drain, and when it was allowed to enter the house it sowed itself, so to speak, in the human body, producing that terrible scourge typhoid fever. That was one of the most important points to which their attention had been drawn. He could heartily sympathise with the lecturer in respect to those "chattering ventilators." To a studious man, they were a most diabolic invention, and made a noise when least expected. For his own part he always drew the valve when he studied, and did not let the ventilator open at all.

The motion was agreed to, and, on the proposal of Mr. Bickersteth, a vote of thanks was also passed to Professor Tyndall for presiding.

PUBLIC WORKS AT BARROW.

THE NEW DOCKS.

NOTWITHSTANDING the great depression of trade which prevails throughout the country, works of an important character are actively proceeding at the new and rising town and port of Barrow-in-Furness, whilst others are projected. Extensive new docks, in addition to the Buccleugh and the Devonshire docks (two of the largest docks in the kingdom), have for some time been in progress, consisting of the Ramsden dock, 100 acres in extent, together with a tidal basin of 9½ acres, and a lock 900 ft. in length, the two last-named having been completed and now ready for opening. Beyond this, spacious berths for large ocean steamers which will shortly commence running between Barrow and the American ports, are in course of construction, and fast approaching completion, whilst the works at the large Ramsden dock of 100 acres in extent, are in a forward state, most of the excavation work having been effected, and the construction of the dock walls commenced. When the works are completed, ocean ships of the very largest size will be able to enter the harbour and docks, as the channel of the river is being dredged to the depth of the Ramsden dock, whilst Peel Bar, at the entrance of the harbour, is being dredged to a similar depth, which will secure a uniform depth of 30 ft. at high water, thus giving greater facilities for the entrance of vessels of larger tonnage than are possessed at Liverpool and other ports. It is expected that the new docks will be opened for shipping in spring.

Another project which has just been brought forward is the construction of steam tramways in the main thoroughfares of the borough, and the principal street of the town, which is planted with trees on each side, is at present being constructed at such a gradient as to allow steam tram-cars to be worked upon it. It is stated

that in order to carry out this project the Furness Railway Company are about to apply for Parliamentary power.

THE WINDSOR COLLECTION OF DRAWINGS BY THE OLD MASTERS.

It is good news that Her Majesty the Queen has been pleased to accord her permission for the publication, in fac-simile, of a series of reproductions from the noble collection of drawings in the Royal Library at Windsor, as recently exhibited at the Grosvenor Gallery.

Sir Coutts Lindsay justly believes such a publication will be cordially welcomed as a substantial contribution to the materials of artistic study, and as offering invaluable models to the students of the various art-schools throughout the country, and he has decided to take advantage of Her Majesty's gracious permission, and to issue forthwith a series of faithful reproductions from the drawings of Leonardo da Vinci, Raffaelle, and Michelangelo, to be followed by works of other masters of the Early Italian, German, and French schools. The drawings have been selected under the personal supervision of Mr. Richard Holmes, F.S.A., Her Majesty's Librarian at Windsor, and they have been reproduced by Mr. Stephen Thompson, by means of the autotype permanent process.

The entire publication will, of course, be expensive, but will be divided for the convenience of those who may be unable to subscribe for a complete series. We trust the publication will be a success financially; in other respects there can be no question.

THE PROPOSED NEW TOWN-HALL AT READING.

The subject of a new town-hall and free library for Reading has for some time been before the inhabitants and the local authorities, and two plans have been under consideration, but in consequence of a proposal to expend 60,000*l.* on a building larger than that originally contemplated, it was feared that the entire project would collapse. It is now, however, proposed that instead of the larger project in its entirety being carried out at present, the sum of 40,000*l.* shall now be expended as originally intended, rather that the 60,000*l.*, the estimated cost of the more comprehensive scheme, and that the additions be postponed to a future period. It is stated that up to the present time more than 20,000*l.* have been raised in subscriptions, which, it is understood, can be raised to 30,000*l.* if the Corporation will guarantee the remaining 10,000*l.*

GARWAY, HEREFORDSHIRE.

This interesting church is now undergoing a gradual process of repair and restoration. The first instalment of the works being completed, the Bishop of Hereford, accompanied by the Archdeacon (Lord Saye and Sele) attended the re-opening services on the 8th ult. The greater portion of the building dates from the commencement of the fourteenth century, though there are not wanting evidences of both Norman and Perpendicular times. The Knights Templars resided at a preceptory close by, so it is inferred that a good deal of the work is due to their skill and energy; indeed, internal corroborative evidence exists of this in the position and size of the tower, which is 27 ft. square, and placed about 10 ft. away from the north-west corner of the nave, as well as in several of the ornamental features of the interior, notably in the richly-sculptured chancel arch.

The following may be taken as a sample of the work already done. A heavy gallery, extending across the west end of the nave, and along the greater part of the north wall, has been removed, revealing a three-light window. A wall between the chancel and chapel has also been taken down, thus showing to full advantage a beautiful specimen of fourteenth-century arcading. The old oak benches, with ends 4 in. in thickness, have been refixed on a wooden platform, and by a simple alteration made comfortable enough for nineteenth-century worship. The old altar-slab, with its five incised crosses, which was found face downwards amongst the old paving of the church, has been placed again in its original position. The carved oak rood-loft has long since disappeared, but the flight of steps and raised gangway leading to it extending along the whole length of the north chancel wall, are fortunately intact, while the original doorway has now been opened out.

The work has been executed by Mr. W. Balcombe, of Kenilworth, under the superintendence of Mr. E. H. Lingen-Barker.

THE BERMONDSEY NEW VESTRY HALL

After having had the subject several times under discussion, the Bermondsey Vestry have at length come to a final decision as to the erection of a new vestry-hall. At their meeting, held last week, the advisability of giving instructions for the erection of a vestry-hall, offices, and public hall for the parish, the estimated cost of which is 20,000*l.*, was taken into consideration. It was moved by Mr. Morgan that the necessary steps be taken at once. He observed that the want of a public hall, as well as a vestry-hall and offices, was very much required in the parish, the necessity for this improvement being constantly brought under their notice. Dr. Preston, who seconded the motion, in proof of the necessity for the new building, pointed out that the parish, which contained 100,000 inhabitants, was without any adequate public hall, a circumstance that was not to be found in any small town. Objection was taken by one or two members of the Vestry that it was very inopportune to proceed to so large an expenditure as 20,000*l.* at the present time, especially as the ratepayers had not been consulted, and they expressed a hope that in these bad times the Vestry would not go on with the project. The great majority of the members were, however, in favour of the proposal, which was adopted, and it was resolved that steps be taken for obtaining designs for the building.

GREAT SALE OF MESSRS. M'LAREN & CO.'S EFFECTS.

One of the disastrous results of the failure of the City of Glasgow Bank has been exemplified during the present week in the sale of the stock and plant of Messrs. Andrew M'Laren & Co., of Thames-street, the extensive ironfounders and contractors in connexion with buildings. The firm, which is one of the largest of its kind in the metropolis, has for several years past been well known amongst builders and others, having supplied the iron-work and machinery to many public establishments, including the spacious new infirmary at Lambeth, which was recently opened. The firm, which was in the midst of an extensive and well-established business, has been compelled to go into liquidation in consequence of the collapse of the City of Glasgow Bank. The sale includes the whole of their immense stock of ironmongery, and articles connected with building, at the show-rooms and general business premises in Thames-street, as well as the plant and machinery at their manufactory at Bankside and elsewhere, and will last several days. The firm has hitherto employed upwards of 400 artisans, who are thrown out of work by the disaster.

COMPETITIONS AS A GOOD.

Sir,—It is with great diffidence that I venture to address you upon a subject,—that of competitions,—on which at the opening meeting of the Royal Institute of British Architects, the president has spoken with all the weight of his authority and experience.

But, sir, there is another light in which I would ask permission to place the subject before your readers.

All architects will cordially agree with the president that the present condition of things is deplorable, wasteful, and vexatious, and it may be that we ourselves are partly to blame in maintaining it; but, I think, few at least of the younger ones will agree with him as to the remedy he proposes, that, avoiding competitions, they should be content with "patient, quiet, and even unknown good work," until "recognised by their seniors," as a course involving no disappointment and *only* delay. The delay in itself would be sufficiently serious, and even ruinous in many cases, but after the delay are the seniors in the profession ready to recognise their juniors, who are actually their competitors, or to lend them a helping hand? Or is it by the seniors that the juniors would wish to be recognised? Would they not rather be recognised and *patronised* by the public? And are not competitions, if honestly conducted, one of their readiest means of appearing before the public?

It is true this patient, quiet, good work will improve and ripen the powers of young architects; but so, on the other hand, will competition work, though, of course, to a smaller extent.

Architects would, no doubt, be very glad if competitions could be abolished entirely, if each one could have his fair share of the work to be done; but we must not forget the Scripture rule, that "to him that hath shall be given,"—a rule which may, perhaps, be applied more literally to our profession than to any other, and the effect of which would be that only the senior and best-known men would get work,—an instance of which is given by the President himself relative to the Hove Town-hall.

What appears to me to be wanted is, that competitions should be fairly and honestly conducted, and that it should be generally understood that architects would not compete in any unless the conditions were in accordance with general rules drawn up or approved, and made publicly known, by the Council of the Royal Institute.

Such disgraceful conditions as we now occasionally see laid down for competitions would then be no longer offered, or, if offered, would very properly be left by all respectable members of the profession for those who wish to "run before they can walk."

T. N. L.

Sir,—I think it will be admitted by the majority of the profession, or, at least by its younger members, that the president's remarks on competition in his opening address do not represent the views generally held on this subject. It is all very well for those members of the profession who are established on their lofty perches to look down on their younger brethren, and tell them that "quiet labour" succeeds better than trying to "run before they can walk." If committees are to select from names instead of from drawings, it simply means that well-known and established architects will get all the work, and young men, no matter how clever they may be, will go to the wall. We are asked to think that nothing is gained by competition; still, how can we shut our eyes to the fact that the Manchester Assize Courts and Town-hall, also the Midland Hotel, Albert Memorial, and Hamburg Church, were won in this way? And he must be a bold man indeed who will deny that the architects of these buildings have gained nothing by competition. The architect of the Criterion Restaurant has more than a little, I fancy, to be thankful for under this head: so that competitions, if properly conducted, are not such very terrible things. Our president closed his address by asking whether the action of the Institute was to be "active or passive." I trust it will be the former, and that this most vital question of competitions will not be burked, but will receive the attention which is its due; and I say it is the solemn duty of the Institute to take the matter up, and endeavour to get a law passed which shall prevent its members from gambling away their very life-blood.

W. Galsworthy Davie.

THE "TECHNIQUE" OF PAINTING.

"Meter" on the "Future of Art" has touched some vital points on the "Technique" of painting. The question naturally arises, with the possession of new and beautiful colours, and prismatic and other scientific theories for the harmonic production of colour arrangement, how is it that modern painting is so wanting in many of the excellent qualities possessed by the old masters? One plain answer may be given. They are not such good mechanical workmen, for then the artist prepared his own canvas or panel, ground his own colours, and sometimes made them, and manufactured his vehicle, and, consequently, understood their nature and properties; but now he takes just what the colourman thinks best for the artist or his own profit, not knowing or caring whether the colours will from the poor preparation sink into the ground or disappear altogether in the course of time; neither the one nor the other asking any questions for conscience sake.

Reynolds and Gainsborough, two of England's great colourists, were both ignorant of the "Technique" of painting. Reynolds is said

to have destroyed a valuable Titian in order if possible to discover the process and vehicle employed by the great Venetian painters; but he did not succeed, we well know. Had he even possessed the mechanical knowledge of an ordinary house-painter, he would not have done the foolish things attributed to him, such as painting distemper on an oil ground, then using varnish, and still further repeating the process, or of using, as he certainly did, large quantities of wax and varnish, which naturally contracted by the influence of time, causing great cracks into which the little finger might be laid. His whole art career as to paint and colours may be said to be a great and continued experiment; he discovered much as to ground preparation, but never became possessed of the proper vehicle for finishing. Hence, what might have become beautiful pictures are rendered next to valueless, unless it be to point to future artists what they ought not to do.

Then with regard to Gainsborough, he did not aim at discovering the Venetian method, but was content to adopt the Dutch and Flemish system by painting transparently on a white or light ground instead of a solid preparation. Though different in process, the two were nearly identical in principle. But he being dependent on the colourman, never had a hard or rightly prepared ground, such as the Dutch used, nor had he like them the rich transparent vehicle: hence too many of his otherwise beautiful pictures appear dark, thin, and washy. It is not so in the old masters. Titian, though solid, is rich, brilliant, and permanent in colour; and Veronese is pure and brilliant to this day; and Correggio, with his solid *impasto*, is transparently clear, constituting the very perfection of paint. Compare much modern work with such. Look at the Continental ideal of paint, too often bearing the appearance of mortar put on with a trowel, under the false notion of representing the solidity of nature, and, unfortunately, this pernicious style has its imitators amongst talented English artists.

I trust I may not be deemed presumptuous in now stating I consider myself to be in possession of the vehicle used by the Venetian and Dutch painters. It is not by mere accident, for the search for it extends over a period of thirty-five years; and about a year and a half ago I felt justified in using the words of the Greek philosopher, — "I have found it"; and it is only in consequence of being engaged up to the present moment in other pursuits that I have been prevented from announcing the fact. But the letter of "Meter" has compelled me to break silence. I may now be permitted to say, further, that the first efforts, done a year and a half ago, retain the same lustrous transparency, or nearly so, as they had the day the colours were laid on; and as to all other working qualities requisite for the artist in all the varied kinds of execution, I believe nothing more can be desired. The evidence also that it was a commercial article in use at an early date in art tends to support my conviction that it is what was used by the old masters; and, I believe, in the hands of a Millais or a Leighton and others, modern art in technical qualities would soon vie with anything done in the past.

R. MARTIN.

TECHNICAL EDUCATION.

SIR,—Your correspondent, Mr. Buckmaster, says we occasionally hear of technical education for bricklayers and masons, but what is meant by this technical education is not so clear to the outside public. Now, sir, as I happen to be one of those who initiated the movement which was the origin of the bricklayers' classes, and for a considerable period was one of the principal teachers, I am in a position to enlighten the outside public, and also your correspondent, in respect to the meaning of them. It is meant to teach by the aid of bricklayer teachers, not only all, but more than all, the subjects taught at the drawing-classes, and classes in building construction, as carried on under the auspices of the Science and Art Department, but also what the teachers at these classes are not able to do, "to teach the practical application of them, and other affinitive subjects, to the technical details of all the various phases in the art of bricklaying." Not exactly in the same manner as implied by your correspondent, when he rather sneeringly alludes to the garret at the Artisans' Institute, but by a thoroughly searching explanation of the theory, illustrated by diagram, showing every detail put in actual practice, frequently accompanied by models constructed to scale. By these means the students have had brought home to them, in such a manner as can only be done by one of their own trade, information and knowledge of such a character that possibly not one in a score, nor even one in fifty, could ever hope to obtain during a lifetime spent in the routine of their every-day work, and certainly not at the Science and Art classes as now carried on by teachers who know next to nothing of the practical application of the subjects they teach.

Now, sir, in my simplicity, I cannot help thinking this is the kind of technical education needed, evidenced by the ready way in which the Royal Institute of British Architects kindly lent their name as patrons; also that the president graciously performed the part of chairman at our first distribution of prizes; also that several architects, and more than one City Company, sent donations to the funds. Further, South Kensington itself so far acknowledged the importance of the work being done as to depute an inspector, Mr. J. F. Iselin, to pay a visit to the classes then in operation at the Artisans' Institute; the most important in numbers, and interesting in the manner of the teaching, being the bricklayers' class,—which at that time was in hired lodgings at the Institute. That he was highly pleased at what he saw his report will show.

Thus it will be seen that the classes in question scarcely deserved to be spoken of in the derisive, not to say sneering, manner adopted by Mr. J. C. Buckmaster.

I may add that at the time of Mr. Iselin's report the services of the teachers of the bricklayers' classes,—carried on at the Artisans' Institute, at the Lecture Hall, Greenwich, and at a schoolroom in Chelsea,—were entirely gratuitous, and if, as is quite true, the good work has, for a time at least, come to a stop, it is not from the want of efficiency in the teaching, or from the lack of support, but from the want of harmony in the management.

J. WOODLEY.

CASES UNDER METROPOLITAN BUILDING ACT.

"MORTAR."

A SUMMONS was heard before Mr. Paget at the Hammersmith Police Court, on the 26th ult., which had been taken out by Mr. T. E. Knightley, district surveyor of Hammersmith, against Mr. Isaac Mears, of 8, Burfield-street, Hammersmith, to enforce compliance with the provisions of the Building Act in regard to the mortar being used in the erection of houses in Bassieu Park-road, under Mr. Mears's superintendence.

The District Surveyor stated that defendant, in erecting the aforesaid houses, had failed to comply with section 12, and with Rule 2 of the 1st Schedule of the Act, which required that brickwork be solidly put together with mortar or cement. Instead of using mortar composed of lime one part, and sand three parts, a very inferior substitute had been used, composed mainly of vegetable soil, slightly covered during the process of tempering bricks upon the ground. He had frequently remonstrated with him, and had complained that the good sand, with which the neighbourhood abounds, had been dug out and sent away instead of being used in the buildings. Decided cases on the subject were referred to, Mr. Knightley taking occasion to say he had, after taking immense trouble some time back, succeeded in getting a decision at that court on the question of "Mortar." His assistant, Mr. William Hobbitt, and some witnesses for the defence, having given evidence,

Mr. Paget said he had yet to know what "mortar" was, and how it should be made. It should consist of lime and sand only, mixed with water, and it was clear that defendant's mortar contained other unsuitable ingredients. If he should make the order as prayed, for the demolition of two portions complained of, allowing the district surveyor his costs.

FIRE-PROOF DIVISIONS.

Mr. W. Ayres, pawnbroker, of 87, King-street, Hammersmith, was summoned before Mr. Bridge by the same district surveyor, for not constructing a fire-proof floor to his premises.

Mr. Gane appeared for the defendant.

From the evidence it appeared that the defendant formerly occupied the adjoining premises 89, 91, and 93. He now occupied 87 exclusively, and the upper portions of 89 and 91, the shops underneath being let to another person, who held and resided in 93. As the defendant had access from the first house to the upper portions of 89 and 91, Mr. Knightley required him to construct a horizontal fire-proof division to the latter-mentioned premises.

Mr. Knightley said there was such a change in the occupation of the premises as brought them within the rule, but contemplated by the Act. He measured the whole four houses, the superficial square feet exceeding 3,000, mentioned in the section.

Mr. Gane said it was a most important matter to the defendant, for if the order were made he would have to pull the four houses down. He argued that the Act did not apply to old houses.

Mr. Bridge said the question was whether they were chambers or rooms. He had [illegible] the exclusive occupation of another person, it did not form a portion of the same premises, which would then be under 3,000 superficial square feet.

The District Surveyor said he could not withdraw the case, which was therefore the Metropolitan Board of Works. He submitted that 91 must be included in the measurement, as there was the danger of a fire extending to the shop.

Mr. Bridge dismissed the summons, and granted a case for the opinion of a Superior Court.

SETTING ASIDE AN AWARD.

RE THE CORPORATION OF BIRMINGHAM v. THE WEST BROMWICH IMPROVEMENT COMMISSIONERS.

THIS was an application, in the Queen's Bench, on the part of the Corporation of Birmingham to set aside an award made by Sir H. Hunt, C.B., as to the amount of compensation to be paid to the Corporation by various local bodies in respect of the transfer to them of certain gas-works and other undertakings. By the Act, the amount was to be settled by arbitration, and the provisions of the Act did not differ in this case from the first, but the object of the purchase was to serve the subsequent arbitrations. A claim being made by the West Bromwich Commissioners for the purchase of a portion of the undertakings, arbitrators were appointed.—Mr. Hawkesley on behalf of the Corporation, and Mr. Bramwell on behalf of the Local Commissioners. They appointed Sir Henry Hunt, C.B., as umpire, and he made an award for the sum of £70,000, which was only £15,000 more than the Corporation's bid. Bond, whereas the Corporation had [illegible]£28,000, and the lowest amount estimated by their witnesses was £20,000. Strong notes of dissatisfaction on the part of the Corporation had been expressed by the [illegible] and that the award did not disclose the principle on which the valuation was made. On these grounds,

The Attorney-General (with the Solicitor-General, Mr. Michael, Q.C., and Mr. C. Bowen) moved on Saturday, on the part of the Corporation, for a rule *nisi* to set aside the award, contending that the umpire must have adopted a wrong ground for valuation, and could not have adopted the right one; and at all events, had not disclosed the principle of valuation on which his award was made.

The Court granted a rule *nisi* to set aside the award.

THE DEATH OF THE LATE MR. F. H. ADAMSON.

SIR,—Will you kindly allow me to correct your notice of the above, which attributes the mishap to the failure of a rung of the ladder.

It was not so, the ladder being perfectly sound in every way, and fixed in a thorough workmanlike manner,—a fact unanimously acknowledged by the jury, when they inspected the same. There is no doubt whatever but it was caused by what is technically known as *skidding*.

The unfortunate gentleman was descending the ladder in the usual manner, as many as practised by persons employed on building works,—two steps or rungs at each step, when [illegible] or other metal alloy to the lower rung for passing his left leg he commenced to skid. He fought with great tenacity to maintain his grip of the sides of the ladder; failing, however, to do so, his fall was certain, which occurred at a height of 15 ft. or 16 ft.

At the inquest held on the body, on Tuesday afternoon, a verdict of accidental death was returned, the coroner and jury expressing themselves satisfied no one was to blame.

THE CLERK OF THE WORKS.

*** We had no intention of imputing blame; and the statement came to us from what we considered unquestionable authority.

COMPETITIONS.

Cocoa Hotel at Blaenau, Festiniog, North Wales.—Fifteen sets of designs were received in the competition for a cocoa hotel, proposed to be built at Blaenau, Festiniog. The board of directors decided on giving the first premium to designs by Mr. C. Jenkin Jones, architect, London; the second, to designs by Mr. J. Humphreys-Jones, architect, Mold; and the third, to designs by Mr. Walker, architect, Liverpool.

The Rous Memorial.—The design of Mr. F. W. Roper, of 9, Adam-street, Adelphi, has been selected by the committee of the Rous Memorial for a cottage hospital and almshouses at Newmarket.

Hotel, Lancaster.—In August last, the Lancaster King's Arms and Royal Hotel Company Limited, having acquired the present Old King's Arms Hotel, and other properties, advertised offering premiums, and inviting architects to send in designs for rebuilding the hotel on a more modern and extensive scale, and for laying out the rest of the estate to the greatest advantage. In response, nineteen architects sent in designs, including one set from France, and after much consideration the company have this week awarded as follows:—First premium, the carrying out of the work to Messrs. Holtom & Connon, architects, Leeds; second, 30*l.*, to Mr. Stephen Shaw, architect, Kendal; and the third, 20*l.*, to Messrs. Hetherington & Oliver, architects, Carlisle. The amount proposed to be expended upon the hotel portion is 6,000*l.* Mr. Austin, of the firm of Paley & Austin, assisted in adjudging the designs.

MASTERS AND MEN.

Belfast.—The master builders of Belfast propose reducing the wages of carpenters from 7½d. to 7d. per hour, and an extension of the town boundary, outside which extra payment is allowed for lodgings and travelling. The reply of the men, about 700 in number, was given on Monday, opposing the boundary extension, and asking the masters to adhere to the former compact, by which it was agreed to give three months' notice of any alteration in the scale of pay. The Belfast stonecutters' wages have been reduced from 8d. to 7½d. per hour, and notice given of another ½d. an hour reduction three months hence.

Crieff.—The wages of the labourers employed by the master builders of Crieff were on Monday reduced from 4½d. to 4d. per hour.

Perth.—On Monday the Perth painters commenced work at a reduction of ½d. per hour, the wages now being 6½d. per hour.

Glasgow.—At the weekly meeting of the Edinburgh operative masons on Monday night, it was reported that the strike amongst the masons in Glasgow had now come to an end, the men having accepted the masters' terms of 7d. per hour.

Edinburgh.—At the usual weekly meeting of the Lodge of the Edinburgh United Operative Masons on Monday night, a letter was (the *Scotsman* believes) read from the Secretary of the Edinburgh and Leith Master Builders' Association, stating that it had been resolved to reduce the rate of wages immediately from 7½d. to 7d. per hour for competent workmen. It was agreed to defer action till a letter specifying the date on which the reduction should take effect had been received from the Masters' Association. This, it may be mentioned, will make a reduction of 2d. per hour on the rate of wages, or 8s. 6d. per week since the month of May.——A few days ago, a notice signed by the Chairman of the Edinburgh Master Joiners' Association, was issued to the trade, stating that, "owing to the depression of trade, joiners' wages will be reduced to 7d. per hour for competent workmen on and after Monday December 2." This notice was duly posted at the works of a number of firms, including some of the principal establishments in the city. Accordingly, the reduction came into operation in such shops on Monday—the workmen, it is reported, submitting without any further protest than that implied in the resolution adopted at their general meeting on the 29th ult., to the effect that the reduction "is uncalled for and unwarranted, and therefore we agree to resist it as far as possible."

CAUTION AS TO PROPOSED TRAMWAYS.

Sir,—I trust you will allow me to direct the attention of the owners and lessees of house property in the suburbs of London to the numerous notices given of new tramways about to be constructed. Unlike railway companies (who are compelled to give notice through the post to every "owner, lessee, and occupier," along the proposed line), all that is done in the case of a tramway is to publish an advertisement, which nobody reads, and to hang little boards to some of the lampposts along the line of road. Unless unusual vigilance is used, an Act of Parliament may be obtained, and the first intimation many an owner will have will be the appearance of the workmen to carry out a work which when done will probably deprive his house of half its saleable value. It is most unjust that a public road, made and maintained by the ratepayers, should virtually be made a present of to a tramway company, and an ever-increasing nuisance in the shape of "cars," with the eternal "bell accompaniment," be brought upon it, damaging irretrievably the property along the road. Why should not tramway companies be compelled to pay compensation like railway or other companies who take or injure people's private property? It behoves all persons interested in London house-property to be up and doing,—to petition the various vestries and local boards to oppose the Bills promoted in Parliament, to convene meetings; to combine for mutual aid and protection (a "House-owners' Protection Society" might be started with limited liability), and while strenuously opposing the construction of new, to seek to compel the existing tramway companies to discontinue their bells, and to fix them with liability to compensate persons whose property they have injured. No one ever contemplated tramways being laid down as is now proposed nearly all over London. They are becoming simply a public nuisance, and it is clear that when a new tramway is laid in a road, the ordinary traffic is gradually driven off, and the road becomes simply a railway; house-property, in fact, suffers for the benefit of companies, who reap all the profit, and leave the loss to be borne, anyhow, usually by an unhappy lessee. H. W.

ROMAN NUMBERS.

Sir,—Your correspondent, "C. H.," in last week's issue, asks how to add up Roman numerals. It is simply a question of units, tens, and hundreds, as shown below:—

19	.....	X	IX
111	 C	X	I
95	.....	XC	V
22	.....	XX	II
		X	
247	(247)	CC XL	VII

The 1 from the first column, 17, must be reckoned as x to be placed in the next column.

J. Gilbert.

Sir,—I send you an answer to "C. H.'s" inquiry. His difficulty arises from not seeing that these figures were merely signs of value. In the Arabic every sign is single; in the Roman the signs are not uncommonly double. Sometimes, as in VIII, four parts constitute the sign.

In the case before us, XIX consists of three signs, one for the ten, two for the units. The next, CXI, one sign for each hundreds, tens, and units. The next, XCV, two for the tens, one for the units. And the last, XXII, two for the tens and two for the units.

Ranging the signs as below, in their columns of value, the result is easily found, and the Roman had no more difficulty in placing these signs mentally in their proper columns, than we have in casting shillings and pence, even when the figures are not placed in columns:—

	X	IX	
C	X	I	
	XC	V	
	XX	II	
(CCXLVII.)	CC	XL	VII

A. Stewart Harrison.

Sir,—In answer to inquiry respecting Roman figures, I venture to suggest that they may be dealt with as follows:—

Addition.

	X	IX	
C	X	I	
	XC	V	
	XX	II	
	CC	XL	VII

Subtraction.

C	X	I	
	XX	II	
	LXXX	IX	

Multiplication.

		X	IX	
	C	X	I	
		X	IX	
	C	XC		
M	DCCCC			
MM	C	IX		

Division.

Thou.	Hund.	Tens.	Units.	
XIX) MM	C	:	IX	(CXI
XIX				
CC	:			
XIX				
XIX				
XIX				

XXX.*

Drainage of Westgate-on-Sea. — Mr. Henry Robinson, C.E., has been instructed to prepare a drainage scheme for this rising watering-place.

* We have to acknowledge eleven other letters on the same subject.

THE QUANTITIES QUESTION.

Sir,—To those who have experienced the comfort to the architect on the one hand, and advantage to the client on the other, in the conjoined duties of architect and quantity surveyor, it appears singular there should be any ground for discussion on the question, and it cannot be from any lack of argument that the recent correspondence on this subject should have been left by the profession almost entirely to those who, it may be, through preference or from local usage, decline this combination of duties.

While the disgraceful system of illicit commissions has been very properly protested against by the Institute and other societies throughout the country, the practice of quantity-taking by the architect has been inferentially placed very much in the same position.

The Institute, instead of repudiating this practice, should rather encourage it; if not by making it one of the conditions of membership, at least recognising it as desirable for architects to cultivate.

It appears almost unnecessary to enumerate the advantages the architect possesses by retaining this branch of the profession in his own hands, they lie on the surface. Who, for instance, is more likely to interpret the drawings with accuracy than the author himself? And while an architect has up to the definite point of plan and design done his utmost for a client, why should he decline responsibility for the financial department by delegating this correlative duty to another?

He has to give certificates for payments to the contractors as the work proceeds: how can he efficiently do this if he has to depend on a second party for information?

He has to examine and attest the final accounts: how can he effectually do this but on the basis of a most thorough personal knowledge of the amount of work intended by the drawings and expressed in the schedule of quantities?

The chief and really the only ground of objection to the architect undertaking both duties is a very proper desire to avoid the appearance of collusion with contractors. But why should there be such a morbid feeling in this matter? It suggests anything but a robust, healthy, professional sentiment, and to carry out this theory in other directions we should hardly move hand or foot without being misunderstood.

If a client has the confidence sufficient to justify him in selecting any particular man as his architect, does it less than betoken a lack of self-respect if the architect virtually says, "You must only trust me thus far; I have so delicate a sense of honour that I should prefer you to suspect some other man,—the quantity surveyor, to wit,—even although I preclude myself from doing you full justice"?

There has been also a difference of opinion in recent correspondence on the point,—should the schedule of quantities form part of the contract or not? Surely it should, in justice both to client and builder, otherwise of what use is it?

It determines the dimensions and specific nature of the details of a building, points which the drawings themselves cannot possibly do, and in which, therefore, they are thus so far incomplete and unserviceable to the builder.

The interest of the architect and client alike make it necessary that, so far as it is in the power of skill to do it, the whole intended work shall be fully detailed, so that, on the one hand, the contractor should not be asked to do work without payment which he has not taken into account in his estimate, and, on the other hand, the architect be satisfied that the contractor has done all that was bargained for.

There is another anomaly in connexion with this question, the responsibility which lies on the unfortunate surveyor to reimburse the client for anything he should have included, but has omitted in his calculations. When usage justifies this arrangement, and the surveyor is agreeable to the responsibility, no one has any right to object. All the same, it seems opposed to common sense.

I believe, in conclusion, that were the architect to recognise his duty in this matter, he would be less troubled with the vexatious item of extras, would carry on his work with more facility, and afford greater satisfaction to his client.

And if there are clients,—although I do not believe it,—who think the architect will, in such a case, occupy a suspicious attitude, the architect's sense of duty should be strong enough to carry him through this delicate position.

A few words in reply to Messrs. A. & C. Harston. Their use of the word "loss" is hardly appropriate. In the instance of the surveyor omitting to detail a portion of a building, it can be no source of loss to the proprietor that he should pay for the part omitted; he may have been misled, but he is not a loser in the due sense of the term. Should the surveyor, however, describe work in such a way as to be constructively unsound, it seems natural that he should be responsible for its eventual failure, as that is otherwise direct loss to the proprietor. In fact, it is evidently not just that surveyor or architect, as the case may be, should pay for work which becomes the possession of a third party. Such a course is simply confiscation.

Dundee. Geo. S. Aitken.

*** We have printed this letter that all sides of the question should be before our readers. It should be unnecessary, however, for us to say that we do not take this view of the matter, believing that architects who take out their own quantities run the risk of serious inconveniences, and may place themselves in a false position.

STAINS IN OAK.

"R. W.," or any one else, can readily remove dark stains caused by nails or bolts in old oak by washing the disfigured parts with a solution formed of a pennyworth of oxalic acid to a pint of hot water. It is immaterial whether this is applied hot or cold. If the stains are very deep and strong, repeated applications must be made, and the fluid allowed to soak well in, sundry and often; but ultimately it will assuredly fetch out the ink, for that is what the stain really is. The same mixture is useful for applying to oak that, when worked, goes blue in places,—the result, of course, of not being quite dry. Wash the work lightly with this liquor, and it will bleach the wood so thoroughly as to leave it perfectly clean. Harry Hems.

HUNT v. WIMBLEDON LOCAL BOARD.

SIR,—My notice has been drawn to your report of this case in the *Builder* of the week before last (23rd November) and the defendants' solicitor's reply.

Your report of the case is quite correct, and it is quite true, as the defendants' solicitor states, that the plaintiff's one witness was contradicted by three witnesses on the part of the Board; but he does not tell you that the evidence of those three witnesses was so damaged in cross-examination that the jury did not place any reliance upon it, and gave a verdict for the plaintiff, but on argument on the point of law (*i.e.*, the technical plea) Mr. Justice Lindley directed a verdict to be entered for the defendants.

WM. J. FOSTER, Plaintiff's Solicitor.

*** Here the correspondence must end.

CREWKERNE GRAMMAR SCHOOL COMPETITION.

SIR,—In some of your contemporaries, very strong language has been used relative to the conditions of this competition. Probably the writers are unaware of what I know to be a fact—namely, that in the locality round Crewkerne the best building materials are to be found at a very low cost—and that the price of labour, both skilled and unskilled, is from 15 to 20 per cent. less than in the middle and North of England. The Governors must know this, and it is as well that architects should also learn it. I have seen the site for the proposed buildings: there is not a finer one in any town with which I am acquainted.

X. Y. Z.

VARIORUM.

A PAMPHLET on the question of "How to Avoid or Mitigate Famines and Droughts," by S. B. Goslin (Warner & Sons and McCorquodale), is by an engineer who is no novice at water supply or irrigation questions. Mr. Goslin shows that the famine question has received much attention at his hands, and he points out as a remedy the multiplying of wells and tanks, which, from the details given, are easily provided either in India, Australia, Cyprus, or other famine countries. Connected with wells and tanks, machinery of special design for wind and animal power is pointed out. We have so often expressed our belief in the necessity for increased means of irrigation in India that we need scarcely say we consider the matter submitted is well worthy of perusal and consideration.——The Christmas part of the *Gentleman's Magazine*, titled "The Gentleman's Annual" (Chatto), consists of an interesting story by Mr. Albany de Fonblanque. —— "Arrows of the Bow," the Christmas number of the *Quiver*, is well worth its cost.——"The Magic Lantern Manual" (Warne & Co.) will tell any one how to make and manage all the varieties of that amusing and instructive instrument.

Christmas and New Year's Cards.

MESSRS. EYRE & SPOTTISWOODE having determined to issue a series of Christmas and New Year's cards of their own, have "gone in" for it in earnest, as they were bound by their reputation to do if they did it at all, and they have sent us such a budget of all sizes, sorts, and shapes as would stock and make brilliant a small shop-window. They are mostly floral, many illuminated; some in packets, such as six crosses with floral emblems; six Christmas greetings in verse and poetical gleanings, with miniatures of the various authors quoted; and dozens of them single. As specimens of design and colour-printing many of them may be alike highly commended. They are mostly designed by Mr. Albert H. Warren, and maintain his reputation in a branch of art to which he has long given sedulous attention.

Miscellanea.

Ventilation.—We have pleasure in directing our readers to a system of ventilation introduced by Mr. J. E. Ellison, of Leeds, by which air may be admitted to the interior of buildings without draught. This is carried out in a simple and effectual manner by allowing the air to enter through cone-shaped openings, which cause it to be quickly radiated and diffused, so that no movement is experienced. Mr. Ellison applies this principle to bricks and skirtings which are made with conical perforations of a neat and ornamental character, suitable for all classes of buildings and any style of architecture. The system commends itself for its simplicity, cheapness, and easy method of application.

Grand Superintendent of Works.—This office in Masonry, left vacant by the death of Mr. Cockerell, has been filled by the appointment of Mr. John Gibson.

The Theatre in Paris.—The French Government does not neglect the arts. A new law, affecting the *régime* of the Opéra, is in preparation, and M. Barboux, Minister of Public Instruction, recently sent a letter to the theatrical managers of Paris, inviting them to communicate their views upon the declension of the dramatic and lyric stage, together with suggestions for improvement. The regulations at present in force were established by an Imperial decree issued in 1864, and the Minister desires to know how, after fourteen years' trial, they can be amended in the interests alike of art, artists, and the public. He wishes to secure for artists a just recompense, for the public a pure and worthy entertainment, and for both dramatic and lyric theatres those "*habitudes de bon ton*" which originally gave them a legitimate reputation. The issue of this comprehensive inquiry will be awaited with interest and the best wishes for its success. "Surely," says the *Telegraph*, "France is the favoured land of art! What would be said in England if a Minister in Downing-street were to complete the National Opera House, ask for a vote of some thousands to carry on her Majesty's, and appoint a commission to devise means of improving our dramatic and lyric stage?"

Portland Cement from Sewage.—The annual general meeting of Scott's Sewage Company was held on Tuesday at Stafford House, the Duke of Sutherland in the chair. The directors, in their fifth annual report, stated that the works at Burnley are now in successful operation, and that an average of about 10 tons of Portland cement of the value of 2*l.* a ton is manufactured weekly. There was a ready sale for it, and the quantity would be increased with additional accommodation for the production of manure. The Blackburn Corporation had erected offices at Finnington, and negotiations were going on at Rochdale. Correspondence was now going on with the Metropolitan Board of Works, the Thames Conservancy Board, and the company, for getting rid of the pollution of the Thames. Sir Henry Cole, in moving the adoption of the report, dwelt upon the success of the works at Burnley. Correspondence was proceeding with 130 places in Lancashire, where, as soon as the law compelled towns to cease from polluting rivers, the plan would probably come into operation.

Improvements near Dublin.—We have received a plan for improving the Killiney Estate, laid out by Mr. Charles Geoghegan, architect, with sketches for villa residences around it. The great object sought, and in which the public are interested, is to form a continuation of the Vica-road from Dalkey, direct through the estate, thereby affording Dalkey and Kingstown a public road on the low level along the coast to Bray. Up to the present time a wall at Sunnyside cuts off all communication between the properties on each side of the same, to the great annoyance and damage of the proprietors outside the boundary, and the owners of which are seeking to get the obstruction removed. This would be a great improvement, and it is to be hoped they will succeed.

Hollow Flooring.—Mr. G. E. Pritchett, F.S.A., has patented a system of "Economic Dry Flooring." It consists in using ordinary agricultural or other pipes laid together over the whole surface to be paved; they should be bedded on a substratum, such as concrete, or other material, so as to form a floor. The pipes when laid level are either cemented or asphalted over, so as to form a pavement or floor. For the pavement of churches, conservatories, or halls, encaustic or any tiles may be bedded on the pipes before alluded to. The invention, it is obvious, may be also applied for ventilating and heating purposes by admission of air, cold or hot, through the pipes.

Sewer Ventilation. Weston-super-Mare. A resolution of the Weston-super-Mare Local Board to adopt the system of open ventilation for the public sewers, as urged upon them for a long time past by the Local Government Board, and recommended by their own committee, is not to pass unchallenged by the ratepayers. A memorial to the Local Board is in course of signature. The object of the memorialists is to induce the Board before they commence the alterations necessary for introducing the "Open System of Sewer Ventilation," to obtain the opinion of an eminent sanitary engineer, of London, as to the expediency, or otherwise, of applying this method of ventilation to Weston.

Soane Museum.—The Royal Academy have named Sir Frederic Leighton, President of the Royal Academy, as additional trustee to succeed the late Sir Francis Grant: and the life trustees have appointed Mr. Alfred Waterhouse, architect, A.R.A., to succeed to the vacancy caused by the death of the late Mr. Frederick Pepys Cockerell, hon. secretary of the Royal Institute of British Architects.

"The Automatic" Steam Engine.—Persons looking for a compact economic engine will do well to inquire for themselves into the merits of "the Automatic." It seems to us to deserve attention. Among the advantages claimed for it over other engines, it has no throttle-valve, but is governed direct by a simple patent automatic variable expansion, ensuring great economy of steam and regularity of speed whether the load be on or off. There are no noisy-toothed wheels, and steel and phosphor bronze are used instead of wrought-iron and brass.

Stains for Wood.—We learn that the only medal given for this article at the Paris Exhibition has been awarded to Mr. H. C. Stephens, 171, Aldersgate-street.

TENDERS

For the supply of sanitary pipes for the proposed sewerage works of the Local Board, Ripley, Derby. Mr. R. Argile, jun., engineer. Quantities supplied:—

Gooddy	£898	8	1
Clower	870	0	0
Brooke & Son	850	0	0
Tugby & Co.	815	12	8
Cliff & Sons	810	18	2
Knowles & Co.	804	13	8
Wragg & Sons	784	4	3
Slater (accepted)	639	14	3

For building the warehouses and premises, Nos. 3 and 4, Princes-street, Red Lion-square, Holborn. Mr. J. N. Kingcharch, architect:—

Stimpson & Co.	£4,410	0	0
Wagner	3,749	0	0
Eaton	3,484	0	0
Page	3,393	0	0
Higgs & Hill	3,383	0	0
Howard	3,295	0	0
Crockett	3,000	0	0
Ansell	2,975	0	0
Julien & Co.	2,975	0	0
Downs	2,897	0	0
Reading	2,889	0	0
Battley (accepted)	2,859	0	0
Bowley	2,471	0	0

For the erection of a Board school for 330 boys, master's residence, boundary walls, &c., at West Ham, for the St. Mary Extra School Board. Mr. W. H. Mitchell, architect:—

Stevens & Son	£3,884	0	0
Brinton & Bouc	2,830	0	0
Crook	2,879	0	0
Dyer	2,825	0	0
Rowland (accepted)	2,770	0	0

For a villa residence, Dane Park, Ramsgate. Mr. Pite, architect.—

Goodman	£2,112	0	0
Burkitt	2,041	0	0
Shapley	1,975	0	0
Parker & Evans	1,775	0	0
Starke	1,775	0	0
Martin	1,675	0	0

For the erection of a villa residence in Elsworthy-road, Primrose Hill, for Mr. L. Reynolds Mr. W. Emden, architect. Messrs. J. Lewis & Co, surveyors:—

Patman & Fotheringham	£1,625	0	0
Lea (accepted)	1,439	0	0
Way	1,393	0	0

For the construction of roads and sewers on the High Cross Estate, Tottenham, for Mr. A. Waterer. Mr. H. A. Alexander, surveyor:—

Dunmore	£2,615	0	0
Bloomfield	2,337	0	0
Bell	2,251	0	0
Harris (accepted)	2,120	0	0

For constructing roads and sewers at Brecklih Park Estate, Enfield. Mr. C. R. Brighten, surveyor:—

Batch & Acock (accepted)	£3,100	0	0

For picking up metalling, and rolling part of Southwark Bridge-road, for the Vestry of St. George the Martyr, Southwark. Mr. A. M. Hiscocks, surveyor.

Turner	£1,420	0	0
Booth & Wheeler	1,396	0	0
Ratty	1,380	0	0
Beevers	1,240	0	0
Batch (accepted)	1,049	0	0

For new premises for the Wilts and Dorset Bank, Bristol. Mr. G. M. Tilley, architect. Quantities supplied:—

Hatherley	£9,647	0	0
Wilkins & Son	8,330	0	0
Church	8,149	0	0
H. Beaven	8,018	0	0
Lang	7,743	0	0
Howell & Son	7,698	0	0
Davis	7,644	0	0
Veale	7,379	0	0
Brock & Bruce	7,189	0	0
Jones & Co.	7,054	0	0
Wilkins & Hill	7,049	0	0
Cowlin & Sons	6,987	0	0
A. J. Beaven	6,983	0	0
Forse & Ashley	6,664	0	0
Stephens & Bastow	6,589	0	0

For shop and residence, Aldershott. Mr. T. Wonnacott, architect. Quantities supplied:—

Cranston	£7,230	0	0
Mesher	6,576	0	0
Hughes	6,471	0	0
Stephens & Bastow	6,434	0	0
Jones & Co.	6,091	0	0
Duke & Fowler	5,500	0	0

For the erection of corn stores, stabling, and other works in Fisherton-street, Salisbury, for Mr. G. J. M. Main. Mr. Fred. Bath, architect. Quantities supplied:—

Hopkins & Son	£1,690	0	0
G. & C. Harris	1,670	0	0
Hale & Sons	1,650	0	0
Young & Sons	1,555	0	0
Cooper	1,525	0	0
Barber	1,510	8	0
Sawkins & Mist	1,483	0	0
Adey	1,477	0	0
A. Harris	1,445	0	0
Kite	1,377	10	0
Tryhorn (accepted)	1,334	0	0

For alterations and additions to the Potter's Arms, Lewisham. Mr. Horace T. Bonner, architect. Quantities supplied:—

Suneaton	£305	0	0
Higgs	397	0	0
Jerrard	397	0	0

TO CORRESPONDENTS.

Blackballing at the Architectural Association (three violent letters on this subject reached us too late for consideration this week. Gentlemen who "call names" should, at any rate, affix their own names). L. D. C.—C. J. S. G.—R. A.—J. G.—J. M.—W. H. C.—A. D. D.—R. N.—A. A.—B. B.—L. P.—G. S.—R. A.—R. T.—F. J.—C. E. H.—W. G. C.—W. H. M.—F. B.—S. H.—J. H. C.—C. E. F.—W. G.—G. F. W.—A. B.—B. & Co.—H. T. P.—T. H. H. C.—S. K.—M. H.—M. de F.—M. M.—H. A.—P. & Son.—H. B.—W. A.—H. C. S.—J. B.—J. M'D.—D. & Sons.—J. P. B.—S. & P.—H. S. (not received).—T. W. (somewhat late).—W. H. F. (yes).—An Engineer (next week).—W. P. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

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The Outlook of Labour for the Winter and the Shortest Road to Ruin.

THE gloom of the season is anything but lightened by the news that comes from South Wales. How far the actual condition of the Welsh collieries may be due to the start which the long coal-war of 1875 enabled the northern coal-owners to obtain in the market may be a matter of doubt. But unfortunately there is no doubt at all that the Welsh coal trade at the present time is in a state of such depression as to render its continuance extremely precarious. The northern coal-pits, according to statements made at a meeting of the Monmouthshire and South Wales Colliery Association held in Cardiff in the last week of November, have recently effected a further reduction in wages, making a total abatement of 22½ per cent. on the rate paid in 1869. The owners' representatives on the Sliding Scale Committee have come to the resolution that unless the minimum wage arrangement be put an end to, and the working hours restored to sixty per week, it will be impossible to keep the Welsh collieries open, even at a reduced rate of wages. Failing the assent of the workmen to this proposal, the owners see no alternative but to give, on December 31, the requisite six months' notice to put an end to the sliding scale agreement.

It is disheartening to find from this intelligence that in a region which has already suffered so much from the results of an ill-advised labour war, the worst does not yet seem to be over. At present, indeed, we have no indications of that embittered feeling between the owners and the workmen which was one of the most regrettable features of the great strike of 1875. In the presence of great calamities minor enmities are forgotten. Misery makes men acquainted with strange bedfellows. The depressed condition of the Welsh coal trade must be too indisputable to allow of any suggestion that sales are to be commanded by diminished out-put, or by shortened hours. Men, as well as masters, are being taught by a stern and sorrowful experience that the attempt to increase sales by limiting produce, or to raise the market price by working in the most expensive manner, must necessarily prove a disastrous failure. The only consolation to be drawn from the actual distress is the hope that in other trades and crafts the bitter lesson may be intelligently laid to heart.

It must be unnecessary, at the present time, to make any very lengthened remarks as to the sympathy felt by the *Builder* for the working classes, or as to our hearty concurrence in any effort for their elevation in the social scale. The only points on which we have before now joined issue with certain advisers of the working men have been as to what are the proper steps to arrive at that end. The two points which have been adopted as maxims, and placed as the great objects to be accomplished by the powerful machinery of trade organisations, have been the advance of wages and the reduction of hours. And at all critical periods of the labour dispute, the question of time has been preferred to that of pay. In fact, the cotton-spinners, the last of the trades whose contention with their employers has attracted public regard, have given the most distinct proof of the earnestness with which they have held the current opinion of their class, by agreeing to reduce wages, if accompanied by reduced time. Thus, it is true, the artisan would doubly suffer. He would burn the candle at both ends. But, so firm was his belief that over-production was the main cause of the absence of demand, that he was willing to back this view of political economics at a loss (which he hoped would be only temporary) of 40 per cent. of his weekly earnings, if the mills stopped for two days in the week; rather than submit to the simple deduction of one-tenth, without any change in the hours of working.

We doubt whether this question of short-time has ever yet been conclusively placed in the clear light of day. At a moment when the colliers in the North have found themselves forced to return to sixty hours of work per week, and when, by so doing, they have so far rolled back the tide of prosperity which had ebbed from their district towards Wales, that in Wales the need of following this example is becoming apparent, it is desirable to look a little closely at this part of the subject.

Mr. Howell has told us, very recently, that the advisers of the trade unions attached more importance to the shortening of the hours of labour than to any advance of pay, and that for the reason that it was certain that wages would hereafter fluctuate according to the activity of trade; but that short time, once established, would be permanent. In one great industry we see that this forecast has proved incorrect. It follows that there must be a law regulating the hours of work, which is not altogether subordinate to the will of the workman.

Efforts have been, until very recently, constant and persistent for the reduction of the length of the working day. The miners have generally established a day of eight hours; and it is among the miners, as we see, that the return to a day of ten hours has first proved to be necessary. The engineers, masons, and other trades, have repeatedly agitated for a like reduction. This idea has filled the imagination of the workmen. At their anniversary dinners, bean-feasts, club feasts, and drinking bouts, when they have the opportunity of indulging in such recreations, the one toast which is most enthusiastically received,—we give it on the unexceptionable authority of Mr. Howell,—is "The Four Eights." The meaning of that somewhat enigmatical phrase is this,—eight hours' work, eight hours' play, eight hours' rest, and eight shillings a day. Golden times, indeed, they would be for old England. But the question is,—how to attain them. Or, indeed, there is a yet more urgent question, and that is, how far are the four eights mutually consistent? Is it possible to advance towards them altogether? Or are they in any way mutually exclusive? Is the eight hours' play, for instance, practically consistent with the eight shillings a day?

Let us take the case of a model workman, skilful, sober, industrious, provident; who, with every prospect of long life to look forward to, and a large family to maintain, has the means of choosing how many hours in the day he will work. Let it be, for instance, a journeyman who works at home, and who is paid by the piece, or by the actual quantity of work which he takes to his employer completed. Such a man, after a little preliminary experience, will settle down to that rate and duration of work which he finds on the whole the most expedient. The wages will form one limit, the power of endurance another. He will strike the balance between the two. And, if he can choose, he will ultimately work as many hours on the average in a week as he finds that he can do without over-fatigue,—his incentive being the greater amount of money that he will receive on the Saturday night. And if he be the father of a family it is pretty sure that forty-eight hours in the week will not be the limit of his industry.

As it is with the individual workman, so it is with the trade of which he is a member; so it is with the country in which the trades are elements of productive power. As a general rule, the more a man, an association, or a country can produce, the richer it must be. As to that there can be no dispute. The application of industry to the products of nature is the source of all wealth. Gold has to be found to be dug, to be washed, to be melted. The labour expended in the obtaining of the metal is the measure, sooner or later, of the exchangeable value of gold. Coal has to be mined and brought to market. Wheat has to be sown, to be watched, to be reaped, to be garnered, and to be thrashed. The wealth of a country consists of the products of industry; and the more steady and enlightened the industry, the greater the wealth.

It is, of course, possible that the industry of a nation may be unduly distributed. Thus if, instead of two men devoting their time to the production of cotton fabrics, and one to that of fabrics of silk, all three work for cotton, too much cotton and too little silk may be the result. But the remedy is, not to make the three men each work for only two-thirds of his time, but to send the third man back again to his silk works. And this, though a simple illustration, underlies the whole affair. Com-

paratively there may be an over-production. In one item or in several items, too much, relatively speaking, may be produced,—as if a farmer should grow all barley and no wheat, or all turnips and no hay. In such case there is an error in the distribution of labour. But, as far as the country as a whole is concerned, there need be no such thing as over-production. There may be, and perhaps often is, an ill-regulated and disproportionate production. But while few men are found to admit that they are either too successful or too industrious, it is certain that a country cannot be too productive.

The main difference, in this case, between the man and the country, the part and the whole, lies here. The man must have a certain time for rest, and it will be well if he has also a certain time for recreation, and especially for that kind of education which, in all of us but those who emulate the lot of lower animals, goes on, for good or for evil, through the greater part of life. The country requires no such break in the energy of production. The corn grows by night, or, at all events, by early dawn, as well as by day. All the addition that nature makes to her store of national wealth is steady in its increase. And while human nerve, and brain, and muscle demand alternatives of rest and of activity, one great army of mechanical motors, amounting, at least, to a power of from fifteen to twenty millions of horses, ask only for coal and for water to keep up an untiring duty.

It is impossible to keep too distinctly before the attention the fact that the present century (together with a few closing years of the past) has witnessed the introduction of an entirely new element into the field of labour. The adaptation of mechanical motor power long since made, and that to the great advantage of mankind, by windmills and by watermills, has reached its present development by the improvement of the steam-engine. A man may now obtain a mechanical motor, exerting the power of a horse, for the price of a horse. If he be able to employ 100 horses he can obtain 100-horse power in steam-engines at a much lower price than he would pay for 100 horses. And the animals will only last a few years,—eight or ten at the outside. They must be regularly fed, work or no work; they must rest for at least sixteen hours out of the twenty-four. Take what pains we will, we cannot obtain a horse-power from a horse at much less than fourpence an hour, taking into account the cost for twenty-four hours, and the work done in eight hours, or fewer.

For the mechanical horse-power, on the contrary, which becomes cheaper the larger the quantity in which it is employed, a cost of a penny per working hour is the outside for a small engine. For a large one a halfpenny, or less, per hour per horse-power will cover all expense. And then the steam-horse never tires. Instead of one rider being able to tire out three horses or more in a day, one steam-horse will work steadily on so as to employ the successive care of three drivers in the twenty-four hours, if each work for only eight hours. And the steam-horse eats only in exact proportion to the work he does. He costs, as matter of interest of money and depreciation, less than half the cost of the animal, per annum or per week. And as to provender, he consumes only the exact quantity which he converts into work. For all exertion of power in a continuous groove, then, the productive energy which is added to the resources of a nation by the discovery and application of the mechanical theory of heat is practically illimitable.

It is obvious that as far as regards the productive power of the nation, the chief problem is how to dispose the services of some 6,000,000 or 7,000,000 of working folk as to make the most of the duty of 15,000,000, 20,000,000, or any greater number of mechanical horse-powers. In many cases, *i.e.*, such as mines, smelting furnaces, mills, and the like, it is evident how this best can be done. Supposing that the cost of the mechanical power, including the rent and maintenance of houses, factories, mills, engines, machinery, interest on the money locked up in them, and sinking-fund to replace the depreciation of the plant in use, be equal to that of the human power,—which is in many instances the rule. Fifty pounds spent in wages, plus fifty pounds found in this way by the employer, will produce work of the cost price of 100*l*. But if the arrangements be so made that, instead of 100 men working for forty-eight hours a week, 50 men work for the same time, and a second 50 men for a second forty-eight hours in the same week, what is the result? Roughly speaking, the work which cost 100*l*. in the first instance will be produced for 75*l*. in the second. For, on the one hand, either the product will be doubled, because the time for which the mechanical power is employed in the work is doubled; or, on the other hand, the employer's cost will be halved. Machinery of any kind that is requisite for the employment of fifty men will be only half that required for the employment of a hundred men. Thus the owner will have to pay 25*l*. (*plus* some small addition for extra coal and light) for machinery, and 50*l*., in two sums of 25*l*. each, for wages. For this 75*l*. (and a little more) he will turn out work which, at the old rate of wages, will still be worth 100*l*. There is thus created a margin of profit of 25*l*. out of the 100*l*. It will be possible to lower the market price eight per cent., to pay eight per cent. higher wages, and yet to put nine per cent. more in the pocket of the employer. And if, as has sometimes been the case when work is urgent, and as is always convenient in mines, three shifts of men are employed in the twenty-four hours, a third, instead of a fourth of the original cost will be saved. The only correction to be made, on paper, to this calculation, is that of the price of coals and other like materials. If we include those in the sum allowed for wages, the reduction in the cost of production will be directly proportionate to the increase in the number of hours, out of the twenty-four, for which the machinery is kept in motion. In very many cases the amount paid for wages is less than half the total cost given; and in such cases the economical inducement,—as regards the interest of all concerned,—to work long time is the more palpable.

Whether, then, we regard the power of commanding the market by abatement of price, the creation of a margin which will allow of an increase of wages, or the remuneration of the employer, we find that the first requisite is to keep the machinery running for as long a time as possible, and thus to get the most out of the mechanical power. But to gain the full advantage this long time must be normal. Thus, if a master whose machinery cost 50*l*. per day, and whose wages are 50*l*. per day, works double tides for three months, he only obtains half the advantages that would result from steadily working all the year round in double sets. For either he doubles his output, which may disturb the market; or he has machinery at work doing only half that which it could do if properly manned. The expenditure, in the first case, will be 150*l*.; the product will be worth 200*l*. But while there was a sale for 100*l*. worth of goods, there may not be a sale for 200*l*. worth of goods. So far, no doubt, the workers are justified in their complaints as to over-production. Doing double work by spurts is liable to this objection. If, on the other hand, the employer can calculate that his men will aid him, for the common advantage, in making the most of his mechanical appliances, he will restrict his outlay in the first instance, and thus, as before shown, produce his 100*l*. worth of output for 75*l*.

We do not, of course, for a moment imply that it is in the power of the producers of labour, by a sudden accord as to the above indisputable facts, at once to reduce the cost price of production by 25 per cent. A very great, and possibly a very wasteful, expenditure has been already incurred for the service of the work-people, who have insisted on short time. Only slowly, even in the event of so salutary a revolution in the views of the working men as logic would indicate to be desirable, could the loss thus caused be made up. Loss, that is to say, not absolute, but relative. It can hardly be called an absolute loss to the country, in the first place, to have two cotton-mills made to do the work of one. But it is a loss of the economical value of the silk-mill, or the irrigation, or the harbour, or something else which might have been erected for the cost of the duplicate cotton-mill. It is only by the conversion of factories and machinery to objects for which there is a demand, or by the steady increase of trade, that the machinery now existing can be made to pay as it ought to pay.

But what we are anxious to show is the tendency of long or short time. If we take the extreme cases,—of a mine that is worked for twenty-four hours per day for six days in the week, and of a factory which has been put on short time, working four days out of six, we have two outside limits, between which almost every arrangement as to time can be included. In the first instance, allowing 25*l*. for master's cost and three sums of 25*l*. each for wages, we have a production of 150 for a cost of 100, where we should only have had a production of 50 by working for eight hours at a cost of 50. We have thus secured a profit of 50 per cent. *over* any profit gained by working for one shift per day. And if it be not by increasing production but by diminishing outlay, both of capital and of wages, that the result is obtained, the proportion will be the same. In the other case,—supposing that to work for sixty hours in a week costs 60*l*. in labour and 60*l*. in plant and machinery, giving a cost price of 120; to reduce the working time to forty hours will reduce the cost price to 100; but it will reduce the outcome, taking its value as before, to 80*l*. There is thus a net loss to the country of 20 per cent. incurred by the loss of 40 per cent. in time. Nor is there any reason to object to the general statement that whatever reduction is made in the working hours is a loss, to the trades involved in the reduction, of an amount equal to at least half that of the wages reduced. To the country, indeed, the loss is that of the entire production which might have gone on in the idle time. But the loss of which we speak is not gross, but net; it is the loss of a profit which might have been divided fairly between customers and producers.

Unless some unexpected hole can be picked in this argument, it is thus demonstrated that the short-time policy is a suicidal policy. In trying to put asunder what nature has joined together, stored-up appliance and manual labour, the workman has been equally injuring his master and himself. As far as the nation is concerned he has thus inflicted a double injury. Nor is it to be for a moment supposed that by the production of a smaller quantity of commodities, at an enhanced price,—which is the logical outcome of short time,—the market can have a turn given to it. So long as any monopoly of production exists such may be the case. But of what have we a monopoly of production? Not of coal, of which our collieries form about 4 per cent of the known coalfields of the world. Not of textile fabrics, of which we have to import the raw materials, and by the export of the best machinery for making which at least one great house at Oldham has become rich. Not of iron, in which Belgium, Germany, France, and America are our rivals, and sometimes, even now, our successful rivals. We have, if we make the best of our appliances, a fair start in the market of the world. But we have no advantages to throw away. The stern logic of fact is teaching this wholesome truth to our colliers. It will, disastrously not only for themselves, but for us all, teach the same to other trades and crafts, unless the men, before it be too late, will look simple truth in the face, and learn that short time means a short road to ruin.

"ROBERT DICK, BAKER, OF THURSO."

We confess that when we heard that the author of the life of Edward, the naturalist, of Banff, had "picked up" another specimen of a self-taught Highland man of science to biographise, we were under some little fear lest the repetition of such a literary enterprise should prove to be rather perfunctory work, done at the instance of those expecting people, the publishers, who always want to have a successful venture repeated in some form or other. But the result is much and happily otherwise. The hero of the new biography* is no man of straw, furbished up for literary purposes. Robert Dick was a remarkable, we might say in not a few respects a great man, and was recognised as such a good many years ago among leaders of geological science; a kind of fame, however, which takes a good while to permeate society, more especially when, as in this case, the modest worker made it a request often to those who made use of his labour, that his name might not be mentioned. In one respect his wish seems to have been only too well attended to, from the fact, to which Mr. Smiles calls particular attention, that not a word is said about him in the life of Hugh Miller, although they had been close friends and correspondents for years, and Dick had supplied Miller with much valuable information and equally valuable geological specimens, and had, as Miller said once on a public occasion, robbed himself to furnish his more renowned friend.

* Robert Dick, Baker, of Thurso, Geologist and Botanist. By Samuel Smiles, LL.D. London: John Murray. 1878.

This fact would furnish, in itself, an excuse for a biography of Dick; but the man himself is sufficient excuse.

Robert Dick was a native of a small place named Tullibody, in Clackmannanshire, but spent the greater part of his life at Thurso, on the north coast of Caithness, where he commenced his occupation of a baker on his own account, when about twenty years of age. It is subsequently to this period that the chief interest of his life begins. In regard to his boyish days, there is a certain similarity between his character and that of Edward of Banff, in so far as that he was very early addicted to the study of nature in the course of long rambles of his own choosing, and that he suffered considerable family and neighbourly persecution in consequence, and with just as little effect in modifying his tastes. There is also, in a general way, sufficient similarity between his life and that of the Banff naturalist to lead one to some curious considerations as to whether there is anything in the influence of manners or scenery, or both, in the North of Scotland, tending to evolve self-taught genius among the humbly-born class of people. Burns, of course in a different way, is an example of the same phenomenon. In regard to the natural history study, one can imagine how the influences might be traced. Given a man of active mind and great physical endurance, and with the persevering energy characteristic of the typical Scotchman, put him down to a wearisome and uninteresting trade, and give him no pleasures of society, or of what are generally called amusements, and it is rather to be expected that he should take to nature as an outlet for his mind, the more so if he live near a seacoast with all its records of change and its opportunities of studying the working of great physical forces. But the similarity between these two men, of whom Mr. Smiles has written, is only in a general way in regard to the nature of their career, their perseverance, and physical endurance, and we may add the rather melancholy fact that each fell into poverty and difficulty towards the close of his days, and had to sell a large part of his collected treasures. But the men were very different, and, on the whole, we are inclined to think Edward was the more remarkable character of the two, partly, perhaps, in consequence of some deficiencies from which the other did not suffer so much: for Edward had nothing to call "taste" or cultivation, and it was by the sheer force of an over-mastering and passionate enthusiasm for "beasties" and for knowing all their ways that he was led to toil after them through all obstacles, and make himself an authority on them in spite of every disadvantage. The discouragements against which Dick had to struggle were not so great, nor was his enthusiasm so extraordinary and overpowering, for the reason that he had more outlets to his mind: he seems to have been by nature a man of more refined tastes, though his original station in life was much the same as that of Edward: he writes and expresses himself like a man of literary cultivation, he wrote verse which was more than passable, he could draw with considerable ability and had a great taste for art, and took an enlightened interest in such topics of intellectual controversy as Darwinism and Colenso-ism. This, perhaps, looks like saying the reverse of what we have implied in regard to the relative interest of the two men; but, to our thinking, the untaught and almost fierce enthusiasm of Edward has something wilder and even more unusual about it.

The achievements of Robert Dick, however, were extraordinary enough. His life was that of a small baker in a small coast town, working with his own hands entirely, and obliged to be up at very early and regular hours in the pursuit of his work, to which he attended most religiously and, it is said, ably, though there seems some reason to think that he lost business in the latter part of his life, indirectly through his scientific studies, as the stupid neighbours could not believe that a man who had other pursuits beyond their comprehension could be attending properly to his baking. In spite, however, of really most regular attention to work, he contrived to get time to walk all over the desolate Caithness country, to know all its botany, all its geological features, and to discover many fossils of the greatest value to geologists and palæontologists, and which gave the foundation for important modifications in the theories of such men as Hugh Miller and Murchison, who, in fact, made use of what Dick had discovered for them, and which they might never have discovered for themselves. This was not without the most ample and public acknowledgment on the part, at all events, of Murchison, who paid an enthusiastic tribute to Dick at the Leeds meeting of the British Association in 1858, concluding his remarks by observing that he had brought before his audience this account of what had been done by a man with so few advantages, in order that they "might deduce a practical application" from the story. This is the more to the credit of Murchison, as he has been accused, perhaps not quite without cause, of having been himself a little too much of a "gentleman-geologist," a character abhorrent to Dick, who seems to have been never tired of sarcasms against geologists who went about the country "in gigs," and who visited, as he averred, scenes rich in specimens, and returned empty,—"and why? For this simple reason, that they were afraid to 'fyle'* their trousers!" The latter criticism one has every sympathy with, of course; but as to the heinous sin of the gigs, Dick did not, probably, realise that all men were not possessed of his powers of speed and endurance on foot. However, Murchison, at all events, seems to have thoroughly appreciated Robert Dick, and the account of the first meeting of the baker and the baronet is one of the pleasantest and most characteristic passages in the book. The meeting took place in the bakehouse, in front of the oven, for Dick would not (in fact, could not) leave his "daily bread" to talk even to geologists; and Sir Roderick, in speaking of the dip of certain rocks in Caithness, complained of the want of a sufficient map of the county. Dick readily responded that the existing maps of the county were, on his experience, "all bosh," but he thought he could make Sir Roderick a map, which he proceeded to do on the spot by making a model in relief with flour on a baking-board, in such a manner as to show in relief all the geological structures of Caithness,—"the dislocations and fractures, the watersheds and the drainage, and in fact an outline of the entire geography of the county." The power of thus illustrating his knowledge *extempore* is, as our readers will admit, nearly as remarkable as the knowledge itself. In half acknowledgment of Murchison's speech at Leeds, Dick wrote a ballad which got into the papers under the name of "The Geologist's Song," and was so much liked as to be sung at one of the club dinners at which the scientific lions occasionally indulge in "high jinks"; they are really easy and pointed verses, with a touch of humour like that of Burns, and a burden of—

"Hammers an' chisels an' a'
Chisels an' fossils an' a'."

He did not, however, like Murchison speaking so publicly of him, as it brought lion-hunters down upon him, with whom he had no patience, and, in fact, would seldom see them, were they gentle or simple. He was no respecter of persons, and even the Duke of Argyll,—"the lord their god his Grace," as Burns called the Duke of his own day,—found that when he was late in an appointment he had made to see Dick's collection, the busy worker, expecting people to keep time in their appointments, had only waited till the time fixed upon, and then at once had gone out on one of his fossil-hunts, merely leaving a message that the things were on the table upstairs if the visitor came. Indeed, Mr. Dick seems to us to have been not only a genius, but to have shown the feelings of a high-minded gentleman, spite of his humble occupation and surroundings, in his sensitive dislike to publicity, and his proud contempt for visitors who intruded on him out of idle curiosity. A trait of gentle feeling is mentioned on page 287; when Lady Sinclair proposed to become his customer, he only said he should be the last person to take the bread from the mouth of another, and that he was sure she was admirably served by her present baker. How many of our great tradesmen, rolling in money, or even, alas! of our professional men, would show the like magnanimity? And it was not that he did not bitterly feel the plague of want of money when it came upon him, either. To a friend who praised his "independence" under adverse circumstances, he answered that it was very good to credit him with independence of feeling, but for all that he had been at work among flour-sacks for over thirty years, and he "never yet knew an empty sack stand upright." What a spirit of sad and shrewd sarcasm in that!

Robert Dick was a noble, gifted, and interesting man, and we are indebted to Mr. Smiles for introducing us to him. In other ways the book is a very pleasant one, from the number of beautiful illustrations of the scenery about Caithness; and the description of that wild and grand coast is so vivid, and in a certain sense enticing, that we should not wonder if the effect of the book were to draw some more visitors than usual into that bleak corner of Scotland, where there must be much that is grand in coast scenery and effect to be enjoyed, though not such, perhaps, as would best suit people "in gigs."

* Anglicè, "defile."

INSTITUTE OF PAINTERS IN WATER-COLOURS.

THE thirteenth Winter Exhibition of this Society is, much more than usual, what these Winter Exhibitions originally professed to be, exhibitions of sketches and studies rather than of finished drawings. We have always urged that it was desirable to keep to this professed object *bonâ fide*, seeing that the sketch stage of a work of art, or the sketch from nature which is made as a sketch, and with no ulterior end, has an interest of its own quite different from that of the finished drawing, and that thus a different character is given to the Winter Exhibition, and it avoids becoming a mere repetition of the Summer one. As a sketch exhibition the present one strikes us as of unusual interest and excellence, and there are some good works by names that seem comparatively new or unaccustomed to our eyes in the catalogue of the Institute.

Figure studies are not numerous. Mr. J. D. Linton, who naturally claims the first notice in regard to this branch of the art, is not, however, "in first force" this year; his most prominent work, "A Cup of Tea" (75), an interior sketch with a figure of a placid and very buxom brunette in modern costume, though showing very fine qualities of colour and drawing, is almost entirely destitute of the sentiment which is usually the leading interest in the works of this artist, even above his splendid qualities of technique. A slighter sketch of a "Fisher Girl" (37) has more of personal character in it, and interests us besides as showing the artist in a style of subject unusual with him. In short, Mr. Linton is realistic this season instead of poetic. Mr. Seymour Lucas, whose reputation seems steadily rising, sends two fine broadly-executed studies of "A Royalist" and "A Puritan" (9, 289), of which the latter is by far the more forcible both in composition and in character; the Royalist is not an attractive-looking gentleman, but the artist has avoided the common temptation to make him theatrical. Mr. Guido Bach's "Poultry-seller, Cairo" (26), is an effective sketch, far more attractive to us than most of his finished drawings. We next come across Mr. C. Green, whose "*Tête-à-tête*" (21) carries us back very characteristically to the days of Jane Austen. Other sketches by the same artist are worthy of great admiration, and superior to this: one especially, "A Chasseur of the First Empire" (322) on one of the screens; indeed, we have rarely seen this artist better represented in an exhibition. Mr. Hugh Carter, whom we have several times before recognised as an artist sitting at the feet of Israels, has a fine and rather pathetic study on a larger scale than usual, of "A Dutch Woman" (127), an aged and frail-looking person with a sadly resigned expression of countenance. We hardly understand why Mr. Poole painted and sent his study of "A Cottage Girl" (151): it is not worthy of his reputation; he exhibits also the water-colour study for his picture of the "Cave of Mammon," which is very welcome indeed, and in some respects strikes us as finer than the large painting (speaking of the latter from memory only). We next notice the largest figure subject in the place, and one which is quite a finished drawing, Mr. Towneley Green's "Actors in an Inn Yard" (197), representing a performance on an extempore stage in the courtyard of a "hostelry." This is in many respects an exceedingly interesting work in composition, colour, and, feeling; it is perhaps finished with a care and subtlety in regard to colour combinations, and a degree of smoothed-out finish in regard to execution, which detracts from its reality, and makes us feel too distinctly that it is a picture only and not a scene in actual human life; but the various degrees of interest shown by the spectators are very well and minutely discriminated, although the whole of them seem too uniformly placid and quiet in their mien and manner. The principal actor

looks as if he were intended to be bombastic, but he again is hardly sufficiently so, and looks rather as if playing or acting; his subordinate, the valet or serving-man of the piece, is much more lifelike in manner, and there is some able drawing shown in the figure. Altogether, the work is one to be looked on with interest and respect, though nothing in it excites our sympathies very much. A kindred subject is that by Mr. C. Cattermole, "Hamlet and the Players" (214), which may be instructively compared with the previously-named work. Mr. Cattermole is neither so refined in execution nor so agreeable in colour, nor is his Hamlet very successful as a Hamlet, but the group of players listening with varied expressions of criticism or respect have something about them more distinctly human and dramatic than the placid and dream-like figures of Mr. Green. Two or three studies of heads by Mr. Gregory have force and power; and there is something, but not so much, in the pretty but rather affected studies of Mr. E. Bale. Mr. Herkomer's large and very ugly unfinished drawing, called "A Phrenologist" (273) derives considerable force and piquancy from the expression imparted to the skill which the *savant* holds in his hand, and which appears to grin sardonically at him. On the screen are some of the admirable *Punch* drawings of Mr. Tenniel, and Mr. Linton's sketch (a very fine and bold one) for "The Flag of Truce," and, last but not least, a small Israels, "Grace before Meat" (307), full of fine effect and expressive pathos.

In landscape there are a great many charming small sketches. Mr. Hine contributes a great number, all of them purely sketches which might have been (and probably were) finished on the spot, and some of which are in illustration of subjects not usually handled by him. Two of the best of these are the bridge leading to the "Back of St. John's College, Cambridge" (116), with part of the college buildings, and still better, the "Fisherman's Refuge, Yarmouth" (41), a most unusual and quaintly picturesque brick building, admirably rendered in all its old-world character, without any labour or over-finish. There is a study, too, "On the South Coast" (202), of a set of coasting craft on the beach, with their big red sails hung out to dry; and another of "New Barns, St. Alban's" (203), and one on the second screen, representing the artist's favourite type of subject, "On the Downs near Lewes" (319), which is beautiful. Mr. W. Small's "Summer-time" (51) may count either among landscape or figure subjects, and is good from either point of view, and notable for the free handling both of figures and landscape and their successful combination. Mr. Fulleylove is accurate and topographical, and at the same time artistic (no easy feat) in representations of scenes in which buildings pay an important part. "Lincoln's-inn-fields" (10) is one, and a better one is "Tabley Old Hall, Cheshire," a dear old haunted-looking house, with a garden gay in the foreground with great rank poppies. A number of mostly small sketches represent Mr. Wimperis, one of the best and most thoroughly true water-colour artists who exhibits here; of these, "Waste Land" (257) seems to us far the most powerful, though, perhaps, the little drawing, "A Passing Storm" (324), on one of the screens, is inferior to it only in being smaller and slighter. Mr. Pidgeon's "Inner Harbour, Shoreham" (35) painted on the spot, is an admirable little work under those conditions, and a small sketch by Mr. Aumonier, "March" (59), a bank of red ploughed field, with thin, bare trees on the top of the ridge against a peculiarly delicate and tender sky, is a very characteristic little bit of poetic painting. Mr. T. Collier, who has in several recent exhibitions of the Institute been *facile princeps* in regard to landscape, contributes a powerful but rather rough sketch called "A June Morning" (71) which hardly shows his finest characteristics; there are finer qualities in two small sketches on the screen (309). Mr. E. Hargitt's works are exceptionally good, especially "The Hay Wagon" (85), which is, in fact, an extended landscape with a remarkably fine sky, and "The Skirts of Dartmoor" (146); we cannot but think that his work has higher artistic results than are realised in many of his more highly-finished drawings, which have less power than these sketches and show a less pure water-colour style. Mr. Orrock's studies on the Lincolnshire coast,—flat, sandy landscapes with a great expanse of sky, are very noteworthy for their truth of tone and aërial effect and a certain originality of sentiment and handling. Two studies by Mr. Beavis, at Hastings and Harwich (159, 184), are very successful as out-door studies, particularly in this respect, that they combine freedom of execution and a decisively "out-door" feeling with great precision in the indication of detail in the middle distance; notice in regard to this the "Harwich" especially, where the buildings and general character of the town seen across the meadows are so well rendered as to produce the exactitude of effect of a finished drawing, though, in fact, the work is slight enough in manipulation. Mr. Maplestone has a style of his own; the best of his drawings is "Watford" (246); it may possibly err in the direction of deficiency of precision in indicating local colour and detail, but there can be no question of its fine qualities in regard to the sentiment of landscape. Among drawings dealing with architectural subjects (among which there are a good many that are not very good) may be mentioned Mr. Carl Werner's two fine studies of the Erechtheum and the Propylæa at Athens; and in another way a small drawing by Mr. L. Haghe, of the "Kitchen of the Convent of St. Onofrio, Rome" (210), is interesting as showing what material for really picturesque effect can be got out of such prosaic details as frying-pans and other metal utensils of the cooking department.

Altogether, this is one of the most satisfactory exhibitions we have seen lately at the Institute rooms, not the less because the best of the contributions keep to their professed character of "sketches and studies."

THE LEGAL RELATION OF QUANTITY SURVEYORS TO ARCHITECTS, BUILDERS, AND OWNERS.

Our readers are aware that some correspondence has recently been published in our columns in regard to the law as to quantities. The subject is undoubtedly one not only of interest to those who are professionally concerned in the erection of buildings, but of much practical importance. One of the chief reasons which are given for the establishment of a code of English law is that it should make plain to laymen, so far as is possible, the main propositions of law. When we consider the uncertainty which clearly exists in our readers' minds in regard to the law as to quantities, we regret that we cannot present them with a page from an English code which should set their doubts on this point at rest. The letter of Messrs. Harston, which we published in our issue of November 23rd, seemed to us to set out by no means incorrectly the general impressions as to the law of quantities. Still, having, as we have said, no code to refer to, or with which to compare these propositions, we determined to take the opinion of counsel on the matter, so that our readers might, so far as was possible, be correctly informed what is the present state of the law in regard to quantities, for it is in this aspect chiefly a question for a legal mind to determine. We are quite sure that those who are interested in this question will consider this the most satisfactory manner of closing the correspondence which has appeared in our pages, and we therefore without further comment leave the case and opinion to our readers' perusal.

The gentleman to whom the case was sent by our solicitors, Messrs. Bockett & Son, is known to have given special attention to the law connected with building.

Case for the Opinion of Counsel.

Herewith is a letter from Messrs. A. & C. Harston, architects, published in the *Builder* of November 23rd, in which various points connected with the legal relation of quantity surveyors to architects, builders, and house-owners are raised. The editor of the *Builder* is desirous of obtaining a legal opinion on the matter, for publication, if desired. Counsel will, therefore, please to give his opinion as to

(1.) Who is responsible to the quantity surveyor for the costs of taking out the quantities, firstly, when no tender is made by a builder, or he is prevented from continuing a work undertaken; and, secondly, where a builder who has tendered has completed the work. (2.) Generally, on any other points which will make the legal position of the above-mentioned persons clear under the circumstances suggested in the letter sent herewith, as, for instance, when the architect himself takes out the quantities.

Opinion.

1. *Primâ facie* when an architect engages a quantity surveyor to take out the quantities, he will be liable to the surveyor for his charges, unless he states that he is agent for a named principal. But if the surveyor proves an express or implied authority from the person for whom the architect has been doing work to employ a quantity surveyor, then the architect's employer will be liable to the quantity surveyor. That was what happened in the case of Moon *v.* The Guardians of the Witney Union, 3 C. B. 814. But it must be borne in mind that the implied authority arises from the force of a custom of the trade, which must be proved by the person who relies on it. This disposes of the case when no building has been erected, or the owner has prevented its completion.

2. But should the builder execute the works as described in the bill of quantities, then he becomes liable to the surveyor for his charges, provided the latter establishes either a distinct custom of the trade to that effect, or a condition in the contract between the builder and the employer that the builder shall pay the surveyor's charges. But an express agreement between the architect and the builder that in any event the latter shall not be liable for the surveyor's charges, as occurred in Taylor *v.* Walsh, 4 Irish L. R. C. P. 467, would take away the effect of the custom.

3. Assuming, however, that the architect himself takes out the quantities. If he were expressly authorised to do this by his employer there could be no question as to the liability of the latter for the cost of this work. If however, the architect were to take out the quantities, without having any agreement to this effect with his employer, it is clear that since there was no contract between them, the employer would be under no obligation in the matter. If, however, the builder made use of the quantities as taken out by the architect, the former would clearly be bound to pay a reasonable remuneration to the architect, not from any custom, but because he had used the work of another person for his own purpose and profit. There would, in fact, be a claim against the builder "for work and labour."

4. As to losses incurred through incorrect bills of quantities. I consider that it is quite clear that the person whom I may call the house-owner is in no case liable for any losses incurred by the builder in consequence of the quantities being incorrect; that is, whether there be a separate quantity surveyor or whether the architect act in this capacity. This is plain from two authorities,—Scrivener *v.* Pask, 18 C.B. N.S. 785, and on appeal 1 L.R.C.P. 715, and Thorn *v.* The Mayor of London, 1 L.R. App. Cases, 120, the latter of which cases was finally a decision of the House of Lords. It was an action by a contractor against his employers for loss incurred through errors in the engineer's plans, on the ground that there was an implied warranty that they were correct.

The reasoning in that case clearly applies to bills of quantities. Lord Cairns said, in delivering judgment,—"If it were to be held that there is, with regard to the specification itself, an implied warranty on the part of the person who invites tenders for the contract, that the work can be done in the way and under the conditions mentioned in the specification, so that he is to be found liable in damages if it is found that it cannot be so done, the consequences would be most alarming. They would be consequences which would go to affect every person who, having employed an architect to prepare a plan for a house, afterwards enters into a contract to have a house built according to that plan. It would go to every case in which work was contracted to be done according to a specification, however unexpected might be the results from that work when it came actually to be executed."

But as between a surveyor and a builder I am inclined to think that there is an implied warranty by the former that he has used ordinary skill and care in compiling the bill of quantities, and that it is reasonably correct. The tendency of the Courts is rather in this direction, as shown in some recent cases, and there is no case to the contrary effect of which I am aware, like Thorn *v.* The Mayor of London, which governs one portion of this question. But it must be borne in mind that express contracts, fraud, and want of evidence, and other circumstances may frequently modify or change the above rules.

Temple, Dec. 4, 1878. E. S. Roscoe.

CANOVA'S COUNTRY.

LIVING in the country where the name of Canova, not only as a great artist, but as a charitable benefactor, is much revered, it is difficult to resist uniting in this esteem, if not with as much warmth, at least with a greatly renewed respect, for an artist whose works have so long been famous. Having recently visited the early home of this favourite sculptor, and seen with what sound good sense he devoted the proceeds of his industrious life to the benefit of his countrymen, it is with no small degree of pleasure that we give in these pages some account of Canova's native place, compared, as his expressed wishes in regard to that native place may be, with those of one of our own famous sculptors, John Gibson, whose wishes have been but only lately carried out in London, in accordance with his last request.

In this picturesque province of Venetia, embroidered thickly with the traditions of art-history, we must not allow our veneration of the great names of the past to lead us to overlook those more modern names which, unconnected with any group, stand by themselves, their country almost ignored by the world at large, which admires, and has long admired, their works.

To such belongs Canova, whose romantic birthplace lies among the picturesque Cadore Hills, their beautiful outline distinctly visible from Venice. At no great distance from the antique town of Asolo,* and situated on the southern slope of Monte Grappa, the last of the chain of Alps which overlook the great Trevisan plain, stretching to the Adriatic Sea, the approach to Possagno, whether from the ivy-walled and historic town of Bassano, or from the deserted mountain hamlet of Asolo, is in the highest degree beautiful: it is no surprise that artistic genius should have been developed in such a cradle. In threading the Via di Caniezza to reach Possagno, one sees almost hidden in the morning mist, half way up the pale blue mountain side, the classic Temple of Possagno, surrounded with picturesque hills and solitary valleys. The village of Caniezza, gathered round its little church on the mountain slope, the pastoral appearance of its meadows shut in by rocks and trees, pictures completely the ideal Alpine hamlet. The Temple of Possagno, the stern Doric columns and simple pediment, bear one, as if on Prince Houssain's magic carpet, to Greece, a contrast singularly impressive in a scene, set, as it is, in the midst of nature's almost untouched effects.

And here is the country of Canova, where his father, honest Pietro, worked for many years, and from under whose roof young Antonio went forth to the world to achieve that fame which he had seen floating before him even when a boy, and with difficulty wielding the mallet and the chisel.

The story of Canova's life is too familiar, and the incidents are of too recent occurrence to permit us to do more than refer to them in these pages. His first journey was to Venice; but it was not here that the models of which he was in search were to be found, and soon we see young Canova leaving Northern Italy for Rome. Here at last, in the museum of the Papal capital, he discovered by study that secret he had so long sought, and fame soon recognised his skill.

Arrived at the pinnacle of his renown, he had not forgotten his native town, and it was at this period that he planned and built the Temple of Possagno, showing in its resemblance to the Parthenon that admiration for the Greek which penetrated everything he attempted. In June of the year 1819 the first stone of this temple was laid by him. He had already painted an altar-piece,—the Deposition of the Cross,—and had returned to his studio at Rome (the same occupied in later years by Gibson), to prepare the metopes, and had, indeed, modelled the group of the Pietà. Each year (in this resembling our own Shakspeare, who annually visited his home at Stratford) he came to Possagno, to superintend the erection of the church. In 1822, returning from his native place, he was struck down at Venice, and there, on October 22nd, he breathed his last, amidst the universally-expressed grief of the whole artistic world.

Born in 1757, he had passed sixty-five years amidst sympathising friends, who had welcomed each work as it came from his hand,—appreciative friends, like the refined and *spirituelle* Isabella Albrizzi, whom Byron, it will be remembered, has called the Madame de Staël of Venice, and the lively society which met at her beautiful villa on the Terraglio.*

Canova's remains, by his request, repose in the beautiful church which he had erected at his birthplace, surrounded by the scenes of his happy youth. At Rome, his second home, in the Campidaglio, a mausoleum was erected to his memory; while Europe herself aided in the monument at S. Maria Gloriosa, in Venice, carried out from the model left by the sculptor for the tomb of Titian, and there was preserved Canova's heart; nor did the little town of Asolo, which had conferred on him his first title of nobility, neglect to honour its countryman, and there may be still seen the cenotaph raised by the Asolanesi to Canova.

But amidst all these public honours to the famous sculptor, the most glorious monument to Canova's memory remains in the noble deeds of benevolence and charity that, during his successful life, he secretly carried out, not alone for Possagno, his native place, but for more than one town in the country round about. The interesting museum at Bassano (which, among other treasures, contains a valuable collection of prints of all periods, and notably some rare examples of English masters) preserves, in addition to some 22,000 autographs of famous men, the gift of Canova, several hundreds of his letters, as yet unpublished, from which may be gathered many particulars of the artist's benevolence and endeavours to alleviate the sufferings of his country when Napoleon's army invaded Italy. "I beg of you," he writes to a friend in 1801,† "to send some means of help to this unhappy land, whose sufferings I grieve over to the utmost. I can assure you that many times in the course of the day I exclaim against him who is the cause of all our misery." In these few lines we see Canova, the simple patriotic citizen who, on the suitable occasion, knew how to speak in behalf of his country to those who occasioned its misery. Canova's reply, when Napoleon proposed to transport to Paris the famous Farnese Hercules, is worthy of record,—"Let your majesty, at least, leave something to our poor Italy. These antique monuments form links in a chain of association which can never be transported either from Naples or Rome." Nor must Canova's influence be forgotten in the eventual restoration to Italy of those "illustrious spoils," the artistic treasures which Napoleon had gathered from the whole of Europe in Paris.

At the foot of the hill-side of Possagno stands Canova's house and the Gypsoteca,—an interesting museum where are preserved numerous models of his works (some 200), his sketches, and his books. In this museum, of which there is an equally interesting annexe in the neighbouring town of Bassano, one is able to judge by comparison, so valuable a means of determining an artist's merit, all Canova's famous works, so varied in their conception, from the Icarus in the first gleam of hope in his imagined discovery to the calm features of Washington displaying to his countrymen the table of the laws, the ægis of their liberty; the grace of the Venus issuing from her bath; the even more familiar Hebe (who, by something in her action and in the flutter of her drapery, recalls a suggestion of Goëthe's, of the beauty for a "pathetic statue" of Eurydice bitten in the heel by a snake as she goes joyfully through the meadows with the flowers she has collected); the figures of the Dansatrice, the Psyche, and the Graces, which have already made the fortunes of more than one generation of Italian cast-sellers; the refined beauty of Eliza Bonaparte, the Slumber of the Nymph, and the Sleeping Venus, with its tradition of the model having been the beautiful Princess Pauline Borghese, or the contrast in the spirited Pugilists and the numerous male portraits, or the still more expressive Magdalene, in which is so perfectly idealised that complete dejection which has inspired for centuries so many famous painters. And all these works are here, with an additional interest in their associations; in many cases the perishable model "pointed," for the sculptor to reproduce in imperishable marble.

When we saw a portion merely of Canova's collected works in the gallery at Bassano, we could not help drawing a comparison unfavourable to the arrangement of the Gibson collection at Burlington House; and even here, in the mountains, in a portion of Italy but little frequented by strangers, there are considerably more visitors to the Canova Gallery than the Burlington House authorities can record in their upper room, although amply, indeed, would the visitor be repaid for ascending those few steps, even if Gibson's works were not there, by the sight of an original work by Michelangelo and three or four superb portraits by Reynolds,—to say nothing of the collected diploma pictures of the Royal Academicians from the earliest days to one of the last gifts, that of the St. Jerome, by the present accomplished P. R. A., or, perhaps, even more interesting, Marco D'Oggione's copy of his master's perishing "Last Supper."

All the numerous works left by Canova, which show his powers as a sculptor, a painter, and an architect, evince the extraordinary effort he made to attain that ideal of which, from his youth, he had never allowed himself to lose sight; his fame as an artist may be said to be universal, but the modesty which veiled his nature is less known to the public, as also are his beneficence, and those virtues of a patriotic citizen which he on more than one occasion displayed so openly.

All the numerous honours which were heaped on him he received as a tribute to that art which he represented; all the riches which he gained by his numerous works he spent in acts of public and private benevolence, and long will the fortunate country of his birth be daily reminded of his loving sympathy.

While he lived, his house and studio were ever open to young aspirants, whose first works he often purchased; while secretly he aided more than one suffering artist's family, and cheered more than one unhappy home.

It would be unjust to the memory of so great a benefactor to leave his birthplace without visiting, at some short distance from it, the village of Crespano, almost, one might say (in common with more than one village on these Alpine slopes), created by Canova, and where the generous traditions left by the artist have been continued by the noble family Canal, whose charming residence, not far from Crespano, is especially interesting to the English visitor, if not to the admirer of Canova, for, among the many recollections of the famous sculptor may be found his portrait by Sir Thomas Lawrence, while the same features, even more gracefully treated by another familiar hand, that of Angelica Kauffmann, hang at no great distance off.

It is a curious fact recalled by this picture, and one probably known to few but those who remember the pleasant evenings at Porchester-terrace of thirty years ago, that Mrs. London, the admirable authoress of "The Mummy," was the god-daughter of Canova.

But several other interesting memories of Canova's connexion with England still remain in the peaceful province which gave him birth. Among these are especially worthy of mention as bibliographical curiosities, in the collection of the Arrigoni family, at their beautifully-situated seat at Valdobbiadene, two small volumes presented to Canova by the beautiful Duchess of Devonshire.* These works were at a later period given by Canova to the Arrigoni family. Each volume bears, written in pencil on the first page, in the minutest handwriting, its dedication;—on the "Horace,"—"The Duchess of Devonshire, *née* Hervey, to Sig. Canova"; and on the "Virgil,"—"Sent to Antonio Canova by Elizabeth, Duchess of Devonshire, *née* Hervey, in testimony of her sincere friendship and great admiration." Equally interesting is a gold snuff-box, presented by George III.'s Queen to Sir Charles Long, by whom it was given, as we gather from the words engraved on the lid, "To his friend Antonio Canova." Meeting with these modern English names, so familiar to us all, high up in the Venetian mountains, from which one may look down over

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* See *Builder*, p. 1186, *ante*.

* The high road leading from Treviso to Mestre, and so to Venice, along which all travellers entering the capital from Germany, passed, before the days of the railway.

† In a letter which we take from Sig. Cacciamigo's interesting "Ricordo della Provincia di Treviso."

* One volume is the fifth satire of Horace (the journey to Brundisi), superbly printed at the expense of the authoress of the "Passage of St. Gothard," accompanied by an Italian translation, and a portrait of Horace taken from a medal in the Poniatowsky cabinet. But more beautiful is the "Æneid" of Virgil, translated by Annibal Caro, published in two folio volumes, on wove paper, with views of the places mentioned. The edition executed in Rome at the Stamperia di Romani (MDCCCXIX), at the cost of the Duchess, consisted of only 164 copies, distributed, we learn, only to the principal libraries and sovereigns of Europe. It is a fact worthy of addition to this, that it was the Duchess of Devonshire, doubtless at Canova's suggestion, who subscribed the first funds to establish what is called the English Academy of Arts at Rome, where so many English artists for the last sixty years have studied, more or less.

the great plain of Northern Italy, produces a strange effect on the mind, filled as it is, in this picturesque corner of Europe, with the traditions of the long by-gone Venetian school; but still stranger, it can be imagined, is likely to be the effect produced on the mind of the English traveller, who, like ourselves, might visit the interesting cathedral at Bassano, to find himself, on entering a side door of that Mediæval pile, confronted with an old friend in a copy of the famous Holy Family by Sir Joshua Reynolds.

Treviso.

A NEW ART PROJECT.

A recent number of the *République Française* publishes the new regulations for the future management of the annual Exhibition of the *Salon*. The Minister of Public Instruction and Fine Arts, who has put these regulations forward, is deserving the gratitude of the whole artistic world for the broad and judicious liberality that these new rules offer to the workers in the fine arts, and for the means of instruction that his project holds forth for the future of French and foreign art generally.

The Minister of Fine Arts, with a rare originality that must be the result of careful study and a profound acknowledgment of precedents, with an acquaintance with the failures and difficulties that all those encounter who desire to secure general satisfaction, seems really to have almost accomplished the solution of an apparently difficult problem. Impossible as it may seem, it cannot be denied that the minister's new project will at least reduce to a minimum the amount of dissatisfaction expressed, and the complainers will be found to be simply those who, under the old system, enjoyed special advantages, which now will be equalised for all.

The Council of Fine Arts (reorganised by a recent Governmental decree), held on Wednesday, the 13th of November,—the same day that our Royal Academy met to appoint the new president, — first meeting under the presidency of the Minister of Public Instruction and Fine Arts, who communicated to the council some resolutions altering in an important degree the administration of the fine arts.

These decrees consist of a recommendation to encourage even still further instruction of "drawing," but especially of a project tending to greatly modify the existing regulations of admission to the yearly Exhibition of the *Salon*, a project on the terms of which the Minister invited the council to deliberate and give their opinion. These new regulations are now made known to the public.

In the first place, the much-vexed question of the jury of admission is to be solved by its election from a body formed of all artists whose works have already been exhibited at least three times on the walls of the *Salon*. There will also be in addition to the jury of admission, one to award the prizes and rewards. In these juries all the different branches of those arts which figure at the *Salon* will have a representant.

It has also been determined to hold, at the close of the *Salon*, an Art Union resembling that of the Paris Exhibition of this year, with the funds raised by which numerous works of art will be purchased.

An important innovation is that regarding the question of the free entries, distributed till now so unjustly, and to such unsuitable individuals: henceforward *all artisans, schoolboys, and soldiers will be admitted free of charge.*

Such are the most important innovations projected by the Minister of Fine Arts. Among the less important, are worthy of mention the following:—Every artist must write on a label, to be attached conspicuously to the frame, the subject of the picture, as also his name; the exact dimensions of each picture are to be inserted in the catalogue; and as a minor point, we notice the exclusion henceforward of all copies on enamel.

But the most novel portion, probably, of the new project consists in the formation of an exhibition of the refused pictures, an innovation which may lead to singular results. Furthermore, every five years, will be exhibited the most successful works that have figured in the five previous exhibitions. In addition to these innovations, mention should be made of the formation of two important committees, one to be entrusted with the Government commissions and purchases, the other with the conduct of artistic missions at home and abroad.

These new regulations gain additional interest from the certainty that the French Minister for Fine Arts has not only given the matter careful consideration, but he has been guided by practical men, whose lives are devoted, as so many lives are in France, to the study of the fine arts as an element of the greatest importance in establishing a nation's name in the history of the world: affording, in addition, another proof of the desire of the French Republic to advance the æsthetic institutions of the country.

ROCK-BORING MACHINERY IN CORNWALL.

The recent depression in the mining industry of this county, owing to a rapid and complete fall in the price of tin, has exemplified in a marked degree the well-known proverb, "'Tis an ill wind that blows nobody good."

Every sovereign's worth of tin costing some 25s. to raise, naturally reduced "the adventurers," as the shareholders are locally called, to utter despair, and, with many of the smaller mines, resulted in the stoppage of the engines and the letting in of the water; while the miners, thrown out of employment, were forced, together with their families, to emigrate, and seek their daily bread in other climes. The bigger mines, on which more outlay naturally had been expended, and which, therefore, seemed worth more to the adventurers, were only kept going by sheer pluck and determination, and at great expense, in the hope of a turn in the tide of low prices. Many despaired, but many, fortunately, turned their thoughts and serious attention to economy in production, with the resulting discovery that the means hitherto employed to raise the mineral had been extravagant and wasteful in the extreme, and that, under proper management and economy, now for the first time really called into play, tin could be raised at about half the cost!

Nor was this all. Mine adventurers and mine agents, the latter, as a rule, a class too closely wedded to old ways and customs, began to see that there was something in rock-boring machinery after all, and to turn a more attentive ear to those who advocated its merits.

The Diamond Rock Drill Company and the Barrow Company were, we believe, the first to avail themselves of the route thus thrown open to them, while, in their wake, the representatives of the "M'Kean" drill, the "Darlington," the "Eclipse," the "Champion," and "Jordan's Hand-power Drill," have crossed the Tamar; so that, what with the many drills before their eyes, and those further advertised in the local papers, the adventurers and agents are not a little puzzled, and are somewhat in the position we might imagine the inhabitants of Venice would be if their "silent highways" were suddenly to be converted into macadamised roads, and they had, in place of their gondolas, to make use of beasts of burden and of draught!

The vendors of horses, mules, asses, oxen, and perhaps camels and elephants, would soon be in the city, each vaunting the merits of his own peculiar class of beast; the Venetians would see the necessity of making a choice, but feel themselves, from entire ignorance of the subject, utterly incompetent to do so. In some such position are Cornish adventurers and mine agents at the present moment.

The necessity for boring-machinery is patent to all, but they are utterly at a loss how to make selection. The Venetians would, after a year or so of experience, be able to descant freely on the merits of the various natures of quadrupeds, and so will these agents by-and-by, on the merits of the different drills, but just now they feel themselves in the dark, and unable to walk except with cautious and timid steps.

We imagine there is as much difference between rock-drills as between the beasts of burden and draught we have supposed the Venetians called upon to choose from. They cannot all be equally good, and so, while some mines have boldly purchased some expensive drill or other and set it to work, others have pursued a more middle and safe course, and contracted with the proprietors of the drills for the "driving," as it is termed, of so many fathoms of levels at the ordinary hand-labour price, the mines supplying, as a rule, the steam necessary to work the air-compressors, in return for an agreement on the part of the contractors to drive at least at double the speed of hand labour.

Thus in one-half the time that used to be occupied, generally in less, ground is explored and communications made to the very great advantages of all interested in the mines, while the agents are afforded time to become acquainted with machinery utterly new to them, and to learn the respective merits of each kind.

The disastrous fall in the price of tin, by compelling proper economy in production and by paving the way to the extensive use of boring machinery, has decidedly lined with silver the dark cloud that it threw so thickly over the whole county of Cornwall, and if the present rise in prices continues, will possibly prove to have been of actual benefit.

It is certain, however, that while the shareholders or adventurers may be, on the whole, the gainers, the miners themselves are reaping, and will continue to reap, incalculable benefits; for not only are they relieved of the heavy, exhausting, nay killing work of boring by hand the holes necessary for blasting, but no matter how far the "end" where they are working may be from the nearest shaft, or how deep below the surface, the compressed air, which feeds and works the drill, issuing from the exhaust-pipe as fresh, cool, and pure as when it left the ground above, enables them to work almost as well, and perhaps with as little danger to health, as if they were at the surface.

Surely, with this flooding of the "dead" and unwholesome "ends" of Cornish mines with pure air, "miner's complaint" and other serious ills will well-nigh be stamped out, and the wonder and shame are that the priceless boon now afforded should have been brought about in struggling to economise in expenditure of money, rather than in the more laudable endeavour to economise in expenditure of human life, and that that which the highest prices for tin failed to accomplish in extorting from the hands of wealthy and gratified shareholders has been derived in so different a manner.

It is hardly in our province, even were it in our power, to review the comparative merits of the dozen or more rock-drills, and their attendant compressors, that are now before the public, and on which extravagant encomiums are lavished by the proprietors in almost every case.

The main points will be apparent to all. The air-compressor must work efficiently and with the least possible expenditure of steam, and the drill with the least possible expenditure of air. This latter desideratum is very necessary, for it is a no small matter of importance in the long run, whether 2-in. or 4-in. tubes have to be used, not only as regards the first cost of the tubes, but as regards economy of labour in fixing, and especially of economy in space.

The drill should be as light and portable as is possible, in combination with efficiency; should be simple in all its parts, and be calculated to work steadily on, month after month, underground; without the necessity for sending it on its upward and costly journey to the fitting-shop for repairs.

The mines of Cornwall have at present the monopoly of all the boring machinery in the county; but the time is not far distant, we think, when it will be seen at work in many large granite and elvan quarries, and the consequent reduction in the cost of building-stone thus brought about would not fail to be a subject of congratulation with all our professional readers.

Roman Remains, Lincoln.—Recent excavations in Lincoln have revealed the bases of four columns in fairly perfect condition, with a portion of their circular shafts still remaining. Two of these are evidently a portion of a row of columns forming the side of a portico. The two others not only indicate the end, but the commencement at right angles of another row. They have the remarkable peculiarity of being "attached,"—the two columns are built, as it were, into one another, and although in separate stones, the abutting column is worked out in a hollow to receive its neighbour. One is larger than another; while the three smaller columns are 2 ft. 6 in. in diameter, the return column is 2 ft. 9 in. The bases are imitations of the classical Attic bases tolerably well wrought, but with many very apparent departures. They stand on square plinths, and the whole composition, columns and bases together, is about 5 ft. in height from what was the original flooring. The space from column to column is four-and-a-half diameters, a very wide proportion.

THE ORGAN AND ITS TREATMENT.*

I DO not conceive that any excuse is needed, nor apology on my part, for bringing this subject forward. To those who are conversant with it, I have nothing new to say; nevertheless, an inspection of the drawings of new churches constantly published, and a visit to those that are built and building, makes me feel that at any rate if many persons know what they ought to do with regard to this noble instrument, they in many cases leave it undone.

I shall confine myself to the subject of organs in churches, as not only being one that presents greater difficulties in treatment, but as coming more frequently under our notice than organs in rooms. I speak, too, of *new* churches. I do not propose to treat the matter from an antiquarian point of view, although from that standpoint the subject is one full of interest, and is as yet but little investigated; nor, on the other hand, do I wish to be guilty of treating the matter as though the organ were the one thing for which churches and choirs existed. I fear that the lovers of, and the performers on, this instrument are far too apt to take this latter view of the case, and in conversation with organists I have often found it impossible to induce them to appreciate the fact that the organ, the choir, and all the musical arrangements, exist only for the purpose of duly rendering the service of the church, and, standing alone, mean nothing. It would be well if we were more in the habit of viewing our architecture from a similar point. In illustration of what I have just said, I may be permitted to refer to a conversation I had some time since with Dr. Wesley, late organist at Hereford,—one of the most accomplished musicians and performers of this century. I had been with him to a large church in a county town. The organ stood exceedingly well in a lofty and open aisle of the chancel, conveniently near the singers and vestry, and I remarked that this was good. The Doctor agreed that it was fair, but then a flight of the imagination took him to far more musical regions: "If that church were mine, I would take out the east window, throw open a great arch, and stand the organ over the altar. How it would sound down the church! You *would* hear it then!"

My best course will be, firstly, to describe the machine itself (not technically, but only enough to answer my purpose); and, secondly, to consider what is its best position, and the conditions of that position, including its external as well as general treatment.

Firstly, as to the machine itself. To have some acquaintance with the interior arrangement of the organ is really essential to treating it rightly when drawings are being prepared for a building which is to receive an instrument of the sort. If we have to design a hospital, we make ourselves acquainted with a host of particulars without which our design cannot be called a true piece of architecture. The same with a picture-gallery or an hotel; and now we have to take into consideration that a particular part of a given building is to receive a particular thing for a given purpose. It is, therefore, our business to have some acquaintance with this particular thing. Although the varieties are infinite, yet everybody knows what the outside of an organ is like. The old-fashioned case was often a splendid monumental, but frequently cumbersome and unmeaning, thing. The modern one is an ugly box, surmounted by a stack of pipes, reminding one of a zincworker's premises in the New-road. The architect finds, on further investigation, that this case takes up a great deal of room, but has not anything very substantial inside,—a great many little sticks, a vast amount of dust, and other things, not to be understood, but generally a large box somewhere near the roof, and this box often presents a most ugly and obtrusive appearance from the outside. I am so well aware that I am addressing an audience acquainted with technicalities, that I shall not presume to go into a great number of details that might otherwise be needed. The organ-builder is the best man to consult on the question of the internal plan of the machine, but unless we are ourselves somewhat acquainted with what he will have to tell us, we shall find that, perhaps by our plans and sections of building, we have put him and his organ at an unfair and unnecessary disadvantage, and are not at all able to understand what he would tell us. I will say, then, that generally an organ consists of four main divisions, called the great organ, the swell organ, the choir organ, and the pedal, the first three divisions being controlled by three manual key-boards, the fourth division by a pedal-board. Each of these divisions of the instrument is, in a manner, complete in itself, and consists roughly of (1) the pipes; (2) the wind-chest,—like a double table-top, on which the pipes stand and from which they receive the wind which makes them speak; and (3) the mechanism that connects these divisions with the key-boards. Common to all, unless the instrument be of large dimensions, is the apparatus for "raising the wind," viz., a reservoir to hold it, and feeders or bellows to pump it into the reservoir. Wood trunks or conduits convey the wind from this reservoir to the various departments of the instruments. Lastly, the department put second, the swell-organ, is enclosed in the great box already referred to, and which, as we all know, makes the sound *piano* or *forte* as it is shut or opened by the performer. The question now presents itself, "What space ought we to allow for an average instrument of the above description?" We have to accommodate the organ, the blower, and the player,—to accommodate them, not merely to say that they can all be packed away in this or that little hole. It is often the case that an organ of needless size is put into a church. There is a passion nowadays for monsters. A huge machine of fifty stops in a church where one of thirty would amply suffice, and sound more effectively, is not now an uncommon thing. If the architect knows from the first that he is to stable such a monster he is to blame if he does not do it to advantage; but where, as is usually the case, he does not know what is coming, but has only to make adequate provision for a sufficient organ, he is not to be blamed more if the monster be pent up than if his pulpit would not hold a Daniel Lambert. We do not want Daniel Lamberts in the pulpit more than we want these roaring monsters in the aisle. Taking, then, the size of an average organ in an average church, we shall find that the pipes are in many instances things of considerable size. The pedal department has pipes of 16 ft. speaking length. With the block on which a pipe of this length stands, we ought not to allow less in height than 18 ft. to take it, and where the church is one of low pitch we may take this as an average minimum height for the organ-space. A large organ will have pipes of 32 ft. speaking length in the pedal department. If these pipes are of metal, such as those in front of the organ at the Crystal Palace or the Albert Hall, they will be 40 ft. long over all, or thereabouts; if of wood, they will require about 31 ft. of length. It is obvious that if there be height enough to accommodate pipes of this length, there will be abundance of height for the rest of the instrument; but this does not always follow in the first case put,—that of pipes 16 ft. long. The "great organ" is the department of the instrument that next claims our attention. Whilst the "pedal organ," or at least, its longest pipes, frequently stands on the floor, or just above it, the great organ, and indeed all the other departments, are lifted up, and, within reason, the higher the better, as the sound gets away above the heads of the people and the inclosure of the lower part of the case. Our average organ will give us, as the longest pipe with which we have to deal, one of 8 ft. speaking-length. This pipe will be 10 ft. long or thereabouts, but as the wind-chest on which it stands will need to be some 6 ft. from the floor, we find the top of the pipe about as high up as the top of the pedal-pipe first referred to, viz., 16 ft. or 18 ft. In the "swell organ" the length of pipes is the same as in the great, and as the whole of this department is usually enclosed in a great box or wooden room, a less height than that already given will not do. The organ-builder usually endeavours to raise the swell-box as high as possible. It would appear that the best musical effect is so obtained, and the choir organ is not unfrequently put below it. In this case a greater height is needed than that already given. In the space below the wind-chests of the great, swell, and choir departments, usually lies the reservoir, &c., on the floor. Those who wish to see this plan more fully explained will find a section of it in the folding plate at the front of the great work on organs and organ-building by Messrs. Hopkins & Rimbault,—the standard work on the subject in this country. We now come to the question of floor-space required for an average organ, again supposing, as I have hitherto done, that there are no peculiarities in the site which necessitate an arrangement out of the common. A square of from 14 ft. to 16 ft. on a side will answer the purpose well. If in the scheme of the instrument there be many pedal stops, then more space is needed; if there be few, smaller space will suffice; but I may say that in an average-sized church, to accommodate 600 people, an average organ will probably occupy a space of 16 ft. by 16 ft. by 20 ft., and it will consist of four departments,—great, swell, choir, and pedal.

I now come to the second division of my subject:—What is the best position for the organ, and what are the conditions of that position, including the external as well as internal treatment? In the matter of position, I do not think that we ought to take precedent as our guide. By "precedent" I mean those old examples in plan, detail, &c., on which we base our architectural work of to-day. The organ in its present form did not exist in our Mediæval churches. It was vastly smaller and exceedingly clumsy. It did not need that a special place should be provided for it and due regard paid to its requirements in height, "speaking"-room, protection from changes of temperature, blowing, &c.; nor was the music so far developed as now, when the relative position of the organist and his choir is of no little moment, also that he should himself be well able to hear what he is about, and calculate with ease the weight of his accompaniment, that he should be able to see on what the clergy are engaged, and also have a reasonable view of the congregation. The modern organ is, in fact, as great an innovation on the Mediæval church plan as a heating-apparatus or gas-lighting. On the Continent, organs assumed large proportions long before we had one of medium size in this country, but the ordinary parish church did not often possess one of these instruments, and the scale of nearly all the more important ecclesiastical buildings abroad is so much larger than it is with us that a bulky organ could be accommodated in most instances without special structural preparation for it. My paper is to deal with ordinary new churches. In dealing with old ones the conditions vary in almost every case. By general consent the choir is now placed in the chancel, in the old place. It seems contrary to common sense to place the organ far away from the voices it is to support and accompany. Indeed, those few who advocate the removal once more to the west end are most fairly to be placed in my class of persons who would hold that the church and choir exist solely for the glorification of the organ. Presuming, therefore, that the chancel is accepted, and that the organ is to be immediately at hand, we have to consider how the organ shall best be treated,—whether we shall build an organ-chamber, a transept, or an aisle; whether we shall divide the organ, or bracket it out from the wall; whether it shall be on the floor or raised, and if raised what benefits or inconveniences may result; whether we are likely to have a blowing-engine, or blow by hand, and if an engine where shall it go? And, over and above all these, our plans and sections must show that the organ will not interfere with the convenient use of the church by the clergy and congregation, and will not darken or obstruct the church. Then the organist should, as I have before said, be well placed for seeing and hearing, both for himself and for others, and should not be in the dark where artificial light is needed, and where, consequently, additional danger from fire exists. The first great *desideratum* is, that there should be abundant space about the organ, and, above all, height. As a matter of fact, the musical man so often hankers after a west-end organ, not because there is any special virtue in that locality, but because his sensitive ear discovers the charming quality and elasticity of tone given by that open situation,—unbroken space in front, abundant height, and sufficient room for the pipes not to be crowded up inside the case. He compares an instrument so placed with one put into what the obliging architect calls an "organ-chamber,"—a species of enlarged dog-kennel, with two little doors, one to the chancel and one to the aisle, the whole thing, arches and all, crammed with pipes whistling and screaming at one another, the bulk of them half above the crowns of the little doors aforesaid. The larger and more complete the organ is that is placed in this conventional organ-chamber, the worse will be the result, as each individual portion of the in-

* By Mr. Somers Clark, jun. Read before the Architectural Association on the 6th inst.

strument has less space about it. I am quite within the mark when I say that in many instances an organ that has cost, we will say, 1,000*l.*, when placed as before said is far less powerful in effect and less pleasing in tone than would be one with half the number of stops and similarly placed. Having already given the dimensions of an average three-manual organ, 16 ft. by 16 ft. on the floor, and about 20 ft. high, we have something to start from for ascertaining the dimensions of the proposed receptacle for the instrument. If the plan and sections of the new church are such as to make it most desirable that there should be a building more or less of the nature of an organ-chamber, it is of the first importance that this should be as thoroughly one with the church as possible. I could point to several instances in which the receptacle is, in itself, of ample proportions, but the arches into the church are low; there is consequently a vast quantity of the organ-sound buzzing above the tops of the arches, and which has positively to descend, after reflection from the roof, before we can hear it. Quality of tone is very much impaired by this. The roof of the organ-chamber should be as lofty as can possibly be got. The openings into the chancel and into the aisle should be as lofty as possible. Avoid an arch into the aisle, and continue the aisle-roof (if the aisle be lofty) right over the organ. Or, treat the chamber as a comparatively shallow and broad recess, cutting into the main roof of the chancel like a transept. The organ-front can, with this latter treatment, be made continuous with, or even project beyond, the line of chancel wall, and thus the effect of a large break in the length of the wall (architecturally most unsatisfactory) will be avoided. I should here explain that the arrangement of the various internal departments of the organ can be considerably modified to suit various positions. In the organ-chamber the instrument is generally arranged much after the manner I have already indicated. If, however, this chamber be shallower, or become, as it often may with advantage, a shallow transept projecting from the chancel, then the various departments can be placed over one another, and carried to a very considerable height. I may instance, as a very large and important example of this distribution, the great organ at the west end of the Marien-Kirche at Lübeck. This instrument is upwards of 80 ft. high and 40 ft. wide, but not more than 7 ft. or 8 ft. deep, standing in a gallery. I should here add that unless there be abundant height,—far more than we generally get in our modern churches,—it is not good to build a projection for the organ with the vestry below; at any rate, this should be done, if we are forced to it, in such a way that only the back part of the instrument will be over the vestry, the front part coming down to the floor, otherwise the organ is virtually behind arches and up in a gallery. In consequence of the smallness of our modern towers, and the necessary thickness of the walls in proportion to the size of the openings through them, the conversion of the lower part of the tower to the use of an organ-chamber is about one of the worst, and unfortunately one of the most usual, places. I may be permitted to give a few examples from time to time from existing works, and as I shall have to speak well of some and ill of others, I trust no one may think I am doing wrong. The examples of instruments stuck away in little holes and corners called by courtesy organ-chambers, and badly stowed away in the lower parts of towers, are countless. I could not particularise one especially, but I may refer, as an instance of successful treatment of the organ in a tower, where, on the face of it, one would not have expected success, the fine instrument at the Church of St. Mary Magdalene, Paddington; but here there is a good deal of height and clear space above. Of an instrument well placed in a shallow recess, a good example is to be found at the Church of St. Peter, Vauxhall. We will now consider the advantage or disadvantage of a transept. A transept may, as we all know, cut the longitudinal axis of the church in one of two places,—east or west of the entrance to the chancel. For my own part, I think a transept in either position to be a mistake in an ordinary church, not because it may not have a fine effect, if well treated, but because it is sacrificing the convenience and use of the building to effect, a thing which brings our profession,—and justly,—more into disgrace with common-sense folk than most other charges that can be brought against us. It is well known that the voice stands specially in need of support at the place from which it emanates. With a transept east of the chancel-gates, far from finding support, one finds the worst of all arrangements,—a large space *behind* the speaker, reader, or singers, as the case may be. With a transept west of the entrance to the chancel (and here the transepts are usually much larger than if placed as last stated), immediately at each side of the speaker or singers, but with less ill-effect to these latter, we find a lateral space, and if the roofs of nave and transept intersect, the voices, quite early in their career down the church, are positively led to either side, to the complete sacrifice of the western part of the nave. The organ, on the other hand, is nearly certain to sound well when standing in a transept, for the same reasons that it sounds well if stood at the west end; but, on the other hand, the connexion between the player and the choir is difficult to maintain. If the transept be at all deep, things cannot work well together. As an instance of a good treatment of transepts east of the entrance to the chancel I may quote the Church of St. Columba, Haggerston, but in this instance the transepts are so shallow that they are hardly more than a pair of great shallow organ-recesses, and on plan the church does not show transepts external to the narrow aisles. On the other hand, I see that at the new cathedral at Edinburgh, where no adequate structural provision seems to have been made for the organ so as to use it with the choir sitting in the eastern arm of the cross, it has been decided to place the stalls under the centre-tower, and so bring the singers and the organ as much together as could be managed. I should next mention an aisle (to the chancel, of course) as a place for the organ. As a matter of fact, I have already implied that a good "organ-chamber" will be at least equal to the construction of a nave aisle, and with that I must dismiss any further consideration of this arrangement, beyond saying that a flat or nearly flat-roofed aisle should not be less than 23 ft. or 24 ft. high if it can be avoided. Then comes the question, "Shall we divide the organ?" Every one who knows St. Paul's Cathedral, All Saints', Margaret-street, or St. Mary Redcliff at Bristol, has seen what a divided organ is. With modern mechanical appliances, doing this is a question of money only, not at all of feasibility. Although the instrument does not seem to have been much used in that way, it is evident that for antiphonal singing this arrangement is excellent. It also places the whole choir near that which is to accompany and support the voices. If well considered in plan and section of the building, I doubt whether any arrangement can be found superior to this. In churches the section of which is of considerable magnitude, carrying the organ on brackets from the wall, and at some little elevation from the ground, can be taken into consideration. The modern organ,—such a one as I have chosen to take as my "average organ," is, however, of such a bulk that it is not possible, without inconvenience, to lodge it upon brackets, unless also some recess in the church wall is made which shall take the more cumbrous parts of the machine. To quote a large example well known, the organ at the cathedral at Strasburg hangs from the wall, and has, I believe, all the pipe-work in the case, but the bellows are in a little projection from the triforium. The organ at Ely is not more than half of it in the visible case. A lot is stowed away in the triforium. At St. Paul's Cathedral all the pedal organ is behind the stalls, and not in the two cases, whilst the blowing apparatus and bellows are in the crypt. The little hanging-organ at St. Mary Magdalene's, Munster-square, is not of sufficient size to enter into our consideration here. I give the above instances of hanging organs to show that a great deal of consideration must be given to the convenient arrangement of the instruments in such a position. For musical effect, bracketing-out is often very successful, as it brings the bulk of the pipe-work fully into the open, and gives the sound abundant room to spread. The next question is, Shall we place the organ on the floor, or raise it up? I am somewhat doubtful of the benefits to be obtained by raising the organ. It should not, of course, stand low. The months of the pipes must stand clear and well above the heads of both choir and congregation, but I think that often there is not that complete unity between the two,—the singers and the organ,—that might be wished when the instrument is raised over-head on the top of stalls or in a gallery, although, for organ-effect alone, it is better than when on the floor-level. There are often, too, difficulties in communicating between the player and the singers when one is up above and the others are below. Of course, a long movement, enabling the organ to be played from the choir-stalls or close to them, can be had, but here, again, lack of money is usually a conclusive termination to dreams of this sort. As a gallery arrangement, nothing can be more picturesque, or for organ-sound be better, than that adopted at St. Agnes, Kennington. An instrument of considerable size could be accommodated in this church without inconvenience or obstruction, but, on the other hand, it is most inconvenient for the player. He cannot hear the singing well. He cannot see his singers at all, and I doubt whether any arrangement in a church of this size could, on the existing lines, be made very convenient. If the chancel were so much longer that the choir sat one bay further east than they do, some arrangement might be made, but charming as the scheme is in many ways, some grave difficulties have to be surmounted before success is achieved. The organs as placed in our cathedrals are the commonest instances I can give of gallery organs. In almost all instances they are placed on a floor at 18 ft. or more from the ground, but the buildings being so much larger than the churches which we are likely to be called upon to build, difficulties are more easily surmounted. Things are not all crammed together in a small space. Of course, there should be, in theory, a director of the choir, standing forward in the midst, and to his direction player and singers would look, but we seldom get this. I think that in many cases a couple of speaking tubes, starting from the organ, and carried north and south, one to each set of choir-stalls, might be of use to give directions, and avoid the passing about of messages on mysterious bits of paper, which from time to time seem unavoidable, even in the best regulated choir. I have tired you out with possible places for the organ, although there are yet others that may be thought of. I will only add on this head that the organ is best to stand on a wood floor; that windows near or behind the organ are a source of damp, chill, and danger to it; that a coil of hot-pipes near it, or even inside, is frequently of use to keep it in tune; that the space in which it stands cannot too carefully be kept dry, and is best if lined with wood, and ceiled below the rafters with plaster or wood. An open roof, unless at a great height above an organ, is a great mistake.

The next question was,—Are we likely to have a blowing-engine, or to have the organ blown by hand? The water-engine, now much used for blowing, is a most convenient and noiseless little servant, and will work away in a cellar, vault, or any odd corner, but the consumption of water is often an expensive item in accounts. Gas-engines are also used for the same purpose. I do not know of a church-organ blown by steam, but in the major number of cases with which we may have to deal, hand-blowing will most probably be used. Where it can be done, it is very desirable to get the blower and the handle at which he pumps out of hearing. To have one's thought suddenly distracted by the desperate pumping that is often resorted to by the wretched youth who has been nodding in some dismal corner of the church, is very unsatisfactory. On the other hand, unless there is some near prospect of blowing by machinery, it is not fair to place the handles in the vaults or in regions unknown, especially as, instead of waking at the right time, the blower is very likely to sleep on placidly when his exertions are much needed; but it must be remembered that it is quite possible, and, indeed, usual, to have hand-blowing as well as machine-blowing to the same organ, so that the former can be used when the latter is out of order. Provision can, therefore, be made for an engine in any case.

The statement I have already made that the organ must be so arranged as not to block up the church, encroach on passages, or darken the building, speaks for itself. I may, however, suggest that the position of an outer door may seriously affect the comfort of the organist and the health of the organ, and I may say the same of a window. I think, however, that I should not leave unconsidered the provision for convenience of the player. A vast deal of the

good effect of the organ will result from the player being able to ascertain what effect he is producing, and how much power of organ-tone he is employing. In many cases he is really placed inside the organ-case. A notable instance of this may be seen at St. Peter's, Eaton-square, where a doleful little den, a sort of forgotten hole, is the place from which the superb organ has to be played, and the choir and people accompanied. A case overhanging the player's head to a considerable extent is, as a rule, unsatisfactory. He cannot hear his organ enough, and it sounds dead.

I must now hurry on to a consideration of the organ-case,—to us of considerable importance, and, indeed, of no little moment to the organ itself, as in a smallish church, or where the openings from the space in which the organ may stand to the church are restricted, a case may very much diminish these openings. We all know those dignified old cases in which most of our earliest English organs of the seventeenth and early eighteenth century have been enshrined. Numbers of them have gone, destroyed by Vandallic "restorers." They were not, doubtless, built on very "true principles." Some,—such, for instance, as the case at St. Paul's Cathedral,—are excessively solid, and without apertures, but it is superlatively painful to see a stately old fabric such as that which formerly graced the west end of St. Mary Redcliff give place to a mere row of "tall-boys,"—a regiment of zinc chimney-cans,—and which are not, as a rule, on truer principles than were the old cases. According to theory, each pipe in an organ should stand on the sound-board, and not be placed at some little distance from its brethren, merely for show; but in most cases it is really an advantage to remove some of the largest pipes from within the instrument, and place them where they have unlimited speaking-room. A consultation with the organ-builder, and a thorough understanding of how he sees it best to lay out the plan of the various departments of the organ, will enable the architect to arrange the case so that it may be at the same time truthful and ornamental. If we take a row of pipes,—metal open diapason, we will say,—we shall find that as each one rises in the musical scale, it diminishes in size and length. When, therefore, we see in the pipe-stack case beloved by the modern Gothic mind, that there is a tall pipe in the middle, and pipes diminishing in exactly corresponding length on either side, we see almost to a certainty what is not true. These pipes are longer than they really ought to be. If we go behind, we shall see holes cut in the backs of these pipes to prevent the length of the vibrating column of air within being over the due proportion. All of the pipes, therefore, beyond this proper length, is sham. There is not the faintest reason why woodwork, tracery, &c., should not enter largely into the making of the case, and in many instances pipes may be arranged in two or three stories above one another, and represent the internal construction of the organ. Those tremendous edifices we see at the west ends of many large Continental churches are seldom good examples to quote. They are sumptuous, but very false in every way. I need not enter into a description of an average English organ-case. I here refer to seventeenth or eighteenth century examples, but may say that the scroll-work which appears immediately above the pipes has its use. It not only gives richness to the skeleton of the case, but it masks the unequal lengths of the pipes, and brings the whole design into symmetry. You will find exactly the same thing in idea, but with Gothic detail, in the organ-case at Strasburg, and I could mention several other Mediæval examples. This method of designing the front is common to the greater part of Europe. In Italy, however, and some southern parts of Europe adjacent, a somewhat different system prevails. Here the case is considerably taller than the longest pipe that is to be shown, and is more like a sort of temple front or piece of very open Renaissance screen-work, with the pipes standing inside and showing the inequality of their real lengths quite honestly. The lines of the case are usually very defined, and consequently the unequal length of pipes is not at all disturbing or inharmonious. I think that the organ over the west door at the Madeleine in Paris is so treated. In Spain we find another peculiarity, also very effective. Here all churches of any importance have two organs, and very sumptuous the cases are, covered with carving and gilding. The general type of case is much the same as that first described, but at the top of the solid panelling of the lower part of the case, and immediately below the vertical pipes, an armoury of trumpet and other reed stops bristles forth, supported horizontally by iron rods or brackets. The effect is curious and not unpleasing, but it is essential that the organ should, as it usually does, stand up in a gallery. The horizontal pipes would look most horrible just overhead. In small churches I have seen these reed-stops project certainly as much as one-third across the church, and yet with no ill effect, but they are not crowded close together, although one may see four, five, or six rows one above another.

I dare say that the length to which this paper has already gone will lead you to see that there is yet a vast deal more to be said, but I am not anxious to say it, nor can you be to hear it; but a moment's consideration will show that the historical and archæological side of the question, also the architectural study of old examples and the adaptation of the organ to old buildings, have not even been touched upon. The subject is immense. Indeed, there are very few machines of man's invention more complex or wonderfully interesting than the organ, the king of musical instruments.

ROMAN MILITARY ROAD THROUGH DURHAM TO NORTH WALES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

AN important paper on the above subject was read on the 4th of December, before the British Archæological Association, by the Rev. Dr. Hooppell, rector of Byers Green. We print some extracts from it:—

No two antiquaries appear yet to have agreed upon the course laid down in the Tenth Iter of Antonine, although very many have endeavoured to solve the enigma presented by that route. My attention has been for some time strongly directed to the subject. The main cause of the difficulty that has hitherto been experienced in endeavouring to assign a reasonable course for this iter appears to me to have arisen from the fact that in every case a wrong starting-point has been taken. Horsley selected Lanchester; Camden and Burton, Wentsbeck; Bishop Gibson, Caervoran; and later writers have chosen other places; but, in my opinion,—and I think I can give good grounds for the opinion I hold,—Tynemouth or South Shields should have been the station. The recent excavations at South Shields have proved what a very important military post the promontory of the Lawe, at the mouth of the Tyne, was, and the history of the centuries immediately succeeding the departure of the Romans shows that Tynemouth, on the opposite bank of the Tyne, was a place of remarkable note in Saxon times. I have, on a former occasion, given reasons for believing South Shields to be the Tunnocelum, and Tynemouth the Glannibanta, of the Notitia. Glanoventa, or Glanovanta, from which the Tenth Iter takes its departure, is identically the same, in point of language, with Glannibanta. Each in Keltic means "The brink of the height," and if the final "a" be dropped, each is good Welsh, at the present day, for the site of Tynemouth Castle.

It is a circumstance supplying a very strong argument in favour of Tynemouth or South Shields being the starting-point of this Iter, that the accounts which have come down to us of the great roads *left* by the Romans in this country, make the mouth of the Tyne the terminus of the one which ran across the island in a south-westerly direction. In Leland, vol. iii., p. 370, we read:—"Rekenild Streate, going from the south to the north Vulturnal Country, both begins from the aforesaid Menevia, and goes through Wigornia, by Wicombe, by Birmingham, Lichefeld, Darbe, Chesterfeld, York, to the mouth of the river Tyne." This is on the authority of Giraldus Cambrensis. The following, in vol. iii., p. 395, is from "The Book of the Histories of Eulogius":—"The Fourth way is called Leim Streate, going from the south to the north. For it begins at Menevia, and proceeds by Herford, Wigorn, Wicum, Bermingham, Lichefeld, Derby, Chestrefeld, by York, to the mouth of the River Tyne."

The county of Durham abounds in traces of ancient roads, and I will not now discuss what may have been the precise course of the Wreckendyke, Rykenild-street, or Leim-street, for it bore all these names, after it reached the heights of Wreckenton and Eighton, but I have very little doubt it crossed the Tees into Yorkshire at Pounteys Bridge. This bridge has long ceased to exist, but there can scarcely be a question that it was Roman, and that the road across it was the great avenue into the Eastern half of the county of Durham, as the road across Pierce Bridge was into the Western half. Pounteys Bridge, and the ford which succeeded to it after its destruction or decay, continued on the high road for many centuries. It was not till a comparatively recent age that the ancient road gave place to the modern one through Croft and Darlington.

Galava is the first station mentioned after Glanoventa, and the distance given is eighteen miles. I cannot myself make out the Roman miles to have been much different from our own. They would be shorter, if anything, but they appear to have varied somewhat in different parts of the kingdom, according, possibly, as they had been measured by different persons or at different times, but to have been on the whole not much less in length than ours of the present day. Durham or Old Durham would suit well as regards distance, from Tynemouth or South Shields; and the signification of the name, Galava, would suit equally well. Gal afan, pronounced Gal avan, is in Keltic, "a high plain," and is applicable to a comparatively level piece of ground at a considerable elevation. No description could be truer of the existing cathedral-crowned eminence, or of the neighbouring entrenched mount, where the site of a Roman fortified post is, by general consent, placed.

Among other reasons which lead me to conclude that the Wreckendyke went, in a direction not far from Ripon, to Mancunium and Mediolanum, is the fact that there must have been a great road to that city from Jarrow, Chester-le-Street, and Durham, in very early times. The monks of Lindisfarne, in the year 882, driven from their island by the Danes, after many wanderings, settled in Chester-le-Street; in 995, still fleeing southward, they went to Ripon. They carried with them their treasures, and St. Cuthbert in his ponderous stone coffin. They must have gone by a good paved road, and we have no reason to think there were any such in the kingdom but those that had been left by the Romans. A few months afterwards, in 995, they returned again from Ripon, and instead of going back to Chester-le-Street or Lindisfarne, selected a new spot, Durham, some distance, but, as I think, no great distance off the road. In 1069, they went from Durham to Lindisfarne, stopping the first night at Jarrow, which must, therefore, have been on the direct road, the second night at Bedlington, the third at Tughil, and the fourth at their journey's end.

In strong confirmation of the opinion here expressed is the discovery in 1874 of an important and wealthy Roman station, on the site known for ages past as Castle Dykes, about three miles north of Ripon.

From the neighbourhood of Ripon I have not traversed the country towards Manchester, but I have a strong conviction that the road passed thence to Ripley or Harrogate, and so to Bradford and Halifax. The names of many localities on the route indicate it. We have Staineley, Brackenthwaite (Horsley says the Wrekendyke, in North Durham, was also called Brackendyke, and the connexion between the two words Wreken and Bracken appears to be very close). Stainburn, Castley, and Stanningley. The most probable explanation of Harrogate itself is "Here Gate," "Army Way," "Military Road," and Stainburn or Castley is at the right distance from Romanby for Bremetonacæ.

Burlington Colonnade in Battersea Park.—All who know Battersea Park must have noticed the prostrate pillars by the river-side, near the Albert Bridge, mixed with friezes, carved with crests and coats of arms, other stones more or less broken, and amongst these ruins some huge wooden doors, with their great knocker still attached. These stones formed the well-known colonnade of old Burlington House, in Piccadilly. The *St. Mary Battersea Parish Magazine* says:—"It is a sad pity that these stones are not set up, if only as a picturesque ruin, or, as we would suggest, as an entrance to the Park from the broad boulevard that runs along the Thames, and which greatly needs some feature to relieve its long monotony. The palatial residences on the Chelsea Embankment would benefit more than Battersea by such a river gate to the Park."

MR. CRACE'S VIEWS AND MAPS OF OLD LONDON.

The collection of maps and views of Old London, which has been lent by Mr. Crace for exhibition in the rooms at South Kensington where the Caxton exhibition was held, was open for a preliminary private view on Tuesday afternoon last. The extent of the collection must have surprised many of the visitors, and confounded those who wished, like ourselves, to enter on an analysis of its contents. This is really impossible until we are in the possession of the catalogue, which is not yet ready. While mentioning the fact, we may at the same time express the hope that it will not be delayed, as is so constantly the case with exhibitions in the region of Kensington, until the period of exhibition of the drawings is nearly over. Grievous were the complaints in regard to this delay in the case of the Caxton Exhibition. But as the works exhibited are in this case the private collection of one owner, and as Mr. Crace is a man of business, we have reason to hope that the properly tabulated information will be forthcoming at the proper time.

We must content ourselves for the present with a few general observations only, which may serve to call attention to the remarkable interest of the exhibition to all who care about the history of the growth and development of the tract of country covered with buildings, into which "the cities of London and Westminster" have now expanded. The views exhibited include a multitude of careful engravings of buildings which have long since disappeared, but which have played great parts in the history of London life, social and municipal, and whose names and objects in many cases still exist in new and equally-renowned structures. The engravings include also many which are of value as records of social habits and character; scenes in the old Mall, &c., with the costumes and habitudes of the period stereotyped for us, so that we can not only see in imagination the old lines of the parks and streets, but people them with the men and women who carried on business or flirtation in these now changed or forgotten enclosures and thoroughfares. Old London seems spread out in perspective before us, and the more we examine the drawings and compare one with another, and with our own present knowledge of the places represented, the more widely interesting the subject becomes. Into many of the suggestions and reminiscences, architectural and historical, which this remarkable exhibition gives rise to, we hope to go in some detail when the exhibition is open to the public, and when, as we have said, the catalogue (it is to be hoped) will be at hand to assist us in making notes and references in a systematic manner.

Meantime, just a few words, the result of necessarily hasty jottings, in regard to the maps, which are hung in a separate room at the end of the long gallery containing the bulk of the collection, and which, though less attractive to the general eye, perhaps, have really as much interest as any part of the exhibition. The collection of maps is, we believe, nearly complete in regard to all known to exist previously to the present century: subsequently to 1800 of course they become more numerous and of less archæological value, and a selection of the best only has been made. The maps have been hung in chronological order, the first one of all being a sketch, made by Stukeley (or from his collection), of London in the time of the Romans, but the authority or basis for the conclusions embodied in the map is not given. It shows a long, narrow strip of town running in a north-easterly direction from the point where London Bridge has for so many centuries, in one form or another, given a passage across the Thames. We jump from this to the map by Ralph Aggas, made in 1560, but not published till 1603, and showing us London in the time of Elizabeth. This is the most complete example in the collection of the old notion of mapping a town in a manner which is a cross between a plan and a bird's-eye view, and in which the necessity of finding room for the gables of the houses and at the same time showing the streets, leads to obvious and inevitable inaccuracy of plan, though no doubt the general result is more interesting to the eye and the fancy than that of a plan with contour lines. The map shows London as a considerable town in appearance, though we realise effectually the enormous difference between that and the modern London when we trace on the map of the latter the boundaries of the Elizabethan town eastward extending to Aldgate, northward to Hounds-ditch and "London-wall," westward to Temple-bar and Chancery-lane, while a long strip runs down the north bank of the river to Charing and Westminster. We were looking for some map which would show us "the Strand," as we cannot but think it must at first have been built in order to gain its name, i.e., as a single row of houses fronting the beach or "Strand," which would have formed the roadway in front of them. But this, the oldest map in the collection, shows the Strand as a street built on both sides, and quite separated, by houses, from the river bank. The various gates of the City, Ald Gate, Moor Gate, New Gate, &c., are shown on the view or map, which ever we like to call it, in perspective, and help us to realise the actual growth of nomenclature of streets, whose names we use every day with little remembrance of the circumstances under which they arose. The next map, by Rischer (1604), shows the names of the streets much more fully and clearly, and has, in fact, in every respect, more of the clearness and precision properly belonging to a map. There is not much difference in the extent of the town, the additions being chiefly in the north-east, adjoining Bishopsgate and its neighbourhood. It is curious to see here Wentworth-street as a new and principal street in the outskirts of London. The street now exists under the same name, and probably on the same lines, as a narrow back-street in Whitechapel. The eastern part of Cannon-street shows on its present lines, but is called either Canning or Conning street, the type is too indistinct to be certain which. The connexion with St. Paul's-churchyard is only by the still existing route of Watling-street and Budgerow, now also in their turn degraded into back streets. The changes in the way of spelling the names of streets are curious, and apparently very arbitrary, as shown in the case of Cannon-street among others, which, in the maps a little later than the one we have been just noticing, assumes its present spelling, but, later on, is altered to Canon-street, in 1688; in a map of 1690, it is "Cannon"-street, and in one of 1700 is again "Canon," and the same kind of change backward and forward in etymology is observable still more curiously in other cases. Faithorne's map (1658) is the next of importance: we here see the Whitechapel district slightly extending, and we find Piccadilly as a road leading out of town, all fields to the north, so that "Green Pastures and Piccadilly" is only an expression of the early topography after all. "Piccadilly Hall," at the east end of the road, is the only building on the north side of it: and not far from this, on the precise spot now occupied by the Criterion, is a large isolated house, marked "Gaming House." The site of the Westminster Palace Hotel and the Aquarium appears as "Tutle Feilds," a name which soon alters in succeeding maps into "Tuthill." Some of the best plans after the fire are executed by poor Hollar, who had to sell himself to the map-engravers for a living, and illustrated his mechanical work of plan-drawing by beautiful little marginal drawings of "principal edifices." A Dutch plan showing the portion of the City cleared by the Fire ("a huge half-moon, a monstrous cantle out") is accompanied by another showing a scheme for rebuilding the burnt-out portion, in a truly Dutch fashion, in squares formed by the intersection of straight streets, giving the whole the effect of a gridiron on the drawing: the Dutch planner has the consideration to leave (of course, at equal intervals) open squares, and he might claim the merit of having provided a number of wide streets at right angles to the river and giving a view of it into the town, only that it is quite certain he only did so because otherwise his squares would not have been symmetrical every way. However, burnt London was not rebuilt on the Dutch plan, and we may be glad that it was not, for we have at least some of the old lines preserved, instead of having the whole totally obliterated. The date of this map is 1666. In 1675 is Green's map (drawn by Hollar), and in 1690 one from the Stowe collection, in which we first notice the present St. James's-square as a specially-defined space called St. James's-fields, and partly surrounded by houses; and St. James's Park water appears as a long straight canal running up to the front of the then Buckingham Palace, just in the same style as the Hampton Court canals, with a regular avenue of trees on each side. The development of the eastern extension of London is of interest, as shown in these maps. For some time it is entirely confined to the gradual extension of houses in a scattered manner along what is now Whitechapel High-street and Mile-end-road, but which in almost all the old maps is designated as "the road to Harwich," which place was thus obviously, from the importance thus attached to it, at that time a principal port of communication with Holland, and its revival by modern companies as "the fastest route to the Continent" is only restoring it to its former position. The two great arteries out of East London, Mile-end-road and Commercial-road, are now so similar in apparent age and importance that it is difficult to realise that the latter is only a new thoroughfare in comparison; but so it is. For centuries, Mile-end-road, as "the road to Harwich," was the great route out of London eastward; "The White Chapple" formed an incident on the road, and "Mile-end," probably named as being a mile from the old gate (Aldgate), was another. South of this road was open country and fields traversed by a straggling lane called "White Horse-lane," and even after Mile-end-road had been completely built along, the land south of it remained *in statu quo*. But the coming change is heralded by a small marginal plan in a map dated 1796 showing "plan of proposed wet docks" for the site now occupied by the West India Docks, and in the next map (1807) the docks are made, and at once White Horse-lane and its meadows are things of the past, and the long straight thoroughfare of Commercial-road marches clean over and through them. We were recently in one, probably, of the first houses built in consequence of this movement of the West-India Docks,—a good-sized square comfortable house, now abutted on each side by the smaller dwellings which line East-India Dock-road, but obviously in its day a dwelling-house of importance built by some ship-owner who wished to be near the scene of action, with a handsomely moulded and solid entrance-door, and a nearly flat roof covered with copper sheathing. To return, however, to one or two of the older plans that we have passed by, we notice in a large map called "London accurately Surveyed" (and dedicated to William and Mary, whose portraits adorn it), the first development of the Cavendish-square neighbourhood, little more than a square marked out, with one or two houses scattered about, and a congeries of fields in the rear, on which is the note, "These pastures were Marybone Park." In 1752 a good collection of houses has grown around Cavendish-square, though Marybone Pond, an oblong piece of water of regular shape and no great extent, remains northward of the square. In a map dated 1773 there is another instance in connexion with this district of those irregularities in nomenclature we have before adverted to; for, after having called the neighbourhood Marybone on the maps of half a century, we have suddenly a conscientious reversion to the origin of the name, and it is printed "Mary-la-bonne."

But we must break off these rather desultory comments here, though if there were time the maps themselves, independently of the views, might furnish matter for a whole number of this journal. We may just mention, in conclusion, that among items of great interest in this part of the collection, are some of the original sale plans of the land of well-known districts, showing their precise boundaries and characteristics at the time; among others, that of Grosvenor-place and the adjoining district.

ROYAL ACADEMY.

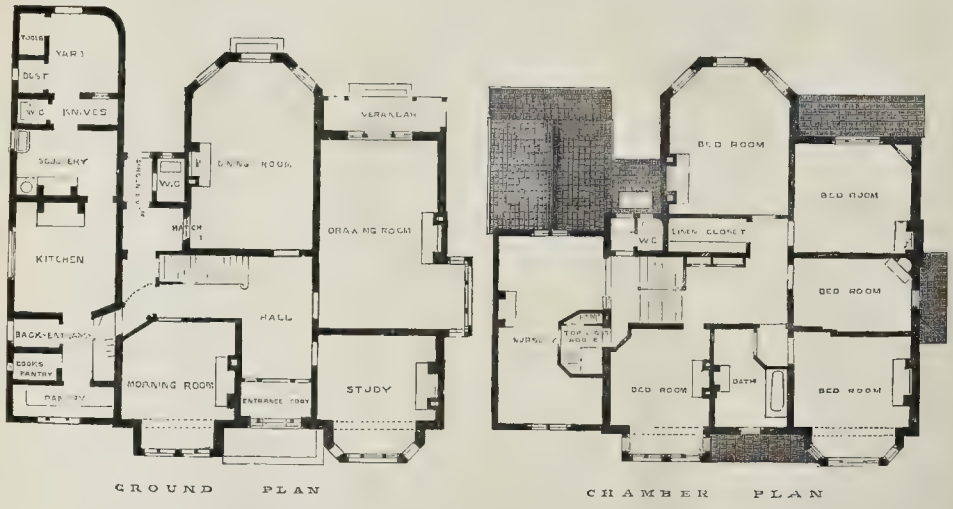
The President, Sir F. Leighton, delivered the prizes to the successful competitors amongst the students on Tuesday last. The works were very creditable, but will not be open to inspection, as the arrangements for the Winter Exhibition have to be proceeded with forthwith. The following are the Architectural Prize gainers:—

Travelling Studentship for One Year, with 130l. Allowance: Subject, "A Provincial Town-hall." Four competitors. Prize awarded to Mr. William Scott.

Medals for Measured Drawings: Subject, "Strand Gateway, Somerset House." Four competitors. First medal, R. W. Gibson; second medal, F. Baggallay.

Perspective and Sciography: Subject, "Porch of Temple Church." Two competitors. Medal, W. H. Wood.





GROUND PLAN CHAMBER PLAN

NEW VICARAGE, FOREST GATE, ESSEX.—Mr. George M'Donell, Architect.



INTERNATIONAL EXHIBITION BUILDING, MELBOURNE.—Selected Design, by Messrs. Reed & Barnes, Architects.

SUBURBAN STREETS AND PAVEMENTS.

The paving question in some of the metropolitan districts is giving rise to much angry warfare in the local boards and to indignation meetings on the part of sections of the ratepayers. The question to be satisfactorily settled is, Who is liable for paving the footways in new streets: should the cost be paid out of the general rate or through a levy on the owners of the property? In Hackney now, as in Shoreditch and other parishes not long since, the paving difficulty is likely to lead to some litigation before the question is set at rest, although the law as stated in the 105th section of the Metropolis Local Management Act (1855) is clear enough as to the matter at issue. According to the section of the Act alluded to, it was laid down that the owners or occupiers of houses in new streets should first pave the front of their houses, and then the Vestry or District Board should keep them in repair for ever afterwards. In Hackney the District Board took over between 1855 and 1862 a large number of thoroughfares, and several of these had their footways paved at the public cost. In several instances persons had to pay their apportionments, while again in a number of other cases where houses were erected subsequently the cost of pavement has been paid out of the general rate. It is clear that the local authorities of more than one parish have attempted to play fast and loose with Acts of Parliament, and act according to their own sweet fancies. A case occurred in Shoreditch two or three years ago which went into Court. Certain occupiers in one of the wards fought the question of liability with the Shoreditch Vestry, and, after hearing the case, and consulting the Acts, the magistrate decided that the occupiers of the houses were liable for the paving. There can be no doubt that in the case of new thoroughfares the Acts of Parliament plainly and clearly provide that the prime cost of footway paving shall be paid by the owners. Should any difficulty arise in respect to getting at the owners, it is provided that the work may be done, and the cost levied upon the occupiers in instalments ranging over a number of years. It is worthy of notice that in the parish of Islington, in 1856, the year the Act came into operation, the local authorities put a number of streets in repair under the section. Though twenty-three years have passed since the Act came into operation, the local authorities in Hackney have allowed it to remain almost a dead letter.

The Hackney authorities are now contemplating a heavy loan, which will probably exceed a quarter of a million before the paving operations are finished. Large sums of money have already been expended for paving work, and the general rate has been put under contribution, instead of the cost being levied on the owners of property. We are certain that the Hackney authorities are committing a grievous injustice,—we will not say mistake,—because, with the Act before them, they must or ought to be conscious that they are in the wrong. Before they proceed further, they should reconsider their position, and discriminate between new streets and old thoroughfares. In Hackney, in several instances, first paving operations have been paid out of the rates, instead of by levy upon the owners of property. Unpaved thoroughfares through neglect are rapidly increasing by miles in Hackney yearly, and if the local authorities had done their duty by putting the provisions of the Act in operation years ago, they would not now be attempting to surmount the difficulty by doing what appears to be clearly illegal.

It may not be amiss to say here that Hackney, perhaps more than any other suburban parish, has suffered severely through the vile system of speculative or "Jerry" building operations. New streets were formed, but they never passed into the hands of the local authorities in a proper condition, for the building speculators and owners wasted little labour or materials on their formation. The new streets between the houses were robbed of their natural soil, sand and gravel, as well as the foundations of the houses on either side. Feculent rubbish and filth were shot down into depths renging from 8 ft. to 16 ft., and a little top-dressing, cleverly spread, formed the surface of the new roads and pathways. The local authorities of Hackney have been constantly taking over into their care roads and streets of the kind described, and paving them at the ratepayers' expense. Take one of a sample of new roads in Hackney, whose footways have just been paved. Three years ago a couple of "Jerry" builders, one of them a member of a local board, took a piece of Crown land. A number of houses were erected, the sand being robbed from beneath the foundations and the road, or the space intended for the new road, in front. The usual filthy filling-up process took place. While the houses were being finished, and the majority of them sold or let, the road was made up with rubbish. The footpaths were formed and kerbed after a manner, but in less than six months the roads and footpaths sank and undulated, as if a small earthquake had shaken their foundations. In a few months more the kerbstones for the greater part of the length of the road disappeared below the surface of the footpath. A few weeks ago the roads and paths were in a wretched condition, and the local authorities commenced to make up the footways by laying down asphalte pavement. In this instance, however, an apportionment was made on the owners of the houses; but in other parts of the parish, where roads and portions of roads were similarly treated by speculative builders, the footpaths were paved at the cost of the ratepayers.

When speculative builders and first owners of house property are allowed to act in the manner we have described, there will be plenty of paving operations for years to come at the ratepayers' expense in Hackney and other parishes. Several owners of property, too, in new streets, from the original bad formation of the roadways, are likely to pay more in apportionments for paving than they should had the local authorities in the first instance performed their obvious duties.

We might dwell more on the side bearings of the paving question in the suburban parishes, but on the question of liability we think we have said sufficient for the present.

SEWAGE AND IRRIGATION WORKS IN GERMANY.

In continuation of our former article on this subject,* we now proceed to consider the case of the German capital. The drainage of Berlin has been a most difficult and complicated subject for the engineer. Until 1873,—when the necessity for doing something in the matter of the general drainage of their city was recognised by the corporation, and the work of canalisation commenced,—the capital was without any properly regulated system of drains and sewers. It is true a number of schemes had been proposed, and for various reasons, some of a technical, others of a financial nature, rejected; the earliest proposal dating from 1816.

About twelve years ago a plan for the drainage of Berlin was submitted to the authorities by Herr Geheim-Oberbaurath Wiebe. In this, *one* system of sewers for the whole city was projected, with a main outlet in the river Spree near Charlottenburg. Berlin being very flat, and only a few feet above the level of the river, the execution of this project,—a main sewer necessarily falling from end to end of the city (with provision for future extension in all directions),—the subsoil being running sand, permitting water to percolate in large quantities, would have been attended with great difficulties and enormous expense, and was consequently also rejected.

The project of Herr Baurath Hobrecht, adopted in 1873, and now being carried out, however, is based upon what is called in Germany the "radial" system,—a system eminently suited to the special circumstances of Berlin, besides preventing the pollution of the river, the sewage being ultimately used for irrigation purposes. There are five systems of sewers, each with a pumping-station, and each starting from the centre of the city and running in a different direction.

The many advantages of this plan are at once apparent. The main sewers are, as a great depth is in no case necessary, comparatively easy to execute; the branch sewers in proportion. As any extensions can only be necessary in the periphery, the works in the central (built-upon) area have an unusually permanent character, and are never likely to be subject to alteration. The extensions necessary can easily be connected without any interruption to the trunk systems. The height the sewage has to be pumped is much reduced. It is undoubtedly also an advantage that the authorities are in no way bound to any one particular site or direction as to irrigation areas. Besides these advantages, the dangers of serious flooding, accidents, disturbances, &c., are greatly lessened by this division and distribution.

The works in Berlin are approaching completion. Already two radial systems are working, so far as pumping operations are concerned, and already for two seasons irrigation has been carried on, and with most satisfactory results. It is to be hoped that the Metropolitan Board of Works will one day take courage, and address to the municipal authorities of Berlin an official inquiry on the subject.

The irrigation area for the three systems on the south side of the Spree is distant from the various pumping-stations about eight miles. In order to reach the fields by gravitation, the sewage has to be lifted at the stations nearly 65 ft. In the middle of this year the amount of sewage passed through the pumping-station of the radial system No. III. was nearly 240,000,000 gallons per month, which is only about the sixth part of the maximum capacity of that station.

The irrigation farm of Osdorf comprises, in round numbers, about 2,000 acres, of which at present about 500 acres have been adapted for irrigation. Of this area, 225 acres are grass land, 150 acres are used for market-gardening, while 125 acres are covered by shallow reservoirs, serving for storing provisionally the sewage during winter, should severe weather involve a stoppage of the irrigation. The irrigation ground is undulating, rising in some instances 40 ft. The delivery-pipe is carried to nearly all higher-lying points, where there are outflow-holes with ordinary slides. The steeper slopes are covered with Italian rye-grass, while the more level ground is used for vegetable-growing, and for this purpose formed into terraces, with narrow raised beds, divided by trenches, from which the water penetrates laterally to the roots. The paths between the fields are planted with fruit-trees, the luxurious growth of which, combined with the even more than luxurious look of the fields, imparts a most satisfactory impression.

The irrigation area at Osdorf has been acquired at an expense, including the laying out of the farm, of 125,000*l.* (over 60*l.* an acre). The total cost of the draining and sewerage of Berlin is estimated at 2,000,000*l.* There will be two sewage-farms on the north side of the River Spree, when the drainage of that part of the city is once in working order.

Strange to say, the project was at first looked upon with most unfavourable eyes by the rich as well as the poor of the German capital; but what is stranger still, the municipal authorities of Berlin, as those of other German cities where sewage and irrigation works have been projected, met with but scant encouragement from the Government. However, the beneficial effects are already appearing, in a direction, too, in which the poorer classes of Berlin have hitherto been great sufferers. Leaving out of the question the improvement in the sanitary condition of the city,—which, of course, is by itself a highly important factor,—the Berliners are already reaping substantial advantages. The success of market-gardening on the communal irrigation farm, the excellent quality of the vegetables of all descriptions grown there, has sent down the prices of those indispensable commodities wonderfully. "When once the works are a few years older, when a little more experience has put them more in working order, especially when gardeners practised in the systematic cultivation of market-gardens have been engaged," writes us a correspondent intimately acquainted with Berlin, "the Berliners will not be long in turning enthusiastic defenders of the welcome little stranger, formerly very much ill used, which has brought them clean streets without open gutters, pure air, salubrious water-closets and courts, and good vegetables and milk, which will now also be within the reach of the poor man."

A few words in conclusion as regards sewage and irrigation works, with which waterworks are closely connected, in Germany. People in that country are gradually becoming alive to the fact that the health of towns *may* be improved by the supply of pure air and pure water. Witness the numerous works undertaken with this view, not only in the larger cities, but also in smaller towns, the mere mention of which would make up a very respectable list. Of the more populous cities, besides the two which form the subject of this article, the cases of Breslau and Munich may be cited. As

* See p. 1267, *ante*.

regards Breslau, the sewer system, on which Messrs. Aird, of Berlin, have been engaged during the last few years, will be completed in 1879. Sewage irrigation is to come into operation there on the completion of the works. The lands are already being prepared for irrigation.

With respect to Munich, plans for the sewerage have been prepared by J. Gordon, C.E. (formerly of Carlisle). The execution of those plans involves an estimated expenditure of 73½,000*l.*, and they are now being revised by Herr Geheimrath Wiebe. A deputation of the Munich magistracy recently spent some days in Danzig, inspecting the works there and visiting the farm. Departing, they expressed the most thorough approval of the system and the arrangements.

ARCHITECTURE IN AMERICA.

The twelfth annual convention of the American Institute of Architects was held last month in New York. Mr. Walter, the president, in his opening address, said,—

The progress of architecture during the past year has been quite in sympathy with the times. A period of financial depression, such as our country has passed through since our last annual convention, is by no means calculated to promote the development of architectural science. Some works of importance have been commenced, but not many; and others that were begun in better times have continued in progress of execution, with satisfactory results. Much has been done during the year in our large cities, in the construction of residences and buildings for business purposes, the most of which bear the impress of independent thought in architectural composition, and it is not to be doubted that the development of the genius of design is becoming every year more apparent. While it is true that we as architects recognise with satisfaction the progress of our art, it should be borne in mind that we do not expect everybody to admire what everybody else does. Our tastes, fortunately, differ in regard to the æsthetic handling of most of the works that come under our notice; but that difference is the life of our art. If, in the processes of architectural design, we all thought alike, our works would be devoid of individual inspiration, and a wearisome monotony would pervade all manner of buildings. It is therefore well for our art that differences of opinion in matters of taste exist among its professors, provided the individuality that characterises our respective works is the outgrowth of genius and cultivation. We have, unfortunately, some specimens of building in our principal cities, which, so far from exhibiting progress in the artistic manipulation of material forms, remind us of the primitive efforts of a barbarous age, carrying us back to Ellora, Elephanta, or Uxmal. It is, however, a satisfaction to know that such eccentricities are comparatively few. As the masses of the people become more imbued with intelligent conceptions of art, whatever fails to develop the good, the true, and the beautiful will cease to be tolerated. After all, it is to the education of the public mind in what constitutes the genius of architecture that we are to look for the suppression of crude and inartistic building, and the promotion of a taste that will do honour to the age in which we live.

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In the works of the recent past a decided improvement in the structural character of buildings is noticeable. More attention than heretofore is being paid to the permanency of foundations, and to the scientific elements of construction, thus affording conclusive evidence of the value of the improved architectural training which students now enjoy, and of the increased attention of architects in general to the sciences which underlie the art of building. The pursuit of knowledge in this direction, both in and out of the profession, is, no doubt, mainly to be attributed to the Institute and its chapters. It is, however, to be regretted that we are not yet without occasional examples of imperfect building, some of which have resulted in serious disaster; but it should be remarked that in most, if not in every instance, the faults have been traced to unskilful superintendents and unreliable contractors, rather than to the architects from whose plans they are constructed, and who in most instances had no control over their execution. Architects are frequently called upon to furnish designs for buildings, with detail drawings and specifications, with the understanding, implied or expressed, that in order to save a portion of the full commission of five per cent. on the cost of the work, their services in the direction and execution of the design will be dispensed with; such economy is "penny-wise and pound-foolish," as it seldom fails to result in defects in carrying out the plans, as well as in a greater expenditure than would have been incurred had their author's design been properly executed; and what is still more, the false economy referred to has in some cases, resulted in serious disaster. It must, nevertheless, be borne in mind that an architect is always considered by the public as responsible for his designs, whether he is employed to see them executed or not. Should they be committed to unskilful hands, and be mutilated *ad libitum*, and so imperfectly executed as to result in a want of stability, he need not expect that public opinion will exonerate him from a certain degree of blame, however perfect his design of construction may have been. Not only is the permanency of a structure affected disadvantageously by intrusting its execution to irresponsible mechanics, without professional guidance, but its architectural proportions and appointments are sure to be hardly dealt with.

A paper by Mr. Littel on the use of brick in decoration provoked considerable discussion on the relative value of brick and terra-cotta as building materials; and others were read, on the metric system, on the faults of American architecture, and on plumbing.

A report was received from the Committee of Ways and Means, suggesting the value of a technical examination as a qualification either for membership or for professional practice, and proposing means to secure the interest of the younger members of the profession by prizes or other appeals, and to increase the importance of the conventions.

The other things which occupied the convention were chiefly matters of domestic business or discipline. The old officers and committees were re-elected with a few exceptions, of which the chief was the election of Mr. Charles D. Gambrill as secretary, in place of Mr. McKim, who declined to serve another year.

The conduct of architects in competitions led to considerable discussion. The following resolutions were passed:—

"That any member of this body who, in case of competition, should propose or agree to undertake the work for which he is competing for a less commission or compensation than his fellows in the competition, violates the sole condition of membership of this society, viz., 'the honourable practice of his profession;' and that upon proof of the fact to an investigating committee, which shall consist of three Fellows, who shall be appointed by the Board of Trustees upon the demand of two Fellows of the Institute, he shall be declared to be expelled by the Board of Trustees, without further action of the Institute as a body, and that such expulsion shall expel him also from the chapter."

"That if in case of paid competition any member of this Institute shall offer his services free of charge, he shall be liable to censure, if charges are made by two Fellows and a committee appointed as provided in a former resolution, for censure for violation of the conditions of membership in the Institute."

ADDITIONAL WATERWORKS, VIENNA.

The high-level waterworks of Vienna were completed in 1873 by the contractor, Mr. Gabrielli. Although the expenditure had been enormous, it was found after a very short time that the supply of water fell much below the quantity required, the want of that necessary commodity making itself felt especially in winter during severe frost. In consequence, a committee was appointed by the Vienna municipality, charged with remedying this state of things, by opening up new springs. It was soon found, however, that this extension would not have the desired effect; the supply, under those conditions, would still have remained precarious, and would have required for its realisation, in consequence of large additions to the supply area, &c., several years to complete. It was then that an offer was made by Messrs. J. and A. Aird & Mare, the Berlin firm of engineers, in conjunction with Herr Carl Freiherr von Schwarz, to the municipality of Vienna to undertake the works necessary for ensuring a regular supply of 300,000 eimers (4,500,000 gallons) daily for the city. This quantity was considered amply sufficient for the wants of Vienna, and the contract accepted.

It had been suggested already in an engineers' report presented in 1875, and based upon the inquiries made by a water supply committee in 1864 and subsequent observations by engineers, that the currents of underground spring-water which run through the gravelly basin of the Schwarza valley could be best made available for the additional quantity required for supplementing the high-level works. Up to the present time, the principal point to be decided with respect to the storing, raising, and conducting the supplemental supply to the present high-level works was the selection of the most suitable site, as well as instituting inquiries with regard to the quality and quantity of the underground spring water. Careful investigations pointed to the neighbourhood of Pottschach as the most suitable spot, not only on account of the quality of the water,—it is there so cold (already at a low depth 3½° to 5° R.) that the inhabitants, as a proof of its excellence, are in the habit of keeping everywhere trout in their wells,—but also because of the favourable position of the locality to the aqueduct of the high-level works.

The water is pumped out of four deep wells, and carried in two sets of pipes 24 in. in diameter to the high-level works. The cost of the new works amounts in round numbers to 60,000*l.*; their capacity exceeds already the guaranteed quantity of 300,000 eimers. The works are expected to be in operation before the end of this month.

NEW VICARAGE, FOREST GATE.

The new vicarage at Forest-gate, Essex, view and plans of which are given in our present issue, is now approaching completion.

Architecturally, it is very simply treated, not a single moulding or chamfer, either in brick or stone, being introduced in any of the fronts. The aim appears to have been to gain a certain effect merely by the disposition of the lines and the solidity of the work. Internally, also, the finishings are to be of a modest kind.

The design is a modification of the Queen Anne style, very plain in character. The building is faced externally throughout with red bricks, with white brick bands on the back and side fronts; and on the main front has solid, plain stone dressings, and stone bands, a blue brick base, and a few blue bricks in patterns. The roof is covered with Broomhall tiles, of a brownish tint. The walls on the south and west are built hollow, the hollow spaces being also utilised for ventilating purposes. As regards the plan, a few slight modifications have been introduced in carrying out the work.

Mr. Joseph Page, of Spitalfields, is the contractor, and the work is being executed from the designs and under the superintendence of Mr. George McDonell, architect.

The total cost, exclusive of boundary-walls, will be about 2,263*l.*

ACCEPTED DESIGN FOR THE INTERNATIONAL EXHIBITION BUILDING, MELBOURNE.

In the last session of the Victorian Parliament the Government introduced a Bill to provide for holding an International Exhibition in Melbourne, and to furnish the means for erecting the necessary buildings, &c. That measure the Legislative Council rejected, but not before competitive designs had been invited for the proposed building by the commissioners appointed. A number of designs were sent in, and the commissioners, having undertaken to award prizes in terms of their advertisement, have assigned the first to that depicted in our illustration, which is by Messrs. Reed & Barnes, architects, Melbourne.

The site on which it is proposed to erect this structure is at the south end of the Carlton-gardens, fronting on Victoria-parade. Nothing more wonderful than the growth of Melbourne and the other cities of the Victorian colony is known. Look at a view of Melbourne, such, for example, as that lately published in a special number of the *Illustrated Australian News*, and remember that the actual founder of that city, John Fawkner, died no longer ago than 1869, and the truth of this assertion becomes obvious. Where a few lone men encamped in 1836, there is now a city of 300,000 inhabitants, with fine buildings of all kinds, and an International Exhibition in course of arrangement.

Messrs. McLaren's Sale.—A correspondent, signing "R. S. D.," writes to deny that the Glasgow Bank had anything to do with the failure of Messrs. McLaren & Co. We may add that the auctioneer engaged was Mr. Henry Bourn.

THE HIGH SANCTUARY AT JERUSALEM.*

THE next question which requires to be considered is that of the position of the Temple itself and its inner courts within the Haram; and a few remarks on this question may perhaps find a proper place as a sequel to the preceding account of the High Sanctuary.

Mr. Fergusson proposes to confine the Temple to a square of 600 ft. side in the south-west part of the Haram enclosure, but it seems to me, with all deference, that such a theory is open to several grave objections: 1st. The south Haram wall is, as above shown, 922 ft. in length, and the master-course runs unbroken beyond the limit proposed by Mr. Fergusson. 2nd. The junction of the Ophel wall at the south-east angle also seems to point to the east wall of the Haram as being the old east wall of the Temple, and the Double and Triple Gates correspond to the two Huldah, or "Mole Gates," of the Temple, according to the Talmud. 3rd. The north-west corner of Mr. Fergusson's enclosure is placed where the rock is 100 ft. lower than the Sakhrah; thus there is no possibility of the existence of a rock-scarp at this point, such as is required for the site of Antonia. 4th. Foundations would, on Mr. Fergusson's hypothesis, be required for the Holy of Holies, which would be from 60 ft. to 90 ft. deep, in order to give to the floor of the Temple the requisite elevation (as given in the Talmud) above the outer court. 5th. There are no remains of ancient rampart walls on the lines where Mr. Fergusson would draw the north and east boundaries of the Temple. 6th. The dimensions in the Talmud give an area considerably greater than that of 600 ft. square, proposed by Mr. Fergusson. These six main objections seem to me to render the proposed restoration improbable, as not fitting with the facts now ascertained.

The only way in which the sections of the Temple can be made to fit with the ground in the Haram, is by placing the Holy House itself in that part where the rock is highest; in fact, on the "top of the hill," where Josephus says that the Temple stood. The spot in question has been shown to be the Sakhrah, and the Sakhrah is traditionally the site of the Holy of Holies. This hypothesis was first put forward by Dr. Chaplin, of Jerusalem, in a letter to the *Athenæum* in 1877. There are many indications of the correctness of such a restoration; the first and most important being the satisfactory result with regard to levels, as will be seen by referring to the section east and west. In drawing that section, I have assumed, for reasons which there is not now time to explain, that the cubit was about 16 English inches in length. Mr. Fergusson takes its length to have been 18 in.; but the difference would not materially affect the results, though a 16-in. cubit seems to give greater exactitude. A cubit of 21 in. or 22 in. has been proposed by other writers; but the Talmudic statements will not, I think, allow of this; and one very evident objection to such a unit is, that it would make the rise of all the steps in the Temple 11 in. (half a cubit), which seems far less probable than 8 in. or 9 in.

The section shows how well the levels of the various courts agree with the gradual slope of the rock, as deduced from various observations along the line. The greatest depth of solid foundation required is about 8 ft., and this is beneath the Holy House itself; where, as we learn from Josephus, a solid masonry foundation did actually exist. Under the Court of the Priests, the rock is about 15 ft. from the original surface; but we learn from the Talmud that exactly in this part of the Temple there was a vault beneath the higher court opening into the lower court, or Court of the Women.

Another valuable indication is given by the number of steps which led from the various Temple gates. Those on the north and south had ten steps each, giving a rise of five cubits, or 7 ft. The eastern gate Nicanor had fifteen steps, giving 7½ cubits, or rather over 10 ft. rise. The levels thus obtained fit exactly with the ground according to the present hypothesis.

There are many other indications of the satisfactory nature of this restoration, of which the following are the most striking:—(1) The centre line east and west through the Holy House will, if produced, strike the summit of Olivet, and it is expressly stated that the high priest on the summit of that mountain could look straight into the Holy House. (2) There were no cisterns within the area of the Temple courts,—the water was obtained from without. The existing cisterns are all outside the boundary of the courts, according to the present plan. (3) On the north-west of the Priests' court was the great gate-house called Moked, where was the watch-fire of the priests. It is described in the Talmud as being "on a level," and occurs on the present plan in a place where the rock is about the same level inside and outside the gate. From the chamber west of this gate there was an underground passage running beneath the *Bireh*, which seems to have been the passage leading from Antonia to the Temple, according to Josephus (*Baris*, the old name of Antonia, being probably the same word as *Bireh* or "fortress"). Now, from the position proposed for Moked, a rock gallery does actually run north for about 130 ft. towards the great rock scarp of Antonia, and corresponds to the tunnel from the Double Gateway on the south.

But yet further. The passage from Moked led to a gateway called *Tadi*, or "obscurity," and thence to a large bath-house. Now on visiting the rock gallery mentioned above in 1874, I was able to ascertain that the north end is not cut in rock, but is closed by a rude massive wall—the passage runs on further; and the same fact I also ascertained in another rock gallery (No. 3 Ordnance Survey) west of the one already mentioned. It is not improbable that these two galleries run on to join, and their directions, if produced, meet at one of the entrances to the platform, which is called "the arcade of *El Atm*, or 'obscurity,'" thus retaining the name of the old gate *Tadi*. Another indication is obtained by the position of various gateways on the platform, which seem at present to be arranged without any system, but which are all on the production of the lines from the old Temple gates. Moreover, the entrances to the outer inclosure mentioned by Josephus and in the Talmud were eight in all—four on the west, two on the south, one on the east, and one on the north. Now on the present plan it will be seen that a great passage cuts the west wall of the Haram north of that from the Prophets' gate, and this probably represents an ancient gateway. North of this again is a modern gate which retains the old name of "Iron Gate," mentioned in the Bible as that of the gate leading from Antonia to the city; thus, including the entrance over the great bridge on the south-west, we have four western gates. The Double and Triple gates on the south are the two mentioned as Huldah Gates in the Talmud, but the actual remains of the northern gate *Tadi*, and the eastern gate *Shushan*—which was just opposite the Holy House, require still to be discovered.

Such, briefly stated, are the main arguments in favour of this proposed restoration of the Temple. A theory or hypothesis is convenient, and indeed necessary in many cases, as a nucleus round which to group facts, and to give system to exploration; but a hypothesis is merely the scaffolding by which the edifice is erected, and which disappears when the work is complete. It is to be hoped that future exploration will some day enable us to dispense with theories; meantime the preceding remarks may perhaps be of some value as indicating the direction in which we should work. The practical lesson for the future, which seems to me to be taught, is the importance of discovering what lies hidden beneath the platform on which the Dome of the Rock stands. There are many other points where exploration is desirable,—as, for instance, along the north wall of the Haram along the north side of the platform, and outside the east wall at the point opposite the site of the Holy House, in order to find the old east gate of the enclosure; and again, on the north-west of the Haram, to trace the limits of the great rock scarp. But of all explorations, those beneath the flagging of the platform would be the most interesting. In 1873 I found towards the west of the platform, in a chamber the floor of which is of rough rock, a finely-worked vertical scarp cut in rock, and over 7 ft. high. No doubt the platform conceals many such foundations, and from them we might, perhaps, determine more exactly the ground-plan of the Temple. To excavate beneath the platform is at present impossible; but there is one point where exploration might perhaps be practicable,—namely, in that unknown vault on the east of the platform, the closed entrance to which is still visible; and if the restoration above proposed for the Temple be correct, this point is one of extreme interest, as it is possible that the south-west corner of the lower Court of the Women, and the foundation of the upper Court of the Priests, still exist beneath the modern platform inside this vault.

The second portion of this paper is to be devoted to the buildings within the area of the High Sanctuary, dating after the Christian era, especially the Mosque el Aksah, the Golden Gateway, and the Dome of the Rock. In venturing to dissent from the conclusions which Mr. Fergusson has published as to the origin of these buildings, I do not wish it to be thought that I undervalue his great architectural experience. I merely hope to point out facts discovered since the time when his theory was first published, and to submit them to the judgment both of himself and of other experts. Mr. Fergusson is of opinion that the Dome of the Rock was originally built by Constantine, and that the Cave in the Rock is the true sepulchre of our Lord. With regard to the second hypothesis it may be remarked that if the temple stood on the Sakhrah, the true sepulchre of Christ cannot have been situated there also. With regard to the first and distinct question, where did Constantine build his church?—the main objection, out of the very many to Mr. Fergusson's theory, lies in the numerous topographical descriptions of Jerusalem in the fourth and fifth centuries, which place Constantine's church in the middle of the city, and north of Sion; while the Arab historians agree with the Cufic inscriptions on the Dome of the Rock, in attributing that building to the Caliph 'Abd-el-Malek, in the seventh century.

In the fourth and fifth centuries the Haram area is described as lying waste, with the Twin Pools on the north, and a "pinnacle" on the south, which appears to have been that part of the old wall at the south-east corner where the ancient masonry still reaches up some 40 ft. above the ground, and which before the walls were rebuilt must have stood up alone,—a conspicuous object. In the sixth century, however, a basilica erected by Justinian is mentioned by one chronicler, and we learn from Procopius that this church, built in 527 A.D., was founded partly on the ground and partly on vaults, and that the masonry was only inferior in size to the ancient Jewish masonry. The basilica had three aisles, and each aisle had a door. In the Aksah mosque the remains of such a three-aisled basilica have been traced by M. du Vogüé, and among the various capitals of the columns many have been found closely resembling in character those in the church of Kalb Louzeh in the Hauràn, which was built in the sixth century. The vault which runs beneath the Aksah is of fine undrafted masonry, and the roof has the peculiar characteristic of Byzantine vaulting, — a narrow keystone and broad haunch stones,—which is observed in all the early convents in Palestine. The small side doorway, with a low relieving arch above a lintel, found in the west wall of this same passage, also presents a common Byzantine construction, and the mouldings of another doorway are compared by M. du Vogüé to those of a doorway at Khakkah belonging to the sixth century. The chamber immediately within the Double Gate is, however, older. It is roofed with four domes with pendentives supported by massive monoliths, which can scarcely be girthed by three men's extended arms, reminding us of Josephus's description of the Temple columns. This gatehouse is by general consent attributed to the Herodian period, and the details of the tracery on the domes, the vine pattern and other designs, are akin to the ornamentation of the rock-cut tombs of the first century in Palestine. The gatehouse has, however, been altered at a later period; the faces of the stones in the side walls have been cut back so as to obliterate the drafts. Relieving arches have been turned over the great lintel stones (one of which is cracked) and pillars of semi-classic character have been placed beneath them. The relieving arches date later than the time of Hadrian, as is evidenced by the inscription bearing that emperor's name built in upside down into the wall close to the arch. At the time at which these restorations were made, a kind of cornice with an arched soffit appears to have been also built in above the lintels. Its details reproduce those of the Golden Gateway so closely as to leave little doubt as to their belonging to the same period, and a few words may be ventured on the question of the date of these two buildings.

The Golden Gate does not appear to have been one of the ancient temple gates. The

* By Claude R. Conder, Lieut. R.E. Read before the Royal Institute of British Architects on the 2nd inst. See p. 1269, *ante*.

level of its sill is considerably higher than those of the ancient gates, and the whole of its masonry appears to be of later style. Mr. Fergusson compares this monument with the Golden Gate at Spalatro, and refers it to the fourth century; M. du Vogüé compares it with the churches of El Bârah, Kalb Louzeh, and Khakkah, in the Haurân, and gives drawings of details which are almost identical with those of the Jerusalem example. With reference to this question, it may be noted that the archivolt, or architrave deflected into an arch, which is the main feature of the Golden Gate, is found in the Haurân (or close to Palestine) in the sixth century, but that it is not used in the only undisputed fourth century building in Palestine, namely, Constantine's Basilica at Bethlehem. It seems safer to form a judgment from examples in the immediate neighbourhood than from European examples, and the character of the columns which support the roof of the Golden Gateway may perhaps be cited as indicating late date, for their capitals have the heavy ram's-horn volute, which in Syria is commonly found in the pseudo-Ionic capitals of the fifth and sixth century buildings. The Golden Gateway and the restorations of the Double and Triple gates are apparently of one date, and it remains for architects to decide whether these monuments, together with the fine undrafted ashlar in the walls, and the tunnel vaulting of many of the Haram passages, are not to be attributed to Justinian, who is said to have boasted that he had surpassed Solomon.

The Aksah contains remains of various dates. There are the fragments of the old mosque enlarged by 'Abd el Melek, in 691 A.D.; the cupola is dated 728 A.D.; and there are traces of a Crusading apse, and of the Templars' Hospital, belonging to the twelfth century, while the façade, with its bold dog-tooth mouldings and broad pointed arches, is referred by M. du Vogüé to the thirteenth. Capitals of Classic design are found in the interior, and bulging basket-work capitals, evidently Byzantine, while in the so-called "Station of Omar" there are beautiful and intricate capitals, carved with leaves and dragons in high relief, which are evidently of Crusading origin.

In 637 A.D., about a century after Justinian, the caliph Omar visited the Haram. He entered through the Prophets' Gateway, and visited the basilica. He found the *Sakhrah* covered with rubbish, and caused it to be purified. He afterwards built a square wooden mosque beside it. In 688 A.D., according to the Arab historian Mejr-ed-Dîn, the caliph 'Abd el Melek addressed a letter to his subject inviting subscriptions for the rebuilding of the Haram. He began, according to this authority, by building the Dome of the Chain, and was so pleased with it that he replaced Omar's wooden building by a *Kubbeh*, or "domed building" on the model of the Dome of the Chain built round the *Sakhrah*. The same caliph also enlarged the Mosque el Aksah, and built fifteen chapels in the Haram.

Such is the account of the Arab historian, and in corroboration we find a Cufic inscription within the present Dome of the Rock, which gives the same date, 688 A.D., as that of the erection of the building. Against this view of the subject, Mr. Fergusson urges,—first, that the form of the building—an octagon—is never used by the Moslems in any age for a mosque (I think that is a very strong objection); and secondly, that the style of the building is Byzantine, and that the Dome of the Rock must have been built in the fourth century, judging from its plan, its round arches, the pillars supporting the dome, and the beam joining the pillars in the screen. These are, I believe, the details to which Mr. Fergusson specially calls attention, as later discoveries have induced him to reconsider his observations regarding the present bases of the pillars and the wooden ceiling of the building.

With regard to the first of these arguments it may be pointed out that a considerable confusion has arisen in the nomenclature of the Haram, and that the Dome of the Rock is commonly called the "Mosque of Omar," a title properly belonging to part of the Aksah. The Haram es Sherîf, or "High Sanctuary," also called "Masjid el Aksa," or "remote praying-place" (remote, that is, from Mecca), contains only one mosque, the Jâmia el Aksa, or "meeting-house of el Aksa," on the south wall. It contains also many *Kubbehs* or "domes," of which the Kubbet es Sakhrah is one. They are not mosques, and no regular service is held in them; they are shrines built over sacred spots, and as at Damascus and in Egypt, so here, a round or polygonal building, with a dome above, is employed to shield the sacred locality. The Dome of the Rock may be compared to the "Dome of the Books" in the Damascus mosque, and the fountain in the Mosque of 'Amru at Cairo is covered with a similar polygonal domed building. There is no building in the Haram really built for a mosque. The form of the Aksa is not convenient for Moslem worship, and mosques originally built as such are rare in Syria (though a good example is to be found at Acre) because the Moslems found the shape of the Crusading churches specially adapted for mosque worship, —a *mihrab* being constructed in the side of the building looking south, thus allowing long rows of worshippers to stand in line facing Mecca. In the Aksa the length of the original basilica is directed north and south, and the worshippers are obliged to stand one behind another, and are less able to follow the motions of the fuglemen in front.

Turning next to the question of the plan of the Dome of the Rock, one cannot fail to recognise a general resemblance to the Dome of the Chain, except in respect of the outer wall of the larger building. The Dome of the Rock has a circular drum rising from twelve pillars and four piers, while a screen outside this circle springs from sixteen pillars and eight piers arranged in an octagon. The outer wall has also the octagonal form, and the measurement from angle to angle through the centre of the building is 176 ft. from outside to outside. The Dome of the Chain has an octagonal drum supported on six pillars, and a screen supported on ten pillars. It will be found that the diameter of the Dome of the Chain is almost exactly two-fifths of that of the Dome of the Rock, measuring to the octagonal screen, and that the heights to the top of the two domes have the same proportion. The proportions of the Dome of the Rock will probably strike any observer as giving too great a breadth for the height; thus we are led to ask whether the outer wall may not be a later addition, and in corroboration of such a supposition we find that while the screen has on it an inscription dated A.D. 688, the doors of the outer wall have the date A.D. 831 in the Cufic inscriptions on their leaves, and the beams of the ceiling above the wall bear the date A.D. 913. As far as concerns the plan of the buildings, there seems, therefore, no great difficulty in accepting the Arab account, which makes the Dome of the Chain the model whence the Dome of the Rock was built, if we suppose the outer wall of the latter to be a later addition.

We may next consider briefly the details of the two buildings, especially the pillars, the arches, and the wooden tie-rods between the columns. It may be noted generally that these buildings, if the Arab historians are trustworthy, belong to a very early period of Moslem art. It may be easy to compare them with Byzantine buildings, but it is almost impossible to find contemporary Arab examples. The Mosque at Damascus, belonging to the same period, is merely a converted basilica like the Aksa: and the Mosque of Amru, Mr. Fergusson informs us, has been rebuilt, so that it is doubtful whether any of the original work remains. Whatever, then, be the style of the two buildings now under consideration, it cannot be positively said that such a style was not used by the Caliph Abd el Melek, because no examples are known of his style which can be contrasted with these his supposed erections. If, moreover, there is any striking structural resemblance in the details of the Dome of the Rock and Dome of the Chain, we should hardly conclude that the one is the work of 'Abd el Melek, but that the other is nearly 400 years older; for, to say the least, such a conclusion would be unnatural in the face of the historical evidence. If it be possible that the Caliph built the Dome of the Chain, it is equally possible that he built the Dome of the Rock, if it is shown that the two have a similar plan and a similar style in their details?

The pillars in the Dome of the Chain are of various design, but, generally speaking, of semi-Classic or Byzantine outline, and appear to have been taken from some older building. They are tied together by a wooden beam above the capitals, and semicircular arches spring from them. The pillars in the Dome of the Rock are also of various design, and of Early Byzantine character. A wooden beam runs above them, and semicircular arches spring from the beam. The varied character of the columns can be judged by the sketches given in illustration of this paper. I have several times examined both the inner and the outer circle, and made sketches of all the capitals and of several bases. Only three of the capitals under the drum are alike, the rest differ in size, in outline, and in details. The capitals also differ in their state of preservation, but in most cases the volutes and acanthus-leaves have been much defaced, the projecting edges having been knocked off. One of the capitals is evidently placed on a shaft which did not originally belong to it, but which requires a larger capital. The sixteen capitals in the screen are more uniform, and twelve of them differ only in the device between the volutes, one of which devices has been thought to represent a cross, though possibly it is only a trefoil. Two of the capitals in this line are, however, of entirely different design, and the shafts supporting them are longer than the other shafts. Above the pillars in the screen are blocks now covered with thin marble veneer. In 1874 the construction of these blocks became visible, and it was seen that they surround smaller stone blocks which are square and quite plain. The spaces between are filled with rubble. The blocks above the two capitals, which stand on the longer shafts, are only half as deep as those above the other capitals, so that all the arches spring from one level. There is a difference of several inches in the diameters of the various shafts of the columns. The shafts do not rest immediately on the bases but on layers of lead, differing from 1½ in. to ¾ in. in thickness. The original bases are now covered up with marble flagging, but this was removed in 1874, and it was then found that the bases also differ in outline and in height, one being only 4 in. high, a second 12 in., and a third 17 in. It is clear, then, that the columns and their bases and capitals are of a very heterogeneous character, and that they were probably taken from some other building and not expressly made for the Dome of the Rock. It would consequently be unsafe to base any argument on their Byzantine character.

The wooden beam above the pillars is adorned with a wooden cornice, which is clamped on to the original square beam, and may, perhaps, be a later addition. In other respects it resembles those wooden beams found in so many early Saracenic buildings, and there does not appear to be any known example of a Byzantine building having such a wooden beam.

The arches of the arcade are semicircular; those under the dome have now the appearance of being struck from two centres, with a flat key-stone; but the structure of the original arch is hidden beneath a thin marble veneer, and the flat key-stone seems to point to a semicircular arch beneath. The original arches of the outer wall are also semicircular, though pointed arches have been built inside them. The structure was visible when the glazed tiles were removed in 1873, and it was then found that a small arcade runs on the top of the wall, with pillars of almost Norman outline. With regard to these arches, it need only be observed that they resemble those in the Dome of the Chain, and that they do not present that characteristic of Byzantine round arches previously mentioned, namely, the narrow key-stone and graduated voussoirs, with wide haunch stones.

The only other work in the Dome of the Rock belonging to an early date is the beautiful glass mosaic on the screen. It can hardly be doubted that the arabesque designs and Cufic inscription are of one date, judging from the colour and general appearance. That date, according to the inscription in 72 A.H., or 688 A.D. The designs on the mosaic are entirely conventional, resembling somewhat those in the Dome of the Aksah, which is dated 728 A.D., or forty years later. The absence of figures in the design is significant; for the old Christian mosaics in the Damascus mosque are almost entirely devoted to figure subjects, and the same is found to be the case in the Crusading glass mosaics at Bethlehem.

Such is a plain account of the principal details of the Kubbet es Sakhrah. There appears to be nothing in the building of distinctly Byzantine character beyond the pillars with their blocks above them, or at least, if there is, I have failed to gather from Mr. Fergusson's works what that detail is. The pillars appear to have been taken from an older building or buildings, and the habit of so collecting columns of very various design has been commonly adopted by the Arabs from a very early period. Such pilfered

columns are found not only at Jerusalem, but at Cairo, and at Acre, at Damascus, and at Gaza,—in fact, wherever old material was available. That this use of old material was a common practice of Byzantine architects seems on the other hand unlikely, and, at least in the case of Constantine's Basilica at Bethlehem, the pillar-shafts, bases, and capitals are of uniform character.

It is for architects to judge whether the above-mentioned facts are at all conclusive as to the claims of the building to Arab origin, and whether the preceding comparisons are sound in principle. If we would know what was the form and style of Constantine's Jerusalem Basilica, should we not study the Basilica he built at Bethlehem? If we wish to ascertain the date of the Byzantine architecture of the Golden Gate, it seems preferable to refer to Syrian rather than to European types. If we would arrive at a conclusion as to the date and style of the Dome of the Rock, it is at least only fair to inquire whether it has anything in common with the Dome of the Chain, which Arab historians state to have been the model from which it was designed.

Time does not allow any further account of the High Sanctuary and its buildings. The subject is almost inexhaustible, and when one has wandered day by day over the great area, descending into the damp rock tunnels, or entering into the purple gloom of the Chapel of the Rock, watching the countless doves which hover over the dome or crowd in the beautiful honeycombs of the great gateway roof, one's interest grows ever greater in the beautiful and wonderful enclosure. Much has been done to throw light on the origin of the various buildings,—so much that very unreasonable expectations have been raised and impossibilities have been demanded of explorers. Much still, no doubt, remains to be done, especially beneath the flagging of the platform, but it is to be remembered that the High Sanctuary is the second sacred enclosure of the Moslems, inferior only to the Kaabah, and that excavation within the area is regarded by them much in the same light in which we should regard proposed excavations in the choir of Westminster. It is only by patient study and by occasional opportunities that further information can be obtained, and that facts will gradually take the place of conflicting theories.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association on the 6th inst., Mr. H. L. Florence, president, in the chair, some conversation took place as to the balloting for members at the previous meeting, when, as reported in the *Build-r* a fortnight ago (p. 1258, *ante*), nineteen out of sixty-two candidates were black-balled. Mr. Hayes announced that the committee had passed the following resolution:—"That a special business meeting be called, to consider the subject of the election of members, with special reference to the late ballot." He further announced that such special meeting would be held on Friday, the 13th inst. Mr. J. Douglass Mathews gave notice of his intention to move at that meeting the omission of the following words in Rule XI., "No one whose nomination has been voted upon and negatived shall be again voted upon in the same session." He considered that a great slur had been cast upon the gentlemen who had been rejected, and the sooner the rule was altered in the direction he had indicated the better. Mr. Ridge, with the same end in view, also gave notice of his intention to move to add the following words at the end of rule XI., viz., "without the sanction of the committee." The President incidentally remarked that to some of the candidates who had been rejected exclusion for a year from the benefits of the Association would be a very serious thing,—in fact, it would mean exclusion altogether, as they were in the last year of their articles, and would be out of London next year.

The following gentlemen were then elected members by show of hands, viz.:—Messrs. T. H. Letts, F. H. Jennings, C. Stuart Smith, M. Saunders, H. S. Saunders, W. Martin, —Blizard, —Goodwin, J. Jeffreys, Harvey Dyball, D. S. Henderson, A. Morton, J. E. Harpen, J. Coutts, and H. Fry. Nine nominations for membership were read.

A letter was read from Mrs. Cockerell, acknowledging a vote of condolence passed by the Association on the death of Mr. F. Pepys Cockerell. The letter contained the following passage:—"My only consolation in my great bereavement is the testimony given by all his friends to the memory of my beloved husband, and none are more delightful than those from the members of the profession he loved so well."

Mr. Somers Clark, jun., then read a paper on "The Organ and its Treatment," which we print on other pages.

In the discussion which followed,

Mr. H. H. Statham moved a vote of thanks to the author of the paper, and went on to say that although Mr. Clark had deprecated very strongly what he had called the "monster" organs in modern churches, in his (Mr. Statham's) experience adequately-large organs were but too rarely met with, and, in fact, the modern church-organ too often justified the derisive appellation of "a kist of whustles." It seemed o be the custom to provide churches with a sort of regulation pattern organ, which, as Mr. Clark had said, was generally somewhat about "16 ft. by 16 ft. by 20 ft." In fact, those of one firm which used to have large orders for churches seemed as though they were made in 300 ft. lengths, and cut off in portions as needed. In a church of any size there should be far more space allotted to the organ than was usually the practice. He was glad to hear Mr. Clark's direct onslaught on the conventional "organ-chamber." To box up an organ in the way so continually practised was the worst possible way of placing it. The reason why some of our old cathedral organs sounded so well was that they had plenty of space around and about them. The protection of the organ from changes of temperature was a most important matter, and he thought there should be no large windows opening on it, whatever might be the external effect. Another important point for consideration was the position of the organ, whether high or low. Mr. Best, the greatest organ-player living, had in one case within his knowledge advocated lowering the floor of an organ-chamber so as to get the instrument as low as possible. Then, as to materials and accessories of the building in which an organ was to be located, large quantities of curtains or draperies should be avoided, especially near the organ. As to the design of the organ-case, he quite sympathised with Mr. Clark in his dislike of what he called the "zinc-chimney-pot" style." He considered that the old English cases, which covered the tops of the pipes with designs in woodwork, were far more artistic. As to the influence of external design upon the internal construction of the organ, there was a great deal of misapprehension. In a design for an organ in a Gothic building the architect naturally wanted to get the highest pipes in the centre of the front, but such an arrangement was contrary to the principle of the construction of the instrument. The proper thing to do was to put the higher pipes at the sides and the lower ones in the centre, in the first place for æsthetic reasons, and in the second place on account of practical considerations. The pipes in an organ were not placed in order of sounding, but the largest pipe was placed at the extreme left of the sound-board, the next at the extreme right, and so on, the smallest of all coming in the centre. The reason for this was that if all the large (bass) pipes were put together at one end of the sound-board, they would swallow up all the wind from the smaller ones. The pipes being arranged thus internally, it was practically desirable that when pipes were mounted on the front as part of the design, they should be kept as near their normal position as possible, as the wind had to be taken to them by "conveyances" from the sound-board, and the longer these were the more liability there was to leakage, and the less promptly the pipes would speak. He had been interested in seeing Mr. Clark's sketch of the method of treating Italian organ-cases. It was a perfectly frank and legitimate mode of treatment, and had been followed by Professor Cockerell in his design for the great organ-case at St. George's Hall, Liverpool. A beautiful feature in many Continental organs was that the choir organ was placed a little in advance of the large organ, and as it had, in addition, the merit of convenience, it was surpising that it was not more often adopted. He did not think a gas-engine was sufficiently reliable for blowing-purposes, but it was always desirable to get some mechanical means of blowing if possible. It was also desirable to treat the blower as a being with a soul to be saved, and while he should be kept out of sight, he ought to be within hearing of the service. With regard to the position of the organist, there were many contrivances, more or less effective, for enabling him to sit at a distance from the organ. Perhaps one of the best of these was the pneumatic movement introduced by Messrs. Bishop & Son.* The organist was able to hear his instrument better when sitting a little away from it.

Mr. C. M. Hudson, in seconding the vote of thanks, said that as an amateur organist he fully agreed with the remarks made by the author of the paper and Mr. Statham as to the ill effects of confining the organ in a small chamber. Ample space above ought to be left, and in designing his organ-case the architect ought to look to the future, and leave space for the addition of further "stops" as funds were available.

Mr. Norbury spoke in favour of large organs, and as a matter of tone objected to organ-chambers. In his opinion the west end of a church or a transept had great advantages as positions for an organ. Hanging organs were also very effective. As to dimensions, instead of having an organ 16 ft. by 16 ft. by 20 ft., he would prefer to have it 20 ft. or 30 ft. by 8 ft. or 10 ft. only. By that means space would be available for spreading the pipes. As to seating the organist away from his instrument, it was advisable where practicable. At St. Michael's, Cornhill, the organist sat away from the organ, and there was an electric movement, which, however, sometimes failed.

Mr. W. F. Potter asked what form of roof was best adapted to go over the space containing an organ.

Mr. Riddett thought it would be an advantage, whenever possible, to have a small organ in the choir, and a larger one in a west gallery for grand occasions.

Mr. Francis Bramley Baker said that, speaking as a choirman, he had to complain that in most churches in which he had sung the architect had made the mistake of shutting the instrument up in a little box-like place,—treating it, in fact, very much like a man who held his hands over his mouth while speaking treated his voice,—did not give it fair play.

Mr. Spencer Nottingham thought that if a choir organ were provided for accompaniment, as suggested by Mr. Riddett, with a large organ at the west end for grand occasions, it would be a great step in the right direction. As a matter of convenience, the organ ought to be placed on the same side of the chancel as the choir vestry.

Mr. W. L. Spiers wished to know whether Mr. Somers Clark considered that an organ of two or three stops only would be preferable to an American organ for a village church for 100 or 200 people, and where it would be out of the question to spend 1,000*l.*, or anything like it, for an organ. He begged to support the vote of thanks to Mr. Clark, coupled with thanks to Mr. Norbury for lending the collection of drawings of organ-cases shown on the screen.

The motion having been carried,

Mr. Somers Clark, in replying to the points raised in the discussion, said he still thought that many of our church organs were too large for the buildings in which they were placed. As to the material, in churches, at any rate, architects would have to be content with ashlar walls, or brick or plaster, with perhaps a timber roof. Mr. Willis, when the Albert Hall organ was being built, expressed the opinion that the finest thing that could be done would be to complete the whole of the internal surface of that building with material that would reflect the sound, even to a plaster floor. That had been partially done at St. George's Hall, Liverpool, but not with unqualified success. The form of roof was a matter of no great moment, provided sufficient height was allowed. Mr. Riddett had suggested a choir organ and a large organ at the west end. That was certainly a splendid idea, but one not likely to be carried out except on rare occasions, on account of the cost. As to Mr. Spiers's question, an organ with only one or two stops would be a most doleful machine, emitting one perpetual grind, neither *piano* nor *forte*. Better introduce the village musicians into the church, with their euphoniums and violoncellos.

The London Labourers' Dwellings Society opened a block of new buildings in Burnett-street, Vauxhall ("Murray Buildings"), on Saturday last. We will give some particulars when we have had an opportunity to see the tenements.

* Described in the *Builder*, p. 800, *ante*.

NEW BUILDING BYE-LAWS FOR LONDON,
UNDER 41 & 42 VICT., CH. 32.*

SECTION 1,—"As to Foundations and Sites of Buildings," and section 2, "As to Walls," contain the most important new provisions, and should be subjected to a good deal of sifting, and to very keen scrutiny thereafter. These new bye-laws might seem to an outsider to indicate improvement in public opinion during the last twenty-three years, and a desire for a corresponding improvement in buildings. But such an outsider would be mistaken. The bye-laws are mere evidences of an endeavour on the part of public authorities to wrestle with the folly and wickedness of people who would, if left uncontrolled, build hopelessly unhealthy, damp, and unstable buildings,—endangering the health and safety of the long-suffering poor of London. The special importance of sections 1 and 2 of the bye-laws, to architects, builders, investors,—to everybody, in fact,—is due to their universal application. Some of the other sections may be brought into use pretty frequently; but every building or other erection hereafter erected will be regulated, more or less, by sections 1 and 2. If any of the provisions are in conflict with those of the Acts of Parliament, they will cause confusion; those which are in conflict with common sense will be worse than useless. If any are vague, they will be differently interpreted by district surveyors, and by other people; and litigation, ill-will, and annotated editions will be the results. Amendment, after a decorous interval, will then be inevitable, with consequent inconvenience to the public, and discredit to the Board, and to all members of the professions and trades especially affected, who should have shown foresight and energy at the right time.

If the bye-laws prove insufficient, and leave obvious evils uncontrolled, discredit will come swiftly on all concerned. The Board will be held responsible by millions of people; and rightly so, for the bye-laws will be practically what the Board chooses to make them. Surrounded by critics,—some hostile, and with keen eyes for defects,—others friendly, but not able to avoid seeing them,—some anxious to limit the Board's powers, others to reform its constitution,—it is clear that thorough performance in such a matter as this should be preferred. I cannot accuse myself of any want of painstaking in this endeavour to help the Board to make the bye-laws concise, unambiguous, and sufficient; and you have allowed me a very liberal share of space, so that details have been gone into, and the scope of the bye-laws made clear, by showing what the Acts would authorise, what the framers of bye-laws might have attempted, and what they have actually done.

Section 3 says that each district surveyor shall see that the provisions are observed; and section 4 awards a district surveyor a special fee of 10s., when he succeeds by means of legal proceedings in getting foul matter removed from a site. Section 5 enacts that plans and sections of public buildings are always to be shown to a district surveyor, and that he may see drawings of other buildings as well if he asks properly. Section 6 describes chimney-shafts and concrete buildings, which may be erected without special permission of the Board,—a provision which will do away with a large portion of the red-tape and delay that have vexed the souls of London manufacturers for a generation, and have put obstacles in the way of the use of concrete. Section 7 gives power to the Board to demolish buildings improperly constructed; and section 8 provides penalties for breaches, and gives a general power to the Board to do anything it likes,—to dispense in any case with the observance of the bye-laws, or to make conditions which shall be binding in place of them.

The order in which the different subjects are mentioned in section 16 of the 1878 Act has been followed in the bye-laws,—a lawyer's method, but an awkward one sometimes. There is a logical sequence which should be respected. Section 3, as it now stands, refers to the *foregoing* bye-laws, which can only mean sections 1 and 2. Clause 3 of section 16 very properly deals only with the subjects mentioned in clauses 1 and 2; but it would amount to the same thing if section 3 were transposed and made to follow what is now Bye-law No. 6,—a mere matter of form, it is true, but the present form looks very odd. The present No. 4 is allied in subject to No. 7, and might very well be incorporated with it, or, at any rate, be put after it. It contains a proper, though to all seeming not a very liberal, provision of pay for special services; but its prominent, disconnected position gives it a kind of satirical look which should be avoided. The order of the bye-laws would then be 1, 2, 5, 6, 3, 7, 4, 8, and in following them through they shall be taken in that order.

Section 5.—*As to the Deposit of Plans and Sections.*

Paragraph I.—"On notice being given to a district surveyor of the intended erection or re-erection, or alteration of, or of an addition to, a public building, it shall be the duty of the person giving such notice to deposit plans and sections of such building with the district surveyor for his inspection, and no work shall be proceeded with until seven clear days after such plans and sections shall have been so deposited."

Section 30 of the 1855 Act gives the district surveyor a good deal of control over the construction of public buildings. By the operation of this bye-law he will know, before anything is commenced, what are the main features of the work he is to be called upon to control. It is not stated that he shall retain the drawings, nor stipulated that he shall approve them. Magistrates will, however, be disposed to say that approval of everything is implied, unless by a proper letter the district surveyor puts something on record. Should not, therefore, such a letter be customary?—a letter which would approve "walls, roofs, floors, galleries, and staircases" (section 30), but reserve all minor questions. It might, in the long-run, save trouble to the district surveyor, as well as to every one else, if all matters of importance were definitively settled before work was started. Although the district surveyors cannot be compelled by law to do this, other architects would be better satisfied, if the present members of the District Surveyors' Association pledged themselves to set a good example. It might seem a corollary that the district surveyor should have for his own use complete copies of the drawings which he formally approves; but, however desirable this might be as an act of grace, there should be hesitation as to making it into a right. Public buildings in London are usually set about in a great hurry, and are frequently much altered in execution from the first proposals; in fact, many reasons could easily be given.

Paragraph II.—"On notice being given to the district surveyor of the intended erection or alteration of or addition to any house, building, or other erection, other than a public building, the district surveyor may, if he think fit so to do, by notice in writing, require the person giving such notice to produce a plan or plans and sections of any such house, building, or other erection, or of the intended alterations or additions thereto, for his inspection, and the erection of any such house, building, or other erection, or of any alteration or addition, shall not be proceeded with until the notice of the district surveyor for the production of the plan and sections of such house, building, or other erection or alterations or additions shall have been complied with."

In these cases also there is neither retention nor approval of the drawings,—only inspection of them; and the drawings are limited to plans and sections. No control over timbers or iron construction is given, either by the Acts or the bye-laws. Some day laws may enact that floors and roofs shall be strong enough to stand, but that time has not come yet. At present, and for some time to come, district surveyors must content themselves with friendly suasion when obviously insufficient work is put up; and lay wait for signs of failure, and consequent danger to life. Then a condemnation can be made. It is perhaps well thus to bear in mind how very little more power the 1878 Act is giving in these matters to the elbow of the Metropolitan Board and its officers. The public may be anxious to stretch the irreducible minimum a little farther before many years are past.

Section 6. *As to the Deposit of Plans and Sections of Buildings to which section 56 of the Metropolitan Building Act, 1855, applies:—*

"On any person being desirous of erecting a furnace chimney-shaft, or of constructing a building of concrete, it shall be the duty of such person to deposit plans and sections of the furnace chimney-shaft or concrete building, as the case may be, with the district surveyor; and the district surveyor, on being satisfied that the furnace chimney-shaft or concrete building is to be constructed in conformity with the following rules, may permit the erection of such furnace chimney-shaft or concrete building; and the Board may, in every case where the district surveyor has declined or omits to grant such permission, permit the erection of such furnace chimney-shaft or concrete building."

a. This section does not deal with all buildings to which section 56 might apply. It only refers to two sorts of buildings, belonging to that rather numerous class. The heading might, therefore, be simply, "As to Furnace Chimney-shafts and Concrete Buildings."

b. The action of the district surveyor when permitting these erections will, as the law stands, be decidedly irregular. By section 56 an application is necessary, and by section 58 the approval is to be in writing, signed in a specified way; and none of this is superseded by anything in the 1878 Act. But this need not cause us any anxiety. The practical meaning of the bye-law will be, that the district surveyor will be empowered to permit the erection of a building, which the Metropolitan Board of Works would be certain to approve if applied to. A fee of 10s. has hitherto been paid in respect of these approvals "to such person as the Board may appoint" (under section 60). As "the expenses in and about such approval" will now fall on the district surveyor, how would it be to pay him the same amount for the same services?

c. The last portion of this paragraph sounds like a slap in the face to the district surveyors. It is quite unnecessary here, as the powers of section 56 will always remain, till Parliament takes them away. Besides, section 8 of these bye-laws gives most ample dispensatory powers.

d. It would be a good thing to bring the new "General Rules," which will be made under section 57, into one cover with the new bye-laws. It is well to do only what the Acts allow; but it would be the merest pedantry to sacrifice the convenience of the general public for what is practically no reason at all. The whole document would be called "Bye-laws, General Rules, and Regulations,"—a heading which might safely be left to define itself without references to Acts, sections, &c. After the Building Bye-laws would come the General Rules with respect to applications,—as to projections, general lines of buildings, &c., formation of new streets, naming streets and numbering houses, petroleum, &c.

The rules as to furnace chimney-shafts may now be given. The paragraphs have here been numbered, and transposed so as to come in the following order:—1, General; 2, Foundation; 3, Footings; 4, Width immediately above the footings; 5, Thicknesses of brickwork; 6, Batter; 7, Cornices and caps.

"*Furnace Chimney Shafts.*

1. Every chimney-shaft for the furnace of a steam *boiler*, or of a brewery, distillery, or manufactory, shall be carried up throughout in brickwork *or stonework laid in* mortar or cement of the best quality.

2. Every furnace chimney-shaft shall be built upon a bed of concrete satisfactory to the district surveyor.

3. The footings shall spread, where possible, on all sides of the base of the shaft, and shall have regular offsets. *The projection of the bottom of the footing from the face of the wall shall be equal to the thickness of the brickwork at the base of the chimney-shaft; that is, at that portion immediately above the foot ups.*

4. The width of a furnace chimney-shaft at the base, if square on plan, shall be at least one-tenth of the total height of the shaft, *reckoned from the top of the footings to the top of the cap;* if octagonal in plan, at least one-eleventh of the total height of the shaft; and if circular on plan, at least one-twelfth of the total height of the shaft.

5. The brickwork shall be at least 9 in. thick at the top of the shaft, and for 20 ft. below; and shall be increased at least one half-brick in thickness for every 20 ft. of additional height measured downwards.

6. Every furnace chimney-shaft shall have a batter of 2½ in. at least in every 10 ft. of height.

7. No cornice shall project more than the thickness of the brickwork at the top of the shaft. No iron cap to a shaft shall be less than 1 in. in thickness, and every iron cap shall be held down by iron bolts.

8 *There shall be paid to the district surveyor the following fees in respect of the approval and supervision of furnace chimney-shafts; for every furnace chimney-shaft not exceeding 75 ft. in height, 2l.; not exceeding 100 ft. in height, 2l. 10s.; for every 10 ft. in addition, up to 150 ft., 2s. 6d.; for every 10 ft. in addition, above 150 ft., 5s.*"

a. Minor alterations, that do not seem to require discussion, have been made in the wording; these are pointed to by the italics. Two paragraphs have been omitted,—one stipulates that no portion of the enclosures shall be of fire-brick, and the other that,—where projecting stones occur in a shaft,—the wall behind them shall not be in consequence reduced in thickness. These may be thrown overboard without a pang.

b. The thickness named for brickwork in 5 differs from the well-recognised rule of 9 in. for 25 ft. from the top, 14 in. for the next 25 ft., and so downwards. Superfluous weight, put on the foundations of these structures, is always an injury,—especially where nature provides only the poorest of foundations, or none at all. In some half-score shafts approved by the Board, and erected, and now looked over with a view to this point, this old rule seems to have been recognised by the designers and the Board. Why should there be a new rule calling for heavier walls?

c. The batter has been settled in 6 so as to absorb half a brick in 20 ft.; but it is very doubtful whether any batter should be prescribed. Why may not the internal dimension of a shaft be the same all the way up,—set-offs

* See pp. 1231, 1249, 1285, *ante*.

being formed externally? Some people prefer the insides of shafts in that way; and it is, besides, a somewhat convenient method of building when a shaft is laid against a wall, as so frequently happens in central London.

d. The paragraph as to fees is a new one. The suggested bye-laws set the example at the end of "Concrete Buildings." The fee is the present fee (appointed under section 50) + 10s.

"*Concrete Buildings.*

I. Concrete used for buildings shall be composed of Portland cement and clean Thames ballast, or of gravel, or crushed smith's clinkers, brick burrs, or small broken stones, or any hard and suitable substance; and each shall be passed through a screen or mesh not exceeding 2 in. diameter. Sand must be added to such materials *as directed by the district surveyor.* All such materials must be perfectly clean, and free from all greasy, loamy, or clayey matter; and, if necessary, to be washed.

II. These materials and cement shall be mixed in the proportion of not more than six parts of material as aforesaid, by measure, to one part, by measure, of the best Portland cement.

III. In making the concrete, a box, 2 ft. by 4 ft. by 2 ft., *or of other shape to contain the same quantity,* shall be used for the materials; and another box, capable of containing two bushels *shall be used for the cement.* The cement and materials must be turned over at least three times, and thoroughly mixed together with water.

IV. The concrete thus composed shall be laid into the walls of buildings all round, in equal layers, and grouted *with a mixture* of one cement to two of clean-washed sharp sand after each layer, until the walls are completed in height. The grout to be made as mortar first, and then thinned with water to the necessary consistence.

VI. The thicknesses of walls shall be equal at the least to the thicknesses for brickwork prescribed in the Building Act.

IX. The portions of the party-walls and chimney-stacks above the roofs of buildings must be rendered externally with Portland cement, *or otherwise protected.*

X. The rules of the Metropolitan Building Act, 1855, as to the use of timber in walls, and the other rules of that Act *which can be properly applied,* are to be observed *in concrete buildings.*

XI. There shall be paid to the district surveyor, in respect of his supervision of every concrete building, a fee one-half more in amount than the fee to which he would be entitled under the Building Act for new buildings or additions. No additional fee is, however, to be charged in respect of any alteration to a concrete building, *beyond the fee chargeable in accordance with the Building Act.*"

a. Italics point out minor alterations. Paragraphs 5, 7, and 8, of the bye-laws officially suggested may be omitted. 5 is a fragmentary relic of a larger clause, which has hitherto, in concrete permissions, stipulated for the concrete being "applied by one or other of the processes now in use." 7 stipulates for cores for flues and fireplaces. 8 could not be attended to in decent work, where door and window frames cannot be fixed till the walls are getting dry.

b. A description of the cement might be desirable; and the paragraph cut out from section 2 might come in here with this addition,—"The test, when ordered by the district surveyor, to be made at the works of the Metropolitan Board."

Sections 3, 7, 4, and 8, would deserve several paragraphs; but, in place of quoting the sections and making notes, I will express the hope that some one will make the necessary emendations in drift and wording. C.

SEWAGE TREATMENT AT HERTFORD.

On Friday in last week a number of engineers, chemists, and sanitarians visited Hertford to inspect the sewage works there, which are now being conducted by the Rivers Purification Association (Limited), who undertake all the operations of defecating the sewage, under a lease from the Corporation, and for an annual subsidy. The Association, as was stated last year in our account of the Coventry Sewage Works,* which are also worked by the Association, has been formed for the purpose of carrying out the requirements of the Rivers Pollution Prevention Act (which prohibits undefecated sewage from being discharged into streams and rivers), by assisting town councils, local boards, sanitary authorities, and others, to purify the water-carried sewage and manufacturing refuse of their districts, by the system or combination of systems best suited to local conditions, and either to execute new works or adapt existing works for these purposes. The Association also undertakes to carry on the works and to purify the sewage. The basis of the Association's operations is precipitation by the aid of chemicals, the effluent water being passed over a comparatively small area of land where necessary or desirable. At Coventry nine acres of land in the shape of filter-beds are available as an auxiliary, but at Hertford chemical treatment alone is used. The system which the Association adopts consists in applying a cheap salt of alumina, in combination with cheap proto-sulphide of iron and milk of lime, the cost of the treatment varying according to the quality and flow of the sewage to be dealt with and the standard of purity required in the effluent water. At Hertford, where there is no land in use for filtering the effluent,—it being discharged direct from the works by a straight open cut about a mile long into the River Lea, at a point about half a mile above the town of Ware,—the chemical treatment is somewhat more costly than at Coventry, although the population of the latter city is 40,000,—nearly six times as great as that of Hertford,—and notwithstanding the fact that at Coventry the sewage is largely charged with manufacturing refuse from dye-works, &c. The population of Hertford is about 7,200. It is a thoroughly water-closeted town, and as there are no manufactories discharging into the sewers, the sewage may be considered as being of a purely domestic character. The daily flow, amounting in ordinary times to nearly a million gallons (or about 140 gallons per head) is large in proportion to the population of the town, as there is a considerable quantity of subsoil water leaking into the sewers.

The works, which were constructed in 1872 from the designs of Mr. Thomas W. Grindle (until lately borough engineer, but now manager of the works), were not specially designed for the identical means of treatment now carried on in them; still, they are fairly suitable for the process, although, as Mr. Grindle himself remarked, he should like the tanks 3 ft. or 4 ft. deeper (the present depth is uniformly 4 ft. 6 in., —a depth limited by the level of the subsoil water), especially at the ends where the sewage enters. The tanks are six in number, each 120 ft. long by 20 ft. wide, divided into sets of three, which are worked alternately. At the point where the sewage in its crude state first enters the works, a solution composed of sulphate of alumina and protosulphide of iron is caused to flow into it in a continuous stream, this solution being caused to mix well with the sewage by the latter being agitated by flowing through what is known as a salmon-ladder arrangement. A little further on a continuous stream of milk of lime is, in order to correct acidity, poured into the sewage, which then passes into the tanks for precipitation. Each tank has a weir at the lower end, over which the effluent flows into a filter 20 ft. by 20 ft., with about 6 in. of finely-broken coke at the bottom. The beds of coke are removed every day, and the coke being washed and aërated each time, is available for use over and over again. After passing through these filters, the effluent is utilised to turn an undershot water-wheel, which works the machinery for mixing the chemicals, and pumps the sludge out of the tanks on to an open space, where it is dried by exposure to the atmosphere. We were informed that the sludge is bought by the farmers at 5s. 6d. a ton, although not always so readily as could be desired. It should also be mentioned that partly owing to the shallowness of the tanks, the lowest foot of water in them, lying on top of the sludge, is considered too foul to pass into the filter-beds, and is pumped back to the crude sewage to be again treated with chemicals. Any excess of storm-water cannot be dealt with by the works, and it has to "go by the board,"—in other words, it is allowed to pass direct to the outfall. The cost of chemicals used at Hertford is stated to be 11s. 6d. per million gallons of sewage treated. The quantities used per day are: 6 cwt. of sulphate of alumina, 1¼ cwt. protosulphide of iron, and 1 cwt. of lime. The visitors were conducted over the works by Mr. Grindle, the manager, and by Messrs. Henry Robinson and J. C. Melliss, the engineers to the Association, together with Mr. Onslow, managing director, Capt. Twynam (director), and the Mayor of Hertford (Dr. Tasker Evans).

At the luncheon which followed the inspection of the works, Capt. Twynam, Mr. Onslow, and Mr. Robinson explained the objects of the Association, as carried on at Hertford and Coventry, Mr. Robinson deprecating the dogmatic preference for irrigation under all circumstances which he alleged to have prevailed in high quarters. Precipitationists, he remarked, had had an uphill battle to fight, but it was now becoming generally recognised that precipitation, efficiently carried out, was indispensable to the solution of the sewage problem in many localities. In conclusion, Mr. Robinson complimented Mr. Grindle upon the design of the works at Hertford, which were so well suited to the process now carried on there, although they were constructed when the chemical treatment of sewage had not been so far advanced towards perfection as was now the case. Professor Wanklyn made a few remarks, in the course of which he said that the effluent waters turned out by the Association, both at Coventry and Hertford, were excellent, considered as products which might be turned into rivers. He believed that precipitation processes were essential in many places to the solution of the sewage question, and the process which was carried out by the Association was the best one which had come under his notice. The Mayor of Hertford having expressed the satisfaction of the Corporation at the way in which the works have been conducted, the visitors returned to town.

* See vol. xxxv., page 1038.

A NATIONAL THEATRE NOT WHOLLY CONTROLLED BY THE PREVAILING TASTE.

The proposition continues to find support in various quarters. In the current number of the *Theatre*, the paper read at Cheltenham is reprinted in a condensed form; it was also reprinted *in extenso* in an Irish contemporary; commended in *Touchstone*, and the practicability of the scheme questioned, without direct mention of the paper, in the *Observer* and the *World*. In the current number of *Social Notes*, in a paper on "A Reformed Stage," signed Leith Derwent, we find the following encouraging observations:—

"At the Social Congress recently held in Cheltenham, Mr. Godwin read a paper suggesting that the best reformer of the popular taste would be a theatre which the fluctuations of that taste should be powerless to influence. A home of the drama to which nothing impure or worthless should be admitted is, Mr. Godwin thinks, the luminary of which our theatrical darkness stands in want. This theatre, he decides, must depend for its existence 'upon that plan which gave us the great Exhibition of 1851 and some of its successors,—*a list of guarantors.*' State subsidies, the golden showers that cause the Comédie Française of Paris, the royal theatres of Berlin, Vienna, and other capitals, to flourish, are at present unobtainable in England. If some of our most eminent authorities on theatrical subjects may be trusted, they are also undesirable. The drama, if a brighter future awaits it, must trust for that future to men who,—indignant that what should be a means of education is turned to a means of debasement,—are sufficiently wealthy and public-spirited to devote time and money to the removal of a national reproach. Liberal and thoughtful management presupposed, a theatre conducted on these principles must in the end become a profitable property. It is by no means improbable that it would recoup expenses even from the commencement. 'Hamlet,' as Mr. Godwin justly reminds us, was played for upwards of a hundred nights at the Lyceum, to stalls, pit, gallery, &c., that, in place of the ruinous emptiness managers associate with the name of Shakspeare, presented a goodly array of playgoers. The 'School for Scandal' filled the Vaudeville during 400 nights. There seems little reason to suppose that the future would be denied a repetition of the successes of the past; above all, when those successes are looked for in a theatre established as a rallying-point of all who cherish a sincere attachment to dramatic art.

A stage given up to immodesty and buffoonery; playwrights who spend such talent as they possess in the production of dreary burlesques, or who, descending still lower, try how much immorality they can bring over from the French stage to the English, despite the licenser of plays; a scarcity of good actors, and a superabundance of actresses unfit to mouth melodrama in a barn,—such is the picture our theatrical world at present offers. Here and there we see a lady distinguished by genuine talent, and possessing some attachment to her profession, but tried by ceaseless temptations and struggling with a host of obstacles. All around her are the disreputable rivals who owe positions for which they are unfit to the patronage that brands with infamy both him that gives and her that takes. Art is the brightest, the tenderest, the fairest of mistresses. She is treated, so far as the drama is concerned, as a mere commodity of sale and purchase; and

blushes to see herself served by painted incapables who, destitute of talent and in general of education also, earn their employment as her handmaidens by the fact that they are themselves sold and bought. The scandal of a theatre directed by a *favorita* may be seen in Paris and elsewhere; but on the Continent the audience rigidly exacts that an actress shall be such in fact as well as in name. It is only in England that immorality and incompetency are alike accounted ornaments of the stage.

The task of such a theatre as that of which Mr. Godwin would have the present generation become the architect would be, in the most admirable sense of the words, 'to hold up the mirror to nature; to show virtue her own feature, and scorn her own image.' A good taste cannot be formed from bad models, and bad models are all that our plays at present furnish. When a school of actors worthy to interpret the dramatic masterpieces of our literature has been originated, the vicious imbecilities that at present excite the laughter of fools will speedily be banished from the London stage. The blindness of the public has never been such as to render it impossible to open their eyes to the loveliness of genuine art.

Must all the characters created by Shakspeare follow the example of the spirit-actors in the 'Tempest,' and melt into 'air, thin air'? Is the banished Coriolanus to find not only that his exile still continues, but that it is shared by Hamlet, Lear, Macbeth, Othello, and the other princes of the drama? The wit of Falstaff is silenced among us; the sweet names of Juliet, Viola, Ophelia, Rosalind are to the modern playgoer names and little more. Shall it be written that the chivalry of the existing generation was appealed to vainly on their behalf, and that Shakspeare, though the poet of all time, cannot be rendered the dramatist of ours?"

THE RESTORATION OF ANCIENT BUILDINGS.

On Monday evening, a public meeting was held in the Royal Institution, Colquitt-street, Liverpool, under the auspices of the Notes and Queries Society, for the free and impartial discussion of the principle and practice of modern architectural restoration.

Mr. T. H. Hall Caine (from the chair) said,—Forty years ago, or thereabouts, there arose in England and on the Continent a very general desire for the restoration of ancient buildings. The movement began with the clergy, who observed the slow but sure decay of their churches. It did not and could not stop there. Art-lovers everywhere, so far as they were represented by the architectural profession, took up the work with manifestations of hearty sympathy. The plea was mainly a moral one, and appealed but slightly to men's love of art. Buildings of inestimable beauty and historical value, in Venice and Vienna, in Paris and London, and throughout the English provinces, came out of the restorers' hands with whatever spick-and-span improvements the combined genius of priest and architect might devise for them. It was a holy work. It was a crusade of square, and trowel, and broadcloth, against sun, and rain, and time; and the elemental forces got the worst of it. Restoration, as a principle, was held up to admiration from many a pulpit, and the press echoed its praises. Well, the practice thus initiated continued to enlarge its sphere of action until very nearly every art-monument about which men would think it worth while to contend became embraced in its operations. Then suddenly, a year or two ago, the whole principle of restoration came to be challenged. In our piety we had forgotten our art. The whitewash of our immediate predecessors, which covered but did not destroy the art-treasures of the old craftsmen, was the light touch of a reverent element, compared with the merciless and dishonouring hacking of modern restoration. Religion, history, poetry, and art, were being sacrificed, perhaps to a vulgar utilitarianism, at best to an ignorant zeal.

Now, it is the object of these meetings to consider that plea and this protest. And first, let it be understood that this is no sectarian question. A Catholic friend, Mr. Frank Marshall, knowing my interest in the subject, writes:—"It makes a Catholic's heart bleed to see the chapels of our old English cathedrals so despoiled and desecrated. I should like to see our old churches restored to their proper use." There is much sad truth in what Mr. Marshall says. Large numbers of our ancient churches are structurally unfit for the Protestant form of worship. They were designed to answer the needs of what is called sacerdotalism; and the effort to accommodate them to the services of the reformed faith has robbed the aisles and the chapels of their first religious significance. Protestants should abandon them, and Catholics should be content to leave them as a witness of the past. Mr. Marshall would then be able to join hands with Canon Venables and the Bishop of Truro in an effort to preserve the best monuments of old English, religious, and artistic life. Even under existing conditions of things, the problem presented by this question of restoration rises superior to sectarian differences, and the vital matter both with Catholic and with Protestant is, and will be, How far is it worth the while of Englishmen to protect from dishonour and falsification the history of England as it is written in stone?

It is also necessary to say that this is not a professional question. I mean no disrespect to the architectural profession in saying it will be a sad time for national art-culture, and for the refinement of moral feeling which true art-culture involves, when the care of the grand old cathedrals, which make the face of our country fairer, ceases to be a thing of national importance.

And if this is not a professional question, so far as it bears upon broad issues, still less is it what is, in professional language, called a "Battle of the Styles." Efforts have been made to saddle upon Protectionists an undue regard for certain forms of art, certain styles of architecture. The principle of protection demands equally an earnest opposition to the ignorant destruction of Norman and Classic, Early English and Perpendicular, and the list of preservationists counts amongst its members men of such opposite shades of artistic opinion as Professor S. Colvin and Professor J. Ruskin.

And now a word relative to well-known restorations in the North of England. Few persons, I imagine, would recognise the sober lines of the eastern aspect of the Chester Cathedral of 1868 in the spic-and-span filigree of 1878. Dean Howson is just now engaged in describing in the *Art-Journal* the kind and extent of the cathedral restoration. In reading his papers I ask you to consider his grounds of defence of two pedantic reconstructions which have done more, perhaps, than all else to remove from the whole pile its ancient character. First, the pyramid roof at the choir end of the south aisle; and, secondly, the high-pitched roof of the lady-chapel, hipped down to the foot of the choir window.

Relative to the restorations at Ormskirk, I cannot trust myself to speak with patience. The one pitiful fact which usurps the whole domain of memory is, that thousands of bodies have there been tumbled out of their intermural burial-places at the will of an insensitive clergy and a sophisticated laity.

Just a word on the contemplated restoration at Grasmere. St. Oswald's Church was Wordsworth's parish church: his pew in it remains until now; but it is proposed forthwith to commit the peculiar sacrilege involved in obliterating the memories in Grasmere of the greatest of the lake poets. St. Oswald's has deep historical interest. It is bound up with the names of the elder and younger Coleridge, of De Quincey, Southey, and Scott. To disturb the shrine in which worshipped these giants in English thought will be a grim farce of vandalism and desolation such as no thinking man will be slow to whip with execration. A well-known parishioner writes to me:—"I trust you will be able to do something to stop our new rector in his wild attempt to destroy our historic old church. I can assure you that a very large majority of the parishioners are against him." So far as my poor powers go I will give what help I can; but the best help is self-help, and we shall hear no more of the Grasmere restoration if the parishioners in vestry do but give the scheme an emphatic opposition. Let that be done earnestly, and at once, or no power on earth will stop ignorant piety and pedantic vandalism in its work of ruin.

One word more, and it shall be on the prospect of legislative defence. There is, I fear, not much to be hoped for in these days from the predilections of the vulgar, who take the new for the beautiful.

Professor Ruskin, in acknowledging a little pamphlet of mine on the subject, says:—"I have, of course, the deepest interest in your work, and for that reason must keep wholly out of it. . . . . I am entirely hopeless of any good whatever from these modern powers and fashions. You who are able for it must fight with fools. I will be no more plagued by them." The language is emphatic, but no artist will call it unjust. Now, a resolution will be put to one of these meetings, asking for such an extension of the principle of the schedule of Sir John Lubbock's Bill as may embrace all old churches about which men would care to contend.

Papers by Mr. S. Huggins and the Rev. S. Fletcher Williams, to which we will return, were afterwards read.

Mr. J. M. Hay (ex-president of the Liverpool Architectural Society) moved the first resolution,—"That this meeting regrets the dishonouring and false treatment, under the name of restoration, of many ancient buildings in the North of England, and thinks the Society for the Protection of Ancient Buildings deserves the support of all those who are interested in art, archæology, and history." He said, it is of essential importance that our ancient monuments should be preserved. To bring back an old building to its original condition is simply an impossibility. As an architect, an artist, and an archæologist, I protest against the wholesale falsification of history as written in our ancient churches. The errors of greater artists may be discovered by lesser ones, and I should be the last man to construct a pyramid terminal to a cathedral aisle out of such slender evidence as the rake of a few buried stones might afford; or to substitute for a flat roof a high-pitched one supposed to be more in harmony with the spirit of the fabric.

The resolution was supported by Mr. J. S. Moore and Mr. Henry Clark (who regretted Mr. Caine's allusion to the non-sectarian nature of the question), and carried.

Mr. J. F. Drinkwater proposed the second resolution:—"That in view of their value as records of history and progress, the loss of which is definite and irreparable, ancient buildings demand the utmost care of individuals, and are worthy of the legislative protection of the public." This was seconded by Mr. George Rose, and supported by Mr. R. R. Douglas and Rev. S. Fletcher Williams, and carried unanimously.

A NEW GUARD-HOUSE AT THE TOWER.

At the south-east corner of the Tower, overlooking the Thames, a new guard-house for the use and shelter of the soldiers when on duty, has just been erected by the Government authorities, there being little or no protection against wet and the inclemency of the weather at an adjoining fragile old shed, which, until lately, did duty for that purpose. It is built of Kentish rag, with Portland stone dressings, and open port-holes in front. It is about 50 ft. in length, and surmounted all round by a castellated parapet, between 2 ft. and 3 ft. in height, inclosing a flat roof. Extending the whole length of the building on the south side, in front of the river, is an arcade upwards of 6 ft. in width, having Gothic arches in front, faced with Portland stone, the arcade serving as a covered promenade for the military on duty. The building contains on the ground-floor a spacious apartment for the use of the men when not actually on duty. The building has been erected by Messrs. Martin & Wells, Government contractors, of Aldershott. The site upon which the former guard-house or shed stood has been cleared and ornamentally planted.

MANCHESTER CITY SURVEYOR.

The son of the city surveyor, Manchester, Mr. J. G. Lynde, is a rising engineer resident there, and being engaged in some important public works in which the Corporation are interested, Mr. J. G. Lynde has thought himself bound in honour to resign his appointment, holding which he would have to advise the Corporation. At a meeting of the City Council on the 4th inst., the Mayor moved:—

"That this Council, whilst accepting the resignation of their city surveyor, Mr. James Gascoigne Lynde, with regret, recognise and appreciate the honourable motives which have induced him to take the step, and avail themselves of the occasion to record their sense of the ability, integrity, and zeal with which he has served the Corporation for a period of twenty-one years, and their best wishes for his future prosperity."

Alderman Lamb seconded the motion, which was unanimously carried, and a special committee was appointed to take steps to obtain a gentleman to succeed him in the office.

"ABOUT ETCHING."

SIR,—I always read with interest and instruction whatever in the way of art criticism the *Builder* puts forth, and I thank you heartily for the appreciative article of Saturday. The writer, however, is wrong as to the causes which first set me, I will not say to draw, but to etch. Draw I always did from boyhood, but drawing with the *point* was *first* suggested to me while demonstrating surgical anatomy to the students in the great military hospital at Grenoble, where I was what is called "prosecteur." Some one present noticed the "length of handle" which I gave to the knife, and I said it was from the habit of freehand-drawing, and that if they, the students, wanted to operate well, and see what was going on at the end of their instrument, they had better cultivate the use of the point.

And, in fact, I made them all draw instead of describe the parts they had been dissecting, and with the best results as to surgical teaching.

Then, as a matter of fact, I never did neglect my practice for my drawing, even for a moment. I have been a most energetic and constant worker in it for thirty-five years, and it is only in the autumnal holiday that I have ever permitted myself to sit down to etch. I am quite aware that in our profession, as in every other, there is a stupid class, who see in every occupation outside the professional groove a proof that you are neglecting your work. I have a contempt for these gentlemen of one idea, and never condescend to disturb their belief, or their pretended beliefs. Meantime, if they had a grain of foresight they would perceive that the greater the cultivation the more advanced would be the social status of the physician and surgeon, and that it is because we have not now the Meads and the Sloanes, who were the leaders of society in their day, that we have deservedly lost caste.

My father, who was editing the *Medical Intelligencer*, and carrying on a large practice at the same time, was told by an eminent physician of his day (Dr. Clarke) that if he played the violoncello (which he occasionally did in the evening), he would lose his practice; and I have been told over and over again that if I published what I drew it would be the same thing. I need not say that, like my father before me, I have always held this sort of *professionalism* at its proper value, and treated it accordingly.

However, after thirty-five years of hard work the day will come, I suppose, when I shall have none to do, and then, if eyesight endures, I count on doing some *real* art work, and not only that, but on saying openly what I think has to be said on the subject. F. SEYMOUR HADEN.

COSTLESS POWER FOR THE ELECTRIC LIGHT.

SIR,—In the *Builder* for Nov. 23, some space was given to portions of a report upon the electric light addressed to the Loughborough Corporation by a firm of architects in that town. Some of the statements set forth appeared to me to be based upon views of science so novel and uncommon among engineers, that in the last number I looked for some comment upon them, or a little information sought. Somewhat to my disappointment, being interested in the use and application of water and water-power, no reference to the report appeared, and I therefore feel constrained to seek the desired information myself, and, by your leave, in the same medium, premising that I am in no way concerned in gas, but, on the contrary, shall be glad to see the electric light brought to a point of economy and efficiency of which at present we have no experience.

First, then, Messrs. Hodson's report states that the principal source of cost after the provision of the apparatus is the motive power needed to generate electricity; that in the case of Loughborough, *like the majority of towns having a supply of water by gravitation*, there exists during at least six months in the year, an ample supply of water sufficient for this purpose, which supply, owing to the *incapacity of reservoir space, is absolutely wasted*. Now, for my present purpose, it is not necessary that I should stop to ask how it comes that the majority of towns having a gravitation supply are here placed in the same category as Loughborough with respect to catch ground area and reservoir capacity, but will pass on a few lines, and ask Messrs. Hodson in what manner "every facility exists" for converting the waste water into useful light? It is expressly stated that the reservoir cannot contain this water, and yet, so far as the report in the *Builder* is concerned, not a word is said as to the means of storing it, so that it shall become, -what is indispensable, - a constant and equal motive power.

Will the authors say at how much they have estimated the cost of this means? At how much the cost of a new reservoir for, say 180 days' consumption, with its preliminary expenses of an Act of Parliament, probably opposed,—and compensation for land taken, and for water withdrawn,—say one-third of the total volume, for line of pipes of sufficient capacity, valves, gauges, air-cocks, and discharge drains, and finally, for the hydraulic motor? How many instances can they cite in which a gravitation supply for town's purposes has cost less than 3d. per 1,000 gallons, and how many that have exceeded 6d. per 1,000? Perhaps it may be replied that the whole is merely a suggestion, thrown out for consideration; but, if so, why say that "every facility exists" for converting the waste power into light?

In this sense, equally does every facility exist for converting the winds that blow at the equinox, or the rain as it falls from heaven, into useful power. There, too, waste power exists: why not use it? Because it will not pay. Because experience tells us that under these conditions, water power has, and can have, no chance of competing against steam power, under the ordinary conditions of cheap coal and iron. Taking the average cost of the pure water supplied to towns, recommended for use, to be 4½d. per 1,000 gallons, and adopting the figures of the report without examination, we find that the cost of the water alone, for the 70 cubic feet per minute, giving out at a pressure not stated eight indicated horse-power for an average daily period of say ten hours, would be as follows:—

$$\frac{70 \times 6{\cdot}25 \times 60 \times 10 \times 4\frac{1}{2}}{1{,}000 \times 12 \times 20} = 4l.\ 18s.\ 6d., \text{ or}$$

nearly 1,800*l.* per annum for a matter of 400 lamps, and this exclusive of all motors, electric apparatus, carbon, and supervision; a result somewhat different from the 20*l.* set forth in the report. This will scarcely afford much encouragement to the Loughborough corporation, nor to other public bodies struggling for a little *dry* light upon the light question.

One other point demands brief notice, and my queries are ended. How do Messrs. Hodson propose to utilise the waste powers of the rivers of this country? At every mill on the Soar they say sufficient power is wasted to light up in a *glorious* manner every village along its banks. I do not know much of this river, nor of its mill and other riparian owners; but here, in Yorkshire, any attempt to raise the levels of existing weirs, so as to create storage for a constant flow of water for any purpose whatsoever, would be opposed at every step, and would be hopeless. Indeed, it is thought by many of our most experienced engineers, in view of the disastrous and increasing effect of floods, that all river obstructions for purposes of water-power only should be done away with. Instead of a "glorious" electric light, I fear the motive-power of these streams would become the source of a glorious Parliamentary fight.

But, as I merely ask for information, and may have overlooked some mysterious creation of constant power, I pause for a reply.

M. PATERSON.

A NEW TOWN-HALL AT HOVE.

TOWN improvements of a varied character are about to be effected at Hove, near Brighton, which is rapidly increasing both in population and importance. The Town Commissioners have decided upon the erection of a new Town-hall upon an eligible site which has been secured in Church-street. The building, which will cost 25,000*l.*, is intended to be a spacious and ornamental structure. The Commissioners are likewise about to provide a new cemetery, for a population estimated at 50,000, including the erection of mortuary chapels and other necessary buildings, the cost of which is estimated at about 15,000*l.*

Royal Scottish Academy.—At a meeting of the Royal Scottish Academy, held on the 4th inst., Mr. Arthur Mitchell, M.D., LL.D., was elected Professor of Ancient History to the Academy, in room of the late David Laing.

BLACKBALLING AT THE ARCHITECTURAL ASSOCIATION.

SIR,—I have read with combined indignation and amusement your report of the proceedings and "speech" of the Mr. W. Scott who, it appears, is the author of the farce lately played at the Architectural Association,—a farce which was practically an insult flung in the face of at least thirty-eight members and their friends. Will you allow me to analyse the figures? Nineteen candidates out of 63, or just 30 per cent., were blackballed by thirty voters. The rules of the Association provide that one black ball to four white balls is fatal to a candidate. Each candidate was obliged to be proposed and seconded by two members. Thus Mr. W. Scott and four friends had it in their power to reject the nominations of thirty-eight fellow-members, and in the recognised absence of any valid reason for objecting to most, if not all, of the names proposed, and in the absence of any figures to the contrary, it is fair to assume that the blackballers did actually thus insult a body of men who are believed to be gentlemen. The fact that only thirty voted out of 130 present is a proof that better feelings prevail among the mass of members.

I am not, and am not likely to become, a member of the Architectural Association; but, like a large portion of the general public, I take great interest in its work and in the work of the profession at large; and I do know that it was never intended to be the club of a clique. The public will, I think, wish the Association to declare in a decided manner whether architectural students of unblemished character are to be denied admission to its advantages through mere caprice. It will remain either for these blackballers to maintain the Architectural Association as the sacred abode of shining lights like themselves,—and for others not so gifted, but still recognised as ornaments to the profession, to form for poor despised students a separate body to carry out the intentions of the original founders of the Association; or for the Association, *en masse*, to repudiate this interference.

AN OBSERVER.

STRENGTH OF STONE.

SIR,—Will any of your readers tell me where I can obtain information as to the transverse strength of stone? Tables of crushing strength are given in all the various works on building materials; but I can find nothing about the transverse, with the exception of "Barlow's Strength of Materials," in which is given a short account of some experiments made by Rennie on Green Moor (Yorkshire) paving stone, from the results of which Barlow deduces, using the same formula as for wooden beams,

viz., $S = \frac{2\,W}{4\,b\,d^2}$, a breaking weight in centre

of from 335 lb. to 339 lb. per square inch of section. Cases frequently occur in practice when it is desirable to know what weight can be safely supported by the stone-head of a doorway or window, and I therefore wish to ascertain if any reliable expetiments have been made as to the strength of the various kinds of stone used in this manner. W. A.

CONCRETE ROOFS.

SIR,—I live in a house built of concrete, having a flat roof of the same material, and occasionally the ceilings and walls on the top floor are streaming with water. The house has been built several years, and at first I thought the rain found its way through the roof, and I had the outer surface covered with asphalte. I have now arrived at the conclusion that the damp is caused by the moisture of the atmosphere condensing on the cold ceilings, and that the rain has nothing whatever to do with it. Can any of your readers suggest a remedy for the evil? J. M.

*** A coat of absorbent plaster. But proper ventilation would lessen the necessity.

Valuation Lists of the Metropolis.—A circular from the Metropolitan Asylums Board shows that the totals of the valuation lists of the metropolis were:—Gross values.—Metropolis, 25,816,267*l.*; the City, 3,843,513*l.*; and the Middle Temple, 13,144*l.*; making a total of 29,672,924*l.* Rateable values.—Metropolis, 21,209,749*l.*; City, 3,222,393*l.*; and Temple, 10,929*l.*; or in all, 24,443,072*l.* Last year the respective totals were:—Gross value, 29,022,188*l.*; and rateable value, 23,903,833*l.*

A YARD OF BALLAST.

Sir,—Following your correspondent, "A Contractor," as to what a cubic yard of lime is, I should like to know what is a cubic yard of, say, Thames ballast?

Our contractor tells me that a yard is a "one-horse" load, and that a "two-horse" is two yards, the check is the size of the carts; but I fail to see any proof at all that the "one" or "two" horse loads must be the measurement given, for the carts are very variously loaded and afterwards shaken down in transit.

Now I happen to have a dispute of this kind. A floor containing exactly 33½ cubic yards, including the bulk of some 80 light iron joists, has taken 47 yards of these "one" and "two" horse loads of ballast, besides the bulk of 72 sacks of cement, nearly another 2 yards. I say it is impossible; but the contractor replies, "You do not allow for *shrinkage* in mixing." So the whole matter turns on what is lost in bulk by the addition of water.

I have had twenty years of practical experience, but have never found Thames ballast or any other ballast to lose nearly one-half in mixing, and I should like to know very much what light some of your readers can throw upon this much-vexed question. An Engineer.

TOWN CLERKS AND BOROUGH SURVEYORS.

Sir,—Will you kindly allow the following question to be ventilated in your columns?

When a Corporation or Local Board have decided that a certain street in their district shall be made, whose duty is it to get the names of the owners, so that the proper notices may be served upon them to make the street? In many instances, this, like other work in my opinion belonging to the town clerk, is shelved on to the borough surveyor.

It is the duty of the town clerk, or clerk of the local board, as the case may be, to serve the notices; it is, therefore, his duty to see that they are served on the proper persons, and this is borne out by precedent, for in the preparation of Parliamentary plans, &c., the lawyers tell us that it is their duty to obtain the names of the owners, or reputed owners, &c., and serve the notices, the engineers and surveyors being thus confined to their proper business.

I think it should be understood that after the plans for making a proposed street have been prepared by the borough surveyor, a tracing of the plan of the street, with each property numbered thereon, should be handed to the town clerk, who should then obtain the names of the owners and enter them in a book of reference, from which he should serve the notices.

This is an important matter to a surveyor, because when he is called upon to do this part of the town clerk's work, he takes practically all the responsibility off the latter, who, as a rule, is generally well paid for his services, compared with the borough surveyor, who has quite sufficient to do to spend the money of the ratepayers to the best advantage. Delta.

WORK DONE DURING BANKRUPTCY.

JAMESON AND CO. *v.* THE BRICK AND STONE COMPANY, LIMITED.

This case, in the Court of Appeal, before Lords Justices Bramwell, Brett, and Cotton, gave rise to a question of law of some importance as to the power of an undischarged bankrupt to hold and deal with property on his own account.

The plaintiff, who was an architect and surveyor, became bankrupt in 1873, and the bankruptcy proceedings were not brought to a close till the 22nd of January, 1878. In the meantime, the plaintiff carried on business as an architect and surveyor, and during the year 1877 did some work in preparing plans and making valuations for the defendants. On the 16th of January, 1878, the plaintiff commenced this action to recover the value of the work done from the defendants. One of the defences relied upon by the defendants was that in consequence of the bankruptcy of the plaintiff all property acquired by and debts becoming due to him during the continuance of the bankruptcy proceedings were vested in the trustee, and, therefore, the trustee was the only person who could recover the value of the work. It was proved at the trial that the plaintiff employed six clerks to assist him in his business; but a considerable part of the work in question was done by the plaintiff in person. The trustee had not claimed the sum due from the defendants. Lord Justice Baggallay, who tried the case, on the facts stated above, gave judgment for the plaintiff. The defendants appealed.

Mr. Digby Seymour, Q.C., and Mr. Gainsford Bruce, for the appellants, contended that an undischarged bankrupt could not hold property or sue for a debt on his own account, except in the case of property or money acquired by his own personal skill or labour alone. They admitted that there were decisions on the old Bankruptcy Acts against their contention, but they argued that the Bankruptcy Act of 1869 had altered the law so that those decisions were no longer applicable.

Mr. Cave, Q.C., on behalf of the plaintiff, contended that there was no distinction in construction between the present Bankruptcy Act and the earlier Acts, and therefore the decisions on the earlier Acts were still in force; and those decisions showed that the law was that, although as against his trustee an undischarged bankrupt could not assert his title to a sum of money earned otherwise than by his own personal labour or skill, as against other persons he had a good title until the debt was claimed by the trustee.

Their lordships dismissed the appeal, being of opinion that the effect of the decisions was unaltered by the present Bankruptcy Act.

PREVENTION OF WATER-WASTE.

Mr. George Jennings has patented an invention made by his son which bids fair to supersede the expensive and objectionable water-waste preventer, with its attendant cistern now in use. It consists in a simple attachment to the handle or pull of any description of basin without in any way altering the character of the w.c. with which it may be connected. If the closet-handle is raised and lowered in the usual and proper way, without unnecessary delay, the attachment for preventing waste being unnecessary is not brought into action, but any attempt to waste water by retaining or propping up the handle is defeated, as the latter, after an allotted time, becomes mechanically detached, allowing the discharge and service valves to close, irrespective of the position of the handle, which must be again lowered or dropped to reopen these valves. The difference in time between the instantaneous closing of the discharge-valve and the gradual closing of the service-valve insures that after-supply so necessary to all closets. It is very simple and ingenious, and can scarcely fail to come into use.

SOUTHPORT.

The New Victoria Foot-Bridge was opened on the 3rd inst. It has been erected for the Corporation by Messrs. Shewell & Co., of Darlington, and connects Virginia-street with London-street. It is 456 ft. long, in four spans, the longest girder being 134 ft. The bridge is 10 ft. wide from centre to centre of girders. The cost has been upwards of 3,000*l.*

The Smedley Hydropathic Institution has just received an addition in the shape of a new wing (capable of accommodating eighty persons), which has been erected from the designs of Messrs. Royle & Bennett, architects, Manchester, by Mr. Southern, builder, of Salford, and Messrs. Wishart & Irving, builders, Southport.

COMPENSATION CASE.

THE SOUTH-WESTERN RAILWAY COMPANY AND THE WIMBLEDON LOCAL BOARD.

SEWAGE FARM.

A two days' inquiry has been held, before the Under-Sheriff of Surrey and a special jury, to assess the amount to be paid to the Wimbledon Local Board for 0a. 3r. 35p. of land, part of the sewage farm adjoining the Merton-lane level-crossing, the company having acquired Parliamentary powers to construct a bridge over the main line of their railway at that spot.

Evidence was given on the part of the claimants by Mr. Driver, Mr. Galsworthy, Mr. Ogden, Mr. Mason, and Mr. Grantham, C.E., whose valuations for land and construction of sewage carriers, &c., ranged from 1,178*l.* to 1,648*l.*

The valuers on behalf of the company were Mr. V. Buckland, Mr. Harry Jones, Mr. Robert Vigers, Mr. Rowell, C.E., and Mr. Jacomb, C.E., whose estimates amounted to 604*l.*

The jury awarded 800*l.*

It was understood that this amount being below the offer made by the company, the Local Board will have to pay their own costs, and half the costs of the jury.

ACCIDENTS.

A concrete house has fallen at Quarry Hill, Hamilton, N.B. A petition having been presented to the Dean of Guild Court, praying that a competent person should be appointed to inspect the building, and ascertain the cause of the catastrophe. Messrs. George Bell (of the firm of Clarke & Bell, architects, Glasgow) and White (Assistant Master of Works, Glasgow) were appointed in terms of the prayer of the petition, and they have reported that, in their opinion, the fall of the building was to be attributed to the faulty principle in construction, the lightness of the walls against pressure, the want of proper bond, and careless workmanship in the erection.

Shortly before noon on Saturday last the side wall of the Bell beerhouse, in Church-street, Lambeth, fell down, without any warning, on to the roof of a cottage, 3, Norfolk-place, a narrow court out of Church-street, immediately opposite the church. The cottage was occupied by William Brown, a mason's labourer, and his wife and five children. Mrs. Brown and the three younger children were buried in the ruins. On being extricated, one child was found to be much injured, one was breathing, and died before it reached the hospital, while the mother and a child of eighteen months old were picked up dead. The inquest was opened on Wednesday. One witness deposed to having noticed for the previous fortnight that the wall (which was about 40 ft. high) was out of the perpendicular, and that it was not shored up. The inquiry was adjourned.

VARIORUM.

Under the title, "How Can a Sound Knowledge of Music be best and most generally disseminated," Dr. John Hullah has published, through Messrs. Longmans, the paper read by him at the Cheltenham Congress of the Social Science Association. The two points which the writer endeavours to establish are,—1st, the necessity, if we are to make music a universal accomplishment, of beginning the teaching of it very early; and 2nd, of ascertaining through competent inspection, that it is, at least in schools aided by public grants, properly taught. The paper is well calculated to advance the object in view. —— From *Great Industries of Great Britain* for December we get the following as to the capital of the hardware district:—"If Birmingham is not now in a special manner the seat of the iron and steel industries of Great Britain, Birmingham and its district may truly be called their cradle. Situated in the very centre of the kingdom, cut off from those fishing and trading pursuits which populated the coast, forced upon its own resources for support, and possessed of extremely valuable mineral in the form of coal and iron, it was inevitable that this district should become the home of the descendants of Tubal-Cain. There is no doubt that Birmingham was originally one of a group of scattered villages which sprang up about the great South Staffordshire coal-field, and sheltered the primitive artificers who wrought up the Staffordshire iron into rude forms of use and beauty. These villages have now become large and populous towns, and Birmingham, the greatest of them all, is bidding hard for the honour of being the second city in the empire. Still, in relation to the iron and steel industries, it can have no isolated importance, and cannot be separated from the family group. So close is the connexion between it and the neighbouring hardware towns, that they really form one industrial community. Smethwick adjoins it with scarcely a break; and from Smethwick extend in one continuous chain Oldbury, West Bromwich, Wednesbury, Darlaston, Bilston, Dudley, and all the towns of the Black Country. From the forges of this grim locality come the immense supplies of bar-iron, rod-iron, angle-iron, and sheet-iron which are worked up in the Birmingham factories. From here the Birmingham tool-makers, die-sinkers, and pen-workers get their trusty steel in convenient forms made ready to their hands. Gun-locks from Wolverhampton, Darlaston, and Wednesbury are fitted into Birmingham guns; buckles, harness, and stirrups, from Walsall, are worked up into Birmingham saddlery and harness. Willenhall padlocks, Wolverhampton coal-scuttles, Walsall curry-combs, Dudley fire-irons, West Bromwich hollow-ware, and a thousand other hardware products from these and a score of other tributaries, flow daily into the warehouses of the Birmingham merchants and factors, thence to be distributed to every part of the habitable globe. Industrially and commercially, Birmingham cannot be regarded otherwise than as the centre of a system—the capital of the Midland hardware district."—— *Mirth*, for its Christmas number, consists of one story, "The Finding of the Ice Queen," by Frank Barrett,—original and amusing.——In like manner, *Tinsley's Magazine* gives as a Christmas number one exciting story, by B. L. Farjeon, called "The Mystery of Roaring Meg."——The *Victoria Magazine* Christmas number, besides a number of tales, includes a photograph of its editor, Miss Faithfull, and a portion of a serial, by Emilia Aylmer Blake (Mrs. Gowing), entitled "My Only Love."——A new edition for 1879 of "Sprague's Pocket Diary and Architects' and Surveyors' Memorandum Book" has been issued, containing their well-known tables, &c., which have been extensively used for the last ten years by surveyors. The present edition has undergone revision, and much valuable matter has been added, under the editorship of Mr. E. Wyndham Tarn.

Miscellanea.

The Building Trade.—A meeting of the Lincoln Master Builders' Association (a branch of the National Builders' Association of Great Britain) was held during the week, to take into consideration the question of a reduction in the wages of workmen in the various branches, and an increase in the hours of labour. After a discussion, it was unanimously resolved that notice to this effect should at once be sent to the representatives of each branch—carpenters and joiners, masons and bricklayers; such notice to expire according to the agreement made between the operatives and employers some time since. By this arrangement the alteration, so far as regards the masons, will take place at the end of three months from the time the notice was given; the carpenters, joiners, and bricklayers six months. In taking this step the Lincoln master builders are only following the example of other employers in large towns, and it is satisfactory to note that in many instances the men have promptly met their employers in the matter, well knowing that under the present general depression in trade some concession must be made to induce building operations. The Lincoln master builders have for some time been labouring under a great disadvantage. Paying a higher rate than firms in surrounding towns, their inability on this account to compete with contractors from those places has led to important works being placed in other hands, thus creating a greater local depression than would otherwise exist. This being the case, and as it is not for a moment to be supposed a Lincoln man would work for a stranger at less wage than he would for an established Lincoln builder, the right course would apparently be to promptly arrange a meeting between employers and employed, and boldly face the difficulty before the new year.

Smithfield Club Cattle Show. — The show will close this Friday, December 13th. The machinery and implement departments constitute a most interesting exhibition of themselves; and so great is the continued increased demand for space that it is in contemplation on the part of the Agricultural Hall directory as to whether they may not be compelled to enlarge the premises by the introduction of an annexe on the north side of St. Mary's Hall, utilising for the purpose an outbuilding and a small piece of land they still possess unoccupied in that direction. The galleries are replete with novelties in agricultural implements. The St. Pancras Ironwork Company is the only firm who show any fittings for cow-houses, and they exhibit several different designs of their improved sanitary iron fittings for cattle-stalls and piggeries. These are designed after the recommendations of scientific and practical men, and while dispensing with any complicated arrangements, are strong and safe for the beasts, and calculated to prevent waste of food and any spread of contagion. Their system of water-supply and general arrangements for cleanliness are well thought out. Their patent piggery fittings are also strong, simple, and efficient. Their exhibits at the Paris Exhibition obtained a silver medal.

"Art in Landscapes."—This was the title of a paper read by Mr. William Neilson on the 4th inst. before the Edinburgh Photographic Society. The author laid down two propositions,—first, that art was not an imitation of Nature; and second, that pictorial grandeur depended wholly on shades. Shades, he said, were the great essentials in a picture, while, of course, there must be dominant and other lights; but these could not be wrong if the shades were right, seeing that they existed as cause and effect. The photograph did not represent nature. In nature they saw nothing sharp, while in the photograph they saw the sharp edges of a razor, and nature did not like razors. What he advised the photographer who wished to make a picture to do was, after having got as strong a foreground as possible, to study his view in a salient light, and find what arrangement of shades would most bring out its main features, and let non-essentials look after themselves.

Signs of the Times.—A sale of timber and woodwork at the Millwall Docks, on the 11th inst., included some thousands of bundles of "hand-made plasterers' laths," and about a thousand 1¼ in. and 1½ in. deal doors, all from Gothenburg, ready to hang.

Sale of Building Stances in Edinburgh. On the 2nd inst. several building stances, belonging to the Corporation of Edinburgh, were disposed of by public roup. The first lot, consisting of an area in Royal-crescent (between Nos. 10 and 14), containing stances for three houses, and measuring 78 ft. in front, was sold at the upset annual feu-duty of 22*l.* 10*s.* to Mr. Alexander Robertson, builder, Summerbank. Lot No. 2, fronting the public road from Broughton to Canonmills, measuring 170 ft. in front along the road, with an average depth of 115 ft. from front to back; having also a frontage of 54 ft. towards a street proposed to be formed from the public road to Scotland-street, was acquired by Mr. Robert Paterson, jun., on behalf of the Edinburgh School Board, for the upset annual feu-duty of 9*s.* per foot of frontage to the public road, and 6*s.* per foot of frontage to the proposed new street. Lot 3, immediately to the south of part of the first-mentioned area, being the corner formed by the public road and the proposed new street, of an average width of 55 ft. towards the public road, and an average depth of about 95 ft. from front to back, was purchased at the upset annual feu-duty of 24*l.* 15*s.*, by Mr. J. B. Wemyss, architect, Leith, on behalf of the German congregation in Edinburgh, who propose to build a church on the site.

Doctors and Architects.—At a meeting of the members of the Gloucestershire branch of the British Medical Association, Mr. F. W. Waller read a paper showing how the medical and architectural professions could work together for the public good. He pointed to the important aid the medical profession could render the architect in designing and constructing public institutions and private dwellings, more particularly those of the middle and lower classes, in devising the best means of providing good sanitary arrangements. If the two professions could be got to co-operate for this end, the architect would be able to make health conditions an essential of his plans. Among the means suggested by Mr. Waller for carrying out the co-operation suggested were the interchange of professional books and periodicals, and the arrangement of meetings between the two professions.

Liverpool Master Builders' Association. The twelfth annual report of the Liverpool Master Builders' Association has been published, together with a report of the dinner held at the Adelphi Hotel, Liverpool, in November. The report says:—During the year a National Association (a combination of local associations) has been formed, for the purpose of assisting local associations, and acting as one united body in all trade matters. Thirty-seven associations have joined, representing the principal towns in Great Britain, and have appointed as secretary the secretary of the Association. This Association has already experienced the benefit of its alliance with the National Association, especially in connexion with the Painters' Strike.

A Cornish Genius.—Neville Burnard, the Cornish poet and sculptor, has died in the Redruth Union sixty years old, and been interred in a pauper's grave. The *Western Times* says, as a sculptor he possessed great ability and taste, and gave a correct life-like appearance to his works. The bust of the Rev. H. Rogers, late rector of Camborne, in the parish church, and that of the late Dr. George Smith, in the Wesleyan Chapel, in the same town, were chiselled by his skilful hand, and are remarkable for the perfect resemblance they bear to the gentlemen mentioned. As a poet he displayed a deal of thought and satiric witticism, and has enjoyed the company of many literary men of the present age.

Royal Albert Hall.—An exhibition of works of fine art is about to be opened here. A large number of pictures and drawings have been sent in, and a committee of selection has just begun work.——Mendelssohn's "Hymn of Praise" and Rossini's "Stabat Mater" were given with great *éclat* on Thursday, the 12th inst., Mr. Barnby conducting. Madame Sherrington, Miss E. de Fonblanque, Mr. Edward Lloyd, and Mr. R. Hilton were the exponents, with chorus and band numbering 1,000.——Arrangements are being made to illuminate the hall by means of the electric light. It will be an important experiment.

The City Architect, Mr. Horace Jones, was, at the meeting of the Court of Common Council on Thursday, granted four months' leave of absence, on the ground of ill-health.

Decorated Artists.—The following English artists, architects, and sculptors, whose works figured at the Exhibition, have received decorations:—Mr. Millais, Sir F. Leighton, Mr. Barry, Mr. Alma Tadema, and Mr. Gilbert Redgrave have been appointed officers; and Sir John Gilbert, Mr. P. H Calderon, Mr. J. Arnoux, Mr. W. P. Frith, Mr. J. Collier, Mr. Carl Haag, Mr. Street, Mr. Calder Marshall, and Count d'Epinay have been appointed Knights of the Legion of Honour. In addition to these, about eighty commissioners, jurors, and exhibitors have received different grades of the Legion of Honour.

Mr. Lascelles has received the Cross of Chevalier of the Legion of Honour, by post, from Paris, with a note, signed by M. Waddington, informing him it is for his exhibits in the late Exhibition.

Mr. Forster Graham, of the firm of Jackson & Graham, has received the Cross of the Legion of Honour, the firm having previously received the *Grand Prix* in the furniture classes.

Mr. Joseph Ruston, of the firm of Ruston, Proctor, & Co., of Lincoln, has received from the President of the French Republic the Cross of the Legion of Honour.

A Church Destroyed by Fire.—On Monday morning the parish church of St. Peter's, near Bridgwater, Somerset, which was re-opened on Easter Tuesday by the Bishop of Bath and Wells after undergoing a restoration at an expense of nearly 1,500*l.*, was entirely destroyed by fire. The fire originated in an over-heated flue, which ignited a portion of the roof. In a few hours nothing but the bare walls of the building and the tower remained. The peal of six bells, which were remodelled and rehung last Easter, came down one after another with a crash, and were smashed to pieces. Only the chancel portion of the edifice was insured.

Welbeck Abbey, near Worksop.—The gardens and pleasure-grounds here are so extensive that it would be impossible to see them thoroughly in a day. There are fifty acres of pleasure-grounds. The kitchen gardens cover an immense area of ground, and produce every kind of fruit and vegetables. A wall 1,200 ft. in length, has been covered with Rendle's patent lean-to glass, to hasten the ripening of the apricots. This arrangement is also used to protect the strawberry beds, on the opposite side of the path, and which are exactly as long as the wall. Most of the fruit is sent away to London, in the form of presents.

The Sewage Question at Rochdale.—To prevent the further pollution of the Roach, and to comply with the provisions of the Rivers Pollution Act, the Rochdale Town Council have instructed Mr. R. Vawser, civil engineer, Manchester, to complete the necessary plans for intercepting and purifying the sewage of the borough. As the works will be very extensive, the plans cannot be got ready for some time.

Mr. and Mrs. German Reed's Entertainment.—On this Saturday, 14th, Mr. Arthur Sketchley will give his last reading of "Mrs. Brown." On Monday next, December 16th, will be produced a "Musical Fairyauza," entitled "Enchantment," written by Arthur Law. "A Tremendous Mystery" still retains its place in the programme, and Mr. Corney Grain, all will be glad to hear, has a new musical sketch in preparation for the Christmas holidays.

Protection of the City from Fire.—The *City Press* states that a plan has been agreed upon between a committee of the Corporation and the Metropolitan Board of Works, to be submitted to the next Court of Common Council, by which it is proposed that the 900 hydrants in the City will be supplemented by thirty-five hose stations, properly manned day and night.

Sunderland.—An application has been made to the Local Government Board for power to borrow 26,000*l.*, for an extension of the drainage system of the borough; and Parliamentary plans have been deposited for the construction of about six miles of tramways by the corporation, the plans for which were prepared under the direction of Mr. Christopher Thwaites, C.E., the borough engineer and surveyor.

Memorial Glass.—The friends of the late Dr. Livingston, the African explorer, will be pleased to hear that a memorial is about to be erected to his memory in Westminster Abbey. With the consent of Dean Stanley it will take the form of a stained-glass window. The commission has been placed in the hands of Mr. W. F. Dixon.

The Artisans' Dwellings Act.—In the House of Commons, on Monday, Mr. Cross, the Home Secretary, in reply to a question by Sir U. Kay-Shuttleworth, promised to arrange with the hon. member for the presentation in a return of information with regard to the towns where an official report under the Artisans and Labourers' Dwellings Act, 1875, had been made, and no action taken upon it.

TENDERS

For erecting two detached corner houses on the Gunnersbury Estate, for Mr. A. Bassano. Mr. Richard Tomlinson, architect. Quantities supplied :—

F. Taylor	£3,520 0 0
Johnstone	3,469 0 0
Niblett	3,273 0 0
Taylor	3,173 0 0
Stephenson	3,121 0 0
Shapley	2,880 0 0
Taylor & Son	2,850 0 0
Parker & Evans	2,800 0 0
Keefe (accepted, subject to alterations)	2,492 0 0

For finishing Bellevue House, Heathfield-gardens, Gunnersbury, for Miss Edwards. Mr. Richard Tomlinson, architect :—

Johnstone	£350 0 0
Ireland (accepted)	270 0 0
Bailey	250 0 0

For the erection of schools and mission-hall, in Sutton-lane, Chiswick, in connexion with Trinity Church, for the Rev. Wm. Frith. Mr. Richard Tomlinson, architect. Quantities supplied :—

Barnes (accepted)	£463 0 0

For finishing detached house in Brandenburgh-road, Chiswick. Mr. Richard Tomlinson, architect. Quantities supplied:—

Johnstone (accepted)	£263 0 0

For shops and residences, Aldershott. Mr. T. Wonnacott, architect :—

Cranston	£7,230 0 0
Mesher	6,576 0 0
Hughes	6,471 0 0
Stephens & Bastow	6,434 0 0
Jones & Co.	6,091 0 0
Kemp	5,518 0 0
Duke & Fowler	5,500 0 0
Garland	5,293 0 0

For two iron cisterns at Rotherhithe. Messrs. H. Saxon Snell & Son, architects :—

Potter & Sons	£516 10 0
May Bros.	535 0 0
Perry & Co.	512 0 0
Berry & Sons	505 0 0
Benham & Sons	501 10 0
Turner & Co. (accepted)	487 0 0

For the erection of nine houses and shop at Hornsey. Mr. Wm. Hussey, architect. No quantities :—

Keefe	£2,941 14 0
Niblett	2,634 0 0
Beach Bros.	2,500 0 0
Somerville & Hill	2,490 0 0
Foster	2,469 0 0
Cross	2,450 0 0
Willmott & Sons	2,360 0 0
Taylor & Co.	2,310 0 0
Marriott	2,210 0 0
Riley	2,073 0 0
Ellis & Edmondstone	2,060 0 0
Cousin	1,997 0 0
Waite & Son	1,995 0 0
Hobern	1,960 0 0
Eady	1,950 0 0
Warr	1,890 0 0
Manning	1,850 0 0
Porter & Abrahams	1,800 0 0
Sims	1,787 0 0
Prout	1,775 0 0
Heather	1,632 10 0
Freeman	1,575 0 0

For additions to the Lodge at Fisherton Cemetery, Wilts, for the Fisherton Burial Board. Mr. F. Bath, architect :—

Newton	£120 0 0
G. Harris	101 12 6
Kite	95 6 0
With	93 8 0
A. Harris (accepted)	80 10 0

For the erection of Board Schools, play-sheds, boundary walls, &c., in Wharf-lane, Shelton, for the Hanley School Board. Mr. W. A. Keates, architect. Quantities supplied :—

Collis	£3,630 0 0
Yoxall & Heath	3,400 0 0
Barlow	3,395 0 0
Redfern	3,325 0 0
Corns	3,250 0 0
Gallimore	3,235 0 0
Jukes & Weston	3,215 0 0
Grosvenor	3,200 0 0
Meadon	3,050 0 0
Emery	2,995 0 0
Clarke	2,940 0 0
Windsor & Co.	2,920 0 0
Ellis	2,870 0 0
Matthews (accepted)	2,698 0 0

For new Temperance Hospital, Hampstead-road. Mr. Barker, architect. Mr. Abbott, surveyor :—

Tarrant & Son	£11,940 0 0
Tyerman	11,872 0 0
Nightingale	11,772 0 0
Brass	11,633 0 0
Nash	11,550 0 0
Langmead & Way	11,500 0 0
Perry	11,465 0 0
Grover	11,450 0 0
Roberts	11,098 0 0
Downs & Co.	10,390 0 0

For alterations, &c., at King-street, Grosvenor-square, for the Earl of Breadalbane. Mr. Beazley, architect. Mr. Mullett, surveyor :—

Knapp & Co.	£1,249 0 0
Tongue	1,131 0 0
Adamson	1,121 0 0
Langmead & Way	1,120 0 0
Nightingale	1,073 0 0
Pope	1,047 0 0

For sundry works in finishing, at Tolmers-square Congregational Schools, Drummond-street, Hampstead-road. Messrs. Tarring & Wilkinson, architects :—

Joiners' Work, &c., in Preparing for Glazing.

Morley	£195 12 6
Veitch & Close	153 10 0
Auley	135 0 0
Bebington	114 0 0

Glazing.

Ramsey	127 12 8
Bussell Gibbs & Co.	122 10 0

For the erection of infirmaries, probationary wards, and other works, at the District Schools, Brentwood. Messrs. Lee & Smith, architects. Quantities by Messrs. Linsdell & Giffard :—

Nightingale	£19,657 0 0
Hunt	19,200 0 0
Bangs	18,980 0 0
Sawyer	18 888 0 0
Perry & Co.	18,500 0 0
Greenwood	18,490 0 0
Forrest	18,385 0 0
Goddard	18,164 0 0
Hayworth	17,748 0 0
Smith	17,747 0 0
Beale	16,862 0 0
Jones (accepted)	16,459 0 0

For the erection of a pair of semi-detached houses at Elm-grove, Salisbury, for Mr. S. Curtis. Mr. F. Bath, architect (exclusive of smith, plumber, painter, glazier, gasfitter, and bellhanger's work) :—

Tryhorn	£630 0 0
Sawkins & Mist	550 0 0
Young & Sons (accepted)	480 0 0

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We are compelled to decline pointing out books and giving addresses.

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N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.

The Builder.

Vol. XXXVI. No. 1872. Saturday, December 21, 1878

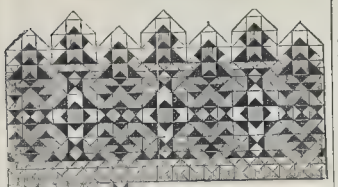
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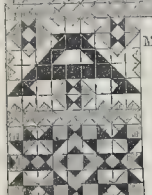
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Three Furniture-Books.





AMONG recent new purchases for the library of the Institute of Architects, we observe that there have been acquired original copies of the illustrations of furniture design by Chippendale, Heppelwhite, and Sheraton; books dated respectively 1755, 1788, and 1801. We were rather surprised to observe, from seeing these entered as recent purchases, that they were not previously among the possessions of the library, for they were all standard books in their day, and have a considerable historical interest, at all events. At present, they will be considered by many to have an interest of a more directly artistic nature, for they represent the original development of the style of furniture which has recently been again brought into fashion, and by the numerous votaries of the present fashion would no doubt be regarded as so many Sybilline books of the furniture-designer and decorator, not to be mentioned without a very considerable respect and veneration, as the authorities for the true typical and normal forms of furniture design. As we are not under the influence of fashion, but rather have studiously endeavoured always to contemplate its whirligigs from an outside stationary point of criticism, we can view these sacred books with an impartial judgment; and it may be worth while to look through them in this unbiassed spirit, and consider what they are really worth to designers of the present day.

Chippendale's book is a handsome folio, got up in the solid and permanent-looking style in which books were brought out when they were not so numerous as now; the letterpress in large clear type, the paper thick, the diagrams executed with the best skill available, probably, at the date of publication. It bears the title, "The Gentleman and Cabinet-maker's Director: a Collection of Designs in Gothic, Chinese, and Modern Taste." The title is odd both in the rather ungrammatical construction of the first sentence, and in the prominence given to the "Gothic" and "Chinese" designs in placing them first in order, though in fact the designs so termed are a small portion of the whole, the greater part of which is professedly in "modern" taste; *i.e.*, the taste borrowed from the French of the previous generation and imported with some little modification into this country. Chippendale obviously thought he was doing a work of considerable importance to the world at large in bringing out his book, and sets about it in a spirit and with a dignity becoming so important a task. "I have," he observes, "been encouraged to begin and to carry on this work not only (as the puff in the play-bill says) by persons of distinction, but of eminent taste for performances of this sort, who have upon many occasions expressed some surprise and regret that an art capable of so much perfection and refinement should be executed with so little propriety and elegance." Though he owns to "patrons" (the inevitable accompaniment of a new book in the last century), he is careful thus to let the reader know that he values them for their taste, not for their rank, according to the proper spirit of an artist. He is also sedulous to maintain the practical suitability of his designs. He has given nothing, he says, that may not be executed by an able workman, though "some of the profession have been diligent enough to represent them (especially those after the Gothic and Chinese manner) as so many specious drawings, impossible to be worked off by any mechanic whatsoever." And it may be said in credit to Chippendale's excellence in regard to manufacture, that probably the jealousy here referred to really arose from a dislike to the careful and delicate execution and putting together of the parts which these designs of Chippendale's involved, at least as carried out by himself. His preface, however, deals with more serious matters than these, for he proceeds to lay down the proportions and details of the Five Orders, without a due regard to which no such book of designs could be carried out, as they formed "the very soul and basis" of the art here illustrated. In Chippendale's time the Orders were of course regarded *nem. con.*, as the very soul and basis of all decorative or architectural art whatsoever; indeed, one would hardly be surprised to find they were regarded as the basis of law, or medicine, or any other abstract study, in such reverence were they held. But the amusing part of it is, that after all this parade of them, they hardly play any part in the designs at all; for it is really one point to the credit of Chippendale's work, that whatever its æsthetic faults, it was pure furniture design for the most part, with very little mimicry of architecture imported into it; and in cases where there is something like architectural detail based on "the Orders," it is mostly, considered in an architectural light, very poor, and with no appearance whatever of having proceeded from a detailed and conscientious study of architectural examples.

Even after the Orders are drawn out, however, and described, there is something else to be done before we can get fairly to work with the furniture. Our good Chippendale is most anxious that those who use his book as a text-book for furniture designs should understand the method in which the objects are represented in perspective, not only that they may properly understand his drawings, but that they may be enabled in making their own designs to go and do likewise. To this end, however, he does not go into the general theory of perspective, but he gives successive examples how "to draw a book-case in perspective," "to draw a chair in perspective," as if each object were a special problem in itself, instead of being merely a slightly varied application of the same method. In some of the succeeding drawings, unfortunately, Chippendale's application of his own principles is not much more fortunate in regard to perspective than in regard to the "Orders," for most of his chairs are wrong in the perspective of the legs, the further pair appearing in nearly every case too far from the eye, and improperly foreshortened in their curves.

We come now to the practical part of Chippendale,—the actual designs, commencing with chairs. The characteristic form of these chairs is well known; they are marked by a predominance of curves very carefully and delicately worked out, and requiring both good material and careful workmanship to render the furniture sufficiently strong and durable, in spite of its apparently fragile nature and its weak lines. The general design of the chair-legs, however, is very good, if we put on one side the impropriety of such sinuous lines in the part of the furniture which has most weight to bear, and ought, therefore, to be strongest: the greatest thickness is where it should be, at the juncture with the seat frame, and this juncture is very well managed so as to produce an easy transition from the horizontal line of the seat to the vertical lines of the supports, the leg expanding into a kind of shoulder (or perhaps one should rather say, thigh) at this point. The mistake of nearly all the designs, however, is in over-ornamenting the legs; Chippendale seems to have thought them an opportunity for the display of all kinds of fancies in carving and other ornament; he, indeed, draws nearly every chair with two different or alternative legs, so as to allow a choice; and the result of his over-ornamenting is that all the appearance of strength they might have had in spite of their sinuous lines and thin proportions, is taken away, and they appear flimsy and gimcrack when regarded as supporters of the weight of the chair and its occupier. Among the chairs of his own style on which the author most prided himself, are some which he calls "ribband-back chairs," the meaning of which is merely that the greater portion of the back is formed by open woodwork carved as intertwined ribbands; of one of these he declares that he may say, "without vanity," that it is the best chair he ever saw, "and perhaps the best that ever was made." That the workmanship was such as he might fairly have prided himself upon is probable; but the design is unquestionably weak and unsuitable for its object, and represents a misapplied ingenuity. He goes next to "French chairs," which are mostly more solid in appearance and better designed in the leg, than those of his own favourite model; the majority of these are arm-chairs with one arm only, a variety which has not received much favour, as far as we have observed, at the hands of modern restorers of the furniture of this school, but which is certainly a very elegant and characteristic form of seat, remarkably civilised in appearance, suggesting the easy and unembarrassed lounge in the seat of persons

who are quite at their ease and know how to sit gracefully and not squat formally in the centre of the seat. What Chippendale calls "Gothic" chairs form quite a joke from our present point of view; it is impossible to make out what single detail in them Chippendale imagined to be "Gothic" in character. In fact, to modern eyes they seem to differ little from the style of the other designs; but Chippendale evidently thought there was a marked peculiarity of style in these designs, as he specially calls attention to them as likely to be of use to those who are "not accustomed to that style of work." His Chinese chairs are Chinese chiefly in virtue of a certain amount of open work in the backs and legs rather resembling Chinese pierced ivory work on a large scale. The general shape of these chairs is good; in general better than those of Chippendale's own model.

The four-post beds represented are truly terrible erections, heavy and ponderous, and finished above the tester with great ungainly scrolls. In his library-tables, and other rather light tables, Chippendale is at his best, they are thoroughly suitable for their purpose in design and construction. The "French commode tables," also, illustrated further on, are, indeed, all curves and sinuosities in every direction, but there is consistency and unity of design about them, and the curves seem to grow naturally from one another. But in sideboards Chippendale loses this consistency entirely; he wants to make them solid and ponderous, and then he sticks a bit of filagree in the angle between the legs and the top rail, which has nothing whatever to do with the rest of the design. In one of the designs for a clothes-press this inconsistency of detail is still more flagrant, for we have a solid, heavy, square box, totally unornamented, supported by legs of light, open, carved work. It is curious how persistently he comes back to curves, in each class of article, as the *ne plus ultra* in furniture design. In the plates devoted to library-tables and clothes-presses, he commences in each case with simple square forms and straight lines, such as are really most suitable for woodwork, but in each case the progress to more elaborate designs is marked by an increase of twisted surfaces, till we arrive at the culmination in a thing that is all curves, and nothing else. The bookcases are mostly suitable for their purpose, and are necessarily kept more to straight and upright lines; it may be noticed that they all, without exception, terminate above in a pediment broken in the centre, generally with a small pedestal for placing a bust on: this seems to have been a *sine qud non* for a bookcase design.

Heppelwhite's "Cabinetmaker's and Upholsterer's Guide," published thirty-three years after Chippendale's work, also commences with chairs, the successful design and manufacture of which has always been one of the chief objects of the cabinetmaker's art. The chair is not only the most indispensable and most frequently used article of sitting-room furniture, but it is also the only one in which it is indispensably necessary to consider its convenience for being easily moved and lifted about, as well as its appearance. It is this fact which makes the chair so characteristic an indication of the society which uses it, in regard to those times at least when the taste and choice indulged in were really those of the society of the day, and not imitated from a former epoch. In this respect the chairs of the last century are peculiarly the furniture of the epoch, suitable to an exclusive society that was polished, refined, and graceful in manners; accustomed to handling fragile things with care and delicacy; mobile and vivacious, and not given to sitting long in one place. The chairs of the period are just suitable for this kind of society: light and easily moved, elegant, but in a rather luxurious and effeminate taste. And Hepplewhite's chairs are models in this way, and superior to Chippendale's. They are less ornamented, and their ornament is more suited to its position; the legs appear more intended to do their work, and the backs are designed in a very suitable and elegant manner. His favourite pattern of a light chair is one in which the back appears as an almost separate design carried upon a prolongation of the hind legs of the chair above the seat: it does not look as if it were meant to bear a heavy person to lean back in it very safely, but then these are not chairs meant for heavy people: these are sprightly conversational chairs, to be easily moved where you will at the convenience of a ceremonial caller who wants only a coign of vantage from which to talk civil nothings for a few minutes. Everything in these chairs is subordinated to the mere provision of an elegant temporary seat; there is no lounging any way in them; all the lines fall away from the seat every way; it is a chair to sit upright and to be witty on, and would contribute nothing to the wishes of that sad young man in Ben Jonson's play, who asks for a seat "to be melancholy upon." Heppelwhite, however, shows a larger pattern of chair with a broad square seat and a wide back, the back formed (so far as design is concerned) by the two hind legs continued up and brought round to meet each other in a curve and then interlaced. This is an admirable chair in regard to design and construction, simple and suitable, strong enough to last for a long time and yet sufficiently light for convenience. It is less to Heppelwhite's credit that he seems to have invented that terrible article, the hall chair, with the high wooden back and flat wooden seat, which in its main features remaineth unto this day in many houses. Indeed, it must have been difficult to ensure any use being made of such an instrument of torture, such as would be sufficient to wear it out in a reasonable time. The backs of these machines are mostly carved in low relief with festoon ornaments, and in one case they represent, with an extravagance of bad taste, the *silhouette* of a funeral urn and its drapery, squeezed flat so as to appear in outline only. Urns seem to have been a little on Heppelwhite's mind, in fact, as he uses them on another page for knife-chests. He is more reasonable and logical when he comes to sofas, and such drawing-room lounges, for there are several types under various names. Of these, the "confidante" is very characteristic, consisting of an ordinary sofa in the centre portion, with the addition of a seat placed angle-wise at each end, so that the person occupying the angle seat can talk to the next occupant of the sofa a little apart, and with faces turned away from the other occupants. It is worth notice that all the sofas are for sitting on merely, there is no sofa for a regular comfortable lying down, such as is in so much request now in the private sitting-rooms even of young men, as well as of ladies. It would seem that society in those days, with all its elegance of *ancien régime*, was, in fact, much less self-indulgent than at present, and had no provision for regularly lying down, except when one was ill enough to keep in bed.

In the matter of beds, Heppelwhite is again much superior to Chippendale, in that his furniture of this kind is much simpler and less pretentious; but it must be admitted that the more ornamental his beds become, the worse they are in point of design and good taste. In other specimens of bedroom furniture, such as chests of drawers and washing-stands, he is excellent, and it would be difficult to find furniture of this sort more simply, tastefully, and suitably designed for its purpose than some of these articles illustrated here. In some other small varieties of drawing-room and sitting-room furniture he displays also great elegance of design, more particularly in his candle-stands designed in thin branching lines curving easily from a central stem, in a manner far more directly derived from Nature than is usual in the ornamental art of the last century. His forms of girandoles, for carrying lights combined with a mirror fixed against the wall, are also very elegant, though much more artificial and conventional in style. The urn-stand is a pretty little bit of furniture which has passed out of use, now that people no longer care about having their tea hot. Among other articles, Hepplewhite's form of the cellaret, or *garde-de-vin*, is worth notice, as it is much more practical in shape than those generally in use now. It is a circular or octagonal locker supported on legs, and takes the same number of bottles in less space than a square or oblong coffer, besides that it has a characteristic shape and appearance, and cannot be mistaken for anything but what it is.

A study of Heppelwhite's designs leads to the conclusion that he was really much in advance of Chippendale as a designer of furniture, and that the name of the latter has occupied a central place in the estimation of revivers of furniture of the last century, to which it is not fully entitled.

Sheraton brings us to the commencement of the present century. His book, dated 1801, and called "Designs for Household Furniture," shows a marked decadence in taste and in the feeling for consistency of style and design, as compared with Heppelwhite. His mind seems to have been much exercised with the draping of window curtains, the first plates of his work being devoted entirely to designs for festoons and loopings, one of them being described as "a grand design in honour of the immortal Nelson," whose portrait occupies the centre of the window cornice, while a sail with a proper "bolt-rope" in the hem is festooned below it, and ropes and anchors hung in the curtain-folds, while tridents rise to meet them from below. Whatever the vulgarity of the taste displayed, this and the design for "Nelson chairs" in a subsequent page of the book, are very interesting as indications of the place then filled in the public mind by England's beloved naval hero, the favourite especially of the people. Sheraton's furniture is much more solid in proportion than that of his predecessors, it might even be called heavy, though sometimes rich in effect; but the detail is somewhat vulgar, and he is too fond of the continual repetition of certain fancies, such as lion's claws for feet, or at least claws of some kind, for in general they can hardly be said to resemble very much the claws of any living thing. There is a want of consistency in his treatment of different parts of the same object; not more marked, perhaps, than in some of Chippendale's designs, but in a different manner. His sideboard designs, for example, are for the most part heavy; but he discards the solid backing to them, and places an open, light, ornamental railing only as a back to the main shelf, which looks flimsy and unsatisfactory in comparison with the rest of the design. One sideboard, however, is very effective, if a trifle pretentious; the plan of it expands into a three-quarter circle at each of the angles next the room, and over this portion rise two or three tiers of circular shelves around a central stem, which would give opportunity, of course, for a brilliant arrangement of plate or ornamental glass in pyramidal towers, as one may say, flanking the centre of the sideboard; but such a design could only be fitly used in a very large and handsomely furnished room, otherwise it would merely look vulgar and pretentious. The centre of the back of this sideboard, by the way, is occupied by one of those circular convex mirrors which it has been a fashion to revive of late, and which is here really effective, as it would reflect and reinforce the glister of the articles which the sideboard is intended to display. Sheraton is fond of working circles into his design in an unexpected manner. There is one for a sofa, in which the bed of the sofa is stopped by large cylinders, crosswise, at each end, the upper circumference of which form the cushions for the head of the occupant, the lower the *appui* for the legs of the sofa; the centre of each cylinder facing the front being occupied by a griffin's head which carries one end of a series of little festoons that are draped along the front of the sofa from end to end as a decoration. The whole thing is effective, though looking a little too much as if it was meant to be so. Sheraton is also clever and ingenious in his adaptation of a circular section to various forms of ladies' worktables and writing-desks; and there is one called "A Sisters' Bookcase and Writing-table," in which a small bookcase facing two ways is mounted upon a cylinder, which also opens both ways as a double writing-table; to make it more graphic, the "sisters" are thrown in,—two young ladies, with the small bunches of curls on their temples, and the high waists, of the period. Sheraton is always best in designing objects where a certain degree of weight and solidity are required; for instance, his dining-room chairs are mostly very good; but grace and elegance without pretence he had no conception of, and his "handsome" drawing-room chairs are odious in their vulgarity and ostentation. His idea of a "Gothic" candelabrum is (of course) as wonderful as Chippendale's idea of a Gothic chair; and his beds are simply masses of curtains and festoons, under which all form and construction are smothered.

If we compare the furniture designs shown in these books with what is now to be seen at the leading furniture-shops, and with books of design published more recently, we shall find that on the whole they bear comparison very fairly. There are better-designed articles, in truer taste, to be had now from good makers, than perhaps any that are to be found in these books, except a few of Heppelwhite's; but, on the other hand, there seems to have been in the practice of both Chippendale and Heppelwhite a more general unity of aim and taste than we can find anywhere at present: we have collec

tions of things in very various taste, and designed on very various principles. In regard to workmanship, it is more than probable that we can hardly get anything as good and as careful as Chippendale's work now, except by taking very special steps to secure it. As books of furniture design, it is probable that Heppelwhite, on the whole, has fewer faults and more to recommend it, than most, if not any, modern books of the kind. Certainly, some books of design of Gothic furniture which were brought out when Gothic feeling was at its height, are no more beautiful, and far more inconvenient and unsuitable, than the general run of designs in the books we have been speaking of; and in the furniture of modified Gothic feeling, which is often to be found now, there is a squareness and heaviness which is more suitable, certainly, to execution in wood, than the voluptuous curves of Chippendale's furniture, but which a future generation will probably regard as ungraceful in appearance; just as we now, having in some respects certainly a more robust and healthy taste in decorative art than prevailed in the last century, regard the furniture of that date as deficient in mass and solidity of design, notwithstanding its frequently unquestionable elegance.

THE FOURTH CENTENARY OF TITIAN'S BIRTH.

Some weeks ago, when describing the celebration of Giorgione's fourth centenary, we had occasion to announce for the end of this year the unveiling of the statue of Titian at his native place, Pieve di Cadore. Born in the same year as Giorgione, it had been originally determined to celebrate in the same year the fourth centenary of the birth of the great master of the Venetian school. But within a short time a sad announcement of the destruction of the mould (the statue was to have been in bronze) in the course of its casting, has obliged the interesting ceremony of the unveiling to be indefinitely postponed.

Great disappointment has been, as might be imagined, expressed, but among the numerous admirers of the great painter, there have not been wanting those who have made the pleasant pilgrimage to the place of his birth, situated in the most beautiful portion of the Cadore Alps, and but a few steps, comparatively speaking, from the great high road of the gorgeous Ampezzo Pass, the rival of the Brenner in the old days, and still considered by the traditionalists as the most impressive entrance into Venetia and Northern Italy.

It is not our intention to do more than refer at present to the quiet little village of Pieve di Cadore, the birthplace of Titian, where still exists, almost untouched, the house in which he was born.

On the road to Pieve, approaching it either from Venice, or after leaving it on the road thither, one traverses the whole country in which Titian passed the happiest years of his life, and when the traveller, supposing he is visiting the Cadore hills from Venice, has left behind him the city from which we are at present writing, he soon reaches the picturesquely-situated town of Conegliano, with all its gentle memories of Giambattista Cima, called hence da Conegliano, recalled in the glowing frescoes still in excellent preservation on the exterior of the houses; while the old castle, the fortifications, and the distant ruins of the Mediæval Castello di San Salvatore, speaks of the warlike fame of the town in the days gone by,—days when the renown (still kept up) of the wine of Conegliano was universal throughout Italy, and even Germany.

But, arrived at Conegliano, the traveller to reach Titian's country must rumble in a *diligence* through the streets of the town, and pass on by the tree-bordered and well-kept high road to the antique town of Ceneda,* and now approaching the first spurs of the Alps, enter the narrow valley, between the precipice of which foams the Meschio, and passing under the gray and crumbling tower of King Madrucco,—a weird and spectral sentinel, as it were, of the Middle Ages,—enter the war-battered town of Serravalle, in whose piazza still stands the flagstaff of the Venetian Republic, and over the gateway of whose town-hall still may be discovered in a mutilated condition the winged lion of St. Mark.

And now at last we are in Titian's country; in the church of St. Maria may still be admired a famous altar-piece already more than once described, and whose authenticity is proved, not alone by the name written on it, but by the records, preserved, of an interesting dispute engaged between the painter and the governing body of the church, a dispute which lasted six years, occasioned by their desire to see substituted, and without extra charge, the St. Peter for the St. Vicenzo.

It is with no small degree of pride that the Serravallesi tell one of Titian's long sojourn in their town, and how he married his beautiful daughter Lavinia to a native of the place, Cornelio Sarcinello. From the marriage contract of March 20th, 1555, still existing, but which, alas! we have not been able to see, doubtless a superb specimen of the then still flourishing art of illumination, we learn that the dowry was 2,400 ducats,—a sum corresponding in the present day to little more than 300*l*.

Lavinia, Titian's beautiful daughter, was born, as is well known, in 1530, after her brother Pomponio and Orazio; the former's bad conduct sadly embittered the great painter's latter days, though he was through his influence placed high in the Church; the latter, Orazio, his father's pride, died in the prime of life. Titian dearly loved his daughter Lavinia, whose beauty numerous engravings by Hollar and others have made familiar to the world, from the well-known pictures at Dresden, in the Louvre, and in the Barberigo collection at Venice. To the painter's grief, his Lavinia, after having borne him six grandsons, died when only thirty years of age.

The Sarcinelli family possessed in times gone by numerous documents, portraits, and sketches by their famous relation,—treasures long since, horrible to relate, employed as fuel for the kitchen fire. The house in which Lavinia lived,—belonging at present to the Carnieletti family, we believe, who still with rare courtesy show one a Venus painted by the master, and a few documents saved from the general destruction,—is one of that characteristic type of the Lombardesque architecture which has left such a lasting impression on the towns of the Venetian *terra-firma*, showing at the same time the past prosperity of Serravalle at a time when it was the emporium of all the goods coming from or going into Germany, or, when prospered, among various other branches of industry, a renowned manufactory of arms.

Intimately connected thus, as is the town of Serravalle, with the domestic life of the greatest probably of all painters, the surrounding country is no less interesting from its being hallowed, so to speak, by the long residence of Titian.

It is not along the Strada d'Alemagna, the antique but well-kept road into Germany, through mountain gorges, down which, in this season, dash more than one foaming torrent,* or past the mist-hidden ruins of the tower of S. Floriano, standing on the banks of the dark-blue Lago Morto, and so on the direct road to Belluno and Pieve, among the Cadore hills, where Titian was born, that one must travel to reach the country-house where the great painter passed so many happy summer hours.

Turning to the right, and leaving Serravalle behind, rises before one standing alone in the midst of the fertile plain, one of the last spurs of the Alps, the Colle Umberto, recently so denominated, antique as it is, in honour of the reigning King of Italy, and on its slopes the old-world church of S. Fior, with its treasure, a picture by Cima, in excellent condition, and representing John the Baptist gaunt with famine from his fast in the desert.

At no great distance from S. Fior commences the ascent of the Colle, the slopes of which are dotted with many a pleasant patrician villa. One of these, even if not conspicious for its "model" character, is interesting as having been the residence of the well-known antiquary the Conte Domenico Morosini, the Italian Lord Braybrooke (the decipherer of Pepys's Diary) of some generations since, gifted like that nobleman with the rare power of puzzling out the most abstruse cipher. A story is extant how the Abbate Cancellieri, writing the history of the Lincei, had not been able throughout Italy to find any paleographer capable of deciphering the letters of Federico Cesi, the founder of that academy; thanks, however, to the Conte Morosini, these letters were at length brought before the public.

It would have been unjust to have passed the pleasant residence of this antiquary without a word of gratitude to his memory; and now again climbing up the hill, one reaches at length its summit. In clear weather, one is told that from this position can be seen in the far distance the line of the sea, with Venice, Treviso, Pordenone, and at one's feet the vast plain of the Camollo, where at the beginning of this century (1809) was fought between the French and Austrians the terrible battle of Sacile (in which Thiers tells us there were no less than 6,000 killed). Near us on the hill cluster the little houses of the village, where still live the descendants of the famous musical instrument-makers, the brothers Antoniazzi, — a name revered by all followers of Euterpe.

Artistic memories in this country abound; and now, descending the slopes of the Colle, we find ourselves at the doors of the church of Castel Roganzuolo, the treasure-house of three paintings by Titian. Some twenty years back, the Venetian Academy of Arts deputed several gentlemen to examine into the state of these paintings, and the decision was come to that a judicious restoration was required, but the worthy villagers, shrewdly suspecting that the pictures would be copied and their originals robbed, threatened to oppose the project of restoration, declaring that the work of Titian should never be touched. One of the Commissioners hereupon pointed to the Virgin's mantle, which was sadly chipped. "This is not Titian's work, *per Dio!*" said he; "this is canvas: nothing else than canvas." The honest authorities allowed themselves to be persuaded on condition, however, that the painter should never be left alone one instant with the pictures. All was agreed upon; but, later on, further difficulties arising, the whole work was eventually left intact. As a strange sequel to this, some five years ago the cherished Titians were found to have been stolen; not long after they reappeared, but a profound mystery will ever hang over the whole affair.

The mention of these three pictures by Titian brings us directly to speak of the country-house which the famous painter possessed here at Castel Roganzuolo. From the contract of 1549 of the Massari with Titian, it appears that for the three pictures above mentioned, 200 Venetian ducats were to be paid; it being difficult at the moment to raise this sum, it was agreed that the parishioners should lend their help to carry up to this spot the materials for a house which the painter had determined on building for his *villeggiatura* among the hills. These services were soon, however, not merely confined to the transport of materials; in the canon's house are still preserved the accounts of the period, from which we gather that firewood, grain, and wine were often carried "a Venecia a Messer Tician depentor." But the item which is the most often repeated is that of wine.

From these simple entries we learn how highly, and with what shrewdness (judging even by the wine of this year's vintage), Titian prized the product of the vineyards of these hills. It is well known that, at his house in Venice, he used to have many a joyful banquet with his brother artists and his worthy compeer, Aretino, who invited him in return in such terms as these,—"A brace of pheasants, and I know not what beside, await you at supper at Signora Angela Taffetta's; so come that, by continual merriment, old age, that spy of death's, shall never carry us off till we be old."*

So was understood the artist's life in those times, and Fra Sebastian del Piombo at Rome, remembering those festive meetings, writes to "Messer Pietro Aretino,"—"Now that I am become a monk, I do not wish you to believe that the brotherhood has spoilt me, and that I am not the same Sebastiano, painter, good companion, which, in the days gone by, I have always been," and ends by sending his greeting to Jacopo Sansovino, adding, "and to our dear compeer, Titian, I beg you to recommend me warmly and to all the friends."

* It was in this town that was born Lorenzo da Ponte, who, after having held at Treviso the chair of Belles-Lettres, succeeded in the theatre of Vienna the famous Metastasio; and, after having travelled through Europe in the vain search of fortune, married, and went to America, where he taught Italian; and, after having been a druggist and bookseller, and founded a library of some 25,000 volumes, died a Catholic, leaving his son his successor in the New York University, together with two volumes of Memoirs, written with the intention, as he says, that at least others may learn from my example what I have not had the occasion so to learn.]

* In the sixteenth century the town of Serravalle was almost entirely destroyed by a mass of rock washed down by these winter torrents, and the road this year, as we know to our cost, was completely blocked up from the same cause.

* Letters, vol. iv., p. 133.

The fatigue of his profession and his busy life at Venice rendering repose absolutely necessary from time to time, Titian determined, with this view, to reside on the enchanting spot near Castel Roganzuolo, called then as now Col de Manza.

After the death of the famous painter, the house and the fields attached (there were ten, as we learn from a note written by himself in 1566) passed to the sons of his daughter Lavinia, and from them to the noble family of Fabrio, in whose possession it remained no less than 200 years.

The site of the house having been chosen by Titian, it is easy to imagine how admirably it is situated to enjoy all the beauties of nature, and the picturesque views of the valley. Within the house all is calm, silent, and pastoral. In the distance stands out the panorama of the mountains, which recalled to him each day his native Cadore, and in the opposite direction the immense plain, through which run the silvery threads of the Sile, the Piave, and the Tagliamento, and on the extreme horizon Venice, where were centred all his art, his ambition, and his fame; almost at his feet Ceneda and Serravalle, where he looked down on the home of his daughter Lavinia, in which was centred all his domestic affection.

Here the divine painter, at the close of his glorious and still laborious life, enjoyed for many years a well-merited peace and repose, and who knows how often, under the delicious sky, and surrounded by these scenes, drinking in the inspiration of those marvellous conceptions which have rendered his name immortal, have honoured in such an extraordinary manner Italian art, and gained the admiration of the world.

Treviso.

A RUN THROUGH SPAIN.

VALLADOLID AND THE ESCORIAL.

The journey from the French frontier to Madrid, if unbroken, would be performed with reluctance. New to Spain and to Spanish towns, the traveller would naturally consider he was wasting his opportunities if he did not halt on the road, and Burgos and Valladolid naturally suggest themselves. The latter town has the advantage of being about half way, and a study of the railway time-tables prompted us to select this resting-place. We haste, however, to confess that our choice was unwise.

Burgos is by far the most attractive town. If only one out of these two towns can be visited, the preference should be given to Burgos. Yet Valladolid was the capital of Castile before Madrid acquired that honour; and even now, commercially speaking, it is one of the chief towns in Spain, especially with regard to the trade in tissues. We consequently expected to find that the hand of progress had made its mark on this old seat of learning, this antique, ecclesiastical, and political capital. It would be difficult, however to imagine a greater deception. Here, on the contrary, we met with our first melancholy experience of Spanish slovenliness, indifference, indolence, dirt, and squalor.

Our hotel, though a modest one, was, it is true, perfectly clean. Our bed-room, however, could not boast of either chimney or window. There was a little wooden trap, a foot square, which, as nimbly demonstrated by a portly chamber-maid, could be reached by standing on the dressing-table; but it was expedient not to open this, though it opened out on to a delightful terrace, for fear of admitting mosquitoes. But we ought not to complain, considering that for our room, for chocolate in the morning, a substantial lunch, and equally solid dinner, including wine, the charge was only twenty-four reals, or five shillings per day. The managers of this hotel, we might add, are so far imbued with modern ideas, that they alone in all Valladolid have ventured to advertise in the Spanish Railway Guide.

The town was one swamp of mud, with streets which we can hardly qualify as badly paved, since many of them were not paved at all. The old buildings were neglected, the churches were comparatively insignificant, and the Esgeva, an open sewer, waters the banks of the Romenada or principal promenade of the town. The unornamented cathedral Herrera built is hardly worth looking at; the sooner we pass the ugly, reddish, sun-burnt walls of St. Peter, the better, till, at last, we reach San Pablo, which alone invites a long and earnest contemplation. The side door is particularly remarkable, and here tobacco is kept under military guard. Notwithstanding this desecration, the pointed arch retains its pristine symmetry, and is not spoilt either by the fumes of tobacco, or the ruthless assaults it endured from the French during the Peninsular war. The church was, on that occasion, gutted, and thus shared the fate of other and innumerable Spanish monuments. The façade and this side porch still remain, however, to remind us of the celebrated inquisitor Cardinal Juan Torquemada, who built a great portion of this church. We should be tempted to land at the Collegiata de San Gregorio, which also possesses a splendid façade, but for the general sense of disappointment inspired by the town, viewed as a whole. How such a city can be allowed to remain in such a state of neglect when, after all, there are large fortunes made within its walls, passes our understanding. The inhabitants of Valladolid have evidently but very little public spirit. There is one detail, however, which we should in justice mention, namely, the excellence and the cheapness of one of the theatres. The Spaniards, though very fond of this form of entertainment, object to paying the indispensable charge for entrance. An ingenious compromise had consequently to be organised. Three one-act plays and three ballets are given every night; and the theatre cleared after each. Thus a complete entertainment can be enjoyed, the dilettanti can boast of having been to the theatre, and yet only disburse about a third of what they would otherwise have to pay. Profiting by this arrangement, we were able to witness a comedy and applaud a good characteristic, and in no respect immodest dance, while waiting for the evening train to Madrid, and, though we went to the stalls, the entire expenditure only amounted to 5d. We should add that this was a handsome, gay, high-class theatre, well frequented, with boxes, four tiers of velvet seats, &c. If such good performances could be witnessed in London for approximately the same price, the public houses would not, we imagine, be quite so crowded.

During the whole night the train travels onwards, through sierra after sierra, reaching sometimes an altitude of over 3,000 ft. above the level of the sea. Here the cold is intense, and as a contrast to the heat in the day, and on the plain, should be guarded against with the utmost precaution. At last the morning dawns, revealing the wildest and most disconsolate of scenes. The brown dull sierras stretch out before us, beyond a barren ugly plain fringed by the most fantastic peaks. Then suddenly these great hills seem to rush up on the train, and we cut our way through a fringe of rocks, while the monster mountains threaten us on either side. Sometimes a mountain will bear on its bald sharpened peak a huge round stone the size of a house, and yet poised so lightly, on so fine a point, that it seems as if a child's breath would suffice to send it crushing down as a mighty avalanche below. A convent has been built under one of these stones. One day it must fall and utterly annihilate the small community living under its shade. But this danger is considered as a sure corrective to temptation. One glance upwards at the quivering stone, and mundane thoughts vanish in the presence of this embodiment of death. With the best of inclinations to tolerate all that may improve our natures, and while quite appreciating the admirable moral lessons that may be derived from "a sermon in stones," we cannot but think that this crumbling rock, with its perpetual menace of thoughtless, brutal annihilation, is scarcely in keeping with the gentle, peaceful, humane teachings of pure Christianity. How much better it would be to remove these magnificent but dangerous stones, and use them for the construction of the numerous buildings Spain needs so much.

The country is now, at last, more open. To the right of the train, a flat arid plain stretches out towards Madrid. But suddenly, to the left, resting at the very foot of a huge mountain, the enormous palace of the Escorial bursts upon the view. The suddenness of the apparition, the completeness of the view obtained, the splendid site, 2,700 ft. above the level of the sea, occupied by the palace, and, above all, the enormous size of the Escorial, cannot fail to excite at least momentarily enthusiasm. For our part, we at once resolved not to proceed any further, but got out of the train directly it stopped at the Escorial station. We will not attempt to describe in detail this celebrated palace. But few buildings in the world are more open to criticism. The closer the visitor approaches the keener must be his disappointment. There is nothing ancient about the building; it has not the proportions of a Pagan temple, and it does not produce the religious effect and the awe-inspiring influence of a Gothic structure. The plain smooth granite walls, the small and scarce windows, the slate roofs, all appear more like a barrack than a palace. It is a sombre place, built by a sombre, morose monarch, whose mind was filled with sinister thoughts, whose acts were chiefly deeds of blood and persecution; a retiring, shy, perhaps remorseful, and, in any case, dull, yet, in his way, ambitious king. "From the foot of a mountain," Philip II. exclaimed, "I govern the world, both old and new, with two inches of paper." The palace was begun in 1563 by Juan Bautista de Toledo, and finished in 1584 by his great pupil Juan de Herrera. As size is its principal virtue, we should mention that it covers 500,000 ft., contains eighty-eight fountains, fifteen cloisters, eighty-six staircases, sixteen court-yards, and 3,000 ft. of painted frescos. Of these latter, those that ornament the grand staircase are particularly fine. They are also well preserved, which is not always the case, even at the Escorial. The church is, of course, the most interesting part of the palace. Its decorous black and white pavement, the superb retablo of the high altar, the screen, 93 ft. high and 43 ft. wide, which Giacomo Trezzo, of Milan, took seven years to make, the dividing columns in jasper, the beautiful alabaster pulpit, the paintings, and the gilt statues, all contribute to enhance the beauty of the church, and to detain the gaze of the visitor. Perhaps, however, the majority of tourists will be more interested in the contemplation of the bronze gilt effigies of Charles V., the greatest of all Spanish monarchs, and his wife and his daughters kneeling in a low oratory of black marble on one side of the altar; while, on the other side, Philip II. and three of his four wives, and his son Charles, form a similar group of statuary. These statues are excellent portraits, and are most richly inlaid with marble and precious stones. Immediately below the effigy of Philip II. is a dark, dismal, ill-ventilated, cold room, whence a view may be had of Charles V. opposite, and of the high altar. It was here that Philip II. spent in agony the last days of his life; dying, at last, in this miserable room, which by its general disposition would in itself suffice to kill an invalid, notwithstanding the 515 relics, each in separate shrines, which this miserable monarch kept close at hand.

From here we descend into the Royal tomb, which is under the high altar. It is a gorgeous chamber where, even in death, the kings of Spain are able to surround themselves with a certain splendour. It is an octagon 36 ft. in diameter and 38 ft. high, made principally of dark polished marble and gilt bronze. There is a tawdry chandelier, some angels that are well sculptured, and a fine crucifix. Twenty-six niches have been built in the wall to receive the kings and queens of Spain, for none must rest here but those who have actually reigned on the throne. The queens are placed to the left and the kings to the right of the altar, in somewhat gracefully-shaped marble coffins. But for the length we should be inclined to consider these coffins rather in the light of urns. The bodies go through a process of mummification, and are not admitted into this Pantheon for some years. Thus the body of the late Queen Christina is confined in a little chamber half-way down the staircase, and will not be admitted to her final resting-place in company with the other monarchs till a certain process of decomposition, or rather of mummification, has been accomplished. In the same manner the body of the unfortunate young Queen Mercedes is kept apart in a little chamber near the altar.

The library is well worth visiting because of its ancient manuscripts, its beautifully illuminated works, and its magnificent Arabic Koran. There are innumerable paintings, frescoes, specimens of tapestry work, &c., which we cannot stop to describe. The apartments that are inhabited when the royal family come to the Escorial seemed to us cheerless in the extreme. The furniture was poor, gaudy, and uncomfortable. There were straw chairs in the dining-room! Two or three rooms, furnished with rich marquetry, were certainly handsome; the doors, the furniture, the wainscoting, all were most

richly inlaid. But the whole was spoiled by the presence of a most inartistic and vulgar clock on the mantelpiece.

In spite of all these criticisms, it must be admitted that the Escorial is a wonderful place, and thoroughly repays the trouble of a visit. Indeed, no Spaniard would forgive the stranger who passed near Madrid and failed to visit the Escorial. The Spaniards are immensely proud of this gloomy building, which certainly contains many curious objects, and affords ample food for thoughts on history, theology, painting, and architecture.

ONLY A BREWER.

A LITTLE more than a mile from the Northern capital, Copenhagen, on a moderate eminence, which permits of an extensive view over the green Sund as far as the blue coast-line of Sweden on the other side of the broad channel dividing the latter from Denmark, rises a large block of buildings which might be taken for a castle, but which its tall chimneys betray as an industrial establishment. It is the Karlsberg Brewery, one of the largest of Scandinavia. This extensive establishment was founded in 1845 by Hr. J. C. Jacobsen, for the express purpose of introducing in Denmark the brewing of "young" Lager-beer, *i.e.*, beer to be consumed before it is one year old, such as is drunk in immense quantities in Germany, whence its manufacture and consumption have spread not only over almost the whole Continent of Europe, but also to the United States, &c. The owner of the Karlsberg Brewery himself has told us how, at the beginning of his career as a brewer, he travelled to Munich, that happy home of brewers and Elysium of beer-drinkers, in order to bring to Copenhagen a small quantity of yeast *in his hat*. This insignificant treasure, however, he knew how to employ correctly and how to increase. During the first few years he produced only about 70,000 gallons of beer per annum, but by degrees the Northmen began to like the taste of the precious Germanic beverage, and thus the annual production of Lager-beer in his brewery has risen to over 3,000,000 gallons! Everybody knows that such success must be based on solid foundations. They were supplied in the case of the Karlsberg establishment by the energy and the scientific capacity of its founder and conductor. Jacobsen is the first brewer in Denmark who has had the good fortune and the opportunity of being able to acquire a thorough training in natural sciences. The discoverer of electro-magnetism, H. C. Oersted, was the director of the Polytechnic School of Copenhagen, where young Jacobsen studied, and the latter is greatly indebted to that naturalist, who was his favourite teacher, and who seems to have transmitted to his disciple a share of his spirit of inquiry, for awakening that love of natural sciences which later on in life incited him to future exertions. The amiable disposition of character of the author of "The Soul in Nature," which attracted permanently all who once came in contact with him, gained him a school of enthusiastic followers, who emulated each other in the endeavour to be worthy of such a master. The wonderful influence exerted by Oersted on many of the most eminent of his contemporaries—we need only mention Oehlenschläger, Thorwaldsen, Andersen, amongst others,—acted also powerfully on his disciples, among whom he himself accorded to young Jacobsen a high position. The latter, under such guidance, devoted himself heart and soul to Science, and has continued faithful to her, by introducing her intelligently and perseveringly into practical life, and by constantly calling upon her in his own particular sphere. In this he succeeded to his great satisfaction, but only in this sense, that he was able to prove the close connexion between theory and practice, and thus showing that there is nothing nobler than a blending of the beautiful and the idealistic with the useful and reality of life. There are not many such high-minded men, and of these, the Dane Jacobsen is one of the foremost. It is well that his example should be held up to the gaze and emulation of a larger public.

As soon as Jacobsen was independent, he threw himself with fervour into public life, developing an unwearied activity in many directions, without, however, in the least neglecting or impairing his own industrial activity. For many years he was a busy member of the Municipal Council of Copenhagen. The Danish Government commissioned him, the brewer, to superintend the erection of the buildings in the new botanical gardens, which contain a collection not often met with, and on that account to be seen. He showed his knowledge and talent as architect by designing the plans for the palm-houses and conservatories with novel heating and ventilating apparatus, no less than by conducting all those works to their completion, all the time giving his services gratuitously. When, in 1859, the celebrated chapel of the castle of Frederiksborg was burnt down, Jacobsen undertook its re-erection and the restoration of its numerous treasures of art, at his sole expense, and at the present day the church stands there more beautiful than before, an object of veneration, the goal of every pilgrim who visits Denmark, and a monument to the munificence of one of her children. Being an eminent connoisseur, the brewer has a picture-gallery and a collection of works of the plastic arts which seek their equal; he gives employment, moreover, throughout the year to national painters and sculptors in large numbers, mostly for public purposes. It may also be mentioned that Jacobsen, after being member for several years of the second chamber of the Danish Rigsdag, was made a life peer of the house of lords. Truly, an ornament to any house of lords, and yet only a brewer!

After thus describing the man, we may speak of his latest foundation. In the autumn of 1876, Jacobsen announced to the Copenhagen Academy of Sciences that he had put aside a capital of one million crowns (65,000*l.*) for a "Karlsberg Institution," the more immediate object of which was to promote the industry of beer-brewing by scientific investigation, and to perfect it to its greatest possible extent. In the next place, it was to render support to all branches of natural science, as well as to mathematics, philosophy, and history, as far as the means would permit of it. The administration of the Institution and the execution of its regulations are to be handed over to the Danish Academy, which selects from its midst a direction of five members. Three of the latter, which must be naturalists, form, with two non-academical professors, the executive committee, or the supervising body of the laboratories. All those persons receive for their labour stipends, ranging from 26*l.* to 65*l.* per annum. The conductors of the laboratories receive a salary of 208*l.*, with a quinquennial rise of 39*l.*, until it reaches the maximum salary of 390*l.* They receive besides free residences, firing, and light at the Karlsberg Institution. The chemical, physiological, physical, and other laboratories are in connexion with the extensive buildings of the brewery; at present only the first is completed, and fitted up completely, at an additional expense to Jacobsen, with apparatus, collections, library, &c. The administrative body of the Karlsberg Institution consists at present of the following members of the Academy and professors:—Madvig, Steenstrup, Panum, Barfoed, and Holm, all names well known beyond the borders of their country, some of them enjoying a high reputation. The conductors of the chemical and physiological sections of the laboratory are Hr. M. Kjeldahl and Hr. M. R. Pedersen, both tried men of science. The work was begun in 1877, and a series of happily chosen and interesting experiments were begun. They include at present only such problems as touch upon zymology, especially the chemistry and mycology of beer.

Should the principal aim of this magnificent institution be directed towards supplying a scientific foundation, already possessed by the two important branches of sugar-refining and distilling, to an industry hitherto carried on in a commonplace sort of way, this special object can only be commended. Jacobsen feels that he is indebted to the trade which had made him a millionaire, and that he cannot pay more efficiently than by ensuring the perfection which it otherwise could not attain to. The laboratory established by the Association of German Brewers pursues the same object, but its labours are more one-sided and its investigations more restricted. Other trades in Germany, where chemistry plays an important part, have also notably distinguished themselves in this direction. We may only mention, among others, the laboratory of the German Tanners' Association at Berlin, where knotty questions affecting that important trade are solved.

The Karlsberg Institution will soon develop into a great scientific central institute in which zymological investigation will only occupy a section. The founder is proceeding in this direction unfalteringly. Already in the spring of 1878 he increased the capital of the institution by 12,000*l.*, the interest of which sum will be devoted to the establishment and extension of a natural history museum, to serve as a complement to the institution. The museum is to be located in the rooms of the castle of Frederiksborg, to the re-erection of which after the fire Jacobsen contributed 17,000*l.* All those magnificent gifts of a warm patriotism, combined with an appreciation of the wants of our time, and an ardent zeal for propagating information, engender a feeling of reverence for the man who so unselfishly brings such vast gifts.

But the country and the people from which spring such men must not be forgotten. And Scandinavia, and again little Denmark, are full of them. There is not another country, speaking proportionately, which is able to pass in muster such a large number of institutions for public purposes. Besides numerous smaller ones, there have been added during the last few decades several important institutes, which represent a capital of 520,000*l.*, of which 130,000*l.* have been exclusively devoted to the arts and sciences. In Sweden the recently deceased J. Letterstedt has left for the advancement of science in the three Scandinavian kingdoms a sum of 39,000*l.* The name of Oskar Dickson, of Gothenburg, has been made known all over the globe by the equipment of three expeditions for the exploration of the Arctic regions. The latter has also given thousands towards the foundation of important schools and collections in his country. In the city of Copenhagen alone, deceased citizens have, within the last five years, left to its charitable and public institutions, whose possessions already amount in value to millions, a sum of nearly 100,000*l.* Since her liberation from the incumbrances of the German duchies, which were a clog to her national development, Denmark has progressed in every respect, but especially materially,—silently, it is true, but all the more rapidly, so that she, in this respect, may serve as a pattern to many other countries, much larger and placed more fortunately.

But to return to the subject with which we started,—to our brewer and brewing. The often-repeated objection, that good beer may be brewed, and has been brewed, without going for advice to the chemical laboratory, may be decisively met by the fact that wherever brewing is carried on on a large scale, producing always a well-known article of consumption, it is carried on on scientific principles. The results of the award of prizes at this year's Paris Exhibiton are proof of this assertion. The greatest distinction,—the Grand Prix,—in the branch of brewing, has been carried off by Dreher in Schechat, Bergner & Engel in Philadelphia, and — J. C. Jacobsen in Karlsberg, near Copenhagen. The honest Danish patriot (to borrow from a contemporary) who thus nobly causes the riches acquired by a scientific pursuit of his trade to flow back to the people which contributed to their accumulation, and whose name will surely shine amongst those of the greatest benefactors of mankind, will pardon us if, by the publication of the preceding data, we should hurt his well-known, almost excessively modest simplicity. But, once more, it is useful, it is advisable, in our time of egotistic materialism, to hold up to the public a picture whence are yet reflected unselfish humanity, unpretending patriotism, and a just appreciation of the means to the end: the welfare of the people, even at the risk of some nabob or mental Lazarus shrugging his shoulders, and turning away from it with the contemptuous "Only a brewer!"

New Vestry-hall for Kensington.—The foundation-stone of a new vestry-hall for the parish of St. Mary Abbotts, Kensington, was laid on the 12th inst., upon a piece of ground immediately adjoining the old vestry in High-street, by Lord Kensington, M.P. General Boileau, the chairman of the building committee, read a statement, from which it appeared that whereas in 1851 the houses and premises in the parish numbered 6,131, with an annual rateable value of 228,864*l.*, they had now increased to 21,908, with a rateable value of 1,396,956*l.*, only 350 of the 2,245 acres comprising the area of the parish not being covered. The cost of the hall and offices would amount to 30,549*l.*, and the gross expenditure, including purchase of freehold, &c., would be 41,671*l.*

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THE HIGH SANCTUARY AT JERUSALEM.

The discussion on Lieut. Conder's paper* on this subject was resumed, as elsewhere stated, on Monday evening last, at the meeting of the Royal Institute of British Architects. In our report of the proceedings at the Institute, a fortnight ago (p. 1281, *ante*), we mentioned that Mr. Fergusson replied to some of the points raised in the paper, and said that he would put his remarks on paper, for submittal to the meeting on Monday evening last. The following is Mr. Fergusson's paper, amplifying the remarks made by him at the previous meeting.

Mr. Fergusson said,—I rise with considerable reluctance to attempt to reply to the paper by Lieut. Conder, not that I feel the least difficulty in answering all the objections he raises to my views, but that they are brought forward in such a form as to render it extremely difficult to follow the reasoning on which they are based. I have myself frequently intended to bring the subject before the Institute, but have always been deterred by its extreme complexity. There are so many authorities to be sifted, so many plans and diagrams to be drawn, in order to make it intelligible, and so many collateral illustrations to be adduced, that I have always felt that to attempt this before an audience not specially interested in or familiar with the subject would be labour in vain. I have, consequently, thought it better to write a book, in which all these things could be brought forward, with all the necessary references to authorities, in such a manner that any student might at leisure, with books and drawing-board by his side, master the whole much more satisfactorily than in listening to a single lecture on so complicated a subject. All this has been done in my "Temples of the Jews and other Buildings in the Haram Area at Jerusalem," a volume of 300 quarto pages of text, with nine plates and fifty-two woodcuts. To answer the paper I would like to read you my book from the beginning to the end; but this you would hardly stand, and I must content myself with such explanations of it as the time remaining of this meeting will admit. If I felt that I could not, with all the illustrations and appliances at my command, make my views intelligible in a single night, even if I confined myself to the Temple only, it is hardly to be expected that Lieut. Conder could make, not only his, but mine also, intelligible in a paper, with very scant diagrams and without a single reference to authorities, while ranging over, not only the Jewish, but the Christian and Saracenic, buildings in the Haram area.

Although it is not expressly so stated in so many words, it is quite evident from the context that this paper is, from the first line to the last, intended as a refutation of certain heresies of which I am accused regarding the topography of Jerusalem. His theory of the site of the Temple and its area is not, as I understand it, put forward as a serious scheme, and certainly is not worked out either with the detail, or the references to authorities, that could command acceptance from others. As he himself states, it is put forward as a "theory or hypothesis indicating the direction in which we should work"; the advantage of introducing such things here being that if anything can be said in their favour, it is so much argued against my views—as it is impossible both can be right—and *pro tanto* it aids the whole argument of the paper. The objections to my views, however, are in this paper stated in so indistinct a manner that it would even now be quite open to its author to say he had never seen or heard of my work above referred to, and his strictures referred to some previous publication of mine. Certain it is that the work is not once named in the paper. My words are nowhere quoted, and no reference is made to the page or place where any statement is to be found, so that, though I may guess what is intended, no one else can be sure. More than this, I have no hesitation in asserting that a full and detailed answer, with all the requisite illustrations and references, will be found in my work to every one of the objections raised to my views in this paper. Whether these are logical and satisfactory others must determine. To me they appear completely so; but however this may be, it is not a sufficient reply simply to ignore them, as is done in this paper throughout. So completely is this the case that, had this paper appeared anywhere else, I probably would not have thought it necessary to reply to it, but coming in so formal a manner before the Institute, I feel it incumbent on me to offer such remarks as the limited time at my disposal will admit of, though this will be hardly more than sufficient to enter a protest against its assertions.

In the first place, I must be allowed to object *in limine* to any one being allowed to put forward any scheme for restoring the Holy House without first having worked through all the indications regarding the temples of the Jews to be found in the Bible. It has been too much the fashion to neglect these as indistinct and unintelligible, and to trust more to the assertions of the Talmud, which certainly are distinct enough, but in almost all cases can be proved to be erroneous, or erroneously applied, from the ignorance of the Rabbis of the real form of the building they were talking about. I have gone over the passages in the Bible referring to the Temple, not only once, but several times, and always with an increasing conviction that, with the knowledge we derive from other sources, they are sufficient to fix the position and dimensions of the temples of the Jews within the narrowest possible limits. I may say, we now know that the dimensions of the courts of Solomon's Temple were 300 cubits east and west, by 100 cubits north and south. The temple Ezekiel describes in his vision was of the same dimensions, though he complicates the matter by adding a north and south court, making it 300 cubits in that direction also. We know from the description of Hecateus of Abdera, who saw it in the time of Alexander the Great, that the Temple, as rebuilt after the return from the Captivity, was of these dimensions, five plethra (500 ft.) east and west, by 100 cubits in the other direction, and when we come to protract the Biblical measurements on the Ordnance Survey, combined with what we learn from Josephus and the Talmud, we find that, from the inner side of the wall of Solomon's porch,—the site of which is perfectly well known,—to the inner side of the wall at the back of the court of the Holy House, it measures 300 cubits,—450 ft.,—neither more nor less.

It is of course impossible for me to enter at present into the details, though they will all be found in my work above referred to, and I must consequently content myself by stating broadly that I have embodied all the indications found in the Bible, combined with all the measurements furnished by Josephus and the Talmud, in a plan of the Temple which forms plate No. 2 of my work, which was drawn on a large plan of the Ordnance Survey. Having done this I find the whole so consentaneous, and to fit so well together, that I would now undertake to draw a circle with a foot radius, on the pavement of the Haram area, which should mark the centre of the Jewish altar, within its limits, and another further west, which should mark the centre of the Holy of Holies within the same limits of deviation. Having fixed these two points, and the external dimension being fixed by the Ordnance Survey (as will presently be shown), I assert that there is not one dimension or one feature in the plan of the Temple which may not be fixed within the limits of a cubit or two at the utmost. There may be some details of the chambers and minor features which require further consideration, and the elevation may be open to criticism, owing to the scant materials for reconstructing it; but in so far as the plan and general outside dimensions are concerned, I have no hesitation in saying that there is no building in antiquity of the same extent and complication whose plan and arrangements can be made with the same certainty. There may be errors of arithmetic or of typography in my work, but, barring such, I challenge the exposure of any error beyond the limits, above indicated, in my plan of the Temple of Jerusalem as rebuilt by Herod. I need hardly add that no such criticism has yet been attempted, nor probably will be soon, as requiring more care and attention than it is usual to bestow on such subjects.

Without attempting this, and indeed without referring to any of my plans, Lieut. Conder resumes the argument by enumerating six objections which he considers quite fatal to my theory of the Temple of the Jews. As these are really the most important points in his paper perhaps you will allow me to state as briefly as I can why I think them irrelevant.

No. 1.—"The south wall of the Haram, as above shown, is 922 ft. in length, and the master course runs unbroken beyond the limit proposed by Mr. Fergusson."

When I first wrote on the subject ("Topography of Jerusalem, 1847," p. 8), I was content to state that the Stoa Basilica could not extend beyond 600 ft. from the south-west angle of the Haram, from which point Lieut. Conder and every one else admits that it began, because there was nothing beyond for it to stand upon. Finding that this was overlooked, in 1860 I published a diagram in Smith's "Dictionary of the Bible" to show how impossible it was. This answered its purpose for a certain time, but in 1875, in the *Athenæum* journal (June and July), Captain Warren challenged me to show why it should not extend to the south-east angle. I answered, firstly, that forty columns extended over 922 ft. would require epistylia 24 ft. in length, and none such existed in the ancient world; and, secondly, that beyond those 600 ft. there was nothing but what he afterwards called "weak arches of the Byzantine period" ("Underground Jerusalem," pp. 347, 325). After shifting his ground once or twice, he turned to personal abuse, and so closed the correspondence, and I thought I had done with him, and am surprised that the question should again be brought forward. If Lieut. Conder will only draw a plan and section of these vaults with the Stoa over them, he will, I feel, be convinced that it is impossible it did extend over them. Besides, this extending the Temple to the south-east angle leaves no room for Solomon's palace, which, I believe, undoubtedly existed in that corner. Plan No. 1 of my work, with the accompanying text, proves this, to my mind, beyond all dispute; but if I am wrong, say so; and say where the error lies. Simply ignoring my statements and plans is no answer. Till it is shown to be otherwise, I assert that the triple gateway stands on the site of the Horse Gate of Solomon's palace where Athaliah was slain (2 Kings xi. 19), and the corner tower was "the Great Tower by the wall of Ophel, which the Tekoites repaired." The corresponding "tower by the Court of the Prison" was 600 ft. further north, and marked the north-east angle of the king's high house (Nehemiah iii. 25 to 27). All this seems so clear and certain, that till the error is pointed out, I must be allowed to assume it as a fact. When some one will explain what the "master course" means, and whether it was put there by Solomon, or Herod, or Justinian, I will state whether I agree with him or not. It does not at present appear to me to have any bearing on the question; but if I were asked to guess, I should say it was part of Justinian's repairs, as all the work above it certainly is.

No. 2.—"The junction of the Ophel wall with the south-east angle also points to the east wall of the Haram as being the old east wall of the Temple, and the Double and Triple Gates correspond to the two Huldah, or 'mole-gates' of the Temple, according to the Talmud."

This objection is fully answered in the preceding paragraphs, and I could therefore only remark that the Huldah Gateway under the Mosque El-Aksah is double, and as such fully answers to the description given of it by Josephus (Ant. xi., 5) and the Talmud, so far as I know it; though, as Lieut. Conder gives no reference, I do not feel sure. But, from all I know, I feel certain that the assumption that there were two separate entrances, at some distance from one another, is wholly gratuitous, and unsupported by any fact within my knowledge.

Nos. 3 and 4.—"The north-west corner of Mr. Fergusson's enclosure is placed where the rock is 100 ft. lower than the Sakhrah; thus, there is no possibility of the existence of a rock-scarp at this point, such as is required for the site of Antonia. Foundations would, on Mr. Fergusson's hypothesis, be required for the Holy of Holies, which would be from 60 ft. to 90 ft. deep, in order to give to the floor of the Temple the requisite elevation (as given in the Talmud) above the outer court."

Objections 3 and 4 may as well be taken together, as they refer to matters of which neither Lieut. Conder nor I have any real knowledge. On this subject, however, I may be allowed to remark that both Capt. Warren and Lieut. Conder have done immense injury to the correct topography of Jerusalem, by publishing imaginary contours of the rock surfaces at Jerusalem, at depths which neither they nor any one else saw, or ever could have seen them. Capt. Warren's contoured plan of the Haram area ("Recovery of Jerusalem," p. 298) is one of the most misleading documents ever published, being based wholly on imaginary surfaces he never saw; and Lieut. Conder's state-

* See pp. 1269, 1307, *ante*.

ment that the rock was from 60 ft. to 90 ft. below the Holy of Holies is in itself sufficient to show how little is really known. So far as I can make out,—and I believe I may state that Major Wilson entirely agrees with me,—the rock rises gradually though irregularly from the valley of Jehoshophat to a ridge terminating westward in something very like a cliff, where I believe the tower of Antonia to have been, and just behind the Holy of Holies of the Temple, where I place it. Where the altar stood, the rock rises almost to the surface; and I see no reason for supposing that it is many feet below where the Holy of Holies stood,—6 ft. or 9 ft., I believe, would be nearer the mark than 60 ft. to 90 ft.; but even if it did, all that can be said is, that Solomon raised the foundations of his Temple in the same manner and from the same depth that Herod afterwards accomplished. No further argument can be based upon it; and that may safely be disregarded, in comparison with the mass of evidence for fixing it where I have done. In like manner, if there was a drop of 100 ft. in the 400 ft. which extend from the Dome of the Rock to where it was next seen under Wilson's arch, the probability is that there would be a cliff of 50 ft. in height somewhere on which the "Turris Antonia" might be placed. But till we really know where the rock is, these are idle speculations; and I do not profess to be able to see further through the solid earth than my neighbours.

Fifth objection. "There are no remains of ancient rampart walls on the lines where Mr. Fergusson draws the north and east boundaries of the Temple."

If my views are correct, the facts are the exact reverse of this. At a distance of exactly 600 ft. from the south wall, and perfectly parallel to it, is a wall 10 ft. to 15 ft. in height, supporting the terrace of the upper platform. I believe that what we now see is the inner face of the north wall of Herod's Temple; it extends 600 ft.,—or, more exactly, 585 ft.,—from the west wall. In like manner, if we measure 585 ft. from the south-west angle, we come to the treble gateway, where the wall, here 40 ft. in height, turns up at a right angle, still visible for some 200 ft. in length, partly cut in the rock, partly in old masonry, though a good deal knocked about, till it loses itself in the mass apparently of Justinian substructures; but, if continued to a length of 600 ft., it would meet the north wall of the Temple at 585 ft. from the western wall. We have, therefore, on the Ordnance Survey, a perfectly regular rectangle 600 ft. by 585 ft., perfectly level throughout, and in every way suited to receive and accommodate such a temple as that Herod built at Jerusalem. I need hardly add, there is no other spot in the Haram area, or anywhere else, where the Temple could be placed, with boundaries so well defined, and which, so far as I know, cannot be increased or diminished by a single foot without getting into difficulties which, so far as I am capable of forming an opinion, are absolutely insurmountable.

Sixth difficulty. "The dimensions in the Talmud give an area considerably greater than the 600 ft. square proposed by Mr. Fergusson."

The first answer to this is, that it is of the least possible consequence what the Rabbis said, when contradicted by the evidence of the Bible, of Josephus,—who is never wrong in plan, though frequently he exaggerates heights,—and the Ordnance Survey, whose correctness no one disputes.

The second answer is, that the Talmudic dimensions are a mistaken quotation from Ezekiel. What that prophet said was (chap. xlii., 16 to 20) that the boundary-wall of the Sanctuary,—the Temple itself, as before stated, he makes only 300 cubits square,—measures 500 reeds, or 3,000 cubits each way. The Septuagint rightly considering this an improbable dimension for a temple, translated it cubits; and the Rabbis, adopting this as a sacred measure, gave it as the dimensions of the "Mountain of the House," but being unable to reconcile it with their other measurements for the holy places, put the 100 cubits so gained beyond the true 400 of Josephus, into the semi-sacred Court of the Women, where it is easily shown it was impossible. Generally the Rabbis are aware of the difficulty: some try to explain it, by saying that it means the smaller cubit of 15 in., while they know and admit that Josephus used the Greek cubit of 18 Greek inches. The one, they say, means 600 ft., or one stadium, the other 625, which they consider as no material difference. Lieut. Conder's cubit of 16 in.,—which I never heard of before,—would make 666 ft.; but even 18 in. would only make 750 ft., which is still far from 922 ft. But none of these hypotheses will bear a moment's examination, for reasons I have stated elsewhere, but which are too long to go into here. The truth of the matter is, the Talmud is a perfectly worthless authority when its statements cannot be checked and authenticated from other sources, and in this instance is demonstrably wrong.

In concluding this part of the subject, allow me to state, as distinctly as I can, the Temple of the Jews, as rebuilt by Herod, was a rectangle 600 ft. by 585 ft., situated in the south-west angle of the Haram area; and within that space it is easy to arrange all the buildings described by all the known authorities with exactness and consistency, were it either larger or smaller, or were these two dimensions in the opposite direction, I believe it would be impossible to do so. The result is shown in plan No. II. of my "Temples of the Jews"; and I wait now for some one to point out any important or even appreciable error in the plan so drawn. I believe it will stand the most searching scrutiny; and certainly nothing in it is invalidated in the slightest degree by any of the six objections brought forward by Lieut. Conder, to which I have just been replying. So long as the correctness of this plan remains unshaken, I must be allowed to consider the position and plan of the Temple as settled beyond dispute; and all reasoning with regard to it, or to the other buildings in the Haram area, must consequently be based on this plan as an established fact.

The second part of Lieut. Conder's paper is a more direct attack on my theories than even the first, though he still leaves it doubtful which of my works on the subject he refers to, or whether he has ever seen the last. It is, however, a part of the subject which it is much more difficult to reply to, not only from its greater complexity, but also because the authorities on which any reasoning can be based are generally unknown to any ordinary English audience. Every one possesses a Bible, most possess a copy of Josephus, and many have access to the Middoth of the Talmud, and these nearly suffice to enable any one to form an opinion as to the correctness of any theory of the Temple. On the other hand, very few are familiar with the Byzantine historians, between Constantine and Justinian; fewer still are acquainted with the Arab writers on whom we must depend for our knowledge of the history of their buildings in the Haram; and it is even rarer to find any one well read in the Mediæval narratives collected and edited with such care by the late Titus Tobler. Under these circumstances, without the least desire or intention to mislead, it is manifestly impossible within the limits of a lecture to produce all the quotations and references necessary for forming a judgment on such a subject, and without them what is said can only be a mere string of assertions which must be taken on trust, as no means are afforded of verifying them. In my various works on this subject, I have given the extracts and references and other data required for the elucidation of the argument, but so far as I know no one has ever read them. No one certainly has ever noticed them in print, though had any one done so, this controversy would long ago have been settled one way or another. As it is, it remains pretty much where it was when I took it up thirty years ago. Such being the case, I shall not now attempt to follow Lieut. Conder through all the various statements he makes in his paper, but shall confine my remarks to such as present some novelty either as being the result of his own researches, or a new reading of passages already known.

Among the first, Lieut. Conder considers the Dome of the Rock could not have been built by Constantine, because the capitals and bases of the twelve columns supporting the inner drum of the Dome, which he was the first to draw with sufficient care to make the fact obvious, are nearly all different. If I or any one else had ever asserted that the building was erected entirely of new materials, this would be an argument, no doubt, but it would have been quite contrary to the spirit and practice of the age that it should be so. Any one who knows anything of the buildings of Rome at that time knows that, almost without exception, they are made up of materials torn from older buildings, and used in the most incongruous manner. Not to travel beyond our record. In the Lateran Baptistery, which Constantine erected as his own tomb-house ("Temples of the Jews," W.C. 66), half the capitals are Corinthian, half are Ionic, and so in almost every basilica or building of that age in Rome. At Bethlehem, where there were no remains, the capitals seem all original, but at Jerusalem we know that Hadrian built at least one temple to Jupiter. We know that a temple to Venus stood over the Sakhra, which had to be cleared away before the sacred Cave was disclosed (Eusebius, "Vita Constantini," iii., 26 and 27), and no doubt there were many other temples and portices erected during the two centuries and a half that Jerusalem was a flourishing Roman colony, and from some of them these columns may have been taken. Had any of the capitals been later than the time of Constantine, it would have been an argument. Very many of those in the Aksah are of the time of Justinian or later, and prove that this building is after his time, and of a different age from the Dome of the Rock, where all the capitals are either of the time of Constantine or anterior to his age. This, as far as it goes, is a proof that though the Aksah is known to have been erected after Justinian's time, the Dome of the Rock certainly belongs to a different and earlier age. I do not in fact believe that any architect can examine the drawings and photographs of these two buildings without perceiving and acknowledging this as a fact. If the Aksah was erected in the seventh century, the Dome of the Rock is certainly some centuries earlier.

Of the second class, one of the most startling novelties of Lieutenant Conder's paper is his adoption of what always appeared to me a very silly conceit of Mejr-ed-din, an Arabic writer of the sixteenth century, that the Dome of the Chain had been erected by Abd-el-Malik as a model of the Dome of the Rock in order to judge of the effect before commencing the larger building. Any one, I fancy, familiar with Oriental literature, would see that this is just such a fable as an Oriental writer living eight centuries after the events would be sure to invent, to account for a certain similarity that existed between two buildings so near to one another, but of whose real history he knew absolutely nothing.

The adoption of this story, if it rested there, would be of the least possible consequence, but to found on it the theory that the Dome of the Rock was originally erected without external walls, in spite of the recent discovery of the upper arcades, with their mosaics and all the features of Byzantine architecture recently disclosed, is one of the boldest flights of imagination of this class I am acquainted with. What we really do know of the Dome of the Chain is that during the Crusades, at all events, it was considered the tomb of James the Just, the brother of Jesus, and if my view of matters is correct, nothing could appear more natural than that his tomb should be found in immediate proximity to that of his brother. But be this as it may, Theodoricus copied the following inscription from its walls (see Tobler's edition, p. 42):—

> "Dic, lapis et fossa cujus sunt, quæ regis ossa,
> Sunt Jacobi Justi. Jacet hic sub tegmine busti."

As is perfectly well known, the moment the Crusaders entered Jerusalem, in the year 1099, they seized on the Dome of the Rock, which they called Templum Domini, in contradistinction to the Templum Salomonis, which they knew was represented by the Aksah. That they desecrated and turned into a barrack for the Knights Templars, whence their name; on the rock, however, in the "Temple of our Lord" they erected a golden cross, and adorned it with precious marbles. A golden lamp hung over it and burned day and night during the eighty-eight years they possessed it; "Canons regular" were appointed to superintend constant services, and in every respect the Dome of the Rock was considered as sacred and as important a Christian edifice,—whoever built it,—as the Sepulchrum Domini, which then stood in the middle of the Christians' quarter of the town. There seem no means now of knowing exactly what they thought the rock and its appurtenances really were, nor do any of the Latin inscriptions in mosaic, with which they adorned its walls both internally and externally, clearly express this. Yet these inscriptions are important for our present purposes, as they prove incontestably that the Cufic inscriptions which now take their place, though so confidently relied upon by Lieut. Conder, are forgeries of the thirteenth century, after the building was recovered by the Moslems under Saladin.

In the first place, it is most improbable that the Crusaders should have allowed inscriptions in the writing of the infidels and in praise of their false prophet, as they called him, to remain on the walls of their most sacred church. It will not do to say the people could not read them. Their doctors and learned men could; and even the character of the writing was an insult that all could appreciate. Besides this, however, we know that the building was covered inside and out with Latin inscriptions in the place where these Cufic inscriptions now are. These were copied by two independent witnesses, Theodoricus and John of Wurtzburg, and are quoted at sufficient length in my "Temples of the Jews" (p. 220 *et seq.*).

I cannot, of course, attempt at this moment to go into the history of these mosaics; my reasons for believing them forgeries are given at length in my work just referred to (pp. 218 to 224), to which those wanting further information on the subject are referred. The Latin and Cufic inscriptions are, however, of very great importance to the history of the building, and whether I am right or wrong regarding the latter being forgeries, it is not a fair mode of representing my case to ignore them altogether, and pass over in silence all I have said regarding them, as Lieut. Conder has done.

The subsequent history of the Dome of the Chain, in so far as I can make it out, is simply this. When the Mohamedans under Saladin resumed possession of the Dome of the Rock, they found themselves in possession of a building in which prayer was impossible according to the Moslem ritual, because the principal entrance was on the south, in the direction of Mecca, and though it was not absolutely indispensable, it was convenient to have a place of prayer close at hand. So, at least, it has been found in all the great Indian tombs which are similarly situated. They consequently converted the Tomb of St. James for this purpose, by providing a prayer niche on the south, which was all that was required to adapt it for a mosque, and it has been so used ever since. Who the original builder of the Dome of the Chain may have been I do not pretend to know, but that it was originally erected as the Tomb of St. James seems nearly certain; and if his was so, it certainly was not erected by Abd-el-Malek as a model, or for any other purpose.

There is, therefore, nothing in all this, or in anything said in the second part of Lieut. Conder's paper, that at all shakes my faith in my statement, that the Dome of the Rock is the identical building which Constantine erected, over *what he believed to be the Sepulchre of Christ*. I may be right or I may be wrong in this, but certain it is, at all events, that nothing that has yet appeared in print can be considered for one moment in favour of this view as an equivalent to the arguments adduced. As I said before in the preface to my last work on this subject, some one or some new discovery may at some future time alter the aspect of the case; but as it at present stands, the evidence in favour of this theory is absolutely unrefuted.

A very few words will suffice to show that Lieut. Conder is entirely mistaken in stating that the Mosque el Aksah was originally the Mary Church of Justinian. It is one of those assertions which every one repeats without thinking, and many will probably go on repeating in spite of any amount of refutation. Broadly, the fact is this. The Aksah stands, even on Lieut. Conder's own showing, within the precincts of the accursed Temple of the Jews, and Justinian did not and could not build his church on a spot so utterly abhorred by the Christians. Without going into details, every one knows the history of Julian's abortive attempt to rebuild the Temple. So impious was this considered, that all Christians of that day believed that it was stopped by miraculous interference from heaven; and any one who will read the account given by Eutychius (A.D. 870) of the grant of this site to the Caliph Omar, after Justinian's death, will probably be convinced that it was then still held accursed. When Omar claimed, in accordance with the treaty, a place on which to build a mosque, the Patriarch Sophronius replied, "I give to the Commander of the Faithful a place where he may build a Temple, which the Grecian Emperors could not build" (alluding to Julian's attempt). He then goes on to describe the position of the Temple, and its form, which must at that time have been perfectly well known, and the Sakhra in the midst, which was certainly the Lapis Pertusus of the Bordeaux Pilgrim, and the corner-stone of the Jewish altar ("Temples of the Jews," pp. 191, 225). When, having obtained from the Caliph a written promise that he would erect *only one house* of prayer in Jerusalem,* Eutychius goes on to say, "For when the Romans embraced Christianity, and Helena, the mother of Constantine, erected churches in Jerusalem, the place of the rock [altar] and those adjacent to it were laid waste, and so left: and they threw dust on the rock, so that a large dunghill was heaped upon it, and the Romans did not reverence it, as the Jews had done, nor *did they erect any church upon it*, because the Lord had said in the holy Gospel, 'Behold, your house shall be left desolate'; and again, 'There shall not one stone be left upon another that shall not be cast down': on this account the Christians had left it lying waste, and had not erected any church upon it" ("Annales, ii., p. 284).

Now, bearing in mind that the situation and dimensions of the Jewish Temple must then have been easily recognised, and it can, in fact be proved from a long list of authorities ("Temples of the Jews," pp. 182 *et seq.*) that they were perfectly well known till at least after the Crusades, it seems impossible to assume that a Justinian church was then standing within the precincts of the Temple. It seems equally certain that when Eutychius wrote, the Moslems had not erected two places of worship in Jerusalem: in fact, that the Aksah was theirs and their only place of worship, which is confirmed by all we learn from all their other historians, while there is no mention of the Dome of the Rock as belonging to them at any age.

Besides, this placing the Justinian church inside the Temple area contradicts every word that is said by Procopius about the enormous difficulty the Emperor had, and the expense he went to, in getting a level foundation for his church. Where the Aksah stands, or, indeed, on any spot within the limits of the Temple area, all was flat and solid, and he need not have spent a penny on his foundations anywhere. What he really did we learn from Procopius. He brought up the level of the old deserted site of Solomon's palace to that of the Temple floor, and then erected his church, "Secus Porticum Solomonis," as Antoninus tells us, and there, the remains of its foundations may still be seen in the vaults now known as Solomon's stables.

The only remaining question is, why did Justinian seek this remote, cramped, and difficult site for his great monastic establishment, when he had the command of many others in other parts of Jerusalem far more convenient and much less expensive? I answer, unhesitatingly, because he wished his establishment to be near the Anastasis, the Martyrium, and other sacred sites of the Christians, and where it did afterwards form one of the four great churches of Jerusalem ("Temples of the Jews," pp. 238 *et seq.*). If any one has any other answer to give, all I can say is that it has not reached my ears.

A very few words will suffice regarding the Golden Gateway, which is the only other building noticed in this part of Lieutenant Conder's paper. He and all the rest of the world are now prepared to admit that it is a Christian building, erected between the ages of Constantine and Justinian. Lieutenant Conder says the fifth or sixth century. I still maintain, for reasons given in my "Topography of Jerusalem" (pp. 94 *et seq.*), and my "Temple of the Jews" (pp. 229 *et seq.*), that it was the festal portal erected by Constantine, and described by Eusebius as leading to his basilica. But even waiving this argument for the nonce, and assuming that I am wrong in this, I have asked over and over again who built the Golden Gateway, and why was it placed where we find it? We know the history of Jerusalem perfectly from the time of Constantine to that of Justinian, and not one author, either contemporary or afterwards, mentions the erection of such a building, either directly or indirectly, and no one in modern times has ventured even to try to explain why it was erected where we find it. Yet it is an important building, and evidently from its form and construction only a part of a group of buildings which must have been of greater importance than itself; and I hold it to be literally impossible that such a gateway, with its adjuncts, could have been smuggled into existence, without any one at the time or since being able to say by whom or for what purpose it was erected. The nearest approach to an answer is by the Count de Vogüé, who, quoting John of Wurtzburg, a writer during the Crusades, suggests that it was the Porta Speciosa, the Beautiful Gate of the Temple, and re-erected by Christians,—he does not hint when or by whom,—in honour of the miracle performed there by Peter and John in curing the lame man. The answer to this is, first, that the Porta Speciosa was an inner gate of the Temple, and this is not only outside the Temple and city, as his own plan shows, but did not belong to the Temple at all. Secondly, that at no time did the Christians ever attempt to rebuild any part of the accursed Temple of the Jews; and thirdly, the Porta Speciosa to which John of Wurtzburg alludes was on the west side of the Haram area. The Golden Gateway is on the east. This answer of the Count's will not, therefore, suffice, and till some one can suggest a better, my suggestion must be allowed to stand as the only feasible one. Simply ignoring the facts, as writers have hitherto been content to do, is no answer to any honest inquirer who is searching after truth, and that only.

I have now run through, as briefly as I can, all the most important points in Lieutenant Conder's paper, but though I have tried to do it in as few words as possible, I must apologise for having taken up so much time. The subject, however, is, to me at least, so important and interesting, that I could hardly omit anything I have said. What I have written on the subject extends to several volumes, and to make what I have to say complete, it ought to be nearly as long. I have, however, probably said enough to prove that there is a good deal to be said on my side of the question.

In conclusion, I can only add that I shall rejoice if this discussion leads to any practical result. Hitherto, the mode of treating the subject has been by nibbling over the smaller details on the outskirts of the argument, and ignoring the more important issues. I feel sure the Institute of British Architects will insist on a broader and fairer mode of treatment, and if that is applied, I have perfect confidence that the result will be the establishment of many, if not of all, the truths I have so long advocated.

A short rejoinder to this paper was read from Lieutenant Conder, who was unable to be present; and to this rejoinder Mr. Fergusson briefly replied, but no new points were raised on either side.

Mr. J. D. Crace said that, as a member of the Executive Committee of the Palestine Exploration Fund, he was much interested in the question, although he had no theories of his own with regard to the position of the Temple. He would, therefore, content himself with asking one or two questions. One was whether he correctly understood Mr. Fergusson's view to be that the southern wall of the Haram enclosure did not, in the time of Herod, extend so far as the existing south-eastern corner? If that were the case, he would ask Mr. Fergusson how he accounted for the angle stones at the foundations of that corner, which, to all appearance, were very ancient, being marked with Phœnician characters. He was informed that these characters might very well occur as late as the time of the Maccabees, and probably later, but not later than the time of Herod. If the wall did not extend so far as that, could Mr. Fergusson say what those stones formed part of? Did not the colonnade or portico extend so far, and if not, what did extend to that point? Another question he wished to ask was with regard to the measurements of the Temple given by Ezekiel. Ezekiel gave an enormous mass of measurements, which were, no doubt, intimately interwoven into Herod's Temple. One important point in Ezekiel's measurements was that in describing the measuring-reed (ch. xl. 5), he spoke of it as "a measuring-reed of six cubits long, by the cubit and an hand-breadth." And again, ch. xliii. 13,—"The cubit is a cubit and an hand-breadth." Now, taking the cubit at 18 in., and the hand-breadth at 4 in., each of those cubits would be 22 in. long, and when he said the outer walls measured 500 reeds round about, on each side (xlii. 20), it being evident that 500 cubits as given on the reed were meant, that would give a length of 916 ft. 8 in. on each side, the actual measurement being 922 ft. The "Middoth," as quoted by Mr. Fergusson,

* The passage is quoted at length in my "Topography of Ancient Jerusalem," p. 133, to which the reader is referred.

also says, "the mountain of the house was 500 cubits square." And the "Middoth" and Ezekiel both gave the altar as "twelve cubits square," whence it might be inferred that the same cubit was meant. Another remark he had to make was that, if he understood him aright, Mr. Fergusson placed the king's palace east of the eastern gate. Now, would not the existence of that building at that point distinctly interfere with that opening to the sun's rising, as Josephus called it, and would it not have been incompatible with the sun shining into the Temple through the eastern gate? Ezekiel, too, made mention of the top of the mountain in a way which rather led one to infer that that was the centre of the Holy of Holies. He says (xliii. 12), "Upon the top of the mountain, the whole limit thereof roundabout shall be most holy." One important point in considering Mr. Fergusson's contention that the Dome of the Rock was the site of the holy Sepulchre was the improbability that the Jews would have tolerated the execution of one whom they regarded as a criminal upon the summit of Mount Moriah and a spot immediately overlooking their Holy of Holies, and whether it was likely that a burial-ground would have existed within 100 ft. from that holy spot.

Mr. Maynard said that as he read Ezekiel he had come to the conclusion that the Temple was on the top of the rock. It was for Bible students to inquire where it was most usual to place a thrashing-floor, for the Bible distinctly stated that the Temple was built on the site of a thrashing-floor.

Captain Burton said he perfectly agreed with Mr. Fergusson as to the migration of holy places. There was an instance of it going on in the present day. The place of the conversion of St. Paul, near Damascus, was gradually working nearer to the road traversed by the French *diligence*, and he had no doubt that in a few years it would be upon the road itself. It was not surprising, therefore, that there was a difficulty in agreeing as to the exact site of the Temple. He himself had no opinion to offer on the question.

It was announced that the discussion would be continued on the 13th of January.

THE PLASTER WORKS AT VAUX.

THESE great works are situated in the river basin which contains Paris, and are among the most remarkable in all France. The geology of the neighbourhood is exceedingly favourable to this particular and important industry, and full advantage has been taken of it for the opening of what the French call "plaster quarries," many of which have, for centuries, lain with their surfaces bare, in the close vicinity of the capital; but, in the majority of instances, the superincumbent mass has been too thick to allow of this method being adopted, so that, as at Vaux, all the processes of ordinary mining, the sinking of shafts, excavation of galleries, and hollowing out of vast chambers, with roofs, supported either by massive timbers, or by cloister-like arches and columns of the natural material, have had to be carried out. The hill in which the Vaux quarries are burrowed rises abruptly from the bank of the river, with the flow of which the uppermost layers of gypsum are about level. Above these are heavy masses of marl, sand, mill-stone rock, and a thick bed of soil, covered with trees. Some hundred years ago the works were commenced, with a thickness of 90 ft. to deal with, whereas four times that depth has recently been discovered, developing an enormous trade. For, not merely do the builders of Paris, Mantes, Vernon, Rouen, and Havre, rely upon this apparently inexhaustible source of supply, but it employs also a special branch of navigation to the ports of Brittany, Bordeaux, Belgium, Holland, America, India, and even Australia. Gypsum, which rapidly decays under the influence of light, air, and rain, is well adapted for dark ships' holds, and requires only a slight preparation in order to be converted into most serviceable plaster. Formerly, considerable danger attended the working of the quarries, owing to the narrowness and steepness of the galleries; but of late the hill has been pierced by two tunnels, lined with masonry, striking two hundred yards through its interior, and carrying an ascending and a descending line of rails. These branch off in various directions through artificial arches and colonnades, until at their termination the entrance into the bowels of the hill is at least 1,200 yards distant. The transition from the ancient to the modern excavations is distinctly apparent in the change from rude and irregular clusters of pillars and huge hollows scooped out here and there, as if at random, to an order and symmetry producing architectural effects not a little imposing to the unaccustomed eye. The distribution of spaces excavated, and of masses left to uphold the roofs, is perfectly regular, and on no account are the quarrymen permitted to cut away so much as an ounce from that which is considered essential to the safety of their labour. These paths are not always straight and flat, but curve and undulate occasionally, according to the variations of the strata, and now and then are completely stopped by a wall, which indicates either that the vein, so to term it, has ceased, or that it has become dangerous. All, of course, would be utter darkness were it not for the feebly-burning candles carried by every miner, and the atmosphere is intensely cold, without, however, being damp. There is no drip from the upper surfaces, nor any efflorescence; and a peculiar characteristic of this underground region is the dead silence that generally prevails. Plaster-getting is by no means a noisy toil. Now and then, but not often, an explosion of gunpowder takes place, and there is a pretty continuous rumbling of the tumbrils rolling to and from the mouth of the mine, but the men, owing to the frequency of the intervening pillars and partitions, are necessarily divided into small gangs of from two to six at the utmost, so that nothing like clamour arises. The work to be performed, however, is not everywhere the same, for the material is usually found in two layers: one, the upper, soft, and capable of being loosened by the pick, and cut out easily; the other, or lower, extremely hard, very close-grained, of a dark colour, and rarely to be removed except by blasting. The second is the more difficult part of the task; the first the more anxious, since the very pliability of the material renders it a source of peril to those engaged. A favourite method of operation, when a promising mass of fine quality has been hit upon, is to cut a base across it, and then for two sets of men to hew diagonally towards a point, so as to separate from the rest a great triangular block, which, afterwards, is easily disintegrated. Wheeled platforms and levers are used to transport the *débris* to the stations where the wagons take them up, and where the "hammerers" break up the pieces that are considered too large. They are then tumbled into the cars,—bell-mouthed receptacles, drawn down empty, and tugged up full, by horses; these vehicles have no wheels, but are constructed in something like the fashion of sledges, and their velocity is often such as to necessitate the application of a brake. They never run off the rails, and are so solidly built that it is rare for even the most violent concussions to shatter them, though the weights carried by them are frequently stupendous, though in the downward trip they turn sharp corners at full speed, and though they are suddenly brought up, from time to time, to receive accessions of cargo at the mouths of the lateral passages. Arrived at the great tunnel of masonry, already spoken of, they are hooked on to an endless chain passing round an immense iron drum, the empty trains, by a system of checks, being contrived to balance the loaded; and thus, by an ascent contrived with extraordinary ingenuity, and with the least possible waste of power, little hillocks of gypsum, brought up from those remote depths, are piled along the edge of the forest.

Within this, deep holes are dug in straight lines; each, the work of only two men, furnished with the simplest of instruments, is about 10 ft. deep, and in them, by means of gunpowder, a certain proportion of the gypsum is reduced to powder, while the choicer qualities, destined for exportation, are set apart solid, loaded into special cars, and passed from point to point, with the utmost solicitude, until they reach the place of embarkation on the Seine,—nearly the whole distance being accomplished on inclines, without the assistance of locomotive draught power. But, while vast quantities of substance, dug from the quarries of Vaux, are sent abroad, in their raw, or rough state, vast quantities also are gathered at what is technically styled the "distillery" of Saint-Nicaise, which furnishes an article of commerce, in the form of plaster, baked and ground by a peculiar process. The baking, or burning, of the gypsum, indeed, is among the most interesting of the operations in connexion with these celebrated quarries. Dry though the substance be, to all appearance, when extracted from the heart of the hill, it nevertheless contains water, and the object is to draw this forth, if possible, to the last atom of a drop, until, indeed, a perfect crystallisation has been attained. In pursuit of this purpose, strange effects are sometimes created, as in those immense transparent slabs, vulgarly known among the miners as "the asses' mirror," the "table of speculation," and "the stone of Christ." Three walls, erected at right angles, inclose a space open in front, and support a thick iron roof; within this the stones are piled upon, but in a manner distinct from, each other, tending together until a rough arch is formed, and covered at the top with broken *débris* from the mine. Through this, fire is allowed to penetrate for from ten to twelve hours, when, completely desiccated, the gypsum is drawn forth, and pulverised, either in mills or by hammers. But, the fuel employed being wood, the heat is unavoidably unequal, so that the results cannot be depended upon to a certainty,—a part being excessively, and a part insufficiently, baked. To remedy this various expedients have been tried, including the use of twice-burned coke; but, with no particular success, though, of late years, more systematic methods have been employed at Saint-Nicaise. Upon arriving at the crushing works the stones are stopped by a sort of grating which only permits of a certain size and quantity passing through at a time, and the supply is regularly and incessantly kept up; men being stationed on either side, armed with mallets, to break up the pieces which are too large, and then allowing them to fall through a metal funnel into a zinc trough, the bottom of which is formed of thick iron bars, closely laid together, so that only the gypsum which has been sufficiently triturated can fall through. Meanwhile, a huge wheel, revolving upon an equally huge axle, kept in check by cogs, and weighted with heavy blocks of iron, passes over those stones which have resisted the hammer, and sends them rolling in wagons down a sloping platform that leads directly to the upper apertures of the calcining furnaces,—a great improvement, it will be seen, on the primitive plan, and suggestive of some progress in the manufacture of "Plaster of Paris." These furnaces are unique in their form, and in the principles of their action, consisting of a series of chambers of graduated heating force, until the term "red-hot" is reached. They are built of brick and metal, and the material to be calcined falls gradually through from the one to the other. Ordinary coke is here preferred to any other fuel, and the plaster-powder, therefore, comes out purely white, in which alone it is regarded as a commercial product,—without any of those various discolorations which might be expected from the employment of coal. At every stage, indeed, the utmost precautions have to be observed, and the utmost difficulties are encountered, in insuring the total absence of damps or acids of any kind, the very process of "dishydratation" being liable to evoke acidulate vapours from the metallic parts of the machinery. But the pulverisation is not complete yet. The powder descends from the furnaces into mills furnished with vertical stone wheels; thence it passes, or is "bolted," through finely-pierced iron sieves, and, the crystallisation being now, in its turn, entirely got rid of, the "Plaster of Paris" is perfect as an article of trade. Of course, not a few minute details, in a general notice like the present, have to be left out of view; but two or three points of interest remain to be remarked upon, among them being that in the Saint-Nicaise "plaster-foundry," if such a phrase applies, 100 cubic yards of "rough plaster" may be converted into "fine plaster," fit for the purposes of commerce, within twenty-four hours, intricate and numerous though the processes are, and that this particular manufacture is more free from the marly alloy, or "streakiness" than any other known,—on the Continent, at all events. Even it, however, is liable to sophistications, as by the admixture of salt, calcined indigo, and, indeed, every variety of white and pulverisable substance. But its modern uses are innumerable, and once extended to the manufacture of *papier mâché*, though kaolin is now its substitute in that sphere. All artificial stones, all artificial marbles, have it as their basis; it has been made to imitate ivory, and wrought into statues susceptible of a magnificent polish. It has been applied at once to the clarification of wines and to the manuring of land, by ink-makers, printers, moulders of every class, porcelain and faience artists, the mimicry of

Sèvres, the fixing of mirrors to frames or walls, and, above all, to the copying of statuary. Without insisting that the Vaux works, in the valley of the Seine, constitute the centre of this industry, they unquestionably afford the best facilities, from an outside point of view, for studying and understanding it.

ABUSES IN HOUSE FURNITURE MANUFACTURE.

There are many vested abuses in connexion with trades akin to those other vested interests which an enlightened public opinion is gradually disturbing with a view to a better administration for the Commonweal. The holders and upholders of sinecures and pluralities in public appointments are still numerous, and, of course, wax irate if any reformer dare to question them, or to investigate the rule of their office. Our exposure of some of the abuses in the furniture trade, as might be expected, has not been well received in certain directions, and a shallow cry is raised of "spoiling trade," or injuring "a local industry" that has already to contend with opposition in other quarters interested in transferring the centre of a long-established trade from one part of the metropolis to another. Now cabinet-making, or furniture manufacture, is no more a local industry than house-building, and, like the latter, it has its ramifications wide and far, though certain localities or streets may have long contained a number of persons practising the trade. We are not interested in injuring the trade of one part of the town to benefit another, but are equally earnest in pointing out abuses wherever they may exist. "Scamped" work in the building trades has been continuously exposed in these pages for long years, and persistent condemnation has at last led to legislation, which is now making a wholesome though as yet only a partial improvement. In the furniture trade it is notorious that, for many years, "slop-work" has prevailed, and that to a most fraudulent and dangerous extent. Heretofore furniture manufacturers and sellers of the new and second-hand trade have had matters pretty much to their own liking, and this immunity has emboldened unprincipled members of them to impose still further upon the credulity of the purchasing public by palming off articles of furniture of a most deceptive kind utterly unfit for usage. From a serious and impartial consideration of the abuses in connexion with the furniture trades, we have no hesitation in saying that the time has long since arrived for holding a certain class of manufacturing furniture-makers and upholsterers amenable to the law for obtaining money under false pretences. A baker or butcher is punished for selling adulterated bread or unsound meat, and generally in the food and drink line the vendors are at any moment liable to an unwelcome visitor who takes a sample, perchance on the sly, for analysis. Chairs and tables are continually sold at present represented to be composed of a certain description of wood which they are not, and lady purchasers are generally the most often imposed upon. In the upholstery of chairs considerable artifice is evidenced, and in material, and colour, and tinsel ornamentation and finish, women generally fall victims to the garish show as the moths at night do to the gas or candle light. We made some general statements in our previous article in reference to chairs and their upholstery materials which have been doubted by some people, and even contradicted by manufacturers.

To place our statements beyond all cavil, we will furnish the result of a dissection of a sitting-room suite, comprising a couch, a gentleman's and lady's easy chairs, and half a dozen of ordinary chairs to match, &c. This suite is but one of many others of the same kind at present being extensively manufactured, and was sold to a lady purchaser a few months ago as made of fancy wood,—walnut-wood, if we remember aright. In the entire framing (seat, rails, legs, arms, backs) there was not one mortise or tenon, but single dowels. The wood of all the articles was beech darkly stained; indeed, it was in a manner grained as painters grain hall-doors and shutters, only by a different method of procedure, staining material being dabbed on, and the surface polished over afterwards. This "handsome suite," for which a liberal price was paid, was thoroughly dishonest in make and materials, and any practical man could see without much scrutiny that it was made to sell. The narrow fascia moulding planted on the lower part of the framing rails connecting with the legs and backs was in no sense a moulding, but a very flat half-round, with a ¼-in. gouge groove on its surface. Instead of being closely fitted to the curve or sweep of the chair and couch rails and glued, it was nailed on. Were it even a good fascia or fascia-moulding, no nails should have been used, and such a vile system of planting on would not have been tolerated a few years ago by any respectable cabinet or chair maker. No respectable house at present, we think, would give countenance to such a system. The cross-bearing rails of the couch were not an inch in thickness, and were framed into the sides with a single dowel. The rails should have been 1¼-in. or 1½-in., and instead of dowelling either tenons and mortises or dovetailing should have been employed. The upholstery of this drawing-room suite was the veriest "slop-work" that it was possible to conceive. Indeed, a whole detail of the manipulation would astonish the reader. Briefly described, however, we may say the couch, easy chairs, &c., were covered with rep, and, in common parlance, were "spring-bottomed." The rep had an edging of gimp to form a "genteel border" line of demarcation between it and the fascia moulding. The stuffing of the seat within was a composite of a variety of vile materials, of which the following was clearly discernible in greater and lesser quantities: alva marina, flock, list, ravellings of woollen and cotton stuffs, hay, in fact, rubbish of all kinds, but not an ounce of any kind of hair. The framing and workmanship of this drawing-room suite was not only bad, but in the instance under notice wedges of wood were inserted to make close joints between the shoulders of the tenons and their seats. The house from which the above furniture was turned out does a brisk trade, and the manufacturer has many brethren who are engaged in turning out wholesale a similar description of "fancy goods." Are we not justified in holding up to reprobation such a class of house-furniture wherever manufactured, whether in the East or West End? In chests of drawers, and marble-top washing-stands and dressing-tables, articles in which a good trade is at present done, the only bit of value and cleanliness of finish about them is in the marble, as far as some manufacturers are concerned. The framework of a large number of these half-round or semicircular stands is of the most flimsy and disreputable kind. They are mostly all deal, veneered with the exception of the leg or claw in front. The two back stiles or rails (uprights) are often half-inch deal veneered with a little quarter-round for a plinth or base moulding at foot. Once the marble top gets loose the stand soon loses its right to that title, and shortly goes the road of all "slop work." Cabinet, chair, and sofa work were once articles exhibiting good joinery, but to a large extent now bad single dowelling has taken the place of double dowelling and dovetailing, and screws and nails, with coloured putty, are unblushingly used in open places in lieu of mortises and tenons and good glue joints. We are well aware that excellent English house-furniture is manufactured, but the "slop-work" system, from reasons stated in our former article, is rapidly extending, and we fear if some steps are not taken to counteract a most dangerous abuse the cabinet trade will be ruined and the export trade in such goods destroyed.

While on the subject of furniture-making, it would be remiss on our part if we did not take some notice of the part that the second-hand furniture dealers play in the system of deception. The fact is, that the large second-hand furniture sellers and brokers are also makers of a large amount of the slop-work that is thrown into the market. Some of these men keep jobbing cabinetmakers and chairmakers employed not only for repairs, but for purposely manufacturing new articles to be sold, when finished, as "prime second-hand" furniture. Flimsy tables, chests of drawers, chairs, couches, &c., are manufactured on their premises or otherwise made for them by "slop-work" hands outside. This new work is, of course, made of the thinnest and cheapest materials in wood and upholstery. The pale-grained mahogany, however, is soon made to assume a deep brown or dark colour by the application of lime water. A little bit of lime dissolved in a basin of water, and applied to the mahogany or veneer surface transforms in a few moments the bran new gingerbread into a deep-toned "modern antique." A little polish afterwards, and dubbing and doctoring here and there, are quite sufficient for "taking in" all ordinary "flats," newly-married pairs, or old ladies out furniture-hunting. Who can resist "prime second-hand," little the worse for wear, articles which the seller assures them could not be bought when new for double the price asked? This new-second-hand furniture pays the seller better than if he sold it as finished undoctored. In fact, he fares better than the respectable manufacturer, and his profits are large. Here, then, we think that the honest portion of the chair and cabinet trade have a legitimate cause for complaint, and they should take some action for counteracting this fraudulent system. The selling of second-hand furniture is quite as unobjectionable a business as the trade in second-hand books if honestly carried out, but the manufacturing of slop-work and selling it for prime second-hand goods is simply an obtaining of money under false pretences, and the dealers should be held amenable to the law. The second-hand furniture brokers also perpetrate a number of frauds by their alliances and confederacies with a low class of auctioneers, who play into the furniture-brokers' hands at all sales and auctions. A few days before auctions of household furniture take place doctored, new, and second-hand articles of furniture are often carted at night from the second-hand brokers' shops and placed along with the goods in the house where the sale takes place. Picture-dealers and the sellers of objects of *virtu* play at the same game to no small extent and the "pot-boilers" of poor artists, who are often obliged to work for the Jews and Gentiles who murder the Old Masters without compunction, are knocked down for considerably more than they are worth. It is almost impossible for any respectable person to attend ordinary auctions of household furniture at present and buy articles at their value. The furniture and other brokers and the "Commission Men" will bid against all newcomers, unless you give one of them the "tip" before the sale, which means allowing him a certain commission for buying the articles you want. Many of our London auctioneers are completely in the hands of the furniture-brokers, and are obliged to some extent to study the interests of their constant customers. The unity of interests that exists between the lowest class of auctioneers and the furniture-brokers is close, and the auctioneers of this class are often furniture-brokers themselves. We often pity the fate of the poor householder,—the man with the large family, or the widow who is forced through necessity to auction her effects. She is generally well fleeced in the interests of the furniture auctioneers and brokers.

Reverting to the main question of furniture manufacture proper, the question arises, how is a reform to be effected? What is the best way to encourage improvement in execution?—for, without an improvement in this latter particular, design will only be utilised as an external to enhance the value of slop-work, and to further impose upon the credulity of the public. Art is very good, but in a world of artifices art can make but small headway if the workmen are arrayed against it, or so handled by their unprincipled directors or employers as to render its usefulness *nil* or of little avail. It rests at present, to a large extent, with employers of skilled labour to encourage, for their own sake if for no other, the execution of good work. In building materials and workmanship, where there is an architect, he has a voice, and, without being too exacting, he can make it heard for the credit of his art, and for the benefit of the future of skilled labour. In the house-furniture trade, except to a very limited extent, where expense is of little object, the architect is still powerless. An architect is generally the designer of his own works, but the furniture, manufacturer is seldom his own designer, at least in person; but even admitting that he is such, in general nobody stands between him and the purchasing public but the workman, who has little or no voice in the matters at issue. The connexion between an architect and his client is always direct, but it is only in cases of special orders, or where a design or special instructions are given, that the furniture manufacturer moves out of his ordinary groove. A client can find fault with his architect, and the architect can hold the builder responsible for serious breaches, but the ordinary furniture purchaser is out of court. He has bought with his eyes open, he was perhaps no judge of good from bad furniture,

and he must make the best of a bad bargain. There ought, we should imagine, to be room in this great manufacturing country for such a professional as a furniture expert, and perhaps the time is coming when the duties of such an office, at present unlooked for, may be thrust upon the architect. House designing and building of the better kind has of late years, in the interests of a certain class of clients, been setting forth more wants, requirements, and comforts at the hands of architects and builders. The owners or purchasers of new houses are yearly expecting something more than bare walls for their outlay or investment. A few fixed and permanent articles of household furniture and domestic appliances have already been provided in the better class of houses, from kitchen to attic. Even in middle-class houses and workmen's dwellings certain fixtures, drawers, lockers, and other articles of accommodation are provided before hand. As time advances, there will be further demands upon architects in every description of dwelling. Well-built and thick-walled country mansions and town houses afford ready facilities (if it be so wished) for architects meeting several wants, in the way of permanent furniture accommodation. To be sure, it may not be advisable to break the wall surfaces of large rooms into too many angles, but fashion is often stronger than statute law, and so long as recesses are provided by chimney-breasts, or other domestic exigencies, people will not be long in finding use for them. A family mansion or house, in the true sense of the term, needs that the furniture should be lasting and good, but most of our present-day movable furniture is neither one nor the other. Seldom, indeed, are our present-day houses, even of the better kind, in their plaster enrichments and painting decoration, in harmony with the furniture. Where the latter is not out of harmony with architectural finish, the general run of upholstery and drapery is. In fact, the man-milliner swathes all that is worthy of view from an architectural point out of sight, as if he were intent on proving that upholstery was necessary to the existence of architecture and human life, and that without it all rooms are but whitened sepulchres.

During the last thirty or forty years much joinery-work for internal finishing has been eliminated from our houses, and not always with the best results. In the majority of our middle-class houses the doors and windows are denuded of much of the elaborate trimmings that formerly gave an artistic appearance to the rooms in conjunction with the stucco and scagliola work of the ceilings and cornice mouldings, and the exquisite ornamentation of the mantelpieces, whether in carved oak, marble, or affixed scagliola. Panelled wainscoting, wooden cornices, surbases or dados, &c., have been given up, — in some instances with advantage; but what was permanent and real has been replaced by the rickety and movable nuisances of the modern furniture purveyor. Many of the dwellings of our people, instead of being comfortable homes, are converted into lumber-rooms, in which moving and handling is a danger, rest a risk, and contentment impossible. A constant misgiving haunts men's minds because fraud is rampant, and they know not how soon they may be undeceived, in what they paid dearly for in furniture, pictures, and other objects of art as art-workmanship.

We hope what we have written now, and in our former article, has been sufficiently comprehensive and clearly stated as to admit of no doubt. We have only touched upon the fringe or fringes of some great interlocked abuses, and by nowise exhausted a subject which is matted with gigantic frauds and honeycombed with commercial corruption.

Bust of the Late Thomas Wright, F.S.A. A subscription is on foot to purchase a marble bust of the late Mr. Thomas Wright, the property of Mrs. Wright, executed by Mr. Joseph Durham, R.A., and to place it in some public hall or library; and the proposers trust that, as the sum received will be devoted to the necessities of Mrs. Wright, it will not be limited by any reference to the mere artistic value. Subscriptions may be sent to Mr. Dillon Croker, F.S.A., treasurer, 9, Pelham-place, Brompton; or Mr. C. Roach Smith, F.S.A., Temple-place, Strood. The Prince Imperial has subscribed 10*l.*, and amongst those who have already sent their names, we find the Earl Powis, the Earl of Derby, Lord Houghton, Sir John Lubbock, Mr. Joseph Mayer, and others equally well known.

A MODERN ITALIAN WORK ON THE ART OF THE PAST AND THE PRESENT.

SIGNOR CHIRTANI, in a handsome volume recently published at Milan, "*L'Arte attraverso ai secoli*," has made judicious use of the prolific source of information in the field of art supplied to the world by numerous French writers; but Signor Chirtani himself is a critic too thoughtful and too original to merely popularise their ideas without some valuable reflections of his own. He has recognised that numerous additions were necessary, and that in passing over such a beaten track the utmost care and attention were obligatory. Everything shows us that Signor Chirtani is no new traveller on this familiar route. Thoughts such as are to be met with in these pages are not the mere result of hasty consideration, but that of a lifetime spent in the study of one subject; they are the patient analyses of the thoughts of contemporaries and predecessors, and, in one additional point, exceptionally valuable from his inferences being drawn, not so much from individuals and their ideas as from the epoch in which they were expressed, an historical precept followed by too few of the numerous writers on the past.

The result of such a study and intimate knowledge of so much that has been already said and thought, is an originality of view, the expression of which is in more than one case really refreshing in comparison with the so often written, so often read, praises of what the world has for centuries admired. Signor Chirtani shows no disposition to encourage preconceived ideas, whose influence he valiantly resists.

How often has the artistic world, or rather those who pretend to belong to it, wept over the lost beauty of classic times,—its Attica, its noble Doric temples and propylæi,—lamentations so often uttered, that the world at large has at length allowed itself to be persuaded that perfect art has for ever remained buried with Grecian architecture. Such prejudices Signor Chirtani in no way encourages; for him, art advances, just as human thought and human intellect have advanced since those far distant days.

In the art of antiquity, in the Celtic and Pelasgian art, one theme, one need, seems ever to have been uppermost—mere strength. True that the arch in its boldest form was known to the Pelasgians, the Assyrians, and the Greeks, but it was left to the Etruscans to understand its importance, and give it life. And this form of the arch, gradually growing bolder, our critic seeks it in every school, follows it to San Marco, to Sta. Sophia at Constantinople, in the cupola of St. Peter's, and in more modern times in the graceful lines of the Israelitish temple, now the National Museum of Turin. "A Greek," writes Signor Chirtani, "so far from carrying out, would not even have dreamt of such elegance, of such boldness, of such power, of contrast or of resistance, of action and reaction, so complicated."

When we have further wandered with the author among the works of the past, among the ruins and the aqueducts of Rome, we find ourselves in India, surrounded by its extraordinary Indo-Mussulman architecture; and then we follow the author into the consideration of the Byzantine and Latin architecture,—syntheses, as he terms them, of barbarism and grandeur, of light and shade, of the grandiose and the absurd, of the immense and the ridiculous.

Next we see the Lombard art, almost the exact image of that epoch in which, the Roman Empire ruined, Italy fell into barbaric anarchy. Further on we are presented with the beautiful creations of the Saracenic architecture "when the pollen of the Eastern flora deposited itself in the bosom of Lombard art, and the solemn mystery had for its sacred scene that most gorgeous of Mediterranean islands, Sicily," till finally we are brought in presence of the Gothic period, which for three centuries displayed its elegance, its miracles of construction, its spires and pinnacles, its buttresses, its lovely windows and ornaments, in which the most capricious imagination is puzzled and enchanted in the extreme delicacy of detail blended with the imposing, and at the same time severe, character of the whole.

This sublime art, says Signor Chirtani,—making use of a comparison at which, like ourselves, more than one reader will take umbrage, was as much superior to the antique as the pale features of Beatrice are superior to the flushed face of the Bacchante, as the wrinkles of St. Jerome, who weeps for the fate of Rome and prepares the way for a new civilisation, are worthy of greater respect than the graces of a decrepit Faun.

The dispute was an old one even in the days when Walpole penned his familiar praise of Gothic; the dispute none the less still wages, nor is it likely to be settled yet for many a year to come.

Italy in the fifteenth century is next presented to us, the creator of that gay art which drove before it Mediæval superstition, and, urging back the art of the North, returned to simple nature. We hurry through the decadence and rococo, noisy, restless, and glaring, and find ourselves at last in modern times. Severe is Signor Chirtani's judgment on their productions. Severe in particular, and with justice, when he bids us stop at "harlequinesque Munich," the synthesis of modern art, which shows us a pseudo-Pitti with a pseudo-Pompeian portico, with imitation Parthenons, and Florentine, Bramantesque, and Lombard models, with obelisks and Gothic spires, with Apollo and the tuneful Nine escorting the *debonnaire* Maximilian. We ourselves remember seeing in one of the principal squares of the city, and purporting to be the statue of Goethe, the familiar and noble figure of the Aristides.

Signor Chirtani closes this section with the fervent hope, one which in all countries is likely to be echoed, for an art which will be in accordance with the needs and thoughts of the present day.

The journey of the reader completed, among the monuments of architecture and the creations of the sister art of the chisel, our genial critic leads us to the masterpieces of the painters. We see how the noble art, having left the temple, is taken from the wall; we see the origin of the picture and the successive metamorphoses of the antique art, of which such rare fragments remain, its joyfulness, its beauty, the apotheosis of human form,—hidden, as was hidden the whole world, in the early centuries of Christianity, rising again with Giotto, breaking at length the charm of asceticism, and soaring to the utmost heights of elevated sentiment; rendered sublime in the glorious cinque-cento by Leonardo da Vinci, by Michelangelo and Raffaelle, by Giorgione and Titian, by Paul Veronese and Correggio, and then,—the sad decline. To Italy succeeded Spain; to Spain, Flanders and Holland; and Holland, Flanders, and Spain, indeed, all Europe, we fly over in this book, always in search of the finest works of art, from century to century, from picture to picture, from name to name, till we come down to Herkomer for England (which, in the author's limited knowledge, he seems to consider that of our only painter), to Regnault for France, to De Vienne for Belgium, to Alma Tadema for the Low Countries, to Makart and Knaus for Germany, to Jaroslav Cermak for Bohemia, to Mateiko for Poland, to Fortuny for Spain, and Tranquillo Cremona and Fontana for Italy.

Such is the outline of the work which unfolds itself to the student and the thinker. For the reader who merely wishes to regard the work as a "picture-book," we may say that almost every page presents the image of some monument, the design of some master-work, the reproduction of some famous picture. The volume, indeed, contains something more than 500 cuts, and one is able, without fatigue, and with a certain amount of profit, to pass in review all the marvels of the art of every country and of every epoch.

Ancient Monuments Bill.—In moving the second reading of this Bill (House of Commons), Sir J. Lubbock said that as the House had on several occasions affirmed the principle of the Bill, he thought hon. members would not wish him to enter into the subject at length on the present occasion. He would only observe that the principle of the Bill was that, after proper notice had been given, an owner of one of these monuments who wished to destroy it should, at least, give the country the option of purchasing it at a fair price. As regarded the constitution of the commission and other details, he did not ask the House to commit itself, though, for his part, he believed it would work well, but he should be most ready to consider any suggestions with reference to it in committee. He had adopted all the recommendations of the Select Committee which sat on the measure and also other suggestions for removing objections. The Bill was then read the second time.

EPPING FOREST.

It is now universally acknowledged that open spaces reserved for the exercise and recreation of all classes, at the centres of population in our cities and larger towns, are necessary and conducive to the health and happiness of the people. Not only philanthropists and those professionally engaged in the promotion or carrying out sanitary arrangements are urgent as regards this, but local and municipal authorities are alive to the advantages, and take pains to secure them for the public. Hence the formation of parks dedicated to the public use, and the demand for the art of the landscape gardener in the disposition and planting of the ground, so as to make them, in some cases, rival most successfully the most favoured demesne of the aristocracy.

The City of London has taken a most prominent part recently in securing in perpetuity the remains of Epping Forest, and wresting from the hands of unlawful possessors those parts which had been alienated from their original purpose. But now comes the question,—What will they do with it? This is no less an important matter than the original acquisition; for it is obvious it can be seriously mismanaged, and at least made nothing of, or be hereafter a reproach rather than an honour, by the way this splendid opportunity is to be wasted, or, on the other hand, improved, for the adornment of the forest and the advancement of arboriculture as a science.

This large open tract called "Epping Forest" is now intrusted to a committee (verderers) of the London Corporation, and they have to decide how it shall be planted, laid out, drained or not, and in other ways be made available for public use and enjoyment. The "capabilities," it is hoped, will not be now neglected, but, under proper guidance, developed to the fullest extent, so that the grounds may be instructive and useful as well as ornamental, and adapted to recreative purposes. In the November number of the *Fortnightly Review* all this is admirably discussed in an article, to which we desire to call especial attention, by Mr. Alfred R. Wallace, a name well known as a naturalist of the highest authority, and one who does not write without the necessary information and experience of his subject. The arguments used and the proposals made are deserving the attention of all who are interested in arboriculture, as well as citizens and visitors to the great metropolis. Mr. Wallace's experience was gained in prosecuting his researches as a naturalist in many parts of the world, and he is an acknowledged leader in that department of scientific inquiry.

Describing in his own words the plan which he recommends for planting and laying out the forest in a way which would be at once far from costly, splendid in result, certain of success, and capable of being accomplished within a very reasonable period of time, it is,—"One which would be perfectly novel, perfectly practicable, intensely interesting as an arboricultural experiment, attractive alike to the uneducated and the scientific, not more expensive than any other plan, and perfectly in harmony with the character of the domain as essentially a forest. It is, briefly, to form several distinct portions of forest, each composed solely of trees and shrubs which are natives of one of the great forest regions of the temperate zone."

Taking only one of these regions first into consideration, it is to be remarked that the forest trees of Eastern America number 155 different kinds against eighty-five of our European region, a large proportion of them being susceptible of introduction into our island. Here is an ample field for diversified groups of the most picturesque character. Quoting our author,—"Now let us suppose one of the most suitable of the open tracts recovered at Epping to be thus converted into an American forest in which as many trees and shrubs peculiar to Eastern North America, as we know to be hardy, are planted in masses and variously intermingled. Such an experiment would excite interest in every stage of its growth." Nor would the expense, it is calculated, exceed the culture of our own varieties of timber trees. Some of the foreign species are of rapid growth. This is the case with the Wellingtonia and the Douglas pine. Mr. Wallace justly observes, "Here, again, is no question of success. The experiment has been made already for us a hundred times over, and we have only to profit by it." Eastern Asia and Japan are represented as even richer than America in deciduous trees. There remain, our author proceeds to state, the temperate forests of the southern hemisphere, in Chili, Patagonia, Australia, and New Zealand. Many of their denizens are susceptible of acclimatisation in our regions. We have thus briefly indicated the nature and value of Mr. Wallace's contribution, which deserves the perusal of the members of the committee and of every person interested in the embellishment, and, not least, the useful and profitable occupation, of Epping Forest, but we must refer them to the article itself for his views as to laying out drainage, or rather avoiding too much drainage and other necessary details of the proposal.

C. F. H.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute held on Monday evening last, Mr. Charles Barry, president, in the chair, the following gentlemen were balloted for and declared to be duly elected, viz.:—As Fellows, —Mr. T. C. Hine, of Nottingham; Mr. George Gilbert Scott; Mr. John Wynne, of Manchester; Mr. George Bell, of Glasgow; Mr. William Millican, of Leicester, president of the Leicestershire Society of Architects; Mr. H. L. Florence, president of the (London) Architectural Association; and Mr. George Wilkinson, of Dublin. As Associates,—Mr. C. A. Monday, of Croydon; Mr. H. A. K. Gribble; Mr. W. W. K. Clarke; Mr. H. G. Brace; Mr. H. Tanner; Mr. F. E. Eales; Mr. S. F. Williams; Mr. H. B. Rowlatt; and Mr. R. E. Powtall. As Honorary Associates,—Mr. W. H. Barlow, F.R.S.; Mr. John Hopgood; Mr. W. S. Inman (past vice-president); Lord Elcho, M.P.; Sir James Watson, of Glasgow; Mr. R. Bruce Bell, C.E.; Lieut.-Col. Chesney, R.E., president of the Royal Indian Engineering College; the Earl of Carnarvon, president of the Society of Antiquaries; Mr. John Murray; Mr. W. Harry Rylands; Sir W. E. W. Gregory, bart., M.P.; Mr. William Hardman; Mr. Hugh Leonard, C.E.; Lord Henry Scott, M.P.; Mr. John Penn, C.E.; the Dean of Norwich; and Mr. H. C. Coote, F.S.A.

There were thus elected thirty-three new members, a number without precedent, Mr. Barry believed, on any previous occasion.

The President announced that M. Davioud, of Paris, had written thanking the Institute for electing him an Honorary and Corresponding Member; and that the President of the Société Centrale des Architectes de Paris had written in the name of that body expressing great regret at the death of Mr. Cockerell. Mr. Barry farther stated that the Council had ventured to send a special letter of condolence to Mrs. Cockerell, signed by him as President in the name of all the members. He also stated that as her Majesty the Queen was the patroness of the Institute, the Council had thought that some expression of sympathy with her Majesty, who was now in deep sorrow, would not be unacceptable, and he was quite sure that the members would approve of the Council's proposal to send a letter sympathising with her Majesty in the great loss she has just sustained.

The discussion on Lieut. Conder's paper on "The High Sanctuary at Jerusalem" was then proceeded with. We give a report on another page.

Captain R. F. Burton then read a paper on "Remains of Buildings in Midian." Of this we shall print the substance in our next.

The President announced that the next meeting of the Institute would be held on January 13, 1879, when the discussion on Captain Burton's paper would take place, and the discussion on Lieut. Conder's paper resumed and concluded.

Technological Museum for Sydney, New South Wales.—We are informed that the Government of New South Wales has requested Mr. William Forster, Agent-General for the Colony, Professor Liversidge, of the University of Sydney, and Mr. E. Combes, M.P., C.M.G., to collect information in the United Kingdom and on the Continent relative to the working of English and foreign technological museums and colleges, with a view to forming similar institutions in Sydney. A sum of money has been placed on the estimates by the Government of the colony, to enable the committee to purchase suitable specimens.

CHRIST CHURCH, NEUILLY.

THE ENGLISH IN PARIS.

Christ Church, Neuilly, has been built under somewhat different circumstances from those of most churches.

One usually finds mission work the outcome of the Church, but in this instance Christ Church is the outgrowth of mission work. It was on the 20th of December, 1872, that Miss Leigh first opened her Mission Home at 77, Avenue Wagram, being impelled to make this effort from the gift of a Scotch girl of 10d.,—1 fr.,—"a gift of faith and love"!

The work grew so rapidly, that some eighteen months after, Miss Leigh undertook the purchase of the whole house at a cost of 10,000*l*.

On May 9th, 1875, the whole of this amount was paid down, and the large house, consisting of some seventy rooms, was divided into five separate homes, being (1) a home for daily and unemployed governesses, (2) a home for girls who work out by the day, (3) a home for ladies' maids and nurses, for all of whom free registry is kept, (4) a sanatorium for the sick, (5) a *crèche*.

Some 1,500 of our young country-women have been admitted into the Home, and over 22,000 visits received from them.

Within a few months after the commencement of her work, Miss Leigh's attention was called to the number of orphan and otherwise destitute English children in Paris. In July, 1876, about eighty of these children had passed through her hands, some of whom had been restored to friends, others sent to Schools and Homes in England, twenty-four still remaining under her care, when M. Galignani, hearing of the crowded state of the Mission Home, most graciously offered his Hospital in the Boulevard Beneau, Neuilly, as a more suitable home for the orphans. This munificent gift was ratified October 25, 1876, M. Galignani expressing to Miss Leigh his knowledge of the need of her work, and his high appreciation of her administrative power.

The Orphanage has a household varying from forty to forty-six, and perhaps Paris has no more touching sight than these orphans, with histories differing in circumstances, though not in need, sitting two and two up the aisle, in the church that has sprung up within the last few months; commemorative of a "work of faith and love," which has been wonderfully crowned and blessed.

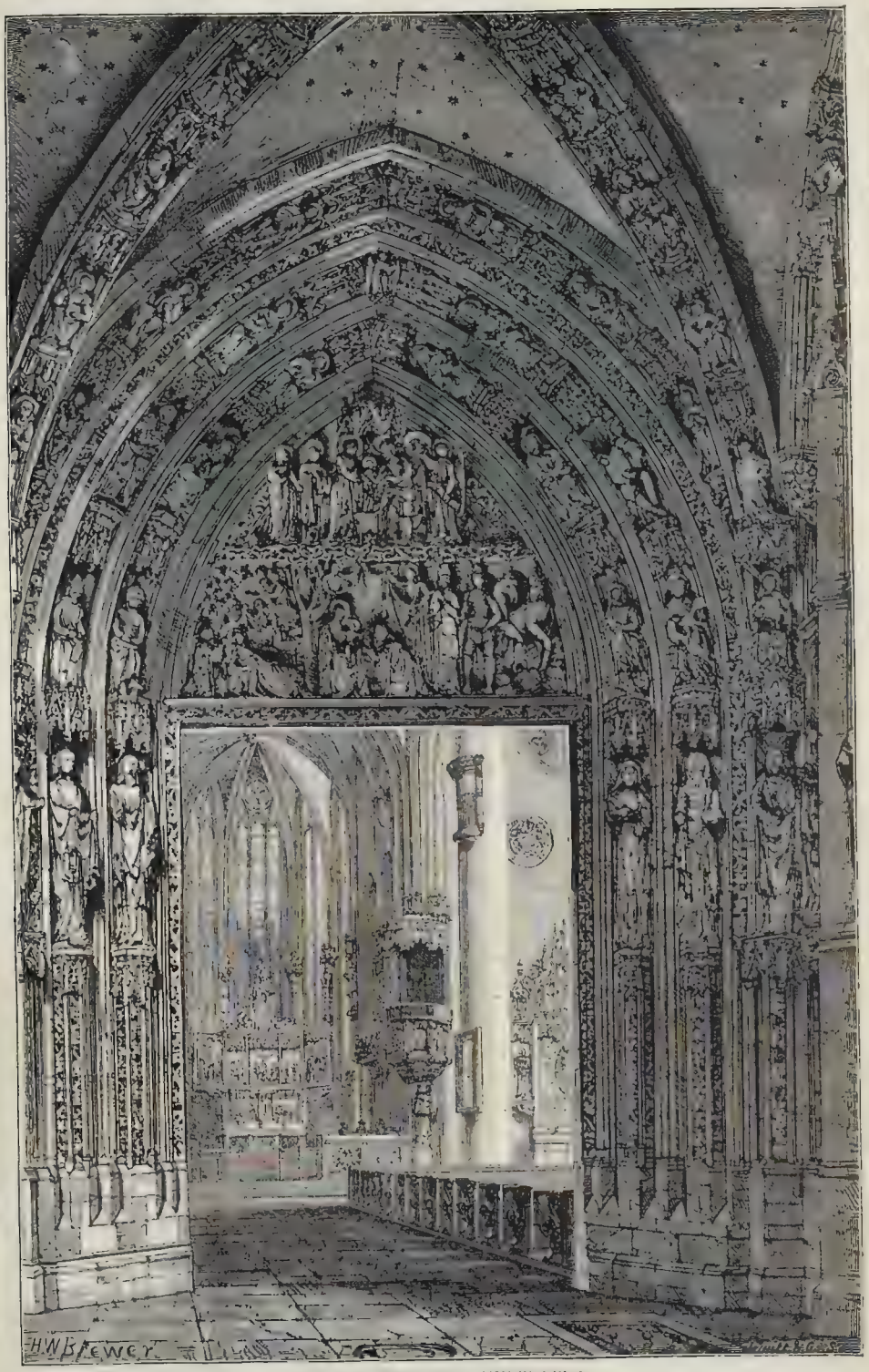
The total number of children who have now been received and helped over a time of need is 166. Between the Mission Home and the Orphanage 130 of our country-women and children are daily provided and cared for. It should be added that a soup-kitchen has also sprung up close to the Mission Home, where, during last winter, a total of 2,734 English women and children, and sick, received portions of meat, bread, and soup.

About a mile from this Home, in different directions, are the Christian Association Rooms, 88, Faubourg St. Honoré, and 33, Rue de Morny, giving a comfortable Sunday home, where food is provided for numbers of English girls who are homeless upon that day.

To return to the church, which is built on the confiscated property of the Orleans family, and in the neighbourhood of the desperate struggle that took place between the Versailles troops and the Communists,—Christ Church, Neuilly, charmingly situated at the corner of the Boulevards Eugène and Beneau, where five avenues meet, and which is only partially finished. Its style is mainly Early English, with occasional transitions into that of a later date. Its western façade has a belfry-tower at the southern angle. The interior consists of nave, side aisles, and choir, with a flight of steps up to the communion-table at the east end. Spacious clearstory windows of three foliated lights light the nave, and similar ones the side aisles. All the sittings will be free and open, without exception, the offertory alone being looked to for supporting the church. The architect, Monsieur Leroux, made two or three journeys to England for the purpose of studying its church architecture. The Prince and Princess of Wales laid a memorial-stone in the chancel on the occasion of one of their recent visits to Paris. The church, when finished, will comfortably seat 650 persons, and is to cost 8,500*l*. Of this about 3,200*l*. have been raised, and paid over to the *entrepreneurs*, who claim one-half the cost during the continuation of the works, and the other half within six months of its completion.



CHRIST CHURCH, NEUILLY, FRANCE.—M. Leroux, Architect.



THE FRAUENKIRCHE, NUREMBERG.

About 400*l.* a month are therefore needed to keep pace with the pecuniary needs of the church-building fund, which must be looked for mainly from friends in England. Although there is a large and growing English population (already estimated at 1,500) at Neuilly, yet from its nature, not much substantial help from it can be counted upon. First, there are many schools in which are to be found a certain number of English pupils; secondly, many private English families, to whom such a locality presents more attraction than it does to French people in general; and thirdly, and above all, there are many English *employés* and workmen who are compelled to seek there lodgings for themselves and their families less expensive than in the more central quarters of the town. All these together undoubtedly form a population, both larger and in general more necessitous than that for which many English churches have been erected on the Continent. It is equally certain also that the great majority of this population would never be induced to frequent English churches so far off as those which already exist, even supposing they could find room in them, which can now hardly be said to be the case.

It need scarcely be added that, although simple and not costly for the high purpose to which it is intended, Christ Church, Neuilly, is the only really ecclesiastical structure which the English possess in Paris.

Springing up as it has from the tiny seed of faith and love planted scarcely six years ago, and round which are gathered the branches of what M. Galignani justly calls "a representative work of the English nation at Paris," Christ Church, Neuilly, appeals to the Christian patriotism of the English at home to prevent the possibility of any debt being incurred in its erection, and to maintain with due efficiency various agencies for good to all classes of our country people needing help, in one of the most luxurious cities in the world.

Subscriptions may be sent to the church-building fund, Neuilly, Paris; Messrs. Barclay, Bevan, & Co., 54, Lombard-street; or to Miss Leigh, 77, Avenue Wagram.

THE FRAUENKIRCHE, NUREMBERG.

IN any less wonderful town than Nuremberg the Frauenkirche, or Church of Our Lady (the chief Roman Catholic church in the town), would be looked upon as a most remarkable building. It is, however, so far surpassed in magnificence by the churches of St. Sebald and St. Lawrence, that it is often overlooked by visitors to Nuremberg.

The Frauenkirche is by no means a large building. It consists of a short nave and aisles divided into three bays; the aisles are the same height as the nave, and the whole is covered externally by one vast roof. The chancel is without aisles, and is four bays in length. At the east end is a three-sided apse.

The west front of the Frauenkirche is a beautiful composition, with a projecting porch in the centre, over which is a small chapel. This portion of the church is said to be the work of two brother architects, of the name of George and Fritz Rapprecht, between the years 1335 and 1361.

The interior of the porch is very rich, and shows a very uncommon treatment of the vaulting ribs. These ribs are unusually large, and have canopied niches running up their face. The sculpture which adorns this portion of the building was the work of Sebald Schonhofer, and dates from the year 1355 to 1361.

The furniture of the Frauenkirche is, however, far more interesting than the structure itself. The high altar is a remarkably beautiful work of the end of the fifteenth or commencement of the sixteenth century; the reredos consists of a large triptych beautifully painted in a style much resembling the works of Martin Schoen, the name of the artist, however, is not known. The stalls are also well worthy of notice. The pulpit is of stone, and is probably a work of Sebald Schonhofer. There are two other ancient altars in the church, one of which, known as the "Tucker'sche altar," is considered to be one of the finest examples of a painted triptych altar in Nuremberg. Against one of the columns is a splendid basrelief representing the Madonna surrounded by worshippers,—a noble work by Adam Kraft; and against one of the walls is another fine bas-relief, representing the coronation of the Virgin, which is *attributed* to Kraft, but there is some doubt as to its origin. There is some good stained glass in the east windows, and at the west end of the aisles are two genuine fifteenth-century galleries of oak, well carved.

CURRENT MOVEMENTS.

THE address to the members of the Manchester Architectural Association by Mr. Thomas Worthington, president, to which we alluded at the time of its delivery, has been published. In the course of it Mr. Worthington says:—We live in the centre of a great population—some half-million inhabitants in Manchester itself, and probably quadruple that number in the district surrounding it. This vast multitude must be provided with roofs over their heads; and where every branch of industry and activity developes some special needs of its own, there must be endless opportunities for the exercise of ingenuity and design. All cannot be employed in the erection of great public works, but surely there must be ample scope for a good class of design, even if not of the highest artistic quality. Every workshop, every mill, every cottage may be in good taste, and expressive of its purpose; and in going through the streets of any great town it must be obvious that the services of an architect are by no means always called into requisition, where practical and intelligent advice might have produced very different results without increased outlay of money. It is true that in our warehouse architecture a great movement has been made, and a great improvement taken place, so much so that very shortly the old dingy brick Manchester streets will have been entirely rebuilt, and hardly an old landmark be left. It seems to me that in ours as in other professions, perhaps the best opening a man has, not only in forwarding his own fortunes, but in doing high-class work, is by taking up specialities. Besides churches and schools, hospitals and warehouses, there are endless fields of labour open, and the rising generation of architects may with advantage devote their special attention of some of the new combinations which are being constantly evolved in the stirring life of our great centres of activity. When one looks back for a quarter of a century and sees the vast changes which that period has made in many of our industries, one cannot but surmise that great movements must take place in the future.

I told you last year something of the experiences of my student days, how in the streets of Paris and Rome there were no footpaths, no plate-glass windows, no light except the dim old-fashioned oil-lamps in the streets, and now that has all changed. No one can have visited Paris this year and seen the Avenue de l'Opéra lighted by its forty-five large electric globe lamps without feeling that sooner or later, at all events for great public squares and open places, or where great concentration of light is required, this must eventually supersede gas, in spite of its costliness. And just now, as you all know, an intelligent and well-known American inventor claims to have solved the problem of dividing and distributing the electric light in such a manner as to make it available for ordinary domestic purposes and at a moderate cost. I mention this simply to show how the advance of science modifies and changes our habits and requirements, and it is only necessary to look round to see that in many ways the growth of our populous towns is giving rise to new modes of construction and new applications of material in building. The enormous and daily-increasing traffic of our streets with the introduction of tramways, which must become more and more general, will, in my opinion, develop a new phase in our street architecture. Underground railways may partially relieve traffic, and we shall doubtless be compelled to resort to other methods.

Our Transatlantic brethren have lately introduced an overhead or "elevated" railway, which carries an enormous number of passengers through the streets of New York, the rails being supported on iron columns, and the height of the erection is just sufficient to allow curious passengers to pry into the interior of the houses, to the great annoyance and inconvenience of the inhabitants, to say nothing of the constant rush and scream of the trains and engines, daily and nightly, or of the constant dropping of red-hot embers and sparks of fire, which are said to keep the poor residents in New York in a state of chronic anxiety and uneasiness. Well, in old-fashioned England, I hardly think we are likely to introduce such a "passing annoyance," as the New Yorkers facetiously call it, to destroy the calmness and tranquillity of our daily and nightly lives, but it is highly probably we may be compelled to invent some method of relief as the unceasing activity of our crowded thoroughfares becomes, as it does year by year, more complex and embarrassing.

It has often been a matter of astonishment to me that in all the improvements which are being made from time to time in forming new lines of streets, no attempt has ever been made to carry an upper-galleried footpath, at the first-floor level, over the ordinary footpath, with bridges across at the intersections of the streets and staircases occasionally (somewhat after the manner of the galleries in the Crystal Palace and some of our other exhibition buildings). Such galleries might either be of light construction or more on the principle of the Rows at Chester, and many of the arcaded Continental towns would afford valuable hints. Columns supporting the galleries might be so arranged as to serve also as pillars for gas-lights, and might further be utilised as shafts for the purpose of ventilating the drainage, a question which is daily gaining importance, and which must, sooner or later, be fairly grappled with. Such ventilating-shafts would thus be at frequent intervals, and probably some mechanical means might be devised which should compel the poisonous vapours from the drains to pass through the gas flame and become partially neutralised. At all events, such an arrangement would, if it accomplished nothing else, discharge the noxious gases from our drains above our heads instead of under our noses.

Such an arrangement as that I have attempted to describe would doubtless lead to the introduction of a story of shops on the gallery level, and ladies would then be able to do their shopping without the constant terror of being run over at the crossings, while the busy stream of heavy traffic would pass on below where shops of a more solid business character would probably find their location. So great a change could, of course, only be attempted when some great public improvement might be in progress, but opportunities offer, from time to time, in every large town, and especially in modern and active communities like those in our own neighbourhood. I should think with the increasing necessity for economising land some such plan may not become unusual, and, indeed, in the Barton Arcade and the Victoria-street Buildings a step in the direction I have suggested has already been made. In Milan a very large arcade on this principle, called the "Galleria Vittorio Emanuele," has been attempted with considerable success, and here the architectural design and decorations have been very carefully studied, as well as the constructive features. There is no carriageway, but a very broad and magnificent avenue which is a public promenade, and during the evenings gaily-dressed crowds sit in Continental fashion outside the doors of the *cafés* and restaurants, of which there is an abundant supply in the arcade. Paris also has several galleried arcades, but not on so large a scale as the one at Milan, which is the most important structure of the kind I know in Europe.

Building operations generally in our more important towns have, of late, assumed larger and larger proportions, the principle of association and co-operation has been very generally adopted, and we find companies formed for the building of enormous hotels, theatres, club chambers of various kinds, club offices, club residences, and associated dwellings on flats for both upper and lower classes; such undertakings being yet only in their infancy, the rising generation of architects will have ample scope for the exercise of ingenuity as the complex requirements of our social life become more and more developed.

Some little time ago some suggestions were made by Professor E. M. Barry, which were favourably commented on in the *Times*, and may therefore be regarded as not unpractical or Utopian. Mr. Barry thought that much waste occurred in squares of mansions in London by each residence having its own separate cooking establishment, and that great economy might be exercised by placing a large common kitchen, with a very complete apparatus for cooking and ample staff of servants, in a basement in the centre of the square, with every appliance for the distribution of the food by an underground service to each mansion, and proper lifts to the butler's department; in fact, a sort of club

arrangement to minimise labour and space, and so that when the morning orders for the day have been given by the housekeeper no further trouble would arise, and the smells of the cuisine would be cut off from the dwelling-rooms. I think it was a part of the suggestion that the usual garden should be converted into conservatories, easily heated from the kitchen and masking any unsightly chimneys or skylights,—an arrangement which would probably, at all events during a large portion of the year, be more enjoyable than gardens of blackened evergreens.

THE LAST OF THE THÉÂTRE ITALIEN IN PARIS.

To all art-lovers, the last news that reaches us from Paris is sad indeed; we learn from the *Perseveranza* that the Théâtre Italien has ceased to exist there, and that a few days ago the contract was signed which hands over the familiar old establishment of the Rue Mehul to the company *La Foncière*. The news will be sad to all lovers of music, but especially to the Italian colony at Paris, and, the correspondent of the *Perseveranza* might have added, to the whole foreign colony and winter visitors of the capital.

A long series of failures has led to this result. The proprietors of the theatre, who for the last eight years have never been able to secure with certainty the lease of their house, have at last been obliged to consult the dictates of their own interest; and few can otherwise than sympathise with them.

The house was one of the most agreeable and commodious in Paris, where the refined society of the capital met on the most delightful terms; it cannot but be greatly attributed to their indifference, however, that one of the treats of the winter season in Paris can no longer be looked forward to. It was the only house where ease could be enjoyed, the communications and places all being excellent, and equally suited to the means of all.

It was here that during the long time that it took to build M. Garnier's gigantic opera-house, was the French opera played on alternate nights with the Italian company, and those who have heard as we have, "Don Giovanni," in both houses, will remember how much more one enjoyed that magnificent work interpreted by the Italian company than by the French, and it must not be forgotten that it was under the Italian management that Paris was introduced to Verdi's last triumph, the Egyptian "Aïda." Older opera-goers will recall that it was at this house, also under the Italian management, that Grisi, Lablache, and Rubini, that splendid phalanx of musical talent, first appeared so far north, and here also, in accordance with the custom in Paris, whenever foreign actors have appeared the house was generally lent to them, and here Macready and Helen Faucit appeared in their famous parts.

THE UNPRECEDENTED DEPRESSION IN TRADE.

The severe commercial depression which has existed for so long a period is now affecting very seriously not only the building trade, but almost every branch of constructive and other industries throughout the country.

As regards building operations a general reduction of wages seems now to be almost the rule. At a recent meeting of the master builders in *Blackpool, Lytham*, and that part of Lancashire, it was resolved to reduce the wages in the various building trades 10 per cent.——A similar meeting has been held at *Hastings*, at which fourteen firms agreed to reduce the wages of plasterers 1d. per hour, and other trades ½d. per hour.——At *Banbury*, the wages of carpenters and joiners have likewise been reduced.——In the brick trade at *Sittingbourne*, the depression is also being actively felt. There is little or no demand just now for bricks, whilst the market price has fallen considerably, and the manufacturers are consequently retrenching, and reducing the wages of their workmen, whilst other men are being discharged. One of the largest firms of brickmakers has been compelled to discharge several of its best workmen; and the ship and barge builders have also discharged a large number of artisans of this class.——At the well-known Longridge Stone Quarries, near Preston, in Lancashire, the time of the workmen has been reduced from nine hours a day to seven and a half hours per day, and the wages from 5s. 6d. a day to 4s. 0½d., or from 30s. 3d. to 22s. 5½d. per week.—— Owing to the depression a large number of men have been discharged from the *Caithness Paving Company's* works and quarries. This company's works form the staple industry of Caithness-shire.

The iron trade is likewise most severely feeling the depression. At *Stoke-upon-Trent*, the *Chatterley Iron Company* have for the present discharged no fewer than 900 men, and great distress is being felt.——In the *Cleveland district* the distress is also manifesting itself amongst the ironstone miners, in consequence of short time having been resorted to, and one of the largest mines,—Rosedale,—which has an output of over a thousand tons of ironstone daily, has been closed to allow the immense stocks of ironstone which have accumulated to be wrought out. The re-opening of the mine is not settled, as, if trade is no better, the furnaces may be blown out.——In *Sheffield*, the distress and destitution are appalling. As a proof of the scarcity of work, it may be stated that at one establishment where formerly 1,200 men were engaged, now only forty are employed. It is also feared that the Government contracts for plates have left the town, inasmuch as the large firms cannot compete with Barrow, Middlesbrough, Swansea, and some other places, which have the advantage of carriage by sea. The last contract for 20,000 tons of plates went into South Wales, which involved a loss to Sheffield of 300,000*l*. Hundreds of the working people are living in houses stripped of furniture, without fire, and many have to go without food for days.——It is understood that most of the ironmasters in *Manchester* contemplate effecting a considerable reduction of wages in every branch of the trade.——A circumstance attending the recent offer for public sale at *Middlesbrough* of the Liverstone Ironstone Mines strongly indicates the disorganised condition of the iron trade in Cleveland. The bidding for the complete estate, mines, and plant, began at 45,000*l*., and slowly rose to 50,000*l*., when it was knocked down to a Mr. Graham for the debenture-holders, who are deeply interested. The estate is said to be worth 150,000*l*.

The great Fenton Colliery Company, at *Stoke-upon-Trent*, in which the Duke of Sutherland is a large shareholder, have resolved to close temporarily, and have paid off all hands to the number of 300.——Owing to the continuance of the strike, the *Denaby Main Colliery Company*, near *Rotherham*, are obtaining orders from magistrates for the ejectment of colliers occupying the Company's cottages.

At *Hartlepool* there has been a reduction in the wages of the engineers, firemen, and seamen employed in the shipping trade, freights of vessels being abnormally low. Similar reductions have been notified in other parts on the east coast.——Accounts from *Sunderland* state that the iron shipbuilding trade on the Wear is very dull, and that a discharge of large numbers of workmen is contemplated.

The Cotton trade in all parts of Lancashire shares in the general depression. At *Haslingden* short time and a reduction of wages from five to eight per cent. has taken place.——In *Rochdale* a reduction in wages of ten per cent. has taken place, whilst in *Blackburn* the accounts state that things are going from bad to worse, and that three large firms are stopped by bankruptcy.

In several of the woollen factories in Yorkshire, short time has commenced in consequence of the dulness of trade; including *Huddersfield, Leeds, Darlington*, and other places.

At *Leek* and *Congleton* great distress is felt owing to the extraordinary falling off in the silk trade. It is stated that in *Congleton* several families are starving. —At *Chesterfield* it is stated that there never was greater distress than there is at present—that people have not clothes to wear, and are compelled to lie in bed in consequence, and that in some parts of the district people who were formerly well to do are literally starving.——At *Wednesfield*, owing to the depression of trade in the town and neighbourhood, some hundreds of working men are walking about the streets unemployed.

Several of the railway companies are likewise suffering from the depression. The *London and North-Western Company*, which employs about 7,000 men at their works at Crewe, now close their works the whole of Saturday, and do not open until nine o'clock on Monday, the reduction of the hours of employment being 7½ hours per week for each man.——The *Midland Company* have also reduced the wages of men working under them in the capacity of labourers 1s. per week, and announce their intention of reducing the wages of porters of all descriptions, policemen, carriage-cleaners, number-takers, &c.——The *North-Eastern Company* have reduced the rates of wages paid to the fitters and labourers by 1s. per man weekly.——The whole of the operatives of the North Staffordshire Railway Locomotive and Carriage Works at *Stoke* have been placed on short time, which is the first time such a step has been found necessary since the opening of the railway.——The *Furness Railway Company* have intimated to their workmen that a reduction must be made in their wages to the extent of 5 per cent., or that they must return to the system of fifty-seven hours per week.

ENGLISH AND FOREIGN WORKMANSHIP.

The first result of the visit paid by English workmen to the Paris Exhibition comes in the shape of "Reports of the Liverpool Artisan Delegates to the Paris Industrial Exposition of 1878 (Liverpool: Lee & Nightingale), a pamphlet of forty-three pages, containing reports on bookbinders, boot and shoe makers, bread-makers, confectioners, &c.; cabinet-makers, coopers, engineering pattern-makers, gilders, letterpress printers, and ropemakers.

Each artisan was requested to devote at least seven days, inclusive of travelling, to an inspection of the Exhibition, and of the manufacturing establishments in the city of Paris, where the special work in which he was interested was carried on.

According to the reporters, "we have no reason to fear that we shall be unable, in the future, to keep our due place as an industrial and manufacturing nation, if we all heartily unite in the promotion of general and technical education, steady and conscientious work, and friendly relations between employers and employed." They all seem to agree that English workmen can hold their own against the workmen of any other country.

The writer of the "General Report" (E. Jones), which precedes the others, gives a few facts in connexion with the domestic condition of the unskilled labourer of Paris:—"He is found living in overcrowded upper attics, in a condition of poverty which must be seen to be understood, but which is unaccompanied by squalor and filth. The best-paid artisans rarely occupy more than two rooms, and the furniture as a rule is very scant, but very clean and neat. There is no convenience whatever in their apartments for either cooking or washing.

The sanitary condition generally is most defective. I visited block after block of barrack-like houses, and found the "cabinets," as they are called, in a condition which, for stench, would put Widnes to the blush. The rent in these dwellings is from 250 to 350 francs per annum.

The public laundries of Paris are invaluable to the poor, and for excellence and cheapness outrival anything of the kind we have."

We take a passage from the Report on Cabinet-making (by Peter McStay):—"Turning my attention to the general cabinet trade of Paris, besides the letters of introduction I received from the British Commissioners to employers, I received, while passing through London, from the General Secretary of the Alliance Cabinet-makers' Association, letters of introduction to several members of the Continental Branch of that Association, working in Paris. I was received with the utmost cordiality in the shops I went to, and a desire was expressed that I should fairly understand their system of working. In most shops there are men who have worked in London, and other parts of England, many of whom could speak English tolerably well. From them I learned that in the majority of shops the system of working is piece or lump work, that they have no general day for the payment of wages, some shops paying weekly, others fortnightly, and some every third week and every fourth week. In the two last cases the men get what would be called in England a *sub.* of twenty francs each between pay-days. I was told that their shops commenced work at six in the morning and kept open until eight at night, with two hours between for meals. The men said they were not actually bound to start at six, or not to leave off before eight, for, as the majority work by the piece, time was not taken into consideration. They stated that they got 7d. per hour when

working by the hour, and that, of course, the more hours they worked the more they received. They do not rest on the Sunday as we do. Sunday is as much a day for work as any other day, but they have a holiday when *fêtes* take place if they like. I examined their work very closely. In an English workshop it would be considered an offence for one journeyman to examine the work of another, but here the offence seemed to be the other way, every one being anxious that I should particularly examine the work that he was engaged upon. The principal wood was, as in the Exhibition, walnut, but there was also mahogany, appletree, and oak. The prices paid to the men were much above what we could get in Liverpool for similar jobs, but they took a much longer time to make them, their activity at the bench bearing but a poor comparison to that seen in our own workshops. Their work was well made; the men have to polish their own work, so that, when they have finished it, it is ready for the showroom. In going through the showrooms I was bound to admire their polishing, it gave to their work such a clean appearance. I cannot say much for the machinery I saw in use, and it was surprising to me how they executed the work with such primitive machines. It could only be by the dexterity of the operatives. In regard to their social condition and manner of living I found that a Frenchman's home was not to be compared to an Englishman's idea of home."

Turning his attention next to the manner in which cabinet-work is disposed of, he found that it passed more directly from the manufacturer to the consumer than is the case in this country.

An Englishman, who had resided for twenty years in Paris, told him that the Parisians thought it quite sufficient to pay the profits of the manufacturers without paying additional profits to middle-men; and it would be better for the public of this and other towns if they would patronise tradesmen who manufacture the work which they sell, and where good work can be got at a fair price, instead of establishments where another business is carried on; where the commonest work is bought in, and sold by salesmen who know no more of the work they sell than the cost price, and the large profit their employers expect them to make when they sell it; where rubbish is got for their money, and a jobbing cabinetmaker is often employed on the premises to keep it in repair. In Paris there is not an establishment of this kind, as far as he could ascertain.

The writer of the short notice of engineering pattern-makers (H. Thomas) describes a school there is in Paris for teaching the theory and practice of mechanical engineering. It was established by the Commune, and continued by the Thiers Government. It has about 150 pupils, the sons of respectable working-class parents. The boys are admitted at the minimum age of thirteen to the maximum age of sixteen, and have to remain three years in the establishment. In the first year they work five hours per day, and spend three at school; the second year six hours' work, and two for education; and the last year seven hours' work and one for study. The municipality of Paris give an annual grant to the school of 60,000 francs. Hitherto no work has been done for private orders, but now the authorities of the establishment contemplate doing it, for it is estimated that it will bring the establishment 12,000 francs. The first year a lad must work for two months at each branch of the business; for instance, a boy will be a striker for two months and then a blacksmith, but in the beginning of the second year he must take up with his special branch. At the expiration of the three years the lads go out as improvers, at wages of 3 or 4 francs per day, and there is no difficulty for them to find employment. The admission to the school is by competitive examinations in elementary education, with particular attention to freehand drawing. All the tools and a good deal of the machinery used are made in the school, and what is not required in the establishment is given away to communal schools formed on the same principle. Boys for diligence and good workmanship are promoted from class to class, and on leaving receive prizes in tools. There are six practical teachers and two draughtsmen, and two principals in the workshops. Like most all French workshops, there is ample room for the hands, no crowding of any kind. The reporter thinks that this and similar establishments will in a few years revolutionise the iron industries of France.

THE RAILWAYS OF THE UNITED KINGDOM.

THEIR COST AND MILEAGE.

THE enormous amount invested in the railways of Great Britain and Ireland renders specially interesting at this moment,—when applications to Parliament for the construction of still further lines are about to be made,—the aggregate capital expended on the several lines already made, together with the total mileage of the same, up to the end of the year which will now shortly close. Taking thirty-seven of these lines, which embrace, it may be said, nearly all the prominent railways in the kingdom, the following compilation shows that the capital expended to the end of June last on fifteen of the great leading lines amounted to 535,569,871*l.*, on a total length of 12,300 miles of railway, constructed by the fifteen companies referred to. The capital expended by these several fifteen companies varies from 10,000,000*l.* to upwards of 75,000,000*l.* At the head of the list is the London and North-Western Company, the capital expended being 75,475,800*l.* on the construction of 1,653 miles of railway. Next in order is the Midland Company, the capital expended being 63,913,502*l.*; miles constructed, 1,408. The Great Western follows, with a capital expenditure of 63,703,727*l.* on 2,139 miles, which, with the lines that have recently been absorbed in this company, makes its mileage greater than any other railway in the country, with an average expenditure per mile considerably less than that of the London and North-Western and the Midland Companies. Next in order of expenditure and mileage come the North-Eastern Company; capital expended 55,652,697*l.*, miles constructed 1,446; the Caledonian, capital expended 34,201,297*l.*, miles constructed 720; the Great Eastern, capital expended 32,323,941*l.*, miles constructed 789; the Great Northern, capital expended 31,205,450*l.*, miles constructed 754; the Lancashire and Yorkshire, capital expended 31,188,477*l.*, miles constructed 452; the North British, capital expended 29,888,969*l.*, miles constructed 895; the Manchester, Sheffield, and Lincolnshire, capital expended 23,338,211*l.*, miles constructed 455; the London, Chatham, and Dover, capital expended 22,310,319*l.*, miles constructed 134; the London and South-Western, capital expended 22,191,899*l.*, miles constructed 717; the South-Western, capital expended 20,625,074*l.*, miles constructed 332; the London and Brighton, capital expended 20,025,808*l.*, miles constructed 360; and the Glasgow and South-Western, capital expended 10,000,800*l.*, miles constructed 312. In addition to the foregoing, these several fifteen companies are now expending, up to the close of the year, 6,497,890*l.* for the construction of 780 miles of new railway and other works. The total capital expenditure, therefore, of these companies, up to the end of December, will have amounted to 542,067,761*l.*

On the remaining twenty-two lines the sum of 62,564,783*l.* has been expended for the construction of 2,954 miles of railway, whilst on these last-named lines and extensions a further expenditure of 4,427,186*l.* will have been incurred by the end of the year, bringing up the total aggregate expenditure on these several railways in the United Kingdom, to the close of December, to 609,059,730*l.* for the construction of 16,073 miles of railway. The largest amounts of capital expenditure incurred by the twenty-two companies last referred to are those by the Metropolitan Company, which is 8,630,134*l.* for thirteen miles of railway; the Great Northern Railway Company of Ireland, 5,661,302*l.* for 404 miles of railway; the North Staffordshire, 7,594,233*l.* for 201 miles; the Metropolitan District, 5,814,444*l.* for 8½ miles; the Furness Railway, 5,358,566*l.* for 122 miles; the Midland Great Western of Ireland, 4,786,882*l.* for 425 miles; the North London, 3,895,866*l.* for 17 miles; the Great North of Scotland, 3,623,562*l.* for 268 miles; the Dublin, Wicklow, and Wexford, 2,265,933*l.* for 135 miles; the Taff Vale, 2,237,000*l.* for 83 miles; the Brecon and Merthyr, for 1,983,320*l.* for 61 miles; the Waterford and Limerick, 1,967,092*l.* for 192 miles; the Cornwall Railway, 1,833,060*l.* for 65 miles; the Belfast and Northern Counties, 1,593,832*l.* for 150 miles; and the Rhymney, 1,339,300*l.* for 50 miles.

The most costly of all the railways were those wholly within the metropolitan area, the Metropolitan District line, which in this respect stands at the head of the list, having cost 735,000*l.* per mile; the Metropolitan, 660,000*l.*; and the North London, 244,000*l.* per mile. The average cost per mile of the London, Chatham, and Dover line was 170,000*l.*, but it is generally understood that that portion of the company's system between Ludgate-hill and Victoria, and known as the Metropolitan Extension Railway, cost on an average upwards of 500,000*l.* per mile. The average cost of the South-Eastern line was 69,000*l.*, but the Charing-cross and Cannon-street Extension involved an outlay equal to that for the Metropolitan Extension. The Midland cost 45,000*l.* per mile; the London and North-Western, 50,000*l.* per mile; the Great Northern, 41,000*l.* per mile; the Great Eastern, 41,000*l.*; the Great Western, 30,000*l.*; and the South-Western, 25,000*l.* per mile. The cost of the East London line, which for its short length was very heavy, is not included in the foregoing returns, but with this exception the above figures represent, in the main, the cost up to the present time of the railways of the United Kingdom.

DRAINAGE OPERATIONS IN ITALY.

PROFESSOR FLEEMING JENKIN, in his inaugural address to the members of the Engineering Class in connexion with Edinburgh University, gave an interesting account of the great project for draining Lake Fucino in Italy, which, commenced 2,000 years ago, had at last been successfully accomplished. The lake was situated in the Abruzzi province, 53 miles east of Rome, and covered the greater part of a large tableland near the small town of Avezzano. The surface of the water was 2,094 ft. above the sea, but to the lake there was no natural outlet; and though the action of the wind on the water prevented it from stagnating, the neighbourhood of the lake was very unhealthy. Whenever there was a succession of years in which the rainfall was heavy, the lake rose enormously, and covered the adjoining country. The nearest river was the Liris, 3¾ miles away, but the mountain Salviano and a high plain separated the two. The comparisons between what the lake was recently and what it had been in ancient times were extremely curious, as showing the changes which took place in the rainfall over a long cycle of years. Between 1783 and 1816 the lake rose 30 ft. 5 in., and was then 74 ft. deep. From the commencement of 1820 to 1835 it fell to nearly 11 ft. below its level in 1783, being then 31 ft. deep. In 1861 it had risen again 30 ft. The remains of drainage works on the lake showed that its area was about the same in 1816 as it was in the reign of Julius Cæsar or the Emperor Claudius, though there was evidence that it had risen much higher in prehistoric times. The average extent of the lake was 33,050 acres. It was 12·4 miles long and 6·8 miles broad. The Italian engineers calculated that the lake had been silting up at the rate of 12 in. per century, and that was an interesting geographical fact, as showing the rate at which these large lakes silted,—so that the present bottom was 15 ft. higher than it was in the reign of Emperor Claudius. Julius Cæsar had conceived the utility of draining the lake for the sake of the health of the district, and also with the view of increasing the corn-growing area near Rome, but his death put an end to the scheme. In the reign of Claudius the project was again revived, and the favourite Narcissus was ordered to go on with the necessary works at the public expense. Suetonius stated that for eleven years 30,000 men were employed there, and the Elder Pliny said that the works were so extraordinary that no language could give any idea of them. These works consisted in boring a tunnel under Mount Salviano, 984 ft. below its summit, and under the Palentine fields at an average depth of 323 ft., to discharge into the river Liris the surplus water of the lake. The construction of a tunnel of about four miles in length, at a great depth, under a mountain was, in the then state of engineering science, a wonderful undertaking. It would not be an easy job now. The tunnel actually was made, and the lake partially drained; and it appeared from the remains of the old tunnel that the original engineer understood his work extremely well, but that the designs were imperfectly carried out, and the work shockingly scamped by the contractor. First of all, levels could not have been well understood in those days; nevertheless, the outfall had been most correctly chosen, so as to give the reasonable fall to the water of 1½ in 1,000; the new outlet at the river Liris was

within a foot or two, and at the same level as that chosen by the Roman engineer; and the Roman engineer had also selected the direction of the tunnel very properly, and had followed so correctly the configuration of the ground in making it, that the modern engineers had not been able to improve upon it. The old shafts, forty in number, which had been sunk so that headings might be driven in various directions at one and the same time, had been well constructed, and had been largely taken advantage of in constructing the modern tunnel. A great difficulty the Romans must have encountered was the quantity of water which flowed from the strata, and how they got over it was not easy to say, as it was not known that they had pumps sufficient to cope with large accumulations of water. One of the most curious things about the old tunnel was the constant variation of the cross sections. Beginning with a finely-arched entrance, the tunnel, as it went into the hill, got smaller and smaller, just as the men got tired of the work, until in the centre there was only a hole large enough for a man to creep through. Then it opened out again towards the outfall. Where it could be inspected it was all right, but what was altogether out of sight had been scamped in the way indicated. During the progress of the work a great slip had occurred; and evidently as they could not get through the loose earth, the workmen turned off to the right and made a curved gallery through the stone some 400 ft. in length round the obstructing mass. The tunnel was opened by Claudius, who first of all witnessed a sanguinary sham sea-fight on the lake, in which the convicts gathered from all parts of Italy were made to destroy each other. The tunnel, however, soon got blocked, and it was not until Hadrian's time that it was put right. The lake was then reduced to some 17,000 acres. The entrance to the tunnel seemed to have been kept in good order down to the fifth century, but with the fall of the Roman Empire the tunnel was abandoned and the lake resumed its ancient extent. Various abortive attempts were afterwards mede to open the tunnel from time to time. In 1851 a company, with a capital of 200,000*l.*, was formed for draining the lake, the concession they were to get in return being land which was reclaimed; but this enterprise, too, fell through. Prince Alexander Zorlonia, who held half the shares in the concern, however, bought up the other half, and having obtained the repeal of some objectionable clauses in the concession proceeded with the work. He consulted a French engineer, Frantz Mayu de Monsucher, under whose direction a tunnel following the line of the old one, for carrying off 11,000 gallons of water per minute from the lake, was completed in June 1875. The cost had been 1¾ million sterling. The lake had now been completely drained, Zorlonia had got an estate of 35,000 acres, the neighbourhood was now healthy, and the general prosperity which had been brought about to the population by this great work had been most marked.

ROYAL ACADEMY.—LECTURES ON ARCHITECTURE.

Professor Edward M. Barry, R.A., will deliver a course of six lectures at Burlington House early in the New Year. The lectures are primarily addressed to the students of the Royal Academy, but we may mention that other persons will be admitted by ticket as far as space may permit. Application for tickets should be addressed to the Professor of Architecture, at the Royal Academy, or 21, Abingdon-street.

The following is the synopsis of the course:—

January 30th.—"Recent Artistic Losses; The Gothic Revival and Sir Gilbert Scott."
February 6th.—"Italian Gothic the Precursor of the Renaissance."
February 13th.—"Italian Gothic in Secular Architecture."
February 20th.—"Early Renaissance: Brunelleschi."
February 27th.—"Second Period of the Renaissance: Bramante and Sansovini.
March 6th.—"Third Period of the Renaissance: Palladio and Vignola.

Duffield Cemetery Competition. — The Board have selected the design sent under the motto "Veritas," by Mr. Ernest Long, architect, Dudley, for the first premium; and that by Messrs. Gilbert & Stevenson, of Nottingham, for the second premium, subject to the condition of tenders being obtained for the specified amounts. There were sixty-six competitors.

"BLACKBALLING" AT THE ARCHITECTURAL ASSOCIATION.

A special business meeting of this Association was held on the 13th inst., to consider the subject of the election of members, with special reference to the late ballot (mentioned in the *Builder*, pp. 1258, 1309, 1313, *ante*). The meeting was well attended. Mr. H. L. Florence, president, occupied the chair.

Mr. J. D. Mathews proposed, in accordance with notice given, to alter Rule 11 by omitting the words,—"No one whose nomination has been voted upon and negatived shall be again nominated during the same session." He took occasion to state his views as to the qualifications for membership,—views which, he said, had prevailed in the Association for many years. Rule 6 provided that members should be engaged professionally in the study or practice of architecture, and the nomination paper made it clear that a candidate for election must be either an architect, architectural pupil, assistant, or architectural surveyor. Every one who belonged to either of the specified classes, and could get two members to propose him, was morally entitled to election. The Association was not a close club, but an open society of students. It was not possible for the Association to control the entry of young men into the profession, although perhaps some of the members might be disposed to think that some advice would be useful to those who contemplated following the profession. But that was not the point. When a man *had* entered the profession, it was to the interest of everybody to make the best of him,—to encourage him to work hard by the stimulus of emulation and association with fellow students; and to help him by such teaching as men some years older than himself, who had shown special capacity, could most usefully afford. This had been the theory of the Association hitherto, and he thought should continue to be so; and with a view of securing a fresh chance of election for the young men who had, to his intense regret, been injured by their rejection on the 22nd of November, he proposed the alteration of the rules. The names of those of the rejected candidates who put themselves in nomination again, should be submitted to the general body at the earliest possible date. He thought it satisfactory that the committee should have taken the initiative in the matter by calling the meeting.

Mr. Blashill supported the proposed alteration,—stating that some years since the ballot was always used, but occasioned so much delay in the meetings, and was considered to serve so little useful purpose, that the rules were altered, and all elections, except when the ballot was demanded,—had since been by show of hands. He approved of this, but could not approve of any capricious or careless use of the power of rejection. He was convinced that the nomination papers of several of the rejected candidates ought to have secured their election. More than that, Mr. Mathews's view of the moral right of duly-qualified persons to election had his hearty concurrence.

Mr. Ridge brought forward the amendment to Rule 11, of which he had given notice, which would make the clause as to re-nominations read thus,—"No one whose nomination has been voted upon and negatived shall be again nominated during the same session, *without the special sanction of the committee.*"

This alteration having been supported by Messrs. Clarkson, Sulman, Pownall, Edis, and other members,

Mr. Mathews said that, as the sense of the meeting was evidently rather in favour of Mr. Ridge's proposal, he should be glad to obtain leave to withdraw the amendment which would strike out the clause, and to support, instead, the plan of giving to the committee a power of considering any cases of rejection, and affording the whole body of members an opportunity of setting right any decision come to apparently in error, or without proper deliberation.

Mr. Ridge's proposition was then put, and carried with very few dissentients.

The proposed addition to Rule 10 was then considered, the words to be added being,—"In each case in which a ballot is demanded, notice shall be forwarded in writing to the proposer and seconder by the hon. secretaries at least three days before the election. If necessary, the election to be postponed until such notice shall have been given."

Mr. W. Scott, who, it will be remembered, demanded the ballot on the 22nd of November, spoke at some length, his views apparently meeting with a large amount of approval from the meeting. He proposed that the addition to Rule 10 should not be made, but that the whole question of the election of members should be carefully reconsidered. He formally proposed a reference of the whole subject to the committee from the meeting. The result of the ballot on the 22nd in several instances had, he remarked, been observed with extreme annoyance by himself and the other members who had supported him in his demand for the ballot on that occasion. He could not consider, however, that they were to blame because a bad use,—as well as probably a good use,—had been made of one of the rules. He was quite prepared to take his share of responsibility. The ballot, he thought, should be used at times, and should not be looked upon with such surprise as to frighten members from demanding it on occasions when they felt that it was really called for. The rules provided for the ballot, when required; and left it in the discretion of members to demand it when they thought it necessary:—yet it had been so long since there had been a ballot, that, if he had not been supported by the assurance of many members that he would be doing good service to the Association and the profession, he should not have faced the disagreeable task. He did not advocate a close society, nor wish that membership of the Association should be regarded as a title of honour. It should remain a students' society,—a society for the hard-working students of the architectural profession. But the members should be *bonâ fide* members of the profession, who intended to practise it, or at any rate to seriously study it; and he confessed that he thought it desirable to keep out all others by every possible means. The architectural profession might be said at the present time to be, in a special sense, on its trial before the country. One of the bitter things that architects had to swallow was, that there was no law,—no custom, even,—which could prevent any one, however ignorant, assuming the name of architect, and claiming, from all who were not in the secret, work and confidence, to the injury of every one, especially of properly-qualified architects, actuated in all their relations by principles of honour. The Association, unfortunately, might be turned to evil uses; and, being the only educating body in the profession, might really, at great cost of pains and exertion to its working members, aid in acquiring a smattering of professional knowledge men who would use all the knowledge they acquired to the prejudice of the profession. That was so true that he felt it ought to be said, and ought to lead to effective action, and that at once. Mere numerical strength should be looked upon with no very special satisfaction; what was more to be desired was the right kind of members, prepared to derive advantage from the Association, and, in so doing, to do good to their fellow-members. It would, of course, be impossible for him to point out publicly instances of members who ought not to have been elected; probably, however, most members present could remember only too many cases in point. However, let the past go; but for the future let the privilege of nomination be exercised with due care and sense of responsibility: let the qualifications of candidates be strictly scrutinised, let the ballot be demanded when members thought it necessary. The whole Association should be a vigilance committee to keep out men who did not promise to be good members of the body or of the profession, and to secure the co-operation of all those who belonged to the profession, and were anxious to join the Association. The feeling which he was then expressing was not his own simply. He had taken no step without the fullest consultation with a very large number of his fellow-members; and he was their mouthpiece, because he felt that the Association was being injured in the estimation of its own members and of others so long as that feeling was unexpressed, and the question of the desirability of change, or of the maintenance of previous custom, not thoroughly thrashed out. He concluded by urging the reference to the committee, as the surest way of attaining well-considered action, or an intelligent acquiescence in the old rules, enforced, perhaps, in a new spirit.

Mr. Blashill and others supported Mr. Scott's motion,—only regretting that he had not taken an earlier opportunity of bringing the matter

forward. Any discontent with the rules ought to be considered at once. Mr. Blashill expressed regret that the ballot should have been demanded apparently for the purpose of calling attention to the general question of elections,—not that he considered Mr. Scott was to blame for all that had occurred.

Mr. S. F. Clarkson observed that he thought it would be desirable to pass the amendment of Rule 10 as proposed,—so as to give gentlemen who were to be balloted for every fair opportunity. That expedient might serve only a temporary purpose, but it would make the rules better for the time being,—the interim might not be very short after all,—as considerable questions might arise when elections came to be legislated about; and such questions would probably take a long time to settle.

This suggestion was not pressed, as the meeting wished to allow the amendment of the rule to be withdrawn. Mr. Scott's motion was then put, and carried without any dissentient.

FLOATING BATHS FOR THE CLYDE.

A SCHEME for providing a floating-bath on the Clyde, off Greenock, has been taken up by a limited company, who are about to carry out the plans prepared by Mr. James McCann, shipowner, Greenock. A model of the proposed bath has been made and exhibited in the Watt Museum, Greenock, and has met with approval. The Town Council have for some years past been considering the question of providing baths for the public, and a committee lately visited other large towns for the purpose of getting information. The great cost of a suitable site has been a serious obstacle, and no definite conclusion had been arrived at, but at a recent meeting Provost Lyle expressed himself in favour of the floating baths as projected by Mr. McCann, and the company is therefore likely to have the countenance of the Corporation in carrying out the scheme. The structure will be anchored off the Esplanade, Greenock, its length being 120 ft. and its breadth 45 ft. It mainly consists of two long pontoons, or tanks, of iron, divided into water-tight compartments, which are united by girders stretching across the top in an arch forming the roof, and also across the bottom. The pontoons are about 6 ft. wide, and bear the whole weight of the structure, and the water flows in from the ends, through apertures that will ensure the water being clean, and also through the bottom, which will give a constant current. The pontoons are about 6 ft. wide, and sustain the whole structure. The depth of water in the bath at one end will be 3 ft., for boys, sloping down to 8 ft. at the other, for men. The portion allotted to ladies will be 5 ft. deep. All round the bath fifty dressing-rooms are to be built on the pontoons, and in the space at the end, or stern, a cooking-range and stove will be erected. Externally, the structure will have an agreeable appearance, and the form has been designed with the view of offering the least possible resistance to wind and waves. The cost will be nearly 2,000*l*. It is believed that, should this bath turn out a success in Greenock, others of a like description will be erected at numerous watering-places on the Clyde where the beach is very indifferent for bathers.

INSTITUTION OF CIVIL ENGINEERS.

HEATING AND VENTILATION, GLASGOW UNIVERSITY; RAILWAY WORK IN JAPAN.

At the meeting on Tuesday, the 3rd of December, a paper was read on "The Heating and Ventilating Apparatus of the Glasgow University," by Mr. Wilson W. Phipson, C.E.

In 1864, when the new University was resolved upon, a sub-committee—including, among others, Sir W. Thomson, Dr. Allen Thomson, Professor H. Blackburn, and Dr. Rankine,—considered the general principles which should form the basis of the operation, to secure the most efficient system of ventilation and warming. The apparatus described was based on their suggestions. The velocity at which the air would travel at different parts of an apparatus was of great importance, as it fixed the area of the inlets and outlets of the air passages. An increased area of the inlet over the outlet of the space to be ventilated was advisable, and the distribution of air into such spaces should be at a mid level, combined with an upward and downward extraction of the air. In determining the form of the air passages, the resistance to the air in motion should be considered; in no case would it be advisable to have sharp angles or sudden contraction in such passages. The form of fan was selected on account of the good results obtained in previous buildings in which it had been used, and because it was not of a complicated construction. The volume of air evacuated by an extraction shaft depended on its area, and on the difference between the internal and external temperature that could be maintained in the shaft, which difference should not be less than from 30° to 40° Fahrenheit. Practice proved that an allowance of 5 to 12 square feet of heating surface, at a temperature of 160° Fahrenheit, was necessary for every 1,000 cubic feet of space to be warmed, and that the best form of boiler for an extended apparatus was the Cornish type. The apparatus consisted of a fan 7 ft. 6 in. in diameter, having four blades set at an angle of about 60°, fixed on a spindle parallel to the axis of the air-channel, and driven by a direct-acting 8-h.p. steam-engine. It drew its supply of air from a height of 100 ft. above the level of the ground, and forced the air through a series of passages into five distinct chambers. In these chambers the fresh air was warmed, previously to its distribution, by being passed over the surface of 4-in. hot-water pipes, arranged in coils, each chamber having its distinct hot-water boiler. The air then left the chambers and passed to a secondary series of passages in direct communication with the rooms, through vertical shafts formed in the thickness of the walls. The air, after its circulation over the different spaces, was carried away by a third series of shafts formed in the roofs, in communication with the main extractor, situated at the east, south-east, and south-west angles of the building. The heating surface distributed over the building was about 20,760 square feet. The cubic space to be warmed, including the amount of air necessary for ventilation supplied by the fan, was about 3,800,000 cubic feet, and the average consumption of fuel daily was 2 tons 3 cwt. for a difference of 125° Fahrenheit between the temperature of the pipes and the spaces to be warmed. The volume of air supplied per hour to the building was 1,800,000 cubic feet. The cost of the annual maintenance of the apparatus was about 500*l*.

At the meeting on the 10th of December, Mr. Bateman, president, in the chair, a paper was read on "Railway Work in Japan," by Mr. W. Furniss Potter, C.E. The author stated that there were at present 66¼ miles of railways in Japan, 142¾ miles laid out, with working plans, sections, and estimates, completed, and 455 miles projected, the general route only having been examined and decided upon. The earthworks of the existing lines had been made for a double way, and the bridges for a single way. The superstructure of the smaller bridges was originally of timber, but had been renewed with iron. The larger bridges were all of the Warren girder type, and as a rule of 100 ft. spans. The foundations were on brick wells 12 ft. diameter, and on an average about 60 ft. deep. Native examples of engineering were chiefly remarkable for their temporary character. The wages of first-class carpenters were 1s. 8d. per day; of blacksmiths, 1s. 6d.; of bricklayers and masons, 1s. 5d.; and of coolies, 11d. Materials found in the country for construction were not very good, except timber, which was abundant. No limestone possessing hydraulic properties had been found. It was impossible to furnish any reliable information as to the cost of the works. The chief engineering difficulty in Japan was the treatment of the watershed. The beds of the rivers were nearly all higher than the surrounding country, varying from a few feet to 40 ft., or more. In some instances the railway had been taken under the rivers by tunnelling, and an example of this was given. As a rule, however, the rivers were bridged over, and approached by steep gradients and high embankments. The traffic on the railways already constructed was considerable, and it was estimated that on future railways the passenger traffic alone would pay a dividend of seven per cent. Not much had been done in goods traffic, as the existing lines were in competition with the water communications.

At the annual meeting on the 17th, the council and officers for the ensuing year were elected. A correspondent writes,—"There is a strong feeling among the members that the 'house list,' as issued by the council, is composed partially of Government and other contractors, whose places ought to be occupied by independent civil engineers. What would be said if the council of the Royal Institute of British Architects proposed that the new council should consist partly of contractors and builders, although they might happen to have 'handles' to their names? It is clear the members of council ought to be, like Cæsar's wife, above all suspicion."

TECHNICAL SCHOOLS AND COLLEGES FOR BUILDERS IN PRUSSIA.

THE first technical school for builders founded in Prussia was opened about twenty-five years ago at Nienburg-on-the-Weser, in the then kingdom, now the Prussian province, of Hanover. It early became a Government establishment, and for a long time remained the only institution of the kind, but within the last ten years a number of similar schools have been founded, generally by private persons. These institutions have, however, generally passed into the hands of local authorities, and now the central government has given notice wherever such schools exist that it is prepared on certain conditions to make annual grants for their support. The conditions are that the State shall have the right of co-operating in the general organisation of the institutions, in laying out the course of instruction, in the appointment of the teachers, and in the holding of examinations. These institutions are quite distinct from the ordinary trade schools which have been in operation in Prussia for a long period. For the latter a comparatively high entrance examination has to be passed, and a regular three years' course of instruction, including the higher branches of theory and practice of the chief trades and some of the professions, is given to all students attending them. The new technical school for persons entering the building trades, on the other hand, only require in the pupils as much education as is imparted in the common elementary schools, together with some experience in actual building work. The course extends over a year and a half to two years, and the time devoted to the classes, which include drawing, planning, mensuration, taking out quantities, estimates, practical demonstrations in work, the knowledge of all processes, instruments and materials used in the trade, occupies no less than forty-eight hours a week, or eight hours a day. The western provinces of Germany are already tolerably well supplied with this class of schools, the chief being those at Holzminden and the fine *Bauschule* at Hamburg. In the eastern provinces, on the other hand, there is such a dearth that Prussian subjects have been compelled to avail themselves of the building schools of Saxony, and it is accordingly intended to establish a number of new institutions in suitable centres in that portion of the country. In addition to this reorganisation of the building schools, the Government is creating new technical schools for other special trades in several of the chief seats of manufactures. Thus in Crefeld, a great centre of the cotton and silk manufactures, the old School of Weaving, which has fallen into neglect, is to be remodelled under the combined auspices of the Government, the Town Council, and the Chamber of Commerce, and is to be turned into a school of textile industry, worthy of the present times. At Iserlohn, again, which is one of the chief centres of the cutlery and metallic industry, the old provincial trade school is to be entirely reorganised, and turned into a great technical college for all branches of metallic industry.

All this is only part of a grand scheme of reorganisation of the various classes of technical schools in Prussia. Thus the Bauakademie, or central Building College of Berlin, is to be united with the *Gewerbe Akademie*, or central Trade College of that city, so as to form one great central Technical College, which is to be placed under the laws peculiar to universities in Germany. All the other trade schools (*Gewerbe Schulen*) of the kingdom are to be divided into two groups. Another innovation which it is proposed to introduce without delay is the establishment of technical workshops and laboratories in connexion with all the middle and lower trade schools, in which certain improvements suggested by a recent inspection of similar institutions in France, Austria, and South Germany, are to be embodied. It may be also noted that on the State railways workshops are to be erected specially for the teaching and training of young men in all branches of the technical and scientific, as well as the practical, work of railway engineering.

OUR IRON: ITS SOURCE AND USES.

Few of our industries have a more romantic history than that of the iron manufacture, which waxes and wanes in countries and districts according to the abundance or scarcity of ore or fuel, the distance of the raw materials and other allied circumstances; and which, having its early home in the south of England, has gradually forsaken that and found a dwelling in Welsh valleys, in the west of Scotland, and in the north of England. But its location is not yet fixed, for changes are still in progress, and the alteration in the form of demand is causing further fluctuations in some of the ancestral seats of the iron trade in Britain. In the early use of iron, the quantity consumed was so small that the richer ores were found in abundance to satisfy the demand, and the use of the purest and best form of fuel was practicable; but as the demand increased, and as the supply of wood became less, very considerable importations were made before the use of coal-smelted iron became general. As it did so, however, there was a partial change in the locality from which our increasing supplies of iron were drawn. The utilisation of the vast stores of minerals in Staffordshire, and of the even larger supplies of South Wales, caused very great accessions to the total of the production of the country, and enabled the increasing demand to be met with even a reduction in the prices. Again, the discovery of the "black band" in Scotland and that of the hot-blast built up the great trade of the Scotch iron manufacture; whilst later the old industry of Furness was greatly enlarged, and the use of the vast stores of ironstone in Cleveland converted that isolated locality into one of the greatest of our mineral centres. Thus there has been a continual growth in the output of iron, by leaps and bounds with periods of depression interspersed, and there has been also a continual movement in the centre of production,—the tendency being, on the whole, however, unmistakably northwards. Remembering how vitally important that industry has become in the building up of our commercial greatness, it cannot be uninteresting to trace out the districts from which we draw our present supplies of iron, and to observe the proportions of their contributions.

Probably the best test will be that of the locality of our pig-iron manufacture. It is true that there is an importation of ironstone into some of our iron-smelting districts, and that there is also a considerable use of iron in them brought from other districts, but that importation and use is small in comparison with the total, and there are counter-balancing circumstances. We have an output of iron ores in the United Kingdom of over 16,600,000 tons, and the importations of iron ore vary from half a million to rather more than a million tons yearly. From these ores our production of pig-iron varies from six to six and a half million tons yearly,—over 15,000,000 tons of coal being used in the manufacture. The smelting-plant in the kingdom is close upon a thousand blast-furnaces, but a considerable number thereout, in the older districts especially, are antiquated and obsolete, —the smallness of their production and dimensions rendering their use undesirable on account of the additional expense the smelting of ores in them is necessarily charged with. In late years, our production of iron has generally been from less than two-thirds of that number, and in the latest year for which we have official records of the output, the total number of furnaces in work did not exceed 541. The localities of the works may be, then, fairly taken as the best test of the centres of iron production in the kingdom, whilst the extent of that production may be assumed to be pretty fully indicated by the contribution of the several districts to the total output. Of the 541 blast-furnaces, none are in Ireland; sixty-three are in Wales; 109 in Scotland; and the remainder are in England. These numbers are necessarily fluctuating ones; but they represented the actual numbers stated to be in blast at the end of last year; and, allowing for local and exceptional circumstances, they indicate with tolerable accuracy the sources of our supply of crude iron. England, it may be said, produced last year about 4,888,991 tons of iron; Wales, 737,673 tons; and Scotland, 982,000 tons, — the total being thus 6,608,664 tons for the kingdom. Coming now a little to the details, the output of England may be divided into that formed by sixteen districts, having about 148 sets of active iron-works, in numbers for each district varying from one to seventy-five. As, however, these blast-furnaces were of very varied dimensions and output, varying from one or two of the old charcoal furnaces yet in operation in the north-west to the massive and costly erections of late years which have raised the dimensions from those general a few years ago,—of about 45-ft. high furnaces,—to such as those at Ferry Hill, above 100 ft. high, with corresponding enlargement of their other dimensions, — the mere number of furnaces is not a criterion of the output, and the actual production for the last year may be better given in detail for each of these districts. Commencing, then, with the north-east, which depends upon the supplies of Cleveland for its iron, and the adjoining coalfield of Durham for its fuel, we find that Northumberland and Durham, from forty-one blast-furnaces, produced 734,438 tons of pig-iron, and the North Riding of Yorkshire, from seventy-five blast-furnaces, produced 1,374,582 tons, the total production of over 2,100,000 tons giving what is technically called the Cleveland district the position of head of our iron-producing centres, inasmuch as it contributes nearly a third of the total output of the kingdom. Another comparatively young district, that of Furness, occupies the next place, Lancashire making from its thirty-three blast-furnaces in operation 624,189 tons. Adjoining this, the district of West Cumberland makes, also of rich hematite iron, at its twenty-six blast-furnaces, 538,156 tons. The old district of South Staffordshire has only a very small number of its 150 blast-furnaces at work, but out of its fifty-seven in operation it produced 428,276 tons of its well-known iron; and the adjoining district of North Staffordshire added from twenty-five blast-furnaces about 255,383 tons. The Derbyshire district had from thirty-seven blast-furnaces in use a production of 328,203 tons. The West Riding of Yorkshire has an ancient reputation for its iron, and it produced from its thirty furnaces 229,027 tons. Lincolnshire,—one of the newest of our districts,—had ten of its furnaces in operation, yielding 116,857 tons; and Northamptonshire, from thirteen furnaces, produced 106,948 tons; whilst the older and long-renowned county of Shropshire, out of its fourteen furnaces in blast, only produced 102,180 tons. Gloucestershire had four operative furnaces, and an output of 25,602 tons; whilst Wiltshire, Hampshire, and Somersetshire, from three furnaces, had a total output of 25,150 tons.

Passing on to Wales. In North Wales,—Denbighshire produced 26,715 tons, the only contribution from that part of the principality. South Wales had sixty furnaces at work, the production being 710,000 tons, almost equally divided between Glamorganshire and Monmouthshire. In Scotland there are blast furnaces erected in six counties, and 109 were at work last year. Lanarkshire takes the lead, having produced last year 620,474 tons out of seventy-three blast-furnaces. Ayrshire follows with 306,285 tons from twenty-nine blast-furnaces, and the output of the rest is insignificant,—the total of the four counties being seven operative furnaces and a production of 55,241 tons. There has been since the period to which these figures bring us down, some fluctuation in the details, generally in the direction of lessened output; but the proportionate production is not so much modified by this circumstance as by that of the change which is taking place in the nature of the demand for iron. Only a few years ago nearly all our iron for steel-making purposes was imported into the kingdom, and the great uses of our pig-iron were for the foundries and for malleable iron works. But since the discovery of the Bessemer and Siemens processes for the manufacture of cheap steel, a very great demand has grown up for pig-iron capable of conversion by these processes into steel, and now almost entirely from our own pig-iron a million tons of steel are annually manufactured in the United Kingdom, whilst there has been a decided diminution in the consumption of malleable iron,—a diminution still in progress. At the same time, the growing cheapness of our crude iron is stimulating its use for foundry purposes, and there is an ever-expanding area for its consumption in this respect. The feature least satisfactory about the prospect of the trade is that our supplies of ironstone, the pig-iron from which is capable of conversion under present circumstances of the manufacture into steel, are very limited, and confined, so far as extensive deposits are concerned, to one locality, but attempts to utilise the more abundantly-dispersed, if poorer ores, are being made, and with some prospects of success. Were these attempts successful, it is in every way probable that there would be a very great expansion in the demand for iron, for steel would be capable of unlimited supply even cheaper than at its present low rates. Meantime, there is an unquestionable check to the production of iron, or rather, to the increase of our output, but it is one due to many causes, and it is accompanied with very great economy in the production attained by an enlargement of the average output of our blast furnaces, and by a reduction of the expenditure in the cost of smelting. We have in our Cleveland and other iron fields unlimited supplies of iron, and if means can be found to convert these into steel cheaply and expeditiously, a greater future may be predicted for our metallurgical industries even than their famous past.

KENDAL.

In a country like that which the pilgrims called "pleasant and mountainous," in the far north-west, Kendal stands, one of the ancient seats of industry in the region where bold hills and fertile valleys are interspersed with long bleak moors between Lancaster and Carlisle. The place of the town in history is no unimportant one; its industries have long been both varied and great; and it has played its part in the development of the resources of a county not greatly benefitted by art till recent days. It was near the course of an old Roman road, its castle, ruined and grim, is said to stand on the site of an old Roman station; and it is associated with the memories of the Parrs and others of the visitors to Kendal. Three centuries have passed since the incorporation of the town; a much more limited period has passed since the opening out of the canal gave its trade a stimulus; and it is not half a century since the legislature invested it with the privilege of direct Parliamentary representation. In the widening valley of the Kent, surrounded with green and often well-wooded hills, and backed by its long dells, it occupies no second situation amongst the comparatively few populous places of Westmoreland. It has not known the progress which some towns have in recent years, but it has, in some degree, fulfilled the promise of its past.

Forty years ago Kendal was one of the chief towns in the north-west. Its population was not much inferior to that of Carlisle, and it had a variety of trade not possessed by the merry old Border City. Its population had risen from 8,984 in 1821, to 10,015 in 1831, whilst neighbouring townships had benefited much by the aggregation of trade there. Its corporation had larger powers than they now have, and it had the journalistic enterprise which it has so long shown. Its manufactures embraced the "making of waistcoating in all its branches" in addition to kerseymeres and linsey woolsey, it made serges, baizes, carpetings, and knit woollen caps and jackets, combed and spun wool, worked marble, dyed and tanned, and in other modes contributed to the producing power of the county. There were then three bobbin-turning firms in the town; three dyers; "Atkinson & Whitwell" were manufacturing carpets; six manufacturers of fancy waistcoatings were enumerated, as well as four of webbing, fourteen of hosiery, four of linen and checks, ten of linseys, and twelve of woollens. Coal and slate merchants were located at Aynam Wharf; tanners and skinners in Highgate and Stramongate; whilst sacking-makers and others gave some little variety to the trades of the town. The gasworks were then in Park-lands, with "Isaac Wilson, secretary," eight coaches passed through the town with carriers many, whilst the Water-witch Packet bore passengers to Preston and Lancaster by canal daily. There were two churches, one "so old that men know not by whom it was built," and ten chapels; whilst the public buildings included a theatre, news and assembly rooms, an institute and savings-banks, schools, and an Oddfellows' hall. Round about the town, in the valley of the Kent, there were paper and textile industries; the green hills were dotted with the light walls of little villa residences, in which the aristocracy of the district dwelt, and Kendal presented the appearance of a prosperous town, in which trade met spade to mutual advantage.

The years that have flown have not very

materially affected the appearance of Kendal: it still preserves its agricultural supremacy, and it still manufactures its woollens, carpets, and rope, as well as other similar goods, on perhaps a smaller scale. Its population has not very largely swollen: it was at the last census 13,446; but there are not the elements of the rapid growth some towns know,—it has neither coal nor iron, those great producing powers of large populations, neither is it a vast maritime or railway centre. The casual visitor to Kendal sees proof that it is still a centre for the woollen and carpet trades; the bobbin-turners are still located in the district, utilising the water power. Its wool sales are noted far and near; in hosiery it has no mean fame, fishhooks and rope in comparatively limited quantities are made, and its proximity to quarries gives it some advantage in the building trades. Its markets retain much of their former fame in an age unfavourable to the general retention of this mode of sale; for it is still the centre of a wide agricultural domain, fruitful and fertile, and of this it is the natural mart.

An old and a wealthy town, it has naturally attracted to itself many of the institutions which wealth enables its possessors to supply, and thus it is in advance of many towns in its provision for the social and intellectual as well as the spiritual needs of its people. It has the germ of a good and growing rateable basis, that of the town proper being 41,152*l.*; Kirkland, 1,849*l.*; and Nethergraveship, 4,106*l.*, the rates levied by its urban sanitary authority are close upon 3,000*l.* in the half-year; and there are decided symptoms of municipal life. Chief amongst its literary associations is its Institute, which for over twoscore years has done something towards spreading literary and scientific knowledge, which has 177 members, an income of about 250*l.*; and issues from 5,000 to 6,000 volumes from its library yearly. There are a workmen's institute and other similar organisations, each in its sphere exerting some beneficial influence. Church and Dissent, in many shades, are represented in the old town by organisation and often stately homes; and Kendal has deserved the credit it has long possessed for its schools; whilst it has had no lack of associations of a social as well as a commercial and patriotic character. There is not the growth in some of these which might fittingly be looked for amongst towns where there is a rapidly-growing population. It is not stationary, but its growth is slow, and there are no circumstances to induce the belief that in this respect there will be a speedy change. Its situation, pleasant as it is, places it off the main track of trade now, and hence it cannot hope for a further rapid development, though it may hope to maintain the fame it has acquired in centuries in which it did good service.

A pleasant sight is Kendal, seen from the main line of railway, its higher houses shining by night and gleaming by day in the woods and on the banks on which they are built; whilst lower down, towards where its river runs its course by factories and tanneries, trade centres in the narrow streets and gates, and the ruins of its castle rising in grim greyness from the green mounds. It is true that the anticipations that might be formed are not fulfilled by the nearer glimpse, for the narrow and sometimes dirty streets hide away many of the handsome and even stately buildings the town has acquired since the days when "James the Third" was proclaimed at the Market-cross, and the Earl of Derwentwater, his devoted adherent, took his ease at his inn in Stricklandgate, whilst Highland clans kept guard and pibrochs sounded. The "days o' 45" have gone, and something has been done to purge Kendal from one of the ills that old towns are so often heir to,—overcrowded streets and their accompaniments; but much yet remains to be done. With a trade varied, and in parts extensive, with devoted and capable citizens, and with a noble situation, giving to it the command of the primal industry, Kendal should in the future flourish even more than in the past. It has not the rich gifts of mineral treasures that many northern towns possess, nor has it the advantages which flow from situation in the way of travel; but it has a capacity for work,—it has cheap power in its flowing stream, which gives it other advantages for the textile trades, and it is in the rut of the pleasure-seeker, whilst it retains in a large degree some of the advantages it acquired in the days when another mode of travel than that now known placed it in the front rank of towns of the North. With wealth added to these advantages, it should be able not only to hold its own, but to improve its commercial position, whilst it devoted some attention to the needed task of improving its own state, and removing some of the things which render its mortality more than it otherwise would be, and contribute to the pauperism and drunkenness it has its share of, in common with most populous places.

PORTLAND CEMENT.

Sir,—Will you allow us to reply to Mr. Faija's letter on the question of Weight *v.* Measure? Mr. Faija apparently does not recognise the fact that Portland cement has been sold by weight, and not by measure, for some years.

In our former letter to you we stated that it it is the custom to call 100 lb. a bushel, and it is only the word "bushel" that we wish to see discarded. We cannot, therefore, see in what way it would be a premium to manufacturers to send out what he pleases to call "heavily-limed and badly-ground cement." If Mr. Faija knows anything whatever about the manufacture of Portland cement, he must know that it is very far from the interest of any manufacturer to make any excessively heavy cement; on the contrary, we would much rather not exceed 112 lb. per bushel.

We still maintain that cement should be sold by weight, as it has hitherto been, and that if this is done without calling 100 lb. a bushel, consumers would know the exact value they were getting for their money.

John C. Gostling & Co.

Sir,—Will you allow me, as a plasterer of forty years' experience in the use of cements, to thoroughly indorse Messrs. Gostling & Co.'s opinion that Portland cement should be sold by weight, as I always found the heavy cement the best,—the longest setting and the hardest getting; and also to point to a few of the many jobs where I have been employed, and where I have used heavy Portland cement, viz., the front of the Alexandra Hotel, Hyde Park-corner, in best heavy Nine-elms Portland cement (Francis Bros.), done in the year 1853, and is now as perfect as on the first day; and if Mr. H. Faija will look into the yard of Messrs. Bazley White Bros., of Millbank-street, Westminster, he will see some steps up to their offices, in their heavy special Portland cement, done by me in the year 1864, as the date over the door will testify, and which have stood the wear and tear daily of carmen's hob-nailed boots, and have not a scratch on them, and are as sound as when completed. The cement used weighed 117 lb. to the striked-bushel. And I here give it as my opinion that Portland cement to be good should not weigh less than 115 lb. to the striked-bushel. It is the heavily-limed and coarsely-ground cement that causes so many lamentable failures, and brings a capital material into disrepute and disuse; and to prevent these failures manufacturers should grind it finer, and sift it through a sieve not less than from eighteen holes to twenty holes to the lineal inch, as these large particles of coarsely-ground cement expand, causing fire-cracking and flaking in the fining coat in plastering.

William Pulham.

Sir,—With reference to the suggestion that Portland cement should be sold by weight alone, I quite agree with Mr. H. Faija, who states that, taken alone, weight is no true indication of the quality of cement. In fact, nothing in my opinion can be more misleading. The results of experiments which I have made on the strength of Portland cement in relation to weight prove this most conclusively (*vide* Mins. of Proceedings Inst. C. E., vol. xlvii., p. 127, and vol. liv., sess. 77-78, part iv.). I therefore fully endorse the opinion, that in buying by weight alone the purchaser would certainly not know what quality he was receiving. Neither, on the other hand, would he be any better informed if he were to buy by measure alone. The quality of Portland cement depends, I think, upon three conditions in combination, viz., weight, degree of fineness, and tensile strength, the second of which is almost universally ignored. The only alteration in the present practice necessary as to the sale and purchase is, that the degree of fineness should be distinctly stated, and insisted upon. What is absolutely required is, that consumers should have a clear conception of what they require as regards weight, fineness, tensile strength, &c.; and having drawn up the specification in such a manner that there should be no ambiguity, the manufacturer would have an equally clear conception of what he is asked to supply, and, having undertaken the contract, would understand that the cement would be received only on a strict compliance with the terms of the specification.

I would suggest that the cubic foot should be substituted for the bushel, as being far more convenient as a unit of measure.

C. Colson.

THE PRACTICAL SCHOOL OF MEDICINE IN PARIS.

The practical school of the medical faculty in Paris, of which the foundation-stone was laid on the 4th inst., will be an edifice of a very extensive character. It will lie in the *École de Médecine*, opposite the Medical Faculty, and will cover an area of 11,784 square mètres. The cost of its erection is estimated at twelve million francs, or 480,000*l.* At the ceremony of laying the foundation-stone, the Minister of Education stated that the institution would, when completed, contain fifty-two amphitheatres, sixty laboratories, each with eight saloons attached, and twenty-five rooms additional for the library; while the practical medical school, instead of having as hitherto six laboratories, will possess fourteen, together with twenty small ones for the professors, and six consultation or conference chambers. Thus, according to the minister, the University of Paris will be raised above all competition, and the Parisian Medical Faculty will again stand at the head of everything of the kind throughout the world.

DOINGS OF THE ARCHITECTURAL ASSOCIATION.

Sir,—When, now over thirty years ago, the Architectural Association was founded, it was essentially a "*students' society*." Those who promoted it,—myself among the number,—were nearly all boys, and I think that the kind sympathy and help we received from our seniors, prominently among them dear old Professor Donaldson and yourself, was mainly due to the fact that we were a body of *juniors* anxious to advance ourselves in the profession, and I venture to think that the ultimate success of the Architectural Association was due to this more than anything else; and as we grew older, and one by one left the Association, it was not from want of interest in it, but rather from a feeling that it was our duty to give place to younger men. Now, it appears, if the story of the recent blackballing be true, all is changed, and to be a young man is a disqualification for membership. A case in point, of my own personal knowledge. One of the recently blackballed is a youth, aged nineteen (a pupil of a highly-respectable firm of architects, formerly members of the Association), possessing no conceivable disqualification for election *except his youth*. My own son, whom I have recently articled, is looking forward to join the Association, but I shall certainly think twice before I have him proposed, if youth is to remain a barrier to membership.

C. G.

COSTLESS POWER FOR THE ELECTRIC LIGHT.

Sir,—Referring to the letter of Mr. M. Paterson in the last week's *Builder*, there is no doubt that electric lighting will compare most favourably with other systems where water-power provides an economical motor; and advantage may at last be taken of many sources of power at present neglected. The water companies seldom favour the use of their water as power, and their arrangements and tariffs would need considerable alteration to make them applicable. Many small rivers with a fall and volume inadequate for giving directly the necessary power, might, if applied to the working of small pumps, continuously raising water to an elevated reservoir, accumulate sufficient gravity-force for use during the hours of lighting. The successful combination of water-supply with power-transmission in Zurich and other Swiss towns affords numerous examples for guidance. The transfer of water-supply undertakings to municipal bodies is becoming more and more the custom in England to favour such economical methods.

Ewing Matheson.

SUGGESTIVE FURNITURE.

Sir,—Additional evidence of any fact, however well established, is always interesting to the lover of truth, and with reference to Lady Morgan's chair, I can affirm that in 1843, when that lady sat to me for a sketch in her pleasant little house in Hans-place, I have a distinct recollection of her sitting in the chair which you now own, and by referring to the engraving of the sketch which appeared either in the *Illustrated London News* or Mr. Spottiswoode's *Pictorial Times*, I think it will be found that the two chairs resemble each other.

The lovers of old furniture, and of the many interesting facts that must always surround our household gods, must be exceedingly indebted to you for the suggestive furniture you are good enough to show them; and I, for my part, take so much interest in such matters, that I should like exceedingly to see your series increased by the addition of many more similarly rare pieces that exist in the possession of lovers like yourself of such objects. C. M.

BUILDERS' ACCOUNTS.

Sir,—Will you please allow me space to say a few words respecting the manner in which a great portion of builders' accounts are disposed of? I have been a builders' surveyor a great many years, and spent a great deal of time in settling accounts with architects or their surveyors, and am sorry to say that during the last few years, since the rises in wages, I am continually offered the same old prices as fifteen years ago, and find it very difficult, indeed, to obtain anything like an adequate profit, and very frequently am offered what does not arrive at prime cost, and by men who, I believe, have every wish to deal honourably, and who really are convinced they are dealing very fairly. What is the reason of all this, and what is the remedy for this state of things?

It will be admitted by all that a great increase has, during the last few years, taken place on the cost of work generally. Lessening the number of hours per week increases cost over and above the mere increase in wages, the more pay the less in quantity of work holds good almost universally.

Now, after any rise in wages it will be found hard, tedious work to adapt prices so as to properly come out to fit, and it can only be done by constant application and proving.

As I take it, no one will dispute that all knowledge of prices must emanate from the builder's office, and by dint of hard struggle by degrees it obtains an amount of recognition by the architect or his surveyor. I can only say that every attention should be paid to what are asserted to be fair and proper prices. On the other hand, the builder's surveyor should make it his business to show beyond dispute the prime cost of any matter required. This can only be done by a thorough system of booking.

Do not let me be misunderstood. It cannot be expected that any two surveyors will entirely agree as to fractional prices in the sub-division of items, and unless polite deference is used on either side it will be found very hard and unpleasant work. For a man to assert himself simply for the sake of doing so is the height of absurdity. A Builder's Surveyor.

OUR PAVEMENTS.

Sir,—Permit me to ask on what principle our vestries act in ignoring their duties of *cleansing* the roadways, footways, and pavements of snow. We pay very heavy rates for paving, lighting, and cleansing, and surely this is peculiarly one of these; in fact, we have no legal status on the footways or pavements, but are simply trespassers. This is manifestly and clearly a duty that can only be properly and efficiently carried out by the vestries. I trust we may soon have a magisterial decision on this.

A Surveyor.

Cremation.—Professor Gorini is at the present moment in London employed in superintending the erection of a funeral pyre on a site belonging to the Cremation Society near London. The pyre is on the system which has been approved in numerous cremations at Milan and other places in Italy.—*British Medical Journal.*

"COFFEE TAVERNS."

Sir,—Most of your readers will be glad to see Mr. Horace Field's letter on the subject of coffee taverns in your pages. A great deal has been written and spoken of late on the education and culture of the working man; but in all these well-meant efforts the root of the matter has seldom been touched. The coffee-tavern movement is but a branch, and a very important one, of a much-needed reform in the habits and tastes of the working classes. What those habits and tastes are let any casual passer-by notice for himself. In five cases out of six, I believe, he will tell you that the chief topics of conversation among working-men are beer and wages. Can the working-men be blamed for this?

In London there are about 8,000 or 9,000 public-houses, beautifully situated, as we are all aware, at the corners of the principal streets, and thriving most luxuriantly in those districts most thickly populated and inhabited by the working class. The result of all this is naturally to produce a system of drinking early and late, during work and out of work; in fact, a kind of etiquette to drink, to treat others to drink, and to be treated in return, whether thirsty or not. This system (which extends more or less to other classes) amounts, I believe, to a perfect thraldom, making it most difficult, if not impossible, for a moderate drinker to remain so. He must become an abstainer altogether, and in so doing cuts himself off from many of his friends, which makes his sobriety irksome and far less tempting. This being so, it can be readily understood what a downright good work is the providing of public-houses and clubs, bright and cheerful inside and out, where a man can obtain, at a reasonable rate, *food*, and as much as he likes of other than intoxicating drinks.

But I would go further than this, and urge that architects as a body, travelling as they do to all parts of the country, can do much both by example and by a word of advice or caution, as opportunity offers, to influence working-men on the side of temperance rather than indulgence. It may be said that this is outside the architect's province. Doubtless it is so, according to the bare letter of the "specification and conditions of contract." But even on these grounds, from an art point of view, apart from any higher motive, there is every reason for the profession to encourage, if they cannot take a part in, this movement. Every architect must have felt the pleasure of meeting and consulting with a really intelligent and reliable artisan.

Let the English workman bid a final adieu to drunkenness and the drinking habits which lead to it, and he will emerge, as God has made him, of as good capacity and as good a disposition as any man on earth to work, and take a real interest in his work, for its own sake. He would indeed be an embodiment of the "artworkman" discovered not long ago by the gifted writer of the article in the *Quarterly Review*.

To builders and large employers of labour the benefit of this movement is obvious. Truly, if the time and money could be collected that have been wasted in the last few years by the intemperate portion of the working and other classes, there would be amply sufficient to "excavate and remove" the whole of the Russian and Turkish empires, or to smother Afghanistan with ultimatums and cannon-balls 10 ft. deep. T. E. C. S.

A NEW PILE.

Messrs. Le Grand & Sutcliff's patent tubular pile is very ingenious. The blow is delivered not on the head of the pile, but at the very point. An elongated cylindrical monkey, which passes down inside the tubular pile, is used, and being raised by means of rods or rope is allowed to fall upon the flat head of the solid point, the pile forming its own guide for the monkey.

One advantage of these piles is that they can be driven with facility, of very great length, and in deep water. They can also be filled with concrete, if desired, to increase their strength.

Builders' Benevolent Institution.—The annual ball in aid of the funds of this institution is to be held at Willis's Rooms on Thursday, the 30th of January next. Stewards are being looked for.

CHURCH-BUILDING NEWS.

Yateley.—The parish church of Yateley has been re-opened, after the restoration of the tower and belfry. The work has been carried out by Mr. Bunch, of Yateley, from design by Mr. Foster, of London. An extra bell has been supplied, increasing the peal from five to six, and the work of re-hanging the peal, which has been fitted with new frames and clappers, has been entrusted to Mr. Harmes, of London.

Buckland Newton.—On the 13th ult. the parish church of Buckland Newton was re-opened, after restoration. Eight years ago the unusually large Early English chancel was restored and reseated, and now, under the superintendence of the diocesan architect, Mr. T. H. Wyatt, new lead roofs have been provided for the nave and north aisle, a fresh panelled ceiling to the south aisle, the church paved and re-seated, the unsightly gallery removed, and the tower arch opened, &c. As the work progressed, it was found necessary to rebuild the north arcade, the arches were so dangerously out of the perpendicular. The old oak Elizabethan seat-ends have been preserved in the nave along the centre aisle. Mr. Trask, of Norton-sub-Hamdon, was the builder employed.

Winderton.—On the 10th inst. the new Church of St. Peter and St. Paul, at Winderton, in the parish of Brailes, Warwickshire, was opened for worship under episcopal licence. The church is of the Early English style, with arcaded porch, lofty chancel arch, circular apse, and alabaster reredos; and its shingled spire is 90 ft. in height. Variously coloured local and other stone is used in the building, both inside and out. The architect is Mr. William Smith, of London, his clerk of works being Mr. Munt. The builders are Messrs. Atwood & Son, of Brailes.

Brampton.—On the 11th ult. the new parish church of St. Martin, Brampton, was consecrated by the Bishop of Carlisle. The church, which has cost about 6,800*l.*, without including the unfinished tower, which will cost 1,770*l.* more, consists on plan of a parallelogram 108 ft. by 60 ft., divided into nave and aisles, a *quasi*-chancel being formed by dividing off a portion of the east end of the nave by low screen wall of stone. The church will seat 500 persons. The walls and columns are wholly composed of red sandstone from the Gelt quarry. Mr. Webb is the architect. The contractors for the whole work were Messrs. Beaty Brothers, Carlisle. The joiners' work is by Mr. Court, of Carlisle; and the painting, plumbing, and glazing were done by Messrs. Thomson & Sons, Carlisle. The plans were carried out under the superintendence of Mr. Isaac Morland, clerk of the works.

Bungay.—It is proposed to restore St. Mary's Church, Bungay, from plans prepared by Mr. Phipson. The estimated outlay is 3,300*l.*

Wentbridge.—The new church which has been erected at Wentbridge, near Pontefract, at the cost of Mrs. Barton, of Stapylton Park, was consecrated by the Archbishop of York on the 14th ult. It is in the Early English style, and comprises nave, chancel, and transepts. It contains accommodation for 100 persons. The reredos, the work of Mr. Earp, of London, is divided into three panels, the centre one being occupied by a cross, the gift of the mother of the late Mr. Barton. The apse windows were presented by Mrs. Barton's sisters, and the windows in the south side of the nave, containing representations of St. Peter and St. Paul, by Mrs. Ramsden. In the other windows is glass of a diagonal form, the work of Mr. Pepper, of London. The architect was Mr. A. W. Blomfield, of London.

North Lopham.—At a vestry meeting, held on the 7th ult., the plans for the repair and restoration of the parish church, prepared by Mr. H. F. Bacon, architect, of London, were presented and approved, subject to sufficient funds being raised for the purpose.

High Bray.—The parish church of High Bray, North Devon, which has during the last eight months been in course of restoration, from plans by Mr. E. Ashworth, has been re-opened. The chancel walls have been rebuilt, and a good portion of the tower, buttresses, and parapets reconstructed. The windows have been rebuilt in the local stone; the tower has been thrown open to the church; and the west window enlarged to its original design. The ceilings have been divided into compartments by moulded ribs, the nave wall-plates disclosed. New floors have been laid, in Langport stone for

the avenues, and in Minton's tiles for the sacrarium. A Porritt stove has been introduced near the south entrance. The seating is of simple character, of pitch-pine, the altar, prayer-desk, and lectern of oak. The contract for the works has been carried out by Mr. Cock, jun., of South Molton; that for the stonework by Mr. J. Pulsford, of Barnstaple. The outlay is about 900*l.*

South Kirkby (*Yorkshire*).—This very interesting old church, dedicated to All Saints, dating from the thirteenth and fourteenth centuries, after its re-arrangement and refitting, was re-opened on the 28th ult. It consists of a fine tower at the west end, nave of two bays with north and south aisles, chancel with arcade of two small bays, north and south aisles, vestry, and north and south porches. The latter were originally groined. The present arrangement gives seating accommodation for 403, whilst the old pews accommodated about 280, including a gallery at the west end of the nave, which, besides being a great disfigurement, effectually blocked up the tower arch. The gallery has been removed and the tower arch opened out, the ringing-floor being placed at its original level, thereby disclosing the west window over the tower entrance. The whole of the church under seating, &c., was originally paved with stone, and was very damp. This has been taken up, and the whole has been covered with a layer of concrete. The whole of the passages and chancel have been laid with Minton's tiles. The steps are of Robin Hood stone, as also the base of a low stone screen which divides the nave and chancel, the upper part of which is of Ancaster stone. This screen is carried round to form the base of the pulpit. White's wood block flooring has been used under the whole of the seating. The heating is effected by flat hot-water piping, laid level with the floor, and radiators in the chancel aisles, supplied by Messrs. Cameron & Robertson, of Kirkintilloch, near Glasgow. The whole of the interior stonework has been cleansed of all paint and whitewash. The nave roof has been re-covered with new lead, the old lead roof being much oxidised, and unfit for further use. The work has been carried out by Mr. William Anelay, of Doncaster, the plumbing work being done by Messrs. Tasker, of South Kirkby. The cost of the whole has been about 1,000*l.* The architects are Messrs. Oswell & Blake, of London.

Stalbridge (*Dorset*).—The Church of St. Mary has been re-opened for service, after extensive restoration and additions. It is a very quaint church, in the Perpendicular style, and dates back to the fifteenth century. The cost of the restoration has been 2,500*l.* Mr. T. H. Wyatt is the architect, and the work has been executed by Mr. W. H. Miles, for the firm of Messrs. L. Miles & Son, of Shaftesbury.

Garway.—This church, situate on the banks of the Monnow, close to the borders of the counties of Hereford and Monmouth, has been reopened. A new vicar, the Rev. J. Jones, has recently been appointed, who has set himself the task of effecting a complete restoration of a church which the Bishop of Hereford described, "without fear of contradiction," as one of the most curious and interesting to be found in the West of England. The fine Norman tower, 27 ft. square, is detached, and there is much excellent work of the twelfth, thirteenth, and fourteenth centuries about the church. The stone altar, with five incised crosses, remains *in situ*, and the rood-loft steps are intact, while the open seats of massive oak have ends 4 in. in thickness. The architect engaged in the restoration is Mr. E. H. Lingen Barker, and the contractor for the works just executed was Mr. W. Balcombe, of Kenilworth.

EMMANUEL CHURCH, FOREST GATE.

This church, which has been undergoing enlargement, has just been re-opened. The bishop of the diocese (St. Alban's) preached at the opening service, and was highly gratified with the successful result achieved. The building, which is in the Decorated style, was one of the late Sir Gilbert Scott's early works. It was originally designed as a village church, but the very rapidly growing neighbourhood demanded increased accommodation, and the work which has been carried out is part only of a larger scheme.

A new aisle and vestry have been added on the south side, and the chancel has been thrown open by means of arches. The organ, which formerly blocked up the east window of the north aisle, has been removed to the south side of the chancel; and a portion of the north aisle, previously screened off as a vestry, has been thrown into the church.

The work has been carried out by Mr. Gibbons, of Buntingford, at a cost of 1,040*l.* The carving has been executed by Mr. Hearn, in a highly satisfactory manner. The architect engaged was Mr. George McDonell.

SEWERAGE OF BERLIN.

Sir,—Seeing from the reports in the *Builder* and the *Sanitary Record* of the meeting of the Institution of Surveyors that Mr. Mechi is stated to have said,—"The whole city of Berlin had been sewered by English engineers, Messrs. Aird," I hasten to correct this.

The Berlin works have been projected and carried out solely by the Royal Baurath Hobrecht. We have been engaged in laying the main pipes from the town to the irrigation fields, and also in connecting the houses with the sewers, but the whole of the five sewer systems, with pumping-stations, laying out of the irrigation fields, &c., have been carried out (chiefly in day-work) by and under the immediate superintendence of the Baurath Hobrecht.

Danzig. A. Aird.

Books Received.

Health Primers. London: Hardwicke & Bogue. 1878.

Under this title a series of little books are in course of publication, which bid fair to be very useful. We have before us four of them, "The House and its Surroundings," "Alcohol," "Exercise and Training," and "Premature Death: its Promotion and Prevention." Although necessarily brief, they contain a considerable amount of condensed information, and are the work of men who know what they are about.

VARIORUM.

"Revived Guild Action: Suggestions to the Worshipful Company of Plumbers," by George Shaw (Pardon & Son), is a worthy attempt to induce that Company to confer the membership of it, as a premium and diploma, to craftsmen who prove themselves deserving of it. Mr. Shaw shows what was originally the purpose of the guild, and the importance at the present time of obtaining a supply of properly-trained plumbers. It is a valuable effort.——The paper on "The Electric Light," read by E. Conder, jun., at an ordinary meeting of the Engineering Society, King's College, London, has been published (office of the *Freemason*). It gives a pleasant account of what has been done and what is promised. The writer, still a student, is the son of Mr. Edward Conder, builder, president of the Builders' Benevolent Institution.——"Bad Trade," by Edwin Guthrie (Ireland & Co., Manchester), is a pamphlet which may be usefully read just now. This one paragraph will show its tone and object:—"Over-production has never overtaken us yet, and it never will. Because production is the creation of wealth, and we cannot be poorer because of the superfluity of our riches. The assertion of the contrary, which has become so common lately, is a glaring paradox."——We need only mention that "The City Diary" is published for 1879, and is as usual interleaved with blotting-paper, and has money columns.——"The Cosmopolitan Masonic Calendar" for 1879 (Geo. Kenning), contains a large amount of information, which must be very useful to members of the craft.——We have no hesitation in recommending "Calvert's Mechanics' Almanack and Workshop Companion" for 1879, to those for whom it is intended. Much may be learned from it.

Letts's Publications.

We may safely say from what we see that such of our readers as require a pocket-book, almanac, or diary, will find among Messrs. Letts's exactly what they want, both as to size andscope. The No. 8 diary, which gives a page (small 8vo.) for each day, is a capital little book for those who keep records of their thoughts or doings. Letts's "Weekly Diary and Blotting-pad" is a novel combination; and amongst minor facilities offered by the firm, we particularly recommend their labels, adhesive and otherwise.

Miscellanea.

An Abortive Drainage Scheme.—On the 4th inst. Col. Ponsonby Cox attended at Ribchester, near Blackburn, to hold an inquiry into an application the Preston Rural Sanitary Authority desired to make to borrow 1,000*l.* to drain Ribchester. It was stated that the township was not drained at all at present, and that it had lacked in this important particular for many years. The proposal was to allow the drainage of the district to fall into the river Ribble by gravitation at two points named in the plan presented. There were 158 houses in the district, one half composing the village, and the other half consisting of detached and semi-detached residences. The township contained 1,329 inhabitants, and it had an area of 2,127 acres, its rateable value being 4,205*l.* The estimate for the improvement was, pipes and laying them, 780*l.*; gullies, 80*l.*; ventilators for the sewers, 37*l.* 10*s.*; and contingent expenses, 40*l.*; total, 936*l.* Colonel Cox said the rate to be levied for this sum would be 7*d.* in the pound on property, and 1½*d.* on land. Dr. Spencer, medical officer, said that in the report which he made in February last, he pointed out to the Local Government Board that the discharge of sewage into the Ribble was contrary to the Rivers Pollution Act, but that owing to various causes he thought that the Local Government Board might allow the sewage to flow into the river, and thus minimise causes of epidemic diseases. The report was sent to the Local Government Board, and had not been replied to; hence they inferred that the suggestion was approved. Colonel Cox said that surely they must know that the Local Government Board had no power of altering Acts of Parliament, and the London authorities never conceived that it could be thought so. The inquiry thus ended in the collapse of the scheme.

Trees in Streets.—A very important advance in street architecture may be hoped for as the result of a favourable recognition of trees as proper inhabitants of cities. In narrow streets, high-class architecture is crushed out of sight; it is a waste of money to pile up a fine façade where it cannot be seen, and, moreover, the architecture of a narrow street ought to be as flat as possible, because the fine shadows that are characteristic and expressive of good work become evils where light is scarce, though so desirable where there is proper space for a dignified display. We are too much tied up to certain tame styles that reflect but too faithfully only degeneracy in matters of taste, and hence it is that the average Englishman experiences a succession of surprises in visiting first-class Continental cities; and, of course, when he returns home, he asks, "Why cannot we make our cities beautiful?" Well, the answer is, that we can if we like. The reason we have been content with organised dreariness is because we have been deficient of taste and public spirit; and in London the case has been aggravated by the fact that there was no local government, and even now there is not such a local government as is needed for the administration of the largest cluster of houses in the world.—*Gardeners' Chronicle.*

The Ebbw Vale Waterworks.—At a meeting of the Edinburgh and Leith Engineers' Society held on the 4th inst., a paper was read by Mr. John C. Mackay, C.E., on the Ebbw Vale Waterworks. It was stated that the depth of the reservoir at its deepest part is 48 ft., and that it had a capacity of 61,000,000 gallons, giving 18 gallons per day to 20,000 people for 104 days, besides allowing compensation to the river Ebbw. The total cost of the reservoir, two filter-beds, tank, &c., was 25,000*l.*; and the necessary fittings and pipes for distributing the water came to about 6,000*l.* more, thus bringing the entire cost of the whole work to 31,000*l.*, representing 516*l.* per 1,000,000 gallons, or 10*s.* 4*d.* per 1,000 gallons storage.

A Landslip occurred on Monday, in connexion with the new dock extension works at Devonport Dockyard. Mr. Pethick, of Plymouth, is the contractor. The result of the present accident is the immediate stoppage of all work, for a mass of rock, 250 ft. long, 12 ft. wide, and 30 ft. deep, equal to 90,000 cubic feet, has shifted from its proper position, carrying with it a great deal of masonry and destroying building material valued at several thousand pounds. The main road round the dock also shows a considerable fissure.

A Manchester Publisher.—The premises which were occupied by Mr. John Heywood, bookseller and publisher, at the foot of Brasenose-street, have been swept away, and the business transferred to a handsome building which Mr. Heywood has just had erected in Ridgefield. The building has been specially constructed for the purposes of the business; has side entrances in John Dalton-street and Mulberry-street. It has a sub-basement, a basement, and six floors above, covers 900 square yards of ground, and has a floor area of 6,450 square yards, or nearly two acres. The appliances with which the building is fitted are of the most approved order: hoists, lifts, and such conveniences are to hand wherever they are needed; and so they had need be. The ordinary sale of school-slates at this one establishment now reaches a weekly average of nearly five tons; 175,000 slate-pencils accompany them, while 5,000 penny bottles of ink, and about 2,000 similar bottles of gum, leave this department during each week of the year. From the basement all the orders to London publishers are despatched, and the parcels for country booksellers made up. The former occupies, exclusively, the attention of a dozen clerks; the latter is a subject of some interest as to detail. The introduction of many new card-games has greatly increased the sale of all classes of cards, including the ordinary playing-cards, and from this one establishment alone there is now an annual sale of about 4½ tons in weight, representing over 30,000 packs, to say nothing of the sale of books and periodicals. Over half a million envelopes and ten tons weight of note-paper, made up into packets or in sheets, are weekly forwarded from the department having control of that branch of the trade. Such, in brief outline, is the work of a firm which finds employment for 270 workpeople, receives a thousand letters a day (more than any other Manchester firm), and posts them daily in sackfuls. Over 2,000 parcels are despatched from the warehouse daily, and about 1,000,000 newspapers and periodicals pass through the hands of the firm every week, this department alone finding employment for 110 persons, and twenty-five vehicles being used for the delivery of parcels to town newsagents and the various railway stations.

The Cathedral of Nicosia.—Mr. Hepworth Dixon is contributing an interesting series of letters from Cyprus to the *Portsmouth Times*. We take a paragraph from that paper of the 7th inst.—"The second quarter (that of the north-east corner), the most secluded, garden-like bit of Nicosia, holds the main architectural feature of the town, the great mosque, once the cathedral of Santa Sophia, in which all the Anglo-Norman kings were crowned. As the kings of Castile saved the mosque of Cordova, and the Popes of Rome saved the Pantheon, from the zeal of their disciples by consecrating them to the new worship, the Ottomans saved what siege and storm had left of the cathedral of Nicosia by turning it into a mosque. Under the shadow of the mosque at Nicosia stands the wreck of a Crusaders' church, now called the Betestan, and let out to a merchant as a granary of wheat. Enclosed by the usual courtyard, the mosque has the customary well and fountain, with the ever-flowing water for cleansing hands. An air of rest and mercy reigns within this court. An imaun leads you through the mosque and to the minaret, from which you gain a splendid view of the great plain and the enclosing mountain ridges. Other mosques within the walls have names, as, for example,—Serai mosque, Arab mosque, Ahmed Pasha mosque, and Omer mosque; but not the edifice-in-chief. Santa Sophia is the mosque, just as Westminster with ourselves was always the Abbey, even when London had a score of cloisters, with orders of friars from black to white. Not far from Santa Sophia stands the mosque of Haidar Pasha, once a Latin church, dedicated to Santa Catarino, afterwards spoiled by Cypriote fanatics, and saved from destruction by the Turks. This second quarter of Nicosia will remain the residence of Turks."

Irrigation: Leyton.—At a meeting of the Leyton Local Board, held on Tuesday, the 10th of December, a resolution was passed, appointing Messrs. Bailey-Denton, Son, & North, engineers to the Board for the preparation and carrying out of a complete system of sewerage and sewage disposal for the district. At Halstead, Essex, the same firm have been called in

The Electric Light on the Thames Embankment and Holborn Viaduct.—On Saturday evening ten out of the twenty electric lights which the Metropolitan Board of Works have ordered to be exhaustively tested on the Victoria Embankment were lighted for a couple of hours experimentally, prior to the full number being commenced on Monday. The preliminary operations were under the superintendence of M. Berly, the electrician to the Société Générale d'Électricité, of Paris, who supply the electric machines and fittings, and the three months' experiment will be crucially tested photometrically and economically as compared with gas by Mr. Keates, the chemist to the Board. The engine,—a semi-portable locomotive, by Ransome, Sims, & Co., of 20-horse-power nominal,—and the machinery employed in the production of the light, are housed in a wooden shed by the side of the Charing-cross Railway Bridge. The system employed is that of the Jablochkoff candle. On Saturday evening also the experiment which the Corporation of the City of London have ordered to be carried out at the Holborn Viaduct during the winter was commenced. Sixteen lamps are to be tested under the supervision of Colonel Haywood, and no doubt as rigorous a watch will be kept, scientifically and economically, on the results as in the case of the Metropolitan Board of Works. This experiment is also on the Jablochkoff system. The arrangements for the Viaduct are similar to those at the Embankment; a 20-horse-power semi-portable engine, by Robey & Son, and the electrical machinery, being housed in a wooden shed on a vacant plot of land on the west side of Farringdon-street.

The Railway Passenger Duty. The Travelling Tax Abolition Committee have addressed a letter to Lord Sandon, the new President of the Board of Trade, calling on him to bring in a Bill for the rectification of the railway passenger duty. They tell him that, for thirty years the spirit of the Cheap Trains Act, which was passed for the protection of "the poorer class of travellers," was properly carried out by the judicious interpretation of the Board of Trade, who certified for the exemption from duty the penny a mile fares of all trains which aided in carrying out the objectof the Act, which was that passengers might every day be able to travel from any one station to any other station on the line at a penny per mile. The Court of Exchequer has decided that no exemption can be claimed by any train that does not go from one end to the other of a trunk, branch, or junction line, and stop at every intermediate station to set down and take up passengers at a penny per mile. The committee show that this decision, though it may be technically correct, is contrary to the spirit of the Cheap Trains Act. The Board of Trade have stated in reply, that the committee's letter has been fully considered by them, and that in view of the fact that any legislation in the direction urged by the committee must affect the Exchequer, they have forwarded a copy of the statement, together with the committee's "Gazettes" of April and September last, to the Secretary of the Treasury, in order that the same may be laid before the Lords Commissioners of her Majesty's Treasury.

New Promenade and Sea-wall at Bridlington Quay.—In reply to the offer of 20*l* for the best plan and report thereon for erecting sea defences between Sand's-cut and Sand's-lane, five sets of plans and reports have been received, and such plans having been examined, the committee resolved that the Board be recommended to award the premium of 20*l*. to Messrs. Clarke & Pickwell, civil engineers, Hull, for their plans and report thereon for erecting such sea defences. The Board adopted the report. It was also resolved that application be made to the Public Works Loan Commissioners for a loan of 5,000*l*. to carry out the sea defences from the Sand's-cut to the boundary of the district of the Board. The Board have obtained the conveyance of 45,000 ft. of land, comprising a strip 45 ft. wide, extending the whole length of the works above referred to.

The "Secure" Sash-Fastener.—Evered & Clarke's patent "Secure" Sash-Fastener, a view of which may be seen in our advertising columns, is certainly superior to the ordinary run of sash-fasteners. It cannot be opened with a knife or other instrument from the outside; it locks the two sashes together and prevents all noise of rattling sashes; and it is not dearer than the ordinary insecure fastenings.

The Nave Roof, St. Alban's Abbey.—At a meeting of the Restoration Committee, held in St. Alban's on the 13th inst., the roof question was again discussed. There were present the Earl of Verulam (in the chair), the Ven. Archdeacon Grant, Rev. Canon Davys, Rev. W. J. Lawrance (rector), Sir E. Beckett, bart., Q.C., Mr. R. Pryor (chairman of Quarter Sessions), Mr. H. J. Toulmin (secretary), &c. The committee had before them the resolution passed at the recent meeting of the Society of Antiquaries, and also heard a paper read by Mr. J. O. Scott, the architect, and then resolved "That it is inexpedient to re-open the question of the roof of the nave; and that the architect be requested, in constructing the new roof of the nave, to retain such portions of the ancient roof as may be found sound, on condition that the necessary funds are furnished by Lady-day next." It is stated that "a gentleman much interested in the adoption of the high-pitched roof" has "promised to find nearly all the funds required for the woodwork," and it now only remains to pay for the deficiency of lead needed to have the roof covered with that material. In consequence of the determination of a majority of the committee to persist in having a high-pitched roof, two members have withdrawn.

The Telephone in America.—The Bell Telephone Company, according to the *Electrician*, has placed on the market about 20,000 telephones, and is now making over 400 per week. "Telephones were first used only on private lines; but, in the spring of 1877, Mr. Coy, of New Haven, Agent of the Bell Telephone Company, devised the exchange system. Lines radiate from a central office to the houses and offices of the subscribers; and subscribers put in connexion through the central office with any other subscriber can at pleasure carry on private conversation. The great advantages of such a system are evident on slight examination. It has already been introduced into all the principal cities of the country, and is destined to produce a great change in the method of doing business in cities, as the telegraph has between more distant points. Many private lines of ten, fifteen, and twenty miles in length are already in operation, and there seems to be no practical difficulty in connecting, by telephone lines, places several hundred miles apart. The highest award, with the grand prize, at the Paris Exhibition was given to Professor Bell as the inventor of the articulating telephone."

Ventilation.—At the *soriée* of the Leeds Philosophical Society, a patent for ventilating houses and workshops was exhibited by Messrs. A. R. & J. W. Harding. For the admission of fresh air and its diffusion in a room without draughts, an opening or air-passage is formed from the exterior to the interior of the apartment, and inside the room the opening is covered with a box or chamber. This is perforated with any required number of holes or slots, these having a diagonal upward direction. In order to properly diffuse the air, hollow ferrules or tubes of any desired length are fitted into the holes or slots provided in the box. These ferrules or tubes give the desired direction to the various streams or jets of air, in the same manner as the barrel of a rifle or gun gives direction to projectiles, and the elevation of the mouth or outlet of each ferrule or tube varies the trajectory or line of delivery in the same manner as the elevation or depression of a rifle or gun. The box or chamber is of a conical or pyramidal form, so as to give direction to the ferrules or tubes. A stop-valve is employed for regulating the supply of air.

Proposed New Vestry Hall and Public Baths and Wash-houses for Clerkenwell.—A proposal is before the Clerkenwell parochial authorities for the erection of a new vestry-hall, and also public baths and wash-houses within the parish. The subject was discussed at the last meeting of the vestry, when it transpired that the Clerkenwell workhouse, the freehold of which is the property of the parish, will shortly be vacated by the opening of the new infirmary at Highgate, and Mr. Brookes proposed that either a new vestry-hall or public baths and washhouses should be erected on the site. The discussion was ultimately adjourned.

"Restoration of Ancient Buildings."—We postpone continuation of report of proceedings at the recent meetings in Liverpool that we may have space to print some of the papers that were read.

Books.—At the sale of a Library just concluded by Messrs. Puttick & Simpson, of Leicester-square, Ruskin's Seven Lamps of Architecture brought 8*l.* 5s. (Feetham); Ruskin's Modern Painters, 5 vols., 45*l.* (Parkinson); Ruskin's Stones of Venice, 3 vols., 18*l.* 10s. (Parsans); Ædes Althorpianæ, 2 vols., 7*l.* 10s. (Beet); Boccace, Le Decameron, 5 vols., 12*l.* 15s. (Harrison); La Fontaine, ses Fables, 6 vols., with numerous additional plates, 26*l.* (ditto); Saint-Pierre, Paul et Virginie, with extra plates, 3 vols., 39*l.* (ditto); Zoological Society of London, Proceedings 1848 to 1877, 13 vols., 22*l.*; Bewick's History of Birds and Quadrupeds, 3 vols., 13*l.* 10s. (Hayes); Bewick's Select Fables, 12*l.* 15s. (Pickering); Bewick's Fables of Æsop and others, 12*l.* 10s. (Parsans); Lyson's Magna Britannia, 6 vols., 22*l.* Ellis & White); Art-Journal from 1845 to 1878, 34 vols., 26*l.* (Marsden); Turner's Picturesque Views, 2 vols., 16*l.* 5s.; Claude's Liber Veritatis, 3 vols., 16*l.* 15s. (Hayes); Chippendale's Gentleman's and Cabinet Maker's Director, 13*l.* (Kerslake).

Bristol Industrial Dwellings Company. The annual meeting of the Bristol Industrial Dwellings Company, Limited, was held on the 13th inst. The chairman (Mr. W. H. Budgett) stated that, notwithstanding the depression of trade, the directors were enabled to propose that a dividend of 3*l.* 10s. per cent. should be declared, and that a balance of 16*l.* 18s. 4d. be carried forward to the reserve fund. The report stated that 6,600*l.* had been taken up in shares towards the new block of buildings, which was fast progressing towards completion, and that the directors hoped a few more shares would be subscribed for, so that the building might be completed without any debt whatever. The chairman said he was glad to find that the buildings were as popular as ever, and he saw no reason why the dividend next year should not be greater. He added that Miss Winkworth still continued to give her valuable superintendence, and that the tenants at the present time paid their rent regularly, and were quiet and orderly. The report was unanimously adopted.

Mr. Di Cesnola and Cypriote Antiquities.—In the House of Commons, on the 12th inst., Sir C. Dilke asked the Under Foreign Secretary whether, in October last, Mr. Di Cesnola, an American citizen, was tried for an offence against Turkish law in digging up objects of antiquarian interest without a firman, by the district court of Larnaca, in Cyprus; whether the court was presided over by a Turkish cadi, assisted by an English assessor; whether Mr. Di Cesnola was sentenced to a fine, afterwards remitted by Sir Garnet Wolseley, and the confiscation of the objects found pronounced by the court; whether the latter portion of the judgment was carried into effect; whether any protest was made by Mr. Di Cesnola against the jurisdiction of the court, &c. Mr. Bourke replied that it was true that Mr. Di Cesnola was so tried, that he was sentenced to a fine, afterwards remitted, and that the objects found were confiscated. It was true also that Mr. Di Cesnola protested.

The New Law Courts.—It is worthy of note that no designation has yet been authoritatively settled for the structure which is to afford accommodation for all the divisions of the High Court and the Court of Appeal, and it is greatly to be feared that, after our usual fashion, we shall drift into some unmeaning and unworthy name. In the draft of some general orders not yet promulgated we have observed that the building is spoken of as "The New Law Courts." It is to be regretted that a designation which would so soon cease to be appropriate should be attached to the structure. If "Palace of Justice" is too high-sounding a name, why not call the building the "Supreme Court House?" Or, if that is still too grand, "The Law Courts" would be better than "The New Law Courts."—*Solicitors' Journal.*

Military Brigade Depot.—We understand that the new military centre at Hounslow (which may be classed among the largest in the kingdom), is now rapidly approaching completion. The works, begun originally by Messrs. Niblett & Son, Hornsey, have been carried out by Messrs. Downs & Co., of the Borough, under the direction of Major Montmorency, R.E., the foreman of works being Sergeant-Major Hamilton, R.E. All the locks, latches, and door furniture for upwards of 600 doors have been supplied by Mr. James Hill, of Upper Thames-street.

On Herren-Chiemsee, an island beautifully situated in Lake Chiem, the king of Bavaria has laid the foundation of a palace to be built somewhat on the model of that of Versailles. The chief materials of which the building is to be constructed are ordinary bricks, which have to be brought from some distance. About 300 workmen are at present engaged on the work; but so vast is the extent of the proposed structure that it is not expected to be completed before the lapse of fifteen years, if the plan, which is for a palace as extensive as that of the royal residence at Munich, is fully carried out. The estimated cost of the building is no less than 36 million marks, equal to 1,800,000*l.* sterling.

Society of Engineers. — At the annual general meeting of this society, held on the 9th inst., Mr. Robert P. Spice was elected president (for the second time), and it was announced that the following premiums had been awarded by the council for papers read during the year, viz., to Mr. Henry S. Copland, for his paper on "Modern Roadway Construction," and to Mr. George G. André, for his paper on the "Application of Electricity to the Ignition of Blasting Charges." Votes of thanks were accorded to the honorary secretary, Mr. Alfred Williams; to the acting secretary, Mr. Perry F. Nursey; and others.

The Thames Valley Drainage. — At a meeting of the Lower Thames Valley Main Sewerage Board, at Kingston, the City Solicitor (Mr. T. J. Nelson) in the chair, the Special Drainage Committee reported that they had taken the necessary steps for obtaining an Act of Parliament to carry out Col. Haywood's scheme. They also recommended that Col. Haywood and Messrs. Bailey-Denton, Son, & North, and Mr. Mansergh, should receive 200 guineas each as authors of the three schemes for disposing of the sewage which appeared to offer the best prospect of success.

Death of Mr. Henry Dawson.—Mr. Henry Dawson, sen., the well-known artist, died on the 13th inst. at Chiswick, aged 67. Mr. Dawson, in early life, was employed as a "hand" at a lace manufactory at Nottingham, his native town, and devoted his leisure to landscape-painting, being entirely self-taught. Unceasing devotion to his profession brought him fame, and a room was specially allotted to his pictures in the exhibition opened at Nottingham Castle, in July, by the Prince of Wales.

The Building Trade at Oxford.—A threatened strike in the building trade at Oxford has been averted. The master builders of the city met a deputation of carpenters in the City Buildings, and, after some discussion, it was agreed that the wages should be reduced from December 28th next. A set of rules was drawn up and also agreed to, by which, for the future, it will be necessary that six months' notice shall be given on either side before any alteration takes place.

Projected Tramways in Chelsea.—We are glad to find that the surveyor to the Vestry, Mr. G. H. Stayton, C.E., has advised his vestry to oppose the whole of the schemes; the roadways being altogether unsuited to the projected tramways. If they should be admitted to the Fulham-road, enormous injury would be done to the neighbourhood.

Cost of the Electric Light.—The most valuable statement yet printed, all to nothing, on the electric light, with special reference to the expenditure likely to be incurred by those towns which adopt it, is an "Interim Report" on the subject, presented to the town council of Liverpool by the borough and water engineer, Mr. G. F. Deacon, C.E.

The Royal Academy of Arts.—The students of the Royal Academy of Arts held their annual dinner (in celebration of the distribution of prizes) at Frank White's Hotel, Swallow-street, Piccadilly, Mr. J. Ballantyne, R.S.A., curator of the School of Painting, presiding.

Fire.—On Wednesday morning the Basin Sawmills, near Exeter, where some large Government and railway contracts were being carried out, were destroyed by fire. The damage is estimated at from 6,000*l.* to 8,000*l.*

Halifax School Board Competition. — 187 architects have applied for the particulars in this competition!

TENDERS

For the erection of an eight-roomed house at Leytonstone, Essex. Mr. R. Griggs, architect:—

Arber	£744	0	0
Wood	720	0	0
Tillett	708	0	0
Cains	700	0	0
Sayer	630	0	0

For additions to Wey-gate, Guildown, Guildford:—

Mitchell, Brothers	£590	15	9
Smith & Sons	570	0	0
Nye	540	0	0
Goddard & Sons	524	0	0
Colls & Sons (accepted)	520	0	0

For alterations and additions for Messrs. S. Mordecai & Co., 108, Mile End-road. Mr. Hall, surveyor:—

Sampson & Parrish (accepted) ... £213 0 0

For new brick water-dam, with wrought-iron flood-gates, &c., on the river Tame, near Weston, Oxon, for Alfred Howland & Co. Mr. H. J. Heath, architect:—

Barton (accepted).

For alterations and fittings at the Ship and Blue Coat Boy, Walworth-road, for Mr. Edward Smith. Mr. James Joy, architect:—

Whitby (accepted) £440 0 0

For the erection of the Congregational Chapel, Newport, Essex. Mr. C. Pertwee, architect:—

Lindall	£1,614	0	0
Dix	1,168	0	0
Cornwell	1,159	0	0
Staines	998	0	0

For laying-out the New Market, and approaches, Chelmsford, for the Local Board of Health. Mr. Charles Pertwee, surveyor:—

Levelling, Draining, Roadmaking, &c.

Wood	£878	0	0
Ford & Norris	799	0	0
Walker	655	0	0

Carbing, Paving, Masons' Work, &c.

Choat & Son	£1,133	10	6
Hardy	1,117	4	6
Rutty	960	0	0
Finnegan	900	0	0
Wray	866	0	0

Water-mains, Iron Fencing, Smith's Work, &c.

Green & Burleigh	£2,193	0	0
Cottam & Co.	1,352	10	0
Beckett Bros.	1,337	0	0
Hill & Smith	1,183	0	0
Fletcher	1,037	10	0

Builder's Work in Settling-house, Sheds, &c.

Wood	£587	0	0
Gozzett	541	0	0
Byatt	469	0	0
Choat & Son	442	0	0

For additions to Christ Church, Chislehurst. Mr. Alfred R. Pite, architect.—

	Northern Extension.	Western Extension.
Patman & Fotheringham	£2,930	£2,919
Smith	2,802	2,908
Burkitt	2,722	2,850
Downs	2,775	2,710
Falkner	2,667	2,633
Payne & Balding	2,733	2,610
Harris & Wardrop	2,695	2,535
Stickland Bros.	2,782	2,520
Crowland Bros.	2,424	2,505
Tongue	2,315	2,105

For taking down and rebuilding premises at Bovey Tracey, Devon, for Mr. John G. Beer. Mr. John M. Pinn, architect. Quantities supplied:—

Stephens & Son	£1,728	0	0
Davis Bros.	1,215	0	0
Stacey & Rabbage	1,180	0	0
Underhill & Aggett	1,178	0	0
Mardon	1,120	0	0
Palfry & Sly	1,110	0	0
Colling & Son	1,082	12	0
Tapper	1,010	0	0

For dwelling-house and butcher's shop at Arnold, near Nottingham, for Mr. George Dean. Mr. Herbert Walker, architect. Quantities supplied:—

Wilson & Bulling	£763	5	0
Baldwin & Bellamy	745	0	0
Dudson & Parrish	712	0	0
S. & J. Cargill	705	0	0
Scott	699	0	0
Slim	690	0	0
Wood	670	0	0
Franks	670	0	0
Mosley	668	0	0
Stainforth	664	4	0
Baines & Burton	645	0	0
Clayson & Mould	640	0	0
Smith & Greaves	630	0	0
Wayte	629	18	6
Crookes & Foster	624	0	0
Doughty	620	0	0
Noble	588	0	0
Tutin	580	0	0
G. & J. White	525	0	0

For the erection of new granaries, stabling, &c., in the Coombe-road, for Mr. C. Andrews. Mr. Henry W. Beale, architect:—

Pleece (accepted, labour only).

For new stabling, coach-house, &c., Burlington-road. Mr. Henry W. Beale, architect:

Drewitt (accepted).

For altering and adding to Mr Eddowes's premises, 247, Old Kent-road. Mr. J. W. Brooker, architect:—

Weekes	£1,050	0	0
Sharpley	1,007	0	0
Cullum	872	0	0
Battley (accepted)	785	0	0

For finishing ten houses at Hounslow, for Mr. W Schofield. Mr. J. W. Brooker, architect:

Bartlett	£4,500	0	0
Lingman	4,500	0	0
Vincent	4,385	0	0
Sanders	3,898	0	0
Simmons & Co.	3,9[illegible]	0	0
Battley	3,[illegible]	0	0
Priddle	3,[illegible]	0	0
Cullum	3,[illegible]	0	0

For alterations at Mr. Bellringer's premises, 59 and 61, Newington-causeway. Mr. J. W. Brooker, architect:—

Colls	£1,050	0	0
Hockley	912	0	0
Cullum	905	0	0
Battley	875	0	0

For the erection of a warehouse, High-street, Shoreditch, for Messrs. E. Levy & Bros. Mr. J. W. Brooker, architect:—

Battley	£3,760	0	0
Forrest	3,446	0	0
Axford	3,385	0	0
Thompson	3,368	0	0
Morter	3,360	0	0
Lawrance	3,295	0	0
Cullum	3,248	0	0
Ashby, Bros.	3,129	0	0
Colls & Sons	3,087	0	0
Crockett	3,068	0	0
Browne & Robinson (accepted)	3,018	0	0

For the erection of the Swan Tavern, Selater-street, E., for Mr. J. Grey. Mr. J. W. Brooker, architect:—

Ashby & Brothers	£3,100	0	0
Axford	3,055	0	0
Wagner	3,020	0	0
Browne & Robinson	2,990	0	0
Lawrance	2,980	0	0
Chessum	2,936	0	0
Grover	2,894	0	0
Morter	2,873	0	0
Crockett	2,778	0	0
Elkington	2,760	0	0
Battley	2,685	0	0
Cullum	2,550	0	0
W. & F. Croaker (accepted)	2,495	0	0

For stonework and fixing of the Green Dragon, Bishopsgate, for Mr. W. Chapman. Mr. J. W. Brooker, architect:—

Plows	£244	0	0
Seale (accepted)	215	0	0
Schofield	210	0	0
Perriman	175	0	0

For the erection of a villa in Wickham Park, Brockley, for Mr. F. H. Leaver. Mr. J. W. Brooker, architect:—

W. & F. Croaker	£3,239	0	0
Battley	3,100	0	0
Spillane	3,068	0	0
Grover	3,058	0	0
Crockett	2,900	0	0
Jerrard	2,777	0	0
Cullum	2,698	0	0
Redman (accepted)	2,425	0	0

For the erection of two villas in Grove-hill-road, Denmark-hill. Mr. J. W. Brooker, architect:—

Cullum	£1,400	0	0
Battley	1,259	0	0
Kingsman (accepted)	1,125	0	0

For the erection of a warehouse and factory, for Mr. W. H. Vaughan, in rear of 332, Old-street, E.C. Mr. J. W. Brooker, architect:—

Morter	£2,228	0	0
Browne & Robinson	2,179	0	0
Axford	2,125	0	0
Crockett	2,122	0	0
W. & F. Croaker	2,038	0	0
Downs	2,015	0	0
Lawrance	1,985	0	0
Cullum (accepted)	1,932	0	0

For villa residence, Chalcots, Haverstock-hill. Mr. R. Groom, architect:

Nash (accepted)	£1,616	0	0

For alterations and additions to the Builders' Arms, Charles-street, Kensington. Messrs. Bird & Walters, architects:—

Mark	£1,155	0	0
Braid & Co.	1,150	0	0
Grimwood & Sons	1,110	0	0
Williams & Son	1,083	0	0
Godden	1,035	0	0
Hockly	1,005	0	0
Anley	870	0	0

For porter's lodge at the Ashford School for Imbecile Children, Darenth, Kent, for the managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, architects:—

Braid & Co.	£600	0	0
Gumbrell (accepted)	420	0	0

For schools for the Ashford School Board, Mr. J. T. Hanson, architect. Quantities by Mr. Clement Dowling:—

North Bros.	£5,350	0	0
Reading	4,990	0	0
Wood	4,774	0	0
Beale	4,627	0	0
Prout	4,585	0	0
Hughes	4,455	0	0
Petts	4,400	0	0
Knock	4,364	16	4
Knight	4,327	0	0
Jones	4,261	0	0
Bourne	4,250	0	0
Denne	4,170	0	0
Denne	3,994	0	0
Steddy & Co.	3,980	0	0
Adcock	3,674	0	0
Howler	3,437	0	0

For alterations and additions to the George and Dragon, No. 2, Hackney-road. Messrs. Bird & Walters, architects:—

Mark	1,517	0	0
Braid & Co.	1,500	0	0
Stamp & Bowtle	1,439	0	0
Williams & Son	1,383	0	0
McLachlan	1,348	0	0
Hockley	1,345	0	0
Marr	1,343	0	0
Forrest	1,287	0	0
Anley	1,253	0	0

For the first portion of Terrace Wall, England's-lane, N.W. Mr. R. Groom, architect:

Nash (accepted)	£345	0	0

For re-building No. 2, Serle-street, Lincoln's-inn-fields; exclusive of party walls. Mr. R. Groom, architect:—

Staines & Son	£963	0	0
Nash	900	0	0
Howse (accepted)	785	0	0

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We are compelled to decline pointing out books and giving addresses.

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The Builder.

VOL. XXXVI. No. 1873. SATURDAY, DECEMBER 28, 1878.

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Costless Power.

THE question very aptly raised by Mr. Paterson, in the *Builder* of the 14th of December, has an importance far larger than that which pertains to the question of the cost of lighting any particular town. Looked at in its very core, the question is, "What is the cost of transmission?" It is difficult to insist too strongly on the importance of this element of outlay. In very many cases the cost of transmission equals, or exceeds, that of production. And in every case there is a certain balance to be observed between these two elements of cost. The latter part of the eighteenth, and the first part of the nineteenth, centuries, were distinguished for the immense reduction which they effected in many instances in the cost of production. The application of mechanical motor power, the invention and improvement of machinery, and the division of labour, reduced the cost and time of producing silken, woollen, cotton, and various kinds of woven fabrics, in a few years, to a mere fraction of their former prices. But this reduction would have been, comparatively speaking, of but little effect, had not the labours of the last half-century been directed to facilitate the speed and diminish the cost of transmission. The rich plains of the Upper Ganges bear harvests ample for the support of our entire population,—harvests produced with little labour, and which, fifty years ago, if yielded by nature, must have dropped and rotted on the ground; but when railway and canal communication opened the valley of the Ganges, when the voyage of 120 days or more round the Cape was reduced to one-fourth of the time by the reopening of the ancient channel of communication between the Mediterrancan and the Arabian Gulf, the wheat of the Ganges could be transmitted, and has been transmitted, to London at a moderate price, and a corresponding outlet has been opened for the consumption of the products of British labour. Wheat can be grown in India, Sir Arthur Cotton states, at 6d. per bushel, or 4s. per quarter. The *Friend of India* states that it can be grown at 6s. per quarter. At Allyghur, some miles below Delhi, Mr. Crawford quotes a price of 16s. per quarter. Adding to this last price the rates of freight on the East Indian Railway, and shipping and insurance to London, we obtain a price under 34s. per quarter at which wheat could be delivered in London (the figures taken for January, 1877), when the Mark-lane price was 51s. 7d.

If one economical principle more than another has underlain the enormous stride made in the productive efficiency of this country since the origin of the railway system, it has been that it may be a wise economy not to spare cost in the first instance. In nothing has this been so remarkably apparent as in the case of the natural motor powers of wind and water, in fact,—in the application, as a motor power, of the costless and unresting energy of gravitation. When we look at those unexpected revelations of the life and habits of the early inhabitants of Greece and Asia Minor which we owe to such researches as those of Dr. Schliemann, or even of those, not two thousand years since, which the Chevalier Fiorelli is bringing to light at Pompeii, we are taught how severe a labour was imposed on the gentler sex by the housewifely duty of grinding corn. Of the first performance of this onerous duty by water-power we know far less than is desirable. No doubt the change, wherever and whenever effected, must have seemed to the women who were thus relieved from a very arduous part of their daily toil as a veritable commencement of the millennium. We know how, through feudal times, the right of the lords, lay or ecclesiastical, of the manor or lordship to have their tenants' corn brought to their own mills for grinding was jealously enforced. The plea of going to the nearest mills was held to be altogether inadmissible. There may have been occasions when much unnecessary hardship was thus occasioned. At the same time, when we consider what was saved to the people by the application of a natural power in this manner, we cannot but contrast the mode in which the advantage was divided between the owner of the mill and the consumers of flour, with that adopted on the first introduction of labour-saving machinery in the textile manufactures amongst ourselves.

Now all is changed. The power of water is not, indeed, absolutely gratuitous. It requires, under any circumstances, attention to banks, ponds, and channels. We may distinguish the cost attendant on the preservation and maintenance of a supply of water from all other expenses of a water-mill, such as attendance, interest on capital, and repairs. These charges must exist, whatever be the motive power employed. We are speaking of the cost of motor power alone. And in this, as far as this country is concerned, must often be included a very heavy item for the waste of agricultural produce by the water-logged soil and undrained floods, due to the stoppage of water-courses in order to procure heads of water for mills.

For this, however, unfortunately for the country, the water-miller has not to pay. He procures his motive power at a considerable cost, may be, but, if so, it is borne by his neighbour. His own outlay for maintaining his mill-head, and draining his mill-tail, is very much in proportion to the motive power obtained. His chief hindrance is the irrigation amount of that power. In times of drought there is not enough for his requirements. In times of flood he may be choked by over-supply. For this reason, as well as for the reason of the cost of transmission, now that all the customers of a mill are free to choose that which is most conveniently accessible, the costly power of steam is, throughout England, more or less rapidly replacing the cheaper water-power, even for so simple a duty as the grinding of flour. In many cases where the old mills are in a locality sufficiently accessible to maintain their custom, we find, first, steam used as an accessory,—and, by-and-by, water sinks to the position of the accessory, even if used at all. The power which, costing a fixed sum, is at any moment available, is steadily taking the place of that which, though costing considerably less, is both uncertain and strictly localised.

Those who have studied, as we have recently had occasion very closely to do, the development of the natural resources and manufacturing industry of the country for the last half-century, will probably be found to concur in the opinion that the use of the natural powers of wind and water is rapidly diminishing in England, and to anticipate that the cases are few and rare where these natural motor powers are likely to be permanently retained. The matter reduces itself to the cost of transmission. When the cost of transmission of coal to a convenient locality,—that is to say, to a locality convenient to a great centre of population,—is considerably less than the cost of the transmission of the raw material to the vicinity of a natural motor power, and of the manufactured material back to the market, steam-power in the place of consumption will displace water-power in any other place.

By steadily keeping in view this important question of the balance of the costs of production and of transmission, we shall be enabled to steer clear of many paradoxes, and to avoid many mistakes. Economy of production may be much increased by a careful study of this often-neglected element of cost. If we take that mode of transmission which, when the requisite amount of preparatory outlay has been effected, is, perhaps, the cheapest of all,—namely, the flow of water or of gas through pipes,—we shall see in what unexpected form the cost of transmission makes its appearance. According to the accounts of the London Gas Companies, there is a difference of from four to eight per cent. between the quantity of gas produced and that sold or brought to account. This difference is mainly due to leakage. It is more considerable in the richer gases, such as those made from cannel-coal, than in the poorer. Now this leakage is, in point of fact, a cost of transmission. If gas be sold at 3s. 4d. per 1,000 cubic feet, and the loss by leakage is 5 per cent., the cost of transmission due to this source is equal to twopence per 1,000 cubic feet. And if

the accounts and conclusions of the companies be reliable, and the loss really arise from leakage, and not from pilfering or misreckoning, the cost of transmission of a richer gas is nearly twice that of an ordinary gas. Thus the highly carboniferous gas of the cannel-coal costs more, in proportion to its illuminating power, than a poorer gas, not only in distillation, but also in transmission. This is one of those outcomes of financial experience which no theory could anticipate.

With regard to the transmission of water through pipes, which so readily commends itself to theory as an admirable means for cheap transmission of power, we shall also do well to take the guidance of experience. The subject has been carefully investigated by the engineers of the different water companies, and has been fully and lucidly debated at the meetings of the Institution of Civil Engineers. The outcome of the uncontradicted testimony of these experts is, that the loss by leakage of water is far greater than that by leakage of gas. It may be said that this ought not to be the case,—that improvements are in course of operation, that pipes are better, fittings better, and that we must look forward to the time when we shall draw out of a closed system of pipes all that we put into them. Perhaps so. We hope that we are moving in that direction. We should be the last persons to undervalue the economic result of good materials and good workmanship. But the very gist of our present remarks is, that theory must be controlled by the experience of practice. Over-estimates of profit and advantage are far more fatal to progress and improvement than under estimates. Thus, in looking at the transmission of power by hydraulic pressure, high or low, through pipes, we must first ascertain the actual state of this mode of conveying the needful fluid. After fifty years of improvement on the old wooden water pipes, it is now on evidence, as the opinion of competent men, that 30 per cent. of the water actually supplied to our great cities is wasted by leakage, besides another 30 per cent. by the carelessness of the consumers in letting taps run, in propping open valves, and the like. If this is the case where the pressure is only that required to reach the upper stories of a house—say as much as two or three atmospheres,—what will be the case if water is thus transmitted for use as power? It will be easy to calculate what quantity of water, at what pressure, is requisite for each horse power. And when anything of a considerable amount is wanted, either the pressure must be so high as to require great care and cost in the pipes, joints, and fittings, or the quantity will be so large as to require large and costly pipes. It would be quite out of the question, for example, to attempt to obtain 1 h.p. of water power for every ten houses in London without a total reconstruction of the entire system of water supply.

We have then to look at the necessary elements of cost in the application of that which in the first instance costs nothing. If we compare the total revenue of the eight London Water Companies with the total quantity of water which they send into London in a year, we shall find the result gives a cost of almost exactly three half-pence per ton of water delivered. The motor power which could be obtained from this quantity of water will, of course, vary according to the level at which it is delivered. Let us take a case where it would reach the top of a house 30 ft. high. A ton of water delivered at that height, would be thus valued as power, $\frac{2240 \times 30}{33{,}000} = 2{\cdot}04$d. per horse-power of work done. But we have to add the allowance for leakage. If we take the whole allowance made by the companies, this will raise the power to 3·26d. per horse power of work done. According to statements made in the Minutes of the Proceedings of the Institution of Civil Engineers, an Otto and Laagen gas-engine consumes 30 cubic feet of gas for an hour's work of one horse power. We have thus to compare $2{,}240 \times 30 = 67{,}200$ foot pounds of work done at a cost of from 2d. to 3½d., with $33{,}000 \times 60 = 1{,}980{,}000$ foot pounds of work done for $\frac{30 \times 42\text{d.}}{1{,}000} = 1{\cdot}26$d. The latter is just twenty-eight times as much as the former. If, now, we suppose the water to be delivered with a head of 120 ft., we shall still only obtain one-seventh of the work from our "cheap" motor power, water, that we obtain from our costly motor power coal-gas. If steam-power to a large nominal horse-power be employed, the cost will be considerably less than 1½d. per horse-power per hour. We are allowing for the cost of motor-power alone, supposing attendance, repairs, and interest of money to be the same in both cases. But, as we before intimated, in case of the abstraction of a large quantity of water from the London supply for the purposes of producing motion, such additional outlay would be required that the charge of 1½d. per ton, including waste, would probably have to be considerably raised.

We have entered thus far into detail with the object of enabling any of our readers who are practically interested in the matter to make similar calculations for their own guidance. Mr. Paterson refers to prices of from 3d. to 6d. per 1,000 gallons as the cost of water supplied by gravitation. The lowest of these prices would be about half that incurred for the supply of London, reckoned per ton of water. The difference is chiefly due to the amount of steam-power required. This, for the year 1877, came to 1,660*l.* per annum for each million gallons per diem. It must be remembered that the value of water, as a power, depends directly on its head; and that if it has to be pumped up, rather less power will be obtainable from it in its descent than was required for its ascent. Thus we are confined to cases where gravity can operate. And in these,—first, the locality is everything, as to level. Then the distance has to be considered, both as to first outlay, maintenance, and leakage. Then is to be borne in mind the interest on capital, and cost of distribution, meterage, and watching against loss. When all these things are borne in mind, it will be seen that the idea of effecting any great saving by a return to the use of water as a motor power is somewhat Utopian. There may be large towns in which a large head of water is available by gravitation. But in these cases it will be necessary to ascertain the real cost of the reservoirs, pipes, and apparatus needed for the distribution, and thus to come to the actual cost of a ton of water delivered at a fixed level. We do not wish to dogmatise. It is rather our aim to set our readers to work for themselves. But it is indubitable, we think, that the cases must be extremely rare in England in which water-power can be made readily, permanently, and directly available at so low a cost as steam power, including under that generic title the employment of the cheap and convenient motor of the gas-engine. And if 1½d. per horse-power per hour be grudged, we think we should have little difficulty in pointing out how results of the same kind are attainable, even at a great reduction on that low cost.

In referring, in our columns for the 21st of December, to Zurich, as a place where water-power is available, Mr. Matheson has tacitly confirmed the truth of the above remarks. The Swiss torrents afford natural motors of a kind far superior to those to be found anywhere but on lofty mountain districts. Those regions of England where water-power of this nature, though on a smaller scale, is available, are not those in which the application is demanded by a teeming population.

If there be a loss of 4 to 8 per cent. in the transmission of gas, and of from 30 to 60 per cent. in the transmission of water, the question of the loss in transmission of electric power is not yet by any means settled. For low currents of electricity, the isolation attained by wires hung in the air is so satisfactory that one eminent writer on telegraphy has declared that the simple contact, made in the mouth of the operator, of a silver sixpence with a plate of zinc of equal size, will deflect a delicate galvanometer at a distance of 500 miles on a circuit. This is, no doubt, incredible, if true; but it is the statement of a competent man. For the transmission, however, of any current which has a dynamo-electric value, the case is different. The general rule is that the resistance is directly as the length of the current, and inversely as the section of the conductor. Thus, for an increased length of circuit, an increased thickness of wire is requisite. But that is not all. Although the amount is as yet unknown, and the laws which regulate it undetected, there is no doubt that something occurs in the transmission of the electric current akin to leakage in the transmission of gas or water through pipes. Or, in other words, the resistance increases at a more rapid rate than the length of the circuit. It would also appear that this leakage, or resistance, may be represented as a fraction of the intensity of the current. On this point, no doubt, many minds of high inventive order are now at work. All that we can say, from the latest communications we have had with the leaders of the movement, is that no mathematical expression for this loss has as yet been ever suggested. One gentleman, who has attained extraordinary success in manipulating electric power, states that the difference in rate of loss is so great as to impose a very narrow limit on the length of a circuit that can be practically available, whether for the production of light, or for any other dynamo-electric purposes.

It is thus tolerably clear that the idea of the possibility of commanding a costless power is one of those which, as far as our actual mechanical skill and science go, must be ranked among the advantages of Utopia. Gold may be bought too dear. Gravitation is, no doubt, a costless as well as an unsleeping power. But to set it to work for us,—to make a slave of it,—generally costs more than to avail ourselves of the work which the sun and the elements have been storing up for us during the uncounted centuries which produced the carbon stores of the coal measures. It is cheaper for English mechanics, in ninety-nine cases out of 100, to avail themselves of the heat liberated by the combustion of coal, than it is to make use of water-power, wind-power, or any application of gravitation. Such, we do not doubt, will continue to be the case so long as our coal is unexhausted. Such, we believe, would be the case even if we were reduced to the necessity of importing coal. The pursuit of costless power has something of the nature of a chase of the will-o'-the-wisp. What we have to do is, to make the best use of that power of which we know the outside cost.

A NATIONAL THEATRE FOR THE NATIONAL DRAMA.

In all our aspirations after a national theatre, there is no doubt that we start from Shakspeare, and to Shakspeare we come back, if we do not end with him. From what point, it might be thought, could we start with more appropriateness, and also with more promise. Shakspeare has not only the highest reputation of all English writers, but is the most popular,—the most generally popular,—of all our old writers, and has a popularity that may be brought into comparison by several tangible tests with that of authors who are in full enjoyment of the sympathy of contemporaries. Editions of Shakspeare follow most closely, even when they do not run on alongside each other, and it cannot be doubted that after all deductions for the merely ornamental and the conventional, the books are bought to be read, and are read. We need not lay too much stress on the pertinacity of Shakspearian critics and commentators; but there are public readings or recitals of the dramas which are as frankly as they are justly appreciated; and private readings abound which may not always be sources of unmixed pleasure to those who take part in them any more than to all who are listeners, but that very constantly evince the possession by a considerable proportion of the readers, of the greatest familiarity with the poetry and a fine feeling for its most characteristic beauties.

And yet reading Shakspeare to oneself, or even hearing it read, is necessarily an imperfect enjoyment, much of the nature of reading music. It is what an engraving of a picture is to the picture itself,—what an engraved outline is to the plate with completed finish of light and shade. Only when fine speeches are delivered with that good emphasis and discretion which it is a matter of fine art to realise, can they be duly understood, not to say felt; and even so the effect of one such speech is dependent on relief and contrast by another,—by visible gestures, actions, expressions, which are still more important at transitions than at sustained courses of declamation. Let scenery and costume be put aside; what can less easily be dispensed with is that commentary of "stage business" of which Shakspeare must have been a consummate master, as he supplies occasion for its fullest resources. But how, then, is it that when the stage has such a store of enhancements to add to what by itself is so delighted in, that Shakspeare, according to the manager's dictum, should of necessity spell ruin. As between reading and representation, it is no question of gilding refined gold, or painting the lily, but of bringing gold into light that enables

it to be seen,—of so planting the lily that its beauty shall have the perfect charm of vitality.

The questions which are thus opened must be entertained with candour if any worthy result is to ensue. In all candour be it said that the manager knows his business,—and that it is out of the question to expect that under existing, nay, under any conceivable conditions, a theatre can sustain itself on Shakspeare alone, or with the further aid of the writers of his period or that of the Stuarts. Every age will have authors of its own, however much it may value the past. Let the philosophers, or, failing them, the physiologists, look to it,—for a fact it is, either in philosophy or physics, that our rising generation, to whom all literature is new, turns away from the literature which we welcomed when young with as much sense of weariness of it, as if they, and not we, had studied it till we were tired. A fashion in literature, as in dress, may no doubt be so old that it becomes new again unsuspectedly; but even so it will have for the most part to make concessions to the period it visits, as the modern sash lies *perdu* behind the mullion, and the lintel is discoverable behind the pointed arch, as Falstaff's white beard was descried by Sir Hugh Evans under the muffler of the personated Mother Pratt. If ever, then, we are to have a Shakspearian stage, we must be prepared for a combination with a modern development of the drama. This is the more necessary, and would be the more useful, because so, and only so, it may be hoped to restrain the spirit of modernism from asserting itself within the Shakspearian pale. If the world cannot have modern plays as well as Shakspeare's, it will insist on his plays being overlaid with all manner of modern encumbrance. And, moreover, one of the most valued results that should ensue from establishment of a Shakspearian drama is the cultivation of the dramatic art to a very high pitch in a company of actors capable of doing justice to new works of a high class. The embodiment of the conceptions of a bygone age cannot be expected unless from a course of study and, it must be added, of instruction, and then of habitual exercise in concert, that cannot but raise the mental standard and professional aptitude of all who participate in the discipline.

Let us consider, then, what is the summit of our desires in this matter of a worthy theatre, and then we may cast about for available helps and ladders for "young ambition" to climb up to it, and for our chances of firm ground to plant them on.

A worthy ambition is, that this metropolis of ours should possess a theatre at which, during a certain portion of the year, and for years in succession, there should be given, in most perfect style and at no extravagant expense:—

1. The plays of Shakspeare. As regards these it were desirable that the entire series, with exceptions that indicate themselves, should, within a certain term, be presented. A friend commences an amusing anecdote with—"When I saw the 'Comedy of Errors' excellently acted in the Court Theatre at Vienna, &c."; but we in London may live a life through and never have a chance of seeing the "Comedy of Errors" acted, well or ill. That the most favourite—the most actable plays—should be presented most frequently passes of course; but as we are now upon the ideal, it would be imperative that the less attractive should also have their more restricted turn. The "Comedy of Errors" is an example of some that would be found to gain in attractiveness most unexpectedly when illustrated by well-managed stage business. Lovers of Shakspeare's priated page would soon find that to have once attended a well-studied representation is to become sensible for all time of marvels of force and of delicacy in words long familiar before, but that only yielded half their import. Years, of which we have lost the exact count, have elapsed since we saw Edmund Kean in "Othello" and "Shylock"; but years have not effaced the consequent accession of pleasure to the reading of these plays, and never have we crossed the bridge of the Rialto, or stood in the council-chamber of the Doge's palace at Venice, without some reason for gratitude to the same experience. The actor's assistance goes for most doubtless in the best of the plays, but proportionately it tells for more in the others, and on this ground we have aspirations for a theatre established under conditions that shall render not only possible, but certain, the occasional production of such plays as "Love's Labour's lost," "Pericles," "All's well that ends well."

2. A rule cannot be drawn with equal stringency in respect of any other of the dramatists anterior to the Commonwealth. In most of these cases the question is less what must we perforce neglect than what can we find that is fairly presentable. Ford and Massinger are in this respect more easily dealt with than the inborn corruption that taints so generally the finest work of Beaumont and Fletcher. Still, this section is not to be arbitrarily ruled out any more than Webster or Marlowe and some others, where careful walking is required between dulness or extravagance on the one hand and indelicacy on the other. Others, again, may weigh when the time comes the claims of Ben Jonson, not without regard to the renown of Garrick in some of his characters,—Abel Drugger, and even Kiteley, in the, to us, unreadable "Every Man in his Humour,"—a humour that is not ours.

3. Tastes curiously sophisticated or unsophisticated may undertake the advocacy of Farquhar, Congreve, or Wycherley, but not even Dryden's compliment to the

> Satire, wit, and strength of manly Wycherley,—

or to Congreve,—

> Nature, who once was prodigal before,
> To Shakspeare gave as much she could not give him more,

induce to make further trial of picking over their remains, and Dryden himself, as a dramatist available for present revival, is passed over with a sigh for misdirected genius.

We must not, however, be tempted into a review of dramatic literature; let it be enough to say further on this head that the period after the revolution of 1688, extended to the last generation, or say to the French revolution, is not barren of even tragedies which may deserve attention, and still less of the "old comedies," of which very many have given true pleasure to the elder among us at far-scattered intervals,—in some cases at more frequent recurrence.

Let it, then, be agreed, or at any rate assumed, that what is required is a theatrical establishment which shall give annually representations of Shakspeare's plays, representations truly worthy of immortal works, and representations also of other dramas of former generations that have a classic or, at least, a deserved popular standing; that shall also be ready and equal to the production of new works, supposing such to be forthcoming, that aspire to a like position, and have a claim to study and consideration as works of art. If these conditions could be achieved, indulgence might be conceded to a proportion of pieces of slighter pretensions,—such pieces even as cannot be expected to live far beyond their day,—and pieces there are of such ephemeral character that have fair claim to their brief existence. Gratefully we can recall how poor Jullien gradually educated the popular ear to the enjoyment of the most refined music of Beethoven; albeit he brought the popular ear first within range by a ballad, or an extravagance, "Trab, trab!" or the "Row Polka." The principle may be accepted without following the application to the borders of screaming farce.

But the completed work having been bodied forth ideally, the inquiry has to face the problems of machinery and motive power.

It is clear that for such a system to become a possibility, a company of actors would be required that should include much first-rate talent, and then a larger contingent of that talent which is not so rare, the talent which is teachable. In every art, and not least conspicuously in the dramatic, there is a vast fund of undeveloped but developable power,—power that is strangely dormant or strangely perverse until it meets appropriate stimulus, but then responds sympathetically. For this to be utilised the apt instructor must be forthcoming; but this given, the lower rank and file of a company may act with an efficiency that surprises others and even themselves. A leading mind may thus pervade the whole as thoroughly as does that of a musical conductor, whose *bâton* is before the eyes of a chorus at every note they sing.

But such a company must be a solid company; its members must continue to act together year after year, and its new recruits must come in from time to time with the intent and prospect of permanency. This is at once a negation of what is called the "star" system; it ought to be called the meteoric system; if true splendour of result is to be obtained the stars of the company must be fixed stars; the illumination that is demanded is the brilliant, not the flashy. The actors and actresses, therefore, must have as a rule permanent engagements, permanent positions. This has been effected in other countries; it may not be possible in England, and if certainly not, we may break off our analysis of the problem; the negative, however, is not certain, or we will assume that it is not, and we will go on.

The star system in its fullest development has only been known since the world of the metropolis has become so numerous, and the influx of visitors extra-metroplitan so constantly renewed, that a popular piece may go on for a thousand,—we may yet have to say for thousands of successive nights,—before all are satisfied who wish to see it. Fine actors may thus be kept occupied with the same characters all the year round; for if the London season ends, or relaxation is imperative, they merely transfer their activity in the same characters to the provinces. This practice cannot, of course, but exercise at last a detrimental influence on the originality of the performers, and, at the same time, dramatic invention suffers also, for such a run of one piece, of course, excludes the introduction of others; and if others find opening elsewhere, it is without the aid of the special talents of the monopolised actors.

The star system, however, as regards both actors and pieces, is an outgrowth of the time,—of the increase of population and its increased mobility by land and water; its position is rooted, and there is more promise in an attempt to compete with it than to destroy it. If a popular exhibitor like Albert Smith found that a single entertainment without further rehearsal or preparation might be repeated by him every evening, and a third of the afternoons of half a lifetime pleased better than anything he attempted to substitute, and continued to please so well as to be equivalent to a fortune to him, what could be hoped? Unhappily, or not at all, arguments against persistence would be like a duello between poetry and political and private economy, and of like hopeless characteristics is argumentative declamation against the easily and abundantly remunerative star system of the contemporary drama.

It is, in fact, because, as the world is now constituted, this system cannot be forbidden, and cannot be eradicated, that an effort is chiefly necessary to save the art of acting, and the prospects of dramatic literature from being gradually hackneyed and degraded; the effort that it seems worth making is to evolve, if possible, some scheme which shall develop a rivalry on a better system of its own, compete with uniformity by variety, with the hackneyed by the versatile, with the ephemerally by the eternally admirable.

An accomplished actor, like any other professional man, not to refer to other classes, has a right to look forward to remuneration which is relatively appropriate, and sufficient to cover a provision for retirement as age advances; this which is sought and obtained in the open profession would have to be secured in what we have called the Solid Company, for the representation of, let us call it, National Drama, adequate remuneration, and certainty of provision, retiring pension, superannuation,—call it what we please,—the inducements that fill and overfill offices London throughout, would go far to secure the loyal adherence of the members of the dramatic company required.

This is the elephant that has to support the dramatic world,—a cosmos,—whatever may be the substitute for the tortoise on which we must rely to support the elephant.

But we may yet give attention to many considerations on which the mere organisation of the original cosmos must yet depend. All experience assures us that we have to rely, in a matter of social organisation of complex character, on an overruling or master mind,—upon, in fact, a manager,—the equivalent upon an extended scope and scale of our conductor of the orchestra and chorus. At this stage we have to assume that membership of our imagined company will be a prize in the actor's profession, and popular appreciation may be trusted, to a certain extent, to mark out those who are entitled to the distinction and advantage, but reliance will have to be placed upon individual judgment at last as to what qualities are required to supplement those already in possession, of two aspirants which will make up best for the most serious deficiency. The function of our manager will not be utterly unlike that of

a premier designate composing his cabinet; when the indispensable members are decided, success may be jeopardised by a mistake as to the desirable; and sagacity and insight must be trusted sometimes to discern the efficiency which the world at large has been too prejudiced or preoccupied to have a suspicion of. The accomplishments which shall be equal to selecting the company, to distributing casts in the most diversified dramas, must be combined with skill in selecting the dramas that are to be associated in representation, and their sequence so as to gain the utmost popularity possible for those plays of which the representation is a condition of the establishment of the company,—with acumen to accept such new dramas as are really worthy,—and finally there is required the energy and instinct of organisation which not only controls and disciplines a difficult body, but that can inspire it with that *esprit* which is the ultimate condition of harmonious and zealous co-operation. To say more on this head, perhaps to have said so much, might seem to provoke the interruption by which Rasselas broke off Imlac's tirade,—"Enough, thou hast convinced me it is impossible ever to be a poet; tell me now," &c.

But there is no impossibility in the present case, for artists of such endowments there have been, and there may be again. It is an open question how far such an autocracy might be tempered by votes of existing members being required for the admission of a candidate. On the one hand, jealousy of a rival might send a vote astray; but, on the other, such a company as we have supposed would assuredly gain the experience that the qualities of a new member would have the same heightening or depressing effect on those of all the others, as would the right colour or the wrong for the scarf of Ariadne upon the value of every other tint in Titian's picture of her interview with Bacchus. No rule can be derived for this case from grounds for satisfaction, or the reverse, with ordinary elections for the Royal Academy. One essential in the case is that the prosperity,—the emoluments,—of the company shall be susceptible of enhancement as well as its honour by the results of a judicious selection of associates.

Given, then, the best company, organisation, and administration that can be desired upon these lines,—given, that is, a scheme and conception of such filled out in far more detail than can here now be entered into, —the ultimate object of dramatic art having been agreed on, and the general arrangements considered which are its proximate conditions, analysis conducts us to an ultimate consideration in an opposite direction. What we have to ask is, the precise link that will connect the present and actual with the proposed and the ideal. Let us be agreed as to the fruit that we desire, and as to the identification of the tree that produces and bears it; but what are our means for scaling the tree, for vainly shall we try to shake it, that by such inartificial operation the fruit will drop ripe into our mouths. We have, to take a contrasted illustration, the old Æsopian problem of the rats' congress,—how to bell the cat. The cat is only too evident, and the warning bell is readily forthcoming, it may be,—but how is it to be attached?

It is agreed that the company must be assumed to entail a dead loss somewhere. This is, however, a coarse way of stating the matter. It is agreed as inevitable that the finest dramatic art cannot be realised in competition with the inferior as a paying speculation, any more, —nothing invidious is intended, than the sculpture galleries at the British Museum could pay their way by admissions against the Royal Academy, to say nothing of Madame Tussaud's. But the power that finds the money will assert, and must be counted upon as asserting, a certain influence of the most positive kind. It therefore becomes essential to the project to secure that the strings of the purse shall not be controlled by those who are likely to fail in zeal for the great objects of the institution, or to give into ignorant or sinister guidance that would inevitably frustrate the design of the scheme from beginning to end.

When the question of raising money for a purpose arises, the first question to be asked is, *Quanto?* How much? And the next is,—Whence is it to be looked for? And no doubt the answer to the second question often makes it necessary to revise the amount which was the answer to the first. As a matter of theoretical design, which we are now concerned about, we are not bound to a limitation by figures; at the same time, the subject would not be worth mooting at all if the conviction were not entertained that sufficient securing funds not only ought to be but might be obtained. If the rescue of a noble art,—the establishment of an ennobling institution,—will not attract a fair proportion of the superfluity that streams so freely into so many channels around us,—noble or ignoble,—trifling or respectable, or simply careless,—it is high time for the richest country in the world to set its house in order, and prepare to find itself superseded disgracefully in what was once its boasted function "of teaching the nations how to live." Subscriptions flow in with disinterested alacrity at an appeal for the advancement of science and for the promotion of research in directions that have not the faintest regard to prospects of remunerativeness, and less should not be hoped for in favour of that higher education which aims at refining the taste of all classes, for dramatic poetry chiefly, but for poetry in union most concrete with all the other arts. The world has found out at last that primary and secondary education must no longer be left without superior control, organisation, guidance, and subsidisation, to a very considerable amount indeed. The discovery has further been made that even the rich accumulators of centuries at universities will not develope the very best growths, classical and mathematical, without some correction and stimulus from without, and certainly would not produce spontaneously any germs of more expansive studies. Doubtless, we must look to growth, and not rely upon unnatural and hasty forcings for the perfection of social organisations, — whether a political constitution, a scientific tripos, or a national theatre. If we are not aware of this, it is not for want of having the crude principle dinned into our ears. But only the simple will be lulled into torpor by being told to wait until noble institutions come about of themselves. The wiser, who are also the bolder, will be aware that for any growth to be worth waiting for there must be a period of antecedent laborious struggle with difficulties in the preparation, the selection, and the planting. Progress must be preceded by initiation, and this does not come by waiting for. The stanchest evolutionist, we presume, will admit that evolution presupposes something to be evolved. One of the most distinguished promoters of this philosophy has recently admitted that the sum of what evolution can propound is comprised in Topsy's "'spect I grow'd." But Topsy had a father and mother somewhere nevertheless, and before she came into the "'spekilator's" hands had cost no little trouble in rearing. What evolution has done for the drama is to bring about a state of things which has, at least, the advantage of rousing public feeling extensively to the conviction that a great effort is required, even at a great sacrifice, in a new direction. The true crisis of evolution is revolution, when an antecedent state,—political or private,—is even less reformed than transformed, — when experience, thought, inventive sagacity, and, lastly, when expenditure are so freely but so effectively lavished that a new birth is given to the world in contrast with what has gone before,—endowed with new and prolific vitality.

It is out of the question to hope that a national theatre can, at the instant of its institution, have all that advantage which is derived from tradition in the long-established national theatres of other countries. But if an original scheme and constitution are well adjusted, it is astonishing how soon the *esprit de corps* developes along with experience of success and power. Given, then, conditions which are not too extravagant to hope for, there is no reason why London, within a few years, should not be in possession of a theatre at which two representations every week, at least, should not be devoted to Shakspeare,—and what are entitled to be called standard plays should also be frequently represented; which should be bound also to produce every year new dramas,—if at first but one or two,—which fairly aspire to the character of high-class works of art. The company of such a theatre would require artists, male and female, of the best endowments of talent, who must be withdrawn from other engagements, and could only be so by the assurance of very considerable salaries, only reduced at the time by the advantage of permanence, and then of proportionate retiring provision. The company would be recruited by either artists of approved powers, who would take full standing at once, or by others who should have been associated at first from promise of power, and have justified promise by a period of probation. The selection of new members of the company would be chiefly controlled by the votes of those already constituting it, who would not only be the best judges of histrionic talent, and of what class of such talent they were most in need of; but should have the strong motive for consulting the efficiency of the company above all, by increased emoluments being dependent on efficiency.

We have said that a company bound to the premised conditions of classical representation would at first, probably, be at a commercial disadvantage with competitors. In compensation it must be, in some form or other, subsidised; and the provision of this subsidy would be, in fact, the security that the characteristic scheme of the national theatre should be strictly adhered to,—the imperative performances punctually and properly brought before the world, whether they attracted the largest or lesser audiences. The company, then, must be relieved in the first instance from rent; the theatre, its structure and all fixed appurtenances, must be purchased by a fund that is no more to be expected to yield interest to outlay or shareholders than London Bridge or Westminster Abbey. What further endowment might be necessary would be matter for calculation; we have agreed to assume that, whatever the sum, it ought to be forthcoming, and that, therefore, as a matter of course, it might be. The entire endowment would then be held under a trust-deed, which would specify the conditions of the disposal of the theatre and funds, and would define, as might be thought best, the authority of the trustees and their powers of delegation to administrator or manager.

Finally, the relief of the company from charges relatively to the imperative conditions of representation must be so liberal that ample scope would be allowed them to increase their emoluments by representations that, without being inconsistent with the dignity of art, should be more generally attractive. That the establishment of a regular course of Shakspearian representations,—well studied, finely acted,—would ultimately improve the scope of the popularly attractive we do not doubt. Such a course would, in itself, be an education for actors and actresses, such as now they have no opportunity of receiving. Complaints are growing at the present time of increasing scarcity of actors who are competent for what are professionally called "powder-pieces,"—the valuable dramas which, like the "School for Scandal," demand the assumption of manners that have a certain contrast with those of our own day. What can we then expect,—what may we not expect,—when, at rare intervals, the romance of Italy or the heroism of Rome has to be placed before us?

May the time not be far distant,—and why should it be?—when the performances of the English national theatre shall revive something of the glories of the noblest antique theatre of Athens. Æschines made it a serious item in his attack upon Demosthenes,—that attack which gave occasion for the noblest of all orations in reply,—that the crown which had been, as he averred, illegally voted to him for what he denied to have been worthy services, had been illegally presented to him in the public theatre,—in the theatre when strangers had come to Athens from every part of Greece for the new tragedies. The chief reward of a visit to Paris is still for many the newest comedy; for many is it the enjoyment of admirable representations of the oldest dramas of Molière or Racine. There is no reason why the acted drama of the metropolis of Shakspeare should not even yet emulate Athens and rival Paris.

The Council of the Institution of Civil Engineers.—The following gentlemen have been elected to fill the several offices in the Council for the ensuing year:—Mr. John Frederic Bateman, F.R.S., president; Mr. J. Abernethy, Sir W. G. Armstrong, C.B., F.R.S., Mr. W. H. Barlow, F.R.S., and Mr. J. Brunlees, vice-presidents; Mr. W. Baker, Sir J. W. Bazalgette, C.B., Mr. G. Berkley, Mr. F. J. Bramwell, F.R.S., Mr. G. B. Fruce, Sir John Coode, Mr. W. Froude, M.A., F.R.S., Mr. A. Giles, M.P., Mr. H. Hayter, Dr. W. Pole, F.R.S, Mr. R. Rawlinson, C.B., Dr. C. W. Siemens, F.R.S., Mr. D. Stevenson, F.R.S.E., Sir Jos. Whitworth, bart., F.R.S., and Mr. E. Woods, other members of council.

CITIES AND CEMETERIES OF ETRURIA.

WE do not very frequently meet with persons who have much information about, or interest in, the sepulchral remains of Etruria, and it seems that accordingly thirty years have elapsed before there has been any requirement of a new edition of Mr. Dennis's work on Etruria, which was first published in 1848. During this time, however, a knowledge of the subject has been gradually diffusing itself, and we may predict that the new edition of the work,* in two handsome and copiously-illustrated volumes, will find the reading world prepared to welcome it in a much more cordial and general manner than before, and that it will do a good deal to popularise a subject which till lately has been vaguely regarded as dealing only with a half mythical region and people concerning whom there were more theories than facts to be had. The perusal of Mr. Dennis's pages will in itself be sufficient to correct this idea wherever it still remains; and if we cannot quite fully adopt his remark that "we can now," by aid of recent researches, "penetrate into the inner life of the Etruscans," we must, at all events, allow that the series of paintings from the many sepulchres that have been opened, and which are here described and in many cases illustrated, suffice entirely to remove the Etruscans from the region of myth or of pre-historic imaginings, and bring them before us as a people with an historical existence and a body of "habits, manners, and customs" as nearly defined to our knowledge as in the case of the Greeks or Romans.

The portion of Italy on which the remains of the Etruscan era are found, and which therefore for the present purpose may be called Etruria, is that included between the Apennines and the west coast, from the latitude of Rome northward to about that of Pistoja; and a good many important towns of this part of the country,—Siena, Perugia, Arezzo, and others, including "Firenze" herself, occupy old Etruscan sites. As to the race and origin of the Etruscans, we must leave the reader to balance, if he likes, between the various suggestions that have been made by various ethnologists, given impartially by our author, who is not sure that they have not even been set up as the Lost Tribes of Israel, or that at all events a theory might not be maintained to that effect which would appear cogent to all who believe in their Coningsby. Mr. Dennis commits himself to no theory, but he leans towards the Lydian emigration origin. We will not commit ourselves further than to express a decided impression as to the Asiatic origin or connexion of the type of people figured in the tomb-paintings; and those who have studied the extraordinary sepulchral monument from Cervetri, which has for a year or two stood in the British Museum, and which struck one at first sight as if coming from some new world, of which we had no previous experience, must have recognised, nevertheless, that the type of face of the reclining figure in particular is essentially Asiatic. There is, however, a good deal in the art of the Etruscans which speaks of an artistic or commercial connexion with Egypt, and there are points again in which we are reminded of Greek art; all this, of course, tending more and more to do away with that tacit idea of the isolated character of Greek art, to connect it more and more with arts of other times and countries in a natural chain of sequence and relationship, such as we have before shown to be suggested so strongly by the gold work discovered by Dr. Schliemann at Mycenæ.

Our knowledge of the art and manners of the Etruscans arises almost entirely from the fact that they were in the habit of paying such great respect to the resting-places of the dead, as habitually to decorate the walls of tombs with apparently the best resources of their art; and these tombs being excavations have not suffered the inevitable fate which would ere this have overtaken most of them had they been erections above the surface of the ground. Many who take up Mr. Dennis's book without previous knowledge of the subject will no doubt be astonished to find what an amount of pictorial representation of this kind is still in existence, in spite of the extent of time which separates us from the people who left these records, and the long period of forgetfulness under which they have lain. We are not entirely without records of the architecture of the Etruscans, but only in the shape of isolated fragments, which serve merely as hints of what may have been its general character, rather than as evidence on which to found any conception of an architectural style. We have indications here and there of a method of building having some affinity with that of the Egyptians, as in the remains of pyramidal pylons flanking the "arco d' Augusto," at Perugia, and in other pieces of ancient walling of massive stones, with an occasional arch here and there; and there is the "Porto del arco," at Volterra, which Mr. Dennis is inclined to give to the Etruscans, but of which we think the arch, with its three remarkable remains of projecting heads, cannot possibly belong to what can be called original Etruscan work, and is more likely to be Roman in influence if not in actual workmanship. Old enough it is in regard to us, no doubt; but, in regard to other indications of Etruscan buildings which exist, it has an almost modern appearance. Mr. Dennis gives us the profiles of mouldings from certain of the fronts of rock-cut tombs at Sovana, and very curious and unusual these are, and have more affinity with Egyptian detail than with any other of the known styles of architecture. We have, however, a curious piece of evidence in regard to Etruscan domestic architecture, in the shape of a cinerary urn, fashioned as a model of a house, with doorways, and roof with projecting eaves; an object which suggests upon what kind of data M. Viollet-le-Duc has built some of his highly-elaborated theories as to the habitations of men in ancient times. Another illustration on which we look with considerable interest is that representing the remains of a tumulus on the Montarozzi, and called "Il Mausoleo," consisting of a drum of masonry standing 5 ft. or 6 ft. above the surface of the ground, on which there has been a probably pyramidal mound, now crumbled to an irregular low heap, overgrown with vegetation. But one is struck, in looking at the representation of this, with its resemblance in general idea to the types of India, also consisting of a bare mass piled upon a drum of masonry in much the same manner, only spherical instead of (as this probably was) pointed.

We seem to get the nearest to the actual architectural forms employed by the Etruscans in the line of rock-cut tomb façades at Castel d'Asso, of which the following is the description given by the author, accompanied by a view of the place:

"Just opposite the ruined castle which gives its name to the site, we found a smaller glen, opening at an angle into the larger one, and here we descended, and presently came upon the object of our search. Tomb after tomb, hewn out of the cliffs, on either hand, —a street of sepulchres, all with a house-like character. They were unlike any Etruscan tombs I had yet seen; not simply openings in the cliffs as at Sutri and Civita Castellana, nor fronted with arched porticos as at Falerii, but hewn into square architectural façades, with bold cornices and mouldings in high relief, and many with inscriptions graven on their fronts, in the striking characters and mysterious language of Etruria.

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The façades are formed by the face of the cliffs being hewn to a smooth surface, save when the decorations are left in relief; the height of the cliff being that of the monuments, which vary, in this respect, from 20 ft. to 30 ft. The imposing effect of these fronts is perhaps increased by their form, which is like that of Egyptian edifices and Doric doorways, narrower above than below, the front also retreating from the perpendicular,—a form ordinarily associated in our minds with the remotest antiquity. Still more of Egyptian character is seen in the massive horizontal cornices, which, however, depart from that type in receding, instead of projecting from the plane of the façade. These cornices, in many instances, are carried round the sides of the monument, and even where this is not the case, each tomb is quite isolated from its neighbours; a broad upright groove, or a flight of steps cut in the rock, and leading to the plain above, marking the separation. In the centre of each façade is a rod-moulding, describing the outline of a door, in some instances having panels recessed one within another. This is not the entrance, but merely the frontispiece to the tomb; and the title is generally engraved on the lowest and most prominent fascia, or in some cases on the flat surface of the façade just above the moulded door. The letters are seldom 6 in. in height, though from the depth of their intaglio, they can be read in the sunshine from a considerable distance."

The real entrance to the sepulchre is through a kind of cave, or ante-chamber, which is entered under the façade just described, and has a doorway sometimes similarly recessed and sloped at the further side, giving access to a passage opening into the tomb. In regard to the evidence as to architectural style afforded by the façades above described, it is not safe to regard rock-cut details always as representing the built architecture of the people who made them, for the differences of the circumstances of execution may lead to a great deal of modification in proportion and detail; but the style of these façades, coupled with the remains of the Perugian gateway before mentioned, leaves little doubt that the Etruscan architecture, like that of the Egyptians, was characterised especially by the use of sloping surfaces, or, as we should say, battering the walls; and considering the remoteness of the localities in those days, we may take this as an indication that this system of building was not so peculiarly a mark of Egyptian style as has been long supposed: that it was once a widely-diffused and generally-adopted method of building, which has been specially connected with the Egyptians because they were the most powerful nation which practised it, and have left its records in grander and more durable monuments than are to be found in any other land.

But the interest of this book, as we have already inferred, would be comparatively slight if it dealt only with the remains, few and scattered, of Etruscan architecture. The interest of the subject lies mainly in the paintings which adorn the interiors of the numerous sepulchres. These are of various date and character, but in all of them there seems to be the intention, so far as the talents of the artist enable him to do so, to represent the actual life of either the departed persons or their families and survivors; most probably the latter. The first specimen of which an illustration is given, from the tombs of Veii, is probably one of the very earliest in existence. The paintings are as remarkable for their colouring as for their form. A horse with abnormally long legs and thin body carries on his back a naked boy, behind whom, on the horse's hind quarters, sits some small domestic animal; and the horse is led by a groom, also naked, the bodies of both the human figures being of a deep red hue; but the horse is the most extraordinary parti-coloured animal: "his neck and forehead are red, with yellow spots; his head black, mane and tail yellow, hind quarters and near-leg black, near fore-leg corresponding with his body, but off-legs yellow, spotted with red." In short, this and other paintings in the same apartment represent completely what is sometimes called the childish age of a nation. They are exactly such as a child with a colour-box, and with some little power of observing and imitating objects in an imperfect manner, might be expected to produce. The whole scene is so removed from any experience or any meaning which we can understand, that its interest is more as a curiosity than from any archæological knowledge which can be gleaned from it. But it is otherwise with many of the tomb-paintings, some of which are illustrated in other parts of the book. A good many of these,—though nearly all in a stiff archaic style, and exhibiting confused notions in regard to profile and front views of the figures,—have no little beauty of a grave and severe kind, and are clear and comprehensible enough in the story they tell. They represent mostly scenes of festivity, banquets and dances, occasionally religious ceremonies; sometimes scenes in the other world, where Pluto and Proserpine, and other characters familiar to us in mythology, are distinctly recognisable; sometimes allegorical representations of the departure of the soul of the deceased, and the grief of their survivor, and their efforts to detain it from its enforced journey. One peculiarity of colouring seems to run through all these paintings of all dates; the sexes are always distinguished by a difference of colour, the bodies or faces of the men artificially coloured red or reddish-brown, those of the women left uncoloured of the natural tint of the surface on which the drawing is made. It is not difficult, even in casually turning over the illustrations from various localities, to perceive in a general way the comparative difference of date, the distinction between the early and the later art, the pure Etruscan work and the still later work in which the original spirit of Etruscan art had died out, and the drawings show an obvious adaptation of the more modern manner of the Greeks. Some of these Græco-Etruscan designs, as we may call them, are of rare beauty, such as the one which is given as the frontispiece to Mr. Dennis's first volume, which, by the way, is not a wall-painting, but the back of a metal mirror. Tais represents a group of Bacchus, Semele, and Apollo, the latter standing holding a branch of laurel; Bacchus is represented as a beautiful youth throwing back his head and arms, which are clasped round the neck of the taller Semele, who stands behind and bends over her face to his: there is a beautiful and touching *abandon* in the manner of these two figures. At the same time, this, charming as it is in spirit and in some respects in design, does not so much interest one as do the more purely Etruscan

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* The Cities and Cemeteries of Etruria. By George Dennis. Revised edition, recording the most recent discoveries. John Murray. 1878.

designs; it is only like Greek art with a certain degree of imperfection of execution in it. We look with more interest at such groups as those illustrated on i. 261, from some painted tiles found at Cervetri. These seem to represent part of a sacrificial act or procession, and show figures absolutely unlike those represented in the art of any other nation. The drawing is stiff, and in profile only, but very passable; the men represented with black hair and mostly black beards, projecting more or less in a point beyond their chins; they wear what may be best described as a short tight-fitting shirt, in all cases apparently with a thigh-piece sewn on, making a seam just above the thigh; the legs are bare, the feet encased in very picturesque buskins with stripes or bands at the ankle, and apparently buttoned with a large button half-way between ankle and knee. The female figures are fully draped from head to foot "in red, white, or yellow *chitones*, and where the material represented is of very light texture, this character is expressed by black, wavy lines." Into one of the tile designs illustrated the supernatural element enters, as there is a winged and beardless personage; but in the others it seems obvious that there is an intention of complete and simple realism, and we cannot have a doubt that in looking at them we see, as nearly as the artist could represent it, the actual physiognomy, figure, and dress, of these long-ago people, of whose history and doings we have now only the faintest and most vague ideas, but the pattern and detail of whose daily costume are thus preserved to us after a lapse of more than 2,000 years. These are staid and sober figures, seriously engaged; but we have far more lively and piquant representatives of the life of the period. In a painting, probably of about the same period (i., p. 358), we have a complete after-dinner family scene so at least we should interpret it: this is from what is called the "tomb of the painted vases," at Corneto, and we see the master of the house, a large dignified-looking man naked to the waist, reclined on his dinner-couch with his wife opposite to him, and holding with one hand a mighty bowl, in which he is about to pledge the lady, while with a look of placid and contented affection he chucks her under the chin with the other hand. A slave boy brings a couple of ladles almost exactly resembling in shape the small ladles sometimes now used for "toddy"; two of the young people, brother and sister, fondle each other in a corner; the dogs lie under the table; it is a complete scene of domestic felicity of an ancient and simple, but in its way of a perfectly civilised type. The only decided contrast with modern civilisation is that the youths are naked, the master of the house nearly so; but the ladies, younger and elder, are entirely and elaborately clothed, exhibiting the same contrast between the ideas of decorum in regard to the clothing of the two sexes which we find in Greek sculpture of the best period. There is a soberness about the whole scene which indicates the entire respectability of the place and personages; but there are in tomb-paintings of the same kind many festive or banquet scenes of a much more lively and decidedly "fast" character, as described by the author, who fortunately, or unfortunately (according to the reader's tastes or morality), does not give illustrations of these scenes of looser revelry and companionship so many ages ago. We have, however, pretty numerous illustrations of figures from paintings of a later date (in the second of the three manners into which Mr. Dennis considers the paintings may be divided), in which the revelry and voluptuous character of the entertainments seems to have assumed a more recognised professional form, when the Etruscans had arrived at that refinement in civilisation when people, in the Chesterfield phrase, "pay fiddlers to fiddle for them,"—when professional dancers in transparent robes form an important portion of the company. A few of these figures have become well known in book illustrations for some time past; and on the whole they are, as the author hints, no more open to the objection of a Lord Chamberlain than our own ballet-dancers, and certainly their costume is infinitely more becoming. The head of one of these dancers (*saltatrices*), from the "Grotta del citaredo," is given on a large scale (p. 379), and is in a fine style of mural decorative painting, the only blemish being the representation of the full eye in a profile head, so common in the early art of all nations; and the character of the head is as pure and calm as that of a Mediæval saint. This was not from inability to represent more passionate expression, as is proved by the romantic head of the *Citharœdus*, or minstrel, from whom the grotto takes its name, who, with parted lips and extended neck, is putting his whole soul into his song, the wild effect of the head being intensified by the long parted locks of hair streaming over neck and shoulders. Some of the single figures of dancers are remarkable for the energy and *abandon* of their whole pose and action. The griefs, too, of these old-world folk, as well as their pleasures, are left on record with the same simple directness of representation. A frequently portrayed incident is the removal of a member of a family by death, generally metaphorically indicated, with a curious mingling of pathos and childishness, by the departure of the lost one on a horse, which is the appointed conveyance to the other world, and whose progress the sorrowing relatives vainly endeavour to restrain. In one, the little sister of a youth, who is already mounted for the last journey, strives to detain the horse's steps; in another, a man has mounted, and a group of women rush out frantically to stop him; "in some the parting takes place at a column, the bourn that cannot be repassed, the living on this side, the dead on that; or at a doorway, one within, the other without, giving the last squeeze of the hand ere the door closes upon one for ever": touches of nature that make us kin to these old Etruscans, as "men of like passions with ourselves."

Among the specimens of ornamental art applied to utensils, &c., are some which suggest a good deal either artistically or historically: for instance, the fact that in the "Grotta d'Iside" were found not only objects of native art anterior to all Helenic influence, "but articles purely and unequivocally Egyptian, attesting the very early intercourse between Etruria and Egypt . . . From the character of the contents of this tomb it received the name of 'Tomb of Isis,' but it was really the sepulchre of the Etruscan ladies of rank, whose effigies are still in existence, though nearly three thousand years may have elapsed since their decease." A singularly pretty fancy is exhibited in the "fire-rake" illustrated p. 481 (vol. ii.), and now in the Museo Gregoriano at Rome; this terminates in a hand, bent at the wrist so as to extend at right angles to the stick or handle. We find, however, plenty of evidence of what meets us everywhere in ancient art, that form of bad taste so constantly denounced as a special sin of modern art,—the formation of utensils in the form of animals: a flagrant and absurd example is that of a vase, or jug, shaped like a fish, but with the face of a woman where the fish's snout should be. We might find in the "tomb of the reliefs" at Cervetri notable examples of a style of decoration of which we lately treated, in which artificial objects are used as decoration: the square pilasters here being carved all over with a medley of cooking and fighting implements. One anecdote in connexion with Etruscan utensils is amusing. It seems that in the Etruscan Museum at Florence is an article in bronze, which years ago used to be inquired after by English (the author surely means Irish) travellers, as the "compass" by which the Etruscans steered to Carnsore Point, in the county of Wexford. The first persons who asked for this curiosity from Professor Migliarini, then director of antiquities in Tuscany, were sent into the bronze-room, in charge of an attendant, who was gravely instructed by the Professor to show the visitors the Etruscan compass. The man, who was much surprised at the order, could not pitch on the right article, till at last the Professor himself produced what was wanted, an article having the appearance of a lamp, with an inscription round it. The attendant, astounded, said he had always taken that for a lamp,—an eight-branched lamp. "Know, then," said Migliarini, with great gravity, "that this has been discovered by a learned Irishman to be an Etrusco-Phœnician nautical compass, used by the Etruscans to steer by on their voyages to Ireland, which was a colony of theirs, and this inscription, written in pure Etruscan or Irish, which is the same thing, certifies the fact: 'in the night, on a voyage out or home, in sailing happily always in clear weather is known the course of going.'" As the Etruscan language has never yet been unriddled, beyond a word or two, the translation was, of course, *ben trovato* for the occasion.

We have indicated merely some of the points of interest in a very full and valuable book, which every one interested in archæology and art should read, for the information it gives upon so interesting and almost unique a chapter in human history, social and artistic.

REMAINS OF BUILDINGS IN MIDIAN.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary fortnightly meeting of this Institute, on Monday evening, the 16th, Captain Burton, the distinguished traveller and explorer, read a long and interesting paper bearing this title. We give the greater portion of it.

Before the year of grace, 1877, "Midian" was a word and little more. Some mappers extended its vague and mysterious limits deep into the peninsula miscalled Sinai. Others stretched them northward to, and even beyond, the parallel of the Dead Sea; while the "Coryphæus of the Encyclopædists" reduced Midian to a "Canton of Idumæa," and so forth. On the other hand the Bedawin, who now hold the soil, speak with no uncertain sound. Arab tradition, it may be observed, allows many things to slip from memory: for instance, it has clean forgotten "Ophir," of golden fame. But when it does retain a name, or the semblance of a name, as *El-Kaṭṭán* for "Havilah," and *Es-Sabá* for "Sheba," we may rely upon its truth. And Midian is a case in point. *Arz Madyan*,—the land of Midian,—in the language of its actual tenants, begins northwards with the Fort of El-'Akabah (in latitude 29° 28′); and, subtending the seaboard, extends south to the Fort of El-Muwaylah (N. latitude 27° 40′). It has, therefore, a latitudinal length of 108 direct geographical miles. For political, geographical, and other reasons, I have ventured to call it "Madyan Proper," or "North Midian," in opposition to "South Midian." The latter section would stretch from the Fort of El-Muwaylah as far as the Wady Hamz in N. latitude 25° 55′, or 105 miles. Thus the total extent of the Midianite seaboard is 213 direct geographical miles, a line which the extensive sinuosities of the coast may prolong to nearly 300. Midian, both north and south, forms the easternmost province of Egypt. Like H.H.'s "Mameluke' predecessors, the Khedive, Ismail I. of Egypt, a prince to whose liberality and perspicacious views both my expeditions owe their existence, still garrisons the seaboard forts. Even considered mineralogically, the land falls into a two-fold division. In northern or Upper Midian, the ancient Egyptians mined for copper, while the Nabathæans and their successors worked Southern or Lower Midian chiefly for gold.

Topographically speaking, the whole tract is a prolongation of the great Hauranic Valley (Auranitis); of the land of Moab; of the Nejeb, or south country; of Idumæa, which the Hebrews called Edom; and of the classical Nabathæa, whose western capital was Petra, the Rock. Like those regions lying east and south-east of the Jordan Valley and the Dead Sea, regions once so populous and powerful, and now very types of the abomination of desolation, Midian is, and ever has been, inhabited by a mixed and kindred race of citizens and Bedawin. The former would naturally affect the seaboard; hence, even in the days of Moses (B.C. 1452) we find that the maritime country had its "cities and goodly castles" (Num. xxxi.). The wild men, who wandered about the interior, are still what they always were, Scenitæ, tent-dwellers. Thus the learned Mr. Fergusson opines (p. 25, "The Temple of the Jews," &c., London, Murray, 1878) that the Tabernacle may have had its origin from some sacred tent of the Arabs of Midian." Moses, who was connected by marriage with the ruler of the land, would naturally have borrowed, from his country of refuge, the idea of the Pavilion, which developed itself into the Temple of Solomon.

The Land of Midian must also have been influenced by the great line of transit and traffic which ran through its length from south to north. Strabo (xvi. c. 4, § 21) shows that, about the beginning of the Christian era, this main road, subtending the coast, was one of the earliest of "Overlands." The merchandise of India and of Southern Arabia was landed at the southernmost Nabathæan port, Leuke Kome (*Λευκὴ Κώμη*), the "White Village," whose name translated survives in *El-Haurá*. The fine port lies in N. lat. 25° 6′, about the same parallel as El-Medinah, and in E. long. 37° 13′ 30″ (Gr.). Here, before the Nile route to Alexandria was opened, merchants disembarked their goods, preferring the long and toilsome

camel journey to the dangerous ship voyage; northwards, and reaching Petra, the imports were passed on to Phœnicia and Egypt. The remains of the eighteen cities and towns discovered by the two Khedival expeditions, all lie upon or near this ancient "Overland," and the country appears to have been equally rich in commerce, in agriculture, and in minerals.

Considering her position, then, ancient Midian would adopt the style of building chosen by the races that lived, under similar conditions, on her northern frontier. And we have an excellent point of comparison in the Nejeb (Negeb), called, in the days of Abraham (Gen. xx. 1), the "South Country," because the Holy Land lay to the north of it. This tract has been opened to us by the late Rev. E. Wilton ("The Negeb, or the South Country," London, 1863), and pictorially by the journey of Messrs. Tyrwhitt-Drake and Palmer. Part ii. of "The Desert of the Exodus" (E. H. Palmer, M.A., London: Bell & Daldy, 1871), contains a long and trustworthy description of this interesting region. The illustrations, *mutato nomine*, might serve for Midian, especially those of El-'Aujeh, of Kharábat Lussán (p. 346), of the "Muweileh" Cairns (p. 354), and of the ancient fort of "El-Meshrifeh" (p. 371). Midian, it is true, can show few remains of building to be compared with the ruined houses and the town gateway of Sebaita-Zephath (pp. 360, 375), or the "interior of church at El'-Aujeh" (p. 369), while her catacombs are far from equalling those of the capital, Petra. On the other hand, her shafts and galleries are superior in science to the stone quarry at El-'Aujeh (p. 366); and her classical shrine or temple at the southernmost limit has no rival known to us in the "South Country." The destruction of buildings in both regions is probably synchronous. "The history of the Christian Church of the Negeb," says Professor Palmer (p. 377), "is now quite lost, but it is more than probable that it perished either under the invasion of the Persian Khosroes, or that of Caliph Omar." The same effects may have extended to Midian under the conquering Sassanian king, Khusrau Anúshírawán (A.D. 531–579), or when 'Omar and his successors sent forth the various expeditions which began in A.D. 650. But here it would appear there was a second period of destruction; and that evidently dates from the early sixteenth century, when Sultan Selim laid down his maritime road for the pilgrim caravans. As regards the precious metals, it is my opinion that they have been worked, more or less, up to the present day.

And yet another preliminary, the building material supplied by the maritime country and the subtending mountains. In this point the Midianite architects were peculiarly fortunate. A vast formation of the Secondary period, which ran along the seaboard and even extended into the "Sinaitic Peninsula," supplied them with an abundance of limestone. For their temples, palaces, and houses, they had the finest *Rughám* (alabaster), plain and variegated; while the gypsum served as cement. I have deposited in the British Museum a noble specimen of *Rukham* (white saccharine marble) from the Jebel-El-Lauz or Almond Mountain. Equally abundant are the grits; and the new red sandstone of the Hismá or inner region is self-faced, built in places like natural brickwork. The Ghâts and submaritime chains consist of porphyritic traps, red and green; and of close hard granites containing little mica; the degradation of the latter yields a felspathic or kaolin clay which makes admirable fire-bricks. The granites are almost everywhere cut by veins of quartz, showing every variety of colour, and trending in all directions. This rock, which is richest in ore at its junction with the containing primaries, is the characteristic of the country. Here it whitens the valleys and lowlands that look as if snow had freshly fallen; there it rises in rounded cones which number hundreds of feet in height. Details concerning building material will occur in the course of description. Suffice it now to say that it is found in three several states; either artificially cut, or self-faced, or in water-rolled blocks and boulders.

SECTION I.—*Ruins in North Midian.*

The forts and settlement of El-'Akabah, at the head of the dangerous gulf similarly named, have been described by a host of travellers. I do not remember, however, that any one has noticed the traces of the ancient Elath or Eloth, which lies at the very head of the bay, and which evidently extended all round the chord from the north-east to north-west. This part is called El Dár (the house), and it was the halting-place of the pilgrim caravans before New 'Akabah was founded; the principal remains are large blocks of cut stone covered by seawater, which is here of the clearest. Inland and to the north rise the mounds and tumuli, the only remains of ancient Elath, once the port of Petra, which is distant only two dromedary marches. A line of larger heaps farther north shows where, according to the people, ran the city wall; finding it thickly strewed with scoria, old and new, I decided that this was the *Siyághah* (mint or smiths' quarter). Between it and the sea the surface is scattered with glass, shards, and slag; the metal treated was probably native copper from the Sinaitic Jebre and Wady Raddádi. Of this chrysocolla, a specimen has been deposited in the British Museum.

About seven miles distant from El-'Akabah, and close to the western or Sinaitic shore, lies the "Pharaoh's Isle"; the natives know it as the *Tibil el Kala'h*, or fort-hill. The bit of rock is a saddle-back, with pommel and cantle well defined; the material is grey granite, quartz-veined, and dyked with decaying porphyritic trap; and the ground-plan is a long oval of about 320 by 152 mètres. Here we made careful plans, drawings, and photographs; there is, however, nothing novel in the castle, which was described by Rüppell in 1826, and by Wellstead in 1838. Suffice it to say, that we found several strata of building. The mass is evidently European, built during the days when the Christians and the Crusaders held El-'Akabah. Apparently it rests upon Roman ruins, and the latter, perhaps, upon Egyptian remains of far older date. I can assign no period to the rock-hewn cisterns. The upper part of the fortification is attributed by popular legend to the reign of Salàh el-Dín (Saladin), who, in A.D. 1167, cleared El-'Akabah of the infidel invader by carrying ships on camels' back from Cairo. Later generations of thieves, pirates, and fishermen made it their refuge and abode; and thus the uppermost masonry and embrasures are rude in the extreme.

Steaming southwards along the eastern side of the 'Akabah Gulf, we pass some unimportant ruins, the "Girl's Palace," the "Bedawi's Castle," and the remains of El-Hakl (popularly pronounced El-Hagul), the 'Αγκάλη (Ancale) of Ptolemy. A second islet off this shore is said to contain the "Palace of the Bedawi Woman"; and inland there are signs of a *Mashghal* or *atelier* where metal worked in a mountain known as Tayyib Ism—of the "good name." After finishing the northern two-thirds of the gulf we land at Makná, and enter upon a highly interesting section of Midian.

Makná, also called by the people "Madyan," is evidently the *Μάκνα*, *Μαίνα*, or *Μαήνα*, which Ptolemy (vi. 7, sect. 27) places in N. lat. 28° 45', the true being 28° 23'. It is evidently the port of the Midianite capital, and the site of an important mining industry. But it will hardly bear description. Dr. Beke visited it in 1874; and the fine volume lately edited by his widow contains a plan of the so-called "Praying-place of Moses."

The road to the capital lies up this huge Fiumara, which is known to the Arabs as Wady Makná, or Wady Madyan. A march of 17¼ miles east, with some five degrees of northing, leads to its head, where a shallow wave of ground divides it from the Wady 'Afál, alias the Wady El-Bada'. The latter Fiumara shows both banks lined with courses of rough stone, mostly rounded and water-rolled boulders, evidently the ruins of the conduits which served to feed the rich growth of the lower valley.

This place is evidently the capital of Madyan Proper, the *Μαδιάμα* which Ptolemy (vi. 7, sec. 27), places amongst his Mesopean towns in N. lat. 28° 15' with little error (true 20° 28'). The Bedawin, true to their tradition, call it *Maghair Shu'ayb*, "Caves" (or catacombs) "of the Prophet Jethro," who used to winter at this place, and wander seawards in the date-season.

The ruins, of large extent for North Midian, and equal to those of all the towns we have seen put together, begin with a palm-orchard on the left bank. The Jebel el-Safrá, a mass of gypsum, shows the foundations of what may have been the *arx*. It is a double quoin, the taller to the south, the lower to the north, and both bluff in the latter direction. The dip is about 45 degrees; the upper parts of the dorsa are scatters of white on brown-yellow stone; and below it, where the surface has given way, appear mauve-coloured strata, as if stained by manganese. Viewed in profile from the west, the site of *El-Muttali'*, as the Arabs call the "Hauteville," becomes a tall, uptilted wedge, continued northwards by the smaller feature, and backed by a long sky-line, a high ridge of plaster, pale coloured, with glittering points.

This isolated "Yellow Hill," a "horse" in Icelandic parlance, rising about 200 ft. above the valley-sole, is separated by a deep, narrow gorge from the adjacent eastern block. The slopes, now water-torn and jagged, may formerly have declined in regular lines; and evidently all were built over to the crest, like those of Syrian Safet. The foundations of walls and rock-cut steps are still found even on the far side of the eastern gut. The knife-back is covered with the foundations of what appears to have been a fortified monastery or palace; a straight street or passage running north and south, with 5° west (mag.). It serves as base for walls, one mètre and a half thick, opening upon it like rooms: of these we counted twenty on either side. At the northern end of the ridge, which, like the southern, has been weathered to a mere spur, is a work composed of two semicircles, fronting to the north and east. A bastion of well-built wall in three straight lines overhangs the perpendicular face of the eastern gorge: in two places there are signs of a similar defence to the south, but time and weather have eaten most of it away. The ground sounds hollow, and the feet sink in the crumbling heap; evidently the whole building was of *Rughám* (gypsum); and in the process of decay it has become white as blocks of ice, here and there powdered with snow.

On the narrow, flat ledge, between the western base af the Safrá and the eastern side of the Badu' Valley, lie masses of ruin, now mere rubbish, bits of wall built with cut stone, and water-conduits of fine mortar, containing, like that of the Pyramids, powdered brick, and sometimes pebbles.

Walking down the left bank of the great Wady, and between these second gorges that drain the "Yellow Hill," we came upon a dwarf mound of dark earth and rubbish. This is the *Siyághah* (mint and smith's quarter), a place always to be sought, as Ba'lbak and Palmyra taught me. Remains of tall furnaces were scattered about, and here, upon the surface and below it, but not more than 1 ft. deep, were found the coins of Midian for the first time *in situ*.

Beyond the Siyághah, the left bank is gashed by the ravines draining the south-eastern prolongation of the Yellow Hill. Water cuts through this rotten formation of rubbish like a knife into cheese, forming deep chasms, here narrow, there broad, with wall built up, as it were, of fragments, and ready to be levelled by the first rains. The lines of street and the outlines of tenements can be dimly traced; while revetments of rounded boulders show artificial watercourses and defences against the now dried-up stream. The breadth of this the eastern settlement varies with the extent of the ledge between the gypsum hills and the sandy Wady. The length may be a kilomètre. The best preserved traces of crowded building end with the south-eastern spur of the Jebel-el-Safrá. Beyond them is a huge cemetery. The ancient graves are pits in the ground, a few still uncovered, the many yawning wide, and all of them ignoring orientation.

At the south-eastern end of the outliers projected by the Jebel el-Safrá, where a gentle slope of red earth falls towards the valley bank, is the only group of buildings of which any part is still standing. The site may be old, but the present ruins are distinctly Mediæval, dating probably from the days of the Egyptian "Mameluke Sultans." Beginning from below and to the south-west is a *Haus*, or cistern, measuring twenty-six by nineteen and a half mètres, with a depth of 9 ft. or 10 ft. The material is cut sandstone, cemented outside with mortar containing the normal brick-crumbs and pebbles, and inside mixed with mud. At the north-eastern and south-western corners are retaining buttresses in two steps, exactly like those in the island fort of El-Wijh: at the two other angles are flights of stairs; and the sole is a sheet of dried silt. To the south-east lies the remnant of a small circular furnace, and on the north-north-east a broken wall shows where stood the *Bayt el-Saghir*, or smaller reservoir. A narrow conduit of cut stone leads, with elaborate zigzags, towards two *Sil'ah* ("draw-wells") hollowed in the gypsum. The southern

an oval of five mètres ten centimètres, is much dilapidated; and its crumbling throat is spanned by a worn-out arch of the surrounding Secondary rock. Close to the north-west is the other, riveted with cut stone, and measuring six mètres in diameter. It is an elaborate affair; with a pointed arch and a regular keystone; circular *Sadád*, or "walls for supporting the hauling-apparatus," and minor reservoirs numbering three. On a detached hillock, a few paces to the north, stands the fort which defended the establishment. The short walls of the parallelogram measure fifteen mètres forty centimètres; and the long, eighteen mètres sixty centimètres: the gate, choked by ruins, leads to a small hall, with a masked entrance opening to the right. There is a narrow room under the stone steps to the west, and two others occupy the eastern side. This fort is to be restored for the better protection of pilgrims; and shortly after our departure an Egyptian engineer, Sulayman Effendi, came from Suez to inspect and report upon it.

On the opposite or right bank of the broad and sandy bed, the traces of ancient buildings extend to a far greater distance,—at least, to two kilomètres. They have been a continuous line of forts, cisterns, and tenements, still marked out by the bases of long thick walls; the material is mostly gypsum, leprous white as the skin of Gehazi. But here, and indeed generally throughout Midian, the furious torrents, uncontrolled during long ages by the hand of man, have swept large gaps in the masses of homestead and public buildings. Again, the ruins of this section are distributable into two kinds, the City of the Living and the City of the Dead. . . . . .

Section II.—*Ruins in South Midian.*

The mining of the north country, to judge from the ruins, was confined to copper smelting and to spalling the quartz which was treated in the several establishments, notably at 'Aynúwah. In the section which we are about to visit, the remains, as will be seen, were much more considerable, and gold appears to have been the metal principally worked.

From El-Muwaylah a run of twenty direct miles southwards places us at the little port of Zibá, in north latitude 27° 20'. I have described this place in "The Gold Mines of Midian" (chap. xi.); in "The Land of Midian" (revisited) I shall give my reasons for holding it to be the Φοινίκων κώμη (Phœnicon vilus) of Ptolemy. The old town stood immediately behind, or inland of, the modern settlement, and its stones, buried for ages under the sand, are now dug up to build its successor. To the north-east of it lies the Jebel El-Ghál, where the best turquoises are found; and to the east is a mining station called "Umm Âmil." It had been grandiosely described to me during my first visit, and I was somewhat disappointed to see a few worthless heaps of water-rolled stones. Our caravan entitled it "El-Lomán,"—the bagnio, the prison for galley-slaves.

A three days' ride from Zibá to the east-south-east places the traveller at Shuwák (north latitude 27° 15'). It can be no other than the Σόακα of Ptolemy, a large and important station on the great Nabathæan "Overland." The site is a long island in the broad and sandy Wady Shuwák; at the ruins the bend of the valley is from north-east to south-west, and the altitude is about 1,700 ft.

We will begin at the Wady-head, and note the ruins as we stroll down. This section, Shuwák proper, is nearly a mile and a half long, and could hardly have lodged less than twenty thousand souls. But that extent by no means represents the whole; our next march will prolong it along the water-course for a total of at least four miles. The material is various,—boulders of granite and syenite; squares of trap and porphyry; the red sandstones of the Hismá; the basalts of the Harrah; and the rock found *in situ*, a brown and crumbling grit, modern, and still in process of agglutination. The heaps and piles which denote buildings are divided by mounds and tumuli of loose friable soil, white with salt, miniatures of Babylon, Nineveh, and Troy. On the right side we find a large fort, half sliced away by the torrents, but still showing the concrete flooring of a tower. About the centre of the length are the remnants of a round "Burj"; blocks of buildings, all levelled to the foundations, lie to the north-west, and on the west appear signs of a square. Perhaps the most interesting discovery is that of catacombs, proving a civilisation analogous to that of Magháir Shu'ayb, but ruder, because more distant from the centre. The "caves" are hollowed in a long reef of loose *breccia*, which, fronting eastward, forms the right bank of the smaller branch. They are now almost obliterated by being turned into sheep-folds; the roofs have fallen in, and only one preserves the traces of two loculi.

The arrangements touching fuel and water in this great metal-working establishment are on a large scale. The biggest of the *afrán* ("furnaces") lies to the north-west, near the right bank of the valley: all are of the ordinary type, originally some 5 ft. or 6 ft. high, to judge from the bases. They are built of fire-brick, and of the Hismá stone, which faces itself into a natural *later*. We dug deep into several of them; but so careful had been the workmen, or perhaps those who afterwards ransacked these places, that not the smallest tear of metal remained: we found only ashes, pottery, and scoriæ, as usual black and green, the latter worked sub-aërially; many of them had projections like stalactites.

Water had been stored with prodigious labour. We traced the lines of half a dozen aqueducts, mostly channelled with rough cement, overlying a fine concrete; some of them had stones grooved to divert the stream by lashers. The *fiskíyyah*, or "tanks," were of all sizes; and the wells, which appeared to be mediæval, were lined with stones cut in segments of circles. The greatest feat is an aqueduct which, sauded over in the upper part, subtends the left side of the valley. It is carefully but rudely built, and where it crosses a gully, the arch is of the Egyptian or Etruscan type, which Mr. Fergusson calls the "horizontal"; that is, formed of projecting stone tiers, without a sign of the key. This *magnum opus* must date from the days when the southern part of the Wady was nearly what it is now. . . . . .

Section III.—*The Southernmost Ruins.*

After riding nine miles on our return towards the coast, we came unexpectedly upon a large and curious ruin, backed by the broad Wady Dámah, gleaming white in the sun. The first feature noticed was a pair of parallel walls, or, rather, their foundations, 35 ft. apart, and nearly a kilomètre in length. It looked like a vast *hangar*. To the left lie three tracings of squares. The central is a work of earth and stone, not unlike a rude battery, and a few paces further north a similar fort has a cistern attached to its western curtain. Heaps of rounded boulders and the crumbling white-edged mounds, which in these regions always denote old habitations, run down the right bank of the Wady-el-Khandakí, to its junction with the Wady Damáh. For want of a better name I called this old settlement *Kharábát* (the "ruins of") *el-Khandakí*, and greatly regretted that we had not time enough to march down the whole line of the Dámah.

From Zibá we again steam southwards to El-Wijh El-Buhr ("face of the sea"), vulgarly called "Wedge," which lies in N. lat. 26° 14', eighty-six direct miles, or 107 knots of log, from El-Muwaylah. The name may be known to some of you; for here, till the last two years, was the main quarantine-station of the pilgrims returning from Mecca. It was removed to Tor, at the instance, I am told, of the English Government, and the sooner it is restored to El-Wijh the better. It is my conviction that, under present circumstances, "Tor" is a standing danger, not only to Egypt, but to universal Europe.

We set out from El-Wijh on March 29, 1878, and after covering six miles we reached the inland fort. To the north-east of this work we picked up old and well-treated scoriæ, suggesting a more ancient settlement. Perhaps it was the *locale* preferred by the proprietors of the slaves who worked the inner mines, hidden from view and protected from the sea breeze by the hills. Upon a reef of hard greenstone-porphyry higher up the bed, we found Bedawi *Wusúm*, or "tribal marks," and Moslem scrapings comparatively modern. About half an hour's walk leads to another "written stone." A tall, fissured rock, of the hardest porphyritic greenstone, high raised from the valley-sole, facing north-west, and reducible to two main blocks, is scattered over with these "inscriptions," that spread in all directions. Most of them are Arab *Wusúm*; others are rude drawings of men and beasts, amongst which are conspicuous the artless camel and the serpent; and there is a *duello* between two funny warriors armed with sword and shield. These efforts of art resemble, not a little, the "Totem" attempts of the "Red Indians" in North and South America. There are, however, two inscriptions evidently alphabetic, and probably Nabathæan, which are offered to the specialists in epigraphy. M. Lacaze and I copied the most striking features in our *carnets*; he taking the right or southern side, and leaving the other block to me. But the results did not satisfy us; and, on April 10th, I sent him with M. Philipin to make photographs: the latter, again, are hardly as satisfactory as they might be, because the inscriptions have not been considered the central points of interest.

We now approach the first of the three great mining centres, and I shall describe it with some detail. Umm el-Karáyát, the "Mother of the Villages," is denoted by an airy heap of white quartz, some 200 ft. high, which, capped and strewed with snowy boulders, seems to float above its valley. Instead of being a regular round-headed cone, as is usual with such formations, the summit is distinctly crateriform.

After nighting at some uninteresting ruins which we named, after their Wady, *Mashghal Aba 'l-Gezaz*, on April 3, we reached the great station on the Nabathæan "Overland" between Leukè Kóme and Petra. It is the commercial and industrial, the agricultural and mineral centre, which the Greeks called Βαδαΐς; the Romans, Badanatha (Pliny, vi. 32); and the Mediæval Arab geographers, Badá Ya'kúb. Now it is simply El-Badá: the name of the "Prophet" Jacob, who is supposed to have visited it from Egypt or Syria, being clean forgotten. The better to understand the shape of the ruins we will prospect them from the *Shahíb el-Búm*, the "ash-coloured hill of the owl," one of the many rocks that stud the broad and fertile plain. It is an out-crop of grey granite, with large elements, pigeon-holed by weather, and veined by a variety of dykes. Here we find greenstone breccia'd with the blackest hornblende; there huge *filons* of hard red, heat-altered clays, faced with iron, whilst the fracture is white as trachyte; and there *filets* of quartz, traversing large curtains and sheets of light-coloured argils. This was evidently the main quarry: the sides still show signs of made zigzags; and the red blocks and boulders, all round the hill, bear the prayers and pious ejaculations of the Faithful. The characters range between square Kufic, hardly antedating four centuries, and the cursive form of our day. Some are merely scraped; others are deeply and laborously cut in the hard material, a work more appropriate for the miner than for the passing pilgrim. From the ruined look-out on the summit the shape of the city shows a highly irregular triangle of nine facets, forming an apex at the east end of our "Owl's Hill": the rises and falls of the ground have evidently determined the outline. A palm-orchard, whose total circumference is 536 mètres, occupies a small portion of its south-eastern corner; and our camping-place, farther east, was evidently included in the *enceinte*. The emplacement, extending along the eastern bank of the main watercourse, is marked by a number of mounds scattered over with broken glass and pottery of all kinds; no coins were found, but rude bits of metal, all verdigris, were picked up north of the palm-orchard. Descending the Shahíb el-Búm, and passing a smaller black and white block appended to its south-south-western side, we now cross to the left bank of the main drain. Here lies the broken tank, the normal construction of El-Islam's flourishing days. It is a square of thirty-two mètres, whose faces and angles do not front the cardinal points. At each corner a flight of steps has been; two have almost disappeared, and the others are very shaky. The floor, originally stone-paved, is now a sheet of hard silt, growing trees and bush: dense Tanzib-clump (*Sodada decidua*), with edible red berries, sheltering a couple of birds' nests, suggested a comparison between the present and the past. At the east end is the *Makhzan el-Máyah* ("smaller reservoir"), an oblong of 7·80 by 6·60 mètres: the wagon-tilt roof has disappeared, and the fissures show brick within the ashlar. Along the eastern side are huge standing slabs of the coarse new sandstone with which the tank is lined: these may be remains of a conduit. Around the cistern lies a ruined graveyard, whose yawning graves supplied a couple of skulls. A broken line of masonry, probably an aqueduct, runs south-south-east (143° mag.) towards the palms: after 200 mètres all traces of it are lost.

On April 8 we reached our southern terminus,

the Wady el-Hamz; it is a feature more interesting to the Royal Geographical Society than to the Royal Institute of Architects. I will simply refer the curious to my coming book on "The Land of Midian," and proceed directly to notice its remarkable ruin. The latter is known as the *Gasr* (=Kasr). *Gurayyim Sa'id*, "Sa'id the Brave," was an African slave, belonging to an Arab Shaykh, whose name is forgotten. One day it so happened that a *razzia* came to plunder his lord, when the black, whose strength and stature were equal to his courage and, let me add, his appetite, did more than his duty. Thus he obtained as a reward the promise of a bride, his master's daughter. But when the day of danger was past, and the slave applied for the fair guerdon, the Shaykh traitorously refused to keep his word. The Brave, finding a fit opportunity, naturally enough carried off the girl to the mountains; solemnly thrashed every pursuing party; and, having established a "reign of terror," came to the banks of the Hamz, and built the *Gasr* ("Palace") for himself and his wife. But his love for flesh-diet did not allow him to live happily ever after. As the land yielded little game, he took to sallying out every day and carrying off a camel, which in the evening he slew, and roasted, and ate, giving a small bit of it to his spouse. This extravagance ended by scandalising the whole country side, till at last the owner of the plundered herds, Diyáb ibn Ghánim, one of the notables celebrated in the romance called *Sirat Abú Zayd*, assembled his merry men, attacked the Gurayyim, and slew him. The site of the "Palace" is north latitude 25° 55′ 15″. It stands upon the very edge of its Wady's left bank, a cliffet some 25 ft. high, sloping inland with the usual dark metal disposed upon loose yellow sand. Thus it commands a glorious view of the tree-grown valley, or rather valleys, beneath it; and of the picturesque peaks of the Tihámat-Balawíyyah in the background. The distance from the sea is now a little over three miles; in ancient days it may have been much less.

The "Palace" is a Roman building of pure style; whether temple or *nymphæum*, we had no means of ascertaining. The material is the Rughám or alabaster supplied by the Secondary formation; and this, as we saw, readily crumbles to a white powder when burnt. The people, who in this matter may be trusted, declare that the quarries are still open at *Abú Makhárir*, under the hills embosoming *Ab'ál Marú*. We should have been less surprised had the ruin been built of marble, which might have been transported from Egypt; but this careful and classical treatment of the common country stone, only added to the marvel.

It must have been a bright and brilliant bit of colouring in its best days,—hence, possibly, the local tradition that the stone sweats oil. The whole building, from the pavement to the coping notched to receive the roof joists, is of alabaster, plain white, and streaked with ruddy, mauve, and dark bands, whose mottling gives the effect of marble. Perhaps in places the gypsum has been subjected to plutonic action; and we thought that the coloured was preferred to the clear for the bases of the columns. The exposed foundations of the eastern and western walls, where the torrent has washed away the northern *enceinte*, show that, after the fashion of ancient Egypt, sandstone slabs have been laid under-ground, the calcaire being reserved for the hypæthral part. The admirable hydraulic cement is here and there made to take the place of broken corners, and flaws have been remedied by carefully letting in small cubes of sound stone. There are also cramp holes for metal, which, of course, had been carried off by the Bedawin, and the rusty stains suggest iron.

The building is square-shaped, as we see from the western wall, and it evidently faced eastward with 25° (mag.) of southing. This orientation, probably borrowed from the Jews, was not thoroughly adopted by Christendom till the early fifth century, when it became a *mos*. The southern wall, whose basement is perfect, shows everywhere a thickness of 0·95 centimètre, and a total length of 8 mètres 30 centimètres. At 2 mètres 87 centimètres from the south-western corner is a slightly raised surface, measuring in length 2 mètres 15 centimètres. Mr. James Fergusson supposes that this projection, which directly fronts the eastern entrance, was the base of a niche intended for the image. On each side of the latter might have been a smaller colonnette, which would account for the capital carried off by us to Egypt. Thus, adding 2 mètres 87 centimètres for the northern end swept into the valley, we have a length of 7 mètres 89 centimètres; and the additional half thickness of the east wall would bring it to a total of 8 mètres 30 centimètres.

The shrine was not *in antis*, and the site hardly admits of a peristyle; besides which, excavations failed to find it. That it might have had a small external *atrium* is made probable by the peculiarity of the entrance. The two rounded pilasters, worked with the usual care inside, but left rough in other parts, because they could not be seen, were engaged in the *enceinte* wall, measuring here, as elsewhere, 0·95 centimètre in thickness. Nothing remained of them but their bases, whose lower diameters were 0·95 centimètre, and the upper 0·65; the drums found elsewhere also measured 0·65. The interval between the lowest rings was 1 mètre 63 centimètres; and this would give the measure of the doorway, here probably a parallelogram. Lying on the sand-slope to the north, a single capital showed signs of double brackets, although both have been broken off: the maximum diameter across the top was 0·60 centimètre, diminishing below to 0·50 and 0·44, whilst the height was 0·40. The encircling wall was probably supported by pilasters, measuring 0·62 centimètre below, 0·45 above, and 0·11 in height: they are not shown in the plan; and I leave experts to determine whether they supported the inside or the outside. Several stones, probably copings, are cut with three mortise-joints or joist-holes, each measuring 0·15 centimètre, at intervals of 0·14 to 0·15.

The tossed and tumbled interior of this *maison carrés* exactly resembles the ruins of the Synagogue of Tel Hum, and similar localities published by the Palestine Exploration Fund. The pavement-slabs, especially along the south-western side, appear in tolerable order and not much disturbed; whilst further east a long trench from north to south had been sunk by the treasure-seeker. The breadth of the free passage is 1 mètre 2 centimètres; and the disposal suggested an inner peristyle, forming an *impluvium*. Thus the cube could not have been a *heroön* or a tomb. Four bases of columns, with a number of drums, lie in the heap of ruins, and in the torrent-bed were six, of which we carried off four. They are much smaller than the pilasters of the entrance; the lower *tori* of the bases measure 0·60 centimètre in diameter, and 0·20 in height (to 0·90 and 0·25), while the drums are 0·45 instead of 0·65. It is an enormous apparatus to support what must have been a very light matter of a roof. The only specimen of a colonnette capital has an upper diameter of 0·26, a lower of 0·17, and the height of 0·16.

Although the Meccan Ka'bah is, as its name denotes, a "cube," this square alabaster box did not give the impression of being either Arab or Nabathæan. The work is far too curiously and conscientiously done; the bases and drums, as the sundries carried to Cairo prove, but rather as if turned by machinery than chiselled in the usual way. I could not but conjecture that it belongs to the days of such Roman invasions as that of Ælius Gallus. Strabo* tells us of his unfortunate friend and companion, that, on the return march, after destroying Negrân† (Pliny, vi. 32), he arrived at Egra or Hegra (El-Wijh), where he must have delayed some time before he could embark "as much of his army as could be saved," for the opposite African harbour Myus Hormus. It is within the limits of probability that this historical personage‡ might have built the Gasr, either for a shrine or for a *nymphæum*, a votive-offering to the Great Wady, which must have cheered his heart after so many days of "Desert country, with only a few watering-places." Perhaps an investigation of the ruins at Ras Kurkumah, and the remains of Madáin Salih may throw some light upon the mystery. In our travel this bit of classical temple was unique.

Mr. Fergusson, whose authority will not readily be disputed, calls the building a small shrine, and determines that it can hardly be a tomb, as it is hypæthral. The only similar building known to him is that of "Soueideh" (Suwaydah) in the Haurán (De Vogüé, "Syrie Centrale," plate IV.). The latter, which is Roman, and belonging to the days of Herod Augustus, has a peristyle here wanting; in other respects the resemblance is striking.

Captain Burton concluded his paper with an account of his discovery of the mine El-Marwah, the northernmost of the gold diggings known to the Mediæval Arabian geographers, and mentioned by all who have described this part of Arabia.

* Lib. xvi., c. iv., sec. 24. The MSS. differ in the name of the "village situated on the sea"; some call it Egra, others Negra, after the inland settlement, and the commentator Kramer remarks, "Mire corrupta est hæc ultima libri pars."

† North lat. 28°, which would correspond with that of the Ab'ál-Marú ruins.

‡ My friend Sprenger strongly protests against Ælius Gallus, begging me to abandon him, as the Romans must long have held the whole coast to El-Haurá, their chief settlement.

THE RESTORATION OF ANCIENT BUILDINGS.

At the meeting of the Notes and Queries Society, in Liverpool, to which we have already referred,* the Rev. S. Fletcher Williams read the following paper by Mr. William Morris, M.A.:—The public may broadly be divided into two classes as to the way in which they look on the relics of ancient art: that is, into those who care about them, and those who do not. With the latter class I do not propose to argue at present: they must be dealt with by the slow process of education; it is to the former class I now apeal, in order that something may be left wherewith to educate those whom want of cultivation, or the deadening influence of a degraded art that imitates older works without understanding them, has deprived of some part of the original faculties of man. As to those that care about the art that has been left us by our fathers, *i.e.*,—in short, those who care about art at all, their task is certainly a heavy one, but their duty in undertaking it is clear. If art is what they suppose it to be, the extinction of it will permanently degrade mankind: those that love it, therefore, are bound to put themselves to pain in labouring for the staying its degradation, or rather, to be more hopeful, for its advancement. That duty, with all the troop of troubles and disappointments that attend it, many of those present have doubtless already accepted, and many more, I hope, will do so, and cast aside the foolish idea that they can be happy in the enjoyment of a small corner of art doomed to a speedy end, and in which the greater part of the world has no share. But these labours that we have undertaken will lead to little, unless we keep our eyes open to all that the world has now become.

We must be in sympathy with the general aspirations of the age: the negative virtue of having escaped some of its errors will help us little if we are not touched by, and instinct with, the spirit that yet makes the world live. I ask your pardon for touching on a subject so wide and vast; a subject which would lead us—well, through all art, that is to say, through all life,—but I have done so, because one side of it is indeed most intimately connected with the subject you have met here to consider. It is impossible to discuss the right way of treating the works of art that our forefathers have left us, without acknowledging the great change that has crept over the world in its knowledge of and love for history. In earlier times, indeed, people delighted in reading and in writing of the deeds of those that had gone before them; looked up to them with reverence, or cursed them, as it might be, but all the while knew but little of their real lives, little of whither their times were tending; all that happened in past times they pictured to themselves as being done just as the like deeds would be done in their own days; they judged the past and its men, both for blame and for praise, by the standard of their own times; of those times they were so full that they did not think of the growth of the past, or of the future. How different all that is now it is scarcely worth while saying; the ever-growing knowledge of to-day, while showing us how much all has changed, and how differently men of like passions to ourselves, and with something like the same circumstances about them as about us have acted,—while showing us all this difference, has nevertheless linked us to the past, so that we feel it yet alive with us, a part of our own growth; and this, I make bold to say, is a thing that has never happened before, but is new; and, being new, demands a new way of looking on and dealing with those relics of the past which convenience, tradition, and our needs compel us to use as part of the furniture, so to call it, of our daily life. It is common for us who protest

* *Builder*, p. 1312, *ante*.

against the wholesale modernisation of ancient buildings to have it thrown in our teeth that those who built the works we are striving to protect did not act as we would have architects act now; that men of every succeeding generation rebuilt and destroyed according to their convenience or pleasure, and they say, "Were they right or wrong?" I will not say that they were either right or wrong; it is true, indeed, that much that those artists did must needs grieve us, though they and their times were so fertile in great works; and rather than say that those deeds were right or wrong, I would say that they were necessary. It is with them as with other matters of history: the fall of the blacksmith's apron banner before the Arabs, the last day of Carthage, the end of Harald,—these things were fated,—natural, perhaps beneficent,—yet it is scarcely strange that, looking back to them, we should feel their tragedy rather than their triumph; yet who can picture to himself the course of history, with such events as these reversed? William of Wykeham and the rest of them did as their times cried out on them to do, and if we do less than this, though we may seem to imitate them, we shall but disgrace them by caricature. A man who cites the precedent of the elder architects, and claims our respect for wholesale alterations of a great minster, in spite of his assertion of practicality, and the like, is only indulging in a pedantic masquerade.

I repeat that we of this century have made a discovery that former ages missed, viz., that no fresh splendour or modern ingenuity can repay us for the loss of an ancient work that is a genuine piece of art. Two practical conclusions follow from that discovery:—1. That it is worth making great sacrifices to preserve such works; and 2. That preserving them means keeping them in the actual state in which they have come down to us, recognisable on the one hand as historical relics, and not as models of such things, and, on the other, as real works of art executed by artists, who were free to have worked otherwise if they would have, and not as make-shifts and stop-gaps turned out by machines, or by men so slavish in their work as to be no better than machines.

People may say, and do say, that we who look with such reverence on these pieces of ancient days forget that they have to be used often for some such purpose as they were originally built for. I cannot at all admit the justice of the accusation. I have already spoken of them as forming part of the furniture of our daily life. It is surely no hindrance, but a help to that life, that part of its furniture should be venerable, historical, and beautiful; and as to the burden of keeping them untampered with and "inconvenient," as the phrase goes, it seems to me we bear greater burdens and more inconvenience in modern buildings with less outcry. And once again I appeal to the real spirit of the age, that side of it which one day will infallibly triumph, as being on our part in refusing to accept any amount of "respectable" and "decent" finery as an equivalent to the time-worn and romantic simplicity of an ancient building. One day I do think the whole country will awake and stare, ashamed at the wonderful heap of frippery which the guardians of some of our public buildings have accumulated in them. Unfortunately, the bonfires that will be lighted on that occasion, though they may relieve the world of a vast deal of trash, will not be able to burn away all the injury that has been done to the fabric of the said buildings before men come to their senses.

Now, as I will not affect to conceal my opinion that the views I have been putting forward have, even within the last two or three years, made very rapid -nay, even sudden—progress, so, on the other hand, I must needs suppose I am addressing some to whom they are a great shock and surprise. To these I must say that if my arguments appear weak, it is because I am conscious that the truth of my statements is so plain and obvious that argument is really out of the question. It seems to me like arguing that sugar is sweet, or gall bitter, to argue that it is an absurdity to re-do an ancient work of art to-day, and still call it an ancient work, and to claim any value for it as an historical relic. But if arguing is difficult, I will beg to be allowed a last word to appeal to your feelings, and to ask those of you who have assisted in a work of so-called restoration to say what you really thought of it when all was over. After the architect, the builder, the subscribers, had all received their due share of flattery; after all the excitement had been gone through of the discoveries of what the Norman, the Early English, the Decorated builders had intended to do; after the real work of the time of Charles II., Henry VIII., Edward IV., had been swept away to make room for the Early English of Victoria, for the Norman of the railway days; after the ornaments once wrought by the village artist, who had no knowledge of abstract science, but whose hands were skilled to carry out the quaint poetry of his perverse English brain; after these ornaments have been copied by the contractors' London carver,—a man, no doubt, when he is not at his work, but a machine when he is; after grey oak had given way to varnished deal, grey stone covered with the records of dead parishioners to red and yellow string tiles, feebly imitating the rude manufacture of the early potters; after the stained-glass windows were in their places, and the altar-cloth worked,—when all was done, and you sat the first time in the old building, not I in. of whose surface was older than three months ago,—did you not, I must ask you, amidst the exultation at the attainment of all this glitter and grandeur, feel that perhaps, though so much was gained, yet something was lost? If you did, and were puzzled to say what you missed, I can tell you. It was, in one word, the *life* of the old building, which you, with whatever good intentions, had robbed it and us of.

And, to conclude. If by any chance you think that a little thing, and that we are rich enough in all sorts of intellectual enjoyments not to grudge the common sort the enjoyment of bedizening their place of meeting into vulgarity,—that is, in all the meaning of the word, appalling. Ask some American gentleman of high cultivation what he would give to have an ancient building in three-fourths of all the parishes of the United States; or, rather, ask yourselves if, without them, England could be the England that you love?

The following paper by Mr. Samuel Huggins was also read:—

I have written so much on the subject of "Restoration" during the last ten years that the call of Mr. Caine, the president of this society, for a contribution to its proceedings put me in a difficulty for something fresh to say on it.

While I freely yield to Mr. Ruskin the honour of being the first to denounce the principle and practice of "Restorations," which he did with all the eloquence for which he is famed, it is due to myself to say that I have done more to expose them, to meet all arguments in their favour; and more fully answered the oft-repeated question, "What are we to do with these old fabrics when they become unfit for use?" than any other writer. I was first led to the subject by my feeling of disgust at what I had witnessed around me and near me. I had seen some of the noblest cathedrals in England, each the crown of glory of its city, the tower of which caught the last smile of departing day, completely denuded of all interest, and I well remembered my sensations at the "restoration" of St. John's Church, Chester, as early as 1861, when I felt daily that virtue was going out of it, and that its "restoration" was its destruction. These are what led me to the subject, and to say, in a paper on "The Growth of Liverpool," read to the Architectural Society in April, 1868, and printed in its Transactions,—"There is talk of 'restoring' the cathedral [Chester], which, to the ear of an artist, as it will probably involve the entire recasing of the building, simply means *destroying*: destroying its antiquarian and historic interest and picturesque beauty."

Since this I have so fully shown up the evil that I now feel I could better serve the cause of protection by republishing what I have already written, which would fill a thickish octavo volume, than by writing any more. A letter from Mr. James Bromley, informing me that certain *literati* had expressed their determination to be down upon "the mawkish sentimentalism" of the objectors to restorations, suggested the course I have taken in the following remarks:—"Restoration" means the taking a building back to what it was in its prime of youth and beauty, by which, of course, history is falsified, its (the building's) teachings to the architect and archæologist for ever silenced, and the harmonising effects of time and the associations of history and legend, destroyed. I leave to others the archæological grounds of objection to "restorations," and confine myself to the consideration of the æsthetical and poetic.

A new building is interesting and valuable, like a new poem, statue, or picture. But unlike these works, which never really increase in beauty, the building is no sooner finished by man than nature takes it in hand, lavishes on it her own infinite system of beauty, and gives it finishing touches beyond the reach of art; which assimilates it to all round, and marks it for her own. The beauty of an ancient edifice is beauty upon beauty, nature having worked on a ground prepared by art. The building originally, perchance, was a noble piece of harmonious architecture; the ages have breathed on it, and now every one of its stones has become a picture, a poem, a history. The building added to nature, and nature has requited the benefit a hundredfold, and ennobled the building; which henceforth has something divine about it: it is architecture glorified, sublimated, idealised. The higher class of ancient buildings, I say it advisedly, are gems of the brightest landscapes—the high-water marks of material beauty on the face of the earth, over the loveliest portions of which they shed fresh glory, and give to flower, and grass, and stream a new and diviner birth.

They differ from new buildings also in having a virtue seen only by the eye of the imagination, viz., the memories of the past with which they are pregnant. The mind descries on them the lights and shadows of history, which give them an ineffable charm, which is not possessed by any object of pure nature, by rock, tree, field, or mountain, which is always, from the vital forces within it, for ever renewing itself. We know, looking on the Colosseum or Pantheon, that it has witnessed the events of human history for 2,000 years, and it has, in addition to its original and acquired physical beauty, an impassioned eloquence,—a pathos that thrills and moves the heart. The light of ancient days is on it, the lingering beams of a departed glory, and the shadows still hover over it of the important events or renowned deeds of the illustrious, of which it was the scene or the witness.

I object to "restoration" chiefly on the ground that all this beauty and interest are entirely destroyed by it.

How completely this is done by "restoration" I was forcibly reminded awhile ago on writing a poem entitled "An Address to the Great Pyramid" (see *Builder*, Nov. 30), based on the adage "Stone walls have ears," in which I supposed it ear and eye witness of some of the most important events of history, as "You saw this," or "Did you hear that?" and I could have gone on and imputed to it a knowledge of the whole history of the world since its erection. It struck me that not one syllable of what I said could, with any degree of propriety or any stretch of poetic licence, have been said had that pyramid been recased. It had ears, but the restorer had stopped its ears, blinded its eyes, filled its mouth with new stone and mortar; in short, made it another pyramid; and it might reply, "Oh no, sir, you are mistaken: I never saw nor heard any of those things you mention. I know nothing about the siege of Troy or any other siege. I have only just come out of the quarry. The old pyramid you take me for has been smothered and buried under me, and can neither see nor hear any more."

But this is not all. I have hitherto supposed that the restorer fulfils his implied promise to make the building all it was in its prime, with regard to artistic merit and beauty. But it is impossible. Invariably in the restoration process, there is cut away carving by men who gave their whole hearts to it, and worked, not for 2*l.* or 3*l.* a week, but for their souls' salvation, one square foot of which work, with the faintest vestige of what it had been, is worth more than all that is supplied by the workmen of the day. This I know was done at Chester, one of the least sculpturesque of our cathedrals.

I object to restoration on this ground, and confess that the virtual disappearance of our cathedrals, by its means, has been felt by me as something like a bereavement of old and beloved friends. This would be an infinitesimally small matter to the world if it were all I could say. But the feeling which recognises and appreciates the beauty of these buildings is not an exceptional one at all, but the same instinctive feeling that appreciates beauty of any kind, natural or artificial, and common, in a more or less degree, to humanity,—a real element in human nature,—the holiest, the

divinest part of it. It is simply our sense of beauty.

If, therefore, the love of ancient buildings, and desire to protect them from the restorer, are a sickly sentimentalism, then the whole of the fine arts,—poetry, painting, sculpture, architecture, music,—are a sickly sentimentalism; for they are all based on the same moving principle in man, and are exponents of it,—the principle from which springs everything that administers to our higher needs, including moral philosophy, and even religion itself, so far as it attracts by its moral beauty.

If the love of ancient buildings is a mawkish sentimentalism, then the whole world has been wrong in not preferring some of Watts's hymns for children (I mean no disparagement to the learned and pious divine), as, for example, the well-known one,—

"How doth the little busy bee
Improve each shining hour,"—

because they teach some useful facts, to the most celebrated lyric poems in the language, full of the most gorgeous poetic imagery and music; which tell you nothing you did not know before, but which take hold upon you by the emotional part of you,—the essence of your being,—and lift you into a purer sphere, till you feel that you are something more than an eating-and-drinking-and-money-getting machine, living by bread alone.

Prove the feeling in question to be sickly sentimentalism, and you lay the axe to the root of all the greatest productions of the human mind. Take "Othello," perhaps the grandest of all Shakspeare's tragedies, and what are all those wild bursts of passion,—those heart-rending out-pourings of his grief and indignation,—all the sublime expressions of his love, strong as death,—of his jealousy, cruel as the grave,—but effusions of sentimentalism equally dependent upon imagination for support and apology, and equally void of foundation in utilitarian reality? For, was not his wife, supposing her guilty, as beautiful to look upon,—as pleasing to all his senses,—as useful as the mistress of his house, and in every respect, as ever? Certainly she was. But she was all valueless in his eyes. His sentimental woes, in which we all sympathise, had poisoned this and all other blessings, till life had lost its savour:—

"Oh, now, for ever,
Farewell the tranquil mind! Farewell content!
Farewell the plumed troop, and the big wars
That make ambition virtue! Oh, farewell!
Farewell the neighing steed, and the shrill trump,
The spirit-stirring drum, the ear piercing fife,
The royal banner; and all quality,
Pride, pomp, and circumstance of glorious war;
Farewell! Othello's occupation's gone!"

There is no comparison, of course, in *degree*, between the loss of a wife's fidelity, and your own honour, on the one side, and the loss of a cathedral by "restoration" on the other; but they are equally ideal, or unreal, in the common acceptation of the term. Nay, if grief and indignation at the loss of a cathedral by "restoration" is mawkish, then Othello's grief is still more mawkish; for while the cathedral pleased the eye as well as the imagination, what Othello had lost appealed to none of his senses, it was purely sentimental.

But I could have reached the conclusion to which this points by a shorter road. If the love of material beauty is a natural passion, and a building five or six hundred years old is infinitely more beautiful than the same building when it was new, or when renovated by the "restoration" process, which the instinct and practice of landscape-painters and painters of architecture, of all time,—as Canaletto, Turner, Paul Veronese, Watteau, Prout, David Roberts, prove it to be,—for what landscape-painter ever sat down before a new building?—then there can be nothing mawkish in preferring the old to the new,—the old still farther endeared by its talismanic power of calling up visions of the past,—or in bewailing the loss of the old by restoration or any other misfortune; and the poet Gray might have composed as pathetic an elegy or lament as well based on the feelings of human nature over the old country *church*, in which "the rude forefathers of the hamlet" worshipped, and beneath the shadow of which they were buried, as he did over their graves in his celebrated "Elegy," had that church been restored. Yet I believe there is no more popular poem in the English language than that elegy.

These arguments must leave the advocates of restoration without a leg to stand upon; and I believe the chief of them have become conscious of this; for if any really rational and consistent plea could have been framed in its favour, assuredly they would have framed it, and built a Society upon it. Let me conclude with an exclamation that burst from my pen some ten months ago in a letter to the *Builder*,—"Absurdity, thy name is Restoration!"

At the second meeting, the Rev. S. Fletcher Williams in the chair, a paper by Mr. J. J. Stevenson was read: this we print under a separate heading. On the motion of Mr. G. A. Audsley, seconded by Mr. W. Tirebuck, the following resolution was passed:—

"That, although designed for other uses, many ancient churches, the property of the nation, have in process of transmission become ancient monuments in the spirit of the 'National Monuments Preservation Act, 1875'; and that, in the opinion of this meeting, such ancient churches, at the selection of the Commissioners appointed under its provisions, should be embraced within the schedules of that Act.

That a copy of this resolution be forwarded to Sir John Lubbock, bart."

The second resolution, moved by Mr. P. H. Rathbone, seconded by Mr. Walter Lewin, and carried, was as follows:—

"That, pending legislation having for its object the protection of ancient buildings, the following gentlemen be requested to form a local committee to co-operate with the Society for the Protection of Ancient Buildings, for the purpose of collecting information with regard to contemplated restorations, and of preventing injury to ancient buildings of value in this district:—Mr. J. A. Picton, Mr. Alderman Samuelson, Mr. G. A. Audsley, Mr. J. M. Hay, Mr. Hy. Clarke, Mr. W. Tirebuck, Mr. James Bromley, Mr. T. L. Bowes, Mr. T. F. Drinkwater, Rev. S. Fletcher Williams, Mr. T. H. Hall Caine, and Mr. P. H. Rathbone."

We cannot afford more space than will allow us to say that a paper by Mr. Jas. Bromley, on "The Uses of Ancient Buildings," was read; and that Mr. T. H. H. Caine closed the proceedings by moving a vote of thanks to the various gentlemen who had contributed papers.

EUSTON STATION HALL.

THE great hall at the Euston Station of the London and North-Western Railway is worthy of the grand entrance that gives access to it. This hall has been repainted and decorated by Messrs. Jackson & Graham. It is 125 ft. in length, 60 ft. wide, and 60 ft. high. The entablature and the coffered ceiling are enriched with Greco-Doric ornaments, the lines and members of which have been preserved, clean and sharp, in the repainting. The hall, it may be here mentioned, is warmed by hot water, and satisfactory provision is made for its ventilation. The spacious flight of stairs at the end leads to the shareholders' hall on the landing, and on the right and left to the general manager's and secretary's rooms, and the apartments occupied by other officers and clerks. Galleries, supported on ornamental cantilevers, are carried along each side, and across one end of the hall; these afford communication between the different office departments in the extensive pile of building. There are departure-platforms, booking-offices, and restaurants, on each side of the hall. The enrichments of the upper corners include emblematical bas-reliefs to represent the principal stations on the London and North-Western system,—London, Liverpool, Manchester, Birmingham, Carlisle, Chester, Lancaster, and Northampton. It need scarcely be said that since the great hall was finished, extensive ramifications have been added to the company's system, its direct continuous communication reaching to the chief cities and towns in Scotland, and to Dublin and Belfast in Ireland. It seems scarcely credible that less than forty years ago the following timid comment should have applied to travelling by the North-Western:—"The prospect of travelling from the metropolis to Liverpool, a distance of 210 miles in ten hours, calls forcibly to mind the tales of fairies and the genii, by which we were amused in our youth, and contrasts strongly with the fact that, about the commencement of the present century this same journey occupied about sixty hours." The express mail is now run at a speed that would take a train from London to Liverpool and back, and do nearly half a second journey within the ten hours!

At a suitable distance from the flight of steps, and facing the entrance, is a fine statue of George Stephenson in Carrara marble executed by E. H. Bailey, R.A. It is to be regretted that the quality of the block was not worthy of the masterly work expended upon it by the sculptor, its colour being very indifferent.

The tints employed in re-painting and decoration are much lighter than the more sombre colours that have given place to them. The walls to the height of the galleries, and of the grand flight, are in imitation of red Mansfield stone in courses; above the galleries the walls are in light-coloured Yorkshire stone, blocked by double red lines; the enriched entablature is in a darker tint, and the pilasters, trusses above it, and the coffered ceiling, are only a warm shade off pure white. The Ionic columns at each end of the hall,—they are 2 ft. 3 in. diameter at the base,—are, in the shafts, representations of Sicilian marble, the pedestals, Belgian St. Anne marble. The bases and caps, and the rails round the galleries, are in green bronze and gold. The central entrance to the shareholders' room on the grand landing has a stone door-piece, with a number of well-executed emblematical figures, from the chisel of the late John Thomas, date 1849. This door-piece, which is of Caen stone, has been cleaned.

It is seventeen years since the hall was painted, the work having then been executed by Messrs. Cubitt. Messrs. Jackson & Graham's men were engaged for five weeks in the erection of their scaffold, which filled the hall from side to side, end to end, and floor to ceiling. The top required for the ceiling-work a floor of sixty dozen planks, and there were sixty-four uprights, many of them of two and three poles lashed together, besides horizontal and diagonal braces.

FOUNTAIN IN THE PIAZZA DEL DUOMO, PERUGIA.

PERUGIA, the Perusia Augusta of the ancients, is one of the most interesting among the many Italian cities rich in mementoes of former times, and on that account vast storehouses of Classic and Mediæval art-treasures. Besides being favoured by nature in its surroundings, Perugia possesses an unusual number of handsome buildings and monuments, one of which is the artistic and original fountain in the square in front of the cathedral. We give in this number an illustration of it, which speaks for itself.

CAMDEN TURKISH BATHS, CAMDEN TOWN.

THE Camden Turkish Baths, of which we publish a view and plan this week, erected from the designs and under the superintendence of Mr. H. H. Bridgman, architect, were inaugurated on the 28th ult., under the presidency of Dr. Morell Mackenzie. At five o'clock in the evening, about 150 gentlemen, at the invitation of the architect, assembled in the "cooling-room" of the baths, which is fitted up in a most sumptuous manner, the walls and ceiling being composed entirely of variegated marbles.

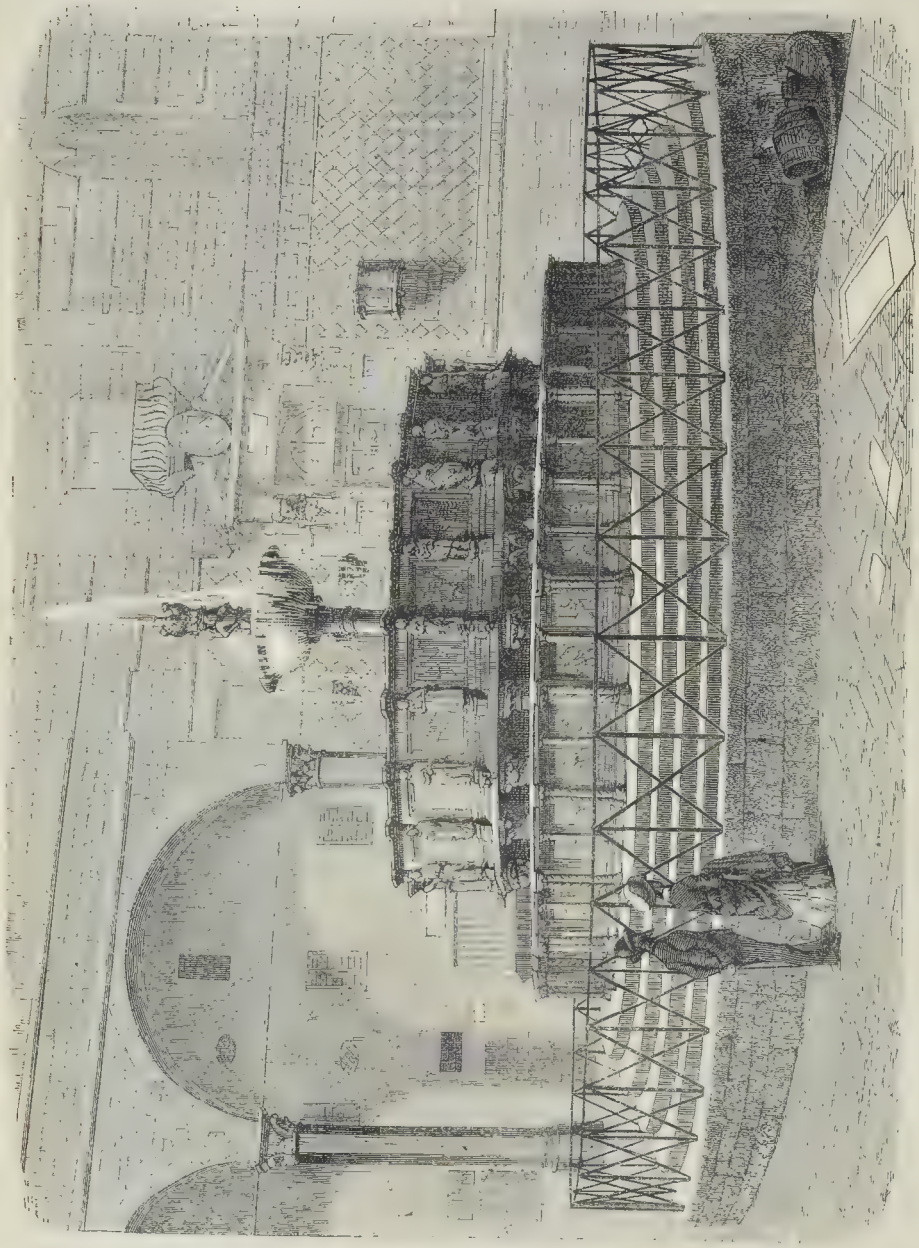
After inspecting the building, the company, which included many well-known men, returned to the marble room, and Dr. Morell Mackenzie complimented the architect upon the spirit he had displayed in erecting these baths at his own expense; at the same time expressing his belief that they would prove a great success, as there was at least a population of half a million inhabitants between Regent's Park and Holloway. Dr. Mackenzie traced the history of the Turkish bath from the time of the Romans to its introduction into England about twenty years ago, and dilated at some length on the objections hitherto raised against the Turkish bath, and refuted them: (1) of fear, which was based in ignorance; (2) that Turkish baths weakened the body; (3) that they injured the constitution; and (4) that they occupied much time in being taken. Dr. Mackenzie then declared the "Camden Turkish Baths" open, and the company adjourned to the St. Pancras Vestry-hall, kindly granted for the occasion by the Vestry, where a dinner was provided in commemoration of the opening ceremony, Sir Thos. Chambers, M.P., presiding.

The Chairman, in a happy speech, maintained that every man who introduced any sanitary institution was a public benefactor.

A description of the baths appeared in the *Builder* of the 30th ult.

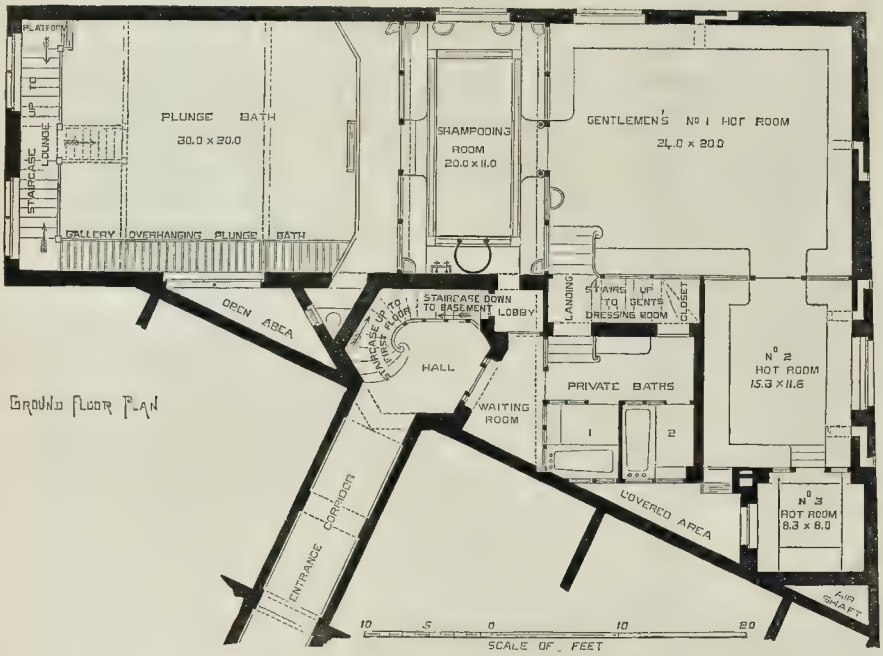
The view we now give illustrates the interior of the cooling-room; the walls and ceiling being in "Athenian marble," decorated in gold, the recesses being lined with silvered glass. As before stated, Mr. J. R. Hunt, of St. Paul's Works, Bow-common, was the builder.

Royal Academy.—At a general assembly of the Royal Academy of Arts, held on the 19th, Mr. Henry Stacy Marks, painter, was elected an Academician.



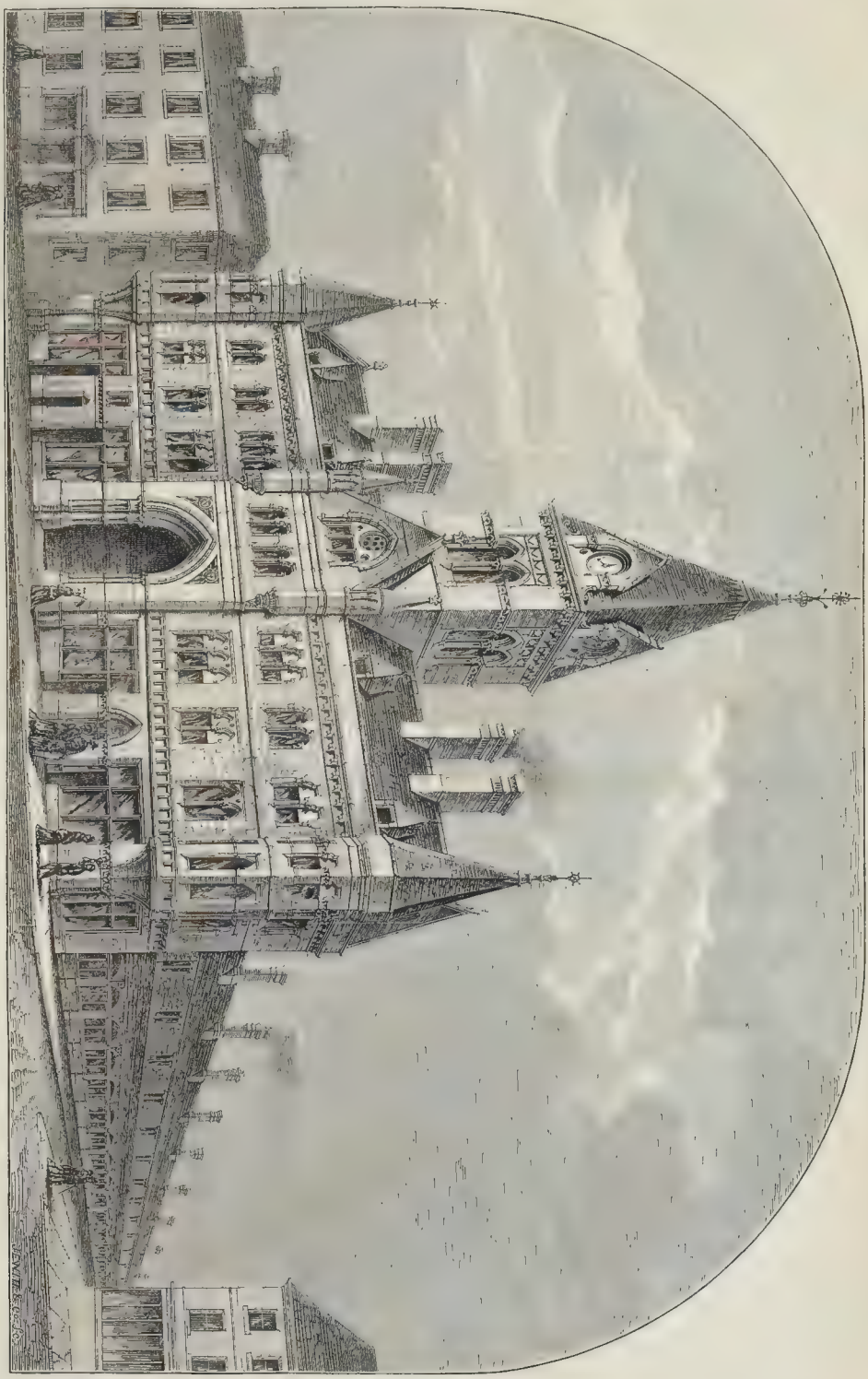
FOUNTAIN IN THE PIAZZA DEL DUOMO, PERUGIA, ITALY.





GROUND FLOOR PLAN.

THE CAMDEN TURKISH BATHS.—Mr. H. H. Bridgman, Architect.



THE NEW MARKET HALL, HUDDERSFIELD.—Mr. Edward Hughes, Architect.

HUDDERSFIELD NEW MARKET HALL.

HUDDERSFIELD, which is rising in importance, has long needed a covered market. The need is about to be supplied, and the accompanying engraving shows how this is being done. The style of the new building is after an early type of domestic Gothic.

The plan is an oblong parallelogram, 270 ft. by 101 ft. 6 in., surrounded by shops, having an entrance in the centre of each side; and it is bounded on the north by King-street, on the south by Victoria-street, east by Shambles-lane, and west by Victoria-lane. Externally, there are two blocks of shops and offices in the King-street and Victoria-street fronts, connected by butchers' shops running the whole length of Shambles and Victoria lanes. The King-street front is four stories high, having a gable in the centre, and octagonal oriel windows at the corners. This block contains on the ground floor the principal entrance and the entrances to some ten first-class offices and conveniences (situated on the first and second floors), and four shops, with cellaring beneath, suitable for grocers or provision merchants. Accommodation is also provided on the third floor for the office-keepers. Immediately over the entrance rises a clock-tower, with wooden spire, to the height of 106 ft. The Victoria-street front contains, on the ground-floor, the entrance to the wholesale market, having two fishmongers' shops on either side, with cellaring under and offices over, similar in general arrangement to the King-street front. Entering the hall from King-street, by a few steps to the left, it is seen that the architect has taken advantage of the sloping ground, and has placed a row of general shops immediately over the butchers' shops, in Shambles-lane, while on the right he has placed an arcaded gallery, raised some 4 ft. above the general floor level. This gallery will, probably, be let in stalls for the sale of toys, books, musical instruments, and such like goods; while the hall itself, 231 ft. 9 in. by 71 ft. 6 in. (which has cellaring 10 ft. high for the storing of green-grocery, &c., under the whole area), is to be fitted up with octagonal stands, each containing four stalls,—having longitudinal and transverse gangways running from wall to wall between the same. The whole of the flooring of the hall is to be laid with Claridge's Seyssel asphalte, and is carried by Dennett's patent fireproof arching on some sixty or seventy iron columns. The roof is in one span of 71 ft. 6 in., framed together with wrought-iron purlins, wind bracings, and principals, 12 ft. apart, having ridges and gutters running transversely, whereby there will be an abundant supply of light obtained from the north side only. The shops are finished in white and ornamental glazed bricks, and are provided with gas, water, open fireplaces, &c. The hall will probably be lighted at night by means of electric lights. The present contracts for the building amount to the sum of 24,000*l.* The building is so designed that the wholesale market can be removed, and the general market extended throughout. The architect is Mr. Edward Hughes, Lord-street, Huddersfield; and the several contractors are, for the mason's work, &c., Messrs. Radcliffe & Sons; joiner's work, Messrs. Dawson & Co., Moldgreen; slater's work, Mr. G. Hargreaves, Dewsbury; plumber's work, Mr. J. E. Smithson, Bradford-road; plasterer's work, Messrs. Longbottom & Sons; ironfounder's work, Messrs. Handyside & Co., Derby; carver's work, Mr. S. Auty, Lindley; and the painter's work, Messrs. Mitchell Bros. The walls are now ready for the roof.

A Novel Exhibition.—An interesting exhibition of children's work is being held at the Alexandra Palace during the Christmas holidays. It consists of a collection of dolls in costume, rag dolls and animals, dolls' houses, scrap-books, and illuminated texts, the sole and unaided work of children—readers of "Little Folks" Magazine. The dolls, &c., have been sent in from every quarter of the globe—from Java, Egypt, Canada, the West Indies, and all parts of Europe, as well as from our own country,—in competition for valuable prizes and medals offered by the proprietors of "Little Folks." A noteworthy feature of the exhibition consists in the fact that immediately after the close of the show, on the 11th of January, all the work will be distributed among the numerous children's hospitals, for the benefit of the little sick inmates.

THE VIEWS OF THE ANTI-RESTORERS.*

I THINK we can afford to dismiss, without notice, an accusation against our society, frequent at the commencement of its existence, that the practical effect of our principles in opposing restoration was to allow old buildings to perish. The restorers, in opposing our views, boasted of the buildings which they had saved from destruction by shoring and underpinning; and if this had been all they had done, we could only have bid them God speed.

They understand us better now, and acknowledge that we are all at one as to the duty of taking every mechanical means of keeping old buildings standing.

But they think us mere enthusiasts, well meaning perhaps, sometimes even useful in our way, though occasionally troublesome. An architect, whose friendship I value, and whose talents I admire, told me that the views and principles of our society were quite unpractical, and that they would break down if an architect attempted to carry them out in his business; but that he rejoiced at the foundation of the society, and believed that we were doing good work,—all the more that we over-stated our views; because the public, between destructiveness of the restorers and the exaggerations of our side, would form a sound judgment on the matter. I know that this is also the opinion of many able and conscientious architects, who would never consciously sacrifice old monuments to their own interest.

At a meeting of the younger Architectural Association great fun was made of the probable practical results of the Society's views, and a really amusing picture was exhibited of a rotten old village, which (it was supposed) the Society had purchased, prolonging the existence of its falling gables and chimneys by a forest of props.

And doubtless it is a hard saying, and few can bear it, that every ancient building is worth the ground it stands on, and that even if an old building has become useless for present purposes we should preserve it unaltered; rather than by our meddling destroy it as a monument of bygone art; or in our greed pull it down for the value of the site.

Undoubtedly, from an ordinary point of view these opinions are unpractical,—mere waste of money, if the building serves no practical use and the site can be sold for a high price.

Some one wrote the other day to the *Times* that he had visited a number of the City churches one Sunday during service and found an average congregation of only twenty in each, which fact he thought conclusive for their destruction.

But the practical question in reality is, "What do we think it best worth while to spend our money on?" The clergy, for instance, say that the City churches should be sold for the good of souls. The Ecclesiastical Commissioners put the money they get for these churches into their common fund, and spend 30,000*l.* out of it in restoring Southwell Minster, which is quite sound and weather-tight.

I can conceive no better employment of the overgrown wealth of the London City Companies than in preserving the old buildings on their land; yet they are destroying them every year; the Carpenters' Company have even destroyed their old historic hall for the sake of bigger ground-rents, and have erected a gorgeous new one, in which the motive of the design seems to have been how much money they could possibly spend on it.

I believe that Wren's churches, apart from any practical use, are of more value than the price of their sites, and that it is not the true interest of the Church to sell them for the money which they bring.

We hold of these and every ancient building that they ought to be preserved with every feature of every age of their history, even though we have no actual use for them; and that the money of the country could not be better employed than in so doing. But we have employed our wealth rather in destroying our old art. Poverty, as Wordsworth said, is the great preserver. People live on in old houses when they cannot afford to build new ones; and it is marvellous how useful and suitable they find them when they have no money to alter them and pull them about. If we had not had those millions to spend on restoring our churches what treasures of old art would have been preserved to us. If Napoleon III. had not renewed the French cathedrals to give the people work, what a pleasure it would still have been to visit them; and it may be one of the advantages of the lessened wealth of the country at the present time that it may spare the few churches that yet remain unrestored, by cutting off the supplies from the restoring clergy and architects.

Every one who loves old buildings would like to see them continued in daily use, still serving human wants; for this is the surest guarantee for their preservation. It is this which has preserved to us the few antique classic buildings which the world still possesses,—the Parthenon and the Pantheon and the Roman basilicas, because they were Christian churches; the amphitheatres of Rome and Verona, and the theatre at Orange, because they were Mediæval fortresses. And though we have now a knowledge of the value of authentic historical monuments and documents foreign to the thought of antiquity and the Middle Ages, which ought to make us preserve them at any cost, however practically useless to us, there is a risk that this historical enthusiasm might grow languid, the roofs get leaky, and the building fall into decay, without any one knowing or caring. If a house is lived in, broken slates and rotten timbers are looked to and replaced; if a church is used, it is kept weather-tight.

Therefore, keep an old building in use as long as you can. If the old use is utterly extinct, then put it to some other, provided this can be done without destroying its historical features.

Among the most authentically preserved of Middle-aged buildings are some "desecrated" churches and convents in France, kept sound and weather-tight as barns and farm buildings, or even applied to the baser uses of manufactories, unless where a rich and æsthetic proprietor has beautified them in modern Mediæval taste.

An opponent of our society's views has asked whether we would object to such churches being restored to their original use. The society would probably reserve its opinion till some actual case came under its observation. Speaking for myself, I should say that, if the old fabric of such a church were sound, I should prefer to see the manufactory cleared out of it.

The case is different with ruins. To restore them to actual use again almost certainly involves the destruction of their artistic and historical interest. Think of a ruined hall or castle restored into a modern house, as has occasional been done, its historical features replaced by butlers' pantries and servants' rooms, and the complicated comforts of modern life. Fix the loose stones in a ruined building, stop water getting into the walls, prop up the bulging walls by obvious nineteenth-century buttresses, prevent, as far as may be, its further decay.

But if an old house has continued to be lived in, keep it still habitable by constant repairing; and, if possible, inhabited. This may involve some alterations; though I am sure those which are made are often quite unnecessary. I know a beautiful Jacobean house whose owners, for generations, have been poor, and never had any money to spend on altering it. It is, therefore, one of the most perfect and charming in the land.

I know another old house which would have been as interesting, but its owners have all been rich, and one after another has altered it according to the fashion of his day. Originally Elizabethan, the mullioned windows were changed to sash windows in Georgian times. Their last owner altered them back into the false Gothic of fifty years ago. Their present owner would rather that either of the old styles had been retained. A family may really often find that it can fit itself to an old house with greater advantage than refitting the house to the family. Changes in old houses and churches, are mostly made for mere fashion and fancy, and not from any real necessity.

Modern church restorations surely afford innumerable examples of this. Excellent oak panelling and beautiful woodwork are pulled away because they are out of fashion. The carved Jacobean pulpit, with its canopy, which was of real practical use, in assisting the preacher's voice, indicating the time when preaching became an important part of the service, is discarded for one of the wine-glass pattern, and all this, not for any practical good, but because they are out of fashion, from precisely the same motive in the parson and architect as makes a lady discard last year's bonnet for a new one.

Are the new open-timbered roofs, which let in the wind, and sometimes even the snow, and

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* By Mr. John J. Stevenson.

keep the congregation shivering, practical? Is it practical to replace the glorious carved oak roofs of the Norfolk churches with deal ones, and sell the lead to pay for the process? Is what is threatened at St. Alban's a sensible or practical proceeding? The building has an ancient oak roof, of flat pitch, covered with lead of the beautiful white colour which old lead with the silver in it always has, with a flat painted wooden ceiling, an old repainting, probably, of still more ancient decoration. The architect reported that this roof could be cheaply and substantially repaired. Sir Edmund Beckett decided to destroy it, and replace it by a new steep pitched roof of pine and slates, as there is not money to do anything better. All seem to agree that slates are a paltry covering for such a building. One suggests red tiles, another copper. The architect writes to the *Times* that it has been irrevocably decreed to have a new tall roof. That, to be worthy of the building, this roof ought to be covered with lead, but that there is not money to cover it with anything better than slates; as there is not, to make it of better wood than fir; and on these grounds he appeals to the public to subscribe money to provide the lead. And this, after he had declared that the present roof of oak was sound, and only wanted repair, a roof, already covered with old lead with the silver in it white and beautiful; not like new lead, which, if we may judge from the results on the lantern at Ely, turns as black as one's hat, or like a lead cistern. This does not seem to me practical or common sense.

One of the "practical" necessities which has caused the greatest pulling about of the interior of old churches is the return to the ancient practice of having surpliced boys to sing in the chancel instead of the village choir in the west gallery. It would be presumptuous in me to have any opinion on a matter of church order, but I confess I cannot sympathise with the feeling which forbids female voices to lead the singing in a village church. Fitting rather and beautiful are the lines in the "Village Blacksmith," —

> "He hears his daughter's voice
> Singing in the village choir,
> And it makes his heart rejoice."

In great cathedrals which, with us in England, were generally monastic establishments, or minsters as well as cathedrals, we would not wish to see the tradition broken of having choirs of men and boys only, and in the Sistine Chapel the peculiar composition of the Pope's choir may even be fitting; but I cannot think such ecclesiastical arrangements holier or more seemly than the old village choirs in our country churches.

But in the old galleries there was a risk, I have heard, of young men catching maidens' eyes as they sat behind the congregation. But since Petrarch's day, and before it, men have seen their Lauras first in church, and it is to be feared that no re-arrangements of church fittings will prevent it.

Another great cause of the wholesale destruction of old church fittings has been the crusade against pews. These, doubtless, had evils connected with them, and sometimes were the outward embodiment of unchristian exclusiveness and selfishness, as when a pew in a crowded church was kept empty and locked, its owners being absent. But this might have been remedied without destroying them; the locks, for instance, might have been removed. There were many tender and beautiful associations connected with old family pews, and their almost universal destruction has marred the historical interest of most of our old churches.

But even admitting that all these changes in church arrangement were necessary results of the new life and earnestness which have visited the church in these latter days, if only the changes had been made which were necessary to give embodiment to the new ideas, our old churches would have remained to us little injured or altered. These changes in arrangement would have told their own tale—would have added a new chapter to the history of the church, and an additional record of changing manners and opinions.

It is the *needless* alterations which have ruined our old churches, alterations caused by no necessities of ritual, or stability of the fabric, but born of vanity and fashion, of a hatred of particular styles, — Classic, Jacobean, Perpendicular, and even Decorated, which makes the restoring parsons and architects destroy the most beautiful and costly specimens of them; and kept alive by one of the strangest and stupidest fallacies of modern times, namely, that the restoring architect's imitation of some epoch of Mediæval art is practically the same thing as Mediæval art itself. As well say that rouge, and wigs, and false teeth are characteristics of the health and life of youth. Surely it is more practical to hold with the Society for the Preservation of Ancient Monuments that every specimen of old art of every age ought to be religiously preserved.

ST. ALBAN'S CATHEDRAL.

THE NAVE ROOF.

A GENERAL meeting of the St. Alban's Archæological and Architectural Society was held last week. An elaborate paper was read by Mr. E. Keyser, on "The Decorative Paintings of St. Alban's Abbey," comparing these works with those similar in period and subject existing elsewhere in England. The following report to the Faculty Committee, by Mr. J. O. Scott, the architect, "On the Nave Roof," was then read: -

Since the last meeting of the committee, a new aspect of the great question of re-roofing the nave of St. Alban's Cathedral has arisen, owing to the action of the Royal Institute of British Architects and the Society of Antiquaries. Considerable differences of opinion having been expressed in the newspapers and elsewhere on this subject, Mr. Street was requested, by the Conservation Committee of the Institute of Architects to visit St. Alban's, and to report to them on the question. He paid a visit about a fortnight ago, accompanied by Mr. Christian and Mr. Blomfield, and the result of his examination has been drawn up in a formal paper, which was read by him before the Society of Antiquaries, on the 28th of last month.*

Mr. Street urges two points of great importance. The first is,—that the present roof is of far too much interest and value to be destroyed, and that, though in want of considerable repairs, it is capable of being restored and made sound. His second point is as follows:—From the notes which he took, and the observations he was able to make during his visit, he has come to the conclusion that only one high-pitched roof ever existed, namely, the original Norman one,—that this roof must of necessity have been without parapets, and that it had overhanging eaves, — that the existing parapets are of late date, and were added at the same time that the low roof was substituted for the high Norman one, — and that, therefore, to do as is proposed, that is to say, to retain the parapets and cornice, and to add a high-pitched roof within them, would be altogether unjustifiable, because it would be producing a combination which has never at any time existed in St. Alban's. Doubtless, if Mr. Street is right in these conclusions, the only reasonable course open to the committee would be to abandon the proposed high-pitched roof, for the only alternative would be to restore the ancient Norman roof, destroying the existing parapets and cornice, which would be a bold act of destructive restoration,—such as I am convinced the committee would never deliberately sanction, and in which I could never consent to take part. The tone of Mr. Street's paper was very positive, and, as no one present at the meeting was able to controvert his theory, it is not to be wondered at that the Society came to a unanimous resolution based upon that theory, and condemning our proposals. So emphatic were the statements that, when I first heard of the facts Mr. Street had insisted upon as being indisputable, I confess I was staggered, though, from my previous knowledge of the case, I had great doubts of their accuracy. As soon as possible I came down to St. Alban's, for the purpose of ascertaining whether Mr. Street's theory, or that upon which we had worked in preparing our drawings for the new roof, was the correct one. With every facility for making a complete investigation, I inspected all those parts of the building which are involved in the question with the utmost care, and had minutely accurate measurements taken, showing the true relation between the present parapets and the roof marks still existing upon the tower-walls. The opinion which I have formed from these investigations is entirely opposed to Mr. Street's theory of no high roof having ever existed at the same time with parapets.

The leading facts are these:—first, that there are on the west wall of the tower indications of two high roofs, of different altitudes, having abutted against it; and secondly, that the Norman walls of the nave were raised some 3 ft. when the present cornices and parapets were added to them. The evidences of the two high roofs can be most distinctly seen when once attention has been directed to them; but, owing to the careful way in which these chases or grooves were filled up when the tower was restored, they are by no means conspicuous, and I can quite understand their having escaped attention. From the relative position of these indications on the tower-wall, and the original and existing levels of the nave-walls, I deduce the following conclusions:—That at some period, which, I think, was probably some little time before the erection of the Decorated bays of the nave, the builders became dissatisfied with the absolute severity of the nave and transepts; that, to remedy this, they determined to add an enriched cornice, with a parapet, in place of the overhanging eaves then existing; and that it was manifestly impossible to do this with the walls and roof left just as they were. Two measures were adopted,—the Norman clearstory walls were raised, while the roof was dropped. Although neither of these alterations alone was sufficient to give enough space for a gutter and parapet between the outside of the wall and the feet of the rafters, yet, together, they afforded the space required, and that in this way the builders were enabled to enrich the nave, and at the same time, by additional height of wall, to give increased dignity, both within and without the building. The arches or bridges across the angles of the tower connecting the nave and transept parapets were, I have no doubt, added at the same time, the intention being to enrich the transepts as well as the nave. This seems never to have been done, there being on the transepts no trace whatever of Mediæval parapets. It is quite possible that the fall of the central portion of the nave, and the consequent rebuilding of it, absorbed all the available funds, and the transepts had to be left for better times. Mr. Street has stated that these bridges are "certainly not earlier" than the fifteenth century, and perhaps as late as 1500. But, that this is impossible is proved by the fact that the short length of the upper moulding of the nave cornice, which belongs to the end of the thirteenth century, returns in the solid along the face of the bridge. This is on the south side. On the north side, where the details are plainer, the nave cornice consists only of a bold string, which, though very plain, I feel confident is of Decorated date. Its continuation across the bridge is quite complete. Mr. Street has spoken of the ancient parapet which exists on the north side of the nave as being, to the best of his belief, "not older than the fifteenth century." It may be presumptuous in me to differ from him on a question of this sort, but in all its features, although it is so plain, it is unquestionably what I have been taught to regard as Decorated in style. To sum up this part of the subject, I am able to assert with confidence, that at some period, a high-pitched roof co-existed with the parapets, and that, so far, the resolution of the Society of Antiquaries is based upon an erroneous theory.

Turning now to Mr. Street's first point, that the present roof is of far too great value to be swept away, and is capable of thorough repair, I need hardly say that this is the same opinion which I have myself advocated before this committee on several occasions. I accept all that Mr. Street says on this subject, which is indeed almost identical with what I have myself said and written repeatedly. I do not, however, deduce the opinion that the vast improvement which the addition of the high roof would be, should be abandoned; but that a reasonable mode of dealing with the case would be to retain the present roof as an object of great interest to many, to remove from it its heavy covering of boarding and lead, to make such repairs as are absolutely necessary, and to erect, altogether independently of it, our high-pitched roof exactly as it has been contracted for, placing the new principals of it side by side with the old ones, and even where necessary giving the old timbers support from the new, as has already been sanctioned by the committee in the case of the eastern bays. Treated in this way the old roof would have no actual work to do, being retained as an object of antiquarian interest, while the cathedral would have for its

* See p. 1273, *ante*.

covering as perfect a roof as can be constructed. It may be felt by some that such a course at the present moment would be yielding too much to the adverse opinion which has been expressed. But I will venture to ask whether any committee, however distinguished, can lose dignity through being influenced on an antiquarian question by so august a body as the Society of Antiquaries, whose special province it surely is, not indeed to decide architectural questions, but to determine the value of objects of antiquity? In this case, they have expressed a strong opinion that this old roof, bearing as it does traces of various dates and modes of construction, while its timbers are those of a far more ancient structure, is an object of great worth, and one which deserves careful conservation. It has been objected that it would be useless to preserve this roof, as it would be hidden from below by the ceiling and from above by the new covering; but I desire to point out that it would be far more accessible and visible than it is now, and that all who desired to do so would be able to examine it with facility, which certainly cannot be done now. My advice to the committee then is, that so far we should yield to the representations of the Society; but at the same time, for the reasons I have stated, we should adhere stoutly to our determination to erect a high roof. I am confident, as I have always been, that the gain in external appearance will be very great, though the alteration in the general aspect of the building will not be nearly so startling as some expect, owing to the very moderate height to which the old roof, which I propose to follow exactly, rose.

Two objections of Mr. Street's must be noticed, namely, that the roof would dwarf the tower, and that it must be followed by a similar change in the transepts. With reference to the first, he mentions the case of Winchester, which rises 27 ft. above the ridge of the roof and looks low. But, according to Mr. Street's own figures, the tower at St. Alban's will still rise to nearly double this height, while I am confident that its great size and magnificence will prevent any such injury as he fears being done to it. As regards the transepts, I hold that, although the restoration of their high roofs would be lawful, it would be far from expedient. It is the vast length of the nave which demands the restoration of its former height, but no such reason exists in the case of the transepts, nor do I see any objection to their being subordinate to the nave, as indeed I believe them to have been originally. Moreover, their present effect is so highly picturesque, so unique and characteristic, that I should shrink from making any marked alteration in their present form.

This paper was illustrated by diagrams, showing the disturbed portions of the tile work in the tower walls, and showing the lines of the suggested roofs.

Discussion having been invited, Mr. J. Neale, F.S.A., stated that it was unnecessary for him to defend Messrs. Street, Christian, and Blomfield, because the former gentleman determined to answer Mr. Scott's paper. He considered the present state of the question most unsatisfactory. It had been made most clear that the existing roof might be maintained; and, if so, it should be maintained as the real covering of the building, and not be treated as suggested. He had strenuously endeavoured to obtain a full consideration of the matter. It seemed most reasonable that the subscribers, who really came to their decision on imperfect information, in August last, should have an opportunity of rescinding their resolution. They decided that a high-pitched roof should be erected, because they believed that the present roof could not be repaired. This was now agreed on all hands to be incorrect, and a real decision should be come to in a full meeting of the subscribers, who should be made well acquainted with the facts. He had spent several days in measuring the west face of the tower, marking every disturbed tile on his drawing. The grooves or chases mentioned by Mr. Scott did not exist, and he considered Mr. Scott's drawings, therefore, extremely likely to mislead any one who did not know how much conjecture Mr. Scott was mingling with facts. He (Mr. Neale) could not agree with the conclusions.

Mr. Toulmin (a member of the Faculty Committee) stated that the real question was, whether they should spend many thousands of pounds in patching up a debased roof of a debased age, or whether they should bring back the Abbey to the splendid times of the thirteenth century. When those lovely western porches were built, and the new west front completed around them, what an absurd thing it would be to have a miserable flat line of roof between the west end and the great tower.

The rector (the Rev. W. J. Lawrance) stated that the Faculty Committee had decided to retain the old roof *in situ*, at a cost of about 400*l.*, and they would put over the old roof a new high-pitched roof, following as nearly as possible the lower line of Mr. J. O. Scott's drawing, which was supposed to have been that of the Early English or Decorated roof. As far as he could judge from the feeling of the committee, the decision they had now arrived at would not be altered. Two dissentient members (Archdeacon Grant and Mr. John Evans, F.S.A.) had resigned, and would no longer be members of the Faculty Committee.

THE NAVE ROOF OF ST. ALBAN'S CATHEDRAL.

WE have received for publication, from Mr. Street, the following reply to Mr. J. O. Scott's last report, as above printed:—

A few words seem to be required in reply to the remarks which have been made by Mr. J. O. Scott in a paper read to the Committee for the Restoration of St. Alban's on the 17th inst., and in a letter to the *Times* on a later date. As to the letter, I will only say that his suggestion that the visit to St. Alban's made by Mr. Christian, Mr. Blomfield, and myself, was "surreptitious" in its character, is as unintelligible as it is uncourteous. I wrote to him myself, and received a very friendly reply from him, with permission for us to examine the roof. He gave directions to his clerk of the works and to the contractor to meet us, and to open the roof for our inspection, and I presume that he told the rector of our intention, as that gentleman met us on the roof. The secretary of the Committee had written to Mr. Blomfield as well as to me, begging us to support the Committee by letter in August, when the subject was under discussion.

It was obviously impossible for us to agree with *all* Mr. Scott's views given at different times, but with the only views of which we then knew anything, viz., those expressed in his printed Report of June 25th we did agree, and the whole object of my paper at the Society of Antiquaries was to show that we did so, and to support him in the line he then laid down for himself.

St. Alban's is, however, not the private property either of Mr. J. O. Scott or of the Committee, and it would have needed no apology if we had stated our views, or examined the roof without his consent or authority. It would be absurd, indeed, were this otherwise.

Mr. Scott's answer to my paper is practically confined to two questions,—(1) Of the original pitch of the nave roof; and (2) the age of the nave parapets.

As to the pitch of the original roofs, I believe the view which Mr. Scott holds to be quite wrong. I began my paper by stating that "The original design of the roofs was uniform throughout, the roofs being all of steep pitch, and abutting at the same level against the central steeple." I assumed that the nearly uniform lines which I saw on the south and west sides of the tower (and I think on the north also) were the lines of the original roof, or as I said of a second roof erected by Trumpington, or some one after him, on much the same lines, and I showed from the structure of the tower and the remains of the old timbers what those lines were. I pointed out also that the lower portions of the south transept gable still existed, which gave the exact lines for the original roof, and though it was impossible for me to ascertain whether the lines so obtained agreed with the lines against the tower, at the time I wrote I assumed that they would do so. In opposition to these statements, Mr. Scott declares that there are marks of two roofs against the west wall of the tower, and he informed the St. Alban's committee, as he did also the committee of the Royal Institute of British Architects, when he met them, that the upper of these two lines was the line of the original nave roof, whilst the lower and visible line was that of the same roof cut down when the walls were raised, and that the roofs of nave, choir, and transepts finished originally at a variety of levels.

I have thought over these statements at my leisure, and am perfectly satisfied that Mr. Scott's theory will not stand for an instant before any competent judge.

In the first place, it is evidently one which Sir Gilbert Scott never entertained.

He repaired, cleaned, and repointed the whole of the tower, and in doing so took pains to emphasise the lines which he thought were the original roof-lines on three sides, and which are those which any one can still see, whilst he left Mr. J. O. Scott's supposed line so obscured that to people generally it is all but, if not quite, invisible. This is not what I should expect from him if he ever had the slightest idea that the line was so important a line as Mr. J. O. Scott assumes. Then, on the face of it, a line which cuts, as this new one does, across the window-jambs of two important windows in the tower is just the most unlikely line possible to have been adopted by the very men who built those windows. But beyond all this the line is so slightly marked as to be, according to Mr. Scott's own statement, all but invisible; and I am told by Mr. Neale, who has been again examining it most carefully since Mr. Scott's last statement, that it is so uncertain and irregular as not really to admit of exact verification.

It is necessary for me to observe here what I have before said, that until Mr. Scott can tell us what the pitch of the old south transept gable is, nothing can be stated with certainty about the original pitch of any of the roofs. But that as soon as this is determined, as it may and ought to be by the architect of such a work who has the means and appliances for getting at it, we shall have some fresh and really reliable knowledge on the question.

Mr. Neale's elevation of the south transept, if it is correct,—as I do not doubt it is,—shows that its original gable is built at an angle of 45 degrees, and that the apex of the roof finished where one would expect it to finish, under the lowest string-course of the tower, and below the windows, across the jambs of which Mr. Scott's supposed original roof was built. The nave and transepts are within a few inches of the same width. Their walls, as I stated (and in this Mr. Scott, pretending to correct, confirms me), finished at the same level, and no one, I am confident, who knows much about the ordinary practice of Norman architects, will hesitate in agreeing with me that their roofs, in all probability, finished at the same level also, and this level several feet below Mr. Scott's presumed original line. In addition to the highest line seen, as he supposes, by Mr. Scott, and which none of us saw, our attention not having been directed to the "careful way in which" Sir G. Scott's clerk, "Mr. Chapple filled up the chases or grooves," there is a lower line which Mr. Chapple did not fill up wholly when he restored the tower, and which we did carefully examine. We got Mr. Chapple to hold up a long straight-edge as exactly as we could fit it to this line, and we found, as we thought, that it cut into the gutter of the nave roof at a point only 3 in. within the southern nave parapet; and assuming at the time that this was the only visible line of roof, we all agreed that no parapet could have existed with it. Mr. Scott's statement of what he has found does not agree with what we saw, or thought we saw, and he has formulated an ingenious theory to account for the two lines which he sees, the upper being, as he thinks, that of the original roof, and the lower one that of the same when it was cut down and the walls raised some 3 ft. 6 in. for the sake, as he says, of adding parapets. Of this theory there is absolutely not a shadow of proof of any sort, and a far simpler explanation would be that when the nave walls were raised 3 ft. 6 in. above the transept walls, the ridge of the nave roof was also raised 3 ft. 6 in. above the old line, and so has produced the "original" marks above the other. If, when we can go to the cathedral again without being charged with making surreptitious visits, we find that we three,—Mr. Christian, Mr. Blomfield, and myself,—were mistaken, and that Mr. Street's line is the right one, no one, I am sure, will be more ready than we shall all be to confess our mistake.

Next, as to the age of the parapets. To me the section of the coping appeared to be of very uncertain date, and that of the moulding where it exists below the parapet does not affect the question, unless it can be proved that it never belonged to a cornice or corbel-table under the eaves of the roofs.

Mr. Scott's assumption,—for it is no more,—is that "some little time before the erection of the Decorated bays of the nave," "the builders

became dissatisfied with the absolute severity" of the old work, and "added an enriched cornice and parapet to the walls," and, in order to be able to do this, lowered the nave roof, and added to the height of the nave walls. And in his letter to the *Times* a few days later, he says that his work, when complete, will leave the church in the condition in which he supposes it was left after the middle of the fourteenth century, or, as he says, in Decorated times. With this view he has taken away whatever remained of the old corbel table, &c., of the western part of the nave, and has erected a new parapet of Early English style to agree with the old work in the clearstory. He assumes, therefore, in this work that Trumpington's part of the nave had a parapet, that the parapet in his time went the whole length of the nave, and, I suppose, that it was replaced over the Decorated bays when they were built.

Therefore, Trumpington's was the lowered roof line, and if the transept gable turns out as Mr. Neale's elevation shows it, not to be the same as Mr. Scott's highest line, we have to assume, in order to make his theory work, that two roofs were erected on the nave before the thirteenth-century parapet, and that the second of these was cut down in order to make the parapet possible, which, if the parapet was really of the style in which he has already restored it, is something very like a *reductio ad absurdum*. Mr. Scott is also very certain as to the age of the arches which carry the passages from the nave to the transept roofs, but as he tells us in the same breath that he does not believe the transepts ever had any Mediæval parapets, and as Mediæval builders were not fond of making perfectly useless passages, I very much prefer my original view,—that they were contemporary with the flat roofs of the nave and transepts,—to his lame and insufficient explanation of their history. The arches which carry these passages appeared to me to be of late date. Nothing can be proved by the mouldings above them, which may well be those of the earlier eaves cornice re-used, and here I may observe how very little there is in the remaining portion of these parapets that has not already been so much repaired as to make it unusually difficult to fix their date, or to decide what part is original and what rebuilt. I have said enough on these archæological questions. Mr. Scott has promised to publish a drawing, showing his lines of supposed roofs and parapets, and Mr. Neale is, I hear, engaged on a similar operation, and I hope Mr. Scott will see the necessity of giving us with his drawing the line, on which I have laid so much stress, of the south transept gable. We shall then be able to test better than we now can the accuracy of the various supposed roof lines. Mr. Scott and some of the St. Alban's people—Mr. Toulmin and Mr. Owen Davys in particular—when they are discussing the question of the existing roof seem to think that we have very short memories. It is notorious that Mr. Scott's Report of June 25th certified that the roof could be repaired, and that it was intended to be repaired and made "serviceable" by his father, and though in this Report he never alluded in any way whatever to the scheme of erecting another over it or in its place, yet that at a meeting held within two months of its date he allowed it to be condemned as being "ruinous," and "beyond repair," and "perfectly rotten," and is himself reported to have said "that if it came to be a question of sacrificing the old roof, which was rotten, and the erection of a high-pitched roof, he would go in for the latter." He did "go in," under pressure, as I always supposed, for the latter, and was appealing only the other day for money for a lead covering to it without a word of public protest against the destruction of the old roof and ceiling. And he must forgive me for saying that if it had not been for the interference of the Society of Antiquaries, destroyed it would have been without one word of public correction by him of the absurdly incorrect accounts of its condition, its design, and its history, given in the *Times* in August last, and in his presence at the St. Alban's meetings, by gentlemen like Mr. Owen Davys, who it must be supposed had never seen or examined the work which they were so anxious to condemn!

The scheme to which (by a majority, as I now understand, of one of those present) the Committee have now given their adhesion, has been delicately described by me as being "strange"—I might have called it "impossible." Mr. Scott says that he will erect his new roof "independently" of the old one, and that he will put his new principal trusses "side by side with the old ones." That is to say, that without disturbing the old work he will mix up with it the timbers of a new queen-post roof. He must see, if he will reflect, that the only way of doing this is by placing his new tie-beams above the ridge of the present roof, and not side by side with them unless he dispenses with tie-beams altogether, which, he will agree with me, would not be wise, and which, at any rate, was not his design. As to the ceiling of the nave, there seems to be no question in Mr. Scott's mind. He is ready to treat it all as the western portion has been treated, to take it down and then to put up a new ceiling and paint it afresh. My hope was that, if the old roof were repaired and rendered serviceable, there would be no need whatever to do this. The contractor, evidently, is like most contractors, and prefers new work to old, and does not much care to preserve any of it; but any one of experience in such matters knows how often it is easy to preserve such a work in its place, though it may be quite impossible to take it down and reinstate it afterwards. As far as we could judge, the ceiling generally is in a sounder state than that of the three bays which Sir G. G. Scott at considerable expense preserved and restored over the choir.

To sum up. It seems to me that this proposal to alter an old work by the destruction of a roof which can be restored is calculated to give an enormous impetus to those who object to any restoration whatever of ancient buildings. The only pretence for doing it is that it will effect, in Mr. J. O. Scott's opinion, "a vast improvement." I well remember not so many months ago sitting by Sir Gilbert Scott's side, at the Institute of Architects, when the charge was made against us that we took down old flat roofs under pretence of improvement, by substituting steep roofs, and how indignantly we both repudiated the charge. Mr. J. O. Scott says that it is foolish to object to such a scheme as his proposed combination of a new steep fir roof with what can be kept of the heavy old flat oak roof, because "half a loaf is better than no bread," to which the obvious answer is that a whole loaf is better than half a loaf. But if the power of the St. Alban's Committee is as great as they suppose it to be, and if the faculty which they hold for the repair and restoration of the Abbey does really give them the power to do such entirely novel works as they propose, I submit to them and to Mr. Scott that his Report and their decision still require further revision. If the nave roof at St. Alban's were, as was so stoutly asserted in August last, rotten and beyond repair, I should have agreed with them in the propriety of raising the ridges of the roofs *to the level at which they stood when the tower was built*. I should do so, because at this level it would be possible hereafter to look forward to all the roofs being as they once were at the same level, and because then the finest feature of the cathedral,—the central tower,—would not be shorn of the proportion its builders intended it should have. It is the one really magnificent architectural feature in a building whose exterior is in every other respect inferior in design to all our finer cathedrals. And when Mr. Scott asserts, as he does, that the reduction of more than a fourth of its height above the nave roof will not affect its proportions or appearance, I confess I hardly know how to express the astonishment with which his assertion fills me.

George Edmund Street.

ENLARGEMENT OF LONDON BOARD SCHOOLS.

The School Board for London are about to incur a considerable expenditure in the enlargement of several of the recently-built schools in the metropolis, having agreed to accept tenders for the enlargement of the Waterloo-street school, Hammersmith, at a cost of 5,889*l.*; also 10,225*l.* for the enlargement of the Gifford-street School, Islington; 3,056*l.* for the Hanover-street School, Islington; 5,084*l.* for the Sumner-road School, Peckham; 2,639*l.* for the Tennyson-road School, Battersea; and 3,130*l.* for the High-street School, Bromley; being a total outlay in these several enlargements of 30,023*l.* They also propose to erect new schools in Hackney, Lambeth, Marylebone, and Southwark.

ARCHITECT OR SURVEYOR? QUANTITIES AND CONTRACTS.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association, on the 20th inst., a discussion on this subject was opened by Mr. Alexander Payne, with the following paper:—

"Architect or Surveyor?" This is the text that has been given me to open a discussion upon, and I feel it is by no means an easy task,—the feud between the "artist" and the "practical man" in our profession being almost as bitter, sometimes, as the "Battle of the Styles." A. says of B.,—"He may be a very good man at shop-fronts, or roads, or quantities, but he is in no sense an artist." B. says of A.,—"He draws very pretty pictures, but his plans and construction are wasteful, and he is not a man of business, and lets his client in for all kinds of 'extras.'" Which of these two is most in the right, and towards what branch of the profession should the student chiefly direct his studies? Should the man who means to practise as an architect learn also the business commonly known as "Architectural Surveyor"? and is it advisable for a young architect to take out his own quantities? The last question is the one I undertook more particularly to bring before this Association for discussion, though the heading, "Architect or Surveyor," permits the discussion to travel over a wider range. I propose, in the few remarks I shall make, therefore, to confine myself chiefly to that point, leaving to others who will follow the many other important points that are suggested by the subject under discussion. I venture to submit that the practical knowledge required, and careful dissection of a building made by a surveyor in preparing quantities,—analysing, as it were, each detail of a design into its constituent parts, and ascertaining the amount of labour and material in each,—is more necessary to an architect who wishes to have a thorough grasp of his work, than is a knowledge of anatomy to a figure-painter, and that it is highly advisable for an architect, on commencing practice, not only to be able to take out quantities, but also to join the profession of quantity surveyor to that of architect; and that it would be very much to his client's interest, as well as to his own, for him to take out the quantities of his own buildings. In fact, I would go so far as to say that it appears to me that an architect at the commencement of his career is hardly fit to look after his clients' interest, and make the best use of the materials at his disposal, or even to write the specification properly, unless he possesses the knowledge proper to the quantity surveyor. Of course, I am not addressing myself to those older members of the profession who have acquired such an extensive practice that they are compelled to devote themselves to this or that branch for which they have developed the greatest aptitude; though even these, I fancy, would generally acknowledge that an acquaintance with other branches acquired in former life was invaluable. But, I take it, the particular question we have to consider here is, how can the younger members of the profession best prepare themselves for and carry on their practice to the greatest benefit of their employers, and to the credit of themselves? Supposing a design to be prepared by an architect who has not had much experience, and who knows nothing about quantities, I think it will generally be found that there is a vagueness about the whole thing, especially about the details, or the materials are shown put together in a way that cannot be carried out by the builders. Then there is perhaps a worse looseness about the specification; the roofs are to be "properly" constructed, the stonework is to be "properly" put together, the joiners' fittings are to be "properly" made,—in fact, the whole specification seems to be, do everything "properly." This may be proper, but is not very explicit. Then the quantity surveyor has to take this up, and finds himself very much thrown on his own resources in matters of construction and detail, and unless he re-writes the specification it will generally turn out that though the main outlines of the design may be the architect's, as represented by the general drawings, the way in which the work is to be practically carried out is dictated by the quantity surveyor, as represented by the bill of quantities. But this document only gives results, and the quantity of work in the whole building, and not the amount in each detail, which information is contained in the dimensions usually

ept in the surveyor's office. The builder, again, is left to *his* resources as to the manner of carrying out the work (always with the exception that it is to be done "properly"), and a builder's resources are wonderful, but they chiefly lie in the direction of omitting and cutting down, so that the work as carried out is probably different again to the intentions of the quantity surveyor, and the client is a loser. Then comes the reckoning day. Doubtless there have been various alterations rendered necessary or required by the client during the progress of the works, and an architect ignorant of quantities would be unable to see with precision how these affect the rest of the work, either as extras or deductions, and the builder, whose propensities seemed before to be chiefly in the cutting-down line, now developes amazing abilities in the putting-on way. He has "lost tremendously by the job"; this alteration had "stopped all his men and put him to vast expense"; that extra was "a very serious consideration"; whereas any deductions [brought forward are "mere trifles," and "ought not to be mentioned"; or perhaps he thinks the only way that he can be properly paid is by setting aside the contract and by an enormous bill for time and materials. I am not saying that every contractor, or the majority of contractors, will act in this way, or that contractors are any worse than other people; there are some, no doubt, that could be very well trusted to carry out a work without a contract at all; but I am supposing the worst case, because it may be the fortune of any one to meet with it, and every architect, like a good general, should hope for the best, but be prepared for the worst; and in a case of this kind, where an architect had been acting, as it were, independently of the quantities, it might be exceedingly difficult to maintain the contract, or, at any rate, to prevent the client from being saddled with a large amount of extras, priced on a very different scale to the prices in the original contract. Let us now consider how the above case would work supposing the architect to have himself taken out the quantities. The general drawings will be prepared, and probably the details and specification only partly, when the quantities are begun; as each part of the work is taken out in the quantities, the details and part of the specification referring to it will probably be finished in exact accordance with it, and probably the careful dissection necessitated by taking out the quantities will suggest to the architect many ways in which the details of the work can be carried out better or more economically than he had at first intended, thus improving the design and saving his client's pocket. When all is finished, the drawings, specification, and quantities will agree, and each and all explicitly show the way in which the work is to be carried out in detail. As the work proceeds, if any extras or deductions are required, the architect has the dimensions at hand, and can at once see how this or that detail is affected by the alteration, and adjust the difference upon contract prices. Such an arrangement is the fairest for all parties, and is only disappointing to a contractor who has entered upon the work with intention of making his profit, not out of the contract itself, but out of the extras he hopes it will carry in its train. I should be very glad to have the opinion of those gentlemen who take part in the discussion as to whether, especially when the architect acts as his own quantity surveyor, the quantities themselves may not, with great fairness to all concerned, be made the basis of the agreement and contract. That is to say, the builder contracts to do the amount of work in the quantities for so much, any more to be added or any less to be deducted at contract prices, a schedule of which is given. I know that it is argued against this,—first, that in this case a client would never know what he is going to pay for the work, on account of possible errors in the quantities; and secondly, that by this plan a quantity surveyor would be shirking the responsibility which ought to rest with him to supply a correct list of quantities. In reply to this I ask,—first, does a client under the system commonly adopted always know what he is going to pay for the work? and secondly,—does the responsibility towards the builder, always hanging over the quantity surveyor's head, act detrimentally or no towards the client's interest? Does not the fact that the quantity surveyor is paid by the builder, and is responsible to the builder, tend naturally to make him favour the builder? There are many anecdotes which occur to me that indicate that this is the case. I have heard of a contractor calling on a surveyor, and pointing out to him a clerical error in the quantities, and demanding reparation, on which the surveyor said, "Then it will be my duty to go through the whole work as executed, and see how it agrees with the quantities!" on which the contractor took up his hat, and beat a quick retreat. I think it would be a good arrangement for clients, and a fair one for all, if they were themselves to pay the quantity surveyor, and if the quantities were made the basis of the contract. There would be no inducement then to make the quantities anything but what they should be, namely, an exact, close, and accurate statement of the work to be done, without fear or favour to any one. It would tend, too, to remove a certain underhand look about the payment for quantities that now exists. In many cases the client believes that the fees he pays to the architect cover all the professional charges in connexion with the work. He pays the builder for the quantities without knowing it, and the builder passes on the money to the quantity surveyor. If it comes to the client's knowledge that he has paid the extra amount for the quantities, he very probably looks upon it as an imposition, and I have known of cases in which he has positively claimed the amount back from the architect. How much better would it be for all if it were openly recognised that the bill of quantities is a necessity as much for the client's interest as any body's, and if he paid for it directly and openly. It is impossible in a responsible profession like ours to have things done too openly and above board. Another important argument in favour of uniting the professions of architect and surveyor is that by such an arrangement there is less danger of an architect exceeding his estimates. I will mention a case in point, though I am not at liberty to give names. A client comes to an architect and instructs him to prepare plans for a house, the cost of which is not to exceed 8,000*l*. The design is made and approved; a quantity surveyor is appointed, and estimates are obtained, the lowest of which amounts to 12,000*l*. The client was willing to spend 8,000*l*., but not 12,000*l*., so he throws over the design and goes to a contractor, who makes him a fresh design, and carries it out. In process of time he receives an account from both architect and quantity surveyor. He does not object to pay the architect a fair sum for the plans, but objects to the account of the quantity surveyor, and especially that he should have to pay on the 12,000*l*.; but ultimately he had to do so, because it was held that it was not the surveyor's fault that the cost came to more than the client anticipated,—he simply had to prepare quantities to given plans. Now, though this might be just as between the client and surveyor, there is no doubt the whole case was one of hardship for the client, and not calculated to raise his opinion of either profession. If the architect and surveyor had been the same person, probably the incident would never have occurred,—the architect would have seen the costliness of the work before, and would have explained it to the client, and the expensiveness of the design would have been reduced before tenders were invited. This discussion will naturally suggest the further question, should an architect confine himself to designing and carrying out buildings and works of a decorative character, or should he undertake valuations, estimates of dilapidations, land surveys, general superintendence of building estates, &c.? A generation ago I suppose there is no doubt that these would have been all undertaken by an architect, and most practitioners in the country would now accept work of this class; but in town, division of labour in our profession seems to be on the increase, and some architects not only avoid this class of work, but confine their attention principally to one particular class of buildings. Thus some are more especially ecclesiastical and some secular architects. The quantity surveyor has become a separate profession and the surveyor of dilapidations and valuer another; and probably this division of labour may lead to better work when the particular division is adopted by an architect who finds that that is the particular branch in which his services are most appreciated by the public;—but I certainly think it would not be wise for a younger member of the profession who will have to depend upon his business for a livelihood, to neglect these, for the very obvious reason that he may not find, when commencing business, a large amount of work flowing in of the particular sort he prefers, and he may lose many opportunities in the other direction. When he finds a large amount of employment in one particular direction it will be a much better opportunity to turn specialist than to start as one at the beginning of his career,—though certainly, one who can afford to wait, and is determined to devote himself entirely to architecture proper, that is, the designing and carrying out of buildings, and declines all temptations to enter upon the other branches mentioned in order that he may have all his time for improvement in the line he has chosen, is, it seems to me, much to be approved; but even he is by no means exonerated, so it seems to me, from the many practical studies relating to architecture, and especially from studying quantities. If he educate himself in the fine-art branches alone, for instance, at the commencement, he may find himself a draughtsman of pretty pictures, but not an architect. There is so very much to induce the student to spend his time chiefly in the artistic studies of our profession—they are so fascinating in themselves, they seem to be the chief means by which the architect makes his fame; they will enable him (so, no doubt, every young architect flatters himself), by a successful competition, to step at once into the foremost rank, that I cannot forbear making a few remarks in favour of devoting more time to practical studies. For one who makes a name by successful competition, twenty, perhaps equally clever, but not quite so lucky, are nearly ruined by them. I believe it is better, and more likely to lead to lasting practice, to patiently and laboriously carry out a small unpretending job without much architectural pretensions, but in every point of which the best is made of the client's money, and all is well done, than to win a competition in which the showy drawings have to be cut down and pared to something very different to what the coloured perspectives portrayed. Why is it that we may pass through suburb after suburb of this metropolis with row after row of residences and other buildings of considerable magnitude, in which the hand of the architect is conspicuous by its absence? Why is it that the sanitary engineer and ventilating doctor, to say nothing of the zinc chimney-pot man, are not unfrequently called in to remedy the work of the architect? Why is it that there is an idea abroad amongst the public that the architect is a kind of expensive luxury, well enough for *dilettanti* and those who have plenty of money to spend in ornamentation, but who can be very well done without in ordinary practical buildings? Is it not because we are much in the habit of thinking too exclusively about the appearance of our buildings? We do not sufficiently look at the matter from our client's standpoint, who probably wants, first, that his building should be adapted to its purpose, comfortable, well lighted, dry, convenient; that his money should be wisely and judiciously expended; and, of course, also that it should be in good taste. I once heard a distinguished man in this room some years ago define one of the main duties of the architect to be "to minister to the pleasures of the aristocracy." The definition very much grated against my perceptions at the time, and I felt our noble vocation lowered by it to the level of that of a pastry-cook or a man-milliner. I hope this discussion will be undertaken in the spirit that it is the architect's duty to minister to the health and comfort and general prosperity of everybody for whom he has any business to do,—if he can, —and by so doing I believe he will also in the long run conduce to his own prosperity as well.

In the discussion which followed,

Mr. T. Roger Smith said he had always felt that the question of quantities was a little in danger of being looked at from a wrong point of view. It ought to be remembered that to a large extent the quantities, and the drawings and the specification, represented the building from two different sides. The drawings and specification represented the building as a whole, —the structure which the employer desired to have, as the architect had designed it, and as it formed the subject of the contract. The quantities, on the other hand, represented not the building at all, but the amount of stone, brick, timber, paint, glass, lead, labour, &c., which would have to be expended in the erection of the building. For a great many purposes, therefore, the quantities were not the same thing as the drawings and specification, and hence the objection entertained by some people

to making the quantities part of the contract. Although the bill of quantities was a document with which the client was not concerned, but merely a document to guide the builder in tendering, it was, according to the present methods of practice, an indispensable document; for very few builders of any position and character would tender for works without having the quantities before them. As the bill of quantities was so essential, its preparation ought to be, in some more direct way than at present, supervised by the architect, and although he (Mr. Smith) thoroughly agreed in the opinion that an architect ought to be able to take out his own quantities, he certainly did not believe that it was, as a rule, advisable for him to do so. The practical knowledge of his profession, which would alone enable an architect to take out quantities, was no less requisite in the preparation of working drawings, plans, and specifications. There were many objections to an architect taking out his own quantities, although, on the other hand, there was much to be said in favour of his doing so. One objection,—and a great one,—was that as the quantities were prepared for the builder's use, it was necessary, under existing conditions of practice, that the builder should pay the architect for their preparation, and any monetary payment by a builder to the architect who was supervising the erection of a building by him (the builder) was open to be misconstrued, and might, in some cases, lead the architect to feel that he was in a less independent position than he would wish to, and ought to, occupy. It would be desirable, wherever the architect, under exceptional circumstances, took out his own quantities, for him to be paid for the work by the person for whom the building was to be erected; but even then he thought the architect would not be in so favourable a position as when the quantities were taken out by an independent surveyor, although under his (the architect's) supervision. Besides, an architect who took out his own quantities was liable to be unconsciously biassed by his own work, and to under-estimate the quantities, and therefore to understate the cost of the building. Such a state of things only led to disputes and delay in the settlement of accounts. Of course, another objection to architects taking out their own quantities was that many of them would be doing laborious and clerkly work, with an expenditure of time and energy which could be better and more profitably devoted to designing and planning.

Mr. T. H. Watson said he agreed with a great deal of what Mr. Smith had said, although he thought that some of his arguments refuted themselves. There were many young architects at the present day who took out the quantities for their own buildings, and he thought that under certain circumstances there could be no objection to such a practice. Now he wished to clearly establish what those circumstances were, and in so doing he would call attention to the opinion of Mr. Roscoe, which the editor of the *Builder* had been good enough to publish,* as to the legal relations of quantity surveyors to architects, builders, and others, and he would stop to say that he thought the editor of the *Builder* was deserving of the thanks of the Association, and of the profession generally, for having gone to the expense and trouble of obtaining and publishing that opinion of counsel. Mr. Roscoe pointed out very clearly that no work could be undertaken by one man for another without responsibility, although, by express contract, any unusual or out-of-the-way arrangement would be binding. An important question for consideration was, what special contract (if any) it was necessary to have if the architect wished to take out the quantities for his own building. It was all very well to say that the quantities should be taken out by an "independent" man, but why was the quantity surveyor more "independent" than the architect? The quantity-surveyor was certainly not an "independent" man; he was rather doubly dependent, for he had to serve two masters, —the architect and the builder,—neither of whom submitted to his authority. Mr. Smith had spoken of the advisability of having a "clear-headed" quantity surveyor to prepare the bill of quantities, and he (Mr. Watson) quite agreed that, for one who undertook such work, clear-headedness was most essential. But supposing the architect to possess the necessary clear-headedness, knowledge, and industry, to take out his own quantities, how did he sacrifice his independence, especially when (as was mostly the case) the contract contained some such proviso as that "all matters in dispute shall be determined by the architect, whose decision shall be final and binding to both parties"? With such a clause as that in the contract, the architect was a perfectly independent man. As to the question of payment for quantities, it was perfectly well known that, as a general rule, he who paid was master and he who received was servant; but since it was usual never to undertake that any of the tenders made on bills of quantities would be accepted, the architect retained his independence, and the client or building owner soon learned that if he did not accept any one of the tenders sent in he had to pay for taking out the quantities; for the momont that a man began the undertaking of building a house, he, and he alone, must pay for everything. The quantities were paid for by the client, though indirectly, to the builder, who in turn paid the quantity-surveyor (who might be the architect himself) for his services. That was a roundabout, informal, and unsatisfactory way of doing business. The present method of practice as between architect, quantity-surveyor, and builder was suggestive of nothing so much as of three persons playing the game of "blindman's buff." The architect, by his drawings and specification, pointed out what he wished to be done. The quantity-surveyor examined the drawings and read the specification, and, by his bill of quantities, pointed in another direction. The builder next entered upon the scene, and pointed in an altogether new direction. The result of that triangular sort of business was that the "doctrine of chances" was very much increased. Oliver Wendell Holmes had humorously pointed out how two persons talking together were really six persons. There was firstly John as he fancied himself to be; secondly, John as he was understood by Tom; thirdly, John as he really was; fourthly, Tom as he fancied himself to be; fifthly, Tom as John understood him; and sixthly, the real Tom. Applying that state of things to the three separate persons of architect, quantity-surveyor, and builder, it would be readily seen how the number would be increased. As to making the bill of quantities part of the contract, he believed that unless they were made part of the contract it was not only dangerous, but highly objectionable, for an architect to prepare or touch the quantities; but before the architect would be justified, under the present conditions of professional practice in making the bill of quantities part of the contract, it would be necessary for him to obtain his client's distinct concurrence, and no bye-paths or side-ways should be resorted to. Under such circumstances he could see no objection to the architect taking out his own quantities if he were so minded. The objection that payment would have to be made by the builder to the architect for preparing the quantities was more apparent than real. In point of fact, the builder did not pay for the quantities, and the money which he paid the architect for them was not his, and never was his. At the same time, it would be more satisfactory if, in addition to getting his client to adopt the bill of quantities as part of the contract, he could induce him to pay him for the quantities, for in such case the architect would be beyond the possibility of reproach, and it would be better for the client. Moreover, he believed that the builders themselves would approve of such change in practice.

Mr. W. Hilton Nash said he had generally found that bills of quantities prepared by professed quantity-surveyors had a tendency to increase the cost of building to a client, but he thought the present system was a necessary evil, as few builders would tender for works except on the basis of a bill of quantities. The quantity surveyor could, he thought, hardly be called "independent"; he was in a very peculiar position with regard to the architect and builder. No man could serve two masters, but certainly the quantity surveyor had, in a measure, to serve two masters,—the architect and the builder, and as he was paid by the builder his tendency was to serve the builder more than the architect. He was of opinion that it would be a very objectionable course to make the quantities the basis of the contract, and could not agree with Mr. Watson in thinking that the builders would approve of such a course; for if the quantities were made the basis of the contract, the builders would be tied hand and foot in every way. He believed that the present system of having the quantities taken out by some one other than the architect had mainly arisen of late years through architects not making sufficiently careful drawings and specifications, owing to the high-pressure speed at which business was now conducted. Thirty or forty years ago it was the custom to make most complete and elaborate specifications, which were practically as serviceable to the builder as the bill of quantities of the present day. He quite agreed with the author of the paper that architects should retain in their own hands as many branches of surveying and cognate work as possible.

Mr. Cooper said that most architects would admit that it was a good thing, and a necessary part of an architect's education, to know how to take out quantities; but why should they not be allowed to use that knowledge, as they had opportunity and inclination, in taking out the quantities for their own works? The architect of a building would get more real knowledge of his building by taking out its quantities than by any other method. He was in favour of making the quantities part of the contract, believing that no honest builder would mind being tied down.

Mr. Cole A. Adams said he had always been accustomed to think that there was room for both architects and surveyors, but the question really raised by the discussion was that of the artist *v.* the practical man,—which of the two should an architect elect to be? In his opinion an architect ought to be both. As to the "quantities" question, the taking out of quantities taught the architect habits of method, care, and precision, making him familiar with every part of his work in hand, enabling him to check his drawings and specifications, showing him where a saving could be effected, and where fancies could be displaced by facts, adding to his store of practical knowledge in many ways, familiarising him with measurements and prices, and enabling him to readily discern what materials could be economically used and what dispensed with. How often was it the case that even with the utmost care in working out plans and specifications, errors would creep in, which would be detected in taking out the quantities? He was not so confident as to making the quantities the basis of the contract. At the Conference of Architects, held in June, 1874, that knotty question was discussed and afterwards "shelved." A committee of men well qualified to report on the matter was appointed, and suggested that it would be advisable to incorporate the quantities in the contract, and it was stated by Mr. Arthur Cates that out of over sixty replies sent in answer to the question, fifty were in favour of the suggestion of the committee. That report so alarmed the Council of the Institute, that they passed a resolution against its adoption, and when the question came on for discussion, much was said against it, but many spoke in favour of it, among them Mr. Waterhouse, whose great experience on public domestic works entitled his opinion to respect. The quantities might very fairly in his (the speaker's) opinion be made a part of the contract, with an arbitration clause for the settlement of any questions which might arise. Where the quantities were taken out by the architect,—and an architect who could take out his own quantities was less likely to make designs that would exceed the outlay proposed by the client,—the client should pay the architect for them direct. As to the general question of range of practice, he thought any architect might, without derogation (if he were duly qualified), undertake valuations, dilapidations, land surveying, the general superintendence of building estates, &c.; for what men could be better gifted for that class of work than those who, as architects, had been educated in the theory and practice of the art of building? Would architects be wise to turn over that large and profitable branch of work to lawyers, auctioneers, and estate-agents, who, admirable as they were in their own vocations, were not qualified as architects were? Could any one, in short, really define where the duties of the architect ended and those of the surveyor began? The profession had several branches or departments of work, and the architect should be free to practise in one or several of those branches if he saw that he could do so with advantage to himself and his client. The "art-architect" had no right to look down upon and snub the general practitioner. However brimful of artistic qualities he might be, the architect was nothing if not practical.

Mr. Robert Walker demurred to the statement that a bill of quantities was entirely the

* See p. 1294, *ante*.

growth of modern architectural practice, and thought that Shakspeare could be quoted to show that quantities were, at all events, known in his day. He thoroughly agreed with previous speakers that an architect ought to know how to take out quantities, but he did not believe it was desirable that an architect should take out the quantities for his own buildings; for if he did so, he must place himself in an awkward position in the event of any dispute arising. As to making the bill of quantities a part of the contract, it was not always possible to do so, even if it were desired by the architect; for the legal advisers of town councils, local boards, vestries, and other public bodies were generally unwilling to have anything to do with the quantities. The question had been raised whether the professional quantity-surveyor was not unduly biassed in favour of the man to whom he looked for payment, and to whom he was responsible, viz., the builder. Now, as a class, he believed that the professional quantity-surveyors were men of the highest integrity, and he should be sorry if anything said in the course of the discussion should for a moment be liable to be construed to the detriment of those gentlemen. On the other hand, the architect who took out his own quantities was certainly in danger of being biassed in favour of his own pre-conceived notions, and to understate the quantities, and therefore the cost, of his building. He agreed with the rules which had been laid down by the Institute as to quantities. Many young architects urged that they ought to be allowed to take out the quantities, not only of their own buildings, but of buildings designed by other architects, but many architects in practice objected to have the quantities of their buildings taken out by men who were practising architects as well as quantity surveyors, and sometimes with reason, for in one instance he knew of, a set of drawings and specification for a villa residence in the North of England were put into the hands of one of those gentlemen, who not only took out the quantities, but traced the drawings and erected a precisely similar building in the South of England, using the same bill of quantities as he had made for the first building! As to surveying work generally, the time was coming rapidly on when the public and the profession would demand some sort of public recognition of the duties and qualifications of a surveyor, for very frequently auctioneers and others who knew nothing whatever of building dubbed themselves "surveyors," and then presumed to take upon themselves duties the satisfactory performance of which demanded the exercise of a thorough technical knowledge of construction and materials.

Mr. J. Douglass Mathews said that whatever difference of opinion there might be on individual points, it seemed to have been generally admitted by all the speakers that the architect who was worthy of the name must also be a surveyor of some description. Quantities, as at present understood, were a thing of comparatively recent growth, and they had come to be so largely made use of owing to the increase of competition in the building trade, so that several builders simultaneously could have a definite and identical basis on which to tender for a given building. He fully agreed with almost all that had been said by Mr. Payne. One question had been overlooked in the discussion, and that was the question of quantities from the client's point of view. Now the client or building owner, as a rule, knew nothing at all about quantities. He went to an architect in whom he placed confidence, and told him that he wanted certain buildings erected at a cost not exceeding a certain sum. He assumed that he had nothing to do with anybody but the architect and builder; but the architect committed or delegated a portion of what the client considered to be his (the architect's) work, and a very responsible portion of that work, to some one who was an entire stranger to the client. He could not but think that the prevalence of that system of deputing the taking out of quantities was largely due to the inability of many architects to take out their own quantities. He agreed with other speakers as to the great practical benefits to be derived by architects taking out their own quantities. In fact, an architect thoroughly knew his building from beginning to end when he had taken out its quantities. He was strongly in favour of making the bill of quantities a part of the contract, as that was the fairest course for all parties. It was right neither for the builder to do more work than he was paid for, nor for the building owner to pay for more work than was actually done. One reason why architects should, wherever possible, take out their own quantities was, that they should keep as much work as they could in their own profession, and not let any one branch of their work pass to an outside profession. They had already lost one important branch of professional work, and they stood the chance of losing two or three other branches. As the profession was a very comprehensive one, it was of course optional to any members of it to become specialists in the special branch in which they felt they could best serve the public and promote their own advancement. But quantity-taking ought certainly to be part of the training of every young architect. As to the payment made by the builder to the architect when the latter took out his own quantities, he (Mr. Mathews) could not see any but a fanciful objection to it. It certainly was a reflection upon the probity of the profession to say, because an architect received a cheque from a builder for work done in taking out the quantities, that the architect was under any obligation to the builder. The honour of the profession was surely sufficiently strong and well-established to guard against any such imputation. Of course it would not be possible to get paid for the quantities by the client, as he would not be able to disabuse his mind of the idea that he was paying the architect more than five per cent.

Mr. Payne, in closing the discussion, said he had nothing to say, as one speaker had answered another. He was surprised that no one had championed the views of the "art-architects."

The Chairman, in putting a vote of thanks to Mr. Payne for opening the discussion, said he thought that the admirably practical way in which the discussion had been sustained was a sufficient answer to those who thought that the members of the Association could only sketch and make pretty pictures.

THE LEGAL RELATION OF QUANTITY SURVEYORS TO ARCHITECTS, BUILDERS, AND OWNERS.

SIR,—As the above question is a most important one to surveyors generally, perhaps you will kindly allow me space (notwithstanding you have announced the close of the correspondence in this matter) to dissent from the opinion of your counsel.* I have just consulted an eminent special pleader in the Temple upon this same question, whose name I am not at liberty to mention, as the matter is now in a solicitor's hands. His opinion is, that without doubt the architect is the agent of the building owner, therefore not liable to the surveyor for his charges; but that the builder also is simply an agent to the principal, to pay the money to the surveyor; therefore, should the builder misappropriate the charges of the surveyor, which he has been asked to include in the amount of his tender for the works, simply for the sake of convenience, the principal or building owner is alone answerable, and it is for him to recover from his agents afterwards. If this opinion be of any value or not, at least it will show that our recognised exponents of precedent (for of law, as you justly remark, there seems to be none in this matter) differ considerably in their opinions.

"FOGGED."

Boring.—An endeavour to reach the water-bearing stratum of the lower greensand is now being carried out by the New River Company. A well has been sunk to a depth of 900 ft., at Turnford, near Cheshunt, in Hertfordshire, and is about to be carried deeper by means of a diamond drill, which has just been manufactured for the Diamond Drill Company, Victoria-street, Westminster. The drill is the largest ever made, and is constructed according to the patent design of Mr. James K. Gulland, the company's engineer. It is made of steel, in the form of a ring, 9 in. deep by 23 in. in diameter. On its edge, firmly embedded by means of plugs or holders, which nevertheless are capable of easy removal, are forty-eight opaque diamonds. This "iron crown" will be screwed on to the tube at the base of the boring-machine, and will be driven by steam power. The contract for the boring is in the hands of Messrs. T. Docwra & Son, who have also sunk the well to its present depth.

* *Builder*, p. 1294, *ante*.

THE HIGH SANCTUARY AT JERUSALEM.

BRIEF REVIEW OF THEORIES.

SIR,—Owing to the pressure of other business the continuance of the discussion at the Institute on the above subject has been postponed to the next ordinary meeting in January.

It was my intention to take part in this discussion, and I forwarded some six or eight plans, which were exhibited in the room, in illustration of what I wished to say. As I am leaving London for Rome on the 21st inst. I shall not be in town again before the discussion is ended. I beg, therefore, permission to say a few words in your journal in explanation of the plans which I propose to leave at the Institute for reference, it not being the custom of the Institute to receive written contributions to discussions.

Since Dr. Robinson published his Biblical researches in 1811, and Mr. Fergusson his work on Jerusalem in 1847, the study of Jewish antiquities and topography has considerably increased in interest.

With a view to the elucidation of the difference of opinion existing as to the appropriation of the Haram area at Jerusalem at various periods of its history, I have drawn to one uniform scale several representative examples, viz.:—

1. Bartlett's, given in 1842.
2. Fergusson, in 1847 and in 1878.
3. Lewin, in 1863 and in 1871.
4. Count M. de Vogüé's, in 1864.
5. Warren, in 1878.

Bartlett represents the prevailing opinion prior to the publication of Mr. Fergusson's original work in 1847. He gives three-fourths of the whole Haram area to the Temple of Herod and the remainder to Antonia, which he conceives to have extended along the whole northern wall of the Haram with a trench outside of it.

Lieut. Conder's plan is a resuscitation of this theory; both authors place the Sanctuary on the site of the Mosque of Omar, but Conder limits Antonia to the north-west corner of the area, like De Vogüé.

Count M. de Vogüé devotes the entire Haram area to the Temple and its courts, excepting about 200 ft. square at the north-western corner, where he places the Tower of Antonia, thus leaving about one-third of the northern wall of the Temple courts exposed between Antonia and Birket Israil.

The inner Temple in both these designs occupies the highest part of the Haram area. And it is this disposition which as aforesaid is proposed to be followed by Lieut. Conder.

Lieut. Warren limits the area of the Temple and its courts to about two-thirds of the Haram area, or, roughly speaking, about 1,000 ft. square, the Golden Gate being taken as the northern limit. Antonia is made to occupy the space between the Birket Israil of the western wall, at the northern extremity of the Haram.

The inner Temple is situated half on the upper and half on the lower platform, the outer side of the northern wall being in line with the central axis of the Mosque of Omar,—the only apparent reason for fixing the position of the altar and principal entrance to the inner Temple where it is shown being that the main central axis may be a line drawn from the summit of Mount Olivet at right angles to the eastern façade.

In each of these schemes Herod's great Stoa Basilica on the southern side is carried over the substructures called Solomon's Stables.

Mr. Fergusson's criticism of Count M. de Vogüé's restoration, in an appendix to his latest work, is applicable to all these allied plans.

Mr. Lewin's theory also occupied the whole area of the Haram, but it is so different from the preceding that a more particular description of his views is desirable.

Mr. Fergusson still stands alone in his opinion that not more than about a third of the area of the present Haram formed any part of the Temple enclosures in the time of Christ, and still has in the time of Solomon (see the plans given in his book, one of which shows the area supposed by him to have been occupied by Solomon's temple and palace).

But, to return to the late Mr. Lewin, whose careful study of this subject, for upwards of a quarter of a century, entitles him to great consideration. Mr. Lewin is recognised by Mr. Fergusson as a "formidable opponent," but reminds us that "he knew nothing of architecture, and was familiar only with the Classical

branch of the literature of the subject." Nevertheless, he comes nearest to Mr. Fergusson's theory of any whose plans I have seen.

In 1863 Mr. Lewin published a work on the "Siege of Jerusalem by Titus," with a journal of a recent visit to the Holy City, and a general sketch of the topography of Jerusalem from the earliest times down to the siege.

Attached to this was a map of Jerusalem based on Titus Tobler's map of the Holy City in the time of Christ. The whole of the Haram area is occupied by him. Although the Temple is confined to the square stadium of Josephus at the south-west corner, as first suggested by Mr. Fergusson, Antonia is placed about 250 ft. north of the Temple, but is connected with it by parallel cloisters, which play an important part in his story of the siege. The Macedonian fortress of Acra he situates on the escarpment of rock at the north-west corner of the Haram area. The unoccupied portion on the western side of the area he calls the Cedron ravine, which he considers was enclosed by the eastern wall.

In February, 1866, Mr. Lewin read a paper at the Society of Antiquaries on the "Genuineness of the Holy Sepulchre," followed in March the same year by a paper on the "Mosque of Omar."

Mr. Lewin adopts that disposition of the second wall which excludes the Church of the Holy Sepulchre from the city, and makes it appear to be without the walls, in opposition to Mr. Fergusson's arrangement, which brings it within the walls, and believes that Constantine did not build the Mosque of Omar; yet he does not attribute the Mosque to Mahometans, but suggests that it is the Temple of Jupiter Capitolinus, originated by the Emperor Hadrian, but restored or rebuilt by Maximus Daza, who, on the abdication of Diocletian in A.D. 303, became the sovereign of Syria and Egypt, quoting Eusebius, who says "Maximin ordered temples to be erected in every city, and the sacred inclosures that from length of time had fallen into decay he caused to be repaired."

In support of his argument, he refers to the points of resemblance between the Mosque and Diocletian's Temple of Jupiter at Spalatro, which is octagonal, and has an inner and outer peristyle of Corinthian columns and a vaulted chamber beneath the floor under the domical roof.

In 1871 Mr. Lewin read a third paper before the Society of Antiquaries, entitled "Observations on the Probable Site of the Jewish Temple and Antonia and the Acra, with Reference to the result of the Recent Palestine Explorations." This paper was accompanied by a revised plan of the Haram in Herod's time, which shows the Temple occupying the same position at the south-west corner as before, but the Tower of Antonia is shown to occupy as large a site as the Temple at the north-west corner of the Haram, with a fosse on the southern and eastern sides, and a connecting cloister with the Temple on the western wall. The intervening space, being that portion of the Haram area more elevated than the rest, is called the fortress of Acra, while the Cedron ravine, "so-called," and garden of Uzza, flank all three on the east from the Birket Israil to Solomon's Stables.

Mr. Lewin reiterates all Mr. Fergusson's incontrovertible arguments in favour of his plans of Herod's Temple site and the Bridge and Stoa Basilica, and it seems strange he should fail to appreciate his equally cogent reasoning with reference to Antonia and the Mosque of Omar, the classical style of the design of which he fully recognises, and only hesitates to accept Constantine as its founder because he cannot accept the transference of the Holy Sepulchre, though it would seem to require much greater credulity, as Dr. Robinson observes, to accept the present substitute.

It is, however, curious that Mr. Fergusson should have so little to say about the Macedonian fortress, the history of which is so carefully given by Mr. Lewin, and which he finally sums up in the following words:—

"Such is the varied history of the Acra:—

First, a bare rock in the garden of Uzza,
Then the mausoleum of the kings of Judah.
Then a Macedonian fortress,
Then the tombs of King Alexander,
Then a Temple of Jupiter,
Then a church to St. Sophia,
And now a Mohamedan mosque."

Anything and everything but Constantine's Church of the Holy Sepulchre.

Mr. Fergusson's assumption that the Antonia, Acra, Baris, Mido, are all rolled into one, has the merit of simplicity and convenience; but it is difficult at first to conceive that so small a portion of the space now occupied by the Haram area should have been enclosed until long after the siege of Jerusalem.

Nevertheless, it is gratifying to me to find that Mr. Fergusson's main argument has not yet been successfully assailed.

And considering that it is from an architectural point of view that his case is strongest, which is that which is least appreciable by the uninitiated in the ethnology of art prior to the Reformation, Mr. Lewin's partial adhesion to his views is the more interesting and observable.

The projection of new theories is much easier than the disproof of the arguments by which the old one is supported; and whatever new light may be thrown on the subject by independent investigators, so far as my judgment goes, after a patient perusal of most of them, I am driven to the conclusion that the position taken up by Mr. Fergusson is still the most in accordance with trustworthy authorities and common sense.

Edwd. C. Robins.

CRYSTAL PALACE ENGINEERING SCHOOL.

This school concluded its sixth year and eighteenth term on Saturday last. The students in attendance during the term were sixty-seven in number, increased from the nine students with which the school opened in January, 1873.

After inspection of the students' work in the drawing-office, and the various workshops, a large company of visitors proceeded to the lecture-room, where the certificates awarded to the successful students were presented by Mr. Harrison Hayter, M.Inst.C.E., who was introduced by Mr. R. Jacomb Hood, C.E., member of the Committee of Directors.

In addressing the students before presenting the certificates, Mr. Hayter referred to the sadly depressing crisis the country had reached, and was passing through. Hard times had occurred before, as in 1848 and 1856, but the country had got over them, and he hoped that we should do so again. It had been often said that the engineering profession was overstocked, but he scarcely thought this was the case; excepting, perhaps, in the railway department, they had been fairly well employed. Engineering, as they knew, consisted now of many branches, and it might be well for young engineers, instead of dabbling in every branch of the profession, as was the old-fashioned method, to give their special attention to one or two branches on the division of labour principle. They had a wide field for choice, in railway works, harbours, docks, gas, electricity, irrigation, water supply, sanitary affairs, and other branches that might be named.

The examiners were Messrs. R. C. May, C.E., and A. G. Fenn, C.E., both of whom addressed the students in appropriate terms, laudatory of the school and of the students' work.

In replying to a vote of thanks, Mr. Wilson the principal, stated that about 300 students had entered or passed through the school, and it was within his own knowledge that eighty of them were earning their livings as professional men.

WATER-POWER FOR ELECTRIC LIGHTING.

Sir,—Our attention has been called to a letter in your issue of December 14th, signed "M. Paterson," in which various questions are asked in explanation of statements made in our recent report to the Lighting Committee of the Loughborough Local Board, upon the subject of lighting some of the open spaces of that town by means of the electric light, in which we recommended the utilisation of the waste water from the reservoir watershed during the wet months of the year for driving the generating-machines, and stated our conviction that falls of water upon estates and the waste water flowing over the weirs of existing water-mills might be usefully employed for the same purposes during similar periods.

Mr. Paterson has mistaken the purport of our report. What we propose to do is not to construct either waterworks or river works for developing power to drive dynamo-electric machines, but to utilise the waste power wherever it exists in sufficient quantity to be made available, and therefore his remarks as to the cost of reservoirs, and as to the other *et-ceteras* enumerated, and the cost of applications to Parliament and opposition thereto, are utterly beside the question.

Practical engineers and managers of gravitation water supplies from gathering-grounds know perfectly well that, from the time of the commencement of the autumnal rains, throughout the wet months, and until the commencement of the summer season, they usually have very large volumes of water, which they are at present compelled to allow to run to waste. The reservoirs once filled generally remain so, and the excess of water either goes over the safety-weirs, or is drawn off through the deep sluices in order to maintain a flow through the reservoir, and we only stated a fact generally known when we said that every facility exists for converting this waste water into a useful power to generate useful light. Our suggestion, if adopted, would cause the reservoir to be used throughout the wet months for storage of sufficient quantity to equalise the flow during the periods of fluctuating rainfall, and in periods of droughts, or from any other disturbing cause likely to jeopardise the town supply: proper provision must be made, by means of a steam boiler or gas engine, for the continual working of the electric machines.

Objections may, of course, be readily made to our proposals, and we have never in the smallest degree hinted that they were generally applicable; but we do say that they are applicable to the circumstances of the authority to whom our report was addressed, and that we believe they will be adopted by them; and we believe also, from communications we have received, that the hint has not been lost upon many practical men having the control of works. One of the principal objections instanced to us has been the cost of filtration of the water, on the ground that it would be very improper to mix filtered and unfiltered water in the town mains. This objection does not appreciably apply here, however, because, owing to the excellent arrangements of the works, all flood-water, during the few hours it is in a dirty state, is wholly diverted from the reservoir, and nothing but clear and comparatively pure water admitted; and also from the excellent arrangements for cleansing and sand-washing in the filters themselves; in fact, the only expense of filtering throughout the winter is confined to the wages of the man in charge at the reservoir, who, in addition to having various other matters, besides attending to turning on and off the water, now has to fill up his time breaking stones for the adjoining highways. There is, therefore, no reason whatever, on the score of expense, why the whole volume of water should not be filtered; and, in point of fact, the works are now so arranged that it is impossible for any water to enter the town main except through the filter-beds.

Mr. Paterson is entirely mistaken when he supposes that we recommend the establishment of river works and new weirs. Our suggestion is simply to use the water of the wet periods which now flows away in waste. None of the mills on the Soar have sufficient pound room to store the night water for the day's use, except in periods of drought. And if it was thought desirable to continue the lighting during those periods, special means of a similar character to those already enunciated would have to be provided, but for six months of the year at least; and those months, the dark and dreary months, the provision of generating power would be, as we have stated, comparatively costless to those parties now having the right to make use of it. And the value of the power or of the water must be taken to be that of the value of the comfort and enjoyment to be derived from the possession of the light, and cannot be estimated at 4½d. or 2½d., or any other price, per 1,000 gallons, because of the practical impossibility of finding a customer willing to take the water at the times and in the volumes at which it could be delivered or must be withheld.

Hodson, Price, & Hodson.

Reduction.—The whole of the associated builders in Wolverhampton have given their men notice of a reduction of ½d. per hour all round, to take effect from the 18th proximo. The depression in this trade is increasing so fast that last week thirty-five carpenters were discharged from one yard alone in that town, for want of employment.

THE OBSTRUCTION OF RIGHT OF WAY BY THE CONSTRUCTION OF PIERS.

AT the present time there is a good deal of constructive activity exhibited at many watering-places in the erection of piers. Indeed, it is not so long ago that in a description of the town of Douglas, in the Isle of Man, the new pier in that place was commented upon in this publication; and there is scarcely a watering-place or seaport in which these erections, if they do not exist, are being established. It is of some importance, therefore, that those who are engaged in this class of work, and those who are likely to be affected by it, should keep themselves well informed as to what may or may not be done in the construction of piers. We are by no means going through a long string of legal propositions to show how private property may or may not be injuriously affected by this class of public undertakings, but are concerned only with the question of the obstruction of a right of way by the erection of piers,—a subject specially important to those who may undertake such works. For it is scarcely possible to imagine anything more injurious to the pecuniary interest of the proprietors than to be involved in expensive law suits.

The Act of Parliament under which most piers are now constructed is that known as the General Piers and Harbours Act, 1861 (24 & 25 Vict., c. 45), that was preceded by a much earlier Act passed in the year 1847; but it is with the last Act in point of time that we are now concerned, though, since the two Acts are to be read together, they do, in fact, form the general rules in regard to this matter. The last Act, we may say *en passant*, was intended to prevent the necessity of obtaining private Bills, and the machinery substituted were the provisional orders of the Board of Trade, which were afterwards to be confirmed by an Act of Parliament. But in such cases the expenditure was limited to the sum of 100,000*l*.

Now we are all aware how common a thing it is for the public to have access to the sea across certain portions of the shore, and where houses get built along a sea-shore the places where the right of way exists become often really valuable, especially to men such as boatmen and others, who find them what may be termed the high roads to their boats. The two questions which then arise are these: Assuming that such a right exists, and assuming also that the proprietors of a pier obtain the necessary provisional order, and that such a pier is erected on the very spot to which there has hitherto been access to the shore, is the right of the public, or the right conferred on the proprietors of the pier by their provisional order, paramount? And next, assuming that such a public right exists, is a substituted right created by which the public may be permitted to walk on to the pier and descend from it on to the shore adjoining,—of course, without payment? If such a substituted right did exist, undoubtedly it would have serious consequences for many companies and private persons who are or may hereafter become the owners of piers in watering-places and sea-ports. These are, in fact, the questions which had to be answered by the judge of the Chancery Division, in the recent case of the Mayor of Yarmouth *v.* Simmons (47 *Law Journal*, Chancery 792). What happened here was exactly what might take place any day, in any hour, on the coast. In 1874 an Act of Parliament was passed, confirming various provisional orders made by the Board of Trade, under the General Piers and Harbours Act, and among others was an order enabling the Mayor and Corporation of Yarmouth to construct a pier at that town. This work was executed in such a manner as to block up the end of a street from which people had been in the habit of going on to the shingle. Thereupon, as Mr. Justice Fry tersely put it, "the exercise of the right and the existence of the pier became absolutely incompatible." But, as might have been expected, it was decided that the pier had precedence over the right, for the reason that "the pier, having been authorised in that portion, it was absolutely inconsistent with the existence of the right." Equally, also, was a substituted right to go to the pier inconsistent with the order which authorised the proprietors to charge a certain toll for persons walking on the pier, or embarking, or disembarking from it. This reasoning seems wholly incontestable, for once a provisional order has been made and sanctioned by an Act of Parliament, it is obvious that, under the circumstances already narrated, to keep open the old right of way would practically be to abrogate the Act of Parliament and the previous order, for the existence of the pier depended on the extinction of the right of way. But it may be said that a great injury may thus be inflicted on various persons without any remedy. The case which we have mentioned may, however, prevent such injustice in the future. Because those who possess rights which may be injured by such works as the Yarmouth pier should take care early in the day to make certain terms with the promoters of such undertakings, or to obtain such savings of their rights as will prevent any actual or any very large loss. If a railway is made through a man's property under an Act of Parliament, he obtains compensation for any injury he may receive, but he takes care either to agree privately with the company, or to have his interests guarded whilst the Bill is in preparation, or he makes a claim for compensation when it becomes law. Boatmen and others should, therefore, look carefully after their interests in the case of the construction of piers or harbours, and those promoting such undertakings will do well to ascertain what rights exist, and, if possible, satisfy them in a friendly way.

A NEW GOVERNMENT DOCK AT DEVONPORT.

THE foundation-stone of a new dry dock, which is about to be constructed at Devonport, has been laid by Rear-Admiral Willes, Superintendent of the Dockyard. The peculiarity of this dock is that it is to be constructed on an entirely new principle, the steps forming the sides of the dock being surmounted with masonry arches, thus avoiding the increase of breadth at the top, and enabling travelling-cranes to be brought to bear right over the floor of the dock. The preliminary work was commenced in 1876, but two serious mishaps having occurred, much additional expense and delay has been caused. One accident was the bursting of the caisson, and the other was a landslip. When finished, it is stated that it will be one of the finest Government docks in the country, and make Plymouth and Devonport equal as a naval station to Portsmouth or Chatham. It will be 386½ ft. long, 95 ft. broad, with 43 ft. sill, giving over 32 ft. of water at the entrance at ordinary spring-tides, and will take any vessel afloat, or likely to be built, for some time to come.

SIR,—As your report of the 21st inst. of the above, and that of other journals, is exaggerated, I feel it my duty as the contractor to set the matter right.

The slip is about 200 ft. long, and does not contain more than 3,000 cubic yards. A portion of this must have been removed for timber slides, steps, &c. No masonry or brickwork was near it or injured in any way, and the damage to plant and materials, as stated by you to be many thousands, does not exceed 1,000*l*. I have further to state that the works have not been stopped.

JOHN PETRICK.

HYGIENE APPLIED TO DWELLINGS.

MR. B. H. THWAITE, of Bolton, read a paper on "Hygiene applied to Dwellings," before the Manchester Architectural Association, on Tuesday week. He said that seeing the principal questions of the day are how to revive our languishing trade, and our position as a trading country in the future, a few words on the subjects, and their relation to architects, will not be out of place. In an interesting article on the retrograde movements in British trade, Mr. Edmund Ashworth, of Bolton, states that the falling off in British exports for the four years following 1873 equalled the enormous sum of 158,264,051*l*. This result he clearly proves to be principally owing to foreign competition, and it is palpable that if foreigners can and do obtain all the latest improved machinery, our success in competition will depend upon the superior physique and energy of our working population. We have certainly the advantage of a more temperate climate than the Continentals, and a more bracing and invigorating atmosphere, but the latter advantage may be rendered nugatory by allowing the working population to breathe impure air, deteriorating the physique, and rendering them incapable of procreating healthy offsprings. Mr. Fergus Ferguson, surgeon, stated that the number of children of thirteen years physically unfit for work goes on increasing year by year; he also stated that the physical vigour of the factory operatives had deteriorated during the last fourteen years. The ill-ventilated dwellings and schools contribute the first elements of disease, and the ill-ventilated workshops complete the quota of the necessary requisites to break up the constitution. Pulmonary consumption is the commonest form in which the disease exhibits itself. Mr. Collins, analytical chemist, had kindly allowed him to make use of some recent analyses he has made in the neighbourhood of a manufacturing town: Atmosphere of Public Park, carbonic acid, per cent., 0·039½; oxygen, per cent., 20·97. Sitting-room of dwelling, carbonic acid, per cent., 0·127; oxygen, 20·71. School-room, carbonic acid, 0·203; oxygen, 20·64. Card-room of mill, carbonic acid, 0·211. According to the late Dr. Parkes, the amount of carbonic acid in the air should never be allowed to exceed six volumes in 10,000, and here we have in dwelling, school, and card-room an average of 20 volumes of carbonic acid. The physique of the working population may well deteriorate. According to Mr. Ashworth, the Continentals work 72 hours per week, and we are limited to 56½; so it is clear our working-hours must be increased to enable us to compete with them. But let the dwellings, schools, and workshops be ventilated, and our working population will become more vigorous and energetic, and the longer hours, with good ventilation, will not exhaust them as much as the present working hours, with deficient ventilation. Architects, by the construction of healthy dwellings, schools, and workshops, may thus effect a great and beneficial change in the physical condition of the working population.

IMPROVEMENTS AT FOLKESTONE.

IMPROVEMENTS of an important character are about to be carried out in the neighbourhood of the shore, immediately to the east of Folkestone. A large portion of land on the East Cliff is now in the hands of an association whose engineers are at present engaged in taking levels and laying it out in accordance with designs and plans which have been prepared. In the first instance the site is to be well drained. A fine new road comprised in the scheme will commence at the east end of Radnor Bridge, which was built thirty years ago for the purpose of opening the East Cliff as a building site. The road will be continued through the valley between two of the martello towers, reaching what is well known as the Warren Farm, by a graceful sweep, and bringing into view the prospect across East Wear Bay to Shakspeare Cliff and the Admiralty Pier of Dover, distant about four miles. The sea side of the road will not be occupied by buildings, but left open, and at various points ornamented by shrubberies, exposing the bay to view as a picturesque adjunct. Passing to the right of Warren Farm, the road will skirt the "Fan" and shortly after reach the Dover-road. There are 1,000 building plots of moderate size included in the plan, 100 of which are already taken, and the whole of the capital for purchasing the estate is subscribed.

VERY SMART!

SIR,—We think, in the interest of the architectural profession, the following facts ought to be made known:—

The committee of visitors of the County Lunatic Asylum, Lancaster, having advertised for an architect, &c., to examine and complete plans, &c. (see advertisement in the *Builder* of November 30th), received, we understand, 140 applications for the appointment, out of which number the following five were selected, four being architects, and one a clerk of works:—

1. Adams & Kelly, architects, 20, Park-row, Leeds.
2. R. Calvert, architect, Bradford.
3. Hetherington & Oliver, architects, Carlisle.
4. — Kershaw, clerk of works at Wadsley Asylum, near Sheffield.
5. Wm. Perkin & Sons, architects, East-parade, Leeds.

The five selected were requested to meet the committee of visitors at the Asylum on Tuesday, the 19th inst., and,—would you credit it?—on the day previous to the meeting of the committee, one of the five selected, after having travelled from Sheffield to Lancaster, actually went up to the asylum with a finished elevation of the proposed new buildings (although none were required or asked for) to show to the officers, after

which he accepted the hospitality of the asylum, and remained there all night as a guest, and on the arrival of the other four selected gentlemen, he told them what he had been doing, and where he had been staying all night; in fact, he was in possession of all information possible.

The estimated cost, we understand, will be about 60,000*l.* TWO ARCHITECTS.

A CUBIC YARD.

REFERRING to a letter written by "Engineer," in your issue of the 14th inst., I beg to state that in the engineering profession a cubic yard of any material implies standard measure, which is equivalent to about 21 bushels. As regards the decrease in the volume of sand and gravel, Pasley states that the former will occupy only four-fifths of the space which it did when dry. The decrease in volume depends, in is great measure, on the size of the stones and grains of sand. If the grains are about 100th of an inch in diameter, sand will decrease when wetted to the extent of nearly one-third of its bulk. C. GRAHAM SMITH.

BUILDERS' ACCOUNTS.

SIR,—The way out of the difficulty suggested by your correspondent, "A Builder's Surveyor," is the following: -Have quantities supplied for every job, and priced bills sealed up and deposited by the builder who does the work on signing the contract, and introduce a clause in the specification that all extras and omissions shall be valued by them. They should be of course tested, and that there may be no debating with respect to items not in the original, have an agreement that all such shall be valued by the Government schedules or recognised price-books, with or without a certain per-centage on or off. There need be no embarassment in settling accounts if proper arrangements are made *before* the work is begun.

THOS. ED. KNIGHTLEY.

"INDIAN BUG."

SIR,—I would be glad if some readers of your paper would let me know the effect this insect would have upon the timbers of an ordinary dwelling-house, and if it would eventually destroy the strength of joists, roof, &c., and if there is any possible way of eradicating it or stopping its progress. J. S.

CHURCH-BUILDING NEWS.

South Lambeth.—All Saints' Church, South Lambeth, was opened by the Bishop of Rochester, on the 4th inst. The accommodation is for 800 worshippers. In plan, the church consists of a nave, 92 ft. 6 in. long, 25 ft. wide, and 36 ft. high to the plate level of the roof; chancel 31 ft. long, 20 ft. wide, and 48 ft. high to the ridge; also north and south aisle, 13 ft. 3 in. wide. On the south side of the chancel are the vestries, and on the north side the organ-chamber. The tower stands at the south-west angle. The lower stage is the only portion at present carried up. The design shows a lofty tower and spire, and it is hoped shortly to be able to complete this portion of the building, and provide a peal of seven bells. The total height of the tower and spire when completed will be nearly 170 ft. At the western end of the north aisle is a baptistery. The style adopted by the architect partakes of the characteristics of the thirteenth century. The walls externally are of Kentish rag, with dressings of Bath stone, red Mansfield stone being adopted for the shafts of the west entrance doorway and chancel arch. Internally, the walls are faced with picked stock bricks, neatly tuck-pointed, with horizontal bands running round the walls, of red bricks, as are also the drop arches over the windows. The piers and arches of the nave arcade are of Portland and Bath stone, the bosses at the intersection of the hood-mould exhibit excellent specimens of carving, executed by Mr. Searle. The chancel is apsidal on plan, and there are five single-light windows, with traceried heads, completed internally with shafts, foliage cap, and moulded bases. Three of these windows, and the heads of the remaining two are already filled with painted glass, executed by Messrs. Lavers, Barraud, & Westlake. The baptistery window (two lights) is also filled with painted glass, designed and executed by the same firm. The other windows generally are glazed with cathedral glass. The roofs are open-timbered throughout and boarded. The work has been satisfactorily carried out by Messrs. Lucas Brothers, the well-known contractors. The whole of the polished pitch-pine choir-stalls and pewing has been, through the architect, presented to the vicar by Messrs. Lucas. It should also be noted that the stone carving internally is also the gift of the contractors. The altar-rail was supplied by Messrs. Hart, Son, & Peard. The architect is Mr. Bedborough.

Lewisham.—The memorial stone of the new Church of St. George, Perry-hill, Lewisham, Kent, which was commenced some four months ago, has been laid by Mrs. George Parker. The church is intended to seat 600 persons, and will consist of a nave 85 ft. by 27 ft. 6 in. wide, with clearstory and aisles on the north and south sides, divided by Mansfield stone pier columns, with carved capitals and moulded arches. It will have as a special feature a spacious apsidal baptistery at the west end of the nave, with an open vestibule on each side leading to inner and outer porches. The vestibules and baptistery communicate with the nave and aisles by five moulded arches. The pulpit is to be on the north side of the nave, and the lectern on the south side. The chancel, which will be 40 ft. long, and the same width as the nave, will be approached therefrom by three steps, with four additional steps to the sacrarium. It is apsidal on plan, and is to have a timber-vaulted roof, supported by marble shafts. The vestries for the clergy and choir will be on the south side of the chancel, with communications into the church from the chancel and south aisle. On the north side is the organ-chamber, with furnace-room beneath, and tower rising above it to a height of about 70 ft. The walls will be faced with Kentish rag in horizontal drop courses, the dressings being in Bath stone. The style is Decorated. The entire cost will be defrayed by Mr. George Parker, J.P., of Lewisham House, and, when completed according to the present contract, will amount to 8,000*l.* The architect is Mr. William C. Banks, and the contractor is Mr. B. E. Nightingale.

Jersey.—The old Church of St. Martin's, Jersey, has been undergoing restoration for some time past, and the work is now on the eve of completion. On plan the church consists of nave and chancel, with their respective south aisle and north transept. Some of the building is perhaps of very early work, but the major portion is Decorated. The tower is Early English, and the belfry windows are single-light lancet-headed ones. The tower is graceful, but not lofty, bearing more resemblance to the few examples one meets with in the West country, than to the lofty and more beautiful ones of Northamptonshire and the Midland counties. This remark applies equally to all the spires in the Channel Isles. The upper part of this spire was struck by lightning some thirty-seven years ago, and rebuilt soon afterwards from 10 ft. below the apex stone. At present, the whole of it is covered with rough-cast. The church is built, in the main, of a warm pinky-toned granite, and covered in by red tiles. Its walls are supported by numerous exceedingly massive buttresses, reminding one, by their bulky proportions, of those at the angles of the tower at Malines. The present Seigneur of Rozel is the Rev. William Lemprière, at whose cost the restoration in the chancel is being defrayed. The dressings, like the walling of the building, being all of granite, there is necessarily a lack generally of delicate detail; but upon the eastern windows the labels are ornamented by crockets, and in other parts of the church thoughtful fourteenth-century bits occur. The interior of the edifice presents all the characteristics of a Jersey church. The roofs are of no great altitude, and are, like most of the others on the island, stone-groined and bomb-proof: hence an idea of great strength and solidity is conveyed. The east window contains a painted subject by Messrs. Ward & Hughes. It represents the Ascension. Beneath this window is a rerndos, by Hems, of Exeter, boldly designed, in character with the surroundings. It is, in the main, of Portland and Caen stone. The sanctuary and approaches, and avenues generally, are laid with encaustic tiles by Godwin, of Lugwardine. The chancel-stalls have been designed, as also has the reredos and the rest of the chancel fittings, by Messrs. J. Hayward & Son, architects, Exeter; and the whole have been carried out by Mr. Harry Hems. The chancel-aisle floor runs at the same level as the nave, the difference in height being taken off by Mr. Hayward's management of the parclose. The seats in this aisle have been arranged by the architect for the restoration of the rest of the church,—Mr. Le Seur, of St. Heliers, Jersey,—to face *westward*. The pulpit stands at the south-east side of the south aisle, and, as the chancel-aisle is a long one, about forty benches would, under the usual arrangement, face away from the pulpit. To meet this congregational difficulty Mr. Le Seur has adopted the expedient of turning the whole of these benches round.

Stourton.—Stourton Church has been re-opened, after restoration and enlargement. The church is of Decorated and Perpendicular work. In plan it consists of a western tower, nave, north and south aisles, chancel, organ-chamber, and vestry. The south and eastern walls of the chancel and the vestry, &c., are entirely new. The western gallery has been cleared away, and the tower arch brought out. The nave remains much as before. A new tower-screen, of English oak, has been erected. Another new feature is the pulpit. It stands on the north side, upon a carved stone base; it is octagonal, and of oak, panelled, moulded, and carved. The new font is fixed towards the western end of the north aisle, raised upon a bold step of Forest of Dean stone. It is octagonal in plan, and made in the main of finely-grained Corsham stone. The east window is by Mr. Daniel Bell, of London, and represents the King of Kings, the supporters being figures of St. Peter and St. Paul. Beneath is a reredos of oak, gabled, and rich in moulding and carved detail. The doors are all of oak; the wrought-iron fittings being by Mr. Collins, of Warminster. The stone and wood carving throughout is by Mr. Harry Hems, to whom was entrusted the making and fixing of the font and its cover. The contractor for the works generally was Mr. Joseph Gaisford, builder, of Warminster. The whole of the restoration has been carried out from the designs and under the superintendence of Mr. Edward Swinfen-Harris, jun., architect.

Chelsea.—The parish church (St. Jude's) has just been provided with new pitch-pine open seats and a new pulpit, at the sole cost of the vicar, the Rev. W. H. Dalton. The seats supersede the flimsy high-backed painted deal framework of fifty years ago. The fronts of the seats and the pulpit are richly carved. The pulpit, which is hexagonal on plan, has inlaid panels of oak, walnut, and ebony parqueterie. The work has been carried out by Messrs. Richardson & Balcombe, from the designs of Mr. E. H. Lingen-Barker, architect.

DISSENTING CHURCH-BUILDING NEWS.

Poole.—A new Wesleyan chapel is in course of erection here. The site, the freehold of which was given by Sir Ivor Guest, is in the High-street. The chapel is designed to seat 950 persons, and will be Gothic in style, built of Swanage rag and Bath stone. There will be a tower and spire at the angle of Chapel-lane, rising about 100 ft. The architect is Mr. Charles Bell, and the builder Mr. S. Clarke, of Parkstone, Poole, whose contract amounts to about 4,000*l.*

Ottery St. Mary.—A new Baptist chapel has been opened at Ottery St. Mary, Devon. It has been erected by Mr. Edward Carnall, of Exeter, from the designs of Messrs. Packham & Croote, architects, Exeter. The contract amounted to between 500*l.* and 600*l.*

Perth.—A new church for the North U. P. congregation, Perth, is about to be erected from a design prepared by Mr. T. L. Watson, architect, Glasgow, and selected in competition with a large number of other designs, in pursuance of a report made by Mr. J. Dick Peddie, architect, Edinburgh, who acted as professional adviser to the building committee. The new building will be Italian in character, and will accommodate 710 persons in the area, and 495 in the gallery. Special attention is paid in the plans to acoustics, the floor being set out on the curve named by Mr. Scott Russell the "isa-coustic." The estimated cost is 7,000*l.*

Lightning Rod Conference.—The Council of the Institute of Architects have appointed two of their members to meet delegates from several scientific societies, in order to confer as to the best methods of protecting buildings from lightning, and, in accordance with a resolution of that Conference the Council are circulating a series of questions, in order to obtain a body of information on the subject, the result of actual experience.

Books Received.

Æsthetics. By EUGÈNE VÉRON. Translated by W. H. Armstrong, B.A. London: Chapman & Hall.

MESSRS. REINWALD & Co., of Paris, are publishing a series of works on the sciences of the day, treated popularly by good hands, and Messrs. Chapman & Hall have made arrangements to present the various volumes composing it in a thoroughly English dress to the reading public of this country. Several volumes have been already issued by them. The last is an English version of M. Eugène Véron's work on Æsthetics, a thoughtful and interesting book, though we may differ from the author of it on many points. Before long we will make it the subject of an article.

Pleasant Days in Pleasant Places. By EDWARD WALFORD, M.A. London: Hardwicke & Bogue.

THIS is the last addition to "Bogue's Half-hour Volumes," and a very agreeable addition too. It will not tax the reader's powers of attention any more than Mr. Walford has taxed himself in producing the sketches which compose the volume; but the various places visited are brought pleasantly to the mind, and the chief points of interest concerning them are hinted at and suggested rather than detailed.

Hudson & Kearns' Diaries and Account-Books.

WE have received copies of this firm's Diaries and Account-Books (Southwark-street) for Architects and Builders, and are able to say that they present considerable claims for public favour. The novel and valuable feature of these diaries is, that each volume forms in itself a complete set of books for the year, while the various editions are adapted to meet the requirements of all classes. Two, for example, Nos. 9 and 10, are intended for universal use, Nos. 12 and 13 are ruled and printed especially for the use of architects and surveyors, but would be very serviceable for all engaged in business; for they comprise amongst other things a diary, a note-book, a cash-book, and a ledger; the whole being paged and indexed, so that reference may be immediately made to any particular name or transaction. No. 11 is prepared for the use of builders and contractors, and contains a large number of very useful tables for all engaged in the various branches of the building trade. Considering that they are strongly bound, and that the paper is of unusual goodness, their prices are moderate, ranging from 2s. 6d. to 6s. Amongst the general information is a useful epitome of the Weights and Measures Act that comes into operation on the 1st of January next, and a notice of some new regulations as to bills of sale, &c. The Patent Diary Blotting-pad combines, as the name implies, two serviceable things.

VARIORUM.

THE *Zeitschrift für Baukunde*, "Organ of the Associations of Architects and Civil Engineers of Bavaria, Würtemberg, Baden, &c." (the first number of which we have received), is a new periodical, the title of which explains its aims. It is to be the record for those associations of Southern and Western Germany, and will take rank among the many high-class publications of Germany. Its contents are of a nature to satisfy the requirements of men who see further than the ends of their noses. It is published by Theodor Ackermann, of Munich, and numbers among its contributors some well-known eminent architects and engineers. ——"The Professional Papers on Indian Engineering" (No. 30, Vol. VII.), edited by Major A. M. Brandreth, R.E., includes some useful practical papers, notably one on Limes and Cements, by Mr. P. Dejoux, and an account of the Goon Concrete Bridge, Dalhousie and Lunsu Road. These papers are published quarterly at the Thomason College Press, Roorkee. —— "The British Almanack and Companion for 1879" does not give the same attention to architectural works and metropolitan improvements as its predecessors have done; a slight general sketch taking the place of the more minute review heretofore given. In other respects it holds its own. The weightiest paper is one by John Plummer on "The War Industries of the United Kingdom."——"The Professional Pocket-Book," 1879 (Waterlow), admits the entry of engagements for every hour in the day, from eight in the morning till nine at night.

Miscellanea.

Science Teaching in Elementary Schools. At a meeting of the Society of Arts, held on the 18th inst., under the presidency of Dr. Mann, Dr. J. H. Gladstone, F.R.S., read a paper on "Science Teaching in Elementary Schools." The science teaching which the paper advocated was not what is understood by that term at South Kensington or the Universities, but merely instruction in the common facts and common modes of nature. For this kind of teaching, which stands in much the same relation to natural science as the reading lessons and grammar do to literature, or arithmetic to mathematics, Dr. Gladstone claimed a place in the education of every child on two distinct grounds,—the usefulness of the knowledge conveyed, and its value in training the mind. In carrying out any such plan of instruction in the common facts of nature it should be, as far as possible, within the scope of the child's experience, experimentally illustrated, continuous throughout the various classes, and having reference to practical life. Dr. Gladstone hoped that the Education Department would see its way to give some encouragement to systematised object-lessons, especially in the lower standards. One means of doing this would be to adopt the plan which had been brought forward by Sir John Lubbock in Parliament, —that the "knowledge of common things" should take its place among the class subjects in the second and third standards. A discussion, in which the chairman, Mr. J. G. Fitch, inspector of schools, Mr. G. C. T. Bartley, Professor Tennant, and others, took part, followed the reading of the paper.

Culture in Athens.—An eminent inhabitant of Athens, writing with reference to the paper on a National Theatre which appeared in our columns, says,—I shall take the liberty of reproducing parts of it in the Greek press, and nothing could give me greater pleasure than to stimulate in this way the Athenian people to finish *their* National Theatre, which was begun some six years ago, but left unfinished. I have great hopes to do something in this way when the new provinces are annexed, because it is impossible that Athens, the cradle of civilisation, should remain without a theatre worthy its name. The modern Greeks are very clever, and are susceptible of the highest culture; all they want is encouragement. If Greece were situated like Italy, and thus on the highway of travellers, you would find the people again excelling all other nations in fine arts and in many branches of science. Nay, it is wonderful to see boys in shops, and even servants, who, getting tired of their manual work, employ their small evenings in the study of classics, and are in a few months' time able to understand Thucydides. But the evil side of this again is, that there are too many scholars and too few agriculturists in Greece. However, the new provinces will offer a fair outlet for doctors, lawyers, and professors.

Anticipated Strike of 100,000 Colliers.—An extensive strike is threatened by the miners in South and West Yorkshire and North Derbyshire. The masters a few days ago gave notice of a further reduction of 12½ per cent. in the wages, and this caused considerable alarm amongst the men, who, in 1874, when the prices began to fall, stipulated with the masters that the reductions should not go beyond the amount that the men had gained in advances. The reduction of which notice is now given is stated to be a violation of that stipulation, but the masters contend that the state of trade renders it impossible for them to avoid the course upon which they have decided. The notices have already been served at some pits, and this fact has induced the belief that the masters, instead of relying on concerted action, have determined to issue notices of the reduction at individual pits. To circumvent the coalowners the men have decided to withdraw from the pits in a body. The South Yorkshire and West Yorkshire Unions propose to unite for this purpose, and if they carry out their intention, it is thought that at least 100,000 miners will strike at the commencement of the New Year.

Buckfastleigh. — A three-light stained-glass window, by Messrs. Beer & Driffield, of Exeter, has been erected in the south transept of Buckfastleigh Church, to the memory of the late Mr. William Ellis, of Arislade, in Dean Prior, the subject being "The Presentation in the Temple."

Battersea and Albert Bridges.—On the 18th inst., at the Middlesex Sheriff's Court, Red Lion-square, Mr. Joseph Brown, Q.C., as assessor, presided over a special jury summoned in the case of "The Albert Bridge Company *v.* The Metropolitan Board of Works," to assess the amount to be given under the Metropolitan Bridge Act of 1877 to the Battersea and Albert Bridges Company for the purpose of freeing the same for the public benefit. As the company required a special jury to be summoned, the usual warrant was issued by the Metropolitan Board of Works. The amount claimed by the company was 300,000*l.* Eleven jurors assembled, and a pause occurred in the commencement of the proceedings, and counsel were some time engaged in consultation. Subsequently Sir H. James (who appeared for the Board) informed the Court that by an arrangement with his learned friends who appeared for the claimants the jury would be spared a long inquiry into the matter, and the case would now go before another tribunal accustomed to such matters. Mr. Pope, Q.C., on behalf of the company, said it had been agreed between the parties that the best course would be for the case to be determined by arbitration, with the appointment of an umpire. There would be an inquiry into the substantiality of the structures and other matters, which would be better ascertained by the tribunal he had mentioned; better also for the public, and for the parties engaged. The agreement was that the jury would be discharged, but with the understanding that the parties had no idea that they could not have proceeded with the inquiry, but from the fact that large figures were involved, and a court was not the best place for such matters, and that a room with arbitrators and gentlemen conversant with them would be the best not only for the parties, but the public who were interested in the purchase of the bridge. The learned assessor told the jury that he thought the course suggested was the best for all parties. The jury was therefore discharged.

Churches on Fire.—St. George's Church, near Bristol, was totally destroyed by fire early on Sunday morning. The cause assigned is the over-heating of a gas-stove. The building was entirely gutted. The vicarage was only slightly damaged. The church has recently been restored. A wedding took place in the ruined porch a few hours after the fire!——On Monday morning, at two o'clock, the roof of the Protestant parochial church of St. Nicholas, Galway, was discovered to be on fire. The fire originated in a burning chimney, which also communicated the flames to the adjoining roof of Lynch's Chapel. The 68th Brigade Depôt, with the aid of a powerful engine, confined the fire to the church roof, which soon fell in. The fire was shortly afterwards extinguished. The church is fully insured. St. Nicholas Church was built in 1320, and is described as one of the stateliest ecclesiastical edifices in Ireland. The number of churches recently destroyed or damaged by fire suggests the desirability of periodical surveys of flues and heating apparatus.

Compensation Case. — At the Surrey Sheriffs' Court, Mr. Under-Sheriff Abbott presided over a special jury, in the case of "Kellaway *v.* The Metropolitan Board of Works," which was a compensation claim for upwards of 2,000*l.* for some leasehold premises, No. 51, Church-street, Camberwell, required to widen the thoroughfare as a public improvement. Mr. Kemp, Q.C., and Mr. M'Millan were for the claimant, an undertaker and general contractor for building purposes; Mr. Philbrick, Q.C., and Mr. Cripps, were for the Metropolitan Board. In 1869 a lease was granted for twenty-one years at 50*l.* a year, and was now said to be worth 95*l.* a year by one surveyor, 100*l.* by another, and 105*l.* by a third. On behalf of the Board the annual value was put at 65*l.* The net profits were about 400*l.* a year for the last three years, and 1,200*l.* was asked, at the rate of three years' purchase. The jury assessed the compensation at 900*l.*

Technical Classes for carpenters and joiners, bricklayers, tin-plate and zinc-workers, and for modellers, have been re-opened at the Artisans' Institute, St. Martin's-lane. The principal, Mr. G. Gray, C.E., proposes to admit apprentices free of charge, when nominated by their employers. Mr. T. Twining's course, "Science made Easy," will commence at the Institute on the 9th of January. To those (attending the lectures) who answer a fair proportion of the questions, money prizes and certificates will be granted.

Straps of Sheep's Guts.—Straps are now being made from sheep's guts, in the following manner. The guts, which, as we all know, are about 50 ft. long, are well cleaned, and put for a few days into salt and water. They are then not thicker than ordinary cotton-yarn, but are capable of resisting a strain of over 10lb., and are wound, like yarn, on bobbins. If round straps are to be made of them, the procedure is the same as in the manufacture of ordinary rope; but if broad, flat straps are required, they must be woven on a loom, always five skeins together, as in ribbon-weaving. Flat straps may be made any size; the round ones hitherto produced have a diameter of from 0·06 in. to 1·6 in. Round straps have the appearance either of smooth rope or of rope of three to five skeins.—*Jahresbericht des Stuttgarter Gewerbevereins.*

The late Mr. E. T. Stevens, F.S.A., of Salisbury.—The lamented death, after a prolonged and severe illness, of Mr. Edward T. Stevens, F.S.A., honorary curator and trustee of the Blackmore Museum, author of "Flint Chips," and other archæological works, took place at Salisbury on the 18th of August last. In him archæology has lost one of its most enthusiastic and enlightened workers. Mr. Stevens's name must be favourably known to a wide circle, but it may not be so generally known that he who had devoted so much of his time and energies to the public good, died a poor man, the sale of his property after his death not having fully satisfied the claims of his creditors. An appeal is now being made to all students of prehistoric archæology for a substantial recognition of his services.

Schools, Clee-with-Weelsby. — New schools for the Clee-with-Weelsby School Board have been opened. They accommodate 525 children,—boys, girls, and infants,—in separate departments. The rooms are all on the ground floor, and have each two class-rooms and teachers' room. There is also a board-room. The playgrounds are asphalted. The schools are raised on a terrace 3 ft. above the ground line, and are built in a simple Gothic style, of red local bricks. The main windows are of stone. The warming is by Shillito & Co.'s patent grates. The builder is Mr. C. P. Topham, of Grimsby, and the architect is Mr. Charles Bell.

Electricity as a Motive Power.—In the course of a lecture on electricity delivered by Mr. Gerard Finch, M.A., in connexion with the Wigan Mining and Mechanical School last week, a novel illustration was given of electricity performing mechanical work. A saw-bench was placed on a platform connected with a Siemens dynamo-electric machine, which in its turn was connected by wires with the machine outside the hall used for producing the electric light during the lecture. On the electricity being communicated the saw was set in motion, and timber up to 5 in. in thickness was cut into strips.

Drawing in France.—According to the *Academy*, the French Chamber have voted a grant of 51,000 fr. for the purpose of creating a Government inspection of drawing in the seventeen universities. We have before stated that instruction in drawing has been lately rendered compulsory in France.

Mr. Joseph Nash.—We hear with regret of the death of Mr. Joseph Nash, the water-colour painter, at the age of 71. He commenced exhibiting at the Old Society of Painters in Water-Colours in 1835, showing drawings of French cathedrals and antiquities. In 1838 was published "Architecture of the Middle Ages," with illustrations from his pencil, and between 1839-1849 appeared "Mansions of England in the Olden Time," in four series, Mr. Nash's interiors, &c., being lithographed. Among Mr. Nash's pictures were "The Queen's Visit to Lincoln's-inn Hall," exhibited in 1846; "Interior Views of the Great Exhibition in 1851," "Charles V. visiting Francis I. during his Confinement," shown at the Water-Colour Society's exhibition in 1865, and "The Chapel of Edward the Confessor in Westminster Abbey," shown at the same place in 1866. Some good specimens of his work will be found in the South Kensington Museum.

TENDERS

For supplying and laying about eight miles of cast-iron water mains, 6, 4, 3, and 2 in., with meters, sluice, air, and reflux valves, hydrants, expan-ion joints, and all other necessary appurtenances, in connexion with new works for the water supply of Washington, Usworth, and Barmston townships, in the county of Durham, for the Chester-le-Street Union Rural Sanitary Authority. Mr. D. Balfour, C.E., engineer. Quantities supplied:—

Lane	£4,835	0	0
Carrick	4,353	0	0
Steuart & Creber	3,919	0	0
Woodhave	3,895	0	0
Charlton & Co.	3,802	0	0
Waddell	3,800	0	0
Bartley Iron Company	3,771	0	0
Bell	3,768	0	0
Prior	3,678	0	0
Dodds	3,647	0	0
Hatton & Dowell (corrected)	3,627	0	0
Pickthall & Sons	3,601	0	0
Geldard	3,532	0	0
Artley	3,463	0	0
Evans Brothers	3,443	0	0
Pattinson & Co.	3,412	0	0
Hunter (accepted)	3,376	0	0
Forster	3,364	0	0

For excavations and foundations to ground-floor level to new premises, Nos. 19, 21, and 23, Ludgate-hill, for Mr. C. Samuel. Messrs. Joseph & Pearson, architects. Quantities not supplied:—

Browne & Robinson	£1,140	0	0
Conder	1,067	0	0
Langmead & Way	1,049	0	0

For the erection of a pair of semi-detached residences at Rushem-road, Nightingale-lane, Wandsworth, for Mr. J. K. Farlow. Mr. F. C. Notley, architect:—

Fitness & Sons	£3,000	0	0
Hayworth	2,885	0	0
R. & E. Smith	2,743	0	0
Tarrant & Sons	2,605	0	0
S. & G. L. Manu	2,550	0	0

For the erection of chancel and vestry to the Church of St. Swithin's, in the city of Lincoln. Mr. James Fowler, architect:—

Pattinson	£3,012	0	0
Otter & Elsey	2,840	0	0
Thompson	2,800	0	0
Greenham	2,689	0	0
Close	2,654	0	0
Rudd & Son	2,585	0	0
Cornish & Gaymer	2,530	0	0
Walter & Hensman	2,545	0	0
Burton	2,396	0	0
Baines	2,380	0	0

For pair of semi-detached villa residences in West Green-road, Seven Sisters, Tottenham, for Mr. Spencer Wm. Grant:—

Mattock Bros.	£2,073	0	0
McCowan	1,762	0	0
Pocock	1,750	0	0
White	1,600	2	0
Noddins (accepted)	1,599	6	10

TO CORRESPONDENTS.

W. C. (we can take no notice of mere general charges. Make a specific statement, and it shall be sifted).—S. W. E (yes; if the subject be approved).—M. T.—E.—S.—R. H.—M. W.—D. C.—E. S.—J. F.—P.—A. & C. H.—C. S.—S. & G. M.—H. N.—M. G.—W. R.—J. W. S.—W. O.—A. A.—D. B.—A. S.—L. W. L.—G. E. S.—H. C. B.—Professor G.—A. M. & Co.—A. P.

We are compelled to decline pointing out books and giving addresses.

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Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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